TITLE: COMPUTERWORLD.

REEL NO: 2 OF 2

VOLUME: 24 ISSUES: 27-53

DATE: JULY 2, 1990 - JANUARY 1, 1991

PUBLICATION NO: 6206.00

NOTES: INCLUDES:
SUPPLEMENT: JAPAN (AUGUST 13)
THE PREMIER 100 (ISSUE 41)
FORECAST 1991 (ISSUE 52/53)

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VOL 24
ISS 27
JL 2 1990
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THE NEWSWEEKLY OF INFORMATION SYSTEMS MANAGEMENT
July 2, 1990 · Vol. XXIV · No. 27 · 80 Pages · $2/Copy · $48/Year

COMPUTERWORLD

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They call it the most significant upgrade ever to CICS, and it shipped last week. Page 8.

'Let's make a deal,' says struggling Western Union as it tries to sell off its E-mail unit. Page 7.

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Anything they can do, we can do, says MCI of its new thrust into data communications. Page 77.

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Turmoil in T1 has users confused about where to put their money next. Page 55.

Apple and DEC were the talk of Dexpo East, but few were listening. Page 14.

DEC spins silk from 9000 snag

IBM-style attention draws buyer applause

BY MARYFRAN JOHNSON
CW STAFF

Bogged down by delays in shipping its first mainframe computer, Digital Equipment Corp. is turning a tough situation to its advantage by coddling its VAX 9000 customers with IBM-like hand-holding and special deals.

Interviews with several customers awaiting VAX 9000 deliveries indicated that DEC is becoming a quick study in the mainframe way of doing business.

"It's been a win-win situation for us," said George Kerns, vice-president of information services at Contel Cellular, Inc. in Atlanta. "I think they really understand what customers are going through. Of course, we wish the 9000 was available earlier, but the delay won't cause us a problem because DEC is providing us with alternative capacity in the interim."

Kerns met with DEC representatives last Friday to work out the logistics of adding a VAX 6000 processor to one of the Vaxclusters running at the fast-growing, $170 million cellular phone company. Contel will not be charged for the loaner machine but will likely be offered

Continued on page 8

Lotus scores copyright win

BY NELL MARGOLIS
CW STAFF

BOSTON — A 110-page federal court ruling late last week handed Lotus Development Corp. an unambiguous victory in its closely watched "look-and-feel" copyright infringement suit against an alleged cloner of 1-2-3. Although industry observers agreed that the decision will have "significant impact on the industry," they differed widely as to who and what will be affected.

In finding for Lotus in its case against Paperback Software International, Inc. of Berkeley, Calif., U.S. District Judge Robert E. Keeton stated that copyright protection applies to the graphics, menus and commands of a software product, as opposed to the product's underlying code.

Judgment day
Highlights of the ruling by Federal District Judge Robert E. Keeton

- ✔ Confirmed "overwhelming and pervasive" copying of 1-2-3's interface by Paperback Software International
- ✔ Ruled that organization of menus and commands can be copyrighted
- ✔ Said individual commands, such as the slash key to invoke a menu, are not copyrightable
- ✔ Indicated that 1-2-3 did not infringe on such earlier spreadsheets as Visicalc

CW Chart: Tom Monahan

Observers agreed that for now, the finding is most important to software developers, who are still wrestling with the problem of what menus and commands they can legitimately borrow from leading software. However, observers said they expect the case to have a long-term impact on the availability of low-cost software look-alikes and will have a major bearing on pending copyright suits involving such firms as Apple Computer, Inc., Microsoft Corp. and

Continued on page 76

Hero of the information age

The Jason Project's *Cathy Offinger accepts a Computerworld Smithsonian Award from Roger Kennedy of The Smithsonian Institution. Jason, which introduced 225,000 children to live undersea exploration, was one of nine award winners honored last week. Page 74.*

Unisys seeks software cure for profit ills

BY ELLIS BOOKER
CW STAFF

BLUE BELL, Pa. — Cost-cutting is the top priority at Unisys Corp., but unifying the software product line, rather than laying off employees, is the way to achieve it, Chief Executive Officer James A. Unruh told *Computerworld* recently.

"My No. 1 priority at the moment is to turn around the financial performance of the company, to get this company back to a profitable position," Unruh said.

However, rather than the draconian staff cuts of last year, when the company eliminated 8,000 jobs, Unruh said that cost savings will come increasingly from economies of scale achieved through common software and hardware components able to run across its product line — from mainframe computers down to Unix-based workstations and servers.

The glue to bind these systems will be the company's fourth-generation computer-aided software engineering products and a commitment to open

Continued on page 6

CA hits Goal with copyright suit, raid

BY JOHANNA AMBROSIO
CW STAFF

HOUSTON — Computer Associates International, Inc. sued systems software rival Goal Systems International, Inc. and one of Goal's developers last week, charging copyright infringement. The suit involves Goal's Jobtrac and Runtrac job scheduling and restart packages, which Goal acquired from an independent company in 1988.

CA filed the suit last Monday in U.S. District Court in the Southern District of Texas. U.S. marshals searched Goal's Houston office Tuesday, shut down the computer system and seized the source code for Jobtrac and Runtrac as evidence in the case. A temporary restraining order bars Goal from selling the products containing the questionable code. CA sells comparable job scheduling products called CA-11 and CA-7.

Whatever happens with the case, Goal will "stand behind our customers," President David Wetmore said. "If it's found that our code is questionable, we will rewrite it and offer the new version to existing customers. If they're not satisfied with it, we will refund their money. We will make things right in whatever way the customer feels is appropriate."

CA's counsel, Stephen D. Kahn, suggested that current Jobtrac and Runtrac customers may not have to give up their products. "CA is conscious of not hurting existing customers," he

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Quotable

"They patch what they have and add homegrown modifications."

DR. LAWRENCE BRENKUS
ARTHUR D. LITTLE

On pharmaceutical companies' lack of innovation in information systems. Page 49.

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IN DEPTH

53 As AD/Cycle creeps closer to reality, user organizations watch and wait. By Hugh Watson.

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It's mid-1990 and still no recession. How 'bout some economist humor to celebrate? "These economists today are really something. They've actually predicted seven of the last two recessions." "Only difference between a dead economist in the road and a dead skunk are the skid marks in front of the skunk." "If you laid all the economists in the country end-to-end, we'd be better off." "A bunch of economists were marching with the army in the Soviet Union's May Day parade. 'What are they doing there?' a bureaucrat asked. A comrade replied, 'They belong with the army. You'd be amazed at the damage they can do.' " Cheers.

Jon Rodriguez

Pharmaceutical industry IS leaders like Glaxo's Joel Dobbs face a huge challenge in trying to cut drugs' time to market with technology. Page 49.

M. E. Cohen

Will AD/Cycle be a shot heard 'round the world — or a blank? Page 53.

EXECUTIVE BRIEFING

■ **Competitive pressures are heating up the profitable pharmaceutical industry,** and firms are looking to information systems for help. Shortening the lengthy product time to market — which includes research and development, clinical and field testing and the FDA approval process — is critical. So far, drug firms have only scratched the surface of IS benefits — long-established procedures and technology limits remain barriers. **Page 49.**

■ **Computer Associates goes on the copyright infringement warpath** against systems software competitor Goal Systems. CA won a restraining order last week preventing Goal from selling Jobtrac and Runtrac, two job scheduling and restart packages. Goal pledged to continue supporting the two products' customers, who number about 200. **Page 1.**

■ **Chargeback is still controversial** and difficult to implement in many IS shops. But new twists on the age-old issue are emerging, including charge rates based on single jobs completed and new competition from outsourcing vendors. **Page 25.**

■ **IBM brought CICS into the 1990s,** starting shipments of the Enterprise Systems Architecture version of the 22-year-old transaction processing operating system. IS managers welcomed the long-awaited version with open arms. **Page 8.**

■ **DEC is making up for the VAX 9000 delay** with special deals, customer handholding and loaner systems while customers wait, VAX users report. DEC appears to be sacrificing short-term revenue for long-term customer loyalty. **Page 1.**

■ **Sovran Financial Corp. will consolidate** four data centers into one and slash its IS operations staff by 50%. The move comes in the wake of the Norfolk, Va.-based banking firm's merger with Citizens & Southern in Atlanta. **Page 7.**

■ **MCI wasted no time in its bid** to become a major data communications firm. The firm claimed it can match AT&T in most data networking services to large customers, such as 45M bit/sec. connections and high-speed switched services. **Page 77.**

■ **A computerized traffic control system** that uses sensors placed in cars was unveiled on a pilot basis in Los Angeles. The $1.8 million Pathfinder project will produce a viability report for the technology in about a year. **Page 12.**

■ **Federal Express' package tracking system** is a testament to the power of belief in an idea, even when the technology to implement it is not yet available. The Cosmos II system earned the company a 1990 *Computerworld Smithsonian Award.* **Page 77.**

■ **Business schools may not be making the grade** in preparing graduates to manage in a rapidly changing business world where information technology plays a big part. **Page 51.**

■ **Most IS organizations have far to go before they** can embrace IBM's AD/Cycle. Many development groups are still in the information-gathering stage, but a solid 25% remain skeptical that the ambitious strategy is more vapor ware than substance. **Page 53.**

■ **On-site this week:** For computer power to fuel its dramatic growth, America West Airlines has grown from PCs to Unisys mainframes to the IBM 3090. Core applications include a large personnel tracking system at the employee-owned airline. **Page 28.** Who says eliminating paper isn't a worthwhile goal? The U.S. Navy intends its PC-based job application system to replace the bulk of 110,000 pounds of civilian job announcement memos per year. The Navy's Crystal City, Va., personnel office begins deploying the new system this week. **Page 35.**

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Suit

FROM PAGE 1

said. The combined Jobtrac/Runtrac customer base numbers around 200.

In fact, odds are that the case will not even come to trial, said Daniel T. Brooks, a Washington attorney who specializes in computer law. "The risk to current users depends on how aggressive CA wants to be. But most of these kinds of cases are settled out of court." In the typical scenario, he added, Goal would make a cash payment to CA and give them some percentage of the royalties from the products.

CA is seeking a permanent injunction against Goal selling the products in question and is asking unspecified monetary damages that will depend on "the sales figures associated with the Goal products," Kahn said.

Wetmore said that Runtrac contributed "under $1 million" in revenue and Jobtrac accounted for approximately $3 million in the most recent fiscal year.

A hearing on CA's motion for a preliminary injunction is scheduled for July 6. In the meantime, Goal has suspended without pay Jerry Bennett, the developer of Jobtrac and Runtrac. Goal acquired the products in November 1988 when it bought J. William Bennett Co. in Houston for $1 million. Bennett and his company are named as defendants in the suit, along with Goal.

Bennett was unavailable for comment, but Wetmore said that to the best of his knowledge, Bennett has never worked directly for CA. However, when the products were developed in late 1987, Bennett was "an independent consultant doing work for a customer who had license to CA products," Wetmore said.

It is not immediately apparent which of the two Goal products contains the questionable code or whether both do. Runtrac has the restart and rerun features said to be at the heart of the case.

Until recently, Runtrac was sold as a component of Jobtrac. In other words, to get Runtrac, a customer needed to have Jobtrac up and running. However, with Version 2.0 of Jobtrac, released about a week before the suit was filed, Runtrac is now a separate package.

Goal is still selling Jobtrac but has suspended all sales of Runtrac.

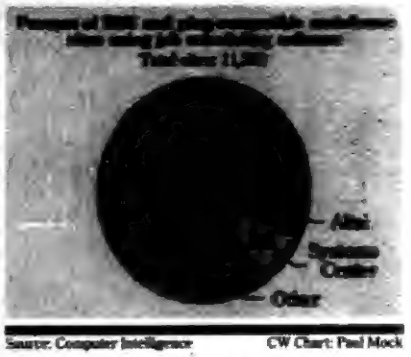
"At this point, we don't know whether the case has any merit," Wetmore said. "We don't have access to our source code or to the Computer Associates source code, and that makes it difficult to find out what's going on." Wetmore said that Goal officials at the Columbus, Ohio, headquarters found out about the suit only after the marshals had concluded their June 26 search.

One observer said that the search procedure was "not uncommon" in such a case. "If you're the plaintiff, you may feel that to give the defendant notice may allow the defendant to destroy evidence," said Barry D. Weiss, an attorney specializing in computer copyright law at the Chicago firm of Neal Gerber & Eisenberg.

The exact legalities surrounding the case are fuzzy, in part because the court documents have been sealed at CA's request. The documents contain "trade secrets that the plaintiff did not want publicly available," Kahn said. He did confirm, however, that the CA complaint includes four counts, the first two of which allege infringement of copyright and misappropriation of trade secrets.

Full schedule

CA's lawsuit involves job scheduling software, a market in which the firm already holds a commanding share



Source: Computer Intelligence — CW Chart: Paul Mock

IBM's low-end swing bids for long home run

BY RICHARD PASTORE
CW STAFF

If IBM's claim is true that the home computer will be the "VCR of the '90s," it remains to be seen whether the new Personal System/1 will be a VHS smash hit or a Betamax sales dog. Analysts are already questioning whether the machine will interest the work-at-home piece of the residential market, which is one of IBM's target segments.

The home office is a significant chunk of the overall residential computing market. "The real driver in home computing is the work-at-home user," said Tom Miller, an analyst at Link Resources Corp. in New York.

"People buying PCs for the home are buying for specific reasons — home office or work-at-home activities and education applications," added Andy Bose, home computing analyst at Link.

Yet, the PS/1 is underpowered for home-office applications such as Microsoft Corp.'s Windows 3.0 and Lotus Development Corp.'s 1-2-3 Release 3.0, according to Leslie Fiering, an analyst at Gartner Group, Inc.

"One megabyte [of memory] is a little low," Fiering said. To get a second megabyte of memory, IBM requires a user to shell out $570 for an expansion chassis and a memory board. That would hike the system cost to the level of an Intel Corp. 80386SX-based clone, which a user might as well buy in the first place, she said.

The total cost of an expanded PS/1 would also exceed the typical home worker's preferred level of investment, which Link pegs at $1,700.

Both IBM business partners and competitors suggest that the home-office segment will not be a big market for the machine. "It's an important component of the market but not the thing that sparks a revolution," said Mike Maples, vice-president of applications at Microsoft, which provided the PS/1 with a bundled version of Microsoft Works.

"The work-at-home market is not going to consider the PS/1 or the Tandy," said Ed Juge, director of marketing at Tandy Corp., which is planning to unveil a similar machine next month. Juge said the home machines would be of most interest to first-time users without serious work-at-home needs.

Analysts agreed. While serious work-at-home users may prefer to buy a $1,500 386SX-based clone, novices will be attracted to the PS/1's distinguishing features such as the built-in modem and Prodigy on-line service, Bose said. Also, ease-of-use features such as the graphical interface — as well as department-store distribution — "will create more home-computing awareness and interest over time."

"The PS/1 will help generate a lot of revenue for IBM," said Sam Albert, an IBM consultant and president of Sam Albert Associates in Scarsdale, N.Y. Albert predicted sales of one million units next year. Other estimates put 1991 sales at 500,000.

IBM already owns 15% of the home market, which Link Resources values at 10% of the $28 billion total U.S. PC market this year. Apple Computer, Inc. leads the pack with more than 23%. Commodore Business Machines, Inc. (19%), IBM and Tandy (11%) round out the top four, according to Dataquest, Inc. in San Jose, Calif.

Mid-Atlantic Senior Correspondent Johanna Ambrosio contributed to this report.

No place like home

IBM is bundling Microsoft Works and Prodigy with its newest "home" computer, the PS/1

IBM PS/1

CPU: 10-MHz Intel 80286

Memory: 512K - 7M bytes

Display: IBM Video Graphics Array monochrome or optional color

Communications: Internal 2,400 bit/sec. modem

Storage: Single disk (30M-byte hard disk optional)

Base prices: $999 and $1,999 (with color monitor and hard disk)

Source: IBM — CW Chart: Doreen Dahle

Madge card gets a case of the jitters

BY JOANIE M. WEXLER
CW STAFF

SAN JOSE, Calif. — Madge Networks, Inc. made a false start last month in shipping its 16M bit/sec. token-ring adapter cards, which it recalled last week because of a jitter problem in networks with more than 20 nodes, said Ed Murray, director of North American operations.

The company shipped about 2,000 of its Smart 16/4 Ringnodes, which connect computers to a token-ring local-area network, before discovering the problem. Madge said that all but 200 have been reclaimed.

Murray said that the recall probably affects between 500 and 1,000 customers.

The vendor cited a shortcoming in Texas Instruments, Inc.'s Falcon ring-interface chip as the jitter-causing culprit.

TI had identified a problem with the previous version of the chip running at 4M bit/sec. before release and had corrected it "in a new round of silicon" that was incorporated into Madge 16/4 products, Murray said. He said that Madge did not test the 16/4 cards in an actual 250-station network before shipping.

Madge and TI are currently "doing a whole lot of testing" to rectify the problem but cannot give a date when the boards will be reissued, Murray said.

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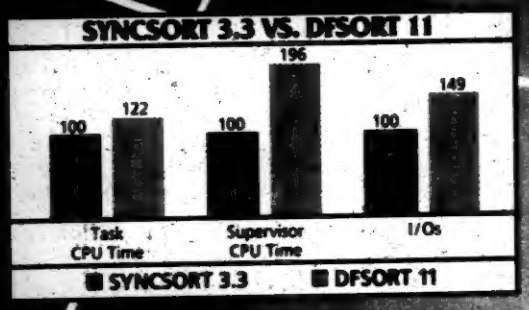

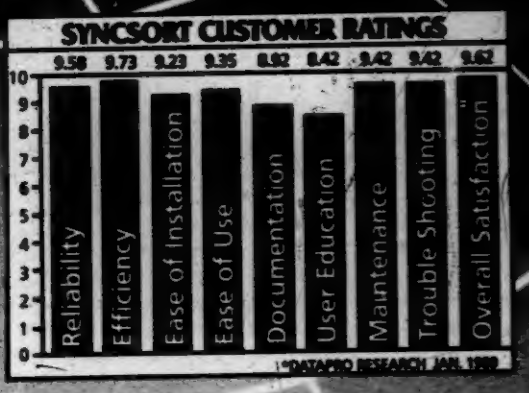

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NEWS SHORTS

Data center analysis service bows

Compass America, Inc., based in Herndon, Va., introduced a service designed to give corporate executives an objective statistical analysis of the unit costs of running a data center. The analysis — useful for making decisions about outsourcing — compares the client's data center with a reference group of efficient data centers and identifies areas for cost reductions. The service costs $30,000 to $100,000.

Puette to head Apple USA

Apple Computer, Inc. plucked a key employee from a competitor last week when it named a 24-year veteran of Hewlett-Packard Co. to lead Apple's domestic sales division. Robert Puette, former general manager of HP's personal computer group, will take over today as president of Apple USA, which has been struggling after a period of managerial turmoil and weak revenue growth. Allan Loren resigned from the position in January as part of a management overhaul. The job had been filled on an interim basis by Chief Operating Officer Michael Spindler.

Apple's Puette

Oracle offers Datalens

Oracle Systems Corp. last week announced a database management system interface for Digital Equipment Corp. VMS users running Lotus Development Corp. 1-2-3. The Oracle for 1-2-3 Datalens gives Lotus users on VAX/VMS systems full read-write access to Oracle data without leaving their Lotus screens. Users can query and modify Oracle data as well as perform complex SQL operations from within 1-2-3 applications, according to Oracle. The new product will be sold and supported by Oracle at prices ranging from $500 to $30,000.

DEX extends ISO support

Digital Equipment Corp. expanded its support of standards-based factory communications last week by introducing DEC/Omni/VMS network interface, which is said to support communications between VAX/VMS systems and shop-floor devices via the International Standards Organization's Manufacturing Message Specification (MMS). Applications written to the interface will be able to communicate using either the final ISO version of MMS or the earlier Manufacturing Automation Protocol Version 3.0.

DEC, AMS sign pact

DEC last week announced an agreement to market 20-year-old American Management Systems, Inc.'s (AMS) government financial management software on DEC's VAX line of computer systems — including its new VAX 9000 mainframe line. Through the agreement, Arlington, Va.-based AMS will offer its Government Financial System and Local Government Financial System products to DEC's customers.

IS layoffs at Chicago bank

Continental Bank Corp. laid off 56 employees from its information technology services department last week. The bank said the employees supported Continental's futures and options execution-and-clearing business, which the Chicago-based bank disbanded. Continental said it is providing the former employees with severance packages and outplacement counseling.

HP adds high-end PC

HP unveiled a 25-MHz Intel Corp. 80386-based PC that offers 32K bytes of cache memory and Super Video Graphics Array capability. The Vectra 386/25 is intended for spreadsheet analysis, computer-aided design applications and multiuser/local-area network configurations. Hard disk options range from 42M to 340M bytes. Prices range from $5,400 to $8,000.

More news shorts on page 76

Unisys

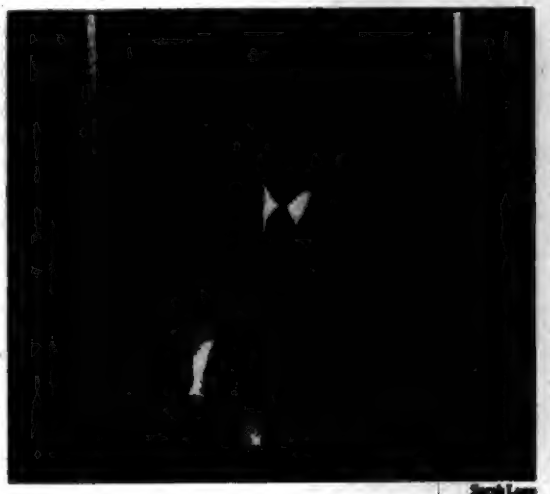
FROM PAGE 1

systems architectures and industry communications standards.

However, the plan will not include a unification of the two incompatible mainframe product lines — the 2200 and the A series, which evolved from the Sperry Corp. and Burroughs Corp. sides of the house, respectively.

"You don't drive the A series and the 2200 series together in terms of the operating system," Unruh said, "because that's what customers have written their application around, and there are huge investments out there that we have to protect for them."

When Sperry and Burroughs merged to form Unisys in 1986, they took on the job of bringing together several computing systems, an effort that observers have noted has proven more difficult than anticipated.



Sarah Leen

Unisys' Unruh *has no plans for hardware merger*

Unisys hopes to clear the air this fall, however, when it describes a set of formal software and communications standards to work across all its platforms.

Company officials outlined plans to use X/Open Consortium Ltd.'s X/Open standards for applications development and communications as the basis of a unified standards set, which will also include support for such de facto standards as IBM's Systems Network Architecture.

In addition, the architecture will emphasize the mainframe as an on-line transaction processing (OLTP) engine able to process thousands of transactions per second.

According to Scott Silk, Unisys' director of fourth-generation language (4GL) marketing and business development, Mapper — Sperry's end-user 4GL — and Linc — Burroughs' CASE development system for information systems shops — are finally working in tandem.

Silk said the first objective was to find ways to first integrate the systems and then expand their reach.

The first phase of the work is complete, he said. Linc II can take a single application specification and compile it on either a 2200 or an A series mainframe.

Meanwhile, Mapper has been ported to Unisys' U6000 Unix workstation line, and Unisys executives have promised ports to non-Unisys Unix boxes in the near future. A Unix implementation of Linc is also planned for later this year, Unisys officials said.

At the same time, Ally — a 4GL tool for Unix, OS/2, MS-DOS and Unisys CTOS platforms — is being resuscitated and positioned as the primary 4GL for Unisys' OLTP computing platforms. Ally provides access to multiple databases and applications, including Unisys and third-party development languages and databases.

Last year, Unisys posted a $639.3 million loss, the worst since the company's creation in mid-1986 with the merger of Burroughs and Sperry. In response, Unisys underwent a wrenching 8,000-person staff cut. Unruh would not disavow further staff reductions or asset sales to reach the $10 billion company's stated goal of a $600 million to $800 million debt reduction by year's end. "In a sense, we have to restructure a little bit every day," he said.

Last week, Unisys sold $140 million of preferred stock to Mitsui & Co., a Japanese trading company that is a partial owner of Unisys' operation in Japan. Unisys also received a $50 million, five-year loan from Mitsui.

Regarding the outlook for the remainder of the year, Unruh said revenue would be up — but modestly. He observed that demand in the U.S. continues to be sluggish because of persistent worries about the economy and added that European business is slower than last year, overall.

High hopes for imaging

Unisys Corp. wants to be the "preeminent" vendor of cooperative network computing, according to Chief Executive Officer James Unruh, and one of the drivers for that will be imaging.

Unisys has invested "tens of millions of dollars" in imaging, Unruh said. Officials said they hope to claim 20% of what the Association for Information and Image Management predicted will be the $6.8 billion imaging market by 1993.

Unisys is not planning to use the mainframe as an image-processing hub but rather will locate this function at the server and workstation level.

This could be a distinguishing characteristic between Unisys and IBM in their imaging and long-term mainframe strategies, said George Lindamood, a Unisys watcher at Gartner Group, Inc.

"We believe that IBM will use the imaging to give its mainframes one last hurrah," Lindamood said. "It may be that Unisys is marching to a different drummer."

Mainframes, which Unisys has described as information hubs, are instead slated to be put to use as massive on-line transaction processing (OLTP) engines.

Unisys' mainframe business accounted for 30% of its revenue last year and is growing "in the single digits," according to company executives.

Meanwhile, its workstation and server business, now estimated to be growing at 12% to 15% annually, holds high promise because of the general move toward distributed processing and network computing.

OLTP will remain the province of the mainframe for the time being, said Brian Magowan, Unisys vice-president of systems software. To support these OLTP applications, Unisys will use Extended Transaction Processing Architecture (XTPA), an architecture Unisys announced for the airline industry in 1988.

The first implementation of XTPA can now connect four six-processor 2200 hosts. Eventually, Magowan said, XTPA will be able to support an 8-by-8 architecture with 64 IBM "Summit-class" machines.

Later this year, he continued, Unisys will apply the scheme to nonairline customers and applications.

ELLIS BOOKER

Western Union puts E-mail unit on the block

BY ALAN J. RYAN
CW STAFF

UPPER SADDLE RIVER, N.J. — Just two weeks after missing a June 15 deadline for a $51 million payment on junk bond interest, Western Union Corp. confirmed that it is involved in discussions to sell its Business Services unit.

Business Services is the company's technology unit, and it includes the electronic mail, volume telegram and Telex businesses. If the 138-year-old company is able to unload the unit, it will be left with only its Financial Services unit, which includes its money transfer and individual telegram businesses.

Al Casazza, a credit analyst at Moody's Investors Service, Inc. said the potential sale of Business Services is surprising. The unit, he said, accounts for nearly half of Western Union's operating profit.

"Of all the businesses they are in, electronic mail was the fastest growing," Casazza said.

In an interview earlier this year, Steven Graham, vice-president of marketing for Business Services, said that the Easylink E-mail system with its electronic data interchange options was a potential growth area for Western Union.

Western Union claimed to have the largest installed base of public E-mail systems in the nation with more than 200,000 subscribers. The service can connect users to other U.S. Easylink users, more than two million Telex terminals worldwide and more than three million facsimile machines worldwide.

If Business Services is sold, Western Union's only profitable business will be its money transfer operation, Casazza said. "You could almost say they are dismembering the company," he said.

It is unlikely the sale of the Business Services unit would have any impact on users of its products, assuming the new owner continued to support the products, analysts said.

Western Union spokesman Warren R. Bechtel said any agreement regarding the sale of the Business Services unit would be conditional on completion of a Western Union debt restructuring and that there can be no assurance that any agreement will be reached.

Western Union shareholders will meet Friday for the company's annual meeting (postponed from June 15) and are expected to vote on a proposal to reclassify certain preferred shares to common shares. The company is proposing to refinance up to $530 million of its debt by reclassifying common shares and notes as part of the recapitalization plan filed with the Securities and Exchange Commission.

"Even if the exchange offer is successful, maybe they are thinking of winding down to repay the debt they can pay and then close out the business," Casazza said. He added that it is possible that Western Union might sell off the unit with the intention of buying another business.

Sovran to merge data centers

BY SALLY CUSACK
CW STAFF

NORFOLK, Va. — Sovran Financial Corp., a $25 billion holding company, announced last week that it plans to consolidate all four of its banking data centers into one operation, to be located in Villa Park, Va., by the end of 1991.

A spokesman said that the move will affect 130 positions in the data centers, with about 60 of these targeted to move to the Villa Park facility. The remaining 70 or so employees will be offered other positions within the company.

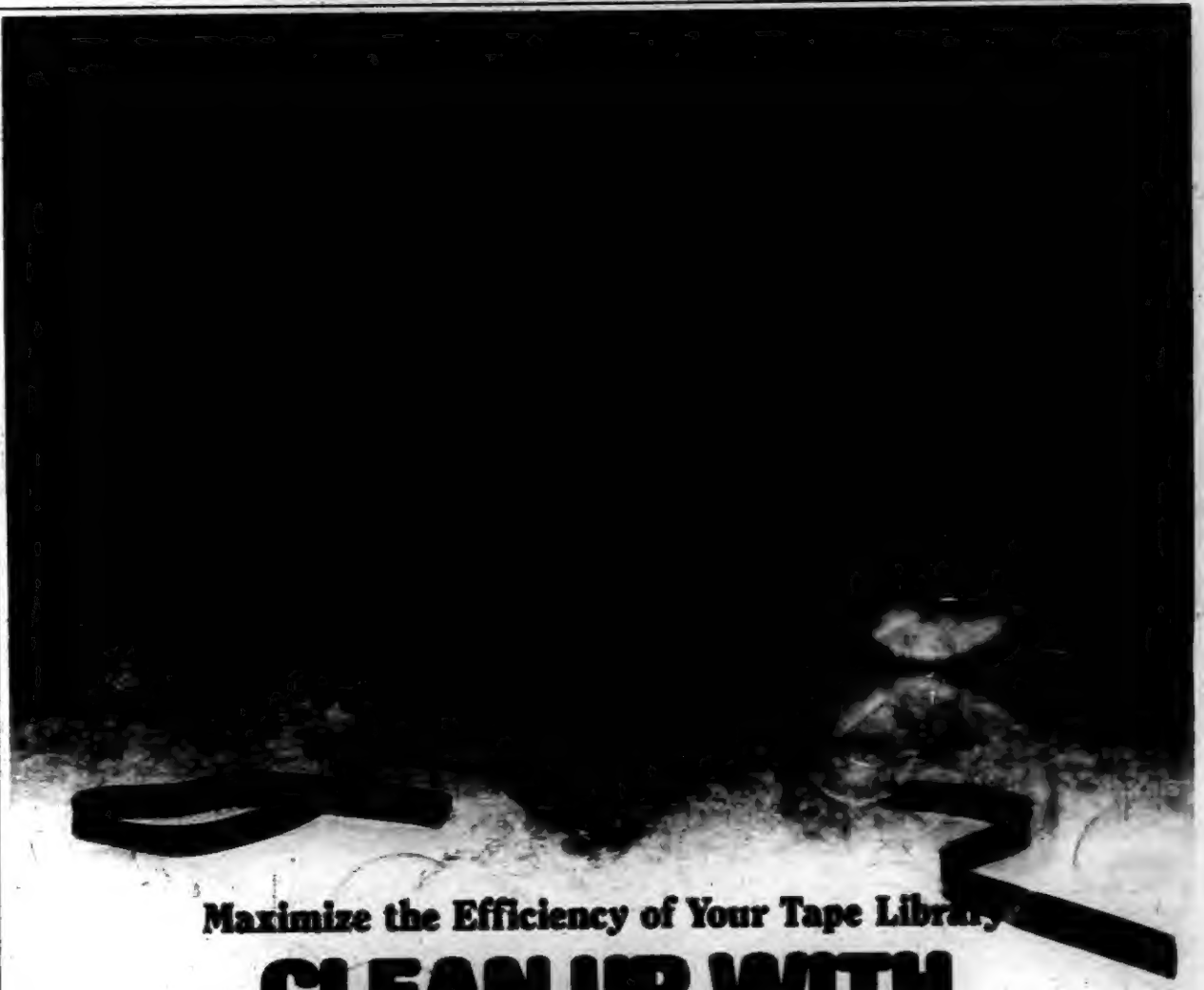
The spokesman declined to comment either on potential or realized cost savings derived from consolidation or on specifics of the hardware and software environment.

Sovran employs approximately 15,000 people nationwide, scattered across the firm's individual leasing, insurance and mortgage companies.

The move was also designed to coordinate with the company's merger with Citizens and Southern Corp. (C&S), expected to culminate later this year. The two companies have announced a definitive agreement to combine under a new holding company — Avantor Financial Corp. — in a tax-free, stock-for-stock transaction. The Federal Reserve Board officially accepted the Sovran and C&S merger applications May 25.

The union is a merger of equals, according to Elisabeth Albert Hayes, a senior financial analyst at Johnston, Lemon & Co. in Washington, D.C. "What they have done is create a bank that runs along most of the East Coast, from Maryland downward," she said, adding that each company has strengths in different yet complementary areas, so there will be no overlapping of branches. "What you're seeing now is back-office consolidation," she said.

According to John J. Sponksi, executive vice-president for corporate operations and technology, the new center will "reduce current operational and managerial complexities" resulting from the maintenance of multiple data centers.



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Overhauled CICS ships to eager customer base

BY ROSEMARY HAMILTON
CW STAFF

IBM's CICS, a mainstay in many IBM mainframe shops, is finally moving out of the 1960s.

The company was scheduled to begin shipments last week of CICS/ESA Version 3, Release 1.1, the biggest overhaul in the transaction processing system's 22-year history.

Information systems managers contacted said they welcome the change and plan to install it soon.

"It has been somewhat constricted by being basically a 360 architecture system," said Doug Underhill, assistant vice-president of technical services at CSX Technology, the IS division of CSX Corp. "This release positions it to grow with new technologies that will come along."

The new version restructures some of the CICS innards while also doing away with older methods of interacting with it, according to IBM and observers.

For example, the new version has been designed with separate internal areas called domains. If one domain needs modification or crashes, it will not hurt other data, which can occur with the current version. This boosts reliability and also brings CICS closer to a continuous operation mode, noted Michael Satzinberg, a vice-president at Manufacturers Hanover Trust Co. in New York.

"CICS was pretty much an open box, so programmers could get in there and muck around," said Joel Goodman, a senior consultant at Circle Education Ltd., a consulting firm in London specializing in CICS.

"The functional boxes can be isolated from programmers," Goodman added. "If they obey the rules to the [domain's] interface, they can use that function. This should prevent people from going and messing around with it. It is now finally engineered as a proper software product should be."

The internal changes will not affect end users, but programmers will face "re-education efforts," according to IBM.

This version can make full use of MVS/ESA features, such as expanded storage. This should boost performance by placing more data in expanded storage and thus reduce the need to go out to a disk for data.

The current CICS can run under MVS/ESA but cannot use all of its functions. Additionally, the new version offers support for the C programming language, a first for CICS.

"I'm sure we'll have the tape as soon as it's available," said David Moore, a senior vice-president at Mellon Bank NA in Pittsburgh. "This removes some of the constraints to better performance."

CICS was introduced in 1969 as a teleprocessing or transaction processing environment for a terminal-based user population supported by mainframes. CICS functions as a traffic cop, allowing terminals access to applications written for a CICS environment.

Over the last two decades, IBM has rolled out nine new releases of CICS, each one adding features to keep up with industry advances, such as multiprocessor support. However, each release was a patch onto the older code, originally written in assembler language, according to Goodman.

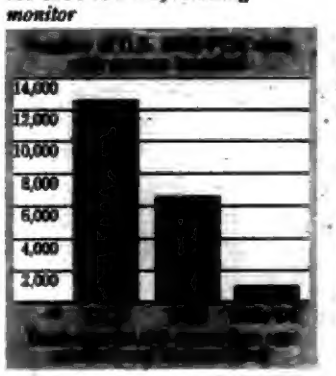
"It was still based on the way computers worked in the 1960s," Goodman said.

The new version, however, was written to accommodate more current methods of both programming and software management. For example, this version no longer works with macro-level commands with the exception of assembler language programming, according to Goodman. Macro-level commands had long been the way programmers talked to CICS, and the commands required in-depth knowledge of the CICS code.

With CICS/ESA Version 3, programmers must use the newer command-level interface, which was first introduced in the late 1970s. This approach requires less knowledge of the CICS internals and allows a programmer to write a more simple command to access CICS.

Top of the charts

An estimated 75% of all IBM and plug-compatible mainframe sites use CICS as a teleprocessing monitor



Source: Computer Intelligence

DEC

FROM PAGE 1

"an excellent deal" on purchasing it later, Kerns added.

"The big guys like IBM and DEC have exceedingly strong balance sheets and the staying power to do [loaner programs]," said Byron Walker, an analyst at Moody's Investor Service, Inc. in New York. "If you are savvy about what customers need and your product is slightly delayed, it's a very good strategy to use."

While loaner programs will delay the additional revenue Wall Street is waiting for, Walker said DEC must protect its market share and sustain "the tremendous long-term goodwill" of its customer base.

He and other financial analysts originally said they expected to see a revenue boost for DEC by late this year, but the company's recent acknowledgment that volume shipping has been delayed until next quarter has shifted that expectation into at least the first quarter of 1991.

At the University of Pittsburgh, where a VAX 9000 was expected last month but has now been delayed until September, DEC is filling in the gap with a VAX 6000 Model 440, said Paul Stieman, associate vice-president for computing and information services.

The discounted price the university paid for the midrange machine will be subtracted from the price of the mainframe once it arrives, he added.

"We made some adjustments, and DEC accommodated them," Stieman said. The university uses mainly DEC equipment for its academic research and instructional computing, with administrative and financial processing on Amdahl Corp. hardware and IBM mainframe system software.

"I feel DEC performs very positively and in a comparable fashion to mainframe vendors," he added.

Stieman also noted that the researchers who will use the VAX 9000 for a variety of scientific and technical applications were mollified to learn that the mainframe would be faster than original benchmarks indicated.

DEC recently released new benchmark results on the VAX 9000, showing a 33% improvement over the originally announced speed of 30 million instructions per second.

Litel Telecommunications Corp. in Columbus, Ohio, was the first company to order a VAX 9000, and it will be one of the first this summer to accept delivery of the mainframe.

"We're getting excellent preinstallation, pre-engineering and support for the 9000," said Michael Guider, vice-president of network and information services at Litel. "But it would be fair to say Litel is very, very anxious to receive this system and apply it to our business. I think the majority of customers would feel that they would rather wait to have it work well than put it in before it's ready."

"We really want to protect their business as well as ours," said Phil Grove, a marketing consultant at DEC.

Grove stressed that the technology problems have been worked out at this point and that volume manufacturing processes are under way this month for VAX 9000s at DEC's Cupertino, Calif., facility.

> "I THINK THE MAJORITY of customers would feel that they would rather wait to have it work well than put it in before it's ready."
>
> MICHAEL GUIDER
> LITEL TELECOMMUNICATIONS

CORRECTIONS

Six hundred and sixty Digital Equipment Corp. users responded to an industry trends survey conducted by the Digital Equipment Computer Users Society at its conference in May. An incorrect number was cited in "Portrait of DEC users, East to West Coast" [CW, June 25].

A Page 1 chart on U.S. defense procurements [CW, June 25] should have noted that the figures were in billions of dollars.

Olof Soderblom's token-ring patent has not been suspended [CW, June 25]. The U.S. Patent Office issued an initial response to suspend the U.S. patent, but the decision is not final.

Lotus spreads 1-2-3 wings in DEC, IBM host territory

BY RICHARD PASTORE
CW STAFF

CAMBRIDGE, Mass. — New products keep appearing from Lotus Development Corp. like mechanical ducks at a shooting gallery. But users are not shooting them down. On the contrary, last week they praised the functionality of Lotus' 1-2-3 for All-In-1 and 1-2-3/M for IBM's advanced MVS and VM operating systems.

Users of Digital Equipment Corp.'s All-In-1 integrated office system can now run 1-2-3 within All-In-1. The spreadsheet package, which is linked with All-In-1 at the code level, began shipping last week.

The 1-2-3 application will appear as a menu choice in All-In-1's main menu. The Lotus product will also conform to All-In-1's simplified terminology, such as "documents," "folders" and "cabinets." In addition, 1-2-3 will function with the DEC product's specially configured shortcut, Gold Keys.

Two users of All-In-1, which reportedly has a user base of three million, hailed the integration features they expect to gain from the new 1-2-3 but expressed concern over the effect on the spreadsheet application's speed.

It takes several annoying steps to transmit and import personal computer-derived 1-2-3 spreadsheets into the VAX system at Grinnell Mutual Reinsurance Co. in Grinnell, Iowa, said David Renaud, director of technical services. The integration within the DEC environment will eliminate these hassles, said Renaud, who does not yet use the new 1-2-3 version.

The VAX-based 1-2-3 makes for "a slicker operation," added Dan Snyder, vice-president of MIS at Tyson Foods, Inc. in Springdale, Ark.

VAX users can share spreadsheet data much more easily than if they had to import spreadsheets from PCs, Snyder said.

However, Renaud and Snyder expressed concern that a multiuser version of 1-2-3 would yield slower response times. "It's hard to have it all," Renaud said. "If your priorities are blindingly fast response times, then a stand-alone PC is probably your best bet."

The product will reportedly run on all VAX/VMS computers running All-In-1. The price depends on the platform: A version for the Microvax 3100 costs $3,554; one for the VAX 6210 retails for $14,484.

Lotus also announced shipment last week of 1-2-3/M for use with IBM's MVS/XA JES 3, MVS/SP, MVS/ESA, VM/SP6 and VM/XA operating systems. The product has been available since March for MVS/XA JES 2 and VM/SP5.

The product prices are dependent on platform and range from $15,360 to $47,470 for primary licenses. Monthly licenses sell for $583 to $1,800.

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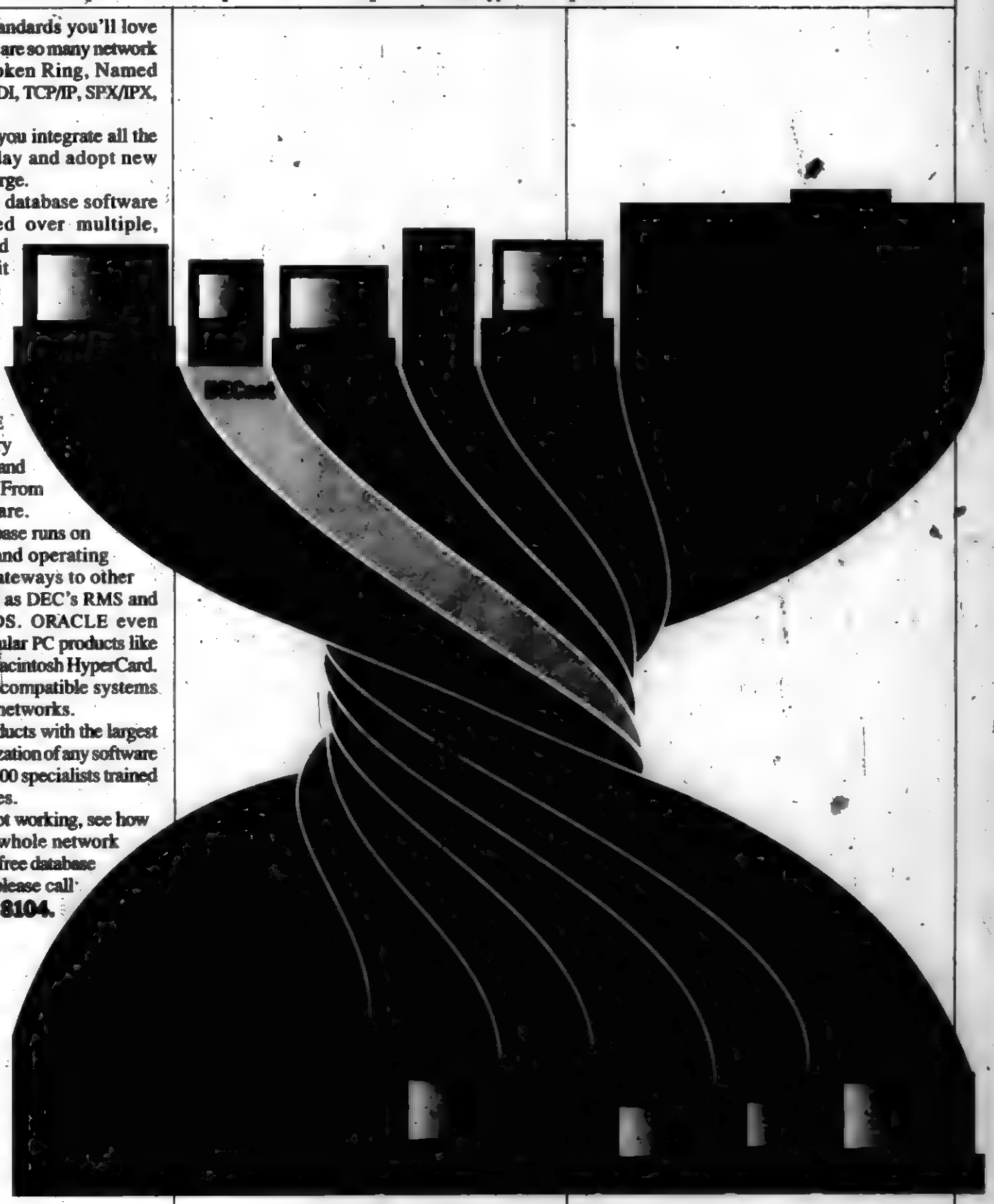

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Motorola, Hitachi plan to settle chip dispute out of court

BY JAMES DALY
CW STAFF

Computer manufacturers breathed a sigh of relief last week when Motorola, Inc. and Hitachi Ltd. agreed to bury the hatchet on a patent dispute that once threatened to disrupt the supply of a vital computer chip to the U.S. market.

The out-of-court agreement effectively ends the threat of a ban on sales of Motorola's 68030 chip, which was found to infringe on a Hitachi patent. The chip forms the computational heart of systems produced by Apple Computer, Inc., Hewlett-Packard Co., Sun Microsystems, Inc. and Next, Inc.

Neither Motorola nor Hitachi would release details of the agreement.

Although both firms characterized the deal as only a framework for settling the 18-month-old dispute, a Hitachi spokesman said final arrangements should be made within three months. "We don't expect customers to be inconvenienced," the spokesman said. The companies agreed not to press for injunctive relief against each other while negotiations continue.

While most analysts said it is likely that the final arrangement would never be made public, they said they expected that the firms will agree to cross-license their patented technologies — the same arrangement that caused the dispute in the first place.

The problems began in January 1989 when, after 14 years of partnership, Schaumberg, Ill.-based Motorola accused Japan's Hitachi of overstepping the bounds of a cross-licensing pact. But the strategy backfired a few days later when Hitachi countersued over patents of its own that Motorola had allegedly violated.

On March 29 in Austin, Texas, U.S. District Judge Lucius Bunton found both companies guilty. Motorola was subsequently banned from selling the 68030 while Hitachi's H8 chip was barred from sale in the U.S.

Bunton granted a stay of the order until June 18 to give both companies time to settle their differences out of court, but the stay expired without a settlement. The order was reinvoked but was again put on hold after Motorola appealed to the U.S. Circuit Court of Appeals in Washington, D.C.

Experts said the dispute over niggling technical details is tied to a ploy now commonly used among sparring firms. "Patents have increasingly turned into weapons when company partnerships don't work out," said Michael Slater, editor of the "Microprocessor Report" newsletter in Sebastol, Calif. "Both companies have fought in the courtoom in the past, and now they're debating over very tiny little features that could exist in any device."

Nick Tredenick, a member of the design team that created Motorola's 68000 microprocessor line and an expert witness who testified in the Motorola/Hitachi case, agreed that the lawsuit resulted more from ill will than from legitimate infringement claims. "It was crazy; the Hitachi chip looks nothing like any Motorola microprocessor," said Tredenick, who now heads up Tredenick, Inc., a chip design firm in San Jose, Calif.

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Computervision targets low end

BY SALLY CUSACK
CW STAFF

BEDFORD, Mass. — The Computervision unit of Prime Computer, Inc. wooed its existing customers and suppliers last week with a family of low-priced prepackaged hardware and software products.

The BabyCADDS computer-aided design and manufacturing systems are based on Sun Microsystems, Inc.'s Sparcstation 1+ and are tagged at a list price of $28,900.

According to Erik Keller, an analyst at Gartner Group, Inc. in Stamford, Conn., Computervision is working hard to maintain account control this year, and this announcement is geared toward that end.

"It does effectively bring the prices down for their current users," he said, "and BabyCADDS offers good integration capabilities with the existing CADDS product line, but it will not bring in much — if any — new business." Keller said that the only new users would be those interested in buying into the entire suite of Computervision CADDS products.

The first component of the product line is the 42F/CADDSdraft system, which combines Computervision's CADDS 4X software for three-dimensional modeling, drafting and detailing with Sun's desktop workstation.

The 42F/CADDSdraft supports the AT&T Unix System V, Release 4.0.3C operating environment and features a 16-in. color monitor, 12M bytes of random-access memory and more than 200M bytes of disk storage space. Shipments are scheduled for the third quarter.

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Green light for traffic monitor test

BY CHARLES VON SIMSON
CW STAFF

LOS ANGELES — The highway of the future arrived with an electronic screech last week, but as formal testing begins today, its designers hope they will not have to hit the brakes.

The California Department of Transportation (Caltrans) is slated to begin the first phase of a project designed to test the viability of transmitting information on traffic conditions collected from electronic sensors on the street to computer-equipped automobiles. The $1.8 million Pathfinder project will conclude with a report to sponsors next summer on the potential for delivering information to traffic-congested Southern California motorists.

"The lesson we learned from the Olympics is that we can use our traffic information system effectively to relieve congestion," said Jerry Baxter, director of Caltrans' Los Angeles region. "What we want to learn from Pathfinder is the impact of giving drivers more information about traffic conditions."

At a media event last week, however, an uncooperative data transmission system caused the small computer in one of the test automobiles to squeal like a tormented alien. "In the early stages of a system like this, you often don't know what will happen until you turn it on," said Goro Endo, senior transportation engineer and head of the Pathfinder technical team. "But I think we are in good shape to begin solid testing."

To start, Caltrans employees will volunteer to drive the 25 cars donated by General Motors Corp. and equipped with an electronic navigational system from Sunnyvale, Calif.-based Etak, Inc. The volunteers will head to work on prearranged routes along which they will be tracked by computer.

The Etak system includes a number of sensors within the car that monitor speed and allow it to transmit and receive data. As much as delivering information to the drivers, Caltrans hopes to use the cars as mobile traffic sensors to augment the 900 sensors placed in streets and highways in Los Angeles, Ventura and Orange County.

> "IN THE EARLY stages of a system like this, you often don't know what will happen until you turn it on."
>
> GORO ENDO
> CALTRANS

Electronic monitoring of the streets is nothing new in the Los Angeles area. Since the 1970s, information has come from sensors via leased lines into a mainframe computer at the district's headquarters. The information is used to generate traffic advisories to local media, as well as create a historical database for use by traffic engineers in the planning process.

The new twist is the installation of an Intel Corp. 80386-based personal computer that, starting today, will take information from a 14-mile stretch of the Santa Monica Freeway and, via data radio, transmit traffic conditions to computers and monitors in the test cars. If traffic is moving at less than 20 mph on the stretch, a solid triangle will appear pointing in the affected direction of travel; if the traffic is moving between 20 and 35 mph, there will be an outline of the triangle; and when traffic is moving faster than 35 mph, no triangle will be visible.

The cars will operate next year with decreasing control over their routes. At the end of the process, a report will be made to the three sponsors: the Federal Highway Authority, Caltrans and GM. The hope is that the system may one day become integrated into monitoring systems in congested areas and become an option on automobiles.

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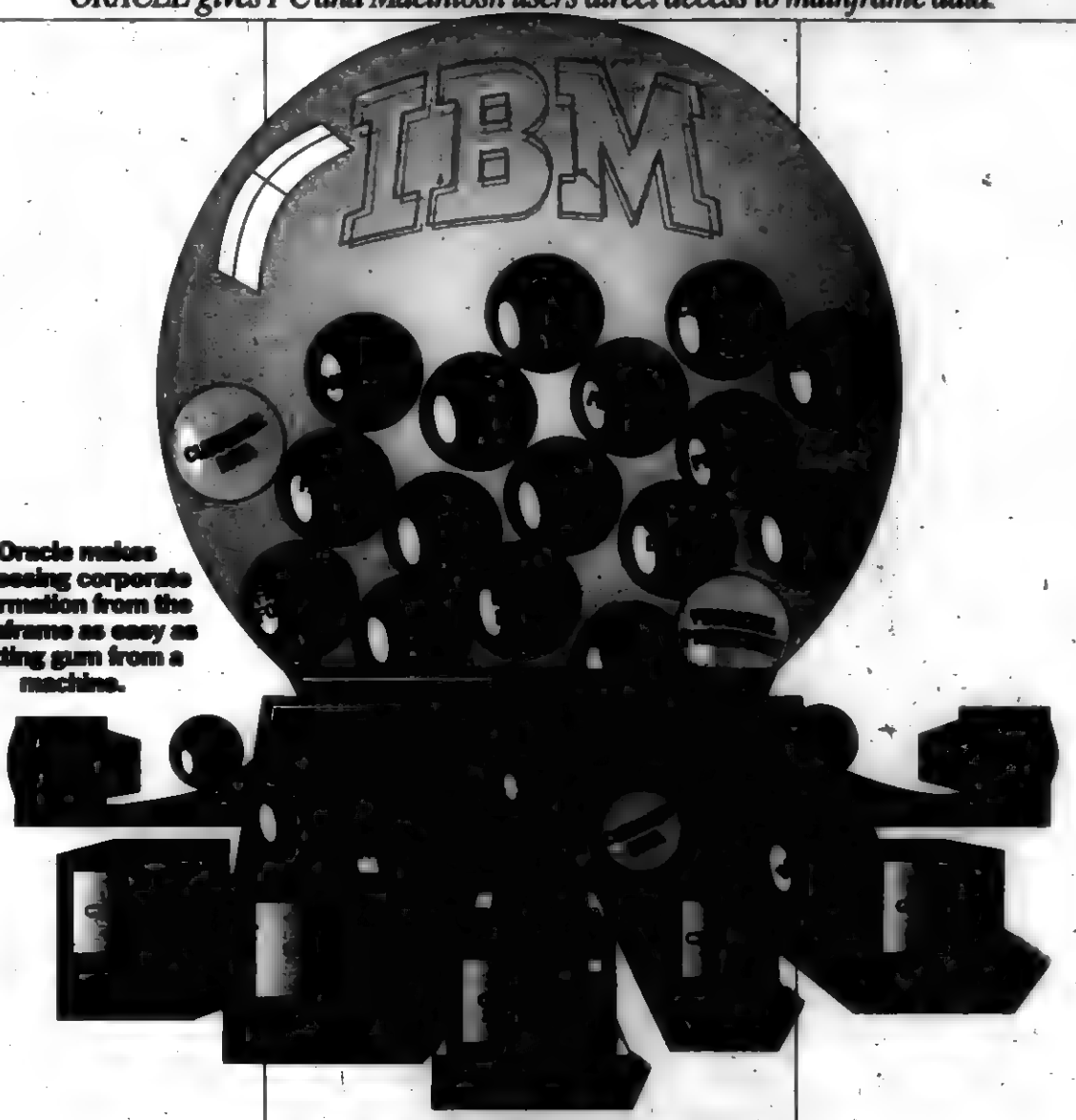

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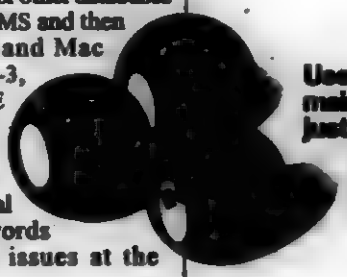

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Dexpo East ain't no cure for the summertime blues

BY MARYFRAN JOHNSON and MAURA J. HARRINGTON
CW STAFF

BOSTON — With 15 booths and 10,000 sq ft of floor space devoted to showcasing its long-awaited integration products, Apple Computer, Inc. and Digital Equipment Corp. dominated the show at Dexpo East last week.

Whether it was worth dominating was another matter.

Wedged between next Monday's opening of Decworld in Boston and the recent Dexpo South in New Orleans, attendance was on the pitiful side — only 2,820 attendees, less than half the number that showed up for Dexpo South in New Orleans last month.

Most users applauded the appearance of integration products such as DEC Lanworks for Macs, lamenting only that it took more than two years to see results from the DEC/Apple alliance.

Mark Scherfling, supervisor of Unix and communications support for GTE Laboratories in Waltham, Mass., said his firm and its 600 users did not wait around for DEC and Apple, however. GTE uses Alisa Systems, Inc. integration products to connect more than 350 Apple Macintoshes to its DEC Vaxcluster via Ethernet.

"We're still waiting for good compound document architecture between DEC and Apple," Scherfling said, referring to documents containing text, graphics and data. He said that while DEC has admirable compound document capabilities now, Apple still lags in that area.

John Davis, a database administrator for Konica Quality Photo-East in Scarboro, Maine, was eager to see Decwindows running on a Mac. Unfortunately, the new software was not working on the first day of the three-day show.

"I'll come by again tomorrow," Davis said with a shrug.

With two Macintoshes in his office now, Davis said he hopes to eventually offload some programs running on Konica's VAX 8350 clustered with a dozen Microvax IIs.

"It's not so much what we can't do now on the Macs but that our VAX is overloaded," he said. "I'd like to enable my people to get data off the VAX and put it right into Mac applications."

Home on the midrange

Jim Leither, executive director of the Boston Computer Society's Macintosh user group, said he would like to work at home on his Mac and access information stored on the VAX at work.

"This is all very exciting to me. I just wish it was a little more Mac-oriented," Leither said of the integration products. He complained that the MacX server — an X Window System-based display server for the Macintosh that is equipped with a Decwindows look and feel — forces Mac users to learn a new graphical user interface.

Michael Harrington, a systems manager at Beth Israel Hospital's biomechanics research laboratory, said he was eyeing DEC Lanworks for a planned integration between Macintoshes in his lab and a similar research lab at nearby Brigham & Women's Hospital. The two labs, which have about 25 Macs between them, are planning to build a patient-tracking database that is mutually accessible via their Macs over a Decnet network backbone.

DEC Lanworks, introduced in May and scheduled to ship in late September, is a set of client/server software products that enable VAXs to act as file or print servers for Macintosh local-area networks.

Like other users, Harrington was optimistic about the increasing numbers of alliances between DEC and third-party software vendors. "It does seem like DEC is opening their arms to PCs and Macs now and realizing that's where the money will be," he said.

Mainframe Current Events

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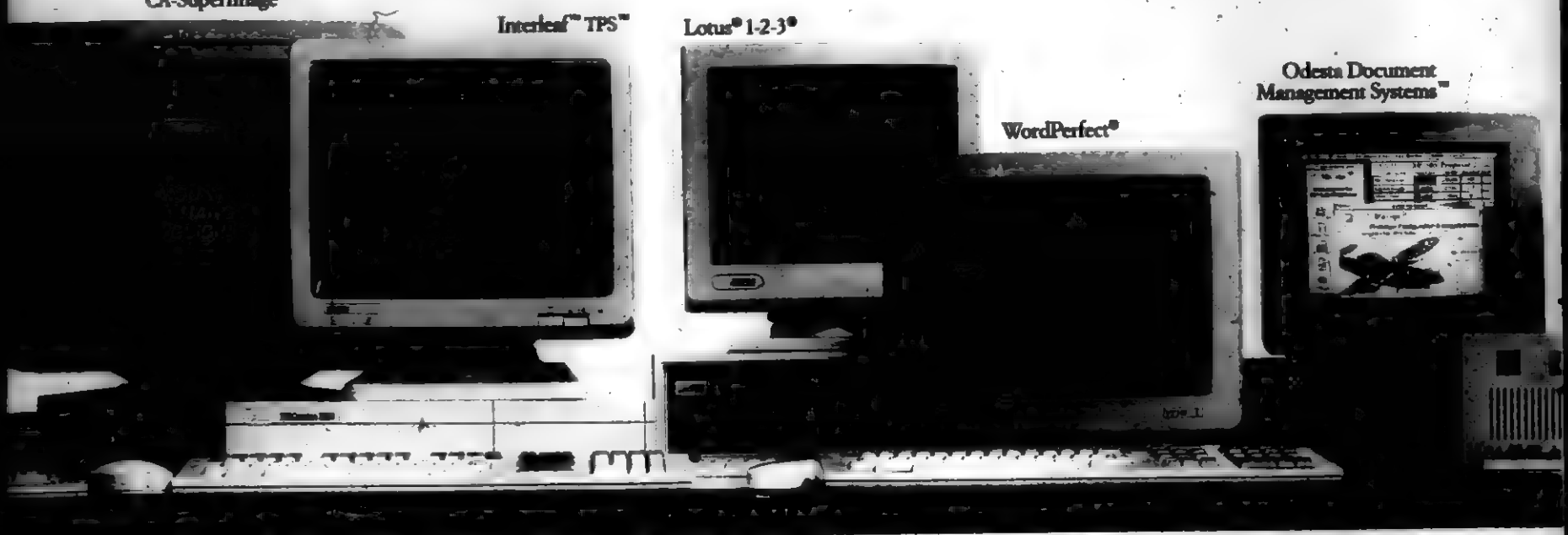

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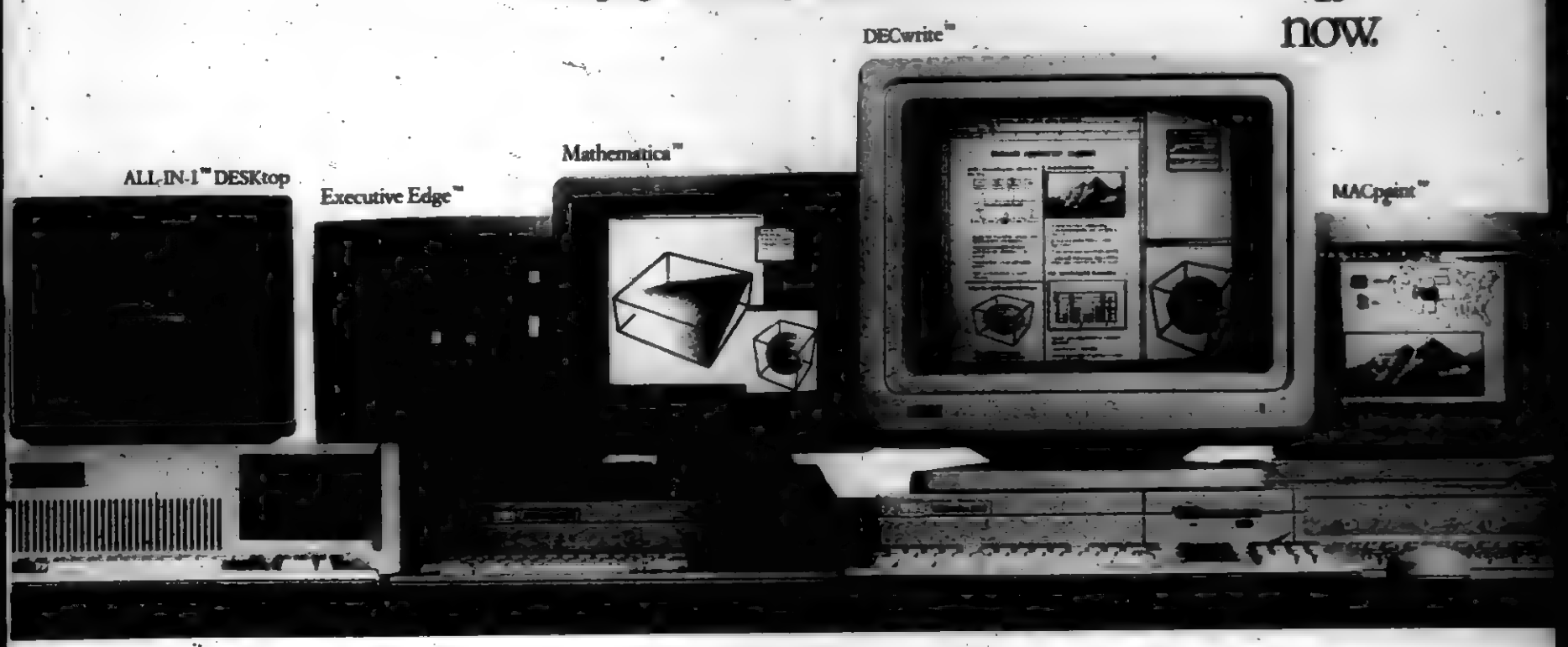


ADVANCED TECHNOLOGY

This robot walks on the wild side

Carnegie Mellon's Ambler is intended for Mars but may find a home on Earth, too

BY GARY H. ANTHES
CW STAFF

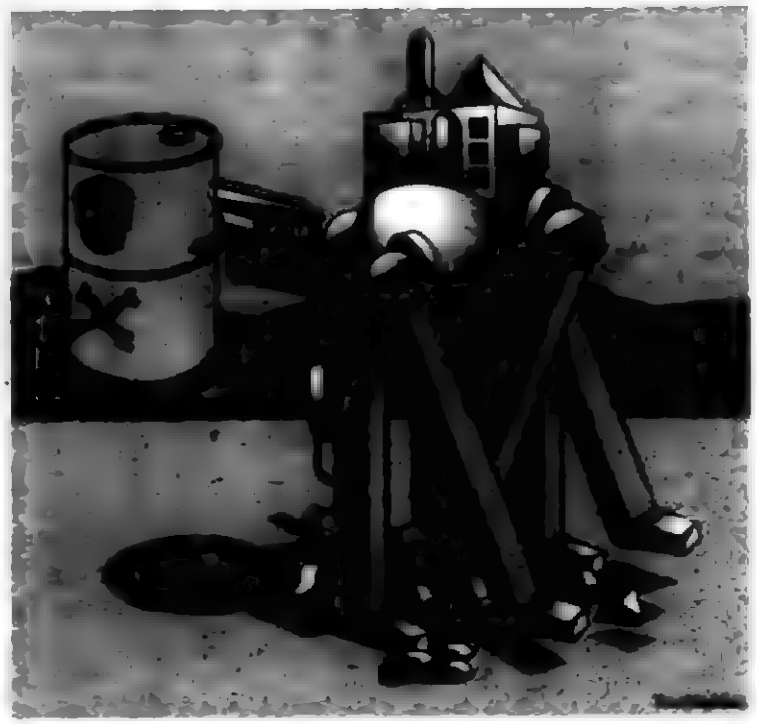
Computer specialists and engineers at Carnegie Mellon University in Pittsburgh are building a 12-ft-high robot that will be able to walk up steep slopes and avoid boulders, gullies, quicksand and other hazards that would put a Range Rover to shame.

Packed with sensors, processors and software, the robot will be able to work autonomously, selecting and navigating routes without relying on externally supplied commands.

The Robotics Institute at Carnegie Mellon is building the six-legged robot, dubbed Ambler, for the National Aeronautics and Space Administration (NASA) as a prototype for walking vehicles to explore the Moon and Mars. Officials at Carnegie Mellon and NASA, however, said that the technology also has applications in more down-to-earth activities such as logging, hazardous waste clean-up, construction, mining, agriculture and emergency response.

"When the going gets tough, Ambler gets going. Earlier space rovers — the Apollo lunar rover and one built by the Soviet Union — were wheeled vehicles.

"That was easier to understand. We've been building wheeled devices for thousands of years," said David Lavery, manager of NASA's Planetary Rover Program. However, rovers with wheels cannot move over extremely rugged terrain, he said.



A problem with earlier walking devices was that they had too little onboard intelligence, Lavery said. Because it takes 45 minutes to get a command from Earth to Mars, the rover must be able to work productively on its own, given only general directions, he added.

"It took a heck of a lot of computer science to get it to move in an intelligent, autonomous way," said David Pahnos, assistant director of the robotics center at Carnegie Mellon. Software drives three critical functions — perception, task control and motion control, he said.

Ambler's field of view — about 30 meters by 30 meters — contains three-dimensional images built up from an infrared scanning laser range finder, a sort of light radar. A path planner pinpoints Ambler's destination based on its mission and then determines the general route to be followed in getting there. A footfall planner determines each step.

Task-control software developed from models of foot-soil interactions interprets data sent from force sensors on each of the robot's six feet. According to Eric Krotkov, research scientist at Carnegie Mellon, the software is able to determine soil density, stiffness and friction, allowing Ambler to guess if it is on soil, sand, gravel, rock or snow.

If Ambler does not like the feel of the ground beneath its latest step, it tries a different step with the same foot. If it cannot find any position to its liking, it puts that foot back in its previous place and tries a step with a different foot. If no foot can be successfully moved forward, Ambler retraces its steps exactly to a point at which a new path can be tried.

These basic concepts have been proven with one foot, and Carnegie Mellon will soon try them in a six-legged configuration, Pahnos said.

The technology for Ambler is not restricted. It could be licensed by Carnegie Mellon for such applications as walking construction cranes or agricultural machines that walk through crops without leaving tractor tire ruts, Pahnos said.

Staying on guard with a computerized watchdog

BY MICHAEL ALEXANDER
CW STAFF

It's not exactly Robocop. More like Robogrunt, actually, but the idea is the same — a robot designed to keep the bad guys at bay.

Researchers in the advanced technology division at Sandia National Laboratories in Albuquerque, N.M., have developed a portable security system for the military that includes a mobile electronic watchdog, a portable security sensor station and a control console.

The Remote Security Station is intended to supplement humans standing guard duty in the field or wherever there are "high-valued assets to protect," said Bryan Pietta, project leader and a member of the technical staff at Sandia. "Humans are excellent observers, but after 10 hours, they are not so alert."

The security system is deployed in the field using either the mobile watchdog, the stationary security station or both simultaneously. The two can be operated from a control console up to one mile away.

The radio-controlled robot — called Thomas for TMSS, which stands for Telemanaged Mobile Security Station — is built around a Honda 350 four-wheel-drive, all-terrain vehicle and includes a computer, video camera and radio links to relay signals from sensors and video to the control console. The video camera and array of sensors are mounted on a pneumatic mast that can be raised up to 10 feet for surveillance while the rest of the vehicle remains hunkered down behind cover.

"Thomas gives the system a versatility that we could not attain with just the portable station," Pietta explained. "If an intruder were in a ravine or behind cover, it's not likely that the portable station's video camera could pick him up. Thomas could be used to scout the area while the console operator remained in a safe location."

The portable security station, which is small enough to be hauled in a pickup truck, is equipped with a computer, video camera, ground surveillance radar, infrared motion sensor, microphones and other intrusion sensing devices. The station, which is mounted on a platform that can tilt and revolve to adjust its field of view, also has weather sensors that measure wind speed, temperature, ambient light and precipitation.

Sandia's ***Pietta with security station and robot***

Thomas and the portable security station are operated from a control console that is equipped with an Intel Corp. 80386-based computer for the operator interface and communications display; a Motorola, Inc. 68020-based computer for video motion detection; and a Motorola 68000-based computer for acoustic detection. The robot's direction, speed and braking are controlled with a joystick mounted into a table top.

The console also includes a digitizing tablet, used to input site maps, a touch screen for controlling some security functions and assessing alarms, a graphics display for site maps and location of security stations and two black-and-white monitors for video.

All of the console equipment is mounted on two 19-in. equipment racks, which can be installed in the back of a truck or in a permanent security facility.

Several enhancements are in the works for the remote security system. Researchers are in the process of installing in Thomas an Intel 80286-based computer, advanced sensors based on neural networking technology and software that will enable the robot to roam on its own. The system will also be expanded so that it can control up to five robots or stationary security stations.

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WANG

EDITORIAL

Get real

A RECENT REPORT FROM the U.S. Department of Commerce has added fuel to the smoldering pile of arguments favoring direct and targeted government aid to some of the nation's high-technology industries.

Some are interpreting the report, one in a continuing series on competitiveness from Commerce, as evidence that the Bush administration's "no-policy policy" toward key economic sectors is failing, in part because other nations are more directly aiding their high-tech bases.

To a certain extent these critics are right, but for the most part, they are failing to see beyond the basic findings of the report.

Specifically, the report says that key high-tech growth industries in the U.S. are in danger of being surpassed by the Japanese, et al., because of the relatively high cost of capital, inattention to advanced manufacturing techniques (related to the first finding) and the fixation of U.S. business leaders on the very short term. The report also listed as causes the help some foreign businesses get from their governments and attending unfair trading practices. Let's start from the bottom of this list.

Show us an example of direct government aid that has produced a world-class market competitor. Let's see, there's the old British Overseas Air Corp. And our federally insured and abetted savings and loan institutions. How about the entire Soviet economy? And, of course, there's U.S. Memories. Suffice to say, it doesn't work.

If it can be proven that foreign governments are competing unfairly, then we have very effective ways of dealing with that if the will to do so exists. However, let us be honest. Sure, the Japanese have made it difficult for U.S. vendors to sell into consumption monsters like its Nippon Telephone and Telegraph. But how many Japanese firms are allowed to sell into our $300 billion defense glutton? It is realities like these that ultimately get in the way of efforts to level international fields of competition.

What will direct government aid to any U.S. industry do to prevent elemental ravages of corporate greed? Under Roger Smith, General Motors lost huge chunks of market share, yet Smith will get a whopping retirement package that has GM's board blushing. Peter Cohen, ousted for doing such a "wonderful" job at Shearson Lehman Hutton, will reportedly get a $10 million severance package. Take that, you naughty boy.

And let us not forget our educational system, which we've cited many times here. If there's one area in which the Bush and Reagan administrations have been so long on rhetoric and frighteningly short on results, it is in effecting improvements to our flagging public education system, otherwise known as our future.

When you come down to it, the handwringing over the government's *laissez-faire* policy toward high-tech is like the flag-burning brouhaha. It's Band-Aid chest beating that disguises the harsher realities defining the real problems in U.S. business.

LETTERS TO THE EDITOR

Don't blame APL2

Information systems management should read Tim Stone's Viewpoint column, "Anti-assembler prejudice hinders better computing" [CW, April 23], to understand the prejudice that many programmers face in their organizations. I, too, regard assembler as a perfectly good tool whose value has been overlooked for too long. His experiences with assembler closely parallel my own and the language I specialize in: APL2.

The men and women who use APL2 and its predecessor, APL, can work well together with Cobol programmers and anybody else who wants to work with us, just as APL2 can work well together with any other programming language. Many of us are polyglots and can use other languages as the situation warrants. Indeed, many applications can be developed using more than one language, and certainly APL can be one of the principal languages chosen.

Regrettably, APL is widely regarded as difficult or impossible to read — a "write-only" language. Yet, there is no reason at all why any production APL application should have poor readability, functionality or flexibility. If such problems should occur, the fault is not with the language itself but rather with the programmers who lack demonstrable competence and responsibility, and here I agree with William Blair and his Reader's Platform, "Place blame where it belongs" [CW, May 21]. Real professionals — regardless of the language they choose to use — build their applications with great pride and craftsmanship, and they sincerely care that others are able to read and maintain their work.

In the future, if someone should ask me why anyone would want to write a program in APL2, I will reply that it's not only the right tool for the job, it's also the right language for *me*, and, ultimately, that is what matters most of all.

Harold H. Macklin III
Richmond, Va.

A lessor problem

Your editorial comment in "Spring cleaning" [CW, May 21] that "customers have grown appropriately wary of the health and viability of their vendors" may be true, but if so, it reflects their lack of understanding of the leasing company's role in a computer lease transaction.

In the typical leveraged transaction on new equipment, the leasing company is merely a middleman. The customer's financial rights and obligations only flow to and from the senior lender (if any) and the equity investor. So whatever the leasing company's financial health is, or may become, is irrelevant.

The user must be wary about a leasing company's "health and viability" only if it commits to untypical practices such as agreeing to sublease the equipment to a leasing company or accepting a leasing company's indemnity to make the rental payments, for example.

The customer can best protect itself by looking at the leasing company's reputation for time-tested integrity. Analyzing its financial statements, net worth, size, etc. will do little to protect the customer.

There may be practices in the industry that could be improved, but don't complicate the customer/vendor relationship by suggesting a measurement criteria that has little relevance.

Tom C. Martin
President
Computer Financial, Inc.
Hackensack, N.J.

Feeling secure

The almost identical overall scores assigned to the four top mainframe security packages in your Buyers' Scorecard, "ACF2 locks up access control ratings" [CW, June 11], provide even more support for something security professionals have known for a long time. That is, it doesn't matter which package you choose — it's how you implement it that matters. Security packages are merely one of many tools that must be employed in a successful security program.

Too often, management is led to believe that one package will provide substantially more security than another and that once the package of choice is installed, all their security problems will be over. It would be an interesting exercise to develop a metric for an organization's overall security program and then see which packages the successful ones use.

Howard Glassman
Vice-President
Information Security
Bank of America
San Francisco

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The upside of software piracy

JAY ZAGORSKY

More than 50 million personal computers currently sit in U.S. homes and offices. How much of the software on these computers is pirated? Estimates of the value of stolen software range from $170 million to $4 billion per year. However, as the Office of Technology Assessment (OTA) noted when examining piracy, "Existing surveys vary considerably and are increasingly less relevant."

Still, whatever the estimate, piracy directly affects over 11,000 U.S. companies engaged in computer programming and software development. These companies are very concerned about how software piracy is affecting their bottom lines.

The effect on profits is often estimated by multiplying the number of illegal copies by the sales price. This simple approach greatly overstates the drain on profits because it overlooks a basic economic lesson: The quantity bought is inversely related to the price. In other words, lower prices increase consumer purchases, while higher prices reduce consumer purchases.

Zagorsky is a lecturer of economics at Boston University and an independent software consultant.

Software piracy is not, in fact, a huge revenue drain for the computer industry. Most pirated copies are only used because they are free, and many are not used at all. Little concrete data exists, but in 1985, Adapso estimated that $3.2 billion in software was sold, and an additional $800 million was stolen.

The OTA report noted that survey results of piracy are "subject to bias" because the surveys are conducted for companies or industries that feel harmed. Hence the simple approach of multiplying stolen copies by the sales price is a gross overestimate because only a small fraction of pirated software represents lost sales.

Imagine a small software development company that sells one product. It charges $75 for the program and has sold 75 copies to users.

Unfortunately for this firm, some of the buyers either deliberately give the package away or accidentally have the software stolen from their machines by users who want it for free. This results in a total of 100 people using the software.

The sales manager points out that 25 people have stolen the package, and the firm is losing $75 times 25 copies ($1,875), which represents a 33% loss in revenue. The president delivers a rousing speech about the decline of morals and directs research and development to come up with a method for preventing stolen software from running.

So, R&D comes up with a simple method that is transparent to legitimate users but prevents stolen software from being used. What happens? Using Adapso's estimate, only five users of the pirated copies value the package enough to buy it.

Jack Levy Likwornik

The firm gains just $75 times five ($375) in revenue, a 7% gain. More importantly, very little of this gain translates into profits because the firm must pay for research into stopping software piracy. Besides this direct cost, there is a reduction in future profits because scarce engineering talent has been devoted to piracy control instead of new product development.

Thus, correct estimates of lost revenue should not be based on the total number of stolen copies but rather on stolen copies that resulted in a missed sale. Even this number overestimates bottom-line damage, because pirated software has a *positive* effect on future sales. Pirates who like the product often buy future releases to access more features. Additional sales are also generated when pirates buy tie-in products that enhance the abilities of their illegal copy.

Software currently has a very short life span, with new products constantly pouring into the market. One of the most important factors affecting demand of a new product is how much exposure the old version received. Piracy does not add to current sales, but it does provide exposure that boosts future demand.

This effect on future demand was highlighted recently when two companies — Xyquest, Inc., maker of the Xywrite word processor, and Xtree Corp., maker of the Xtree disk manager — provided a general amnesty program for users who had pirated their software. Users who sent in pirated disks and paid one-third the list price were sent the latest release of the product.

Both companies said they were extremely happy with the programs. Besides additional revenue, the amnesty provided Xyquest and Xtree with a list of potential customers to solicit when future versions are ready. The response to both amnesty programs shows the effect current pirated copies have on future demand.

Ethically, the pirating of software is a social dilemma. Theft is illegal — whether of a television or a word processing package — yet the two types of theft cause dissimilar reactions. Most of us would never consider stealing a $400 TV but copying a $400 word processing package from a friend is somehow different.

Economically, software developers can ignore piracy. Stolen software does not have a large effect on a computer company's profits because first, only a small fraction of illegal software represents lost sales, and second, piracy increases demand for future products.

IBM's PS/1 follows PCjr's footsteps into home market

PETER BARTOLIK

I will probably be replacing my dependable but geriatric IBM PCjr within the next few months. However, I will definitely not be swapping it out for the much talked about "Personal System/1" home computer that IBM unveiled last week.

To put things in perspective, with more than half a million units sold, the PCjr does not fit the dismal failure profile to which common lore has assigned it. It was an admittedly limited machine, but at the time, it was affordable — I picked up my basic CPU for a $400 closeout price and for a few hundred more, picked up extra memory, a printer and a red-green-blue monitor that doubles as a television set.

The PCjr also had some nifty design features that retain the loyalty of users who are served by a small but active third-party market industry providing add-ons and enhancements. However, it also had some disturbing incompatibilities with the personal computer standard of the day and just did not have the market drive sufficient to hold goliath IBM's interest.

Now, with lessons learned, IBM is set to again strike for the lion's share of the rapidly growing home market. IBM will stress affordability and lump in a few bundled features such as the Prodigy videotex service it has jointly developed with Sears.

With alternative distribution channels through popular store chains such as Sears, IBM seems primed once again to blindly bulldoze its way into the consumer market, mainly on the strength of its logo.

With prices ranging from $999 to $1,999 ($800 to start with usual discounts), it appears that IBM is once again offering too little, too late to inspire a mass market for its PCs.

Bartolik is *Computerworld*'s news editor.

It remains unclear at this point exactly what IBM's motivation is. Undoubtedly, such a system will be a minor success among computer initiates; in fact, bundling in Prodigy and shipping as many units as the PCjr just might make the videotex service successful. In light of steep discounts that are likely to be made available to the nation's educational system, there is also a high potential for success putting desktops on school tables.

But as far as a mass, popular market goes, forget it.

History repeats itself

If published reports are correct, it seems IBM is doomed to repeat the lessons of history. The systems will be based on the Intel 80286 processor and — echoing the woes of the PCjr — will provide little or no expansion capability as IBM seeks to tap dance between the demands of its vast dealer and value-added reseller network and its own need to avoid cannibalizing PS/2 sales.

The IBM label may just scoop up some sales from the impulse K Mart shopper, but — unfortunately for IBM — buying a PC is not yet akin to the experience of buying a toaster. I would bet that relatively few home computer shoppers will be willing to plunk down the dollars without first either seeking the advice of an experienced computer user or skimming through one of the PC monthlies.

When the shopper seeks out that advice, he or she will quickly find out something the business world is well aware of: There is no bargain behind the IBM label. For what it would cost to buy the base PS/1 with monochrome monitor and no hard drive, the first-time computer user will find out that a trip to an appliance superstore will bring home essentially the same system, plus a hard drive and color monitor and perhaps even some bundled-in software.

Sweet dreams

So, should IBM give up its dreams of a consumer market? Absolutely not. As sales to large businesses trail off, PC manufacturers have to pay attention to a home market that is projected to grow as fast as 70% per year.

However, brand loyalty is almost a thing of the past in the retail electronics market, and IBM and others heading into this brave new world may find out that an educated consumer is its worst customer.

As the video cassette recorder industry has found, price and features are the name of the game in building market share to sustainable levels. IBM will not play the features game, offering no expansion slots and relying on the dated 286 processor. And it most definitely has never learned how to play the low-cost supplier game.

Those who do a little more homework may find themselves intrigued by a quiet revolution taking place in the mail-order channel. If you've got the nerve, you will find that for what it will cost to buy the best IBM PS/1 with hard drive and color monitor — let's assume a discounted price of $1,700 — you can take delivery of a more robust and powerful, fully configured 386SX system from one of the increasingly respectable mail-order firms that bundle in a one-year, on-site maintenance policy at no extra cost.

With IBM stepping into Sears, you can be sure that Radio Shack, Lechmere, Service Merchandise or your preferred regional electronics store will quickly drop their prices down closer to mail-order levels in order to compete.

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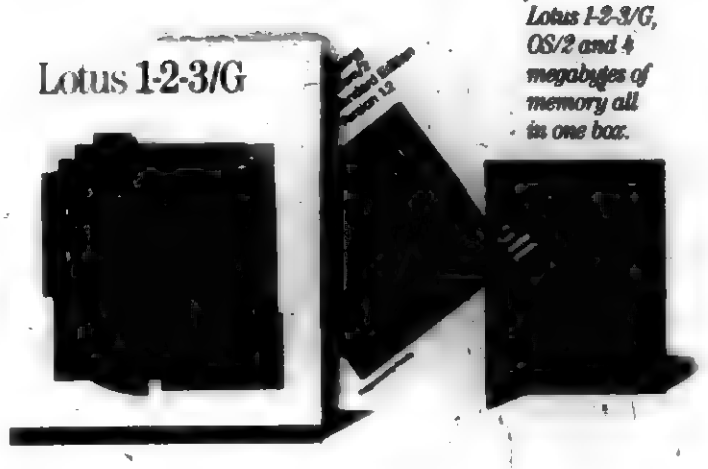

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The more you get to know 1-2-3/G, the more you'll like it. The advanced functionality helps you do better business analysis, with bonuses like file linking, network support, true 3D worksheets, and the new advanced goal-seeking technology of Solver.

Solver helps you solve complex "what if" problems by showing you "how to" achieve desired results. Rather than going through a lengthy trial-and-error process, just ask Solver to present you with alternatives, given whatever variables or constraints you define in your spreadsheet. It will not only give you a choice of solutions but will also point out the optimal one.

IBM

If you're a current 1-2-3 user, you'll be happy to know that all data and macros created in existing versions of 1-2-3 can be retrieved directly into 1-2-3/G. So a move to OS/2 will only serve to enhance any investment you may have already made in 1-2-3.

But how does OS/2 make 1-2-3 better? Well, besides introducing 1-2-3 to a graphical environment, OS/2 works harder and faster, so 1-2-3 can work harder and faster for you.

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At this point, you're probably thinking, "Enough, I'm convinced." But just in case, we'd like to bring you up to date on OS/2.

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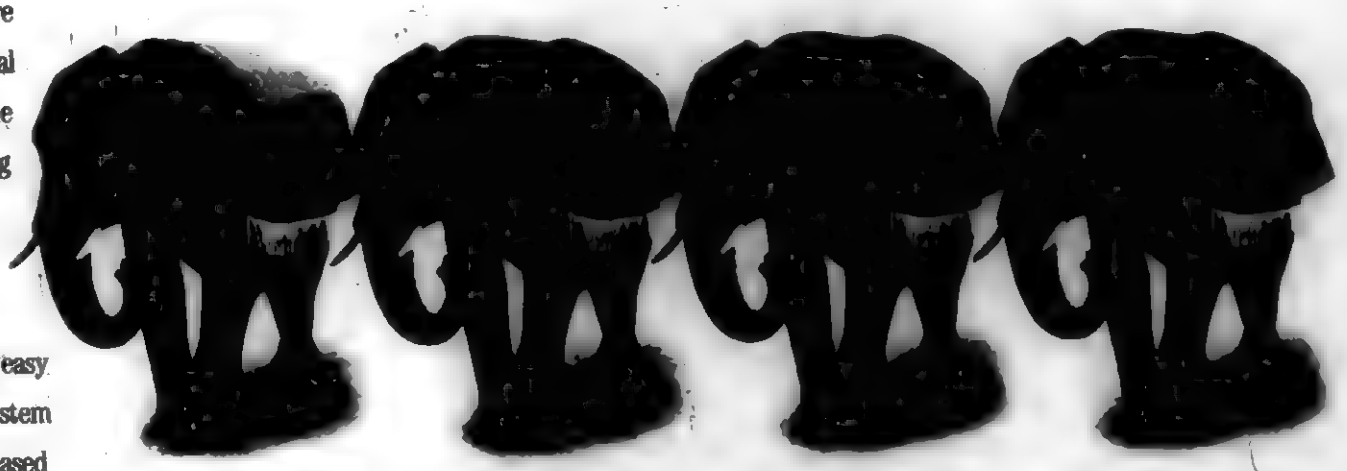

4 megabytes of memory will give you plenty of room to operate OS/2.

Multitasking in OS/2 lets you get your job done more efficiently by allowing you to work with several applications at once, or even perform several functions at once. Instead of having to end one program before retrieving another, you can open as many OS/2 windows as you need, in any size. And not only view them concurrently, but also transfer data among them. You can also do things like print a spreadsheet and run Solver at the same time.

Plus, with a capacity of up to 16Mb of real memory, you can run larger, complex programs concurrently. And reliably. That means your computer is more efficient for you, not just more fun.

If you're worried that a move to OS/2 will mean sacrificing the investment you've made in DOS-based applications, this should put your mind at rest: The DOS compatibility mode in OS/2 allows you to run most of the existing DOS-based programs you already own. Which means the transition to OS/2 involves great gain, without any pain.

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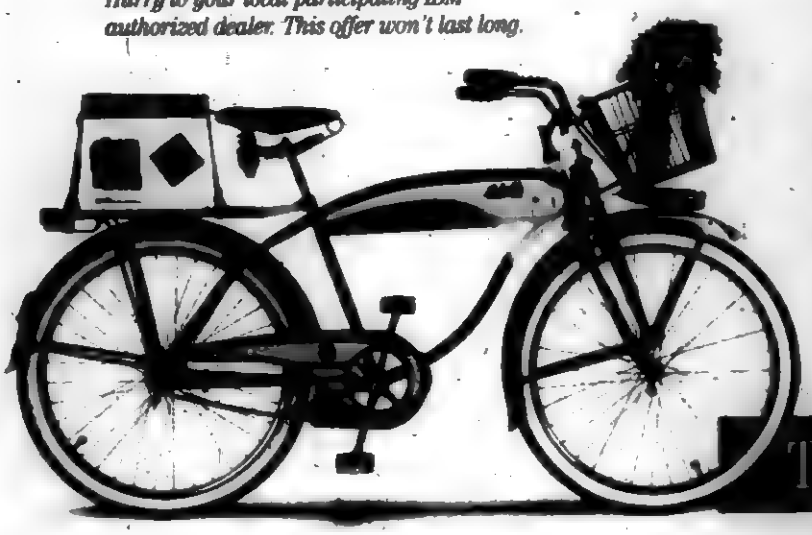

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COMMENTARY

Rosemary Hamilton

No easy answers

Any user who has committed to a computer-aided software engineering (CASE) strategy recently deserves a round of applause. It could not have been an easy decision.

Many users are faced with critical and costly application development problems, and there are no easy answers for them these days.

First, we have IBM and its AD/Cycle strategy. To date, AD/Cycle consists mainly of existing, unintegrated products and big promises for the future.

Then, we have a host of other vendors, each claiming to deliver AD/Cycle-like solutions today.

Well, one might guess that the decision should be based on how badly a company needs to make the move to CASE. If an IS shop needs it now, then it should go with one of the non-IBM alternatives. If it can afford to wait, then it's worth holding off to see what IBM's AD/Cycle will be one day.

Well, fat chance that it could be so straightforward.

Most industry observers say IBM's AD/Cycle will one day be the de facto CASE standard in the IBM world. So, if you go with a vendor that has products today, will you be cut off from the future standard CASE platform?

To answer that question, today's suppliers of AD/Cycle-like products use the following

Continued on page 28

Taking a new chargeback tack

Charging users for IS service, despite new twists, is still controversial

BY JOHANNA AMBROSIO
CW STAFF

The love-hate relationship between information systems managers and chargeback systems continues.

However, there are some new twists on the old debates, observers said. IS shops are pricing their services more competitively these days, and there is even talk of establishing rates based on actual work done — per check processed or invoice completed, for example. The new approach is seen as better because it speaks to line and senior management in terms they can understand. Also fueling some renewed interest are the trend toward outsourcing — with IS having to justify its existence — and Computer Associates International, Inc.'s new chargeback package (see story below) announced last week.

However, charging user departments for their IS expenses remains controversial and difficult to implement. "Chargeback is never really satisfying in a practical sense," said Bill Rosser, vice-president of industry service at Gartner Group, Inc. in Stamford, Conn. "IS may feel it takes too much time, effort and money to get the system going, and users may feel that whatever system is used is unfair, and they're unhappy. So no one's really satisfied with it."

Behavior modification

The purpose of chargeback, Rosser added, is to "modify users' behavior to keep costs at a minimum, but it's very difficult to achieve that goal." Under most chargeback schemes, IS sets prices for different services or components — disk storage and processor time, for example — and then charges those costs back to user departments. There may be incentives in the form of giving discounts for jobs run at night to free up resources during peak periods.

Part of the difficulty is in figuring out which services are subsidized by the IS group, such as disaster recovery and network management, and which are paid for directly by users. Adding to the complexity are distributed systems and trying to determine which part of a network is billable to which users.

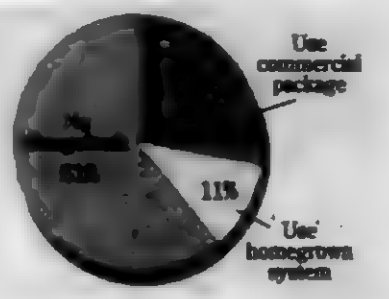
Nor are chargeback systems always popular among line managers, who are not used to paying for computer services. Mutual of Omaha Insurance Co. began its chargeback program on a pilot basis in 1986 and fully implemented it two years later. Even now, according to Dave Pepple, executive vice-president and director of computer data services, "we continue to have discussions about this strategy. It's controversial, and it can generate more emotion than logic. Senior management is supportive, but middle and lower management accept it only reluctantly."

The chargeback scheme has also made the IS department's role "more difficult," Pepple said. "You have to be careful to price the services appropriately, and we have to deal with a lot more customer questions. But now line managers can see both the costs and the benefits of a particular service. It's made them more intelligent users of MIS, and that's good for the company."

Mutual uses a chargeback system called transfer pricing, which means it prices all of its IS services with a careful eye toward competitive rates. "We price some services above what they cost us, and some services below cost," Pepple said.

Charge!

Although most sites don't use chargeback, those that do prefer packaged systems



Source: Computer Intelligence CW Chart: Paul Mock

He is not alone in worrying about what outside services charge. "The big issue in chargeback is market-based pricing," said Len Bergstrom, executive vice-president at Real Decisions Corp., a consulting firm in Darien, Conn. IS has to be prepared when an outside service knocks on users' doors, trying to steal users away.

Also, Bergstrom said, IS needs to know what things cost to be able to intelligently evaluate an outsourcing decision. "If you can't measure it, you can't manage it."

Another new twist is something called natural business unit billing, or charging users by actual work done instead of by computer resources. "Everyone talks about it, but few are able to do it. You need very sophisticated chargeback systems and a real understanding of chargeback to be able to pull this off," Bergstrom said.

Second generation

Computer Associates International, Inc. recently took the wraps off its "second-generation" chargeback package.

Roger Craig, product manager, said CA-PMA/Chargeback is more flexible and more sophisticated than the company's JARS software, introduced in 1974. "But to use PMA/Chargeback, you still need JARS to preprocess the information. Where JARS is batch-oriented, CMA is on-line," Craig said.

The new package, which will go into beta testing during the fourth quarter, allows users to comply with changing enterprise structures and can be set up to set rates with different criteria. On-line reporting is accomplished with pull-down menus that adhere to IBM's Common User Access specification.

PMA/Chargeback runs under IBM and Digital Equipment Corp. operating systems, including MVS, VSE, VM and VMS. It also accepts input from different databases, including DB2 and Software AG of North America, Inc.'s Adabas.

"Chargeback has been an issue for many years and is coming to the front again because corporate America is becoming more concerned with costs," Craig said.

JOHANNA AMBROSIO

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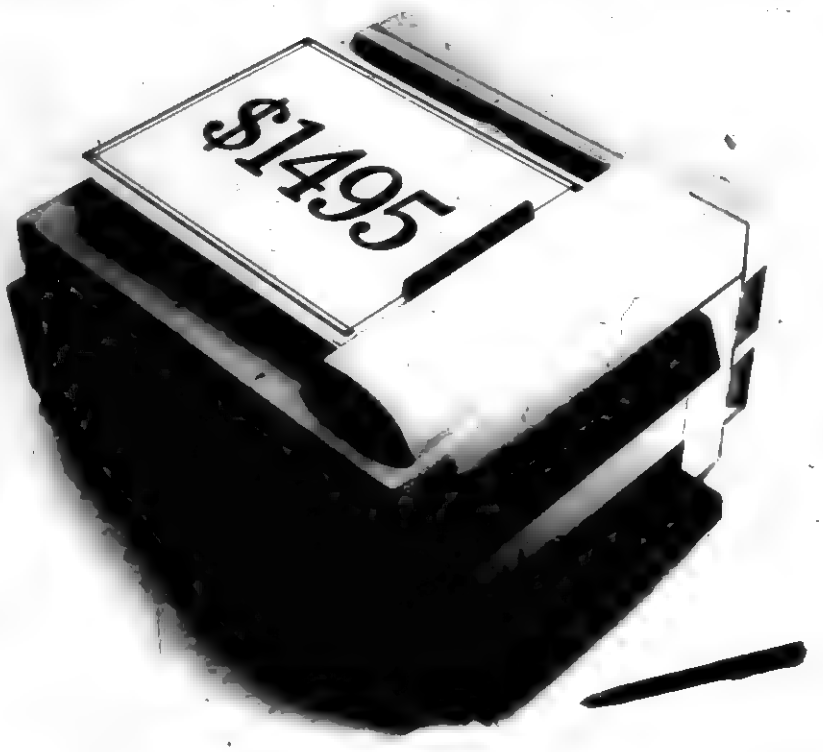

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The Univac I: First in the field

The age of business computing kicked off at a washing machine factory

BY MITCH BETTS
CW STAFF

The Korean War was over, Dwight Eisenhower was president, McCarthyism was in the news and the first business user of a computer was already gaining a competitive advantage.

It was 1954 when a Univac I mainframe computer was installed at General Electric Co.'s Appliance Park in Louisville, Ky., believed to be the first commercial application of a computer. The "giant brain," as computers were called then, was used for payroll and material control at the factory.

"The material control system was so good that management wouldn't let us go out on a lecture tour. They said this was an advantage we didn't want to let out," recalled John Swearingen, a GE member of the task force that installed, programmed and operated the Univac I.

The Univac I saved the company millions of dollars by tracking and scheduling materials for the assembly line and reducing excess inventory. In the first few months at the washing-machine factory, the system cut inventory of raw materials by $1 million, Swearingen said.

Swearingen and other oldtimers of the data processing field reminisced about the Univac I at a recent oral history conference in Washington, D.C., sponsored by the Smithsonian Institution and Unisys Corp. The Univac I was made in Philadelphia by the Eckert-Mauchly division of Remington Rand, Inc.

Du Pont Co., another early user, gained a competitive advantage by using its Univac I for chemical engineering problems, said Donald Marquadt, manager of Du Pont's Quality Management and Technology Center. The computer, which produced very reliable data because of error-checking procedures, was used to study the strength of bundles of fibers under different loads, Marquadt said.

The discussion showed that gaining a competitive advantage with information systems is nothing new. The big difference in 1954 was that the Univac I used 5,400 vacuum tubes, executed a mere 2,000 instructions per second and was programmed in machine code — ones and zeroes.

The conference focused on data processing in the 1950s, but it seemed that speakers touched on many of the same issues affecting IS managers today:

- The systems integrator. It was Arthur Andersen & Co., the accounting and consulting firm, that recommended that GE buy the Univac I rather than a prototype machine from IBM and acted as project coordinator in charge of the installation and training.

At a time when many people were skeptical that computers had any future in business, Leonard Spacek, then-chief executive officer at Arthur Andersen, wanted his firm's Administrative Services Division (now Andersen Consulting) to explore the uses of computers in business accounting.

- The IBM factor. Roddy Osborn, the GE manager who chose Remington Rand's novel computer, took a lot of flak for not buying from trusty IBM, which was the dominant vendor in the tabulating machine market. "It was a courageous decision on his part," Swearingen said.
- Maintenance headaches. A five-man maintenance crew was on hand at all times to pull faulty vacuum tubes and make other repairs. "A six-hour span on that computer without failure was rare," Swearingen said. "The maintenance people may have had the computer more than we had it all week."
- Sales hype vs. reality. Sales representatives said a 10,000-employee weekly payroll could be done in four hours; it actually took 44 hours, Swearingen said. "You just got it done when it was time to start the next one," he said.

Many demonstrations of the new machine were also rigged because the system always seemed to break down at inopportune times, speakers said. Operators learned to keep a good copy of the output tape on top of the printer, ready for use if the live version was headed for failure.

"I have to say the demonstrations were always disasters," Swearingen said. "Demonstrations would make the computer nervous."

Unisys Corporate Archives

The Univac I *introduced a new era of commercial computing*

CASE veterans say: Look before you leap

BY ROSEMARY HAMILTON
CW STAFF

While some information systems shops are well on their way to a full-blown computer-aided software engineering (CASE) environment, other users are just beginning the journey. To those newcomers, users and analysts alike made this recommendation: Don't hurry to buy anything.

"There is a lot you can do without actually buying a repository," said Howard Fosdick, president of Fosdick Consulting, Inc. in Villa Park, Ill.

In recent interviews, IS managers and analysts said new users are making a big mistake if they look at a CASE implementation as a matter of selecting products. CASE is primarily a management issue requiring cultural and organizational changes before software tools can really be effective, observers said.

"People have to look at this as an information management issue and start implementing steps that will move them into that," said Lionel Brooks, a systems engineer in the information resource management department of New York Life Insurance Co., which is committed to IBM's AD/Cycle strategy for CASE. "If the corporate culture isn't in place, then you'll end up with big, expensive tools and not know what to do with them."

Emmanuel Ackerman, manager of data administration at Depository Trust Co., said he expects it will take years before his staff has fully adapted to a CASE environment.

"Taking a company through this, to grow into a formal methodology, is something that the experts say takes three to five years," Ackerman said. "You don't do it overnight. These are the problems of social evolution. This isn't just automating something."

In 1988, "we had no formal life cycle, no tools, nothing upper CASE," Ackerman said. "We became aware that the [IBM] repository was coming down the road, so we asked, what did we need to do to get ready?"

The staff first evaluated what the goals were and what developers needed to get their jobs done. It then began evaluating published methodologies, including process-driven and data-driven methods. It ended up selecting the information engineering approach supported by Knowledgeware, Inc's. Information Engineering Workbench.

Now, the real work was under way.

"We have specialists on staff who are starting pilot projects with a straw methodology, and they are working some people through it," Ackerman said. "We're seeing how well the users respond to it, how the development people respond, and we're measuring the impact on culture and structure."

CASE IS PRIMARILY a management issue that requires cultural and organizational changes before software tools can really be effective.

Fosdick suggested that users first address the nonproduct issues, such as training and selecting a methodology. "For the first time in 30 years, we are getting away from writing code," he said. "Lots of companies structure teams based on this 30-year history. The organization has to change."

According to Vaughan Merlyn, chairman of CASE Research Corp., IS shops should first define standards for application development to replace the sometimes haphazard approaches used today. This step includes not only a software methodology but a staff structure that better reflects data management and standard development procedures. Users should have a data administrator and, eventually, a repository administrator.

"Most organizations don't have a true data administration function today," Merlyn said. "They have database administrators, who are concerned with relatively technical functions. But a data administrator is the keeper of information who has to be sure the company as a whole is sharing a common view of data."

Buoying a Floating Point

Sun Sparc chips to be used in supercomputer

BY J. A. SAVAGE
CW STAFF

Supercomputer maker FPS Computing, Inc. recently said that it will build a supercomputer using Sun Microsystems, Inc. Scalable Processor Architecture (Sparc) chips and will jointly market the resulting system with Sun.

FPS, also known as Floating Point Systems, has been on a downhill slide for at least three years, totaling losses of about $75 million. During the same period of time, Sun made about $183 million.

Bill Keating, Sun's director of corporate technology marketing, said, "We don't have to do much work. Our sales guys just work with their sales guys."

He added that in the worst possible case — if FPS eventually goes under — Sun would no longer support FPS' supercomputers.

The FPS machine, called the 500EA, will use up to eight Sparc chips in parallel and Sun's version of Unix for math-intensive tasks such as oil exploration modeling and finite element analysis.

FPS also sells a stand-alone Unix computer that uses proprietary reduced instruction set computing processors.

FPS will be responsible for developing software to allow Sun applications to run on its supercomputer.

FPS did not say how fast an eight-processor supercomputer would run, but a four-processor configuration that sold last week runs at 133 million instructions per second, according to the company.

America West Airlines clears 3090 for takeoff

ON SITE

BY J. A. SAVAGE
CW STAFF

TEMPE, Ariz. — Perhaps it's the free in-flight drinks. Perhaps it's the increased efficiency of employee ownership. Perhaps it's the record of on-time arrivals. Whatever it is, America West Airlines has grown like a sunflower — approximately 100% in each of the last two years — and information services has changed dramatically to keep up.

From 1983, when the airline was established, to 1986, "essentially all information services were either acquired [as services] or used on PCs," said Carl Faulkner, chief of information services. But that was when America West had revenue below $350 million.

When it looked like revenue would grow by 50% in 1987, the company began looking for a turnkey system. There was no such system available, Faulkner said, so America West invested in a Unisys Corp. Model 1100/73 mainframe and attendant software. "It was OK at first," he said, but despite adding two Model 1100/91s and a Model 1100/92 in 1988 and upgrading to a Model 1100/94 last year, "it's beginning to run of gas."

Faulkner said many applications, written in Unisys' Mapper fourth-generation language, no longer accommodated the expanding business, and it soon became apparent that rewrites were in order. With that task facing it, the information systems staff decided to look at other hardware platforms. The IBM 3090 Model 120 platform proved to be less expensive than another Unisys mainframe, Faulkner said, and he found more software for large domestic airlines was available on a 3090 than the Unisys platform.

Michael Norton

America West's Franco *wants to track human 'currency'*

The 3090 mainframe will host new applications rather than transferring current ones from the Unisys computers.

Jorge Franco Sr., vice-president of the company's new business technology services division and former vice-president of IS, said that the initial application will likely be a DB2 database for employee tracking — a complicated human resources system.

"We need to keep track of the 'currency' of individuals — their expertise and background experience. We encourage people to move across the company, and to do that, we need the most comprehensive database available," he said.

The need for employee tracking is greater at America West than most other airlines because it is employee-owned, and that twist on ownership changes the way things are done. IS can assist departments with a database application.

"In other airlines, there are more rules and regulations," possibly due to their military forebears, Franco said. "We have priorities, either by operational, hardware or software requirements. From there, employees can suggest dramatic changes," he said.

For instance, in development, an employee might find it useful to have a particular development tool. "They do the homework on their own, get specs, sometimes even prices, although we don't encourage [price shopping]," Franco said.

From there, management evaluates the proposal. Franco said that if feasible, the employee's idea will be implemented.

At the same time the company committed to the 3090 mainframe, it also reorganized. Franco's group was spun off as a for-profit business, although it still serves the company's IS department without money changing hands.

The group officially adopted its name in May, and it has yet to have any customers, but its first service will be a cargo management system.

"We'll sell applications to other airlines, ones probably smaller than us because they can't afford their own platform and its attendant infrastructure," Franco said. The application was developed by Cargolux Airlines in Luxembourg and licensed by America West. While currently based on the Unisys platform, the two airlines have agreed to develop software for other computers.

Along with the new mainframe and division is an expansion of activity that, on the surface, appears rather controlled despite its real estate.

For instance, the new computer center, which contains approximately 50,000 sq ft of space, is about two-thirds full, with the rest on reserve for further expansion. While well-staffed, there appears to be no frenetic walkie-talkie communications, just regulation semi-drawl Sun Belt repartee.

Aside from the IBM acquisition, the building is being filled, by and large, with a mishmash of equipment. For instance, a Hewlett-Packard Co. Series 300 Model 950 minicomputer handles just revenue accounting.

That individual systems do not talk to each other is of little concern to Franco. He said there are "periodic interfaces," such as the tape transfers, but that real-time communications are not yet required. "We're gambling on future technology to give us common access," he said.

Looking toward the future, Faulkner said several networking projects are now in the planning stage. For example, America West currently contracts with System One for its reservations and expects to decide next month on whether to bring its reservations in-house.

NEW DEALS

Securities market goes electronic

Portal, the first electronic market for issuing and trading private market securities, began working on a fault-tolerant **Stratus Computer, Inc.** XA2000 Model 110 system last month.

Operated by the **National Association of Securities Dealers** (NASD), Portal offers a faster, more efficient alternative to the traditional method of handling private placement transactions over the phone or by mail. The system is installed at NASD's computer center in Trumbull, Conn. Subscribers can access Portal to launch issues, check prices in real time, execute buy and sell orders and clear and settle trades in any of the world's major currencies.

Lloyd's of London will also be installing a Stratus system as part of a $3.4 million project to streamline its risk insurance placement, reinsurance and claims processing business. The risk insurer will use an XA2000 Model 120 to provide on-line relational database and communications services for the IBM-managed London Insurance Market Network.

The global network, which by the end of the year will link some 600 underwriters and brokers with third-party processing bureaus participating in Lloyd's insurance market, is anchored by an IBM 3090 Model 600S mainframe at Lloyd's remote data processing center in Chatham, England. In 1991, Lloyd's officials plan to build and run advanced on-line transaction processing applications on the Stratus machine.

Digital Equipment Corp. and **Interactive Systems, Inc.** (ISI) will provide a new financial management system to the chief administrative justice office of the **Massachusetts Trial Courts**, the companies announced recently. The fund accounting and budgetary control system from Lowell, Mass.-based ISI will run on two clustered DEC VAX 6410 systems networked to 50 personal computer users.

Integrated Micro Products, Inc. (IMP) will install three of its Unix-based fault-tolerant computer systems as network support machines at **Sandia National Laboratories** in Albuquerque, N.M. The government lab will receive three IMP XR 655 computers to integrate into a campuswide network of Cray Research, Inc. supercomputers. The IMP systems will run the Ingres Corp. Ingres 6.2 relational database management system and Fortran software.

IMC Systems Group, Inc. announced a worldwide licensing agreement with **J.C. Penney Co.** to provide a multiplatform version of IMC-Plus for the retailer's 12 worldwide import departments. This new version of IMC-Plus allows organizations to integrate the import process on midrange and mainframe computers as well as PCs.

Hamilton

FROM PAGE 25

phrases: We intend to be compliant. Our products will be based on it and complement it. We are a preliminary step to it. We will help users migrate to it in the future.

The problem here is most of the vendors don't know exactly what AD/Cycle and its information model will be. So, how can they be sure they can achieve any of the aforementioned claims — without difficulty? Let's not argue the point that they will be able to do it. But what will it involve? We do not know that, plain and simple. If a vendor is promising you help for a future AD/Cycle migration, you can trust that. But no one can promise you it will be easy.

So, what do you do? If you go with a non-IBM product today, you run the risk of having migration problems in the future. But if you need a CASE solution now, waiting around for all the answers is no answer at all.

I think the right course of action was summed up best by Bob Wall, data resource manager at Rite Aid Corp. When asked why he made his decision not to wait for IBM, he said, "You have to make a commitment to do something. You can't sit back and say, 'I made the right decision,' but you can say, 'I made the best decision for my organization at this moment.' "

Wall is working with a third-party software supplier now with the plan to move to IBM's Repository Manager in the future.

AD/Cycle seems so big. It's strategic to IBM, it's an architecture for a critical area of IS, and it's been heavily promoted by IBM. That can be intimidating. It's one thing to buy the wrong software package for a particular operation, but to mess up on an entire application development platform? That decision could scare any user.

But when you think about it, the current CASE dilemma — Should I wait for IBM or go with another vendor's product? — is the same dilemma that has plagued many other market segments. If you think back, you've probably been through it before.

That doesn't lessen the importance of the CASE decision. It's just a reminder that users often have to take the best that is available to them today and then keep their fingers crossed.

Hamilton is Computerworld's senior editor, systems and software.

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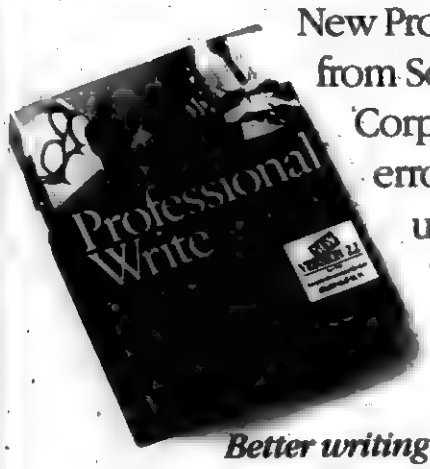

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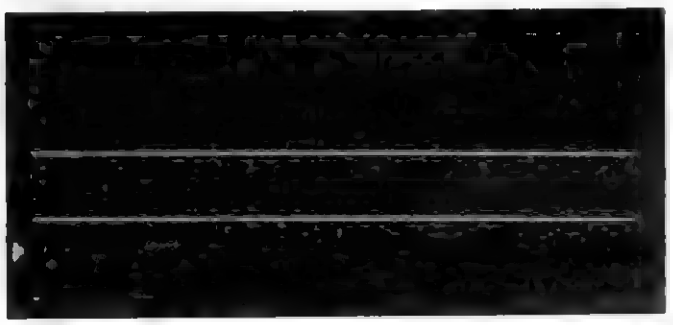

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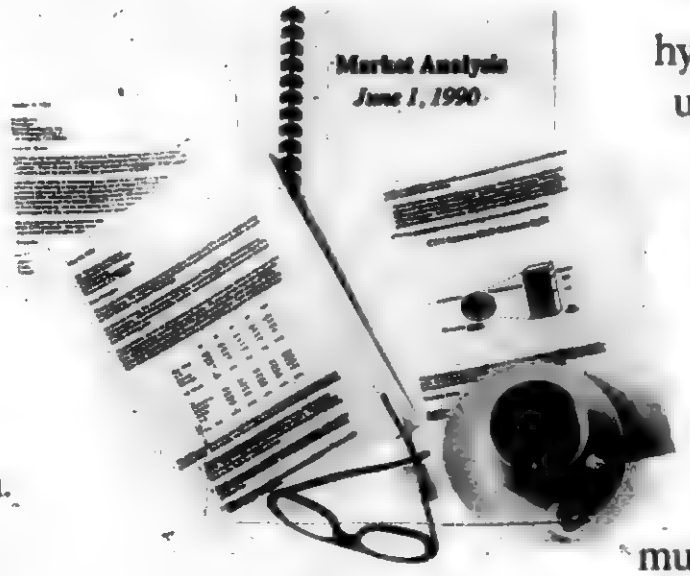

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Unify announces development tool

BY JEAN S. BOZMAN
CW STAFF

SACRAMENTO, Calif. — Unify Corp. late last month introduced a new application development package for Unix workstations.

Called Accell/Workstation Plus, the new package supports the Motif and Open Look graphical user interfaces and has links to relational database management systems made by Unify, Sybase, Inc., Oracle Systems Corp. and Informix Software, Inc.

A key element of Accell/Workstation Plus is a graphics-based generator that allows programmers to design point-and-click, mouse-driven applications for Unix workstations. The product is intended to compete with Ingres Corp.'s Windows/4GL, a graphically based workstation development tool introduced earlier this year, said Anu Shukla, Unify's director of corporate marketing. Prices for the Unify workstation product start at $10,500.

However, the new product also serves as an enhancement for Unify's Accell/SQL forms generator and fourth-generation language. It is designed to allow users to write an application once, then modify it for use on various computers. "We decided to support [graphical user interfaces] for workstations, for character-based terminals and for PCs, because we believe all three types of machines coexist on Unix networks," Shukla said. She explained that Accell/SQL has been modified over the last few months to support the Motif graphical user interface, so that it could be sold to RISC System/6000 users by IBM salespeople. The Motif feature, priced at $3,200, will be available next month, Shukla said.

SOFT NOTES

Informix aims for Opencase

Informix Software, Inc. announced last week its intent to develop Opencase/Structured Systems Analysis and Design Method, a software product aimed at delivering a distributed application development environment for Unix-based firms in the UK working on computer-aided software engineering technology. It is due out in the UK in the first quarter of 1991.

Using **Recital Corp.'s** existing database and fourth-generation language software, **Champion Business Systems** announced that its accounting software packages, previously only personal computer-based, will soon be available on the Digital Equipment Corp. VAX and AT&T Unix System V environments. They are due out by the third quarter.

Cadre Technologies, Inc. and **Cadence Systems, Inc.** agreed last week to jointly market their codesigned solutions for electronic systems hardware and software manufacturers. Cadre, a computer-aided software/systems engineering tools developer, as well as Cadence, an electronic design automation software manufacturer, will aim to provide a way for engineers within a manufacturing environment to work together throughout the product development stage.

NEW PRODUCTS — HARDWARE

Data storage

Clearpoint Research Corp. has announced a memory board equipped with a functional toggle switch that enables users to upgrade their CPUs without replacing the 16M-byte board.

The IMME-400/16 MB is compatible with IBM Application System/400 Models 30 through 70 and includes a lifetime warranty. A 24-hour-a-day, toll-free technical support hot line is also provided.

The board lists at $12,000.

Clearpoint
35 Parkwood Drive
Hopkinton, Mass. 01748
(508) 435-2000

Processors

Sanyo Electric Co. and Icon International, Inc. have announced the Icon 2600 computer system.

The dual-processor product was designed with an enhanced version of the Pick Systems Pick R83, which is the same software package included in other Sanyo Icon systems.

It features 2M or 4M bytes of random-access memory and offers configurations for three to 33 users, the vendor said.

The system also runs MS-DOS Version 3.3. Pricing starts at less than $13,000.

Sanyo/Icon
764 E. Timpanogos Pkwy.
Orem, Utah 84057
(801) 225-6888

The Sanyo Icon 2600 *supports three to 33 users*

I/O devices

Distributed Logic Corp. has announced Model DQ322, a controller board that interfaces ANSI-standard QIC-02-compatible ¼-in. streaming cartridge

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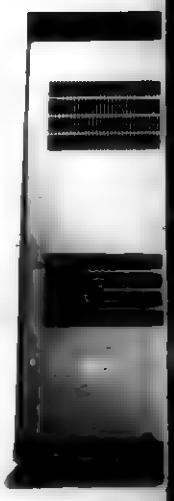

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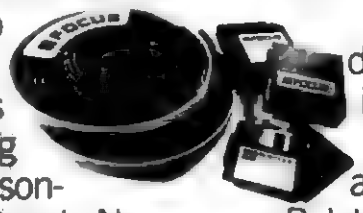

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tape drives with Digital Equipment Corp. Q-bus systems.

The dual-height board connects a single-tape drive to any DEC LSI-11 or MicroPDP-11 computer. The device uses standard 3M Co. or similar 300- or 600-ft tape cartridges and provides up to 144M bytes of formatted data storage per cartridge, according to the vendor.

Its 28K-byte data buffer features an average transfer rate of 82K byte/sec. The product's list price is $1,395.

Dilog
1555 S. Sinclair St.
Anaheim, Calif. 92806
(714) 937-5700

Management Graphics, Inc. has unveiled a digital film recorder that captures 2,000- and 4,000-line 35mm images at a throughput rate of more than 120 per hour.

The Solitaire-8XP was designed with quality color compensation tables and red-enhanced phosphor to provide high-quality color range, balance and uniformity.

Pricing for a unit without a camera head is $49,000.

MGI
1401 E. 79th St.
Minneapolis, Minn. 55425
(612) 854-1220

NEW PRODUCTS — SOFTWARE

System software

Kimtrax, a transportation management system for corporate trucking fleets, has been introduced by Kimberly-Clark Computer Services, Inc.

The product runs on IBM mainframes and provides the following on-line applications: order-entry management; freight planning, rating and billing; performance reporting; dispatching; trip management; driver and equipment management; electronic data interchange; and vehicle maintenance.

The product's list price starts at $150,000. Remote services are available at various prices, depending on the number of resources used.

Kimberly-Clark
P.O. Box 619130
DFW Airport Station
Dallas, Texas 75261
(214) 830-6800

Raxco Software, Inc. has introduced two products that were designed for Digital Equipment Corp. VAX/VMS systems.

The Perfectdisk I/O Optimization System makes files and free space contiguous and intelligently determines its run frequency by watching for file fragmenting and then defragmenting/optimizing in one pass, the vendor said.

Raxmanager can track resource utilization, thus enabling systems managers to identify system bottlenecks, implement project accounting and charge users for resource use.

Perfectdisk is priced from $1,050 to $8,750, and Raxmanager costs between $3,300 and $18,750, depending on VAX configuration.

Raxco
2440 Research Blvd.
Rockville, Md. 20850
(301) 258-2620

Russell Information Sciences, Inc. has introduced a menu-driven operating environment for Digital Equipment Corp. VAX system managers and users.

The Xecutive Office System protects VMS operating systems from user interference and includes a menu interface that allows applications, utilities or custom Digital Language Command procedures to be added to a user's menu in less than one minute, the vendor said.

A manager's menu enables system managers to perform routine tasks, and a menu compiler provides multilevel nested menus and English syntax to add and tailor functions. The software also allows managers to change security codes.

The product is available for DEC VAXs or Vaxstations running the VMS operating system. Pricing ranges from $795 to $34,995, depending on CPU size.

Russell
25201 Paseo De Alicia
Laguna Hills, Calif. 92653
(714) 768-5000

Development tools

Cognos has announced an application development software package for Digital Equipment Corp. VAX users.

Powerhouse Version 6.0 includes a user interface that enables developers to customize screens to resemble DEC's All-In-1 and other graphical interfaces. Pricing ranges from $5,000 to $230,000, depending on configuration.

Cognos
67 S. Bedford St.
Burlington, Mass. 01803
(800) 426-4667

Neuron Data, Inc. has announced a new release of its Nexpert Object expert systems tool.

Nexpert Object Version 2.0 supports multivalue and list data types. The tool runs on more than 30 platforms.

The product is scheduled to begin shipping this month for $5,000 to $8,000 for desktop and midrange versions. Pricing for mainframe models ranges from $50,000 to $80,000.

Neuron
444 High St.
Palo Alto, Calif. 94301
(415) 321-4488

Ready Systems Corp. has introduced the RT-Ada/88K, a real-time operating system designed to support 88K-byte Ada applications on embedded Motorola, Inc. 88000 reduced instruction set computing microprocessors.

The product comprises Ready's Ada Real-Time Executive multitasking kernel and Cardtools, a computer-aided real-time engineering tool set that provides task-level timing and simulation of complex applications during the design phase.

RT-Ada/88K is scheduled to be available next month. Pricing starts at $18,000.

Ready Systems
P.O. Box 60217
Sunnyvale, Calif. 94066
(800) 228-1249

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RED STANDS OUT FROM THE CROWD.

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COMMENTARY

Patricia Keefe

Not too little, but too late

OS/2 "Lite" — it was a good idea once upon a time and, for a small group of users, may well fill a need. First announced as a design goal last November, by the time IBM is ready to ship it — probably later this year — it is likely to be dismissed as too little, too late [CW, June 25].

From all appearances, Microsoft has already won the battle for the desktop with its recent delivery of Windows 3.0.

Backed-up support lines and waves of complaints crashing down on Compuserve notwithstanding, it appears that Microsoft's $10 million-plus marketing campaign for Windows 3.0 has already paid off in spades.

Users are excited — really excited. Several formerly happy users of Quarterdeck Office Systems' Desqview environment told me they have switched to Windows 3.0, and they'll never go back.

Sheldon Laube, national director of advanced technology for Price Waterhouse in New York, used to run OS/2 1.2 on his personal computer. Not anymore. He ditched it for Windows 3.0.

Asked about OS/2 Lite, nev-

Continued on page 39

Multiprocessors still wait for software

ANALYSIS

BY RICHARD PASTORE
CW STAFF

They're not personal computers. They're not minis. They're mutant machines — multiprocessor systems with power rivaling low-end minicomputers but priced and sized in the tradition of high-end workstations. Observers call these hybrids cheap and flexible but say sales will not take off until more multiprocessor-capable software becomes available.

The draw for these systems is their CPU expandability and competitive prices vs. traditional minicomputers. "People who are interested are those that know they're going to grow and don't want to purchase another machine down the road," said Michael Stallo, president of Atlanta-based minicomputer reseller Application Computer Systems.

> "WE'RE ALWAYS interested in more power, but the software's the whole driving thing,"
>
> WILLIAM HARRISON
> HARTFORD INSURANCE GROUP

Publishing house Edgell Communications purchased a dual-processor Wyse Technology 9000i after reaching the limits of its NCR Corp. Tower Series 650 mini. "The Wyse machine gave us the best bang for the buck," said Lori Fraser, telemarketing director at the Cleveland-based company. Though her Wyse system supports 17 users now, "the department can expand to 100 people, and we can still use the same machine," she said.

While the NCR 650 took 10 minutes to perform a sales record search, the 9000i does the job in four seconds, Fraser noted. The same performance improvement could have been achieved by buying a nonexpandable NCR Tower Series 800 mini — but for $30,000 more than the Wyse cost, she said.

Such success stories are rare in the multiprocessor market because there have not been many systems sold. Sales of Compaq Computer Corp.'s much-hyped dual-processor Systempro and Zenith Data Systems' Z-1000 have been less than spectacular, according to observers. A main reason is the lack of software capable of supporting multiprocessing.

"That's the major hold here," said Frank Michnoff, an analyst at Meta Group, Inc. in Westport, Conn. Currently, the only nonproprietary operating system that can handle multiprocessing is Unix, and that requires purchase of special add-on programs.

The lack of software is discouraging interest from The Hartford Insurance Group in Hartford, Conn. "We're always interested in more power, but the software is the whole driving thing," said William Harrison, senior vice-president.

Novell, Inc. and Banyan Systems, Inc. are expected to ship multiprocessor-capable network operating systems early next year, according to Michnoff. "Then we'll see a tremendous amount of growth in these systems, starting in the nine-to-12 month time frame," he said.

PC vendors are not waiting on that day, however. Both AT&T and Advanced Logic Research, Inc. joined the hybrid bunch last month with announcements at Comdex/Spring '90 in Atlanta.

In addition, industry sources said IBM will announce its own dual-processor box later this year. A little larger than IBM's Personal System/2 Model 80, the system will incorporate Intel Corp.'s 80386 and 1486 microprocessors and will rival the low-end Application System/400 mini in performance.

Once the systems and software come into their own, users will find numerous functions for which the technology is ideally suited, analysts said. For example, the machines will address peer-to-peer processing, distributed processing and work group computing, said George Thompson, an analyst at Datapro Research Corp. in Delran, N.J.

"If the work group concept is to take off as most people expect, you'll need this kind of technology," Thompson said.

Analysts also noted that multiprocessor systems are most advantageous for businesses moving up from the PC level rather than down from the mini level. Multiprocessor systems share the same architecture with their PC forebears and run much of the same software. Thus, PC users can preserve most of their PC software investment.

Unless they are running under Unix, mini users may have to rewrite proprietary-based applications to port them to a multiprocessor system.

High-powered hybrids

Multiprocessor systems from PC vendors

Company	System	Processor type	Number of processors	Price
ALR	Multiprocessor Series 3000	486	1 to 6	$16,000 to $27,000 (1 to 2 CPUs)
AT&T	Star server E	486	1 to 4	$27,500 to $89,500 (1 CPU)
Compaq	Systempro	386 (486 to come)	1 to 2	$16,000 to $26,000 (1 CPU)
Wyse	9000i	386 or 486	1 to 6	$85,000 (3 386 CPUs)
Zenith	Z-1000	386 or 486	2 to 6	$18,500 to $45,500 (2 to 6 386 CPUs)

CW Chart: Doreen Dahle

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Navy office rids itself of paper albatross

New PC-based information system will sop up an ocean of job-announcement documentation

ON SITE

BY RICHARD PASTORE
CW STAFF

WASHINGTON, D.C. — If the U.S. Navy personnel office stacked up a year's worth of job vacancy announcements, it could erect a paper tower that would dwarf the nearby Washington Monument by a factor of six.

To reduce these monumental paper proportions and the associated handling costs, the Consolidated Civilian Personnel Office (CCPO) in Crystal City, Va., this week will begin deploying a personal computer-based employment information system.

In a typical year, 4,000 Navy civilian job announcements proliferate into 110,000 pounds of paper that must be distributed to several Navy and other U.S. Department of Defense sites. The new system will eliminate much of that by allowing applicants to access on-line job descriptions and print hard copies of only those positions that interest them.

The cost savings, which will amount to $3,000 per year for photocopying alone, will yield a return on investment in less than two years, according to Karen Buck, CCPO director of technology enhancement.

When it first started planning the automated personnel stations six months ago, the CCPO decided that a lot of applicants for its clerical and administrative positions would be afraid of computer technology. "Giving them an opportunity to walk in and touch the screen for the information they wanted seemed the most user-friendly way to do it," said Diane Cath, a computer systems analyst who helped design the system.

Touch-screen technology also gave the programmers more creative leeway, Buck noted. "We saw other systems that were more limited because they were tied to a specific keyboard," she said. "With the touch screen, we could use our imagination to get anything we wanted up on the screen."

Cath and her fellow programmers designed a multiple-layer menu system that allows users to access jobs by category and grade level. The positions are divided into clerical, engineering, computer-related and senior executive groupings. Details on specific positions include location, salary range and duties.

The hardware setup consists of an Everex Systems, Inc. PC based on Intel Corp.'s 80286 chip. An NEC Technologies, Inc. Multisync color display serves as the touch screen, and a Hewlett-Packard Co. Laserjet IIP prints the hard copies. The touch-screen technology itself comes from Interactive Images, Inc.'s Easel software.

Seven stations will be operational at four Navy sites by October, according to Buck. But it will take another two years before the separate stations are tied into the department's Novell, Inc. Netware-based network. At that point, department managers will be able to directly send vacancy announcements into the system. Currently, CCPO personnel have to key in the new positions and deliver seven different floppy disks to seven different stations.

The touch-screen stations are just the first phase of a two-year employment automation project. The CCPO said it expects to have networks powered by eight to 12 Unix-based servers that can handle up to 1,000 users. The networks will run new applications such as an on-line personnel policies manual, up-to-date training course schedules and an executive information system (EIS). Some applications, such as the EIS, will be based on touch-screen technology but not all, Buck said.

> "GIVING THEM AN opportunity to walk in and touch the screen for the information they wanted seemed the most user-friendly way to do it."
>
> DIANE CATH
> CONSOLIDATED CIVILIAN PERSONNEL OFFICE

The networks will eventually supplant the CCPO's Data General Corp. MV/20000 and MV/10000 minicomputers, which currently run data tracking applications. All the new applications will go on the network, "and the Data General will eventually go away," Buck said.

Groupware start-up plans to get it Together

BY JOHANNA AMBROSIO
CW STAFF

NEW YORK — Yet another vendor aspires to the list of groupware groupies, but the finished product from start-up Coordination Technology, Inc. is a year away.

Coordination Technology took the wraps off its first product last week — an environment manager for work groups akin to Hewlett-Packard Co.'s New Wave. However, the software, called Together, will not be available until July 1991; it has not even entered beta testing.

The company defended its decision to announce Together before it is really, well, together. "Groupware is hot right now, and we wanted to throw our hat into the ring," said Ron Quinn, vice-president of sales and marketing. "Groupware has a six- to nine-month sales cycle, and we can start working to identify customers."

All together now

When it ships, Together is expected to provide four types of functions: aids for organizing people, work groups and activities; personal support tools through an encapsulation process that allows Together to work with any OS/2 application; work-flow processing to transmit messages and assignments and carry out tasks; and a Microsoft Corp./Sybase, Inc. SQL Server portion that will monitor all work and allow users to generate reports. The company said it will port to other SQL servers as customers request it, and that there are no current plans for a Lotus Development Corp. DataLens driver. Also provided are features such as group calendaring and scheduling.

The package will carry a "starter kit" price of $9,995, which includes software for one server and 12 workstations, installation, documentation, training, two days of consulting and one year of telephone support and upgrades. Additional server and workstation software is priced separately.

The company could still have a rough road ahead. Not only will the software be ready long after other so-called groupware packages hit the streets, but the fact that it runs under the still evolving OS/2 could also hurt sales. Coordination Technology will sell Together through a direct sales force and through value-added resellers and systems integrators.

The first beta-test user, Andersen Consulting in New York, is scheduled to install Together next month. Two others, the State of New York's General Services Administration in Albany and Discover Card in Chicago, will begin their pilot programs this fall.

Looking at Windows

Also on the agenda may be a DOS version to run under Microsoft's Windows on the client with the server portion still running under OS/2 for performance reasons. Together was originally developed for DOS, but Quinn said the operating system does not provide enough horsepower for all of Together's functions.

Also, in its current format, Together requires at least 6M bytes of random-access memory when combined with OS/2 and what the company called a "reasonable complement" of applications, a 60M-byte hard drive and a server with 12M bytes of memory.

"We're playing with DOS now to see if we can get enough of our package to run to make it commercially viable," Quinn said.

Coordination Technology, based in Trumbull, Conn., was founded in 1986 and is backed by investor Eli S. Jacobs.

Bill Micklin, a principal at Alex Brown & Sons, Inc. in Fishkill, N.Y., said, "I think the product incorporates a strong knowledge of how we work. But the real story won't be told until people begin to use it."

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Not just another pretty face

Micrografx's Charisma offers multiple business graphics functionality

BY PATRICIA KEEFE
CW STAFF

NEW YORK — Micrografx, Inc. recently introduced Charisma, a Microsoft Corp. Windows 3.0-compatible business graphics package that the company claimed will do away with the need to run multiple graphics products.

Micrografx Chairman J. Paul Grayson claimed that DOS users in large companies today typically need two to three graphics packages to provide the same functionality that Charisma provides.

Charisma got a thumbs-up from Windows advocate Arthur Block, a vice-president at Manufacturers Hanover Trust Co. in New York, for just that reason. He said he will probably standardize on Charisma to avoid the trauma of having to support many different and incompatible file formats from a variety of other graphics applications.

"It's the right platform for anyone producing big power charts," added Ross Gates, an accountant at the audit division of Arthur Andersen & Co.

What Grayson called the "biggest announcement" in Micrografx's eight-year history coincides with its initial public offering and is targeted at the $200 million business and presentation graphics market — specifically Software Publishing, Inc.'s Harvard Graphics and Lotus Development Corp.'s Freelance, which have an estimated $60 million and $50 million in revenues, respectively.

Micrografx' Charisma *integrates a variety of graphical components*

Using a common template approach, Charisma integrates various graphical components, including word charts, business charts, desktop presentations, illustrations and over 2,200 free clip art images, into one product. Grayson claimed that Charisma provides four times as much clip art as its closest competitor.

In addition to a customizable, intuitive interface, the $495 package directly imports data and graphics from Harvard Graphics, Microsoft's Excel and Lotus' 1-2-3. Charisma ships with a batch print utility and an enhanced Dynamic Data Exchange link for Excel. Dynamic Data Exchange also allows Charisma to be used as a graphics engine for other applications.

Templates automate the creation of word charts by defining paragraph margins, indents, alignment, bullets and fonts for multiple levels.

Micrografx claimed that Charisma is the only Windows application that supports 35 Bitstream and six URW outline fonts with on-the-fly rasterization so that any font can be arbitrarily scaled to any point size and rotated to any angle. It includes printer-specific fonts as well.

Business charts can be created in all the common types: area, bar, column, line, pie, scatter, table and combination as well as unlimited two-dimensional and three-dimensional variations. Custom chart features can be stored in the visual chart folder for later use.

Illustration features include Bezier curve drawings and editing, gradient fills, over 16 million colors, color mixing and predefined custom color palettes, as well as an extensive drawing tool set.

For desktop presentations, Charisma includes Slideshow, an electronic slide utility with more than 30 fade and wipe effects, over 20 predefined master pages, over 20 predefined word chart templates and more than 80 predefined business charts.

Charisma replaces Graph+ and is available as a $99 upgrade for Graph+ users.

PC Expo introductions

In the battle of the big spring trade shows, Comdex/Spring '90 won the contest for most personal computer and portable system debuts. PC Expo, however, fought back with a battalion of peripherals and related software introductions late last month.

Adobe Systems, Inc. announced a version of its Adobe Type Manager for DOS machines running Microsoft Corp. Windows 3.0 applications. The software eliminates the jagged-edge, bit-mapped fonts that non-Postscript PC users once had to contend with. The $99 package is slated for September shipment. Adobe also announced three new sets of fonts for IBM PCs and compatibles. The font packs will retail for $99 to $198 and are expected to ship this month.

Another Postscript-related product that debuted at the show is a bridge that connects Apple Computer, Inc. Macintoshes and IBM PCs to the same printer. Extended Systems' Bridgeport connects to the Mac via Apple's Appletalk interface. The PCs patch in via the serial and parallel ports. Bridgeport costs $495.

Small computer systems interface (SCSI) users can access up to seven different SCSI devices from a single host adapter with Micro Design International, Inc.'s SCSI Express. It includes diagnostic utilities and separate device drivers for each peripheral and supports an array of storage devices and operating systems. It costs from $300 to $500, depending on the operating system used.

Xerox Imaging Systems in Sunnyvale, Calif., said it is shipping a new version of its Gray F/X 8-bit image processing software for IBM PCs and compatibles. The $495 package adds enhanced masking capabilities, improved cursor and icon displays, real-time control of brightness and contrast and an expanded filter set for greater control of visual effects.

Phoenix Technologies Ltd. began shipping its BIOS update for IBM PCs and compatibles. This latest release features a setup interface with pop-up menus, on-line help and a diagnostic tool to provide users with system identification information.

ATI Technologies, Inc. announced a pair of 8514/A-compatible graphics boards, said to be up to 10 times faster than the IBM standard. The boards, which support a resolution of 1,024 by 768 pixels, range in price from $699 to $1,299 and will ship next month.

ATI also unveiled a $249 IBM Video Graphics Array 16-bit adapter card. Available now, the card supports resolutions of both 800 by 600 pixels and 640 by 400 pixels. ATI also unwrapped a 9.6K bit/sec. external modem with V.32 modulation, scheduled to ship next month for $799.

RICHARD PASTORE

Keefe

FROM PAGE 33

eral users summed up their response with a "Big deal!"

This is hardly good news for Microsoft's buddies over at IBM, who can't say the same for the $18 million they have allegedly spent promoting OS/2. But you have to give IBM credit: They listened to users last fall who said that OS/2 was too memory-intensive and that it was too expensive to upgrade all that hardware.

IBM, along with Microsoft, unveiled what was positioned as a 3M-byte OS/2 at Comdex/Fall '89 [CW, Nov. 21]. Both vendors then promised to synchronize their OS/2 plans and products, as well as to work toward a 2M-byte plateau.

Just a week later, Microsoft began backing away from a 2M-byte OS/2. Peter Neupert, Microsoft's senior general manager for OS/2, said that while he was trying to "squeeze OS/2 down, right now we cannot commit to a 2M-byte version" [CW, Nov. 27].

A less-than-enthusiastic Neupert also suggested an OS/2 under 3M bytes might be severely limited in function. Based on demonstrations in IBM's booth two weeks ago at PC Expo, he was wrong.

The operating system demonstrated by IBM was much smaller and much faster than the current 3M-byte OS/2. IBM also insisted that it not only will feature the same capabilities but will provide better printer support.

What's not to like? Nothing, actually, but that's not the point. Microsoft's agenda is.

It's true that Microsoft helped to develop OS/2 Lite. But Chairman Bill Gates hasn't spent years on Windows to allow it to be trampled by a gawky, adolescent operating system that still has trouble making friends. OS/2 has a lot of growing up to do.

There are those developers and analysts who theorize that Microsoft broke its fall '89 deal with IBM to confine Windows to the Intel 80286 and to leave the 80386 strictly to OS/2. IBM, these people speculate, may be looking to derail Windows with OS/2 Lite.

However, Windows 3.0 looks and feels like OS/2 and, some said, has a better user interface. It's also cheaper, has more applications written for it and has succeeded in turning the development tide its way.

That is exactly why OS/2 Lite is unlikely to appeal to anyone but the tiny minority that is running OS/2 1.2.

Some developers have suggested that OS/2 Lite might hold appeal for users interested in running OS/2 on their massive installed bases of 286s. The problem is that these people are already moving to Windows and the 386 platform.

If delivery of OS/2 Lite had preceded Windows 3.0, we might be talking a different story here.

It's worth noting that Microsoft Vice-President Paul Maritz took a shot at positioning OS/2 1.2 as a 2M-byte operating system. (So why all the talk at Comdex/Fall about 1.2 being a 3M-byte system and how we needed to "squeese" it down?)

Maritz claimed 1.2 can boot up in 2M bytes and even run an application but added that since the performance is less than acceptable under those circumstances, Microsoft never suggests that anyone try it. Oh. So in other words, it's a 3M-byte system.

Then there's the fact that OS/2 Lite would spare users the need to go down a two-stage migration path — DOS to Windows to OS/2.

However, Microsoft's "Porthole" migration kit reportedly solves the issue of migrating Windows applications to OS/2.

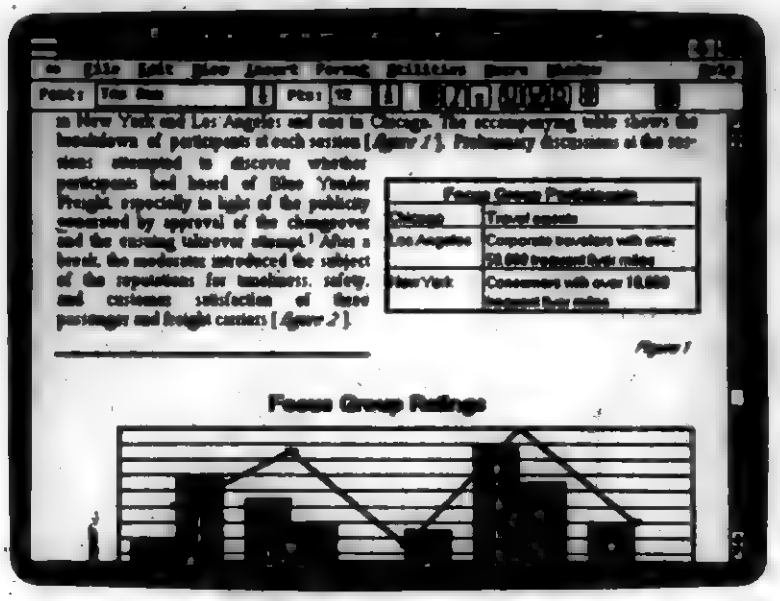
And now that Microsoft is firmly in control of future OS/2 development, sources said one of the key design goals for OS/2 2.0 is to make sure it is completely compatible with Windows. That way, users can migrate up and down the technology highway to their heart's content.

Besides, a lot of corporate managers are holding out for a 32-bit version of OS/2, and while they wait — and wait they will — they are slowly rolling over their installed base of 286-based machines to the 386 standard.

So it would seem that Maritz was right when he suggested that the benefits to be gained from OS/2 Lite do not warrant a separate release. All the evidence so far indicates that users are perfectly happy to accept a Windows diversion until OS/2 2.0 comes out, possibly mid-1991.

In the meantime, OS/2 Lite might become just another good IBM idea that never gets to see the light of day.

Keefe is Computerworld's senior editor, PCs and workstations.



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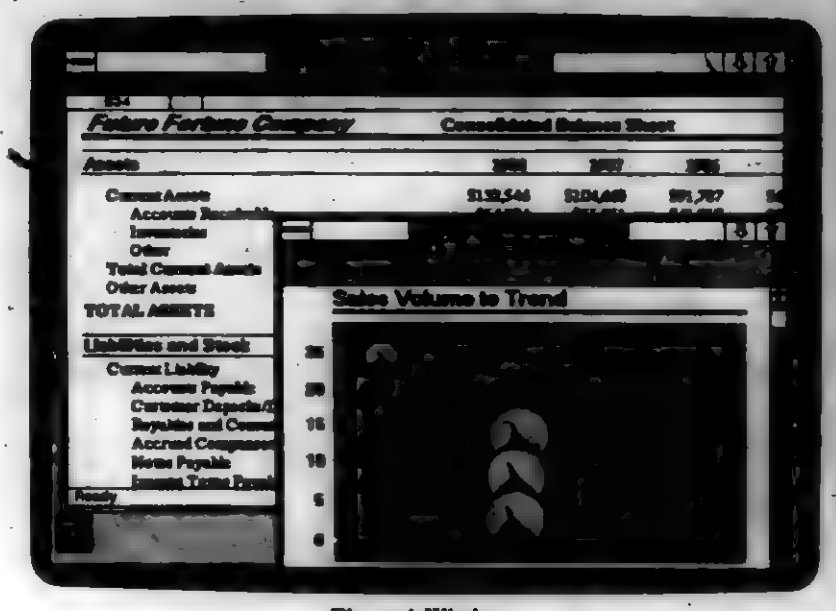

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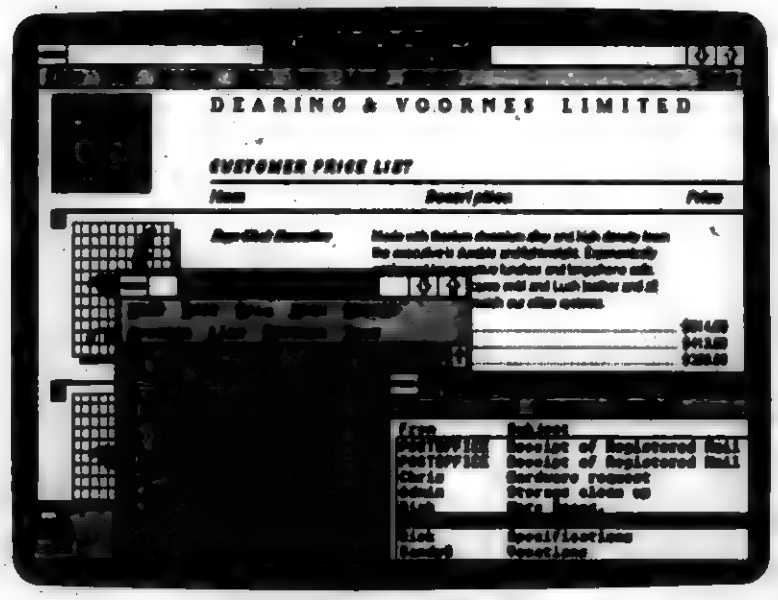

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On The Go Software has announced Version 1.1 of its Expense It expense management system.

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Expense It is priced at $130.

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Macintosh products

Interleaf, Inc. has announced a new version of Interleaf Publisher for the Apple Computer, Inc. Macintosh that includes a gray-scale image editor.

The gray-scale editor allows users to edit photographs and other scanned-in images. Users are reportedly able to pixel edit, zoom, crop and adjust the contrast of photographs. Images may also be rotated, stretched and combined with text or graphic elements. A cloning function enables users to reproduce portions of an image in other parts of an image, the vendor said.

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BIMP3270 — Comprehensive CRT screen image print facility. Copy to terminal printers or spool queue for system printer. DOS and OS.
BIMSERV — On-line display of library directories and entries, VSAM Catalog entries, disk VTOC's, etc.
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Minneapolis, MN 55436
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Data storage

Racet Computes Ltd., a division of Kobe Steel in Japan, has introduced an installation software program that enables users of Apple Computer, Inc. Macintosh systems and IBM Personal Computers or compatibles to install its Cosmos 600 removable, erasable optical storage subsystem in 10 minutes.

PCMS-EZ is bundled with the Cosmos 600, which the vendor is now including in its enhanced Macsimum Storage series of Macintosh-compatible optical disc drives for $4,795 and in its PC-maximum Storage series of optical and hard drives for IBM PCs and compatibles for $5,195.

Racet
3150 E. Birch St.
Brea, Calif. 92621
(714) 579-1725

Iomega Corp. has announced a line of 44M-byte drives that feature access times of less than 22 msec.

The B44 single drive and B244 dual drive use barium ferrite storage media to deliver 44.5M and 89M bytes of on-line storage, respectively. The drives can be used on IBM Personal Computer ATs, Personal System/2s or networks running Novell, Inc.'s Netware 286 or SFT. Versions are also available for Apple Computer, Inc. Macintosh systems and portables.

Pricing ranges from $1,400 to $2,799, depending on type of model. The company has also introduced an OS/2 driver for Microsoft Corp.'s Windows 3.0 upgrade that lists for $99.

Iomega
1821 W. 4000 South
Roy, Utah 84067
(801) 778-1000

Software utilities

Reference Software International has announced a grammar and style checker for Microsoft Corp.'s Windows.

Grammatik Windows checks documents for errors in grammar, style, usage, punctuation and speling; identifies writing errors and suggests improvements; and allows users to make corrections immediately or mark errors to be corrected at a later time. Grammatik Windows requires Windows 286 2.11, 386 2.11 or 3.0 and costs $99.

Reference Software
330 Townsend St.
San Francisco, Calif. 94107
(415) 541-0222

An upgrade to the Sitback memory-resident backup utility for personal computers and local-area networks has been announced by Sitback Technologies, Inc.

Sitback Version 3.0 requires 14K bytes of memory and performs complete and incremental backups in the background of stand-alone PCs or networks. The product can back up recently created files during computer idle times, at preset times or in the background while a PC is being used. The list price is $99.

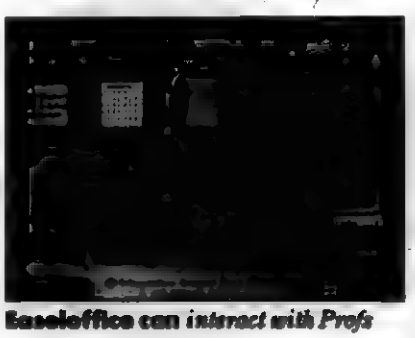
Sitback
9290 Bond
Overland Park, Kan. 66214
(913) 894-0808

Interactive Images, Inc. has announced an upgrade to its personal computer-based application template product for creating graphical user interfaces to IBM's Professional Office System (Profs).

Easeloffice 2.0 allows users in DOS environments to interact with Profs functions such as Profs Note and Calendar by using a mouse instead of a keyboard. It incorporates Interactive's Easel/DOS development tool kit and communicates with Profs via an IBM or Digital Communications Associates, Inc. Irmaboard or a High-Level Language Application Program Interface driver.

A site license costs $25,000.

Interactive Images
600 W. Cummings Park
Woburn, Mass. 01801
(617) 938-8440



Easeloffice can *interact with Profs*

Systems

Swan Technologies has announced a 25-MHz Intel Corp. 80386-based computer system.

The 386/25 uses integrated drive technology, which moves key electronics components from the drive controller to the hard drive itself. It includes 1M byte of 80 nsec dynamic random-access memory. Other features include a 1.2M- or 1.44M-byte floppy drive, two serial ports and one parallel port and eight expansion slots.

The product lists at $1,795.

Swan
3075 Research Drive
State College, Pa. 16801
(814) 238-1820

The LP-286L, a low-end IBM Personal Computer AT-compatible laptop computer from Fora, Inc., includes 1M byte of random-access memory, which can be expanded to 5M-, 20M- or 40M-byte hard disk drives.

It features a 3½-in. 1.44M-byte floppy disk drive, a parallel printer port and an IBM Color Graphics Adapter backlit supertwist LCD screen. A 20M-byte hard drive version costs $3,495, and a 40M-byte hard drive unit sells for $3,595.

Fora
3081 N. First St.
San Jose, Calif. 95134
(408) 944-0393

Two Intel Corp. I486-based personal computers have been announced by AGI Computer, Inc.

The 4000A desktop system and 4100A upright system feature 25-MHz zero wait-state operation and a 64K- or 256K-byte static random-access memory cache. The systems offer 4M bytes of RAM, which can be upgraded to 8M bytes on a motherboard and to 16M bytes by using an additional 8M-byte proprietary memory board, the vendor said.

Models 4000A and 4100A were scheduled to begin shipping on June 30 for respective list prices of $7,395 and $7,995.

AGI
48460 Kato Road
Fremont, Calif. 94538
(415) 683-2800

COMMENTARY

Joanie M. Wexler

Un-Sodering token-ring

In college, we used to call them the "old reliables." These were the folks who always wound up raising their hands when no one else would volunteer to clean up after the horse in the Homecoming parade, collect door-to-door for cystic fibrosis or return the empty keg the day after the party. In short, a few did the dirty work for many.

Robert Madge could end up in the annals of token-ring history for being an old reliable. As the only vendor to date with the moxie to challenge Olof Soderblom's token-ring patent in court, the president of UK-based Madge Networks, Inc. could wind up saving the whole token-ring industry a bundle — particularly in the Fiber Distributed Data Interface (FDDI) arena — if he comes out a winner.

In a long line of vendors that have for years paid patent royalties to Soderblom because "it just wasn't cost-effective to fight" and have passed those costs on to their customers, Madge has gone out on a limb to challenge the validity of the patent in both U.S. and UK courts. This month, he was deemed the victor in the UK by the High Court of the Royal Courts of Justice. The U.S. case is still pending.

The limb Madge is out on is considered brittle by Soderblom, who offered Madge a token-ring license that he refused in order to try to have the patent declared invalid. Soderblom has told the press that if Madge loses in court, he will close the kitchen on his licensing offer.

But it's not even clear that it's legal for Soderblom to selectively license his technology, according to Madge's lawyers. Soderblom's words also contradict the transcript from the UK case, which cites his British attorney as assuring the judge that Soderblom will indeed continue to offer a license to Madge.

Many may say Madge is using poor business judgment, that he is risking the livelihood of his 70 employees if Soderblom is able to withdraw his licensing offer. He's also currently losing

Continued on page 46

National net seeks just the fax

PC-based system gathers financial data from services' fax machines

BY JOANIE M. WEXLER
CW STAFF

When you are supporting a facsimile network of more than 2,100 machines, you need something a little more sophisticated than "Sneakernet" for dumping accounting data into your host.

This was the conclusion of Hotelecopy, a Miami-based organization that supports fax service in hotels nationwide.

The company, which went public last fall, was founded in 1986 by an electrical contractor who lost a multimillion-dollar bid because his hotel had no way for him to send proposal revisions quickly.

Because the company makes its money on service fees collected from client hotels rendering the service for guests, Hotelecopy's data center is primarily concerned with polling the myriad Ricoh Corp. Model 130 machines it has installed in lodging sites across the country and dumping the mounds of transaction data into a general accounting package on a server.

Take it to the bank

A bank of nine IBM-compatible personal computers in the Miami headquarters polls the fax machines as much as three times per day, depending on the sites' general usage levels. To allow the PCs to do that, the company wrote a software application program that, when coupled with a Gammafax PC card from Gammalink Corp., allows the PCs to function as Model 130s and interrogate the internal memory of remote machines.

The data is automatically downloaded to a 386-based, 25-MHz Intel Corp. server that runs the Xenix System V operating system, according to Chris McMorrow, director of MIS. Another Intel server runs the corporate accounting package and database, which stores the master list of fax phone numbers to be polled.

Until about a year and a half ago, the polled data collected on the PCs' hard disks was transferred to floppy disks and hand-carried to the Xenix server. This proved unreliable and too slow for machines polling high-activity sites. Once a fax machine's memory is full, it begins overwriting data, and the company lost track of transactions and revenue, McMorrow said.

All-flavor mix

Integrating the Unix-flavored servers with the DOS-based PCs has been accommodated by a piece of software called Coconet from Atlantix Corp. (see story this page), which allows the PC users to issue DOS commands to access the Xenix servers.

Hotelecopy sold the hard drives on the polling PCs, McMorrow said, adding that for hard disk storage, the PC users use portions of the 380M-byte hard drive on the server.

The company's data center is currently adjusting to its new credit-card-operated fax service, which is spilling into post offices in the Northeast. The service, which allows the public to charge their fax transmissions using major credit cards, is the result of a bid that the company won from the U.S. Postal Service about a year ago.

Hotelecopy also recently won the bid for the remaining four regions of the country and is in the process of actually building its own fax product in conjunction with Touchfax in Kansas City, Mo.

The post office side of Hotelecopy's business requires the polling PCs to link via modems to the PC-based fax machines and download their activity logs to the Miami headquarters, where they are put in a file format and transmitted via modem to a credit-card clearinghouse responsible for collecting the receivables.

Network glue

Coconet, a software connectivity product from Boca Raton, Fla.-based Atlantix Corp. that allows Unix machines based on Intel Corp. 80386 chips to act as an integrated server for DOS and OS/2 clients, is solving interoperability problems for at least two users.

In a facsimile-polling application used by Hotelecopy, which runs Xenix servers and DOS clients, Coconet resides under Xenix's Xnet networking protocol to allow Xenix to communicate with the other operating system.

"It's completely transparent," noted Hotelecopy MIS director Chris McMorrow. "Our PC users, who access portions of the hard drive on the server, don't want to know how they access 'C:'; they just want to use their DOS commands."

"You only have to know two things: how to turn it on and how to turn it off," said Eliot Levin, publisher of the *Southern Beverage Journal*, which replaced its Novell, Inc. Netware network with Coconet.

Levin noted he was having compatibility problems between IBM Personal Computer clones that may have been independent of Novell, though when he replaced the clones with Unisys Corp. 386-based workstations, he still had problems printing. In the two years he has been using Coconet, he said, he has never made a service call.

JOANIE M. WEXLER

Offices seen as LANmark for networking pioneers

BY JIM NASH
CW STAFF

Not particularly known for their pioneering spirit, office workers have led the computer networking charge, and now they are tired.

A study of local-area networking's future indicated that office environments will account for an ever-smaller percentage of the worldwide personal computer network installations during the next three years.

Maryann Bader, president of Bader Associates in Mountain View, Calif., and author of the study, predicted that LANs in offices will account for 57% of all LANs worldwide. Bader estimated that office LANs made up 74% of all networks in 1988. The study was published by Electronic Trends Publications in Saratoga, Calif.

"Offices are closer to the saturation point than other segments as far as installations go," Bader said. "They still have a long way to go in reaching saturation, but they are further along than the others."

In real terms, Bader said, LAN growth in offices will flatten, while growth in medical/scientific and manufacturing fields will more than double by 1993. She explained that the same cost savings that propelled offices to the LAN forefront will also propel growth in other business segments.

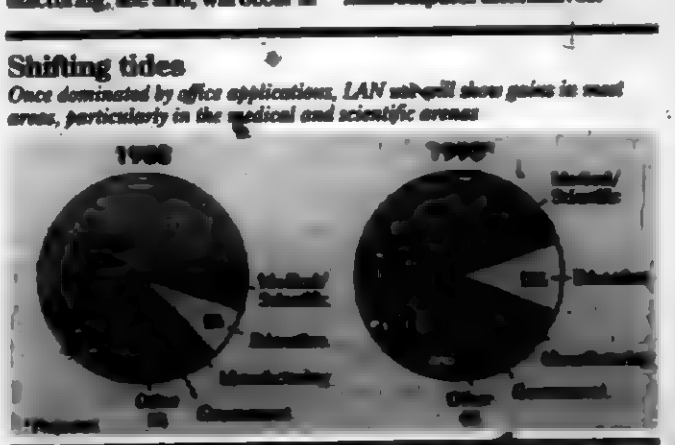
Medical/scientific LAN installations are expected to rise from 6% in 1988 to 13% in 1993. In the same period, systems on the factory floor will grow by five percentage points to 9% worldwide, Bader said.

Medical networks connecting hospitals to doctors, pharmacies and other hospitals, already are building momentum. Bader cited the Kaiser Permanente Group in California, which has linked several hospitals electronically.

The greatest growth in manufacturing, she said, will occur in factories with revenues of $6 million to $50 million. "There are so many businesses at this level that aren't computerized," Bader said. She said these firms were likely to find networking solutions less expensive than minicomputer alternatives.

Shifting tides

Once dominated by office applications, LAN sales will show gains in most areas, particularly in the medical and scientific arenas



Source: Electronic Trends Publications — CW Chart: Paul Monk

My network in marketing won't share

Now what?

The latest directive from senior management is a doozy. Marketing and manufacturing must now share applications. As for all those different PCs and systems in place, management is "confident you can meet that challenge without incurring significant additional capital expense."

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with the network in manufacturing.

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Tandem, Systems Center make Net/Master plans

BY ELISABETH HORWITT
CW STAFF

Tandem Computers, Inc. and Systems Center, Inc. last week moved to give Tandem users the same network management capabilities that Systems Center's Net/Master provides for IBM environments.

Under Tandem and Systems Center's joint development plans, Tandem's existing Distributed Systems Management will provide the basic architecture for gathering information about what is happening on Tandem networks. Meanwhile, Systems Center's recently acquired Net/Master will "provide a more powerful way of dealing with and analyzing those events," often with little or no human intervention, said Michael Katz, Tandem's corporate marketing manager.

It takes two

The two vendors have already been working together for almost two years to develop a network management system based on the core Net/Master architecture, which will "take advantage of Tandem functionality such as fault tolerance and linear expandability," or the ability to add power to a system by adding microprocessors, Katz said. Also in the works is a Tandem version of the Net/Master application development tool, Network Control Language, he added. No time frame has been given for product availability.

Net/Master will be able to communicate in peer fashion with the original IBM version of the product, said John Robinson, executive vice-president at Systems Center. As a result, he added, Tandem and IBM hosts will be able to either cooperatively or alternately perform centralized management operations. A "pipeline between the two Net/Master products" will enable Tandem and IBM hosts to jointly locate problems that extend across their respective domains, Robinson said.

Systems Center currently offers Net/Master on IBM hosts and Fujitsu Ltd. operating systems and plans to implement its products on other systems in the future, Robinson said.

Tandem will continue to support its SNAview product as a way for its systems to send network management information to IBM's Netview, Katz said. However, "we will never achieve with Netview the level of integration we will have with Net/Master" through the joint development effort with Systems Center, he added. "Also, I think Netview isn't really an open system."

Systems Center recently acquired Software Developments International, the original developer of Net/Master.

Military FDDI net goes commercial

BY GARY H. ANTHES
CW STAFF

MCLEAN, Va. — Unisys Corp. recently announced the operational start-up of a new fiber-optic network to carry intelligence data for the Strategic Air Command (SAC).

Unisys Defense Systems said it built the network mostly from commercially available components in conformance with industry connectivity standards, and it said that Timeplex, Inc., a Unisys subsidiary, will offer the technology to other government and commercial users.

The SAC Intelligence Network (Sacintnet), based at SAC headquarters in Omaha, ties together intelligence systems associated with warnings, crisis management, operations planning, force employment and force modernization planning. SAC controls the majority of the nation's nuclear firepower through U.S. Air Force bombers and intercontinental ballistic missiles.

Sacintnet is the most complex Fiber Distributed Data Interface (FDDI) network in existence, said Lorraine Martin, program manager at Unisys Defense Systems.

An Air Force spokesman said that the new network will significantly increase capacity (100M bit/sec.), reliability and security. He also said that the replacement of old, proprietary communications protocols with standard protocols such as Transmission Control Protocol/Internet Protocol and the Standard Network Management Protocol will enhance connectivity, allowing the Air Force network to interface with a broader variety of computers and other networks.

The Sacintnet backbone is based on two counter-rotating fiber-optic cables so that if a component fails, data can make a U-turn and still get to its intended destination. The cables have redundant connections to key network components, which include IBM mainframe and Digital Equipment Corp. VAX hosts, various servers, 16 smart concentrators and 30 routers. It has six times the capacity of SAC's previous network, which was built around proprietary standards, Martin said.

The backbone is supported by three central servers running software developed by Unisys. The Network Control Center monitors and controls all network devices. The Network Security Server monitors and controls security, and a Shared Network Server handles common user services such as printing, mail, files and graphics.

Some 300 intelligence workstations will attach to the backbone via local-area network-FDDI gateways or Internet protocol routers. Ethernet or other FDDI LANs can also attach via the routers, and the backbone also connects to the Defense Data Network through a gateway.

Network software is based on technology approved by the Defense Intelligence Agency for "system high" operation, in which all users must be cleared to the level needed to access all data. An enhanced version, part of the $10 million, eight-year project, will be installed next year offering "compartmented mode" operation, in which users with different clearances can access just those files for which they are cleared. Sacintnet employs a variety of security measures, including thumbprint identification for key system managers.

Charles Clark, Timeplex's technical manager for FDDI products, said Timeplex is selling the components on which Sacintnet is based to commercial users and to other federal agencies. He added that existing commercial users include automotive firms and financial institutions, but he would not name them.

Wexler

FROM PAGE 43

some business because of Soderblom's threats not to license.

But the refreshing thing is that Robert Madge is not fighting the patent because he's cheap. He's doing it because — in his own words — he doesn't like to be bullied. He seems to truly believe that the claims in Soderblom's patent, which are described by many as overly broad, do not apply to the products he and his token-ring colleagues are building today. And he's sick of nobody ever bothering to go to court to find out.

His business judgment may not be so clouded. He's the major shareholder in his company; he has no venture capitalists to please. In addition, he says that there are many other Soderblom licensees that could serve as sales channels for bringing his products to market.

Madge's official position is that Soderblom's original patent was based on a master/slave principle, unlike today's peer-to-peer networks. Because I'm not an engineer or a lawyer, I'm in no position to judge Madge to be correct or not correct. In fact, he could be dead wrong.

However, it's gratifying in today's hard-nosed business world — ruled by the omnipotent bottom line — to see someone just go out and do something because he believes in it.

IBM didn't do it. Hewlett-Packard didn't do it. Fifty-two other vendors didn't do it. Madge Networks *is* doing it.

I haven't talked to all 54 patent licensees, but I have talked to more than half a dozen about this issue. Not one of them has said that they're paying royalties because they believe that the patent covers their technology. They've all said it was cheaper to pay the piper than to rack up the expenses of slogging through litigation.

What amounts to good business decisions for them, then, has perhaps become a form of industry blackmail — if the Soderblom patent really isn't applicable.

That's an "if" that the UK court has decided in Madge's favor. That same week, the U.S. Patent and Trademark Office issued an initial decision to reject and suspend the broad claims added to the Soderblom patent in 1985, based on a re-examination requested by an anonymous third party. The suspension will be in effect until Soderblom files a response and another decision is issued.

The patent issue has reared its head again in recent months because of the emergence of FDDI, the 100M bit/sec. token-ring local-area network. Soderblom has upped the ante to FDDI vendors to license fees reaching $275 per adapter card — costs that get tacked onto the already hefty price of fiber-optic components.

Those in the FDDI community are already exploring ways to lower the prices of getting the high data rates to the desktop, such as using alternative media. Knocking a couple hundred off adapter card prices probably wouldn't hurt, either.

Several FDDI vendors' lawyers have spent quite a bit of time schmoozing about what to do with the patent issue. By the time they get around to realizing that fighting the patent might finally make business sense, though, it's likely Madge will have already done the dirty work for them.

Wexler is a Computerworld senior writer.

User firms may be able to try ISDN one line at a time

BY JOANIE M. WEXLER
CW STAFF

SCHAUMBURG, Ill. — Cost-conscious Illinois businesses will be able to tiptoe into ISDN a line at a time starting next month, if tariffs filed recently by the state's local Bell operating company are approved by the Illinois Commerce Commission.

The filing would allow users to purchase Integrated Services Digital Network (ISDN) lines without having to bundle them with Centrex central office switching services, currently a requirement. The existing packaged approach is one impediment to ISDN for users who have not found Centrex to be an economical alternative to switching calls through an on-premises private branch exchange.

The other Ameritech companies reportedly plan to file similar ISDN tariffs in early 1991, giving users the ability to dabble in the technology at near-business-telephone rates.

For example, according to the Illinois Bell tariff, a customer in Chicago who orders one ISDN line to simultaneously handle voice and data calls will pay $22.66 per month and a one-time installation charge of $94.50. This compares with a monthly fee of $18.78 and one-time charge of $148.50 for the two Touch-Tone business telephone lines otherwise required to provide similar service.

ISDN, an emerging technology for a ubiquitous, digital switched public network, comes in two flavors — Basic Rate and Primary Rate — for combining a mix of voice, video and high-speed data over one line. Illinois Bell's tariff covers Basic Rate services, which provide two 64K bit/sec. channels for voice or data and one 16K bit/sec. channel for signaling.

Pricing is one of several stumbling blocks to ISDN, according to Steve Sasegari, an analyst at market research firm Dataquest, Inc. in San Jose, Calif., who said that ISDN must be priced "at a cost comparable to or cheaper than plain old telephone service" to appeal to users. He cited users running separate phone lines for facsimile and voice as key candidates for line-at-a-time ISDN.

"If they can send a man to the moon, why can't they make my computers talk to each other?"

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3Com moves toward other systems

BY JIM NASH
CW STAFF

SANTA CLARA, Calif. — 3Com Corp. replaced word with deed recently, introducing a software product line that aims to strip away proprietary network hurdles.

The company is delivering on year-old promises to bridge its own networking products with virtually any major networking system with a minimum of cumbersome extra steps.

This month alone, 3Com has introduced software that will link its DOS-based 3+Open operating system with Transmission Control Protocol/Internet Protocol, Novell, Inc.'s Internet Packet Exchange and Xerox Corp.'s Xerox Network System protocols. It also has demonstrated a mesnu service using Microsoft Corp.'s Windows and a naming service that executives said will feature easy migration to X.500. All are scheduled for delivery by this fall.

Industry observers said the announcements are proof that 3Com no longer covets Novell's massive installed base. But it also means that information systems managers with Novell-dominated networks are less likely to phase out smaller 3Com local-area networks simply for the sake of connectivity.

Growing pressure from LAN administrators for true network interoperability has been noted by 3Com's competitors as well. Darrell Miller, an executive vice-president at Novell, said such customer pressure is finally reshaping proprietary policies. Microsoft networking general manager Mike Murray said Microsoft no longer seeks to "annihilate" its competitors. Murray held up as evidence Microsoft's cooperation with 3Com on its 3+Open Mezzaze SNA Gateway software.

Good news

Steve Wigginton, project manager of Sacramento, Calif.-based U.S. Computer Services Corp., an MIS service provider for cable television firms, said 3Com's connectivity announcements are encouraging. Wigginton said he counts himself among the IS professionals cited by Miller who are calling for integration over innovation.

"Up till now," Wigginton said, administrators have "had some communication capabilities, but they have created little communication clusters. We need to join them all and not have to worry about what systems each cluster has."

Wigginton said he has ordered 3+Open for Macintosh — a previously announced software package that was formally endorsed two weeks ago by Apple Computer, Inc. That endorsement "makes me feel a little more comfortable" about his purchase, he said. The software will connect U.S. Computer's 20 Macs to an existing PC LAN. The LAN connects to a Tandem Computers, Inc. host.

3Com's Mezzaze SNA Gateway "simplifies the job of getting people access to the mainframe," said Rick Reed, a developer at Aion Corp., a Palo Alto, Calif.-based software maker. "This basically gives us a seamless environment."

Aion, which installed the software earlier this year, connects to its IBM mainframe primarily over its 3Com LAN. Reed said he is waiting for an OS/2 version of the software.

Analyst Craig Burton, principal at Clarke Burton Corp. in Salt Lake City, said he was surprised to discover that with 3+Open for Netware, accessing drives through Windows 3.0 will involve identical point-and-click commands on both systems.

Neither Burton nor other analysts contacted were surprised by the introductions themselves, however. The products have been publically discussed, and, although none have been delivered, they are looked at as promises made good.

"It's not brand-new. It's not unexpected. But it's significant nonetheless," said Alice Bradie, an analyst at Hambrecht & Quist, Inc. in New York, about the combined announcements.

Bradie said it is important for LAN companies, and 3Com in particular, to make good on ubiquitous promises of interoperability. These announcements, she said, indicate 3Com is serious about the issue.

GEIS enacts new strategy for E-mail

BY MICHAEL FITZGERALD
CW STAFF

General Electric Information Services (GEIS) announced a new electronic mail local-area network connector late last month as part of an E-mail strategy it has dubbed Businessconnect.

GEIS said it expects that Businessconnect will allow E-mail end users to transparently contact their counterparts at any other site via a keystroke or two, possibly before the end of the year.

The new product, called LAN Connector for MHS, will initially be compatible with DaVinci System's E-Mail/MHS and Transend Corp.'s CompleteE-Mail/MHS. The decision to package GEIS E-Mail services within Businessconnect does not affect pricing.

GEIS, which already supports a number of proprietary E-Mail systems, including IBM's Profs and Wang Laboratories, Inc.'s Wangoffice, said it figures that it is about "75% to 80%" of the way to being transparent, said Ed Isaacs, product manager at Businessconnect.

Stretching out

GEIS has targeted Businessconnect at current users of various pieces of the package as well as companies that want more flexibility than their current E-Mail systems provide. Unlike E-Mail services such as MCI Communications Corp.'s MCI Mail — which targets individuals — GEIS is a private E-Mail service provider that sells exclusively to corporations and associations.

Businessconnect consists of Quik-comm, with its PC Mailbox front end; Quiknews; X.400 interfaces to Western Union Corp.'s Easylink, MCI Mail and AT&T Mail; interconnections to IBM Profs, DISOSS, Application System/400s and System/3Xs, Digital Equipment Corp.'s All-In-1 and VMSmail, Wang's Wangoffice, CC:Mail, Inc.'s CC:Mail LAN, and 3Com Corp.'s 3+Mail LAN.

NEW PRODUCTS

Electronic mail

Esoft, Inc. has announced an automated store-and-forward electronic mail server designed for users who need wide-area access to shared data.

Tims allows an unattended personal computer to automatically contact a central bulletin board server via a dial-up modem to perform message and file-transfer tasks. A user only needs simple key words such as Get and Send and a file description to operate the system from a remote site, the vendor said.

A single phone-line unit costs $189, and a system that supports as many as 32 lines sells for $259.
Esoft
15200 E. Girard Ave.
Aurora, Colo. 80014
(303) 699-6565

Joiner Associates, Inc. has announced an electronic mail gateway that provides messaging capabilities between Digital Equipment Corp. VAX minicomputers and Apple Computer, Inc. Macintosh systems.

Jmail-Inbox is a VAX-resident, software-only device that enables users of Tops Corp.'s Inbox Plus and VMS-mail to transparently exchange mail. It operates on any VAX system running the VMS operating system and with on-line mass storage for VMSmail, files in transit and log files.

Licenses sell for $9,800 per VAX system. Software support and maintenance updates cost $1,500 per VAX system.
Joiner Associates
3800 Regent St.
Madison, Wis. 53705
(608) 238-8637

Front ends/ Multiplexers

Digital Link Corp. has introduced the DL551X-RD, a T1 CSU that automatically transmits an alarm report when T1 problems occur on a network.

The remote dial-out device can send alarm reports via a smart modem from a preprogrammed phone number stored in the CSU or directly output reports to a local printer. It can be programmed to monitor and evaluate T1 network performance characteristics, and more than 12 transmission levels can be alarmed for maintenance reports.

The DL551X-RD has a list price of $2,795.
Digital Link
252 Humboldt Court
Sunnyvale, Calif. 94089
(408) 745-6200

Digital Link's *CSU automatically transmits alarm reports*

Nokia Data Communications Corp. has announced the Nokiamux family of communications network processors.

The products, originally developed for use by European Postal Telephone and Telegraph authorities, offer from four to 128 asynchronous ports with two to eight synchronous composite links. Network management functions are secured with three password levels, and a menu-driven interface enables users to interactively configure a network.

Prices range from $2,040 for a Nokiamux 104 with four ports and two links to $10,750 for a Nokiamux 120 with 32 ports and two links.
Nokia
2300 Tall Pines Drive
Largo, Fla. 34641
(813) 535-6999

Host-to-host

X.Com 6.2, an upgrade of Spectrum Concepts, Inc.'s communications software package, was designed to improve the ability of Stratus Computer, Inc. and IBM System/88 computers to share data with other systems.

The software offers IBM Advanced Program-to-Program Communications/LU6.2 links for environments such as IBM mainframes, System/34, 36 and 38s, DOS and OS/2 personal computers and local-area networks.

License fees for Stratus and System/88 versions range from $6,000 to $16,000. Versions for other environments cost between $495 and $39,000.
Spectrum
150 Broadway
New York, N.Y. 10038
(212) 766-4400

Micro-to-host

United Networks, Inc. has announced its Grandslam line of IBM 3270 adapter boards designed to provide workstation-to-mainframe communication.

The boards connect to IBM 3174, 3274 or 3276 controllers or IBM 4300 series printer adapters via coaxial or twisted-pair wiring. A line of Grandslam IBM Video Graphics Array adapters combine 3270 connectivity with 1,024- by 768-pixel resolution graphics.

Pricing ranges from $445 to $795, depending on model. A Grandslam 3270 CUT-mode software package costs $295.
United Networks
2178 Paragon Drive
San Jose, Calif. 95131
(408) 436-2800

Local-area networking hardware

O'Neill Communications, Inc. has announced the second generation of its local-area wireless network.

The product uses O'Neill's radio technology, which was designed for personal computer networking applications, to provide peripheral sharing, electronic mail and file-transfer capabilities without the need for facility wiring. The system runs at a maximum speed of 19.2K bit/sec. and permits third-party software to run on it.

The network attaches to the RS-232 serial port of an IBM PC, compatible or peripheral. It costs $296 per unit.
O' Neill Communications
100 Thanet Circle
Princeton, N.J. 08540
(609) 924-1095

EXECUTIVE TRACK

Donald L. Cerullo has been elected a vice-president at **United States Tobacco Co.** based in Greenwich, Conn. He is responsible for management and operation of all computerized systems throughout the company and its subsidiaries.

Cerullo reports to Senior Vice-President Walter A. Wichiski.

Cerullo has been director of MIS since 1983. He joined the company in 1980 as a senior systems analyst. Prior to that, he was a systems manager at Pitney Bowes, Inc. in Stamford, Conn.

A resident of Stamford, Cerullo possesses an MBA from the University of New Haven.

.....

Wayne Sadin has been named vice-president and manager of research and development at **Datalink Systems, Inc.**, a South Bend, Ind.-based technical products subsidiary of Mellon Bank, NA.

Sadin was most recently vice-president of administration, which included responsibility for information systems, at Murray Financial Co. in Dallas.

He joined Murray in 1981 and has held a variety of positions there. Before joining Murray, he worked at Axios, Inc. in New York and Bleyer Industries in Boston.

Sadin holds a bachelor's degree in business administration and computer science from Boston University and a master's degree in MIS from the University of Texas at Austin.

.....

Who's on the go?

Changing jobs? Promoting an assistant? Your peers want to know who is coming and going, and *Computerworld* wants to help by mentioning any IS job changes in Executive Track. When you have news about staff changes, be sure to drop a note and photo or have your public relations department write to Clinton Wilder, Senior Editor, Management, *Computerworld*, Box 9171, 375 Cochituate Road, Framingham, Mass. 01701-9171.

Include IS in the prescription

Pharmaceutical firms hope large-scale systems injection will speed new drugs to market

SPECIAL INDUSTRY FEATURE

BY ALICE H. GREENE
SPECIAL TO CW

Jon Rodriguez

Dobbs *says Glaxo has streamlined its submission process with a stand-alone imaging system that uses 5¼-in. optical discs*

Pharmaceutical companies are hoping that investments in information systems will help them to speed up the painfully slow process of bringing patent drugs to market. But it will take a lot more than money to create the kinds of systems required to streamline the lengthy paper chain from development labs to the desks of Federal Drug Administration reviewers.

Among other things, says Dr. Lawrence Brenkus, consultant at the health industries division of Arthur D. Little, Inc. in Cambridge, Mass., it will take more of a commitment to large-scale innovation than most companies have demonstrated thus far. Mostly, he says, "they patch what they have and add homegrown modifications."

By and large, drug development and approval still take place in an environment of data fragmentation and paper stacking. Right now, it takes an average of 12 years for a new patent medication to be developed, tested and approved by the FDA for release to the market. Once, that might have been considered an acceptable interval, but now, the industry is facing a combination of circumstances that make this leisurely pace untenable.

First of all, there is the specter of profit shrinkage because of patent expiration. Patents can account for more than 50% of a pharmaceutical company's profits, and patents on 80% of the top 50 drugs will expire by 1995, making these products fair game for the open market.

Stepped-up competition from the generic drug companies is also helping to exacerbate still another problem: pricing pressures. Congress, health maintenance organizations, retail drug chains and U.S. employers that are helping to foot health-care costs are calling for curbs on prices of patent drugs, which have increased by more than 125% in the past decade.

Most industry experts agree that the best chance for successful resolution of these problems lies with more effective use of IS throughout the development and testing process.

Getting a drug product to market involves a complex series of steps that "consume the drug's patent life and impact time-to-market," says Joel Dobbs, director of information services at Glaxo, Inc. in Research Triangle Park, N.C. Initial basic research and discovery leads to preclinical animal testing, a process that can take up to six years. The next four to seven years are consumed by clinical testing performed by physicians in the field.

Throughout the testing phases, statistical analysis is performed on selected data. Then, as the process steps toward a new drug application (NDA) submission to the FDA, evidence of the drug's efficacy and safety is documented using a word processing or electronic publishing system.

This requires pulling together a varied collection of information, including summaries of experiments, arguments, statistical analysis results, clinical trial data and supporting references. At time of submission, manufacturers provide the FDA with not only this summary documentation but also

Continued on page 50

CIO: More myth than reality in education

BY ALAN J. RYAN
CW STAFF

Just when you thought it was safe to reprint those business cards, a new study has found the title of Chief Information Officer to be much less prevalent than the number of officials functioning in that role in universities and other educational institutions.

The survey, conducted by Boulder, Colo.-based Cause — the Association for the Management of Information Technology in Higher Education — was mailed to more than 400 institutions and had a response rate of 70%.

Early results of the poll showed that although the trade and business press have hailed the CIO function as an important position in businesses and educational institutions, there is no telling whether or not the CIO designation is here to stay. Only one-third of the institutions responding to the survey recognize their information systems chief as a CIO.

However, those who do hold the CIO designation in educational institutions often receive higher pay than their IS chief counterparts, the survey found. In fact, according to respondents, salary-range averages varied by as much as $20,000 annually under some categories. Individual salaries ranged from lows of $30,000 to $39,999 to highs of more than $120,000.

The average salary range for employees functioning as CIO, but not holding the title, was approximately $57,000, while the actual CIOs earned an average of nearly $70,000.

Categories that were surveyed in the poll consisted of system offices, research universities, doctorate-granting institutions, comprehensive universities, liberal arts colleges, two-year institutions and professional schools.

The entire survey, one of four segments of an annual Cause Institution Database survey, queried Cause members about campus demographics and organization as well as about the use of new technologies.

Reports of the study are available to any office or department of a Cause member institution.

Prescription

FROM PAGE 49

statistical analyses and raw data.

The approvals phase usually lasts about 30 months but has been known to drag on for as long as 10 years.

Time savings anywhere in this process could have significant monetary meaning for a manufacturer. Blockbuster drug products can yield sales of as much as half a million dollars per day, and a month or two could easily make the difference between market leader and me-too status.

The development or acquisition of systems for these critical development phases is a sensitive subject for IS executives in the industry. Many refuse to discuss their systems efforts in these areas, claiming that to do so would compromise a competitive advantage. In some instances, that may be true. However, conversations with other drug makers and consultants in this field suggest that there are more people claiming to have research and development systems capable of producing competitive advantage than there are actual systems.

"The single most mission-critical technology," Brenlus says, "is fully integrated information management systems." However, he says, very few companies have actually done much in that area. Most manufacturers have information systems in place and find it wrenching to move from an existing environment to a new one, he explains.

"Making do" is not entirely a matter of choice, says Jerry Paulis, executive director at Ciba-Geigy Corp.'s pharmaceuticals division in Summit, N.J. "We can attempt to shorten the cycle by implementing technology," he says. "We can only do it where it is appropriate, and there are external factors that make it difficult."

That is not to say that there is no upgrading going on. Ciba-Geigy is beginning to use image processing to store scanned live clinical patient data. It also began working with IBM in a partner relationship last year on electronic NDA submissions and on providing access to clinical data for all reviewers via a document management system.

Although Paulis says it is too early to discuss results, he does say that "there will be a significant impact on our overall process, and it is going to change the way we collect and manage data and the way we work with the FDA reviewers." Among the benefits Paulis says he hopes will materialize from the use of imaging are a reduction in paper handling, speedier data entry and improved data integrity.

Electronic submission of NDAs has so far been tested by only a handful of companies for low-priority approvals, although many in the industry are considering a move in this direction.

Ciba-Geigy is one of seven firms that has received approval for a new drug application using computer-assisted new drug application (CANDA) techniques. Five years ago, when the arthritis drug Voltaren was in the initial FDA approval stage, Ciba-Geigy moved its data from a database management system that mirrored its paper submission into another database environment supported by on-line display formats designed for the FDA reviewers.

The company then trained the reviewers and its own personnel in the use of the system. Whether electronic filing actually speeds up the process no one really knows, but the firm speculates that it shaved six months off the approval process. The predominant reason: The new display formats allowed the reviewers to pose their data inquiries on-line and re-analyze data.

Still in the labs

On the whole, electronic submission remains relatively unexplored territory. "Most, if not all, CANDA submissions to date have been experimental and partial, like ours," says Polly Moore, director of information resources at Genentech, Inc. in San Francisco.

Genentech, maker of Activase, a clot-dissolving drug, develops protein pharmaceuticals using new recombinant DNA techniques. The company recently provided the FDA with a partial electronic submission that consisted of statistical data generated from SAS Institute, Inc.'s SAS package and document text prepared in Wordperfect Corp.'s Wordperfect, both of which were used by the assigned FDA reviewers.

Each manufacturer handles electronic submission differently. Some allow the FDA to log into their on-site databases, others send disks of data, and some use electronic mail.

Inefficient as this profusion of techniques may be, it is likely to persist. As Lawrence Rothman, manager of IBM's Pharmaceutical Industry Center, notes, "FDA is public, and they cannot indicate what systems companies must use nor impose standards, which is very difficult for the entire industry."

Lack of standards is not the only impediment to full-scale electronic new drug application submission. The sheer mass and diversity of information contained in filings is simply too much for most systems, according to Dobbs.

"The technology has yet to catch up to the industry's need for a publishing tool that generates a quality document, one that has good cross-referencing and indexing," he says.

What Glaxo, maker of Zantac, an ulcer drug, is doing to streamline the submission process is using a stand-alone imaging system — Optical New Drug Application from Laser Recording Systems, which runs on the Laser Data platform and uses 5¼-in. optical discs to store the clinical trials and document page images.

This, Dobbs says, "gives FDA reviewers desktop access to the entire submission and provides necessary word processing productivity tools. As a result, the entire process is more efficient, the review period is more likely to be shortened, and submission problems such as the need for more specific data can be identified early on."

Efficiency in management of trial documentation prior to submission is actually a more important focus for systems efforts than the submission itself, according to Philip Loftus, director of R&D information services at ICI Pharmaceuticals Group, a business unit of ICI Americas, Inc. in Wilmington, Del. "We recognize that electronic submission is where the industry is headed," he says, "but today, we are not sure what the actual benefits are or if it speeds up the review process. The real benefit comes from improving our own internal document management process. That is where the savings in time and manpower can be gained."

David Carlin, director of clinical research and development at Cetus Corp. (maker of Proleukin IL-2) in Emeryville, Calif., would agree. Carlin says that a clinical trials database has saved his department many months on data entry and data reconciliation. The system was created using Oracle Systems Corp.'s Oracle and its SQL tool set and runs on a Digital Equipment Corp. Vaxcluster.

The database consolidates all the research data from clinical studies for FDA review, as well as providing an environment that mimics existing paper forms.

Today's R&D systems, however, barely scratch the surface of what will have to come as the industry and the research process become increasingly internationalized.

Loftus points out that "as the industry becomes increasingly more international and operates on a worldwide span, development resources and capabilities are being diversified on a global basis." Companies are merging and making acquisitions without regard to borders.

For example, one year ago, SmithKline Beckman Corp. in Philadelphia completed a merger with Beecham Group PLC in London to become SmithKline Beecham. In addition, merger proceedings are currently under way between Genentech and the Swiss firm of Roche Holdings Ltd.

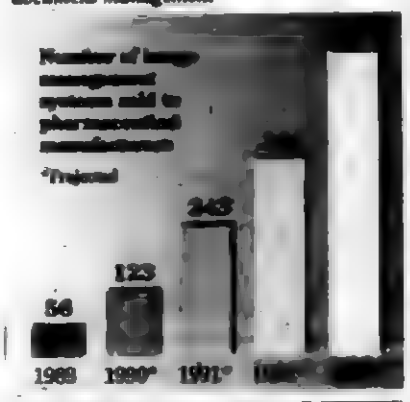
Companies are also creating international development labs to meet the needs of global markets. These changes will require yet another generation of support systems, more complex than the current one.

Peter Keen, executive director of the International Center for Information Technology in Washington, D.C., says he sees large technological hurdles looming. "We don't yet know how to handle massive databases and image files," he says, "let alone how to transport them internationally."

Greene is a free-lance writer based in the Boston area.

Image captures attention

Pharmaceutical makers are starting to look toward imaging systems for improved document management



Source: IBIS CAP International, Inc. CW Chart: Dawna Dahlo

Research in smaller doses

Small pharmaceutical makers have long depended on contract research organizations to handle some phases of research and testing. Recently, however, large drug manufacturers have also been hiring CROs for a considerable amount of business, including clinical trial studies, collection and validation of data, data management, new drug application document preparation, submissions and post-market clinical trials.

Awash in new business and facing the same pressure as manufacturers to reduce time to market, some CROs are starting to think small. By supplementing existing mainframe and minicomputer-based systems with personal computer-based local-area networks, they cut testing time and trim costs.

One firm reaping big benefits from a small platform is Biometric Research Institute, Inc. in Arlington, Va. It started downsizing its operations to a LAN last fall and has been doing projects on the network since early spring.

"The primary advantage is that people who actually use data have better access," says Daniel Wilson, director of computer services. Whereas nurses, researchers, statisticians and others previously had to go through programmers, they now pull up data directly. Wilson cites the task of updating master files, which used to take two days but now takes one hour.

The second reason for downsizing was expense. Processing power is 10 times less expensive on micros than on a large platform, he adds.

Wilson also points to better programming tools available on micros. He estimates that 95% of his programming on micros is reusable.

Using a 386 Compaq Computer Corp. server to support 25 PC clients and Novell, Inc.'s Netware, the company is managing more than 20 smaller studies in its Arlington offices. Larger trials and the work of a second facility are being managed on a mainframe, but Wilson says that full-scale migration will take place within a few years.

Medical and Technical Research Associates (MTRA) in Needham, Mass., has moved in the opposite direction for an interesting reason. Last year, the company acquired a Digital Equipment Corp. VAX 3800 to supplement the PC-based Novell network it installed in 1987. Small trials or work requiring multiple users now run on the network, while large trials run on the VAX.

Although he believes the networked system is faster and more cost-effective than the VAX, John Balser, director of statistical and data processing services, says the DEC system gives the company a marketing advantage. MTRA attracts more clients, he says, because pharmaceutical makers seem to feel more comfortable contracting work out to CROs who have big systems similar to their own.

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   - 23. Dir./Mgr. Sys. Development, Sys. Architecture
   - 31. Mgrs., Supvr. of Programming, Software Dev.
   - 32. Programmers, Software Developers
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   - 11. President, Owner/Partner, General Mgr.
   - 12. Vice President, Asst. VP
   - 13. Treasurer, Controller, Financial Officer
   - 41. Engineering, Scientific, R&D, Tech. Mgt.
   - 51. Sales & Mktg. Management

   OTHER PROFESSIONALS
   - 70. Medical, Legal, Accounting Mgt.
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   - C. Microcomputers/Desktops
   - D. Communications Systems
   - E. Local Area Networks
   - F. No Computer Involvement

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COMMENTARY

Clinton Wilder

No A's for B-schools

Forget what you know. Re-engineer the corporation. Re-think customer service, employee compensation, systems development. Change or perish.

All forward-thinking information systems executives have heard these exhortations in the past year or so. Most of their bosses have probably heard them, too. It's becoming motherhood, apple pie and change the way you do business — with the IS community at the forefront of that change.

Are America's business schools adequately preparing the next generation of managers and executives to think that way? I don't think so. And I'm not alone.

In a rare display of *mea culpa*, a panel of business school deans recently completed a study that concluded, in the words of *The Wall Street Journal*, that "many MBAs today are merely number-crunchers, ill-prepared to manage in the rapidly changing global marketplace." If the hallowed B-school halls continue their traditional ways, the panel warned that business schools may risk "professional irrelevance."

As we all know too well, corporate change is not easy, especially when business is good. And business has been very good in the business school industry, which is still riding the coattails of the 1980s. An influx of foreign students, particularly at the top business schools, has also helped keep enrollments high.

So there isn't much competitive pressure to change the way things are done. The motivation for change in business schools, just as in corporations, must come from forward vision.

I'm not just talking about recognizing the rapidly changing role of information technology. In all areas of business, conventional rules about what functions should be performed by suppliers and customers are becoming very blurred. In consultant Michael Hammer's words, companies are becoming "boundary-less."

Among the examples of this phenomenon are Procter & Gamble and Wal-Mart, which use satellite links and electronic data interchange to redefine the concepts of inventory, distribution and marketing in their business relationship with each other.

But how many business schools still teach management methods based on the old rules of competition — be the lowest cost producer, keep inventories steady, seek economies of scale?

Marketing may be the best example. How many students are learning 1960s-style mass marketing formulas when innovative users of database technology, such as American Express, can market to a segment of one consumer?

The panel of business school deans commendably urged their colleagues not to suddenly add a slew of courses on IS or globalization. That would be like the automation craze of the data processing era, when computers were brought in without much consideration of the way they could change business processes. The panel recommended nothing less than a serious reassessment of the entire business school curriculum — and even of admission guidelines.

To be fair, some business schools are indeed reassessing. At an IS conference at Babson College in May, Babson President William Glavine, former vice-chairman of Xerox, admitted that few of today's MBA programs adequately teach the role of IS — and that the Wellesley, Mass., business-oriented college is studying what to do about it. The University of Pennsylvania's prestigious Wharton School chose Thomas Gerrity, whose Index Group consultancy has advised clients on IS-enabled change for years, as its new dean. That's a good sign.

In the 1980s, many of the best MBAs flocked to Wall Street to play dealmania, a hyperkinetic business craze that left crash-and-burn legacies ranging from Campeau Corp. to Drexel Burnham Lambert. In the 1990s, more MBAs are commendably forsaking careers as asset rearrangers (a.k.a. acquisition/divestiture specialists) to make companies run better.

Let's hope that the schools granting those degrees can change in time to make their graduates the force for change that U.S. businesses desperately need.

Wilder is Computerworld's senior editor, management.

BOOK REVIEW

Could VDT overexposure be terminal?

CURRENTS OF DEATH
By Paul Brodeur
Simon & Schuster, $19.95

"A metronome is just a device which, in essence, moves in two directions. And a 60Hz field is a field where first the magnetic wave moves in one direction, and then it moves in another direction, just like this [metronome]. Only it happens 60 times a second. So what this means, then, is that any kind of molecule that is in a person's brain, or in a person's body, is being twisted 60 times a second up and back." — Dr. Harris Busch in *Currents of Death*.

What is described above might be your brain near a computer terminal. Or a hair dryer. Or an electric blanket. Paul Brodeur's grueling point in *Currents of Death* is simply that society has ignored the potential hazards of the electric field given off by appliances and power lines.

He writes, "So dependent are we upon the benefits of electricity, and so accustomed have we become to it, that we have accepted without question the necessity and ubiquity of its presence."

Brodeur suggests that even commonplace electric appliances such as VDTs should not be taken lightly. His theory is that exposure to electric fields does result in physical responses, such as the metronome metaphor. He doesn't recommend that the public hide from VDTs, hair dryers or electric blankets, but like ultraviolet rays, we should not overexpose ourselves to them.

At the beginning, Brodeur's book reads like a detective story, with epidemiologists playing the role of Sam Spade. He investigates the connection between childhood leukemia and those ubiquitous power lines in several research projects spanning more than a decade. He airs research that has been ignored or discredited by other scientists.

Brodeur tries to breathe life back into such research by showing time and time again that those doing the discrediting were either from the government, which has a vested interest in the military use of electric fields, or by scientists working for the Electric Power Research Institute, a research organization that is funded by the electric industry.

Once he lays out the labyrinth of research on the effects of electric fields and electromagnetic fields, he zeros in on the one electric appliance to which millions of American workers are exposed for many hours each working day — the VDT. He details how a computer's hardware creates magnetic fields.

"The display terminal operates on the same principle as a television set: The image on the screen is produced by an electron beam generated in a CRT — an evacuated glass tube containing an electron gun, which produces a narrow electron beam. This beam is accelerated and directed toward the front of the tube by high voltage — between 15,000 and 25,000 volts — from a step-up transformer known as the flyback transformer. When the beam strikes the inner surface of the CRT face, or screen, it interacts with a phosphor coating to generate a spot of visible light, which glows in the form of a letter or number."

Brodeur writes that the average VDT produces a 15-KHz radio-frequency range from the vertical sweep of the electron beam across the screen and a 60Hz range from the horizontal sweep. He writes that manufacturers have long ignored the 60Hz range, although he claims it is the dominant field and the one suspected by some scientists to cause health problems. The book describes reports from the late 1970s from AT&T Bell Laboratories that assured that VDTs are safe.

But several case histories, such as one from 1980, say otherwise. This report describes a case where four out of seven pregnant VDT operators at the *Toronto Star* gave birth to infants with serious birth defects. While Brodeur writes that officials "were falling over themselves" to deny that the Toronto birth defect cluster and others had anything to do with the use of VDTs, he spends the rest of the book discussing studies that point to some relation.

Brodeur's work spawned a special cover-story report in *Computerworld's* sister publication, *Macworld* [July 1990], that warned users to stay an arm's length away from the monitor's screen and four feet away from the back and sides of terminals. In conjunction with the report, 10 monitors were tested for electromagnetic levels, many of which tested within ranges high enough to correlate with studies showing cell mutation and cancer in humans.

Although the subject matter is technical, don't mistake it for dull. It does, however, get nitpicky on occasion. Brodeur sometimes dwells on insignificant rivalries between researchers and whines that the press, even the computer press, does not always present his side of the issue.

As an information systems manager, you will likely have to face conflicting reports on the potential for health problems of your work force because of electromagnetic radiation emanating from VDTs. Since Brodeur's book does pack historical and medical information about the subject in an interesting manner, it could be an easy way to bone up on his side of this controversy.

J. A. SAVAGE

Savage is a Computerworld West Coast senior correspondent.

CALENDAR

JULY 22-28

North American Conference of International Business Schools Computer Users Group Meeting. Omaha, July 22-25 — Contact: Sadi Nasem, College of Business Administration, University of Nebraska, Omaha, Neb. (402) 554-2816.

Guide 77 Convention of Midsize and Large-Scale IBM Systems Users Group. Chicago, July 22-27 — Contact: Guide International, Chicago, Ill. (312) 644-6610.

Rapid Application Development Seminar. Chicago, July 23-25 — Contact: Technology Transfer Institute, Santa Monica, Calif. (213) 394-8305.

The CASSIP Show for Computer-Aided Graphics, Multimedia and Presentations. Chicago, July 23-27 — Contact: Knowledge Industry Publications, White Plains, N.Y. (914) 328-9157.

Multi-Net Expo '90. Houston, July 25-26 — Contact: Ann Garner, Multi-Net Expo, Houston, Texas (713) 627-9030.

Utah State University IT Institute. Logan, Utah, July 25-28 — Contact: Monique Squire, Logan, Utah (801) 750-1890.

Knowledge Acquisition & Engineering Conference. Cambridge, Mass., July 26-27 — Contact: International Business Communications, S. Natick, Mass. (508) 650-4700.

Marketing the IS Organization Internally. Chicago, July 26-27 — Contact: Ouellette & Associates, Bedford, N.H. (603) 623-7373.

Directions and Implications of Advanced Computing Symposium. Cambridge, Mass., July 29 — Contact: Caroline Wisconsin, DIAC, Cambridge, Mass. (617) 891-3160 or (508) 945-6300.

JULY 29-AUG 4

AI-1990 Conference. Boston, July 30-Aug. 3 — Contact: American Association for Artificial Intelligence, Menlo Park, Calif. (415) 328-3123.

Workshop on Electronic Information Exchange Standards Used in Document Processing Applications. Gaithersburg, Md., July 30 — Contact: Lori Phillips, National Institute of Standards and Technology, Gaithersburg, Md. (301) 975-2881.

Insourcing vs. Outsourcing: Who Should Manage. Atlantic City, July 31-Aug. 3 — Contact: The Yankee Group, Boston, Mass. (617) 367-1000.

Delaware Valley DEC-SIG/DS Users Group Meeting. Lexington, Pa., Aug. 1 — Contact: Jean Tucker, Scott Paper, Philadelphia, Pa. (215) 522-6394.

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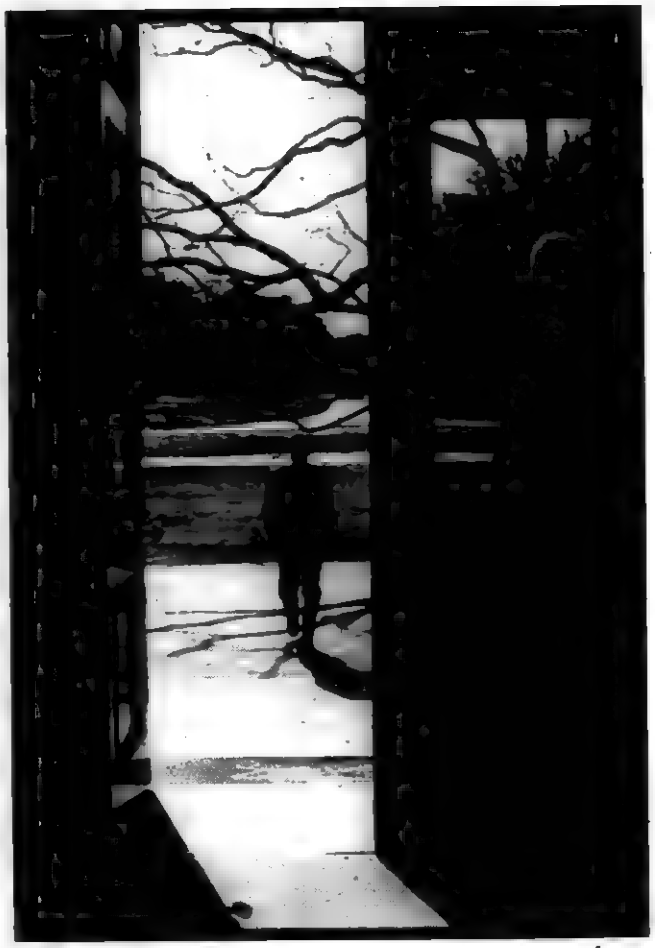

8:56 a.m.: the ROLM representative reporting to work at READER'S DIGEST World Headquarters.

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What's all this noise about AD/Cycle?

How excited you get depends on who you are

BY ROBERT V. BINDER
and JUDITH E. PHILLIPS

Like the "shot heard 'round the world," IBM's September 1989 announcement of AD/Cycle and Repository Manager promises to have a profound impact on the software development world during the next decade.

AD/Cycle has been described as nothing less than a "strategic application development solution" whose far-reaching implications will leave virtually no information systems organization untouched.

Yet all the pre- and post-announcement publicity prompts an important question: How ready are users for AD/Cycle?

How receptive?

A recent survey we conducted (see story page 54), combined with an earlier computer-aided software engineering (CASE) usage survey and recent discussions with many large organizations, indicates that there is much to be concerned about. The following were among the key findings:

- Most IS organizations have far to go before they can embrace AD/Cycle and all of its implications. This lack of organizational preparedness is a result of managerial attitudes, staff capabilities and the type of IS environment.
- Currently, most software development managers are in the process of gathering information about AD/Cycle and trying to assess exactly what it will mean to them and their organizations.

While it is difficult to be well informed about products and technical specifications that are currently unavailable, managers are talking with IBM business partners and other customers, as well as attending seminars and reading everything that comes across their desks.

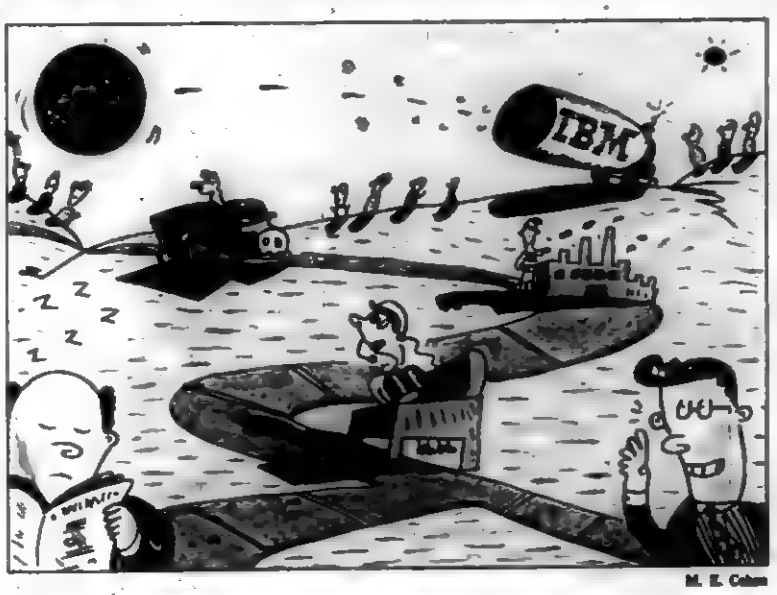
- Most feel the IBM announcement has had significant impact — both within their organizations and among their suppliers, customers and competitors. However, more than seven in 10 managers are adopting a wait-and-see attitude.
- One in three respondents reacted enthusiastically to the announcement and anticipated the repository services rollout with excitement. These managers are looking at AD/Cycle as the total, standardized platform needed to increase the productivity of their software development shops and quality of their products.
- One in four respondents reported feeling skeptical and/or cynical. Major concerns are that the AD/Cycle architecture appears to be too big, too expensive or too restrictive. Pointing to the lack of a tangible product as well as the number of technical delays prior to the September 1989 announcement, several respondents voiced the "vaporware concern."
- One in three of the respondents are undecided. While AD/Cycle sounds good, they reason that it just might not be for them.
- While most managers have adopted a wait-and-see attitude, almost 30% are starting an AD/Cycle implementation plan now. However, even in organizations that are currently planning for AD/Cycle, the readiness level is generally low. This is reflected in the fact that fewer than one in 10 of the surveyed organizations have made a firm commitment to AD/Cycle.

Two key questions

At the simplest level, AD/Cycle is both a collection of products and an approach to software development. Because the approach is as equally important as the products, successful implementation of AD/Cycle is as much an IS responsibility as it is IBM's.

There are two vital issues regarding AD/Cycle. The first important question for IBM customers to ask themselves is, what do I need to do to follow modern software development practices in my shop? Without a realistic, effective plan of attack, the power of the AD/Cycle tools cannot be harnessed.

The second major issue has more to do with the past than the future. Since the mid-1960s, IS organizations have been producing application systems at a prodigious rate. Although estimates vary, several sources claim that in the U.S. alone, there are more than 70 billion lines of Cobol in use. That represents an investment of around $350 billion. These



M. E. Cohen

Binder is president of Robert Binder Systems Consulting, Inc. in Chicago, which specializes in management and technical consulting for software developers. Phillips is the firm's director of business development.

- **Many IS shops unprepared**
- **Only one in 10 are committed**
- **'Wait and see' is popular**

figures suggest that maintenance is the dominant IS software activity. So the second key question is, how can AD/Cycle support software maintenance?

It makes sense that interest in (and readiness for) AD/Cycle is closely related to its ability to support software maintenance.

Ready or not . . .

The most immediate impact of IBM's AD/Cycle announcement is an endorsement of CASE. By endorsing the automation of all steps in the system development life cycle, IBM has jumped into the CASE environment and legitimized it.

The repository is a host-based tool whose open architecture allows the mixing and matching of CASE tools within an integrated environment. The repository acts as a database of rules about a company's information and a warehouse for reusable software components.

Properly used, the latter can provide a single point of control for all software development activities. Information in the repository can be accessed by multiple users, multiple CASE tools or multiple copies of a single CASE tool.

Doer's profile

The following are characteristics of companies committed to AD/Cycle:

- Have already begun implementation plans.
- Six of 10 have used CASE but most for less than a year.
- Half have development centers.
- Nearly eight in 10 have less than one-fourth of their staff trained in software engineering fundamentals.
- There is a slightly greater skill deficit than in uncommitted firms.
- Four in 10 have a defined but optional software development methodology.

Lots of spadework

There are several essential prerequisites for AD/Cycle: DB2, because the repository is a DB2 application; experience with modern software development practices, such as structured analysis; advanced CASE systems; and use of such methodologies as Spectrum, with appropriate project management control.

IS managers also need to be convinced that AD/Cycle is worthwhile. A big inhibiting factor is that proper implementation of AD/Cycle takes a lot of groundwork before the product arrives. The proper use of the AD/Cycle Repository Manager and its accompanying tools and technology requires the software development automation found in CASE. We use the term CASE to mean "upper" CASE products that support design activities.

However, organizations with even a medium level of CASE experience are in a small minority. Where CASE has been adopted, it is infrequently applied. Almost half of the IS shops surveyed have never used CASE technology in their software development. Nearly two-thirds have either used the technology less than one year or never used it.

Nationally, only 20% of software development organizations are CASE users. Of those that are CASE users, only 40% have used CASE on a majority of their development projects. Overall, only one in 20 software development groups are making effective use of CASE technology.

The AD/Cycle repository is implemented in DB2. Yet almost half of the companies surveyed are not DB2 users. Only one in 10 DB2 shops have more than three years of experience with it. This lack of software developer DB2 experience can only lengthen the learning curve and slow the process whereby AD/Cycle implementation leads to a measurable increase in productivity.

While half of the respondents have a development center, fewer than one in five are planning one. Fewer than one in 20 have established a software metrics program; only one in 10 of those without such a program are planning one.

Another inhibiting factor is that systems developers cannot effectively use AD/Cycle unless they are well versed in the fundamentals of software engineering. The high level of software development productivity and quality achieved by a "top-gun" CASE user can only come with high levels of CASE skill and software development sophistication. Furthermore, nine of 10 survey respondents report that less than half of the developers in their shops have had training in software engineering fundamentals. In two thirds of the respondent groups, fewer than one in four of the staff are trained in software engineering fundamentals.

The successful use of CASE and AD/Cycle also depends on the consistent application of a defined software development methodology (a documented set of procedures with specific tasks and deliverables). Only one in 10 of the surveyed firms have a defined methodology that is accepted and consistently used or is mandatory on all projects. One out of four have no defined methodology at all.

Preparedness profile

How ready are companies for AD/Cycle? All of the respondents whose organizations have made a commitment to AD/Cycle are now starting implementation plans. Yet the committed organizations' managerial attitudes and perceptions about AD/Cycle do not jibe with the reality of their respective IS environment and staff skill level.

Of the organizations that have begun AD/Cycle implementation plans, four in 10 have never used CASE; more than one-half have never used it or have used it for less than one year.

Looking at technical skills, almost 75% of the committed organizations have less than one-quarter of their staff trained in software engineering fundamentals; fewer than one in 10 of the organizations have more than half of their staffs trained.

It is interesting to note that organizations committed to AD/Cycle have a slightly greater skill deficit than those that have not committed to it.

Software maintenance

There is no shortage of recommendations on how to adopt AD/Cycle for software development. IBM has a short list of important items repeated in its AD/Cycle documentation and presentations. However, the real make-or-break issue for AD/Cycle will be its support of software maintenance. The reality of IS today makes this certain.

The key to using AD/Cycle in a maintenance-dominated shop is to take a re-engineering approach that makes good use of existing AD/Cycle facilities. Under this view, AD/Cycle becomes primarily a maintenance environment and secondarily a development environment. Existing CASE software and hardware can support this with a suitable shift in emphasis.

The goal is to place all system specifications and implementations — old and new — under the control of the repository. This requires action on several fronts. A model that gives a top-level slice of all existing systems should be developed first and loaded into the repository. As maintenance projects come up in the normal course of work, existing systems can be gradually reverse-engineered. In this way, the initial high-level model is gradually extended. This activity can use the same structured methods and CASE tools normally used for development. Existing systems will then be documented in the repository.

Although using CASE and structured methods for reverse-engineering requires changes in normal development practice, this is an excellent approach. Information collected in the course of maintenance is not thrown away when a program is updated and returned to production.

Bottom-up or top-down

While much-hyped, AD/Cycle can effectively increase software development productivity and quality only in an organization that is prepared for it.

While managers are enthusiastic in firms now starting an AD/Cycle implementation plan, a big gap exists between the perception of what AD/Cycle requires and the reality of the IS environment and technical skills.

If AD/Cycle is viewed as a top-down development solution, it is not likely to be accepted by the typical IS organization because software maintenance is the dominant IS software issue.

There is a general desire for improvement but a reluctance to embrace development solutions for maintenance problems. This is a rational response, but it poses an immediate obstacle to AD/Cycle acceptance.

Because AD/Cycle can benefit software maintenance, some reconciliation of software maintenance with AD/Cycle concepts and facilities is needed. Our survey data suggests that a bottom-up, gradual approach tailored to the development/maintenance mix of each organization has the greatest chance of success. With this approach, AD/Cycle can become a high-leverage tool for the IS organization with a significant application software investment. ●

The answer universe

Fifty-seven software development managers responded to a questionnaire about AD/Cycle readiness that was distributed and analyzed during the first quarter of 1990.

Managers from many types of organizations responded, including manufacturing (37%), distribution (11%) and utilities (9%).

Both large and small software development and maintenance staff shops were represented. Forty-two percent of the respondents were from organizations with more than 120 full-time staff members and contract personnel, 12% were from shops with more than 300 employees and 35% came from from shops with less than 60 workers.

Maintenance roadblocks

The maintenance juggernaut explains much of the lack of readiness for and interest in AD/Cycle.

The methodical software engineering approach advocated in AD/Cycle is completely at odds with the typical IS software maintenance strategy. The concepts and facilities in AD/Cycle are heavily oriented toward the early part of the software life cycle. IS managers see little practical value in following an orderly, disciplined approach because maintenance is inherently reactive. In turn, this perception strongly influences attitudes about how to approach development. This attitude is very much part of the overall maintenance problem and, therefore, part of the AD/Cycle readiness problem.

In the typical organization, less than 20% of resources are used for development. The remainder is split equally between maintenance and development. As such, maintenance defines the way IS does business.

If it's true, as some argue, that IBM is emphasizing the wrong part of the software development life cycle by stressing new development rather than maintenance and re-engineering, the apparent lack of AD/Cycle preparation is more understandable.

But does all this mean that AD/Cycle cannot help with software maintenance?

Making effective use of AD/Cycle for maintenance will require the same concerted effort advocated to adopt it for development.

AD/Cycle can be of significant help for the maintenance problem in three ways: First, the repository can be used to exercise software control over all existing programs, databases, files, etc. Second, CASE tools can be used to reverse-engineer existing systems. Some offerings in the AD/Cycle tool suite provide excellent support for re-engineering. However, most of the hard work of this must still be done manually. Third, proper development use of AD/Cycle will reduce the time and cost of maintenance in the long run.

ROBERT V. BINDER and JUDITH R. PHILLIPS

NATIONAL
BRIEFS

Two for the road

As their respective stock prices skyrocketed beyond investor comfort, fast-trackers **Network General Corp.** and **Synoptics Communications, Inc.** declared two-for-one stock splits. In addition to making the stock more affordable, Synoptics President William Ruehle and Network General Chief Executive Officer Harry Saal said that each company's split is aimed at attracting a wider range of stockholders.

Lucky three

Networking systems vendor **3Com Corp.'s** Chairman Bill Krause likes to count in multiples of his firm's signature number, and the company's fourth quarter — ended May 31 — gave him another opportunity. 3Com's $116.8 million in fourth-quarter revenue marked a 9% increase over the preceding quarter. Net income of $7.3 million was up 9% from the third quarter as well. According to 3Com President Eric Benhamou, new product sales accounted for 27% of the fourth-quarter take. And, hey, annual revenue of $419 million, up 9%. Not divisible by three was the year-to-year profit comparison: down 40% to $20.5 million.

More briefs on page 56

T1 market sitting in limbo?

Dozing but not defeated, networking vendors muster resources for next generation

BY JOANIE M. WEXLER
CW STAFF

In the lull before the anticipated T1 technology storm, some users may be finding themselves at a loss as to what equipment investments to make today.

The T1 arena is in a period of technology transition that has users nervously checking their watches in anticipation of bandwidth-voracious data networking applications that will require new products to accommodate them. This state of limbo is making the saturated T1 market appear to be cooling as vendors take the time to develop support for new technologies, form alliances and expand internationally to meet the new generation of networking trends.

The waning market perception has been fueled by recent disappointing earnings announcements from industry leaders such as Network Equipment Technologies, Inc. (NET) and Newbridge Networks Corp. The market, however, is more dormant than dying, according to analysts.

These revenues still reflect substantial growth, even though they fell below projections. In fact, multiplexer pioneer Timeplex, Inc. has actually reported that first quarter 1990 was its most profitable first quarter ever.

A couple of years ago, analysts predicted that competition would cause prices to drop significantly on high-end multiplexer equipment, allowing the next tier of corporate buyers to enter and nourish the market. This has not happened, according to Frank Dunbeck, president of Communication Network Architects, Inc., a consultancy in Washington, D.C.

"The vendors haven't gone along with the market dynamics," he said. "Margins in the T1 arena are narrow, and vendors like NET say they're a premier company that won't lower prices under competitive pressure."

With data traffic growing at about 35% per year, according to Boston-based research firm The Yankee Group, and with networking habits changing, many users may soon need to swap out their old T1 multiplexers, which burst on the scene after AT&T's divestiture and sent many companies to private networking solutions. T1 multiplexers are devices that combine multiple independent voice and data streams and allow them to be transmitted across a single T1 pipe.

Currently, the hitch in investing in new equipment is that users need new-generation technologies implemented at different rates by different vendors. Unlike other areas of the industry, there has been no push in the T1 market toward compatibility among multivendor products, leaving users pretty well committed to a single supplier.

New products will be needed to accommodate the large, random file transfers that are emerging as local-area networks link up over wide-area communications lines — particularly to communicate with remote mainframes.

"Within three to five years, all the current T1 products will be history," predicted Steven A. Taylor, president of Distributed Networking Associates, a consultancy in Greensboro, N.C.

Taylor noted that when T1 multiplexers stormed the market six years ago, there was virtually no LAN interconnection going on, and data ran primarily in continuous streams, resulting in the proliferation of time-division (circuit-switching) multiplexers, which dedicate 64K bit/sec. channels within the T1 pipe to preset applications.

Market leaders NET, Timeplex and Newbridge are still circuit-switching-oriented, added Timothy Zerbiec, vice-president of Vertical Systems Group, a Dedham, Mass.-based market research firm. This, however, is an inefficient transmission method for large, random file transfers, Zerbiec said.

With today's attractive carrier rates for virtual private networks, which allow customers to lease a portion of the public network, users are plunking much of their voice traffic — which is slogging along at a 5% growth rate per year, according to The Yan-

Continued on page 57

Everybody's doing it

Alliances among T1 vendors can speed LAN traffic in T1 links

Source: The Yankee Group — CW Chart: Paul Mock

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NATIONAL BRIEFS

Count us in

Cray Research, Inc. had said it was going to buy itself a big slice of the minisupercomputer market, and now the planned purchase of Santa Clara, Calif.-based **Supertek Computers, Inc.** is a done deal. As part of the $32.5 million acquisition, Supertek — now a Cray subsidiary — will relocate its headquarters to Mendota Heights, Minn., and gear up for manufacturing at its parent's supercomputer plant in Chippewa Falls, Wis. The deal, Cray Chief Executive Officer John Rollwagen said, will enable the firm to bring a multiprocessor Cray Y-MP-compatible minisupercomputer model to market sometime next year.

In the footsteps

CTG/Scientific Systems Services is putting more than its annual dues behind **Adapso's** efforts to broaden its software industry representation. Last week, Vincent Lamb Jr., president of the systems integration arm at CTG, a Melbourne, Fla.-based consulting firm, was named to the board of the industry association's recently launched Information System Integration division (ISI). In lending his services to ISI, Lamb is furthering a CTG tradition: Company President John Courtney is a past chairman and present board member of Adapso.

The Kaypro shuffle

Last seen mired in a power struggle and financial chaos, **Kaypro Corp.** now has a deadlock-preventing fifth director and a new leader to aid its effort to continue its saga past Chapter 11. Late last month, the bankruptcy court approved the minority and majority shareholders' choice for a new director, Leonard Kneeland. The board then appointed veteran Kaypro employee and turnaround maven Ben Fisher as president and chief executive officer. Last week, Fisher made his first official executive announcement: Production is up and running, with some $1.5 million worth of backlogged orders expected to be filled by the end of this month.

HDS brushes up on marketing tactics

BY J. A. SAVAGE
CW STAFF

"Marketing? What marketing?" cried users and analysts alike two years ago when mainframe maker Hitachi Data Systems Corp. (HDS) was still National Advanced Systems. The self-admitted lack of marketing kept HDS a distant third behind IBM and Amdahl Corp. in the IBM-compatible mainframe market (see chart).

Since May 1989, when Hitachi Ltd. bought 80% of National Advanced Systems and Electronic Data Systems (EDS) bought 20% to create HDS, the company has been taking marketing "voice" lessons so it can be heard — if not louder than the others, at least among the fray.

Given an infusion of patience by majority owner Hitachi, the company has also made business plans aimed far into the future — a major change in corporate attitude. Prior to the Hitachi buyout, then-owner National Semiconductor Corp. used the company to a large degree as a cash cow, said Mark Hess, an analyst at Gartner Group, Inc.

"They tried to do some value-added strategic positioning but always had the rug pulled out from under them with things such as layoffs," Hess said. HDS insiders agreed with the cash-cow characterization.

Now, HDS is on its own, able to plow whatever profits it makes back into the company.

HDS has gone through two reorganizations in 13 months, primarily to consolidate a marketing function that was spread geographically and across corporate divisions. "It's Marketing 101," said James Balassone, executive vice-president of marketing. "It's basic stuff, but because of the company's history, it's not easily put in place."

The firm has folded marketing people from its worldwide operations into a consolidated corporate operation and has added about 20 new people for a total of 70. Even so, HDS is still no match for IBM, which has thousands of employees in mainframe marketing, ex-IBMer Balassone said.

The reorganization also brought short-term planning to the regional marketing level and long-term planning to the divisional level. At the upper end, the division plans ahead five years and the region plans ahead one year. The two groups work on a two-year plan, said Tom Frana, vice-president and general manager of U.S. operations.

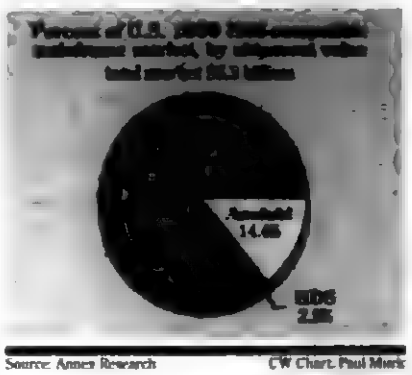
Analysts and HDS insiders said this far-reaching approach is completely different from the old National Advanced Systems. "HDS is focused on long-term growth," Hess said. "They talk in terms of the year 2040."

Announcing the firm's eagerly awaited line of high-end mainframes last month "was the first test of the new marketing organization," Frana said.

The announcement included a model HDS claimed to be the fastest mainframe yet announced, the EX 410, a four-processor computer. At 150 million instructions per second (MIPS), it could run 400 automated teller machines (ATM), compared with about 300 ATMs run by the top-end IBM 3090J mainframe, an HDS spokesman said. He added, however, that HDS has yet to benchmark the computer.

Third in line

HDS hopes its new mainframe line will gain ground for it on its two biggest competitors



Source: Annex Research — CW Chart: Paul Mark

With its new high-end offering, slated for availability in a year, HDS has gained the image of being in the same band as Amdahl and IBM, although it is still singing backup. Before the announcement, insiders and analysts said that the company was loitering somewhere backstage, hardly even in the same arena.

The machine was given a suitably gala debut: HDS' high-end announcement was a five-city, worldwide, near-simultaneous event. HDS used to announce new computers on separate dates, sometimes with conflicting information, such as incongruous MIPS ratings, according to President Gary Moore.

"I'm not sure our sales rep's story has changed, so much as now he has more credibility," Frana said. "He has some press clippings and spec sheets to show."

Marketing may be more coordinated, but the HDS metamorphosis is still in the cocoon stage, Hess said. "It's not an American approach," he said, referring to Hitachi's Japanese ownership and style; EDS' contribution, he said, is basically in name only. "They're not trying to change in 15 minutes or react to the pressure of quarterly profits."

Hess said that HDS is one year into the process of a change that will take another couple of years to complete. "Then you'll see a dramatically different field force, both in quantity and quality," he said.

While Balassone spoke of new products, such as an automated tape library and optical disc storage devices, Hess said he believes that with Hitachi's backing — and its Japanese-style patience — the firm will expand beyond those products, from printers to supercomputers.

Alcatel takes advantage of relaxing export controls

BY RALPH BANCROFT
IDG NEWS SERVICE

BRUSSELS — Alcatel NV, the telecommunications firm 63% owned by Cie. Generale d'Electricite (CGE) in France and 37% by U.S.-based ITT Corp., looks set to be among the firms to take early advantage of the recent relaxation of high-technology export curbs by the Coordinating Committee on Multilateral Export Controls (Cocom).

Willy Vandenberghe, adviser to Belgium's trade minister, said Alcatel's Antwerp, Belgium-based manufacturing facility is close to signing an agreement with the Soviet Ministry of Communications to export digital telephone exchanges.

The deal would initially involve Alcatel System 12 exchanges with a capacity of 50,000 lines. Industry sources said that a second stage in the proposed "framework agreement" calls for a joint-venture factory to be set up in the USSR to manufacture the exchanges. A third stage opens up the possibility of exporting the technology required to let the Soviet Union manufacture the very large-scale integration (VLSI) chips that power the exchanges.

Until several weeks ago, all parts of the agreement would have been banned under Cocom rules, but changes made at the high-level meeting in Paris opened the way for the export of digital telecommunications equipment. Nevertheless, Alcatel remains restricted from exporting the VLSI technology and must wait for further relaxation of export controls.

Alcatel and the Soviet Union are expected to sign the framework agreement next month, Vandenberghe said. The deal is expected to be one of the first of many such joint-venture agreements following the Cocom decision as the Soviet Union rushes ahead to modernize its telephone system, in which some of the exchanges date from before its 1917 revolution.

UK-based Telecommunications Research Centre estimated that a $350 billion market exists during the next 15 years for Western firms to export telecommunications equipment to the Soviet Union and Eastern Europe.

Separately, ITT said it has sold a 7% block of Alcatel shares to CGE for $640 million. It is the first step in unwinding its investment in the venture formed in 1986 when ITT sold its telecommunications business to CGE for $1.3 billion and 37% of the new firm's stock. Since then, the value of that shareholding has more than doubled. ITT is using the cash raised to buy back some of its own common stock.

Exec VP knighted at D&B

Dun & Bradstreet Software recently named Thomas McNeight as executive vice-president of U.S. field operations. McNeight, a senior vice-president and national sales manager at D&B Software and at Management Science America (MSA) prior to the MSA acquisition, will man the post vacated by Doug MacIntyre, who was also with MSA before the merger but left the company last month.

Chairman and Chief Executive Officer John Imlay said he had been aware of MacIntyre's intention to leave the firm for several months. McIntyre, now at Hyannis, Mass.-based Software 2000, said he took the position because it was an offer he "couldn't pass up."

McNeight will be responsible for all employees working outside of the Atlanta and Framingham, Mass., locations of D&B Software. He said he will begin his job by focusing on services and support within the U.S.

McNeight has been working for Imlay since 1979, when he started as a salesman at MSA. In his former position, he worked under MacIntyre as the national sales manager at D&B Software.

MAURA J. HARRINGTON

Phone companies strike up bandwidth

BY J. A. SAVAGE
CW STAFF

MENLO PARK, Calif. — A house in the suburbs these days might not only come with a swimming pool, cul-de-sac and variable mortgage — it could also turn out to be equipped with fiber-optic cabling that would allow the most graphics-intensive engineer to work from a home office or prepare the family for future high-definition television (HDTV) reception.

Phone companies have been busy installing fiber-optic wires throughout the trunk lines and urban offices of the nation to improve the quality and bandwidth of communications. However, while the cost of installation in such high-density areas is effective, it has been prohibitive in single-family dwellings.

Raynet Corp. claims to have an answer.

"It comes down to the last mile between the telephone company and your house — that remaining mile is roughly 35% of the cost of the physical part of the connection," said George Ballog, marketing manager at Raynet, a subsidiary of Raychem Co. created to cable residential areas with fiber-optic wire.

So far, Raynet has one 100-house installation in Lynnfield, Mass. This makes the company a striving second in the business to AT&T, which currently has about 2,000 houses in trial run.

Not door-to-door

While the Raynet project has kept costs down to approximately those of regular phone hookups, there is one missing link: It does not plan on stringing fiber optics all the way to your house. It will, however, come close enough to provide the bandwidth necessary for most expanded services, Ballog said. A doctor, for instance, could not only check a patient's record from home or a remote office, but he could also have the bandwidth necessary to receive an X-ray.

The firm will install a Subscriber Interface Unit at the curb for every few houses — from four to eight, depending on the number of expected phone hookups and the potential for telephone company-supplied cable television. From the interface unit, traditional copper wire or coaxial cable goes to the house. At short distances, such as 200 feet, copper can transmit data at 6M bit/sec., Ballog said.

"It isn't enough for HDTV, but it's enough for near-term use," Ballog said. The telecommunications industry is considering interactive video and newspaper services as future directions for the new hookups, although the services are not yet offered.

With the curbside beachhead, — which is the size of a network server — "you can justify the cost," Ballog said. In fact, it cannot cost more than regular phone wiring; state public utility commissions will not allow phone companies to pass on the increased costs to ratepayers. Ballog estimated the cost at about $1,200 per subscriber.

Most of AT&T's initial hookups do go all the way to the house, according to Laura Huffman, senior product planner at AT&T's Network Cable Systems in Atlanta. AT&T is not concerned about utility commission regulation, because it only affects "narrow-band" services, Huffman said. "We need to be prepared for broadband services," she added.

Cost sharing

If fiber went all the way to the home, Ballog said, the phone company and each home would have to be equipped with a converter to change the electric signal to a digital one and back again. This is an expensive proposition — but with a curbside box, he said, several households share the converter and its cost.

"By providing digital service at about the cost of copper, we enable the phone company to offer fancy services," said Robert Furniss, Raynet's senior product manager.

The curbside boxes, cabled to a telephone office interface, multiplex the copper-wire signals to digital for the optical fiber bandwidth, according to Furniss. At the receiving end, the interface units decode the digital information and send it over copper. With this "drop-box" architecture, Raynet is able to use from two to five fiber-optic lines for four to eight phone and cable television lines, leading to a phone company interface capable of handling 384 lines. One underlying assumption of the architecture, Furniss said, is that phone companies will be able to transmit cable television at some time in the future.

In the long term, Furniss said, Raynet is aiming at eliminating the modem; when each house is equipped with a sender and receiver for optical fiber, he said, there will be no need for a modem.

Raynet sees the market potential of fiber-optic cabling as enormous. "There are 120 million phones out there and 80 million lines to individual houses," Ballog said.

Users haul Atex to court

Users claim injury from keyboards and VDTs

BY ELLIS BOOKER
CW STAFF

NEW YORK — Claiming an assortment of physical injuries as a result of using the keyboards and VDTs sold by electronic publishing systems vendor Atex, Inc., two groups of journalists sued the company last month.

The suits are sure to rekindle debate over the health risks of using computer terminals, which has been linked to various ailments.

In separate actions totaling $288 million in damages sought, journalists from four newspapers and one news service alleged that Atex, an Eastman Kodak Co. unit based in Bedford, Mass., was negligent in warning users of the potential hazards of using its equipment.

The users said they had suffered a variety of "cumulative trauma disorders" to their wrists, arms and shoulders, including carpal tunnel syndrome, tendinitis and nerve disorders.

Both suits also claim that the Atex keyboards and monitors were defectively designed.

"It's far too premature to say anything about the case," said a spokesman for Kodak. The spokesman added that this was the first time a formal complaint had been filed regarding any keyboard produced by a Kodak unit. Kodak itself was not named in either suit.

The suit by three former *New York Newsday* journalists, filed in New York Supreme Court on June 4, seeks $5 million apiece in damages for the reporters, none of whom are currently working at the newspaper.

The journalists' spouses are seeking an additional $1 million apiece in damages for loss of support.

A second suit, filed in federal court in New York City on June 15, represents a total of 10 journalists from *Newsday, American Banker, The Associated Press, Discount Store News* and *The Village Voice.*

That suit, which seeks damages of $270 million, alleged that Atex "disregarded medical and scientific information, studies, tests, data and literature" concerning the relationship between repetitive use of computers and injuries.

One of the key requirements in winning a product liability case — a finding that a product was negligently designed or built and actually caused the injury — is now more difficult to meet. In the wake of recent court decisions, this finding must be based on clinical — not just statistical — evidence, according to Laura P. Berens, a Chicago-based lawyer who specializes in product liability.

INTERNATIONAL BRIEFS

But everyone's doing it

According to a survey on software theft published by the **Federation of Software Theft**, illegal software copying in the UK last year lost the rightful owners an aggregate $520 million. No wonder: The survey, which was commissioned and funded by a group of software firms including **Microsoft Corp., Lotus Development Corp.** and **Ashton-Tate Corp.**, said that more than half of all senior managers who use personal computers at work have indulged in illegal software copying.

Hail, hail, Shenyang is here

Irvine, Calif.-based **Helionetics, Inc.** is teaming up with **North Computer Applications and Development Corp.**, which is based in Shenyang City, China, to launch **Shenyang Shenlong Computer Systems Co.** The joint venture, which is expected to enrich its parent firms by some $200 million over the next five years, will make and market a Sun Microsystems, Inc. Scalable Processor Architecture-based PC that can run both MS-DOS and SUN-OS.

T1

FROM PAGE 55

kee Group — back onto the public network.

Users predicted that with the advent of high-speed LANs, they should have no trouble filling T1 and higher bandwidth backbones with data only.

In addition, imaging, graphics and distributed applications are gobbling up bandwidth, spurring user appetites for bandwidth and bandwidth management technologies such as frame relay, an emerging standard for interfacing a LAN to a communications line that allows users to access bandwidth on demand.

Also on T1 vendor "to do" lists are T3, which provides 45M bit/sec. bandwidth, and fast packet, a speeded-up switching technology.

T3 multiplexers are currently shipping from Infotron Corp. and Timeplex. Fast packet and frame relay were introduced by market innovator Stratacom, which has been kept from dominating the market only by the large chunks of market share grabbed by Timeplex and NET when the time was ripe, according to Joaquin Gonzalez, vice-president of Meta Group, Inc., a Westport, Conn.-based consultancy.

Gonzalez posed a major user concern: "You're thinking of making a major investment in a backbone to extend to hundreds of sites, and you're not even sure that the architecture is there yet from your installed T1 vendor. What do you do?"

Taylor advised that since many applications pay for themselves in six to 18 months, it probably makes sense to put in a current generation of networking multiplexers, "realizing that you may have to trash your investment in three to five years instead of five to seven."

Gonzalez also said that with LAN/WAN integration on the horizon, "what animal do you buy to do bridging, routing, bandwidth management and network management? There's a big bonanza" for whomever can crack the LAN/WAN connectivity solution, he added.

Starting out

T3 technology is beginning to catch on, but substantial revenue won't be seen for a few more years

Source: The Yankee Group — CW Chart: Paul Mock

COMPUTER CAREERS

Promise them anything

In weighing a job offer, beware the hard sell and check for signs of trouble

BY SHERYL KAY
SPECIAL TO CW

Baseball scouts do it. Army recruiters do it. Sometimes, even information systems managers do it.

In the hope of attracting the best talent, IS managers sometimes paint an overly rosy picture of what lies ahead for a prospective employee. This tactic is more popular now than ever, recruiters say. Although there is a growing demand today for experienced IS professionals, corporate cutbacks make them reluctant to leave secure jobs.

Most assurances given in job interviews are true. Occasionally, however, managers make misleading statements. Marybeth Robeson, a recruiter at HR Enterprises in Kansas City, Mo., says that half the computer professionals who seek her services are leaving jobs because of unfulfilled promises.

"Some managers are so desperate [to hire] that they avoid telling the truth and exaggerate one or more aspects of the job," Robeson says. The evasion and exaggeration may not be intentional, she adds.

Misleading statements might relate to job duties, a candidate's ability to climb the promotional ladder, the company's commitment to IS or its dedication to employees.

One programmer/analyst at a Midwestern computer consulting firm, who asked to remain anonymous, says his employer failed to keep several promises made during interviews. He was assured he would be given a raise and an upgraded title after a 90-day trial period. "Two weeks after the 90 days, I still hadn't heard anything," he recalls. "I had to initiate talks with the person who had hired me." In the end, he got a raise of $19 per week and no change in title.

The company also assured the individual that he could be assigned to new development projects and that should he become ill during the trial period, the company would cover him. To this day, his only assignment has been in maintenance, and he has been docked two day's pay for being sick.

"In looking back on it, this has all been my own fault," the individual concedes. "I didn't get anything in writing, and the person who interviewed me was a real smooth talker."

He says several other employees of the firm are disgruntled because of unfulfilled promises. "If I had asked to speak with some of the employees, or sought out a few, I might have become aware of these problems beforehand," he says.

A similar situation confronted Rob Baillie after he was presented with the opportunity to start up a new office for the New Jersey consulting company where he worked. He wasn't aware that the company was positioning itself to be bought out.

"Four months after I accepted the position, it started to become apparent to me," Baillie says. Shortly afterward, the acquisition took place, and the financial resources needed to build the office were reallocated.

Baillie, who since left that firm and is now chief operating officer at Hestair Computer Group, Inc. in Jersey City, N.J., says he should have looked at his former employer with a more critical eye. The fact that the owners were ready to retire, for example, should have prompted him to do more research.

Another IS professional who requested anonymity faced unmet expectations after taking a job at an Atlanta insurance company. The manager who hired her told her she would be the lead member of a team designing and implementing a major database system. The database package had not been chosen at the time, she was told.

Six months later, the woman realized that the project was considerably larger than she had expected, the database had been approved before she joined the firm, and the product did not address users' requirements.

"I suggested breaking down the system into smaller units," she says. "At that point, it was too political. The users had been promised a certain type of system, and my manager was not prepared to tell them that he could not deliver it." Soon afterward, she took advantage of an opportunity to transfer to another job within the company.

"I should have seen a red flag during my interview," the woman says. The manager who hired her spoke in superlatives in outlining the initial job. "He told me that there were no negatives," she says. In discussing the subsequent position, "the manager made it clear that the job would have its ups and downs."

To avoid such scenarios, these IS professionals advise the following:

- Think critically.
- Check references.
- Get promises in writing.
- Don't brood if faced with unfulfilled promises.

Robeson recommends talking to managers to try to sort out the truth. If these efforts prove unsatisfactory, consider taking another job at the company.

"Above all, don't get down on yourself," Robeson says. "Try to stick it out for at least one to two years."

The biggest danger is finding oneself repeatedly saying in job interviews that a former employer misrepresented a job. On the basis of his own hiring, Baillie says, he can accept unfulfilled promises as a reason for leaving a job once or twice. Beyond that, he assumes that the candidate harbored unrealistic expectations and would probably maintain these delusory presumptions if coming to work for him.

> "SOME MANAGERS ARE so desperate [to hire] that they avoid telling the truth and exaggerate one or more aspects of the job."
>
> MARYBETH ROBESON
> HR ENTERPRISES

Kay is a Tampa, Fla.-based business consultant and free-lance writer specializing in emerging technologies and human resources.

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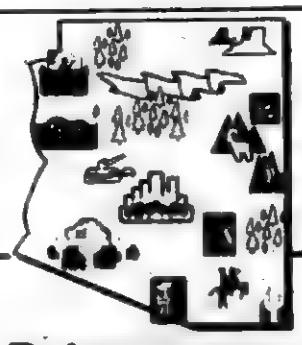

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The incumbent will assist in the analysis and design of business systems that satisfy needs of user departments, and perform programming, testing, installation, and maintenance of information systems, relating to logistics/distribution and accounting/finance applications. Position requires a Bachelor's Degree with five to seven years of related experience.

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We offer a competitive compensation and benefits program, including relocation assistance. If you are interested in career growth with a progressive expanding company, we invite you to apply. Send your resume including salary history to: Michael Ivey, Human Resource Department, Transportation Manufacturing Corporation, P.O. Box 5826 (R&C), Roswell, NM 88202-5826. We are an Equal Opportunity Employer M/F/H/V. No agencies please.

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EOE

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As a Senior Analyst Programmer you will analyze and develop automated application systems solutions to business problems or perform as a project manager on complex projects. The position requires 5+ years of systems development experience with 3+ years of programming, 3+ years programming on-line database systems, 3+ years of structured design and analysis, and a demonstrated ability to direct projects using standard project management methods. A four year degree is preferred.

Application Development Center Analyst

As an Application Development Center Analyst you will evaluate and implement tools and techniques to improve the effectiveness of systems developers and train and support systems developers in utilizing systems development technologies. Experience in all phases of the system development life cycle (planning, definition, analysis, design, coding, testing, implementation and support) is essential. Experience in the application of CASE tools, relational databases, and distributed or cooperative technologies is desired. A four year degree is preferred.

Black Hills Corporation offers an excellent working environment with competitive benefits and salary. Please contact us in complete confidence by submitting a resume, cover letter and a complete salary history to:

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Nippondenso Tennessee, Inc. will match your talent and ability with an excellent salary and benefits package plus outstanding advancement opportunity. If you would like to join our team of quality people, send your resume, cover letter and salary requirements to: **Nippondenso Tennessee, Inc., Human Resources Department, P.O. Box 9710, Maryville, TN 37802-9710.** Equal Opportunity Employer.

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The DIVISION OF LIQUIDATION of the FEDERAL DEPOSIT INSURANCE CORPORATION is accepting applications for the position of EDP Analyst in its Midland, Texas office.

This EDP Analyst position requires leadership experience in design analysis and programming and experience with LAN/WAN systems. Programming experience with languages such as C or Pascal will be given priority consideration. Must have the ability to interact with all levels of personnel, with a demonstrated skill of effective oral and written communications. Salary range $39,407 to $51,233.

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FDIC

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Programmer/Analyst: Develop, design, Test, and Implement software packages for Engineering and Scientific applications using "C" programming language in VAX/VMS and Unix operating system environment on the state of the art engineering workstation, strongly based on database and graphic interaction. Prepare Technical documentation for code maintenance, users, and Training. All levels, $30K/Mo. Requires an M.S. from dept. of Computer Science or related degree, with at least three (3) hours graduate level coursework in Database Management, Operating System, Artificial Intelligence and Graphics, and B.S. or M.S. degree in engineering with emphasis on Numerical Modeling. A minimum of six months hand-on-duty experience programming in "C" on Unix or VAX/VMS based workstation, working with relational databases and preparing technical documentation. Apply at the Texas Employment Commission, Houston, Texas, or send resume to the Texas Employment Commission, TEC Building, Austin, Texas 78778, J.O. # 5455138. Ad paid by an Equal Opportunity Employer.

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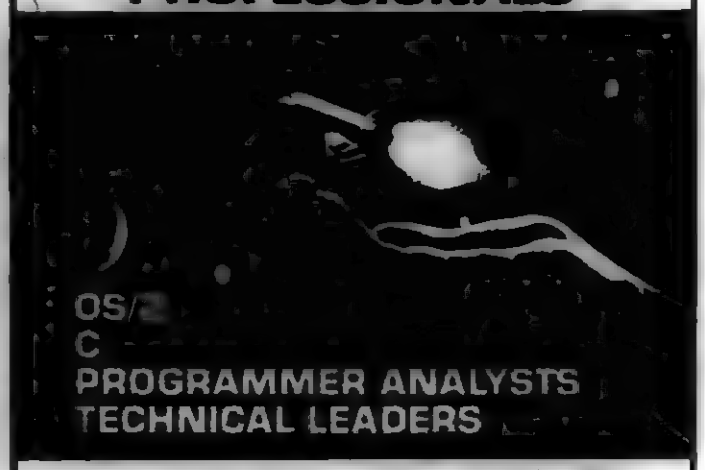

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Systems Analyst - Chicago metro area. Respon. for designing, developing, implementing & maintaining busin. commercial online database systems using IDMS, ADS/O software, Model 204 database language; IBM mainframes. Spns 5-6 Programmer/Analysts. B.S/Eng. or Comp. Sci. 2 yrs/exp. doing abv. 40 hrs/wk. $38,800/yr. Send resume to: IL Dept. of Employment Security, 401 South State Street - 3 South, Chicago, IL 60605. Attn: Mary Miles. Ref. #V-IL-1121-M. AN EMPLOYER PAID AD.

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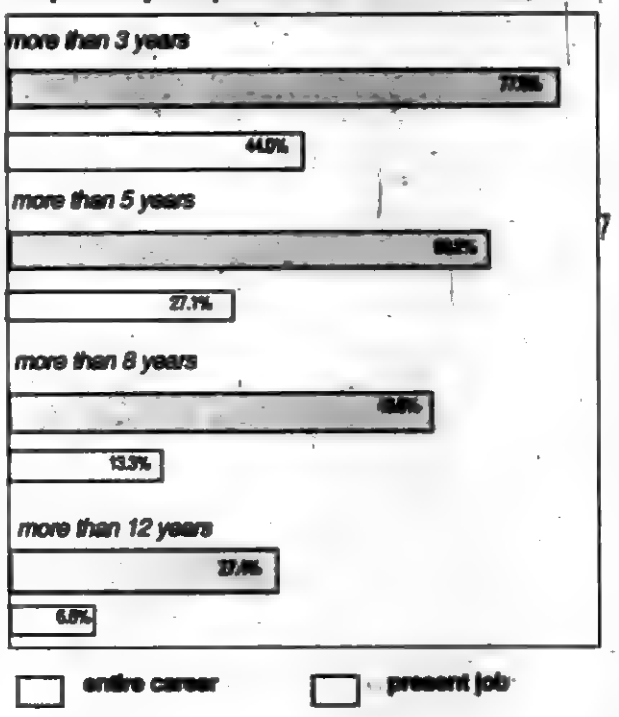

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MARKETPLACE

A guide to the mail-order world

When buying computers through the mail, the first rule is 'buyer beware'

BY JESSICA KEYES
SPECIAL TO CW

If you're anything like me, you have about 50 pounds' worth of computer catalogs sitting on the floor, many of them chock full of hardware and software bargains.

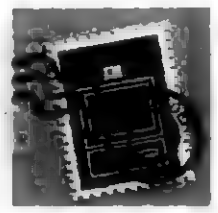
With the purchase of computer equipment becoming more decentralized, information systems managers are taking advantage of the mail-order houses that issue these catalogs in putting together systems. But don't be too quick to dial that number.

An IS manager who is a friend of mine spotted an ad in a catalog for an affordable personal computer with all the bells and whistles and placed his order.

When the boxes arrived a few weeks later, my friend ripped open the cartons and assembled the machine. He flipped on the power switch and heard the fan whir. But he also heard something else — a sputtering sound — then the lights went out.

My friend called the company's hot line and was put on hold. Twenty minutes later he spoke with a technician who diagnosed the problem as a bad IBM Video Graphics Array (VGA) card. Then a customer service representative explained that the VGA card could only be replaced upon payment of an additional $195, which would happily be refunded when the bad VGA card was shipped back.

The next day, the new VGA card arrived. My friend anticipated success, but after he installed the new card, the keyboard would not work. He packed up the computer and sent it back.



Then the real headache started. My friend made dozens of phone calls during the next four months before his charge card account was credited properly. The VGA card had been lost at the mail-order company's shipping and receiving department.

The point of the story is not to stay away from mail-order houses but to be wary. I use them all the time and am usually pleased with the products and service. But I follow a prescribed set of rules.

• **Find out whom you're dealing with.** Have you ever heard of this company before? Has it been written up in major trade publications? Have any of your friends or acquaintances had any dealings with it? One valuable tactic is to call up the Better Business Bureau in the city where the firm is located and find out if there are any outstanding complaints against it.

• **Scrutinize the technical support.** Does the company have an 800 telephone number? It can get pretty expensive to wait on hold for 20 minutes when you have called long distance. When is technical support available? From 9 a.m. to 5 p.m. is OK, but 24-hour coverage is better. A word of advice: Obtain the phone number for technical support and call to check out the response before you place an order. Another word to the wise: Read the fine print to find out how long technical support is actually available to you: Thirty days? Ninety days? Forever?

• **Check out the return policy.** Despite the problems, my friend actually made a fairly good decision when picking the mail-order firm. The one he chose let him return his purchase with no questions asked. Most mail-order companies do the same. However, some of them, as described in the fine print of advertisements, charge a restocking fee — a percentage of the purchase price that a company levies to cover the cost of processing returned merchandise.

• **Know the law.** There is a Federal Trade Commission ruling that covers the mail-order business. Generally, the seller must ship your goods within 30 days of receiving the order, unless its advertisement clearly specifies otherwise. When 30 days has passed, the seller must contact you to ask if you'd like to cancel or accept a new delivery date. If you decide to cancel, the seller must return your check within seven business days or credit your charge-card account within one billing cycle. Under no circumstances can merchandise be substituted without your consent.

If you find out your order has not been received or the merchandise is defective, immediately notify the seller in writing — even if you ordered by phone. Check the warranty and documentation to make sure that you don't expect features or performance that the product is not designed to provide. And when you finally return the merchandise, make sure you get a receipt from the shipper. Many times, sending a copy to the seller will get you a refund of shipping costs.

If you're still not satisfied with the seller's response to problems, you have a friend in the Fair Credit Billing Act. It stipulates that if you pay for your merchandise by credit card — and I strongly recommend that you do so — you may have the right to withhold payment. Call your credit-card company and explain the situation. It will put the charge on hold until the situation is resolved.

If all else fails, you may find an arbiter in the Microcomputer Marketing Council of the Direct Marketing Association. You can write to it at: Mail Order Action Line, c/o DMA, 6 East 43rd St., New York, N.Y. 10017.

You've all heard the expression *caveat emptor*, Latin for "let the buyer beware." Most mail-order firms are legitimate businesses that offer substantial discounts. But the key word here is business — they're in it to make a profit, and to offer you their low prices, most of them do cut some corners. Your best approach is to be prepared.

Keyes is president of New Art, Inc., a management and computer consulting firm in New York.

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Buy/Sell/Lease

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The BoCoEx index on used computers

Closing prices report for the week ending June 22, 1990

	Closing price	Recent high	Recent low
IBM PC Model 176	$425	$660	$250
XT Model 086	$500	$700	$350
XT Model 089	$650	$825	$475
AT Model 099	$1,050	$1,375	$850
AT Model 239	$1,075	$1,325	$700
AT Model 339	$1,200	$1,400	$900
PS/2 Model 50	$1,300	$1,700	$1,050
PS/2 Model 60	$2,500	$2,600	$2,400
Compaq Portable II	$1,675	$1,725	$1,400
Portable III	$2,175	$2,500	$1,900
Portable 286	$1,700	$2,000	$1,500
Plus	$675	$750	$650
Deskpro	$825	$900	$800
Deskpro 286	$1,400	$1,625	$1,200
Deskpro 286/16	$2,500	$2,750	$2,475
Apple Macintosh 512	$375	$775	$275
512E	$450	$450	$350
Plus	$1,175	$1,275	$1,000
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INFORMATION PROVIDED BY THE BOSTON COMPUTER EXCHANGE CORP.

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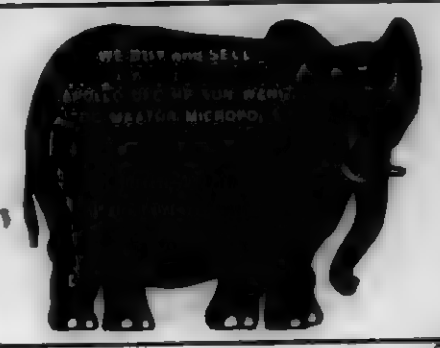

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CP 67-90-02

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- communications
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The true meaning of training

A training philosophy helps direct resources toward the biggest payback

BY AVERY CLOUD
SPECIAL TO CW

In karate, the practitioner learns to focus the energy of his blow on the smallest possible point. He concentrates the power of a punch in two knuckles instead of the entire fist. The result is broken boards or opponents.

A training philosophy works the same way. It helps the manager focus all the energy of his training on the smallest possible set of objectives in order to generate the greatest benefit. One of the best ways to diminish effectiveness is to try doing too many things at once.

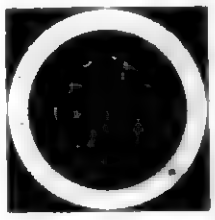
To give more power to the training punch, a training philosophy sets down clear goals and consistent directions. It answers several key questions:

- What kinds of employees should training produce?
- What does the company want from trained employees?
- At what pace will training or education be offered?

A training philosophy is the foundation on which a training program is built. Once developed, it will determine curricula, educational resources, schedules and budgets.

The goals of a training philosophy can be divided into the following five types of statements:

1) Purpose: The organization's beliefs about the need for professional training. The purpose is the training mission statement. It summarizes the company's commitment to and reasons for training. It also describes the needs to be addressed through training.



A training philosophy for the technical support department of a data center, for example, might state its purpose as: "We train employees to promote high retention and develop innovative individuals to meet the needs of fast growth and rapid change."

2) Breadth: The diversity or narrowness of the training. Broadly focused training is aimed at developing well-rounded employees, especially managers and supervisory people. It works well for managers who want to develop successors. A broad program usually includes training in various disciplines, including basic business and management skills.

Narrowly focused training develops specialists — people who master a set of skills but lack a view of the big picture. These individuals work well in companies where control and standardization are the norms.

The breadth statement for our technical support department might be: "We aim to develop specialists with narrow expertise covering no more than two areas. We do not supply training in general skills or business or try to enhance employees' attractiveness in the job market."

3) Depth: The degree of expertise expected. Managers must decide whether they need top experts or can work with moderately proficient 'performers. Some managers prefer "dim stars" with enough skill to get the job done but not enough to attract a lot of job offers; the aim is retention. Other managers like "shooting stars" who become highly skilled, give a lot to the company and then move on. The idea is that their short-term contributions outweigh the long-term contributions of dim stars.

The issue is less one of morality than of the strategy that best serves employer and employee. High-growth organizations usually do best with shooting stars who can innovate and deal with rapid change. Organizations with slower growth sometimes do better with dim stars less hungry for challenge and growth.

The depth statement for the technical support group might be; "Our employees are expected to master their assigned specialties and become top-notch performers in their field."

4) Velocity: The pace of training. Velocity relates to the rate at which employees develop. Some firms prefer slow, steady growth; others expect employees to burn up the road. Once again, the needs of the company determine the course. The need to slow down promotions may reduce velocity. A lack of suitable skills to complete key projects may prompt a high velocity.

The velocity statement for the technical support department might be: "Our training schedules are aggressive in order to produce the greatest proficiency in the least amount of time. Training is timed to maintain state-of-the-art know-how."

5) Rigidity: The relevance of training to other industries or companies. Hospitals, for example, often emphasize knowledge of computing in health care and may provide training specific to their organization. Some companies operate peculiar or specialized business systems and focus training on getting people proficient in them. Other companies operate in more standardized modes and require less rigidity.

In our example, the rigidity statement might be: "Our training is geared to this company and its industry. Required skills are not easily transferable to other industries or companies."

A given training philosophy may offend some people's sensibilities, but a controversial philosophy is better than none at all. Having established philosophical objectives, managers will make more consistent and coherent training decisions.

Cloud is manager of technical services in the information services department at Bowman Gray/Baptist Hospital in Winston-Salem, N.C.

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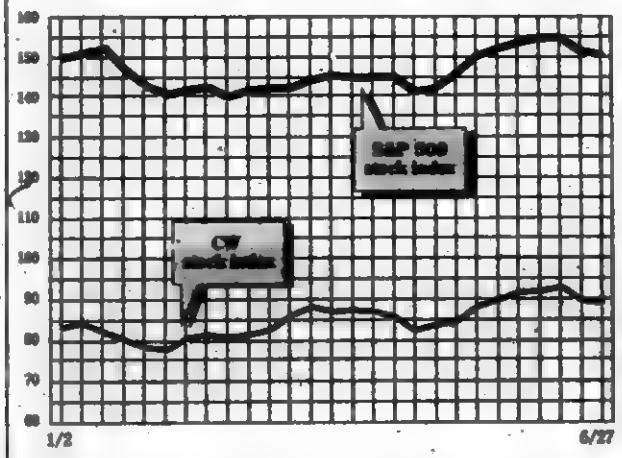

Indexes	Last Week	This Week
Communications	123.2	118.4
Computer Systems	86.5	88.1
Software & DP Services	128.3	127.7
Semiconductors	60.6	59.8
Peripherals & Subsystems	95.4	94.8
Leasing Companies	80.3	79.7
Composite Index	89.8	89.0
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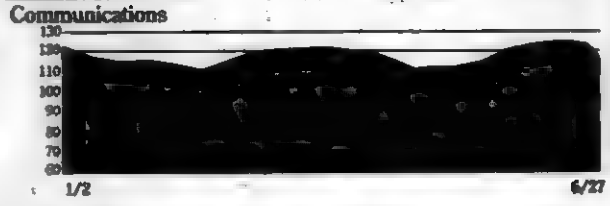
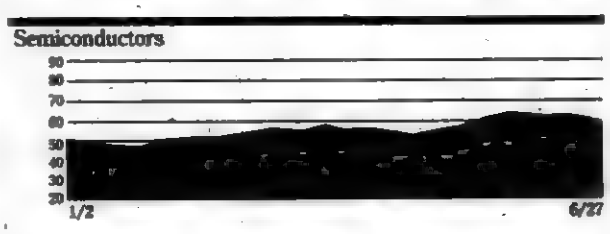
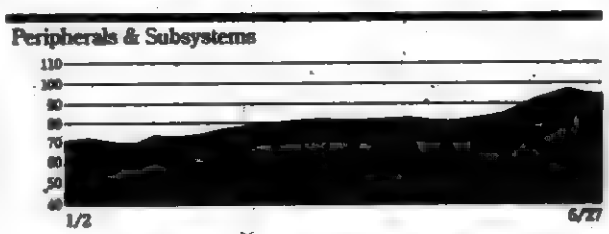






CW CHARTS

Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, JUNE 27, 1990

EXCH	52-WEEK RANGE	PRICE CLOSE JUNE 27, 1990	WEEK NET CHANGE	WEEK PCT CHANGE

Communications and Network Services

N	AMERICAN INFO TECHS CORP	58 38	51.625	-3.5	-6.3
O	ANDREW CORP	32 19	19.25	-2.1	-10.5
O	ARTEL COMM CORP	10 5	5	0.0	0.0
N	AT&T	43 36	39.125	-4.0	-9.3
O	AWATECH INC	7 2	2.875	0.0	0.0
O	AYDIN CORP	21 13	14.5	1.3	9.4
N	BELL ATLANTIC CORP	67 49	60	0.1	0.2
N	BELLSOUTH CORP	67 49	52.625	-1.8	-3.3
O	COMPRESSION LABS INC	16 7	14.25	-1.1	-7.3
O	CONTEL CORP	37 25	28	-1.1	-4.1
O	DATA SWITCH CORP	8 3	3	-0.4	-11.1
O	DIGITAL COMM ASSOC	27 17	22.75	-0.5	-2.2
O	DYNATECH CORP	21 15	16	0.0	0.0
O	FIBRONICS INTNL INC	15 6	11.875	0.0	0.0
O	GANDALF TECHNOLOGIES	7 3	3.5	-0.1	-2.8
O	GENERAL DATACOMM INDS	7 3	3.625	0.0	0.0
N	GTE CORP	36 26	32	-3.9	-10.9
O	INFOTRON SYS CORP	11 4	3.5	-0.4	-9.7
N	ITT CORP	65 51	57	-1.5	-2.5
O	M/A COM INC	6 3	5.125	0.3	5.1
O	MCI COMMUNICATIONS CORP	49 31	41	-0.6	-1.5
O	NETWORK EQUIP TECH INC	24 9	9	-1.0	-10.0
O	NETWORK SYS CORP	15 9	12.625	-0.3	-2.3
N	NORTHERN TELECOM LTD	33 19	27.25	-1.1	-3.9
O	NOVELL INC	57 24	53.25	-2.5	-4.5
N	NYNEX CORP	82 73	82.5	-2.8	-3.1
N	PACIFIC TELESIS GROUP	52 38	44.125	0.1	0.3
A	PENRIL CORP	7 4	6.5	0.0	0.0
N	SCIENTIFIC ATLANTA INC	20 15	20.625	0.9	4.2
N	SOUTHWESTERN BELL CORP	65 50	54	-1.1	-2.0
O	3COM CORP	15 10	10.375	0.5	5.1
N	US WEST INC	41 33	35.875	-2.0	-5.3

Computer Systems

O	ALLIANT COMPUTER SYS	8 4	7.375	-0.4	-5.8
O	ALPHA MICROSYSTEMS	6 3	3.125	0.0	0.0
O	ALTOS COMPUTER SYS	8 5	7.375	1.9	34.1
A	AMDAHL CORP	20 11	15.75	0.4	2.4
O	APPLE COMPUTER INC	35 30	41.5	1.0	2.5
O	AST RESH INC	30 7	22.5	0.1	0.5
N	BOLT BERANEK & NEWMAN	9 4	4.625	-0.2	-5.1
O	COMPAQ COMPUTER CORP	130 73	119.375	4.8	4.7
N	COMMODORE INTNL	16 9	7.625	-0.1	-1.6
O	CONTROL DATA CORP	33 16	18.375	-0.8	-3.9
O	CRAY RESH INC	51 31	48.625	-0.8	-1.3
O	DAISY SYS CORP	6 0	0.188	0.0	24.9
N	DATA GEN CORP	11 6	11.375	0.1	1.1
O	DATAPOINT CORP	6 2	2.75	-0.3	-9.1
O	DELL COMPUTER CORP	13 5	11.375	0.6	5.6
N	DIGITAL EQUIP CORP	108 70	82.125	-3.6	-4.2
N	FLOATING POINT SYS INC	4 0	2.875	-0.1	-4.2
N	HARRIS CORP	40 28	34.375	-0.5	-1.4
N	HEWLETT PACKARD CO	96 48	48.25	-2.0	-4.1
O	HONEYWELL INC	108 72	97.25	2.0	2.1
N	IBM	132 88	118	0.0	0.0
O	INFORMATION INTL INC	16 12	13.125	0.1	1.0
O	IPL SYS INC	14 5	10.5	0.8	7.7
N	MAI BASIC FOUR INC	7 2	2	-0.3	-11.1
N	MATSUSHITA ELEC INDL LTD	180 123	139.75	3.5	2.6
O	MENTOR GRAPHICS CORP	28 14	22.25	1.0	4.7
O	MSI INC	3 0	0.344	0.0	0.0
N	NCR CORP	72 58	63.75	-1.9	-2.9
O	PYRAMID TECHNOLOGY	28 19	20.5	-0.3	-0.8
O	SEQUENT COMP SYS INC	34 11	32.5	0.0	0.0
O	SHAREBASE CORP	3 0	0.516	0.1	23.8
O	SUN MICROSYSTEMS INC	34 13	32.375	-0.6	-1.9
O	SYNOLOGICS INC	2 0	0.5	0.0	0.0
N	TANDEM COMPUTERS INC	28 17	23.625	0.5	2.2
N	TANDY CORP	49 29	38.75	-0.5	-1.7
O	ULTIMATE CORP	11 5	7.75	0.4	5.1
N	UNISYS CORP	20 12	13	-1.4	-9.8
A	WANG LABS INC	6 4	4.25	-0.1	-2.3

Software & DP Services

O	AMERICAN MGMT SYS INC	18 11	17.625	2.0	12.8
O	AMERICAN SOFTWARE INC	20 14	20.375	0.4	1.8
N	ANACOMP INC	7 2	2.75	-0.1	-4.3
O	ANALYSTS INTL CORP	21 14	19.5	0.0	0.0
O	ASHTON TATE	18 9	11.375	0.8	8.3
O	ASK COMPUTER SYS INC	15 7	8.625	-0.4	-4.2
N	AUTO DATA PROCESSING	69 39	64.875	-0.4	-0.7
O	AUTODESK INC	66 33	53.5	0.8	1.4
O	BMC SOFTWARE INC	30 12	26.75	-0.5	-1.8
O	BUSINESSLAND INC	14 7	7.875	-0.5	-3.1
O	COGNOS INC	9 4	8.625	0.1	1.5
O	COMPUTER ASSOC INTL INC	35 11	15.375	-0.1	-0.5
O	COMPUTER HORIZONS CORP	16 7	12.75	-0.5	-3.8
O	COMPUTER SCIENCES CORP	69 40	48.625	-1.0	-2.1
N	COMPUTER TASK GROUP INC	14 9	10.125	-1.1	-10.0
O	COMSHARE INC	24 15	22.75	1.0	4.6
O	CORPORATE SOFTWARE	18 8	13.5	0.0	0.0
N	GENERAL MTRS (CL E)	37 24	26.5	-0.4	-1.9
O	GOAL SYSTEMS INTL	18 10	16.5	-1.0	-5.7
O	HOGAN SYS INC	7 4	3.5	-0.1	-3.4
O	INFORMIX CORP	17 6	15.25	0.3	1.7
O	INTELLICORP INC	7 3	6.625	-0.3	-3.6
O	LOTUS DEV CORP	32 19	27.5	1.3	4.8
O	LOTUS DEV CORP	39 21	35	0.0	0.0
O	MICROSOFT CORP	79 38	78.25	-1.4	-1.8
N	NATIONAL DATA CORP	26 13	14	-0.5	-3.4
O	ON LINE SOFTWARE INTL INC	11 6	7.625	-0.1	-1.6
O	ORACLE SYS CORP	39 15	22.375	-0.6	-2.7
O	PANSOPHIC SYS INC	19 10	13.375	-0.3	-1.8
O	PHOENIX TECHNOLOGIES INC	12 2	4.5	0.1	2.9
O	POLICY MGMT SYS CORP	42 28	40.875	1.1	2.8
O	PROGRAMMING & SYS INC	28 16	25	-0.5	-3.2
O	RELATIONAL TECH INC	11 6	6.375	0.3	4.1
N	REYNOLDS & REYNOLDS CO	27 18	21	-1.5	-7.7
O	SAGE SOFTWARE INC	16 7	13.875	-1.0	-6.7
O	SEI CORP	21 15	20.375	0.4	1.9
O	SHARED MED SYS CORP	17 12	13.25	-0.1	-0.9
O	SOFTWARE PUBG CORP	28 13	24.75	-0.3	-1.0
N	STERLING SOFTWARE INC	11 7	10.125	0.1	1.3
O	SUNGARD DATA SYS INC	28 18	22.75	-0.3	-1.1
N	SYSTEM CENTER INC	28 17	21.5	0.0	0.0
N	SYS. SOFT INC	29 14	24.75	-0.5	-2.9
O	WORDSTAR	2 1	1.125	0.1	8.8

Semiconductors

N	ADV MICRO DEVICES INC	11 7	8.125	0.0	0.0
N	ANALOG DEVICES INC	11 7	7.5	-0.3	-3.2
O	ANALOGIC CORP	11 6	9.375	0.3	2.7
O	CHIPS & TECHNOLOGIES INC	28 15	20.5	0.5	2.5
N	INTEL CORP	49 28	46.875	-1.0	-2.1
O	MICRON TECHNOLOGY INC	21 7	12.25	-0.5	-4.9
N	MOTOROLA INC	85 51	68.125	-2.0	-2.8
N	NATL SEMICONDUCTOR	9 5	6.875	-0.1	-1.8
N	TEXAS INSTRS INC	44 28	39	-0.5	-1.3
A	WESTERN DIGITAL CORP	19 6	13.25	-0.5	-3.6

Peripherals

O	ALLOY COMP	3 0	0.813	0.0	0.0
O	AM INTL INC	3 0	2.5	0.0	0.0
O	AUTO TROL TECH CORP	8 3	4.688	0.2	5.6
O	EXABYTE INC	24 13	16.125	1.1	7.3
O	CONNER PERIPHERALS	28 9	9.5	0.5	5.5
O	DATARAM CORP	10 4	7	0.0	0.0
N	EASTMAN KODAK CO	89 64	67	0.1	0.1
N	E M C CORP MASS	9 5	8.5	0.0	0.0
O	EMULEX CORP	9 4	7.125	0.0	0.0
O	EVANS & SUTHERLAND	26 17	20	0.1	0.5
O	IDOT CORP	3 1	1.375	0.1	10.0
O	INTERLILE INC	8 3	7.375	0.1	1.7
O	IOMEGA CORP	8 3	6.875	0.3	4.7
O	LSE DATA CORP	3 1	1.313	0.1	4.5
O	MAGSTOR SYS CORP	4 1	1.25	0.0	0.0
O	MAXTOR CORP	17 7	14.125	0.0	0.0
O	MICROPOLIS CORP	8 3	7.25	0.0	0.0
N	MINNESOTA MINE & MFG CO	96 66	86.25	0.5	0.5
O	PERSONAL COMP PRODUCTS INC	6 4	4.688	0.0	0.0
O	PRINTRONIX INC	11 7	12.875	0.1	1.0
O	QMS INC	21 8	17.125	1.5	9.6
O	QUANTUM CORP	30 6	20.625	1.1	5.6
O	RECOGNITION EQUIP INC	13 4	5.125	0.0	0.0
O	REXON INC	10 6	8.25	0.1	1.5
O	SEAGATE TECHNOLOGY	30 15	17.625	1.5	9.4
O	STORAGE TECH CORP	34 9	21.125	0.5	2.7
O	TANDON CORP	3 1	2.813	0.2	7.2
N	TEKTRONIX INC	23 12	15.125	1.0	7.1
O	TELEVIDEO SYS INC	1 0	0.375	0.0	7.5
N	XEROX CORP	69 46	62	1.5	2.1

Leasing Companies

N	CAPITAL ASSOC INTNL INC	5 3	3.25	0.0	0.0
O	COMDISCO INC	24 17	17.875	0.0	0.0
O	CONTINENTAL INFO SYS	1 0	0.117	0.0	0.0
O	LDI CORPORATION	16 13	15.5	0.0	0.0
N	PHOENIX AMERN INC	5 3	3.875	0.1	2.1
O	SELECTERM INC	8 5	6.5	0.0	0.0

EXCH: N—NEW YORK; A—AMERICAN; O—NATIONAL

*Numbers are thousands of a penny over stock split.

Fireworks

Investors react as sparks settle over Motorola/Hitachi dispute

Business was less than booming at the start of the week, but technology stocks thundered to a strong finish by Thursday. Motorola, Inc. is one firm that navigated the turbulent seas of turnaround. The chip maker's stock dropped 5 points early in the week as investors questioned the fate of the 68030 chip, but Motorola's stock began to regain lost ground late in the week — even before its agreement to settle an 18-month chip ownership dispute with Hitachi Ltd. out of court, finishing at 83¼, down 2¾ points.

Compaq Computer Corp. bounced back from an early fall, finally gaining 2½ points by Thursday to end at 122¾. Digital Equipment Corp. also rebounded, finishing at 85¼, up 2¼ points.

New products and a new president seemed to propel IBM and Apple Computer, Inc., respectively. After the debut of the Personal System/1 home computer, IBM issues picked up 1¾ points to 117¾. As Apple USA welcomed new leader Robert Puette, traders said hello to Apple stock, driving its price up 1½ points to 43.

As the named winner of a copyright dispute with Paperback Software International, Lotus Development Corp. saw no change in its share price by Thursday, steady at 34⅜. Software Toolworks, Inc., which took a recent tumble on speculation of low quarterly earnings, suddenly came out ahead last week, adding 1⅜ points to total 17⅜.

The announcement of an earnings drop sent AT&T reeling backward 3¼ points to 38¾, as its competitors gained. United Telecom, Inc. advanced 1 point to 39¼, while MCI Communications Corp. wiggled up ⅜ of a point to 49⅜.

KIM S. NASH

Computerworld Smithsonian Awards celebrate the search for new heroes

Second annual awards gala honors winners in nine categories for the innovative use of technology in making our world a better place to live

BY CLINTON WILDER
CW STAFF

Against the dramatic setting of the National Building Museum's spacious Greek Revival atriums and massive Corinthian columns, technology innovators from three continents were honored with the second annual *Computerworld Smithsonian Awards* in Washington, D.C., last week.

Honorees ranged from billionaire H. Ross Perot to a 10-employee company whose software enables the blind to benefit from graphical interfaces on computers. Innovators from Thailand and Switzerland became the first winners from outside the U.S.

International Data Group, Inc. Chairman Patrick J. McGovern touched on this global theme in his closing remarks, noting the power of information and information technology in reshaping the political landscape of Eastern Europe in the past year.

Perot, founder of Electronic Data Systems Corp. and Perot Systems Corp., received the first *Price Waterhouse Lifetime Achievement Award*. The *Siemens Award for the Advancement of Science* went to Robert Tinker, chief scientific officer at the Technical Education Research Centers.

There were 220 award nominees. The awards "celebrate the capacity of our species to strive to do things better," said Roger Kennedy, director of The Smithsonian Institution's National Museum of American History.

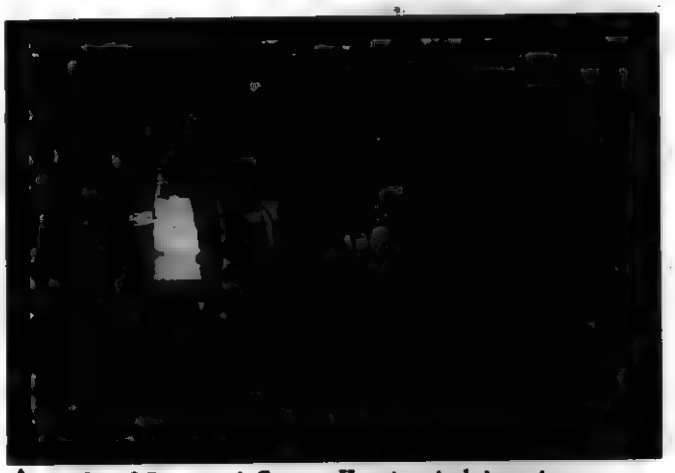
And the winners were:

• **Business and related services — Berkeley Systems.** The tiny Berkeley, Calif., firm developed Outspoken, a "talkback" program that responds audibly to mouse or keyboard commands. It guides blind or visually impaired users through icon-based interfaces.

• **Education — The Jason Foundation for Education.** The foundation pioneered the Jason Project, a system that allows U.S. students to view and interact with undersea exploration projects in real time. In two years, Jason's broadcast technologies have allowed approximately 225,000 schoolchildren to experience sunken shipwreck explorations in the Mediterranean Sea and Lake Ontario.

• **Environment, energy and agriculture — Environmental Systems Research Institute.** Redlands, Calif.-based ESRI developed ARC/INFO, software that helps environmental planners analyze databases of geographic information. Among its users are Third World governments attempting to balance economic development with ecological preservation.

• **Finance, insurance and real estate — Swiss Options and Financial Futures Exchange.** Soffex links 50 Swiss financial firms into a single national exchange located in Basel, removing the need for a trading floor. The three largest Swiss banks and stock exchanges jointly developed the system, increasing the capabilities of Switzerland's largest industry, financial services.



▲ **Federal Express'** *Cosmos II system took transportation honors. (Left to right) Gene Farrar, Harry Dalton, Jim Turpin and David Dietzel accept award from* CW's *Fritz Landmann and Smithsonian's Roger Kennedy.*

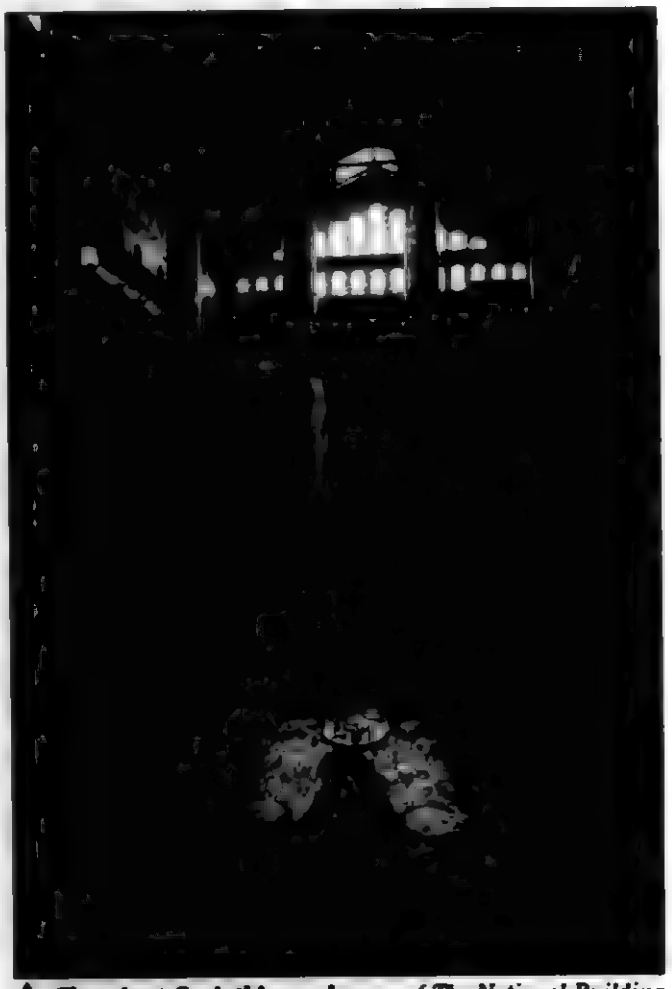
• **Government and nonprofit — The Government of Thailand, Ministry of Interior.** The Thai Ministry in Bangkok automated its demographic data collection, developing five different subsystems to track Thailand's 50 million people. The system, storing more than 100G bytes, enables more accurate planning in education, health care and economic development.

• **Manufacturing — Lubrizol Corp.** The Wickliffe, Ohio-based chemicals firm implemented the Material Safety Data Sheet, a database of all chemicals used in the workplace, their dangers and required handling methods. The data is used by employees, federal and state regulators and customers.

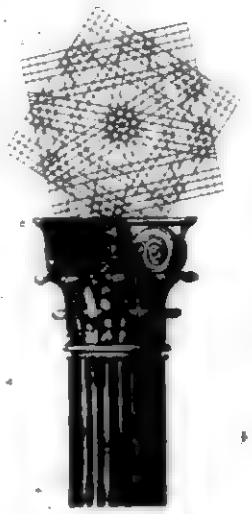
• **Media, arts and entertainment — Personics Corp.** Personics, based in Redwood City, Calif., developed a popular system that lets music buyers create customized audiotapes in record stores.

• **Medicine — Department of Biological Sciences, Purdue University.** Purdue professor Michael Rossman used supercomputer technology to create detailed models of human viruses. First applied to the rhinovirus — a common cold virus — the technique has the potential for greater understanding of more complex strains, including the HIV virus that causes acquired immune deficiency syndrome.

• **Transportation — Federal Express Corp.** Federal's fabled Cosmos II Tracking System enables the Memphis firm to track more than 1.4 million packages daily. Its heart is a pocket-size, full-function computer that links to huge central databases (see story page 77).



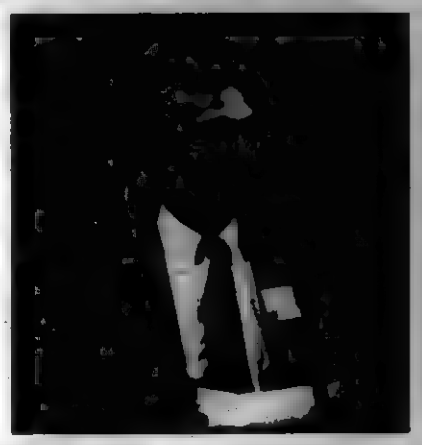
▲ **The giant Corinthian columns** *of The National Building Museum provided the backdrop to the second annual* Computerworld Smithsonian Awards *gala in Washington, D.C., last week.*



▲ **H. Ross Perot's** *accomplishments both in and out of the computer industry earned him the Price Waterhouse Lifetime Achievement Award.*

Giorgio Sorani *of Lubrizol oversaw development of a database that made safety data about* ▼ *hazardous chemicals more accessible.*

Ernst Mollet *represented Soffex,* ▲ *one of two international winners. His association's national exchange system has boosted Switzerland's financial services prowess.*



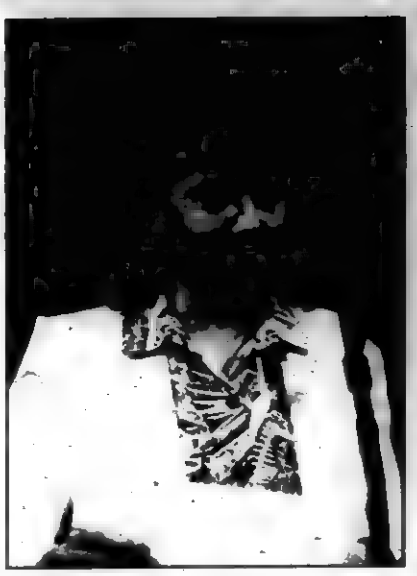
S. J. Camarata *accepted the* ▶ *award for the Environmental Systems Research Institute, which helps manage geographic databases.*

Perot with ▶ *Computerworld Publisher Fritz Landmann.*

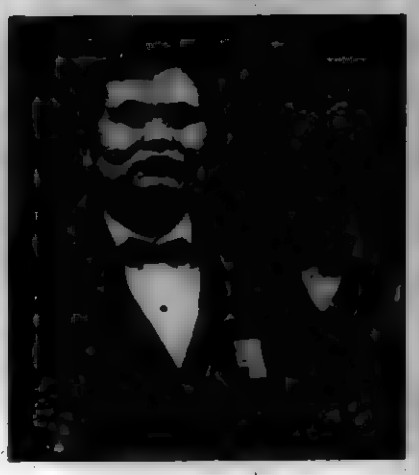
▲ **Judy Woodruff,** *chief Washington correspondent of the MacNeil/Lehrer NewsHour, emceed the ceremony.*

◀ **Charles Garvin** *accepted for Personics, which developed an innovative technique for recording customized audio tapes.*

Patrick McGovern, *chairman of International Data Group and founder of Computerworld.* ▼



▲ **Sharon Wilder** *accepted the Medicine award for Purdue University Professor Michael Rossman, who was honored for his research on modeling viruses.*



▲ **Surachai Sriaurasom** *of the Thailand Ministry of the Interior worked on a demographic database that tracks 50 million people.*

Larry Boyd's *Berkeley Systems* ▶ *has built a link between the Apple Macintosh and blind users.*

NEWS SHORTS

IBM fills board seats

IBM's board of directors and executive management got some beefing up last week with new members and officers. Judith Richards Hope, a senior partner at the California-based law firm Paul, Hastings, Janofsky & Walker, was elected to the board, as was Frank A. Metz Jr., an IBM senior vice-president of finance and planning and chief financial officer. New IBM officers elected by the board include Nobuo Mii, vice-president and general manager of Asia Pacific Technical Operations, IBM Japan; John E. Hickey, named IBM secretary; and William W. K. Rich, named IBM vice-president and president of the services sector division.

Covia enters hotel wars

The battle of the hotel reservation systems has stepped up a notch. Last week, Loewe Hotels and Covia Corp. announced a joint venture to provide such a service. The new Loewe/Covia company is called CLAS International and is based in New York. Like the Confirm system previously announced by AMR Information Services, Budget Rent-A-Car Corp., Hilton Hotels Corp. and Marriott Corp., CLAS offers a turnkey system designed to help hotels tie marketing efforts with reservations.

Feds eye airline fare changes

The U.S. Department of Justice has begun an antitrust investigation into the way airlines post fare changes on the industry's electronic tariff clearinghouse, run by the Airline Tariff Publishing Co., the department confirmed last week. Investigators reportedly suspect that the airlines are using special codes in their databases to communicate with competitors and fix prices, but several airlines denied any price collusion.

News services unite

Dow Jones Information Services and Datatimes, a subsidiary of The Oklahoma Publishing Co., have entered a joint marketing and service agreement to permit the computerized files of 640 international newspapers, magazines and news sources to be electronically searched through a single on-line database. Starting in July, the service will span four continents and give Datatimes network service subscribers the ability to create personalized libraries for onetime or ongoing use.

Sharebase OKs sale

Sharebase Corp. stockholders last week approved the sale of the $29 million Los Gatos, Calif., firm to $210 million Teradata Corp. in Los Angeles. The merger, which had been planned for several months, combines the top two manufacturers of database "machines," which are systems dedicated to running relational database management systems. Sharebase Chief Executive Officer John Cavalier and Executive Vice-President Peter Cassidy left the firm last week.

SQL standards group expands

Microsoft Corp. and Sybase, Inc., which together created the Microsoft/Sybase SQL Server, last week joined the SQL Access Group, an industry consortium that is trying to craft a single "vanilla" SQL standard for the entire industry. Just one week earlier, Cincom Systems, Inc. and Progres Software Corp. also joined the group, which now has 21 systems and database vendors as members. A year ago, industry analysts doubted that Sybase would join, since it sells gateway products that link its RDBMS with other vendors' DBMSs.

Apple reacquires Claris

Apple Computer, Inc. last week brought back into the fold Claris Corp., the software company that it spun off three years ago. Apple, which had been the principal owner of Claris, said it will acquire Claris and run it as a separate operation. According to John Sculley, Apple's chairman and CEO, Claris will give Apple the opportunity to focus its software efforts on increasing the development and marketing of "multivendor configurations" as well as development of its flagship products.

Lotus

FROM PAGE 1

Ashton-Tate Corp.

"This could be an indication that at least some courts are willing to expand copyright coverage to look and feel," said Lee Hagelshaw, a computer industry law specialist and partner at the San Francisco law firm of Hagelshaw and Cole.

Lotus sued Paperback and Cambridge, Mass.-based Mosaic Software, Inc. three years ago, charging that their spreadsheet offerings were copies of 1-2-3. Because Mosaic was allowed to separate from the case when its lawyer fell ill, last week's ruling involved only Paperback.

Until Lotus brought the suit, it was generally assumed among developers that copyright law applied only to actual program code. But Keeton ruled last week that "the user interface of 1-2-3 is its most unique element and is the aspect that has made [it] so popular. That defendants went to such trouble to copy that element is a testament to its substantiality."

Paperback will appeal the decision, Vice-President of Sales and Manufacturing Mike Burdyck said.

Mosaic President Richard Dikran Beajian vowed to continue selling its Twin spreadsheet line. "Mosaic Software has not lost," he said. "There are significant material differences between Mosaic's defense and [Paperback's]."

"This is an area where the courts must exercise an extreme amount of caution," Hagelshaw said. "If copyrights become more like patents, freezing players out of an idea, that would have a chilling effect on the industry."

In Philadelphia, copyright attorney Steven Shaiman saw little danger that the big chill would be ushered in by the Lotus ruling. "I don't think innovation will be stifled," he said.

Keeton's ruling, Shaiman said, detailed many instances of successful spreadsheet packages — Microsoft's Excel, for instance — that offer 1-2-3 features without copying 1-2-3 so clearly as to infringe on Lotus' copyright.

"The lines drawn in the court's opinion are not unclear at all," said Lotus general counsel Thomas Lemberg. Copyright protection, he noted, was not extended to file compatibility: "Nothing in the ruling precludes functional similarity."

Could have gone further

Longtime software developer Stephen Errico, now a Price Waterhouse partner in charge of computer-aided software engineering and software re-engineering, scoffed at the suggestion that Lotus' win would inhibit development. "I feel that developers will be encouraged at the thought that their original achievements can be safeguarded and not just picked off at will," he said.

The probable effect of the Lotus case on the end user, several industry observers said, is likely to be negligible. "This isn't really an issue for users," said Thomas J. Casey, senior computer development consultant at New York Life Insurance Co. in Waltham, Mass.

But some analysts said they fear that developers will go so far to avoid copyright infringement that they will force users to climb a painful learning curve every time they go from one software package to another.

At least one class of users is about to feel the court's impact. At a hearing scheduled for the July 19, Lotus is expected to ask for an immediate injunction against Paperback Software's sales of VP-Planner. It is not likely to end there, several industry observers said.

"There is little doubt in my mind that this will serve as a precedent weighing in Apple's behalf in the Apple vs. Microsoft case," Paine Webber, Inc. analyst Robert Therrien said. Apple is currently in court against Microsoft on copyright infringement matters arising from the development and marketing of Windows technology.

Apple and Microsoft both said they would not comment on the Lotus case.

Even before Apple and Microsoft are affected, he added, software vendor Borland International may feel the weight of the Lotus decision. Borland's Quattro and Quattro Pro spreadsheets have an optional 1-2-3-compatible interface. Lemberg declined to say whether the company will pursue other vendors.

A Borland spokesman would not comment, saying the firm had not seen the judge's decision. "We believe that all aspects of our Quattro spreadsheet products are original, including the programming and command structures," he said.

Stanley Witkow, general counsel for Ashton-Tate, hailed the decision as an affirmation of copyright claims against Fox Software, Inc. and its Foxbase Plus package. Referring to a portion of the decision affirming the application of copyright to a program's command structure, he said: "We have always argued that the command language is part of the interface; this decision looks good for us."

Staff members Sally Cusack, James Daly and Charles von Simson contributed to this report.

Lotus' top offices rumble with change

BY RICHARD PASTORE
CW STAFF

CAMBRIDGE, Mass. — Lotus Development Corp. shuffled the executive deck last week while bringing in new blood from Apple Computer, Inc.

The company hired Donald P. Casey as vice-president of its newly unified spreadsheet division. Casey spent two years at Apple as vice-president of networking and engineering, where he was responsible for Appletalk products. Prior to that, he spent 21 years in management positions at IBM.

A Lotus spokesman said that Casey will lead 1-2-3's thrust into the Apple Macintosh environment but added that Casey was not hired specifically for his Apple experience.

However, Lotus Chief Executive Officer Jim Manzi, who saw his company's proposed merger with local-area networking vendor Novell, Inc. fall through last month, said Casey's experience "will help us focus on emerging network computing opportunities."

Lotus' Ingari to be VP of Emerging Markets group

Other executive changes include the following:

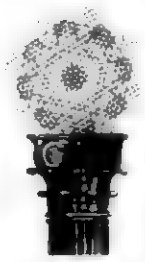
- Frank Ingari, former vice-president of the personal computer spreadsheet division, will become vice-president of the Emerging Markets Business Group.
- David Roux, former vice-president of the Information Services Group, will become vice-president of business development focusing on attracting new users to personal computing.
- June Rokoff will become vice-president of the Communications and Information Services Group. She was most recently vice-president of the graphics and information management division.

With the moves, Lotus is now restructured into five discrete, decentralized business units: the Software Business Group, the International Business Group, the Consulting Services Group, the Communications and Information Services Group and the Emerging Markets Business Group.

High tech gets it there on time

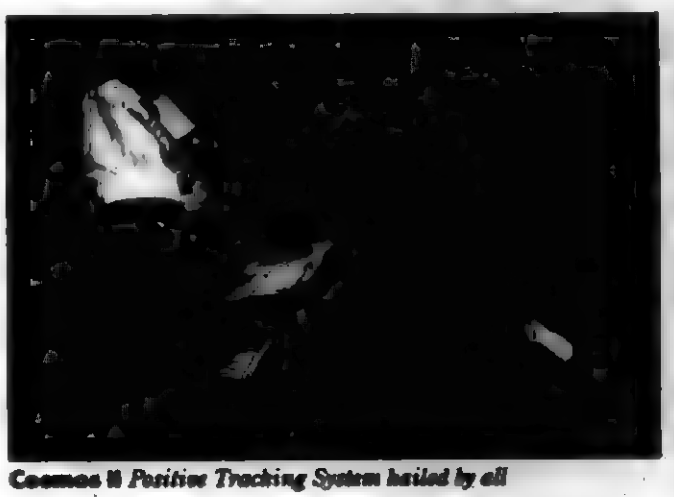
This week, Computerworld begins a series of profiles of Computerworld Smithsonian Award *winners.*

BY NELL MARGOLIS
CW STAFF



If you should ever get the urge to talk to a grateful user about the benefits of Federal Express Corp.'s Cosmos II Positive Tracking System, you won't have to pick up the phone; just close your eyes and try to remember what life was like before it.

More than a decade ago, Fred Smith, the near-legendary chairman of the Memphis-based delivery firm, realized that wholly reliable customer service depended on the firm's ability to track a package at every change of hands or direction. The result — Federal Express Cosmos II, one of the most famous examples of strategic information systems — was honored last week as the 1990 *Computerworld Smithsonian Award* winner in the transportation category.



Cosmos II *Positive Tracking System hailed by all*

"The Cosmos II concept was terrific," said Suzanne Pitney, a consultant at Lexington, Mass.-based Federal Express user site Nolan Norton & Co. There was only one hitch, she noted: The technology needed to translate the theory into practice had not been invented yet.

Getting from Smith's insight to Supertracker — a handheld computer with 32K bytes of memory that can accept data from key entry, bar-code scanning or electronic coupling and withstand the rough-and-tumble world of warehouses, docks and trucks — took approximately 10 years and countless risks, said Harry Dalton, Federal Express' vice-president of strategic integrated systems.

"The general reaction of vendors to the requirements laid out by Dalton's group," Pitney said, "was ridicule and scorn." Ultimately, Federal Express gambled on Hand Held Products, Inc., "a small Charlotte, N.C., electronics engineering firm with limited manufacturing capability," said Federal Express managing director of advanced technology Jim Turpin. Along the way, "the scariest moments were when you stopped to wonder whether or not it would really work," Turpin said.

Safe bet

Federal Express bet the company on it and won. Today, Dalton said, 46,000 Supertrackers, 1,400 quad racks, 2,400 station bases and 26,000 mobile radio attachments in some 1,500 worldwide locations link with a panoply of Federal Express information systems to track the precise point-to-point progress of approximately 1.4 million packages at any given time.

Even when Dalton had the hoped-for technology literally in the palm of his hand, excruciating work lay ahead, he told a Nolan Norton conference recently. The company's Supertracker training effort — a two-stage endeavor that first saw 22,000 couriers through two-hour training sessions over a 10-month period and then schooled 23,000 more over a five-month stint — stands as the largest technology training program outside of the military.

Much of the program's success, Turpin said, results from the fact that Federal Express, like the military, believes that training is no sterile classroom exercise. Every new hire at the firm, computer technologists prominently included, must spend six weeks in the field.

"The only way to understand our environment is to go out and live it," he said. "Get in a uniform! Drive a truck!"

In addition, according to several Federal Express executives, Cosmos II is an ongoing testimonial to a rare level of top-down support and full-firm participation. "This project actually died a few times and got resurrected," Turpin said.

MCI goes full steam ahead in data services

BY ELISABETH HORWITT
CW STAFF

WASHINGTON, D.C. — One month after announcing its official entry into the data networking business, MCI Communications Corp. claimed last week that it can serve up pretty much anything AT&T can provide in this area — if the customer and the contract are big enough.

"Right now, we can turn on a dime" to fulfill the data networking needs of "strategic accounts of $100,000-plus per month," said MCI Vice-President of Data Marketing Donald M. Heath. The firm has begun offering enhanced data networking services such as 45M bit/sec. connections and high-speed switched services to certain large customers, such as Chrysler Corp. and the National Science Foundation, MCI spokesmen indicated.

Currently, MCI is working hard to finish implementing intelligence and reliability standards across its backbone network to provide such services to all its customers — not just the top buyers, Heath said. The next step in this process for MCI, Heath said, will be to "bring out as fast as possible base elements such as dial-up 384K bit/sec. lines and multidrop digital lines."

MCI is investing $125 million this year and will invest about $300 million in 1991, out of a yearly $1.2 billion budget, to meet customers' demand for high-speed data services, according to MCI Executive Vice-President Richard T. Liebhaber.

During the next couple of years, MCI will roll out such services as switched high-speed services, bandwidth on demand and greater customer control of the network, Heath said.

A major introduction that will include the long-awaited data version of MCI's virtual networking service, Vnet, will take place at the Telecommunications Association conference in San Diego this fall, Heath said.

But the company still has a long way to go if it hopes to compete with AT&T for the data communications market, according to one consultant.

MCI is still far behind AT&T when it comes to providing commercial data networking services, according to Berge Ayvazian, a vice-president at Boston-based consulting firm The Yankee Group: "At [the International Communications Association conference in May], MCI and AT&T both ran ads boasting of their data capabilities, but while MCI was saying 'we can talk binary' with a lot of 1s and 0s, AT&T gave an eight-page description of services."

MCI should shortly fill one long-standing gap in its product line with a packet-switching service that it will resell from Infonet, Heath said.

MCI recently purchased a 25% stake in the international packet-switched service vendor and has arranged for Infonet's domestic packet switches to be co-located on its own sites, he added.

Second-class postage paid at Framingham, Mass., and additional mailing offices.
Computerworld (ISSN 0010-4841) is published weekly, with a single combined issue for the last week in December and the first week in January by CW Publishing/Inc., 375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171.
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Fiber net firm charges BOC financing abuses

BY JOANIE M. WEXLER
CW STAFF

OAKBROOK TERRACE, Ill. — Metropolitan Fiber Systems, Inc. urged the Federal Communications Commission and six state public utility commissions last week to investigate possible misappropriations of ratepayer funds by Bell operating companies (BOC) for subsidizing fiber-based metropolitan-area networks.

MFS' Holland

The action goes to the heart of the issue of increased competition in the local loop, which is starting to give corporate customers a wider range of networking choices.

In letters to the regulatory bodies, MFS, an independent provider of fiber MANs, characterized the building of the networks as a new business venture. Such ventures, according to monopoly regulation, must be funded by sources other than revenue collected from the general ratepaying public.

MFS President Royce Holland said that by cross-subsidizing, the BOCs gain an unfair advantage, because they draw on a much larger pool of financial resources — the captive audience of public telephone users — to fund their networks and can charge lower prices.

MFS said that, based on its review of recent tariffs filed by Southwestern Bell Telephone Co. and US West, the public is shouldering the cost of services enjoyed by a select few large corporate customers. Similar tariffs by Ameritech, Nynex Corp. and Pacific Telesis are pending.

US West contends that the fiber rings are a form of modernization for the existing public network in response to customer needs.

"We're investing in the local infrastructure," said John Kure, director of US West communications for private-line transport. "I can't say that initially all of our customers will benefit, but a wide range of them will."

David Ho, Southwestern Bell district manager, said, "Our tariffs ask for rates that are higher than the cost of service. The people using the service are primarily paying for it, so I can't see how that qualifies as cross-subsidization."

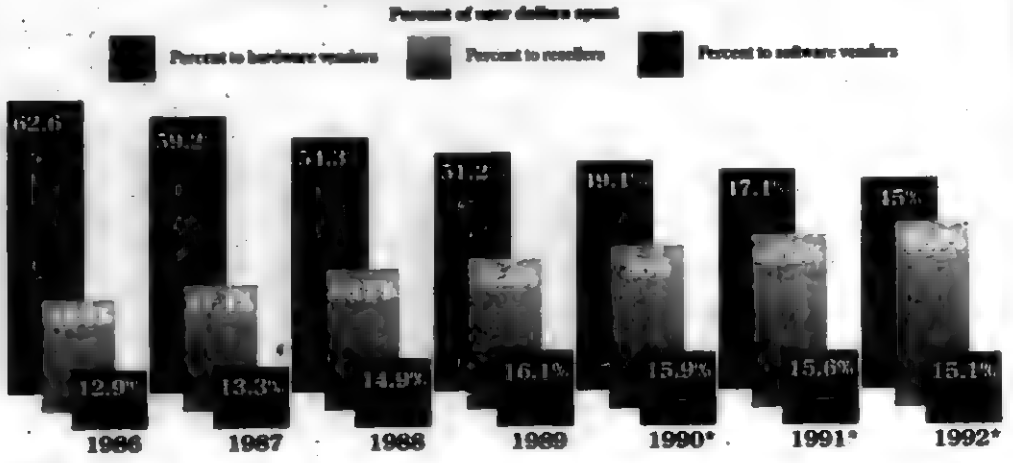
TRENDS

Third-party channel

A shift in distribution preferences is bringing more of the dollars spent by end users into the hands of third-party dealers instead of the manufacturers themselves

Revenue shift

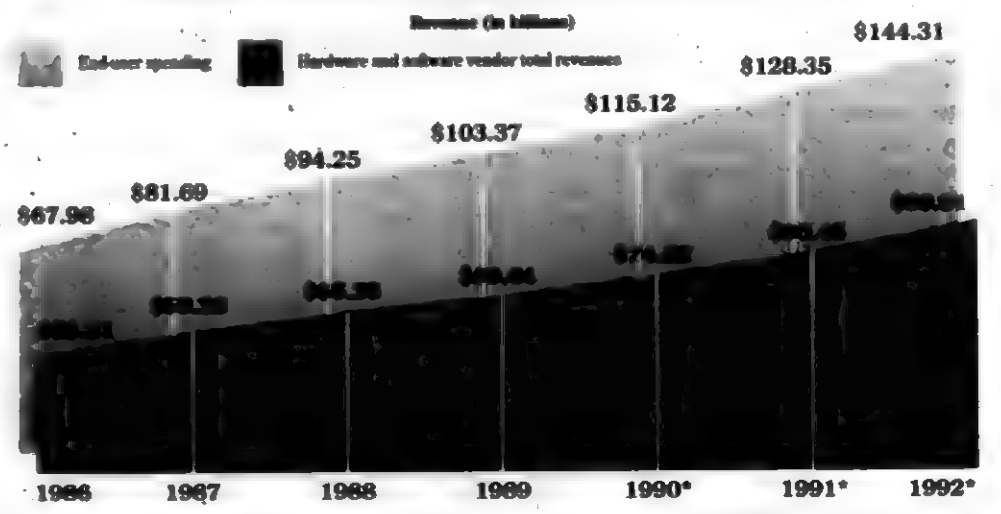
Software vendors will be taking home the same amount, but hardware vendors will continue to see fewer dollars spent directly by end users



*Estimated
Includes PCs and small and medium-scale systems

Expanding breach

Estimates are that in two years, third-party dealers will be claiming more than $57 billion of direct dollars spent by users from vendors, compared with only $16.7 billion four years ago



*Estimated
Includes PCs and small and medium-scale systems

Source: International Data Corp., Framingham, Mass.
CW Chart: Tom Monahan

NEXT WEEK

Alamo Rent-a-Car is a company that believes it tries even harder, and a big reason for this is energetic Vice-President of Information Systems **Tom Loane.** He combines in-depth knowledge of the rental business with a dynamic, hands-on management style. Learn more about Loane and his ideas in the Manager's Journal profile.

Michael Keaton

Has your CEO caught the outsourcing bug? Are users demanding better service at lower costs? Outsourcing and decentralization are not right for everyone. For many, data center restructuring may be a better approach. Restructuring means re-examining resources and priorities to get the most of your IS dollar. To learn more, read In Depth.

INSIDE LINES

We love standards — preferably our own

During the past three years, several personal computer modem makers reportedly implemented a slightly proprietary version of the V.32 standard for 9.6K bit/sec. dial-up communications — which meant that users who expected guaranteed interoperability with other "V.32" modem brands were in for a shock. Why did this happen? Hayes tells us that when V.32 first came out, full compliance carried a $3,500 sticker price — which PC users weren't going to stand for. On May 30, exactly three years after introducing its "proprietary" V.32 modem, Hayes started shipping a truly V.32-compliant modem. Price tag: $1,200.

That old hack magic

The infamous Internet worm, created by ex-Cornell graduate student and hacker Robert T. Morris, still rears its head from time to time, according to one security expert. "It's taken on a life of its own," he said. Admirers of Morris' handiwork have added names to the worm's built-in password-cracking dictionary to make it more effective. One estimate puts the dictionary at 560 passwords, up from the original 430, the expert said. Morris, meanwhile, is still trying to work out a deal with his probation officer on how he will spend his 400 hours of community service — part of his sentence for writing the untamed program, according to his lawyer. A decision will come next week, he added.

But can they separate bottles?

Software 2000 will soon make its first attempt at profiting from ecological anxiety. With companies becoming more environmentally aware, the Hyannis, Mass.-based company claims it will be ready with an environmental management package designed to aid companies in dealing with the issues of tracking and managing their recyclable products, according to President Doug MacIntyre.

Shhh! It's here

Repository Manager/MVS, the key piece to IBM's AD/Cycle strategy, was released as promised last Friday. But no one, including IBM, is expecting customers to line up for this version, which is expected to be short on end-user functionality. Nonetheless, software developers need this release to begin tailoring tools to work with it.

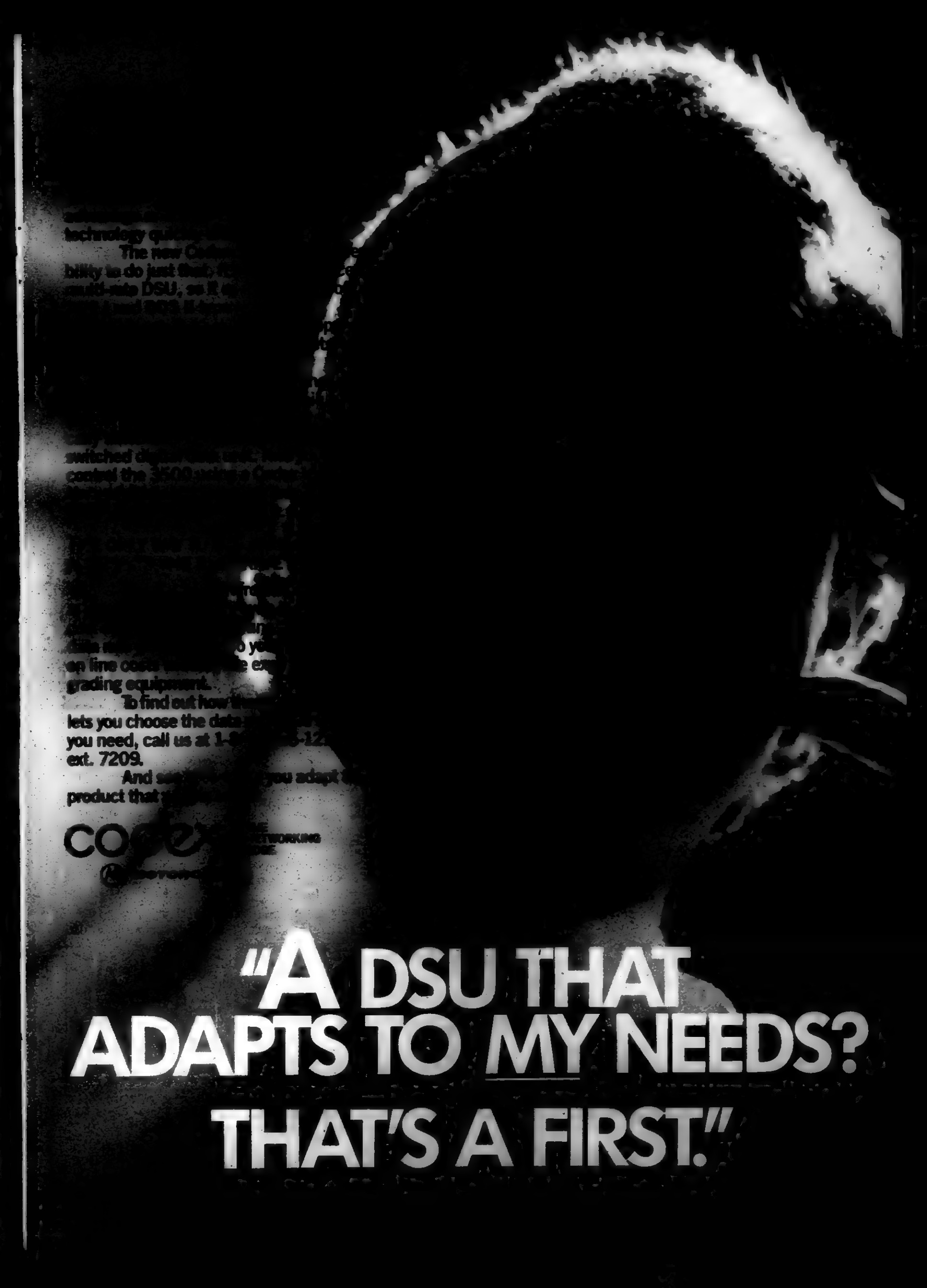
Prints for peupers

Apple is expected to introduce two low-cost laser printers next Monday in an attempt to head off low-end printer competition from companies such as Hewlett-Packard, GCC Technologies and QMS. According to sources, Apple's Personal Laserwriter SC will sell for about $2,000, while the Personal Laserwriter NT — which, unlike other Apple printers, can be connected to IBM-compatible computers — will go for approximately $3,300.

Spelling the surprise

Ingres may have let the cat out of the bag last week when it announced several connectivity products that link Apple's Macintosh with the Ingres relational database management system. It turns out that Ingres plans a momentous announcement of its desktop strategies — including several Mac software products. Seems last week's announcement about an Ingres point-and-click graphical query language for Macs and support for Apple's Data Access Language was a bit premature. Why, the hare d'oeuvres for the Mac bash haven't even been ordered yet.

A recent video critique of users extolling the virtues of 3Com's newest internetworking products provided a unique — and, no doubt, unintended — punch line. A spokesman for Honeywell Bull summed up his satisfaction with and confidence in the computer networking company by saying, "3Com listens to Bull." We listen to it, too, on occasion, but we prefer legitimate news tips. Call those tips in to Assistant News Editor Jim Connolly at (508) 303-6474, fax them to (508) 875-8931 or byte them into our MCI Mail address: COMPUTERWORLD.


"A DSU THAT
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THAT'S A FIRST."

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VOL 24
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THE NEWSWEEKLY OF INFORMATION SYSTEMS MANAGEMENT
July 9, 1990 · Vol. XXIV · No. 28 · 128 Pages · $2/Copy · $48/Year

COMPUTERWORLD

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No grass growing under RS/6000's feet as IBM vows speedy enhancement schedule. Page 61.

Retailers try EDI hard sell

BY ELLIS BOOKER
and MICHAEL FITZGERALD
CW STAFF

After years of cheerleading about the paperless benefits of electronic data interchange, two of the nation's largest retail chains have taken a tougher stance, informing their thousands of suppliers to get with the EDI program.

Suppliers working with Wal-Mart Stores, Inc., the nation's largest EDI user, and K Mart Corp. have been scurrying for the past several months to implement EDI capabilities before summer deadlines set by the retailers. Likewise, Sears, Roebuck and Co. has been pushing EDI onto its trading partners, although less aggressively.

The retailers, while stopping just short of making ultimatums, have strongly implied to trading partners that EDI capability is a prerequisite for a long-term relationship, according to suppliers.

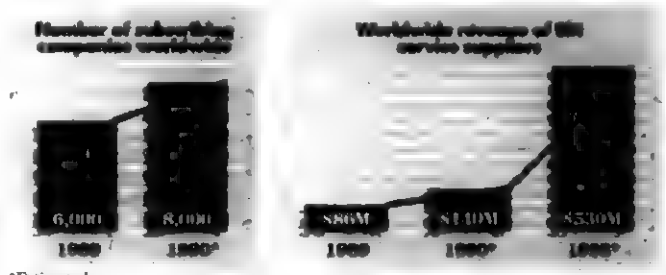
Although Wal-Mart and K Mart have been pushing EDI for a long time, "what's happened, I think, is they're getting more insistent," said Richard C. Norris, the EDI practice leader at Arthur D. Little, Inc. in Cambridge, Mass.

Norris said the move toward standard protocols by all the big retailers, which had previously used unique and proprietary systems, has given suppliers less of an excuse for putting off EDI technology. Meanwhile, he said, small suppliers can choose from a number of personal computer-

Continued on page 8

High-wire act

EDI is moving into the mainstream as large companies push suppliers to adopt the technology



*Estimated

Source: International Data Corp. CW Chart: Tom Monahan

Users give Repository early OK

BY ROSEMARY HAMILTON
CW STAFF

Two early users of IBM's Repository Manager said the software is far from complete, but what exists so far seems to be in good working order.

"It's a noble first step with a long way to go," said Emmanuel Ackerman, manager of data administration at Depository Trust Co. in New York.

Depository Trust and Merrill Lynch & Co. have been working with test versions of Repository Manager/MVS, the cornerstone of IBM's AD/Cycle strategy, since March. Both companies said it delivered what they expected — basic functions that have allowed them to get familiar with the AD/Cycle world.

Repository Manager is the critical piece of IBM's application development plans because it will one day govern all phases

Continued on page 125

Playing the field

CA sketches its repository plan with IBM, DEC coexistence in mind. Page 125.

Lotus steps up interface war, but Microsoft may reap spoils

BY PATRICIA KEEFE
CW STAFF

An emboldened Lotus Development Corp. unleashed its legal hounds on two more spreadsheet competitors last week, but users of the rival products remained unruffled. Meanwhile, observers said Lotus' recent software copyright victory could have the inadvertent effect of strengthening Microsoft Corp.'s control over the microcomputer software industry.

After scoring a copyright win over Paperback Software International, Inc. two weeks ago [CW, July 2], Lotus moved quickly last week to slap both Borland International and The Santa Cruz Operation with infringement suits. The spreadsheet maker charged that both developers have copied the Lotus 1-2-3 commands and menu structure "virtually in their entirety."

An alert Borland managed to beat Lotus to the punch, filing suit first for declaratory relief in California. That action may touch off a battle over jurisdiction. Borland has asked a judge to rule that its Quattro Pro does not infringe on Lotus copyrights, while SCO has filed a similar suit.

Although SCO Professional is considered by some to be a 1-2-3 knockoff, a spokeswoman said the suit was a surprise, citing a long history with Lotus that reportedly included helping to bring 1-2-3/Unix to market.

Continued on page 124

Blind IS managers defy career odds

BY JEAN S. BOZMAN
CW STAFF

DENVER — McKinley Young has never seen a computer. Yet, during his 22-year career in the information systems division of the U.S. Department of Veteran Affairs, he has supervised applications development, served as an assistant division chief and managed as many as 80 IS staffers. Today, he writes multimillion-dollar requests for proposals for hardware and software purchases.

Young, 57, has done all of this despite the fact that he lost his sight as a result of a football injury at the age of 18.

"Sometimes, I think it was easier for me, as a blind person, to go into data processing than it was for many sighted people," Young asserted here last week while attending the American Council of the Blind convention, which drew 2,000 of its 20,000 members. "As a blind person, you have to be organized about almost everything you do, from remembering where you put your keys to remembering what people have said to you. And that's what data processing is all about — being organized, being structured."

Patricia Barry Levy

Blindness *didn't stop Young from climbing the IS ladder*

However, Young, an activist for blind IS personnel, is one of the few IS professionals who have risen to top management jobs. Now a supervisory computer specialist, he is one of 4,000 blind information processing professionals in the U.S., according to the ACB, and one of hundreds of blind IS specialists in the federal government. The government appears to have the lion's share of blind data processors, ACB officials said, because of federal laws requiring equal access to

Continued on page 123

NEWSPAPER
[illegible] 5-DIGIT 48106
[illegible] 0010106263
UNIVERSITY MICROFILMS INT 0573
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SERIAL PUBLICATIONS
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Quotable

"It should be going at about 25% of the price, because it has about 25% of the functionality."

NEIL FERRI
MERRILL LYNCH

On the pricing for IBM's Repository Manager/MVS. See story page 1.

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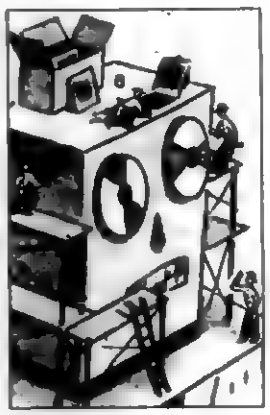
That was some coffee break! How much time do you think today's busy exec wastes on unnecessary activities? If you said 3½ months per year, you're correct, according to a recent survey by Accountemps. The time lost to the bureaucracy monster breaks down approximately this way: Two months attending unnecessary meetings (remember the meeting to discuss rules for the Super Bowl pool?); one month reading and writing unnecessary memos (like all the 'Dear Lunkhead' memos written to your boss and then ripped up); and two weeks waiting on hold on the phone (that was your one call to Moscow).

Dave Bradley

Burlington Coat's Michael Prince finds that being a Unix pioneer means some standards setbacks. Page 76.



Learn what a data center makeover can do for your IS life. Page 91.

EXECUTIVE BRIEFING

■ **It can be risky business** to use advanced technologies for IS projects, but these technologies can also prove extremely beneficial. By doing your homework and anticipating objections, leading-edge projects can be sold to management, as David Carlson, senior vice-president of corporate information systems at K-Mart, has learned. Three years ago, he made a pitch for an advanced satellite network worth $40 million to $50 million. Today, it links 1,900 stores to corporate headquarters. **Page 85.**

■ **'A noble step with a long way to go'** is how one early user of IBM's Repository Manager/MVS describes the cornerstone piece to IBM's AD/Cycle strategy. As a few of these users spoke about their experiences, IBM's software rival, Computer Associates, outlined its own repository strategy, one that emphasizes coexistence with IBM and DEC. **Stories, pages 1, 125.**

■ **Is your data center a cost center?** Is staff responsiveness at an all-time low? If you need to cut data center costs and improve service, then think about restructuring. Payoffs include cutting staff 40% to 80%, slashing cost per MIPS 30% to 60% and boosting staff availability 2% to 5%. **Page 91.**

■ **When BDM International** won a $210 million U.S. Air Force contract to deliver 4.2 million lines of custom software, the company seemed to have bitten off more than it could chew. High error rates and poor documentation shamed BDM and angered its customer. Three years later, productivity is up 30% and errors are down 94%. CASE tools, work teams and project reorganization were the keys to success. **Page 97.**

■ **Mentors make a difference** at Merrill Lynch & Co., where a group of IS professionals say a 2-year-old mentoring program has provided a boost in dealing with work and career issues. Participants say the program has helped them deal with layoffs, set career goals and identify training needs in technology, business and personal growth. **Page 106.**

■ **IS managers whose equipment needs exceed their budgets** should know that there is financing available despite an uncertain business environment. Besides conventional bank loans and leasing, options include asset-based lending, sale-leasebacks, factoring and subsidized loans for socially responsible endeavors. **Page 114.**

■ **Tired of dealing with custom interfaces,** four insurance carriers and two leading insurance agency automation vendors are forming a new company that plans to sell a PC-based software system to other insurance companies and agency automation vendors. They say it will ease electronic connections between insurance agents and carriers while making multiplatform agency software packages work together more smoothly. **Page 27.**

■ **On-site this week:** Computer power is essential to unravel the secrets of matter, and physicists at Fermi National Accelerator Laboratory — home of the world's most powerful particle accelerator — know it. So, when they are not making particles collide, they are building some of the world's most powerful computer systems. **Page 31.** When your fleet of 41 tractor-trailer drivers is logging thousands of miles each week delivering food to 7,000 client sites, any decrease in unnecessary miles is a godsend. International Jobbers Food Service Distributors, Inc. recently replaced its minicomputer fixed-routing software system with a more flexible personal computer package that plots the optimum delivery routes covering the least distance on easily traveled roads. **Page 69.** User consistency was a key requirement when Bay State Gas went shopping for new accounting systems. **Page 32.**

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CEOs catching strategic IS bug

BY GARY H. ANTHES
CW STAFF

After years of skepticism and foot-dragging, chief executive officers are waking up to the strategic imperative of information systems. But that will generate a flood of demands during the 1990s that will find many IS organizations embarrassed and unprepared.

Those are among the conclusions of a soon-to-be published survey of CEOs and chief information officers conducted by the management consulting firm Booz, Allen & Hamilton, Inc.

Booz Allen asked CEOs to evaluate their IS chiefs' understanding of business issues and then asked the CIOs how they thought their bosses would rate them. "Based on the survey responses, we feel only about one-third of the CEOs and CIOs have the necessary understanding of each other's position, role and viewpoint to function together as a team," Booz Allen said.

The good news for IS is that CEO satisfaction with systems has risen dramatically in the three years since Booz Allen did a similar survey. Three-quarters of the CEOs said system performance — particularly in functionality and responsiveness — is better or much better than it was in 1987. Fifty-nine percent said their systems support their business strategy, "an astonishingly high percentage" compared with 1987, when 30% of senior executives felt that support was good, Booz Allen said.

"As little as three years ago, there was still a wall between the CEO and CIO," said Raymond J. Lane, a Booz Allen senior vice-president and architect of the study. "Now, the senior executive is taking over and, if the CIO is prepared, he becomes part of the team. If he's not, he's replaced."

The survey suggested that CIOs will have to re-orient and broaden their perspective to take on business roles that they have traditionally avoided. "The chief executive is taking over thought leadership for systems. Why shouldn't the CIO take over thought leadership for re-engineering the business?" Lane said.

Some IS directors at large companies said they are already seeing changes in demand dynamics. "I'm starting to see a little more pull from top management," agreed Al Hyland, director of worldwide systems at Polaroid Corp. "In the past, it was mostly push."

The CIO position is changing, said Vincent Swoyer, a survey respondent and vice-president of corporate systems at Sara Lee Corp. "It's changing from a technology-oriented position to a business-driven one. We used to look for ways to apply technology; now we look at business problems and then seek ways to solve them."

Booz Allen interviewed 110 CEOs and 110 CIOs at Fortune 500 companies in banking, telecommunications, consumer and industrial products and other industries. Results of the half-hour- to hour-long telephone probes suggested that several factors will lead to an exponential rise in demand for IS, according to the draft report. Top management recognition of the value of information technology is at an all-time high as executives increasingly see cost, time and service benefits.

Booz Allen also found that while almost three-quarters of the CEOs surveyed said they believe the CIO function will still exist in the year 2000, almost half the CIOs think their jobs will have disappeared by then.

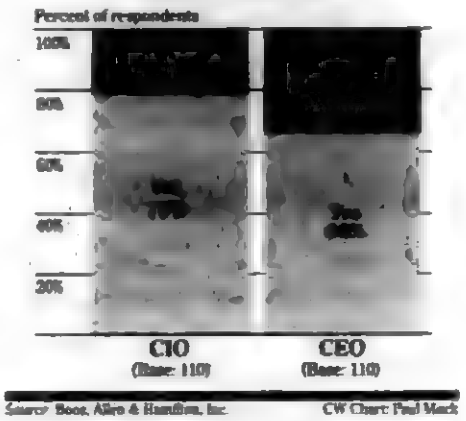
Of the CIOs who counted themselves an endangered species, 53% said the job will evolve into a chief technology officer position, 29% said it will be absorbed into the ranks of line managers who are becoming more technically literate and 18% said it will be split into various specialties.

Ironically, CIOs may not get the credit they deserve for leading CEOs to the IS well, Lane said.

"As CEOs take on more responsibility [for systems], the CIO could be a scapegoat. The CIO has done the education, but he probably won't get the credit," he said.

Corporation gap

A Booz Allen survey finds that CEOs are more skeptical of their IS payback than their CIOs are



Source: Booz, Allen & Hamilton, Inc. CW Chart: Paul Mock

The firm also predicted a dramatic inversion of the traditional demand curve, in which CIOs advocate spending money on technology while CEOs resist. It painted a future picture in which top management will become much more influential in promoting systems development.

Amtrak hopes PC deal will stoke profit fires

BY ELISABETH HORWITT
CW STAFF

WASHINGTON, D.C. — A $14 million workstation contract that Amtrak signed last week with AT&T should pare down maintenance costs and boost reservation agents' productivity, giving the financially troubled national railroad an extra boost toward its "corporate goal of breaking even by the year 2000," according to Marvin Liebow, the project's director.

As prime contractor for the Arrow Terminal Replacement Project, AT&T will supply 2,200 Intel Corp. 80286-based workstations to replace Honeywell, Inc. dumb terminals used by ticketing and reservation agents at National Railroad Passenger Corp., otherwise known as Amtrak. AT&T won out over four other vendors, including IBM, on a request for proposals that Amtrak issued in spring 1989.

A major goal of the project is to improve the productivity of the agents, who handle 34 million information and ticket queries per year, said William Tucci, Amtrak's senior director of reservation sales.

Currently, agents' dealings with customers are hampered by the dumb terminals' inability to feed more than one transaction at a time into Amtrak's IBM 3090 host. For example, "You can be pulling out a passenger record [to make the reservation], and the guy says, 'By the way, what was that departure time?' " Liebow said. The agent must then back out of the booking process and call back the scheduling information, he said.

In contrast, AT&T's windows-based workstations will allow agents to maintain views into scheduling, pricing and booking transactions and hot-key back and forth as needed, Liebow said.

By enabling agents to respond to callers' questions faster, the system should reduce average call time, or at least keep calls from lengthening as scheduling and other information becomes more complex, Tucci said. Chopping off one second from the average call length would result in a $250,000-per-year cost reduction for Amtrak, he added. Agents spend an average of 160 to 170 seconds on each phone call, Liebow said.

In the area of maintenance, the new systems are expected to cost Amtrak $500,000 per year — compared with the "incredible" $2.4 million-per-year maintenance costs levied by the Honeywell equipment, Liebow said.

The contract calls for the terminals to be replaced with AT&T 6286/Entry Level WorkGroup Systems running MS-DOS and equipped with Digital Communications Associates, Inc.'s Irma 3 convertible micro-to-mainframe package and Irmacard.

One key feature of the AT&T system is its ability to support popular local-area networking environments such as Novell, Inc.'s Netware and Microsoft Corp.'s LAN Manager, Liebow said. Amtrak is starting to evaluate implementing LANs as a way for agents to keep nonvolatile reservation information, such as special promotions, on a local server, minimizing the need to access the host, Tucci said.

Amtrak is now performing an initial evaluation of AT&T's proposed system, with implementation to begin Aug. 15 and rollout completion slated for late next year, Liebow said.

Concurrently with the Arrow project, Amtrak is upgrading the reliability and speed of connections between ticketing agents and the host system in Philadelphia, Liebow said. Guaranteed diverse routing for backup lines will ensure better protection against network failures such as AT&T's fiber-optic backbone disaster of 1988, which took out the railroad's northeast communications for almost a day, Liebow said.

The network upgrade will also guarantee response time of under three seconds to users, Liebow said, by boosting line speeds to 4.8K bit/sec. or 9.6K bit/sec. at all sites. Right now, some sites are served by 1,200 bit/sec. lines.

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	MVS/XA	✓	✓
	MVS/ESA	✓	✓
	VSE		✓
	VM		✓
	PC-DOS		✓
	PC LAN		✓
STANDARDS	ANSI SQL	✓	✓
	FIPS	✓	✓
	SAA	✓	✓
	NAS		✓
DISTRIBUTED DATABASE	Remote Request	✓	✓
	Remote Update	✓	✓
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	Partitioning		✓
	2-Phase Commit		✓
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NEWS SHORTS

Pansophic backs off buy

Pansophic Systems, Inc. canceled a deal to buy Heuristics, Inc. last week. Instead, Pansophic said it would form a strategic alliance with Sacramento, Calif.-based Heuristics to market a new computer integrated manufacturing product. Pansophic, a $218 million software firm, makes PRMS, a manufacturing business system, and Heuristics makes Onspec, a control system for the plant floor. Pansophic, based in Lisle, Ill., paid $500,000 for 5% of Heuristics in March 1990, signing a letter of intent to buy the rest of the company. That money will serve as a prepayment for an OEM agreement between the two companies.

Hands across Pacific

In a move that could signal a lessening of trade tensions, five U.S. semiconductor manufacturers have announced that they will join with Japanese automotive giant Toyota Motor Corp. to develop a series of specialized automobile parts. Intel Corp., Motorola, Inc., National Semiconductor Corp., Texas Instruments, Inc. and National Rectifier Corp. have all agreed to develop circuits that will perform specialized applications involving suspensions, meters and audio systems.

IBM: Look at the birdie

IBM and Delphi Technology, Inc. inked a pact last week under which IBM will manufacture automated photo machines for Delphi, an Atlanta-based photo processing firm. The automated photo machine kiosks, which will be tagged with the brand name R Stevens Express, will be built around IBM's Personal System/2 personal computers and use multimedia technology, including digital video interactive. Consumers will use a touch screen to enter information into a specially designed photo processing envelope. The film will then be picked up and processed at a processing center and returned to the kiosk the following day. Delphi plans to install several hundred of the automated kiosks per year nationwide, according to Steve Bostic, president of Delphi.

Spin-off at McDonnell Douglas

It still has some 1,000 employees offering computer systems distribution, service and maintenance nationwide to the tune of approximately $100 million per year. It is still based in Santa Ana, Calif. Moreover, it is still headed by President and Chief Executive Officer Burt Novak. But as of last week, McDonnell Douglas Field Service Co. is no longer a division of McDonnell Douglas Corp. It is out on its own as Novadyne Computer Systems, Inc., the result of a Novak-led management buyout. One of the first acts of the newly private firm was to decline to detail the financial terms of the deal. However, the company did say it hopes to sign on new OEMs and resellers.

Bugs bite revenue flow

Comsat Video Enterprises announced that because of some flaws in its software programming for its hotel pay-per-view television systems, an unanticipated decline resulted in second-quarter revenue for the company's Video Entertainment segment. The problem, which Comsat said has since been fixed, will result in a larger than expected second-quarter loss for the Video Entertainment segment, although parent-company Comsat is expected to post earnings consistent with expectations, the company said.

NEC tops Hitachi

NEC Corp., which dominates the Japanese PC market with a 50% share, took the lead in the mainframe speed race last week, introducing a system that the company claimed operates at up to 500 million instructions per second in scientific calculations. Those figures would put NEC's six-processor ACOS System 3800 Model 60 ahead of Hitachi Ltd.'s M-880 mainframe, introduced a month ago. Unlike Hitachi and Fujitsu Ltd., NEC is not pursuing an IBM-compatible policy. Deliveries are slated for April 1991.

More news shorts on page 124

DEC to beat open network drum

BY ELISABETH HORWITT
CW STAFF

BOSTON — Digital Equipment Corp. is expected to punctuate the opening of Decworld '90 today by bringing out the first commercial pieces of its multivendor network management system and making good on a year-old promise to provide high-speed networking for its systems via the Fiber Distributed Data Interface (FDDI) standard.

Also expected today is the introduction of the VAX 4000, DEC's latest answer to IBM's Application System/400 (see story below).

DEC's emphasis on industry standards in its announcements today will "definitely bolster its open systems network initiative," said Steven Wendler, a program director at Stamford, Conn.-based research firm Gartner Group, Inc. The vendor also seeks to strengthen its "focus on enterprise-level networking," Wendler said, by enabling its systems to communicate with and manage a broader base of communications environments.

On the network management front, DEC is expected to announce delivery dates for the first commercially available components of Decmcc Director, the keystone of the vendor's Enterprise Management Architecture (EMA). These initial introductions — the first with actual shipment dates, analysts said — will include a graphics-based, X Window System-driven interface. This interface will provide users with access to network management functions and access modules that allow Director to manage systems that comply with both Open Systems Interconnect (OSI) and Simple Network Management Protocol specifications for managing Transmission Control Protocol/Internet Protocol (TCP/IP) networks.

DECWORLD '90

DEC is moving faster than anticipated on TCP/IP support "in reaction to the realization that TCP/IP will be there for a while before OSI" becomes widely implemented, said Frank Dzubeck, president of Washington, D.C.-based consulting firm Communications Network Architects, Inc. The vendor recently announced that it would support TCP/IP directly on its VAX systems, eliminating the need for users to implement separate gateways or boxes to do Decnet-to-TCP/IP translation, Dzubeck noted.

Several early supporters of DEC's EMA Partnership Program are expected to announce availability dates for products that will allow Decmcc Director to manage their equipment. T1 switch vendor Stratacom, Inc. confirmed that it would make an announcement.

A significant no-show today will be DEC's long-awaited announcement of support for IBM Token-Ring. DEC intended to announce a third-party bridge between the increasingly popular network and its own Decnet-Ethernet environment but backed down at the last minute because it is still negotiating with the third party, Dzubeck said.

Demand for Token-Ring support among DEC users could well be limited, however, according to Computer Intelligence. Out of 9,100 VAX sites surveyed last month by the La Jolla, Calif.-based research firm, only 5% said they had Token-Ring networks. In contrast, 83% of the surveyed sites said they had Ethernet, the network that traditionally carries Decnet, the firm said.

More than one user expressed interest in DEC's expected FDDI introduction, however. Spokesmen at G.D. Searle and Grinnell Mutual Reinsurance Co. both said that their companies' expected use of imaging on DEC equipment points to the need for FDDI's 100M bit/sec. transmission rates.

VAX 4000 served into IBM, HP court

BY MARYFRAN JOHNSON
CW STAFF

The hardware highlight at Decworld '90 today will be Digital Equipment Corp.'s VAX 4000, a high-performance, office-size system that analysts said is aimed at competitors IBM and Hewlett-Packard Co.

Replacing the Microvax 3900 at the top of that line, the VAX 4000 Model 300 — which is already shipping to customers — comes in four configurations ranging in price from $75,410 to $233,230, DEC officials confirmed last week.

The company is pitching the machine, which runs at roughly 8 million instructions per second, as a price-competitive, more powerful alternative to IBM's Application System/400 and HP's 3000 line.

With a chip set from the VAX 6000, the VAX 4000 could also pose competitive problems for its own siblings. It is equal in power to a VAX 6000 Model 410 at about half the price, with I/O throughput four times greater than the Microvax 3900.

However, company officials shrugged off that performance overlap, saying the VAX 6000 can expand to six processors within the same cabinet and can run a vector processor for complex math computations. The VAX 4000 can do neither.

Then again, a potential VAX 6000 sale is already on the ropes with Chicago Title and Trust Co., which is currently beta-testing several VAX 4000s as candidates for an all-DEC distributed processing network at 40 offices nationwide. The 4000s were chosen as a less expensive alternative to low-end 6000 models, said James Suprinski, director of information services.

The VAX 4000 can be configured as a VMS time-sharing system, a dual-host time-sharing system, a network server machine or a dual-host server. DEC is also making a point of dropping the "micro" from this VAX's name.

Two of the dual-host VAX 4000s arrived last week at Sara Lee Knit Products in Winston-Salem, N.C., where the Hanes men's underwear division will use them to run a new distribution center application from RGTI Systems Software in New York.

Chief Information Officer Tom Cash said the company had Microvax 3800s scheduled to arrive last month, "but we were getting a little queasy about the horsepower this application required, so the 4000 came out at an ideal time for us."

At Structural Dynamics Research Corp. in Milford, Ohio, a VAX 4000 is now in use as a server for a network of Vaxsta-tion 3100s and a time-sharing, batch-processing machine. "We have found it to be real general-purpose type of machine," said Craig Haught, vice-president of computer resources.

Office politics

DEC's VAX 4000-300 overlaps the Microvax and VAX 6000 families

System	VAX 4000-300
Entry price (32M-byte memory)	$127,000
Transactions per second	21.6
Active users	124
Estimated MIPS	8
Maximum memory	128M bytes
Maximum storage	28G bytes

CW Chart: Doreen Dahle

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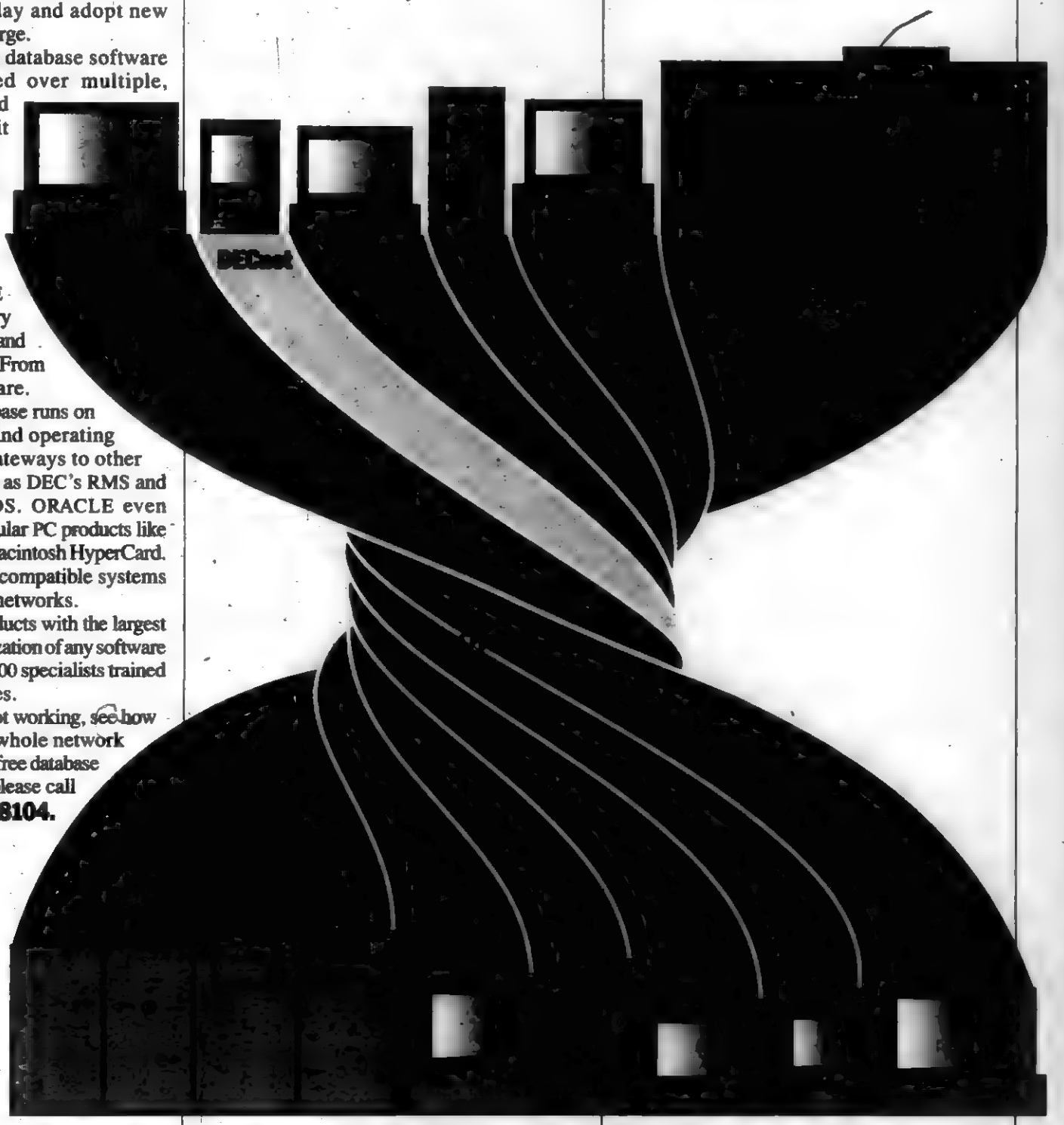

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Western Union finds a friend

AT&T answers distress call, agrees to purchase Business Services unit

BY ALAN J. RYAN
CW STAFF

UPPER SADDLE RIVER, N.J. — Western Union Corp. sought potential buyers and last week found one. AT&T entered into an agreement to purchase most of Western Union's Business Services unit for $180 million, allowing the flailing messaging company to exit the telecommunications arena.

The sale could give Western Union — currently struggling under a tremendous debt burden — some breathing room, according to Al Casazza, a credit analyst at Moody's Investors Service. Western Union would use proceeds of the sale to retire its senior debt.

For users of Western Union's Easylink electronic mail service, which would be sold to AT&T, the deal would mean Easylink would have strong financial backing, said Walter Ulrich, managing director of the Pacific/Southwest region of Arthur D. Little, Inc., and a consultant to the E-mail industry.

"Prospective customers for Easylink services can evaluate those products fully without worrying about the company's financial stability," Ulrich said.

Under the terms of the agreement, AT&T would purchase the assets to provide Western Union's Easylink E-mail service and its packet and Telex services. The agreement also includes the transfer of Business Services' employees and customer base to AT&T. Easylink, with more than 200,000 subscribers, is reportedly the largest public E-mail network in the country.

Carol Knauff, director of AT&T's intelligent network services organization, said that if the deal goes through, AT&T will merge its AT&T Mail electronic mail service with Easylink. The company will work with customers of both services to determine what features are most important to users, she said. The merged system would likely take 18 to 21 months to complete, she added.

For customers of both E-mail services, the switchover will be seamless, as the sales and service organizations of both units will remain in place. There will be no layoffs as a result of the merger, Knauff said.

Robert J. Amman, Western Union's president and chief executive officer, said the move will allow Western Union to concentrate on what it does best: financial services and paper-based messaging.

The agreement with AT&T does not include Western Union Priority Services, which has been part of the Business Services unit. That portion of the business would remain with Western Union and be operated as a separate business unit.

Ulrich said that AT&T's purchase of Business Services is a major endorsement for the E-mail and electronic data interchange markets. He said the deal would benefit subscribers of both AT&T Mail and Easylink.

The combined power of Easylink and AT&T Mail would position the service for market dominance, Ulrich said. For AT&T, the $180 million price is a bargain.

"The opportunity to exercise market leadership for that price is excellent," he said.

However, Moody's Casazza said, until Western Union's debt restructuring has been approved, there is still a danger that the firm could be forced into bankruptcy, negating the deal with AT&T.

The transaction is subject to regulatory approval and is conditional upon completion of a Western Union debt restructuring, which is expected to be completed by September, according to a company statement.

Friday's Western Union shareholders' meeting — postponed from mid-June — was adjourned as soon as it began. The move was made to allow the company more time to prepare and distribute new proxy materials regarding the Business Services sale.

Retailers

FROM PAGE 1

based EDI software systems, some of which cost as little as $3,000.

Besides, a small company that does 30% to 40% of its business with a single trading partner requires very little encouragement to do what such a customer asks, Norris and other analysts said.

Samuel Miller & Co. in Northbrook, Ill., received an EDI edict two weeks after a K Mart EDI seminar last month.

"We got a letter saying we had to be up by Aug. 1," data processing manager Gloria Rzepka said. Rzepka said that her department would not meet the deadline but that they were working toward it. The company has been a Wal-Mart EDI trading partner for more than two years, Rzepka said.

Neither Wal-Mart nor K Mart responded to calls last week asking for details about their EDI directives to suppliers.

Sears has also stepped up its efforts, sending out EDI information to some 1,300 of its 5,000 to 7,000 suppliers. About 400 are now on-line, with another 150 in the testing phase.

Sears has not been as aggressive as K Mart or Wal-Mart, although some customers reported that they were told Sears would eventually stop doing business with them if they did not implement EDI systems.

"We don't say we won't buy the goods," said Lance Dailey, director of EDI implementation at Sears.

However, Chris Talbot, company comptroller at John M. Frey Co., a Sears supplier, said, "They put quite a lot of pressure on us to meet their deadline" of May 1, 1990. Frey, a manufacturer's representative for copper goods in Moline, Ill., learned about the mandate in March and missed the deadline by several weeks but was not cut off as a Sears partner.

In addition to leaning on their trading partners, however, a number of the large chains are offering help — such as educational seminars and lists of EDI software companies — to smaller, less technically sophisticated companies. Sears goes a step further, providing or paying for training of trading-partner staff members to operate the EDI system.

Large retailers, sometimes described as EDI "hubs," use electronic connections with their suppliers to streamline routine business transactions, such as sending invoices and shipping notices. Because they use a standardized data structure, EDI forms also cut down on the clerical overhead required to process different forms from trading partners.

Analysts noted, however, that the ultimate benefit of EDI comes when it is joined with the company's internal information systems.

None of the retailers, however, seemed to back one software company, preferring to let their partners choose from an approved list.

With 1,810 EDI arrangements among its roughly 5,000 trading partners, Bentonville, Ark.-based Wal-Mart is already the largest EDI user and fastest growing retail user of the technology, according to EDI, Spread the Word, an industry information clearinghouse and publisher of the annual *EDI Yellow Pages International.* K Mart, meanwhile, claimed to have 1,000 EDI partners to date out of their approximately 6,000 suppliers.

Last December, Wal-Mart received the group's award for having the industry's fastest implementation rate, the largest retail program and the largest program using the ANSI X.12 standard protocol. In April, Wal-Mart again won the largest standard and largest retail program categories; Chrysler Corp. won the category of fastest implementor.

However, Walter Ulrich, Arthur D. Little, Inc.'s managing director in the Pacific/Southwest region, warned that strong-arm tactics, tried by other industries in the past, have generally backfired.

"It would be foolish to cut [a valued trading partner] off just because they won't do EDI," Ulrich said.

In the driver's seat

The Big Three auto makers, after nearly 20 years of EDI efforts, have begun to see success in the last two years.

Ford Motor Co. and Chrysler Corp. set deadlines for various sorts of critical applications, then invested millions of dollars into supplier seminars and full-time support staff to help implement the software applications suppliers need. The result? Suppliers have met deadlines.

The Big Three now work closely with software vendors and industry associations such as the Automotive Industry Action Group (AIAG). However, "huge problems remain," according to AIAG Project Team Coordinator Michael Gerus.

For instance, last month the AIAG announced a Big Three-supported implementation standard based on the ANSI X.12 format. But it may allow too many variants to help small firms such as Elgin, Ill.-based CR Industries, a maker of oil seals.

"Different plants within the same company define things differently, and we get 86 different versions of the same order," said Lawrence Egel, vice-president of MIS at CR. "We see that with all the manufacturers."

ELLIS BOOKER and MICHAEL FITZGERALD

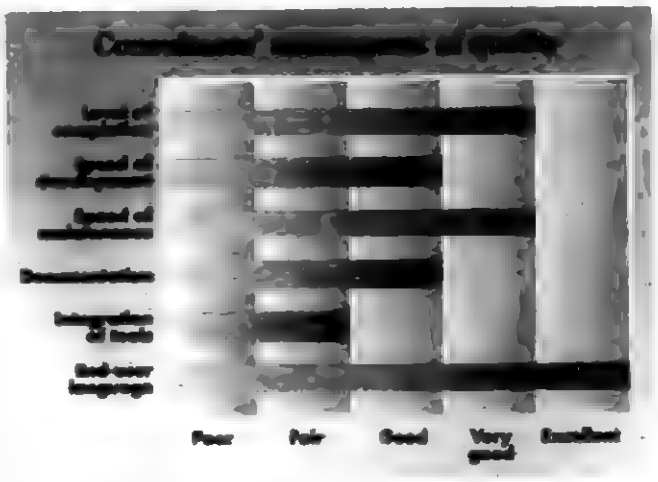
CORRECTION

Because of a transcription error, there were several serious errors in the product review of Software AG's computer-aided software engineering and fourth-generation language offerings [CW, June 25]. As a result, the criteria used to evaluate Software AG's products were consistently rated lower than the benchmark test actually demonstrated.

Below is a corrected version of the chart showing the consultant's assessment of quality of the products benchmarked.

Excerpts of the paragraphs that described the details of the benchmark should have read as follows: Speed of development was rated as "good" (not fair); speed of maintenance was rated as "very good" (not good); documentation was rated as "good" (not fair); and integration was rated as "fair" (not poor). Finally, the products benchmarked were rated as "very good" overall (not good) in the category of level of completion.

We regret our mistakes and any misconceptions that may have resulted about the products tested.



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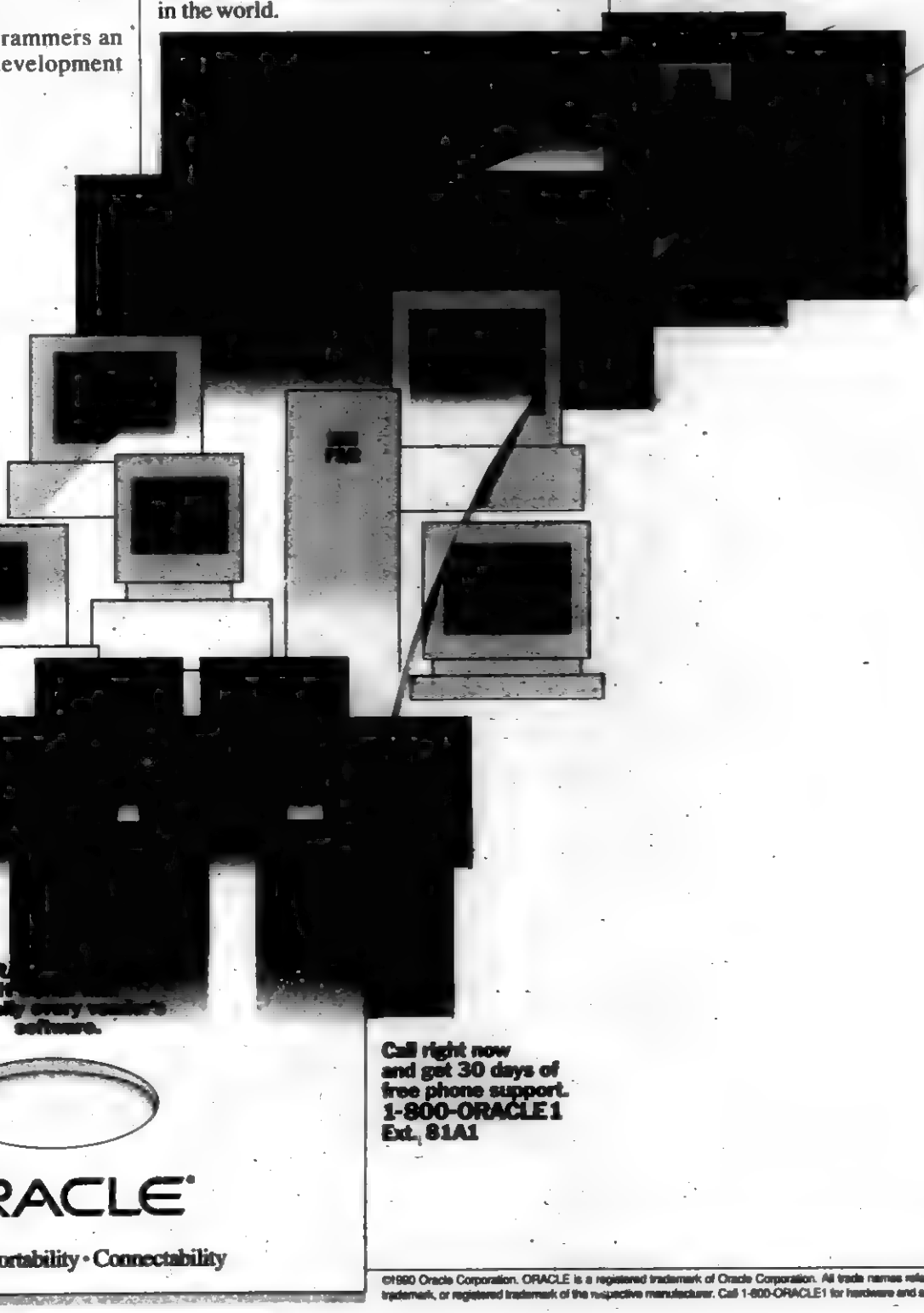

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Electronic price-fixing eyed in Fed investigation of airlines

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — There was a time when illegal price-fixing deals were made with a wink on the golf course or at trade association meetings. Now, the U.S. Department of Justice has embarked on an investigation to determine whether the airline industry has been using its online tariff database to accomplish the same thing electronically.

Investigators apparently are suspicious that airlines use the tariff clearinghouse — jointly owned by several major airlines — to communicate their pricing intentions and to discipline airlines that cut fares too much. "It's a new way of giving a wink and saying, 'Here's what I've done, and I want you to go along,' " said Benjamin Wright, an independent attorney in Dallas who specializes in electronic communications.

"When competitors set up a clearinghouse for pricing, production or marketing information, they need to consider the antitrust implications," he said. Federal antitrust law states that any agreement or conspiracy among competitors to peg or stabilize prices is illegal.

The Justice Department confirmed that it has opened an antitrust investigation of the way airlines use the industry database to monitor competitors' prices and make pricing changes [CW, July 2]. The department is collecting detailed information from the parties, but no charges have yet been filed.

Marx says this case will set an example

Several airlines publicly denied any price collusion and said they set prices independently to reflect competitive pressures.

Legal experts said the case will be closely watched by other industries with electronic networks. "Everybody ought to take a look at this case in the context of their own industry and make sure that safeguards, procedures, systems controls and training are in place" to prevent antitrust problems, said Peter Marx, a Wellesley, Mass.-based legal advisor to the information industry.

The airline industry's data clearinghouse is run by Airline Tariff Publishing Co. near Washington, D.C. Subscribers to the database include Official Airline Guides, Inc., vendors of airline reservation systems, travel agencies and corporate travel departments, according to Michael Ferrier, senior vice-president for computer services at the company.

Ian Ayers, an antitrust expert at Northwestern University, said that certain aspects of the clearinghouse make it conducive to "parallel pricing," whereby companies raise prices together in tacit agreement.

Ayers said the system allows carriers to "preannounce" fare increases that will not be effective for several weeks and allows them to send ancillary messages to other carriers, Ayers said. "They just don't want to be stuck out by themselves when they raise the price," he said.

For example, last September, American Airlines floated a proposed fare increase on the Airline Tariff database; within nine days, it was matched by other airlines. That incident is the subject of a separate investigation by the Justice Department.

Eye for an eye

Another pricing tactic was revealed in a June 28 investigative report by *The Wall Street Journal*. It said that major carriers sometimes insert fare changes and secret codes into the database in order to punish fare-cutting airlines.

For example, a major carrier may retaliate against a fare-cutting airline by slashing fares at the maverick's hub airport — a tactic known as "bombing" or "trashing." To drive the message home, the carrier may add a special letter code next to the fare, the *Journal* said.

The Airline Tariff is jointly owned by the industry's major carriers, including Northwest Airlines, American Airlines, United Airlines, USAir and Continental Airlines.

A spokesman said Airline Tariff is cooperating with the investigation but has no further comment.

Ayers said the Airline Tariff case will be a tough one for the Justice Department to prosecute, because it appears to involve tacit rather than explicit agreements to fix prices. Also, the concept of "parallel pricing" is controversial in antitrust circles, and courts have not unanimously agreed that it is illegal.

If the Justice Department does pursue the case, it is likely to seek civil injunctions barring the airlines from certain practices, such as preannouncements, that facilitate price fixing, Ayers said.

The notion that price agreements could be arranged via an electronic clearinghouse is stretching the traditional boundaries of antitrust law.

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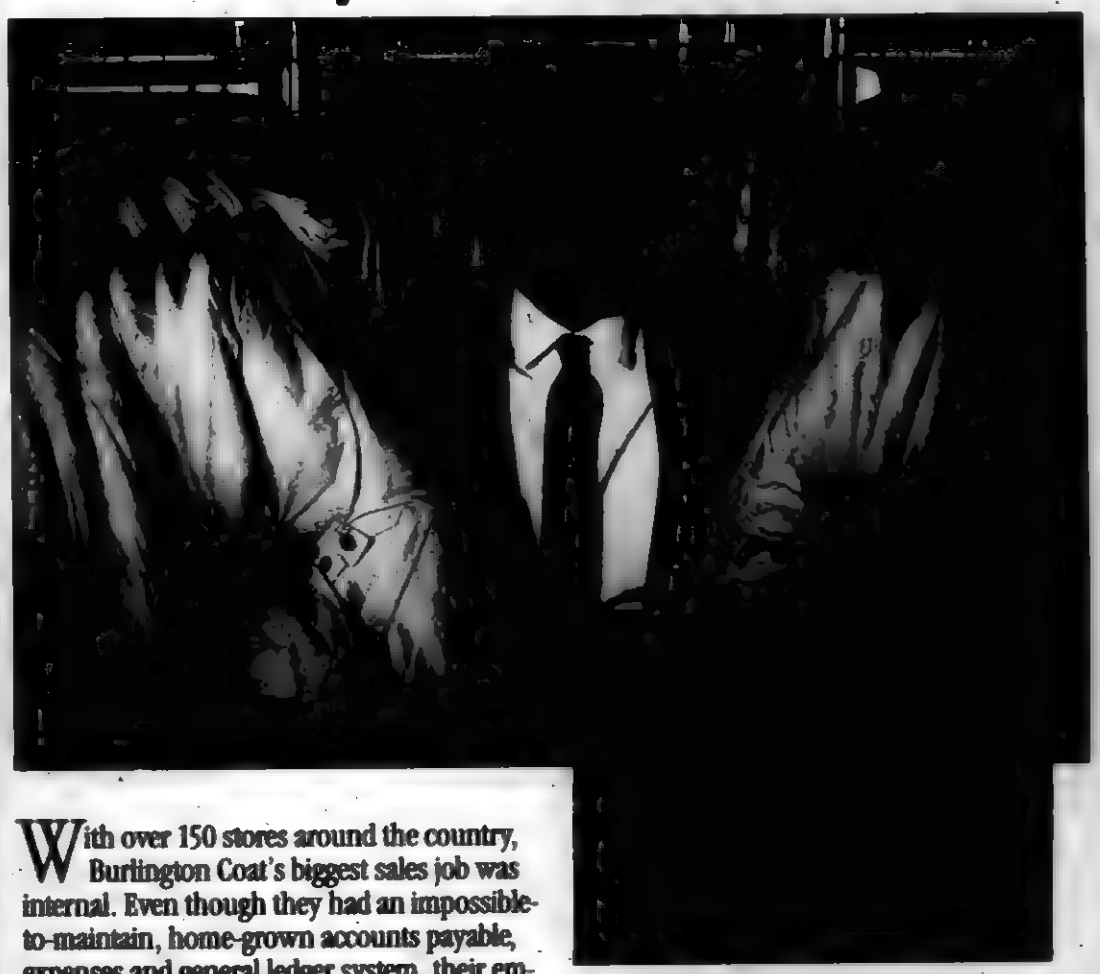

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COMPUTERWORLD

Ex-DARPA director goes to bat for MCC

BY MITCH BETTS
CW STAFF

Craig I. Fields, former director of the Pentagon's advanced technology projects, was named president of Microelectronics and Computer Technology Corp. (MCC) last week and said he hopes to produce some technology "home runs" for the research consortium.

A well-regarded technocrat, Fields made headlines in April when he was transferred from his position as director of the Defense Advanced Research Projects Agency (DARPA) to a low-profile job [CW, April 30]. It is widely believed that the Bush administration ousted Fields because DARPA was straying into the field of "industrial policy." Fields declined to comment on that theory.

Grant Dove, the 62-year-old chairman and chief executive officer of MCC, said Fields will join the Austin, Texas-based consortium this week with the titles of president, chief technical officer and chief operating officer. Moreover, Fields, 43, is in line to take on the CEO role in 1991 as part of a leadership transition from Dove to Fields, an MCC spokesman said.

The hard-charging Fields has long been a supporter of cooperative research ventures such as Sematech and MCC. "I want MCC to have some home-run projects for the member companies to give them a competitive advantage" in the world technology market, he said in a telephone interview.

MCC, which has a research budget of more than $60 million, was formed as an industry consortium in 1982 and — like DARPA — focuses on advanced computer and software technology, including machine learning, microelectronics and high-definition systems.

"At MCC, I'm hoping to combine the development of advanced technology with the transfer of that technology to the member companies. Many organizations can do one or the other, not both. That [combination] is what I've been doing at DARPA for years," Fields said.

Fields brings to the MCC job a mixture of skills, including experience managing DARPA's $1.1 billion research program, technical expertise, salesmanship and an "inquisitive mind," according to Robert Costello, who was Fields' boss and ally during the Reagan administration.

Fields and Costello have argued that the government should support dual-use technologies — such as semiconductors and high-definition television — that could make both the military and commercial sectors more competitive.

U.S. Sen. Jeff Bingaman (D-N.M.) said he was disturbed that Fields "was not allowed to pursue his lifelong dream to direct DARPA" and that the government is losing a valuable employee. "Our government's loss will surely be a gain for the semiconductor and computer industries," he said.

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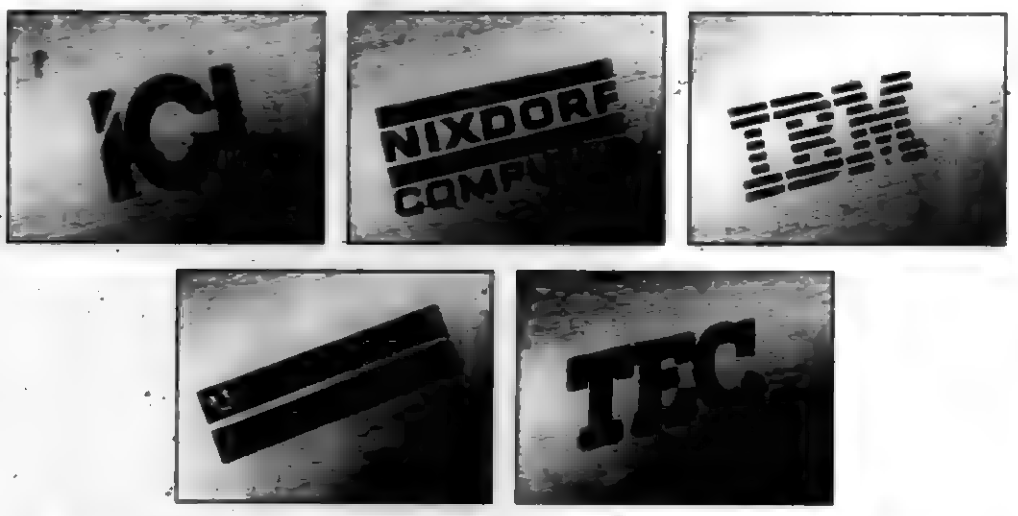

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Sequent airs updated Unix operating system

BY J. A. SAVAGE
CW STAFF

Changing its Unix operating system from a dual University of California at Berkeley and AT&T base, Sequent Computer Systems, Inc. last week announced a new operating system based solely on AT&T Unix System V.

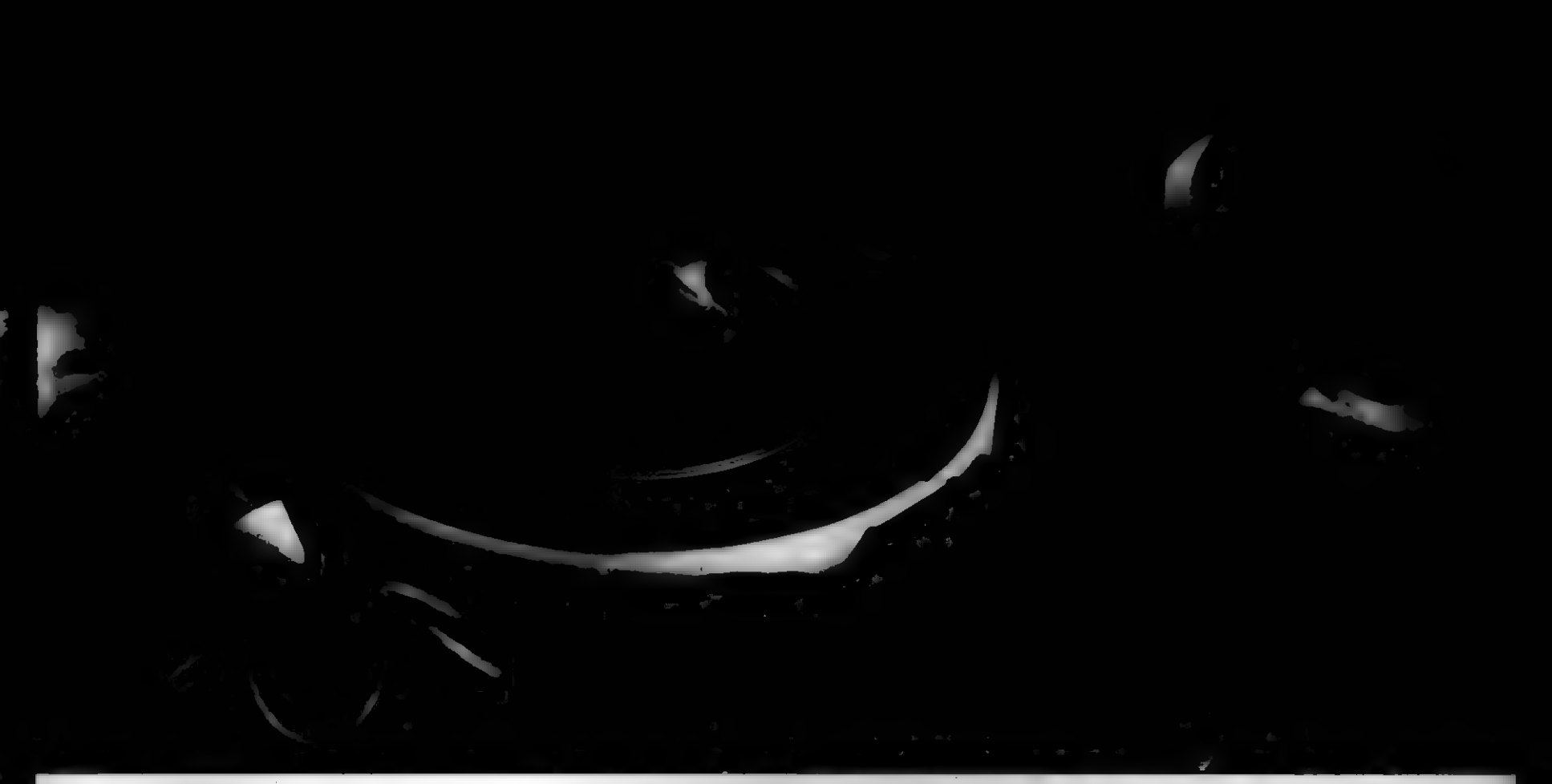
The operating system will be more easily adapted to commercial, on-line transaction processing applications, according to the company. Sequent also announced a new computer intended for office use.

While most firms that offer parallel processing architectures are aiming at the scientific market, Sequent is trying to get a foothold in the commercial arena with its shared-memory systems. "Although only 5% of commercial applications are written to open standards, we think it will grow rapidly," said Stephen Verleye, product manager for Sequent.

The new operating system, Dynix/ptx, incorporates standards such as Posix and the Open Software Foundation's Motif. It also adds functions such as the ability to use X.24 and Transmission Control Protocol/Internet Protocol networking protocols on a parallel computer.

Sequent will offer a "variety of handholding programs" for users who wish to migrate, according to Verleye, ranging from tools to dedicated personnel. If users have applications on major databases, they can port to the new system "in a matter of hours," he said. But if applications are close to the old operating system, users will have to change source code to migrate.

The new computer, the S16, fits between Sequent's low-end single-processor computer and its large computers, which range from six to 30 Intel Corp. 80386 processors. The S16 is geared toward an office environment with two to six processors and starts at $50,000.



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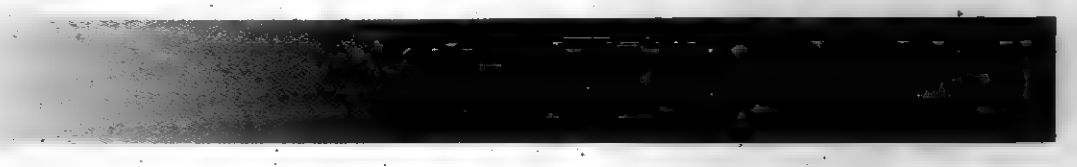

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FCC plan to slacken AT&T's chains draws fire

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — Thousands of pages of comments from dozens of companies and trade associations poured into the Federal Communications Commission last week in what some have called the most important FCC proceeding in a decade.

At issue is a 4-month-old FCC proposal to speed the pace of deregulating AT&T's long-distance voice and data services. In March, the commission said it had "tentatively concluded" that competition in the long-distance marketplace — especially for services to large businesses — had grown robust enough to justify loosening the bonds that have constrained AT&T since the breakup of the Bell System six years ago [CW, March 12].

In its comments filed last week, AT&T hailed the FCC's March proposal, saying the long-distance marketplace is "vigorously competitive" and that numerous government regulations "hobble" the telecommunications firm, thereby stifling competition and depriving customers of the price and services benefits of a free market.

Not surprisingly, MCI Communications Corp., U.S. Sprint Communications Co. and other long-distance carriers did not see it that way. Speaking informally for that group, James M. Smith, president of the Competitive Telecommunications Association, said, "We're united in the belief that ... AT&T deregulation is extremely premature and completely unwarranted." At a press conference, Smith and others argued that AT&T still enjoys unique competitive advantages, including lower costs for access to local telephone networks and enormous operational economies of scale left over from pre-divestiture days. An unregulated AT&T would drive many existing competitors out of business, Smith asserted.

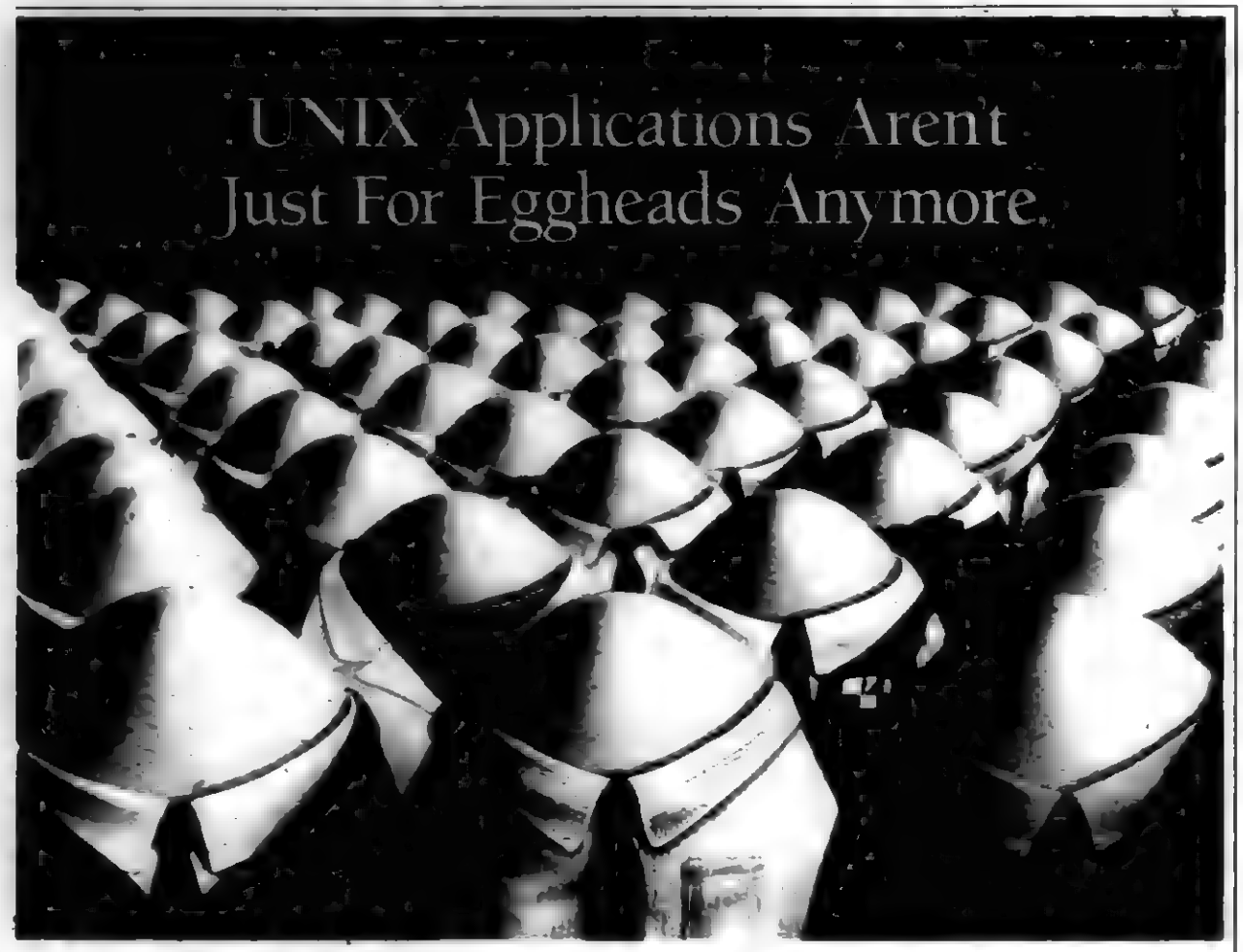
The competitors challenged the FCC's contention that AT&T cannot easily raise prices because MCI, Sprint and others have enough excess network capacity to accommodate a flood of customers fleeing AT&T. Sprint called the excess-capacity argument a myth, saying it would take Sprint years and billions of dollars to substantially boost the capacity of its fiber-optic system.

> "WE'RE UNITED in the belief that ... AT&T deregulation is extremely premature and completely unwarranted."
>
> JAMES M. SMITH
> COMPETITIVE
> TELECOMMUNICATIONS
> ASSOCIATION

Comments filed on behalf of telecommunications users cautiously supported the FCC's conclusion that competition has increased greatly in the market for many services to large businesses. However, some argued that in some areas — such as 800 services — AT&T still enjoys an unfair advantage that should be offset by regulatory controls.

The FCC proposal calls for the elimination of price ceilings and price floors for such services to large businesses as Software Defined Networks, WATS lines and Megacom. The FCC would also move to substantially deregulate Tariff 12 services, Accunet packet-switched services and Skynet KU.

After consideration of the public comments, the FCC will complete the proceeding and issue a final rule on AT&T deregulation. Sources said that is unlikely to occur before the first quarter of 1991.



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Bookmanager Read/2 1.2 costs $185 and will be available this month. Bookmanager Read/DOS 1.2, Build/VM 1.2 and Read/VM 1.2 are scheduled for release in September and will be priced at $185 on the DOS platform and from $7,540 in the mainframe environment.

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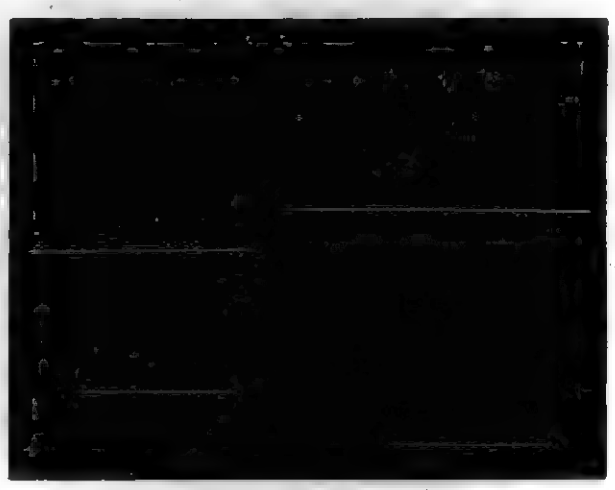

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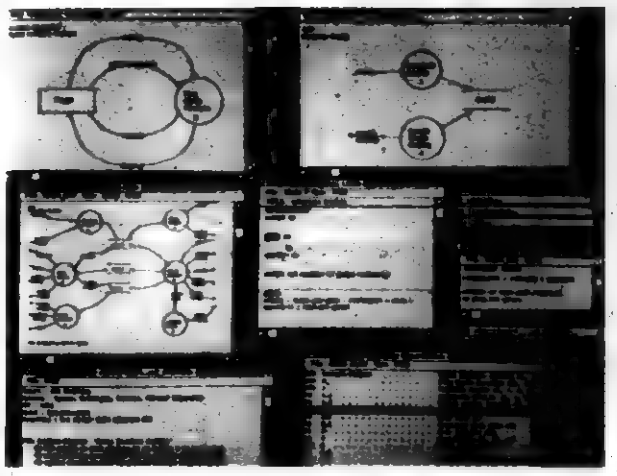

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HP AxDB Debugger: Displays microprocessor code, stack backtrace, and variables. Test coverage window shows statements not executed during test.

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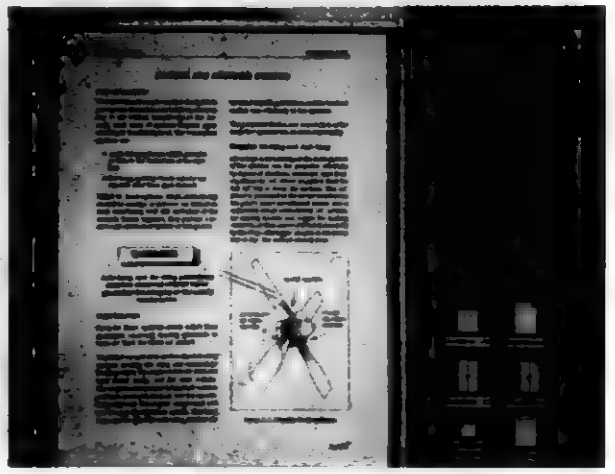

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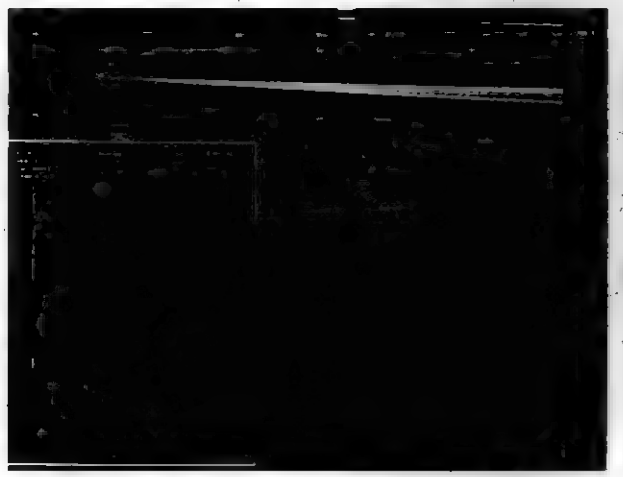

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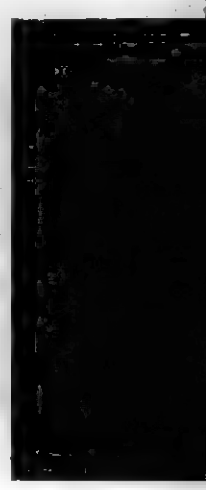

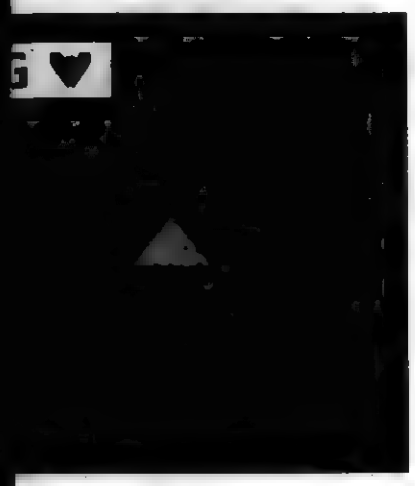

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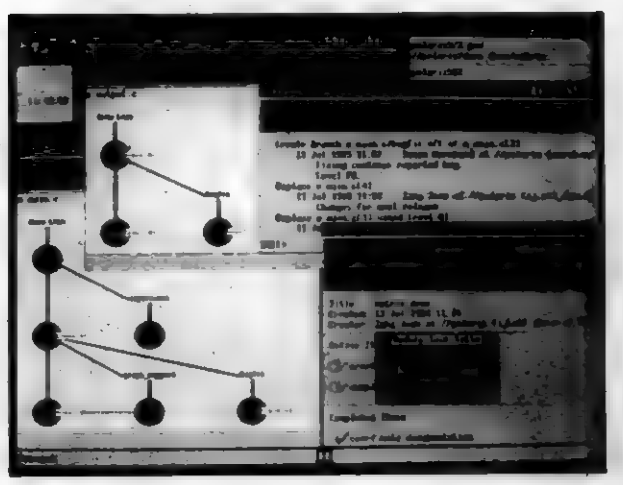

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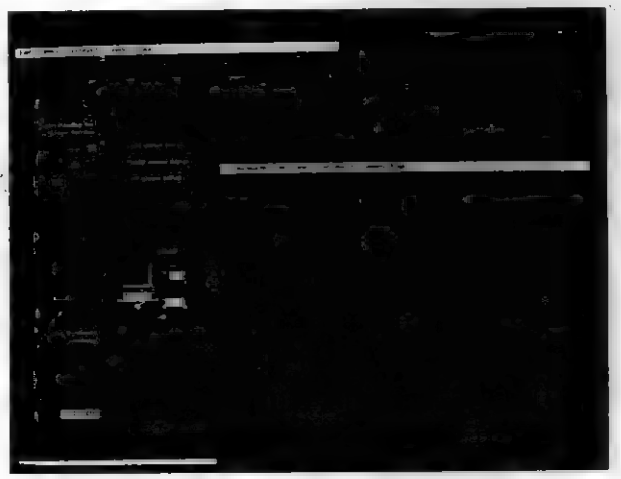

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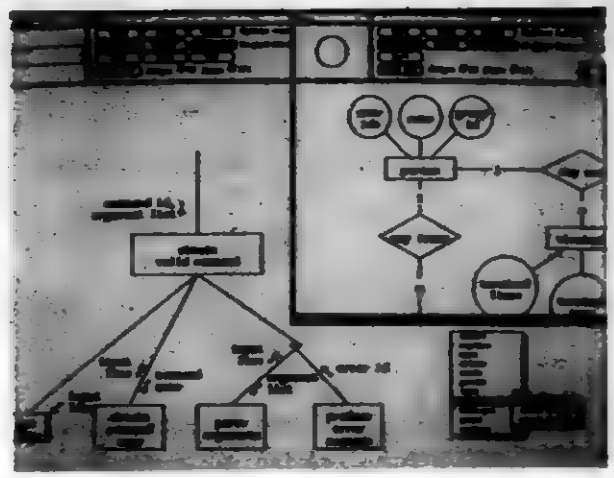

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HP RISC systems to diagnose own ills

BY JEAN S. BOZMAN
CW STAFF

MOUNTAIN VIEW, Calif. — Phone home.

Thousands of Hewlett-Packard Co.'s computers will be doing just that starting this month, when HP ships a new preventive-maintenance package to users of HP 3000 reduced instruction set computers running MPE/XL. A future release will be written for HP 3000s running the Unix operating system, said Roger Costa, general manager of HP's product support division.

The new HP Predictive Support XL package will be shipped on a tape, free of charge, to all HP 3000 MPE/XL users who have a maintenance contract. The software is an extension of a 4-year-old package that was written for older MPE machines.

Predictive Support is a rules-based system that analyzes patterns in logged-error reports relating components such as the CPU and attached peripherals. If failures are detected, the system dials one of HP's 32 support centers worldwide through a dedicated 1,200 bit/sec. modem with the goal of intercepting problems before they get out of hand.

Beta-test site users of the package said it correctly identified slowly failing disk drives in time to safely take those drives off-line. "On three or four occasions, the software notified my [field] engineer that a disk was failing," said Rick Ellison, a senior information systems analyst at Mobil Oil Corp.'s manufacturing department in Fairfax, Va. "It also made a call to HP when we didn't properly configure a new drive."

The Predictive system, which the user runs as a job, can alert the HP 3000 system operator in case of trouble — or it can be set to automatically dial up the HP support center. "My advice would be to run it at night," said Samuel Webster, a technical engineer at the publishing firm of Warren, Gorham & Lamont, Inc. who has used the system since January. "That way, you get a report on your system when you come to work each morning." Webster's Boston-based HP shop used a custom error-detection system before installing Predictive Support.

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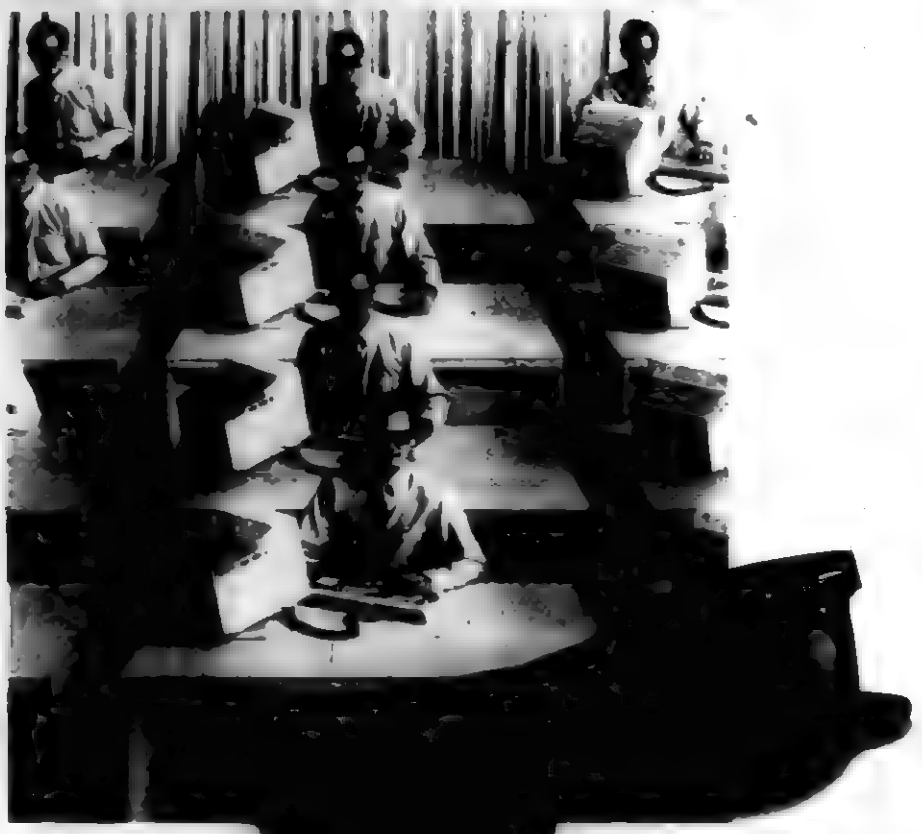

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Indictment issued in Wang theft

BY SALLY CUSACK
CW STAFF

CAMBRIDGE, Mass. — A New Hampshire man was indicted last week in an alleged $720,000 computer equipment theft from Wang Laboratories, Inc. in Lowell, Mass.

According to the Middlesex County District Attorney's Office, Gerard N. Dube, 30, of Derry, N.H., was indicted on 17 counts of larceny over $250 and one count of making false entries in corporate books between November 1988 and November 1989.

Dube is reported to have been employed as an engineer at Wang's Pawtucket Blvd. facility in Lowell, and the indictments charge that the defendant stole computer boards and components used to upgrade or repair computers. Also, Dube allegedly submitted a series of fraudulent requisitions for computer parts and equipment to obtain the items from Wang's inventory.

After completing the necessary paperwork, the items were allegedly moved from the facility and sold to computer firms located outside of Massachusetts, according to District Attorney Scott Harshbarger. Wang security initiated and Massachusetts State Police coordinated the six-month investigation, he said.

If Dube is convicted on all counts, he faces a maximum cumulative sentence of 95 years in state prison and/or a fine of $425,000. No arraignment date has been set.

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TECH TALK

Electronic ink

■ Scratchpad computers that recognize handwriting are the latest rage in portable computing, but unless the user prints characters that are well-defined or in boxed areas, the computer will not get the message. Researchers at IBM said they have developed an experimental computer called the Paper-like Interface that is capable of recognizing natural, cursive writing. With the Paper-like Interface, a user writes with a stylus on a transparent digitizing tablet that is placed over a flat liquid-crystal display. The tablet has a layer that senses the position of the stylus on the tablet's surface and translates writing motion into "electronic ink" on the flat-panel display underneath.

Inner-earth watch

■ The National Science Foundation and 64 U.S. universities are constructing a global network of seismic stations that will generate detailed images of the earth's interior. Scientists said they expect that by studying the movement of massive convection currents deep within the earth, they will better understand earthquakes, continental drifting and the formation of mountain ranges. The cooperative venture said it plans to install more than 100 seismic measuring stations in dozens of locations around the globe, including the ocean bottom, by the year 2005.

Puny but powerful

■ Hitachi Ltd. announced last month that it has become the first company to develop a prototype 64-megabit memory chip. The experimental chip comprises 140 million devices crammed into an area about the same size as a human thumbnail. Hitachi researchers used electron beams to etch the circuits into the chip. The company did not announce when the chip will be ready for production; however, some experts predicted that the first chips will more than likely not be ready before 1995.

In search of a better interface

Whether with gloves or glances, new devices are making computers easier to talk to

BY MICHAEL ALEXANDER
CW STAFF

If an F-16 fighter pilot wearing a data glove can launch a missile inside an artificial environment by pointing, why couldn't that same technology be used to launch an application?

It is certainly possible; all it takes is for software designers to look beyond keyboards and mice, the traditional means of entering data into computers, toward some of the emerging input and output devices that are becoming widely available, according to some experts. It also requires designers to begin thinking in terms of interfaces based on interaction between human and machine as a two-way street and not solely as a one-way, human-to-computer interface, they said.

Manuel King

Thomas Hutchinson, a physicist in the biomedical engineering department at the University of Virginia in Charlottesville, has developed an eye-controlled computer, called ERICA, that has considerable potential in a wide variety of business applications (see story below). For example, eye-gaze technology could be used in word processing, allowing the user to select and move paragraphs by merely looking at them, along with a keystroke or two.

ERICA, shorthand for Eyegaze Response Interface Computer Aid, is now used mainly by paralyzed children and adults to communicate and overcome their disabilities in other ways.

Most software designed today has a user interface based on windows, icons, mice and pointing and assumes that there is one display and one active input device, typically a keyboard or mouse. Applications based on voice, data gloves and other input and output technologies are highly specialized applications and not readily available to the vast majority of computer users. The reason has less to do with the hardware technologies — all are widely available, often inexpensively — and more to do with a lack of software designed to work with them.

"You can't be thinking in highly specialized terms," Hutchinson said. "The fundamental thing is to get software designers to start thinking about interfaces in other ways. They think only about keyboards and mice, but they also have to think about eye gaze and voice and include the hooks into the software that is needed."

Expert systems and artificial intelligence will also be needed to make the human-to-machine interface more natural, he said: "To do the interface properly, the machine has to take into consideration that there is a slow device outside of it that needs a certain amount of response time."

Data gloves, voice, eye-tracking and other methods "can be married commercially, conveniently and appropriately to graphical user interface paradigms," said Aaron Marcus, principal at Aaron Marcus and Associates, a Berkeley, Calif., firm specializing in user interface design and evaluation.

Such input devices could possibly enhance computer communications by adding the visual and aural cues that we take for granted in face-to-face communications, according to Marcus.

"Right now, we have limited ability to add affect into our communication; that is why sideways faces [:-) for smile or ;-) for wink, for example] are sometimes used. We are suffering because we have so little ability to communicate affect in the user interface," Marcus said.

"The payoff is an interface that is more natural to our communications habits, easier to learn and more efficient," Marcus said.

The standard desktop is not a fitting metaphor for working with some new input technologies, and that has hindered the use of some devices in mainstream applications. "Some new paradigms are three-dimensional user interfaces, where things you want to select are all around you in space and not on a flat plane in front of you," Marcus said.

Looking them right in the eye

The Eyegaze Response Interface Computer Aid, or ERICA, developed by Thomas Hutchinson, a physicist in the biomedical engineering department at the University of Virginia in Charlottesville, would have seemed farfetched only a few years ago, but the technology that it is based on is relatively ordinary today. "We're doing this with [an IBM Personal Computer AT] and some additional hardware on the order of less than $3,000," he said.

Based on work originally done by researchers at IBM, Hutchinson was able to create several high-resolution squares set off against a low-resolution background on a computer display. Users operate optical switches that control various devices by focusing their eyes on these specially defined areas, each about 1.5 sq cm.

An infrared LED connected to a video camera mounted beneath a computer monitor beams a light into the user's eye. The light triggers an effect called "bright eye," caused by light reflecting off the retina at the back of the eye. The video camera records the light reflected off the retina, which moves as the user shifts his gaze, as well as light reflected off the cornea, which remains stationary. By measuring the distance between the two points of light, it is possible to determine the spot on the screen that the user is focusing on. The information is then relayed to an analog-to-digital expansion board in the PC, which in turn triggers the software to carry out the command indicated by the square.

ERICA is being used by people with severe spinal cord injuries to communicate, play games and overcome their other disabilities. However, Hutchinson said the technology has a myriad of uses. He is experimenting with an electronic polygraph based on measuring the dilation of a subject's pupils.

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EDITORIAL

Scat, copycat

THE INK WAS barely dry last week on the judge's ruling that upheld Lotus' copyright infringement suit against two small firms when Lotus drew a bead on a more serious player, archrival Borland.

If the decisions reached in one federal court jurisdiction are truly based on precedents set in others (and said decisions stand the test of appeal), you have to like Lotus' chances. Taking this logic and the particulars of the judge's decision a bit further, the look-and-feel suits of Apple against Microsoft/Hewlett-Packard and Ashton-Tate's suit against an alleged copycat all start to look more viable.

Apart from the immediate significance to the companies involved in these litigations and the impact — whatever it may be — on the customer, the more compelling issue now destined for another public airing is the effect of the *interpretation* of copyright law on innovation.

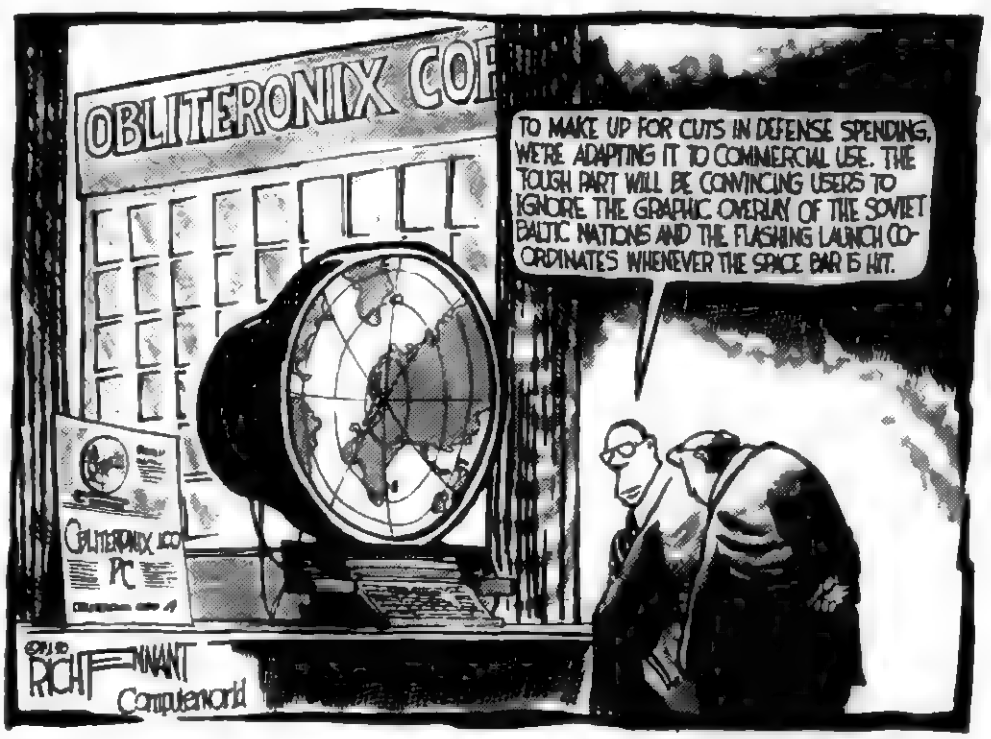
Don't be surprised to see "pro-innovation" forces build into quite a groundswell. There are scores of companies out there that have developed on the coattails of true innovators, walking a marginal line between infringement and legal activity. Now that line has more definition, at least as it relates to software, and that will be very unsettling to these companies.

Their arguments, however, will sound increasingly hollow. Historically, there have been — and today, there remain — compelling reasons for a fair body of copyright law, one that must also be flexible and in accord with the level of competition at any time.

Consider that the most rapidly expanding markets are outside the U.S., particularly the European market for personal computer software. And consider that there are virtually no non-U.S. companies that are major players in the PC software market. Is it too great a stretch to think that the "expanded" interpretation of software copyright law in the Lotus case had international competitive considerations in mind?

Consider also the very nature of PC software development today. While it is still possible for one or two minds to crank out the next revolutionary software package, it isn't bloody likely. Development is a very long and very costly process nowadays, and the risk-laden efforts that lead to a breakthrough product should certainly be protected. For those who think that this protection fosters consolidation and megaliths, there's a whole other body of federal antimonopoly law that ensures that market-making breakthroughs can be licensed for an appropriate price.

For the customer, prudent copyright enforcement guarantees a continuation of the stream of highly innovative products that the risk-takers have brought to market. In no way does this enforcement stifle innovation to anything approaching the extent we are about to hear from a lot of whiners.



LETTERS TO THE EDITOR

Hidden agenda

If, as is stated in "Users bypass war over distributed standards" [CW, May 14], the OSF does choose the Decorum proposal over ONC from Sun Microsystems, it will be another example of the OSF's hidden agenda to muddy rather than clarify the issues of standards and openness.

I also take exception to the article's implication that the OSF is *the* standards organization in the Unix world. I would have thought a more balanced (and accurate) article would have mentioned Unix International. We in the user community have not given OSF the right to set "official" standards. Instead, many of us are voting with our feet (and wallets) for Unix International — which includes Sun.

John Neubert
Manager
Academic Computing
Drew University
Madison, N.J.

Two Amigos

The sidebar to the article, "A moving story: Multimedia stakes its claim on the desktop" [CW, June 4] identifies the key players in multimedia in the future by looking at the computer, communications and entertainment industries, yet not once does it mention the current leader of desktop multimedia — Commodore.

The Commodore Amiga was designed from its start in 1985 to be a "multimedia" machine long before the word "multimedia" was coined by the press. The Amiga has already reached three of the six points mentioned in the main article: It is a core desktop technology; superior multimedia authoring tools are now available; and application software firms incorporate multimedia capabilities into their offerings. Third-party erasable magneto-optical drives are also available for the Amiga.

Strange how a company that has the products out now doesn't get mentioned, yet companies that have merely produced vapor are considered the "key players in multimedia in the future."

Charles E. Hill
Partner
Infotrak
Orlando, Fla.

I am beginning to believe that *Computerworld* is actively suppressing information about the Commodore Amiga. In your article "A moving story: Multimedia stakes its claim on the desktop" [CW, June 4], the capabilities of this powerful multimedia platform were completely ignored.

Overlooking the Amiga when discussing multimedia is like forgetting to mention Cray when discussing supercomputers. If you had done your homework, you would have found that the Amiga was the first personal computer to offer NTSC and PAL video, stereo audio output and multitasking as standard features.

The new Amiga 3000 includes these features plus the Arexx interprocess communications language and the Amigavision multimedia authoring tool. Using Amigavision with Arexx, a multimedia presentation can simultaneously control laser discs, CD-ROM and programs such as spreadsheets or hypertext databases.

Coverage of the Amiga in *Computerworld* seems to be limited to the "Letters to the Editor" column. Such selective reporting is a disservice to your readers.

Christopher R. Hertel
The Erwin Ross Group
Winnetka, Ill.

Just do it

Michael Cohn probably didn't know it when he wrote his terrific column, "Pumping PCs, or the IS route to fun and fitness" [CW, May 28], but someone has come up with a "car aerobics" program. The book is called *Autorobics*, subtitled "An Exercise Program for the Daily Commuter," by Larry Reynolds, John Casella and Charles Eldred.

The book is filled with a full range of isometric exercises to do in the car, tailored to all parts of the body and fully illustrated. Some of the exercises are Steering Wheel Flys, Seat Thigh Press and Floorboard Toe Raisers. There's a detailed anatomy chart showing which muscles are strengthened by each exercise.

Cohn was also on target with his suggestion to do exercises while waiting for a response from the mainframe. Verbatim Corp. put out a booklet in 1983 called "Tone Up at the Terminals" featuring fitness instructor Denise Austin, who now has her own exercise program on ESPN.

Gil E. Gordon
Editor
Telecommuting Review
Monmouth Junction, N.J.

Computerworld *welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor,* Computerworld, *P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701. Fax: (508) 875-8931; MCI Mail: COMPUTERWORLD.*

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Beat the product launch blues

RICHARD J. BLANCHARD

The pressure at U.S. high-technology firms to continually produce new products and get them to the marketplace quickly is tremendous and shows no sign of letting up.

New computer and communications products are being unveiled at a near frenetic pace at glitzy ceremonies resembling political campaign rallies.

Yet the degree of attention afforded product announcements is justified. Each time a company announces a new product line, it is, in effect, relaunching itself as a company in the eyes of industry analysts and observers.

However, all of the attention frequently masks an underlying disarray and lack of control by vendors in the process of product introduction.

At many, if not most, high-tech companies, there is no formal process in place to manage the introduction of new products. As a result, they tend to emerge helter-skelter into the marketplace, often the result of knee jerk, shoot-from-the-hip decisions influenced by individual and departmental agendas or in reaction to competitors.

The widespread lack of an integrated process to manage high-tech product introductions is symptomatic of a larger organizational problem in high tech: a communications gap among the company departments involved with new products from their conception to their final release.

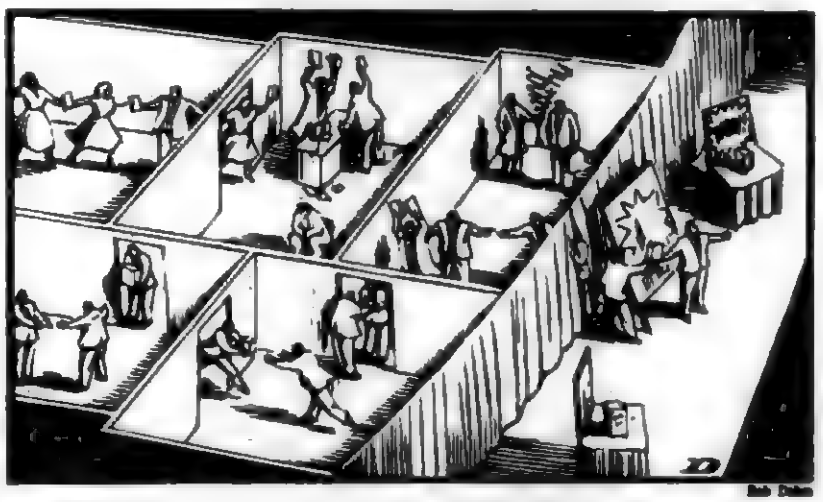
This communication breakdown is costly, extracting a price in the form of missed production deadlines, inaccurate or untimely information and lackluster response to new products from the sales force, press and customers.

Customers also pay a price when their vendors can't show them what clear benefits the product offers. It becomes harder to plan future equipment requirements, budgets and purchases in such a climate. Customers feel unclear about whether their investment in the new product will be protected by a clear upgrade path.

Conflicts of interest

Much of the new product communications gap is rooted in long-standing interdepartmental conflicts over perceived roles in bringing new products to market.

A 1984 McKinsey & Co. survey of 107 research and development managers and 109 marketing managers at 167 high-tech companies found wide perceptual differences between the two groups concerning their respective roles in the new product development process. Thirty-five percent of the marketing managers felt that they worked closely with R&D in generating new product ideas, but only 20% of the R&D managers agreed with them.



Bob Dahm

Thirty-one percent of the marketing managers perceived that they were heavily involved in finding commercial applications for R&D's product ideas; only 16% of the R&D managers shared that view.

In my 16 years as a marketing professional involved with major computer and peripheral products manufacturers, I can confirm that this organizational schism exists. In fact, I submit that the gap is even wider than these figures indicate.

At all too many high-tech companies, products are simply tossed "over the transom" to the next department, moving from R&D to marketing to sales. Instead of a coordinated team effort, the product introduction process resembles a competitive sport, with one department essentially telling the next one in the product development cycle: "The ball's in your court."

Things haven't changed in the six years since the survey. Top management still holds the most influence over the product launch process. Given the current high level of marketing activity and global competition in the high-tech arena, the need for leadership to engender planning, coordination and teamwork in the product introduction process will be even greater in the 1990s.

Given the escalating pace of product introductions and competitive activity, the ability to manage the product introduction process may well spell the difference between the vendors that survive the 1990s and those that do not.

Meet your deadline

According to a McKinsey economic model, spending the extra money required to get a product introduced on time is more critical to the product's profitability than keeping it within budget.

The model postulates that a high-tech product introduced on time but 50% over budget would earn only slightly less projected profit over a five-year period. By comparison, a product that is introduced under budget but six months late would earn 33% less projected profit over the same five-year period.

Clearly, the time has come for a team-oriented process to manage product introductions. Individual departments working harder and faster and longer won't necessarily get better and more marketable products into the marketplace sooner.

Just as the cylinders of an internal combustion engine must fire in harmony to effectively power the drive train, departments within high-tech companies must work together toward the common goal of well-timed and correctly positioned product launches.

Blanchard is president of Marketbound Associates, a Los Gatos, Calif., marketing firm.

Escaping the middle management purge

MICHAEL COHN

Don't get me wrong, computers are a good business. But this is starting to get serious. The information systems boom booms no more. Growth is in the single digits. Companies are tightening their belts. Plants are closing. And people are being laid off.

I suppose most of us are safe. Good salespeople are safe. Technical people are safe. Even my brother-in-law in Hackensack, N.J., is safe, although he's been coding the same report program for a year and a half.

But this is no laughing matter for corporate America's favorite scapegoat: the middle manager. The middle manager is always the first to go.

So right away, I'd advise you to find out whether you are a middle manager. Follow these simple instructions: 1. Ask the guy that works for you if he is a lower manager. 2. Then ask your boss if he is an upper manager. 3. If they both say yes, then you are probably in trouble.

Don't panic! Do not go home and call your headhunter. Do not cut back on the kids' allowance. There are several ways out of this mess. You can still save your job!

- Get technical. Granted, this does sound kind of extreme. You may have to drastically alter your lifestyle. Work in horrible little cubicles. Be nice to users.

However, companies do not lay off technical people. Good technical people are hard to find. So get technical. Learn Cobol. Or learn some language that no one has heard of, such as Lobol. It might save your job. Plenty of technical people have been fooling folks for years.

- Become an upper manager. If you are not qualified to be technical, then try to become an upper manager as soon as possible. This might get a little tricky, because it generally takes somewhere between two and 40 years to get promoted into upper management.

Of course, maybe you don't have that long, especially if there's someone waiting in the corridor to move into your office.

- Become a lower manager. This is a lot easier. Just promote a lower manager, and don't backfill his position. Stick your name into his spot on the org chart, with the word "Acting" in parentheses. You'll be safe, at least for a couple of months.

The tough part is finding a lower manager who's dumb enough to become a middle manager.

- Get a special assignment. No one has "layoffs" anymore. They have cost-effectiveness programs. They have redeployment strategies. If you catch wind of something like this, get involved in it right away. Volunteer for a committee. Do a study. It's no coincidence that three moving vans show up the day they announce a "reorganization." Get on that reorganization task force while there's still time.
- Act paranoid. Become noticeably convinced that layoffs are imminent. Let it get to you. Appear visibly nervous at all times, especially around your upper manager. Continually bring to his attention how a handful of about-to-be-laid-off employees are most certainly planning some type of vengeful computer conspiracy. Be sure to point out that you've prudently made a list of all the important access codes, master files and data security routines so that you can help prevent this type of evil deed.

Keep this list locked in your desk at all times. Not only will everyone thank you for being so security-conscious, but, oddly enough, you suddenly will have remarkable job security.

- Use reverse psychology. Boldly announce that you should be the first to go. Offer to train your replacement. Unselfishly start documenting your responsibilities and procedures. Just make sure you come up with something that's nine inches thick. Fill it with anything: flow charts, blank forms, bowling scores . . . it doesn't matter. Everyone will avoid the document like the plague, and no one will get near your job with a 10-foot pole.
- Stall. Fill out the paperwork for a pay advance. Or ask to change the secondary beneficiary on your group life insurance policy. Little bureaucratic crises like these catch personnel off guard. They will invariably take months to process your request or lose your file altogether. Either way, you bought yourself some time.
- What to do if it's too late. You may have already had your exit interview. They could be cleaning out your desk right now. Thanks to those years of middle management, you may now find yourself unwanted, rejected and about as marketable as New Coke.

Don't despair; you are not alone. All over the country, groups of middle managers are banding together, forming support groups and trying to get on with their lives. Join one. They're in the Yellow Pages, under "management consultants."

Cohn is trying to be a computer salesman in Atlanta, Ga.

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SEE US AT DECWORLD '90

Policy for insurance standards

BY ELLIS BOOKER
CW STAFF

CHICAGO — The insurance industry recently stepped closer to a standard platform in its ongoing search for electronic connections among tens of thousands of independent agents and the thousands of insurance companies they represent.

A consortium composed of four insurance carriers and two leading insurance agency automation vendors announced the formation of a new company to market to insurance companies and agency automation vendors a personal computer-based software system. The system is designed to ease electronic connections between agents and carriers while making multiplatform agency software packages work together more smoothly.

"Today, when an insurance company wants to interface with an agent, it must contract with each agency system vendor, which must write a custom interface," said David Wroe, president and chief executive officer of Agency Management Services, Inc. (AMS). AMS, along with competitor Applied Systems, Inc. in University Park, Ill., are the two founding vendors behind Alliance for Productive Technology (APT), as the joint venture is known.

Promises to keep

The promise of a standard software interface for the country's 45,000 to 60,000 independent insurance agents — who typically represent three different insurers — has been made before. During the 1970s, an industry group began development of the Acord standard. But observers said acceptance of the standard has been slow and that most independent agents use dedicated terminals to access a single insurer's host computer.

APT officials said they would build on past interface efforts and that their software would use the Acord model as its core.

APT's software, which will come in MS-DOS and OS/2 versions, will be built around a relational database that will allow the insurance firm to add company-specific data to the industry model when the agent uploads raw data either in batch or through an on-line session. Databases located at the insurer and the independent agency will contain both the Acord standard and individual insurance company parameters; when changes are made to either the Acord standard or the company's own data form, they will be downloaded to the agents over Ivans, a 6-year-old insurance industry network carried on the IBM Information Network.

Slow acceptance

To date, acceptance of Ivans, like the Acord standard, has been slow, observers said.

"If you look five or 10 or more years down the road, it's inevitable there will be electronic data interchange for insurance claims processing — it just makes so much sense," said Laurence Chaite of the information technology planning practice at Arthur D. Little, Inc. in New York. "This is a positive step along the way," he added.

Chaite and other analysts said the choice of a personal computer platform for APT's interface product would put additional pressure on so-called "captive agents," who sell only one company's insurance product.

"[The interface] completes the puzzle," said Tom Eustace, chairman and chief executive officer of Applied Systems. He predicted productivity improvements made possible by the interface, which will reduce redundant inputting of information into different agent and carrier systems, could benefit consumers down the line in the form of lower insurance rates.

AMS and Applied Systems were joined in Chicago by representatives from some of the nation's largest property/casualty insurers: New Hampshire Insurance Co. in New York; Fireman's Fund Insurance Co. in Novato, Calif.; The Travelers Corp. in Harford, Conn.; EBS, Inc., a unit of The Travelers; and Chicago-based CNA Insurance Companies. CNA is the majority shareholder in AMS.

All four insurers will be on the executive committee that will manage the day-to-day business of the venture, and APT officials said they are seeking participation in the company by other agency vendors, insurance companies and user groups.

APT's marketing operation will be based in Chicago; research and development efforts will be conducted at the member vendors and insurance companies.

CASE on the fast track at large U.S. firms

BY MAURA J. HARRINGTON
CW STAFF

While computer-aided software engineering (CASE) has traditionally been used in highly technical development areas such as computer-aided manufacturing and computer-aided design, CASE technology is also beginning to be used in the commercial applications market, in areas such as project management, graphics-oriented analysis and design and documentation.

In a two-year, cross-industry study on CASE technology conducted by Boston-based Schubert Associates, Inc., more than 60% of the 100 large U.S. companies who responded said they plan to use CASE 30% more than they do now, during the next two years.

The study also showed that commercial use of CASE technology among these companies will grow significantly by 1992, with a likelihood that the largest firms in their market in the U.S. will use CASE tools in support of analysis and design and code generation in more than 70% of their development activities in those categories, according to Lynda Bodman, president of Schubert.

Other findings from the study showed that "CASE benefit objectives are in three dimensions: internal process improvements, project acceleration and end-results quality," according to those surveyed, which included information systems managers and corporate project leaders.

"The general feeling of those surveyed was that CASE tools are no longer associated with the glamour of the unknown; they are now associated as tools to solve the problems that they are built to address," Bodman said.

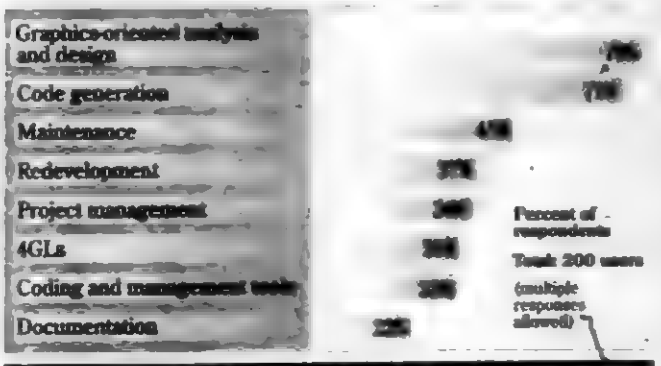
IBM's AD/Cycle strategy will also drive the use of CASE tools, according to Bodman.

"Eighty percent of our work in CASE today is on maintenance. . . . We lust for the time when IBM's AD/Cycle repository is here because we totally believe in the technology," said George DiNardo, executive vice-president in charge of information management systems research at Pittsburgh-based Mellon Bank NA. However, it may be some time before CASE technology becomes a household word.

Mark Mildorf, an employee at the U.S. Census Bureau in Suitland, Md., said while other offices within the Census Bureau have begun to explore the benefits of CASE technology, he is barely familiar with any CASE tools.

Wish list

About three-fourths of the users surveyed indicated that graphics-oriented analysis is the most important application supported by CASE tools today



Source: Schubert Associates, Inc. CW Chart: Doreen Dable

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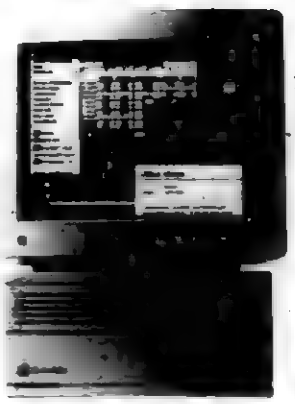

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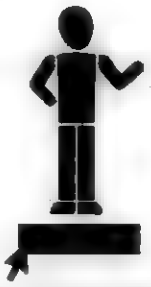

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*PC WEEK, May 7, 1990. **Direct LocalTalk connections dependent on NetWare 386 NLM due Fall, 1990. Macintosh connection achieved today via standard bridges.

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The secret life of Fermi labs

Physics lab takes do-it-yourself approach to computers: It designs its own

ON SITE

BY ELLIS BOOKER
CW STAFF

BATAVIA, Ill. — Colliding subatomic particles together at unimaginable speeds and building computers do not seem, at first glance, to have much in common.

However, physicists at Fermi National Accelerator Laboratory, best known as the home of the world's most powerful particle accelerator, have led dual lives for the past few years, quietly designing some of the world's most powerful computer systems.

The reason for this work, the physicists said, is simple: Computer power is essential to unraveling the secrets of matter.

"Computing is the key technological barrier to be overcome in high-energy physics," said Thomas Nash, head of the lab's computing division.

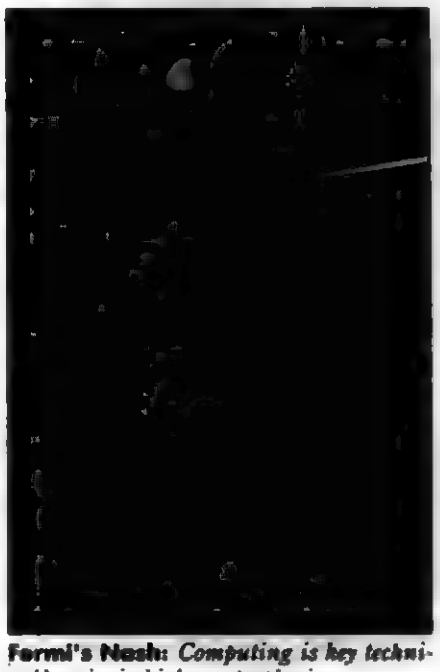
In the past, Fermi's do-it-yourself approach to computing has been driven by several factors, including the combination of greater demands by the lab's 400 scientists for computing power and a tight budget, which puts an emphasis on cost efficiency.

However, the most important factor by far has been the sort of physics done at Fermi.

"We're fortunate that our computational problem lends itself to the trivial parallelism in a simple-minded farm," said Irwin Gaines, associate head of the computing division.

Parallel computing at Fermi comes in two types. First, there is a single experimental machine, soon to be completed, that calculates a complex theoretical equation using software and hardware developed at Fermi.

Second, the trivial parallel processing uses processor farms — collections of dozens of Fermi-made processor boards and more recently, commercial reduced instruction set computing (RISC) workstations — to churn through the vast amounts of data and individual calculations produced by its particle acceleration experiments.



Fermi's Nash: *Computing is key technical barrier in high-energy physics*

For about $1.5 million, Fermi is constructing a massively parallel supercomputer capable of a peak rate of five billion floating-point operations per second (GFLOPS).

This machine, now capable of 1 GFLOPS and dedicated to solving an arcane but important theoretical physics problem, is better than the handful of other specialized computers of its class, according to its creators.

The Fermi machine will have 256 processor boards, each with 20 million floating-point operations per second of capacity, that communicate through the system's intelligent communications backplanes. Fermi's system is capable of 128 simultaneous asynchronous conversations running at 20M byte/sec.

However, the key is Canopy, a fourth-generation software system developed at Fermi for grid-oriented calculations that has already been used on a number of different parallel platforms.

The duty of Fermi's six processor farms is to sift through real empirical data. Since 1986, the lab has strung together relatively simple collections of processors to examine the vast amounts of data produced by the Tevatron, the central piece of equipment at Fermi.

Crammed with electronics and powerful magnets kept at minus 460 degrees Fahrenheit, the Tevatron is a four-mile-long circular tunnel in which two beams of subatomic particles (protons and antiprotons) are guided on a steeplechase until they are aimed at one another. The result is up to 50,000 particle collisions per second, each collision causing a dense shower of new particles to come briefly into existence.

It is in this sea of short-lived particles, which are recorded by ultrafast sensors, that Fermi researchers hope to catch the sixth or "top" quark, a theoretically predicted but as-yet-unobserved particle.

Big Bang insight

Finding the top quark would prove the prevailing theory of subatomic physics known as the Standard Model and give scientists an insight into the nature of the very early universe, moments after the fiery Big Bang 15 billion years ago. The search has become the basis of a fierce competition among particle physics labs around the world.

One typical farm uses six different cabinets, each with 18 processors. A Digital Equipment Corp. Microvax doles out the data of a single "collision event" from a magnetic tape to each of the processors in the system.

The need to record possibly billions of events is one major reason Fermi is moving from its original homegrown processor boards to RISC-based systems.

For example, a 2-month-old farm featuring 25 Silicon Graphics, Inc. workstations offers a total of 300 million instructions per second of computing power.

On-Line's strategy gets a Facelift, good reviews

BY JOHANNA AMBROSIO
CW STAFF

On-Line Software International, Inc. is due to announce Facelift tomorrow, the latest step in the company's renewed corporate direction, which includes a slew of new products and a changed computer-aided software engineering (CASE) strategy.

Facelift is a package that allows the user interface on an application to be changed without having to rewrite the underlying code.

Jack Berdy, On-Line's chief executive officer, said, "Our corporate strategy is to provide not just products, which we do — that represents almost 80% of our business — but also to provide consulting and education services." He added, "All our software will become Systems Application Architecture-compliant."

Users already seem pretty satisfied with the company. Blue Cross/Blue Shield in Washington, D.C., uses On-Line's Verify testing package "extensively," said Donald Rifkin, data processing coordinator. The organization uses Verify to test a new billing and administrative system that has not yet been put into production.

"I'm very happy with the product and with support and service," Rifkin said.

His thoughts were echoed by Michele Otto, senior systems specialist at Time Warner, Inc. in Tampa, Fla., and by Naston Manley, database administrator at Occidental Petroleum Corp. in Los Angeles. Both said they were happy with their On-Line products and with technical support.

Time Warner uses Intertest to test its magazine fulfillment system and other on-line applications. Occidental uses Ramis for reporting off databases.

On the CASE

On-Line users will have other new products to try out within a year or so. The company is developing CASE tools — both mainframe and personal computer-based — with Tata Consultancy Services in Bombay, India.

These products represent a change of CASE strategy for On-Line, which had introduced a full life-cycle development tool set called Casepac in August 1987. Two years later, On-Line stopped selling Casepac.

"We felt our product, having a DB2 data dictionary as the basis of the product, would compete with IBM's Repository," according to Janet Windeknecht, product marketing manager for information engineering. "So we decided to take Casepac off the market and unbundle some of the components, which are some of the tools we'll be releasing."

All the On-Line CASE software will "definitely be compatible with Repository. Our tools will include a migration tool, which will automatically populate Repository with the models

Continued on page 36

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DEC faces new foes with VAXft

BY MARYFRAN JOHNSON
CW STAFF

As its first fault-tolerant VAX computers start elbowing their way into the marketplace, Digital Equipment Corp. is confronting some unfamiliar faces in its scuffle for new accounts.

"We are running into competitors we're not used to," said Craig Anderson, a marketing consultant at DEC. Most often, that means Stratus Computer, Inc., but DEC salespeople have also bumped into their counterparts from fault-tolerant systems makers Sequent Computer Systems, Inc. and Tandem Computers, Inc., with whom DEC is not used to competing.

Interest in the fault-tolerant VAX tends to be highly specific for certain applications, Anderson added, such as train or vehicle routing, shop floor control, process manufacturing, lotteries or commercial clinical laboratories.

One contest still under way involves a Medicare application for a large Northeastern state, which refused to let DEC bid on the contract earlier this year, Anderson said. Once the VAXft 3000 was introduced, DEC was able to go back and pitch its new computer against IBM and Tandem.

"This has put DEC in the competition where it wasn't before," agreed Wayne Kernochan, an analyst at The Yankee Group in Boston. He and other analysts still noted, however, that the VAXft 3000 will be a "slow sell" for DEC, particularly since its salespeople first try to sell high availability — not quite fault tolerance — with clustered VAXs.

"What we've seen from DEC so far is that they are looking both to the obvious traditional fault-tolerant markets and within their own installed bases in banking and securities," Kernochan said. "Tandem, Stratus and DEC all have a very strong proportion of sales to their installed base, but this is really a battle for the future rather than for the present."

There are also signs that all-VAX shops are not necessarily the only homes for the never-fail VAX.

New territory

That was certainly the case with CSX Technology in Jacksonville, Fla. The computer services arm of the international transportation company is about to launch LMS-III, a locomotive management system intended to handle railroad activities on 20,000 miles of track. The system will display the entire railroad network on Apple Computer, Inc. Macintosh workstations. The LMS-III database will reside on the VAXft 3000, acting as an SQL database server for the workstations.

"We initially looked at all sorts of combinations of platforms," said Art Masson, director of transportation systems development for CSX, which is one of IBM's large mainframe customers. "But where Tandem and Stratus fell down was in workstation connectivity. Neither of them had the client/server connectivity we needed."

The company is projecting savings of $16 million to $40 million through this new application, which is supposed to improve locomotive use by 2% to 5%, Masson said. "When you're running a railroad, you can't afford to miss assignments due to a computer breakdown. You literally stop moving trains on the railroad when that happens, and it's not something I want to get a call about at three in the morning," he said.

Another transportation application where DEC emerged with a new account was at Thrane and Thrane, a Danish company specializing in global transportation networks. The firm said it plans to have as many as 50 VAXft 3000s installed worldwide by 1995 to provide services on the International Marine Satellite Organization telex communications system.

The Thrane and Thrane system will enable information on ship movements and cargoes, telex and data messages to be transmitted via shipboard modem, satellite and shore-based VAXft 3000s in Singapore and Denmark.

In a more traditional vein for DEC, the VAXft 3000 was chosen as the core system for a new distributed shop-floor-control and data-collection system at McDonnell Douglas Electronic Systems Co. based in McLean, Va. "We are moving to an all-paperless environment where one system failure could shut the shop down," said Doug Flaherty, senior manager of system development at the electronics manufacturer.

Accounting system fuels success at Baystate Gas

ON SITE

BY SALLY CUSACK
CW STAFF

CANTON, Mass. — The accounting system used at Baystate Gas is not the latest in software chic, but lack of glitz does not tarnish its ability to handle financial operations at New England's largest independent natural gas distributor.

According to David N. Martin, Baystate's manager of accounting information systems, the general ledger software system is the "hub of our wheel."

To maintain the delicate balance of remaining profitable to investors while providing fair prices to customers, Baystate currently depends on a Unisys Corp. A10 Model H mainframe for all functions and has been using a G/L package from Lawson Associates since 1985. Prior to that, a McCormack & Dodge (now merged with Management Science America to form D&B Software) program handled all general ledger requirements for the company, which was then operating in a Burroughs (now Unisys) B-680 environment.

There are currently 300 IBM-compatible personal computers, including Intel Corp. 8088- and 80286-based machines, as well as some Intel 80386-based Unisys systems, attached to the mainframe over 9.6K bit/sec. leased lines for billing functions. Approximately 110 of those users access the G/L system, Martin said.

The accounting department really loved the M&D package, Martin recalled, but when M&D dropped Burroughs support in 1983, Baystate Gas was forced out into the market to look for another program.

Looking to establish user consistency, Martin set down a set of criteria prior to the purchase, including that Baystate adhere to a one-vendor approach for all accounting packages and that the software have a single, interactive database.

After looking at several packages that met those requirements, Baystate settled on the Lawson general ledger program,

Baystate's *Martin recommends one-vendor approach*

in part because it was available in a complete and deliverable format. MSA offered a similar tool at the time, Martin said, but it was not yet ready for delivery, and Baystate needed something immediately.

The Lawson product, a component of its Pinstripe Accounting System, offers a flexible account structure that permits multiple levels of entry and reporting within a company and allows the user to change relationships between levels as it becomes necessary.

One of the most dramatic improvements was seen in report run functions, Martin said. "Under the old system, it took one hour and 40 minutes. Suddenly, it dropped to 12 minutes. It was amazing."

Since the general ledger installation, Baystate has also committed to the Lawson payroll, benefits and personnel modules to maintain files on its 1,200 employees and has bought Lawson's purchase order and inventory-control programs as well.

The accounting IS group's single largest project these days is to integrate these packages under a single materials management system, slated to be finished in October. It will be using a Lawson computer-aided software engineering (CASE) tool, called Android, to that purpose.

"We weren't really in the market for a CASE tool; it just made sense. It's the direction of the future," Martin said. "It tied in well with our applications, and it is perfect for systems generation." He added that Android's screen painter function generates actual Cobol code and that the software functions as a 100% Cobol-generated database CASE tool. Martin runs Android on a Unisys 800-25 A, 386-based machine under Xenix.

Plans to relocate

Baystate plans to relocate its headquarters in November, an in-state move during which the Unisys A-10 Model H mainframe will go back to the leasing company, and a Unisys A-12 Model T will take its place. The new building will also accommodate Ethernet over twisted-pair cabling, Martin said, which will eliminate the need for the communications cards currently used to facilitate micro-to-mainframe connection.

In the foreseeable future, Martin predicted that the gas company will be trying its hand in several different areas, including bar-coding techniques for meter and materials inventory, using portable terminals in the field and exploring the possibilities of automatic meter readings via the telephone. Martin, who started with Baystate as a staff accountant 22 years ago, remembered the early days of excessive overtime to finish a particular job. "Now, we literally have the information at our fingertips," he said.

TI acknowledges plans to send 990 out to pasture

BY MICHAEL FITZGERALD
CW STAFF

An era has ended at Texas Instruments, Inc. TI recently acknowledged that as of the end of last month, it will stop making its Model 990 minicomputer, even though one user claimed that TI promised only two years ago that the system was not a "dead horse."

The proprietary-architecture 990 was the TI Computer Systems Division's best seller ever, racking up some 120,000 installations since it began production in 1971. There are currently 5,172 Model 990s installed worldwide, according to market research firm International Data Corp. in Framingham, Mass.

TI began phasing out the fading machine in 1985, after it released its 1000 Series Unix-based machines. The 990 is based on TI's proprietary 990 chip and runs a proprietary DX10/DNOS operating system.

A TI spokesperson said the company will continue to sell refurbished 990s and will guarantee system support until at least June 1995. However, many users have already migrated elsewhere. Few current users seemed concerned with the news. "We're phasing out the 990 and moving to a micro platform," shrugged J. D. McKnight, senior systems manager for Louisville, Ky.-based Humana, Inc., a hospital management firm with 12 of the 990s.

Another former user laughed when told of the news. "That's a nice trick," said Michael McCulloch, manager of application development at La Quinta Motor Inns, Inc. "TI assured us [in 1988] that [the 990] was not a dead product and that they intended to sell at least as many as they already had installed." La Quinta switched from the 990 to a personal computer-based network in late 1988.

At least one company could profit from the 990's demise. Austin, Texas-based Ten X Technology, Inc. licensed the DX10 operating system six years ago and has built a coprocessor board that allows users of IBM PCs and compatibles to run TI 990 programs.

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Ask taps into process manufacturing

BY MAURA J. HARRINGTON
CW STAFF

BOSTON — Ask Computer Systems, Inc. last week introduced a business information system software package designed for the complex process manufacturing market.

Process manufacturing, which deals with products that must be mixed or blended, is a virtually untapped niche marketing area for software vendors developing programs that address the manufacturing resource planning market in the U.S., according to Anthony Friscia, president of Advanced Manufacturing Research, a market research firm based in Cambridge, Mass., that specializes in the manufacturing industry.

Manman for Process, which stands for manufacturing management and runs on Digital Equipment Corp. VAX systems, is a plantwide information system for process manufacturers. It was co-developed with DEC.

Looking for benefits

Manman for Process was designed for those manufacturers looking to benefit from certain process manufacturing needs such as formula management, process instruction steps, "mixed mode" manufacturing (a combination of discrete and process manufacturing) and manufacturing batch orders, said Ask's product marketing manager, John Valencia.

"Every process industry has its own nuances, and each company has its own problems. One of our biggest problems was the planning system," said Manman user Michael Gallant, manager of the IS department at Unitrode Corp.'s integrated circuits manufacturing division in Merrimack, N.H.

Examples of process manufacturing users include those that manufacture food, pharmaceuticals, processed foods and paper, Friscia said.

He added that the software industry traditionally has developed products for the discrete manufacturing market, which is a repetitive method of manufacturing, usually without the variables that complicate process manufacturing.

Manman for Process includes seven different software programs, including manufacturing functionality, accounts payable, general ledger, lot tracking, a systems integration software package and a repetitive software program for high-volume manufacturing, according to Valencia. Prices range from $50,400 to $141,500 for the software.

On-Line

FROM PAGE 31

and data." The strategy, Windeknecht said, is "to add value to whatever IBM offers, not to compete with a full life-cycle offering."

On-Line has recently unveiled other types of products, including a VTAM version of Verify and support for IBM's new Version 3.1.1 of CICS throughout the On-Line CICS product line, which includes Intertest, Verify, DADS/Plus and UFO.

Scheduled to arrive later this year is Shareoption 5, which reportedly will allow users to access a VSAM file for batch processing.

The company is also working on a new generation of Ramis. Scheduled to be completed in three years, the new Ramis will allow users to access and manipulate data stored across all of IBM's SAA-supported platforms and will adapt IBM's Common User Access interface, according to On-Line. Ramis will also have an object-oriented architecture.

There are no current plans for the systems software company to develop packages for non-IBM platforms. "As you move toward SAA-compliant software, you obtain the portability between the different environments that IBM supports," Berdy said.

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NEW PRODUCTS — SOFTWARE

Applications packages

Cincom Systems, Inc. has announced a mainframe word/text processing system that was designed for users of Computer Associates International, Inc.'s IDMS/DC environment.

M/Text enables end users, programmers or business executives to create and edit business documents such as memos, letters and reports. Other features include a mail merge and personalization utility that enables data from a database to be combined with text in on-line or batch environments, the vendor said.

Pricing ranges from $27,000 to $50,000, depending on CPU size and operating system.

Cincom
2300 Montana Ave.
Cincinnati, Ohio 45211
(513) 662-2300

Britz Publishing, Inc. has announced a system designed to provide small and medium-size businesses with a way to track fixed assets on an IBM Application System/400.

The Britz Fixed Assets System enables users to track fixed assets that have been depreciated or expensed as well as assets that cannot be depreciated. Lists, labels and inventory sheets are provided.

The product is available with RPG source code for $199.

Britz Publishing
101 Canton Road
Madison, Miss. 39110
(800) 255-2028

Compudrug USA, Inc. has announced a release of its Metabolexpert System for Digital Equipment Corp. VAX/VMS platforms.

The VAX/VMS version provides real-time compound look-up abilities, a secure knowledge base with an unlimited number of rules and an unlimited amount of stored metabolic trees.

The product lists at $25,000 for a VAX system with one to three users. Each additional user pays $3,500.

Compudrug USA
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(800) 877-0880

Information Builders, Inc. has announced the integration of an expert system with its Focus fourth-generation language.

Level 5 for Focus enables users to develop applications containing embedded knowledge. While remaining in a Focus session, users can perform consultative queries, exception reporting and intelligent validation procedures against any database or all file structures in a data center.

It is available for all versions of Focus for IBM VM and MVS and Digital Equipment Corp. VAX systems running VMS and costs $19,200 for the IBM and $2,800 for the VAX version.

Information Builders
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Cincinnati Bell Information Systems, Inc. has introduced a document processing system for the banking industry.

Docubanc supports statement rendering processes and facilitates comprehensive document and image management tasks. The IBM host-based tool enables users to specify layout, fonts, literals and data to be used in documents such as account and credit-card statements.

Retail pricing ranges from $100,000 to $200,000.

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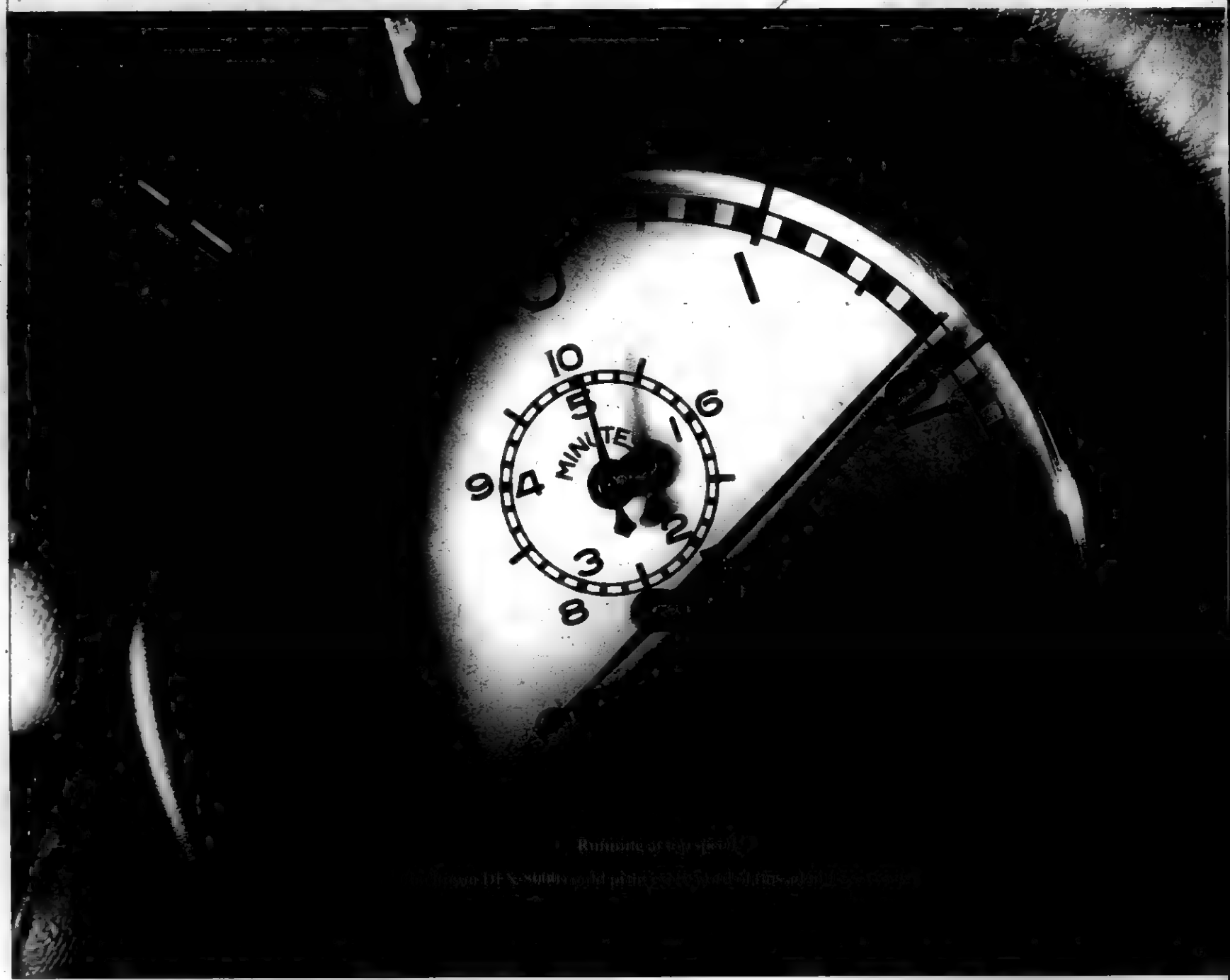

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Through a highly innovative two-in-one print head design, the engineers at Epson were able to double the speed of the DFX-8000—at a cost significantly below that of the average line printer.

While few printers can match the sheer speed of the DFX-8000, even fewer can match the ease with which it handles. Productivity-enhancing conveniences include Epson's advanced Smart-Park™ paper handling, dual paper feeds and an optional automatic paper cutter, plus other useful features rarely found on line printers.

As with every Epson, compatibility and reliability are a foregone conclusion. The DFX-8000 will easily connect to your PCs, minis and mainframes, and will run day after day without the least bit of trouble.

The combination of speed, features and reliability offered by the DFX-8000 is enough to accelerate the pulse of the most demanding high-volume printer user.

That is why, when you finish reading, we encourage you to watch it print a few hundred pages, in person.

It will only take a few minutes of your time.

Engineered For The Way You Work.™

EPSON

NEW PRODUCTS — HARDWARE

Processors

Paracom, Inc. has announced Multicluster-2, a midrange transputer-based parallel processing system.

The device offers up to 32 transputer nodes with 60 million floating-point operations per second and 400 million instructions per second.

Multicluster-2 can be accessed by workstations such as IBM Personal Computer ATs and Personal System/2s, Apple Computer, Inc. Macintosh IIs and Sun Microsystems, Inc. Sun 3s and Sun 4s. It can also be integrated into Ethernet networks via the Transmission Control Protocol/Internet Protocol.

Pricing ranges from $29,900 to $93,700, depending on configuration.

Paracom
2300 N. Barrington Road
Hoffman Estates, Ill. 60195
(708) 293-9500

Data storage

Gescan International, Inc. has announced Release 4.0 of its Gescan full-text retrieval system.

Features include a search accelerator that enables users of Digital Equipment Corp. VAX or Microvax systems to perform full-text searches without building and maintaining a collection of indexes and an interface that provides users with the ability to handle combined text, image and graphic data in X windows or Decwindows environments.

Pricing ranges from $22,000 to $55,000, depending on type of VAX CPU. A stand-alone version, Gfile, costs between $75,000 and $125,000.

Gescan International
P.O. Box 12599
Research Triangle Park, N.C. 27709
(919) 460-3100

Bull H. N. Information Systems, Inc. has introduced the MSS8090, an extension to its MSS8080 Mass Storage Subsystem introduced last year.

Its enhanced architecture provides data transfer rates of 3M byte/sec. An entry-level configuration includes an MSU8092 Mass Storage Unit with 1.89G bytes of formatted storage capacity and two intelligent peripheral interface channels that can transmit data at a maximum speed of 10M byte/sec., the vendor said.

Pricing ranges from $139,900 for a unit with 1.9M bytes of formatted storage capacity to $397,400 for a subsystem that can store 15G bytes.

Bull
Technology Park
Billerica, Mass. 01821
(508) 294-6733

Storage Technology Corp. has added two products to its family of direct-access storage devices (DASD).

The two-director 8900-cached DASD control unit features cache sizes of 32M to 256M bytes.

The half-string 8380R provides users with from 5G to 15G bytes of storage and is field-upgradable to a full 8380R.

The 8900 with a dual port and 32M bytes of cache will be available in the third quarter for $140,000. The 8380R will be available in the second quarter for $142,750 to $196,125, depending on storage capacity.

Storage Technology
2270 S. 88th St.
Louisville, Colo. 80028
(303) 673-5151

I/O devices

Psitech, Inc. has introduced the VME/1200, a graphics card set designed for Motorola, Inc. VMEbus applications.

The product includes four pipelined processors, three Motorola 68030s running at 25 MHz with static memory and a 32-bit digital signal processor — all of which combine to provide 18 million instructions per second and 25 million floating-point operations per second. A first-in, first-out device decouples VME or VSB busses to maximize throughput, the vendor said.

A single unit costs $10,000, with an optional 3M bytes of display list memory offered for $2,000.

Psitech
18368 Bandilier Circle
Fountain Valley, Calif. 92708
(714) 964-7818

Mitsubishi Electronics America, Inc.'s Information Systems Division has announced five monitors that operate over both interlaced and noninterlaced frequencies.

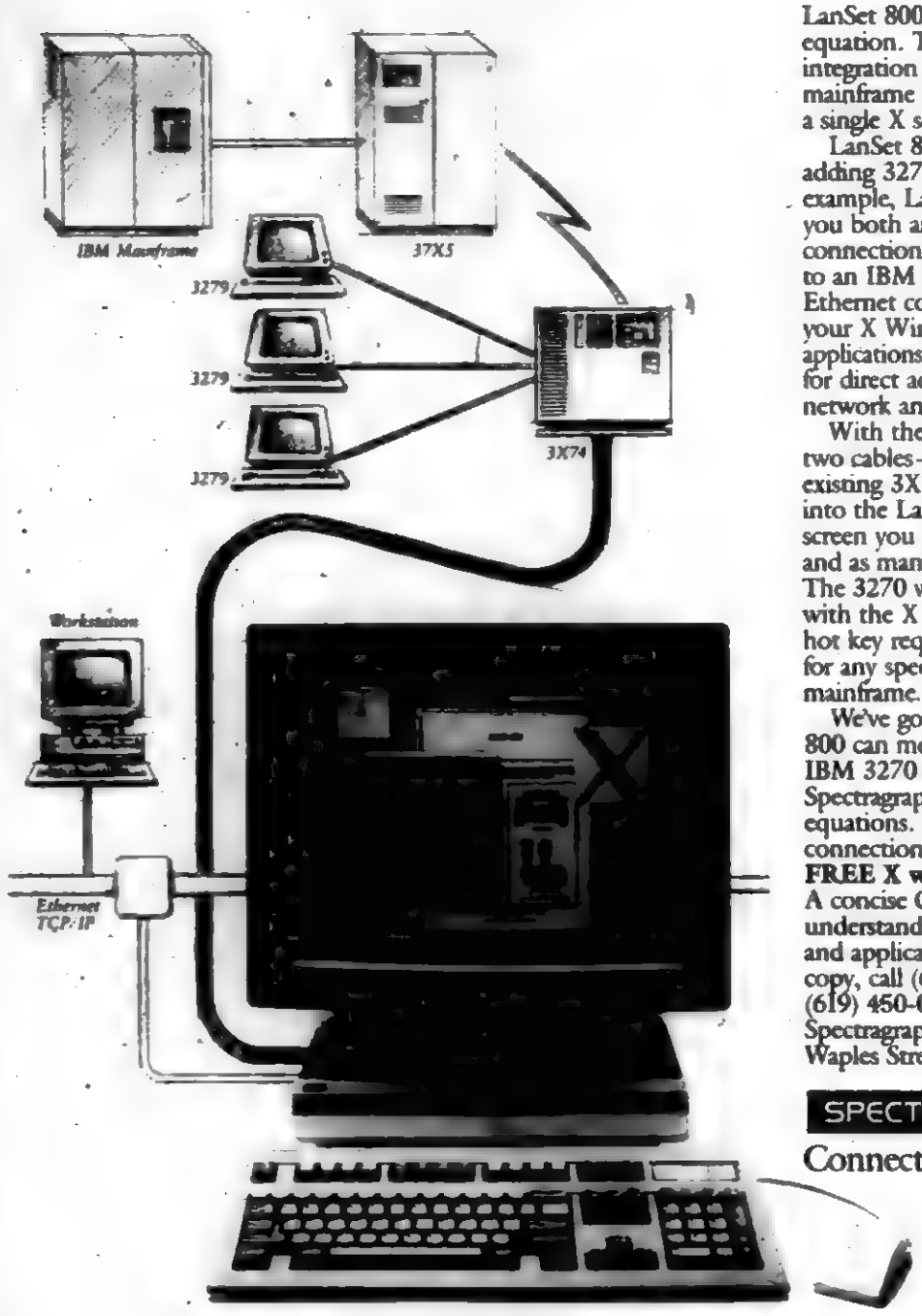
The Mitsubishi HC3905, FA3435 and HC3505SK models range in size from 14 in. to 26 in. and feature autoscanning between 15 kHz and 38 kHz (horizontal) and 50Hz to 87Hz (vertical). The products support analog or digital signal inputs without requiring any internal manual adjustments.

The monitors operate over frequencies such as IBM's Video Graphics Array, Enhanced Graphics Adapter or Apple Computer, Inc.'s Macintosh II.

Retail pricing for the products ranges from $1,280 to $11,300, depending on model.

Mitsubishi
991 Knox St.
Torrance, Calif. 90502
(213) 515-3993

X+3270=LanSet



LanSet 800. A new X Window equation. To give you full integration of X Windows and mainframe 3270 connectivity in a single X server.

LanSet 800 has several ways of adding 3270 functionality to X. For example, LanSet 800/3270dc gives you both an Ethernet TCP/IP connection and direct connection to an IBM 3X74 controller. Use the Ethernet connection for access to all your X Window and other UNIX applications. Use the IBM connection for direct access to your SNA network and SNA applications.

With the LanSet 800/3270dc, two cables–Ethernet and your existing 3X74 coax–plug directly into the LanSet X server. On the screen you have a 3270 window and as many X windows as you like. The 3270 window is fully integrated with the X environment, with no hot key required. There's no need for any special software on your mainframe.

We've got lots more ways LanSet 800 can meet your X Window and IBM 3270 needs. Check out all of Spectragraphics' X Window equations. We have the right connections for you.

FREE X windows Guide.
A concise Guide to help you understand X window technology and applications. For your FREE copy, call (619) 587-6969, FAX (619) 450-0218. Or write, X-Guide, Spectragraphics Corporation, 9707 Waples Street, San Diego, CA 92121.

SPECTRAGRAPHICS

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IDC WHITE PAPER

CATI: Computer-Assisted Testing and Implementation

If you don't think you need automated testing, just read the following article.

Every day, companies stretch the limits of their software programs without realizing that potential glitches could bring their operations to a halt. The examples in this white paper offer vivid testimony to this frightening reality.

For more than 17 years, we've been helping companies anticipate and correct these nightmares before they become front page news. Our products enable your company's DP and MIS personnel to simulate new programs, look at "x rays" of your system's inner workings and send out warnings before crashes can damage your company's reputation.

If you'd like to find out more about Compuware, call us at 1-800-521-9353. We'll do everything we can to keep you out of articles like the one you're about to read.

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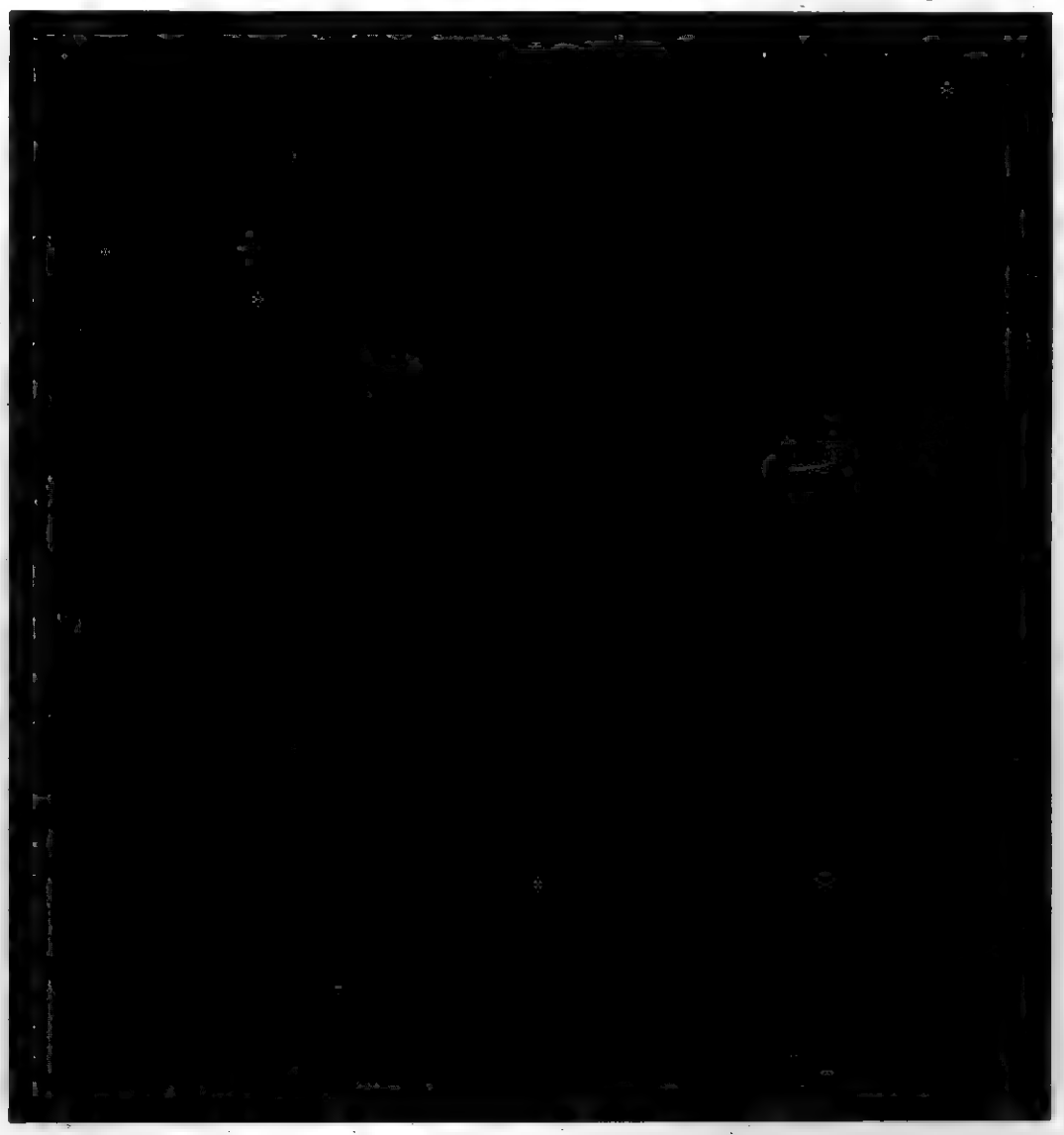
CATI: COMPUTER ASSISTED TESTING AND IMPLEMENTATION

AN IDC WHITE PAPER FOR INFORMATION SYSTEMS MANAGEMENT



CATI

THREE RECENT AND WELL-PUBLICIZED SYSTEMS FAILURES ARE LEADING CORPORATE MANAGEMENT TO RESTRUCTURE ITS APPLICATION DEVELOPMENT PRIORITIES. THESE EXECUTIVES ARE BEGINNING TO UNDERSTAND THAT BUILDING MISSION-CRITICAL APPLICATIONS THAT WORK EFFECTIVELY AND PREDICTABLY IS AS IMPORTANT AS INCREASING PROGRAMMER PRODUCTIVITY. ■ AT&T BEGAN TO NOTICE A PROBLEM. A MAJOR PROBLEM. ITS LONG-DISTANCE NETWORK WAS OUT OF COMMISSION. HOWEVER, HEAVY TRAFFIC WASN'T THE CAUSE. THE CULPRIT WAS A MAJOR FAILURE OF ITS NEW NETWORK SOFTWARE. AT&T REQUIRED MORE THAN A DAY TO CORRECT THE PROBLEM. IT

required longer than that to put its users at ease.

American Airlines recognized that it was not filling all of its available seats. A new software system indicated planes were full when substantial numbers of unsold seats remained. Revenue went out the window, and top management raised the roof.

The Internal Revenue Service was in a taxing situation. Its new digital, income-tax submission system wasn't working, and filers who expected immediate returns weren't getting them. The image of the IRS, already bad enough, got worse.

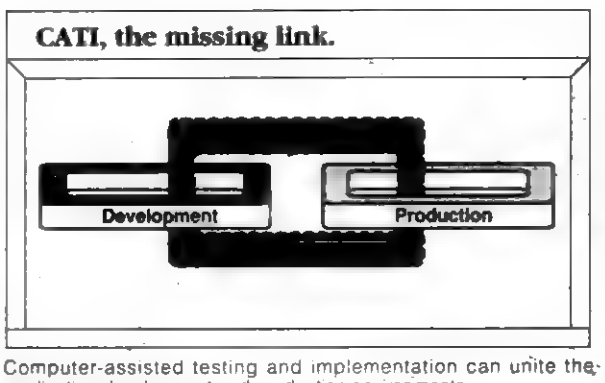
These highly publicized system failures and hundreds of less spectacular, less publicized examples highlight the need for more control in application development environments. Although its ability to rapidly generate code gives a predictable boost to application development, computer-aided software engineering (CASE) is not enough.

Increasingly, corporate managers are demanding computer-assisted testing and implementation (CATI) to ensure that mission-critical applications work as expected. CATI, an ally of CASE, is a set of coordinated and increasingly integrated tools used by application programmers to test and debug application software. Although less predictable in its productivity gains than CASE, CATI can be counted on to provide enhanced programs and fewer production problems in addition to detecting and correcting catastrophic system problems.

CATI TODAY

The AT&T, American Airlines and IRS examples graphically depict the importance of online applications to both current and future business success. The importance of, and growing interest in, CATI flow directly from the increasing dependence of modern corporations on online, networked applications. A company's complex application environment often includes several different database management systems, different file structures and different operating systems that may span multiple time zones and continents.

Online applications are the entry point into mission-critical business information used to make tactical and strategic decisions. The quality of these decisions necessarily reflects the application's strengths and weaknesses. This complex environment places greater demands on the testing, integration and implementation of systems prior to their migration to production.



Computer-assisted testing and implementation can unite the application development and production environments.

Despite the best efforts to prevent it, these crucial online applications do have problems. They can put the temporary fate of an entire company in the hands of an unfortunate applications analyst who is charged with finding a resolution while under unbearable pressure. When placed in a situation such as this, why attempt to cope without the protection offered by CATI?

HOW MISSION-CRITICAL APPLICATIONS FAIL

Mission-critical applications may fail in three general ways. First, the application may suffer from endogenous, or internal, failure. The errors arise from internal inconsistencies that can be identified in isolation. Standard testing and debugging tools and procedures can identify these problems and facilitate correction.

Second, the application may suffer exogenous, or external, failure. Exogenous failures frequently result from interactions with concurrent applications in large network installations. They cannot be identified in isolation. Exogenous failures must be evaluated in the actual production environment or in a simulated environment that effectively mirrors the actual production environment.

Finally, complex applications may suffer from internal inconsistency. In simple terms, the information output from the system may not properly reflect information that has been entered. Complex application environments with thousands, perhaps millions, of potential interactions cannot be validated directly. Recent testing advances use statistical regression techniques to test for valid replicative results.

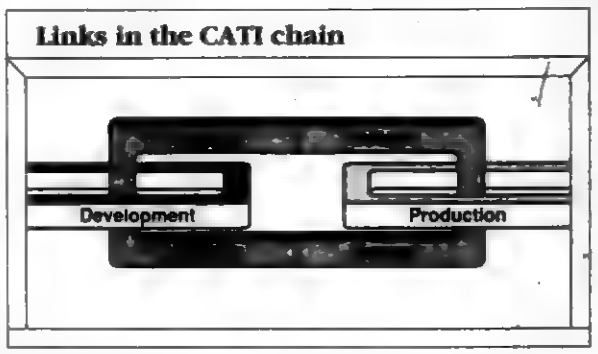
CASE has gotten a lot of attention in the wake of IBM's AD/Cycle announcement and the spate of related announcements from other vendors who want a piece of IBM's pie. Despite CASE's potential for developing new applications, however, it is often not the total answer to mission-critical application environments. IDC predicts AD/Cycle and its spin-off environments will lend themselves to CATI in the near future.

CATI – THE MISSING LINK BETWEEN CASE AND SUCCESSFUL BUSINESS RESULTS

Like CASE, CATI represents the natural evolution of well-known and widely used information systems testing and implementation tools into an integrated package. Those tools, described below, provide a wide range of capabilities.

Fault diagnostics, which rely on expert systems, or knowledge-based tools, intercept system error messages and other problems and immediately identify the nature of the problem. These tools essentially automate the time-consuming process of analyzing hexadecimal memory dumps and system error codes.

Network simulation tools do testing by replicating complex network environments. These tools help implementors who need to time-stamp processes in order to identify specific conditions that cause problems. They also help implementors stress test applications to determine the impact of imposing heavy loads on existing networks.



CATI is much stronger as an integrated entity than it is as a collection of its many individual tools

Some companies have an identity crisis.

We have an anti-crisis identity.

And what exactly is a software crisis? It's $50 million in lost ticket revenue to a major airline. It's a candy company coming up 11,000,000 chocolate eggs short at Easter. It's a telephone company losing half of their calls for nine very long hours.

These are actual software "glitches" that have had disastrous results. In terms of dollars *and* reputation.

That's why Compuware has devoted 17 years to developing products that detect errors and incompatibilities in IS systems. Our programs provide automated testing with clear, concise diagnostics that take you right to the source of any potential problem. Before it becomes a crisis.

Finding a solution *before* there's a problem. That's Compuware.

For more information, or additional copies of the IDC White Paper, call 1-800-521-9353.

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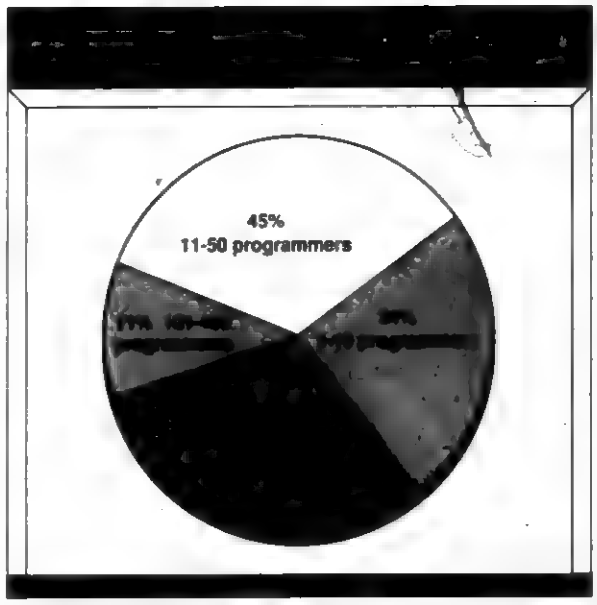
A typical network simulation tool can simulate a live, online CICS transaction processing environment. This allows programmers to do three things: test applications in environments with thousands of simulated transactions in progress, freeze specific snapshots of actual environments and modify simulated environments. Regression techniques permit evaluation of the accuracy and replicability of applications in complex environments.

Debugging tools facilitate immediate problem evaluation and resolution. They incorporate some sophisticated tools for isolating problems in complex network environments. On line editing tools permit rapid correction of application programs for both source code and data.

Without these CATI tools as a link, the benefits of CASE will not ultimately translate into bottom-line business benefits.



Almost 70% of IDC survey sites have between one and 50 programmers, while the remaining 31% have between 51 and 400.

THE IMPORTANCE OF INTEGRATED CATI

CASE and other application development tools measure their impact in terms of months and years. Development programmers can look months ahead to identify and resolve issues. In contrast, CATI measures effectiveness in minutes and hours. Once a problem is identified, management committees need not start counting the hundreds of thousands of dollars at risk, because CATI can identify, analyze and correct the problem swiftly.

Integrated CATI is beginning to establish the next plateau in testing and implementation. Integrated CATI offers two key facilities. First, it allows programmers to move easily between individual tools without logging on and off. This is provided – without extensive education and training – through common interfaces and instruction sets. As a result, solutions from one tool can be implemented within a second tool environment, seamlessly. This significantly reduces total programmer effort. Second, an integrated CATI environment permits construction of expert systems, which draw from common knowledge bases and information generated by multiple analysis tools.

The integrated CATI environment also allows IS and quality assurance people to capture the knowledge of programmers in a consistent and replicative manner. Integrated CATI, with diagnostics and simulation tools, enforces a testing and evaluation structure that remains with the corporation as programmers move to new levels, allowing maximum utilization of key people.

Although we may wish to believe otherwise, problem analysis and correction is an art, not a science. We rely on the expertise of individual technicians who have developed techniques for dealing with a finite number of specific problems. The technicians know the process, but IS typically neglects to capture that knowledge. Why? Many IS shops are so busy responding to, and solving, everyone else's requests and problems that they do not take time to step back and look at their own needs.

Specific problem types call forth common responses – the basic condition for developing an expert system. We are already seeing this methodology being developed in data centers with their "lights out" operations that allow the data centers to operate without humans on the premises. CATI capabilities such as fault diagnostics readily lend themselves to this type of intelligent environment. Why have a human responsible for recording and retaining solutions and responses to repeating problems? With CATI, this is accomplished faster – at machine speed – and more accurately. The integrated CATI environment employs reusable techniques and routines to analyze and correct errors. What could be simpler? In the volatile world of IS, CATI is a consistent buffer against the unpredictability of online systems.

Not too long ago, the major emphasis was on reserving processor resources with "desk checking," a labor-intensive, human-error-prone process. Today's approach is much different. In the quest to optimize the application development effort, there is still much concern for processor resources, but there is also concern for balancing human involvement with machine capabilities. The movement is toward minimizing human involvement, especially in repetitious tasks, while taking advantage of faster processors.

In operation, integrated CATI steps programmers and technicians through a specific sequence of diagnostic steps and possible fixes. In this environment, the problem of not incorporating the expertise of the IS staff is resolved, as CATI works best when synthesizing input from various sources.

Adding simulation capabilities to an integrated CATI environment moves testing and correction to a higher level. Simulation permits reconstruction of the environment in which the problem occurred. Problem resolution structures can require that revised applications pass tests in this simulated environment. This strict adherence to testing gives managers back the power to control their own computing fates.

CATI AS PART OF AN INTEGRATED APPLICATION DEVELOPMENT ENVIRONMENT

As integrated CATI moves upstream in the application development cycle, knowledge of specific problem areas and typical problem conditions will be built into the application development process. This procedure can happen in two ways.

First, new application development efforts can incorporate the knowledge contained in the integrated system. Development programs may be tested in simulated environments to ensure compatibility with existing application portfolios. IDC expects this will become increasingly seamless as application development tools become more sophisticated during the next 10 years.

Second, the knowledge can be incorporated directly into the application development engine. IDC believes this scenario, which is highly attractive to end users, will also occur within the next 10 years.

In either situation, integrated CATI represents a significant new plateau in the drive to automate software development. Leading-edge application development managers will increasingly use integrated CATI to amass application testing knowledge and remain at the forefront of application development practices. This leadership position will put them in a place to implement their systems with confidence, while possibly saving their companies millions of dollars.

CATI AND CORPORATE MANAGEMENT

IS enjoys a unique position in most organizations. Information systems increasingly represent mission-critical applications that help determine corporate viability. Few operating units with similar influence over corporate fortunes could consider moving directly from specification and development to operational status without a formal testing and evaluation process. The IS mystique, coupled with sometimes overwhelming application development backlogs, frequently leads IS to short cut their testing and evaluation procedures.

Despite knowledge of the aforementioned worst-case scenarios that struck AT&T, American Airlines and the IRS, corporate managers frequently overlook the comparative economics of CATI and CASE. CASE offers clear operational efficiencies, while CATI reduces the possibility of major loss and increases programmer productivity.

IDC's Software Research Group regularly monitors and forecasts IS application development plans. As part of its ongoing research, a group of 100 large IBM IS managers was recently surveyed. IDC discussed the users' application development environments and their plans and expectations for application development installations. Their responses, in combination with additional IDC user information, can be used to construct a typical IBM mainframe development installation.

Application development staffs at IDC survey sites range from 10 to 400 programmers, with an average of about 50. The average site programming budget is about $3 million. Using typical budget ratios, it is reasonable to estimate that the data processing budget at this average site will be in the $12 million range. This budget represents typical expenditures for a corporation with total revenue of approximately $500 million.

CASE users and vendors offer a broad range of estimates for sustainable productivity increases associated with CASE implementation. IDC estimates that new application development at large mainframe sites currently represents about 40% of total programmer effort. Total programmer expenditures for new application development would be about $1.2 million at our typical site. The site will probably find that new application development productivity increases by 25% after CASE implementation. CASE, therefore, offers a predictable benefit of approximately $300,000 per year for this shop. The site would also derive substantial indirect benefits from improved maintenance and program quality.

Assume that a specific mission-critical application is tied to 20% of corporate revenue. The mission-critical application at our typical site, therefore, would be integral to efforts generating approximately $100 million per year. In addition to boosting programmer productivity, CATI can help protect that figure from several potential losses.

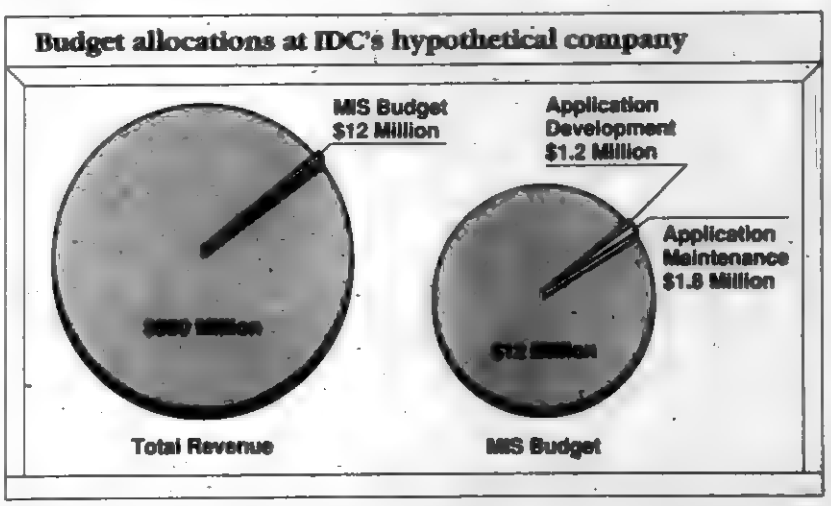
Every hour of downtime costs $2,000 if the system is running 24 hours per day. One day of lost operations per year would represent a total loss of $50,000. More insidiously, a 1% error rate – the equivalent of failing to sell three sellable seats on a 300-passenger airliner – would amount to $1 million per year. Detecting and preventing this error would generate savings equal to three times the expected savings from CASE implementation. With this type of savings, CATI payback periods can be measured in months, rather than years.

WHY DOES MANAGEMENT OVERLOOK CATI?

Today's systems are aging rapidly. This is a result of both business and technology advances. These existing systems are continually revised, and in many cases, completely redesigned and rewritten. The migration from hierarchical to relational database technology is an evolutionary phase that nearly everyone has made. Every effort was, and is, made to affect this process transparently to users. The next step is migrating from the current relational models to object-oriented databases. This step must also be accomplished with minimal impact on users. In order to guarantee this smooth and orderly conversion, the applications staff must have the automated assistance of CATI.

CASE offers clear economic justification in commercial applications – the reduction of existing programmer costs. CATI's benefits are more subtle, but once realized, can dominate those promised by CASE. One way to think of CATI is as an insurance policy. It may be expensive, and it may never be needed, but when it is, the payoff is large. IS setbacks occur in different forms. Some can appear as severe reductions in online system availability. Some will arise when systems experience high-volume peaks. Others will occur when migrating from one system to another. CATI can identify these problem areas before IS implements new applications. Despite these pronounced advantages, bottom-line-oriented top management may be reluctant to spend money on something that may or may not pay off.

Today, justifying CATI must go beyond



In order to illustrate the benefits of CATI, IDC set up a hypothetical company and gave it a realistic budget.

One programmer's phrase even upper management understands.

Ooops.

If you've heard it once, you've heard it a million times. Usually followed by a lengthy technical explanation. But what it all really means, in layman's terms, is problems. Big problems.

And no technical explanation is necessary. Because software program errors are no longer just technical problems. They're *business* problems.

The kind that can turn customers away. The kind that can show up in the papers. Or the annual report.

It's no secret that software development is a complicated and time-consuming process. What's not as well understood is the potential for problem—the long-term impact—of less than thorough software testing.

That's where Compuware comes in. With tools for automated testing, simulating real use, and quickly diagnosing and debugging errors.

Compuware offers your business something you may not expect from technical products. Results.

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the traditional piecemeal approach based only on productivity gained by each testing tool. This is perhaps easier than the detailed and sophisticated risk analysis that is also required. Ever conscious of their own bottom line, IS managers may be reluctant to incur these costs. Corporate line management responsible for financial performance must recognize that it is facing a huge risk by not implementing CATI. Management should work together with IS to evaluate potential losses and justify CATI installations.

WHAT ARE IS SHOPS DOING ABOUT CATI?

IDC application development survey respondents are typically and firmly stalled in the application maintenance quagmire. Overall, respondents are currently spending almost 60% of total programmer time on enhancements and repair of existing applications. Almost one-half of the respondents indicated that maintenance required 70% or more of their efforts. Despite the claims of CASE proponents, respondents say they expect little change by 1993. Overall, they expect to gain about 3% more time for new application development.

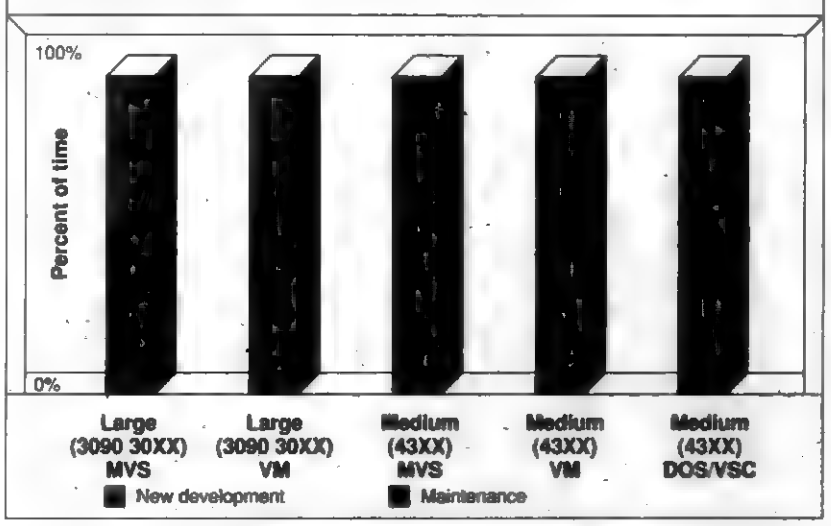
The continuing burden of maintenance and the application development crunch make it difficult for IS management to allocate resources for system testing and evaluation. Respondents' inability to balance their system development life cycles clearly demonstrates this problem. Managers at our survey sites indicate that they are currently allocating slightly over 50% of their total system development life cycles on code generation and program debugging. Less than 20% of total programming time is available for system testing and evaluation.

The number of shops that ignore testing and evaluation, or perform it on an ad hoc basis is alarming. Over 16% of those surveyed do little or no formal testing and evaluation for their new applications. As one industrial user stated, "We do our testing when we have time, or when we are introducing a critical new product. But overall our approach is strictly ad hoc."

Respondents in general report that older CATI tools, including debuggers and online editors, are important parts of their application environments, while newer tools, such as simulation tools and integrated environments, will become increasingly important during the next several years.

The increasing interest in CATI is spurring plans to acquire new tools and systems. Almost 50% of our respondents say they now expect to add new testing and implementation tools in the near future. Even more see a need to add integrated environments.

Time spent on new application development at IBM mainframe sites.



Maintenance continues to outweigh new applications development at Big Blue sites.

IS plans to install CATI will, in part, reflect the concerns of corporate chief executive officers and board members. The American Airlines problem emerged in a financial review by the board of directors rather than from IS. Financial shortfalls burden line management and corporate executives. They are the decision makers best able to evaluate the requirements for, and the economic viability of, enhanced CATI capabilities.

Survey respondents clearly expect senior management to recognize the need for application testing. The publicity that has accompanied recent system failures should significantly increase the visibility of testing and evaluation efforts.

A BRIEF HISTORY OF APPLICATION DEVELOPMENT

Early software developers in the late 1950s and early 1960s routinely automated manual processes by analyzing the work flow and duplicating the existing processes and procedures with computer programs. The emphasis was on understanding the process and then writing programs to significantly reduce both the time and personnel required to complete the manual processing effort. Little thought was given to process simplification, redundant functions and data, or interfaces to other systems.

The programmer functioned as business analyst, systems analyst, coder, tester and documenter of the system. Often the system design consisted of little more than pencil sketches of the process flow and identification of the programs and files required. The primary emphasis was on developing the program flowchart that explicitly defined the decision logic and actions required by each program in the system. Programming teams were small, typically one to five people, hence communication between team members was easily accomplished.

The Emergence of the System Development Life Cycle

In the mid to late 1960s, as organizations began to develop larger and more complex systems with larger programming teams, they found a need to formalize the system development process. System development life cycle methodologies began to emerge that addressed what steps or tasks had to be done and when, to ensure that the system would perform as required by the user community. Typically, most industrial-strength system development life cycles were broken down into life-cycle phases and tasks that defined the major categories and the necessary steps within each phase. The typical phases were planning, analysis, design, development, implementation and maintenance.

The use of this type of approach was characterized as "bottom-up" or "straight-line" development, as most practitioners fully completed phase 1 and obtained user sign-off before proceeding to phase 2. It was typically not until phase 4, which often

came months into the project, that any programs were written. Then it was necessary to fully develop and test each program, integrate programs into subsystems and integrate the subsystems into the overall system.

This often led to significant delays and frustrated users because bugs in the interface programs and the JCL were not found until late in the project. By then, time was short and most of the budget was spent. As a result of these factors and the lack of automated testing tools, test data development was typically left in the hands of the developers, not the users.

Throughout the 1970s, most corporations continued to focus on formalizing their system development life cycles to accommodate the structured design and programming methods being introduced by DeMarco, Yourdan, Gane and Sarson and their compatriots. These methods focused on specific techniques to develop high-level logical models of the system. Then, through a series of stepwise refinements, these techniques first decomposed the logical model into formal design specification requirements and finally into structured programs.

The use of these techniques gradually led developers to recognize that the programming effort could begin immediately after the system boundaries were set and the overall flow determined. However, getting programmers involved as early as phase 2 on such tasks as coding and testing high-level logic and all system interfaces, led to restructured development teams. More debugging aids were also used as testing was conducted throughout the development process.

In a new twist, many organizations also found that end users could become involved in the development process because of their ability to develop realistic test data.

Offsetting the "Waterfall" Approach

As analysts and designers gradually refined the specifications, program details were added to the skeleton programs already created. This process of specification refinement and programming enabled developers to show users increasingly complete results much earlier in the development process. It also allowed them to elicit user feedback while there was still time to make corrections.

Although this approach alleviated many of the problems associated with the "waterfall" system development approach – wherein work is completed in large clumps before feedback is received – developers were still prone to misinterpret requirements. Even though these misinterpreted requirements were normally found when the next version was demonstrated to users, a need for faster user feedback to control project costs and maintain the schedule became critical.

Rapid-prototyping evolved in the mid-1970s to meet this need. It counteracted the waterfall approach by getting users involved early and often. Now as then, a prototype may be an analytical model, a simulation of all or part of the proposed system, pseudo code or screen/report mock-ups with realistic data. In essence, the prototype is comprised of anything that helps the user and developer more fully communicate about the system to be built.

Also in the mid to late 1970s, fourth generation languages (4GLs) began to have an impact on system development methodologies. Fourth generation languages made it feasible to build a throw-away model that simulated key functions of the ultimate system. These key functions accepted input, produced output and for all practical purposes behaved as the final system for the set of functions modeled.

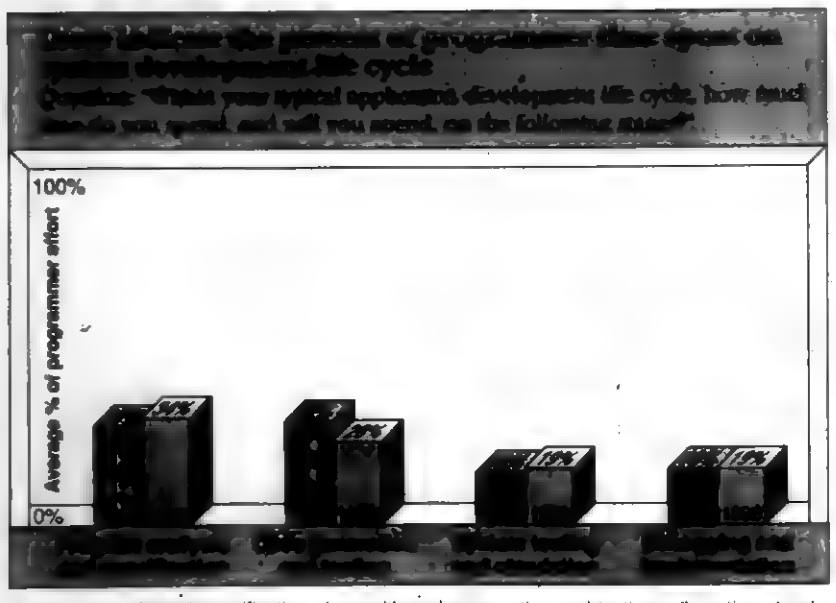
Application generators, or back-end CASE tools, also produced code rapidly. These products enabled developers to implement the rapid-prototyping methodology by rapidly developing incremental versions of a system, reviewing them with the users and incorporating their feedback in the next version. This process was repeated until the system was completed. Developers were in a sense programming in a specification-like language, which significantly reduced the necessary lines of code. Although a few of these back-end CASE tools were available in the late 1970s, they were only used by very early adapters and did not have a significant impact until the early 1980s.

Many prototypes may be built in the process of developing a complex system. Most will be aimed at clarifying/finalizing user requirements. Others may help developers and designers assess database design issues related to the placement of data sets for performance. Or they may define algorithms for complex mathematical calculations, assess final hardware requirements and determine overall system feasibility.

In the early 1980s, front-end CASE tools that performed initial analysis and design became commercially available. They provided graphic interfaces that enabled developers to improve their productivity as well as the overall quality of the development effort.

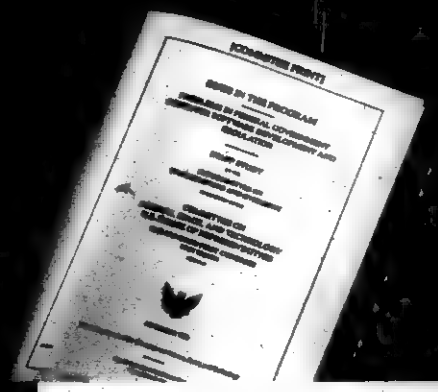
Although these CASE products were introduced with much fanfare, they did not meet with resounding success in the marketplace. Today, only 12% to 15% of mainframe shops are using CASE technology. This lack of market acceptance is primarily due to the failure of the early tools to meet the needs of developers. There are several reasons for this.

First, the tools were primarily focused on new systems development and overlooked systems maintenance. As mentioned systems



Program analysis and specification along with code generation and testing will continue to play prominant roles.

If *they've* issued a report on it,
imagine how widespread
the problem must be.



The U.S. government recently issued a report on the problems of software programming errors. By doing so, they showed *awareness* of the problem, as well as a *resolve* to do something about it. U.S. businesses have been slow to do either.

Is this just another government report? Is it a problem only the government is facing? Not by a long shot.

Then just how widespread *is* the problem? Is there reason to be alarmed? Only if your company uses any software programs.

If you do, we'll be happy to send you a copy of this government report. Along with some information on Compuware's automated testing tools for software programming.

Then you can learn more about the problem. As well as the solution.

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maintenance accounts for 60% of total man-hours within the average IS shop today.

Further, they did not support tool integration. For example, developers often used one CASE tool for analysis and another for design. And CASE productivity gains were difficult to quantify. Most IS shops did not have an adequate history of performance metrics to quantify and cost-justify the productivity gains from CASE.

Finally, CASE products did not support flexible applications. Developers needed flexible software that could be easily adapted to new technology and new methodologies.

Only recently are CASE products arriving that meet developer needs. Application development frameworks are being introduced that allow developers to integrate the tools from several vendors and perform all of the tasks associated with system requirements, design and code generation.

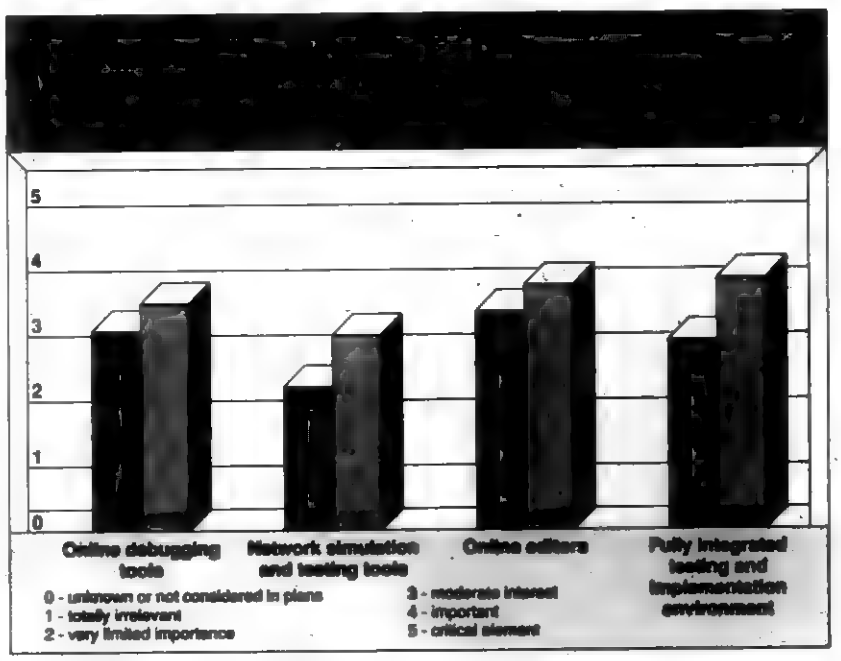
THE IMPACT OF SAA

IBM's Systems Application Architecture (SAA) emphasizes the need for meticulous test and evaluation procedures. SAA codifies IBM's view of the information processing environment of the 1990s by describing how all IBM computers will be able to intercommunicate. One key SAA concept describes distributed- and cooperative-processing environments. It will be implemented in both development and production processing arenas.

Developers working in an SAA environment will use programmable workstations as their primary development tools. However, the actual application development processing may occur on mainframes or servers connected to the developers' workstations. In order for this scenario to become reality, testing and debugging tools that are supported on all SAA platforms must be developed.

In the SAA world, users may enter their requests from a workstation running under OS/2. The requests will then be routed through a Unix server and transmitted via a Systems Network Architecture (SNA) network to a remote mainframe. It is unimaginable to think that anyone could design, develop, test and implement a quality application in so complex an environment without CATI.

Today, virtually all system failures can be traced to software, hardware or communications sources. Cooperative processing complicates these problems beyond simple comprehension. Software, hardware and communications are joined by the synchronization of data at the mainframe, server and workstation levels. Again, realistic problem resolution will not be possible without CATI.



Users indicate a clear, if gradual, movement toward integrated CATI.

LEADING-EDGE USERS

CASE and CATI are coming of age at about the same time. Leading-edge users are just beginning to realize the potential benefits of CATI tools. However, the situation is changing. Results from IDC's survey indicate that 60% of respondents will have some form of CATI installed by 1995.

We asked three leading-edge users to describe their experiences and help us convey the actual impact of CATI tools in their environments. These users represent a broad cross section of CATI users. The first user experienced significant programmer productivity gains in addition to increasing system availability dramatically. The second user used CATI tools to facilitate a major hardware/software conversion effort and retained the tools for application development. The third user determined that CATI tools offer a documented, supported alternative to internally developed utilities in a distributed application development environment.

Peerless Insurance Company

Peerless, a subsidiary of Nationale-Nederlanden North America, is an insurance company with offices in Keene, N.H. It is an IBM 3090 shop, which recently upgraded to a 3090-180E. Peerless handles most traditional insurance applications, including policy management and claims disbursal. It has experienced some normal problems with system availability. One problem in particular plagued the draft-processing program, which dispatches payments to claimants. As Russ Burns, systems consultant notes, "This is the type of application that generates a lot of heat when it goes down. Not much light ... but a lot of heat."

Peerless installed CATI tools to deal with these kinds of seemingly trivial problems that nonetheless were very difficult to pin down. Before CATI, IS was running at about 98% availability, with CICS regions going down approximately once every two weeks. Based on initial investigation and educated guesses, IS expected to find that 50% of the downtime resulted from storage violations under CICS. The group thought its CICS programs were looking for information that was either in the wrong place or the wrong form.

Peerless' management decided to bring in CATI tools to trap these storage violations. Storage violations are difficult to detect because they often lie buried in the logic of complex subroutines. They can be unearthed with storage violation trapping. This process traces the errors and pinpoints the errant code lines. The time-tested and highly unpopular alternative involves reading dumps that describe CPU memory contents.

Burns and other managers also recog-

Some companies spend more time planning for office parties than for devastating software crashes.

It's a rare company that doesn't spend weeks, even months, planning office soirees. And yet few companies devote the same energy to anticipating software problems that could quickly take them out of the party mood.

Why? It could be that time and other factors form a perceived barrier to thorough software testing. But the potential for problems from less than thorough testing is well known: a *single* software error can have serious effects on a company's business.

Compuware's automated testing tools for software programming work to eliminate these problems in a variety of ways. But they will only do so if they are a *planned* part of the testing and implementation process.

Plan to have Compuware get involved in your next project. Then, the only crashes you'll have to worry about are people who crash your office parties.

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nized that in addition to trapping storage violations, CATI tools would improve application programmer productivity. They knew these productivity gains would be icing on the cake if they could cost-justify the new software based on increased availability. Their calculations indicated that they could justify the software acquisition if the tools helped programmers find half of their storage violations.

"The hard justification would follow easily from increased availability," Burns notes. "Based on the hourly cost estimates we used for planning, we estimated that eliminating 25% of our downtime problems would result in a payback period of less than 18 months."

Their estimates proved to be conservative. Peerless programmers were able to identify storage violations that generated virtually all of the CICS region downtime. The problems were relatively simple. In one case a program placed information in a specific position and passed the address to another portion of the program. Unfortunately, still other parts of the complex program overwrote the information before it could be used. This and other storage violations were sometimes painfully obvious once the CATI tools highlighted problem sources. Without CATI, the best programmers may never have found the problems in the briar patch of assembler language code.

The fixes indicated by the CATI products increased availability to over 99%. The savings in CPU time alone justified their acquisition in less than six months. The fringe benefits, including better production programs, fewer production problems and increased application programmer productivity, continue to accrue for Peerless. "This was the best software acquisition decision we ever made," Burns declares.

IDC asked Burns which CATI features mattered most to application development programmers. He mentioned three. "First, application development programmers need source code-level debugging to facilitate corrections. Second, they need the ability to trap storage violations within macro assembler. And third, they need a user interface that's easy to learn. Our people who were used to CICS debugging were very pleased with our acquisition."

The bottom line, however, focused on availability and user issues. "The biggest impact of our acquisition was on our user clients," Burns says. "They saw better than a 50% reduction in downtime. And we save directly on system cost. A CATI purchase should be easy to justify to management based purely on hard dollars associated with availability without resorting to claims of increased programmer productivity. You can home in on the problem without tons of paper."

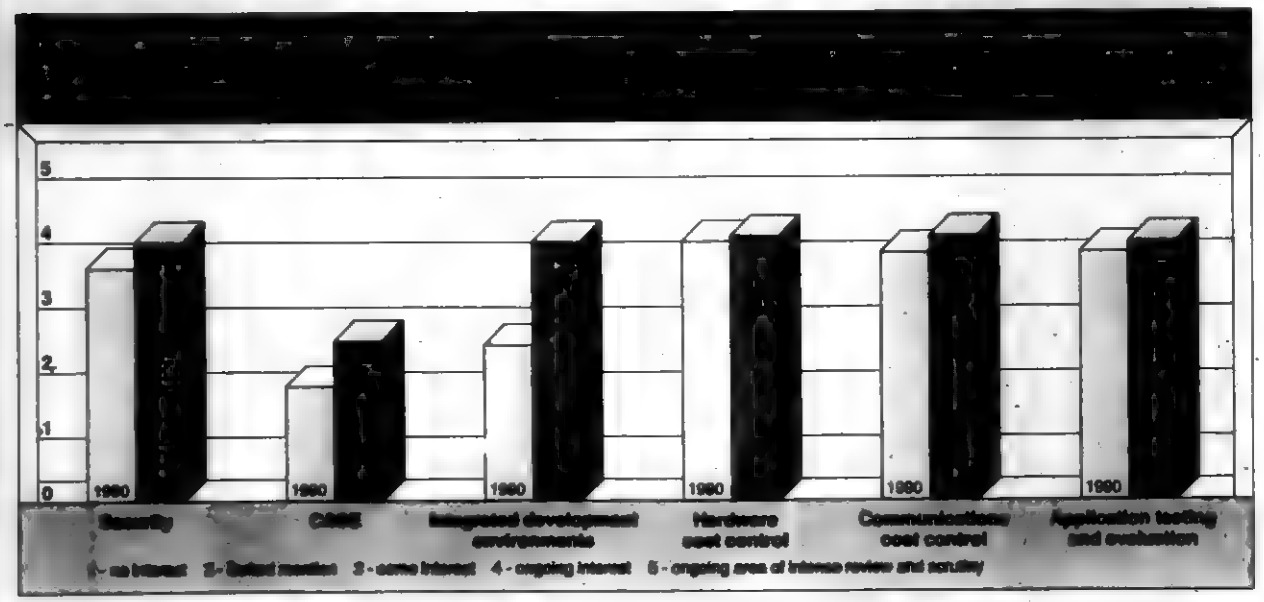
In mid-March 1990, the data center resources from Nationale-Nederlanden North America were consolidated in Indianapolis, Ind. While a significant portion of the application development staff from Keene was relocated to the new information home, a core application development group remained to supply local support. CATI tools have become increasingly important to this staff, as it will not have continual contact with a large number of associate developers.

Federal Home Loan Bank

The Federal Home Loan Bank (FHLB) concentrates on relatively low-volume/ high-value transactions. It was previously running check processing on several Burroughs systems at regional sites. IS developed software centrally and downloaded to remote systems. However, increasing loan volumes led the bank to a central IBM system linked via channel connect to check processing systems at the remote sites. The migration to IBM also led to changes in testing and implementation strategy.

According to Jerry Bassett, FHLB vice-president of MIS, "We recognized early in the planning stages that we would be moving to a very different testing and debugging environment. Our programmers were comfortable with the Burroughs environment, which provides considerable support for application testing and debugging. The IBM environment is quite different. We decided to use CATI tools as an alternative to working our way through the dumps from IBM."

CATI tools represented a key part of the bank's migration process. It had a relatively small application development staff, which was introduced to the IBM system and JCL. Several additional programmers came on board to handle some of the IBM system's



Users anticipate more top management interest in application testing and evaluation than they do in CASE.

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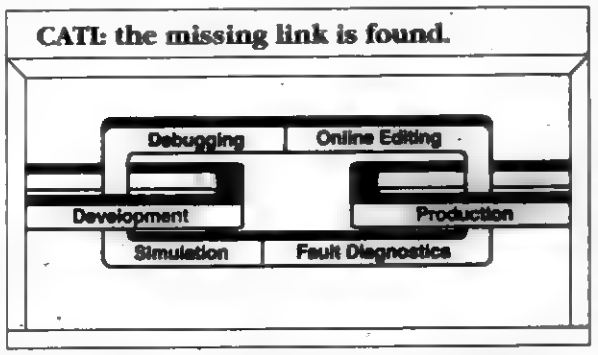
quirks. Testing tools significantly simplified their tasks.

The selection process was straightforward. The bank brought in the major contenders and quickly evaluated each product. Staff members were familiar with the products and reached a consensus on specific tools. FHLB also looked at larger, more complicated application software packages with some built-in assistance but decided that smaller was better for its needs.

The transition period went smoothly, although some programmers found the IBM environment difficult and cumbersome at first. Ultimately, however, they came to appreciate the greater power and flexibility at their installation.

The FHLB staff migrated 18 major systems onto the IBM hardware, working primarily with VSAM files and making extensive use of CATI tools. The staff complemented the testing environment with traditional parallel runs and test periods, permitting a final migration of all 18 new software systems in one day. As Bassett says, "We would have made it without the tools, but we wouldn't have done it in the same time frame."



Debugging, simulation, fault diagnostics and online editing are the key building blocks of CATI

Boise Cascade

Boise Cascade offers a third perspective on the benefits of CATI. The company maintains a highly distributed application development environment. Central facilities provide support, training, consulting and new product evaluation for the distributed application development centers.

Programmers in the application development centers developed numerous utilities over the years. However, maintaining and documenting these utilities represents a significant problem. The programs offer various types of interfaces, including control cards and switch codes. Users must remember multiple interfaces and operating characteristics.

CATI offers the benefit of a single consistent user interface. Existing products also provide active vendor support and strong documentation. These latter qualities become even more important as Boise Cascade evaluates strategies for implementing the integrated approach of AD/Cycle.

The decision to install CATI tools was easy. According to Gerry Hough, lead programmer analyst, "We do not require extensive cost justification. We work by the seat of our pants, allowing us to use our collective experience and judgment to determine if specific software packages are worthwhile. Those of us who have been here long enough know."

Hough's staff set up procedures for users who were accustomed to specific capabilities in the old utilities. Application development programmers are now actively using the new tools. "We see lots of demand for resources to handle the utilities," Hough says. "This is one product that just serves their needs. And the vendors provide support and documentation."

Hough reports he realized significant savings during a recent conversion. "It happened that I was doing both the conversion and the evaluation, so I knew the product from both sides. We saved many hours during that particularly huge conversion job."

Boise Cascade still sees additional requirements. In particular, the company is interested in obtaining CATI capabilities on PC development systems. "We need to be able to develop and test using mainframe-size file structures. The lack of test file manipulation facilities and LAN change management control products is slowing our move to PC development platforms," Hough notes.

MANAGEMENT RECOMMENDATIONS

The overnight batch system of 10 years ago could easily absorb errors and ad hoc testing, evaluation and debugging operations. The networked online transaction processing systems that form the core of applications in the 1990s are far less tolerant. Errors that meant long night hours for systems programmers in the 1970s may mean millions of dollars in lost revenue in the 1990s. Corporate management must respond to the obvious economics of enhanced testing and implementation tools.

It must also recognize that CATI offers positive competitive advantages in addition to reducing the impact of problems. Systems that sustain unexpected loads through testing and planning can provide significant corporate advantages. How can management gain access to these benefits? There are several steps:

- Review your planned and installed mission-critical systems. Be sure that you and your board of directors understand the extent to which you rely on specific systems for the ongoing operations of your corporation.
- Evaluate the cost of downtime. Develop a clear, although not necessarily exhaustively detailed, concept of your financial loss if your systems are unavailable.
- Evaluate the cost of possible errors. What will your company lose if your systems sustain a 1% error rate?
- Develop a methodology for identifying possible systematic errors. How would you know if your system errs significantly? You should identify conditions that indicate potential problems. Many large shops have installed, or are installing, executive information systems that alert senior management to problems by department, operating group or functional activity. Recognize that mission-critical applications are as important as physical production processes. Develop the same types of alerts and exception reports for your systems.
- Ensure that IS recognizes the importance of thorough testing and evaluation – and provides the state-of-the-art tools for required monitoring performance.

Complex information systems will determine the ability of today's corporate leaders to deliver the quality their customers deserve and the profits their boards demand. However, increasing corporate reliance on these systems, and exponential increases in their complexity, are exposing these corporate leaders to tremendous financial risk from catastrophic system failures. IS executives must remain vigilant in their efforts to minimize these risks.

CATI provides a powerful weapon in the battle against system failure. Integrated testing and implementation tools complement emerging CASE technologies. They accommodate the mandates of SAA by easing the introduction of cooperative processing. And they are critical in large open systems environments. The next 10 years will reward leaders with strong development plans. It will deal harshly with the timid who procrastinate.

A cure for the common code.

You don't have to go too far in business to find out about problems. Just read the morning mail or your phone messages.

But finding out about solutions—that's something else.

If anything you've read about software programming errors sounds like a problem you'd like to avoid, you've just found the solution.

And all you had to do was turn to this page.

Compuware automated testing tools for programming can help eliminate potential software problems, along with the anxiety that accompanies them. Compuware has a group of comprehensive testing and implementation tools that are now integrated to work together toward a common goal. No problems.

We've recently put together some case histories about how businesses like yours have used Compuware products. Call or write for a copy.

Then, along with the problems in the morning mail, you'll find solutions, too. In the package marked Compuware.

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COMMENTARY

Richard Pastore

The longer picture

A new-car buyer for the past 30 years, my father decided to save quite a bit of money last year by purchasing a used late-model Nissan Maxima. Used cars had always carried a stigma of inferior quality for Dad. What convinced him to take a gamble this time? It was the manufacturer's reputation for enhanced technology, a lengthy warranty and endorsements by other drivers and mechanics.

Similar factors may increasingly tempt PC shoppers to pass up the pricey, premium-brand machines from IBM and Compaq and — rather than buying "used" — save thousands buying boxes from aggressive second-tier vendors like AST or Dell.

Many of these clone firms are no longer the me-too companies they were when they began life. Some, like ALR Research, are whipping up technology advances while reining in prices. Others, such as Wang Laboratories, are offering aggressive warranties and money-back guarantees to add a dollop of security to the sweet deals. Also, some of the older second-tier players like AST have been around long enough to

Continued on page 70

Taking aim at the workstation world

IBM prepares full-scale assault with RS/6000

BY JAMES DALY
CW STAFF

AUSTIN, Texas — Across the road from IBM's central Texas headquarters, the bulldozers work continuously.

By early next year, the churned-up muddy construction site will be transformed into a network of offices and laboratories that will serve as a command post for what the firm has called one of the most important offensives it has ever launched — conquering the burgeoning workstation market.

When the RISC System/6000 workstation series was announced four months ago [CW, Feb. 19], IBM Vice-President Nick Donofrio said that IBM planned to transform itself from a shadowy presence in the workstation market to one of its top three vendors.

IBM is planning to provide briefings on the RS/6000's progress and future today.

Coming from all sides

However, while the family of nine workstations and servers has been hailed for its versatility and power, the technological strengths of the RS/6000 may be its most temporary boasting points. The reason is that Sun Microsystems, Inc., Hewlett-Packard Co. and Digital Equipment Corp. have promised leapfrog technology that threatens to leave the RS/6000 in the dust.

To IBM, them's fighting words. "We are not going to let the RS/6000 stagnate," said Phil Hester, director of the Advanced Workstation Division.

In a recent interview, Hester described an ambitious technological schedule that he hopes will maintain the momentum he says the RS/6000 line has already gained.

Hester's five-year battle plan includes the following:

- With performance capabilities doubling every 12 months, Hester said IBM is going to push the technology hard.

IBM scientists are working on machines capable of running at between 40 MHz and 50 MHz within the next two years, moving up to 60- to 70-MHz systems by 1994. Also, a model capable of processing 100 million instructions per second, more than double the power of the current line, will be available by 1994.

- Productivity will also be fueled by the increased use of parallelism in the RS/6000's design, Hester said.

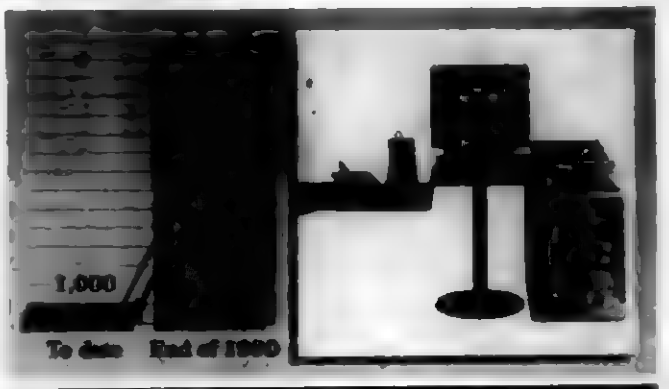
At the introduction of the workstation, officials demonstrated a view of future multiprocessing capabilities, including three workstations linked together to run a complex graphics application.

- The 64-bit hardware architec-

Continued on page 69

Rookie year

The RS/6000 workstation series, of which IBM has shipped 1,000 units, is in for a string of changes



Source: International Data Corp. CW Chart: Tom Monahan

Second Hypercard version adds versatility

BY JAMES DALY
CW STAFF

Apple Computer, Inc. spruced up its popular Hypercard program recently with the release of a revamped version that includes more than 100 new features.

Hypercard is an application that has been packaged with all Apple Macintosh computers shipped since 1987, wherein screens appear as index cards and users make notes, type or draw on the cards just as they could on paper index cards. The cards are grouped in related "stacks," and buttons on each card can be programmed to do a variety of things, from dialing a phone to linking one card to another.

New additions with Hypercard 2.0 include the ability to create multiple windows and view several stacks concurrently, new font and style menus and the ability to create cards ranging in size from one to 18 sq. in.

The Hypertalk programming language was also enhanced with a suite of debugging tools as well as an automatic runtime compiler, which allows designers to build more sophisticated programs and improve the feel of the stacks, Apple officials said.

The revision is the first major upgrade since the application was introduced in 1987.

Hypercard 2.0 will be available in volume this month. Software-only upgrades will be available through user groups, book publishers and Apple dealers. Hypercard 2.0 can also be purchased separately for $49.95, the company said.

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	Micro Focus COBOL/2 Workbench
1. Features for analyzing code to identify errors (1.0G)	10
2. Ability to meet needs and fit habits of skilled programmers (1.0G)	10
3. Integrated integration of tools (1.0G)	9
4. Quality of documentation (0.9T)	10
5. Quality of support for enhancing mainframe applications on PC-based COBOL implementations (0.6T)	9
Weighted Score	**9.6**

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MONO

Traditional PC LAN

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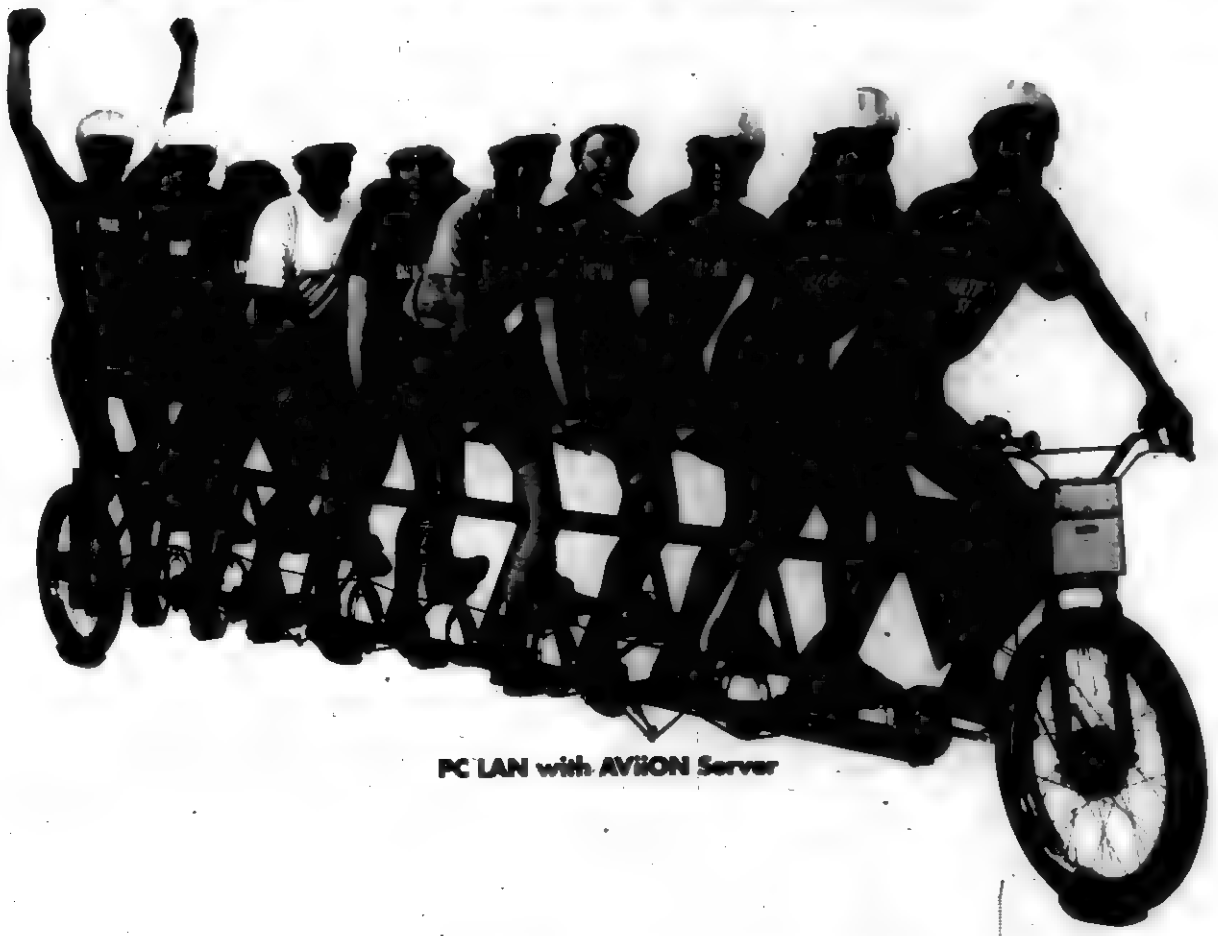
VS. MULTI



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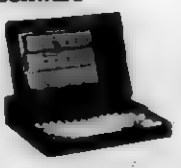

Data General's line of Novell NetWare solutions brings transparent networking and distributed applications to all your PC clients.

To learn more about how an AViiON server with Novell's Portable NetWare can bring more power and more applications to your LAN, call the distributors listed below or 1-800-DATAGEN. Also, ask about Data General's full line of PCs.

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"FINALLY, A SOLUTION INSTEAD OF ANOTHER BLACK BOX."

Physicist turns to Sun; NASA sees the light

ON SITE

BY JAMES DALY
CW STAFF

CAMBRIDGE, Mass. — The federal government is known for a lot of things. Simplicity is not one of them.

At the Harvard-Smithsonian Center for Astrophysics, researcher Ed Kellogg knows that if you want to sell an idea to an organization as labyrinthian and bureaucratic as the National Aeronautics and Space Administration, you present your ideas clearly and precisely — or they may never see the light of day.

But that just was not happening. When Kellogg joined the center two years ago as an astrophysicist, government proposals were often presented in mind-numbing volumes filled with dense text and complicated mathematical equations. To make matters worse, the preparations were created using either a large-print typewriter or a PC connected to dot matrix printers.

When visuals from the reports were put in an overhead projector, the approach was often ham-fisted, with unprofessional visuals containing neither borders nor identifying logos and on-screen print that was difficult to read, Kellogg said.

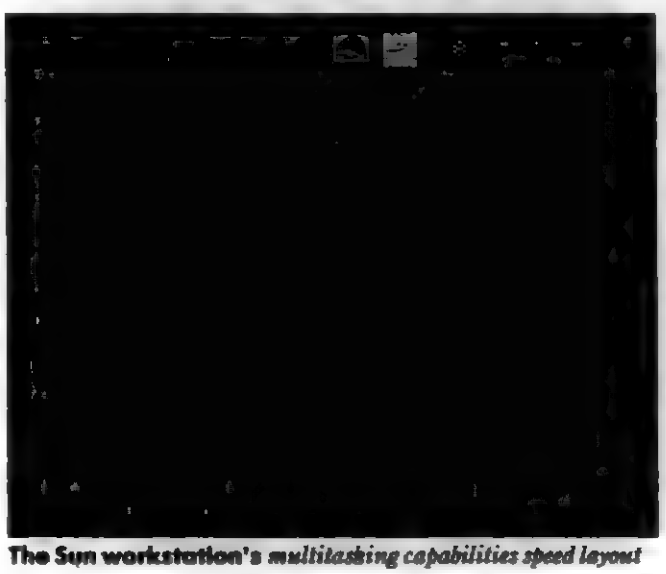
"People went away from the meetings thinking we hadn't accomplished much when, in fact, we had," Kellogg said. "As a result, much of the work we did and the progress we made was hidden."

There'll be changes

Kellogg's patience was running short. Changes had to be made, swiftly and boldly. His first target involved a project the center co-manages with NASA: the Advanced X-Ray Astrophysic Facility (AXAF), a space-based observatory scheduled for launching next year and expected to orbit the Earth for 15 years. The AXAF will measure cosmic X-rays that are invisible from Earth, test fundamental laws of physics and hopefully answer questions about the history and fate of the universe.

Kellogg's first efforts will be directed toward a plan the center had to calibrate the X-ray telescope before lift-off.

Like his colleagues — the 30 astrophysicists and 30 engineers make up the High Energy Astrophysics division — Kellogg used one of the division's 60 Sun Microsystems, Inc. workstations for engineering tasks. Now he decided it was time to teach an old dog new tricks.



The Sun workstation's *multitasking capabilities speed layout*

After searching through Sun's catalog of third-party software, Kellogg chose Frame Technologies Framemaker software and soon began sketching graphs and diagrams on his workstation.

Soon he was performing complex astrophysics calculations and graphics layouts. The windowing environment enabled him to simultaneously run the electronic publishing package in one window, display a spreadsheet exhibiting data from an astronomical database in another and run a directory executing Unix commands in a third. A fourth window offers electronic mail.

His first project turned out to be an elaborate one, using 60 viewgraphs. But although he lacked previous experience with Framemaker, he averaged a mere six minutes per sketch. First, from a graphics library, he selected three geometric shapes: two circles and a rectangle. He then quickly arranged the shapes into a diagram of the telescope and labeled each part. To polish up the image he inserted cross-hatching and wrapped a border around it.

By duplicating the diagram and tailoring it for each successive viewgraph, he clarified the main points of his presentation. The preparation that once took two days to prepare using a textual approach now took less than six hours, including printing and proofing. "It looked like I spent a lot of time on the graphics, but in fact I hadn't," he said. "If I had used only text in my presentation, the headway we made probably wouldn't have been so apparent."

The electronic publishing setup has quickly become an integral part of the division and recently proved vital in securing a deal to design and construct a sophisticated X-ray detection system for NASA.

"We were already convinced we were best equipped to handle these jobs," said a proud Kellogg. "Using this setup now enables us to convince NASA."

Quarterdeck, Microsoft see eye-to-eye

As firms talk standards, Desqview, QEMM releases fill Windows void

BY CHARLES VON SIMSON
CW STAFF

SANTA MONICA, Calif. — Quarterdeck Office Systems, Inc. recently took a step in sync with rival Microsoft Corp. when it announced new releases of its Desqview multitasking system and Expanded Memory Manager (QEMM). Desqview 2.3 will allow users to run DOS-extended programs and Windows graphical applications as well as conventional character-based applications.

QEMM 5.1 provides tools for integrating current installed DOS extended programs into Microsoft's Windows 3.0 environment. QEMM 5.1 will allow Windows 3.0 users to load terminate-and-stay-resident programs, device drivers and DOS resources into high memory when running in real, standard or enhanced modes of Windows 3.0. These types of applications are not compatible with Windows 3.0 by itself, the company said.

By moving network drivers and memory-resident programs out of the DOS address space, applications have more room to run in memory.

"It was pretty clear a year ago that DOS extended applications and Windows 3.0 were going to have problems," said Richard Able, Windows 3.0 product manager at Microsoft. "There was a sizable difference between Windows and the virtual control program interface that had emerged as the standard protected mode interface for most applications."

Executives from microchip manufacturer Intel Corp. were instrumental in arranging the meeting between Microsoft and Quarterdeck Office Systems that led to development of a compromise architecture.

Able said that Intel realized that the divergent interface standards would confuse the market for its 80386 microprocessor products. "Intel acted as a catalyst, and we got together the DOS protected-mode interface. Until that standard is set, the Desqview and QEMM products fill a significant void in the Windows 3.0 area. It is an important set of products for the industry," Able said. Currently, no applications work under the DOS protected-mode interface standard.

"Microsoft did not choose to make high memory available to Windows standard or enhanced mode users," said Therese Myers, president of Quarterdeck. "This revision of QEMM will empower Windows users who intend to run their existing DOS programs in Windows 3.0."

Desqview 2.3 will allow users of Quarterdeck's environment to run DOS programs, 286 extended DOS applications such as Lotus Development Corp.'s 1-2-3 Release 3 and 386 DOS extended programs such as Borland International's Paradox 386.

> **INTEL realized that the divergent interface standards would confuse the market for its 80386.**

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ATMs deal in wheels now

National, Budget rollout unmanned car rental booths

BY MICHAEL FITZGERALD
and ALAN J. RYAN
CW STAFF

After a long flight — probably with delays — most travelers are not keen on the idea of queuing up behind eight or 10 other people to sign a prearranged car rental contract. At least that is what National Car Rental System, Inc. is counting on.

Similarly, consumers are not too thrilled with having to run about town looking for a car rental office after dropping off their own cars for several days of expensive repairs. That is what Budget Rent-A-Car figures.

Beginning in September, National will roll out the second installment of its Smart Key technology — Smart Key II — which allows for quick car rentals for its frequent customers without the intervention of counter personnel. By the end of the year, 200 of the automated teller machine (ATM)-type interactive units will be in place at National locations, predominately at airports.

Meanwhile, Budget is installing 40 automated systems; however, unlike National, it is focusing its ATM-like remote transaction booths in mall locations rather than at airports or hotels and is targeting the system at new customers.

Budget tested the mall concept by installing four booths at Sears Automotive Centers malls in the Dallas-Fort Worth area. Based on the test, Budget has ordered 40 of the approximately $25,000 booths for installation in Minneapolis; San Francisco; Seattle; Hawaii; Raleigh-Durham, N.C.; and Vancouver, B.C., which are all strong markets for Budget. The company has options on another 60 booths from RT Technologies, a San Antonio-based start-up.

Customers sit in the remote transaction booth and connect to a central reservation desk via a phone. A reservation clerk directs the customer through the rental process, using video images transmitted via the computer to verify driver's licenses and contracts. Customers slide their credit cards through a magnetic-stripe reader, and the computer processes the information and prints out a contract. The camera verifies that the customer signs the contract, and an attached carousel deposits the appropriate keys with the customer. The average transaction takes 5 minutes.

Budget's *remote transaction booths use video images to verify contracts*

National's system is built around a personal computer linked to National's central processor in Minneapolis, according to Chief Information Officer Jack Livingston. Access to the system and the cars that can be delivered through it can be controlled in real time from the company's Minneapolis headquarters, he said.

Using Smart Key II, the customer would walk up to the machine at an airport or other fleet location. Using a National credit card, the user can see an inventory of available rentals at that location. The user selects a car, takes a receipt from the machine, goes to the lot and drives off with a car. The only human intervention will be confirmation of the rental by the lot attendant as the driver leaves.

The original Smart Key machines — which actually present keys to the customer — debuted in March 1989. They will still be used in smaller airports and less-secure National lots where keys cannot be left in the cars.

Topscan targets tedium of document scanning

BY JIM NASH
CW STAFF

Since it is impossible to fit a human brain into an optical character recognition (OCR) system to spot mistakes, it can be tricky to transfer hard copy to a database.

Scanner users have long bemoaned the task of paging through an electronically stored document and the original in order to reconcile errors. However, at Coopers & Lybrand, a consulting and accounting firm based in New York, users think they have found the balance between intelligence, speed and cost. Three months ago, the firm picked up Topscan Professional. Introduced last year, Topscan is an OCR firmware product by Calera Recognition Systems, Inc. in Santa Clara, Calif.

Another firm, marketing consultants The TDA Group in Palo Alto, Calif., has picked up a downsized software version of Topscan, Wordscan Plus/AT, designed for less production-intensive settings. The Topscan series of products was formally introduced last month.

Intensive use

Topscan has document management capabilities intended for heavy production use. Among the features is a forms-identification program that allows Topscan to identify which form it is reading so it can scan the correct sections quickly. Wordscan lacks most management features because it is aimed at the more casual OCR user, a company spokeswoman said.

Both run IBM or IBM-compatible platforms based on Intel Corp. 80286 and higher, with a minimum of 2M bytes of memory.

Coopers & Lybrand senior associate Andrey Hankewycz said the firm processes 50 to 100 three-page management reports with tables each week. Those documents are scanned on a Hewlett-Packard Co. Scanjet Plus and, until recently, were electronically stored with an older Calera OCR device, Truescan, he said.

Hankewycz said he switched three months ago to Topscan Professional for one basic reason: Topscan reduced the number of steps involved in processing paper, compared with its predecessor. He said Topscan beat out its competitors, Caere Corp. and Xerox Imaging Systems.

TDA Group partner Bob Tabke also said he found the new Topscan/Wordscan programming superior to previous Calera products. "It's at least two or three times faster in terms of correcting the copy to match the original," Tabke said.

In preview mode, both Topscan and Wordscan allow operators to select specific fields on each page to be scanned and stored, eliminating the need to process whole documents. In correction mode, they use different colored highlights to cite suspected spelling errors, wrong characters and words not in their dictionary.

Other systems use a tilde or an asterisk to indicate problem words, which makes it more difficult to work through copy quickly, Hankewycz said. Tabke said he has been unable to find these features in Wordscan's $595 price range. Wordscan runs on either an Intel 286 or 386 processor with Microsoft Corp.'s Windows 3.0.

Calera offers a pop-up window in both products that, on command, will display a highlighted word exactly as it was recorded by the scanner. This feature, Hankewycz said, virtually eliminates the need to go back to the paper original in the correction process.

The Topscan computer board costs $6,495, combined with a Calera scanner, it runs $31,950. The Wordscan software-only product costs $595; the firmware product, Wordscan Plus AT, costs $3,995.

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Truckin' down the road to efficiency

ON SITE

BY SALLY CUSACK
CW STAFF

KNOXVILLE, Tenn. — With a fleet of 41 tractor-trailer trucks delivering foodstuffs to 7,000 client sites across the Southeast, the folks at Institutional Jobbers Food Service Distributors, Inc. know the importance of being at the right place at the right time.

Looking to boost route productivity by decreasing unnecessary mileage, Institutional Jobbers recently replaced its minicomputer fixed-routing software system with a more flexible personal computer package. The software, called Trucks, is from STSC, Inc. in Rockville, Md., and Version 6.0 of the program is currently whirring away on the food company's Compaq Computer Corp. 386/25 computer under the MS-DOS operating environment.

"The problem with the previous system was that it was done manually on the Hewlett-Packard 3000 machine," said Lowell Cummings, the company's transportation supervisor. "Adjustments took a while, and we couldn't automatically account for things like product fluctuation."

Fluctuations are a fact of life at the food distribution organization. The company delivers goods to restaurants, schools and hospitals in nine Southeastern states and reports $150 million in annual sales.

Keeping orders in order

Trucks 6.0 provides a database that sorts by city, state, Zip Code, customer number and customer name and computes all orders by latitude, longitude and proximity to the distribution center. The program then plots optimum delivery routes covering the least distance on easily traveled roads.

"It's taken the guesswork out of delivery times," Cummings said. "Now, if a key customer needs a 10 o'clock delivery, we can guarantee a 10 a.m. delivery."

Cummings said that while business has increased, his company has actually eliminated six routes per night since the system was installed in April. "We're driving about 40,000 miles a month less, and that gives us a very significant dollar savings," he noted.

After looking at several software programs, including Roadshow from Routing Technology Software and Roadnet Technologies' Roadnet, the company decided that STSC offered the best overall package for their purposes. The Trucks package did not have as many pretty pictures to look at, Cummings said, but the answers were better. Ease of use was also a deciding factor in the purchase.

> "WE'RE DRIVING about 40,000 miles a month less, and that gives us a very significant dollar savings."
>
> LOWELL CUMMINGS
> INSTITUTIONAL JOBBERS

The installation process took approximately three months, with a significant chunk of that time devoted to cleaning the customer database, Cummings said. STSC was onsite for three weeks during the installation process, he added, and has followed up with very good phone support.

The software's flexibility is another key to its success at Industrial Jobbers. The stops are always changing, according to Cummings, and there are a number of parameters involved. These include Department of Transportation specifications on the number of hours any one driver may log in a single day, individual truck weights and volume of cargo, as well as destination and customer location. The package prints out reports on variable cost per mile, cost per hour and number of dispatch calls.

Cummings said the company is now paying an incentive plan based on the Trucks program. If the driver runs faster than the package predicts, he gets a bonus. "This way, the faster guys get rewarded, while the slower ones get penalized," he said.

TI plans OS/2-based tool set

New IEF components to parallel MS-DOS counterparts

BY JOHANNA AMBROSIO
CW STAFF

Texas Instruments, Inc. is planning an OS/2-based tool set for the Information Engineering Facility (IEF), to ship sometime this summer.

According to marketing manager Gregory E. Mann, the new IEF components will allow users to develop and test models for systems using OS/2 workstations. The models can then be used to generate code for other hardware platforms such as MVS.

The OS/2 versions of the Planning, Analysis and Design modules will be very similar to their existing MS-DOS counterparts, Mann said.

New for the OS/2 world is the Construction Toolset, which generates Cobol source code and relational database definition statements. Construction currently works with DBM, the database management system that is included with IBM's OS/2 Extended Edition, although TI may add other DBMSs in the future, according to Mann.

Also, TI is developing an IEF tool set for Unix workstations, although the company is not ready to formally announce that, Mann added.

In the meantime, the four OS/2 tools will sell for $23,800. A trade-in program is available for current users of the DOS packages.

RS/6000

CONTINUED FROM PAGE 61

ture will come into its own within the next three years and be incorporated into the RS/6000.

"The 32-bit architecture is running out of gas [in the workstation]," Hester said. "We'll need to address far more than 4G bytes of addressable memory."

Additionally, a 16M-bit memory chip will be standard on the machine within three years, Hester said.

- Although low-cost RS/6000 models are planned, Hester said that the top-priority "real-life" systems will be priced at $10,000 and up.

"It doesn't take too long to figure out that the bare-bones prices that people advertise are a long way from what it's going to cost to put a usable machine into an organization," he said.

- The availability of a wide range of software applications will go a long way in selling the RS/6000, according to Hester, and he promised "improved" but unspecified advances in IBM's compiler technology.

Meanwhile, IBM will continue to improve the POWER architecture's functionality and power — for example, by shrinking the circuitry.

Break in tradition?

Hester added that IBM is considering breaking with tradition by licensing the POWER architecture, but he would not speculate on who the interested parties would be.

Analysts, however, have put forth one possible client: Steve Jobs' Next, Inc., an IBM partner that has said it will produce a machine based on reduced instruction set computing technology.

While Hester did express interest in the chip-design work being done in gallium arsenide by people such as Cray Research, Inc. founder Seymour Cray, he predicted that in the foreseeable future, IBM's Personal Computers and workstations will continue to be based on CMOS technology.

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StorageTek.

Pastore

CONTINUED FROM PAGE 61

have acquired a word-of-mouth reputation from users (for good or bad).

All of this adds up to a more convincing argument to take the plunge and abandon the old-fashioned nostrum of "the costlier the better."

Everybody has heard horror stories about crummy clones. Kaypro — its new management admits — shipped out a lot of defective machines, but that company has since filed for Chapter 11. But companies such as AST and ALR have proven their staying power and have been gaining market share, according to researchers. These companies' current offerings and future prospects have landed them on the most-favored lists of Wall Street analysts such as Paine Webber's Stephen Smith.

Furthermore, relatively venerable companies such as AST and Wyse have logged their share of ringing endorsements from longtime customers. Melvin Boyer, MIS director at Louisiana-Pacific Corp. in Portland, Ore., says 75% to 80% of the company's personal computers are clones from AST and other vendors. "AST does make good equipment; we do not have any problems in that arena," he said.

"From what I could determine, Wyse is as reliable as Compaq," said Don Race, director of information systems at Cedar Fair, an amusement park partnership in Sandusky, Ohio.

Companies that lack such a track record are instead tempting users with technology innovations and peace-of-mind guarantees. Airis Corp., a Chicago-based notebook PC start-up, recently leapfrogged the higher-priced competition with an IBM Video Graphics Array-equipped unit that gains 12 hours of battery life from patented power-conserving innovations. The company was also able to price the unit about $1,000 less than its closest competitors.

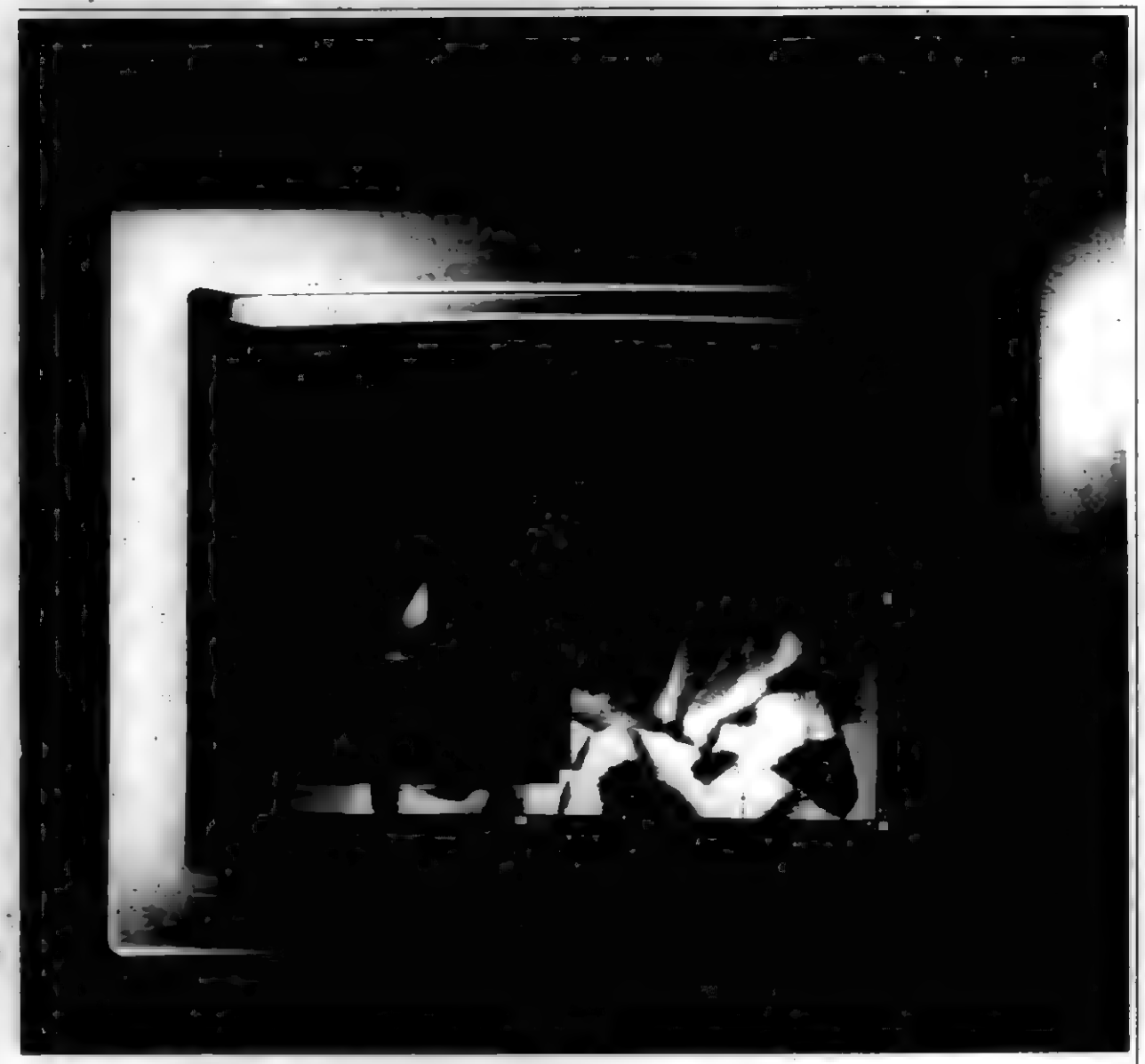
Another newcomer, Wang's WLT Systems, Inc. PC Express line, tried to soothe skittish users last month by extending its free on-site service plan from one year to three. The plan is triple the length of the average PC warranty.

Some second-tier players have concentrated on pushing the technology envelope with such high-end designs as symmetric multiprocessor systems. ALR and AT&T joined Zenith and Compaq with their own multiprocessor boxes earlier this month. Once these systems ship, they will rival the power of low-end minicomputers from old-guard vendors like NCR and DEC.

But a lot of cloners seem content churning out no-frills 286 machines. There's a method to this seeming madness, however. As Compaq and NEC shift their attention away from this "antiquated" processor, low-end users may be grateful that somebody still makes what they need.

Meanwhile, clone users are walking around with a lot of spare change jingling loudly in their pockets, and my Dad is recommending used Nissans to all of his friends.

Pastore is a Computerworld senior writer.



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Multiprocessor extension fans Compaq fires

BY PATRICIA KEEFE
CW STAFF

SANTA CRUZ, Calif. — The recent delivery of SCO MPX, the multiprocessor extension to The Santa Cruz Operation's SCO Unix System V/386, Release 3.2 may prove to be the spark needed to fire up what some observers say are sluggish sales of Compaq Computer Corp.'s Systempro.

Compaq has shipped just 1,572 Systempros worldwide through May, according to John Dunkle, a vice-president at Workgroup Technologies, Inc., a market research group in Hampton, N.H. "We believe that to be 50% of their expectations," he said.

Sales have been stymied in part, say analysts, because a number of multiprocessor operating systems capable of exploiting the machine's hardware had not shipped. These include OS/2 Version 2.0, Novell, Inc.'s Netware/386 Version 3.2 and until recently, SCO MPX. Sources close to SCO claimed the company has booked just 300 orders for SCO MPX so far.

SCO's delivery of MPX is well timed from Compaq's point of view, given AT&T's multiprocessing server announcements made at Comdex/Spring '90.

AT&T's hardware requires AT&T's Unix System V, Release 4.0.3 in order to provide multiprocessing operations, and that version is not expected to ship until the fourth quarter. The net for Compaq is a two-quarter window of opportunity in the Unix-based multiprocessing server market.

Priced at $895, SCO MPX is based on multiprocessor technology developed by Corollary, Inc. and SCO. It also serves as a multiprocessor extension to SCO's Open Desktop graphical operating system for Intel Corp. 80386 and I486-based personal computers. MPX reportedly provides symmetric, closely coupled multiprocessing.

NEW PRODUCTS

Systems

Ogivar Technologies, Inc. has announced the Interport Station, a workstation system that can be detached to form a laptop.

The Interport Station Model SX386 uses Intel Corp.'s 20-MHz 80386SX processor, and Model 386/33E includes Intel's 33-MHz 386DX processor and an Extended Industry Standard Architecture bus.

The product supports MS-DOS, OS/2 and Unix operating systems. The Interport SX386 costs $5,395, and the Interport 386/33E sells for $6,995.

Ogivar
7200 Route Transcanadienne
Ville Saint-Laurent
Quebec, Canada H4T 1A3
(514) 737-3340

Grid Systems Corp. has introduced a notebook-size laptop computer with a removable hard disk drive.

The Grid 1810 allows users to exchange data between laptop and desktop computers by switching disk drives. Features include an 81-key, full-size keyboard, a 10-in. diagonal IBM Enhanced Graphics Adapter display with 1:1 aspect ratio and a 2,400 bit/sec. Microcom, Inc. Microcom Network Protocol modem that uses data compression to double its speed.

A standard configuration is available for $2,895.

Grid
47211 Lakeview Blvd.
Fremont, Calif. 94538
(415) 656-4700

Board-level devices

Award Software, Inc. has announced that it has incorporated Digital Research, Inc.'s read-only memory-executable DR-DOS operating system on a plug-in card.

The new product, dubbed ROS card, enables users to upgrade their systems to a newer version of DOS. Since its operating system uses less memory, users are provided with more memory to run large applications, the vendor said. ROS card is compatible with IBM Personal Computer XT, AT, Personal System/2 and compatibles and laptops.

The suggested list price is $199.

Award Software
130 Knowles Drive
Los Gatos, Calif. 95030
(408) 370-7979

Truevision, Inc. has unveiled a single-card computer designed to transform IBM Personal Computer ATs and compatibles into desktop graphics and video systems.

Horizon860 includes a 33-MHz Intel Corp. I860 microprocessor that reportedly performs rendering and modeling procedures 10 to 20 times faster than host systems.

Horizon860's expandable bus architecture, the Horizonbus, transfers data at 264M byte/sec. A second bus connects to an AT bus to provide communications with a host, according to the vendor.

A 4M-byte configuration is available 30 days after receipt of order for $6,295. An 8M-byte version costs $7,295.

Truevision
7340 Shadeland Station
Indianapolis, Ind. 46256
(317) 841-0332

Software utilities

Micromath Scientific Software has released an upgrade to its Graph package for scientific plotting and data transformation.

Version 2.0 of Graph features grid-line plotting, bar graph or histogram plotting, logit and probit axes and transforms for analyzing sigmoidally or normally distributed data, according to the vendor.

The product requires 640K bytes of memory, two floppy disk drives and a graphics adapter. It can run on IBM Personal Computers or compatibles with MS-DOS 3.0 or higher, the vendor said.

Single-user copies of the pro-

Continued on page 72

Mainframe Current Events

IBM Delivers CICS/ESA V3

Candle First to Support CICS/ESA

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Continued from page 71

gram cost $79; quantity discounts are available with site licenses.

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Salt Lake City, Utah 84121
(801) 943-0290

Interactive Systems Corp. has made Peter Norton Computing, Inc.'s suite of disk and file management tools available for users of the Interactive Unix System V/386, Release 3.2 family of Unix system software products and Intel Corp. 80386-based machines running AT&T's Unix System V/386, Release 3.2.

The Norton Utilities for System V was adapted to the Unix platform by Segue Software, Inc. and Interactive under the terms of an agreement announced in January 1989.

The product is shipping for $295.

Interactive
2401 Colorado Ave., 3rd Floor
Santa Monica, Calif. 90404
(800) 346-7111

Software applications packages

Carberry Technology, Inc. has announced CAD-Leaf, an open system software product that allows users of Interleaf, Inc.'s Interleaf Technical Publishing System to translate graphic files from one application format to another.

The product can be used to convert computer-aided design (CAD) and computer-aided engineering drawings from most CAD systems.

CAD-Leaf was designed to run on Sun Microsystems, Inc. Sun-2, -3 and -4 as well as Sun's 386I under Unix. It is shipping for $4,995 per system.

Carberry
32 Emery Road
Townsend, Mass. 01469
(508) 597-5527

Data storage

Applied Digital Data Systems, Inc.'s systems division has announced a small business computer system that incorporates a 32-bit microprocessor with 64K bytes of cache memory, 4M bytes of random-access memory and a ¼-in. cartridge tape.

Mentor 1/25 includes an Intel Corp. 80386 processor running at 25 MHz and can be equipped with a 107M- or 380M-byte hard disk drive. The system features a small computer systems interface for data transfers, according to the vendor. It was designed to accommodate up to 17 users.

The product is priced at $16,795 and is now available.

ADDS
Systems Division
100 Marcus Blvd.
Hauppauge, N.Y. 11788
(516) 231-5400

The Optimem Products Group division of Cipher Data Products, Inc. has introduced a write-once read-many (WORM) optical storage jukebox.

The Optimem 7650 Desktop Library System provides 6.5G bytes of data storage by using 10 5¼-in. double-sided optical discs in a compact desktop unit. The system employs Optimem's 650 WORM drive, which features an average seek time of 60 msec. The 654M-byte drive uses a small computer systems interface, which supports up to three daisy-chained library systems running simultaneously.

The product costs $10,995.

Optimem
297 N. Bernardo Ave.
Mountain View, Calif. 94043
(415) 961-1800

Peripherals

Key Tronic Corp. has begun shipping a keyboard that is functional with all terminal emulation software packages for MS-DOS computers.

The KB 3270 Plus was designed to work with emulation packages such as Digital Communications Associates, Inc. IRMA, IRMA/2 and IRMAX, according to the vendor.

The 122-key device features 8K bytes of keyboard random-access memory and includes software that enables users to load standard, customized scan code sets for use in microcomputer-to-mainframe environments.

The board is plug compatible with IBM Personal Computer ATs, XTs and Personal System/2s.

It is priced at $349.

Key Tronic
P.O. Box 14687
Spokane, Wash. 99214
(509) 928-8000

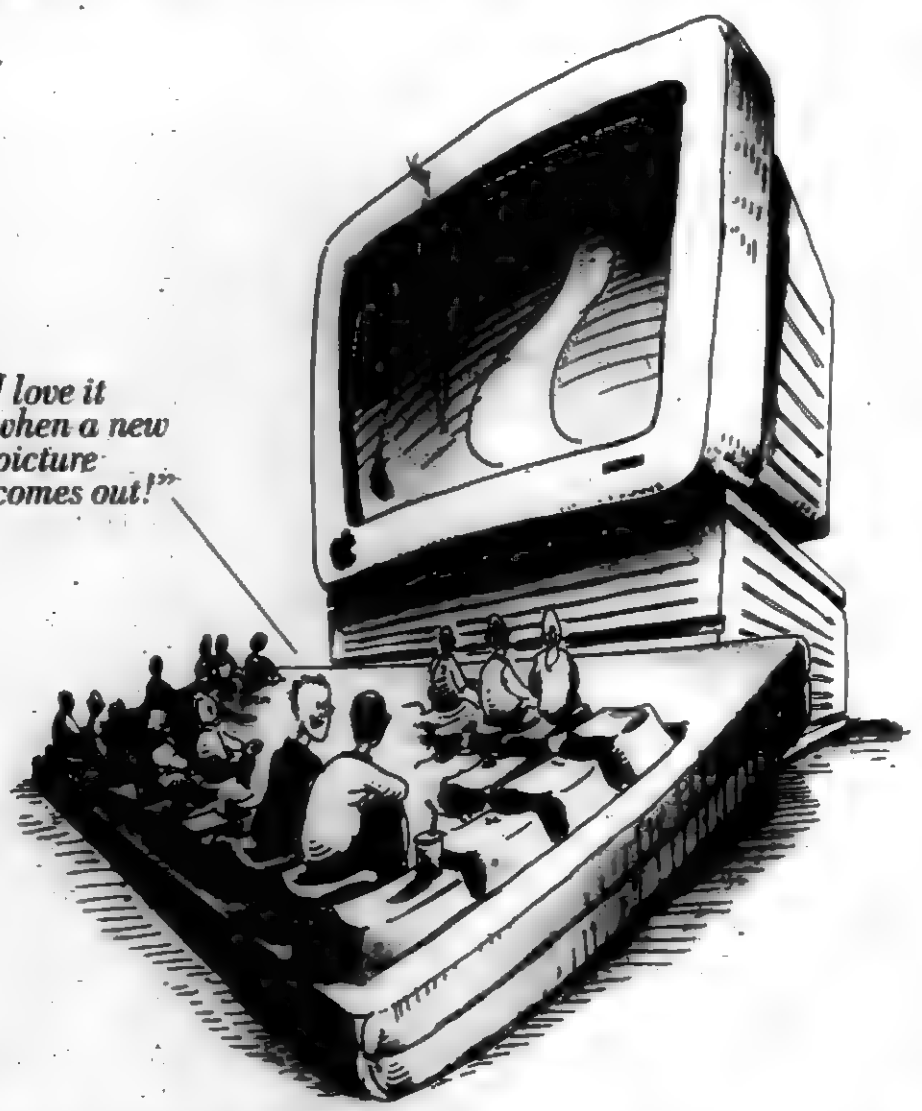
Macintosh products

Microtech International, Inc. has begun shipping 1M- and 4M-byte memory modules for Apple Computer, Inc.'s Macintosh IIFX personal computer.

The 1M-byte IIFX memory module houses 70-nsec., 1M-bit dynamic random-access memory in a one- by nine-chip array, which is surface-mounted on a low-profile single LU line memory module (SIMM) configured with a 64-pin connector, according to the vendor. The 4M-byte IIFX modules use 4M bytes of DRAM.

A single 1M-byte IIFX SIMM costs $179, while a kit of four sells for $716. The 4M-byte IIFX SIMMs are priced at $999, and a 16M-byte upgrade kit is $3,996.

Microtech
158 Commerce St.
E. Haven, Conn. 06512
(203) 468-6223



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COMMENTARY

Jeffrey N. Fritz

Keeping PCs personal

Recent events have brought the issue of computer security to the forefront of many information systems managers and computer users' minds. We have witnessed events that make it hard to ignore the implications of inadequate computer security.

Systems previously thought to be secure, including some government systems, have become the source of some watchful concern. Reports of viruses spreading across networks such as Internet have startled many users on those networks.

Personal computers are just that — personal. PCs have become extensions of the capabilities and thoughts of the user. An invasion of a user's data is like a robbery of a person's home. It is an assault on the person. In fact, an assault mentality can be the most dangerous result of the invasion of computer sanctity. If users react by retreating into shells, the cause of computing will be set back during a time when information flow is becoming increasingly important. Interconnectivity is simply too important an asset to give up.

Life is just not as simple as it used to be. In years past, there

Continued on page 76

X terminals stung in distributed era

ANALYSIS

BY JOANIE M. WEXLER
CW STAFF

One victim of the trend toward distributed computing will be the X terminal market, analysts said, though the products will thrive in such niches as centralized companies and those striving to protect their minicomputer investments.

X terminals are intelligent devices specifically designed to run the X Window System, a networking protocol developed at MIT. X Window allows personal computers and workstations to access applications on multiple hosts and display them simultaneously in separate windows on one screen. To use the protocol, the host must be running a multitasking operating system such as Unix, VMS or MVS.

The hardware-independent X Window protocol is often used in conjunction with a graphical user interface, such as Digital Equipment Corp.'s Decwindows or Hewlett-Packard Co.'s New Wave products. X terminals have been designed as a lower cost alternative to PCs and workstations — or as an upgrade to dumb terminals — for capturing the windowing and graphical interface benefits.

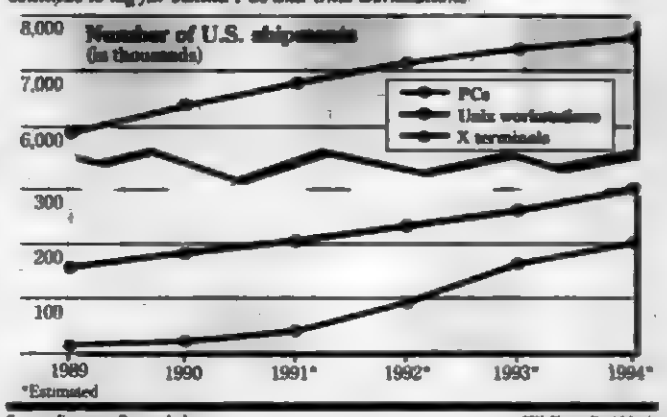
The jury is apparently still out, however, on the practicality of the terminals in today's computing environment, which is moving toward distributed rather than centralized processing at a fast pace.

"X terminals are a form of time-sharing that goes against the grain of the entire flow of computer development, which is

Continued on page 78

Miles to go

Even with steady growth expected in coming years, X terminals will continue to lag far behind PCs and Unix workstations



Source: Forrester Research, Inc. CW Chart: Paul Mock

This EDI software does Windows

BY ELLIS BOOKER
CW STAFF

DEERFIELD, Ill. — Long before windowing became popular, Foretell Corp. had decided to utilize a graphical user interface for its future electronic data interchange software products.

Believing it is the first and only EDI software vendor to use Microsoft Corp.'s Windows, Foretell and its president, Roger Mills, hope the ease of use inherent in a graphical interface will help propel the 5-year-old, $2 million software company, which claims about 1,000 users worldwide, into a larger frame.

Mills is counting on an accelerated deployment of EDI at smaller firms answering the requests of their larger trading partners to get EDI capabilities. He estimated that 70% to 80% of the EDI market is personal computer-based, with another 20% split between minicomputer and mainframe systems.

Classic user

Classic Manufacturing Co., in Cleremont, Fla., for example, began using Foretell's software last month. According to data processing manager Bob Zuckerman, Classic, which said it is the world's top plastic fishing worm supplier, was responding to meet the mid-June and early July EDI deadline set by partners Wal-Mart Stores, Inc. and K Mart Corp., respectively.

"The price was tempting," Zuckerman said about his choice of Foretell, "and I enjoy the hell out of working with Windows and the mouse."

Foretell's ESP II software translates EDI messages back and forth between a half-dozen standard formats, including the European EDIFACT standard. In addition, it offers an array of tools to manage the flow of these paperless documents among multiple EDI partners.

When Foretell first considered a graphical user interface in 1987, it planned to use Presentation Manager. But like many other Windows developers, it has pushed back its Presentation Manager timetable in light of an enhanced Microsoft Windows alternative.

A Windows Version 3.0 rendition of Foretell's ESP II product will hit the street next week.

With the multitasking features of the new Windows, Mills said, ESP II will enable the product to perform up to four functions simultaneously. In addition, it will support the Dynamic Data Exchange (DDE) feature of Windows so that other DDE-compliant applications will be available from the ESP desktop.

Moreover Mills has not abandoned his Presentation Manager strategy, noting that "it's much easier to port from 3.0 to PM."

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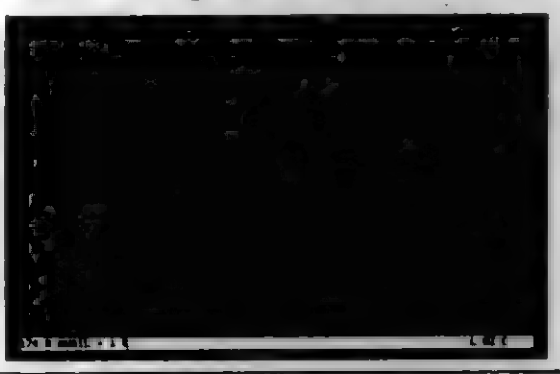

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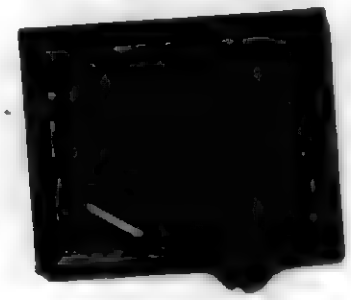

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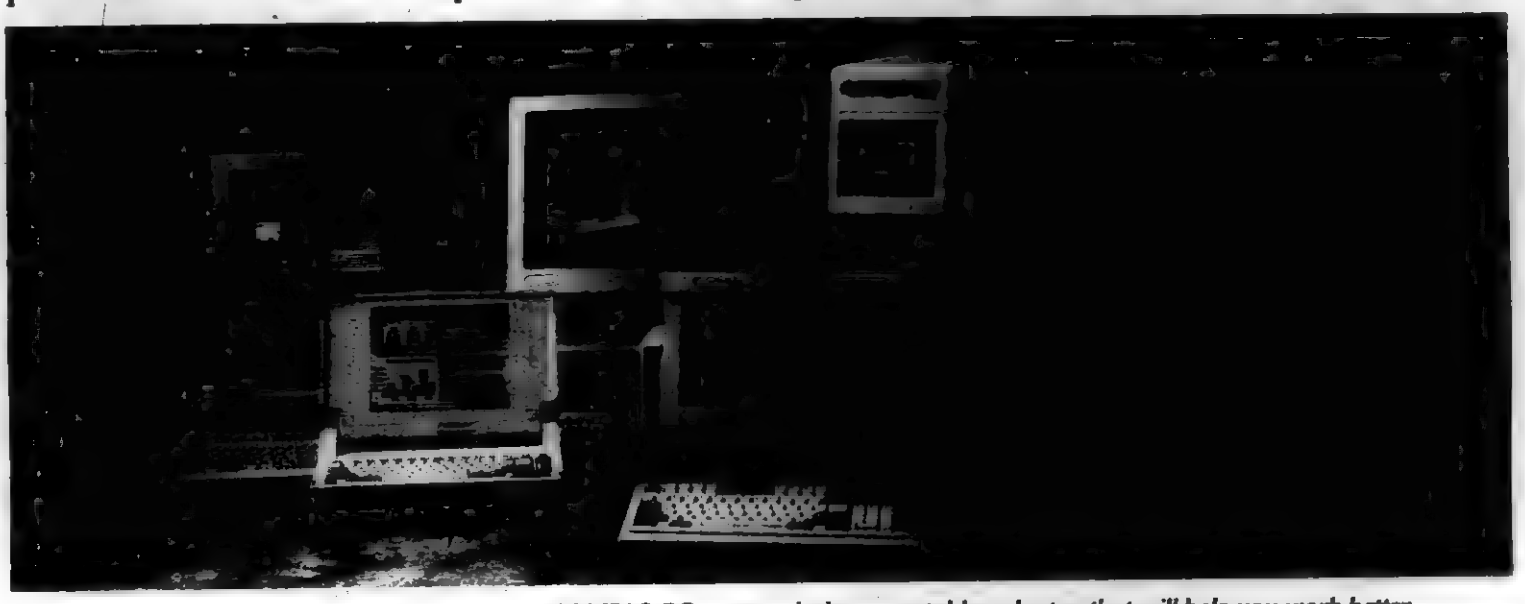

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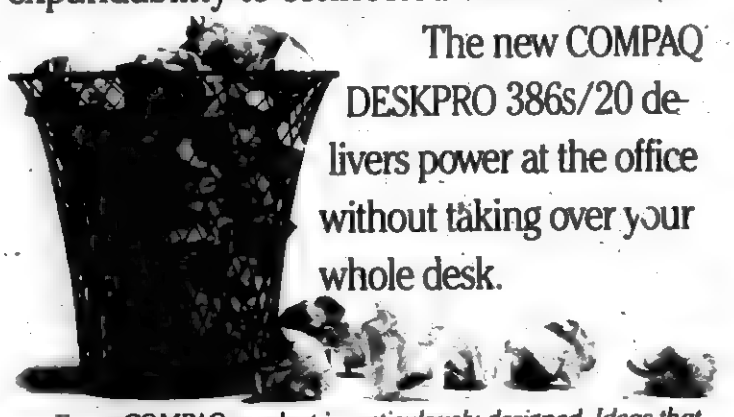

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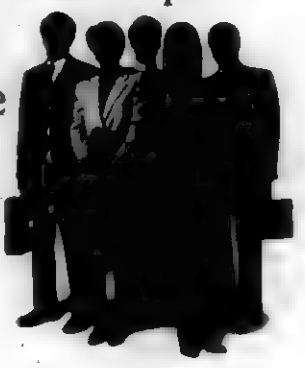

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Forging ahead on Unix frontier

Despite slings, arrows and OSF, Burlington Coat remains loyal to Unix

ON SITE

BY ELLIS BOOKER
CW STAFF

BURLINGTON, N.J. — Being a Unix pioneer can mean walking through a hail of arrows, and Michael Prince, MIS director at Burlington Coat Factory Warehouse, Inc. has had his share of nicks.

In particular, Prince and his staff continue to smart over the Open Software Foundation's (OSF) decision earlier this year to standardize on Transarc Corp.'s technology as the core of its distributed computing environment over Sun Microsystems, Inc.'s Network File System [CW, May 21]. The OSF also selected the remote procedure call (RPC) from Hewlett-Packard Co. Apollo division's Network Computing System to be part of its distributed computing environment. RPCs split an application between a client and a server.

"Initially, [the OSF decision] will lock us out of the OSF vendors," said Prince about the OSF's choice.

Prince admitted to being worried that many vendors will be forced to choose between the Sun RPC — which has been working in some Burlington retail stores for two years — and the OSF-endorsed protocol.

Nevertheless, he said he is convinced an open systems approach to networking is more flexible and that Burlington's early move to Unix has given it a competitive edge.

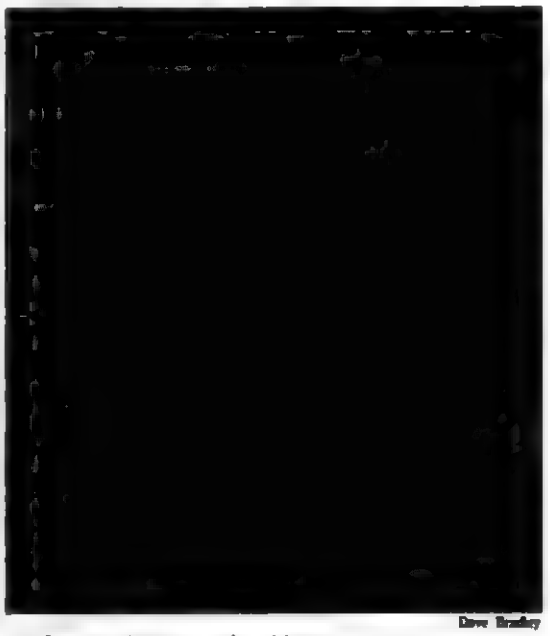
"Six months ago, I would have said we were almost unique in using in-store and host Unix processors," said Prince, who joined Burlington in 1983 from the computer time-sharing service that supported what were then just 32 Burlington stores.

To keep ahead of the pack, Burlington's information systems department is moving forward with a plan to replace the remainder of its in-store computers with Unix-based processors.

Prince plans to deploy five Sun workstations per week for the next 20 weeks. Already, 50 stores in the chain have the Sun processors up and running.

Burlington's in-store computers — Sun Sparcstation SLCs — will function both as communications processors linking Burlington's 154 retail outlets to a very small aperture terminal (VSAT) satellite network, and back-office processors, providing such shared functions as electronic mail and inventory processing.

Two years ago, when Burlington first tried the Unix architecture, it used personal computers at the registers and Sun 386I desktop computers as servers. The deployment now will use the Sparcstations and the NCR Corp. 7052D, a cash register system wrapped around the Intel Corp. 80286-based PC.



Drew Bradley

Burlington's Prince *is sold on open systems*

The intelligent registers and Unix processors will replace the old configuration in Burlington's stores: hosts built on 16-bit Altos Computer Systems desktop computers, running Digital Research, Inc. Concurrent DOS and connected to dumb CRT registers.

The change, according to director of store systems Cy Young, was dictated by the age of the Altos systems, and because the dumb terminals attached to them could not function if this host processor went out of commission.

"Another advantage of a Unix processor," Young said, "is it gives us direct X.25 access in and out of the box. With the Altos we had to use a [packet assembler/disassembler], and we couldn't log on to the old Altos machines remotely to diagnose problems."

Link to the outside

In-store communications between the Sun workstation and up to 50 attached registers and PCs is over an Ethernet local-area network. To connect with the outside world, the Sun is linked to the VSAT terminal at the store, which accesses the Contel ASC satellite network. This connection is through the X.25 packet data protocol.

From Contel's shared hub earthstation in Mountain View, Calif., Burlington's annual $300 million worth of credit-card checks are patched into the Visa network. At the same time, other dedicated 56K bit/sec. lines connect the earthstation to Burlington's corporate data centers in Burlington, N.J., and Lebanon, N.H.

Once all the in-store processors are replaced, Burlington will consolidate the two data and distribution centers into the Lebanon facility.

INTERNATIONAL BRIEFS

Two subscribers sign on to international ISDN network

Last month, the first two subscribers began using an international Integrated Services Digital Network (ISDN) jointly provided by **Nippon Telegraph and Telephone Corp. (NTT), Kokusai Denshin Denwa** and **France Telecom. Wagons-Lits Tourisme**, a French travel agency, is using the service for data transmission, while Canon Co. in Japan is using it for facsimile transmission. International ISDN, which provides 64K bit/sec. switched access between the French and Japanese carriers, was announced last April.

NTT reported that as of April, or two years after it announced its INS-Net ISDN service, 1,300 customers were using the 64K bit/sec. version of the service, while 140 customers were using the 1.5M bit/sec. version.

US West and **Bell Atlantic Corp.** have signed a letter of intent with Czechoslovakia's **Ministry of Posts and Telecommunications** to form a joint venture company to build a public switched packet data network. In addition, the three parties recently signed a letter of intent to construct a national cellular system and work together to modernize Czechoslovakia's telecommunications infrastructure.

Deutsche Bank and two other West German banks are implementing an estimated 1,100 **Racal-Milgo** modems as well as network support services in East Germany as part of their efforts to provide computerized support for their extended operations.

British Telecom has announced that its Servicedesk product has been integrated into its Concert integrated network management system. Servicedesk is a computer-based help desk system that coordinates responses to network service calls across a user organization. Integration with Concert ensures that details of incident reports and service requests, once logged, will be passed on via the Concert interface to the international carrier's own service operation, British Telecom said.

MCI International has signed an agreement with Belgium's telecommunications authority to offer one-stop shopping services for international leased lines between Belgium and the U.S.

Fritz

FROM PAGE 73

was not the current proliferation of local-area networks and interconnectivity that occurs between today's systems. On one hand, this has brought greater power and efficiency for users. However, this can also bring greater vulnerability. The more interconnected systems are, the higher the risk. All of this causes IS directors sleepless nights, as they wonder if someone is out there tampering with their valuable data.

So the question remains: What can be done to limit exposure to unwanted programs and unauthorized user intervention? There are some commonsense methods that can do much to protect the computer's data and the user's sanity.

- Avoid obvious passwords. Nicknames, birthdays, addresses and telephone numbers all make terrible passwords. Although they are easy to remember, they are also easily guessed. One university recently had its LAN administrative files broken into because the systems administrator chose a campus building name as a password for the administrative accounts. It didn't take an intruder long to obtain a campus map, figure out the password and gain access to critical files.
- Security must be continuously monitored and fastidiously maintained. Don't wait for a security breach to begin checking for unauthorized activity. Just as regular visits to the doctor are a part of many people's lives, computer systems must be regularly checked for unauthorized activity.
- Realize that isolation will not guarantee protection against a security breach. Avoiding shareware, bulletin boards or electronic mail is not a solution. Instead, users should carefully check all new programs with virus detection software. There have been cases in which users received viruses from shrink-wrapped commercial software packages. Even if a database service checks for viruses before posting the program, check it again anyway. In fact, the best way to check new software is to run the virus detection software from a locked floppy disk.
- Do not be lulled into a false sense of security by virus detection software. Many of these programs are well designed and regularly updated. However, we are engaged in an insidious game of chess. Those who create viruses are trying to best those who are trying to keep abreast of the virus creators. Thus, it is possible that a virus could escape detection. Watch for unusual activity on your hard drive or strange quirks in your programs. Sometimes, these are caused by a virus that escaped detection. The emphasis here is on the word "sometimes." Most computer problems are not because of viruses.
- Consider security features offered by new communications services. Incoming Calling Line Identification or calling line ID service has gotten a bad rap from the press, some state governments and misguided consumer protection groups. However, when combined with ISDN, Incoming Calling Line Identification has significant advantages for computer security. Because of ISDN's dialing protocol, the host site receives the originating telephone number of the data call. Thus, decisions can be made for access privileges based on not only password and account identification but also on originating location. Of course, an authorized location doesn't guarantee an authorised person, but at least it can be used to limit access from unapproved sites.

> DO NOT BE lulled into a false sense of security by virus detection software.

Fritz is a data communications analyst at West Virginia University in Morgantown, W. Va.

LAN tools to provide reliability at lower cost

BY ELISABETH HORWITT
CW STAFF

Along with the traditional daisies and dandelions, June was busting out all over with local-area network management introductions. This was but the latest evidence that vendors are finally responding to corporate users' increasingly urgent demands for tools to make LANs safe for mission-critical applications.

The number of users planning LAN implementations for key applications, such as database management and electronic mail, has increased as much as 10% recently, according to The Sierra Group, Inc. The Tempe, Ariz., research firm surveyed approximately 2,000 users in late 1988 and again in late 1989 about their plans for implementing applications on various platforms the following year.

Many businesses that are moving critical applications down to LANs are expressing dissatisfaction with currently available LAN management tools. Covia Corp., for example, has had to make a major investment in internal development of LAN management systems, an executive recently stated, because commercially available offerings did not provide all the necessary functionality to ensure that its token-ring-based networks would support mission-critical applications.

The latest crop of LAN diagnostics announcements addresses two emerging market demands: for lower cost tools and for tools that can work with the latest LAN protocols, such as 10M bit/sec. twisted-pair Ethernet. The following fall into the low-cost category:

• Neon Software, Inc., based in Lafayette, Calif., introduced Netminder, a $495 software package that is said to capture, display and analyze data packets traveling over an Ethernet LAN. The Apple Computer, Inc. Macintosh II software is said to measure the amounts of traffic on individual Ethernet nodes or segments and to collect packets generated by Appletalk, Internet and Xerox Network Systems protocols.

• Digilog, Inc. in Montgomeryville, Pa., introduced Lanvista 100, which it calls the first "full-function" protocol analyzer priced at less than $3,500. Based on Microsoft Corp. Windows, the system is said to capture and generate traffic for troubleshooting and capacity testing purposes. It is said to capture and decode all seven layers of a wide variety of protocols, displaying frame size, source and destination address and error indications.

• Tektronix/LP Com in Mountain View, Calif., introduced a variety of network administration products, including a "low-cost" ($1,490) Ethernet Probe that is said to continuously monitor traffic on a local or remote LAN segment. Also announced was network management software that is said to convert a personal computer running Windows 286 into a centralized monitoring and control system for distributed Ethernet networks. The $1,850 price tag includes software and an Ethernet controller card.

Also introduced were the following tools that were designed to work outside the Ethernet/token-ring mainstream:

• Computrol, Inc. in Ridgefield, Conn., announced Isocomm Network Monitor, which is said to monitor traffic on a Manufacturing Automation Protocol (MAP) 3.0 network. The Windows-based product is said to display LAN traffic statistics and a map of nodes. It supports carrier band, broadband or fiber-optic MAP media and any MAP 3.0-compatible network controller, Computrol said.

• David Systems, Inc. in Sunnyvale, Calif., announced the David Pair Scanner, a handheld instrument for diagnosing and troubleshooting faults on coaxial and twisted-pair cabling systems. The product is said to monitor and log activity on a IEEE 802.3 network, including 10M bit/sec. twisted-pair LANs based on the 10Base-T standard. It is priced at $2,495.

Tandem opts for open systems

Tandem Computers, Inc. last week announced enhancements to three networking products designed to allow the company's proprietary operating system-based computers to accommodate more standardized protocols.

Tandem's OSI Applications Services development product offers compatibility with the Open Systems Interconnect (OSI) model up to the seventh, and highest, layer. Last year, the company offered a product only up to Layer 5, according to Tandem spokesman Jim Lewis.

"It allows implementation of networking applications without knowledge of the underlying protocols," Lewis said. He added that it allows a manager to invest in people who are not vendor-specific in their programming expertise.

Also announced were enhancements to the company's SNAX line of IBM communications products and its Transmission Control Protocol/Internet Protocol (TCP/IP) package. SNAX now has wide-area network X.25 capability. Its TCP/IP product includes X.25 capability as well as a mail gateway and network administration software that gives a monitor the location of mainframe devices.

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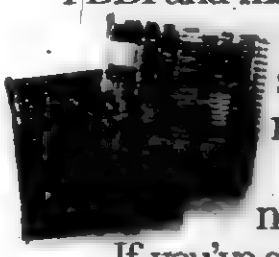

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X terminals

CONTINUED FROM PAGE 73

to deliver more power and function to the desktop," said William Bluestein, an analyst at Forrester Research, Inc., a Cambridge, Mass.-based consulting firm.

Forrester's predictions for X terminal popularity are significantly less bullish than those of consultancy X Business Group and market researcher International Data Corp. (IDC), both of which projected 1990 worldwide X terminal shipments of 68,000 (see chart page 73). IDC predicted U.S. shipments of 42,000 in 1990, compared with Forrester's 18,000.

X terminals are subject to the same limitations as traditional terminals — unreliable response time because of network bottlenecks to the host and the inability to process applications at the desktop. They also offer traditional terminal benefits, such as giving the information services department greater control and security of resources, which are stored in a central repository rather than distributed all over the company. They also protect investments in large-CPU computing power.

In addition, X terminals generally offer higher resolution screens than either dumb terminals or PCs, which enhances the graphics functionality.

Stephen Auditore, president of Fremont, Calif.-based X Business Group, explained that "if you have excess CPU power, memory and network capacity, and your application is not compute-intensive, X terminals make sense. If you require a lot of horsepower, they are problematic."

Cost advantages to X terminals are murky, particularly in light of plummeting workstation prices. For example, Sun Microsystems, Inc. recently unveiled its under-$5,000 diskless Sparcstation SCL, which sells for $1,000 less when purchased in quantities of 20 or more along with a Sparcserver 490, according to Sun. In contrast, X terminal prices range from about $2,000 to $3,000, but they sacrifice functionality for the savings.

"We've been evaluating the new diskless Sun Sparcstation against X terminals," said Gerald Siddons, director of scientific computing for the division of biostatistics and epidemiology at Boston's Dana Farber Cancer Institute. Siddons said he has been experimenting with one Network Computing Devices, Inc. X terminal for about a year and also has a DEC VT-1000 terminal, which he said "arrives brain-dead" with only 1M byte of memory.

The DEC terminal "has been gathering dust for months" waiting for a memory upgrade, he said, with such needed upgrades rendering the workstation/terminal costs more competitive.

The computer services director of a large New York financial institution added, "It doesn't pay for us to invest in X terminals because of their limited function. If we use PCs and workstations to run X [Window System], we can also use them for other tasks."

Who will survive?

Analysts agree that shakeout is inevitable in the X terminal market. Stephen Auditore, president of X Business Group in Fremont, Calif., said there are at least 23 X terminal manufacturers worldwide today.

"That's an awful lot for shipping under 70,000 units this year," he said.

Vendors are moving to differentiate themselves. For example, Network Computing Devices, Inc. recently announced that its terminals will support the Simple Network Management Protocol, a de facto standard for managing Transmission Control Protocol/Internet Protocol networks, which often are Unix-based.

Systems supplier NCR Corp., which recently entered the X terminal business, has taken pains to bundle a version of the Open Software Foundation's Motif graphical user interface into its products.

Auditore said that vendors well positioned to offer color terminals — which currently include Hewlett-Packard Co., Network Computing Devices, NCR and IBM — will likely be survivors of the X terminal business, in that demand for color display stations are expected to account for nearly 35% of 1990 shipments worldwide.

Another possible edge for vendors would be offering a broad product line with various screen sizes, performance and color/monochrome offerings to accommodate users with different needs within one company.

JOANIE M. WEXLER

NEW PRODUCTS

Host-to-host

Wang Laboratories, Inc. has enhanced its Information Distribution System (IDS) family of software products for information sharing between IBM mainframes and Wang VS computers.

IDS Release 3.0 supports IBM Systems Network Architecture communications over X.25 tranports as well as IBM Synchronous Data Link Control.

The enhanced IDS offerings include Store and Forward, Host Delivery Services and Host File Access Facility, which are priced at $11,000 for all three products; Host-to-Host Transport ($2,200); Standard Components ($11,000); and VS IDS Transport ($500).

Wang
One Industrial Ave.
Lowell, Mass. 01851
(508) 459-5000

Gateways/Bridges/ Routers

Promptus Communications, Inc. has introduced a product that combines local-area network bridging and routing with voice/data multiplexing on IBM Personal Computer AT platforms.

Promptus T1 Commserver+ operates over fractional or full T1, switched 56 and European E1 digital services. It can be migrated to services based on Primary Rate Interface Integrated Services Digital Networks and can interconnect Novell, Inc. Netware LANs.

The product is scheduled to begin shipping in the second quarter for $7,000.

Promptus
207 Highpoint Ave.
Portsmouth, R.I. 02871
(401) 683-6100

Clearpoint Research Corp. has announced the CMB-1000, a reduced instruction set computing-based intelligent multiport bridge.

The device provides forwarding rates of 50,000 packet/sec. and offers address filtering, network monitoring and support for the Spanning Tree Algorithm.

A minimum configuration includes one Ethernet port, one wide-area network port, a Starwatch network management software package and full Spanning Tree support. The basic system costs $7,500. A fully configured version, with eight Ethernet ports and three WAN connections, costs $18,500.

Clearpoint
35 Parkwood Drive
Hopkinton, Mass. 01748
(508) 435-2000

Wellfleet Communications, Inc. has announced routing support for two new protocols: Novell, Inc.'s Integrated Packet Exchange Protocol (IPX) and Xerox Network Systems' Internet Transport Protocol (XNS).

The XNS/IPX software is being offered with Transmission Control Protocol/Internet Protocol, Decnet and Spanning Tree Bridge software already supported by other Wellfleet multiprotocol routers and bridges.

The price is $1,000 per protocol.

Wellfleet
12 DeAngelo Drive
Bedford, Mass. 01730
(617) 275-2400

Links

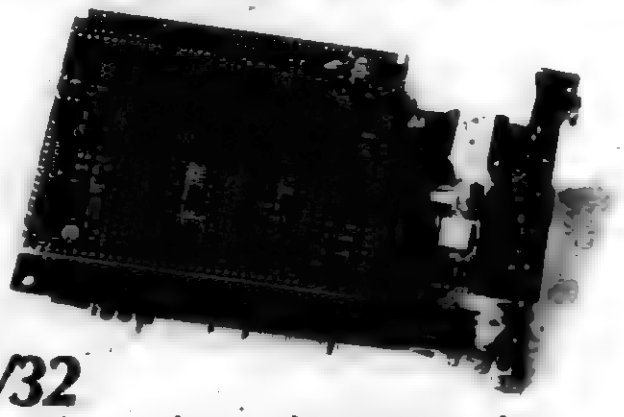
Idea has unveiled a network controller that can support multihost communications in IBM mainframes, midranges or Digital Equipment Corp. VAX computers.

The Concert Controller can be configured as an IBM 3174- or 5394-compatible control unit, and its modular architecture is not strictly configured for any particular host or environment, the vendor said.

The product is available in three models — the Idea Concert 10300, 10400 and 10500 — for token-ring, remote or local environments. Pricing ranges from $2,000 to $12,495, depending on configuration.

Idea
1515 W. 14th St.
Tempe, Ariz. 85281
(602) 894-7000

SNA ENGINE



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MICROGATE CORPORATION

MANAGER'S JOURNAL

EXECUTIVE TRACK

Richard Chow was named to the newly created position of vice-president of MIS at **Pyramid Technology Corp.** He supports all the IS and communications needs of Pyramid, a Mountain View, Calif.-based manufacturer of Unix-based file servers.

Chow, 42, was most recently director of MIS and corporate communications at Wyse Technology. Previously, he founded and served as president at Exante Software and was manager of financial systems and services at National Semiconductor Corp.

Chow has a B.A. in electrical engineering from Stevens Institute of Technology and an MBA from the University of Denver.

Thomas DaRos was promoted to vice-president of systems and data processing at **Webcraft Games**, a division of Webcraft Technologies, Inc., a maker of instant lottery tickets and systems in North Brunswick, N.J.

DaRos is responsible for all computer systems used in the design, production and delivery of lottery tickets. He was previously director of electronic data processing at Webcraft.

Before joining the firm, DaRos was vice-president and regional manager of Software Products, Inc., a consulting firm in Washington, D.C. Other positions he has held include vice-president of administration at Agora Industries and director of MIS at Todd Logistics, Inc.

Who's on the go?

Changing jobs? Promoting an assistant? Your peers want to know who is coming and going, and *Computerworld* wants to help by mentioning any IS job changes in Executive Track. When you have news about staff changes, be sure to drop a note and photo to or have your public relations department write to Clinton Wilder, Senior Editor, Management, *Computerworld*, Box 9171, 375 Cochituate Road, Framingham, Mass. 01701-9171.

Miles to go before he sleeps

Alamo Rent A Car's Tom Loane drives his group by keeping his eyes on the business

BY ROSEMARY HAMILTON
CW STAFF

As the newly appointed head of information systems at Alamo Rent A Car, Inc. in the mid-1980s, Tom Loane saw something he did not like. Staff members were showing up at meetings "whenever they felt like getting started."

So Loane instituted a policy that cost staffers a dollar for each minute they were late. Meetings were soon starting right on schedule, and the policy was discontinued.

"Like anything else," Loane says, "it's good for a while, and then you get to the point where you stop. It achieved its objective."

In managing IS at Fort Lauderdale, Fla.-based Alamo, Loane is apparently fond of this approach. He assesses a situation, comes up with a plan for it, implements it and moves on. He presents himself as a no-nonsense kind of guy who seems to have no time for schmoozing or gratuitous remarks. He speaks frankly and is willing to take actions that will not be popular with others. Yet, he is a gracious boss who treats his staff with respect and believes in their abilities, according to IS department managers. For instance, Loane, vice-president of computer and communications services, refers to his staff as the people who work *with* him, not *for* him.

Director of operations Andy Fay says Loane will not hesitate to tell a vendor what he thinks of them. "It's almost embarrassing," Fay says.

However, Fay also says Loane likes to join the staff when they get together socially every few months. Alamo recently moved its data center to another Fort Lauderdale location, and the job of hauling the equipment fell to Fay's staff. Loane "bought T-shirts for the moving team. He likes doing things like that to keep spirits up," Fay says.

PROFILE: Tom Loane

Ron Tomkins

***Position:** Vice-president of computer/communications services, Alamo Rent A Car, Inc.*
***Mission:** To improve Alamo's bottom line*

Full speed ahead

Loane brings a focus to his job that is almost single-minded. He is quite taken with the car rental business and spent one hour in a recent interview talking about rental trends and the competitive situation before discussing IS.

Alamo ranks fifth in the U.S. car rental business behind The Hertz Corp., Avis Rent-A-Car Systems, Inc., National Car Rental and Budget Rent-A-Car Corp., according to industry estimates. Unlike most of its competitors, it has remained independently owned and stayed focused on a small number of high-volume locations.

Alamo shows the typically feisty personality of the little guy in the market. It makes no bones about being behind powerful competitors, but it is determined to whip them where it can.

To that end, Loane says his mission as IS chief is to help Alamo make more

Continued on page 80

Teaching systems pride to line managers

BY CLINTON WILDER
CW STAFF

Forget Max Hopper. If you're looking for a role model in information systems leadership, set your sights on Horace Mann — America's greatest educator.

The ability to educate senior and line management on IS is the newest critical success factor for the 1990s, according to the man who made critical success factors famous, Jack Rockart of MIT. Rockart closed out the MIT Center for Information Systems Research (CISR) summer seminar in Cambridge, Mass., last month by exhorting IS directors to change the way they view their jobs.

Specifically, Rockart said that chief executives and line managers must feel that systems are *their* systems. "The success or failure of information technology in an organization depends on the line manager," he said. "Therefore, IS needs to educate."

He cited the example of Ray Cairns, who heads IS at Du Pont Co. In the mid-1980s, Cairns set up three different educational programs on the basics and potential of IS — one for midlevel managers, one for a level below the top and one for the most senior executives. "Du Pont today has more programs changing the way they do business than most organizations in the world," Rockart said.

MIT's Rockart advocates education

He urged IS executives to form coalitions and establish formal briefings but noted that "lunch and chance meetings in the hallway" are often even more effective in promoting the IS cause.

The educational section of the job, Rockart added, is part of the IS executive's evolution from manager to leader — one who sees new ways, enabled by IS, for the company to do business. He cited Cairns, United Technologies Corp.'s John Hammitt and Procter & Gamble Co.'s Robert Herbold as IS heads who have adopted this new role.

"They see their role as urging and aiding innovation," he said.

Rockart noted that the CISR session is a perfect spot for IS leaders to practice their new part. "Don't come back next year," he said. "Send someone else in your organization."

Back to school at Alamo

Tom Loane is one IS director who doesn't just talk about knowing the business his company is in; he lives it.

Loane says he owes this in part to Alamo, which has a far-reaching educational policy for all IS staffers, including the boss.

On the first day Loane went to work for Alamo, he was instructed to report to the rental station in Fort Lauderdale, Fla. He worked there for one month before gracing the headquarters offices of IS.

"I prepped cars for rental, I scraped stickers, I washed cars," Loane recalls. "Car washing — that was the primo job there."

IS staffers get classroom time on the car-rental industry, and Loane teaches many of them now. They also work in the rental stations so they get a feel for the business they are in.

"The standard management training puts them through a less strenuous cycle [than Loane's own training], but one of the most important things is to know the business," Loane says.

It apparently won him over. When asked what job he'd like if he became tired of his current one, Loane said he would enjoy managing a rental station.

"I don't ever expect to get bored, but if I did, I'd like to try that," Loane says. "I have a great deal of respect for the people who are doing that every day."

He also says he has no aspirations to climb the Alamo corporate ladder and would not want the job of chief executive officer.

"I have too much fun doing things, and I really don't think I want to be a front-person of an organization," he says. "I'd rather not be in the spokesman role. There's more fun to doing things than talking about them."

While he doesn't say that he would turn down IS opportunities at other companies, he states unequivocally that "it would be very, very unusual to find a better job opportunity."

ROSEMARY HAMILTON

Alamo

FROM PAGE 79

money — period.

"If technology solves the problem, good. If not, fine," Loane says. "This is not about being showy. Does Alamo want to have a pretty DP center or better cars?"

As a result, Loane seems uninterested in discussing technology that is not directly tied to Alamo. He dismisses the recent trend in computer-aided software engineering, claiming that it "tends to replicate what the current systems do." His shop is almost exclusively Cobol.

On the other hand, Alamo recently launched an imaging-based billing system that will send statements to customers with images of their rental slips instead of mailing out packets of individual slips. "We are creative with what our systems do, but we are not trying to be fashionable in IS," he says.

Loane says he believes his job is to create an atmosphere where his staffers can excel and develop competitive systems, such as Alamo's critical on-line reservation system. He works to keep the environment open and upbeat, encouraging staffers to take risks. People do not get fired for making mistakes, he says: They get canned for not trying.

Since Loane speaks frankly, he expects his staffers to speak their minds as well. He trusts their capabilities, saying he has surrounded himself with "incredibly talented people." He

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displays a positive attitude, claiming to have "the best job in the world," and expects his staff to be similarly upbeat.

Luis Arana, an IS director of software development, recalls a recent confrontation with Loane over a software project. Arana believed it was not working and told top management that the project had not been a success.

Loane did not like that negative attitude one bit, Arana says.

"Tom was very, very upset with me, even angry," Arana says. "I tried to convince him that what I had done was right. After a while, he calmed down. He didn't come over to my side 100%, but he sort of agreed with me, and he gave me the project to do over again. We did it, and it worked. He wasn't afraid to try it again, even though I had gotten up in front of everyone and said it didn't work."

Loane joined Alamo six years ago after a short stint as an IS consultant at audit firm Ernst & Whinney (now Ernst & Young) in Miami. Alamo recruited him when its IS manager moved to the marketing department, and Loane jumped at the chance to be the lead IS person. "I would be hard-pressed to find an opportunity as good as the one I have," Loane says.

Loane's upbeat attitude apparently goes way back. In 1960, while a high school sophomore in Baltimore, Loane built a small computer and entered it in the local science fair. First place just escaped him, however, when his machine caught fire. He won second place honors, instead. The mishap apparently did not discourage him but instead helped him decide what his career would be.

"1960 was a good year to get interested in computers," he says. "I'm one of those really strange people who was fortunate to find something I like and stayed with it."

Loane went to Cornell University and majored in engineering, then immediately followed that up with an MBA from Cornell in 1968. He worked briefly for a small textile manufacturer in Pennsylvania before joining Electronic Data Systems Corp. He worked there for 10 years as a project leader for various clients in the health care, banking and transportation industries before giving the Ernst & Whinney consulting job a shot.

However, the job soon lost its charm, Loane says, because prospective clients had more branch offices than corporate headquarters in the Miami area. These offices either did not have decision-making authority or did not need consulting services.

Nonetheless, he calls that job a good experience as well. Loane suggests that convincing yourself that you have a positive situation is half the battle. "I've lived in a lot of places, and every place has been the best place at that time, just as each job has been the best job," Loane says. "I really think this. But there's a little bit of psychology involved."

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MANAGEMENT BRIEFS

Andersen fills three posts

Andersen Consulting announced three appointments last week in its Change Management Services practice.

Carla Paonessa was named managing director of organization change. Based in Andersen's Chicago headquarters, Paonessa, 43, joined Andersen in 1978. Before that, she spent 12 years directing personal development programs at the U.S. Internal Revenue Service and Federal Aviation Administration.

James Caldwell was named managing director of knowledge transfer. He directs Andersen's Change Management Services practice in the Southwest from the Dallas office. Caldwell, 49, has a background in computer-based training and taught accounting at Texas Tech University before joining Andersen in 1979.

Carlos Cervantes was named managing director of technology assimilation. Based in Atlanta, Cervantes, 49, is the division head for service industries. He has worked for Andersen since 1965 in Sao Paulo, Brazil; San Juan, Puerto Rico; Bogota, Colombia; Chicago; and Detroit.

CLIPS

Tim Lewis

Summaries from leading scientific and management journals

"What leaders really do"

By John P. Kotter

Harvard Business Review
Summer 1990

■ "Lead, and they shall follow" is not as simple as it sounds. In today's businesses, leaders are not necessarily the managers, and managers are not necessarily the leaders. This is because leadership and management are two distinct but complementary systems of action. Both are necessary for survival and progress in today's changing corporate world.

So how does a manager incorporate leadership abilities to balance his role? A good way to start is to recognize the fundamental differences in approaches:

- Management is about coping with complexity; leadership is about coping with change.
- Management deals with planning and budgeting; leadership deals with setting a direction.
- Management achieves its plan by organizing and staffing; leadership achieves its plan by aligning people — that is, communicating the new direction to those who can create coalitions that understand the vision.
- Management ensures plan accomplishment by controlling and problem-solving; leadership ensures the same by motivating and inspiring others.

Managers must realize, however, that the main challenge is to have both leadership and management skills.

Notable leaders/managers include Lou Gerstner at American Express Travel Related Services, whose direction for the division helped increase its net income 500% from 1978 to 1987; Chuck Trowbridge and Bob Crandall at Eastman Kodak Co., whose alignment of people helped quality on a main product line increase one hundredfold between 1984 and 1988; and Richard Nicolosi at Procter & Gamble Co., whose emphasis on teamwork and multiple leadership roles pushed paper products division revenue up 40% and profits 66%.

"Issues for the successful information center"

By Ron G. Thorn, Jan L. Guynes and C. Stephen Guynes

Journal of Information Systems Management
Spring 1990

■ The information center — a corporate resource for personal computer training, applications backlog reduction and, sometimes, an entity created to ease user dissatisfaction with the IS department — can only be successful if it can generate user satisfaction with the system and its associated personnel. Lacking an effective plan to create the center is a recipe for failure.

To plan and implement a successful information center, one must assess the organization's mission and objectives; determine whether an information center can support that mission (an organization dedicated to strong centralized control of IS will probably not profit from an information center); maintain a user-oriented identification for the center; and develop a charter for it.

Other tips: Sell the concept to senior management; sell the concept to selected users; and design the information center as a business within a business (the attitude that the center must generate more value than it costs is critical).

"Systems development risks in strategic information systems"

By Chris F. Kemerer and Glenn L. Sosa

MIT Sloan School of Management Center for Information Systems Research
May 1990 Working paper

■ There has been a steady stream of one-sided articles about successful strategic information systems, but very few have addressed the significant risk that such a project will be a failure.

The risk of failure is intensified because strategic systems are very expensive, complex to develop and sometimes employ "bleeding-edge" technology.

A classic example of a failed strategic system is Federal Express Corp.'s Zapmail facsimile service, launched in July 1984. After losing about $350 million, Zapmail was terminated in March 1986 because the market failed to develop.

On the front end, it may be difficult to launch a strategic system unless there is an active partnership between the IS department and line managers and tolerance of experimentation and minor mistakes. On the back end, strategic systems are expensive to maintain and/or enhance — and there is always the risk that the system can be copied by rivals.

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For more information, call **1-800-228-9930**.

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COMMENTARY

Ellis Booker

Test the water before you dive

Only a year ago, Eastman Kodak dove into the bracing outsourcing waters. Today, the hot summer of 1990 finds the beach crowded, with dozens of companies in the surf. Many more users are sitting on the sand, watching and waiting for the right proposal to float by.

Last month in St. Louis, some experienced outsourcing swimmers gathered at a day-long seminar to talk about the advantages and pitfalls of handing a company's information systems operation to an outsider.

By far, the consensus at this seminar was that the economic and strategic success of the outsourcing falls most heavily on the user. Most of the best ideas from "Outsourcing: Strategies for the '90s," sponsored by Washington University's Center for the Study of Data Processing, centered around that point.

The group said again and again that to evaluate and then enter into an outsourcing arrangement, the best approach involves careful planning, evaluation and introspection.

This last item, introspection, is one that doesn't get enough attention — whether the subject is outsourcing or business practices in general. The institutional inertia that grips businesses that employ more than five people is well known and oft-bemoaned.

In fact, I suspect that more than a few savvy managers have seized on the outsourcing concept because it provides exactly the right sort of incentive to take a long, hard look inward at an IS operation that hasn't been placed under the spotlight in years.

Consider the case of Peabody Holding Co., a $1.8 billion oil concern, which since 1985 has conducted frequent reviews of its entire technology operation, from systems software to long-distance service.

"We select vendors to come in and do an analysis on our costs, schedules and plans," Vice-President of Information Services Richard J. Price says.

Price proudly reports that the IS department, which has held its annual budget at $9 million for a number of years, has yet to find an outsourcing vendor with a better deal. "They tell us our cost of operation is significantly less than their cost," Price says.

A bloated IS operation should not be compared with an outsourcing alternative, said Donald T. Winski, executive director of corporate information services at Time Warner, Inc. "You want to start with the *minimum* IS requirement," he says.

Winski recommends the following exercise. Consider what IS functions you would give to an outsourcer if your computer and storage capacity were infinite and your costs were zero.

This kind of thinking, he suggests, will create a "paradigm shift," allowing one to think about how to bring new abilities into the business, as well as cost savings.

On the subject of costs, Michael J. Intille, vice-president of TSC, a Chicago-based consulting firm, offers the following sound advice: Understand the economic underpinnings of your IS department's costs — broken down into capital and variable expenses as well as costs per transaction — before comparing it with the outsourcer's proposal. That proposal, obviously, must also contain a price-per-transaction field.

Interestingly, while a number of the presenters made a compelling case for the economic advantages of outsourcing, this was not their fundamental measure of the success of their arrangements. Rather, most judged it on the basis of the long-term strategic advantages, such as keeping current with technology or — for those who outsource programming development along with hardware — keeping current with the skill level of the industry.

Introspection, especially on the beach in the summer, is important. Without it, you almost always get burned.

Booker is *Computerworld*'s Chicago bureau chief.

IIE winners announced

SAN FRANCISCO — Ford Motor Co. and Mountain Fuel Supply Co. were recently named winners of the 1990 Institute of Industrial Engineers (IIE) Award for Excellence in Productivity Improvement. The companies were honored at the IIE's conference here.

Ford won in the manufacturing category for effectively changing its corporate culture to focus on continuous improvement of products and services.

Salt Lake City-based Mountain Fuel, a natural gas distribution subsidiary of Questar Corp., used industrial engineering tools, training and a personal computer-based application to increase the number of customers served per employee by more than 30%. It won in the service category.

To find out how easy it is to convert DCA's new IRMA from standard to MCA bus, flip the page.

CALENDAR

"Managing Information Resources in the '90s: A Fresh Start" will be the theme of the upcoming National Association of State Information Resource Executives' 22nd annual meeting in Princeton, N.J.

The meeting, to be held Aug. 6-9, will address changes in the way technology is being used and managed in government. Individual session topics include executive information systems, ethics in technology, outsourcing, computer security, technology trends and a tour of the AT&T Network Operations Center.

For more information, contact NASIRE staff director Louise Spieler at (606) 231-1870.

JULY 15-21

Association of College and University Telecommunications Administrators Annual Conference and Exhibit. Orlando, Fla., July 15-19 — Contact: Lisa McLemore, ACUTA, Lexington, Ky. (606) 252-2882.

IBM in the International Marketplace. San Francisco, July 16-18 — Contact: International Congress Registrar, Alexandria, Va. (703) 838-8042.

Industrial and Engineering Applications of Artificial Intelligence and Expert Systems. Charleston, S.C., July 16-19 — Contact: Dr. Moonis Ali, University of Tennessee Space Institute, Tullahoma, Tenn. (615) 455-0631.

Database World Conference & Exposition. Santa Clara, Calif., July 17-19 — Contact: Digital Consulting, Andover, Mass. (508) 470-3870.

Macintosh/New York Conference & Exposition. New York, July 17-19 — Contact: Exposition Management, Waltham, Mass. (617) 290-0400.

Data Processing Disaster Recovery Plan. San Diego, July 17-20 — Contact: Harris Devlin Associates, Wayne, Pa. (215) 341-8854.

JULY 22-28

Guide 77 Convention of Midsize and Large-Scale IBM Systems Users Group. Chicago, July 22-27 — Contact: Guide International, Chicago, Ill. (312) 644-6610.

The CAMMP Show for Computer-Aided Graphics, Multimedia and Presentations. Chicago, July 23-27 — Contact: Debbie Rotolo, Knowledge Industry Publications, White Plains, N.Y. (914) 328-9157.

Multi-Net Expo '90. Houston, July 25-26 — Contact: Ann Garner, Multi-Net Expo, Houston, Texas (713) 827-8030.

Utah State University IT Institute. Logan, Utah, July 25-28 — Contact: Monique Squire, Logan, Utah (801) 750-1690.

Directions and Implications of Advanced Computing Symposium. Cambridge, Mass., July 28 — Contact: Coralee Whitcomb, DIAC, Cambridge, Mass. (617) 891-3103 or (508) 945-0360.

JULY 29-AUG. 4

AI-1990 Conference. Boston, July 29-Aug. 3 — Contact: American Association for Artificial Intelligence, Menlo Park, Calif. (415) 328-3123.

Workshop on Electronic Information Exchange Standards Used in Document Processing Applications. Gaithersburg, Md., July 30 — Contact: Lori Phillips, NIST, Gaithersburg, Md. (301) 975-3881.

Insourcing vs. Outsourcing: The Summit Meeting. Atlantic City, July 31-Aug. 1 — Contact: The Yankee Group, Boston, Mass. (617) 367-1000.

Delaware Valley DB2-SQL/DS Users' Group Meeting. Essington, Pa., Aug. 1 — Contact: Jean Tucker, Scott Paper, Philadelphia, Pa. (215) 522-6294.

Computer Security in the '90s Conference and Exposition. Atlanta, Aug. 1-3 — Contact: Inforum, Atlanta, Ga. (800) 343-5048.

Object-Oriented Design and Programming seminar. Montreal, Aug. 2-3 — Contact: Darcy Harrison, Interactive Software Engineering, Goleta, Calif. (805) 685-1006.

AUG. 5-11

Uniforum Open Systems Seminar. Chicago, Aug. 6 — Contact: Uniforum, Santa Clara, Calif. (408) 986-8840.

North American ISDN Users' Forum. Gaithersburg, Md., Aug. 6-9 — Contact: Lori Phillips, NIST, Gaithersburg, Md. (301) 975-2937.

Siggraph '90. Dallas, Aug. 6-10 — Contact: Siggraph '90, Chicago, Ill. (312) 644-6610.

AUG. 12-18

The Urban and Regional Information Systems Association. Edmonton, Alberta, Aug. 12-16 — Contact: URISA, Washington, D.C. (202) 289-1685.

SHARE 75. New Orleans, Aug. 12-17 — Contact: SHARE headquarters, Chicago, Ill. (312) 644-6610.

Downsizing Conference: Moving from Mainframes to PCs. Boston, Aug. 13-14 — Contact: Digital Consulting, Andover, Mass. (508) 470-3880.

AUG. 19-25

Eastern Regional ISSA Conference. Washington, D.C., Aug. 19-21 — Contact: Ralph S. Poore, Baltimore, Md. (301) 783-3885.

Strategic Information Systems Conference. Boston, Aug. 20-21 — Contact: University Seminar Center, Boston, Mass. (617) 248-8066.

Summer Workshops for the Information Processing Professional. Nashua, N.H., Aug. 20-23 — Contact: Ouellette & Associates, Bedford, N.H. (603) 623-7373.

SCO Forum '90. Santa Cruz, Calif., Aug. 20-24 — Contact: The Santa Cruz Operation, Santa Cruz, Calif. (408) 425-7222.

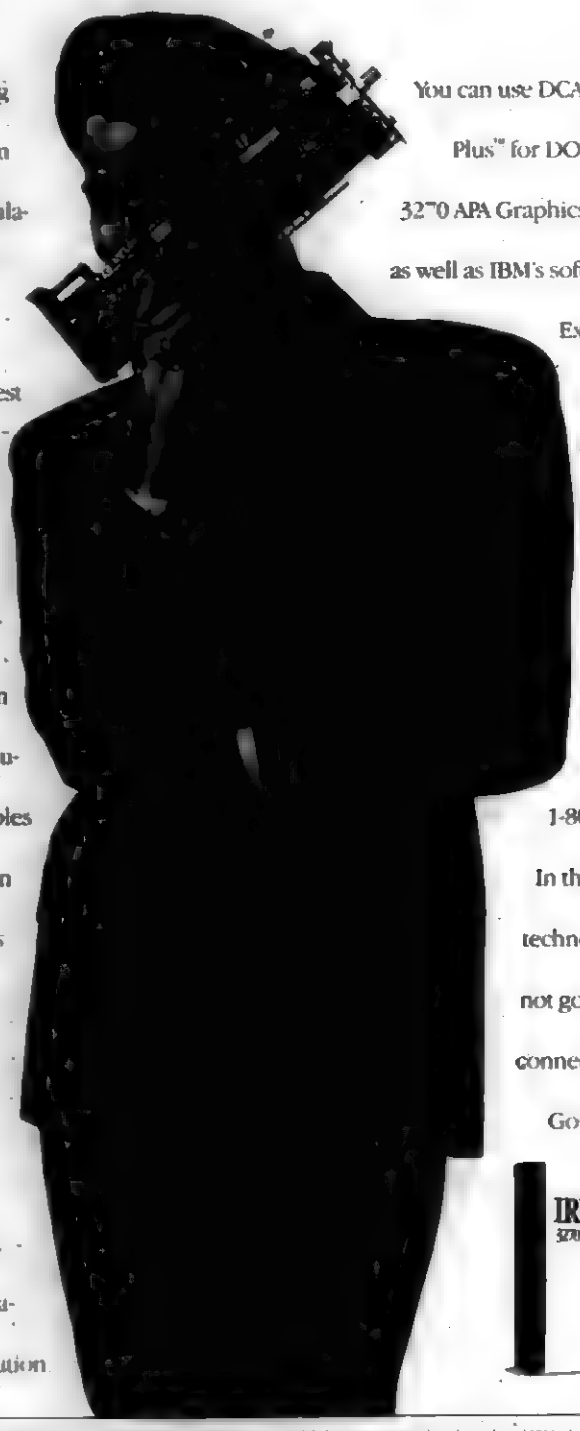
Early, Cloud & Co.'s Summer Conference on Telecommunications. Newport, R.I., Aug. 22-23 — Contact: Early, Cloud & Co., Newport, R.I. (800) 322-3042.

AUG. 26-SEPT. 1

National Computer Graphics Association Conference and Exposition. Houston, Aug. 26-29 — Contact: NCGA, Fairfax, Va. (703) 698-9600.

CASE for the 1990s. Boston, Aug. 27-29 — Contact: Extended Intelligence, Chicago, Ill. (312) 346-7090.

You got the idea.



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Keep risks in sight when walking the edge

BY BARBARA FRANCETT

Three years ago, David Carlson, senior vice-president of corporate information systems at K Mart Corp., made his pitch to the company's senior management for an advanced satellite network to link 2,250 stores. The expected outlay was $40 million to $50 million. Carlson says he remembers the day and the dialogue very well. It went something like this:

Top executive: "How proven is the technology?"

Carlson: "Not at all."

Top executive: "Who else is using it?"

Carlson: "No one you know."

Top executive: "How much experience does the staff have with it?"

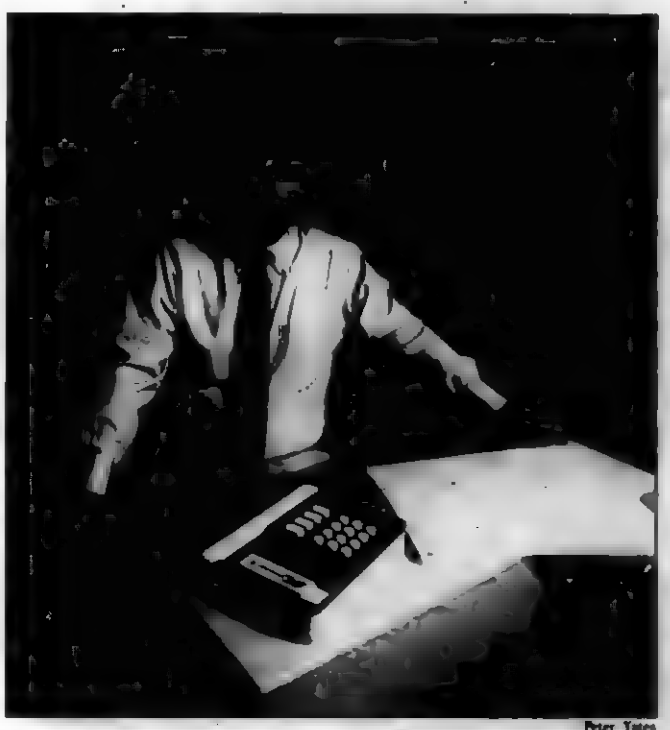
Carlson: "None."

Hardly a promising beginning, but as it turns out, K Mart did sign an agreement for the satellite network with GTE Spacenet. It was the largest commitment to a new technology that K Mart had ever made. Today, the network links 1,900 K Mart stores to the corporate headquarters in Troy, Mich., with about 350 more stores to go.

Projects that use advanced technologies can be risky business, but, as Carlson's experience shows, risky projects can be sold, and the risks can be managed.

It certainly helped that Carlson was dealing with company management predisposed to listen, without prejudice, to unproven ideas. "They are very open to the technology," Carlson says. "They allow risk-taking to occur." Still, it would be a mistake to assume that K Mart was willing to take a step this large without solid information or safeguards.

Although he couldn't show precedents, Carlson could and did produce some very specific supporting arguments. "We anticipated objections and were prepared to answer them," Carlson says.



Peter Yates

K Mart's Carlson *recommends conducting careful research and hiring good lawyers*

The informations systems department, he explains, had tracked and assessed the technology very carefully before bringing up the idea. "We had taken a serious look and determined that the system's technology, VSAT [very small-aperture terminal] and Ku-band [frequency for satellite communication], was superior to that of a terrestrial system," Carlson says.

There was also plenty to say in terms of business justification. On-line credit authorization via the satellite network would produce enough savings to cover investments. Business analyses would be improved with a network that made overnight transmission of store sales data to headquarters feasible. Finally, the ability to transmit management updates and merchandise reviews in video format would promote corporate unity.

The experiment was also hedged with technical and legal safeguards. The vendor was one in which the company could have confidence, Carlson says. And K Mart subjected the technology to trial by fire, first piloting the satellite network in 50 stores — half in Michigan and half in Florida. "Ku-band is influenced by rainstorms. We wanted to see how the network would function under the most rigorous conditions," Carlson says.

If things didn't work, the company's contract attorneys had made sure that there were escape hatches. "If the technology didn't work, we had recourse," Carlson says. "We felt great comfort in the safety net of the contractual relationship."

Knowing how to manage the risks is now more important than ever before, because playing it safe — only choosing the technologically tried and true — is simply not an option anymore for many companies. Today's complex, volatile business environment mandates increased risk-taking.

Armed with knowledge

The technologically adventurous can sweep the competition if they confront risk with knowledge. "If a technology is very high-risk and expensive, it can create a barrier to entry for your competitors," says Thornton May, director of imaging research at Nolan Norton Institute in Lexington, Mass. "But you must understand your business and be proactive."

The demands of a new product inspired Dow Jones & Co. in South Brunswick, N.J., to undertake a parallel processing project for Dowquest, a database search service. The firm chose Connection Machine from Thinking Machines Corp. in Cambridge, Mass. The massively parallel Connection Machine uses 32,000 processors and runs at 4 billion instructions per second.

"It's as risky as you can get," says Frank Panella, director of systems development at Dow Jones. "We needed a fast, reliable, easy-to-use searching machine. We didn't think about an alternative because there was no alternative."

Dow Jones mitigated the riskiness of the technology by developing a close relationship with the vendor. "They modified the product to suit our needs," Panella says. Members of the IS staff also traveled to Cambridge to attend parallel processing classes.

Despite these efforts, difficulties still arose. "There were levels of frustration tied to hardware reliability issues," Panella says. "Things will always break, but it can't be for long because

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Francett is a free-lance writer based in Bloomfield, N.J.

Walking the edge

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we have to provide the highest quality service to our customers."

His struggles with parallel processing haven't turned Panella into a conservative. Right now, he's working on an enhanced user interface and looking forward to adding artificial intelligence to the system. "A more traditional approach may be less risky, but it's not necessarily best for the organization as a whole," Panella says. "If it's for the good of the organization, then that's the way you have to go."

The value of scouts

One way to cut down on the risk factor is to experiment with new technologies as part of your research and development effort, suggests Norm Weiser, senior consultant at Arthur D. Little, Inc. in New York. "Keep someone looking from the crow's nest scanning the horizon."

United Services Automobile Association (USAA), the San Antonio-based insurer, maintains a continuous five-year R&D program, says Donald R. Lasher, president of the information services division. "We're a $5 billion company. Two million a year is invested in R&D, but we leverage the hell out of it," Lasher says.

The R&D group searches literature for new technologies and applications that may be relevant to business problems. "Technologies are considered on a business-case basis for cost-effectiveness, cost benefit and user buy-in," Lasher says.

An executive council grants funding and approval. Then, USAA launches a pilot with user involvement. A division-level officer sponsors the project when it is ready to go into production. USAA's well-known pioneer imaging system, for example, belongs to the property/casualty division.

USAA is currently developing a number of leading-edge systems. One is a cooperative-processing project. Based on IBM Personal System/2s running OS/2, the IBM Systems Application Architecture-compatible system will encompass imaging, office automation, voice integration, video and IBM's AD/Cycle, Lasher explains.

"In general, we don't like to be first. We've learned to be careful."

DONALD R. LASHER
USAA

"In general, we don't like to be first," he says. "We've learned to be careful. You have to make a good business case and make sure you know whether the technology offers a strategic or competitive advantage."

If a technology does pass that test, however, the company doesn't hesitate. "One of our principles is to treat technology as a strategic weapon," Lasher says. "We're not afraid of it. It has stood us in good stead."

When weighing a leading-edge technology, it is also wise to consider compatibility on all levels, advises Michael Packer, vice-president and director of the information technology group at The MAC Group in Cambridge, Mass. "Do you have the skills to maintain the technology? Will it be compatible with your existing systems? Is it the right technology, or will you have to 'rip up track' later?" he asks.

Zale-Lipshy University Hospital, a 163-bed hospital that opened last November in Dallas, decided it wanted to start operation with both the right system for every purpose and an architecture that would link them all. So it bought the skills of Perot Systems Corp.'s health care division in Herndon, Va., a general contractor and systems integrator.

That kind of strategy represents a "tremendous risk," according to Chuck Lyles, a Perot Systems associate. "Most hospitals won't absorb such risk. They'd rather have less functionality," he says.

The way that Lyles chose to minimize the risk was to take a standards-based approach using a common user interface to allow a wide variety of platforms "to execute transparently to the end user." HL-7, a standard hospital-industry protocol, allows plug-and-play integration across all departments.

"Our environment is a distributed network," Lyles says. "Each department has its own database with connectivity between systems." In addition, the individual databases are duplicated on a common SQL-based database from Quantitative Medicine, Inc. in Annapolis, Md.

Lyles had no formal risk-management plan. However, he says he believes insistence on adherence to standards reduces risks substantially. "In some cases, the standards aren't there yet, but they will be," he says. "We developed a system for the hospital to grow into."

According to Lyles, Zale-Lipshy's Chief Executive Officer, Dr. Ronald F. Garvey, believes it makes sense to have the best tools to attract the best physicians. In turn, they bring in patients and generate revenue.

Business needs should drive the choice of an advanced technology, says Gavin Finn, consulting engineer in the advanced systems development services division of Stone & Webster Engineering Corp. in Boston. Finn, who develops expert systems for manufacturers, utilities and aerospace companies, says he makes sure that the problem comes first and the technology second. "We do a functional analysis and requirements specifications first. We don't decide on software and hardware tools until we're somewhere into the project," he explains.

That approach also reduces the need for software development, which Finn says represents another risk factor. "We use commercial packages and do as little software development as possible," he says.

The downside potential in expert systems projects, Finn adds, can also be reduced by investing a lot of time up front. "Building an expert system is an iterative process. It's important to break down the problem into workable pieces and do a good job at the first stage. If we can get our arms around the problem the first time around, we know we'll be successful on the next step," he says.

Know your target

That's a principle that can extend to any kind of advanced technology project, according to Peter G. W. Keen, executive director of the International Center for Information Technologies in Washington, D.C. His translation: "Use advanced technology on an application you understand well."

There's nothing that Unum Life Insurance Co. understands quite as well as claims processing, so it is fitting that the three new technologies the Portland, Maine-based company is piloting are all aimed at that application.

The company now has a project under way to combine image processing, knowledge-based systems and claims life-cycle management.

John Alexander, senior vice-president and chief information officer at Unum, says each of the three technologies was chosen to fit elements of the process: imaging to move massive amounts of claims information electronically, knowledge-

Continued on next page

WHAT EXACTLY *IS* AN ADVANCED TECHNOLOGY?

To one firm, it may be computer-aided software engineering tools; to another, neural networks. The definition is really context-dependent, says Michael Packer, vice-president and director of the information technology group at The MAC Group, a management consulting firm in Cambridge, Mass.

An advanced technology can be any of the following:

- An unproven technology yet to be demonstrated as technically feasible.
- A technology that is feasible but with few, if any, production implementations.
- A technology that has been adopted by many but is new to your company.

Walk, don't run

IS executives report lukewarm corporate support for exploration and implementation of advanced technologies

How a bank insures technology deposits

In the banking business, there's as much or more risk attached to avoidance of technological innovation as there is to investing in advanced technologies, says Jim Breen, vice-president of technology integration at the Royal Bank of Canada in Toronto.

"Banks depend on technology for customer service and service delivery to all their lines of business," he says. But the fact that everything is so customer-driven also means "the impact of failure is very high. Any disruption can cause chaos."

In the interest of minimizing the possibility of technology-induced chaos, Royal Bank has instituted a formal risk-management process.

Before work commences on any project, the project manager must fill out a questionnaire that contains approximately 60 questions dealing, in roughly equal parts, with the size and duration of the effort, the complexity of installation and the sophistication of the technology.

The purpose of this exercise, Breen says, is to give the project manager a means of identifying all the various risks attached to a project and of assessing their gravity. "At the end of the process, they analyse the risk. For example, a grade of low risk on complexity and technology but high on size would result in an overall medium-risk rating.

If you can't beat 'em

Once risks have been identified, the project managers must figure out how to either eliminate or manage them.

Managing risk, Breen says, requires knowing what the probability is that things will go wrong and what the likely consequences will be — not just for IS, but for the entire business.

According to Breen, other risks the Royal bank plans to assess with the same method include operations risks and shareholder risks. "We must also recognize the extent of organizational changes and provide stability with specific communication programs," Breen says.

Royal Bank takes both information and management of information technology risk very seriously. According to Breen, the bank has four strategic management plans: Managing technology and the information resource is one of them.

"We're changing the culture from managing processes to managing information," he says. "Risk management is an absolutely critical success factor."

BARBARA FRANCETT

From previous page

based systems to guide and review claims processors' decisions and the claims management system to help maintain claims records after processing. "Our focus is on improved customer service and improved productivity," Alexander says. "These technologies will make claims processing easier, faster and cheaper."

Alexander chooses the new technologies Unum will develop based on informal research. "We try to structure projects somewhere between maximum bang for the buck and minimum regret," Alexander says. "There's new opportunity but the possibility of failure, too. We talk to people on the bleeding edge and try to infer what the payoff would be for us."

"WOULD our customers use the system effectively? Would they be able to support it? That was the nature of the risk."

CHARLES DARNELL
LITHONIA LIGHTING

Introducing a new technology at Unum is a three-way deal, Alexander says. Once a promising new technology has been identified, IS looks for a partner in the division-level application development and data administration groups and a customer for that technology in the line divisions' business managers. "We don't do anything without a customer ready to allocate resources," Alexander says. "If we can generate a partnership, we're generally pretty successful."

Occasionally, projects have failed, Alexander says, but it's rarely the technology that's to blame. "If costs or resource requirements are too high, the technology washes out early," he says. "Inadequate training, misunderstood business needs, poor project management — these are what can kill a project."

Plugged into users

In implementing leading-edge technologies, the way you address organizational issues can also be a make-or-break factor. At Lithonia Lighting in Conyers, Ga., a change in the fundamental nature of the business and a competitive opportunity motivated the company to create an unprecedented system. However, attention to user issues was key to making the system work.

The company undertook its Lightlink project, made up of hardware, software and network links, to push information systems out to its customers. The Lightlink system is now a fixture. The company's 107 agents, 200 distributors, 2,000 specifiers and 1,800 contractors all use it regularly for pricing, quotations and order-entry tasks. But in 1983, it represented a daring move.

"Would our customers use the system effectively? Would they be able to support it? That was the nature of the risk," says Charles Darnell, senior vice-president and general manager of the management, information and electronic systems group at Lithonia. Having identified the risk, he and his group set out to diminish it. "We acted as missionaries. We presented a program that we boiled down to system features, functions and benefits. We took every opportunity to do videos, slide shows, one-on-one meetings and evening workshops," Darnell says.

That kind of attention to user concerns has continued. "Every time we do a major enhancement, we send a person to spend a week or so to be there with [customers] night and day. We want to make sure they're totally comfortable," Darnell says. "And we pay the whole bill."

Such solicitousness has paid off in an enhanced competitive position. Lithonia's share of the lighting market has increased steadily over the years, while its competitors have lost market share. "Sales increased sixfold from $96 million to $559 million from the beginning of the first generation of Lightlink," Darnell says.

The need to make the organization more effective and responsive to business changes pushed The Hon Co. in Muscatine, Iowa, to adopt advanced technology, says Jim Goughenour, until last fall the vice-president of MIS and now the vice-president of customer service and distribution at the nation's third-largest office furniture manufacturer.

Early this year, Hon began using Linc, a fourth-generation rapid application development tool from Unisys Corp. "We want applications up and running as soon as possible," Goughenour says. After piloting the tool in a budgeting application, its use is now being expanded to general-ledger and accounts-payable applications.

"Linc requires considerable computer resources, but it saves time," Goughenour says. "What used to take three to four weeks now takes three to four days. We can change applications rapidly to suit the business environment."

Goughenour began the project with a pilot. The vendor lent the software at no charge, a tactic Goughenour recommends. "If the pilot was successful, it would mean a big sale for them. It was a gamble they felt they would win. We also had a consultant from the supplier to eliminate the glitches we would make from ignorance." End users were intimately involved in the design of the system, Goughenour says. "We formed task teams of users and MIS. The users knew the application, and MIS knew the technology," he adds.

Goughenour's approach to scheduling also helped reduce risk. "We set target dates, but we didn't bind ourselves to that. It's more important to put in a quality product," he says.

The manufacturer is currently developing a parts order-processing system using Linc. "We're working to become a world-class manufacturer," Goughenour says. "We're using the technology to empower people. To be effective in the global market, you need to use every mind you've got."

New yardsticks

Once the projects are up and running, assessing the impact of leading-edge technologies such as those used by these companies is not easy. Although traditional cost/benefit analyses and measures of profitability and market share changes may help, it's often difficult to trace the impact of an information system to a bottom-line result, says C. Lawrence Meador, president of The Softbridge Group, a consulting firm in Cambridge, Mass.

Meador suggests other necessary evaluation criteria, such as changes in the decision process, the effects of decision outputs and procedural changes as well as changes in managerial concepts. Service measures, such as systems availability, convenience of access, reliability and support may also be better indicators of the true value of technological innovations than traditional cost/benefit analyses.

"It takes courage to take a risk and follow it to the end," Goughenour says. "You have to know where the rewards lie, because they're not always translatable in dollars." •

The don'ts: Common pitfalls

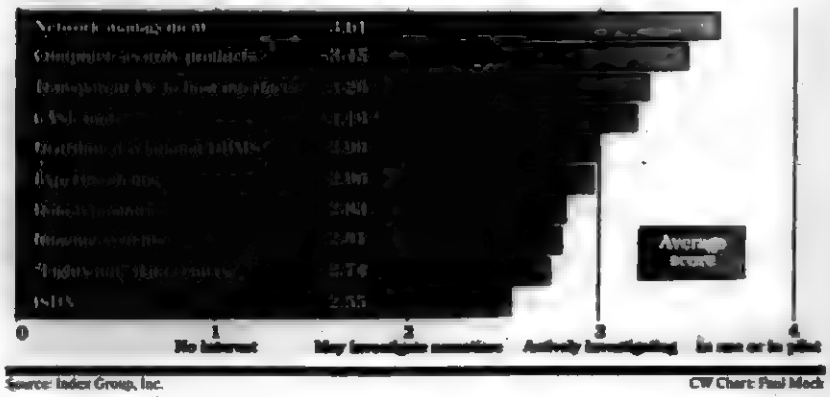
Sometimes the most important thing you can know is what not to do. For example, it is less critical to know that you should drive on the left in England than that you shouldn't drive on the right. In a similar vein, what you don't know about what to avoid when approaching advanced technology projects is more likely to cause harm than a bungled how-to instruction. The following list of prohibitions is based on what consultants say are some of the most common mistakes firms make in using advanced technology:

- Don't choose a highly specialized solution if you can help it. Stick with products that offer flexibility.
- Don't build a system to prove a technology — build it to solve problems.
- Don't install a critical system and test a new technology at the same time.
- Don't set out to solve problems for end users and expect them to sit back and accept the solutions. Involve them in the process.
- Don't be risk-averse just because you might fail. Without the freedom to fail occasionally, you'll be afraid to take any chances, even those that could really pay off.
- Don't become infatuated with technological exotica. The wilder technologies may provide some unusual benefits, but chances are that company management won't care about them or want to pay for them.
- Don't look just at vendors and universities when investigating advanced technologies. Look at what your peers are doing both in your industry and out of it. Read widely and think broadly.

BARBARA FRANCETT

Top priorities

Few companies exhibit interest in technologies such as pattern matching and neural networks. Below are the new technologies that register highest on the interest meter in a survey of 243 IS executives.



Source: Index Group, Inc.

CW Chart: Paul Mock

OfficeVision/MVS

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Personal Services Document Storage Reporter (CDSR) and **DISOSS Document Storage Reporter (DDSR)** provide information about every document filed in the OfficeVision/MVS Personal Services (or PS/CICS) document pool and the DISOSS library.

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Citicorp blends technologies as means to corporate ends

BY SHERYL KAY

Although Kerry Severin sits on the user's side of the desk at Citicorp in Tampa, Fla., she has a true appreciation for high technology. "Using advanced technologies in the information systems department will be the key to our division achieving its productivity goals," the vice-president of operational strategic planning at the global payments products division says. "These tools will ultimately give our customer service reps the ability to do more — smarter and faster."

Severin is referring to the Integrated Systems Project (ISP), the largest application development project ever attempted within Citicorp. This summer marks the culmination of the three-year effort and the unveiling of an integrated database system that processes and tracks the sale and usage of products around the world, including traveler's checks, money orders, official checks and electronic funds transfers. Two hundred technical professionals located in Tampa, Chicago and Buffalo, N.Y., were involved in the project, which entailed replacing 42 stand-alone systems with 15 integrated ones.

The programming and data reconciliation tasks involved in creating a worldwide integrated system for use by individual customers, commercial clients and Citicorp customer service and sales staffs in 92 countries were formidable. In total, 2.2 million lines of fresh code had to be constructed. That couldn't happen, however, until the data files from all of the 42 original systems were organized and reconciled. According to Dave Starr, senior vice-president of information technology, that chore accounted for one-fifth to one-quarter of the labor investment.

"With hundreds of millions of records of data, some dating back 15 years, you can imagine it was an enormous task," Starr says. "We had a pile of paper with updates on information from all over the world standing eight feet high in the office."

Bargain prices

Despite these obstacles, ISP came in at a surprisingly low cost — approximately $6 per line of code, according to Starr. By comparison, the publicly quoted per-line costs for the 25 million lines of code created for the space shuttle and the 400,000 lines behind Lotus Development Corp.'s 1-2-3 were $48 and $17.50, respectively.

The ISP team was able to achieve such cost efficiency because it employed a variety of advanced, but not leading-edge, tools in careful combination, Starr says.

Beginning with a personal computing computer-aided software engineering tool called Automate Plus from Cullinet Software, Inc. (now a part of Computer Associates International, Inc.), the first steps were taken toward data normalization during the design phase, by taking base data structures and defining them on-line. "This allowed us to consistently define business procedures across global, multiple-user groups and to get agreement on everyone's current business process flow problems," says Rick Lessard, vice-president of applications development.

Although a problem with the automatic rollback/recovery feature of the Automate Plus software (since corrected) cost a few extra days, Bill Sawyer, manager of data services, estimates a net time savings of at least two man-months by using the product for data normalization.

Moving from the design phase into development, the ISP group used ADS/A, a front-end prototyping tool, and ADS/0, a fourth-generation language (4GL), both made by Cullinet. Lessard estimates that using tools allowed the job to be done in one-third of the time that a Cobol/CICS development effort would have required.

One concern with using 4GL technology is that it can lead to inefficient programming. The ISP group avoided this problem by creating its own "technical cookbook," which Lessard says "explains the proper way to write 4GL technical routines."

In order to use the facilities of IBM's XA operating system to their fullest extent in an IDMS/R environment, Citicorp called on two database management system performance enhancement products: Fast Access from Allen System in Naples, Fla., and XADC from International Software in Racine, Wis.

"Those products allowed us to take IDMS/R buffers that reside below the 16 meg line and move them above the line into XA storage," Sawyer explains. "That way, we have up to 64 meg buffer sizes, which drastically reduced our I/O."

Another tool Sawyer says he thinks probably saved thousands of hours of programming time is a migration utility. When an on-line program had to be moved from one region to another, the Laderman Migrator from Laderman Associates in Yardley, Pa., took that program, along with all of its associated entities, put them into an extract file and then generated the correct syntax to put the file into the data dictionary in the other region.

Perhaps one of the most important technologies used during the project was LU6.2. Incorporated as SEND/RECEIVE routines in the ADS software, LU6.2 protocols allowed the technician to go from one region of the operating system to another to facilitate concurrent updates in sync.

LU6.2 is not without drawbacks. Updating across multiple regions adds complexity, Lessard says, and "probably added 50 to 60 man-months of effort." But the result, he adds, was greater throughput and faster updating, "which means we saved hundreds of thousands of dollars by delaying the procurement of additional DASD and more sophisticated hardware."

Combined strength

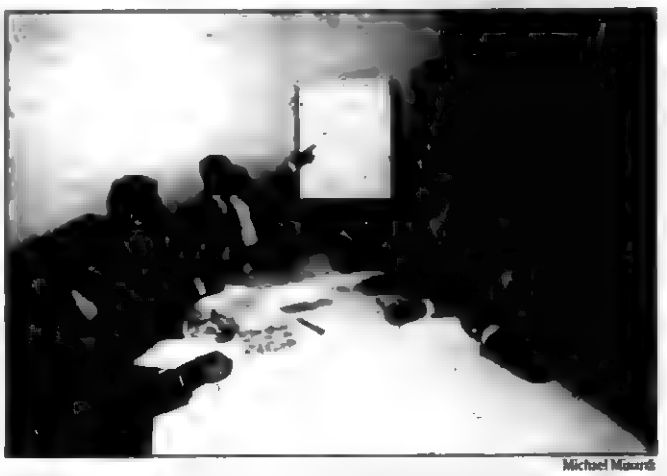
Starr points out that any one of these technologies alone would not have made a significant difference in the cost or speed of development. Taken together, however, the suite of technologies made an appreciable difference in both the budget and delivery time for a system that represents a considerable advancement in Citicorp's business system technology and may even turn into a commercial offering.

With ISP, Citicorp in Tampa has gone from 6,000 standalone, nondatabase files to 1,500 files and from 7,000 existing data elements to 2,300, of which 20% are new elements. "The enhancements to our own systems department are incredible," Starr says.

From the user perspective, Severin notes, the development of ISP as 15 integrated systems has changed Citicorp's view from a fragmented product orientation to a cohesive customer orientation. Because ISP is a completely table-driven system, she says, each customer service representative at Citicorp becomes a knowledge worker and is able to assume many more functions, handling any type of product inquiry during the course of a single phone call.

In addition, she says, the system will "allow us to set prices and establish process procedures uniquely suited to each client's needs and, in turn, maximize our total profitability."

With this revenue enhancement, Starr says he expects that Citicorp will be able to introduce more products and services and may even try out riskier technologies than it would have been inclined to sample before. •



Michael Maiorelli

Citicorp's ISP technical management team. *Sawyer and Lessard, second and third from left.*

Kay is a business consultant and freelance writer specializing in emerging technologies and human resources.

Success often elusive for advanced tech group

BY SABINA SKULSKY

Shaking up "business as usual" may sound like an unorthodox charter, but for advanced technology groups seeking more efficient ways to get the job done, it is a measure of their success.

The Strategic Technology and Research (STAR) group at Manufacturers Hanover Trust Co. in New York is successful in the eyes of Kenneth Hamilton, technology officer at the firm's global bank, because it fulfills a mission to find and participate in leading-edge technological efforts that improve the way the company does business.

In 1987, one of the team's projects transferred the bank's forward-trading operation from a back-office data entry system to an expert system that readily detects trading patterns and anomalies, doubles as an interactive training tool for new traders and makes money to boot.

Improving operations is also a measure of success at J. P. Morgan & Co. in New York. "You know you're successful when you can demonstrate a significant productivity improvement," says William Rabin, senior vice-president of strategic program management. Rabin can do this with a current project involving a component computer-aided software engineering (CASE) environment that will save many millions of dollars and deliver a major system many months earlier than otherwise possible, he says.

Manufacturers' Hamilton *cites benefits to business*

Such stories cast a rosy glow on the ability of groups to turn technology to real advantage. But most groups are largely unsuccessful. For instance, only 7% of respondents to a June 1989 survey of 94 corporations deemed themselves successful in terms of rolling out technological benefits to their firms, even though 81% of them employed some form of advanced technology group. (Respondents were among Fortune 250 companies that sponsor Partnership for Research in Information Systems Management, or PRISM, a joint venture between Index Group, Inc. and Hammer & Co. in Cambridge, Mass.)

Technology groups can fail for several reasons. Most problems originate because groups find it difficult to enlist influential sponsors in the organization. Without such support, the groups do not obtain sufficient funding from senior management. "It's a sale that has to begin at the top," says Sara Kaull, associate director of PRISM.

When upper management is not convinced that an advanced technology group is contributing to the company's success, the short-term profit focus held by

Continued on next page

Skulsky is a recent graduate of MIT's Sloan School of Management concentrating in corporate strategy and operations research.

many firms makes the group a prime target for cost-cutting. This is a short-sighted view on management's part, Kaull says, but is often the case. Frequently, she adds, management lacks faith in research and development efforts and doesn't believe the group can yield sufficient payback to justify the investment.

Another obstacle that these groups face is the IS organization's resistance to change. Executives who are highly skilled in one technology may see an emerging one as a threat and become reluctant to adopt it.

Keep an eye on eagles

Companies can improve the success rate of their advanced technology group endeavors by watching what successful firms do and looking at several key factors: who participates in the group, how the process works, where the emphasis is placed and what types of organizational structures are used.

Kaull cites three types of people needed in the group: those with a business orientation, to provide an understanding of the customer base; those with a project-management focus, to give insight into systems development; and those with technical expertise, to make it tick.

How the groups operate is also critical. Senior executives must understand the advanced technology group's mission so it can be filtered down through the IS organization. Manufacturers Hanover's STAR group, for example, is a full-time team reporting to the executive vice-president for corporate systems and a technology committee staffed by business managers. There's more than one way, however, to organize a group to overcome hurdles.

At Morgan, there are eight groups collectively called "strategic programs." The programs focus on such activities as trading architectures, office automation, data security, networking, transport layers and CASE. Although only a portion of one program is specifically regarded as an advanced technology group, other programs perform a similar function as they undertake projects involving new technologies. One of the eight programs is dedicated to providing internal marketing efforts for and disseminating information to the remaining seven; it informs the groups about new technologies, outlining their particular relevance to Morgan.

Each program has its own manager as well as a corporate sponsor, such as the chief financial officer. Furthermore, three corporate committees consisting of senior business executives provide overall sponsorship for the programs. This illustrates the high-level commitment and companywide awareness that are critical success factors for advanced technology groups, says Rabin, who oversees all of the programs.

Striking a balance

Another factor Rabin cites is balancing work load and goals between current and future needs. The groups at Morgan support current projects through activities such as consulting and data modeling as well as investigate new technologies for future implementation.

Rabin further attributes the success of the programs to keeping the groups small and focused. He explains that Morgan's groups number only seven or eight people each-but that they, in turn, leverage a network of local data managers in every business area throughout the firm.

Structure can also be used to keep groups focused on a primary objective. Reporting structures are particularly important in this regard, says Michael Packer, vice-president and director of the information technology group at The MAC Group in Cambridge, Mass. Groups can report to the head of IS, can exist together with the standards and policies group or can be included within the strategic technology planning and administration function, he explains.

Morgan's Rabin *looks for measurable results*

Another way to categorize groups is by their nature and make-up. According to Kaull's definitions, "labs" are groups of technically oriented types removed from the business and IS functions; "consultant" groups are more integrated into business operations; and "virtual" groups are future-oriented, with teams convening on a project basis and then disbanding.

This spectrum runs from conservative to risk-prone. The optimal structure for a particular group depends on the nature of the company and the industry. Kaull says the consultant structure is the most prevalent form overall, but in utilities and financial services, for instance, labs are predominant.

It is crucial to design a group to streamline the means by which an organization's overall goals can be met and top-down commitment can be won. "Groups should have clearly defined objectives and a mission tied to the overall economy of the organization. Ill-defined groups fail," says Paul Cosgrave, managing partner of integration services for the Northeast at Andersen Consulting in New York.

Packer agrees that groups must keep objectives in mind and stresses that it's important not to become enamored of technology to the point that it undermines the need for practical results. ●

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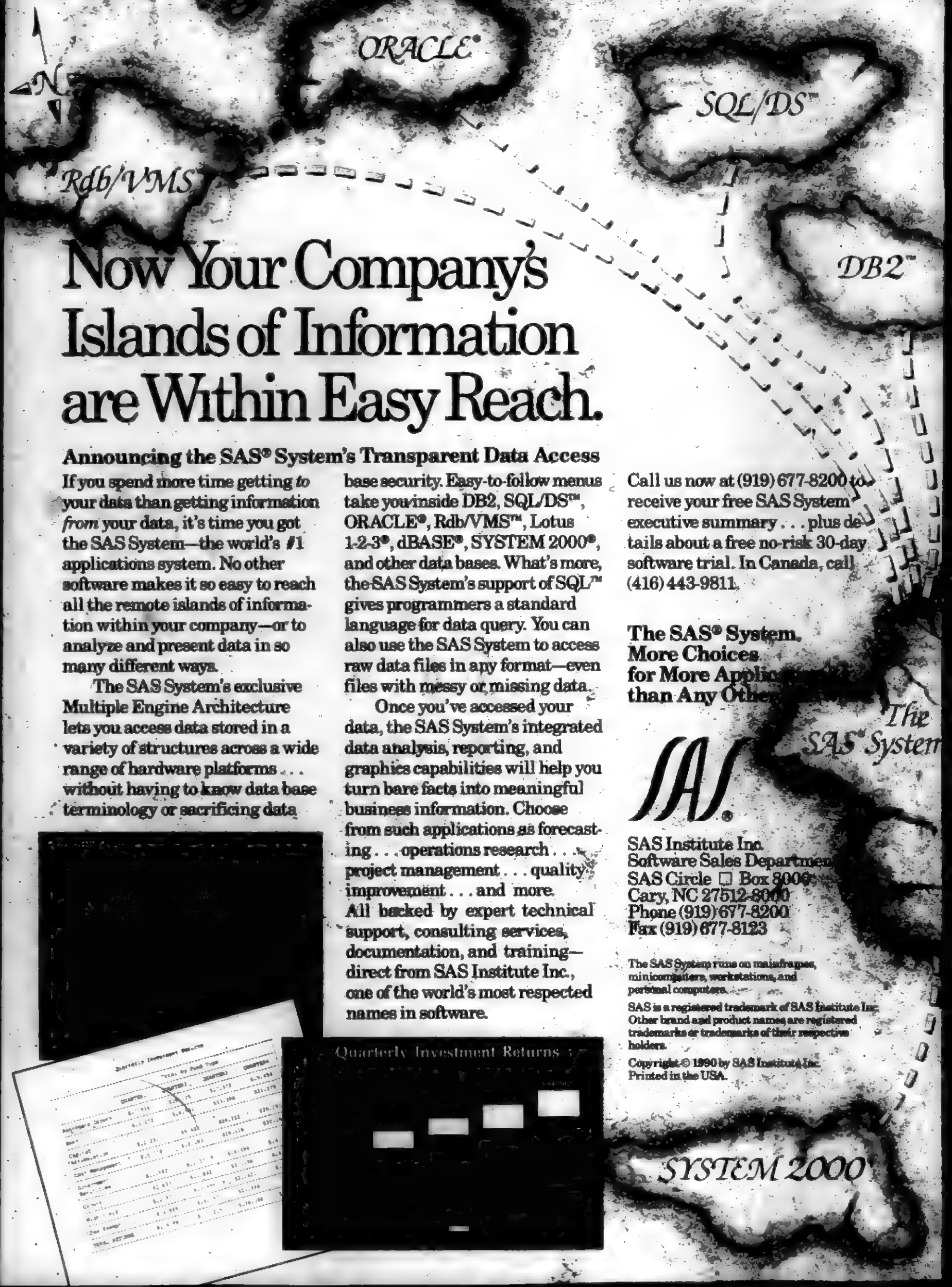

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SYSTEM 2000

Do a data center makeover

As an alternative to outsourcing, data center restructuring can help organizations get more for their IS dollars

BY THOMAS WALSH

Your chief executive officer has caught the outsourcing bug. He's demanding lower costs and higher service levels. He's read a little about outsourcing and wants you to look into it. You've already done some investigating and have a strong feeling that neither outsourcing nor decentralizing is quite right for your operation. "Have you got a better idea?" asks the CEO. "Restructure," you answer.

Put simply, restructuring means examining and reorganizing available resources in a way that cuts unnecessary costs and improves service. It's a way of getting more for the information systems dollar.

Successful data center restructuring takes two things. The first is good management, which means having the skill to manage relationships among upper management, users, peers and employees. The second is adept use of some key elements (see below).

If used creatively, the 12 elements of data center restructuring can transform a high-cost provider with poor service into an effective, efficient data center operation. The prerequisites are good management, two to three years to achieve the turnaround and a reasonable level of demand for the data center's services.

The payoffs: head counts reduced by 40% to 80%, cost per million instructions per second (MIPS) slashed 30% to 60% and staff availability boosted by 2% to 5%.

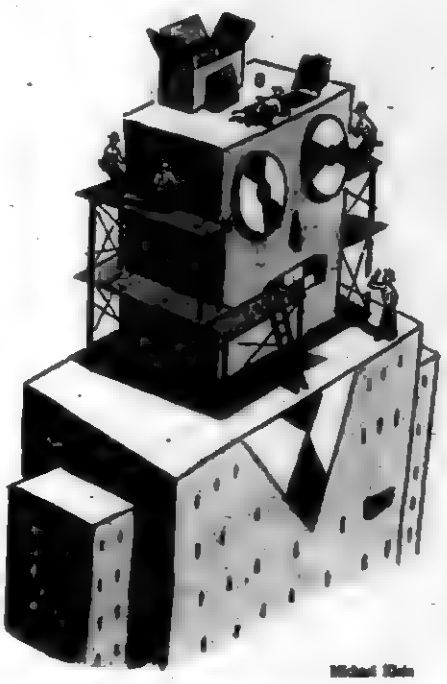
■ **Element 1: A committed work force.** Many business leaders say participative management is crucial for survival in the next decade. The data center is no different. The keys are involvement, bottom-up decision-making, empowerment and trust.

In most data centers (and companies, for that matter), these ideas are revolutionary. But there are enough committed work force success stories to demonstrate that they work.

To get started: Read the literature. Search out companies in which participative management has succeeded — and failed. Determine what form is best: Participative management in a nuclear power plant looks quite different from that in a small software group. Request help from your human resources department, but expect resistance.

■ **Element 2: Performance management.** In most data centers, performance management has a low priority. The prevailing attitude is, "If there is a problem, I'll tell you about it. Otherwise, you are doing OK." The nature of data center management might explain this attitude: For many data center managers used to dealing with technology, dealing with people can be discomforting or unpleasant.

Still, performance management must occur. It must also be applied consistently and fairly. People need to be provided with the following: the knowledge of what they are supposed to do, for example, job descriptions and objectives; the skills to perform their job, for example, training plans and training; the tools and systems to perform their jobs without undue interference; consistent written and verbal feedback (both good and bad) of how they are performing their work; and punishments and rewards.



Michael Klein

While restructured data centers operate with relatively few people, they do not employ marginal performers.

■ **Element 3: Work redesign.** Data center work should be considered a nonroutine, complex activity. The approach to redesigning work has three steps: reviewing the current organization, redesigning the work and implementing a new organization.

Work redesign is best as a participative activity. No one knows the work better than the personnel already performing the activities. However, fear, mistrust and resistance to change will prevent most groups from eliminating jobs if needed. This takes management prodding and requires management to understand enough about the work to know where it can cut staff.

■ **Element 4: Linkage analysis.** Examining the interactions between the data center and user organizations and vendors can often yield opportunities for improved efficiency and effectiveness.

Whenever possible, users should have the tools and training to do the job themselves. It helps to keep in mind a simple principle: Don't perform tasks where there is no value added. This principle can be applied to data entry, computer scheduling, program parameter submission, printing and so on.

■ **Element 5: Relationship management.** Like Topsy, the "it-just-grew" nature of the data center is often a source of conflict between IS and upper management. The latter just doesn't see IS as unique. Instead, it's seen as simply another business with customers, products, costs and sales. Therefore, the first responsibility

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Walsh is director of MIS network services for Champion International Corp., a Stamford, Conn.-based producer of paper for printing, publications and newspapers.

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of the IS manager is to communicate in business terms.

The data center should take the initiative and meet periodically with upper management and key client managers to present the state of the data center business. What is happening to unit costs? How do costs compare with those of competitors? How well are service objectives being met?

Presentations to management can be opportunities to demonstrate that the data center cares about how it is doing, how it is perceived and that it treats users as valued clients. As a prelude, identify and meet with key clients who contribute heavily to upper management perceptions.

Spending time developing informal, personal relationships is a good idea. It can provide intelligence that will help head off problems before they become critical.

■ **Element 6: Chargeback.** A chargeback system must match company culture. How does the company treat transfer pricing? How sensitive is the subject of cost control? Does the company make decisions in a decentralized or centralized manner? Historically, how have capital expenditures been justified for the data center? Does the user have the option to go outside or acquire his own computing facilities? Should the data center be a cost center or a profit center? Should standard costs be used? What should be done about shortfalls in recovery? How should over-recovery of costs be handled?

All these issues need to be worked out within the context of the organization the data center serves.

■ **Element 7: Sourcing.** Competitive negotiations are often left to the purchasing department. Thus, it's a good idea to get to know the purchasing agents. Develop a team approach to competitive negotiations. Create a competitive situation for every acquisition; for example, hardware, software, maintenance supplies and so on.

The presence of head-to-head competition forces prices down. To be successful over the long term, a creditable competitive situation must be created. The data center manager must be willing to exercise competitive alternatives. Be creative when negotiating: Maybe the vendor can't reduce the price of a mainframe, but it may be willing to include software or put caps on future maintenance increases.

■ **Element 8: Asset management.** Data center assets include hardware, software and communications equipment. The first requirement of managing these assets effectively is to create an inventory.

The most difficult aspects of creating an inventory are defining and enforcing the procedures related to ownership of the asset; for example, who has authority and responsibility for adding, deleting and changing data in the inventory. Asset data should include a description, serial number, purchase or lease cost, maintenance cost, vendor, etc. Having the inventory database on-line on a centralized mainframe will facilitate providing access to the various departments that will need access: data center, accounting, purchasing, facilities, etc.

Smart asset management requires managing demand. This means that diplomacy of the highest order is needed. An example would be to look at the recent demands of manufacturing and to point out tactfully to the key manufacturing client that over five years, this demand could require millions of dollars in capital spending in the data center.

Enlist the client's support in finding solutions that are best for the company overall. There may be a simple application that accounts for significant chunks of daytime work load. Lobby to organize a joint project to optimize this application to reduce computer resources.

The carrot for the client is reduced chargeback.

Good asset management practices will yield dividends in keeping costs low.

RESTRUCTURING means examining and reorganizing available resources in a way that cuts unnecessary costs and improves service. It's a way of getting more for the information systems dollar.

■ **Element 9: Simplification.** Over time, data centers tend to grow in complexity. New hardware and software are added; little is completely eliminated.

Complexity carries hidden costs and can create service problems. Sometimes, chargeback can be used to help eliminate an old technology or service. Careful evaluation of new technologies and services can reduce potential problems. Strive for simplification of the operating environment.

■ **Element 10: Systems management.** Establishing systems management disciplines is essential to efficient, effective data center operations. These disciplines include network control, problem management, change management, situation management and service management.

At the center of these disciplines is the requirement for an administration database that includes information on configuration, inventory, security, billing and invoice reconciliation, changes, work orders, problems, service-level agreements and performance.

The database is the foundation of an internal data center application that can have a major impact on service. Tracking of problems and changes can have a positive effect on availability, which is probably the single most important factor affecting how users perceive the data center. A work-order subsystem can improve service by supporting the data center staff members in activities such as installing terminals, a time-consuming task that requires a high level of coordination.

Systems management discipline should be institutionalized and become the "way of life" for the data center. Examples include morning meetings every day to discuss the previous day's problems and the next day's changes. Every major problem should be followed by a postmortem meeting to discuss how the problem could have been avoided or how the mean time to repair it could have been shortened.

Management reports on service should be widely circulated, posted prominently in the work areas and discussed frequently at meetings. Once data center employees sense that information systems management is obsessed with providing good service, positive things will start to happen.

In addition to improving service, good systems management procedures can reduce hardware maintenance costs — vendors will provide lower prices to customers that manage problems well and don't make spurious maintenance calls.

■ **Element 11: Upscaling.** Often, arguments are made for the lower cost per MIPS of minicomputers and personal computers. However, when utilized MIPS are considered, the gap narrows. Data centers are usually run around the clock, seven days a week. In contrast, personal computers spend the majority of their time idle.

There are two approaches to developing economies of scale. The first is data center consolidation. One thousand MIPS data centers can be managed effectively, and given the economies of scale, they can be efficient.

The second approach is to attract new applications. Being a low-cost supplier and providing focused service will result in making the data center an attractive host for many database/data communications-based applications.

■ **Element 12: Automated operations.** Automated operations can eliminate many tasks performed by current data center staff, particularly low-level personnel.

Automated operations can improve service by computerizing repetitive tasks. Worker involvement is important to a successful automated operations program, but management guidance, technical support and extensive training are also necessary for success.

A final word: Restructuring should be viewed as a process — not a project. Improvement must be what the Japanese call "kaizen," or continuous improvement. To succeed, the staff needs to embrace the idea of change and constant training. Restructuring is mostly a people issue, not a technical one. ●

Reshuffling the deck

BY LORY ZOTTOLA
and STEFANIE MOCANN
CW STAFF

There was no room for arguments at Stamford, Conn.-based Champion International Corp. when it came time to make a decision on how to improve its data center. Restructuring, rather than outsourcing, was the answer for the Fortune 100 paper company.

"Restructuring let us make the changes ourselves at a lower cost and with more control," says Thomas Walsh, Champion's director of MIS network services.

The need to restructure the data center to eliminate unnecessary costs and improve service became apparent following Champion's 1984 merger with St. Regis Corp., a paper company based in New York.

Champion

The merged organization had two data centers that employed a total of 200 people in Dallas and Hamilton, Ohio. The centers were similarly equipped.

For example, St. Regis' Dallas center and Champion's Hamilton center both had in place IBM 3081 and 3033 processors, NCR Comten front ends and IBM Systems Network Architecture networks. The operating systems included IBM's MVS in Hamilton and MVS and VM in Dallas.

The result was an expensive duplication of processes. By 1985, the Dallas building and its IBM 3033 were sold, and processing for the company was centered in the Hamilton facility on the two 3081s and a 3033. Today, operating systems include IBM's MVS/XA and VM/HPO.

With the dual data center problem taken care of, Champion's management in 1986 announced a restructuring program to refocus the business and reduce overall costs by 20%. Teams were formed throughout the organization to carry out this mandate.

In the information systems department, a team set out to do the following to restructure:

- Reorganize IS for better focus and accountability.
- Close five small terminal sites that were running remote job entry.
- Close the Hamilton computer input department and move the work to user areas.
- Eliminate obsolete hardware and software.

During the four years following management's restructuring push, a single data center was formed from five IS departments to handle data processing, customer and technical services, contingency planning, security and network control. Data center staff dropped from 130 to 54 employees. Data center availability jumped from 90% to 95% to 99.5% plus. Chargeback and security procedures were put into place. The addition of network control procedures pushed network availability to 99.8% plus.

The company is also in the midst of a project to automate console activities. To this end, it is studying work done by IBM in which the company cut staff in its operations area and achieved limited unattended data center operations.

Restructuring, Walsh says, has helped Champion to increase its processing capabilities 150% while cutting costs by 7%.

According to Walsh, the key enabler during restructuring was Champion's participative management philosophy. "Everybody has a say in how their jobs are done," he notes. "Their opinions and the knowledge of the individual worker is important."

Walsh sees restructuring as "the whole process — it covers a magnitude of steps that make the organization more cost-effective and enables it to improve service." ●

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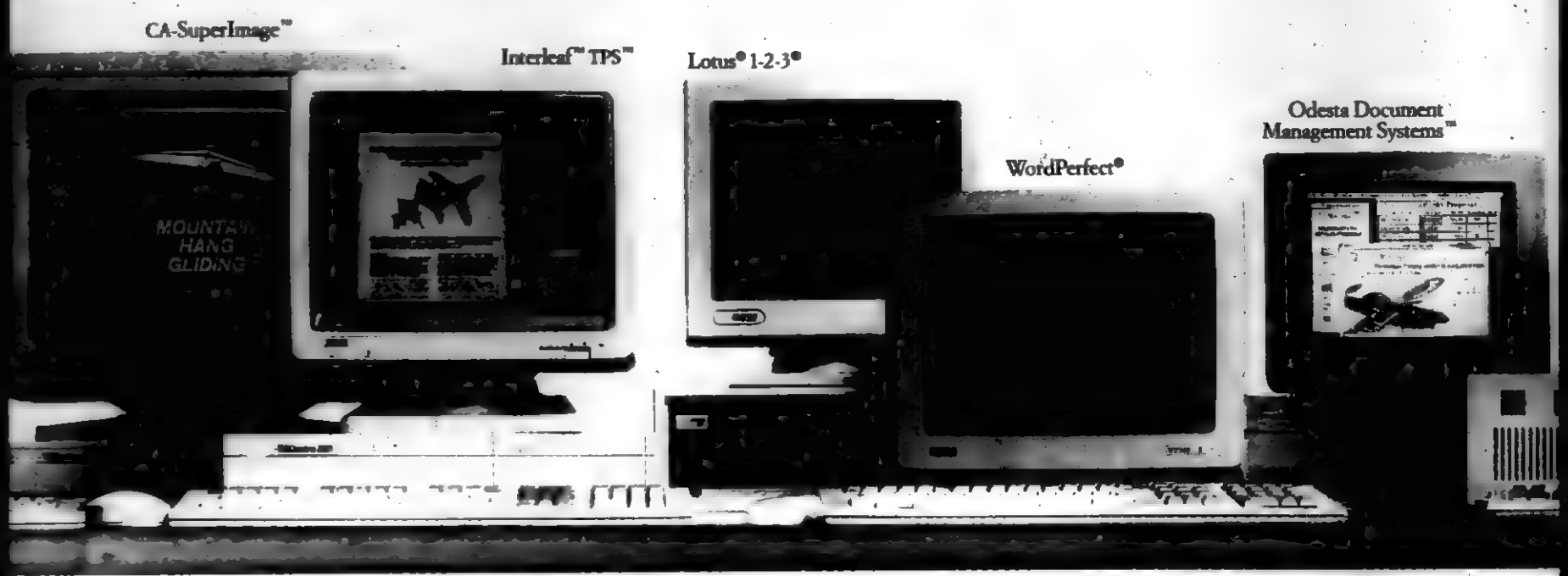

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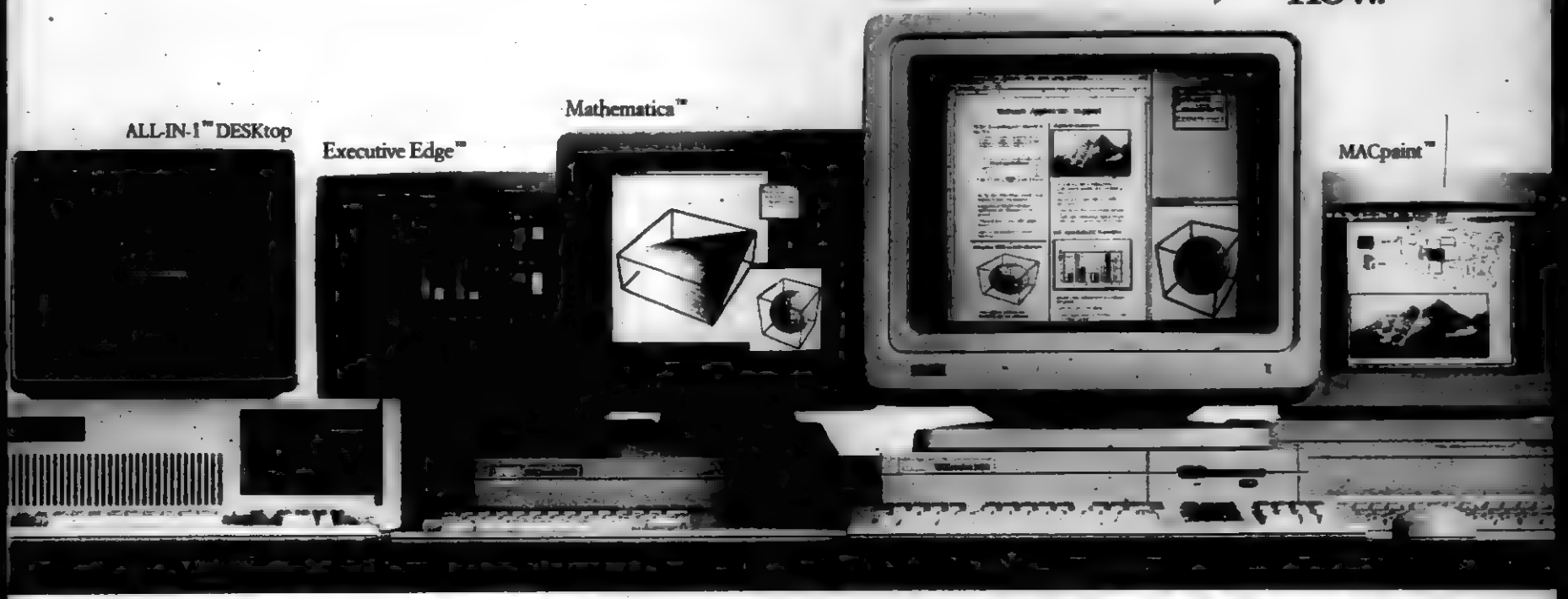

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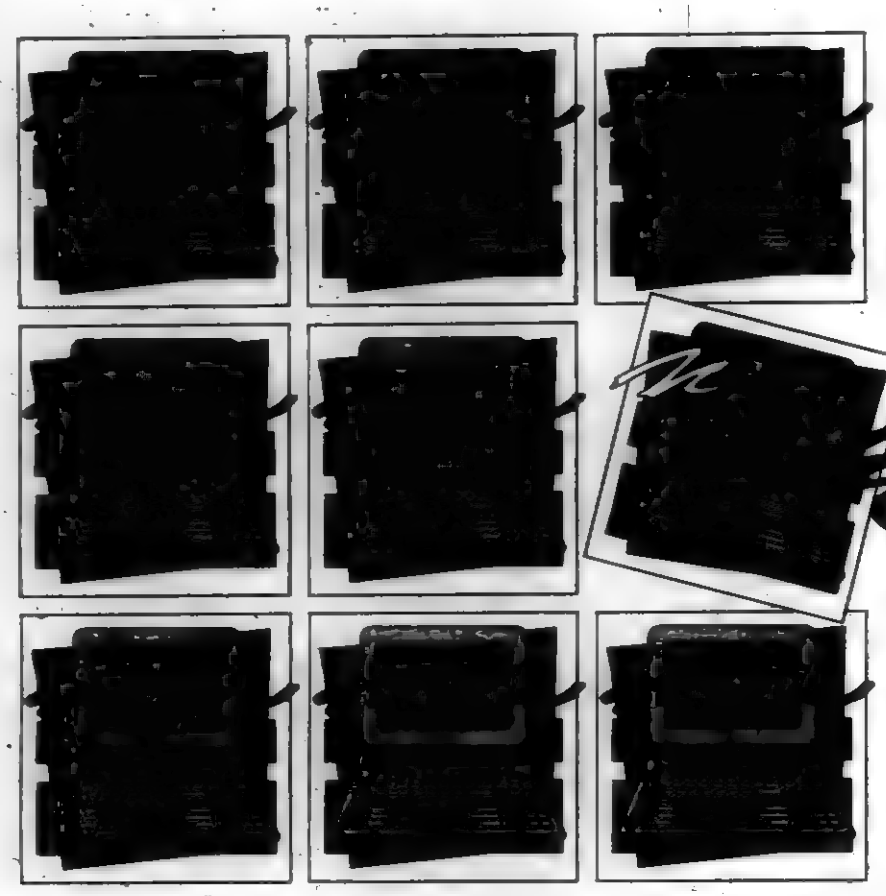

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LEGENT

NATIONAL
BRIEFS

It's official

Former **Maxtor Corp.** Vice-President of Corporate Development **Taroon Kamdar** has been named the president and chief executive officer of the latest Maxtor wholly-owned subsidiary: Longmont, Colo.-based **Maxtor Colorado Corp.**, which came into being last week when Maxtor closed its $46 million April purchase of fallen former competitor **Miniscribe Corp.** Kamdar, who led the acquisition team, will report directly to Maxtor President and Chief Executive Officer George Scalise. Maxtor Colorado, aided by $30 million from Maxtor for the reconstitution of Miniscribe, will be manufacturing 3½-in. disk drives in Colorado, Hong Kong and Singapore.

■

Eastward ho

With last year's revenue from its European operations safely beyond the $1 billion barrier, personal computer maker **Compaq Computer Corp.** is ready to light out for the latest frontier. Last week, **Zelimir Ilic**, a Yugoslav national who has set up eight Compaq subsidiaries in Western Europe, was named to the newly created post of managing director, East Europe. Ilic, who will be stationed in Munich, West Germany, has already made the first step toward accomplishing his mission of opening up the East for Compaq: He announced that four dealers have been authorized to sell the complete Compaq line in Yugoslavia.

■

Toward kinder, gentler computing

Deer Park, N.Y.-based **Biomechanics Corp. of America**, which claims to be the largest ergonomics firm in the U.S., could be aiming at a new buzz-phrase: look-and-feel-*well*. The firm recently formed a new division, HumanCAD Systems, specifically to make and market ergonomic software products.

More briefs on page 100

Marathon mind-set wins race

BDM used steady pace of CASE tools and team effort to achieve government contract

BY GARY H. ANTHES
CW STAFF

It was early 1986, a period that McLean, Va.-based BDM International, Inc. now refers to as "the bad old days." Widely acclaimed as one of the best of the small high-tech government contractors, BDM seemed to have bitten off more than it could chew.

Accustomed to systems development projects on the order of $500,000 or so, the $191 million-a-year firm had in 1984 won a contract from the U.S. Air Force that was worth more than 400 times that amount — $210 million — for which BDM is now expected to deliver some 4.2 million lines of custom software. A trivial system it was not; the functional description alone occupied 7,000 pages of documentation.

BDM won approval to overhaul the Air Force Logistics Command's mammoth material requirements planning system, to be built around a 390G-byte database encompassing a one million item inventory of weapons parts worth $28 billion.

BDM defeated Computer Sciences Corp. for the job in a "compute-off," in which each firm delivered a small working prototype of the system.

BDM decided to build on that precontract success by doing more of the same. Mark C. Filteau, senior vice-president, explained, "We used an extension of the techniques used in the compute-off. It was a lot of people working very hard, a lot of silver bullet approaches. It was the Mao approach to software development — 'let 1,000 flowers bloom.'"

However, techniques that win 100-yard sprints do not work so well in marathons, BDM found. Error rates in the first software delivered were unacceptably high, and documentation was poor. The Air Force was unhappy and so was BDM. "It was killing us to produce things we were not proud of," Filteau said.

Now, a little more than three years later, the situation has completely turned around, BDM and the Air Force asserted. The company and the customer both said that productivity has increased 30%, while software and documentation errors have plunged by 94%, from eight to .5 errors per 1,000 lines of code. Meanwhile, BDM has been able to cut its staff from 280 people to 150 while running under its

Continued on page 101

Way to go

Three years ago, small McLean, Va.-based BDM International, Inc. flew off on the wrong course when it won the contract to overhaul a gargantuan U.S. Air Force software system. Today, the project is flying high, thanks to the following turnaround tactics

- [illegible] moved from heightened to objective use of CASE tools and followed up with a focus on methodologies.
- The company dropped ranking star players of "brilliant but eccentric technicians," employing teamwork instead.
- The mammoth project was reorganized into six product teams of 10 to 15 people, each targeted at a schedule of discrete deliverables.
- A systems integration group was placed under the product groups.
- A financial management/quality assurance group was created.
- Anyone who didn't like the new way of doing things was invited to leave.

CW Chart: Paul Mock

Bipartisan high-tech agendas competing

BY MITCH BETTS
CW STAFF

There is bipartisan support in the U.S. House of Representatives for a permanent research tax credit and for antitrust relief for joint production ventures, but agreement between House Democrats and Republicans on high-technology issues seems to end there.

Leaders of both parties last month announced their separate legislative agendas for making U.S. technology firms more competitive in world markets. The Democratic package of proposals would give the government an active role in setting technology policy and providing financial aid, while the Republican package provides incentives for capital investments.

Mitchell Kertzman, chairman of the American Electronics Association (AEA), issued a statement hinting that perhaps the two approaches could be blended into a bipartisan policy. He said the legislative packages are "unusually complementary to one another," with each proposal containing some of the competitiveness proposals that the AEA supports.

"In fact, it now seems that the time may be right for a bipartisan approach to a legislative technology program," said Kertzman, president of Computer Solutions, Inc. in Burlington, Mass.

However, the House Democrats and Republicans did not seem in a cooperative mood when they announced the competing agendas. Rep. Tom Campbell (R-Calif.) said the Republican plan is "smarter, bolder and more in tune with the needs of American businesses" than the Democratic plan.

Democrats blasted the Bush administration's free-market approach to technology. Rep. Edward J. Markey (D-Mass.) said that with technology policy, administration officials are like cartoon character Bart Simpson — "underachievers and proud of it."

The Democrats' proposal includes government assistance for advanced manufacturing technologies, business/university collaboration and the use of computerized manufacturing systems in small businesses. It also requires the president to publish a five-year plan to support high-performance computing research and to create a High Resolution Information Systems Board to monitor that particular technology.

The Republicans' proposal includes a tax cut for capital gains from long-term investments, a tax credit for investments in new manufacturing equipment, reform of product liability laws and stronger protection of U.S. intellectual property.

The Computer and Business Equipment Manufacturers Association endorsed the Republican package. CBEMA also said it identified two positive elements of the Democratic agenda: a bill giving antitrust relief for joint production ventures and a bill to reform the U.S. export control system. Both groups praised legislators for stressing the competitiveness issue.

Government roles

The U.S. government's role in the computer/electronics industry is a mixture of abstinence and guidance, while the governments of India and Brazil are involved in management

Source: U.S. Department of Commerce

CW Chart: Paul Mock

COMMENTARY

Jean S. Bozman

Promises, promises

On a warm day in June, Mikhail Gorbachev strolled the Stanford University campus, stirring as much excitement in Silicon Valley as a rock star. From the Valley, the Soviet president raced northward to a San Francisco luncheon with business executives, where he promised a new era of Soviet trade relationships with U.S.-based computer firms. There was applause all around.

"You [immediately] had the impression you were in the presence of an enormously powerful leader," recalls Oracle Systems Chief Executive Officer Larry Ellison, who attended the Gorbachev luncheon. "He said the Soviet Union was already taking risks and that it was our turn to take risks in business."

Gorbachev was a convincing cheerleader for the benefits of international trade one month ago. But the rock-tour excitement of that balmy day is gone, the concrete results of that visit are being tallied — and the final count might not be quite as high, quite as soon as we hoped.

In the days after the visit, some California firms have revealed their plans to do business with the Soviet Union. Among them are Borland International, Ashton-Tate and Cypress Semiconductor. These plans, to be sure, were already in place when Gorbachev flew to San Francisco. Oracle, IBM and others also have sales efforts under way.

However, executives at other Silicon Valley firms, including Tandem Computers, say they've been working on establishing relationships for two years — and don't expect any immediate breakthroughs.

"There is a great potential there," says Tandem CEO James Treybig, who attended the Gorbachev luncheon. "But some things would have to change in order for us to do business in the Soviet Union."

Among the deal-breakers on his list, Treybig says, would be payment in hard currency, the ability to establish a Tandem subsidiary in the USSR — and a go-ahead from the U.S. government, which still restricts exports of powerful computers.

As an entrant to the Soviet marketplace, Tandem seems to have everything going for it: a computer line that is optimized for banking and telecommunications systems, experience in supporting customers in more than 40 nations and the presence of former Secretary of State George Shultz on the Tandem board of directors. (It was Shultz who organized Gorbachev's Stanford visit.)

However, Tandem's two-year quest to sell computers in Moscow has yet to bear fruit, says Rick Lamb, former Tandem treasurer, now director of USSR operations — and still based in Cupertino, Calif. Lamb travels frequently to the Soviet Union and even met Gorbachev at a Soviet Trade Council dinner last spring.

Recently, Lamb's been making presentations to the "right" people in the Soviet government rather than making sales. Still, the promise of an untapped market — and a great Soviet thirst for high-tech products — keeps Tandem interested.

Lamb thinks the Soviets may "leapfrog" Third World countries in computer technology, because their highly educated work force is prepared to operate complex systems — and because most Soviet computers are outmoded copies of 20-year-old IBM 360 designs.

Practical barriers to volume Tandem sales remain. "There's this big opening in Soviet trade, and you see everybody and his brother charging in," Lamb says. "You get a lot of people who tell you they know how to deal with the West. The problem is, there are no rules right now."

So the question for most Silicon Valley firms looking to the Eastern Bloc for new markets is this: Will Gorbachev spend considerably more time convincing the Soviet bureaucracy to nurture computer trade than he did having lunch with San Francisco CEOs in June?

Bozman is *Computerworld's* senior West Coast editor.

The Oracle work force reshuffle

REDWOOD CITY, Calif. — The second shoe has dropped in Oracle Systems Corp.'s reorganization. The first phase, launched in late May, gave the firm's top sales job to London-based Geoffrey Squire — who is supervising all Oracle sales in the U.S., Europe and Asia.

In a second round of job-shuffling, positions within the three Oracle sales divisions — Oracle U.S.A., Oracle Europe and Oracle Intercontinental — were redefined, with a surprise addition as Oracle U.S.A. vice-president of marketing: Chris Greendale , who until mid-June was vice-president of marketing at Ingres Corp.

The newly named Oracle Intercontinental division will be headed up by corporate senior vice-president Peter Tierney.

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Prototypes become the applications. New R:BASE 3.0's powerful application generator automatically creates application code as you build a prototype. This allows you to expand the prototype into your application rather than starting from scratch.

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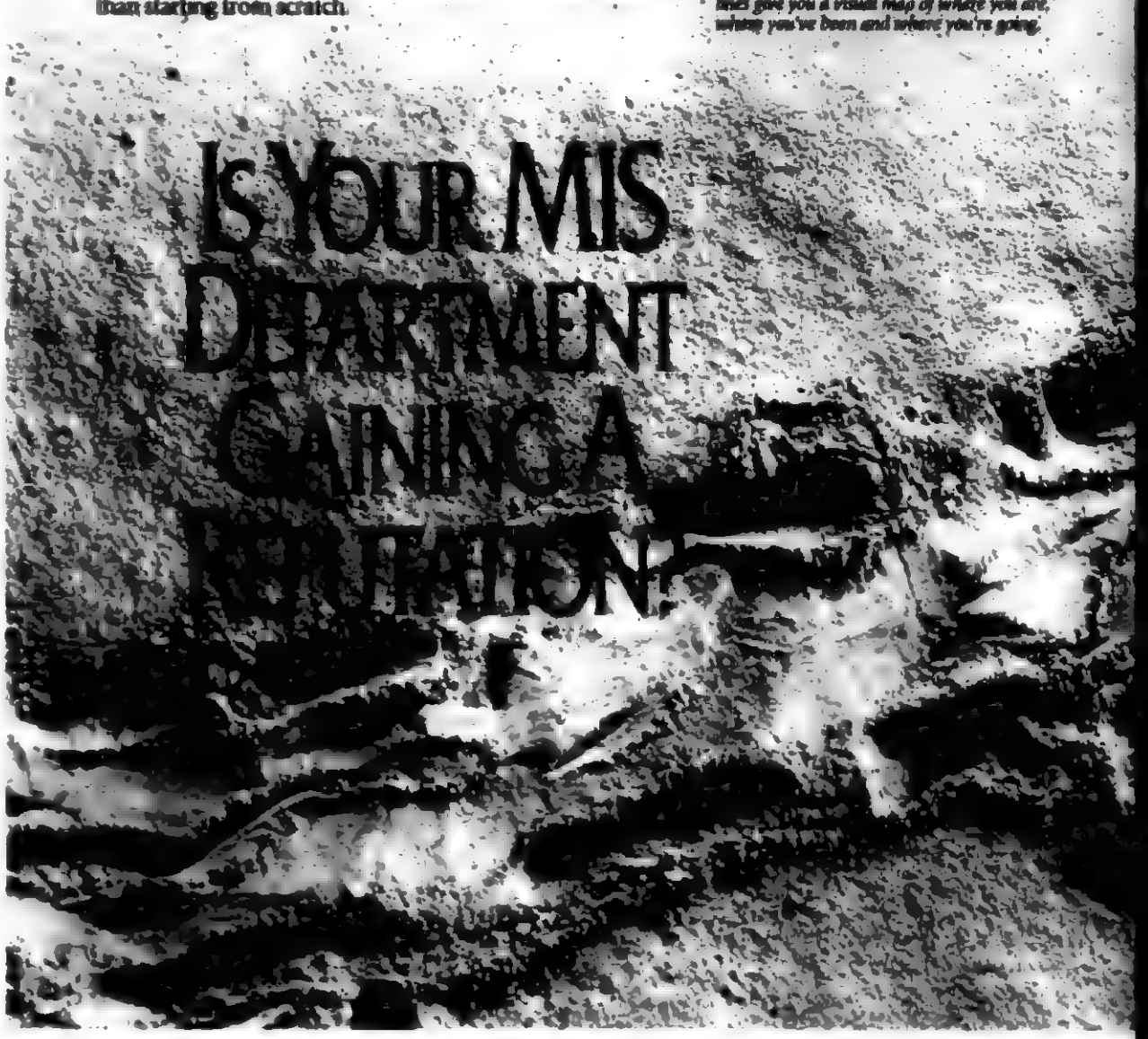

Nixdorf still ailing from management mistakes

THE *COMPUTERWOCHE* STAFF

MUNICH — West Germany's Nixdorf Computer AG recently admitted that significant management mistakes were made during the administration of former Chairman Klaus Luft.

"The enterprise-specific market evaluation in 1987 and 1988, which led to the creation of an additional 5,500 jobs, proved to be too optimistic," the company said.

Nixdorf's dismal forecast for 1989 was fulfilled. The company posted an operating loss of $506 million, over and above the costs of reducing its work force by 2,500 employees and additional restructuring measures. Nixdorf reported a 1989 net loss of $636 million.

The company also recorded a 2% drop in revenue — its first — to $3.13 billion. Foreign business was up 4%, compared with a 7% drop on the domestic market. The order backlog in 1989, however, was 16% less than the previous year's, amounting to approximately $2.56 billion. According to Nixdorf, 9% of this backlog reduction came from restructuring customer services and consolidating subsidiaries.

Sales increased through mid-1989, according to Nixdorf. At that time, however, a surge of speculation about a possible takeover of the company resulted in collapsing revenue, rather than the industry's traditional uptick in the second half of the year.

Merger pending

At least one of the rumors proved true: A merger between Nixdorf and West German technology giant Siemens AG is currently pending.

Restructuring measures became unavoidable in 1989 and included a 23% decrease in investments to $344 million. Personnel and operating costs increased 4% over 1988 figures.

"Substantial losses are still expected" in the current business year until the expected Oct. 1 merger with Siemens, Nixdorf said.

These losses will stem in part from a reduction of 3,500 jobs, of which 1,800 were already cut on April 1.

Aligning Nixdorf's products with that of future partner Siemens is also expected to take its toll.

There is, for example, an overlap in the Unix sector, where Siemens plans to equip its MX systems with Intel Corp. 1486 processors and new operating systems. Nixdorf also offers its Targon series in this arena and is expected to continue to offer it after the merger.

Computerwoche *is an IDG Communications publication in West Germany.*

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INTERNATIONAL BRIEFS

Cuts, cuts . . .

Faced with what it views as another difficult year, according to Chairman and Chief Executive Officer Carlo de Benedetti, Italy's **Ing. C. Olivetti & Co.** plans to trim its work force by 3,000 to 3,500 people this year through early retirement and government-subsidized layoff programs, the company announced late last month. The cuts are expected to be across all company divisions, which have a total of approximately 57,000 employees.

■

And more cuts

Newly elected **Philips N. V.** President **Jan D. Timmer** last week acknowledged that the Netherlands-based electronics company would take a $1.44 billion charge against annual earnings and cut some 10,000 jobs from its European operations as part of a campaign to get its currently unprofitable computer and electronic components divisions back on track. The charge, according to Timmer, is expected to trigger an annual loss of approximately $1 billion for Philips, on estimated 1990 revenue of $29.95 billion.

■

Green light in Red Square

The USSR Ministry of Finance has given the go-ahead to "**Arthur Andersen in the U.S.S.R.,**" a joint venture company launched by 70% majority shareholder **Arthur Andersen & Co.**, major Soviet bank **Promstroybank** and Russian engineering firm **NPO Dinamo Moscow.** Aimed at aiding existing Soviet enterprises — state and otherwise — in their efforts to make the transition to free market management, the company also marks two milestones: Arthur Andersen's return to practice in the Soviet Union after a seven-year hiatus and its designation as the first professional firm of its kind to be allowed to audit Soviet joint ventures operating in the USSR.

Group complains about lack of property protection in Thailand

BY WILLIAM DENNIS
SPECIAL TO CW

SINGAPORE — The International Intellectual Property Alliance (IIPA) has retained a Washington, D.C., law firm to file a so-called 301 petition for unfair trade practices against Thailand, charging inadequate intellectual property protection on that nation's part.

The IIPA has alleged that Thailand officials are cooperating with or protecting computer software pirates instead of prosecuting them.

The alliance complained that the situation for U.S. copyright owners that are attempting to do business in Thailand has become intolerable in recent months because of the "virtually complete and total failure of Thailand authorities to enforce the law against piracy."

The IIPA sent letters to three cabinet members of the Bush administration — U.S. Secretary of State James Baker, Secretary of Commerce Robert Mosbacher and Trade Representative Carla Hills. All three met with their Thailand counterparts during a recent visit to Washington, D.C., by Thailand's Prime Minister Chatichai Choonhaven.

The letters informed the administration that the IIPA's international enforcement arm received no cooperation in Thailand when it asked for cooperation in raids against pirates. "Even more serious was the fact that death threats were received by [enforcement arm] personnel," the letters stated. "The percentage of cases brought to court compared with the number of pirates caught is insignificant, and no one is convicted."

The IIPA claimed that Thailand has shown very little interest in enforcing its copyright law and even less than that in undertaking the legislative improvements that have been made by every other country in Southeast Asia.

Thailand is currently on the 1990 priority watch list under the special 301 provision of the U.S. Trade Act, which covers countries that, in the opinion of the U.S., have not made sufficient progress toward improving intellectual property protection. Other countries on the list include Brazil, India and China. Thailand was put on the list last year.

The software privacy issue, which has been of mounting concern over the past few years, has taken on an increased immediacy recently due in part to the Software Publishers Association's vigilant efforts to shut pirates down worldwide.

Dennis is on the staff of Computerworld Southeast Asia.

NATIONAL
BRIEFS

Shortfall warnings

Beaverton, Ore.-based **Mentor Graphics Corp.** warned last week that its second-quarter earnings and revenue will be substantially lower than anticipated. Chief Executive Officer Thomas Bruggere predicted no upward swing before the fourth quarter. Bruggere pointed to a panoply of industry and economic trends as responsible for the fact that the late second-quarter sales pickup that Mentor Graphics has come to count on failed to materialize this time.

■

. . . And more

In Cambridge, Mass., **Interleaf, Inc.** — still in the throes of a thorny transition from desktop publishing to a software and services orientation — issued a similar warning. President Robert Weiler said the company is looking at a loss in the neighborhood of $2.9 million for the quarter ended June 30.

■

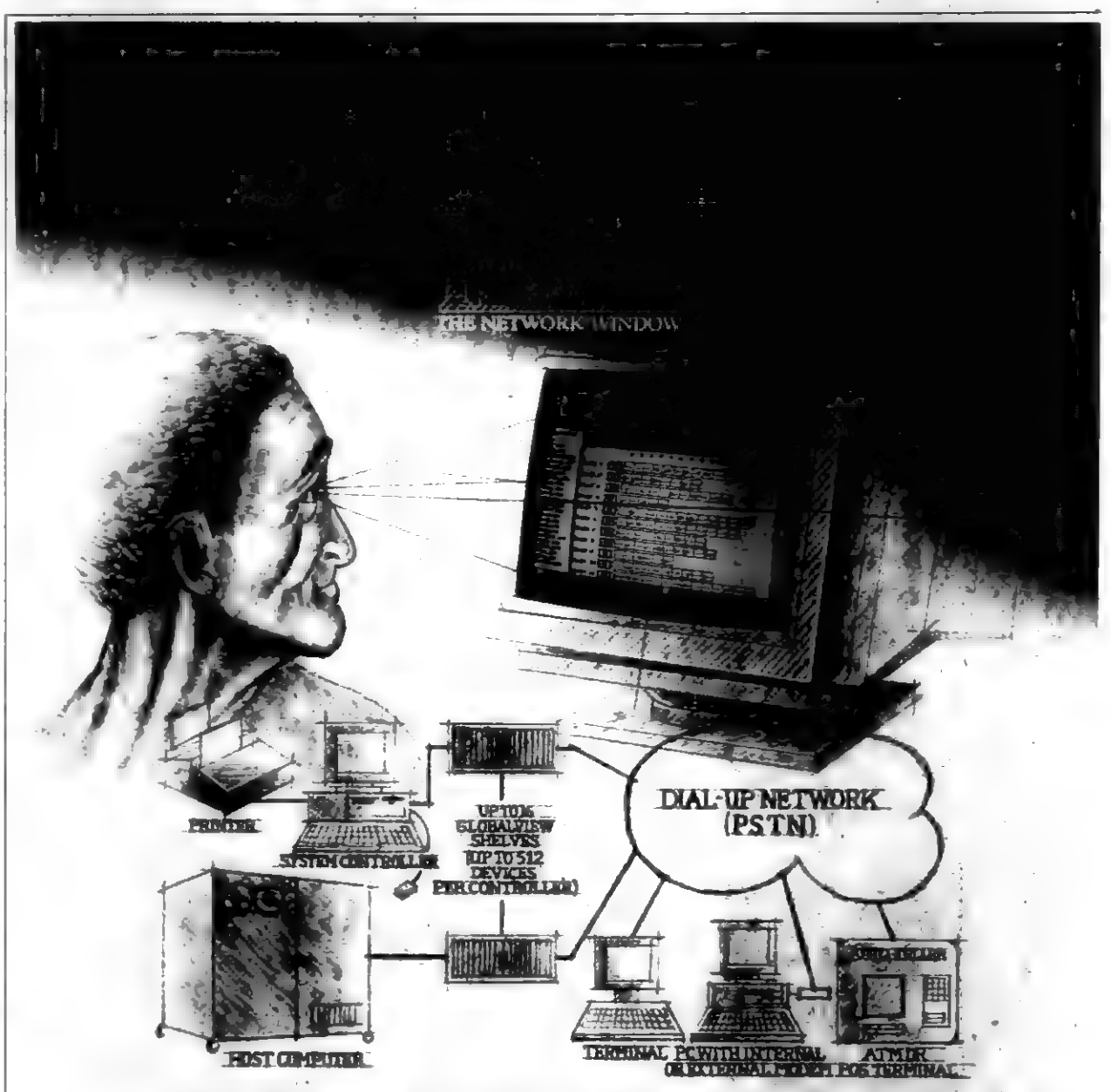
. . . And still more

Workstation connectivity products vendor **Microcom, Inc.** last week announced a downward readjustment in its earlier announced earnings and revenue figures for the fourth quarter and year ended March 31. The company pointed to distributors' overstocking in the fourth quarter as largely responsible for the approximately $3.5 million downscaling of revenue.

■

The flip side

On the other hand, the flood of announcements of expansions abroad or further abroad continues unabated. Among the latest are Arlington, Va.-based software and services provider **American Management Systems, Inc.**, which recently opened offices in Frankfurt, London and Brussels, and Boulder, Colo.-based **Exabyte Corp.** in Houten, Netherlands.



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BDM

CONTINUED FROM PAGE 97

1990 cost budget for the project.

"We're absolutely happy with the program now," said Col. Gary McMahon, Air Force program manager. "Cost-wise, performance-wise, I'll put this up against any [project] in the country." He said the program is the ninth-largest software development program in the U.S. Department of Defense, and it has the best error rate of the lot.

Filteau attributed the turnaround to three key elements, which he put into place in 1986. The first was a move from haphazard to rigorous use of computer-aided software engineering (CASE) tools and with that a strict adherence to design and development methodologies. BDM uses Excelerator, a front-end CASE analysis and design tool from Index Technology Corp., interfaced to Ventura, a desktop publishing environment from Xerox Corp.

Out, too, went a common mind-set in which brilliant but eccentric technicians were allowed to become the keystones of systems development projects. Those who were not team players were fired.

Last, and perhaps most important, Filteau reorganized the project into six product teams of 10 to 12 people, each oriented toward designing, programming and testing discrete software deliverables averaging about 100,000 source statements. He scrapped the common practice of organizing projects by function, in which an analysis group hands off work to a design team, which later passes it on to a programming staff. Each team member was expected to become a sort of Renaissance person, able to design and code with equal facility and expected to stay with the product from concept through delivery.

A systems integration group was put in place under the product teams. It had responsibility for systemswide functions such as database design, common user interface software and system testing. The last leg of the project triad consisted of a financial management group that tended to issues of cost, configuration management and quality assurance.

Filteau acknowledged that the changes were hard for some to swallow. "We invited them to leave," he said.

McMahon agreed that the new project structure made a big difference. "The primary problem was we weren't taking a team approach. Now we've managed to bring all the people together in a cooperative mode; we cooperate right down to the sharing of financial data," he said.

Do as the Japanese do

Filteau repeatedly referred to his team approach as Japanese-like, one in which group performance is emphasized over individual contribution. "Most people in this field [in the U.S.] are still looking for the technological improvement, the silver bullet. They have difficulty accepting the Japanese approach. They admire Japanese robots but not Japanese organizational strategies and philosophies."

Would-be silver bullets such as fourth-generation languages, code generators and CASE tools can be helpful, but none is as important as the relatively mundane organizational considerations, Filteau said.

BDM is currently evaluating the suitability of the techniques employed in the huge Air Force project to the firm's more modest efforts.

"We know for sure this works on big projects," Filteau said. "We don't know if it works on small ones. You don't need a critical path network if you're building an outhouse. You need it if you're building the Chrysler Building."

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EXECUTIVE CORNER

Cognos names new president

Jeffrey P. Papows is the new president and chief operating officer of software vendor **Cognos, Inc.** Papows, who joined Cognos nine months ago as senior vice-president of operations, came to the Ottawa-based firm from Cullinet Software, Inc., where he served as vice-president of marketing prior to Cullinet's acquisition by Computer Associates International, Inc. Cognos Chairman and Chief Executive Officer **Michael Potter** credited Papows with a major role in Cognos' recent gains in market clout and financial strength.

Fiber Distributed Data Interface (FDDI) start-up **Synernetics, Inc.** in North Billerica, Mass., has appointed **Allan Wallack** president and CEO. Wallack was formerly COO of Cognex Corp., a manufacturer of machine vision systems. Synernetics founder **Bruce McClure** has been named chairman and chief technical officer of the firm, which introduced management software for 100M bit/sec. FDDI local-area networks in February.

Fred B. Cox, founder, chairman and CEO of Costa Mesa, Calif.-based **Emulex Corp.**, last week announced that he will cede his executive duties, remaining actively involved in Emulex through his role as chairman. During the search for Cox's successor, which the company said it expects to conclude by the end of the year, veteran industry executive, Emulex board member and consultant **David Hanna** will serve as president of the 12-year-old computer enhancement products vendor.

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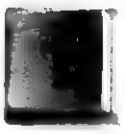

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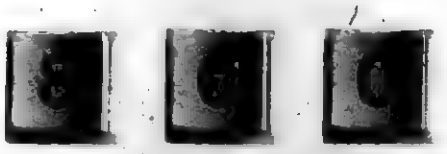

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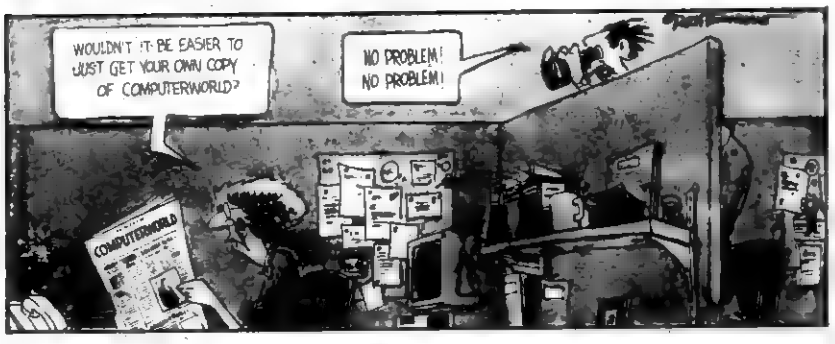

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Company president Alec Gindis was impressed with industry reaction after a news story announcing XCOM 6.2 appeared in *Computerworld*. So when Spectrum began implementing its marketing strategy for the new product, he considered *Computerworld* a key resource.

"Our goal was to generate sales leads from major organizations — Fortune 500 and Fortune 1000-type companies — that need to transfer files. We decided to use response card decks, and, based on the reaction we got to that product announcement, Computerworld's *was the card deck we thought of first.*

"And it's paid off; the results have been terrific. We've received hundreds of high-quality leads so far, and they're still coming in. In fact, Computerworld *Response Card Decks really opened doors to the 'heavy-hitter' accounts — major organizations that learned about us through the cards.*

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Mentors can lend an edge

Merrill Lynch's IS group earned a big return on investment in counseling

BY JAMES LAWLER
SPECIAL TO CW

Information systems professionals looking for an advantage in pursuing career goals should consider acquiring a mentor.

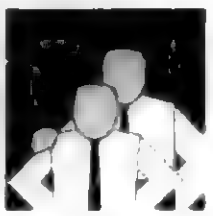
While many business professionals view a mentor as a prerequisite to success, IS people often assume technical skills alone will keep them marketable. But with today's corporate downsizings and reorganizations — and a slower pace of salary growth and promotion — it may be time to rethink this strategy.

Simply defined, a mentor is a colleague who volunteers to serve as a career counselor. A good mentor listens sympathetically, counsels on career moves and serves as a sounding board. A senior-level mentor may even be able to create career opportunities.

Your mentor will typically be in the same organization as you but in a separate line of report. (There are exceptions: Your manager may be your mentor — and a good one.) Ideally, the relationship is not forced; you are comfortable with your mentor, and he is comfortable with you.

Whether mentoring is formal or informal, the contacts often come in a social rather than business setting. Typically, talk takes place over breakfast, lunch or cocktails or at an organizational outing such as a picnic or sporting event. Discussions can last anywhere from several minutes to several hours; the quality of the conversation is more important.

Individuals may benefit from different attributes in a mentor — an unusual career path, a similar background or a reputation for success, to name a few.



Once you have found a willing and able mentor, it is time to get down to business. Questions an IS professional may pose to a mentor include the following:

- Should I be on a managerial or technical career path? Should I chart a course to a user organization?
- What new systems should I support? What new technology should I be learning to be more marketable or promotable?
- What schooling should I pursue? What training in career development and personal skills should I be receiving?
- What tactics help with troublesome peers or users?
- How can I get transferred from an unsupportive manager without turning him off?
- How should I respond to headhunters? Should I pursue internal job postings?
- What networking practices should I be using? With whom?
- Should I abandon ship when the organization is downsizing? Should I wait 18 months for a raise after a tough year?

For IS people just starting their careers, a mentor can teach the unwritten cultural or political norms of the organization. Without this understanding, IS people will not be successful, regardless of technical abilities.

Why not take up these issues with your manager? You ought to, but you may not be comfortable doing so. Also, with the pressures of day-to-day work, your manager may not be available. He may not be adequately skilled at handling such questions or sufficiently committed to taking them on.

During the past two years, IS professionals in the Advanced Office Systems Group at Merrill Lynch & Co. in New York have pursued a mentoring program. About 50 selected junior and intermediate people chose a senior colleague to provide informal career counseling approximately once per month. The program was in effect when the firm began laying off employees as a result of the 1987 stock market crash.

Most of the participants note benefits in setting career goals and addressing the layoffs. Most also say the program prompted them to pursue training in technical topics or in areas such as presentation skills, political acumen, time management and dealing with stress.

ONE PARTICIPANT SAYS the program boosted his confidence in his talents, forced him to rethink his career and taught him specific methods for attaining goals.

One participant says the program boosted his confidence in his talents, forced him to rethink his career and taught him specific methods for attaining goals. It also helped him to identify things that could make his work environment more comfortable. He says he plans to take a more active approach toward meeting goals and spur his manager to support him.

In general, participants who have taken the initiative in working with their mentors have gotten the most out of the program. Their enthusiasm has spurred on their mentors.

Mentors can benefit from the process by staying in touch with life in the corporate trenches. They may want to either talk to their proteges about issues uncovered through mentoring or provide these people with similar kinds of advice.

At Merrill Lynch, two-thirds of the participants say they will network with their mentors on career and work issues in the future. Most indicate that pep talks with their mentors have helped motivate them in the face of corporate downsizing.

Mentoring needn't be confined to one individual; over the course of his working life, the savvy IS professional may work with several mentors who can provide appropriate perspectives at various stages.

If your organization sponsors a mentoring program, take advantage of it. If not, find a mentor on your own. The individual must be willing and able to spend the necessary time, and he must take a personal interest in you. But you may be surprised at the number of senior people who will serve as a mentor if you take the initiative to ask.

With the vicissitudes expected of the corporate world in the 1990s, you will need an edge. Mentoring can provide it.

Lawler is vice-president of sales management systems in the Advanced Office Systems Group at Merrill Lynch & Co. in New York.

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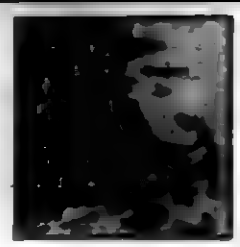

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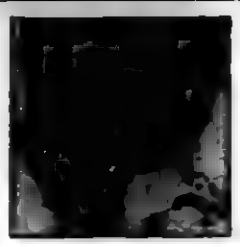

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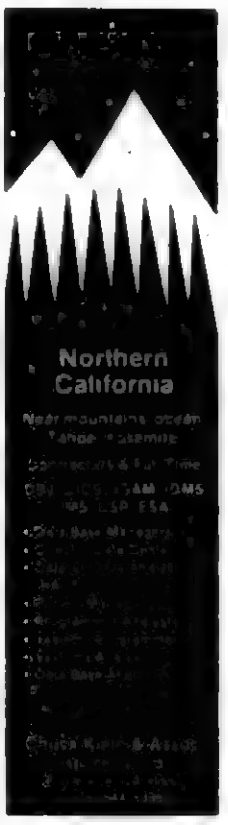

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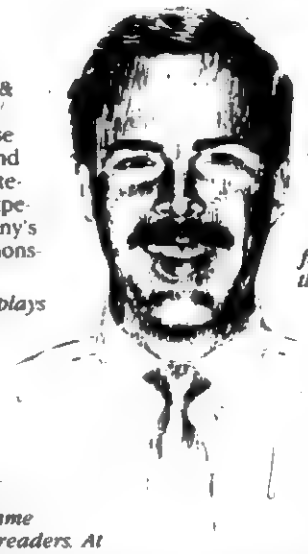

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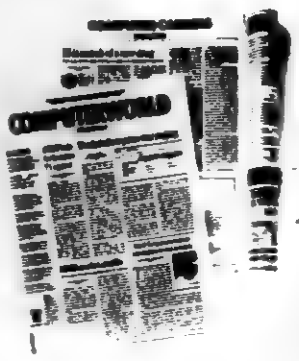

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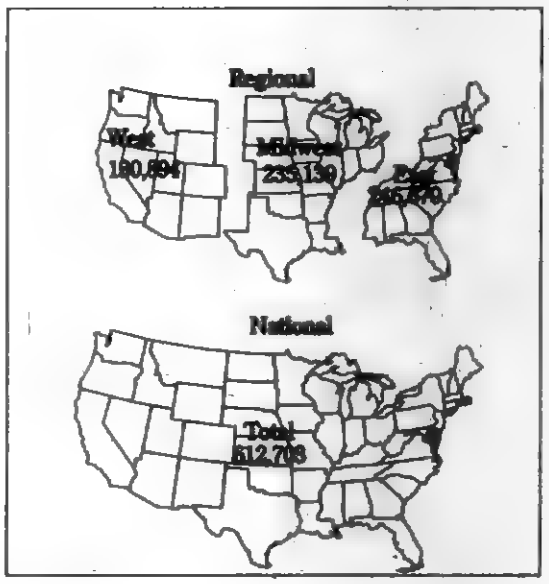

SOURCE: Audit Bureau of Circulations Supplemental Data Report, May 1987.

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COMPUTERWORLD

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Looking beyond bank loans

When acquiring systems, leasing is just one of an array of options

BY NEIL ZOBLER
SPECIAL TO CW

Information systems managers whose equipment needs exceed their budgets should know that despite today's uncertain business environment, there are plenty of dollars available when bank loans are not an option.

The uncertain environment means corporate cash reserves are becoming unavailable for spending on equipment at many companies. In such situations, the usual response is to get a bank loan. Unfortunately, many banks are suffering from bad investments in Latin American and U.S. real estate, among other areas. The press reports restrictive credit policies and the inability of small and medium-size companies to get loans. When a bank does say "yes," it can be at a premium interest rate.

Leasing offers one alternative to conventional bank financing. The Tax Reform Act of 1986 put leasing back into the financial limelight; *The Wall Street Journal* has called it a "surprise loophole" that firms expect will save them millions of dollars under the new tax law.

Although there are literally hundreds of leasing structures, from a lessee's accounting standpoint they fall into two categories: operating leases and capital leases.

Operating leases — also known as tax leases — are "off-balance-sheet financing" because neither the debt obligation nor the asset is listed on a company's balance sheet. Capital — or nontax — leases are like conditional sales contracts, with the equipment reflected on the balance sheet and depreciated by the user.

Simply stated, operating leases and a hybrid variety known as true leases are term rental agreements; they result in tax-deductable expenses rather than capitalized assets. These pretax expenses can improve a company's cash flow and cut its tax obligation, especially if it qualifies for the Alternative Minimum Tax.

Leasing can also offer more flexibility than conventional bank loans. Lease payments can be tied to a company's cash flow and revenue projections through "skip payment leases" and "step leases," under which monthly payments can be skipped or stepped up or down.

Tight money hasn't crimped lessors to the same extent as banks, although it is starting to push up their rates. There are, however, other financial intermediaries that play important roles in generating the cash needed to invest in new projects.

- **Asset-based lenders** typically provide funds for projects using unattached assets of a company as additional collateral. The assets might be accounts receivable or inventory. A related technique is the sale-leaseback, in which a finance or leasing firm provides cash by buying working assets from a company and leasing them back.
- **Factors** can provide an interesting alternative for a company that wants to sell some of its accounts receivable rather than borrow money. A factoring house normally buys uncollected accounts receivable at a discount and assumes the responsibility for collecting them.
- **Investment bankers and merchant bankers**, who solicit funds from institutional and private investors, are instrumental in raising working capital. Merchant bankers typically invest some of their own funds in the projects; investment bankers usually invest other people's money. However, unless your financing needs exceed $500,000, you probably will not attract a lot of interest from these players.
- **Venture capitalists** are another important source of funds. However, their potential clients are sometimes surprised by the return on investment they expect to realize; it can range from 30% to 50% per year over five to seven years. This financing normally includes demand registration rights, which allow the venture capitalist to force the client to go public under specified conditions, possibly leading to a change of control.
- **Junk bonds and other commercial paper** have been major sources of working capital in recent years. Unfortunately, the collapse of financial powerhouse Drexel Burnham Lambert, Inc. has eroded investors' confidence in these vehicles. Companies that offer products or services with socially responsible appeal — on the basis of environmental concerns or social problems — enjoy access to many sources of subsidized loans and other forms of low-interest financing.
- **Small business investment corporations** are private investment companies that leverage their own capital with low-interest government money to make loans. The loans can be subordinated to other financing, which becomes important when a firm is negotiating for additional sources of working capital.
- **Community development corporations** are quasi-government organizations that help administer federal, state and county lending. Their loans are often available at below-market interest rates to companies that will improve an area by creating additional jobs.
- **Industrial development authorities** can also administer low-cost state loans to manufacturing companies expanding or moving into a particular area.

Finding available financing as bank loans get harder to come by can be an interesting task, albeit a challenging one. It may help to bear in mind economist Milton Friedman's comment that the press has reported predictions of seven of the past two recessions.

Zobler is managing director of International Equity Co. in Danbury, Conn., which provides leasing and financing services to computer resellers.

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AT Model 239	$1,075	$1,325	$700
AT Model 339	$1,200	$1,400	$900
PS/2 Model 50	$1,300	$1,700	$1,050
PS/2 Model 60	$2,500	$2,600	$2,400
Compaq Portable II	$1,475	$1,725	$1,400
Portable III	$2,175	$2,500	$1,900
Portable 286	$1,500	$1,875	$1,300
Plus	$675	$750	$650
Deskpro	$825	$900	$800
Deskpro 286	$1,400	$1,625	$1,300
Deskpro 386/16	$2,500	$2,750	$2,475
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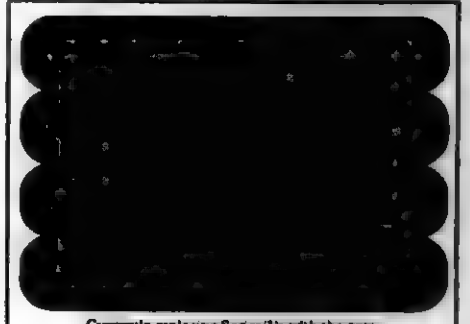

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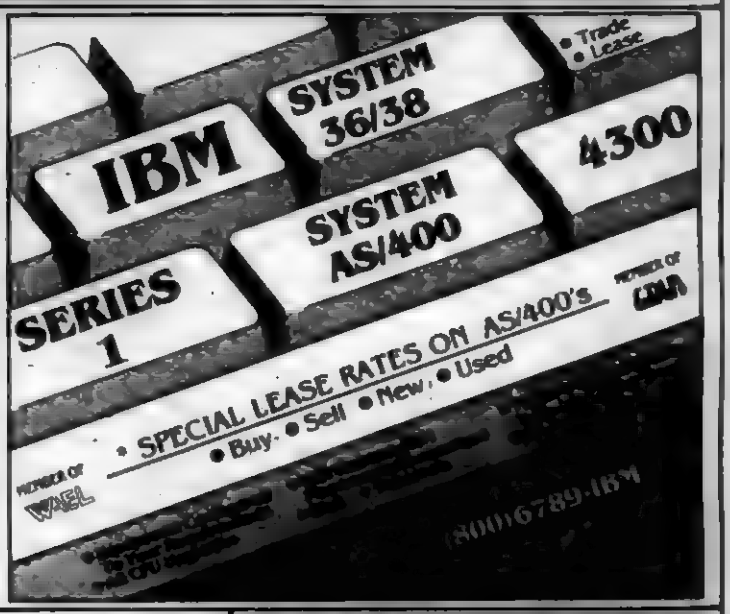

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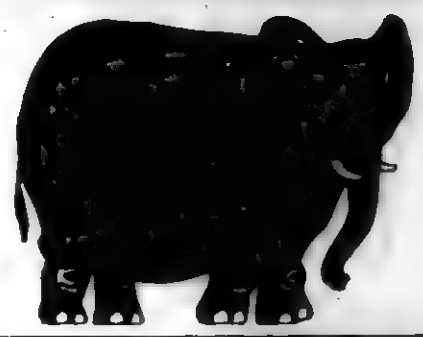

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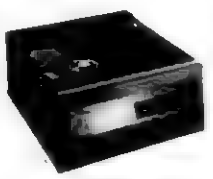

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The diplomacy of training

Understanding organizational cultures makes for effective instruction

BY NAOMI KARTEN
SPECIAL TO CW

Books and courses are popping up everywhere to educate businesspeople about cultural differences among the nations in which they might operate. Although it is less of an "in" topic, it's important for information systems professionals to understand the range of cultures among and within organizations.

This subject is particularly important for IS trainers; they should be able to work more effectively with IS professionals and users throughout their organization if they are sensitive to differences in corporate culture.

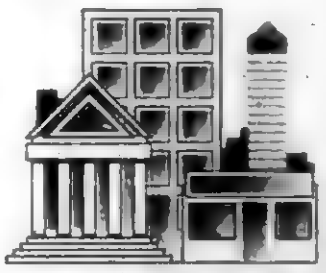
Corporate culture involves the traditions, norms, rituals, shared values and patterns of behavior encouraged in an organization. In their 1982 book *Corporate Culture*, published by Addison-Wesley, Terrence Deal and Allan Kennedy divided corporate cultures into four groups — tough guy, work hard/play hard, bet-your-company and process — and described the differences in personalities, styles, rhythms and values of each.

Such categories are helpful, but large companies are not that simple; few of them have only one culture. IS trainers must avoid regarding users as a homogeneous group with identical attitudes and modes of operation. Divisions, departments, project teams and individuals have their own styles and values.

Similarly, within an IS organization there can be differences among systems developers, operations staffs, technical support groups, information centers — and trainers.

One can become more aware of an organization's culture by thinking about its pace, cohesiveness, style of decision-making and level of information sharing. For example, one might ask the following:

- Is the pace constantly frenzied, or does it suggest an afternoon snooze?
- Is there a sense of cohesiveness between areas so that everyone works toward common goals, or is there a subtle — or not so subtle — tendency toward adversarial relationships?
- Does the organization encourage instant decisions, or does it analyze alternatives endlessly? Does it examine long-term consequences of decisions or encourage short-term thinking?



- Do managers openly share information with their superiors, peers and subordinates, or is everything kept hush-hush, with information doled out only to those who need to know (and even then, not always)?

One can raise similar questions about the organization's attitude toward change, new ideas, risk taking, goal setting and teamwork. It is also appropriate to ask how the organization treats its customers, employees and other constituencies.

Another way to get a grasp of an organization's culture is to identify adjectives or phrases that best describe it. In a recent class, students from several organizations came up with terms that included slow and steady, political, quick on the draw, stimulating, carefree, bureaucratic, full of energy, under constant pressure and free-spirited.

The similarities and differences in lists that several people from the same organization draw up can say a lot about that organization. An organization described as both lackadaisical and energetic probably has difficulty getting departments working together toward common goals.

A related method of characterizing an organization's culture is to ask what its motto might be. For example, see which of the following fits better:

- "Let's try something new" or "Don't make waves"?
- "We stress quality above all" or "We can always fix it later"?
- "We're always here when you need us" or "Don't call us, we'll call you"?

It can be instructive to think about discrepancies between the message an organization sends to customers and its internal culture. For example, does the organization tell customers how important people are while alienating its employees?

With just a slight change in wording, questions about an enterprise can be used to analyze departments or divisions. The units may vary in welcoming or resisting change, encouraging or discouraging creative thinking, requiring rigid adherence to the corporate hierarchy or accepting easygoing relationships in all directions.

For the trainer, knowing that a group likes to jump right in and learn by doing may call for avoiding in-depth analysis of a plan or idea. Similarly, inviting too much open discussion in a group that is used to private conversations — or vice versa — could backfire.

The value of analyzing a group's culture is not in labeling it and thereby pigeonholing it. The value is in facilitating effective working relationships by being sensitive to the differences between and within organizations. Awareness of the variations — whether among countries or within one's organization — can make a big difference in forging these relationships.

Karten is president of Karten Associates in Randolph, Mass., and editor of the monthly newsletter "Managing End-User Computing."

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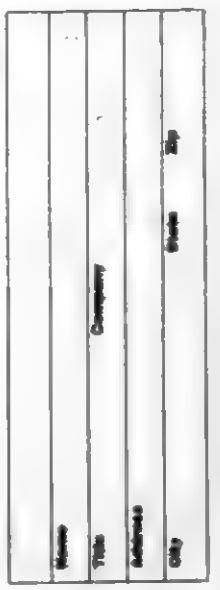

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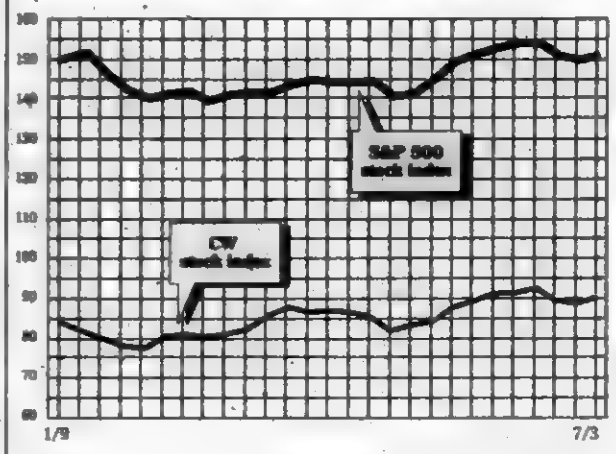

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Semiconductors	59.8	61.6
Peripherals & Subsystems	94.8	96.5
Leasing Companies	79.7	78.2
Composite Index	89.0	90.2
S&P 500 Index	150.0	152.1

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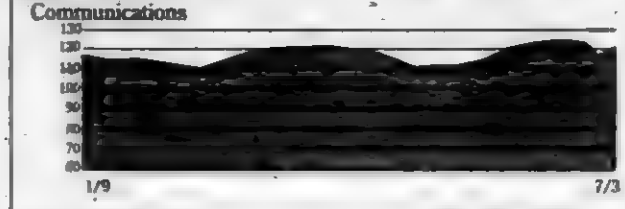

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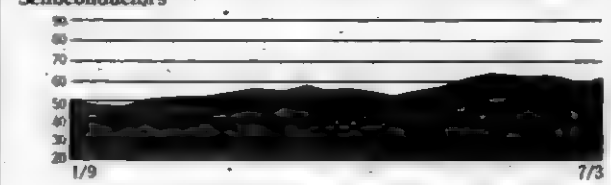

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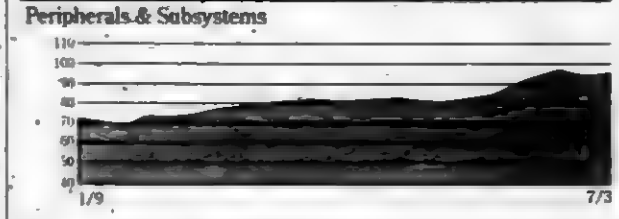

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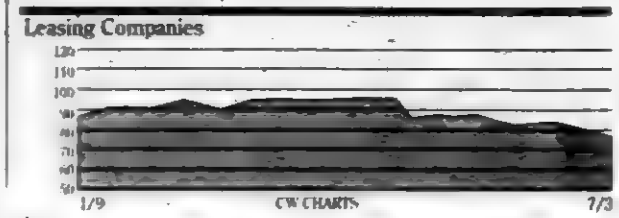

CW CHARTS

Computerworld Stock Trading Summary

CLOSING PRICES TUESDAY, JULY 3, 1990

EXCH		52-WEEK RANGE		CLOSE JULY 3, 1990	WEEK NET CHANGE	WEEK PCT CHANGE
	Communications and Network Services					
N	AMERICAN INFO TECHS CORP	88	55	61	0.4	0.6
Q	ANDREW CORP	28	19	19.25	0.0	0.0
Q	ARTEL COMM CORP	10	5	4.875	-0.1	-2.5
N	AT&T	47	36	38.625	-0.5	-1.3
Q	AWANTEK INC	7	2	2.875	0.0	0.0
N	AYDIN CORP	21	13	14.25	-0.3	-1.7
N	BELL ATLANTIC CORP	57	43	48.75	-0.3	-0.5
N	BELLSOUTH CORP	59	48	53	0.4	0.7
Q	COMPRESSION LABS INC	18	7	14.625	0.4	2.6
Q	CONTEL CORP	37	23	27.625	1.8	6.3
Q	DATA SWITCH CORP	5	2	3.5	0.5	16.7
Q	DIGITAL COMM ASSOC	27	17	23.125	0.4	1.8
Q	DYNATECH CORP	21	15	16.25	0.3	1.6
Q	FIBRONICS INTNL INC	13	5	12.125	0.3	2.1
Q	GANDALF TECHNOLOGIES	7	2	3.875	0.4	10.7
N	GENERAL DATACOMM INDS	7	3	3.5	-0.1	-3.4
N	GTE CORP	38	27	32.375	0.4	1.2
Q	INFOTRON SYS CORP	11	3	3.75	0.3	7.1
N	ITT CORP	60	51	57.5	0.5	0.9
N	M A COM INC	9	3	5.25	0.1	2.4
N	MCI COMMUNICATIONS CORP	49	31	42.5	1.5	3.7
N	NETWORK EQUIP TECH INC	34	9	9	0.0	0.0
Q	NETWORK SYS CORP	15	7	14.125	0.5	3.7
N	NORTHERN TELECOM LTD	30	18	28.375	1.1	4.1
Q	NOVELL INC	57	24	53.75	0.5	0.9
N	NYNEX CORP	92	75	82.75	0.3	0.3
N	PACIFIC TELESIS GROUP	52	40	44.125	0.0	0.0
A	PENRIL CORP	9	4	8.25	1.8	26.9
N	SCIENTIFIC ATLANTA INC	29	19	27.75	1.1	4.2
N	SOUTHWESTERN BELL CORP	65	50	54.25	0.3	0.5
Q	3COM CORP	19	10	16.375	0.0	0.0
N	U S WEST INC	41	33	36.5	0.6	1.7
	Computer Systems					
Q	ALLIANT COMPUTER SYS	9	4	8.438	-0.9	-12.7
Q	ALPHA MICROSYSTEMS	8	3	3	-0.1	-4.0
Q	ALTOS COMPUTER SYS	6	5	7.375	0.0	0.0
A	AMDAHL CORP	17	11	17.125	1.4	8.7
Q	APPLE COMPUTER INC	50	32	44	2.5	6.0
Q	AST RESH INC	26	7	23.25	0.8	3.3
N	BOLT BERANEK & NEWMAN	9	4	5.125	0.5	10.8
N	COMPAQ COMPUTER CORP	130	73	123.125	3.8	3.1
N	COMMODORE INTNL	14	6	8.125	0.5	6.6
N	CONTROL DATA CORP	23	16	19	0.6	3.4
N	CRAY RESH INC	91	31	44.875	-1.8	-3.8
Q	DAISY SYS CORP	5	0	0.156	0.0	0.0
N	DATA GEN CORP	19	8	9.125	-0.1	-1.1
N	DATAPOINT CORP	6	2	2.25	-0.5	-18.2
Q	DELL COMPUTER CORP	13	5	12.375	1.0	8.8
N	DIGITAL EQUIP CORP	109	70	83.75	1.6	2.0
A	FLOATING POINT SYS INC	4	0	3	0.1	4.3
N	HARRIS CORP	40	28	34.25	-0.1	-0.4
N	HEWLETT PACKARD CO	58	40	47.875	1.6	3.5
N	HONEYWELL INC	109	73	102.125	4.9	5.0
N	IBM	122	93	117.625	-0.4	-0.3
Q	INFORMATION INTL INC	16	12	13.125	0.0	0.0
Q	IPL SYS INC	14	5	10.5	0.0	0.0
N	MAI BASIC FOUR INC	7	2	2.25	0.3	12.5
N	MATSUSHITA ELEC INDL LTD	180	123	140	0.3	0.2
Q	MENTOR GRAPHICS CORP	26	14	17.625	-4.8	-20.8
N	NBI INC	3	0	0.344	0.0	0.0
N	NCR CORP	72	53	64	0.3	0.4
Q	PYRAMID TECHNOLOGY	39	10	29	-0.5	-1.7
Q	SEQUENT COMP SYS INC	34	11	29.75	-0.8	-2.5
Q	SUN MICROSYSTEM INC	34	13	33.125	0.8	2.3
Q	SYMBOLICS INC	2	0	0.438	-0.1	-12.4
N	TANDEM COMPUTERS INC	30	17	23.625	0.0	0.0
N	TANDY CORP	49	30	36.375	0.6	1.7
N	ULTIMATE CORP	11	5	7.625	-0.1	-1.6
N	UNISYS CORP	25	12	13.5	0.5	3.8
A	WANG LABS INC	8	4	4.125	-0.1	-2.9
	Software & DP Services					
Q	AMERICAN MGMT SYS INC	18	11	17.625	0.0	0.0
Q	AMERICAN SOFTWARE INC	27	14	26	0.6	2.5
N	ANACOMP INC	7	2	2.625	-0.1	-4.5
Q	ANALYSTS INTL CORP	21	14	20	0.5	2.6
Q	ASHTON TATE	18	9	12.625	1.3	11.0
Q	ASK COMPUTER SYS INC	15	7	8.75	0.1	1.4
N	AUTO DATA PROCESSING	59	40	56.375	1.5	2.7
Q	AUTODESK INC	56	33	54	0.5	0.9
Q	BMC SOFTWARE INC	30	13	26.25	-0.5	-1.9
N	BUSINESSLAND INC	14	7	7.75	-0.1	-1.6
Q	COGNOS INC	9	4	9.25	0.6	7.2
N	COMPUTER ASSOC INTL INC	20	11	16	0.6	4.1
Q	COMPUTER HORIZONS CORP	16	7	13.5	0.8	5.9
N	COMPUTER SCIENCES CORP	59	40	46.75	-0.9	-1.9
N	COMPUTER TASK GROUP INC	14	9	10.125	0.0	0.0
Q	COMSHARE INC	25	15	24	1.3	5.5
Q	CORPORATE SOFTWARE	15	8	14	0.5	3.7
N	GENERAL MTRS (CLS E)	37	24	34.625	-0.9	-2.5
Q	GOAL SYSTEMS INTL	16	10	15.75	-0.75	-4.6
Q	HOGAN SYS INC	7	4	3.75	0.3	7.1
Q	INFORMIX CORP	17	8	15.625	0.4	2.5
Q	INTELLICORP INC	6	3	7.75	1.1	17.0
Q	LEGENT CORP	32	19	26.5	-1.0	-3.6
Q	LOTUS DEV CORP	39	21	34.5	-0.5	-1.4
Q	MICROSOFT CORP	79	26	72	-4.3	-5.6
Q	NATIONAL DATA CORP	35	13	15	1.0	7.1
N	ON LINE SOFTWARE INTL INC	11	6	8.75	1.1	14.8
Q	ORACLE SYS CORP	188	15	29.625	0.3	1.1
N	PANSOPHIC SYS INC	19	10	14.25	0.9	6.5
Q	PHOENIX TECHNOLOGIES INC	11	2	4.5	0.0	0.0
Q	POLICY MGMT SYS CORP	42	28	41.25	0.4	0.9
Q	PROGRAMMING & SYS INC	25	16	24.25	1.3	5.4
Q	RELATIONAL TECH INC	11	5	8.5	0.1	2.0
N	REYNOLDS & REYNOLDS CO	27	19	20.75	-0.3	-1.2
Q	SAGE SOFTWARE INC	16	7	13.625	-0.3	-1.8
Q	SEI CORP	21	15	21	0.6	3.1
Q	SHARED MED SYS CORP	17	12	12.625	-0.6	-4.7
Q	SOFTWARE PUBG CORP	28	13	23.625	-1.1	-4.5
N	STERLING SOFTWARE INC	11	7	10.5	0.4	3.7
Q	SUNGARD DATA SYS INC	26	16	24.25	1.5	6.6
N	SYSTEM CENTER INC	28	17	22.125	0.6	2.9
N	SYS. SOFT INC	29	15	27.25	2.5	10.1
Q	WORDSTAR	2	1	1.125	0.0	0.0
	Semiconductors					
N	ADV MICRO DEVICES INC	11	7	9.5	0.4	4.1
N	ANALOG DEVICES INC	11	7	7.375	-0.1	-1.7
Q	ANALOGIC CORP	11	8	9.5	0.1	1.3
Q	CHIPS & TECHNOLOGIES INC	28	15	21.25	0.8	3.7
Q	INTEL CORP	49	28	47.5	1.6	3.5
Q	MICRON TECHNOLOGY INC	19	7	13.75	1.5	12.2
N	MOTOROLA INC	88	51	85.5	2.4	2.9
N	NATL SEMICONDUCTOR	9	5	7.25	0.4	5.5
N	TEXAS INSTRS INC	44	28	38.25	0.3	0.8
A	WESTERN DIGITAL CORP	15	6	13.5	0.3	1.9
	Peripherals					
Q	ALLOY COMP	2	0	0.782	0.0	-3.8
N	AM INTL INC	6	2	2.5	0.0	0.0
Q	AUTO TROL TECH CORP	8	2	3.75	-0.3	-7.7
Q	BIANCTEC INC	24	13	20.25	1.1	5.9
A	COGNITRONICS CORP	8	3	5.75	0.1	2.2
Q	CONNER PERIPHERALS	29	10	28	2.0	7.7
A	DATARAM CORP	20	8	18.5	1.5	8.8
N	EASTMAN KODAK CO	62	36	41	1.0	2.5
N	E M C CORP MASS	7	3	5.75	0.3	4.5
Q	EMULEX CORP	9	4	7.25	0.1	1.8
Q	EVANS & SUTHERLAND	38	17	29.5	-0.5	-1.7
Q	ICOT CORP	2	1	1.25	-0.1	-8.1
Q	INTERLEAF INC	9	5	6.75	-0.6	-8.5
Q	IOMEGA CORP	8	3	8	0.1	1.3
Q	LEE DATA CORP	3	1	1.313	0.0	0.0
Q	MASSTOR SYS CORP	4	1	1.188	-0.1	-5.0
Q	MAXTOR CORP	17	7	15.375	1.3	8.8
Q	MICROPOLIS CORP	9	3	7.875	0.6	8.6
N	MINNESOTA MNG & MFG CO	96	66	97.625	2.4	2.8
O	PERSONAL COMP PRODUCTS INC	5	4	4.063	0.0	0.0
Q	PRINTRONIX INC	15	7	12.75	-0.1	-1.0
N	QMS INC	21	8	18.5	1.4	8.0
Q	QUANTUM CORP	23	9	22.5	1.9	9.1
N	RECOGNITION EQUIP INC	13	4	5.25	0.1	2.4
Q	REXON INC	10	6	7.875	-0.4	-4.5
Q	SEAGATE TECHNOLOGY	23	10	14.25	0.6	4.6
N	STORAGE TECH CORP	35	9	34.625	3.5	11.2
Q	TANDON CORP	4	0	3.75	0.9	33.3
N	TEKTRONIX INC	23	12	18.125	1.0	5.8
Q	TELEVIDEO SYS INC	1	0	0.344	0.0	-8.3
N	XEROX CORP	69	46	46.375	-0.6	-1.3
	Leasing Companies					
N	CAPITAL ASSOC INTNL INC	8	3	3.125	-0.1	-3.8
N	COMDISCO INC	34	17	18.125	0.3	1.4
Q	LDI CORPORATION	18	13	16	0.5	3.2
Q	PHOENIX AMERN INC	5	3	3.75	-0.1	-3.2
Q	SELECTERM INC	9	8	8	-0.5	-6.1

EXCH: N—NEW YORK; A—AMERICAN; Q—NATIONAL

Skid row

Tech firms finish short week by posting a long trail of losses

Wall Street's bifurcated holiday week was no time for celebration. While skyrockets blasted through the air, technology stocks fizzled and dropped like duds.

An eruption of negative earnings forecasts sent some stocks plunging, including Mentor Graphics, Inc., which lost 5 points to close at 16¾ Thursday. Microcom Corp. plummeted 3⅛ points to 6⅛ after predicting a higher quarterly loss. Interleaf, Inc. and Alliant Computer Systems Corp. also suffered the fate of unfavorable financial news. Interleaf lost 1⅛ points to 6⅛, and Alliant slipped 1⅛ points to 6⅛.

Victorious in its copyright suit against Paperback Software International, Lotus Development Corp. jumped on Borland International's back with a similar gripe. Borland's stock took a 4¾-point hit for the week, finishing at 16⅝. The suit didn't fit Lotus' investors, though. Its stock slipped ⅛ of a notch to close at 34¼.

Compaq Computer Corp., which had gained 2½ points the week before, lost as many last week, ending at 122. Other hard-luck hardware firms included Apple Computer, Inc., which shed 1¼ points to close at 43½; Digital Equipment Corp., down 1⅛ points to 83⅛; and Sun Microsystems, Inc., slipping ⅝ of a point to 33¼.

One bright spot on the hardware scene was NEC Technologies, Inc.'s gain of 1½ points to 66, after unveiling its new superfast mainframe. IBM, scheduled to introduce a comparable machine — nicknamed Summit — this year or in 1991, sank ⅛ of a point to 117¾, while Amdahl Corp., also planning a similar announcement, edged up ⅝ of a point to 16⅛.

KIM S. NASH

Blind

FROM PAGE 1

employment for the handicapped.

There are many more who are visually impaired, 20 years of ACB surveys have shown.

Totally blind and legally blind programmers and systems analysts who aspire to management are often hampered by the varying degrees of support top IS management provides and the high motivation it takes to overcome the physical obstacles.

Blind IS managers said there is also a lack of "adaptive technology," or special equipment needed to give blind workers access to computers, in many places.

Jim Fleming, president of ACB's Visually Impaired Data Processors International (VIDPI), is another government IS manager who advanced his career against the odds. Fleming, 36, is a supervisory computer specialist in the Internal Revenue Service's (IRS) Treasury Integrated Management Information Systems project. He manages a field staff of 15 that is currently working to convert IRS databases to a new hardware system.

Although partially sighted, Fleming's vision is limited because of a condition that causes the retina to deteriorate. "Many people question the ability of blind people to act as managers," Fleming said. "But I think it's actually easier to be a manager than it is to be a technician, in terms of the disability." That is because programmer/analysts need to write and debug thousands of lines of code, something that most people do visually. As a manager, Fleming finds himself writing memos, reviewing others' work and communicating, rather than writing large programs.

Wearing special glasses and using oversized VDT monitors helps Fleming get his work done, but reading from the screen for long periods causes eye fatigue — and viewing text on oversized screens limits his ability to scan. While he ascended rapidly into management from the ranks of Cobol programmers, he said his case is unusual. "We've made some progress in getting our foot in the door, but most blind people are still getting entry-level positions," he said.

Patricia Barry Levy

ACB's Fleming: *We've made progress, but most blind people get entry-level jobs*

Despite the difficulties, both Fleming and Young said their federal agencies have supported their career advancement. Fleming credited his own rise in the ranks to the support of Dan Cappazzoli, a former assistant commissioner of computer services who retired in 1988. Cappazzoli recruited visually impaired persons as entry-level programmers, Fleming said, hiring more than 50 persons from one Arkansas computer school that specialized in training the blind.

Young, who chairs VIDPI, was a typist in 1968, when the Veterans Administration sent him to a nine-month programming course in Austin, Texas. Five years later, he was named computer specialist, and seven years later, he was named a first-line supervisor.

Personal computer technology has removed many of the most difficult obstacles to blind computer professionals. "Twenty years ago, we had to rig up braille printers and listen to textbooks that had been recorded for the blind," said Michael J. Mady, a professor of computer science at San Antonio College. "Now, we get a lot of information on floppy disks and put it into a PC — where voice-synthesizer software reads it out loud."

Young first became a supervisor in the mid-1970s. At that time, most systems information was printed out in reams of fan-fold computer paper. To keep up, Young used to take those printouts home, so that his wife could read the columns of numbers aloud, "walking me through core dumps in an effort to spot errors." There was, he added, "no such thing as an eight-hour day." In 1977, nine years after he began, he became an assistant chief of the systems division, supervising 80 people.

If there were any special problems to managing such a large group, Young did not admit to any. "The others soon learned that I used different techniques to get the job done," he said. "I used tape recorders, braille writers, and I had a secretary to take dictation for memos and reports. After a few days, we all went back to work."

Ingres to sketch out its '90s desktop strategy

BY JEAN S. BOZMAN
CW STAFF

ALAMEDA, Calif. — In a rush to catch up with its relational database management system competitors, Ingres Corp. plans to unveil its desktop strategy for the decade today.

The wide-ranging introductions follow a set of Ingres announcements for the Apple Computer, Inc. Macintosh made two weeks ago.

A new offering called Ingres Server for OS/2 will be mixed in with a number of enhanced products, such as Ingres Tools for DOS. The software tool package, which had been available for Release 5.0 of the Ingres RDBMS, has been updated for Ingres Release 6.0. While not new, the tool package has been vastly improved, according to beta-test users.

Industry analysts noted that Ingres Server for OS/2 supports Release 6.2 of the Ingres RDBMS but lacks the object-management and rules-management functions of Release 6.3. That also means that many features, such as triggers, user-defined functions and data types, are not included in this OS/2 release. Ingres executives confirmed that Ingres for OS/2 conforms with Ingres 6.2. They said programmers are now working on the 6.3 version, but they would not say when it will be available.

The firm also announced support for several personal computer local-area networks, including Novell Corp.'s Netware, 3Com Corp.'s 3+ Open and Microsoft Corp.'s LAN Manager. Before this, users had to link Ingres servers to PCs via Transmission Control Protocol/Internet Protocol, Digital Equipment Corp. Decnet or Ethernet communications protocols. Network support for OS/2 servers is provided on top of IBM's Netbios protocol.

Industry analysts questioned the timing of Ingres' assault on the desktop. "The important thing here is not that they're providing leadership, it's that they're completing the task," said Rich Finkelstein, president of Performance Computing, a Chicago software consulting group. "Before this, Ingres only offered a Unix server solution, even though many corporations wanted an OS/2 version. It may be a technically superior product, but it's being marketed a little late in the game."

"There's no new technology" in the OS/2 server, agreed Nancy McSharry, a senior software analyst at International Data Corp.'s Mountain View, Calif., office. "But Ingres does have a competitive edge, because it implements its tools the same way, no matter what the platform."

Chip Gliedman, Ingres' director of desktop products, conceded that virtually all of his competitors already have OS/2 servers. "They all came out with them in the last 12 months," Gliedman said. "What these products really represent is an expanded focus on desktop products at Ingres. Ingres customers simply didn't have these options before."

The California Department of Water Resources in Sacramento is using the enhanced Ingres Tools for DOS to build a database on equipment and maintenance for the statewide water system. "We found that the first generation of Ingres Tools for DOS [written for Ingres 5.0] constantly failed, but the new one works just fine," systems analyst Afshin Gousheh said.

All the Ingres products are available immediately, Gliedman said. Ingres Server for OS/2 is priced at $1,995; Ingres OS/2 Networking with Netbios support is priced at $495, and Ingres Tools for DOS is priced at $495. Another version of Ingres OS/2 Networking for Novell's SPX/IPX protocol will be available in the fall for $495.

Apple developers find Claris reversal tough to swallow

BY JAMES DALY
CW STAFF

Independent software developers expressed renewed concern about receiving fair treatment from Apple Computer, Inc. last week, only days after the personal computer giant made an abrupt about-face and announced that long-standing plans to turn its Claris Corp. software unit into a separate business had been scrapped.

For two years, Apple officials have pledged to sever ties with Claris because of concerns by software firms that they could not compete with a group so closely tied to Apple. Analysts had expected Claris to go public later this year.

The reversal went down bitterly with many developers and renewed concerns about the stability of Apple's high-level management, which has been rocked by several prominent turnovers this year. "How are we supposed to have confidence in a firm that changes so drastically from day to day and quarter to quarter?" Symantec Corp. President Gordon E. Eubanks Jr. asked.

However, the developers would not say whether Apple's reacquisition of Claris would cause them to scale back their efforts in the Apple market.

Software too crucial

Apple Chief Executive Officer John Sculley said that software will play too important a role in the computer industry to ignore and that Claris will become a wholly owned independent subsidiary.

The decision, however, appears to renege on past promises. Apple officials have maintained that independence was key to Claris' success because it would allow Apple to participate in the applications software market without alienating its third-party developers. International Data Corp. estimated that Claris, in Mountain View, Calif., has grown to an $80 million organization that employs 380 people. Claris produces packages including the Macwrite word processor, the Macpaint graphics program and the Filemaker database manager.

Analysts speculated that had Claris broken away, it would have focused its development efforts on competitive programs such as Microsoft Corp.'s Windows 3.0, which gives an Apple Macintosh-like interface to IBM PCs and compatibles. That could have served to fuel resentment between Apple and Claris.

Only last month, at PC Expo in New York, Claris President Bill Campbell stated that his firm was developing for Windows, and Claris officials have since acknowledged that diversification would have become certain. "Market forces would have dictated that we would have needed to create multiplatform products," said John Zeisler, director of marketing at Claris.

This apparently was the straw that snapped the camel's back. "It would have killed Sculley to see Claris jump on [the Microsoft 3.0] bandwagon," said Charles Rothschild, an analyst at the Jersey City, N.J., office of research firm Pershing & Co.

With separation now a dead issue, developers are keeping their fingers crossed. "It is completely up to Apple how this ball is played," said Mike Maples, vice-president of applications at Microsoft. "There is the opportunity for Apple to be level-handed and fair, and there is the chance for them not to be."

NEWS SHORTS

Gartner Group sold

Information Partners L.P. in Boston last week bought Stamford, Conn.-based market research firm Gartner Group, Inc. from Saatchi & Saatchi PLC for $70 million. Information Partners, a limited partnership specializing in information industry buyouts, bought Gartner Group with the intention of bringing the company "back on its traditional growth record track," said Mark Nunnelly, a general partner at Information Partners. Gartner Group, formerly a subsidiary of publicly held Saatchi & Saatchi, will turn private under the direction of Information Partners.

Mix 'n' match Micro mishaps

Microsoft Corp. said last week that certain combinations of third-party disk partitioning software with Microsoft's Smartdrive disk-caching utility, bundled with Windows 3.0, might result in loss or corruption of data. The risk is greatest with disk partitioning software from Ontrack Computer Systems, Inc., Prism Systems, Inc. and Storage Dimensions, Inc., used in combination with Windows 3.0. Microsoft stressed that of the several hundred thousand versions of Windows 3.0 shipped, only 12 customers have verified problems.

Acer buys Altos

The Acer Group and Altos Computer Systems last week signed a merger agreement under which Altos will become a member of The Acer Group. Acer claimed to be the largest personal computer maker in Taiwan. The transaction, valued at approximately $94 million, has been approved by each company's board of directors. Altos will operate as an independent subsidiary of Acer and continue to market its existing product line of Unix-based multiuser computer systems, as well as introduce new products.

Packet-switching for Moscow

U.S. Sprint Communications Co. will be fostering packet-switched *perestroika* in the Soviet Union under a joint venture announced last week between Sprint International and Soviet carrier Central Telegraph. The two carriers will jointly operate a packet-switching center in Moscow that will provide high-speed data communications, electronic mail and telex services domestically and internationally. The new service, beginning late this year, will support Soviet President Mikhail Gorbachev's recent initiative to bring in U.S. business by ensuring that U.S. firms will get the same level of networking service that they now enjoy in major Western cities, according to a Sprint spokesman. Sprint and other carriers have provided telephone service to Moscow for some time, and Sprint's Telenet subsidiary has provided packet-switched connections to the USSR via a link to Switzerland. However, this will be the first time the USSR has allowed a foreign data networking company to establish a presence there, Sprint said.

Dell adds 486-based model

Dell Computer Corp. last week released the Dell System 433E, an Intel Corp. 1486-based microcomputer that runs at 33 MHz and offers the 32-bit Extended Industry Standard Architecture bus. Austin, Texas-based Dell set prices from $7,899 to $12,199. At the same time, the company dropped prices by $1,500 on the System 425E and the Dell Station 425.

Daewoo plans color Next station

It appears that Next, Inc. has finally given in to pressure to change its all-black-and-white tune. Next Co-founder Steve Jobs has promised a color monitor by the end of this year for his company's workstations, and now Korean PC maker Daewoo Telecom Co. Ltd. is jumping on board the Next color bandwagon. Daewoo says it will have a color display system for the Next computer by sometime early next year. The image processing system will typically sell for between $30,000 and $60,000 and will be distributed in the U.S. by Leading Edge Products, Inc., according to Daewoo officials.

Lotus

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Lotus is unlikely to find much sympathy among accounts that have either switched to Quattro Pro or are evaluating the Borland spreadsheet (see story below). "The suit won't sway my people's evaluations either way," said Brian Ellis, MIS director at Brunswick Bowling & Billiards in Muskegon, Mich. At Charles County Community College in LaPlata, Md., researcher Cynthia Vervena said that Quattro Pro's lower price will outweigh any other concerns. "It's a good deal at $99, compared to Lotus for $495," she said.

Most users contacted last week said they have both 1-2-3 and Quattro Pro in-house. Many preferred the latter, saying it costs less, takes up less memory, requires a less powerful machine and has better graphics and added capabilities. Few were seriously concerned about the suit, although a number criticized Lotus for pursuing its copyright claims.

Pigeonholed

Computer Associates International, Inc.'s Super Calc 5 has already been pigeonholed by analysts as the next target of Lotus' lawyers.

Some analysts, such as Marshall Moseley at Dataquest, Inc., suggested that by the time a decision is rendered in the Lotus vs. Borland and SCO cases, it will be relegated to a footnote, rather than a headline, in history. "The point is, Lotus may have won the battle [copyright ruling] and lost the war [position as the standard interface]," he said.

By as early as 1991, the proprietary advantage of the 1-2-3 interface — as a standard way of interacting with other computer programs — will have begun to fade, said Paul Zagaeski, an analyst at The Yankee Group. "Two years from now, the Lotus menu system will be far less important in the market than it is now," agreed Rick Sherlund at Goldman Sachs & Co., noting that the Borland suit comes at a time when the industry is beginning to move to a new graphical environment. In part because of the Lotus copyright, users and developers may hasten that migration in order to ensure a risk-free, unifying environment for their application families.

Where developers once counted on the Lotus 1-2-3 interface to provide a degree of familiarity and compatibility between packages, they will now look to graphical user interfaces such as Microsoft's Windows, IBM's Common User Access or even Apple Computer, Inc.'s interface.

"I do think Windows will provide a common denominator, although people will be far more careful to make sure they don't copy anyone else's interface features," Sherlund said.

One dissenter is Jeffrey Tarter, editor of "Softletter" newsletter. "There are 10 [million] or 20 million people for whom the Lotus command structure is intuitive. It is unlikely that all these users will abandon this interface," he said.

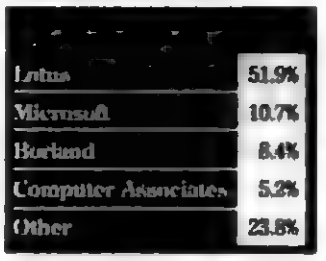
Of course, even in a graphical user interface environment, developers will still be wary of making their product look too much like the next guy's, said David Cearley, a software analyst at Gartner Group, Inc.

Lotus was successful in positioning the 1-2-3 interface as a standard, but the hitch is that it does not license that technology. "They wanted people to write to their interface. They did, and now Lotus is suing," said Adam Osborne, former Paperback chief executive officer. He resigned in mid-February and is still a shareholder.

Conversely, users and developers can license Windows and buy the developer kit or adhere to interface guidelines published by IBM and Apple. "Have [Apple or IBM] ever said they won't sue?" Osborne asked.

King of the hill

Lotus maintains spreadsheet market dominance despite pressure



Source: International Data Corp.
CW Chart: Doreen Dable

Lotus suit deals blow to Borland ambitions

BY PATRICIA KEEFE
CW STAFF

Borland International could lose newly won corporate accounts if it doesn't move quickly to defuse the copyright infringement suit filed against it last week by Lotus Development Corp.

Anticipating the lawsuit, Borland filed suit first, asking the judge to rule that it does not violate any 1-2-3 copyrights. Borland's Quattro Pro offers the option of using a 1-2-3 menu. It normally retails for $495, but Borland is running an aggressive $99 promotion tied to a 1-2-3 trade-in.

The volley of lawsuits forced Borland's stock price down nearly 20% before rebounding slightly at the end of Thursday's trading.

Most industry analysts said they believe Lotus is using its recent copyright victory over Paperback Software International, Inc. as a competitive weapon.

Insisting that Quattro Pro is not a clone of 1-2-3, Spencer Leyton, Borland's senior vice-president of business development, suggested that "We get from one place to another by what has come before."

Kahn's *spreadsheet tactics provoked the wrath of Lotus.*

Some feisty Quattro Pro users do not think much of Lotus' copyright claims. "I don't think the Lotus suit is founded," said Douglas Keim, MIS manager at Strout Plastics in Bloomington, Minn. "But I'm not going to buy 1-2-3 in any case; I don't like it."

"I'll recommend that we *not* use 1-2-3," responded Jerry Criswell, a personal computer technician with the Des Moines-based Iowa Credit Union League. "The 1-2-3 people are out of line [with this suit]," he said, adding that his shop moved over from 1-2-3 to Quattro Pro.

Still, Jeffrey Tarter, editor of "Softletter" newsletter, maintains that Borland will find itself in trouble in larger, corporate accounts. "Quattro Pro could get taken off some buy lists," he said.

For example, the Small Systems Technology group at Phoenix-based Best Western International is considering Quattro Pro as a 1-2-3 replacement based on its lower price and added capabilities, according to group manager Cary Theall. But the suit has left those plans uncertain.

The suit pits Lotus Chief Executive Officer Jim Manzi against one of his chief tormentors, longtime Lotus baiter and Borland founder Philippe Kahn. The normally glib Kahn has ignited Lotus' ire in the past through such stunts as anonymously distributing copies of a critical profile of Manzi and targeting 1-2-3 in its advertising campaigns as overpriced.

Repository

FROM PAGE 1

of software development, from the up-front analysis and design to maintenance of production applications. Eventually, it will provide integration for computer-aided software engineering (CASE) tools so they can share data and work under the same guidelines. The guidelines will be provided by the information model, which, put simply, is the blueprint for how development work should be done.

Both companies said they decided to go with an incomplete product rather than wait for a more robust version because they wanted to stay as current with IBM's steps as possible.

"Our plan was that, regardless of its state, we wanted it to begin the migration to it," said Howard Sorgen, a first vice-president and director of information and technical services at Merrill Lynch. "We never saw from Day 1 any need to hedge on decisions in terms of application development."

The only major gripe concerned pricing, which is steep for an incomplete product, said Neil Ferri, a Merrill Lynch vice-president in charge of data services and information security. Ferri said his staff is installing the official Version 1, which became generally available at the end of last month with a monthly licensing charge of $4,500 for high-end processors.

"My first impression is [the pricing] is out of line, and I plan to pursue it with IBM," Ferri said. "It should be going at about 25% of the price, because it has about 25% of the functionality."

The current version, according to the early users, provides no integration with third-party tools. It is also slow and a resource hog, according to Ackerman. "I'm used to subsecond response time on [IBM's] TSO," he said. "It doesn't have anywhere near that. If you have to wait 15 to 30 seconds for something, it seems like forever."

However, Ackerman said he considers that to be a normal drawback to a new release that he expects will improve with time.

"The performance could be improved, but I'm convinced IBM will do that," Ackerman said. "We were an early support site for DB2 and the first version of it had horrible performance. Now, it is reasonable to talk about it as a transaction processing database."

The lack of tool integration requires users such as Depository Trust to go without user-friendly access methods. It is the CASE tools that will deliver graphical user interfaces. For now, users must rely on terminal-based access.

Depository Trust is using IBM's Query Management Facility, which Ackerman said provides a "fairly nice interface." Merrill Lynch has not yet begun loading models into the software.

Depository Trust is currently loading information from its own corporate model into Repository Manager. Ackerman said the model, which took four years to build and exists mostly on paper, can be loaded into the repository with its batch loader interface. The data has to be set up according to IBM guidelines, or Repository Manager will reject it. Once formatted properly, "it's textual information, so we dumped it straight in," Ackerman said.

Tricky moves

Merrill Lynch, however, is working with data in existing repository-like products, which makes the move to IBM's software a bit trickier. The company is using both the dictionary product developed by Brownstone Solutions, Inc. as well as the encyclopedia component of Knowledgeware, Inc.'s Information Engineering Workbench. As a result, Merrill Lynch has to spend more time up front making sure its existing ways of handling data match Repository Manager methods. "We've spent far more time reviewing the printed material and the information model," Ferri said. "Our intent is to take our existing repository and get it to fit the [guidelines] published for Repository Manager."

Ferri said the existing products provide more functionality than Repository Manager. "We have enterprise models, physical models, logical models," he said. "We can trace anything from a high-level business function all the way down to the code function. Repository Manager is not capable of doing that."

CA seeking to be a crowd pleaser

Welcomes IBM and DEC repository strategies while trying a hand at its own

BY JOHANNA AMBROSIO
CW STAFF

Opting to play both sides of the application development field, Computer Associates International, Inc. last week outlined a plan to embrace both IBM's and Digital Equipment Corp.'s repository strategies while introducing an alternative of its own.

CA said its software strategy will provide for coexistence among IBM's Repository Manager, DEC's CDD Plus/Repository and a CA repository running on either vendor's machines.

Separately, CA said that it will bring out a full line of commercial Unix systems software, database management systems and applications (see story below). The CA strategy means that users can keep their existing DBMSs and still take advantage of repository approaches. Under the CA mix-and-match scheme, database systems from IBM and DEC as well as CA's own will eventually be able to work with the repositories from all three companies.

Over the next year, CA plans to roll out interfaces between its DBMSs and other software to the IBM and DEC repositories. CA's repository — based on its existing data dictionaries — will include some of IBM's repository model.

However, it will also feature CA's own data center model. As the IBM repository will include facilities for storing models of how the business enterprise operates, CA's repository will allow users to define how they want their data center to operate, according to CA officials.

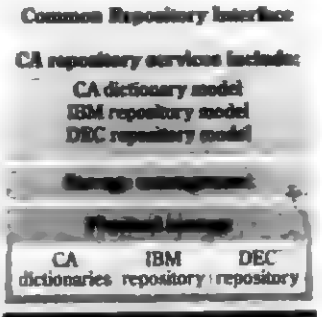
Users welcomed the move toward CA compatibility with IBM and DEC. "To us, the bottom line is, we won't be disrupting operations as we migrate to the new repository," said Jim Wegmann, senior vice-president of corporate data processing at Talman Home Federal Savings & Loan Association of Illinois in Chicago. The company has not yet selected its DBMS or the repository it will use, but the CA strategy "allows us to make a case-by-case transition, and that's important."

New York University is currently using CA's IDMS as its only DBMS. "But this might open other options for us," said Karen Travis, assistant director of administration at the school's University Computing Center.

For example, "we might be able to take a piece of our existing database — financial aid or admissions, for example — and put it on another computer dedicated to that function," she said.

Here's the plan

CA's development strategy features a common interface for underlying models stored in IBM, DEC and CA repositories



Source: Computer Associates International, Inc.
CW Chart: Doreen Dahle

To implement all this, CA is working on something it calls the Common Repository Interface (CRI), which will act as a level of intelligence to "populate, navigate and maintain the information" in any of three repositories — DEC's, IBM's or CA's.

CRI will incorporate the applications programming interfaces (API) used by both IBM's and DEC's repositories. APIs define how third-party software can communicate with the IBM and DEC repositories.

Because CA will use the same interfaces into the DEC and IBM repositories as other third-party vendors, users should be able to mix and match other vendors' software with the CA repository, according to the company.

In the short term, however, users will be somewhat limited in their ability to truly mix and match. For example, a DEC DBMS will be able to access the DEC or CA repositories but not the IBM repository. And a CA or IBM DBMS will but not one from DEC — will be able to access the IBM repository.

Any-DBMS-to-any-repository functionality is not slated to be available for the next several years. "That requires a distributed repository, and that's down the road a bit," according to George van Schaick, CA's vice-president of information systems marketing.

In addition to building the IBM and DEC bridges from its two main DBMSs, CA will also "link a wide range of our software into DB2 and Repository," said Anders Vinberg, CA's senior vice-president of research and development.

This other software includes CA's application development tools, such as fourth-generation languages and expert systems, and applications themselves, such as accounts payable.

CA's own repository will evolve from the current data dictionaries in the company's IDMS and CA-Datacom DBMSs. This means extending the content of the dictionaries to include computer-aided software engineering definitions for enterprise modeling, analysis and design as well as life-cycle management.

CA's repository can be "a replacement for or a user of" DEC and IBM repositories, Vinberg said.

All in the family

Computer Associates plans to bring out an entire family of commercial Unix products over the next several years, including applications, systems management products, database products and information management software.

While the company has not formally announced any new Unix software, CA is preparing a statement of direction for release sometime this summer, a CA executive told *Computerworld*.

CA already has some Unix packages directed at the scientific/technical market. But "we'll make available much of our software on Unix," said Anders Vinberg, CA's senior vice-president of research and development. Generally, after a package has been introduced for the IBM mainframe market, it will come out for Digital Equipment Corp. VAX machines and then for Unix. "You won't be seeing any products for Unix before they're out on the VAX," Vinberg said.

Two Unix packages that CA is readying are an SQL-compatible database management system and a code generator.

JOHANNA AMBROSIO

Second-class postage paid at Framingham, Mass., and additional mailing offices.
Computerworld (ISSN 0010-4841) is published weekly, with a single combined issue for the last week in December and the first week in January by CW Publishing/Inc., 375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171.
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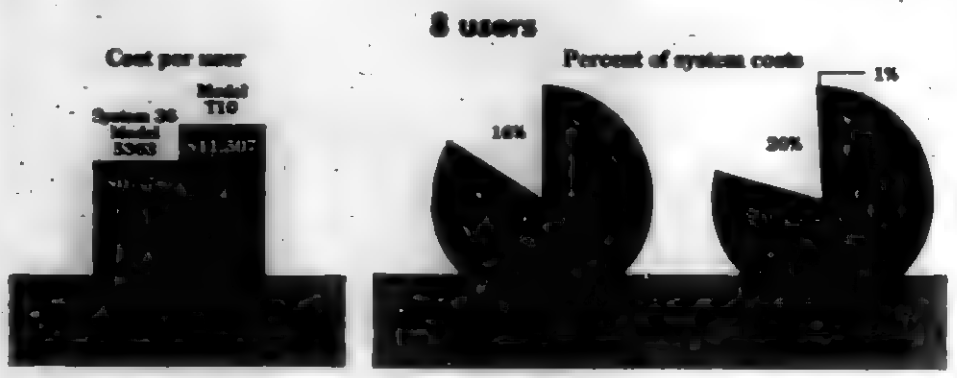
TRENDS

Cost of ownership

Peripherals will likely make up the greatest share of total system costs over a five-year period for AS/400s purchased in 1989 and 1990



Percentages may not equal 100% because of rounding

Source: The Sierra Group, Inc., Tempe, Ariz.

CW Chart: Tom Monahan

NEXT WEEK

The spread of medical imaging technology is a godsend for health care — and a nightmare for the hospital IS departments that must store and transmit all those images. Manager's Journal looks at how Massachusetts General Hospital's radiology department and director of computing **Jaime Taaffe** are meeting this challenge head-on.

Some management rulings may get easier once an executive information system is put into place but, as Product Spotlight and Buyers' Scorecard show, deciding on which EIS product to buy can also be a very tough call. Read all about what it takes to construct an EIS and what users think of the top-selling products in the category.

INSIDE LINES

People unclear on the concept

After Borland International's stock dropped from 21 June 29 to 15¾ last Tuesday, the company scheduled a conference call with Wall Street analysts, ostensibly to practice a little spin control. Unfortunately, Borland Chairman Philippe Kahn spun himself out of control, a source reported. "Philippe lost his cool," the source said, explaining that Kahn's answers to most questions amounted to, "I'm not a lawyer, don't ask me." The stock price has continued to drop.

A steak in their future

IBM and 3Com will announce a joint development agreement at the prestigious 21 Club today (so we know they are taking it seriously). The pact is expected to focus on standards in OSI and network management for local-area networks.

Plenty of RTs, though

Unless you've already got your order in for IBM's RISC System/6000 workstation, don't expect to get your hands on one until at least the end of the year. Although the company is producing between 500 and 1,000 machines per week, "everything is sold out, and we question our ability to build as many machines as we're getting orders for," an IBM spokesman said recently. General availability of the machines began in late May. The best seller so far: the entry-level Powerstation 320, which has accounted for 60% of sales.

Hack 'til you drop

A group headed by Mitch Kapor, founder of Lotus and chairman of On Technology, will hold a news conference tomorrow morning in Washington, D.C., to formally announce the formation of a hacker defense team. The team, which also includes Grateful Dead lyricist John Barlow and two well-known law firms, plans to muster its resources to provide legal and financial assistance to computer hackers who have been accused by federal and state law enforcers of carrying out a variety of computer-related crimes.

Sharing the wealth

DEC reportedly is preparing to announce eight new supporters for its Enterprise Management Architecture network management platform — including Microsoft and Apple — but could not quite get the act together in time for Decworld '90, which begins this week. One star that might actually make curtain time this week is DEC's announcement of support for Microsoft OS/2 LAN Manager servers under its highly strategic Network Application Support (NAS) architecture. This would actually allow other vendors' LAN Manager-based systems to share the limelight with VAX VMS as NAS servers — amazing, if true.

Equal file access

IBM is working on a voice-output version of its OS/2 Presentation Manager graphical user interface that can be used by visually impaired people. The work, under way at IBM's Yorktown Heights research center and at its Boca Raton, Fla., PC product center, is expected to result in a beta-test version by year's end. Computer users at the American Council of the Blind convention in Denver last week were angry that IBM's new graphical user interface strategy leaves them stranded. Most special computer equipment for blind users, including voice-output software, is adapted for use only with DOS. "We need to make sure that as this windowed environment starts to take over, we have access for our blind people," said ACB President LeRoy Saunders.

All the suits emanating from those spreadsheet funsters in Cambridge, Mass., have tickled the fancy of Forrester Research analysts. When we caught up with Forrester's William Bluestein last week, he was busy pondering the possibility that Lotus will next sue Novell Chairman Ray Noorda for making Lotus look and feel bad. We can't help wondering if Lotus' next target will be all the PC game companies that build a fake spreadsheet screen into their products for surreptitious use at the office. We plan to pursue an in-depth product evaluation. Call News Editor Peter Bartolik by phone (800) 343-6474, fax (508) 875-8931 or E-mail (MCI Mail: COMPUTERWORLD) if you learn of Lotus' next target.

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COMPUTERWORLD

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Sears smooths EDI path, requiring 5,000 suppliers to do business electronically and offering software and training to make it easier. Page 132.

IBM and Diebold agree to combine bank ATM efforts. Page 4.

Hold everything: Stardent starts to unravel as Ardent partner charges that Japanese group forced unfavorable merger with Stellar. Page 132.

Users may lose whether Lotus wins in court or not. Page 8.

Lower-priced AS/400s — at least one of which will run the System/36 operating system in native mode — are among the sweeteners IBM is planning to bolster AS/400 migration. Page 27.

Robert Tinker's vision of children as scientists who are able to tackle real-world problems earns accolade for its contributions to science. Page 18.

Weather system storm brews

Promise of high-tech radar station clouded by pressure from critics

BY JIM NASH
CW STAFF

It started as a low, bass rumble and grew to a shaking roar. That noise, made by an approaching wall of water, was the only warning anyone in Shadyside, Ohio, received before last month's flash flood.

The principle behind how noise changes when its source — in this case, the flood — approaches the listener is called the Doppler effect. That same principle has been used for years in research radar stations to dissect storms and gauge their power. Analyzed by powerful mainframes, traces of the effect may eventually offer people 30 minutes' warning of danger with a 90% accuracy rate.

Later this summer, the U.S. government plans to power up its first operational Doppler-based radar station. The Twin Lakes, Okla., installation will be the first of 175 facilities worldwide that will steal secrets from nature. Unisys Defense Systems was named the prime contractor in 1987 for the $420 million task of marrying Doppler radar with 32-bit multiprocessor computers running at a speedy 33 million instructions per second.

However, WSR-88D — which stands for "weather surveillance radar-1988, Doppler" — would be utterly useless at detecting the storm of controversy surrounding it. Critics of the program have attacked it from all sides, offering the following complaints:

- Meteorologists said they doubt government claims that Doppler radar has a 230-km range. Some cited a recent

Continued on page 131

Defense giant pulls Profs plug

BY JEAN S. BOZMAN
CW STAFF

LONG BEACH, Calif. — Someone decided to turn off Douglas Aircraft Co.'s IBM Profs mainframe electronic mail system early last Thursday morning as an austerity measure — and employees at the besieged $4.7 billion subsidiary of McDonnell Douglas Corp. are hopping mad.

"We're stepping back seven years," said one employee at the parent company's headquarters in St. Louis. "We simply don't have the secretarial and clerical people to support us. We rely on Profs as a tool."

Profs, or Professional Office System, is being shut down as part of an cost-cutting plan that seeks to save $700 million for the $14.5 billion McDonnell Douglas by January 1991. Douglas Aircraft's Profs system linked 22,000 of the subsidiary's 47,000 employees. "Seven hundred million is a very big number," Douglas Aircraft spokesman Don Hanson said. "You've

Continued on page 14

Outsource deal bulls through Merrill Lynch telecom group

BY ELISABETH HORWITT
CW STAFF

NEW YORK — One year after signing a $150 million network outsourcing contract with MCI Communications Corp., Merrill Lynch & Co. is reporting smooth network operations, good relations with its carrier and significant cost savings. However, the investment giant has achieved all this at the cost of dismantling its telecommunications department.

Many key networking executives, including former director of telecommunications Robert Niebanck, have departed. While some of the losses were deliberate downsizing measures, a significant number of vital managers left because they felt the outsourcing arrangement gave them little or no future at the company.

During the past year, Merrill Lynch has been involved in a struggle to balance conflicting network priorities. It has tried to cut costs without sacrificing network service quality and cut staff without losing too many key people. At the crux of this balancing act is the question of how much of its network operations the investment company can safely farm out to vendors and how much must remain in-house, sources within the company said.

By deciding not to go through with a $50 million contract to outsource all of its network management operations to MCI and IBM, Merrill Lynch lost the chance to downsize its networking organization by transferring about 50 staff members to MCI and IBM and retaining only 20.

Continued on page 4

Is there a place for Sun in 'open' DEC?

BY MARYFRAN JOHNSON
CW STAFF

BOSTON — Digital Equipment Corp. opened the Decworld '90 show last week with a siren song of open "plug-and-play" multivendor networks, while also putting a new marketing spin on client/server computing.

Underlying the usual marketing hoopla was a repackaged corporate strategy that stressed the minicomputer's emerging role as a network server to "client" personal computers and workstations. DEC officials also spelled out their plans to pull a variety of competing computer systems under their own "open" network architecture umbrella.

Yet there is a catch for Unix-based users: The umbrella will comply with standards blessed by the Open Software Foundation in Cambridge, Mass., a group that counts DEC, IBM and Hewlett-Packard Co. among its weightiest members.

Notably absent is the No. 1 workstation vendor, Sun Microsystems, Inc., which has systems in place at a large percentage of VAX sites nationwide. Can DEC establish a truly open, multivendor network that excludes Sun workstations?

Users working on both DEC and Sun systems — as well as company officials on both sides — vehemently insist that this will not happen.

"DEC and Sun are already supporting a number of the same standards," said Kevin Oberman, network manager of the engineering department at

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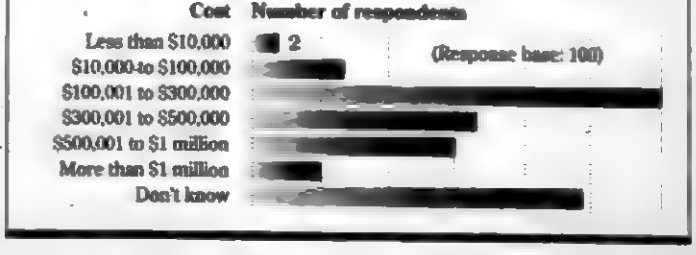
Most users say it cost $100,000 to $300,000 to get their commercial executive information system packages up and running – while many consultants say it should cost $300,000 to $500,000 or more

For product ratings, see Buyers' Scorecard, page 88



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ATTORNEY

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95 From Miami to Moscow, **software copyright issues** take center stage. By Anthony Clapes and Lawrence Savell.

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Viral notes on this Monday after Friday the 13th: About 13% of Japanese organizations polled recently said they've been afflicted with viruses. Also, 92% of those 13% said the bugs had hit Macintosh systems . . . A Japanese ministry chose last Friday to hold its first workshop on virus prevention. The ministry's goal is to develop hacker-resistant programs . . . Netware Users International last week found a Jerusalem B computer virus in one Netware site. The virus entered through a non-Novell DOS program and was designed to delete programs last Friday. Look on the bright side: The next Friday the 13th isn't until September 1991.

How much systems support do telecommuters receive? Telecommuters and IS managers say it ranges from a ton to some to none. Page 43.

Scrutinizing the U.S.' and Soviet Union's software copyright approaches. Page 95.

EXECUTIVE BRIEFING

■ **Outsourcing is not for the faint of heart,** judging from Merrill Lynch's experience. One year after the financial services firm farmed out most of its telecommunications operation, officials say cost savings have been on target — but a lot of good people have left, and the company is fighting an ongoing battle to avoid handing too much control to the contractor. **Page 1.**

■ **Every vendor wants a piece of the EIS market,** and that poses problems for IS managers. With everything from 4GLs to graphical interfaces being hawked as executive support tools, implementors need to ask questions about how much use the system will get, how much they want to spend and what impact they expect on the business. You can build it yourself, slap a front end on a database or spend $100,000 for a custom package, with pros and cons to each approach. The two largest selling EIS packages get high satisfaction ratings from their customers. **Stories begin page 79.**

■ **CIOs are finding themselves** in positions of unaccustomed influence, according to an Input, Inc. report. A survey found that top issues for CIOs in the future will be integrating business and technology; education and communication; and supporting business goals. **Page 67.**

■ **Mitch Kapor and others** vow to protect computer users from violation of their constitutional rights but back away from calling their newly christened Electronic Frontier Foundation a "hacker defense fund." **Page 6.**

■ **The government is dissuading vendors** from developing better security systems by not letting them sell those products abroad, industry leaders say. Officials at some major vendors are urging the government to ease its restrictions. **Page 7.**

■ **Douglas Aircraft Co. pulls the plug** on its Profs system, leaving 22,000 employees without their accustomed E-mail. A drive for cost savings is cited as the reason, but some employees say the move is penny-wise and pound-foolish. **Page 1.**

■ **Goal Systems admits** that its Runtrac product infringes on Computer Associates copyrights and promises to move users smoothly to a clean version. **Page 8.**

■ **DEC stresses peaceful coexistence** with other vendors as Decworld '90 opens. It's also increasingly pushing the VAX as a network server. But openness may not be so simple for some Unix users, particularly if they have Sun equipment. **Page 1.**

■ **IBM leaves the ATM business — sort of.** It sells its ATM products and service business to onetime competitor Diebold, Inc. but also enters into a joint venture with Diebold to develop new banking products. **Page 4.**

■ **IBM and 3Com** will develop a scheme for managing central devices on mixed Token-Ring and Ethernet networks. Users say the standard is needed, but the effort may lack some key vendor support. **Page 8.**

■ **Sears serves notice** that EDI will be a requirement for doing business for its 5,000 suppliers. Partners praise the firm's even-handedness in issuing the mandate. **Page 132.**

■ **On-site this week:** Harcourt Brace Jovanovich enlists CASE tools to build a bread-and-butter mainframe application from scratch. **Page 34.** It's IS on the run for those who are setting up systems for the Goodwill Games, expecting to tear them down two weeks later. **Page 31.** LaQuinta Motor Inns managers are sleeping easier since they scrapped proprietary minicomputers in favor of Unix-based PCs. **Page 45.** CBS hopes T1 plans will save it from the embarrassment of no-coop television. **Page 53.**

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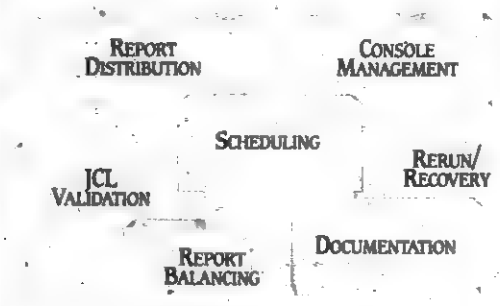

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IBM, Diebold strike ATM deal

BY ELLIS BOOKER
CW STAFF

IBM deposited some cash last week in a joint venture to develop future "self-service banking systems" for the world market while withdrawing from the maintenance side of the automated teller machine (ATM) business.

IBM said it would sell certain portions of its National Service Division, including existing ATM service agreements and service parts, to ATM vendor Diebold, Inc., which will take over support of IBM's installed base in the U.S.

At the same time, IBM and Canton, Ohio-based Diebold signed an agreement to form a joint-venture firm. The new firm, of which Diebold will be the majority owner, will market both lines of ATMs. But the "principal function" of the firm, the firms said, will be to develop new ATM products. These will include applications systems and hardware for ATMs, as well as information stations that let customers access their accounts.

Terms of the two agreements were not disclosed. However, analysts placed IBM, a player in the ATM market for two decades, third behind market leader NCR Corp. and Diebold, adding that IBM's systems had not sold well.

"ATMs are a drop in the bucket. They don't mean anything to [IBM]," said Spensor Nilson, publisher of *Nilson Report*, a trade publication in Santa Monica, Calif. Nilson ranked NCR as the top vendor in the field, selling 15,800 units worldwide last year. He said that in 1989, Diebold sold 7,301 units, while IBM sold 2,955. ATMs have an average cost of about $30,000 each, he said.

According to a Diebold spokeswoman, the company had 12% of all ATM shipments internationally and 39% of all U.S. shipments last year.

For U.S. sales, Diebold and the joint venture company will market the combined IBM/Diebold product line. Internationally, IBM will market the systems.

Diebold, which will pick up assets of IBM's National Service Division as well as ATM maintenance agreements and parts inventories, said the transaction will increase its customer service revenue by 10%.

Diebold President and Chief Operating Officer Robert P. Barone was named chief executive officer of the new company, which will also be based in Canton. The partner companies said they expect the transaction to be completed in the second half of 1990.

Merrill

FROM PAGE 1

However, the firm has effectively outsourced the responsibilities of its telecommunications division to MCI under a $150 million contract signed a year ago, according to Niebanck: "They don't have a telecom division per se anymore." Niebanck founded the division eight years ago and was let go by Merrill Lynch last March as part of a downsizing effort that has so far done away with close to 8,000 positions at the investment firm, he said.

Two reasons to leave

Merrill Lynch backed away from the outsourcing contract for two major reasons, according to Thomas Byrnes, vice-president of telecommunications services. First, the firm could not come to terms with the vendors about ways to ensure that its network would run reliably. Second, it wanted to stanch the flow of communications people who "did not bother to wait around to see" whether they would be axed or asked to join a vendor team, he added.

Since then, Merrill Lynch has been working toward what may be described as a modified outsourcing arrangement with MCI, which puts network operations in the carrier's hands but allows an internal Merrill Lynch network management organization to look over MCI's shoulders.

Merrill Lynch created that group in the past few months by combining the data networking part of the former telecommunications division with its data center organization.

The group is responsible for managing Merrill Lynch's IBM Systems Network Architecture network and helping MCI to weigh business and application priorities as it manages the physical side, according to Leonard Accardo, group manager of information processing.

"Every communication line is not equal" in terms of the importance of keeping it up and running, Accardo said. "If a line to a stock exchange goes down, no one does business on that particular exchange, while if a branch line goes down, that's obviously not as critical."

Last week, top Merrill Lynch systems and communications executives met with MCI to discuss "where to go from here," now that the two companies had finished a one-year project of converting some 500 Merrill Lynch sites to MCI's network.

According to Accardo, DuWayne Peterson, Merrill Lynch's executive vice-president of operations/systems and telecommunications, "made it clear that we've saved a lot of money over the past couple of years, and now our primary efforts have to be toward quality" issues such as improvement of network response time and availability levels.

Merrill Lynch spokesmen expressed their satisfaction at the meeting with the way MCI has filled the firm's networking needs so far.

The question is whether Merrill Lynch still has enough high-quality network management personnel on board to retain some control of its networking future or whether MCI will assume almost total domination.

Merrill Lynch may have lost more of its key networking personnel than it can afford through a combination of its own downsizing efforts and the outsourcing uproar, Niebanck said.

"The four or five people that were key to the telecommunications organization have left," including William Gaze, the original designer of the investment firm's private network, he added. "I think that he will be missed."

Bearish on telecom

Merrill Lynch's reorganization has sharply cut its telecommunications division, concentrating its attention on data networking

Bruce Turkstra
Senior VP, global IS

Thomas Byrnes
VP of telecom services (voice, branch networking)

Howard Sorgen
First VP, director of information processing and technical services

Leonard Accardo
Group manager of information processing

Bruce Sieben
Group manager of systems services

CW Chart: Marie Haines

GTE to tighten telecom grip with Contel buyout

BY ELLIS BOOKER
CW STAFF

GTE Corp. last week said it had reached a preliminary agreement with Atlanta-based Contel Corp. to acquire the company in a stock trade worth about $6 billion at current prices.

If GTE, based in Stamford, Conn., succeeds in obtaining regulatory approval for the purchase, the combined firm would be the nation's fifth-largest phone company and would have the second-largest cellular telephone network.

According to a GTE spokesman, the firm hopes for a definitive agreement within a few weeks and final completion of the deal by year's end. The Federal Communications Commission, as well as the individual state public regulatory commissions, must rule on the merger.

Contel and GTE "are taking a cue from the regional Bells' centralization and streamlining," said Harvey Popell, a principal at Broadview Associates, an information technology mergers and acquisitions firm in Fort Lee, N.J. This deal "should make other telephone companies examine their portfolios and decide whether they should be buying [their competitors] or maybe divesting," he added.

The synergy between GTE's and Contel's cellular operations was an clear attraction of the deal, analysts said. In April, GTE agreed to acquire the cellular phone operations of the Providence Journal Co. for $710 million. Earlier this year, McCaw made a major cellular purchase, buying controlling interest in Lin Broadcasting Corp. for $3.4 billion.

GTE, which has phone operations in 46 states and a major lighting business, posted net earnings of $1.4 billion on sales of $17.42 billion last year. Contel netted $277 million on $3.1 billion in revenues last year.

Both firms also supply units that provide telecommunications equipment to businesses, satellite communications services and cable television enterprises.

If the deal goes through, Contel Chairman Charles Wohlsetter, 80, and Vice-Chairman John L. Segall will reportedly become vice-chairmen of GTE and members of the board.

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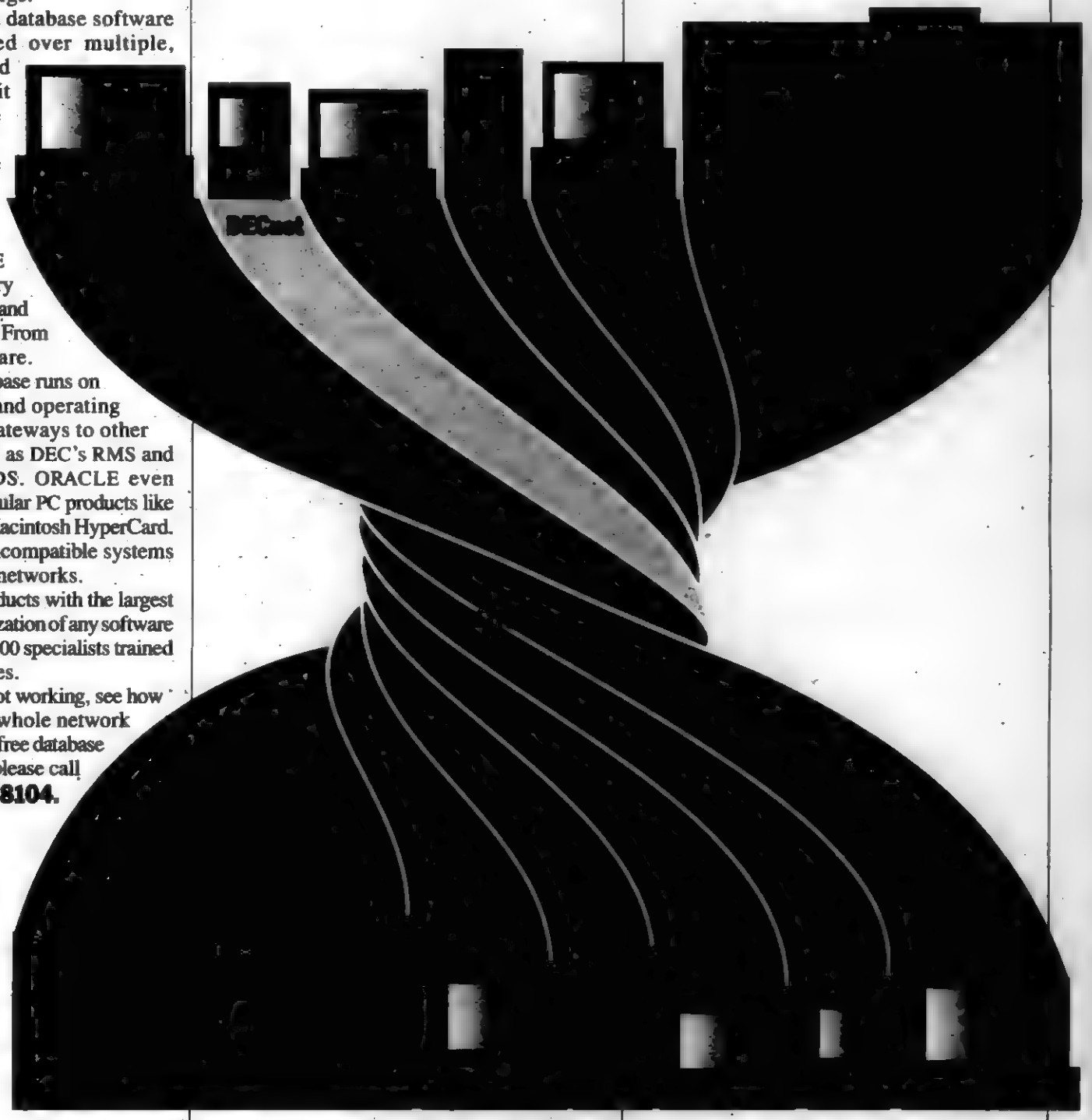

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NEWS SHORTS

Hypercard developer leaves Apple

The exit door continued to swing at Apple Computer, Inc. last week as Bill Atkinson, who developed the popular Hypercard program and ranked as one of the company's leading scientists, announced that he is departing to create a new company with two other former Apple staffers. Atkinson teamed up with Andy Hertzfeld, one of the architects of the operating system for Apple's first Macintosh computer, and former Apple engineer Mark Porat to form Grand Magic, Inc., which is located in Mountain View, Calif. Hertzfeld cryptically described the company's future offering as a personal intelligent communicator, but he has said in the past that he was working on a Macintosh-like windows-and-icons interface to be used on a television.

Semiconductor bookings slip

The semiconductor book-to-bill ratio, one of the most closely watched indicators of the health of the chip industry, dipped from 1.14 points in May to 1.06 in June, the Semiconductor Industry Association said last week. The figure means that for every $100 worth of products chip makers ship, they received $106 in new orders. The June figure, however, is an improvement over the June 1989 figure of 0.90. Analysts said they were not worried about the slip because the unusually high ratio for May was unsustainable.

Graphics workstation war grows

Evans & Sutherland Computer Corp. threw another curve in the hotly contested graphics systems market last week when it announced a high-performance graphics workstation for less than $30,000. The ESV3 reduced instruction set computing-based system will compete for turf in the rapidly expanding market with companies such as Silicon Graphics, Inc. and Stardent Computer, Inc. The Unix machine is priced at $29,900 and is available immediately. The Salt Lake City-based firm is most widely known for its computer graphics applications, including sophisticated flight simulators.

FCC to forge ahead on ONA

Federal Communications Commission Chairman Alfred Sykes said last week that the agency will press on with its plans to foster the development of open network architecture (ONA). The move comes despite a recent decision by a federal appeals court that appeared to reject a 1986 FCC ruling giving the Bell telephone companies freedom to offer enhanced information services such as electronic mail and database services. "I don't see a departure from the course we've been on, [and] ONA development should not be significantly slowed," he said. According to Sykes, the FCC is scheduled to begin a new look at the matter in the fall.

Athena bears commercial fruit

Digital Equipment Corp. announced last week the commercial availability of products and integration services based on Athena, a joint IBM-DEC project to develop distributed desktop management services for MIT. The Athena offerings provide security, systems management and "easy resource access" across a distributed network of multivendor Unix workstations, a DEC spokesman said. The vendor will initially target the academic community but also sees the business sector as a likely market, the spokesman added.

AT&T to digest Western Union unit

To accommodate its recent $180 million purchase of most of Western Union's Business Services unit, AT&T has appointed Gordon Bridge, former AT&T Computer Systems co-president, to head what the telecommunications giant is currently calling the AT&T Global Messaging unit. As president of the new business unit, Bridge will report to Vic Pelson, group executive for AT&T core businesses. Richard McGinn will become the sole president of AT&T Computer Systems, reporting to Robert M. Kavner, group executive of AT&T's Data Systems Group.

Kapor group lines up for rights fight

BY MICHAEL ALEXANDER
CW STAFF

WASHINGTON, D.C. — A pack of peacemakers ambled into town last week with money on their hips and a resolve to lay down the law on the computer frontier.

At a press conference, Mitch Kapor, founder of Lotus Development Corp. and On Technology, Inc., announced that he and John Barlow, a song lyricist and ex-cattle rancher, had created the Electronic Frontier Foundation (EFF) to fund legal efforts to apply First Amendment protection to computer and communications media. The group plans to encourage development of software that makes it easier to use computer networks, among other activities.

Mitch Kapor, *co-founder of EFF*

"We want to help civilize the electronic frontier" — the gap that now exists between society and technology, Kapor said. The foundation will be based in Cambridge, Mass.

The group's founders were quick to say that EFF does not condone unauthorized entry by hackers into computer systems and would not defend hackers accused of such crimes. It will not be a "hacker defense fund," Kapor said.

Kapor added that he, Steve Wozniak, co-founder of Apple Computer, Inc., and a "Silicon Valley high-tech pioneer who wishes to remain anonymous" had each made a "six-figure initial commitment to the foundation."

Among the foundation's first acts was to award a $275,000 grant to Computer Professionals for Social Responsibility, based in Palo Alto, Calif. The funds will be used to host a series of policy roundtables during the next two years with lawmakers, computer users (including hackers), law enforcement officials and others.

EFF is already paying legal fees to Boston and New York law firms providing legal assistance to Steve Jackson, founder of Steve Jackson Games in Austin, Texas, and Craig Neidorf, a 20-year-old electronic newsletter publisher.

In March, the U.S. Secret Service raided Steve Jackson Games and the home of an employee and seized computers that it said contained a "handbook on computer crime," Jackson said. The handbook was in fact a game, published in the form of a handbook, called Cyberpunk, Jackson said. Neither Jackson nor the employee were charged with any crimes, but the government held onto his computers for nearly four months, according to Jackson.

Steve Wozniak *contributes funds*

One of the seized computers was used for an electronic bulletin board and "one of the things we're very interested in is the U.S. Secret Service's interest in electronic bulletin boards," Boston attorney Harvey Silverglate said. "If you go in and take the equipment that runs one of these, it is the equivalent of going in and seizing the presses at *The New York Times*." This prior restraint of publication is a certain violation of the First Amendment, he said.

The foundation also plans to seek "friend of the court" status for Craig Neidorf, a University of Missouri student and co-publisher of "Phrack," an electronic newsletter for hackers. Neidorf has been indicted for his alleged participation in a scheme to steal documentation for an enhanced 911 emergency system from Bellsouth Corp.

Crime doesn't pay — hackers do

Three hackers pleaded guilty last week to their participation in a scheme to steal documentation for an enhanced 911 emergency telephone system from Bellsouth Corp.

The three are members of the Legion of Doom, a group of hackers that has been involved in numerous computer-related crimes, federal prosecutors in Atlanta and Chicago said.

In Chicago, Robert J. Riggs, 21, pleaded guilty to interstate transportation of stolen property and wire fraud charges. He faces up to 15 years in prison and fines of up to $500,000.

Riggs, along with Adam E. Grant, 22, of Atlanta and Franklin E. Darden, 24, of Norcross, Ga., was also indicted in Atlanta last February for conspiracy to commit computer fraud, wire fraud, access-code fraud and interstate transportation of stolen property. Riggs and Darden each pleaded guilty to one count of conspiring to commit computer fraud. Both face a maximum penalty of five years in jail and a $250,000 fine. Grant pleaded guilty to having 15 or more Bellsouth access codes with the intent to defraud.

Sentencing has been set for Sept. 14. "That is when the fireworks will start," said Kent Alexander, assistant U.S. attorney in Atlanta. "There is a distinct possibility that this may be one of the first instances of a hacker [Riggs] going to jail."

In an indictment last February, federal authorities alleged that in September 1988, Riggs and Craig Neidorf, an electronic newsletter publisher, began a scheme to steal documentation to an enhanced 911 system from Bellsouth. Riggs downloaded the text file in December 1988 and posted it on a computer bulletin board in Lockport, Ill., the indictment said.

Neidorf allegedly retrieved the 911 program from the Lockport bulletin board service, edited the document and reposted it on the bulletin board for Riggs to review.

Neidorf has admitted to publishing an edited version of 911 documentation along with information on how to alter telephone switching software so that calls are put into an endless loop. He pleaded not guilty to the charges and is currently set to go to trial next week. Neidorf contends that he was not aware that the 911 documentation had been stolen, said Sheldon Zenner, his attorney. "There is only one guy here who has not broken into anything, and that is Craig Neidorf."

However, government documents asserted that Neidorf was involved in the scheme from the outset. According to the plea agreement between Riggs and federal authorities, Riggs contacted Neidorf and told him that he was transferring a text file stolen from Bellsouth. Also, in an affidavit for a search warrant, a U.S. Secret Service agent alleged that Neidorf admitted to knowing that the 911 documentation was stolen. His edited version of the Bellsouth 911 documentation contained a Bellsouth notice forbidding disclosure of the text file's contents, the agent added. Riggs is expected to testify for the prosecution.

MICHAEL ALEXANDER

National security thwarts business

Rules and squabbles stifle commercial security products

BY GARY H. ANTHES
CW STAFF

U.S. government concerns about national security are ironically inhibiting the development of computer security technology, leaving commercial systems in the U.S. dangerously and unnecessarily exposed, industry officials said.

Some 20 years of research have given the U.S. a commanding lead in methods for safeguarding computer systems, said Stephen T. Walker, president of Trusted Information Systems, Inc. (TIS). "But confusing government policies are squandering that lead," he said.

Since the government will not allow export of products with the most stringent security features, companies are reluctant to develop them, Walker said. "They say, 'If I can't export it, I won't build it.'"

According to Walker, Digital Equipment Corp. abandoned an important project earlier this year to develop a computer able to support multiple operating systems, each running at a different level of security. Development was well under way — some six beta-test sites were established — when DEC threw in the towel, in part over worries about the difficulty of getting the product out of the U.S., he said. "We decided not to bring it to market," confirmed Steven Lipner, manager of the secure products group at DEC. "Getting licenses for field test sites overseas was difficult. Our experience was that the review process [for government licenses] took an indeterminate amount of time."

Loosening the reins

Officials at DEC, IBM, Oracle Systems Corp. and TIS are urging the government to relax its reins on the export of state-of-the-art secure systems. In a joint letter to the National Institute of Standards and Technology (NIST) — with which the National Security Agency (NSA) is directed by law to develop standards for computer security — the officials said, "It is our discouraging conclusion that whatever level of trust is selected for application of export control measures, this policy will establish a boundary that [commercial systems] will never exceed." U.S. vendors will not bear the cost of developing separate product lines for domestic and overseas markets, they said.

Stephen Kent, chief scientist at BBN Communications, Inc., said the export issue may be based in part on a misunderstanding of the NSA's policy. Kent said a panel of the National Academy of Sciences, on which he serves, was recently assured by an NSA official that the agency had never blocked export of a computer system because of its level of trust or safety features in its operating system. "They assured us this wasn't a problem. They don't have a cutoff level for export," he said.

However, the agency does sometimes oppose an export if it also includes sensitive software tools used to develop and test the system, Kent said.

NSA and NIST are also under fire for lack of progress in developing a federal standard for public-key cryptography, an increasingly popular approach for safeguarding data transmissions.

An emerging de facto standard is embodied in the software products of RSA Data Security, Inc. But the algorithm for public-key cryptography used by RSA is so foolproof that NSA fears that it may hamper its own intelligence-gathering efforts, industry sources said.

"NSA is not in favor of anything in crypto. Everything is being stopped by NSA," said Walker, an ex-NSA employee and author of its criteria for evaluating trusted computer systems.

Although neither agency will officially acknowledge it, governmental and business sources cited a long-simmering territorial dispute between NSA, whose primary concern is secure communication of classified information through encryption, and NIST, which is more interested in application and operating system controls to protect sensitive but unclassified data in computers.

While the agencies squabble over the pending standards, many commercial organizations are going their own way to develop security features for electronic data interchange, electronic funds transfer, electronic mail and secure telephones.

However, many companies are reluctant to embrace any kind of encryption scheme until one is officially blessed by Uncle Sam. James Bidzos, president of RSA Data Security, said banks are among the organizations needing the technology most, but some fear use of a nonstandard method may invalidate their insurance policies. Others are reluctant to use something unless it has been endorsed by an official body. The communications networks and computer systems of many banks are at risk as a result, he said.

Asked about the NIST/NSA relationship, Stuart W. Katzke, chief of the computer security division at NIST, said, "Conflict is too strong a word. It's a matter of reconciling two different concerns." Katzke said NIST will publish the first of four standards for public-key cryptography this fall, some eight years after first proposing to do so. The standard will deal with digital signatures for message authentication, he said.

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IBM signs on to LAN mix plan

BY PATRICIA KEEFE
CW STAFF

NEW YORK — IBM and 3Com Corp. announced last week they have teamed up to develop a set of network management specifications that will manage devices on mixed Token-Ring and Ethernet networks while conserving memory in desktop environments.

A final draft should be available by the fourth quarter, although commercial products incorporating the specification will not be forthcoming until late 1991, according to IBM.

Applications written to this specification, dubbed the Heterogeneous LAN Management (HLM) architecture, will reportedly enable local-area network managers to simultaneously control, monitor and analyze network information on interconnected Ethernet and Token-Ring networks with one tool. This is not possible today in an open systems environment, users contacted last week said.

Mixed LAN plan

IBM and 3Com plan to ease management of proliferating devices attached to Ethernet and Token-Ring networks

	Ethernet	Token-Ring
Personal computers	4,200,000	2,200,000
Technical workstations	600,000	less than 10,000
Mainframes/Minicomputers	350,000	10,000
Bridges/Routers	30,000	10,000

Number of nodes

Source: International Data Corp. CW Chart: Marie Haines

Many user sites, particularly in the transportation, utility and education sectors, have separate installations of both networks, but the trend is to link them up, according to International Data Corp., market researchers in Framingham, Mass. A survey of 24,000 contacts at 12,046 sites revealed that 19% have both network types installed.

The Burlington Coat Factory in Lebanon, N.H., uses only Ethernet, in part because of interoperability issues, MIS manager Michael Prince said. "A reason why we might shy away from installing Token-Ring would be the network management issue and the extent to which both LANs could be centrally managed from one facility," he said.

That is the situation at Aion Corp., a software developer in Palo Alto, Calif., running an Ethernet shop. Network manager Rick Reed said the lack of interoperability and cross-management has stopped Aion from picking up Token-Ring, even though he expects he will need one to simulate his customer's heterogeneous environments for software development purposes.

Both Aion and the North American Banking Group at Citicorp use bridges and routers to connect Ethernet to Token-Ring when necessary, and neither wants to overload its systems with even more software. "I could get excited [about this] if it meant that I could use [one] protocol analysis type of device on either side of my network, regardless of the access method employed," said Brian Illari, an assistant vice-president in charge of LANs at Citicorp. He said he would also require support of IBM's 16M bit/sec. Token-Ring.

3Com's Denend

In addition to the joint development agreement, 3Com and IBM said they will seek support for the completed specifications from various industry standard groups and will welcome input from other industry players.

"Microsoft believes this project will benefit [OS/2] LAN Manager customers and applauds the industry's cooperation," said Bruce Jacobson, a group product manager at Microsoft Corp. However, he did not say whether Microsoft would interject itself into the HLM project.

At press time, Novell, Inc. was still preparing a statement. Novell's Netware network operating system runs over both Ethernet and Token-Ring.

Leslie G. Denend, an executive vice-president at 3Com, conceded that the effort probably cannot succeed without support from Novell, which controls the bulk of the LAN market, and Microsoft, which is pitching OS/2 LAN Manager as the networking standard of the future.

Bureau correspondent Jim Nash contributed to this article.

Users biggest losers in spreadsheet wars

ANALYSIS

BY NELL MARGOLIS
CW STAFF

As industry observers watch the courtroom doors to see which rival spreadsheet vendor Lotus Development Corp. will haul through them next, spreadsheet users appear to be thinking that they have nothing to worry about.

According to lawyers, that may be because users are not thinking, or at least not thinking hard enough.

"I don't care one bit about any of this lawsuit business," said a user of Borland International's Quattro spreadsheet soon after Lotus' legal assault against Borland on the charge that Quattro and a second product, Quattro Pro, infringe on Lotus' copyrighted 1-2-3. The user, one of many Quattro users at Hughes Aircraft Co. in El Segundo, Calif., asked not to be identified.

"We bought Quattro because of the price — it costs one-fourth of what Lotus does — and we're going to keep right on using it unless the courts say, 'You've got to rip it out of your building.' And they're never going to say that," the user said.

Frank Crow, accounting manager at Noramco, Inc., a bulk pharmaceuticals company based in Athens, Ga., and a Quattro user site, was similarly sanguine. "Quattro is a good product and a good buy, too," he said. "I doubt that anything is going to come out of this lawsuit that would make much difference to us."

Lawyers know better than to bet on the outcome of litigation. Last week, however, several noted that regardless of who ultimately wins the series of look-and-feel lawsuits, users stand to lose.

"All of this litigation isn't doing users any good," said Lee Hageishaw, a partner in the San Francisco-based law firm of Hageishaw and Cole. At the end of the day, he and other intellectual property attorneys said, the user community could come out on the short end of what promises to be a lengthening series of costly lawsuits, in several respects.

If Lotus wins — and, at federal court level, it has already cinched one decisive victory [CW, July 2] — it could achieve a virtual monopoly in the spreadsheet market. For users, this would mean less choice in both the software and its price tag.

Lotus' legal assault on Borland, industry observers said last week, puts a possible name and dollar figure to that threat. It also moves the debate to a higher plane, they said. Several of the same commentators who expressed little sympathy for Paperback Software International, Inc., which they dismissed as having tried to profit from a quick and dirty cloning of Lotus 1-2-3, voiced no such scorn for Borland or its products, perceived as high-quality variations on the 1-2-3 theme.

Muddled standards

In addition, a judicial expansion of copyright protection for software rains further confusion on the already unclear movement toward standards in the software arena, according to Ned Saltzberg, a partner at Boston-based Warner & Stackpole who represented Stephenson Software, one of the defendants that Lotus defeated along with Paperback late last month. It is users who have clamored for standards, he said; it is users who will be inconvenienced to the extent that developers feel crushed between the competing interests of satisfying the customers and avoiding lawsuits.

"I've already had several [software developer] clients call to ask, 'What are we supposed to do?' " Hageishaw said.

The lawyers who are bombarded with this question will not be able to give their clients satisfyingly concise replies, said Steven Shaiman, who specializes in intellectual property protection at Philadelphia-based Shaiman & Bosch. "How do you reconcile standards with protected rights? Where do you draw the line between public interest and private interest?" he said.

Moreover, Saltzberg said, although every party in the the recent rash of lawsuits claims that victory for its position would benefit users, users themselves have been strangely absent from the courtroom.

"Users need an advocate [in these cases], and so far, there hasn't been one," he said. "Maybe in the next suit, a user group or organization will file an amicus brief."

Goal concedes copyright infringement

BY JOHANNA AMBROSIO
CW STAFF

COLUMBUS, OHIO — Goal Systems International, Inc. is writing a new version of its Runtrac product, due out within six months, because the company has conceded there is some code in Runtrac that infringes on Computer Associates International, Inc.'s CA-11 package.

Two weeks ago, CA filed a lawsuit alleging copyright infringement against Goal, one of Goal's developers and the developer's former company [CW, July 2]. Since then, Goal has completed its investigation into the matter and fired the developer, Jerry Bennett.

"Our preliminary investigation, which was conducted in cooperation with CA, indicates that there was infringing of code in portions of Runtrac when we acquired it in 1988," said David C. Wetmore, Goal's president and chief executive officer.

Although the legalities are far from settled, it now appears that existing Runtrac customers, which total fewer than 200, will have to swap their current version of Runtrac for the new version. "I believe that's the way it will happen," Wetmore said. The other option is that CA will get a royalty, and in return, existing customers will be allowed to keep their current Runtrac versions.

"It's up to Goal to make sure the new Runtrac is functionally equivalent to the old one and to make sure the transition is an easy one," Wetmore said. "And we will do that." He claimed switching Runtrac products will not be a big deal to customers.

A related Goal product, Jobtrac, "appears free of questionable code," Wetmore said. But the interface from Jobtrac to CA-11 was restructured and is now available to Jobtrac customers. An interface between Jobtrac and Runtrac will be included in the new version of Runtrac.

Now that Goal has conceded that its product does infringe on CA, the issue of damages is left for the two companies to resolve. Talks to settle the lawsuit out of court have broken off, and the two companies are not currently negotiating.

CA's world

- Investors stomp stock after revenue dip talk. Page 132.
- Security conference draws users, new products. Page 10.

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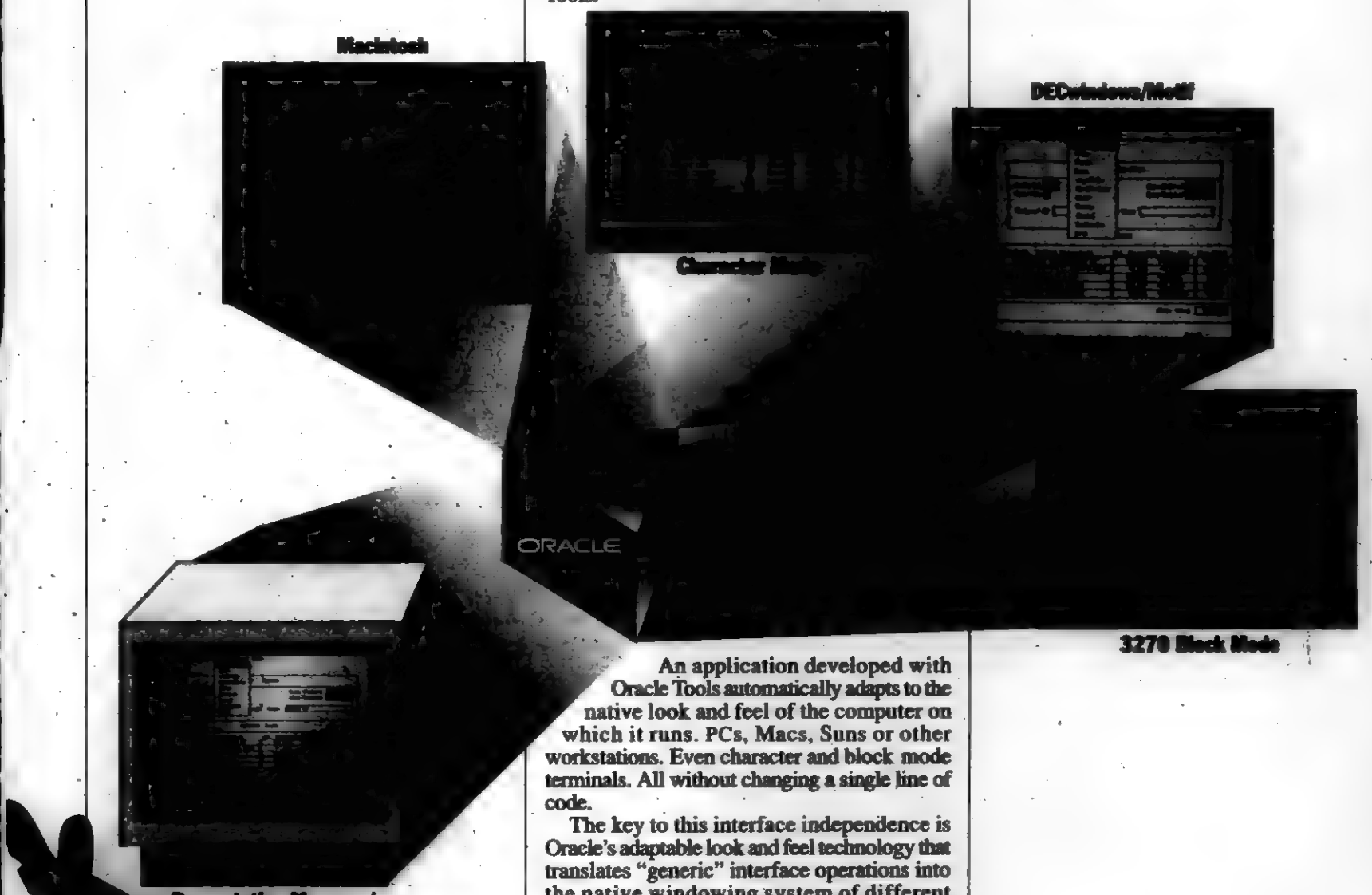

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Security issues get a lock on users' attention

BY JOHANNA AMBROSIO
CW STAFF

ORLANDO, Fla. — It may not be one of the information systems department's favorite jobs, but security is receiving more attention in a growing number of shops. Topping the to-do lists of many users is the need to get a handle on the personal computers and minicomputers that have access to the corporate mainframe.

"There are a lot of holes out there," said Gary Savolainen, technical consultant for data security at Royal Trust in Ontario. "You can't completely control what's coming into the mainframe." He said Royal Trust is attempting to better secure the Application System/400s that connect to its IBM host.

Users spoke about these and related issues at the annual conference for customers of Computer Associates International, Inc.'s security software, held last week in Orlando. CA unveiled new security products at the conference, which attracted some 1,700 people (see story below).

Security is on a lot of minds these days. According to Computer Intelligence in La Jolla, Calif., 47% of the IBM and plug-compatible mainframe base has some kind of security package. That is up from 43% a year ago and 21% in 1985.

"Security is one of the fastest growing mainframe markets," said Jerry Berry, a software industry analyst at Computer Intelligence.

Those users who were willing to be interviewed said their most acute need is in the area of distributed computing. This includes controlling and monitoring information that is uploaded from or downloaded to PCs and minis and administering the security for a network of heterogeneous computers from one place.

As things now stand, users generally have to administer security separately for different computers. For example, when a password is deleted, the administrator has to delete the password from the security program of each computer to which the user was allowed access.

At NCNB Texas National Bank, there are between eight and 10 security packages in the Dallas data center alone. "We want one standard package to control everything," said Glinda Cummings, manager of data security at the bank in Dallas. "But that's blue sky. I hope I live long enough to see it."

Her thoughts were echoed by Richard D. Sinnott, a member of the operations staff at Ciba-Geigy Corp. in Greensboro, N.C.: "Our direction is to get everything onto one security package."

Rohm and Haas Co., a Philadelphia-based chemical manufacturer, is "looking at the issue of PC security," said Barbara A. Glabere, computer security administrator in the firm's computer applications research department. "We're checking into different PC products but haven't made any decisions yet."

Perhaps one measure of how the security industry has grown is that more IS departments are allocating staff members to focus on security issues. At NCNB, for example, the minicomputer security staff comprises six people.

"With all the attention that security breaches have gotten in the press, companies realize the need to devote full-time professionals to this," said Gary Sheehan, senior security specialist at Progressive Corp. in Mayfield, Ohio.

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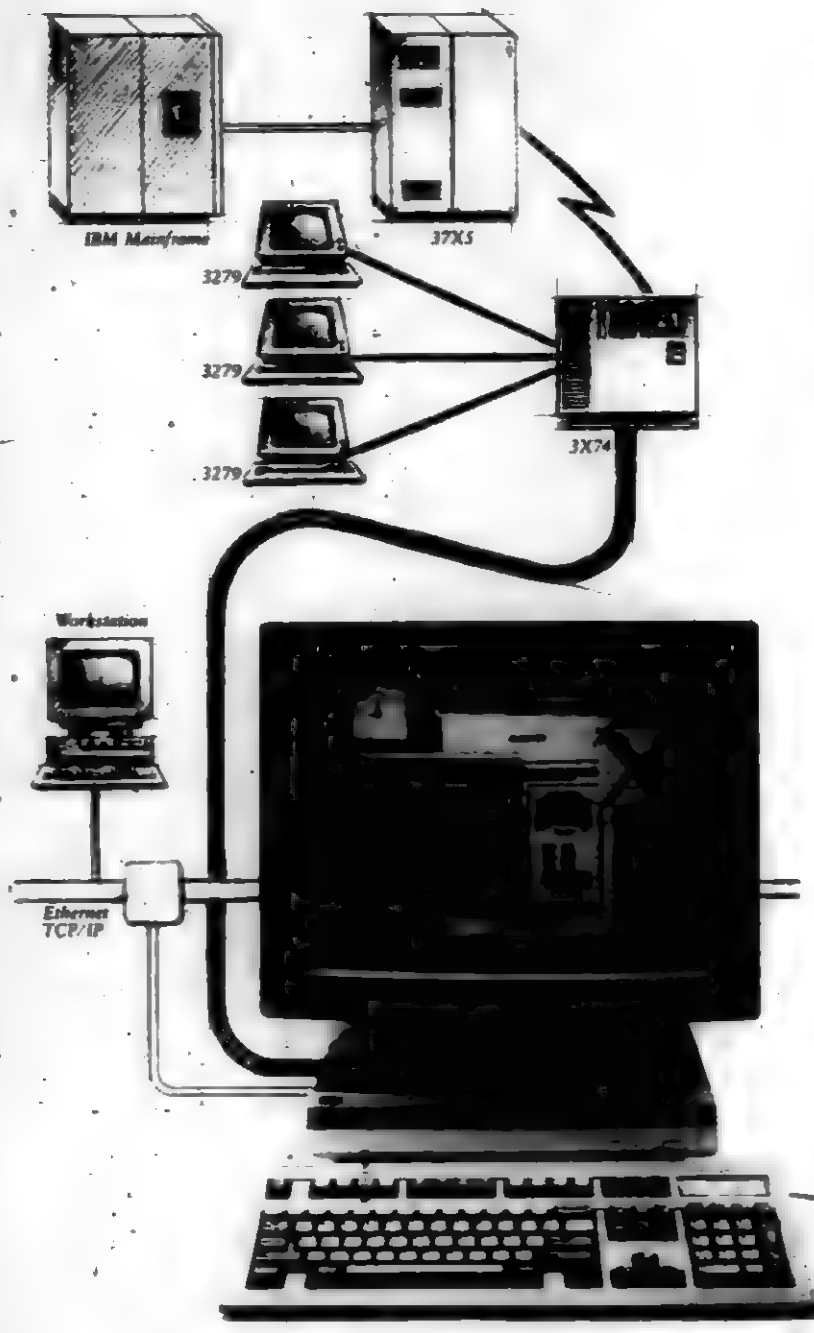

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CA takes the mike

CA took advantage of the user groups convened in Orlando to announce enhancements to its security packages and one new related product. Among the enhancements are virus-control features and the ability to control DB2 security through one of CA's security packages.

Furthermore, Charles B. Wang, CA's chief executive officer, repeated the firm's pledge to keep ACF2 and Top Secret as two separate and supported product lines: "We will not merge them. We want to protect the client's investment."

CA also announced a workstation that provides on-line, interactive Help and documentation for CA's ACF2 security package. The workstation, called the Online Consultant, uses multimedia — text, voice and video stored on compact disc/read-only memory — to teach users about ACF2.

DB2 links from both CA mainframe security packages are available for beta testing. These features will allow the security administrator to control and audit resources and events occurring in DB2 through the rules and procedures in CA's security packages.

The virus-control feature, available in Release 6.0 of IBM's MVS version of CA's ACF2, is said to prevent viruses and similar problems from spreading to data and programs with a high integrity level.

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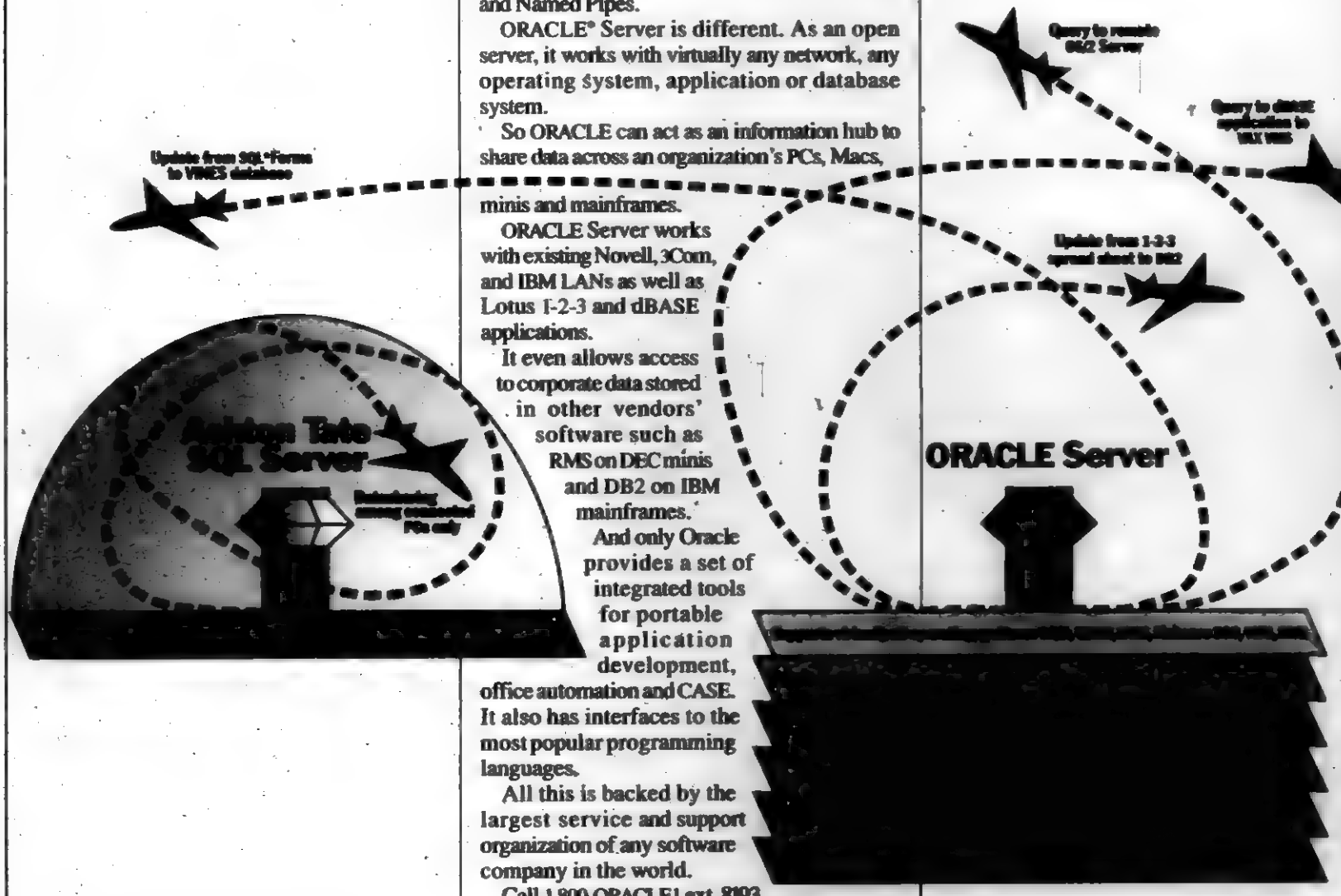

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Cray exec leaves over strategy dispute with CEO

BY ELLIS BOOKER
CW STAFF

MINNEAPOLIS — Cray Research, Inc. President and Chief Operating Officer Marcelo Gumucio, a fixture in the supercomputer maker's management team for the past eight years, resigned unexpectedly last week.

In a letter to employees, Cray Chief Executive Officer John A. Rollwagen said he and Gumucio had disagreed on the execution of the company's long-range strategy. "We attempted to blend our distinct management styles effectively, but we were not successful in that effort," Rollwagen said. Gumucio also resigned from Cray's board of directors.

The resignation surprised industry analysts, who nevertheless agreed that the two top executives brought very different management styles to the job. Rollwagen, described as intuitive and entrepreneurial, promoted a relaxed, collegiate atmosphere at Cray, while Gumucio was more analytical and structured.

Cray's Gumucio *left unexpectedly*

"Marcelo was trying to instill a formal structure and discipline . . . to make Cray more large company-like," said Patricia Laupheimer, a vice-president of research at Shearson Lehman Hutton, Inc. in New York. Although noting this effort may have led to "some ill feeling with employees," Laupheimer credited Gumucio with promoting Cray's push into the low end of the supercomputer market, held by the likes of Convex Computer Corp. in Richardson, Texas.

Cray's stock rose following the announcement of Gumucio's resignation, but Laupheimer said the firm will miss the marketing focus he brought to it.

Gumucio, 52, joined Cray eight years ago as executive vice-president of marketing, taking the title of president and COO in November 1988.

Rollwagen, 49, said he will take on the duties of COO and president "for the foreseeable future." A possible successor, Laupheimer speculated, could be Bob Ewald, now Cray's executive vice-president of software.

Profs

CONTINUED FROM PAGE 1

got to make some serious sacrifices to get there." Further corporate austerity moves are scheduled to be announced today in St. Louis.

But users are puzzled about how the savings will be made, especially if the IBM mainframe running Profs under the VM operating system is not itself shut off. "The only way they're going to save money is by eliminating some hardware or software, not by freeing up capacity on some disk drives," one Douglas Aircraft employee in Southern California said.

In addition to E-mail, Profs supported calendaring and group scheduling of meetings. "We hope this loss is temporary," one longtime Douglas Aircraft employee said. "The people who did this to us see it as a cost-saving measure, but we are trying to tell them it's penny-wise and pound-foolish. They're also laying off people in the mail room. What are they going to do next? Rip out the phone lines and attack all methods of communication?"

"The savings will come primarily in our ability to use that [extra computer] capacity to offset our needs in other application areas," said Rich Nelson, business unit manager for computer operations support at Douglas Aircraft's Automated Systems Center in Long Beach. "It's yet to be seen if we're going to get the results that were intended."

While Profs will no longer be available, the underlying VM/CMS messaging system will be, Nelson noted. Although underutilized, the VM/CMS messaging system could support E-mail services to link Douglas Aircraft's 25-plus buildings scattered throughout Long Beach and the nearby Southern California communities of Torrance and Cypress. If the alternate system were to become widely used, however, the savings in system resources bought with Profs' dismissal could be lost, Nelson said.

Douglas Aircraft is burdened with higher costs linked to launching the new MD-11 commercial jet and enduring a corporate hit as parent McDonnell Douglas faces massive defense cutbacks. "Each component of the company is looking at all their costs, including the costs of electronic messaging," a McDonnell Douglas spokeswoman said.

To save money, Douglas Aircraft announced 3,000 layoffs from its work force of 50,000 in May and centralized three information systems staffs into one in April. McDonnell Douglas still has 131,000 employees worldwide, but more layoffs are expected. Even the McDonnell Douglas computer services division, the Systems Integration Co., has wasted away to a $290 million unit after selling its Tymnet operation and other computer services companies — a far fall from $1.2 billion in the late 1980s.

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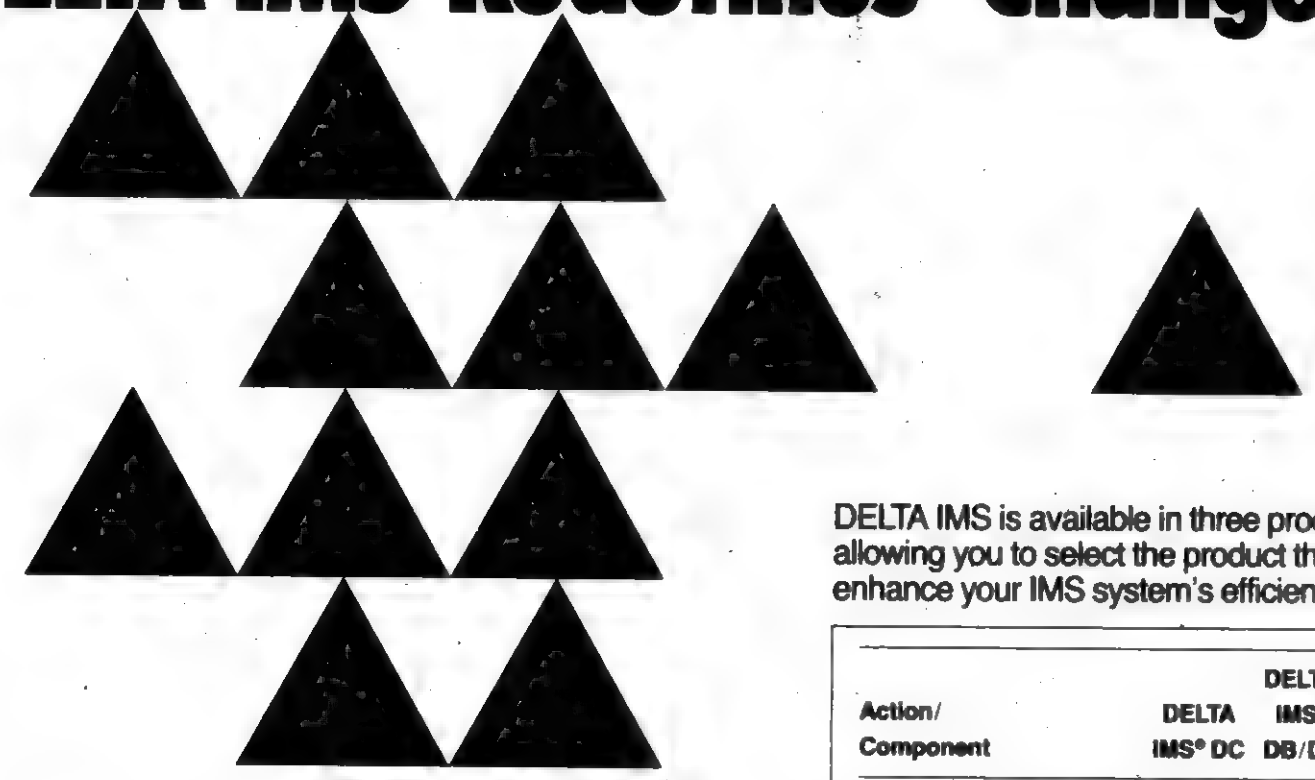

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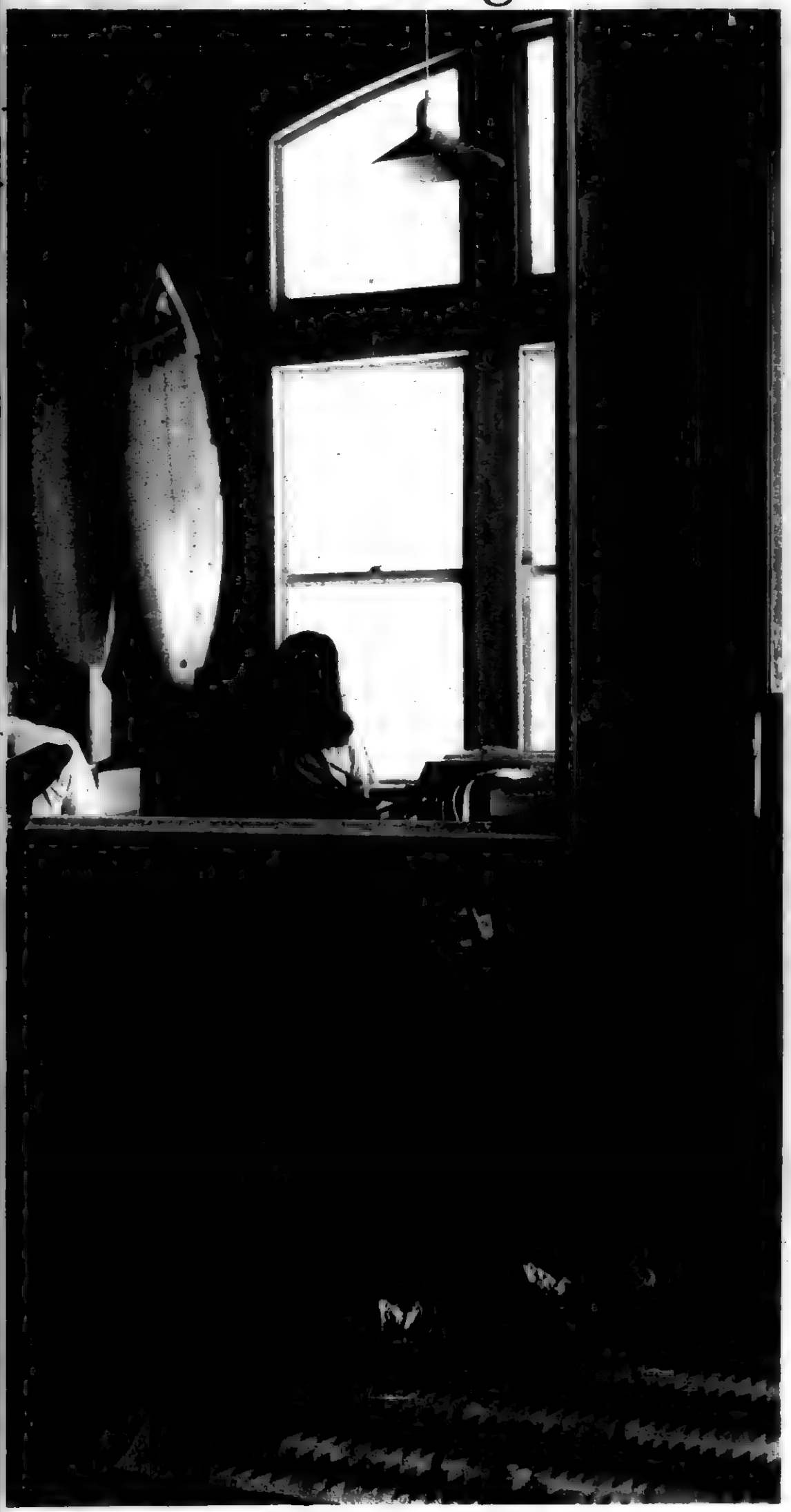

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Leader of young scientists granted Siemens Award

Part of a series of profiles of Computerworld Smithsonian Award *winners.*

BY RICHARD PASTORE
CW STAFF

Scientists in the Soviet Union and Japan who are studying acid rain send their findings via personal computer network to a PC in the U.S. A scientist in the U.S. engaged in the same study calls up his colleagues' data and compares it with his own. Such international cooperation is exciting, but what makes this significant is that the "scientists" are seventh graders.

For his leadership in developing such innovative science education programs, Robert Tinker, chief science officer at the Technical Education Research Center (TERC), received the first *Siemens/Computerworld Smithsonian Award for the Advancement of Science.* The award was presented late last month at a ceremony in Washington, D.C. "Dr. Tinker's vision of children as scientists, tackling real-world problems, makes him the ideal recipient of this award," Siemens Corp. President Hans Decker said.

Tinker has developed several international science networks. Students and teachers in the Global Laboratory, Star Schools and National Geographic Kids Network programs all use networked PCs as their primary data collecting and transmitting tools. TERC's telecommunications programs alone have reached more than 75,000 pupils and 2,500 teachers worldwide.

Despite the technological slant of the Siemens Award, Tinker has not lost sight of the real goal of his efforts — stimulating young people's interest in science. As a result of the programs, "students are becoming more accurate about their assessment of what their role could be, where they could go and what the career paths are," he said.

Tinker *views children as scientists*

TERC, based in Cambridge, Mass., has been promoting such "constructivist" education methods for 25 years. "People learn best by creating their own knowledge in their head instead of having knowledge poured into them," said Tinker, a 48-year-old MIT-trained physicist who has been a full-time TERC leader for the last 12 years. "Technology strongly reinforces this constructivist approach to education — it gives kids more options, more power and more sophistication for what they do."

Among the many other programs using computers and networks is an IBM-sponsored Personal Science Laboratory for high school juniors and seniors. TERC-written software allows students to record gathered scientific and mathematical data into a graphical environment, conduct data analysis and export and import data from Lotus Development Corp.'s 1-2-3 and Microsoft Corp.'s Works spreadsheets.

TERC is also addressing educators with its Microsig special interest group. The Boston-area PC network allows teachers to explore ways to expand computer use by special-needs students.

A staff of eight designs and implements the technological portions of TERC's hands-on education pilot programs. The typical development cycle is two to four years.

"We have kids come in here in the early stages to understand what's going on in their heads," Tinker said. "Then we go out to the school to see [the program] in a dynamic classroom environment."

Much of the nonprofit center's funding comes from the National Science Foundation and the U.S. Department of Education. Computer vendors also lend a hand, including IBM, Digital Equipment Corp. and Apple Computer, Inc.

Once an educational program proves its worth, it is turned over to software vendors for sale to schools. Companies producing and marketing TERC software and materials have included IBM and D.C. Heath & Co.

Tinker and TERC face their own set of problems when dealing with computer vendors and equipment. While businesses' primary concern is PC power and reliability, TERC's needs run more toward affordability and ease of use. Consequently, Tinker is hoping that vendors will develop more low-cost products geared toward novices.

The IBM Personal System/1 introduced last month is a step in the right direction, Tinker said. With its $1,000 price tag, built-in modem and Intel Corp. 80286 power, "the PS/1 could be very important to education," he said.

Citing the Siemens Award as proof, Tinker said private industry is increasingly concerned about fostering and promoting science education "for their own self-interest and long-term viability." Because of deficiencies in science education here, companies such as Siemens "can't get creative or even adequately trained employees to do the work they've already got," he said.

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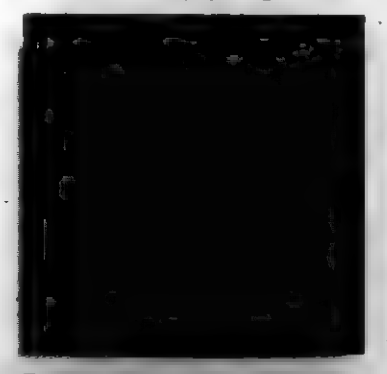

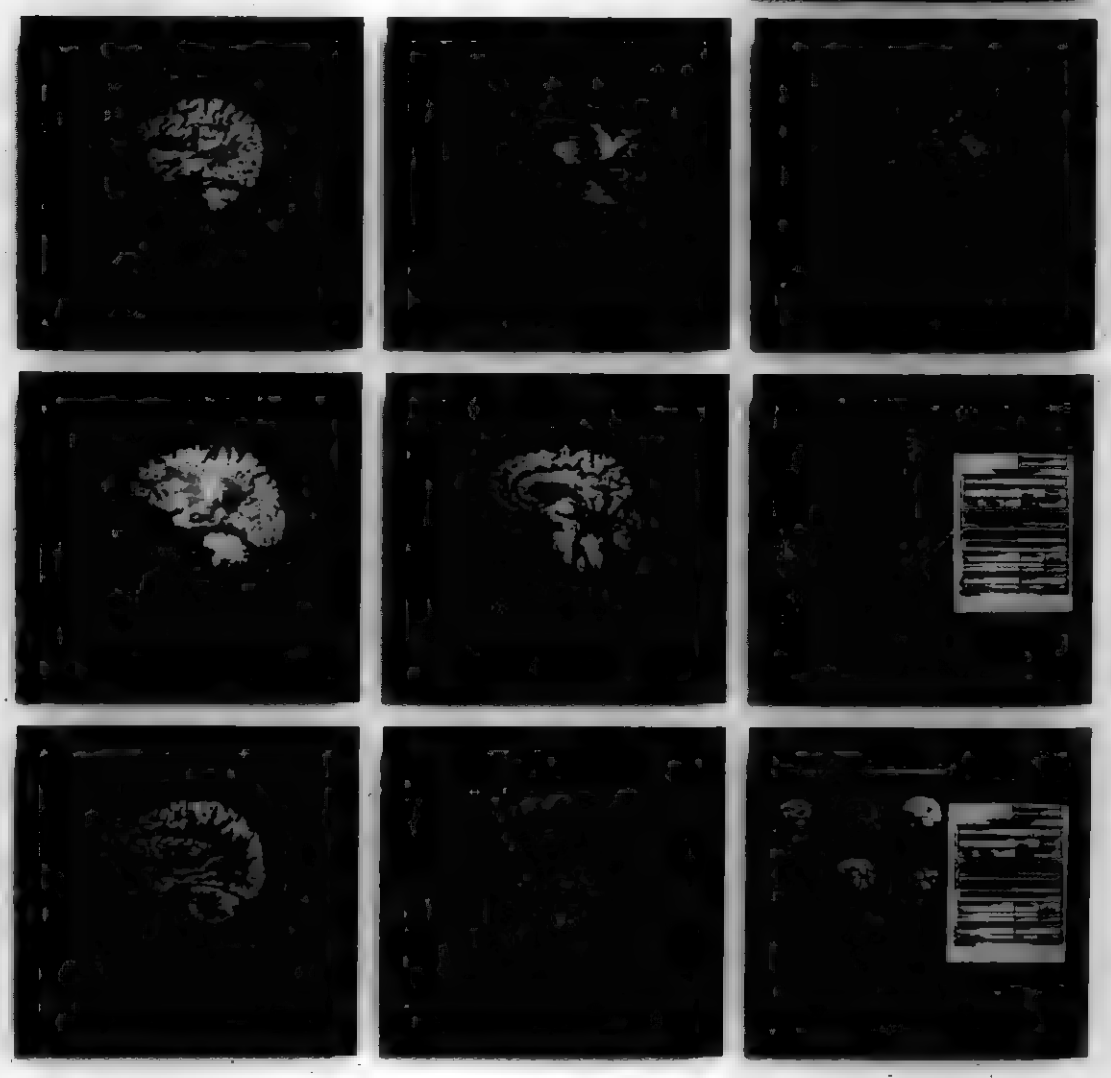

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TECH TALK

Fast as light

Phototonics Corp. last week introduced a device that links computers in separate buildings by infrared light. The Building-to-Building Photolink, which mounts on the inside of a window pane or on a wall near a window, connects desktop computers that are up to 600 ft apart, the company said. It comes in two versions: Apple Computer, Inc. Appletalk/Localtalk for Macintosh networking environments and RS-232 interface for terminal-to-host applications. The Appletalk/Localtalk version is compatible with Appletalk routers and bridges and transmits at the full 230.4K bit/sec. network speed. The RS-232 version can transmit four channels simultaneously at 9.6K bit/sec. and full duplex.

PCs discovered at Pompeii

Rediscovering Pompeii, an exhibit of more than 200 recently excavated artifacts from Pompeii, opened last week at the IBM Gallery of Science and Art in New York. The exhibition also features interactive programs that show how computer technology is being used by archeologists to explore the site at Pompeii as well as to further research and preservation efforts. The exhibition has been organized by the Italian Minister of Cultural and Environmental Assets/Archeological Superintendency of Pompeii and IBM Italy. It runs until Sept. 15.

Learning software

Researchers at the Institute for Learning Sciences and at Andersen Consulting are looking into the way people learn by using software prototypes based on artificial intelligence and cognitive science theory. The institute, which is at Northwestern University in Evanston, Ill., has developed three prototypes: a sounding board that uses Socratic tutoring techniques in problem solving; "Ask Tom," a collection of interviews with experts on video clips; and language learning, which teaches nonnative language to students.

Videotex: Struggling for acceptance

Despite growth potential and business interest, profits are still hard to find

BY MICHAEL ALEXANDER
CW STAFF

"Videotex has a great future if only it can get through the present."
Gary Arlen

After some notable failures in the mid-1980s, videotex appears to be back on track, although it remains unclear just where it is heading. "It's a beast that won't die," said Gary Arlen, president of Arlen Communications, Inc., a Bethesda, Md., videotex research firm and publisher of "Interactivity Report" newsletter.

Though definitions vary, videotex is generally viewed as a two-way interactive service for home and business users that includes text and, increasingly, simple graphics. A wide variety of services ranging from teleshopping to travel information and reservations are available on-line from 35 to 45 companies.

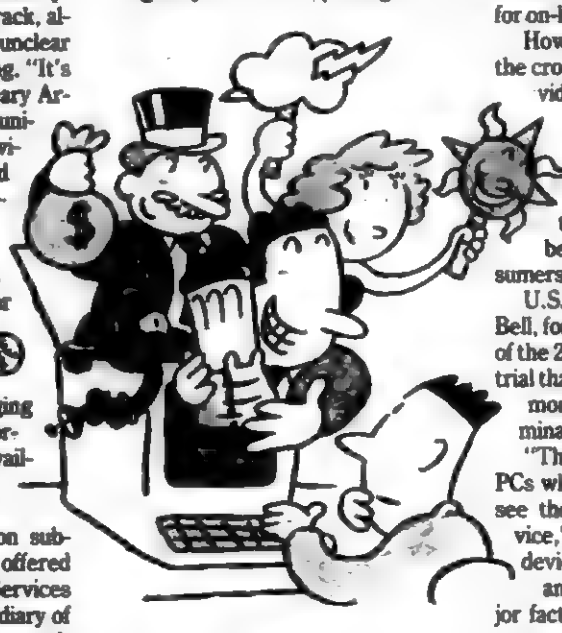
There are about 1.4 million subscribers of videotex services offered by such providers as Prodigy Services Co. and Minitel U.S.A., a subsidiary of French-Telecommunications, according to Robert L. Smith Jr., executive director of the Videotex Industry Association in Silver Spring, Md.

"The industry in general is growing at a 20% to 30% per annum clip," Smith said. "That's not bad growth, but at the same time, everyone in the [videotex] industry agrees that is far from where we would like to be in terms of market size."

The business needs a wider range of high-quality services aimed at both home and business users, Smith said.

Potential videotex customers want easy to use and inexpensive services, said Geoffrey Moore, director of market programs and communications at Prodigy in White Plains, N.Y. Prodigy has been successful marketing to less sophisticated personal computer users by bundling a modem and software in one package and has made its products less costly for users by funding the service through advertising.

"Traditionally, what has been called videotex was a text-based service that charged by the minute, putting most of



the cost on individual subscribers," Moore said. "The interface was designed for people comfortable with computers; it required a modem that was difficult to operate."

The company has grown from 50,000 to more than 435,000 subscribers in only 18 months, making it nearly the largest provider, Moore said.

"I call Prodigy the Great White Plains Hope, because everyone hopes that it will succeed," Arlen said. "Its failure would send a message that after spending three-quarters of a billion dollars, if [Prodigy] can't make it work, who can?"

The videotex industry is looking to get a significant boost from IBM's recent introduction of its Personal System/1 home computer that includes a built-in modem and Prodigy. IBM and Sears, Roebuck & Co. are co-owners of Prodigy.

Other PC manufacturers are expected to follow suit with models that include internal modems and software for on-line services bundled in.

However, PCs may not prove to be the crowbar that will pry the lid off the videotex market. There are several companies in the industry betting that a portable television-size terminal, similar to French Telecommunication's Minitel terminal, would be more readily accepted by consumers and perhaps business users.

U.S. Videotel and Southwestern Bell, for example, discovered that 44% of the 20,000 participants in a videotex trial that ended in March opted to pay a monthly fee to use a low-cost terminal rather than their own PCs.

"That suggests that people with PCs who already have a modem don't see the PC as a communicating device," Arlen said. "A telephonelike device, a home information appliance, is certainly going to be a major factor in creating a business — it may not be videotex but an electronic home and office information service."

Several of the Bell operating companies have been experimenting with "smart telephone" technology and are petitioning the Federal Communications Commission to amend regulations that now prohibit them from offering videotex services.

Videotex services aimed at business users are also slowly picking up, according to Smith. The videotex networks are increasingly being used to provide small and medium-size businesses with order entry, direct marketing and other services (see story, this page).

Adding value

Some managers are looking to add value to their internal corporate networks by linking them with outside videotex services providing travel reservations, for example, Smith said. "Hardware and software support is available for PC users; there is no reason why the person in the data center wouldn't want to have access to that same capability."

Videotex, which celebrates its twentieth birthday next year, has long been characterized as a technology in search of a market. Some experts said that the technology is already rapidly becoming obsolete.

Profits have also remained elusive. Minitel, which is often pointed to as the most visible videotex success because it has five million subscribers, has yet to make a profit in seven years of operation.

Giving them the business

One of fastest growing segments of Prodigy Services Co. is not consumer subscriptions but a division called Prodigy Business Service, which is geared to commercial users during the day when consumers sign off the system and go to work, said Geoffrey Moore, director of market programs and communications.

Artec Distributing, Inc., a prerecorded videotape distributor based in Shelburne, Vt., has been using the service for nearly a year, said Judy Raven, director of marketing for Artec. The 400 retailers enrolled in the service, which is called Artec Express, use it for on-line order entry, inventory look-up and other business applications, Raven said.

Prodigy charges retailers $13/hour on-line, but the tab is ultimately picked up by Artec.

Prodigy has also inked pacts with Moore Medical Supplies and Professional Insurance Agency of California and Nevada, among other firms.

MICHAEL ALEXANDER

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EDITORIAL

Helping hackers

IN THE LAST five years, hacking has evolved from a mischievous pursuit of nerdy teenagers to a legitimate threat to international communications and commerce. If the Internet virus showed how much trouble a single programmer could cause, then the revelation that one group was planning to disrupt the entire 911 emergency network in nine states hammered home the potential damage of a concerted hacking effort.

Law enforcement officials, egged on by nervous business leaders, are reacting with alarm to the situation. But are they trampling individuals in the stampede to end the threat?

The formation of the Electronic Frontier Foundation last week may shed valuable light on this question. The group will draw its share of derision because its mission is to defend the civil rights of computer hackers. But it deserves a chance to raise some emerging issues.

For example, should computer bulletin boards be considered legitimate agents of the press, with all the constitutional protection that entails? If someone publishes information on a bulletin board about how to break into a bank's computer system, who is liable? The originator of the information? The bulletin board operator? The person who uses it to commit a crime? All three?

If law enforcement authorities seize an entire file server from a small business on suspicion that it contains stolen credit card numbers, is that unfair restraint of trade? What if evidence of an unrelated crime is found on the hard disk? Are private electronic mail messages stored on a file server entitled to the same right to privacy as a letter delivered by the U.S. Postal Service? What responsibility do bulletin board operators have for knowing what information is exchanged among their users? How much do they actually have to know about those users?

Increased networking and high-speed communications are making it tougher and tougher to detect the origins of criminal activity and to determine just who is at fault. At the same time, digging out that information involves sifting through increasing amounts of extraneous material in a process that may jeopardize the privacy or livelihood of others.

However, the job must be done, and these issues will be addressed only through the courts. That's where the Electronic Frontier Foundation can make its mark. Not only does the involvement of such respected figures as Mitch Kapor and Steve Wozniak lend the group legitimacy, but also simply raising these issues each time another hacker raid comes to light will force law enforcement authorities to consider their actions more carefully.

On the flip side, we hope Messrs. Kapor et al do not simply use their organization to hold forth on the need to let hackers express themselves or practice their art. Neither business nor the legal community takes that argument seriously anymore. But by picking its targets carefully and sticking to the high road, the group can do a lot to define the boundaries of the debate.

LETTERS TO THE EDITOR

Easy migration

Your article "When a DBMS doesn't relate" [CW, May 28] omitted important information. For example, the concerns expressed about BWD Automotive are that they are "wary of the major investment required to go relational . . . not the least of those concerns was the task of rewriting thousands of lines of code . . . The access methods of file systems such as VSAM made it necessary to substantially modify programs when the structure of the data was changed."

My firm has converted most of our production data structures from VSAM to Computer Associates International's CA-Datacom/DB using a feature called VSAM/Transparency. This enabled us to quickly migrate from CICS/Cobol to IDEAL, CA's fourth-generation language (4GL), for improving current applications and adding new ones.

The old CICS/Cobol applications continue to be used until they need significant changes; then, we convert them to IDEAL. The old applications access the new Datacom/DB databases with no changes via the VSAM/Transparency feature. Our experience indicates that a relatively modest 10% or less overhead is incurred with VSAM/Transparency.

Moving to a 4GL relational database environment was absolutely critical to our effectiveness (for both mainframe and Unix/Xenix platforms). As an integrated steel producer, we need to efficiently run our information systems (still VM/VSE) while constantly adding to and improving our application portfolio. Systems people are a key asset, and a 4GL plus a relational database management system helps them be successful and productive. Your readers should be aware of the CA-Datacom/DB VSAM/Transparency option and benefits.

Richard R. Bailey
Rochester Hills, Mich.

Impenetrable logic

Your article "What's in store for 1995? PCs will fulfill potential" [CW, June 4] keys into a question that I've been ready to ask for several years.

When someone offers me a "personal agent" that "filter[s] all the information sent to [me]," my first question will be: "How do I set the percentage of information that is to be sent through to me unfiltered, undelegated?"

If the vendor states proudly that all information is filtered — that none can get through randomly — I will immediately reply: "How much did my competition pay you for trying to blind and deafen me by artfully preventing me from seeing anything that doesn't fit my preconceived notion? Get out!"

If this cybernetic butler/jailor only shows you what you've already asked to see, then by definition, no new information can reach you! Your filter will prevent you from noticing when you need to change your filter! Literal insanity.

Rob Higgins
Media, Pa.

Go with the flow

I enjoyed the careful and accurate article that Joe Maglitta wrote about the Centers for Disease Control's Wonder project [CW, June 4]. However, I wish to clarify one point. The article states that data is passed seamlessly between Adabas and Natural. What that sentence should have said was that the Adabas/Natural environment passes data seamlessly to the SAS Institute environment where the requested data is graphed or mapped using SAS Graph — the point being that the person who is signed onto the Wonder system requests the data and can receive it either in tabular, chart, graph or map format.

Regarding my staff, Joseph Reid and Andrew Friede are largely responsible for the ideas behind and the implementation of Wonder.

Howard W. Ory, M.D.
Director
Information Resources Management Office
Centers for Disease Control
Atlanta

OS/2 on the rise

I believe "Market justice" [CW, June 25] was a weak and clumsily reasoned editorial.

There would be no Apple Macintosh or derivative graphical user interfaces today without the bold pioneering of Lisa.

Your examples of successes all started with weak software support. OS/2 is still frail, but it will make a powerful follow-on to Microsoft Windows 3.0.

Donald C. MacDonald
Dallas

Computerworld welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor, Computerworld, P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701. Fax: (508) 875-8931; MCI Mail: COMPUTERWORLD.

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Quell the fear of lessor abuses

KEN BOULDIN

On May 4, Jim Hassett, trustee of lessor CIS Corp., took the podium at the Computer Dealers and Lessors Association's (CDLA) spring meeting. He addressed lessor bankruptcies and CIS, which is in Chapter 11. And he mentioned a number of "abuses" perpetrated by leasing companies.

Among the alleged abuses Hassett described were selling computers before exercising a lease's purchase option; removing features from a leased computer and selling or leasing them without the lessor's knowledge; and subleasing a leased computer without the original lessor's knowledge.

Not surprisingly, that part of his speech caught the attention of the audience, which included a number of industry media representatives. As a result, stories have appeared in industry trade publications about "leasing abuses," "dubious business practices," and the need for the leasing industry to undergo a "spring cleaning."

Hassett did raise some very good points, detailing practices that some lessors in his audience were unaware of and mentioning ways to improve how the industry does business. However, his remarks, and the conclusions reached in articles that subsequently appeared, gave the impression that there is rampant wrongdoing within the leasing industry and that customers should feel jeopardized. I strongly believe this is not the case.

The abuses that Hassett described are far from commonplace in the computer leasing industry. Many of those listening to his speech — including a number of industry veterans — do not believe that these situations were fairly described.

In fact, without the CIS bankruptcy, many of the problems Hassett referred to would never have surfaced. However, the light that Hassett shed on these dubious practices has caused many companies to be more aware of potential problems and to improve the manner in which they do business.

It is also important to realize that, contrary to the impression given by some articles in the trade press, few customers of computer lessors and dealers are actually put in jeopardy by the practices Hassett described in his speech. Many of these transactions are conducted between multiple lessors or dealers in computer equipment and do not even involve the customer.

A *Computerworld* editorial [CW, May 21] commenting on the issues Hassett raised maintained that it is "absolutely essential" for the leasing industry to "clean its own house," but "spring cleaning" is already an ongoing process at CDLA. CDLA maintains and enforces a Code of Professional Conduct and Practices by which all member firms must pledge to abide.

CDLA's Industry Practices Committee hears complaints of violations of this code, and if it is determined that a violation has occurred, the committee imposes sanctions and in some cases expels companies from the association. As a result, CDLA membership is the mark of a professional, ethical organization.

CDLA and the leasing industry do not condone any of the activities Hassett mentioned. The fact that these practices are now a topic of discussion may be one of the few positive by-products of the CIS failure.

A similar phenomenon accompanied the O.P.M. Leasing Services debacle. For example, when that firm's massive fraud was exposed in 1981 it caused lenders to verify that leased machines are actually in place before they commit to financing. For honest companies, this change in procedure was a mere inconvenience; for dishonest companies, it meant the exposure of their schemes.

As with any business, computer leasing and remarketing will always face challenges, and a few companies may fail to meet those challenges. But good companies will continue to rise to the occasion. As Hassett wrote in a recent letter to CDLA, "... it was not my intent nor desire to tar the entire industry with regard to these matters, and I also pointed out that one of the inherent problems is that those companies who engage in the practices mentioned create a competitive advantage over those companies who are more concerned with both the morality and ethics, as well as legalities involved."

Lessees wary of the industry need only heed the advice Hassett gave on May 4: Don't base your acceptance of a lease solely on price; the deal that looks too good to be true usually is.

Is computer leasing and remarketing in trouble? The answer is no. A number of CDLA members are experiencing some of their best years in recent memory, with better deals and rising lease rates. The industry *has* experienced some high-profile bankruptcies in the past several years, but these failures were largely a result of money-losing deals that didn't make economic sense or poor management decisions. These firms' problems were for the most part self-inflicted and are not symptoms of a terminally ill industry.

Computer leasing and remarketing is still a healthy industry.

Bouldin is president of the Computer Dealers and Lessors Association.

Why high-tech companies fail from their own success

MARTY GRUHN

The "go-go" 1980s gave our industry a notable rogue's gallery. DEC, HP, Apple, Compaq, Lotus, Microsoft, Ashton-Tate, Novell and Sun Microsystems all broke out of their respective packs and established themselves as standards in the industry. But will they still be luminaries when we look back on the 1990s?

That depends on whether they have done their homework and can avoid some of the traps that have caused other high-tech companies to fail.

One of the problems with success is that it validates corporate cultures and technologies. From this come the sins of internally driven strategies and the evils of an installed base.

Internally driven strategies are created on the belief that a vendor's previous success validates its right to a future. The mind-set evolves as follows:

- Our technology is selling, therefore it is good.
- Our customers like our technology, therefore they will buy more.
- Our customers like our technology, therefore other companies will buy it, too.
- Our installed base equals future opportunity.

If we move down market (cheaper) or up market (more expensive, faster) we can sell more to existing customers. We can't announce an innovative product in our core market because it will upset the installed base (a.k.a. cash cow). The inevitable result of internally driven strategies is that vendors start to contemplate their own navel. They evolve from being pioneers of new ideas to being the caretakers of an installed base. Because they think they are protected by the critical mass, they ignore new or radical technologies. After two or three reorganizations, the firm goes away.

Getting too big for your britches. When a vendor is successful in a niche, it begins to focus on what it wants to be, rather than what it is. This illness is usually expressed in grandiose corporatese about new market opportunities or strategic investments for the future. Forget it. If it isn't a lateral or down-market extension of the core business, it isn't going to work.

Firms that get too big for their britches usually catch the disease by focusing on only one or two competitors. As they win against the bigger giant, they begin to believe that other markets are theirs for the taking as well. This can be the kiss of death.

Surviving the exodus. One of the legacies of success is that vendors usually forget how hard it was to achieve. One reason is that nobody is left. Senior executives are wooed away to other companies that promise to make them president. Salespeople who pioneered the concept retire on their earnings or go to other companies that can offer them a better deal.

The result of this exodus is that the company loses the experience of history and the reasons for its success.

Arrogance. Face it, arrogance begins at the top and works its way down.

There is a fine line between arrogance and esprit de corps. Esprit de corps is created when there is a common enemy and the company is gaining momentum. Esprit de corps turns into arrogance when the enemy is vanquished and no other competitor comes to the fore.

The problem with arrogance is that it spreads like wildfire. Who needs to manage perceptions when the world is beating a path to your door?

Arrogance always comes before a fall, and the more arrogant the company, the harder it is hit.

Playing follow the leader. Vendors in the computer industry are a lot like lemmings with an unlimited number of cliffs. If it's a bad idea, you can be sure that everyone is doing it. If it's the wave of the future, look for one lone voice in the wilderness.

The problem with playing follow the leader is that the leaders in the computer business are pretty smart. They leak their intent to enter new markets and then charter skeleton organizations, which are hyped in the press. While competitors scramble to pursue the "opportunity," they sneak off to make money somewhere else. Face it, the big players didn't get where they are by telling everyone what they plan to do. They got big by weaving fantasies to keep competitors offtrack.

Fat marketing organizations. To check the health of any computer supplier, look at the head counts in marketing vs. engineering and the feet on the street. If marketing is bigger than either or both, you have a vendor on its way out.

Unfortunately, vendor success almost always translates into fat marketing organizations — thriving kingdoms where an ongoing game of Keystone Kops replaces innovation and original thought. Because the "customer" becomes numbers in a market research summary, strategies are designed with a shotgun. It's sure to hit something out there, even if it is wrong.

The results of fat marketing organizations are obvious. Products are thrown out to a progressively more confused audience, and even the smartest salesperson can't fill the void.

To avoid fat marketing organizations, vendors should consider installing a revolving door. Marketers whose products do not make the numbers get to spend a fun-filled year in sales. That's a dose of reality that should clear the halls.

Gruhn is a consultant based in Mesa, Ariz.

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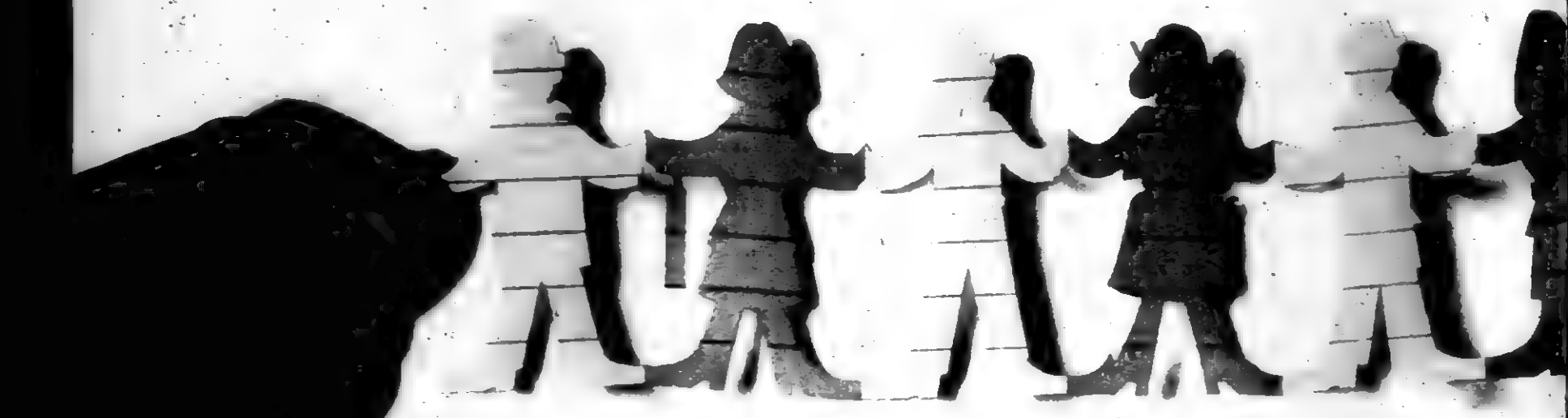

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COMMENTARY

J.A. Savage

This has gone 2 far

You may have read recently that the number $2^{512} + 1$ was factored by a mathematician in New Jersey using more than 275 "MIP years" (the work of a computer running at one million instructions per second [MIPS] for a year) on over 1,000 workstations.

The number takes up nine lines in a column this size and is 155 digits long — which is about all the math this reporter is capable of without a calculator. But why would anyone bother to factor such a problem to find what numbers multiplied together constitute the 155-digit result?

Arjen Lenstra, the man behind 2,424,833 times 7,455,602,825,647,884,208,337,395,736,200,454,918,783,366,342,657 times 741,640,062,627,530,801,524,787,141,901,937,474,059,940,781,097,519,023,905,821,316,144,415,759,504,705,008,092,818,711,693,940,737, said that the resulting number, $2^{512} + 1$, was No. 1 on the Top Ten List of Most Wanted Numbers.

Never heard of the list? Lenstra said it's been around since 1924 in what's called the Cun-

Continued on page 34

Chipping away at a tough wall

IBM tries some new carrots to entice System/36 users over to the AS/400

ANALYSIS

BY MARYFRAN JOHNSON
CW STAFF

For two years now, IBM has been trying to lure a recalcitrant bunch of System/36 users over to its midrange darling, the Application System/400.

Even in cases where AS/400s have joined or replaced System/36s in the workplace, many users remain faithful to their old operating system by running certain applications in a System/36 mode on the AS/400.

By the end of this summer, however, IBM is expected to make yet another overture to the System/36 world with new, lower priced, entry-level AS/400s — at least one of which will run the System/36 operating system, SSP, in native mode.

Also in the wings is a new release of the OS/400 operating system, which IBM has been telling its business partners will be shipping before October. Release 3 of OS/400 is reportedly loaded with features designed to make the AS/400 a more palatable choice for System/36 users.

"Anything that makes it easier will be appreciated," said Beverly Brown, a technical analyst for AS/400 and System/36 systems at Kendall Co.'s adhesive plant in Franklin, Ky. Kendall's two plants in Franklin each use an AS/400 to run their payroll systems, while a manufacturing and data entry application resides on the AS/400 but runs in the System/36 mode.

"It is somewhat slower in the 36 mode, but the application requires System/36," Brown said, noting that her users are also more comfortable with the familiar System/36 operating system.

"IBM's challenge is to provide a real price/performance inducement to these System/36 people," said Carson Soule, president of Computer Applications Specialists, an IBM midrange software company in Beltsville, Md. "Their machines are easy to run. They're cost-effective, they're paid for, and large numbers of these users are not out of capacity yet."

By the end of 1989, there were 113,000 installed System/36s in the U.S. and 249,500 worldwide, according to International Data Corp. (IDC) in Framingham, Mass.

"It is that installed base where IBM realizes the bulk of its new revenue will come for the low-end AS/400 models," said Carolyn Griffin, an analyst at IDC. "The 36 base tends to be old Blue shops, very proprietary-based, very locked into IBM hardware and software."

Luring those System/36 users into the AS/400 tent is a market that analysts estimated at more than $10 billion, figuring an expenditure of $50,000 per site for each customer upgrading to an AS/400. Yet there is universal agreement that total conversion of System/36 applications to native mode on the AS/400 is a rocky trail of frustration and expense.

One way IBM has kept a hook in the promising System/36 base has been to create multiple operating environments on the AS/400.

Although OS/400 comes in only one version, it actually supports three different environments. The main environment is "AS/400 native mode," which includes a relational database management system, hundreds of system menus, a Help facility and other features.

The other two environments are layered on top of OS/400 — one for System/38s and one for System/36s — each allowing users to keep their old, familiar operating system while working on new hardware. This works tolerably well in the System/38 mode because its common heritage with the AS/400 makes the operational differences between the two machines minor, several analysts said.

However, the System/36 mode on the AS/400 has some legendary performance problems.

"We are rewriting everything in native mode because anything we run in the 36 environment is horribly slow," said Richard Deckard, vice-president of data processing for Atlanta-based Manheim Auctions, a division of Cox Enterprises.

"We were the rebels. Other [System/36 users] told us we were crazy to go native," he said. Starting with 27 System/36s, Deckard has moved all of his in-house-developed applications off nine of the machines and said he anticipates another year of work to finish off the remaining 18 System/36s.

The company is now using 15 AS/400s and seeing a "major difference in batch-type work," Deckard said. One program that used to take 10 hours overnight to run on a System/36 now takes 1½ hours on the AS/400 Model B45.

Moving between programs in

Continued on page 36

Low-end strength

In terms of units, the bulk of the 67,000 AS/400s sold since the product was introduced in 1988 have been lower end models

	U.S. shipments in 1989	Shipments worldwide in 1989	Total installed in U.S.	Total shipments worldwide
Model 70	700	1,850	700	1,850
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Models 20, 35, 40 and 45	6,100	17,500	10,100	28,000
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Source: International Data Corp. CW Chart: Paul Mock

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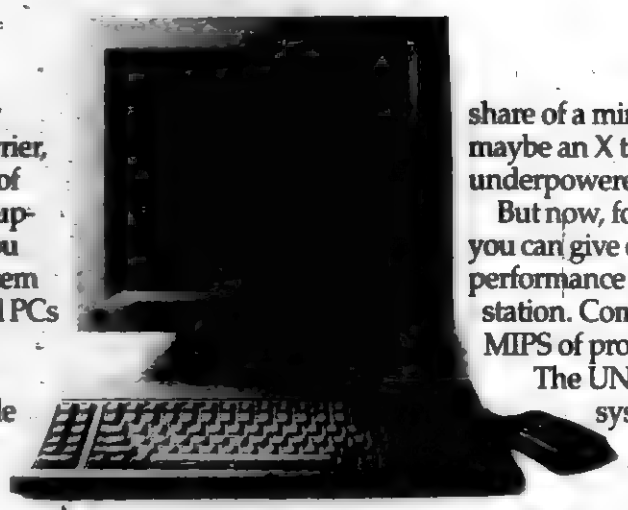

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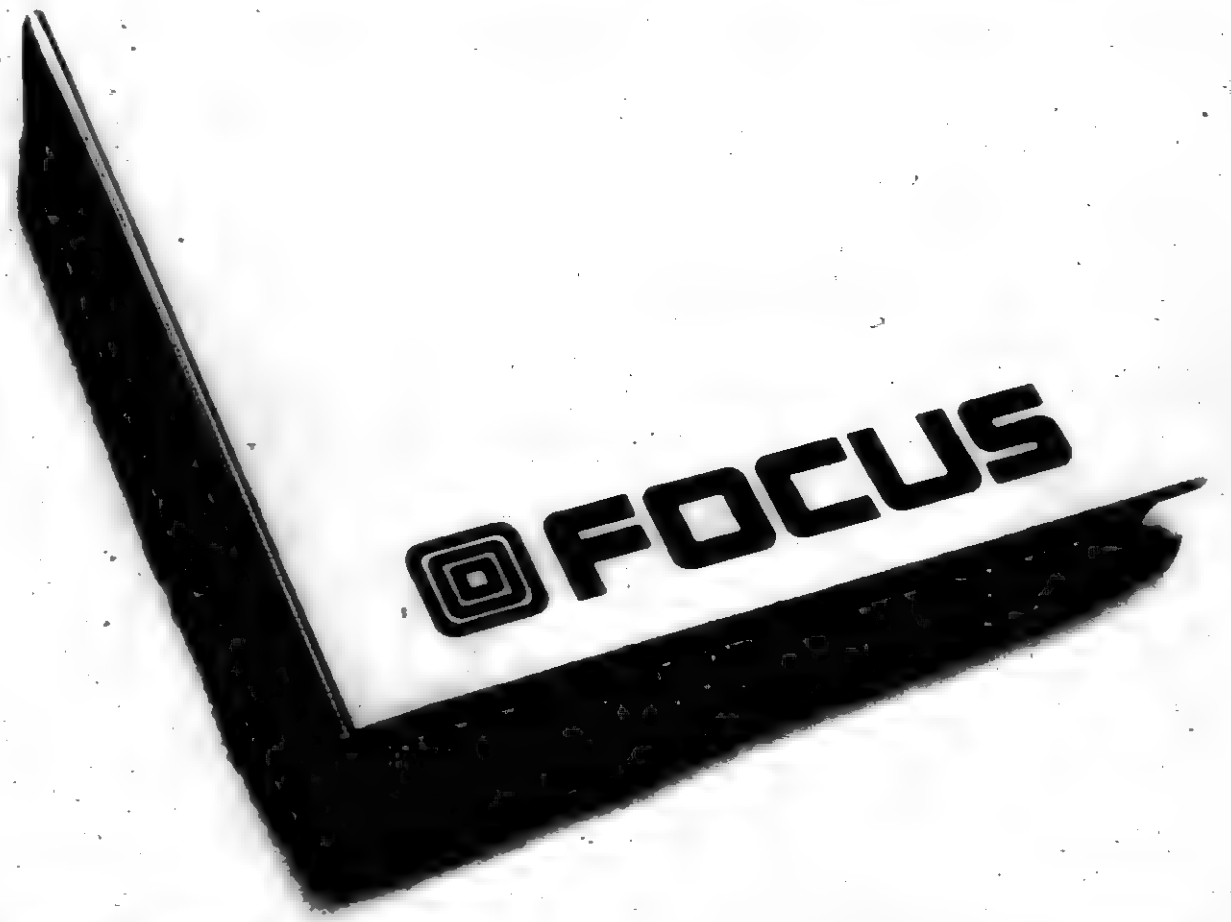

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A brief season of Goodwill

Coordinating IS services for Goodwill Games Seattle was no easy task

ON SITE

BY J. A. SAVAGE
CW STAFF

SEATTLE — This information systems department will not last long.

In fact, IS services for the 1990 Goodwill Games Seattle, an international sports competition one-fourth the size of the Olympics, will only last from July 20 to Aug. 5.

Like those who train their whole lives for a few minutes of glory and perhaps a medal, Mike Mount and Jim Murray have been sweating behind the scenes for more than a year. Their conditioning program revolved around a number of steps, including the following: wrangling free systems from IBM and Apple Computer, Inc.; customizing software left over from the 1984 Olympics; training volunteers; making sure that the 14 venues for activities were spread throughout the state; and having the proper jacks and wiring.

With this logistical nightmare looming, Murray, who is the director of technology, said, "The most difficult work was to get sponsors." After negotiating with IBM for nine months and ending up with 300 personal computers, a 4381 and a System/38, he said that his most pressing problem now is to get skilled volunteers.

"There are two criteria: They must be in management and at a technology company," Murray said. He added that key people, such as data processing and networking managers from companies such as AT&T and The Boeing Co. were selected a year ago, and now these volunteers have been charged with recruiting others from their staffs to fill out the required 700 IS volunteers.

1990 GOODWILL GAMES SEATTLE

Although the coordination sounds nightmarish, both Murray and Mount, vice-president of technology and communications, are swan diving into it for the second time — both had worked in somewhat the same capacity at the 1984 Olympics games in Los Angeles.

"The biggest change from the Olympics is the advances in PCs," Mount said. "The problem with software that existed in 1984 was that the biggest machine only had 256K [bytes] of memory."

The two biggest applications — accreditation for the 2,600 athletes, 1,500 news people, assorted coaches and other staff (adapted from the Olympics) and security — are run on the mainframe and the System/38, respectively.

Job orders for the 12,000 volunteers and inventory for everything from cellular phones to towels are run on PCs. The PCs also schedule transportation for the 10,000 people from 52 countries expected to fly in for the games, which is among their more mundane uses. The Apple computers are primarily used for desktop publishing. "Without PCs, this place would be dead," Murray said.

Another innovation is the use of read-out pagers as receiving terminals for results. The pagers can be hooked up to printers for hard copy, according to Mount. With the pagers, results of competitions such as ice hockey and women's volleyball held hundreds of miles away can be transmitted without expensive communications equipment.

Three to four days before the events start, the organizing committee will have access to the venues to install terminals, copiers, printers and phones with special jacks for journalists with computers. "You don't have time to get the glitches out," Mount said.

A depressing lull follows this frenzy of activity, the two men said. "From the time the games start, there's nothing for me to do. I feel like the Maytag repair man," Mount said. Murray added, "It all just gets boxed up and sent back."

Hacker attacks can be hazardous to health

BY MICHAEL ALEXANDER
CW STAFF

Hospitals are rushing to automate patient records as a way to ease the economic and administrative burdens of storing and using records on paper. While that may be good for business, it poses security headaches for health care information systems professionals.

In general, "the security of hospital information systems is poor," according to Jaime Taaffe, director of computing for the department of radiology at Massachusetts General Hospital in Boston.

No system is completely immune to a discontented insider or a determined hacker, should one or the other decide to alter a diagnosis or treatment procedure hoping to cause bodily harm, said Richard Sneider, president of Sneider & Associates Ltd., a Newton, Mass., consulting firm specializing in hospital information systems.

The safeguard is that medical staffers would question whether an altered procedure was appropriate, he said. "There have been cases where a computer system didn't correctly report the required blood type for a transfusion and the patient died at a large county hospital," Sneider said. "In theory, a hacker could do the same thing, but to my knowledge, there has not been a case where that has happened."

Outlaw hackers have penetrated hospital computer systems, altered patient data and caused other sorts of high-tech mischief. The attacks, while serious, apparently have not resulted in injury to patients.

About two years ago, hackers illegally accessed a computer system at Barrow's Neurological Institute of St. Joseph's Hospital in Phoenix.

"It was a research database that was invaded," a hospital spokeswoman said. "The computer did not contain patient records. None of the information was stolen, but it caused some problems in accessing the database."

A subsequent investigation resulted in the arrest of two hackers last year and culminated in May with a nationwide federal crackdown on computer crime, code-named Operation Sun Devil.

Health care IS managers are forced to walk a tightrope between accessibility and security of patient records, Taaffe said.

For the information to be useful, it must be readily accessible to an ever-growing number of professionals who are responsible for the care of a patient.

However, the same information must be well guarded, not only for the sake of the patient's privacy but also to make sure that it is not unknowingly altered, he said.

"The data that resides in hospital computers — patient demographics, complications and diseases, such as [acquired immune deficiency syndrome], hepatitis and herpes — can have a major impact on individual life," said Ash Dave, vice-president of information technology at Cedars-Sinai Medical Center in Los Angeles. "If the data or analysis is not accurate, the implications are far more serious," he added. "If the information gets out in the wrong hands, it can have a drastic effect on patients and physicians."

Compared with keeping records on paper, information systems are significantly more secure, said Mark Schneider, national manager of health care information systems at Arthur D. Little, Inc. in Cambridge, Mass. "They are not as tight as banking and some governmental systems, but the flip side is that it would be inappropriate if they were," he said.

Some hospital IS managers said that because of the potentially disastrous consequences of not adequately protecting their data, they are more active in promoting proper security procedures among their end users.

"My major concern is that after taking all precautions, we still never know who can turn loose on us," Dave said. "When a report gets out into the user area, the user is really in control of that information. Data processing cannot do anything if the user decides to give the information to someone else or if someone gets a listing of AIDS patients at Johns Hopkins and sells it" to an insurance company.

Policing information stored on stand-alone personal computers is one of the trickiest parts of the security job, he added.

However, most major hospitals are also wrestling with interconnecting patient accounting, materials management, radiology and a wide variety of other applications into seamless, hospitalwide networks. The goal is to have a completely automated record of the patient from admission to checkout and even beyond. Increasingly, these networks are also being extended beyond the boundaries of the hospital to affiliated hospitals, research institutions and others.

> "THE security of hospital information systems is poor."
>
> JAIME TAAFFE
> MASS GENERAL

In stitching together these internal and external networks, security standards may not be uniformly applied, again contributing to security gaps.

"Have we had people try to break in?" Taaffe asked. "You bet. We need to be on these nets, but we don't want to be."

Most institutions can protect themselves from the casual hacker, however.

"To protect against a determined hacker costs over a million dollars, and even in that case, a person familiar with the system such as a disgruntled employee can still do damage," Sneider said. "Luckily, the most disgruntled employees have done so far is to damage financial records."

HARD NOTES

DEC upgrades Microvax II

Digital Equipment Corp. recently announced a $20,000 integrated systems package that allows users to upgrade their Microvax IIs to high-availability, dual-host systems with automatic fail-over. DEC claimed the package will more than triple the processing power of Microvax II configurations. The dual-host machine is a pair of Microvaxes linked with a special bus — the Digital Storage System Interconnect (DSSI). The upgrade packages, available now, include a new Microvax 3300, DSSI bus adapter, cabling, associated software licenses and a choice of various storage elements.

Smartstar Corp. and **DEC** have announced a cooperative selling agreement under which DEC salespeople will sell the Smartstar application development software directly to customers.

In another reseller agreement, **DEC** and **V.I. Corp.** in Amherst, Mass., have announced that they will jointly market V.I.'s Dataview family of graphical user interface development tools.

EMC Corp. has announced a marketing agreement with **Intelogic Trace** in San Antonio under which Intelogic will sell all of EMC's Wang Laboratories, Inc.-compatible storage products to users of Wang VS minicomputers. Intelogic is a third-party maintenance company with approximately 200 U.S. locations. EMC, based in Hopkinton, Mass., will continue to market its storage products to Wang customers.

The On-Line RDBMS

The Sybase View

Business critical on-line applications can dramatically affect the competitiveness of an organization. They require an on-line RDBMS architected to integrate real-time decision support and transaction processing across networked environments.

Historically, RDBMSs were designed only for decision support applications. Many vendors have tried to extend their architecture for on-line capabilities, but lack features critical to success. A true on-line RDBMS demands superior performance, integrity, availability, distributed data management, and integrated tools.

SCALABLE HIGH PERFORMANCE

For the best price performance and absolute performance, an on-line RDBMS must scale up, or down, as business needs dictate. Only an on-line RDBMS with a multi-threaded programmable server architecture has proven successful in handling peak loads, with subsecond response time, for large numbers of users, on a variety of platforms.

SERVER-ENFORCED INTEGRITY

An on-line RDBMS must enforce data security and integrity rules, including referential integrity, *in the database* rather than in each application. This requires an intelligent, programmable server architecture. This architecture dramatically reduces enterprise-wide application development and maintenance time while improving protection and data consistency.

HIGH APPLICATION AVAILABILITY

An on-line RDBMS provides high application availability to avoid costly downtime. It performs backups, recoveries, and database administration changes while applications continue to run. And it supports fault-tolerance with mirrored logs and databases, as well as multi-CPU recovery to minimize exposure to hardware problems.

OPEN DISTRIBUTED DATA MANAGEMENT

An on-line RDBMS fully supports an open client/server architecture that lets you transparently distribute applications and databases over networks of multiple heterogeneous workstations and/or computer systems. It includes a two-phase commit service to support distributed update transactions, as well as retrievals, across two or more servers. And it provides open interfaces for integrating third party tools as alternate clients and foreign data sources as alternate servers for a truly open computing solution.

ADAPTABLE WINDOWING TOOLS

An on-line RDBMS gives developers a set of window-based 4GL tools that are object-oriented, event-driven and portable. And it integrates these tools with the power of the programmable server. In addition, an on-line RDBMS gives users a set of window-based decision support tools that provide real-time access to live data with a highly intuitive graphical user interface.

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SYBASE. Architected from the outset as the on-line RDBMS.

[redacted]

This view of The On-Line RDBMS first appeared in The Sybase Forum (Computerworld, April 2, 1990).

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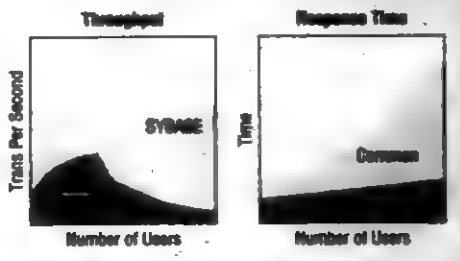
SYBASE SQL Server® delivers the high throughput and fast response times needed for on-line applications. Moreover, SQL Server maintains performance levels as the number of users and the size of the databases grow.

SYBASE performance is based, in part, on a multi-threaded server architecture that includes its own kernel and SQL task manager that are optimized to handle multi-user functions usually associated with the operating system. In addition, the SYBASE SQL Server architecture

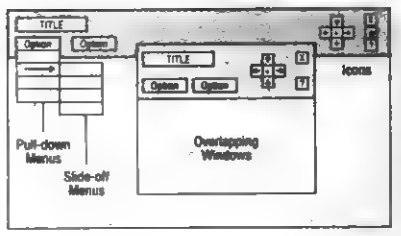


SYBASE maintains maximum transaction throughput and fast response times over an extended range of users.

The on-line enterprise cannot afford an RDBMS that must periodically be taken off-line for routine maintenance activities, such as database backups, diagnostics, design, and integrity changes.

SYBASE SQL Server allows all such activities to be handled on-line, with system-supplied stored procedures, while applications continue to run.

SQL Server also protects against hardware problems by supporting *software-based* fault tolerance with mirrored logs and databases, as well as multi-CPU recovery.



SYBASE provides a highly intuitive graphical user interface to maximize productivity for developers and end-users alike.

SYBASE boosts productivity with powerful window-based tools that meet the needs of all users. Programmers get a state-of-the-art fourth generation language (4GL) programming environment. Overlapping windows, pull-down and slide-off menus, and icons help developers build complex, on-line applications in a fraction of the time it takes using traditional tools.

In addition, SYBASE offers a complete SQL life-cycle toolset for developers. All phases are supported, including design, prototyping, development, testing, administration, and maintenance.

ke To Add Some tive To Our View Of n-Line RDBMS.

has been extended to take full advantage of symmetrical multi-processor (SMP) hardware systems. The resulting benefits are greater throughput, more effective load balancing, extended multi-user capacity, and efficient operational control.

In Computerworld (March 5, 1990, "Buyer's Scorecard") SYBASE ranked first in eight out of eighteen categories, including "Performance in processing on-line transactions" and "Performance in decision-support applications."

One of New York's most respected investment research and management companies, Sanford C. Bernstein & Co., chose SYBASE because "Of all the systems we evaluated, SYBASE was clearly the fastest. It accommodated multiple users without losing performance and offered the most functionality both on the transaction processing end and the data management end."

The on-line enterprise demands data and application integration and interoperability in a multi-vendor environment — *SYBASE Open Client/Server Architecture provides exactly that.*

SYBASE Open Client permits the use of a variety of front-end tools or applications, including SYBASE applications, independent software vendor's tools, and user written applications. SYBASE Open Server can seamlessly integrate hierarchical and relational DBMSs, third-party applications and real-time data feeds into SYBASE applications.

General Logistics International (GLI) is using SYBASE to help manage and distribute the volumes of data generated daily by one of the largest and busiest container carriers in the shipping industry — Mitsui/O.S.K. Lines North America. "The ability to distribute data among various locations combined with flawless data integrity when distributing that data was key to choosing SYBASE."

In the real, multi-vendor world, SYBASE preserves your prior investment in both hardware and software. SQL Server supports portability to a wide range of computing platforms, including VAX/VMS, UNIX, and OS/2, with PC and MAC connectivity, making it a natural for linking applications residing on different machines.

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For more information or seminar reservations, call 1-800-8-SYBASE.

INFO WORLD

This is what InfoWorld (March 5, 1990, "Dueling Servers") had to say about SQL Server's referential integrity: "The more power a multiuser relational database system has, the more potential there is for disaster. If you change a number on one table, any other table that depends on it may need to be changed. The risk lies in the failure to update all the appropriate related tables. The likelihood of this increases even more as more front-end applications that access the same data are added to the system.

"SQL Server offers effective countermethods. Its triggers, a type of stored procedure that executes whenever a given condition occurs, are attached physically to a table...and check all updates, inserts, or deletions for their effect on related tables. Since the trigger is installed at the server level — and not run through the front-end application — it doesn't matter which application updates the critical table. This is a critical feature as front ends multiply, and the potential for mismanaging data is increased. And since a given trigger need only be written once, at the server, it makes data integrity programming easy."

A final note: InfoWorld rated SQL Server referential integrity "excellent."

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Publishing house rewrites the book on systems

Harcourt Brace Jovanovich's renewed focus and homegrown system bring a happy ending

ON SITE

BY SALLY CUSACK
CW STAFF

ORLANDO, Fla. — Publishing conglomerate Harcourt Brace Jovanovich, Inc. (HBJ) is falling on better times. By selling all of its theme parks last year — including Cypress Gardens, four Sea Worlds, and Boardwalk and Baseball — the corporation eliminated an $875 million bank loan and turned its full attention back to what it does best — publishing textbooks.

Michael W. Byrnes, vice-president of MIS at HBJ, is the man ultimately responsible for merging and maintaining the firm's 400,000 accounts. The company produces textbooks for kindergarten through college levels and has customers in the retail, academic, dealer-distributor and international marketplace. A few years ago, HBJ envisioned one order processing system for all accounts.

HBJ's Byrnes *had a lot of management support*

"We acquired publishing group Holt Rheinhart & Winston back in 1986," Byrnes recalled. "And that gave us three different order processing systems: a homegrown one we'd developed, an academic one, and the one Holt had been using. We needed something generic to [meet] the needs of the entire company."

To merge the accounts, HBJ decided to develop a new system in-house, using computer-aided software engineering (CASE) technology. The two existing HBJ systems were each over 20 years old, and the Holt Rheinhart & Winston software dated back to 1980, recalled Dan Donovan, HBJ's director of production support.

"The cleaner direction was to re-engineer the application for the needs of the business today," Donovan said. "It was in 1987, and we also brought in DB2, as well as Cobol 11, as new tools, and we relied on our existing data processing staff."

He added that HBJ experienced the problems that are typical of any shop going from a maintenance to development environment, and "we got some employee resistance to the new methodologies for program development installation and things like that."

The ultimate product was dubbed COPS, for Customer Order Processing System. Programmed in Cobol II, the COPS software is DB2-compatible and runs off the company's Amdahl 5890 300E mainframe under IBM's MVS/XA.

The preliminary system design work was done using Foundation, Arthur Andersen's CASE product, with the detail and programming design handled by the HBJ staff. Arthur Andersen also serves as the auditor for HBJ, and having established contacts at each company made for a natural working relationship.

Byrnes described the COPS system as in "quasi-production" mode at present, getting fixed up for the full production installation scheduled for early November. In hindsight, he said he feels the company should have started with a smaller project.

"COPS in itself is the largest single system HBJ has ever written. It is the front end for all order processing, has a million-plus lines of code and includes 450 programs that operate in on-line, batch and reporting mode," he said, observing that at the outset, the complexity of the project was not completely understood. "We should have spent more time studying," he admitted.

With a local-area network used for the development piece of the project, there are currently 22 persons of the 122-member data processing staff involved in COPS development. Initially, the product was programmed using temporary programmers for cost-effectiveness.

"The happy ending here is that, besides the system, we have had a lot of support from management. They were very much involved in the needs of the project and have learned that data processing isn't a 1-2-3 business; it takes a lot of time and effort and understanding."

Management understanding is important to a shop the size of HBJ's. With 1,200 employees at the Orlando, Fla., office, and a total of almost 6,000 nationwide, the organization has 950 users linked to the mainframe system over 56K and 9.6K bit/sec. leased lines, and there are approximately 1,000 stand-alone IBM Personal Computer-compatibles scattered about. The company recently replaced coaxial with halons cable for quicker and cheaper installation of terminals, and it is also looking toward building an overall network for cost-effectiveness in the future.

Keeping the equipment up and running is another concern for Byrnes. Referring to southern Florida as the "lightning capital of the world," he has taken precautions to isolate the data center operations from any form of outside interference. The two-foot sink floating floor includes sump pumps, and halon systems are installed in the ceiling.

HBJ uses Comdisco, Inc. for disaster recovery services, but according to Byrnes, the company fortunately has had no occasion to use them.

Byrnes said he firmly believes that the MIS group can contribute to the running of the business. "MIS departments should be proactive," he said. "Senior-level management is directly involved with us, as part of the mainframe operations and the CASE development project."

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VIKING
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Savage

CONTINUED FROM PAGE 27

ningham Project, and his number has been No. 1 since 1985.

"They always have a list of numbers they really want to see factored," Lenstra said.

This particular number has been relied on by banks and governments in encryption code because it's been so hard to crack.

So Lenstra the mathematician — not the spy or the thief — decided to crack the number to test his theory of factorization, developed at Bellcore, Inc. in Morristown, N.J.

He split the problem into subprograms to run on distinct processors, a kind of parallelization but with the processors in workstations spread all over the world. Most of the computers used were like Lenstra's own, a Digital Equipment Corp. Decstation 3100, in the eight to 10 MIPS range.

Runtime was donated by researchers who were interested in the result, according to Lenstra, as well as some at universities and at DEC.

For five weeks, those subprograms ran and when done, each would send in the data over electronic mail to the central gathering point in Palo Alto, Calif. The data was assembled on 700M bytes worth of tape and shipped to Florida State University.

There, a 64,000-processor Thinking Machines supercomputer chewed the information for three hours and spat out the three numbers above. (No. No. Don't make me type it over.) Again, Lenstra swears he never took time away from other research projects for the supercomputer run. "I think we got some time that would otherwise be for maintenance," he said.

Cracking the code

Two things resulted in cracking the code number, Lenstra says. First, he was able to parallelize his solution for factorizing numbers, and second, he was able to use the 64,000-processor machine effectively.

I'm trying hard to think of something positive to say about using all that development time and computer time to factor $2^{513} + 1$, and the only thing I can come up with is that highly specialized use of parallel computing is interesting because developing software with the ability to break up problems to run on many processors at once continues to be the drawback to high-performance parallel computing.

But that's about it. If the same effort was put into devising a more precise global weather model, humanity might have a better grasp of global warming, or scientists could use the computer time for molecular modeling that could help develop an acquired immune deficiency syndrome vaccine.

As it stands, it's a fine number in the annals of math history. But it's no longer No. 1.

Savage is a *Computerworld* What Count senior correspondent.

CASE road rocky, but it goes to the top

BY NELL MARGOLIS
CW STAFF

Computer-aided software engineering remains the way to go, although the way needs to be paved by CASE success stories and patient managers who understand that the tolls are steep, the learning curves treacherous and the route longer than it looks at the start.

That is the consensus of a group of users contacted recently, 18 months after they were first featured in *Computerworld* as early implementors of CASE concepts [CW, Dec. 26, 1988-Jan. 2, 1989].

"CASE is a tremendously hard sell," said Judith Martin-Mitchell, vice-president of the First National Bank of Chicago, back in late '88. "At every step as you implement methodologies, new questions and problems appear — you need more understanding, more information, more management."

While the complexities of the CASE undertaking have not abated, Martin-Mitchell said recently, savvier, larger scale users such as First Chicago have learned to anticipate them and not be unduly discouraged or deflected from the CASE approach.

"It's not so hard a sell any more," Martin-Mitchell said. "Success stories help a lot."

At First Chicago, two CASE-enabled applications — a customer contact database and an overnight overdraft package — are currently up and running. The bank's happy experience, and its consequent willingness to forge ahead in CASE, can be credited in part to its software engineering team's continuing compatibility with tools provided by Texas Instruments, Inc. and to the fact that CASE has enjoyed early and consistent executive-level support, Martin-Mitchell said.

That top-down backing is indispensable to a successful CASE implementation was brought home the hard way at Bath Iron Works Corp. A CASE initiative under way at the Bath, Maine-based shipbuilding firm was derailed by hard times in its basic industry and new management that saw CASE as a dispensable luxury.

"CASE? You could say that it's sort of dead in the water here," business systems analyst Wayne Sanford said.

Also critical to First Chicago's success, Martin-Mitchell said, was the bank's decision to rein in the scope of its initial CASE project.

"Start small" is the advice she said she would pass on to companies contemplating CASE. "And stay small for a while. You learn so much when you go through the whole life cycle, and everything you learn will be invaluable to you next time."

Not only is "on-the-job training" the best way to become CASE-worthy, she added; it well might be the only way.

Kurt Wagner agreed. Eighteen months ago, Wagner, then a manager at the Seattle office of accounting and consulting firm Arthur Young, was an avid CASE supporter and was encouraged by the beginnings of a peer-to-peer educational effort. Now the founder/president of an 11-person systems integration firm, he is still a CASE booster — CASE credentials were among the attributes he selected for when staffing his start-up. But he said he now sees limits to the role that user groups will play in easing implementation.

"Grass-roots education is good, but I'm not sure that it's effective," Wagner said. "What we need are some large-scale success stories, broadcast broadband to everybody."

At Arthur Young, which has since merged with former rival Ernst & Whinney to become Ernst & Young, Wagner's successors and former colleagues are still pursuing CASE with a vengeance, both for internal development and as consultants.

"CASE-related projects are all that I've been doing for the last 1½ years, and that will continue to be all that I do," said manager Michael Blackman.

The merger, he said, merely intensified and focused the merging firms' respective efforts. Believing that a strong and consistent methodology is key to successful CASE implementation, Ernst & Young has now standardized on a refined and tailored version of Knowledgeware, Inc.'s Information Engineering Workbench offering — which it has repackaged under the name of Navigator — and has mounted a "very large internal training effort," Blackman said.

The state of CASE, Blackman said, "has changed enough over the past 18 months so that, as a consultant, I don't spend much time educating users. That's not an issue any more." Now, he said, "the issue is that companies have to get out of the mode of thinking in terms of just cutting costs through CASE."

> "STAY SMALL FOR a while. You learn so much when you go through the whole life cycle, and everything you learn will be invaluable to you next time."
>
> JUDITH MARTIN-MITCHELL
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SOFT NOTES

DEC teams with Ross in global market

Ross Systems, Inc., a Redwood City, Calif.-based application software vendor for Digital Equipment Corp. VAX-based systems, recently signed an agreement with DEC that included plans by Ross to implement DEC's RDB database, RISC Ultrix and Network Applications Support software into its product line. The agreement also called for DEC and Ross to jointly sell selected products from both firms worldwide and for DEC to use certain Ross software packages in-house worldwide, according to Dennis Vohs, Ross' chief executive officer.

Cognos Corp. in Burlington, Mass., intends to to sell its application development and relational database management system to users of Hewlett-Packard Co. systems. Cognos Powerhouse software will be available for the HP 9000 Series 800. The Unix-based software will be offered as a full life cycle development environment, covering the various phases of software engineering and maintenance.

Andersen Consulting in Chicago said it plans to offer a service called Client Link that will give users of its Mac-Pac software access to on-line code modifications as well as a database of oft-asked questions and answers. The initial service is targeted at Andersen's customers running manufacturing, distribution and financial software on the IBM Application System/400 minicomputer.

Systems Center, Inc. and **Tandem Computers, Inc.** signed a deal that calls for the two firms to jointly sell systems and network management software to Tandem customers. The software will be based on Systems Center's recently acquired Netmaster management software.

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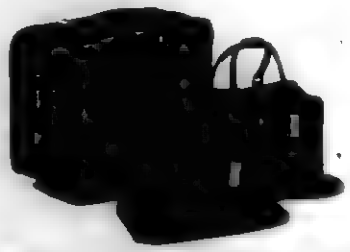

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IBM

FROM PAGE 27

the native mode and System/36 environment is often a tedious process, and the opening and closing of files from the System/36 mode "can drive the AS/400 nuts," said David Andrews, president of ADM, Inc., an AS/400 consulting firm in Cheshire, Conn.

While IBM has solved some performance problems, the ones left, Andrews said, include creating and deleting files, running batch work or data sorts in an interactive environment and signing on or off screens.

Analysts said IBM will clear up most of these difficulties with the System/36 mode through a facility in OS/400 Release 3. Operational Assistant is basically a set of screens that masks the complexity of native mode and mimics the simplicity of the System/36 operating environment.

Stalwarts of the System/36 insist that highly structured, professionally written code is what users need to avoid the performance problems in that environment. Properly used, the System/36 mode can give a user "everything that's native, plus a set of 36 compatibility functions," Soule said. The problem is, many System/36 shops are one- or two-person operations without professional programming expertise.

Consultants in the AS/400 and System/36 world recommend that applications be reviewed on a case-by-case basis to find the best candidates for running in the System/36 environment. "It's the bread-and-butter applications, the ones that get used every day and need to run as fast as they can, that should be rewritten in native mode," said Rodger Peck, president of the Peck Systems Group in Bridgman, Mich., a systems integration and consulting firm in Bridgman, Mich.

Peck said many of his System/36 clients will only be wooed to the AS/400 by lower prices on the entry models.

NEW PRODUCTS — SOFTWARE

Utilities

The Workstation Group has introduced two Unix products designed for users of IBM mainframes who also want to use a Unix environment.

Uni-Xedit is a full-screen implementation of IBM's Xedit text editor that features an online Help system and more than 40 editor commands.

Uni-Rexx is a Unix implementation of IBM's Rexx system control language that offers extensive text parsing and string manipulation facilities.

Both products run on platforms such as Sun Microsystems, Inc.'s Sun-3 and The Santa Cruz Operation's Xenix. The products are sold for $399 each or together for $699.

The Workstation Group
6300 N. River Road
Rosemont, Ill. 60018
(708) 696-4800

Britz Publishing, Inc. has announced a bank account reconciliation system for maintaining accurate data about bank checking activities on an IBM System/36 or Application System/400.

The Recon system includes an RPG data entry program and IBM's Data File Utility. It also features an option to send follow-up letters to payees of checks that have been outstanding for a given length of time.

The product can track up to 999 bank accounts for 999 firms; it can also be used as a stand-alone unit or with accounts-payable systems, the vendor said.

Recon includes complete RPG source code and costs $99. A free 30-day trial period is included.

Britz
101 Old Canton Road
Madison, Miss. 39110
(800) 255-2028

Applications packages

Ace Microsystems Ltd. has announced LEX-WP Version 9C, an upgrade to its word processing and database management software package.

The product features pop-up menus, an integrated spell-checker, proportional space printing, an integrated database and a mail-merge facility.

Ace Microsystems' *LEX-WP features pop-up menus*

LEX-WP runs on Digital Equipment Corp.'s PDP and VAX computers, MS-DOS-based personal computers and Unix and Xenix systems. DEC system license fees range from $390 to $12,000. Licenses for PC- and Unix-based systems cost between $390 and $3,600.

Ace Microsystems
Kew Bridge House
Kew Bridge, Brentford
Middlesex, UK TW8 0EJ
(081) 847-4673

Data 3 Systems, a division of Ask Computer Systems, Inc., has introduced a line of Distributed Requirements Planning (DRP) and Sales Order Management (SOM) products designed for IBM System/38 and Application System/400 machines.

The new products include SIM/400 DRP, a facilitator for linking multiple systems, and Release 2.01 of its SIM/400 Manufacturing and Financials software package.

DRP products range from $20,000 to $66,000, and SOM products cost between $14,000 and $46,200, depending on type of AS/400 machine used.

Data 3 Systems
P.O. Box 441
2544 Cleveland Ave.
Santa Rosa, Calif. 95402
(707) 528-6560

Database management systems

The Answer Systems Division of Sterling Software, Inc. has announced Quick Query, a point-and-click menu enhancement for its Answer/Reporter Software database report generator.

Answer/Reporter Software is used to retrieve and format data from multiple databases on an IBM System/370 and plug-compatible mainframes and then display the data on an IBM 3270 terminal. Quick Query provides nontechnical 3270 users with an interface that enables them to use the data retrieval and formatting features of Answer/Reporter.

Pricing ranges from $6,000 to $15,000, depending on CPU configuration.

Sterling Software
21050 Vanowen St.
Canoga Park, Calif. 91304
(818) 716-1616

Computer-aided software engineering

Interact Corp. has announced the Interact Integrator, a data management framework for integrating computer-aided software engineering tools and other software packages in a networked environment.

Platforms supported include Sun Microsystems, Inc.'s Sun-3 and Sparcstation.

A single-user station that includes a user interface, automatic tool sequencing and comprehensive data management facilities costs $10,000. An integration station with all the features of the user station as well as a tool encapsulator sells for $30,000. The product is slated for a third-quarter release.

Interact
417 Fifth Ave.
New York, N.Y. 10016
(212) 696-3700

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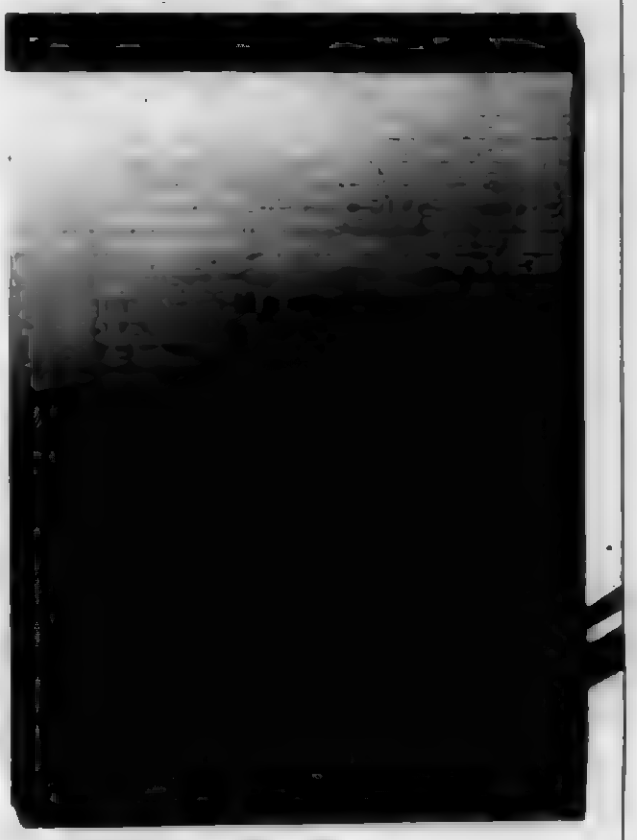

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NEW PRODUCTS — HARDWARE

Turnkey systems

KCR Technology, Inc. has announced a turnkey system that will print information in forms such as shipping tags, bar-code labels, packing slips and customer service reports.

The 7607 Remote Printing System was designed for high-volume remote printing from IBM mainframes operating under System Network Architecture. The system emulates the Remote Job Entry protocol to enable users to print at rates as high as 90 page/min., the vendor said.

The 7607 costs $124,450. Service rates start at $743 per month.

KCR Technology
One Riverview Square
E. Hartford, Conn. 06108
(800) 525-7055

Optigraphics Corp. has introduced a turnkey large-format document scanning system.

Optidraft was designed to meet the data-capture needs of mapping professionals, facility managers and mechanical and manufacturing engineers. Features include the ability to view images in real time while a drawing is being scanned as well as a two-dimensional computer-aided design package with drafting and database capabilities.

The system requires an IBM Personal System/2 or Personal Computer on the Intel Corp. 80386 platform. It sells for $100,000.

Optigraphics
9339 Carroll Park Drive
San Diego, Calif. 92121
(619) 292-6060

Processors

Lantronix has introduced a line of terminal servers that are compatible with Sun Microsystems, Inc. workstations.

The products are offered in four-, eight- and 16-port versions and are equipped with software that provides Sun workstation users with transparent access to file servers and remote network peripherals via Telnet and rlogin.

Pricing ranges from $1,495 to $2,495, depending on model.

Lantronix
26072 Merit Circle
Laguna Hills, Calif. 92653
(714) 367-0050

The Remex Division of Seymour Electronics and Automation, Inc. has announced a line of microprocessor-based shop terminals designed to provide multitasking distributed numerical control without a single point of failure.

The devices can be used as computer-integrated manufacturing (CIM) subsystems in high-level networks or as stand-alone DNC systems at manufacturing firms that are not ready to use CIM. Each terminal reportedly includes a multitasking machine interface unit and a separate, interchangeable operator interface.

The terminals range in price from $1,000 to $4,000, depending on configuration.

Remex
1335 S. Acadia
Fullerton, Calif. 92631
(714) 535-4160

Data storage

Ten X Technology, Inc. has introduced an optical-disc subsystem that enables users to read and write erasable and write-once, read-many optical media using a single drive.

The Opti Xchange subsystem includes a multifunction 5¼-in. optical drive and a built-in hardware interface that provides connectivity without the need for software drivers. The product can store from 650M bytes to 1G byte of data per cartridge, depending on type of compression.

The subsystem is slated to begin shipping this month for $5,995.

Ten X Technology
4807 Spicewood Springs Road
Austin, Texas 78759
(512) 346-8360

Opti Xchange *can store up to 1G byte of data*

Clearpoint Research Corp. has announced the DCMS-TSB, an 8mm tape storage subsystem designed for Digital Equipment Corp. VAX 8000 and 6000 series systems.

The product provides users with emulation for DEC's Tape Mass Storage Control Protocol and serves as a third-party direct-attachment subsystem for DEC's VAXBI bus.

DCMS-TSB also features ports for up to seven tape devices and offers configuration and backup capacities ranging from 2.3G bytes to more than 14G bytes, according to the vendor.

The subsystem is priced at $17,850.

Clearpoint
35 Parkwood Drive
Hopkinton, Mass. 01748
(508) 435-2000

Zetaco, Inc. has introduced a data storage subsystem that provides users of Data General Corp. operating systems with a 4mm, 1.3G-byte cartridge for unattended backup of most 5¼-in. Winchester disk drives.

The SKT-1300 includes a standard small computer systems interface and a proprietary SCZ-4 controller. Other features include a fast file search that reportedly allows users to access file marks and record boundaries in less than 20 seconds.

The price is $9,195, and add-on drives sell for $5,675.

Zetaco
6850 Shady Oak Road
Eden Prairie, Minn. 55344
(612) 941-9480

Distributed Logic Corp. has introduced two series of storage arrays designed for Digital Equipment Corp. VAX systems.

The DA750 and DA850 feature respective disk storage capacities of 10.4G and 15.5G bytes. The products can be ordered with a pair of Exabyte 8200 8mm 2.3G-byte cartridge tape drives or with two Exabyte 8500 5G-byte tape drives.

List price ranges from $146,938 to $235,421, depending on subsystem model.

Dilog
1555 S. Sinclair St.
Anaheim, Calif. 92806
(714) 937-5700

I/O devices

Genicom Corp. has added two models to its 4000 series of line matrix printers.

Models 4410 XT and 4440 XT feature an optional correspondence font that provides twice the speed of near-letter quality printers, the vendor said.

Model 4410 XT lists at $6,195, and Model 4440 XT costs $7,795.

Genicom
Genicom Drive
Waynesboro, Va. 22980
(703) 949-1492

Maintenance equipment

On-Line Environment Corp. has introduced a failure avoidance system designed to detect environmental system problems in computer facilities.

Analysite collects measurements, such as the temperatures of magnetic tape or a freon leak in an air conditioner, at six times per minute and downloads the data for analysis. Maintenance personnel can access the data by dialing into an RS-485 network from IBM Personal Computers.

The service is aimed primarily at medium to large systems. It is being offered for $500 to $1,000 per month, depending on the size of the site.

On-Line Environment
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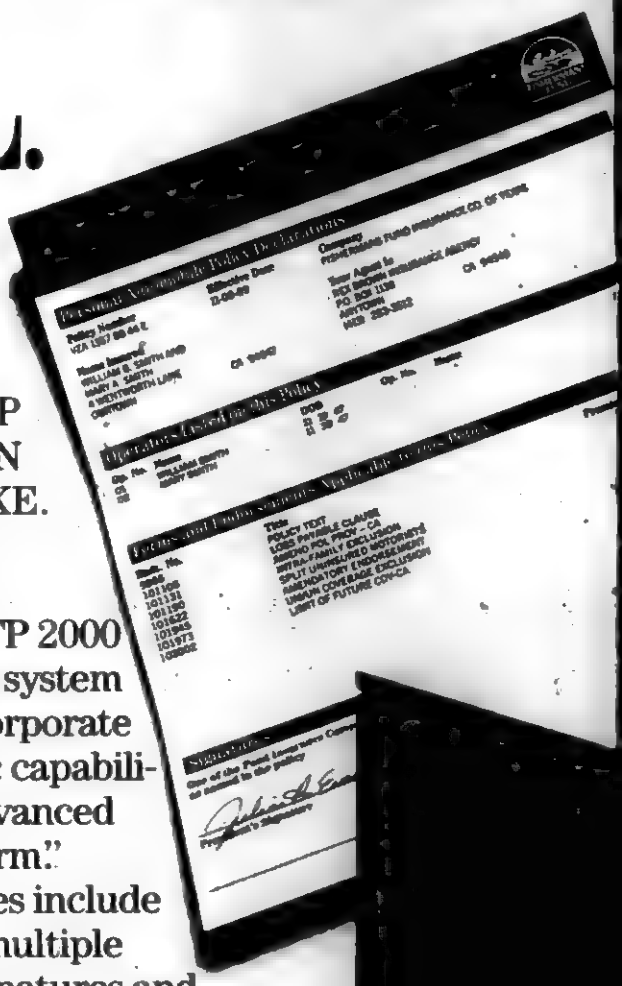

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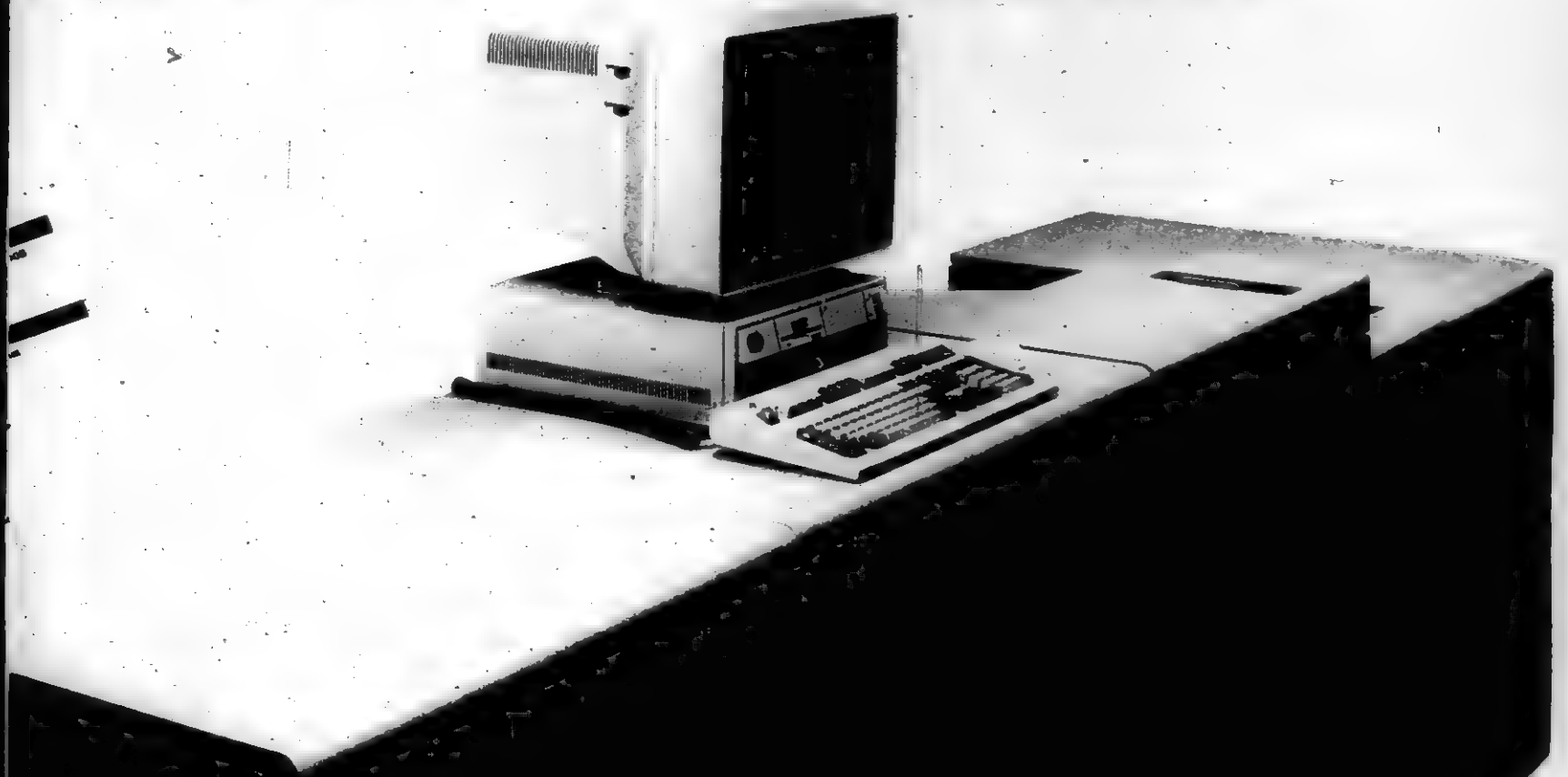

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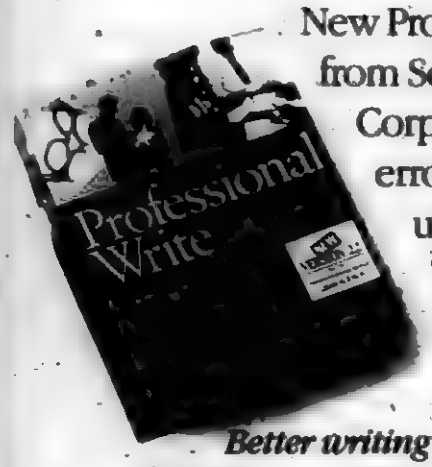

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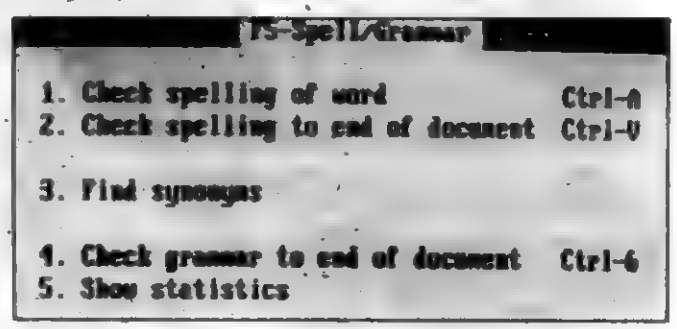

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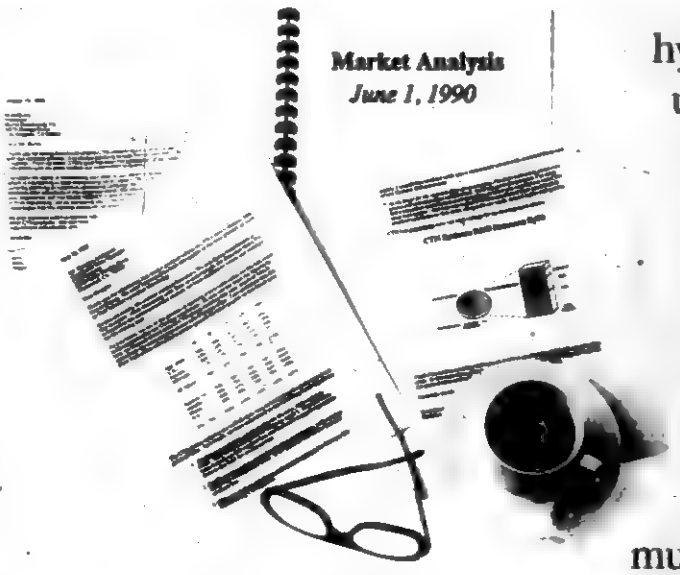

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Multimedia: A royal(ty) mess

ANALYSIS

BY JAMES DALY
CW STAFF

Putting together a multimedia presentation? Better round up the lawyers.

Experts said the dizzying montage of music, video and flashy images that has become the central charm of multimedia also harbors a decidedly dark side: Securing the copyrights for those myriad images has created a landscape peppered with legal sinkholes.

Gary Hare found out the hard way.

Hare is president of Fathom Pictures, Inc., a small Sausalito, Calif.-based production house that specializes in interactive entertainment and amusement park attractions. He has come up with the idea of putting together a product based on Rotisserie League Baseball, a popular game wherein baseball fans craft customized lineups from professional rosters and then engage in a season-long battle of statistics.

Hare wanted to mix images of the players with performance numbers and personal highlights, then spice it up with some music and old film clips. "It was an exciting project," he said.

That is, until he started talking royalty numbers to those with whom he would have to secure copyrights, including Major League Baseball (which wanted 10% of gross wholesale), the Major League Players Association (another 10%), music companies (3%) and publishing houses for statistics (another 5%), as well as television networks and the estates of deceased players. By the time the final figures were added up, property rights had gobbled up nearly 50% of wholesale.

"That's one game that never got off the ground," Hare said.

Hare's aborted game underlines a severe problem facing users in the burgeoning field of multimedia production. The concept of compensation and ownership is today's "single biggest issue in multimedia," said Sean Callahan, an executive vice-president at Savitar, Inc., a San Francisco-based company that develops technology for the electronic publishing community.

Multimedia production operations are suddenly finding huge and valuable amounts of time gobbled up with legal — not creative — issues. "It's not unusual for some shops to spend as much as half of their production time just securing copyright permission," said Nick Arnett, president of Santa Clara, Calif., Multimedia Computing Corp., which publishes "The Multimedia Producer's Legal Survival Guide." With each increase in the complexity of a multimedia presentation comes an exponential increase in the threat of litigation.

Legal minefield

The very characteristics that make multimedia unique also make it a legal minefield. Nearly every image, photograph, letter of a poem or note in a song is protected by a copyright, and there is no such thing as "permissible borrowing" — snitching one line from a poem here or three measures from a song there.

Arnett said that the first step in acquiring preexisting media is finding who owns the copyright. This can often be a sticky business, however. Some types of media (i.e., music) may have several owners, all of whom must grant permission.

It is also important to anticipate and describe all uses of the borrowed medium, so you will not be in a legal straitjacket if you decide to alter original production plans, Arnett said.

If you do not have a particular piece of media in mind, there are catalogs and directories available to help you find what you are looking for. Stock houses and rights and permissions professionals can also provide valuable assistance in locating and acquiring parts of your work.

Continued on page 47

FEATURE: TELECOMMUTING SUPPORT

Who bears the burden?

BY CAROL HILDEBRAND
CW STAFF

For the harassed individual struggling with the demands of a high-stress career and a backbreaking commute, working part-time from home can seem like a ticket to a simpler lifestyle. Many telecommuters say they gain time with family while improving their productivity and reducing stress.

Simple can become complex when telecommuters need system support, however. Such issues as who is responsible for equipment maintenance and repair as well as who pays for the equipment in the first place are

Continued on page 50

Is PC world getting flat?

BY J. A. SAVAGE
CW STAFF

Flat-panel displays could offer computer users a means to reclaim the desktop from boxy personal computers.

With VDTs approaching basic limitations in screen size and resolution, the American Electronics Association claimed that flat-panel displays will take over the market. "The CPU can plug into the display instead of a box," said James Hurd, president of Planar Systems, Inc., a Beaverton, Ore., display maker.

Memory would still take up other real estate for the computer, perhaps in a box set under the desk or a 2½-in. drive on the back of the display.

The reason such display/CPU desktop combinations have yet to appear in force on the market is that the U.S. flat-display industry is still in its infancy, with only about a half-dozen firms.

Pricing should not be a hurdle, however. Hurd claimed that a display/CPU does not have to be more expensive than current workstations. He estimated that an Intel Corp. 80386-based CPU/display combination would cost between $2,000 and $3,000.

"It's simple arithmetic," said Jim Kehoe, president of Plasmaco, Inc., a Highland, N.Y., manufacturer that started shipping display subassemblies in February. "We all have a high level of fixed costs, and as we work to get volumes higher, prices will go down."

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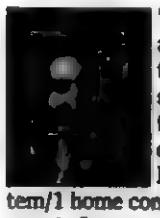
COMMENTARY

Richard Pastore

Not much box for the buck



"They've come a long way from the PCjr," observers said after IBM introduced its Personal System/1 home computer late last month. I can vouch for that — I was a PCjr user for three years before I mercifully pulled the plug on that klunker and bought a Tandy 1000. The PS/1 that I played with at the press conference in New York was a vast improvement — but it was by no means perfect.

The chief problem is the price and value you get — or don't get — for your money. Forget about getting away for under $1,000. All you get for the $999 sticker price is a crippled base model with a black-and-white monitor, only 512K bytes of memory and no hard disk — an inadequate configuration for the kids who want to play colorful games and the adults who want to load Lotus' 1-2-3 or Microsoft's Windows. Plan on spending $1,700 to $2,000 for a truly useful base configuration. But wait — there's more. Because IBM foolishly chose to build a joystick port into a $250 adapter board rather than the back of the system box, adding a couple of joysticks for the kids will cost you an incredible $300.

So now we're talking serious bucks for a machine that isn't all that serious. Although it has Video Graphics Array resolution, the monitor you are forced to use is too small for serious desktop/home publishing use. Microsoft Works is a cute little all-in-one package, but work-at-home users might quickly find the functionality limiting. Prodigy, one of two on-line services IBM bundles with the box, has been almost universally panned for being too slow. The other, Promenade, seems likely to nickel-and-dime you to death with its 25-cents-per-minute prime-time charge.

Even novice users have enough common sense to comparison-shop. If they walk into their local electronics superstore, they may find out the PS/1 is not such a good deal. At a superstore like Lechmere in Boston, you can snag a Packard Bell 386SX with on-board VGA, hard drive, 3½- and 5¼-in. floppy drives, a modem, Prodigy, MS-DOS 4.1 and Lotus-works for $1,699. You can add a VGA monitor for $319.

Continued on page 46

Puette eyes integrated approach at Apple USA

IN PERSON

Two weeks ago, Apple Computer, Inc. filled a 5-month-old major hole in its corporate structure when it scooped Robert Puette from Hewlett-Packard Co. and named him president of Apple USA — the company's domestic sales, marketing and support division.

Puette, the affable former general manager of HP's worldwide personal computer group, has his work cut out for him. Apple USA has struggled through a prolonged period of weak sales and managerial turmoil, and its Cupertino, Calif.-based parent has been known to munch through its ranks like some folks go through salted peanuts.

Senior West Coast Correspondent James Daly recently spoke with Puette to discuss his plans for the division.

Where is Apple USA going in the next year, and how will you mix in your experiences at HP?

It's going to be several months before I can talk specifics about either products or channel directions. But I've spent nine years in the PC business at HP, which deals with the DOS world. I've learned a lot about what works in that situation and what doesn't.

Puette: *"I've got a very clear picture of what is needed"*

Culturally, the companies are similar: very intense people, who appreciate open communications, trying to make a contribution. A lot of these are Silicon Valley characteristics. Beer busts, for example: You talk beer busts to an East Coast company, and they don't know what that is. But everyone in the Valley knows what a Friday afternoon beer bust is. And it's a good communications vehicle.

Any changes organizationally so far?

[Chief Operating Officer] Michael Spindler has flattened the organization to the point where I have about 10 people that report to me. [Former Apple USA head] Allan Loren had three people reporting to him. Instead of having a single person worried about U.S. marketing, I have people who deal with channels — education, business, government. This gives me finer control.

What effect do you see Microsoft Corp.'s Windows 3.0 having on Apple?

Windows 3.0 brings the DOS world closer to the point-and-click environment of the Mac. That [actually] simplifies our marketing job. But the catch [for DOS users] is that the Mac is a plug-and-play environment. If you buy DOS you have to buy Windows separately, and then you're talking up to four hours of integration time. We'll need to play up that fact.

Europe has been tremendously successful during a period in which domestic revenue has been weak. Will we see the Europeanization of Apple USA?

I don't think so. The markets are very different, and you can't always apply what works in Europe to the U.S.

The U.S. is the largest homogeneous marketplace in the world. It's the only place where you can call 3,000 miles across the country and get a product shipped to you the next day. That doesn't exist in Europe, and I'm not sure it's going to exist after the economic reforms of 1992. You have to work with the situation you've got.

The sword of Damocles often hangs over the head of Apple USA. The average shelf life of an Apple USA president during the past five years was about 18 months. Does that worry you?

No. I've spoken with [Chairman and Chief Executive Officer] John Sculley and Michael Spindler, and I've got a very clear picture of what is needed. The sales, service and support organizations have not necessarily worked together over the last few years. We've got to bring that together. Various players in the past have had trouble doing that. Either they didn't understand the task, or they understood our customers but not how to manage our people, or they had trouble relating to the whole thing. I feel comfortable with all parts of the situation. I'm not scared — but maybe I should be.

No reservations about Unix

La Quinta Motor Inns checks in Xenix-based management system

ON SITE

BY MICHAEL FITZGERALD
CW STAFF

SAN ANTONIO — Between Labor Day 1989 and Mother's Day 1990, La Quinta Motor Inns, Inc. took the locks off of its doors.

La Quinta switched from a proprietary minicomputer-based system to Unix-based microcomputers.

The $200 million 205-inn chain opted for The Santa Cruz Operation's (SCO) Xenix/386 Version 2.3.2 running on Hewlett-Packard Co. Vectra RS/20 Model 154Es.

"We wanted to get into a standard environment, and to our minds, it had become more and more apparent that the Unix world was where everything was moving," said Michael Emmons, director of application development at La Quinta.

The company's configuration, unusual at the time when it was implemented in the summer of 1989, allowed it to keep the advantages of the Texas Instruments, Inc. 990 Model 673 minicomputers it began installing in 1980, when it first became automated.

"We didn't want to have a single point of failure that would shut the system down," Emmons said. The connections are made through a Corollary, Inc. 8x4 Intelligent Terminal Concentrator.

The Vectras serve the same functions as the TI machines: handling customer check-in, cashier functions, room inventory and reservations. Customized programs written for the TI system in Information Builders Microfocus Cobol/2 Version 1.0 have been translated to Xenix,

Ralph Penny/SABA

Hamlett *is pleased with performance thus far*

and the hotel chain is currently in the process of writing new, more powerful applications for the system.

Speed and functionality are the primary benefits La Quinta has seen so far. Each Vectra has 4M bytes of random-access memory. Another 4M bytes of RAM will be added in the near future. The TI machines offered only 64K of programmable RAM, which meant complex trickery was needed to get ever-more-complicated applications to run.

La Quinta estimated that it cost less to install the Vectras — each with three HP 700/44 terminals and three Okidata Co. Model 320 printers, plus bar-code readers and light pens — and translate all its software from TI's proprietary DS/10 environment to Xenix than it would to simply maintain the TI system for seven years.

La Quinta sends reservation and other information from its Unisys Corp. 2200/403 mainframe in San Antonio via a Telebit Trailblazer 19.2K bit/sec. modem. Two Unisys 6050 microcomputers serve to translate the mainframe information into Unix, using Unix to Unix Copy Program, after an earlier choice to use a Unix emulation tool proved ungainly.

Another early glitch was solved when SCO twice rewrote a Xenix device driver so that the Vectra's tape drives would work. The fast-paced installation — eight site conversions per week — went smoothly, with a three- to four-week learning curve.

While it is too early to say how beneficial the systems are, Charles Hamlett Jr., vice-president of information systems, said that applications have been greatly enhanced, including the addition of such features as improved room inventory, more consistent rate changes during promotions and improved sales and marketing tools.

Ralph Penny/SABA

Emmons *aimed for a standard environment*

Hamlett said that within a year and a half, the company will upgrade to SCO Unix, which will allow it to explore DOS functions, X terminals, windowing and color terminals. When the company replaces its Unisys mainframe, it will switch to the Unix environment.

Said Hamlett, "We 100% expect [it] will carry us through this decade."

MICRO BITS

Good Word for Goodwill

The Seattle Organizing Committee (SOC) of the **1990 Goodwill Games** has announced that it will standardize on the following packages: **Microsoft Corp.'s** Word for Windows, Word Version 5.0 for the IBM Personal Computer and compatibles and Word Version 4.0 for the Apple Computer, Inc. Macintosh. The SOC is using over 300 IBM Personal System/2s and several Macs and wants to be able to share documents across different environments.

The **National Education Association (NEA)** said it will include **Microsoft Works** in its IBM PS/1-based NEA Edstar system.

The **University of California at Irvine's** Executives MBA program has embraced the electronic notebook. Starting this fall and continuing throughout the next three years, graduate students entering the program will be outfitted with **Zenith Data Systems'** Minisport HD. The notebook computer will come preloaded with specific courseware, as well as word processing and spreadsheet programs. Faculty will also be issued systems.

Hoboken, N.J.-based **Stevens Institute of Technology**, said to be the first institution to require its students to lease or purchase a personal computer, has selected the **AT&T** 6286/EL and 638SX/EL computers for the incoming class of 1994.

Taco Bell, a unit of Pepsico, has closed an 18-month, $8.2 million contract with **Hewlett-Packard Co.** that covers 1,750 HP Vectra QS/16S Intel Corp. 80386-based PCs, software and printers. HP will install and service the machines in Taco Bell outlets nationwide and will automate back-office functions using 22 configurations of systems software, memory and hard drives. Effective use of the new system is expected to improve food costs by 1% and reduce the time store managers spend on administrative work up to 25 hours per week.

Zylab Corp.'s Zyindex has snagged a couple of government bids. The **Federal Bureau of Investigation** will use the product as a retrieval tool to assist investigators in case management. Support for a variety of word processing formats was a key factor in the FBI's decision. The **U.S. Department of Energy** has standardized on Zyindex for document classification and has used the product to create a user manual in comic book form, customized to its application.

First it was the free copy of the Magellan utility software for Trump Shuttle flyers. Now **Lotus Development Corp.** is teaming up with **Fuji Film**. Between Aug. 15 and Dec. 31, buyers of Fuji floppy disks will receive a trial version of Magellan 2.0. Stored on a free 11th disk, the Magellan sampler will be available in specially marked boxes of Fuji 3½-in. MF2HD and 5¼-in. MD2HD disks. Also included is a $25 rebate coupon good toward the purchase of Magellan 2.0. The package retails for $139.

Pastore

CONTINUED FROM PAGE 45

Craftier buyers will go grab a personal computer magazine and order from a direct-mail firm the same machine they saw in the superstore — for 33% less.

Does this mean the PS/1 will follow the PCjr into oblivion? It's doubtful. Big corporations don't like to make the same mistake twice. The PS/1 was clearly designed with at least some input from real-life people. The graphical user interface that cloaks the dreaded DOS prompt is a welcome inclusion. The built-in modem and the mouse are nice touches for the professional as well.

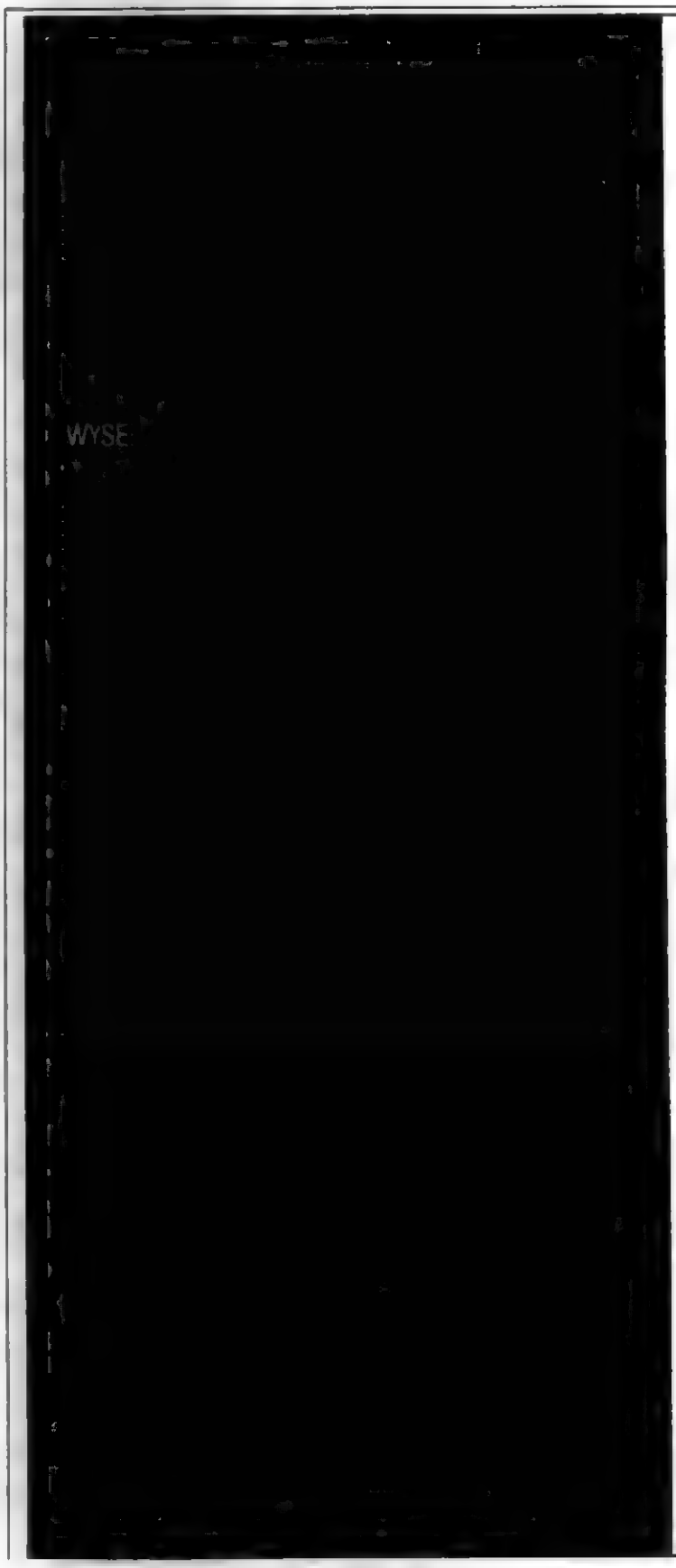
The most buoyant life vest that will keep this machine afloat, however, is its 100% DOS compatibility. If the memory requirements match, you can buy a PS/2 program for your PS/1 with full confidence, IBM claimed. That was hardly the case with the grossly incompatible PCjr.

Yet by making the PS/1 so compatible, IBM is taking a chance that the unit will impinge on its low-end PS/2 sales. This senior line offers more options for monitors, memory, expansion cards and operating systems; however, the two families are basically the same animal from a software standpoint. IBM deserves credit for not insisting on separating the two lines with a frustrating gulf of architectural differences as it did with the PCjr.

IBM executives acknowledged that there could be some cannibalization of low-end PS/2 sales but said they are not worried about any significant impact. Any PS/2 sales losses will be more than offset by PS/1 sales to first-time buyers who would not otherwise have considered any purchase. Pundits predicted 1991 PS/1 sales of 500,000 to one million.

Whether these sales materialize depends on how carefully shoppers look behind the PS/1's sticker price at the nuts and bolts they're getting for their bucks.

Pastore is a *Computerworld* senior writer.



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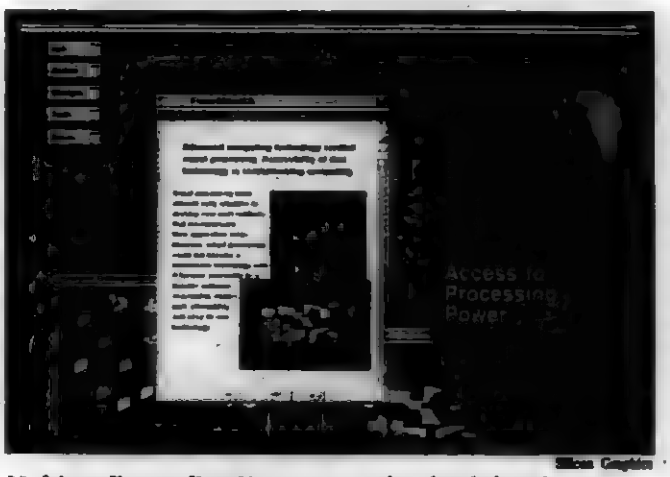
Multimedia

CONTINUED FROM PAGE 43

This legal tangle has spurred people like Arnett and Callahan to call for the formation of a copyright collective along the lines of what the Motion Picture Licensing Corp. does for the film industry or the American Society of Composers, Authors and Publishers does for the music business — provide a central clearinghouse for those who own information and those who would like to use it. "In that way, the user could pay a straight fee to the clearinghouse," Arnett said. "All the negotiations would be done beforehand. There would be no mess."

Until such a framework exists, however, Hare recommended that multimedia producers try to work with large publishing houses where one-stop image shopping can be done. "A place like Time-Life, for instance, can supply you with photos, film clips, nearly everything you need," he said.

Still, experts said that a large amount of people will continue to skip the process of securing copyrights because current social mores tacitly allow it. "We are not a copyright-conscious society," Arnett said. "We tape albums and movies without thinking twice about it."



Silicon Graphics

Multimedia applications *can turn into legal vipers' nests*

With large media conglomerates roaming the land, however, it would only take a few copyright infringement lawsuits to sideswipe the fledgling industry. Conversely, image houses could lock themselves out of a fertile new area if they do not work with multimedia production teams that could make their old properties valuable again.

"There's still an awful lot of work to be done," Arnett said. "Now we just need to do it before the situation gets out of hand."

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*AIM Technology Suite III Benchmark, Dec. 1989

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Wang seeks PC price edge

LOWELL, Mass. — Using price as the bait, Wang Laboratories, Inc. recently unwrapped two high-end personal computers based on Intel Corp. 25-MHz I486 and 33-MHz 80386 chips.

Starting at $8,595, the I486-based Wang PC 480/25C includes cache memory, a memory management unit and a floating-point processor built into its microprocessor. The unit's pricing is said to be comparable to that of Compaq Computer Corp.'s 33-MHz, 386-based Deskpro.

The Wang PC 350/33C features a 33-MHz, 386-based central processor, a chassis with a small footprint and costs $5,395 for a base unit. That pricing is comparable with many 25-MHz, 386-based PCs, Wang claimed.

Despite Wang's efforts to touch off a price war in what is mostly a DOS and OS/2 market, it is targeting the 480/25C at server, multiuser Unix host and technical workstation markets as well as at stand-alone users.

Wang said its 486-based box is sufficiently powered to handle the demands of multiuser computing and provides the flexibility needed to accommodate the large-capacity disk drives required by Unix users.

For example, the PC 480/25C employs 70-nsec standard single LU line memory modules to boost processor performance. All system memory is located on a single plug-in card to simplify memory upgrading and configuration.

The 480/25C base unit includes 4M bytes of memory, an on-chip 8K-byte cache memory, an on-chip numeric coprocessor, an eight-slot chassis with one parallel and serial port, a 1.2M- or 1.44M-byte disk drive and a keyboard.

The PC 350/33C base unit offers 1M byte of main memory, a 64K-byte cache memory, a six-slot chassis with one parallel and two serial ports, a 1.2M- or 1.44M-byte disk drive and a keyboard.

Both systems can support up to 16M bytes of memory.

To enhance system power and versatility, both systems can copy the BIOS and video programs from read-only memory into 32-bit random-access memory to speed up their operations, according to Wang. The PC 480/25C also caches the BIOS to increase system speed even more.

NEW PRODUCTS

Software applications packages

Computervision has announced Revision 4.0 of Microdraft, a two-dimensional design, drafting and detailing software package.

The product is available for personal computers running a DOS extender or Sun Microsystems, Inc.'s Sparcstation 1 workstation. Features include a library of commonly used cross-hatching patterns, the ability to use multiple text fonts with a single drawing and within one line of text and a utility that enables users to locate and remove all zero-length entities from a database in a single pass, according to the company.

Microdraft has a list price of $2,950.

Computervision
100 Crosby Drive
Bedford, Mass. 01730
(617) 275-1800

Structsoft, Inc. has announced Turbocase 2.0, an enhanced computer-aided software engineering program that runs on Apple Computer, Inc. Macintosh systems.

The software package includes a graphical interface with pop-up menus and an implementation of data modeling that features data-object behavior modeling (object-oriented analysis), which provides state transition diagrams for modeling the life cycles of data.

Turbocase 2.0 costs $995.

Structsoft
5416 156th Ave.
Bellevue, Wash. 98006
(206) 644-9834

Software Publishing Corp. has announced an upgraded version of its business presentation graphics software package.

Harvard Graphics 2.3 integrates Draw Partner, a high-end drawing accessory, and introduces Hypershow, a feature that allows business users to customize the flow of a presentation during a screen-show delivery.

Harvard Graphics 2.3 for IBM Personal Computer XTs, ATs, Personal System/2s or compatibles costs $495. A local-area network version, Harvard Graphics 2.3 LAN, requires a network server with a hard disk, 640K bytes of memory and DOS 3.1 or higher.

Pricing ranges from $375 to $1,875, depending on configuration.

Software Publishing
1901 Landings Drive
Mountain View, Calif. 94039
(415) 335-6440

Macintosh products

White Pine Software, Inc. has announced an upgrade to its series of terminal emula-

Laptop users get longer life

BY CHARLES VON SIMSON
CW STAFF

BOTHEL, Wash. — Traveling Software, Inc. recently upped the ante in the laptop battery maintenance war. The company's new deep discharge feature will be a welcome relief to any user plagued by his system's blinking red light.

The deep discharge function bypasses the voltage spike that signals the system when a Nicad battery is running out of power. That bypass is necessary because if, for example, a four-hour battery is consistently recharged after one hour of use, the computer "learns" to signal the battery monitor that the battery is near depletion after just one hour, making gauges of remaining power useless.

The new software overrides that process and, as the battery weakens, sheds certain power loads to pieces of the system, such as modems or disk drives, until it is simply maintaining the power required to run the CPU. At this point, it signals the system's low battery monitor.

"The laptop catch-22 is that the system will shut itself down, making it impossible to completely drain the battery," said Mark Eppley, president of Traveling Software. "The deep discharge function will eliminate the need to either get a new battery all the time or hire a technician to drain the old one."

Traveling Software is the leader in battery monitoring software, supplying systems for 40 laptop vendors including NEC Corp., Toshiba America, Inc., Dell Computer Corp. and Sharp Electronics Corp.

Digital Research, Inc. (DRI), a Mountain View, Calif.-based supplier of DR-DOS, a clone of Microsoft Corp.'s DOS operating system, also announced recently that it would bundle battery-monitor and power-saving software with its version of DOS. DRI's Battery Max software does not have the deep discharge feature.

Both firms market systems that sense active keystrokes and reduce power to the CPU if the system is not active. This type of software can improve battery life by up to 50% on certain machines. DRI only sells its Battery Max feature bundled in its DR-DOS product. DR-DOS is available either direct from the company or bundled with some-clone laptops. Traveling Software's Battery Watch is available from dealers for $49.95.

tors designed for Apple Computer, Inc. Macintosh systems.

Version 3.1.2 is part of a family that includes the Mac220, Mac240 and Mac241. The product includes a Telnet interface and requires that Apple's Mactcp be installed on the Macintosh system.

The product also offers support for Apple's Communication tool box, 1K byte X modem transfers and Y modem batch transfers.

Version 3.1.2 is available for an upgrade fee of $50.

White Pine Software
P. O. Box 1108
94 Route 101A
Amherst, N.H. 03031
(603) 886-9050

Development tools

Microport, Inc. has announced Formula One System/4, a software package that consists of a complete binary distribution of AT&T's Unix System V, Release 4.

The product serves as an environment for developers who need AT&T certification and who work on networked application and development platforms such as Ethernet networks, according to the vendor.

Formula One System/4 is available to qualified software and hardware developers for $2,500 per copy. A free upgrade for the first commercial release of the product, which is scheduled for November, is included with the current price.

Microport
30 Janis Way
Scotts Valley, Calif. 95066
(408) 438-8649

Cadre Technologies, Inc. has introduced a line of software analysis tools designed for developers working on 8-, 16- and 32-bit microprocessors.

The products include the SFA1000 ($10,500) for performance analysis, the SAW2000 ($15,850) for software debugging and performance analysis on 8- and 16-bit machines and the SAW3000 ($19,500) for 32-bit devices.

The company has also announced Taskview, an Ada debugging, analysis and integration tool that enables developers to analyze performance at the system state and task levels and display dynamic run-time data. Taskview costs $4,500.

Cadre
P.O. Box 1309
Beaverton, Ore. 97075
(800) 547-4445

Data storage

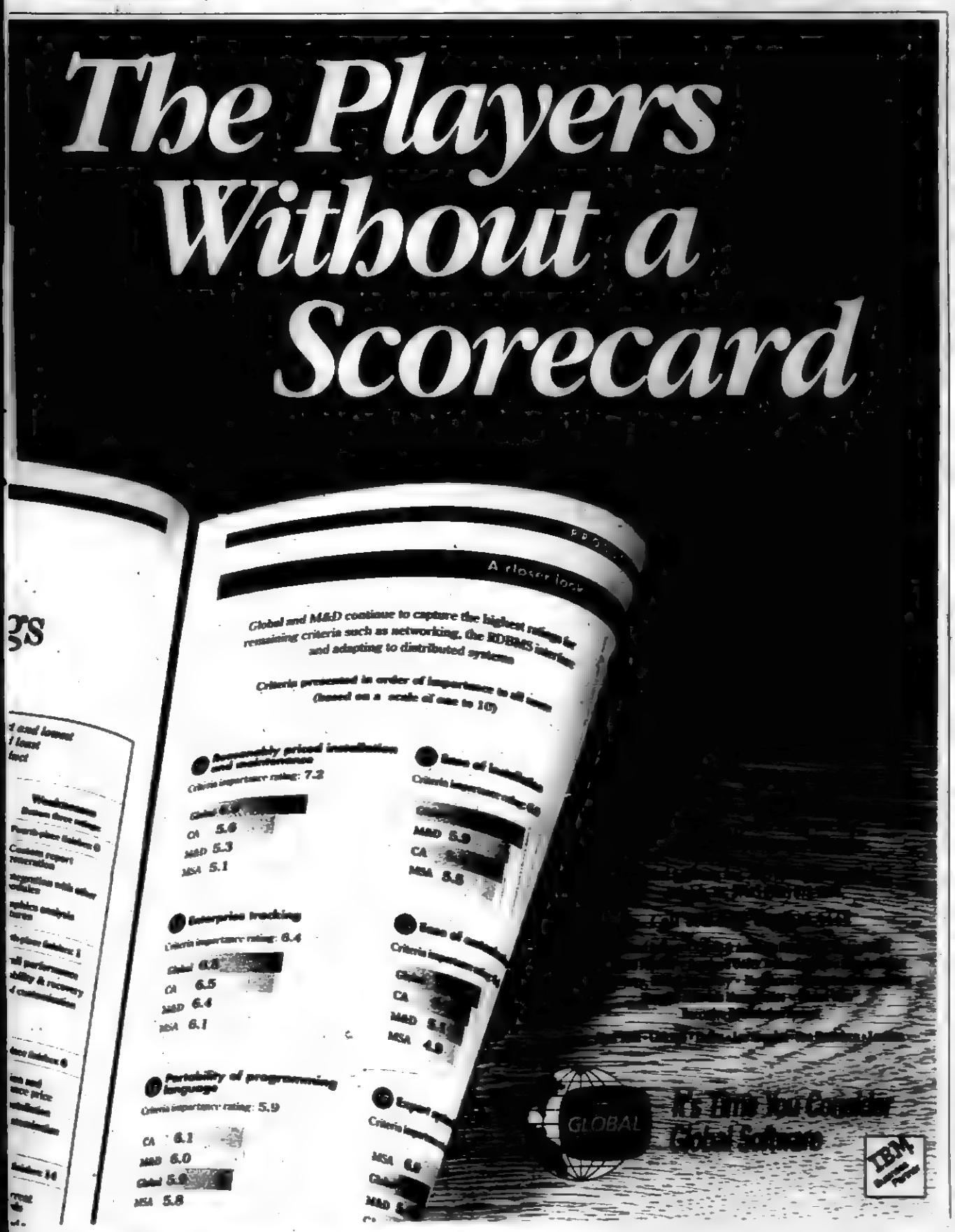
A DOS-based backup product designed for corporate and professional users has been announced by Peter Norton Computing, Inc.

The Norton Backup includes an automated backup interface and a Master Catalog feature, which permits multiple versions of backed-up files to be selected and restored. A Backup Cycle control feature enables users to automatically switch between full and partial backup at predefined frequencies.

The product runs on any IBM Personal Computer, XT, AT, Personal System/2 or compatible with DOS 3.1 or higher versions.

It is priced at $149.

Peter Norton Computing
9th Floor
100 Wilshire Blvd.
Santa Monica, Calif. 90401
(213) 319-2000



Zenith unveils last of its 286s

BY MICHAEL FITZGERALD
CW STAFF

MOUNT PROSPECT, Ill. — Zenith Data Systems last week unwrapped the last Intel Corp. 80286-based desktop machine it will ever make. But this one, the Z-286 LP Plus, rolled out with a twist — a pop-in, pop-out daughterboard said to ease and enhance upgradability.

"In the short term, this is our last 286-based machine for the desktop," a Zenith spokesman said. "We may find some esoteric market that will lead us to make [other 286 systems], but at the moment, we expect that it's our last one."

Unlike previous Zenith models, this 286-based personal computer can be easily upgraded to an Intel 80386SX chip.

Citing statistics showing that some seven million 286-based machines will be sold worldwide in 1990, LP Plus product manager Rusty Graham said: "While today the 286 is a pretty viable market, we expect that in about two years the SX will become the mainstream type of computer."

Previous Zenith computers have featured the processor and the coprocessor soldered onto a system board. The LP Plus has installed these same components onto a small daughterboard that can be popped on and off the main system board. A plug-in upgrade can reportedly be completed in less than five minutes. Graham claimed the LP Plus upgrade option "will give customers an easy transition."

The LP Plus comes with IBM's Video Graphics Array video, 1M byte of random-access memory, three expansion slots and a 1.44M-byte 3½-in. disk drive. It is also available configured with either a 20M-byte or 40M-byte hard drive. It runs at 12 MHz, compared with the 16-MHz upgrade. Pricing of the new machine ranges from $1,999 to $2,699. The upgrade card retails for $599.

Telecommuting

CONTINUED FROM PAGE 43

not always as cut-and-dried as they are in the corporate office.

Working from home can translate into additional expense and inconvenience to those who telecommute: "I love doing this," says Colleen Clark, an engineer at US West in Denver, who has been telecommuting for nearly five years, "but you do have to make a few concessions." Concessions can include a long wait for new equipment, slow access to the office systems and expenses such as buying and repairing personal computers.

The amount of money an organization is able to spend on telecommuting can have a lot to do with how much systems support a user will get, observers say.

> "IT'S SO EXPENSIVE to set someone up at home with everything they have in the office that we haven't been able to do that for anyone yet."
>
> JOHN GABRIEL
> WASHINGTON STATE ENERGY OFFICE

Support at Levi Strauss

Levi Strauss & Co. in San Francisco is running a pilot telecommuting program in its information resources group, where about 30 people have been telecommuting since January. The company installed separate phone lines for voice and data for each telecommuter as well as a PC and a facsimile machine. It also provides call forwarding off its private branch exchange and has a contract with TRW, Inc. for support of PCs and peripherals that extends to the home offices.

The company says there is an eight-hour turnaround time for repairs to equipment at home offices.

The objective was not to cut cost, according to Gevenie Delsol, director of business communications at Levi Strauss. "We're just trying to provide a better business climate. The aim was to duplicate an office environment as closely as possible."

The Washington State Energy Office in Olympia, Wash., has also instituted a pilot telecommuting program as part of a two-year state telecommuting project it is coordinating. The in-house program involves about 30 people. But unlike Levi Strauss, would-be participants who need a PC have to buy it themselves. Loaners are available but are limited in number and given out on a lottery basis. The loaner equipment consisted of four Hewlett-Packard Co. Vectra 286/12 machines that were available for a year in conjunction with the state project.

A few Zenith Data Systems and Toshiba America, Inc. office laptops that had been used by employees attending conferences are also available to be checked out on an as-needed basis when not needed by conference attendees.

"It's so expensive to set someone up at home with everything they have in the office that we haven't been able to do that for anyone yet," says John Gabriel, coordinator of the Energy Office's program. "As a state agency, it's particularly hard for us to justify the expense."

Marilyn VanArkel is one of the telecommuters who made the decision to buy a PC. "Almost all of my work is done on my computer. I figure it was an investment, and I might as well have the equipment I need," she says.

State support

Gabriel's office will provide support for the four Vectras, although users will have to bring them into the central office for service. Telecommuters who own their own equipment are responsible for paying for their repairs.

Because the agency is providing word processing and spreadsheet software to the telecommuters, it will care for anything that goes wrong with the software.

Requiring employees to buy their own PCs creates a financial barrier for some would-be telecommuters, says Gil Gordon, president of Gil Gordon Associates, a Monmouth, N.J.-based consultancy specializing in telecommuting issues. "If the budget is tight," he advises, "why doesn't [a firm] . . . buy a limited number of laptops and lend them out?"

A loaner program can go a long way when setting up a telecommuting program on a limited budget, he adds.

'Mixed bag'

At the California Department of General Services, which is completing a two-year telecommuting pilot program involving approximately 150 people from several different state agencies, who pays for what is a matter of agency discretion.

"It's a mixed bag," says David Fleming, telecommuting program manager. "We had some agencies that said, 'If your telecommuting tasks require a PC, then it will be up to you to provide your own computer.' Others said they would provide a computer if you telecommute three or more days a week."

As with Washington's State Energy office, the PC owner is the one who takes care of maintenance and repairs.

Fleming, who telecommutes using a computer owned by the state, says that if he has a problem, he can contact his office to send an in-house staffer to his home or he can swap out the PC on one of the days that he goes into work.

Al Jacobus at the telecommunications division of the Department of General Services also telecommutes four days per week. While he is entitled to bring his state-owned PC home, he prefers the computer he already has. Thus, maintenance and repair are up to him.

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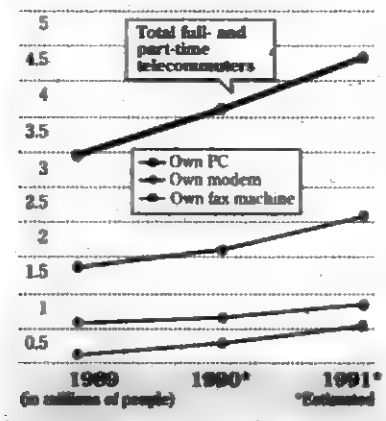
Many companies' telecommuting programs evolve out of more casual arrangements, in which full-time staffers start out by doing extra work on their home PCs and end up working from their homes on a more formal basis. This evolution can blur the lines of support between users and the company.

Home away from business

The number of telecommuters importing equipment into the home is on the rise



Source: Link Resources CW Chart: Paul Mock

Such is the case at Farallon Computing, Inc. in Emeryville, Calif. "Our program is not formal. It definitely just evolved," says Mark Vinsel, Farallon's network manager. Most of Farallon's telecommuters already had machines at home, so the firm provided them with 9.6K bit/sec. modems to tie them into the company's network.

Support is a matter of geography. "If they are a long way away, they have to get local service. But if they are close by, they can bring it in, and I'll swap it," Vinsel says. Farallon picks up the support cost. "[For] Farallon employees using our equipment, we would pay to fix it," Vinsel says.

As more people get involved in a telecommuting program, support issues are likely to crop up more regularly, consultants say.

At the Department of General Services, the level of support for state-owned machines can depend on the employee's computer knowledge. Jacobus installed his equipment himself, "but for people who are not computer literate, [office support staff] will go out, set up the computer, load all the software and get the person going." Installation of state-owned equipment is free.

Western policy

At US West, employees usually install their own equipment, which is provided by the company, says Mike Dillon, who oversees the firm's telecommuting policy. "We don't really have a support group that goes out to the homes to set them up," he says, "but the vast majority of the commuters at US West are in the data computing field and are probably very familiar with the equipment they're dealing with."

That doesn't extend to repairing the equipment, however. US West has telecommuting programs set up at several divisions. Where there is an internal PC repair group at the division, employees can bring in their machines for repair at the company, or a staff member will make a house call. Dillon says that telecommuters at divisions without such staffing can take any repair problems to the local provider previously agreed on by the company. US West bears the cost of the repairs in each case.

Home ties

Another stumbling block for telecommuters can be the ease — or lack thereof — with which they are able to gain access to the corporate office.

To avoid this problem, Levi Strauss chose to install 9.6K bit/sec. modems for its telecommuters. The 2,400 bit/sec. modem "would have made it too obvious that you were working at home," Delsol says. "It would have made it hard for some of the programmers who are on the mainframe a lot."

US West's Clark says her home modem is a 2,400K bit/sec. model, "but in the office we're on 9.6K, so there's a big difference," she says.

Even with the high-speed modems, Levis Strauss did run into trouble with transmission quality. To fix the problem, it worked with Pacific Bell to install data-quality lines, which reduce data errors and the number of retransmissions necessary on the line.

For Washington's Energy Office, the problem with access turned out to be with its packaged communications software,

> "OUR PROGRAM is not formal. It definitely just evolved."
>
> MARK VINSEL, FARALLON

which was "very complex and not really user-friendly," Gabriel says. So the company is developing software in-house that should take care of telecommuters' needs in a much simpler manner. Gabriel says that most of the telecommuters only need to use electronic mail or send and retrieve files and do not need sophisticated communications software.

Gabriel says the software development effort was born when his director nearly lost several weeks' worth of work because of a transmission glitch. "He said, 'That's it. If we can't buy it, we'll create it.' "

In spite of the drawbacks, most telecommuters say they enjoy their situation. According to General Services' Fleming, the key to telecommuting is accepting some give and take.

"The idea with this is not to standardize everything down to the nth degree. Let it work for you, be flexible."

VanArkel finds telecommuting worth the effort, too. "I really like telecommuting," she says. "I find that there are things to be worked out, but they're certainly worth the effort."

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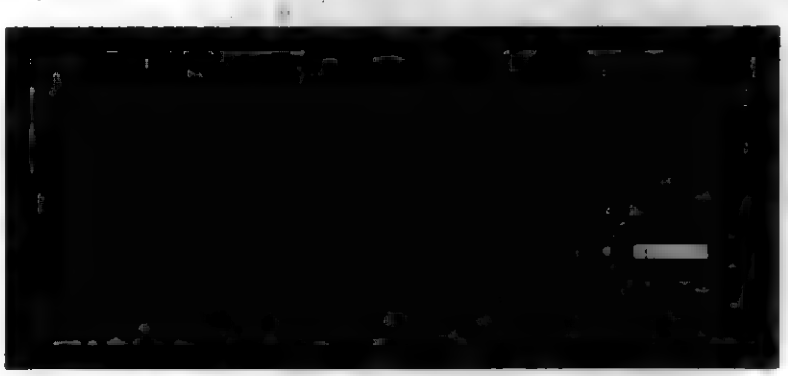

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COMMENTARY

Ellis Booker

EDI in demand

Taking matters into their own hands, top retailers, car makers and insurance companies are telling their trading partners with increasing intensity to ramp up their electronic data interchange (EDI) capabilities.

With varying degrees of stridency, all have told their trading partners that EDI is a good thing, that standardized electronic interfaces promise to improve efficiency by cutting out the administrative overhead required to process paper forms. Electronic messaging, they add, reduces errors, speeds up turnaround times and (in the case of retailers) could reduce the size of inventories in stores.

But there is another reason for the drive to EDI. I suspect that all big, progressive companies, known in EDI parlance as "hubs," realize that the old modes of doing business with consumers are going to change.

Already, savvy (i.e., computer-literate) consumers can access an on-line information network — say, the Prodigy service from IBM and Sears, Roebuck and Co. — and order a dizzying array of goods. All you need is a credit card.

What happens to these high-tech orders on the receiving end, however, is anybody's guess. For example, apparently a number of companies, not all of them small, take incoming EDI orders from their customers, print them out and then traffic

Continued on page 58

The little protocol that could

For three years, EDI has been chugging its way into the railroad industry

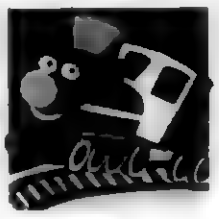
BY JIM NASH
CW STAFF

It was poet lariat Will Rogers who said: "Even if you're on the right track, you'll get run over if you just sit there."

Heeding those words two generations later, the railroad industry embraced electronic data interchange (EDI). In 1987, most major rail companies had dial-up services that customers could use to trace the location of their equipment as it was hauled across the country.

There was a hitch, though. Goods transported by rail are often pulled by several rail companies, each with its own tracing software. The only way to locate equipment was to dial up each railroad company with the appropriate micro-to-mainframe software. Customers were left with the time-consuming task of contacting several firms each day.

Susan Sowerby, office manager at Delta Tank Line Co. in Longview, Texas, said it took her 45 minutes each morning to call up each rail company to keep tabs on Delta tank cars.



"Shippers were saying, 'I just want to key in quickly and find out where my equipment is,' " said Judy Martin, manager of customer support at Burlington Northern Railroad. "I don't think we knew we did it so differently," Martin said of the railroad tracking systems.

Three years ago this month, 14 major North American rail companies gathered as a task force to discuss ways of hurdling protocol barricades for customers. Martin was sent to represent Burlington Northern.

She said defining specifications for software opened the association's eyes. "It helped us appreciate the frustration the customers were experiencing," she said. There seemed no way to reconcile the protocol differences in the industry.

The task force detailed these differences, along with what a generic tracing software package should hold for customers. It then handed the specs over to the Association of American Railroads (AAR), which would find a software developer.

This was where the plan derailed. Specs were drawn up, but in 1988, the AAR's legal staff balked, saying the association risked an antitrust suit if rail companies bought the software from only one vendor, Martin explained. Virtually all activity on the matter stopped, she said. Navigating the protocol problem seemed too daunting for many railroad executives to deal with individually, according to Martin, including some at Fort Worth, Texas-based Burlington Northern.

Many looked at their bottom lines and figured the matter was best left for dead, Martin said.

The prevailing argument at Burlington Northern, however, was that too much time and money had been put into it to abandon the project. Executives bet that a feasible protocol solution could be found and that the company might gain a goodwill bene-

Continued on page 60

Network's network links CBS coast to coast

ON SITE

BY JIM NASH
CW STAFF

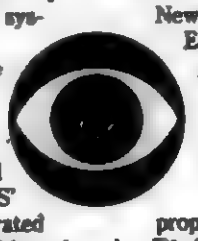
Linking anchorman Dan Rather with *The Young and the Restless* means more than sending the newsman to cover spring break in Palm Springs, Calif.

CBS has finished upgrading its coast-to-coast computer network with Newbridge Networks Corp. 3600-series T1 multiplexers. Last week, it completed the process of tying together its corporate offices — including the New York studio used for Rather's broadcasts and the Los Angeles studios used to tape two soap operas.

The television network is now moving on T1 connections between CBS' largest TV stations. Beyond that, said Tom Maile, vice-president of telecommunications at CBS, lies the possibility of connections to European broadcast companies.

Maile said the Newbridge multiplexers are replacing the network's aging Amdahl Corp. point-to-point multiplexers for transmitting data. Long-term plans call for including voice and facsimile transmissions. He declined to say how much the new system cost or when its payback is expected.

Herndon, Va.-based Newbridge has installed Mainstreet T1 Bandwidth Managers in CBS' New York broadcast center and headquarters, its Secaucus, N.J., data center and its Los Angeles studios and broadcast center as well as its Washington, D.C., news bureau. Two 4602 Mainstreet Networkstations, one each in New York and New Jersey, are managing the system.



The second phase begins in January 1991, connecting TV stations in Chicago, Philadelphia, Miami and St. Louis, four of CBS' largest owned and operated stations. Spare bandwidth on the network's broadcast signal will send information to CBS affiliates, Maile said.

While there are no plans to tie into Canadian stations, Maile said, network executives are looking at possible links to European broadcast companies. CBS has won contracts to televise the 1992 and '94 Olympics in France and Norway, respectively — which, Maile said, highlighted one of Newbridge's strong points.

He said that although competitive pricing was a primary concern in awarding the contract to Newbridge over Network Equipment Technologies, Inc., Timeplex, Inc. and other multiplexer firms, standardization was also key.

"Newbridge is not proprietary," Maile said. "It has T1, fractional T1, and other features based on [CCITT] standards." Mainstreet, for example, is already configured for the European counterpart to T1, he said. What's more, the equipment accommodates U.S. and European power supplies.

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Telecom users root against underdogs

As power of AT&T slips, users call for controls on increasingly powerful Sprint, MCI

ANALYSIS

BY GARY H. ANTHES
CW STAFF

Some of the nation's largest telecommunications users are applauding proposals to loosen regulatory reins on AT&T while simultaneously calling for tighter controls over MCI Communications Corp. and US Sprint Communications Co., the No. 2 and No. 3 players in the $50 billion long-distance marketplace.

In comments filed recently with the Federal Communications Commission (FCC), some consumers of telecom services called for greater public disclosure to MCI and Sprint contract prices, while others suggested that some of the rules that have constrained the former Ma Bell since its 1984 divestiture might reasonably be applied to its increasingly powerful competitors.

Since the breakup of AT&T six years ago, the telecommunications giant has seen a steady erosion of its market share, particularly at the high end of the services market. Meanwhile, the financial and technological prowess of its competitors has grown dramatically.

Heightened competition

In response, the FCC recently concluded that competition in long-distance voice and data services had increased to the point that many of the regulatory constraints on AT&T could be phased out. In addition, the commission found the high-end business services market to be especially competitive.

Users generally supported gradual relaxation of controls on business services, saying that deregulation stimulates competition and leads to lower prices and better service.

"The FCC is striking the right balance and proceeding at about the right pace," said John Lynn, telecommunications counsel at Electronic Data Systems Corp.

However, some users who are enjoying the benefits of lower prices and more choices said that they see a dark lining in the silver cloud of divestiture.

As the market shares of MCI and Sprint increase, so does the possibility that they could engage in the unfair practices long attributed to AT&T, the users said.

A group of the nation's largest financial institutions has banded together to call for reduced regulation for AT&T as well as a simultaneous boost in scrutiny — if not in controls — of AT&T's competitors.

Henry D. Levine, a Washington, D.C.-based attorney for the group, said he would require all long-distance carriers to file tariffs — public notices of prices and services — for customer-specific services, typically the custom deals made for voice and data networks for large customers.

That would put AT&T on an equal footing with MCI and Sprint, but not the footing suggested by the FCC.

One FCC proposal would permit AT&T to negotiate private contract rates rather than submitting to a lengthy process of price disclosure and justification. Levine's proposal would accomplish the same streamlining but would open all prices to public scrutiny.

Levine said he is not proposing to regulate AT&T's competitors. He would simply impose a notification requirement that makes comparison shopping for network services easier.

In its request for public comments in March, the FCC asked whether it should relax controls on AT&T's provision of enhanced services, such as electronic mail and credit-card authorization, as well as whether it should ease its rules against the bundling of services and equipment.

Adapso, a computer software and services trade association, strongly urged the FCC to leave in place the safeguards intended to protect other providers of enhanced services that use AT&T circuits, many of whom are Adapso members.

Follow the leader

Adapso called AT&T, MCI and Sprint an oligopoly in which AT&T erects umbrella prices to which the junior members peg their rates. Adapso also alluded to a "behavioral umbrella" that influences the practices of MCI and Sprint.

The trade association's FCC filing said, "Adapso is very concerned that if the commission were to relieve AT&T of its . . . obligations and AT&T were to discriminate against its enhanced services competitors, MCI and Sprint are just as likely as not to respond by following suit."

Adapso said that the FCC should not relieve AT&T of its controls but should consider requiring the same or similar safeguards of MCI and Sprint.

Charles Helein, general counsel for America's Carriers Telecommunications Association, said, "When AT&T burps, [other carriers] adjust prices accordingly. MCI and Sprint have always dovetailed with AT&T."

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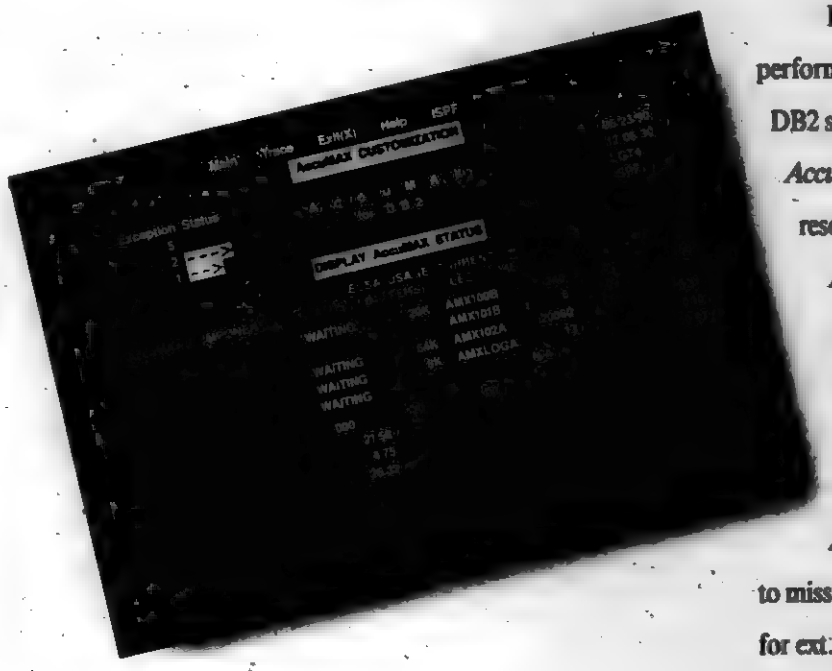

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Finding foreign fingers in standards pie

BY ELISABETH HORWITT
CW STAFF

LUXEMBOURG — The European Community is moving to simplify conformance testing of networking products for its member nations, but U.S. equipment vendors are concerned about losing control of the conformance certification process to a government body.

A recent meeting of Council of Telecommunications ministers achieved consensus on a proposed directive that would give equipment vendors the right to sell to all 12 Common Market nations if their products pass conformance tests administered by just one of those countries. Currently, each country administers its own tests to ensure that equipment complies with protocols for interfacing with its own public networks. The proposal is now set for approval at a future council meeting.

While applauding the commission's overall goals of "harmonizing standards" and providing "uniformity of testing," the Computer and Business Equipment Manufacturers Association (CBEMA) said it opposes making standards conformance testing "a government-run process."

"There is a trend now in Europe to use voluntary standards as the basis for procurement regulations and requirements, and that could amount to a nontariff trade barrier so easily," CBEMA spokeswoman Mary Ann Karinch said.

However, Frank Dzubeck, president of Washington, D.C.-based consulting firm Communications Network Architects, Inc., said he believes that by "providing one point of testing for selling to European markets," the directive would finally open up overseas countries to smaller vendors that cannot afford a country-by-country testing process.

In particular, the local-area network and bridge markets should experience "hellacious growth" in Europe, as vendors such as 3Com Corp., Wellfleet Communications, Inc. and Cisco Systems, Inc. take advantage of the lower cost entry barriers, he added.

The "one-stop conformity checks" proposed by the directive would "mark a significant step toward the single European market" and make "a variety of telecom terminals more widely, cheaply and rapidly available to users," the commission said.

The directive can only work effectively, however, if the commission achieves a related goal of widespread support of telecommunications standards — such as Integrated Services Digital Network — throughout the European Community.

Setting up European administrations as standards certification authorities also poses a number of logistical questions, Karinch added, such as the number of test facilities there would be. Furthermore, if a certification backlog developed, the question would arise as to which gets tested first — European or non-European vendors.

"Obviously, a product has to be approved for use in the country where we want to use it" so that it will interface with the national network and "be maintainable by the local organization," said John Puckett, manager of technical operations at The Foxboro Co., a Foxboro, Mass.-based international manufacturer. Such approval processes can be difficult and lengthy, Puckett acknowledged, "and in some instances there are long backlogs" at test facilities.

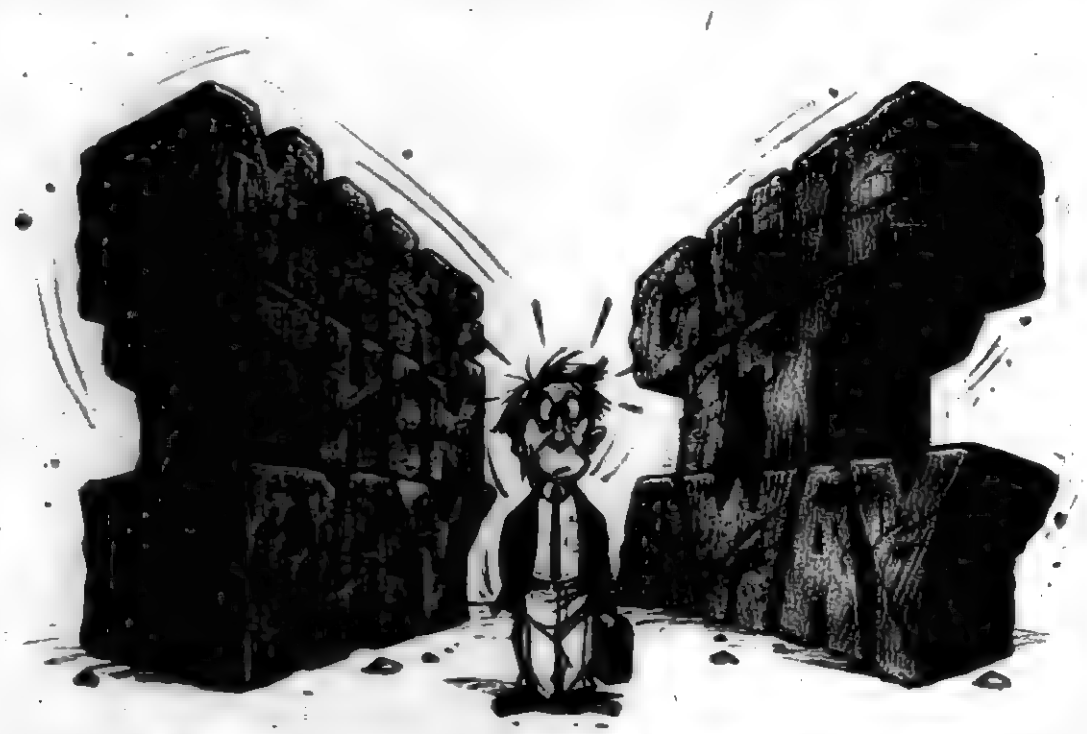
IF A CERTIFICATION backlog developed, the question would arise as to which gets tested first — European or non-European vendors.

CBEMA advocates uniform testing for conformity, "but we want it to remain in the hands of the manufacturers," Karinch said.

Users benefit if vendors provide their own standards certification, she added, because vendors are then legally liable if a product does not turn out to conform to specifications.

The U.S. networking industry has already shown decreasing dependence on conformance testing by organizations such as the Corporation for Open Systems, said Peter Sevcik, president of Sevcik Consulting. "It has not become as big a deal as people thought it would; people are getting by without it," he said.

However, apparently not all users trust vendors to provide reliable standards compliance on their own. At The Foxboro Co., "we like to do our own conformance testing in a pilot environment before we begin implementing, because we find that what vendors publish about conformance testing and specifications is not always true," Puckett said.



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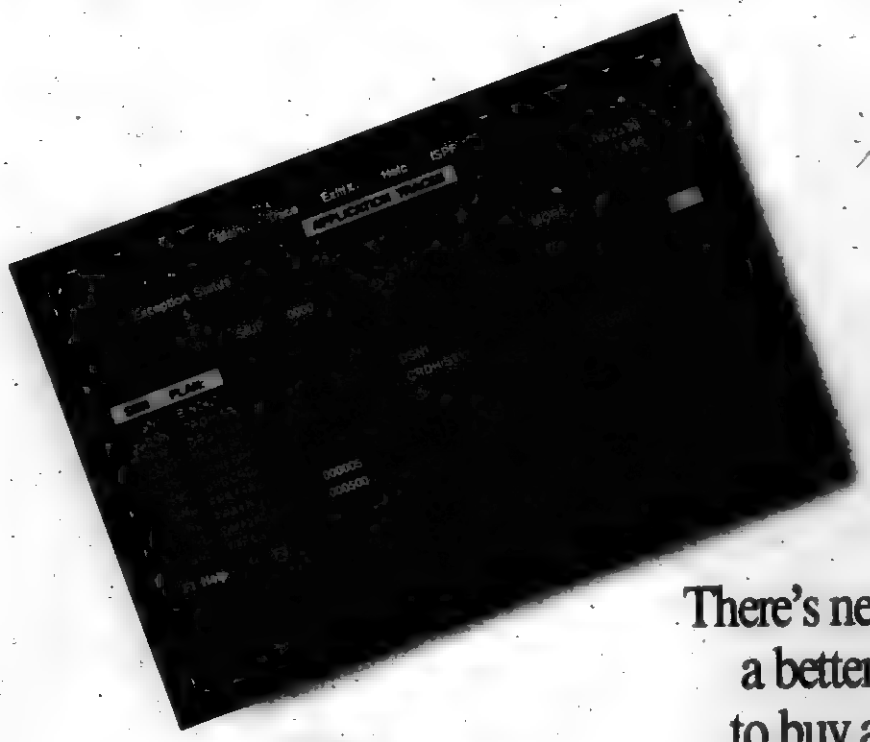

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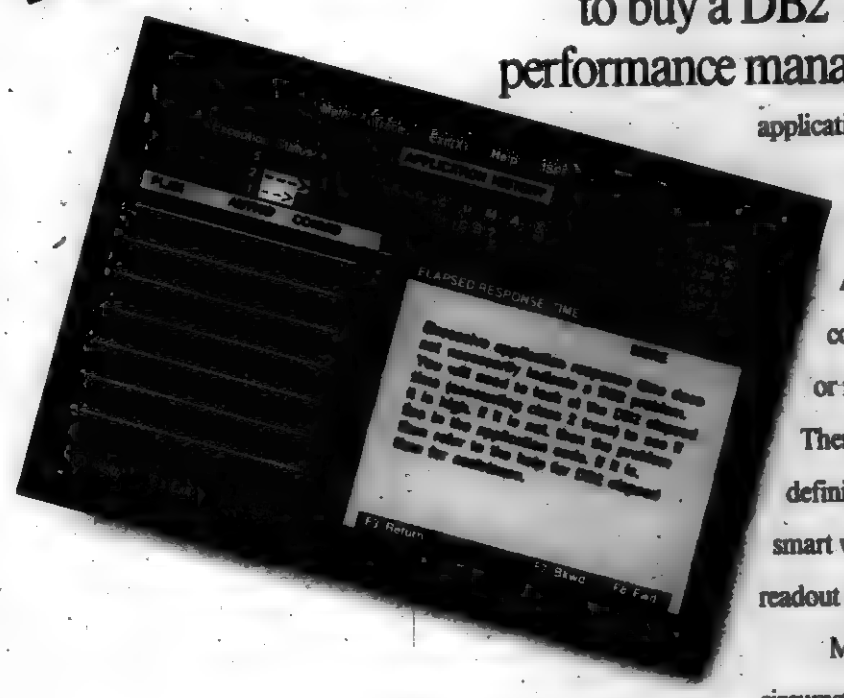

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VSAT industry seeks a few new niches

BY JOANIE M. WEXLER
CW STAFF

FRAMINGHAM, Mass. — Like the saturated private branch exchange and T1 markets, the very small aperture terminal (VSAT) industry will require resuscitation by new market niches, including smaller businesses and those expanding globally, according to a report from industry research firm International Data Corp. (IDC).

VSAT networks, which allow direct satellite communications, generally consist of one large, central station with any number of remote VSATs. VSATs use small 1- to 2-meter dishes, usually located on rooftops.

IDC estimated the total market for VSAT equipment and services for 1989 at $700 million and predicted it will increase to more than $1 billion in 1991 and to $3.37 billion by 1994.

However, the research firm said the expanding market will grow by decreasing percentages because of lower equipment prices caused by competition and lower sales volume generated by smaller customers. Also, VSAT vendors will increasingly operate hubs that can be shared by their customers, which will decrease service costs.

The report pegged VSAT customers as those with high data transmission requirements that tax the dial-up network; those generating large, random data file transfers that do not require dedicated leased lines; and those requiring point-to-multipoint data transmission.

The IDC report editor and primary researcher, Caroline J. Michel, added that VSATs can come in handy as a backup alternative. "Having one terrestrial route and one in the air is safer for mission-critical applications," she noted. "If both alternate routes are in the ground and travel the same general path, the same earthquake will likely knock out both."

Booker

FROM PAGE 53

these pieces of paper as they would any invoice.

However, the notion of making EDI work from the start of the process to the end is going to happen — and may be happening in limited instances even today.

In theory, it will mean that when a consumer dials up the food specialty department of her favorite store to order a nonstick slotted spoon, this request will be transferred to the store's inventory department. If the item isn't in stock, the message will continue on its journey, first to the supplier, which in turn will message its manufacturing plant in Nebraska. There the message, having traversed miles of territory and many computer systems, will be reformatted by a factory-floor controller that runs a slotted spoon die press.

The hubs want to be ready for this world of end-to-end EDI, so they are selling the concept in the meantime to their trading partners in terms of local, relatively limited benefits. Alas, if the hubs were honest, they'd admit that an EDI interface is only the tip of the iceberg.

If the slotted spoon scenario above is accurate, it means the movement toward EDI will require many more fundamental changes to the way information systems are used inside and across enterprises.

Dave Reberry, vice-president of systems engineering and development at US West Advanced Technologies, the research and development arm of the Denver-based regional holding company, recently talked about getting value from IS this way: "For example, all our billing systems have been built around certain assumptions about how you do business with the customer. Going forward, a lot of these assumptions are no longer going to be valid."

Booker is *Computerworld's* Chicago bureau chief.

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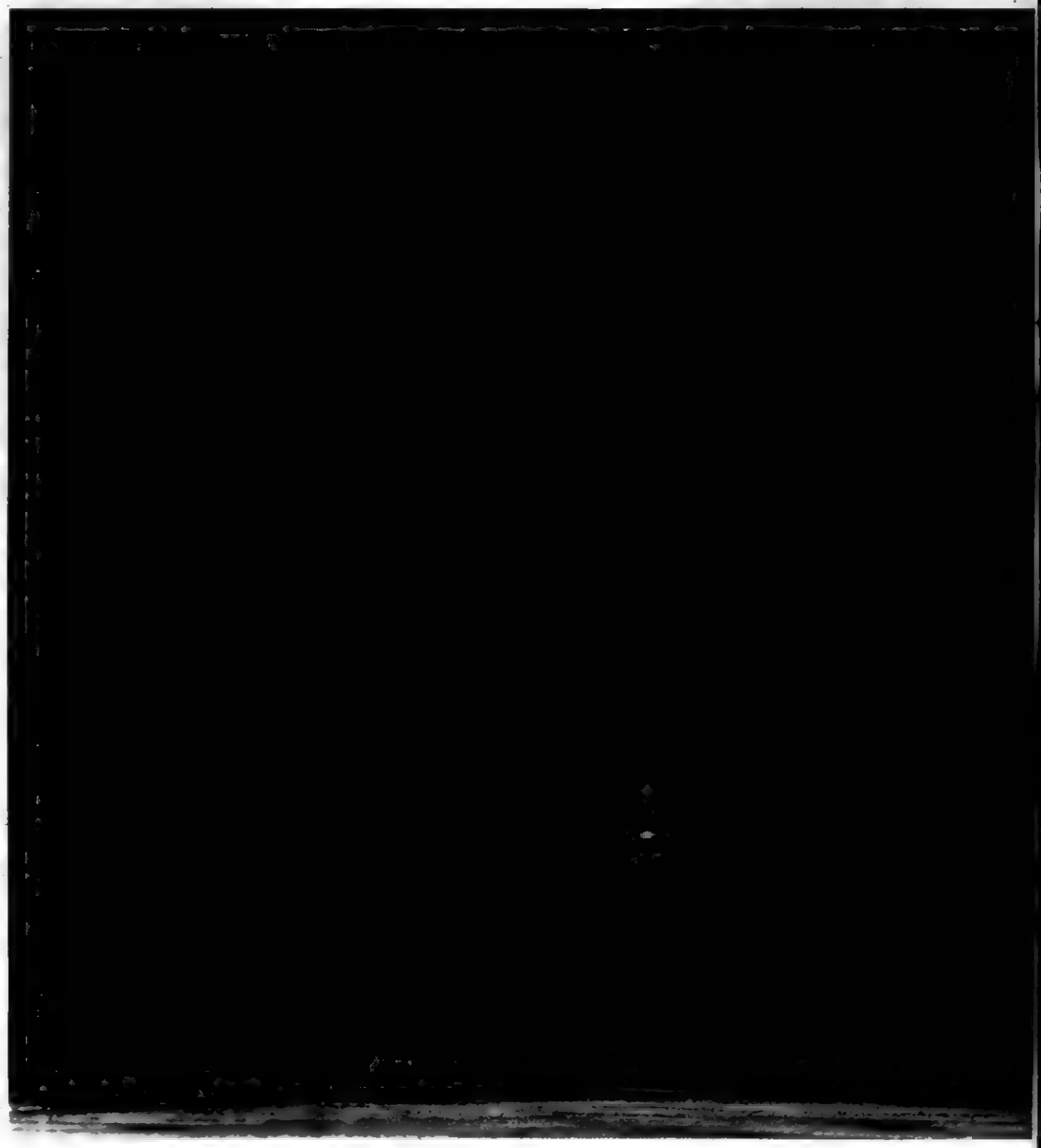

BIT BLAST

IBM to sell Interlink gateways in U.S., Canada

IBM will reportedly sell **Interlink Computer Sciences, Inc.** gateways and other products in the U.S., Canada and Puerto Rico starting Friday.

A test facility for verifying multivendor interoperability of Fiber Distributed Data Interface (FDDI) local-area network tools is up and running at **Advanced Micro Devices, Inc.'s** Sunnyvale, Calif., campus with its reported 18 charter members.

Internetworking company **Vitalink Communications Corp.** has announced that it will add **Digital Equipment Corp.'s** Decnet Phase IV support to Vitalink Transpath bridges and routers.

Under a $3 million contract, **Acer, Inc.** will reportedly incorporate **Proteon, Inc.'s** Pronet-4/16 IBM Token-Ring-compatible network interface cards and its Series 70 Intelligent Wire Center into Acer's Token-Ring Network 5290 series.

Under an agreement with **Powercore, Inc., Vitek Systems Distribution** will distribute Powercore's Network Scheduler II, a multiuser application program for automating projects and meetings across a network.

GTE Telephone Operations has announced plans to provide data communications and office systems services — including systems design and integration — in the company's four operating areas throughout the U.S.

AT&T lowered interstate and international long-distance service rates by more than $300 million July 1. The price cuts were facilitated by a Federal Communications Commission regulation that reduced AT&T and other long-distance carrier fees to local telephone companies for accessing customer telephone lines.

Bell South Corp. reportedly plans to sell **DEC's** voice and data networking products in conjunction with the carrier's private branch exchange (PBX) and/or central office-based products and services.

Ungermann-Bass, Inc. has announced it will resell **Norton-Lambert Corp.'s** Close-Up and Close-Up/LAN remote communications software packages and integrate them into its customer support programs.

IBM has selected **Amnet, Inc.** to develop software for IBM Personal Computers used as nodes in X.25 networks.

Products linking hosts, LANs and videoconferencing and imaging systems to Integrated Services Digital Networks have been announced by **Ascend Communications, Inc.**

Codex Corp. said it will support AT&T's enterprise network manager, Accumaster Integrator, by the end of the year through an interface in the Codex 9800 series Integrated Network Management System.

An FDDI chip that implements all physical-layer functions of the 100M bit/sec. LAN is reportedly being tested by **AT&T Microelectronics.**

Rolm Co. and **Norstan, Inc.** have announced that Norstan will refurbish and resell Rolm PBX equipment in the U.S.

Team One Systems, Inc. has announced that **Sun Microsystems, Inc.'s** Sunnet License — a combination developer's tool kit/Openlook graphical user interface license administration tool — has been integrated into its Teamnet 2.0 Concurrent Product Development Environment.

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BIT BLAST

Compuserve dials up Fujitsu

Compuserve, Inc. has announced an interconnection agreement with **Fujitsu Ltd.** that will give Compuserve's network customers dial-up access at up to 2.4K bit/sec. from nine major Japanese cities next month. Access to additional Japanese cities will be added in future months, Compuserve said. The direct access will be less expensive than Compuserve's current connections to Japan via various gateways, the vendor said.

Infonet and **Andersen Consulting** have entered into a nonexclusive agreement to offer their respective services to each other's clients on a preferred basis. The aim is to combine Andersen Consulting's integration and implementation services with Infonet's global networking services in order to target the outsourcing market more effectively.

Infonet has extended its international packet-switched data, electronic mail, facsimile and telex services to Ireland, with a communications facility in Dublin that is scheduled to become operational next month, Infonet said. Infonet is also interconnecting its services with the Postnet public data network, which is operated by **Postgem** in Ireland.

Sizing systems to run X Window

BY JOANIE M. WEXLER
CW STAFF

Companies considering X terminals and worried about sluggish response time can check out host support capacity with a benchmark system recently introduced by A&T Systems, Inc. in Silver Spring, Md.

XMaster, an extension of the vendor's Benchmaster product, measures system or network response time by recording a live user application scenario and determining what response time would be in a configuration with more users.

X terminals are intelligent devices designed to run the X Window System, a networking protocol that allows users to access applications on multiple hosts and display them in separate windows on one screen. They are subject to unreliable response time because of possible network bottlenecks to the host and the inability to process applications at the desktop.

Alternatives to X terminals include personal computers and workstations; XMaster can reportedly also benchmark X Window applications in these devices.

XMaster captures information on a wide range of system components — including the CPU, I/O devices and controllers. The product makes a copy of all the work that is being done on the entire system in a specified time period and establishes a mock-up of the performance these activities would translate into when supporting larger numbers of users.

Its purpose is to help customers size their systems for X Window applications, company President Ashok Thareja said.

When running Benchmaster and XMaster, the driver machine must run "some flavor" of the Unix operating system but will test machines running any multitasking operating system, Thareja said. The software will also benchmark local-area network performance, as long as the LAN is communicating via Transmission Control Protocol/Internet Protocol or supports rlogin, a utility allowing users to log in from one host to another.

EDI

CONTINUED FROM PAGE 53

fit from pleased customers, Martin said.

Software developer Rathe, Inc. in Forest Lawn, Minn., was hired by Burlington Northern in April 1989 to write a program based on the task force's specs. Rathe created BN Lynx software, which accommodates the protocols of 12 major carriers.

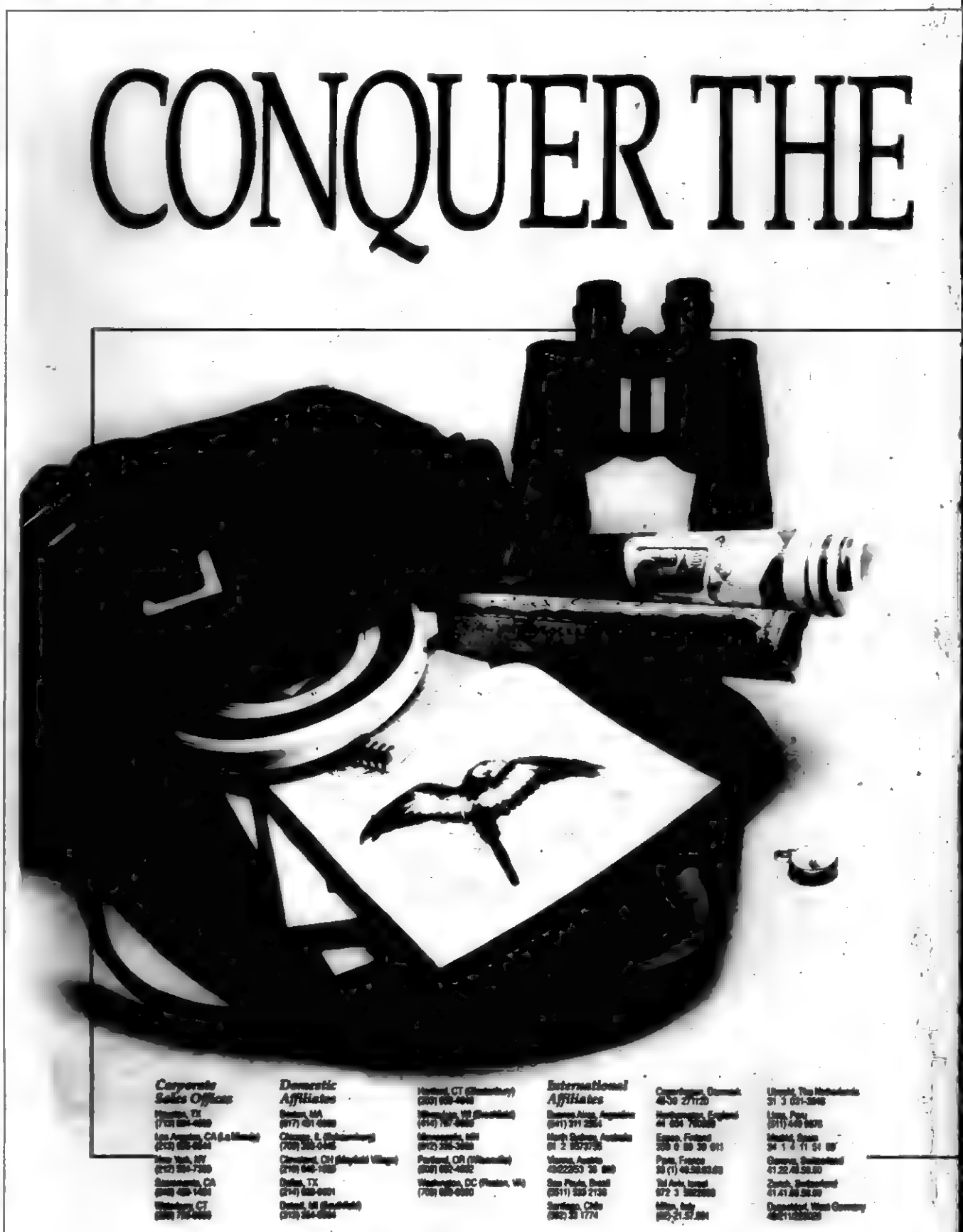
The program runs on an IBM Personal Computer or compatible using DOS 3.0 or above and a Hayes-compatible modem.

The software automatically dials up and interfaces with the mainframes to learn where and when a tank or boxcar was last seen, whether it was empty, which train was pulling it, what the equipment's destination was and other shipping facts, Martin said. Two rail companies have protocol quirks that were not addressed in BN Lynx. If one of the rail companies changes its interface, users can alter the appropriate field and save it, she said.

Burlington Northern customer representative Greg Oakley said BN Lynx ties in with mainframes at 10 other large rail firms.

Souerbry has been overseeing beta tests of BN Lynx Version 2.0. "It takes no more than 10 minutes usually to dial in on nine railroads," she said. Delta shares the information with shippers using its tanks.

BN Lynx is free to Burlington Northern's customers and sells for $350 to firms unlikely to ever use Burlington Northern trains. The firm has sold the source code to one other rail firm and is negotiating with another, Martin said.



NEW PRODUCTS

Electronic mail

Walker Richer & Quinn, Inc. has introduced Dispatch, a personal computer-based electronic mail management system for Hewlett-Packard Co.'s HP Deskmanager, an HP 3000-based E-mail system.

The system enables the PC to download, store and process messages and handle presentation tasks while the HP Deskmanager functions as a mail server and distribution system. Other features include automatic establishment of a host connection during message transfers to and from HP Deskmanager and the ability to schedule message exchanges during off-peak hours. Dispatch sells for $399.

Walker Richer & Quinn
2815 Eastlake Ave. East
Seattle, Wash. 98102
(206) 324-0350

Secured Communications Technologies, Inc. has announced a product that provides complete security for facsimile and electronic mail transmissions among banks, law firms and other organizations that need to protect critical data.

The Secom system uses channel secure technology to allow self-encryption of transmissions among IBM Personal Computers or compatibles via a Hayes-compatible modem over dial-up phone lines. The product lists for $695. A Secom Plus package includes an integrated fax scanner and sells for $1,295.

Secured Communications
1111 Jefferson Highway
Arlington, Va. 22202
(703) 486-1298

Sitka Corp. and Starnine Technologies, Inc. have developed an electronic mail gateway that provides enterprisewide communications among Unix Mail and Sitka's Inbox Plus E-mail program.

Mail*Link SMTP uses the Simple Mail Transfer Protocol (SMTP) to provide seamless peer-to-peer connections between Inbox Plus and other networks that support SMTP. It is said to enable Inbox Plus and Unix Mail users to send messages to each other without altering commands or the messages themselves.

License fees range from $249 to $4,950, depending on the number of users.

Sitka
950 Marina Village Pkwy.
Alameda, Calif. 94501
(415) 769-9669

Micro-to-host

Verbex Voice Systems, Inc. has announced a conversational voice I/O station for performing receiving, returns and inspection applications on an IBM 3270 or Digital Equipment Corp. VAX/VMS machine.

The Verbex Receiving Data Capture System features continuous speech recognition and enables users to create bar-code labels, tickets and control reports at a receiving workstation without any host involvement. The stand-alone system can be tied into a personal computer local-area network environment.

Pricing ranges from $1,750 per month for a single-operator station with a three-year lease to $2,600 per month for a four-operator system.

Verbex
1090 King Georges Post Road
Edison, N.J. 08837
(201) 225-5225

Gateways/Bridges/ Routers

Andrew Corp. has announced a remote local-area network-to-IBM midrange computer system gateway.

Netlynx/5394 enables any Netbios-compatible LAN to communicate with a remote IBM System/34, 36 or 38 or Application System/400. The product is made up of a Synchronous Data Link Control interface board and a software package that enables each node on the LAN to emulate an IBM 5250 terminal.

Support is offered for LAN interfaces such as Arcnet and Ethernet and several file-transfer programs. The product lists for $1,995.

Andrew
2771 Plaza Del Amo
Torrance, Calif. 90503
(213) 320-7126

Electronic data interchange

Harbinger EDI Services recently released an upgrade to its In-Touch*EDI electronic data interchange (EDI) software package.

Version 2.2 allows users to receive any EDI document or link EDI with internal applications. A binary file-transfer capability enables users to receive EDI standards and software updates, the vendor said.

The company has also announced In-Touch*EDI Plus, which can provide users with the power of an EDI front-end processor and the ability to exchange files with midrange, mainframe or personal computer applications.

Version 2.2 costs $1,295. In-Touch*EDI Plus sells for $1,995.

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MANAGER'S JOURNAL

EXECUTIVE TRACK

Ramakrishna Eleswarapu has been named director of data and systems at the **New York State Insurance Fund.** Eleswarapu was formerly chief of data processing at the firm.

In his new position, he will oversee a computer network of 2,000 terminals in operation throughout the state, including the firm's home office in lower Manhattan and its seven district offices.

Eleswarapu has been at the agency since 1980, when he worked as a consultant with an India-based subsidiary of Unisys Corp. and became an employee in 1983 as director of systems and programming. He holds a bachelor's degree from Osmania University and an MBA from the Indian Institute of Management in Calcutta.

Also promoted at the **New York State Insurance Fund** was **Diana Bain,** who has been appointed assistant director of data and systems. She was formerly manager of data processing systems.

Bain began her career at the Fund as a programmer in 1980 and later advanced to senior computer programming analyst. In her new position, she will report to Eleswarapu.

Bain, who immigrated to the U.S. from Poland in 1962, holds degrees from Hunter College and New York University.

Who's on the go?

Changing jobs? Promoting an assistant? Your peers want to know who is coming and going, and *Computerworld* wants to help by mentioning any IS job changes in Executive Track. When you have news about staff changes, be sure to drop a note and photo or have your public relations department write to Clinton Wilder, Senior Editor, Management, *Computerworld*, Box 9171, 375 Cochituate Road, Framingham, Mass. 01701-9171.

A headache this big calls for PACS

Massachusetts hospital's project PACS reduces cost of storing imaging records

BY MICHAEL ALEXANDER
CW STAFF

Thanks to electronic diagnostic imaging technology, physicians now have gentler ways to accurately diagnose ailments than potentially destructive exploratory surgery. That's good news for patients — but a headache for hospital information systems managers.

Electronic diagnostic equipment churns out mountains of images per year, which are costly to maintain and overload manual record-keeping systems. "It's a nightmare," sighs Jaime Taaffe, director of computing for the department of radiology at Massachusetts General Hospital (MGH) in Boston.

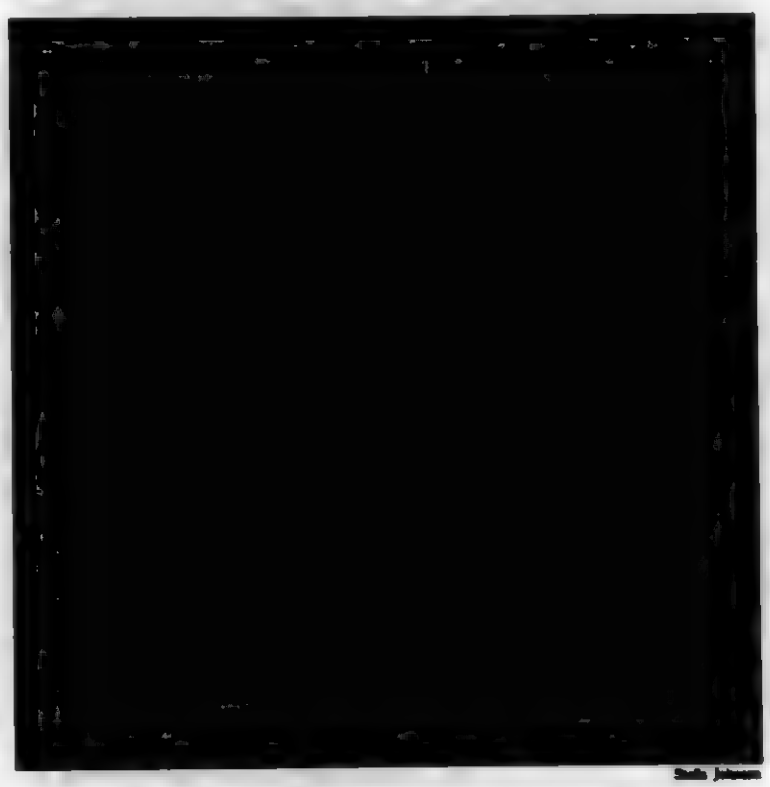
MGH employs 59 people whose sole job is to store, retrieve and shuttle the images generated by electronic diagnostic equipment among departments.

Ironically, automation — which has caused the imaging crush — is also being sought as a means to help ease the economic and administrative burdens of storing and using records on paper, film and other media.

MGH, which is affiliated with Harvard University's Medical School, maintains three film libraries to house the millions of images generated by the radiology department each year. Images already occupy one acre of floor space at the hospital's main film library a few miles away in Somerville, Mass.

The Department of Radiology conducts 340,000 radiology exams per year, resulting in 5 terabytes — 5 *trillion* bytes — of images.

"We're now at 5 terabytes, and we're not keeping all of it," Taaffe says. "We're looking at keeping 6 terabytes of data per year."



Sheila Johnson

MGH's Taaffe *expects PACS project to reduce hospital's imaging crush*

In an attempt to manage this mountain of information, MGH's Radiology Department is preparing to launch the second phase of an ambitious project called the Picture Archiving and Communications System (PACS). The project is intended to help solve the problems of storing, retrieving and distributing images — and will also help generate income for the world-renowned hospital.

PACS, which is based on a network of workstations called Quick-Radiology Storage Transfer Analysis (Q-RSTAR), has been under development for about 18 months and will be up and running before the end of the year (see story page 72). The system is designed to capture, store and transmit all kinds of images as well as graphics and voice, making it one of the first multimedia applications of its kind to be installed anywhere.

The first phase of the PACS project was based on a system called Micro Radiology Storage Transfer Analysis. It was intended to demonstrate to radiologists and other professionals the kinds of technology available and to provide a basis for discussion about what such a system would require if it

Continued on page 72

CIOs: Much more than figureheads

BY ALAN J. RYAN
CW STAFF

In the early 1980s, the term "chief information officer" had not yet been coined. By the close of the decade, CIOs were popping up everywhere but still functioning as information systems managers.

Now, according to a study by Mountain View, Calif.-based Input, the CIO's power is expanding, and he is finding himself in a position of unfamiliar influence. The study, "The Future of Information Systems Management," found that CIOs play a significant role as their firms move toward global competition and the exploitation of information resources as a competitive weapon.

Because of the increased competition, pressures for shortened product development cycles, shortened manufacturing cycle times and consistent reductions in time-to-market have resulted and are intensifying, according to the report.

CIOs listed their primary objective as "integrating business and technology; to serve as an educator and communicator, while driving the IS function to support business rather than technical goals." The emphasis is on directing or driving rather than managing the function, and the focus is on its integration within the business, the report said.

According to Input, key future trends affecting the CIO are increasing levels of integration, extended use of communications systems and emphasis on business planning. The CIO will spend time looking to integrated databases, platform independence/systems connectivity, computer-aided software engineering technologies, expert systems and on-line transaction processing capabilities.

CIOs who were polled listed image processing, voice recognition, natural language processing and self-teaching expert systems as the top four emerging technologies. Input interviewed more than 30 IS executives and industry experts for the survey.

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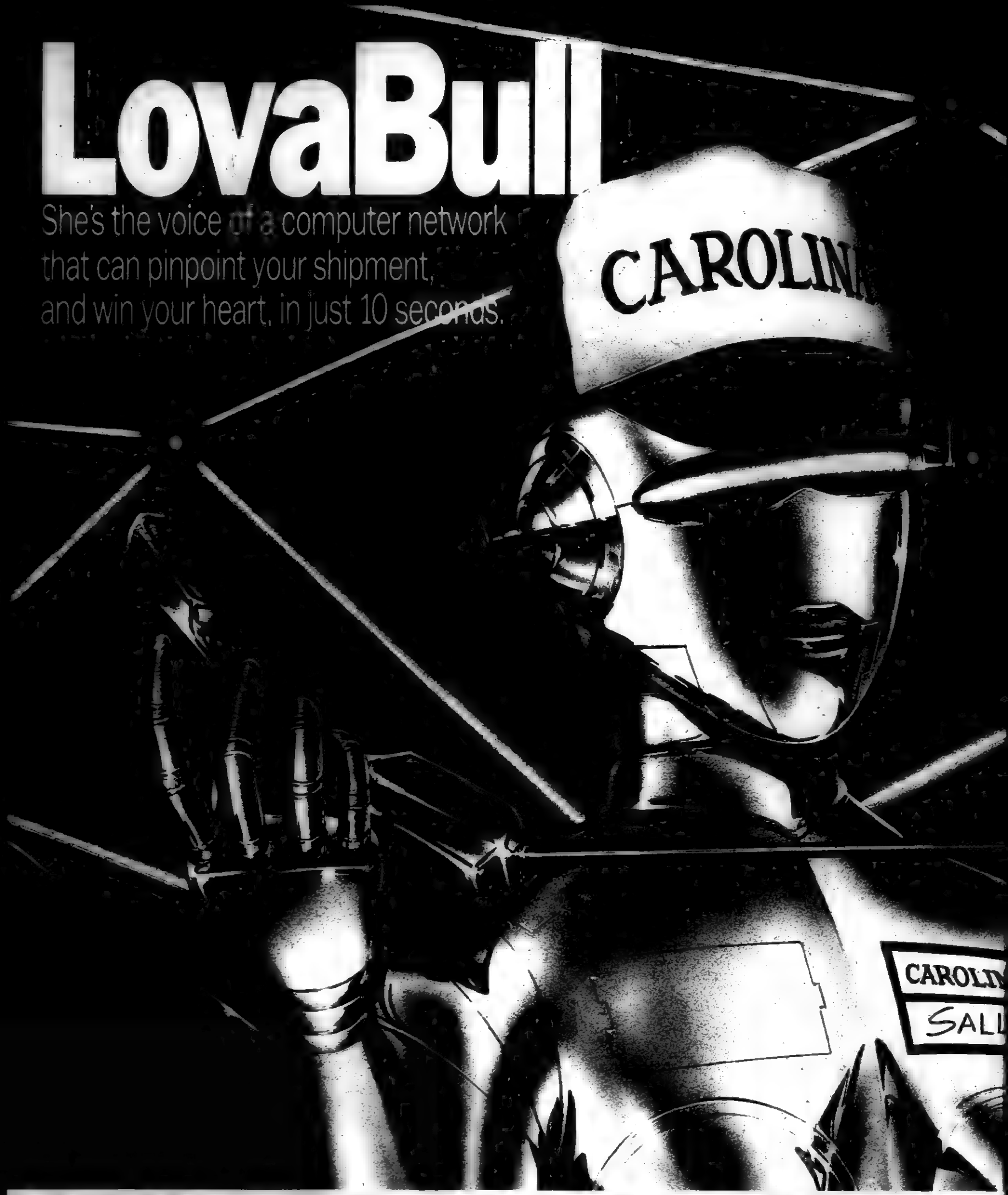

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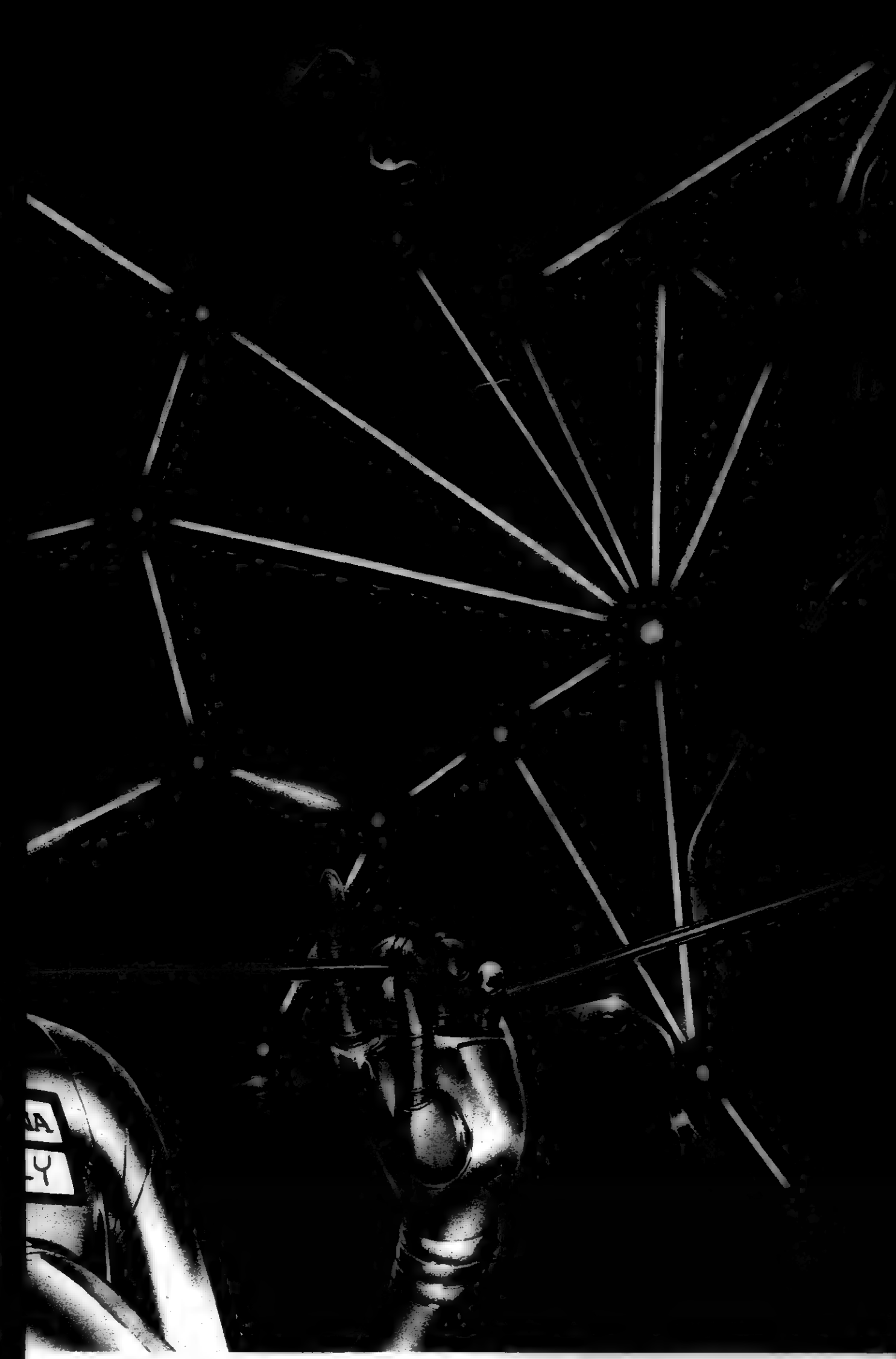

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COMMENTARY

Max Messmer

Punch a hole through the No-Zone Layer

While the information systems department should be at the forefront of change, it faces the same problems that are endemic to the rest of the organization. As IS organizations mature, they tend to put more of their energy into maintaining old ways of doing things instead of initiating new activities with potentially higher productivity.

As a result, they often develop what I refer to as a "No-Zone" Layer. This is a layer of negativity that hangs like a ceiling over an IS staff, suppressing their natural initiative. The layer grows and thickens over time, fed by the repeated "no's" people hear when they propose a new idea.

IS managers overtly cast the No-Zone Layer over employee initiative with responses such as the following: "Yes, a 4GL would really reduce development costs, but then we would have to find new jobs for half the maintenance programmers" or "Unix workstations make a lot of sense for software engineering, but Joe in IBM technical services would never buy off on it, so let's not even bring it up."

Managers inadvertently squash good ideas through benign neglect, banishing creative solutions to languish in the No-Zone Layer. They do this with responses such as: "Great idea. Let's set up a task force to explore it," or "CASE tools make sense, but let's see if we finish the year with some budget left over to cover the education costs."

While inertia is difficult to overcome, it is possible to break through the No-Zone Layer. To do this, the concept of making applications as user-friendly as possible applies equally to your own personal management style.

The kind of entrepreneurial spirit that encourages problem-solving and risk-taking comes from individuals — not organizational charts.

Here are suggested techniques for helping IS managers punch some holes in the No-Zone Layer.

• **Assess your own No-Zone quotient.** A new approach must come from within. Have a private talk with yourself. Try to list all the times you've shrugged off someone else's ideas, and analyze why you did that. Did you really think it wasn't a good idea, or was it just getting in the way of your own plan?

• **Demonstrate your own user-friendliness.** Not only is it OK to argue both sides of an argument in front of people, but it's also the only way you'll loosen them up to feel comfortable in taking risks themselves. The most visionary, creative and innovative ideas often sound offbeat when first uttered. Once people learn that you're open to exposing and publicly exploring your own ideas and concerns, they in turn will open up with their best, most creative thinking.

• **Go to bat for your people.** If you think something is a good idea, the fact that your boss or the telecommunications manager doesn't think so at first glance is not a legitimate excuse for shooting it into the No-Zone Layer. If you won't go to bat for your people, all you've accomplished is to push the No-Zone Layer one level higher in the organization.

THE IS DIRECTOR of one of our client companies issues rewards for "smart mistakes" on a regular basis. He does it to show employees that he really does encourage and value smart risk-taking and that he expects risk to sometimes result in mistakes.

• **Evangelize.** Excitement is contagious. Fire up your peers and people above you over what you are trying to accomplish. They might not become believers overnight, but at least they'll make an effort to support you over the short term, which gives you time to produce concrete results.

• **Remember that "strategy is the art of experimentation."** Try to become more comfortable and confident in the role of risk-taker. Once you've decided to champion an idea, give it its absolute best chance to succeed. If it doesn't, you've still made progress by learning an important lesson that will build a stronger strategy going forward.

• **Reward risk as well as results.** The IS director of one of our client companies issues rewards for "smart mistakes" on a regular basis. He does it to show employees that he really does encourage and value smart risk-taking and that he expects risks to sometimes result in mistakes.

Strike out on your own to break a hole in your No-Zone Layer. Soon, other departments will begin to notice your results and be more supportive of your desire to introduce new systems.

Go about it in whatever creative manner works best for your individual style, with one major exception: Don't set up a task force.

Messmer is chairman and CEO of Robert Half International, Inc., a Menlo Park, Calif.-based IS placement service operating Robert Half and Accountemps divisions.

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BOOK REVIEW

How to put those heaps of data to work for you

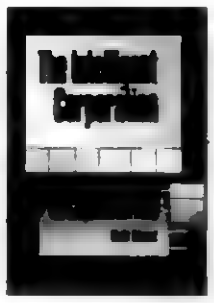
THE INTELLIGENT CORPORATION: CREATING A SHARED NETWORK FOR INFORMATION AND PROFIT
By Ruth Stanat
Amacom Books, $24.95

I've often wondered how companies manage to juggle the myriad considerations that go into building corporate networks without screwing up the whole system and costing the corporation millions. Now I know: They read books like *The Intelligent Corporation.*

The book provides a structure for corporations struggling to make strategic use of the mounds of information that are now so easy to get but so difficult to manage. Author Ruth Stanat digests a complex range of business issues into one convenient little handbook that many managers probably wish they had time to compile for themselves. The book shows no hint of techno-jargon; it is truly a manager's how-to, written in businessese.

As a framework for thinking, the book delineates the financial, political and cultural issues companies must consider as they embark on a systematic approach to information gathering, sharing and maintenance.

This momentous task is put into manageable perspective by a "how-are-we-doing?" gauge that guides the reader through an information audit for measuring the network against the bottom line.



In her wisdom, the author doesn't present a single "correct" networking scenario for every company. Rather, she organizes the corporate manager's mental "things to do" list by providing a step-by-step procedural shell into which readers can drop their own set of circumstances.

Targeting strategy, pricing and sales information as the most valuable competitive information in today's corporate environment, Stanat provides concrete suggestions for integrating the most likely sources of that information: the sales force, customers and the trade press.

She suggests a flexible, phased approach to evaluating, planning, implementing and integrating systems that will accurately reflect the needs of the business and protect existing capital investments. She factors in such industry trends as corporate decentralization, downsizing through the elimination of middle managers, the global expansion of many corporations and the burgeoning role of the corporate marketing research department.

Stanat insists that companies designate an internal champion for the network as a central coordination point and identifies the desirable qualities in such a candidate, including in-depth company knowledge, a willingness to take risks and a results-oriented philosophy. She offers such concrete tips as suggesting that the champion and network administrator make a two-year commitment to the project and offers target time periods for each phase of network development.

This tangible advice, along with the network-building experiences of firms such as Citibank, General Electric Co., AT&T and Ford Motor Co., make this book much more than just blue-sky managerial philosophy. It is something you can get your arms around and use.

For example, it tracks the progress of a centralized GE in the mid-1980s in providing divisional managers with analysis of raw data.

Stanat emphasizes that the invaluable corporate database should reflect how management of the organization views the business. She weighs the pros and cons of internal development vs. outsourcing and offers ways to discourage the "information hoarding" practice.

The book also provides sample questionnaires for department interviews that help assess the internal resources available for intelligence gathering.

Stanat seems to have the credentials for offering all this advice. In addition to holding advanced degrees in finance and statistics, she has 20 years of experience in marketing and planning at Fortune 500 firms, where she witnessed both the success and downfall of information-gathering endeavors.

One point of contention: The author is founder and president of a database publishing firm that also offers consulting services. She continually mentions the option of outside assistance, which could be interpreted as a plug for her company. However, the consultant alternative is always responsibly balanced with the in-house option, so I guess we shouldn't hold the author's possible vested interest against her.

The book also seems a little pricey; it contains about 250 airy pages of large type and oversized flow charts that aren't particularly helpful. But I suppose for the manager who discovers one key idea between the covers, $24.95 will seem like a real bargain.

JOANIE M. WEXLER

Wexler is a *Computerworld* senior writer.

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PACS

CONTINUED FROM PAGE 67

were to be clinically useful.

The goal of Q-RSTAR is to find out whether it is possible to rapidly transmit high-quality images among the hospital and five Boston-area sites: the main film library in Somerville, a magnetic resonance facility in Charlestown, the PACS development center in Cambridge and a hospital and a health maintenance organization (HMO), both in suburban Boston. At the moment, the images are transported between sites on an hourly shuttle bus.

The images will be viewed on Apple Computer, Inc. Macintosh workstations with high-resolution monitors or printed on a laser printer.

"The docs wanted to see originals, but they will adapt," Taaffe says. "The information goes faster to them, and the information is just as good. The answer is that if technology provides better care faster, they will adapt."

Still, designing systems to be used by highly specialized physicians with little computer awareness is a challenge. Based on a previous test, the PACS development team was convinced of the need to have a "capable, forgiving, yet simple user interface," Taaffe says.

"The doc interface has to be radically different than that of an engineering workstation," he says. "Medicine or radiology is visually thin; the interface is not a lot of dialog boxes or menus, but behind it is a lot of heuristics and artificial intelligence." The interface, which was designed in-house, adapts over time so that it becomes easier and faster to use. "The workstation observes what users want and tailors itself, instead of the user tailoring to the system," Taaffe explains.

In the health care industry, the problem of storing and retrieving images will become more acute for the following interrelated reasons, according to many health care professionals:

- Electronic diagnostic equipment generates more types of images than ever before. In addition to X rays, there are spectroscopy, magnetic resonance, nuclear medicine, ultrasound and several other types of imaging technologies. There are some 30 different classes of images, with "no end in sight," Taaffe says.
- Diagnostic equipment is being used to produce more images faster per examination. A magnetic resonance imaging scanner can generate 600M bytes of data in only 20 minutes, for example.
- Health care professionals are requesting more exams, mainly to boost patient care but also to justify the expense of imaging equipment that can often run into the millions of dollars.
- More health care professionals are involved in the treatment of a patient, and each wants to see the original images, thus requiring that images be transported between several locations and tracked.
- Instead of discarding patient images after a few years, hospitals are keeping them longer. Soon, they will keep a patient's records for his entire life.

Taaffe succinctly sums up these prospects for the IS manager: "It's a nightmare."

Smooth operator

Massachusetts General Hospital has spent several years developing a Picture Archiving Communications System (PACS) aimed at helping it get out from under the "crushing weight of images," according to Jaime Taaffe.

In the second phase of the PACS project, Taaffe is overseeing the installation of a network of workstations called the Quick-Radiology Storage Transfer Analysis and Reporting System (Q-RSTAR).

There will be 10 Apple Macintosh workstations in Q-RSTAR once the network is operational later this year. Each will be equipped with either a medium- or high-resolution workstation capable of displaying magnetic resonance imaging, nuclear medicine, radiographs and other sorts of images produced by electronic diagnostic gear. The workstations will also display animation and "cine-loops" — short clips of film.

Shared among the workstations is a multiplexed, 40 million instructions per second image processor capable of more than 80 million floating-point operations per second and constructed from multiple Mercury Computer Systems, Inc. array processors. The overall system is controlled by a Digital Equipment Corp. VAX 6220 with 64M bytes of main memory allocated solely for the Q-RSTAR project.

The workstations will communicate over an Ethernet local-area network for command and control information and a variety of high-bandwidth "image blasters" to speed images within MGH's main campus and a Charlestown facility.

"The image transfer rate is 12M bit/sec. or 17 million pixel images per second," Taaffe says. "If you don't get this kind of performance, no one will use it."

MICHAEL ALEXANDER

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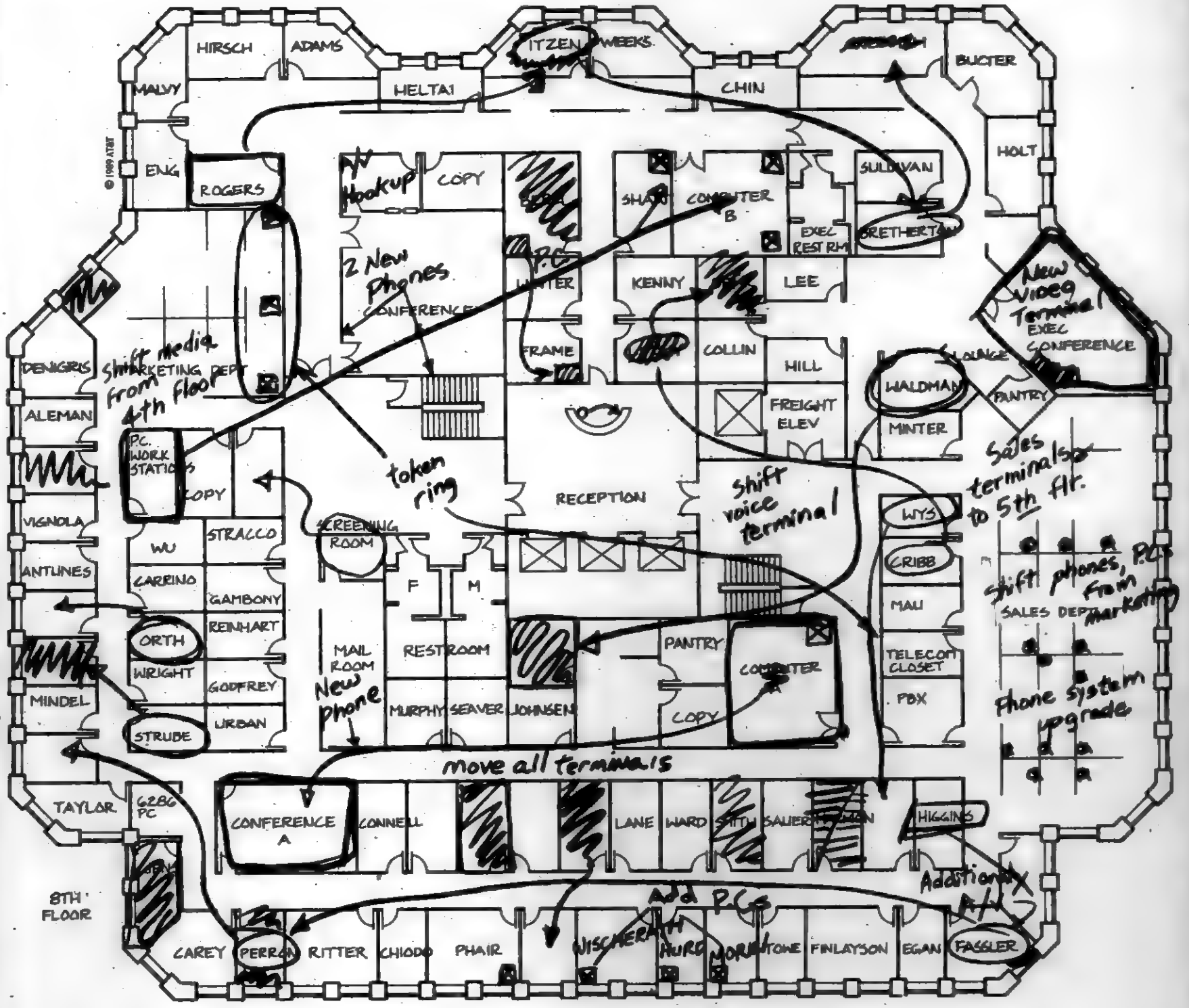

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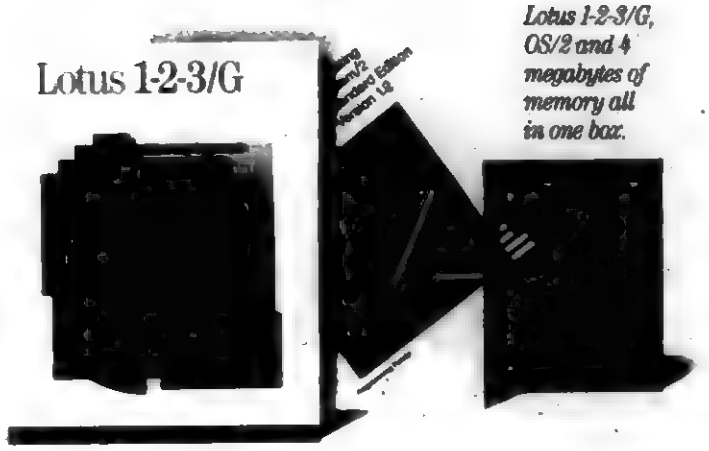

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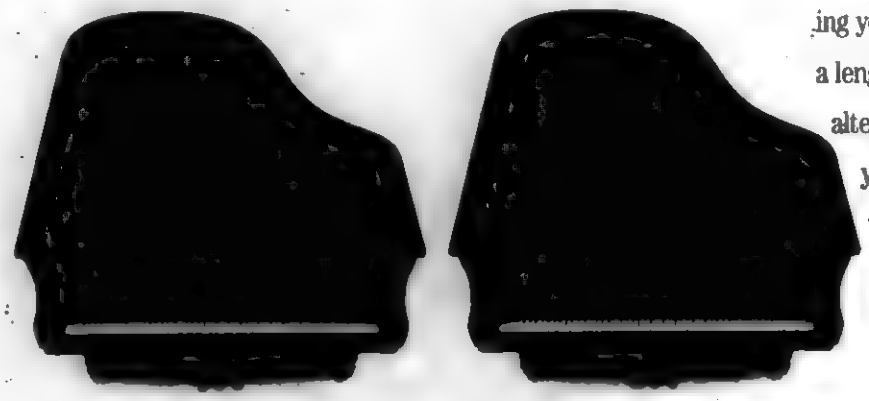

Save a couple of grand when you buy them all together.

First of all, if you're a 1-2-3® user, 1-2-3/G will feel familiar, with menu commands and keystrokes you already know. But look a little closer. You'll begin to notice a lot that's new. Like full mouse support. Pull down menus. And dialog boxes. There's even a WYSIWYG display. And that's just the beginning.

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IBM

If you're a current 1-2-3 user, you'll be happy to know that all data and macros created in existing versions of 1-2-3 can be retrieved directly into 1-2-3/G. So a move to OS/2 will only serve to enhance any investment you may have already made in 1-2-3.

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With OS/2, 1-2-3/G can give you Dynamic Data Exchange. DDE provides live links to other Presentation Manager™ applications for true application integration.

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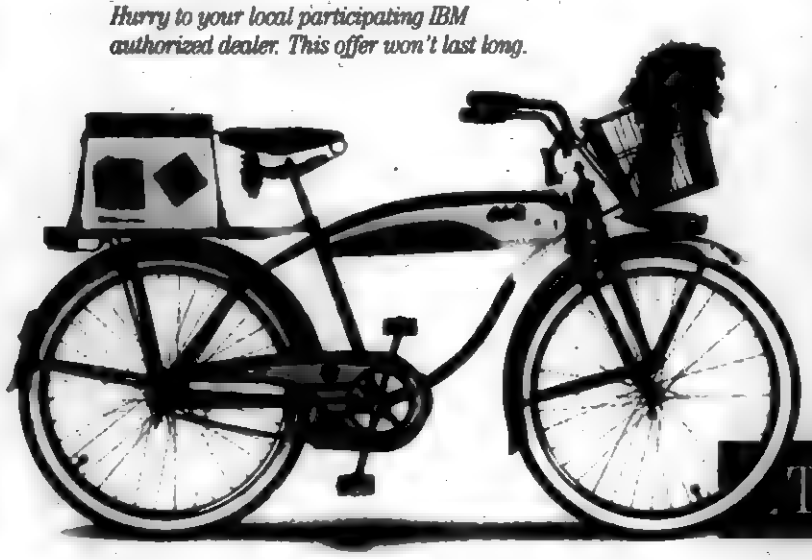

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CALENDAR

JULY 29-AUG. 4

AI-1990 Conference. Boston, July 29-Aug. 3 — Contact: American Association for Artificial Intelligence, Menlo Park, Calif. (415) 328-3123.

Insourcing vs. Outsourcing: The Sunspot Meeting. Atlantic City, July 31-Aug. 1 — Contact: The Yankee Group, Boston, Mass. (617) 367-1000.

Mid-Atlantic Storage Management Association Forum. Philadelphia, Aug. 1 — Contact: Randall Lebeck, MASMA, P.O. Box 391, Manville, N.J. (201) 526-9325.

Computer Security in the '90s Conference and Exposition. Atlanta, Aug. 1-3 — Contact: Informa, Atlanta, Ga. (800) 343-5048.

Object-Oriented Design and Programming seminar. Montreal, Aug. 2-3 — Contact: Darcy Harrison, Interactive Software Engineering, Goleta, Calif. (805) 685-1006.

AUG. 5-11

Uniforum Open Systems Seminar. Chicago, Aug. 6 — Contact: Uniforum, Santa Clara, Calif. (408) 986-8840.

Managing Information Resources in the '90s: A Fresh Start. Princeton, N.J., Aug. 6-9 — Contact: Louise Spieler, National Association of State Information Resource Executives, c/o the Council of State Governments, Lexington, Ky. (606) 231-1870.

North American ISDN Users' Forum. Gaithersburg, Md., Aug. 6-9 — Contact: Lori Phillips, NIST, Gaithersburg, Md. (301) 975-2937.

Siggraph '90. Dallas, Aug. 6-10 — Contact: Siggraph '90, Chicago, Ill. (312) 644-6610.

Introduction to AIX System Administration. Toronto, Aug. 8-10 — Contact: Judy Neumann, Bragen Group, Toronto, Ont., Canada (416) 366-6363.

AUG. 12-18

The Urban and Regional Information Systems Association. Edmonton, Alta., Aug. 12-16 — Contact: URISA, Washington, D.C. (202) 289-1685.

SHARE 75. New Orleans, Aug. 12-17 — Contact: SHARE Headquarters, Chicago, Ill. (312) 644-6610.

Downsizing Conference: Moving from Mainframes to PCs. Boston, Aug. 13-14 — Contact: Digital Consulting, Andover, Mass. (508) 470-3880.

Windows/Full Conference and Exposition. Boston, Aug. 15-17 — Contact: CM Ventures, Emeryville, Calif. (415) 601-5000.

AUG. 19-25

Relational Today Seminar. Palo Alto, Calif., Aug. 20-21 — Contact: Codd and Date, San Jose, Calif. (408) 441-6400.

Eastern Regional ISSA Conference. Washington, D.C., Aug. 19-21 — Contact: Ralph S. Poore, Baltimore, Md. (301) 783-3865.

Strategic Information Systems Conference. Boston, Aug. 20-21 — Contact: University Seminar Center, Boston, Mass. (617) 248-8066.

Summer Workshops for the Information Processing Professional. Nashua, N.H., Aug. 20-23 — Contact: Ouellette & Associates, Bedford, N.H. (603) 623-7373.

SCO Forum '90. Santa Cruz, Calif., Aug. 20-24 — Contact: The Santa Cruz Operation, Santa Cruz, Calif. (408) 425-7222.

Early, Cloud & Co.'s Summer Conference on Telecommunications. Newport, R.I., Aug. 22-23 — Contact: Early, Cloud & Co., Newport, R.I. (800) 322-3042.

AUG. 26-SEPT. 1

National Computer Graphics Association Conference and Exposition. Houston, Aug. 26-29 — Contact: NCGA, Fairfax, Va. (703) 698-9600.

Unix Security Workshop. Portland, Ore., Aug. 27-28 — Contact: Usenix Conference Office, El Toro, Calif. (714) 588-8649.

CASE for the 1990s. Boston, Aug. 27-29 — Contact: Extended Intelligence, Chicago, Ill. (312) 346-7090.

SEPT. 2-8

PSD Micro '90. Washington D.C., Sept. 5-6 — Contact: National Trade Productions, Alexandria, Va. (703) 683-8500.

Strategic Planning for Information Systems. Toronto, Sept. 5-7 — Contact: Barnett Data System, Rockville, Md. (301) 762-1288.

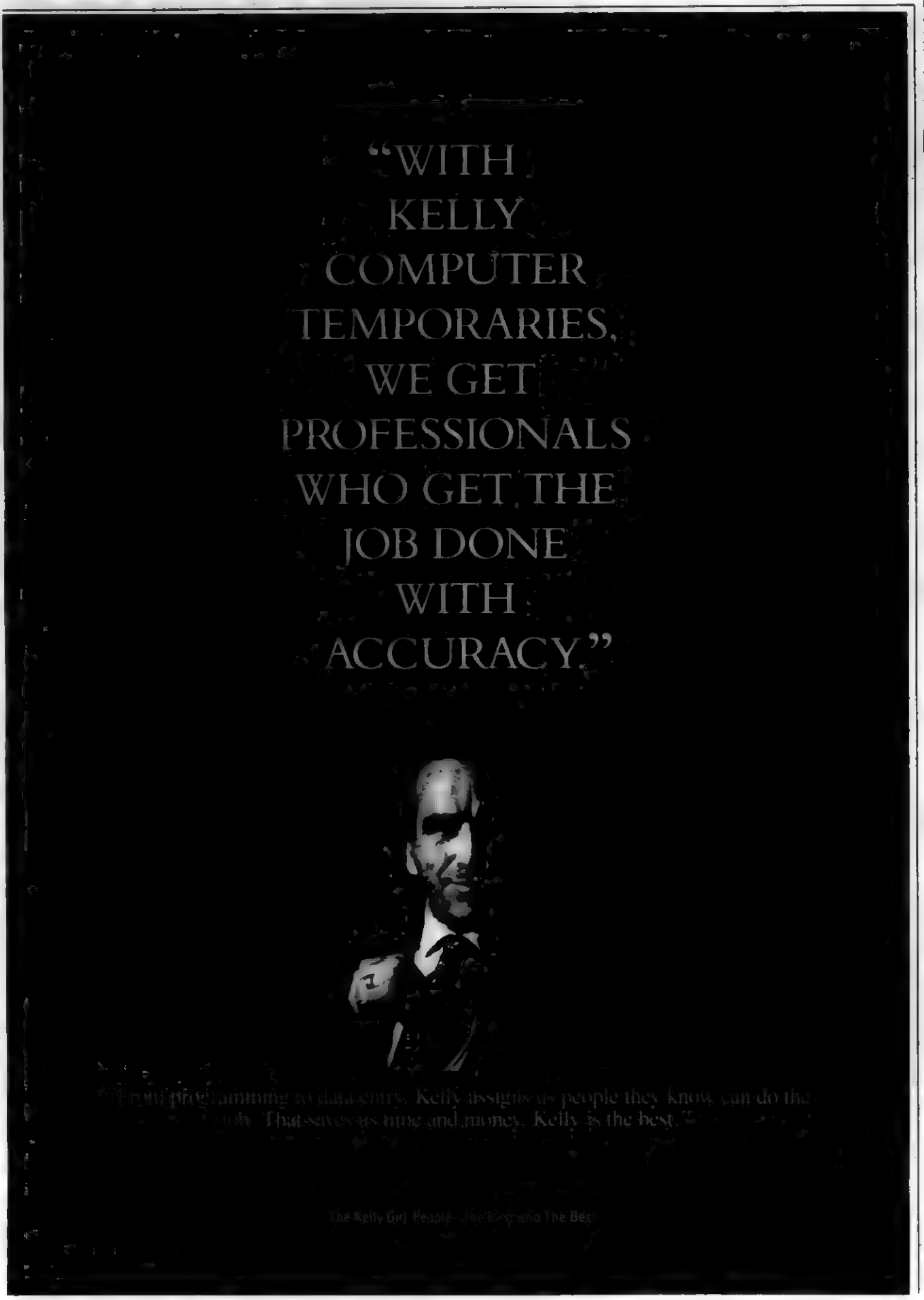
SEPT. 9-15

Adding Image Processing to Information Systems. Toronto, Sept. 9-11 — Contact: Technology Transfer Institute, Santa Monica, Calif. (213) 394-8305.

Open Systems Applications Development Conference. San Jose, Calif., Sept. 9-12 — Contact: Unify, Sacramento, Calif. (916) 920-9092.

Implementing TCP/IP for Systems Integration. Washington, D.C., Sept. 10-11 — Contact: Data-Tech Institute, Clifton, N.J. (201) 478-5400.

Executive Information Systems: From Planning to Implementation. San Francisco, Sept. 10-12 — Contact: Technology Transfer Institute, Santa Monica, Calif. (213) 394-8305.



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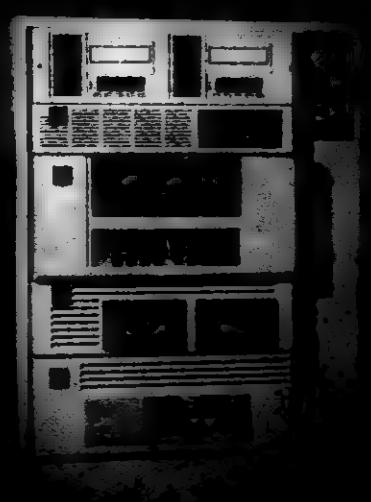

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EXECUTIVE INFORMATION SYSTEMS

What color is your EIS?

BY EILEEN CARLSON

Defining an executive information system (EIS) calls to mind the old TV game show *What's My Line?*, where through a series of questions, panel members tried to determine the occupation of an anonymous contestant.

A lot of people are stumped by what an EIS actually is, and that is understandable. Until a year or so ago, it was easy to point at three vendors and say, "they sell an EIS."

Comshare, Inc., Pilot Executive Software and, more recently, Execucom Systems Corp. all offered software packages in the price range of $100,000 to $200,000, and all offered an easy-to-use interface, access to databases throughout and external to the organization, drill-down capacity, exception reporting and combinations of graphics and text to capsulize information for the busy executive.

During the last couple of years, however, more products have hit the market; while some of these claim full functionality, most are scaled-down versions of EIS or tools to help users build their own systems. With these alternative routes, the definition has become a little more hazy, with enhanced spreadsheets, EIS front ends, prototyping tools and even fourth-generation languages (4GL) vying to fit into the category.

People are looking beyond the "big three" and studying these alternatives. In fact, as many as 50% of all EISs currently in place and one-third of those planned at IBM mainframe installations will be generated from application development tools, according to Clare Gillan, senior analyst for application solution software at International Data Corp. in Framingham, Mass.

As users select the functionality they need for the price they want to pay, no two companies can claim to have the same EIS.

To confuse the issue further, decision support and executive support system (DSS, ESS) characteristics are creeping into commercial and homegrown EIS systems, stirring debate as to how much of a role they need to play and to whom these systems are most valuable.

Marty Bruns

The paths that users can take to achieve some degree of EIS functionality are numerous, including the following:

- Build an EIS using in-house tools such as a spreadsheet, 4GL, applications generator, programming language and their favorite graphics software.
- Put a front end customized for executive access onto a DSS, be it an off-the-shelf or in-house package.
- Use a vendor EIS package to display a handful of reports to a small group of executives.
- Build robust applications with a vendor EIS package for a large number of executives and managers.

However, for each path taken, functionality differs widely. Consider the following three approaches, in ascending order of sophistication:

At Motorola Corp.'s corporate headquarters, 45 executives — from the chairman of the board to the assistant general manager — use personal computers to view economic forecasts, quality measurements and financial information as well as access the Dow Jones News/Retrieval service and the mainframe electronic mail system.

The in-house-built system is based around a graphical interface, which took about one year to develop. This interface serves as the delivery vehicle for information sprinkled throughout headquarters in various databases.

At this point, the system is manually updated. Motorola chose to create the interface first and save the feeder system for the next phase. Inland Steel Co., a steel manufacturer in East Chicago, Indiana, also took a build-your-own approach, primarily because it was working within a one-month time frame and wanted tools that they were comfortable with. The company put a front end onto its Lotus Development Corp. 1-2-3 spreadsheet, integrated the spreadsheet with Ashton-Tate Corp.'s Dbase files and used some add-in products to write custom applications.

The finished system accesses financial, marketing and human resources databases and brings this summary data into the file server. Forty people — from the vice-president of manufacturing down to the section managers — currently use the system, which provides a drill-down function and ad-hoc queries.

While Inland had intended to finesse the system with an off-the-shelf EIS after presenting it to executives, the users were so happy with the results that it no longer seemed necessary. These executives are somewhat technically oriented and don't mind typing in a few extra commands, as opposed to icons.

The fact is that drill-down on the Inland system differs from what an off-the-shelf package would offer. Drill-down in the strict sense means that by clicking on or touching an item on the screen, users access more

Carlson manages the EIS services area at Integrated Technologies, Inc., a consulting firm in Rolling Meadows, Ill.

INSIDE

Make A Wish — What executives would really like to see in their EIS. Page 85.

Buyers' Scorecard — Pilot edges out Comshare in user ratings of EIS software. Page 88.

True Stories — Michigan Senate becomes first legislative body with an EIS. Page 86.

Substantial proof tha

with power and spe

In the terminology of the modern workplace, power and speed have become the shorthand by which personal computers are measured.

The test of the designer's art, though, is to wring the greatest *performance* out of available megabytes and megahertz.

With a disarmingly clean, integrated design, Epson engineers have done just that in the new 286 and 386 Series personal computers.

Consider the evidence:

1 *VLSI Chips. The compact footprint of Epson's new machines is made possible by integrating functions on VLSI chips such as these. Without them, separate boards would require separate slots, and the motherboard alone would be three times the size.*

2 *Surface Mount Technology. Used only by the most advanced manufacturers, SMT techniques protect the structural integrity of the board, which increases overall reliability.*

3 *Hard Drive Controller. The use of Integrated Drive Electronics on the hard disk eliminates the need to add a hard disk controller board. This simplified design means faster throughput and greater reliability.*

Epson's 386SX motherboard displays the elegant architecture necessary for optimal performance.

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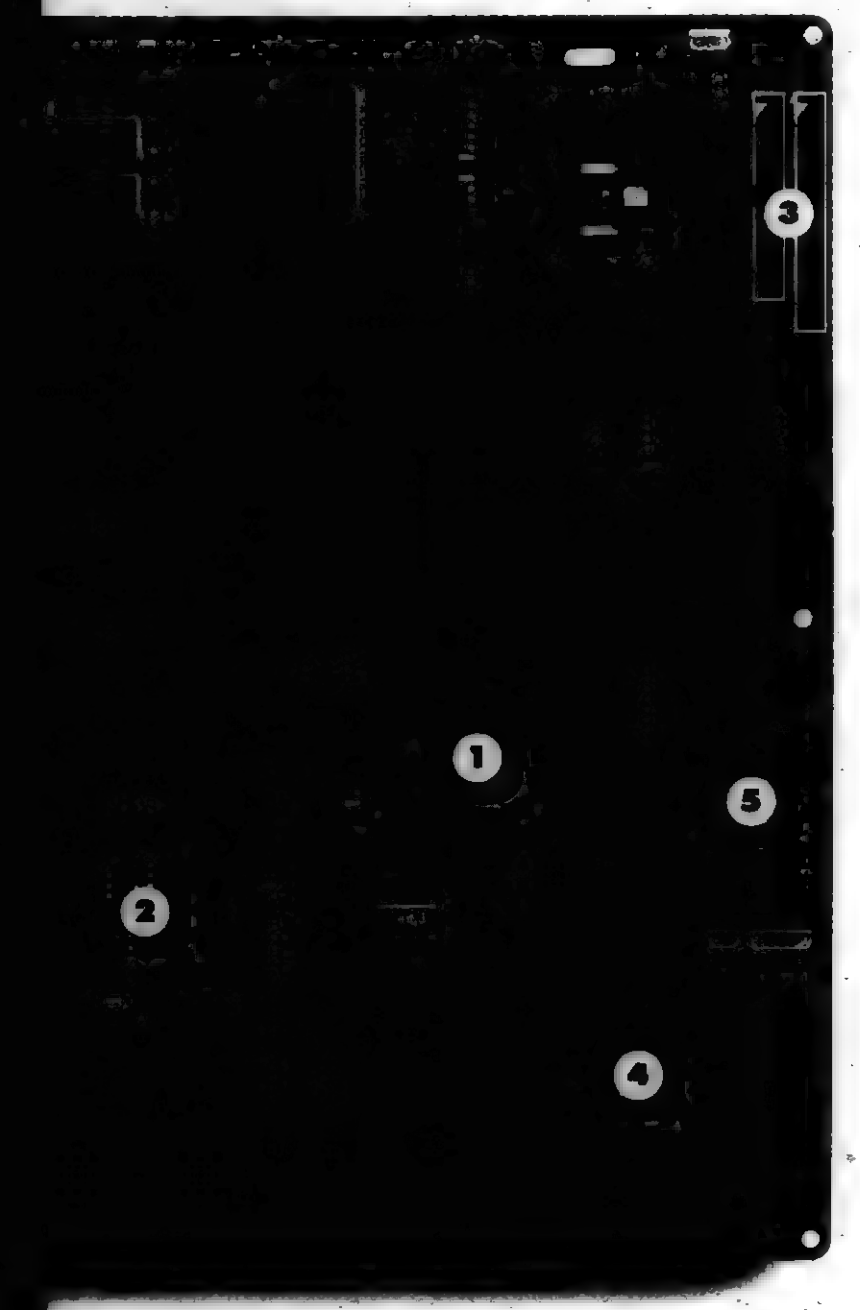

4 *Epson's proprietary BIOS. Epson has elected to develop its own BIOS, customized for each individual system, simply to ensure that your software will get the most out of our hardware.*

5 *High speed memory. In fact, at 70 nanoseconds, they are among the highest speed memory chips available. With them, memory access is faster. Snap-in SIMMS modules make memory upgrades easy and quick.*

6 *Super VGA video graphics are embedded on the motherboard. The result: more efficient data transfer, more reliable circuitry, optimized video performance.*

What the Epson design team has discovered is that *less* is very definitely more. By reducing the number of separate components through integration, performance is increased. The result is a flexible tool which is elegant, efficient and allows the effortless application of power and speed to the task at hand.

In fact, there is only one word that adequately describes the innovative design of these new Epson computers. Neat.

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EIS

CONTINUED FROM PAGE 79

detailed information, whether it's in graphical or textual form. On the Inland system, users hit "page-down" and merely see more preset screen detail, not information relating to any particular item. Additionally, the Lotus graphics are not as high-quality as a vendor package.

Stone Container Corp., on the other hand, began with a custom-built system and replaced it with Pilot's Command Center after the first attempt "didn't work out too well," according to Donna Dreczko, project manager of EIS.

Dreczko attributes the failure to the system's use of function keys and the fact that there were no icons or graphics; users selected menu items with a text-based interface.

The new system clearly displays applications in five colored boxes that executives touch for more detailed information.

The system was implemented in two months and runs five applications, including accounts-receivable, orders, shipments, production and backlog. Users range from the chief executive officer to the senior vice-presidents from each functional area.

When considering what off-the-shelf packages have to offer, it becomes clear what an EIS *can* do. Comshare's Commander offers two primary applications — Briefing Book and Executview. With Briefing Book, information is downloaded from the mainframe to a PC. With standard reports, drill-down, color-coding, trend analysis and commentary features, the product presents the user with his own customized EIS.

Executview's Executive Edge handles ad hoc reporting, where the executive views the data from the mainframe, file server or PC. The product was designed to work with System W or One-Up, Comshare's DSS products.

Execucom, on the other hand, works with preformatted templates, which a company writes applications to fit.

Pilot's Command Center offers drill-down, trend analysis, exception reporting and ad hoc query. It also offers a number of code generators, including Advantage, Dimension and Multipath.

Roads taken

A large percentage of companies, however, willingly give up some of the functionality of the vendor packages, believing they can do so for a fraction of the software cost. In addition, they see no reason to pay so much for software that requires a huge degree of customization — usually one to six months worth before an application is up and running.

One homegrown approach is to use a very powerful 4GL product to provide EIS capabilities.

One such product comes from Information Builders, Inc., which just released Focus EIS. Focus EIS sells for $995 per copy and requires either PC Focus, which lists for $1,295 per copy, or the mainframe version, which costs $180,000.

Focus EIS uses drill-down, trend analysis and exception reporting to improve data access and reporting capabilities for systems built in Focus or PC Focus. Its open architecture allows access to data across many platforms.

Information Builders claims you can bypass the mainframe Focus database and go right to the source systems; however, the ideal method is to pull data from the different sources, bring the data into the Focus database and then present it to executives with Focus EIS.

In addition, Focus EIS is ideal for companies that already have a sophisticated Focus database.

Prototype, then implement

Another approach is to first prototype and then implement a production system. Two products commonly used for this purpose are American Information Systems, Inc.'s Redimaster and Interactive Image's Easel.

At Central and South West Services, a Dallas-based holding company for four electric companies and a gas pipeline company, "The prototype approach was a lot more attractive to our management than making an up-front commitment and going with any of the particular EIS products," says Dick Groff, manager of planning.

Central and South West chose Easel, a general-purpose screen design and prototyping tool. The product creates screens from mainframe databases to present on a PC, complete with color-coding, graphical trends and drill-down capabilities.

It took the IS department about eight weeks to create a demo for the eventual EIS. It included three modules, showing operational information, status reports and organizational charts. From there, six months were spent preparing a more in-depth prototype and standardizing on the use of the three applications.

The project is now on hold until strategic plans are finalized. Nevertheless, it is still less expensive to have a prototype fail than a full-blown EIS.

One drawback to sticking with an EIS created in this manner is that once you enter production mode, maintenance becomes costly and difficult. Each screen that is displayed to the end user has several PC files associated with it, each of which needs to be maintained. If the executives decide they'd like a change in screen format, it is a big job, since hundreds of screens may be at stake.

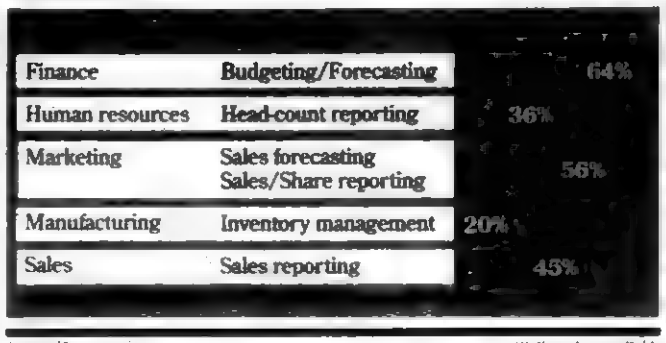
Another way to start small is to take a departmental, distributed approach with a LAN-based system.

"The architecture of the future will be an intelligent workstation providing the human interface and personal productivity functions," says Richard Crandall,

Continued on next page

Where does the money go?

Financial applications are the most popular EIS users, with sales numbers a close second



Source: Pizzano & Co. — CW Chart: Doreen Dahle

Common ground

EISs vary widely in functionality; however, the following are the most common features found in "full-function" products such as those from Comshare, Inc., Pilot Executive Software, Execucom Systems Corp., Information Resources, Inc. and IBM's Executive Decision, according to Hugh J. Watson, director of MIS programs and EIS projects in the department of management at the University of Georgia:

- Support for multiple-user interfaces.
- On-line, context-dependent Help screens.
- Command files.
- Multiple methods for locating information.
- Access to external databases (such as Dow Jones News/Retrieval).
- Interfaces to other software (such as IBM's Professional Office System, Lotus Development Corp.'s 1-2-3).
- Integrated decision support (such as System W, IFPS).
- Easy screen design and maintenance.
- Screen design templates.
- Application shells.
- Data extraction from existing organizational databases.
- Graphical, tabular and textual information on the same screen.
- Integration of data from different sources.
- Security for data, screens and systems.
- Support for rapid prototyping.

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HAS INSTALLED
STORAGETEK

Continued from page 82

president of Comshare. "These will have engines behind the scenes performing the bigger analytical and data management work," he says.

Abbott Laboratories went with Comshare for just this distributed approach. "We could offer executive information systems without them becoming incredibly costly because the preponderance of the work is handled on the PC while the executive is using it," says Nancy C. Boyd, a consultant in the firm's corporate MIS department.

Control and South West's Groff *says prototype approach is preferrable*

Another downscaled approach to PC-based EISs is offered by Channel Computing, Inc.'s PC-based Forest & Trees.

Users of the system define critical success factors or vital signs and set up their applications accordingly. While the $495 product is not a bad step toward eventual EIS functionality, there are a few drawbacks. For one, it is necessary to hard-wire the data to the application as well as program every part of the screen that will be activated. Channel Computing claims that executives can do their own screen modification, but the number of steps involved in this process makes that claim doubtful.

As users choose between large- or small-scale systems, they also are faced with another issue: the degree to which ESS and DSS characteristics should creep into their EIS.

Executive support systems are umbrella systems that enable the executive to communicate with others via E-mail, review people's schedules to set meetings, make travel arrangements and perform other administrative and support functions.

The EIS is the core piece of the ESS that provides the financial, marketing, operational, personnel and competitive information.

The more comfortable the executive is with using a computer, the more ESS functions he'll want in the EIS. For example, on some systems, E-mail is embedded within the EIS application so that the executive doesn't have to go to a separate screen to mail a message about a particular report.

A DSS, on the other hand, is usually targeted at managers and analysts. Whereas an EIS is a presentation vehicle of summary information, a DSS is an analytical tool. EISs do perform some analytical functions, such as sorting, basic mathematics, selection and limited what-if, but DSSs add more sophistication to the picture, performing strategic planning, budgeting and forecasting, consolidated reporting, what-if analysis, goal-setting and optimization on larger volumes of data.

EIS of use

An EIS is also more user-friendly than a DSS. Most vendor packages include a touch screen, mouse or remote control to activate the system. With a DSS vendor package, the user either types in commands or uses function keys to activate the system.

EIS purists hold that executives want only capsulized information and no analytical capabilities. "An executive will take a large report and scan for items that are interesting to him," says Wayne C. Burkan, president of Alternative Visions, Inc., an EIS consulting organization in Farmington Hills, Mich.

"An analyst is far more methodical in

Continued on page 84

Does 'E' stand for 'everybody'?

The "E" in EIS doesn't just have to mean "executive." Once targeted at the top brass, executive information systems are now marketed to — and used at — other levels of the organization. EIS can mean "everybody's information system" to some and even "enterprise intelligence system" to others.

The question is, how far down in an organization can an EIS be effectively used? And, at what point might decision support technology or other information systems better serve needs?

In the traditional view, EISs give top executives a means of tracking critical success factors. With the new approach, "everybody is sharing information and networking from the same ubiquitous database," says Michael Watson, senior manager at Price Waterhouse's Applied Technology Center, which uses the term "enterprise information network." The enterprise view includes all of the people within the organization from the senior-level executives down to the people responsible for the operational work.

> IF EXECUTIVES looked at the business one way, and the rest of the company another, it would create problems.
>
> KEVIN D. GREEN
> INLAND STEEL

Another advocate of this theory is Pilot Executive Software. "EIS is not about executives. It's about a technology that solves a class of information problems," says David Friend, the company's founder and chairman.

"It's about hypertext data navigation, access to multiple data sources, graphical data displays to aid interpretation, multiple ad hoc views of data and so forth. It's just as applicable at the middle-management level as at the top."

Friend even recommends EIS at the operational level. For instance, a plant manager would look at detailed summaries of plant activity to determine the level of efficiency.

Further down in the organization, however, people's information requirements do change, usually growing too specific for an EIS to handle. Friend concurs that decision support system capabilities need to be used at these lower levels.

In Pilot's product, the issue is tackled by assigning different users of the system different access levels to the database. Chief executive officers may access the top three levels of the database, for example, including salary information. Mid-level management and employees on the operational level would view more applicable levels of the database.

Others take a modified view, believing that EIS was designed for more than the top executives, but it's not for everyone.

"Directing the EIS to the top two levels of management is too narrow," says Richard Crandall, president of Comshare. "An EIS must also be designed to include the people who analyze, process, package and deliver information to decision makers. "On the other hand," he continues, "EIS is not relevant right down to the bottom of the organization. There you will start to compete with other products, such as Microsoft and Lotus, that have different functionality than an EIS."

Far reach

People who have used EISs see practical reasons for the filtering-down process. Inland Steel Co. intended from the very beginning for its homegrown EIS to reach beyond top executives, says Kevin D. Green, EIS project manager. "If you had the executives looking at the business using one approach, and the rest of the company is looking at the business using a different approach, it would create problems," he says.

At Inland, 40 people — ranging from the chief operating officer to section managers — use the system, and it is currently being made accessible to analysts. Inland follows Pilot's approach, in which employees at different levels of the organization have access to different parts of the database.

EIS purists argue that the democratization of EISs trivializes the technology and undermines the leadership role of top executives. "The purpose of an EIS is to send signals to the organization as to what is important, to indicate movement toward a new direction and to help executives monitor the progress towards that direction," says Wayne C. Burkan, president of Alternative Visions, Inc.

"The organization will succeed or fail based on the leadership of the executives," he adds.

EILEEN CARLSON

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StorageTek.

Continued from page 83

gathering and analyzing information," he says.

Those who see DSS merging with EIS also expect that lower levels in the organization will use EISs (see story page 83).

The top three vendors have a close affiliation with DSS: Comshare and Execucom started out as DSS vendors and later added EIS products, and Pilot started as an EIS vendor and just last year added a DSS component to its product line.

A fourth vendor that is traditionally strong in DSS, Information Resources, Inc., is beta-testing its EIS product. While companies have used its DSS, Express, to build EISs, the firm has added an EIS tool kit to its PC Express with the intention of easing and speeding the EIS application building process. This kit is scheduled to be released next month and will cost $50,000 along with an additional per-user fee.

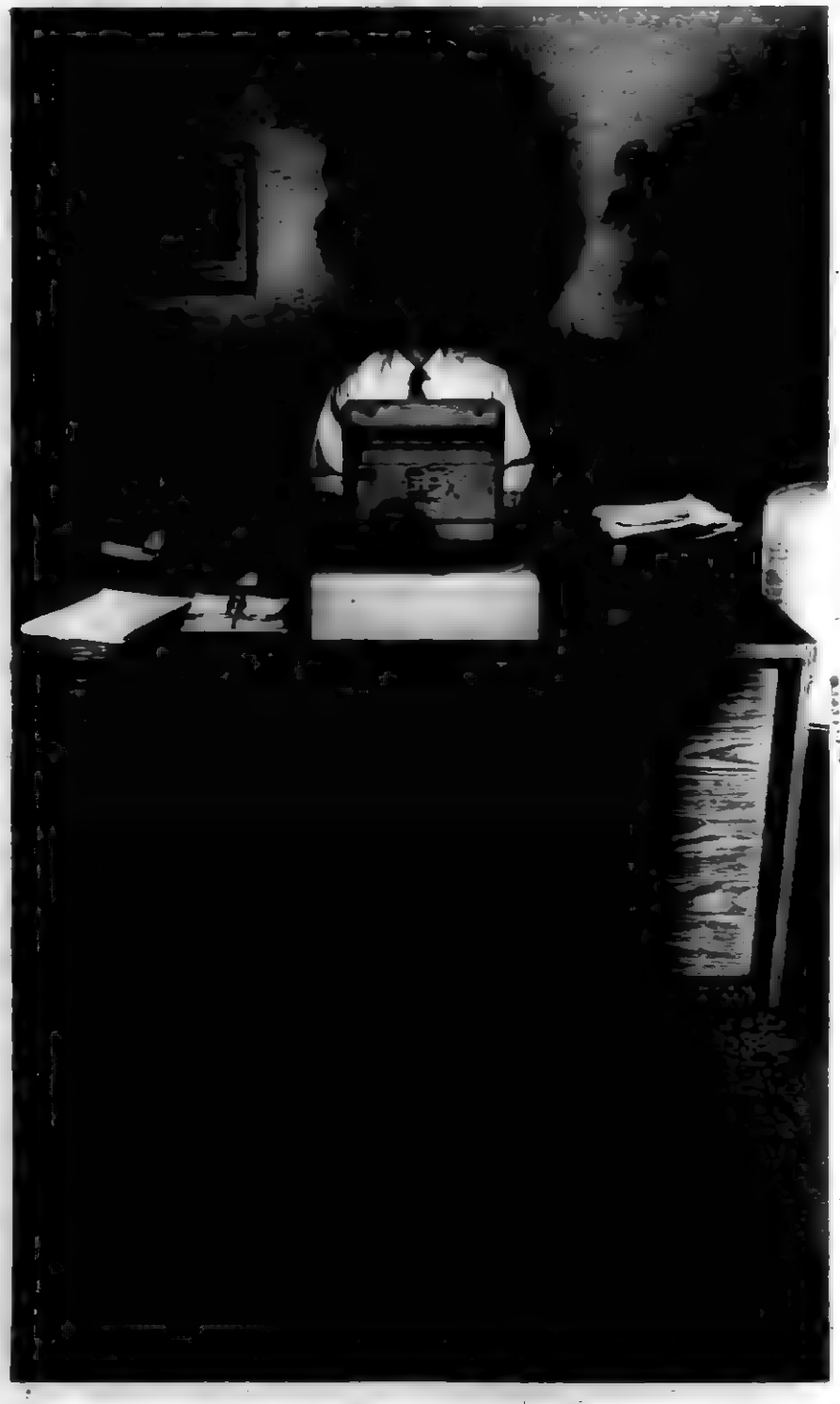
In all four cases, the DSS can be added for $150,000 to $200,000. Used in combination with the EIS, these systems work well to consolidate and massage the raw data on internal systems.

Despite these advantages, stacking an EIS on DSS or vice versa does not produce the integration one might desire. For example, to perform more sophisticated DSS applications on data presented in the EIS, flat-file transfers or other preformatting steps are necessary to present the information in a user-friendly format. It would be nice to say that you get what you pay for with EISs. In some senses, this is true; $495 won't buy the functionality of a $50,000 package.

However, high price alone cannot guarantee a successful system. There are many implementation concerns that will influence your eventual failure or success [CW, June 25].

The good news is that as the EIS definition changes and blurs, there are that many more types of EIS packages on the market, and companies can choose between luxury and economy models. •

The Mistakes You Thought You Could Never Make Are The Ones That Come Back To Haunt You.



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Varying views

There are as many ways to view data through an EIS, as there are ways to view the organization. The most common applications include the following:

- **Financial.** The executive may monitor profitability, analyze expenses or look at the breakdown of revenue — whether by region, corporate division, department or product.
- **Marketing.** The system may display market share, demographic makeup of the customer base and product popularity in various geographic regions.
- **Operational.** The executive may view productivity variation across a number of plants, how the actual production rate compares with the plan and how a strike would affect productivity.
- **Human resources.** May include executive succession planning, number of employees that fit into certain categories according to their skills and experience, actual head count vs. planned head count and background information on individual employees.
- **Competitive.** May include news stories regarding the competitors' financial performance and product mix.
- **External factors.** Execs may want on-line access to interest rates, government regulations, indicators of the general economy and industry trends.

Any of these applications can also be viewed simultaneously; for instance, executives can look at head count vs. financial performance or internal vs. external factors.

EILEEN CARLSON

Execs say, it's nice, but . . .

BY ALAN RADDING

Top executives may not know every technical detail of how their executive information system (EIS) works, but once they use one, they're pretty sure what they want to do with it.

While a number of executives contacted by *Computerworld* said they were generally pleased with their systems, most could see room for improvement. Displeasure arose mostly when the EIS promised more than it delivered.

"WE CAN'T use the EIS from a laptop, but that's something I want."

THOM FARIA
THE NEW ENGLAND

The improvements most wished for varied widely, depending on the executive's usual work habits.

"What I want from an EIS most executives probably don't need," says John Betak, assistant vice-president of asset development at Conrail in Philadelphia, who puts great value on analytical capabilities. On his wish list is specialized software to help analyze the data provided by the EIS.

Matters of taste

The need for analysis tools ranges from the basic to the very sophisticated. Thom Faria, vice-president of agency operations at The New England, a financial services company, for instance, says he would be satisfied with basic modeling capabilities such as what-if scenarios on his EIS from Comshare, Inc.

Sophisticated graphing is in demand at Connecticut Mutual Life Insurance Co. in Hartford, Conn. "Sometimes I'm working with numbers that are in the millions of dollars and numbers that are below half-a-million dollars at the same time," says Richard McGeary, chief financial officer for information systems at the firm. "I need to have logarithmic graphing so I can show orders of magnitude."

Predictive capabilities are gold to some, but they're worthless to others.

"We built our system on the concept of what's happening, not what-if," says Robert Wallace, recently retired president of Phillips 66 in Bartlesville, Okla., a pioneer in EIS. Of more importance is up-to-the-minute accuracy of data.

Other executives just can't get enough information. Conrail's Betak, an experienced computer user who is accustomed to accessing many Conrail databases, says he would like to meld all of these databases into the EIS.

Wallace would like to have more types of data in the EIS, such as information on laws and regulations from legislature and trade associations. To handle this load, he says, the EIS needs to be faster, at least operating "in a speed frame consistent with our mental process."

At Comdisco, Inc., an equipment leasing firm in Rosemont, Ill., James Stanton, vice-president of administration, has access to a massive amount of information through his EIS — the equivalent of 175,000 reports internally plus external data sources. He wouldn't refuse if he were offered more: "If we had better capability to drill down for more detail and if it were easier to get data from outside sources, I'd support that," he says.

The need for detail is echoed by Steve Bonville, second vice-president of individual disability marketing at Unum Life Insurance Co. in Portland, Maine. "I have charts and graphs, but I can't get at the raw numbers," he says. A new version of his Pilot Executive Software EIS promises to remedy that situation.

Other executives seek the comforts of home. "We can't use the EIS from a laptop, but that's something I would very much want," The New England's Faria says. The problem, suggests Connecticut Mutual's McGeary, is the sheer volume of information that would have to be transmitted.

"I'D LOVE to be able to say 'sales' and see sales information open up."

RICHARD MCGEARY
CONNECTICUT MUTUAL

Others chafe at predefined reports and long for unstructured output capabilities. "I wish I could dump [the information from the EIS] on a floppy and move to the desktop publisher or just transfer it to the publisher," Betak says.

Promises to keep

Real dissatisfaction with an EIS arises when it doesn't live up to its billing. At Metropolitan Life Insurance Co. in New York, the problem is not with the EIS but with the incomplete or out-of-date information it delivers.

"They gave me a PC and told me I would have access to a lot of information with a mouse," says Ted Athanassiades, executive vice-president at the firm. "Unfortunately, they aren't keeping up the databases, so it is useless to me."

The screen gives him a colorful display of the information he can select with the click of a mouse, but when he requests that information, he is disappointed. "If I try to access, say, human resources, they give me a report that's dated December 1989. It's useless to me," Athanassiades says.

The company is planning to connect the EIS to the central databases so files can be accessed immediately.

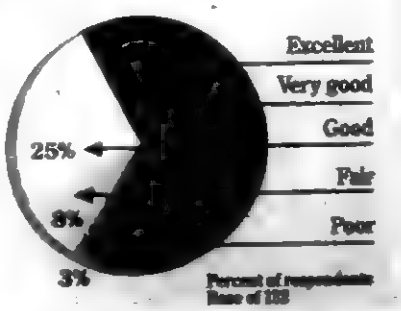
Those who are pleased with their current systems see almost limitless potential for enhancements, including expert systems capabilities. "I would love to have the system become intelligent to who you are and what you like to see through your touch stroke," McGeary says. "I'd also love to be able to say 'sales' and see sales information open up."

Others, such as Comdisco's Stanton, think the current technology could use a few improvements. Stanton's particular peeve is touch-screen design. "At times the lines are too close together for thick fingers," he says. •

Radding is a free-lance writer in Newton, Mass.

Great reviews

End users and IS managers dissatisfied with their EISs make up a distinct minority, according to a survey



Source: Pizzano & Co. CW Chart: Doreen Dable

ASK THE VENDOR

I'm using Decision Pad from Apian Software on my personal computer to evaluate project alternatives and would like to use some data in my minicomputer database. Is there a way to get the information directly into Decision Pad?

T. R. Sandlin
Manager, SP-100 Nuclear Sub Systems Program Control
General Electric, Astrospace
San Jose, Calif.

APIAN SOFTWARE, INC.: Decision Pad can import information directly into its columns and rows, providing that the exported data file has been prepared as an ASCII file in fixed, comma-delimited or Dbase format.

The full querying power of your database can be used to extract, group and accumulate specific criterion values for each of your alternatives before they are imported. You can also instruct Decision Pad to do some preliminary alternative selection at the time of import. You don't have to get the criteria for Decision Pad's matrix into the ASCII file itself. At the start of the import process, Decision Pad lets you map individual ASCII fields to their corresponding Decision Pad criteria cells.

In addition, the names of the alternatives should be in the ASCII file being imported. Decision Pad will automatically place these, as alternative names, at the top of their respective columns.

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Government by screens and keyboards

BY CARYL HOLLAND

FIRST PERSON

It is 30 minutes before the start of a session at the Michigan State Senate. Senators have just enough time to make status checks on their executive information systems (EIS), which were built in-house and implemented earlier this year.

By pressing "daily calendar," they familiarize themselves with the events of the day. They may also check electronic mail messages by using the EIS menu to log on to the office file server.

One senator receives a message from a legislative aide who wants him to review a document pertaining to a bill he is speaking on later today. The senator can retrieve the document located in the shared directory on the file server, make some editing corrections and print the document in the partisan lounge.

A few minutes before the session, the senators check which bills have been referred to the committee by pressing the appropriate button on the screen. While members review the information, the session is called to order, and roll call begins. The screens on the senators' personal computers automatically change to allow them to press the "Aye" button. They then press the "Party" button to view who is present by party.

The Senate is now in full swing, ready to tackle another day of business.

The impetus to build an EIS at the Michigan Senate originated in late 1988, when plans were being finalized to completely gut Senate Chambers and restore the original 1800s decor.

The renovation would result in a complete overhaul, so a few senators who already used PCs suggested incorporating a Chamber computer system into the plans.

"Word processing and database applications were common tools being used to manage the work load," says Senator Bill Sederburg, chairman of the Michigan Capitol Committee. "We realized that computers could help them get the job done on the floor."

The senators were also interested in easy access to Michigan Compiled Laws and legislation under consideration.

Done deed

A little more than a year and $800,000 later ($495,000 in application development and implementation and $322,000 on workstations and network hardware), 34 of the 38 senators are using an EIS in their everyday work and during legislative sessions.

We decided that EIS was the way to go after determining critical success factors for the senators through a series of interviews. Aiding in our study was WW Computer Systems Group in Grand Rapids, Mich.

Bill Snow, the secretary of the Senate, was called on to serve as executive sponsor for the project, and he asked Senate Information Services, the Senate's computer group, to assist in developing a plan.

As our knowledge of EIS grew, we realized how easily one could fail. In order for this project to be successful, we decided to define requirements, document basic assumptions and determine issues that needed to be addressed.

One very basic requirement was that the project had to be completed by Jan. 10, 1990, for the grand opening of the Chamber. Second, we needed to take into consideration the varying degrees of computer skills among the senators: Only 11 of the 38 were computer literate. Third, the computer technology could not intrude on the 1800s decor.

We evaluated some off-the-shelf EIS software but ran into complications. For one, the system had to be compatible with Novell, Inc.'s Netware, which the Senate had chosen as the basis for its computer network. At the time of our implementation, EIS vendors focused primarily on the mainframe environment.

In addition, we could not find prepackaged software that met the operational requirements of the Senate voting system, such as recording votes and requesting to speak on an issue. All of these functions needed to be performed in real time between workstations and the display boards located on the front wall of the gallery.

Given the inability of commercial products to deal with these special requirements, we decided to design and code a system ourselves.

Between April and June, the information systems department worked with Decision Resources Corp., a consulting

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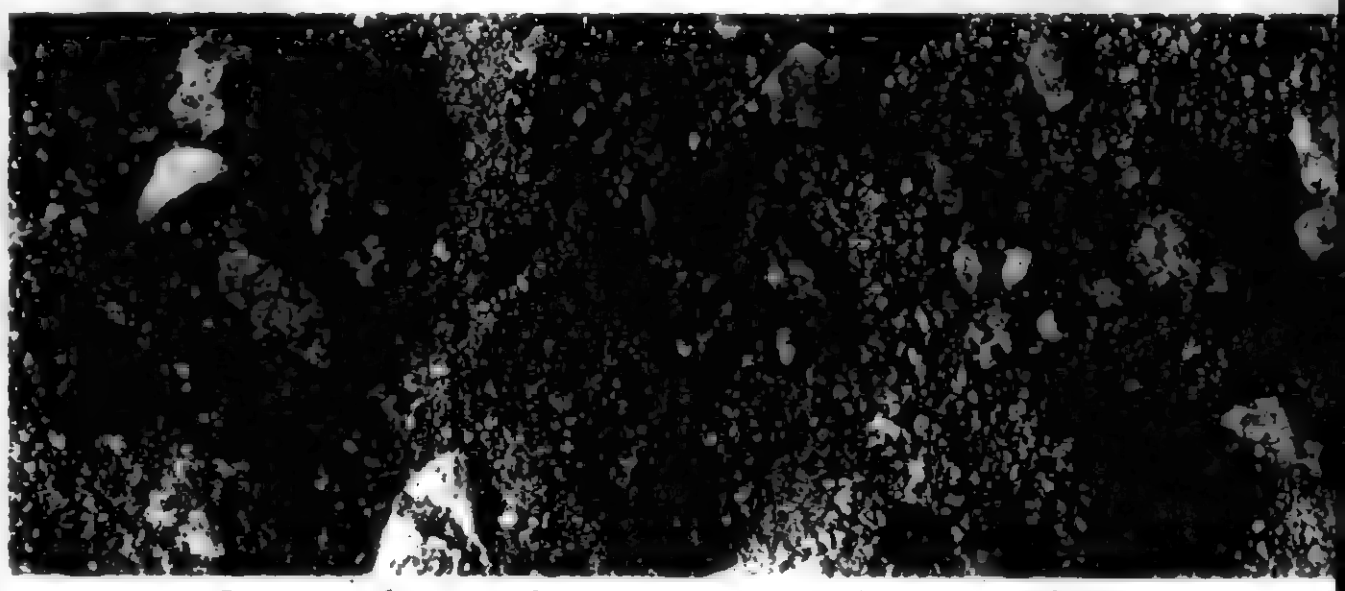
Holland is an implementation manager in the Senate Information Services department in the Michigan State Senate.

1990. The missing north of New York.



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firm in Washington, D.C., and Daktronics, Inc., a major provider of voting display systems, to design system specifications. With working prototypes, we gathered user feedback on screen layout and functionality. This also helped build support for the EIS because the members took ownership of the system.

During this time, we also evaluated which PC to use. While the Apple Macintosh was the strongest candidate because of its easy-to-use interface, it was not yet fully integrated with token-ring Netware local-area networks.

We ended up selecting IBM Personal System/2 Model 70s running Microsoft Corp.'s Windows/386 software as a graphical user interface. This also allowed senators to switch between multiple applications. For touch-screen capability, we selected Micro Touch System, Inc.'s products and used Atlantic Digital to develop an IBM Micro Channel Architecture graphics controller card.

Michigan senators *have text of amendments at their fingertips*

When we implemented the EIS in January, we were the first legislative body to incorporate full-functioning workstations at the senators' desks. Not only that, but the workstations are incorporated into roll-top desks, thus keeping with the Chamber's decor.

We are very pleased with the acceptance of the EIS. "This technology has improved efficiency of senators, allowing them to monitor inter- and intra-office communications. Plus, they have the text of amendments at their fingertips," says Senator John Engler, Senate Majority Leader and a strong advocate of computer technology. As for the future, we are just beginning to discuss such possibilities as access to on-line news services, graphical presentations of fiscal analyses and audio-visual capabilities. •

ASK THE VENDOR

I've used SPSS's Statistical Data Analysis System for decision-making and to produce ad hoc reports. Are you planning on adding more of these types of features?

Richard Tamberrino
Director of Research and Statistics
Maryland Department of Public Safety and Correctional Services
Baltimore, Md.

SPSS, INC.: While no date is yet set for the release, we are planning to add customizable report features, such as utilities for incorporating supporting graphs and text into reports and merging SDAS output with that of other software, such as word processing packages.

How can I express "unquantifiable" elements in terms that Expert Choice's decision support system can understand?

Ern Reynolds
Attorney
Ern Reynolds Professional Corp.
Falls Church, Va.

EXPERT CHOICE, INC.: Suppose you're trying to decide whether to market Product A, B or C and you're concerned with a few different variables, such as making a profit, maintaining the company's image and increasing market share.

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Expert Choice will take you through a series of judgments about the relative importance of pairs of criteria. You would then make judgments based on your experience, intuition and knowledge of the company's culture. These judgments can be expressed either on a numerical scale, ranking one to 10, or on a verbal scale, using the words "equal," "moderate," "strong," "very strong" or "extreme."

You would then make a series of judgments about the products in terms of how well they satisfy each criterion.

In making judgments about price and profits — both quantifiable elements — you may use primarily hard data, such as figures provided by the production and engineering departments. In making judgments about preference of said product in terms of company image, you are likely to rely on personal experience and intuition, perhaps mixed with the results from a marketing survey.

Expert Choice synthesizes the results of all the judgments — whether or not they're based on tangibles or intangibles — and arrives at a choice that incorporates your expertise and knowledge as well as quantifiable data.

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BUYERS' SCORECARD

Command Center slips past Commander *(barely)*

BY MICHAEL L. SULLIVAN-TRAINOR
CW STAFF

Coke or Pepsi, Burger King or McDonald's, Ford or GM — which do you prefer? If you find those choices hard, then you begin to understand the difficulty information systems professionals face in choosing between executive information systems (EIS) rivals Comshare, Inc. and Pilot Executive Software.

While Comshare's Commander owns an imposing 55% of the installed base, as opposed to Pilot Command Center's 34%, the two are nearly equal in the types and qualities of features they offer, according to *Computerworld's* Buyers' Scorecard survey of 50 users of each product.

Introduced in the early 1980s, Pilot's EIS products lost an early lead in share to Comshare, which introduced Commander in 1985. These were followed in October 1988 by Execucom Systems Corp.'s Executive Edge, which has 5.7% of the installed base (See Executive Edge ratings and methodology page 89).

The closeness of Pilot's and Comshare's packages is reflected in a whisker-thin difference in the overall ratings. Command Center edged ahead with 58.1 points to Commander's 57.9. The point totals are derived from multiplying the ratings each user group gave his own product by the importance factors all users assigned to the 17 criteria.

Despite the closeness in overall scores, the two packages do have different approaches in key areas. For example, Command Center is a host-based product, with data downloaded to personal computers on request. Commander, on the other hand, uses host-based data but requires all screens to be downloaded to the PC.

Another feature that wins user points for Command Center is an automatic program generator that supports screen design and maintenance. The product received its highest rating — 8.8 out of a possible 10 — in the area of screen design, which is one of the most key considerations for users. Screen design was rated 8.7 in importance by all users on a one to 10 scale. Command Center also topped other application development categories.

Commander scored higher, however, in data access and integration categories. The package comes with specific links to different types of internal databases. This feature was reflected in a rating of 7.5 for data extraction from existing databases. In addition, Comshare was the first to forge relationships with other vendors that offer external database services. Users recognized these ties with a 7.5 rating for access to external databases.

The strength of Commander's System W decision support system was reflected in a score of 7.7 for well-integrated decision support.

COMPUTERWORLD BUYERS' SCORECARD

Full capability executive information systems

Total scores reflect all criteria and their user-assigned importance. Response base: 50 users per product

Product	First place finishes Top five:	Second place finishes Bottom five:
Pilot's Command Center SCORE 58.1	Integrating data from different sources Ease of screen design and maintenance Quality of service and technical support Ease of customization Interfaces to other software, such as Profs & Lotus 1-2-3	Presenting graphics, text and tables on the same screen Data extraction from existing databases Support for rapid prototyping Support for multiple interfaces Security for data, screens and systems
Comshare's Commander SCORE 57.9	Presenting graphics, text and tables on the same screen Data extraction from existing databases Support for rapid prototyping Support for multiple interfaces Security for data, screens and systems	Integrating data from different sources Ease of screen design and maintenance Quality of service and technical support Ease of customization Interfaces to other software, such as Profs & Lotus 1-2-3

USER RATINGS

Each product shows its strengths in user ratings of EIS capabilities. Commander wins by a considerable margin in three of the five data access categories and takes a fourth by a hair. Command Center has a slight edge in integration, price and user features and excels in several ratings related to ease of use.

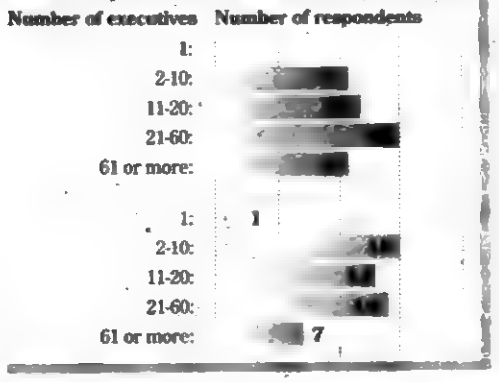
User importance rating	Data access	Command Center	Commander
8.7	Integrating data from different sources		7.8
8.4	Efficient data extraction from existing databases		7.5
8.0	Efficient access to external databases		7.5
7.5	Multilevel, ad hoc query capability		7.3
7.1	Well-integrated decision support system		7.7

User importance rating	Application development	Command Center	Commander
8.7	Ease of screen design and maintenance		7.5
8.4	Ease of customization		7.5
8.3	Support for rapid prototyping		8.1
8.0	Effective support for multiple user interfaces		7.4
7.8	Good security for data, screens and systems		7.8
7.4	Varied application shells		7.0

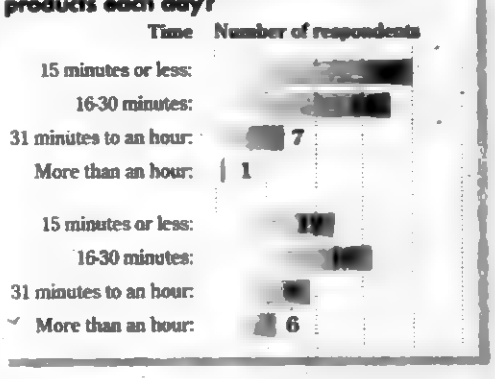
User importance rating	User features	Command Center	Commander
8.9	Well-presented graphics, text, tables on screen		8.6
8.5	Quality of service and technical support		7.3
7.9	Effective interfaces to software such as Profs & Lotus 1-2-3		7.0
7.2	Pricing of installation & maintenance		
7.2	Easy to create hard copy output		
6.5	Useful on-line Help screens		

A CLOSER LOOK

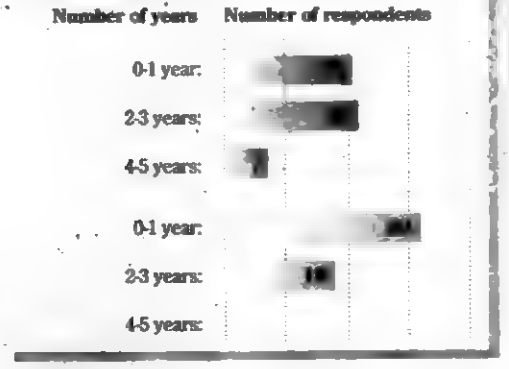
How many executives use these products?



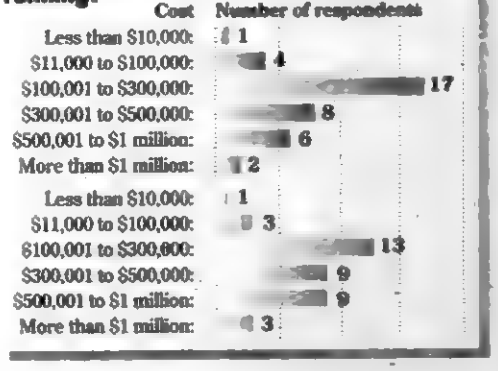
How much do the executives use these products each day?



How long has the package been in use?



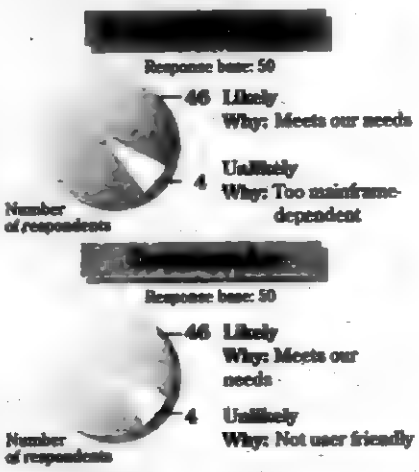
How much did it cost to get the EIS up and running?



Loyalties

Would you buy the product again?

(Reasons based on most frequently stated responses)



"Verbatim"

Responses are based on the most frequently stated answer to:

"What do you like best/least about this product?"

(Response base: 50 per product)

	Likes	Dislikes
	"Ease of use"	"Weak external database access"
	"Ability to customize"	"Inability to create ad hoc PC files"
	"Graphics"	"Poor technical support"
	"Graphical user interface"	"Maintenance"
	"Ease of use"	"Briefing book capabilities"
	"Prototyping capability"	"Not user friendly"

First in pursuit

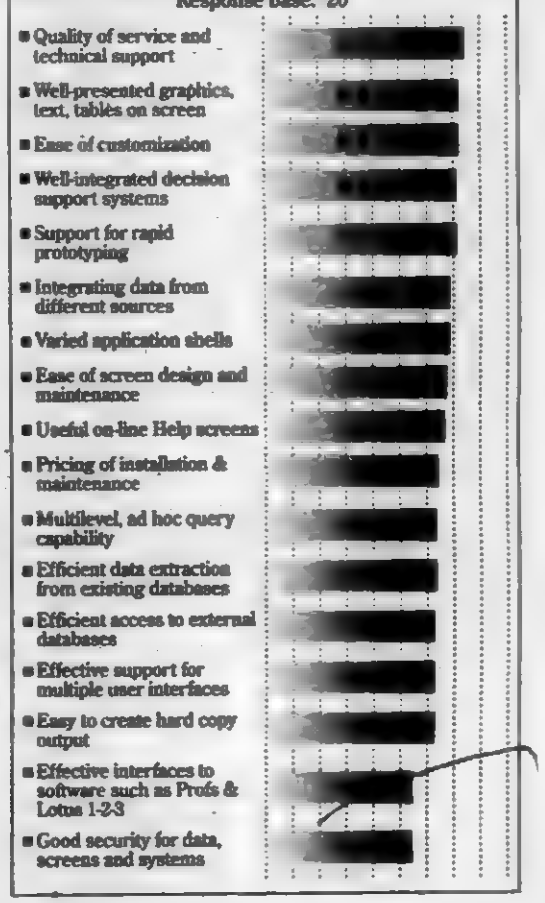
Execucom Systems Corp.'s Executive Edge owns third place in the EIS battle for installed base. About 50 companies are now using the product, which was introduced in October 1988. Many of these were already users of Execucom's IFPS/Plus decision support system (DSS).

Execucom is one of a group of vendors pursuing pioneers Comshare and Pilot. Other competitors include Information Resources, Inc., with its fairly new EIS based on its Express DSS, and IBM's Executive Decision. Express EIS is in beta testing with about 12 users, and IBM's product was just released last September.

The Buyers' Scorecard ratings from 20 Executive Edge users reflect the company's strong tradition of service and support. That was the category in which the product received its highest score. The product features an "explain" function that automates the traditional drill-down process. This expert system-based function did not seem to influence survey users, who assigned a fairly low grade for multilevel, ad hoc query capability.

EXECUTIVE EDGE RATINGS

Response base: 20



METHODOLOGY

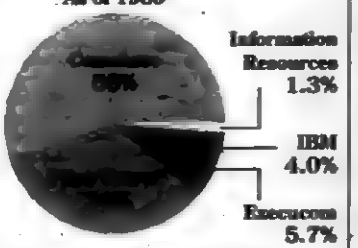
Products rated in *Computerworld's* Executive Information Systems Buyers' Scorecard were chosen based on the following criteria:

Products selected for review by users had to be full-capability EIS, which means they had to be designed for use by top-level management and offer the following functions: drill down; exception reporting; data extraction from existing databases; access to external databases; support for multiple-user interfaces; on-line context-dependent Help screens; command files; multiple methods for locating information; integrated decision support; screen design templates; application shells; graphics, tables and data on the same screen; hard copy output; and integration with office software.

The products also had to be one of the share leaders in both installed base and revenue. For example, Comshare leads the pack with 55% of the installations, followed by Pilot and Thorn EMI, which both sell Command Center and have a combined share of 34%. The firm with the third-largest base of users, Execucom, has 5.7% of the market.

Vendor shares of worldwide host-based EIS installations

As of 1989



*Thorn sells Pilot's Command Center

Source: International Data Corp.

Because of the large market share difference and a consequent difference in the number of users available to be surveyed, the user ratings for Execucom's Executive Edge are presented separately from those of Commander and Command Center. While Commander and Command Center are installed in more than 200 sites per product, Executive Edge is installed in only about 50 sites. While respondent populations of 50 per product were used for the Commander and Command Center ratings, a population of 20 respondents was used for Executive Edge. In addition, less than one-third of the Commander and Command Center respondents were supplied by the vendors, while more than 80% of the Executive Edge respondents were supplied by the vendor.

The ratings were based on telephone surveys conducted by First Market Research in Austin, Texas. Result tabulation was performed by IDG Research Services in Framingham, Mass.

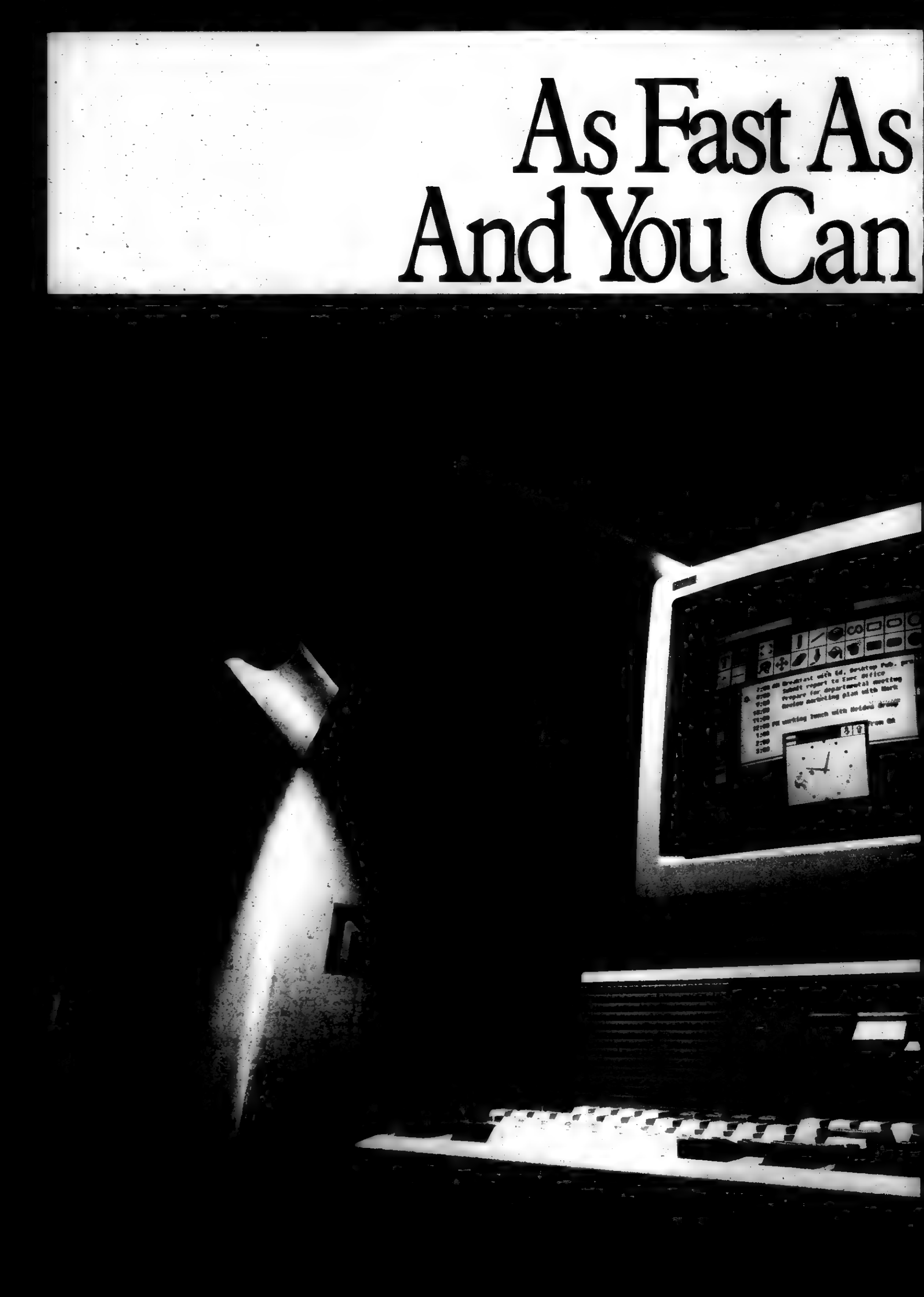
The total scores, which are weighted according to the criteria that all the respondents find most important, are computed by multiplying the mean scores all users assigned to the importance of each criteria by the mean scores each user group gave to its own product.

For example, the criteria — ease of screen design and maintenance — received a mean importance rating of 8.7 on a scale of one to 10. Command Center users gave their product a rating of 8.8 for performance in this criteria. To develop a total score, these two factors are multiplied for a total of 76.56. This total is then added to the other totals of criteria importance ratings and performance ratings. This sum is divided by the total number of ratings for a total score for all 17 criteria.

ACKNOWLEDGMENTS

CW acknowledges the assistance provided by the following individuals and organizations in the preparation of this month's Buyers' Scorecard: Michael Bragen, Business Management Consulting; Cliff Conneighton, Gartner Group, Inc.; Christine Pillatowicz, Dataquest, Inc.; Clare Gillan, International Data Corp.; Peggy Kilburn, The EIS Institute; Alan Paller, EIS Conference Report; Hugh Watson, University of Georgia; Stuart Woodring, Forrester Research, Inc.; Computer Intelligence Corp.; and Installed Technology International.

As Fast As And You Can



It Gets. Get It Fast.

The NCR PC486/MC is one fast machine. *PC/Computing* reports "the PC486/MC is on the front edge" of 486 desktops.* With its dual high-speed cache design, the system takes full advantage of the performance potential of the i486™ microprocessor. And its implementation of Micro Channel™ architecture makes it the clear leader in providing full 32-bit performance.

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It's the first of a family of advanced PCs that will lead the market in speed, power, and availability.

Our PC family also includes high-performing 286™ and 386™-based PCs. Backed by the resources of a $6 billion computer company with service and support in nearly every country in the world. And a commitment to quality that is unequaled.

Call 1 800 544-3333 for a free six-page 486 PC comparison brochure. We'll also put you in touch with the NCR or Businessland representative, or other Authorized NCR Reseller nearest you.

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EIS packages

VENDOR	PRODUCT	HARDWARE PLATFORM	OPERATING SYSTEM	DISK SPACE NECESSARY TO LOAD PROGRAM (BYTES)	GRAPHICS CAPABILITIES	IMPORTS GRAPHICS FROM EXTERNAL SOURCES	OFFICE AUTOMATION TOOLS INTERFACED WITH	REPORT GENERATION (STATIC OR AD HOC)	UPDATE PROCEDURE (AUTOMATIC OR MANUAL)	AUTOMATED APPLICATION DEVELOPMENT	NETWORKS SUPPORTED	WINDOWING FACILITY SUPPORTED	EXTERNAL ON-LINE SERVICES ACCESSED	USER INTERFACES AVAILABLE	OTHER FEATURES	PRICE
Ashton-Tate Corp. (213) 329-8000	Framework III	IBM PC AT, XT, PS/2 and compatibles	DOS, OS/2	2M	Bar, line, pie, scatter, stacked bar, XY	No	Communications, databases, E-mail, spreadsheets, word processing	Both	Automatic	Yes	3Com, AT&T Stargroup, Banyan, IBM PC LAN, Novell Netware	Proprietary	Dow Jones News/Retrieval, Compuserve, Ashton-Tate BBS, others on request	Keyboard, mouse	Outlining capability	$695
Channel Computing, Inc. (800) 282-6613	Focus & Trees	IBM PC AT, XT, PS/2 and compatibles	DOS 3.1 and higher	750K	Bar, line, pie, XY	No	Databases, spreadsheets	Both	Automatic	Yes	Any PC-based, Token-Ring	None	None	Keyboard, mouse	None	$495
Cognos Information Systems, Inc. (800) 755-4500	EISCommander Performance Analysis	Any minicomputer that support operating systems listed at right	Unix, Data/ General, Prime Information, Eloi	500M	Bar, line, pie, XY, others from external graphics packages	Yes	Databases, E-mail, spreadsheets, word processing	Ad hoc	Either	No	Primenet	None	Dow Jones News/Retrieval, Mead Data Central, Reuters, DPI, AP	Keyboard	Built in on request	$35,000+
Comshare, Inc. (800) 922-7979	Commander EIS	DEC VAX 3000, 6000 and 8000 series, IBM PC and compatibles, IBM 9370 series, PS/2, Apple Macintosh	VM, MVS, VMS, DOS, OS/2, Apple Macintosh OS	10M for PC, 40M-100M for host	3-D, bar, line, pie	Yes	Communications, databases, E-mail, spreadsheets, word processing	Both	Automatic	Yes	3Com, Banyan, Decnet, SNA, Novell Netware, Token-Ring	OS/2, Apple Macintosh Multifinder, proprietary	Dow Jones News/Retrieval, Infoglobe	Mouse, touch screen; keyboard optional with DOS machines	CD-ROM support, imaging capabilities, large screen display, on-line tickler file, voice annotation	$48,000
Database Technologies, Inc. (800) 331-4666	Pulse EIS	Apple Macintosh	Apple Macintosh OS	500K	Bar, line, pie	Yes	Communications, databases, E-mail, spreadsheets, word processing	Static	Automatic	Yes	3Com, AppleTalk, Novell Netware, other AFP-compatible networks	Apple Macintosh Multifinder	Dow Jones News/Retrieval	Keyboard, mouse	CD-ROM support, imaging capabilities, large screen display, video, voice annotation	$45,000 for site license
Dialogos, Inc. (212) 431-3600	Access Executive	IBM 370 series, DEC VAX, Unix machines, IBM PC	CMS, TSO, VMS, Unix, DOS	8M	3-D, bar, line, pie, text, XY	No	Communications, databases, spreadsheets, word processing	Both	Automatic	Yes	DEC PCSA, Novell Netware	None	No direct support, but interfaces written on request	Keyboard, mouse	None	$1,000-$200,000
Easel & Strathmore Software (800) 969-4888	Smartview	IBM 370 series, IBM PC, PS/2 and compatibles	MVS, DOS 3.1 and higher, OS/2	4M for PC, 300 cylinders for host	3-D, bar, line, pie, XY	No	Communications, databases, E-mail, spreadsheets, word processing	Both	Either	Yes	Novell Netware, IBM PC LAN	Microsoft Windows 3.0	None	Keyboard, mouse, track ball, touch screen	Large screen display, on-line calendar	$80,000
Executive Systems Corp. (800) 331-0030	Executive Edge	Any machines that support operating systems listed at right	MVS, VM, AIX, SCO-Unix, VMS, Micro VMS, Ultrix, RISC Ultrix, MPE-XL, HP-UX, Dynix, DOS 3.3 and higher, Apple Macintosh OS	360K-720K for workstation, 20M for host	Area, bar, high-low-close, line, pie, variance, XY	Yes	Communications, databases, E-mail, spreadsheets, word processing	Both	Either	Yes	Any PC-based network	Microsoft Windows, proprietary	Dow Jones News/Retrieval, others on request	Keyboard, mouse, remote control	On-line calendar, scheduling template, CASE-style application generator with object-oriented capabilities, icon library	$50,000-$300,000
Focus Microcomputers, Inc. (703) 684-2000	Focus EIS Toolkit	IBM PC AT and compatibles	DOS	200K	Bar, line, pie	Yes	Communications, databases, E-mail, spreadsheets, word processing	Ad hoc	Both	No	Novell, Inteliport, Token-Ring	None	None	Keyboard, mouse	None	$3,000
Global Software, Inc. (800) 256-3444	Global EIS	IBM PS/2 and compatibles	DOS 3.0 and 4.0, OS/2	2M	3-D, bar, high-low-close, line, pie, scatter, XY	No	Communications, spreadsheets, others built in on request	Ad hoc	Either	No	3Com, IBM PC LAN, Novell Netware, others on request	OS/2 Presentation Manager	Dow Jones News/Retrieval, Compuserve, others on request	Keyboard, mouse, touch screen	Large screen display	$75,000-$100,000; annual lease available
IBM Contact local office	Executive Decision	IBM 370 series, PS/2	VM, MVS, OS/2 Extended Edition	2M	3-D, bar, line, pie, XY, others from external graphics packages	Yes	Databases, E-mail, spreadsheets, word processing; communications optional	Both	Automatic	No	Any supported by OS/2 Extended Edition Communications Manager	OS/2 Extended Edition Presentation Manager	Dow Jones News/Retrieval, others via service establishment	Keyboard, mouse, touch screen	Automatic telephone dialing, imaging capabilities, large screen display, on-line calendar and address book, stock ticker graphing capability, voice annotation	$7,500-$60,000 (base components), $500 per workstation, $100 for optional command-center feature
IMRS (203) 227-6800	IMRS On Track	Compaq 286, 386 and compatibles, IBM PC AT, PS/2 and compatibles	DOS	1M-3M	Bar, line, pie, XY	Yes	Communications, databases, E-mail, spreadsheets, word processing, Micro Control and Faster financial packages	Static	Automatic	No	3Com, Ethernet, IBM PC LAN, Netbios, Novell Netware	Microsoft Windows	No direct support but can access any on request	Mouse, touch screen	Large screen display, on-line calendar	$35,000-$50,000, includes five end-user licenses
Information Resources, Inc. (617) 859-1100	ExpressEIS	Any machines that support operating systems listed at right	MVS, VM, VMS, MPE/XL, Prime, DOS	2M	3-D, area, clustered and stacked bar, line, pie, XY	Yes	Communications, databases, E-mail, spreadsheets, word processing	Both	Either	Yes	3Com, Inpath, npath, Banyan, Ethernet, Novell Netware, Token-Ring, SNA, SNLC	Proprietary	Dow Jones News/Retrieval, Compuserve	Keyboard, mouse, remote control, touch screen	CD-ROM support	$80,000+

All products perform exception reporting. All have drill-down capabilities except those from Ashton-Tate Corp., Meta Media, Inc. and New Generation Software, Inc.

The companies included in this chart responded to a recent survey conducted by *Computerworld*. When a vendor is unable to provide specific information about its product, the abbreviation NP (not provided) is used. When a question does not apply to a vendor's product, the abbreviation NA (not applicable) is used. Further product information is available from the vendors.

PRODUCT SPOTLIGHT

VENDOR	PRODUCT	HARDWARE PLATFORM	OPERATING SYSTEM	DISK SPACE NECESSARY TO LOAD PROGRAM (BYTES)	GRAPHICS CAPABILITIES	IMPORTS GRAPHICS FROM EXTERNAL SOURCES	OFFICE AUTOMATION TOOLS INTERFACED WITH	REPORT GENERATION (STATIC OR AD HOC)	UPDATE PROCEDURE (AUTOMATIC OR MANUAL)	AUTOMATED APPLICATION DEVELOPMENT	NETWORKS SUPPORTED	WINDOWING FACILITY SUPPORTED	EXTERNAL ON-LINE SERVICES ACCESSED	USER INTERFACES AVAILABLE	OTHER FEATURES	PRICE
Information Imagine, Inc. (617) 868-8400	Manager's Portfolio	IBM PC, PS/2 and compatibles	DOS, OS/2	256+	3-D, bar, line, pie, XY	Yes	Communications, database, E-mail, spreadsheets	Both	Manual	Yes	Any PC network	OS/2 Presentation Manager	Dow Jones News/Retrieval	Keyboard, mouse, touch screen	Imaging capabilities, large screen display, on-line calendar	$7,500+
Interactive Software Services, Inc. (800) 288-8180	AMIS (Advanced Management Information System)	IBM AS/400, System/38	OS/400, CPF	35M	Bar, line, XY	No	Any externally defined file	Ad hoc	Automatic	No	None	None	None	Keyboard	Large screen display, multidimensional database	$25,000-$75,000
Shenandoah, Inc. (800) 288-8887	Compass	IBM PC, AT, PS/2 and compatibles	DOS, OS/2	1M	Dependent on external 3D graphics package	No	Database, spreadsheets, word processing, ASCII files	Both	Either	Yes	Any that are true under Microsoft Windows	Microsoft Windows 3.0	None	Keyboard, mouse	None	$4,500
Metz Media, Inc. (404) 803-7021	Executive Information System	IBM PC and compatibles with Video Show hardware/software unit	DOS 3.3 and higher	1M	Line	Yes	Communications, database, E-mail, spreadsheets, word processing	Static	Automatic	No	Any that are PC-based, NetBios-compatible	None	Signal, Reuters	Digi Pad, keyboard, mouse	Imaging capabilities, large screen display	$50,000 licensing fee
Metaphor Computer Systems, IBM (800) 368-8888	IBM Data Interpretation System	IBM PS/2, 386-, 1486-based PCs	DOS, OS/2	20MB, plus 4K per user defined file server	Bar, curve, line, pie, XY	No	Database, E-mail, spreadsheets, word processing	Both	Manual	Yes	Ethernet, Token-Ring	Proprietary	Dow Jones News/Retrieval	Keyboard, mouse	None	$40,000 plus $4,000 per workstation
New Generation Software, Inc. (916) 920-2300	I.Q.	IBM AS/400, System/38	OS/400, CPF	1MB	Bar, line, pie, XY	No	Spreadsheets, word processing	Ad hoc	Automatic	No	None	None	None	Keyboard	None	$1,750-$13,500
Pilot Executive Software (617) 229-9100	Command Center EIS	IBM 370 mainframes, DEC VAX, HP 9000, IBM PC XT and compatibles, Apple Macintosh	VM, MVS, VMS, Unix, DOS, Apple Macintosh OS	640K for PC, 20M-200M for host	3-D, bar, line, pie, scatter, symbol, XY	No	Communications, database, E-mail, spreadsheets, word processing	Both	Automatic	Yes	Any supporting IBM LAN, IBM LAN, DEC LAN, Ethernet protocols	Apple Macintosh Multifinder, proprietary	Quotron, Dow Jones' Dow Videx, News Net, Reuters, others	Keyboard, mouse, touch screen	ASK, CD-ROM support, large screen display, imaging capabilities and video connection on Apple Macintosh	$40,000-$150,000
SAS Institute, Inc. (919) 677-8000	The SAS System	IBM 370, 4300, 9370, 3000 series, PC AT, PS/2, DEC VAX, Data General and Prime minicomputers, Sun and HP workstations	MVS, CMS, VSE, VMS, DOS, ADS/VS, Primos, HP-UX, Sun OS	10M+	3-D, bar, line, pie, XY	No	Communications, database, spreadsheets, word processing	Both	Either	Yes	Novell Netware, Ethernet, Decnet	OS/2, DEC, X, proprietary	None	Keyboard, mouse	Large screen display, on-line calendar	$595 for PC component, up to $10,000 for host component
Software 2000 (800) 770-8000	Vision 2000	IBM PC and compatibles, Alpha	DOS 3.1 and higher, Ultrix	700K	Bar, line, pie	No	Database, spreadsheets	Ad hoc	Automatic	No	Any PC network	None	None	Keyboard, mouse	None	$50,000, plus $2,500 per workstation

Products that already understand the lingo

BY RUDOLPH PIZZANO

Executive information systems (EIS) now come in special-purpose flavors.

Several software developers have recently released packages that cater to particular industries, such as financial services or medical institutions, or to specific business departments, such as human resources and information systems.

In some instances, these packages are really just applications software with a twist — an EIS front end that provides a graphical user interface, drill-down capabilities and exception reporting. In others, they began as specific applications and grew into full-blown EISs that can be used independently of the original software. In both cases, these packages have something to recommend them.

For one thing, tailored EISs can reduce customization time because they are geared to the vocabulary and practices of a particular area and written to gather and present data accordingly. While a hospital administrator tracks "DRGs," a television network programming director may monitor "overnights," and the leveraged buyout specialist who owns both firms watches the yield curve.

These departmental and vertical EISs can also save money. Buying an EIS front end for a departmental application costs approximately $50,000 per application — well under the price range of a general-purpose EIS, which typically costs from $100,000 to $200,000.

A departmental EIS is only cost-effective for one or two applications, however. For three or more departments, it is more economical to purchase a general-purpose EIS and customize the interface to each departmental system.

For vertical-market EISs, prices range from less than $50,000 to $150,000.

To develop EIS capabilities in their systems, applications software vendors either license technology from traditional EIS vendors or go it alone.

All three of the top EIS vendors — Comshare, Pilot Executive Software and Execucom Systems Corp. — are currently licensing their technology to software firms.

TAILORED EISs can reduce customization time because they are geared to the vocabulary and practices of a particular area.

Pilot has formed a relationship with HBO & Co., a software developer for hospitals in Atlanta. HBO's system keeps track of financial data, which administrators must report to insurance companies or government agencies. It also tracks patient care information, such as drugs administered, hours of physical therapy and surgical procedures. With Pilot's EIS front end, administrators can more easily access both types of data.

Medicus Systems Corp. in Evanston, Ill., another healthcare software developer, formed a similar alliance with Comshare, which also offers an EIS tailored for the retail industry.

For its part, Execucom has licensed its front end to Telos Corp., a telecommunications company.

Several software firms have developed EIS capabilities internally, including Legent Corp., Multitrak, Software 2000, Inc. and Information Resources, Inc. (IRI).

Whereas Legent's and Multitrak's EIS offerings are designed to work with their applications software, Software 2000 and IRI are pitting general-purpose systems against offerings from the top three EIS vendors.

Legent, based in Vienna, Va., and Boston-based Multitrak both offer project management software for IS. These systems track the progress on projects as well as capacity planning.

After finding that its clients spent a lot of time pulling together information generated from their system to prepare management presentations, Legent decided to add the EIS function.

Multitrak's original project management software was IBM mainframe-based; when it came out with a personal computer version, it decided to add an EIS front end. Legent and Multitrak each price their systems at less than $50,000.

Software 2000 in Hyannis, Mass., is a vendor of human resources and accounting software that licensed an EIS front end from Forest & Trees, Inc. in Portsmouth, N.H. With this technology, Software 2000 has developed a general-purpose EIS that can work with many other applications packages than its own. Now in beta testing, the product is intended to compete directly against Pilot, Comshare and Execucom with a price point of less than $50,000.

Similarly, IRI in Waltham, Mass., is positioning its Express/EIS against the "big three," although its original data retrieval software was intended for consumer packaging firms. Express/EIS, now in beta testing, is priced at $50,000, plus $2,500 per workstation.

With the popularity of graphical interfaces, exception reporting and drill-down capabilities, this trend of adding these EIS capabilities into systems will most likely continue. ●

Pizzano is president of Pizzano & Co., an economic and management consulting firm in Woburn, Mass.

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Software copyright: Two views

United States: 'An orderly unfolding'

BY ANTHONY L. CLAPES

Bullfighting is an activity in which it is required at some point to enter the terrain of the bull. Writing software is not such an activity. Entering the gray area — offering programs that mimic aspects of someone else's program — is an option, not a necessity. Those who do so enter that arena with their eyes open and with the extremists on either side of the intellectual property spectrum shouting at them from the stands to get closer or pull farther back.

The copyright law imposes a set of civilizing rules on competitors in the software *corrida*. Those rules balance the rights of the bull — the innovator — and those of the bullfighter — the follower — so that the barbarism of the traditional bullring does not leak into this large and important area of socioeconomic activity. When the rules of the game are followed, the bull's blood is not drawn and the bullfighter is not gored.

Ideas from an original program, including those reflected in its structure, logic and flow, as well as in its user interface, are made available for free appropriation by the follower. The expression chosen by the innovator remains his exclusive property to exploit, unless it is necessary to the idea or unless the follower serendipitously arrives at the same expression without access to the original. This formula has set humanity's affairs in order for more than 200 years in relation to written expression. No good reason has been advanced for departing from it in the case of computer programs.

Steve Lyons

The silicon spice that gives life and personality to the computer consists of works of authorship in which the range of expression can be both broad and deep, but that is not always so. Some programs exhibit no great creativity and by their nature cannot do so. For such programs, traditional copyright protection will be as thin as it is for recipe books.

Generally speaking, however, programs of any significant size and complexity are works of authorship that exhibit all the attributes of those imaginative literary works of the type with which the general public — and copyright law — are already quite conversant.

Despite being written in languages unfamiliar to most of us, programs are not qualitatively different from traditional works of imagination in ways that should affect the protection available for their detailed internal and external designs.

Copyright is not only an appropriate form of protection for computer programs, but its application is also critical for their continued

Continued on next page

Clapes is senior corporate counsel at IBM, responsible for managing IBM's intellectual property and antitrust litigation. Material is excerpted from chapter 21 in *Software, Copyright and Competition: The Look and Feel of the Law* (Quorum Books, an imprint of Greenwood Publishing Group, Inc., Westport, Conn. 1989), pp. 207 to 215. Abridged and reprinted with permission of the author and Greenwood Publishing Group.

Soviet Union: Opening new doors

BY LAWRENCE SAVELL

For U.S. companies looking to harvest the products of inventors and designers in the Soviet Union, imminent changes in the way the Soviet government views and protects the fruits of private efforts indicate the time to reap may be about to come.

Among the products of greatest potential interest to U.S. businesses is computer software designed by the virtually untapped and growing legion of Soviet programmers.

It is generally agreed that the level of copyright protection afforded in the Soviet Union has failed to keep up with changing technological and political realities and needs. This deficiency is a reflection of the long-standing Marxist philosophy that there is no such thing as private property. As a result, intellectual property has been viewed as being in the public domain and unprotected; therefore, copying of software has been legal and rampant.

Changing Soviet law

Although current Soviet copyright law does not expressly include protection for computer software, changes are on the horizon.

The U.S./Soviet Union "Agreement on Trade Relations" signed by President George Bush and President Mikhail Gorbachev on June 1 during their summit in Washington, D.C., represents the first normalizing of trade relations between the two superpowers since 1951. It includes extensive provisions on copyrights and other intellectual property.

The agreement, which would become effective upon approval by Congress, reflects the Soviet government's promise to increase the level of protection afforded within their country. It therefore helps the Soviets reduce their economy's isolation while allowing Western investors interested in Soviet products and planning joint ventures with newly formed Soviet business cooperatives to obtain a greater measure of Western-style protection for their investments.

One article of the agreement provides for the "Protection of Intellectual Property." The two nations agreed to "ensure in accordance with the provisions of internal legislation, protection and implementation of intellectual property rights, including copyright on literary, scientific and artistic works such as computer programs and data bases . . ."

The parties agreed to "ensure that their international commitments in the field of intellectual property rights are honored." Thus, both nations "reaffirm[ed] the commitments made" in prior agreements, including those "made with respect to copyright in the

Continued on next page

Savell is an attorney at the law firm of Chadbourne & Parke in New York. The firm is a member of the Moscow-based joint venture Chadbourne, Hedman, Raabe & Advocates CCCP-International Lawyers, which provides legal services to Western and Soviet entities.

Soviet Union

FROM PREVIOUS PAGE

Universal Copyright Convention of September 6, 1952 . . ."

In the agreement, the parties also consented to provide "protection for computer programs and databases as literary works under the copyright laws . . ." The Supreme Soviet also directed the Council of Ministers to introduce this year for its examination draft legislation regarding intellectual property, creating conditions necessary for the USSR's participation in the International Berne Convention for the Protection of Literary and Artistic Works. The Soviet government agreed to introduce draft legislation in 1991 that will include the following:

- Extending copyright protection "to all types of computer programs, including application programs and operating systems that may be expressed in any language, whether in source or object code and regardless of their medium of fixation."
- Equating the "duration and level of protection for computer programs" to "that provided to other literary works."
- Allowing owners of a copy of a computer program to make or authorise the making of a single copy or adaptation of that program. The institution of more protective and progressive copyright legislation should help to foster the blossoming of the Soviet software industry — and its potential to eventually become the new Silicon Valley. •

The Tetris case

The vast financial potential of marketing Soviet-created products — as well as the pitfalls of dealing with a society where copyrights have historically been somewhat nebulous — are reflected in the experience regarding the game "Tetris."

Tetris is one of the hottest selling video and computer games in recent years. In Tetris, players manipulate descending geometric shapes to form solid rows at the bottom of the screen, using the available space as efficiently as possible. The shapes are combinations of four boxes (in Greek, "tetra" means "four"). The playing area is surrounded with changing pictures of Soviet scenes; catchy regional folk tunes play in the background.

Tetris was created in 1985 by Alexey Pazhitnov, a programmer and scientific assistant at the Soviet National Academy of Sciences in Moscow. The granting of rights by the Soviet government to import Tetris into the U.S. and elsewhere has been the subject of protracted and heated litigation between Atari Games Corp. and Tengen, Inc. on one side and Nintendo of America, Inc. and related entities on the other.

Andromeda strain

Atari and Tengen claimed rights to the game originating from the purchase of rights by Andromeda Software Ltd. from Electronorgtechnica (Elorg), a Soviet foreign trade agency. Mirrorsoft Ltd., a British company and division of Maxwell Communications, then acquired rights from Andromeda. Atari bought its rights from Mirrorsoft.

Nintendo, however, claimed ownership of certain specific rights relating to the Tetris game arising out of its own subsequent agreement with Elorg, allegedly conveying the worldwide handheld rights and an option for the lucrative home video rights to the game.

Nintendo subsequently issued a press release giving Atari notice of its rights to Tetris, and brought Tetris out for its regular home video game system and handheld Game Boy machines. To date, Nintendo has sold more than 2.5 million copies of the game.

Injunction granted

Claiming superior rights, Atari and Tengen filed suit against Nintendo for copyright infringement. However, the United States District Court for the Northern District of California granted Nintendo's motion for a preliminary injunction, enjoining Atari and Tengen from making, copying or distributing the game or any works copied, derived from or substantially similar to it.

The court held that the evidence did not show that either Tengen or its predecessors in the licensing chain were ever granted the television video game rights to Tetris.

The court pointed to numerous communications between the Soviet agency and its licensee showing that Nintendo was likely to prevail on the merits of its claim. Nintendo subsequently was granted summary judgment on its claim to home video rights to Tetris because the court ruled that Andromeda had purchased only the personal computer rights to the game. Thus, according to the court, Mirrorsoft and Atari had paid for something — the home video rights — that Andromeda did not own. Atari is appealing the decision and accuses the Soviets of knowingly selling the same rights to Nintendo that they sold to Andromeda.

LAWRENCE SAVELL

United States

FROM PREVIOUS PAGE

commercial availability. Other forms of protection do not provide adequate coverage. The principal additional forms of preserving the asset value of original software are patents and trade secrets — neither of which provide sufficient protection.

Patent protection. This is only available for software that contains inventions, which is only a small proportion of the software written in a given year. Moreover, when a program does embody an invention, protection is only available for those portions of the software package comprising the invention. IBM has a patent, for instance, on a particular method of checking for spelling errors by computationally matching the words in the text against candidate words from a stored dictionary. Spell checking is currently offered as part of many word processing systems. The patent covers only small portions of some of IBM's word processing programs.

Moreover, the patenting process is not a cheap one. Unlike copyrights, which arise automatically as soon as the program is written down or otherwise "fixed in a tangible means of expression," patent rights do not accrue until a patent has been issued by the patent office, and for that to happen, the inventor must prepare, submit and prosecute an application.

Trade secret protection. This mode of protection is commonly used in conjunction with copyright. Trade secret protection is only good as long as the code of the program is kept secret. For software distributed commercially, that may

Continued on next page

An issue in Europe and Japan, too

The software protection question is international in scope. The innovators and the clones — and their respective supporters in government and academia — jet around the world to seminars and meetings, trying to drum up support for their points of view. At such a seminar in Phoenix, early in 1989, there were lawyers and business professionals from Japan, a representative from the European Commission and a judge from Taiwan.

Not long ago, a seminar on "reverse engineering of software" sponsored by Japanese computer manufacturers was held in Berlin with speakers from the UK, U.S., West Germany and Japan. Articles on U.S. copyright law as it applies to software appear in European legal periodicals. Articles on Japanese copyright law as it applies to software appear in U.S. legal periodicals. The subject receives a lot of attention, and it deserves it.

The Commission of the European Community has recently had occasion to consider the various forms of protection available for computer programs in connection with a study of the need for harmonising the laws of Common Market countries regarding legal protection for software.

It concluded that if research and investment in computer technology are to continue at a sufficient level to allow the Community to keep pace with other industrialised countries, protections are needed.

Specifically, in a proposal for a council directive on the legal protection of computer programs detailing its proposed harmonization, the EC said it was essential to create a legal environment that will afford a degree of protection against unauthorised reproduction of the computer program at least comparable to that given to works such as books, films, musical recordings or industrial designs.

In the commission's view, the "overwhelming weight of evidence . . . indicated that protection by copyright is the most appropriate measure to adopt." The commission further said that "within the framework of copyright, protection as a literary work is desirable" because a program "has all the characteristics of a literary work; namely, that it is the expression in language and in a perceivable form from which it can be reproduced of an idea or series of ideas, created by the expenditure of human skill and labor."

In Japan, the picture is mixed. The Japanese Ministry of International Trade and Industry (MITI) tried a few years ago to have a special law of software protection adopted in place of traditional copyright protection. The special legislation would have limited fairly substantially the scope of protection for software in Japan. The attempt failed, but MITI has not given up.

Meanwhile, the amendment to the Japanese copyright law that did pass the Japanese Diet excluded from protection "algorithms, rules and programming languages."

New recognition

Even in Japan, however, where one after another of the world's industries has been overtaken by a strategy whose early phases have consisted of slavish copying, there is a new recognition that — at least in the case of software — a different strategy is necessary.

In major part, that realization is the result of the pressures put on Japan's industrial base by competition from the newly industrialized nations of the Pacific Rim, such as Korea, Taiwan and Singapore. Products from those nations are now not only eating into Japan's share of the U.S. market but also invading Japan itself.

With specific reference to software, Peat Marwick Main & Co.'s Yukuo Takenaka, head of the firm's Project Japan, says that Japan can become a global leader, but only if the Japanese government changes its attitude toward intellectual property protection. He says that this is not just a short-term business issue; rather, it is "a moral issue that demands that Japan adopt a global point of view in its truest sense."

In other words, intellectual property rights have now become "global business etiquette." Whether Takenaka's views will be more widely adopted in Japan remains to be seen.

ANTHONY L. CLAPES

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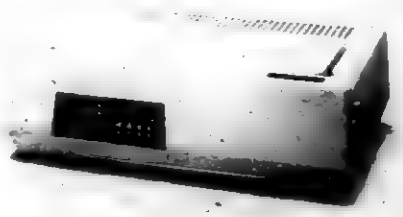

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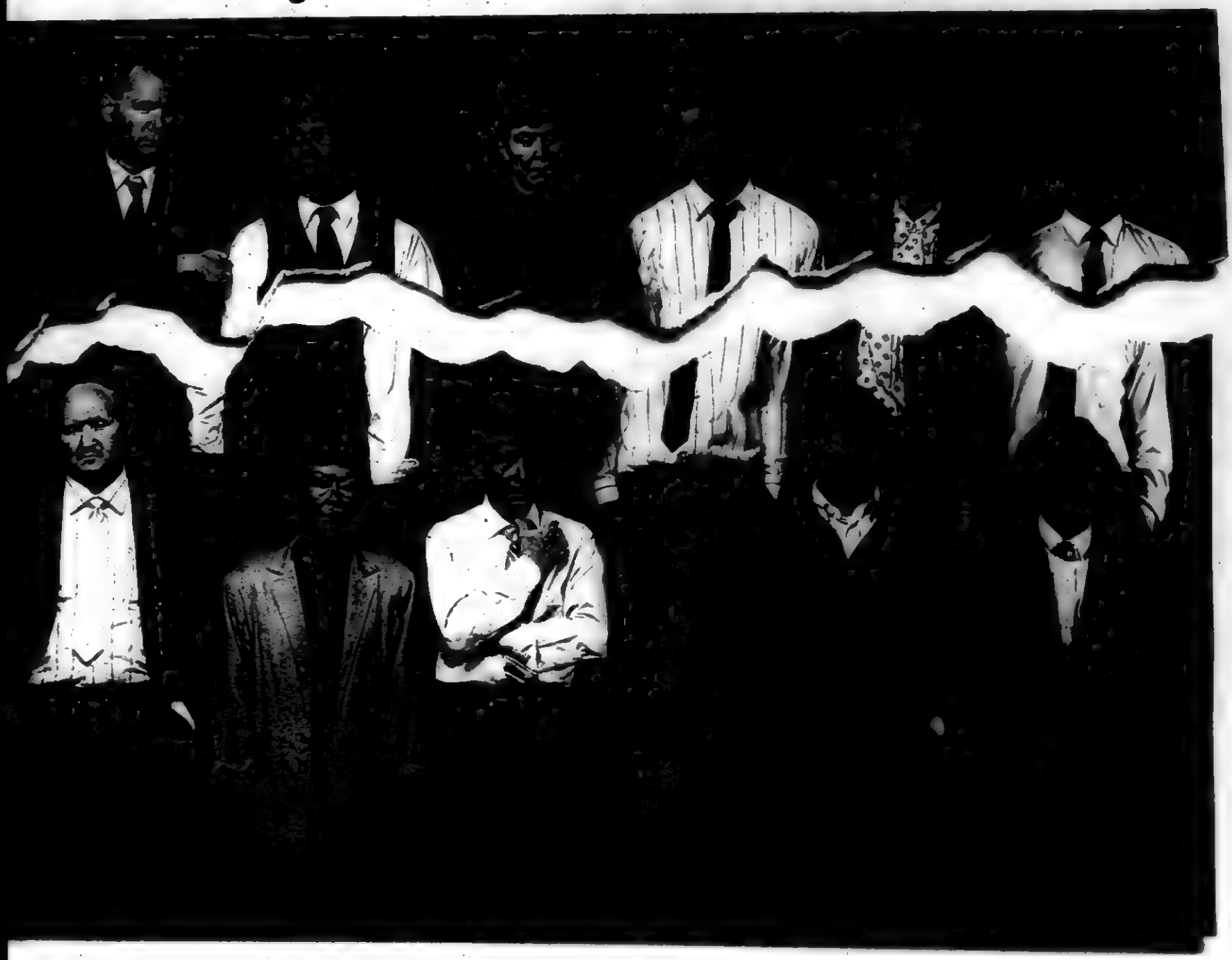

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Continued from previous page

not be very long. Once competitors can acquire a copy of the program, even an object-code copy on diskette, the process of unraveling the secret begins. Software suppliers commonly attempt to protect themselves against loss of secrecy by contract.

Although most authors of commercial programs distribute their products in object-code form only, specifically to preserve the source code as a trade secret, dumping, tracing and decompiling are all activities that compromise that secrecy. Accordingly, most software suppliers license their software under terms explicitly prohibiting such activities.

ONCE COMPETITORS can acquire a copy of the program, even an object-code copy on diskette, the process of unraveling the secret begins.

It is not clear how effective such provisions are. For one thing, the terms of those license agreements cannot prevent dumping, tracing, decompilation or other translation activities by persons who legitimately have access to the object code of the target program without being obligated under those agreements. For another thing, the narrow protectionists have moved beyond copyright and have begun clamoring for legislation that would render contractual prohibitions on reverse engineering unlawful.

Copyright is thus a critical mode of protection for the asset value of software despite the availability of patent or trade secret protection. It protects original expression, whether that expression is an invention or not, and, therefore, covers software writing more generally than patent protection. On the other hand, it does not provide the exclusory powers that patents do, and its broad applicability does not therefore risk hindering progress.

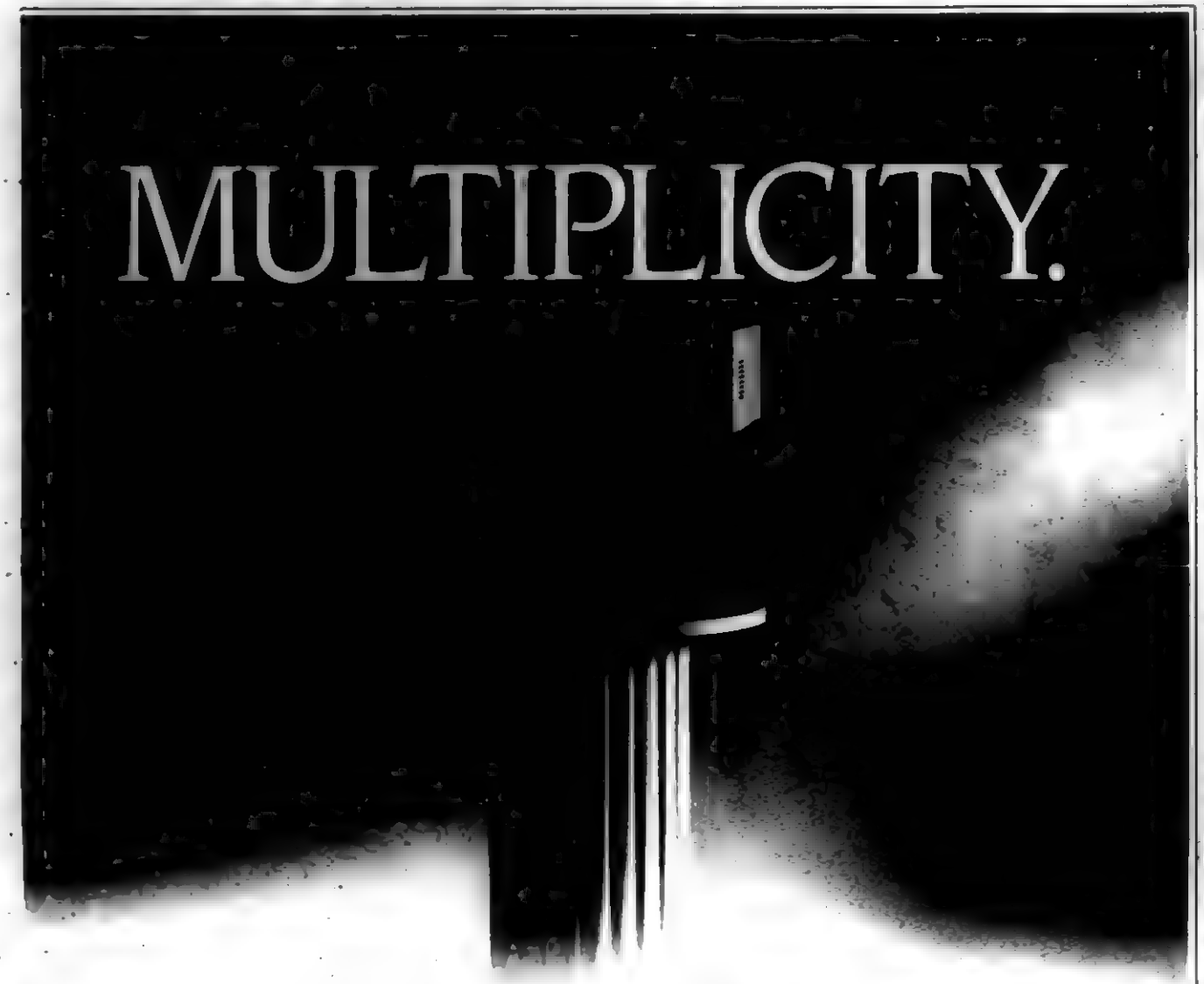
COPYRIGHT is thus a critical mode of protection for the asset value of software despite the availability of patent or trade secret protection.

Unlike trade secret protection, copyright protection does not vanish if the work in question is made public.

In the U.S., the state of the law is clear: Computer programs are eligible for traditional copyright protection. As the body of case law expands, the paths through the gray area of the idea-expression dichotomy become clearer. An orderly unfolding is under way, providing a balanced legal environment for the further development of a vital industry.

As a medium of expression, software is evolving quite rapidly. The force behind that evolution is innovational competition. Copyright protection both induces and facilitates innovational competition by protecting original expression while simultaneously permitting the free use of ideas. While the trial of software copyright cases can present challenging problems of proof, the courts have succeeded so far in coming to grips with the facts and applying the well-known principles of copyright to those facts.

A useful and fascinating body of legal precedent is developing. Firms active in supplying software to users in the U.S. and elsewhere in the world know — or can know — what is expected of them when they choose to refer to their competitors' products in developing their own products. There is every reason to believe that the judiciary body will continue to succeed in adapting copyright doctrine to the arcane epic poetry of the Computer Age. •



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Courtship rituals

Texas Instruments, Inc. returned last week to a lucrative arena: the federal court's patent jurisdiction. This time, TI is contending that **Analog Devices, Inc., Cypress Semiconductor Corp., Integrated Device Technology, LSI Logic Corp.** and **VLSI Technology, Inc.** have been using a patented chip-packaging process without benefit of license. TI wants the court to decree that licenses must be obtained; if it prevails, the firm will reportedly collect about $20,000 per year.

■

Ask and receive

Mountain View, Calif.-based **Ask Computer Systems, Inc.** broadened its marketing span and completed the management transition initiated last fall by founder Sandra Kurtzig's return as chief executive officer with the appointment of Eric Carlson as vice-president of engineeering and product operations. The position places Carlson in charge of product development not only for Ask's traditional Hewlett-Packard Co. and Digital Equipment Corp. platforms, but also for the more recently added IBM and open systems product lines.

More briefs on page 110

Parallel systems: United they stand

Computer firms, universities and their home state pitch in to plant 'Silicon forest'

BY J. A. SAVAGE
CW STAFF

BEAVERTON, Ore. — When Hewlett-Packard Co., Mips Computer Systems, Inc. and Sun Microsystems, Inc. aimed at developing a new architecture — reduced instruction set computing (RISC) — each of those Silicon Valley companies pursued the market in its own competitive way.

A handful of companies cultivating another new architecture — parallel computing — in the Portland, Ore. area are developing it in their own competitive ways as well, but they are also developing it together, for the benefit of all of them and with an added economic benefit going to the state of Oregon.

The extra benefit to users, vendors said, will be code that runs faster on parallel computers and could be leveraged to other architectures.

Parallel computing itself is not new; some of its prototypes date back to the early 1980s. What has kept it from taking off before now is a lack of software, particularly for commercial applications. For the most part, new algorithms must be devised to spread computations over many CPUs at once to take advantage of the architecture. That's where the consortium comes into the picture.

Called the Oregon Advanced Computing Institute, or Oacis, the consortium will not carry products all the way to application software for specific firms, but it will take them approximately 90% of the way, said Sudir Bhagwan, president of the group.

"None of our companies are big enough to do the research and development themselves," Bhagwan said.

All together now...

Several Portland-area companies are counting on their combined efforts – and those of the state and universities of Oregon – to benefit the development of a parallel computing market

Company	Processor Architecture	1989 Sales	Target Market
Sequent Computer Systems, Inc.	Up to 30 concurrent	$145 million	Commercial: Platforms - Intel 386-based, Unix-based, computers with shared memory
Intel Corp.	Scientific: Intel 386 or i860 processors	$20 million	Scientific: Up to 128 processors, Unix and proprietary distributed memory
nCube	Proprietary processors	N/A	Scientific: 64 to 8,000 processors, Unix and proprietary, distributed memory
Cogent [illegible]	Up to 32 [illegible] processors	N/A	Scientific: [illegible]

CW Chart: Paul Mock

Indeed, of the five principal hardware companies involved, Sequent Computer Systems, Inc. is the largest, with revenue of $145 million last year. While Sequent continues in-house software development, it will get to market faster if it takes "raw" software from Oacis and fine-tunes it for the company's particular architecture, said Stephen Verleye, core products marketing manager for the company.

In establishing Oacis last October with a $5 million grant, Oregon Gov. Neil Goldschmidt stated, "The institute is pooling the talents of these companies and computer scientists from Oregon universities into research activities they all can use but none alone could afford."

With a well-publicized decline in the availability of high-quality timber to build Oregon's primary industry, the state is looking to diversify its economic base. In an effort to keep Oacis from going the way of some other consortia — such as the Austin, Texas-based semiconductor-oriented Sematech — that had little federal funding and are now suffering from withering support, Oregon is actively pushing a technology policy.

Practically, parallel software will be able to take existing applications and break them into pieces to be run concurrently on many processors. "Traditional algorithms were devised for sequential processing, even though the problem may be inherently parallel," said Wendy Vittori, director of marketing at Intel Scientific Computers.

"Code and algorithms get old, like computers," said Steve Colley, president of NCUBE. "The side benefit of parallelizing software is that people are revisiting programs.

"Mathematics keeps moving," he said. "Fifteen years ago, the best way to solve a problem was this [particular algorithm]. Then it got buried in a program. When software developers look at it again, they could use new math and make it run twice as fast."

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Dorenfest diagnoses ills of hospital IS

BY MICHAEL FITZGERALD
CW STAFF

CHICAGO — Week and wan, hospital information systems vendors visited the doctor late last month and came away with a prescription for rapid, radical change.

Former colleague-turned-consultant Sheldon Dorenfest played the role of doctor, telling some 80 attendees at his Eighth Annual Conference on Business Opportunities in the Hospital Market that they had fallen behind the times in the strategic use of information.

"You have to change," Dorenfest said.

Dorenfest cited statistics taken from the Dorenfest 3000+ Database, which contains information on more than 3,000 American hospitals. The numbers showed hospitals spending $4.05 billion on IS in 1989, up only 4.5% from 1988 totals. By way of contrast, total hospital spending in 1989 rose 9.1%.

Whereas last year he predicted that hospitals would spend $6 billion on IS in 1993, this year Dorenfest revised that figure down to $5 billion.

He also chided vendors for shipping products before they were finished.

Tough customers

Vendors in attendance generally agreed with Dorenfest. Most of them, however, focused on the difficulty of dealing with hospitals.

"They [users in hospitals] complain about things, and a lot of the complaints are legitimate," said Joanne Clark, who left a hospital radiology department to become a marketing manager for Community Health Care Corp., a maker of systems for hospital labs and radiology units.

"But it's difficult to come up with the things users want, because things change so fast," particularly government regulations, she added.

Cliff Carroll, director of business development at Ferranti Healthcare Systems Corp., an $18 million supplier of turnkey information systems for long-term and acute patient care and patient scheduling, agreed. "It's really difficult to automate 47 different procedures with multiple signatures required for all of them," he said.

The hospital IS vendor community, Carroll said, suffers from complaints familiar to IS vendors in general — a lack of standards and the diversity of potential customers.

"Every hospital is a different business," he said. Moreover, "you have different factions within [each of] them, usually divided between the financial side and the clinical side, and they don't have the same priorities," he added.

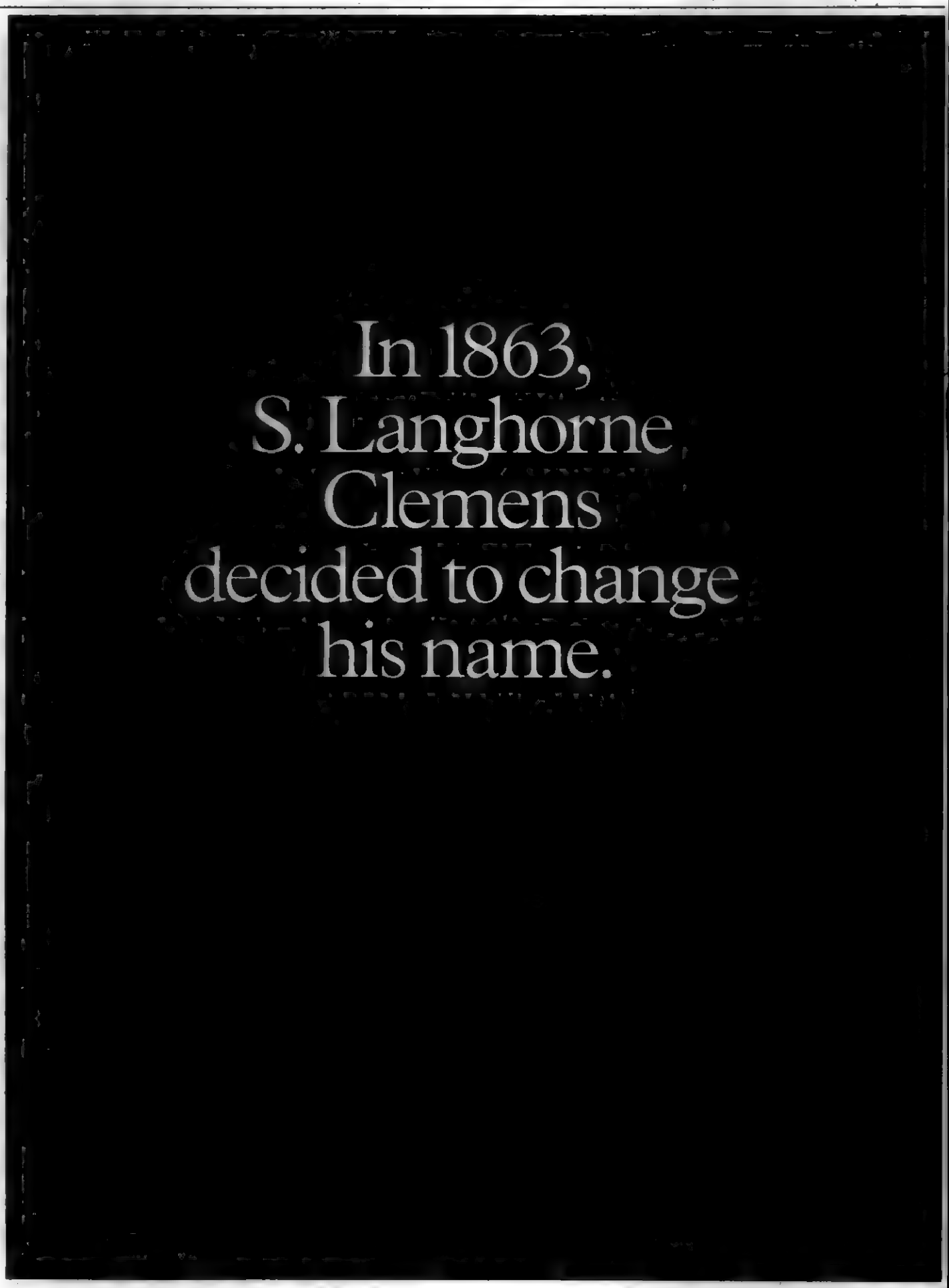
In addition, Dorenfest said, hospitals tend toward inflated expectations of what the relatively young hospital IS products market currently can provide. In response, he said, vendors frequently oversell product features they cannot deliver. As a result, Dorenfest said, current systems are inflexible, difficult to use, lacking in necessary features and slow.

For example, Dorenfest noted, much has been made of Health Level 7, an evolving standard software protocol for inexpensive, fast interfaces between systems. However, he said, it was being "oversold" and was just the beginning of a solution.

"This is a marketplace where things are all screwed up," Dorenfest said. "This industry is [stuck] in the early 1980s and late 1970s; hospitals are making the kinds of mistakes that banks made in the early 1980s," oversimplifying their needs in the hopes of getting systems that will automate their whole process, he said.

IS is not a top priority for most hospital administrators, said Tito Weiss, senior vice-president of Florida Hospital, an 1,100-bed facility in Orlando.

However, Dorenfest stressed repeatedly that hospitals will spend much more heavily on HIS when software improves.



SEC says consulting, auditing can mix

BY ELLIS BOOKER
CW STAFF

Accounting firms can do consulting work for their audit clients provided they keep the two functions separate, according to a recent ruling by the Securities and Exchange Commission (SEC).

While the SEC ruling could spur consulting alliances between accounting firms and their computer company clients — deals that the old rule discouraged — and might even simplify mergers between accounting companies, critics said they were worried it could undermine the integrity and objectivity of the auditing process.

Up until now, the SEC has pulled a blackout shade down over accounting firms that wanted to do consulting work for their audit clients. The earlier rule prohibited them from direct or materially indirect business relationships with the companies they audit.

Earlier this month, however, the SEC ruled in favor of a request by Chicago-based Arthur Andersen & Co. to reconsider the prohibition in light of Arthur Andersen's new corporate structure. Last year, Arthur Andersen separated its accounting, tax and auditing business and its fast-growing consulting businesses. The two units now report to parent Arthur Andersen & Co. S.C. in Switzerland.

The SEC said consulting work can be done for audit clients so long as it has no "material" impact on any of the parties. A "material" impact is usually one with significant revenue implications for either party.

In March 1988, prior to Arthur Andersen's restructuring, the SEC had turned down a similar petition from Arthur Andersen and two other accounting firms.

This month's retreat from the earlier hard line "could be viewed as a plus for consulting service buyers," Andersen Consulting Managing Partner and Chief Executive Officer George T. Shaheen said.

Dallas-based Electronic Data Systems, which does some consulting but is best known as a systems integrator, "has no problems living with [the SEC ruling] and looks forward to competition in the open market," spokesman Jon Senderling said.

However, Senderling added, "To say an auditor will not be influenced by the business his company is doing [for the audit client] is a little naive." Senderling said it was incumbent on the SEC or some other governmental agency to follow up the ruling with strict monitoring.

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Turnkey tools unbundling

MOUNTAIN VIEW, Calif. — Traditional turnkey system vendors are unbundling their systems and moving toward software and services to sustain growth into the mid-1990s, according to a recent report by market research firm Input, Inc.

Turnkey system vendors, which aim their product lines at narrow vertical business applications, are finding that systems standards are making their business less dependent on platforms, and they are changing their business structure to cope.

"Historically, many firms have financed their software application development through profits made from the hardware portion of their turnkey systems solution. As the profit margins from the capital equipment portions continue to decline, alternative sources for capital to fund product development become a major issue," the report said.

While Input estimated that growth will continue at about 10% for the next four years, the total systems package, including hardware, will decline.

Input suggested that turnkey system firms emphasize licensing of new products and providing interfaces to other standard software products.

J.A. SAVAGE

Lotus takes inward look to see future

ANALYSIS

BY PATRICIA KEEFE
CW STAFF

CAMBRIDGE, Mass. — Between bombarding users with a wide-reaching and potentially confusing array of its 1-2-3 spreadsheets and peppering competitors with copyright infringement suits, Lotus Development Corp. has found the time to take a hard look inward.

Twice this year the spreadsheet maker has tinkered with its internal business structure, most recently in the last two weeks [CW, July 2]. These adjustments, which have included a reshuffling of the executive deck, have come during a 12-month period in which the company has rebuilt a crumbling reputation, boosted once-worrisome financials and garnered a self-satisfying court victory.

The machine-gunned delivery this year of an armful of products not only fleshed out a 2-year-old shadow of a cross-platform strategy but also relieved Lotus of a public relations nightmare.

The new products have boosted both sales and the company's image. A court victory following a three-year fight has set the stage both for building a foundation for software copyright law and for potentially adding at least several million dollars to the Lotus coffers.

Lotus has learned the hard way neither to dwell on its past exploits nor to adhere rigidly to product plans. Although the company favors an OS/2 environment, it said it will heed user interest in Microsoft Corp.'s Windows with a 1-2-3 port.

These days the company is keeping a close eye on the future, watching both its competition and emerging markets.

The most recent reorganization appears to focus on the latter issue. "We will change the [internal] structure to reflect opportunities that we see," Lotus Senior Vice-President Frank King said. Toward this end, two executives — David Roux and Frank Ingari — have been moved into planning roles to seek new market opportunities, potential acquisitions and strategic investments. "There is a tremendous piece of the computer software business in markets where today we have no products or presence," King said.

Battling Medusa

"Now that their strategy with Novell has unraveled, they have to think about how they can attain the critical mass necessary to compete head-to-head with Microsoft," said Barbara Isgur, a vice-president at Needham & Co. "Microsoft is a many-headed Medusa with tentacles everywhere, where Lotus has a strong share in only one area of the market. I think Lotus thinks that unless it has enough components to play in several areas and stay abreast of trends, it will become irrelevant."

This is important because Lotus, which is about to head into a slower growth period along with the rest of the software industry, is coming off a failed merger that was to have set the tone for much of its future product direction. Moreover, some of its new offerings have either failed to excite — for example, 1-2-3 Release 3.0 — or will require longer sales cycles, such as Notes, compact disc/read-only memory products and the host-based spin-offs of 1-2-3.

To coordinate those efforts, King — who himself came to Lotus to whip development into shape — created a position to enable former IBM colleague Don Casey to oversee the next stage of 1-2-3's growth. Casey was most recently vice-president of networking operations at Apple Computer, Inc., and his abrupt departure after less than two years there has raised some eyebrows.

"I've been after him for a long time," King said, describing Casey as an avid personal computer user who has many years of experience in a wide range of areas, including databases, networking, the Apple Macintosh, marketing and development.

Lotus 1-2-3 remains king of the hill in the spreadsheet market, and it still generates roughly 60% to 70% of the company's revenue. Therein lie two threats, according to analysts, who said the spreadsheet market is about 80% saturated. As such, Lotus needs to find other sources of revenue to carry the ball. "Lotus is attempting to broaden the definition of a spreadsheet by using it as a connecting point between mainframes, minis and micros," said John Maxwell III, a technical analyst at Dillon, Read & Co.

Meanwhile, many market research firms said that Lotus' sales have either remained steady or have dipped somewhat, while Microsoft's Excel and, more noticeably, Borland International's Quattro Pro have picked up market share.

Some critics hold that the real reason behind Lotus' current copyright infringement suit against Borland and The Santa Cruz Operation [CW, July 9], which has seen the greater growth in market share, is to quash the competition.

Lotus' biggest problem right now, according to David Cearley, a software analyst at Gartner Group, Inc., is that it lacks a clear vision — not of what to do, but how to do it. "How complete is their [cross-platform and networking] vision and how sincere is it?" he said.

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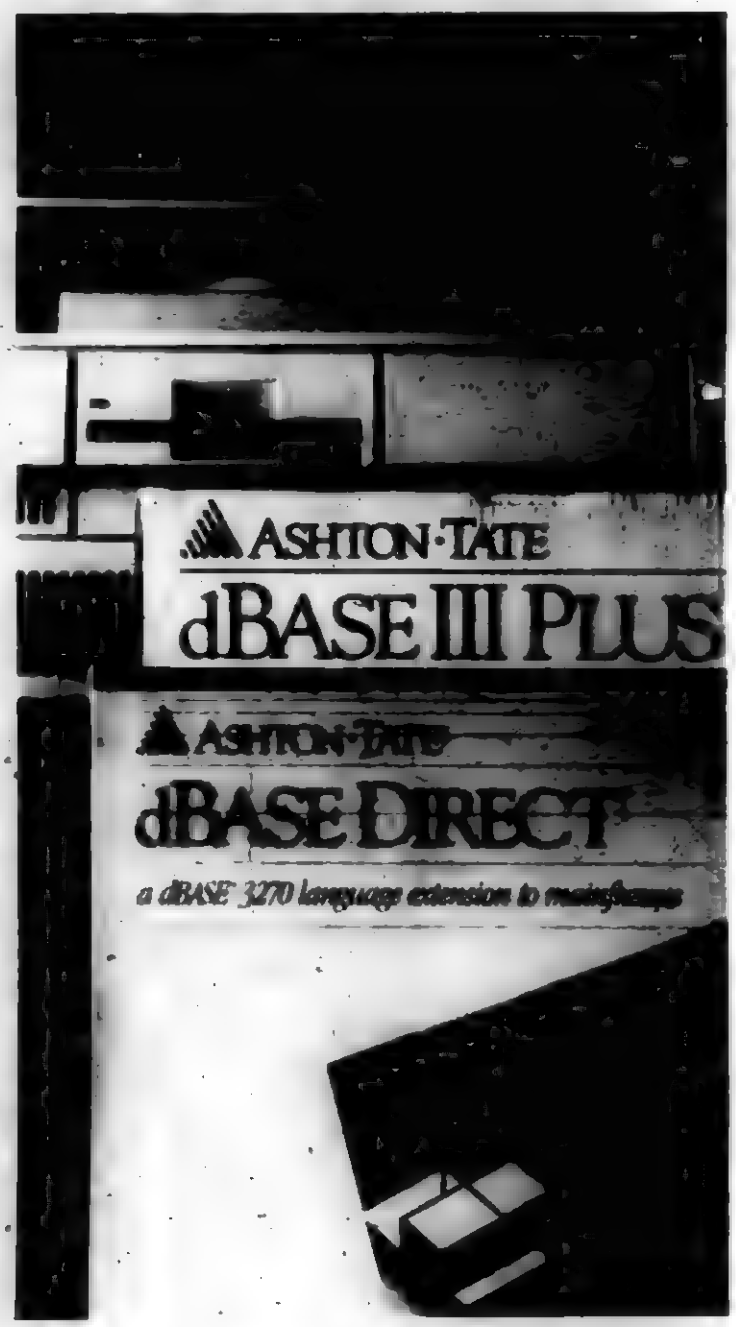

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Taiwan software firms ponder world market

BY CHRIS BROWN
IDG NEWS SERVICE

TAIPEI, Taiwan — Facing a long-term transition from a manufacturing to a service economy, Taiwan industry and government leaders are growing increasingly interested in the global software market.

So far, however, interest does not equal action. Taiwan is up against national stumbling blocks such as software piracy [CW, July 9] and a reliance on Chinese programs. Many industry representatives in Taipei are calling on the government to lead the way in software as it did in hardware 10 years ago.

It is still far from clear how this should be done, however. The rise of Taiwan's personal computer and computer component sectors in the early 1980s hinged on government efforts to underwrite research and development and manufacturing costs. Tax breaks and state-led research paved the way.

The trend now is toward services. Taiwan's Council of Economic Planning and Development forecast that by the next century, 50% of the island's gross national product will come from services. Recent growth in the services sector has topped 7% per year.

Predictions are running high that software services will grow sharply in Taiwan but that overseas sales will be small. This was the concern voiced when a delegation of 16 Taiwanese software developers, users and market watchers held a press conference earlier this month after attending the World Computing Services Industry Congress in Washington, D.C., early last month.

Their belated observations based on the show and a subsequent tour of major U.S. software producers — including Oracle Systems Corp., Computer Associates International, Inc. and IBM — brought them to the same conclusion: Taiwan should take steps now to ensure that it will not miss out on the next wave in the software market.

However, there is no consensus yet as to how this should be accomplished. Speaking at the press event, Hwang Taiyang, president of Information Integrated, called on the government to clarify its software tendering procedures and to move away from a "price only" attitude in evaluating tenders.

Others, such as Arthur Hwa, vice-president of Taipei-based Information Management Systems, noted that

NATIONAL

BRIEFS

It's buying time again

Hewlett-Packard Co. is about to acquire Edmonton, Alberta-based **Idacom Electronics Ltd.**, a privately owned vendor of protocol testing products with a strong track record in the crafting of research and development alliances, according to HP. Details of the deal, which will be done through HP's Canadian subsidiary, were not released. "For the foreseeable future," however, HP said, Idacom will keep its 120 employees, its Edmonton address and its product focus when it becomes a division of the HP communications test business unit.

■

Hard times

John J. Barry, president and chief operating officer of Reston, Va.-based software vendor **Systems Center, Inc.**, resigned last week, ceding his duties to Chairman and Chief Executive Officer Robert E. Cook. The reasons for Barry's sudden departure from the executive suite — he remains on the firm's board — may be rooted in his successor's first announcement from the presidential podium: a warning that the firm, dragged down by the costs of two recent acquisitions, expects to report a loss for its recently closed second quarter.

■

Over the Pacific

Unisys Corp. veteran executive Edward Blechschmidt last week became president of the company's Pacific Asia Americas Division, a 7,500-person unit that added some $2 billion to Unisys' bottom line last year. In his new office, Blechschmidt will oversee 19 subsidiaries and 18 distributorships as well as joint ventures in Japan, India and Thailand. It won't be entirely new terrain; prior to the promotion, the 37-year-old executive served as Unisys' vice-president for Japan operations and president of **Unisys Japan Ltd.**

Taiwan firms face a maddening barrier in communications with their overseas operations. Hwa's firm has been writing tailor-made applications for U.S. clients for the last three years, mostly based on the IBM mainframe family platform. It is about 25% cheaper to develop software in Taiwan than in the U.S., he said, but the distance makes it difficult to communicate, especially on custom jobs.

There is increasing interest in Taiwan in packaged software, although in the past, most of Taiwan's success in this sector has been limited to Chinese language programs. To spur development in Taiwan, the government-sponsored Institute for Information Industry (III) has launched a Chinese version of Unix and the X Window System interface.

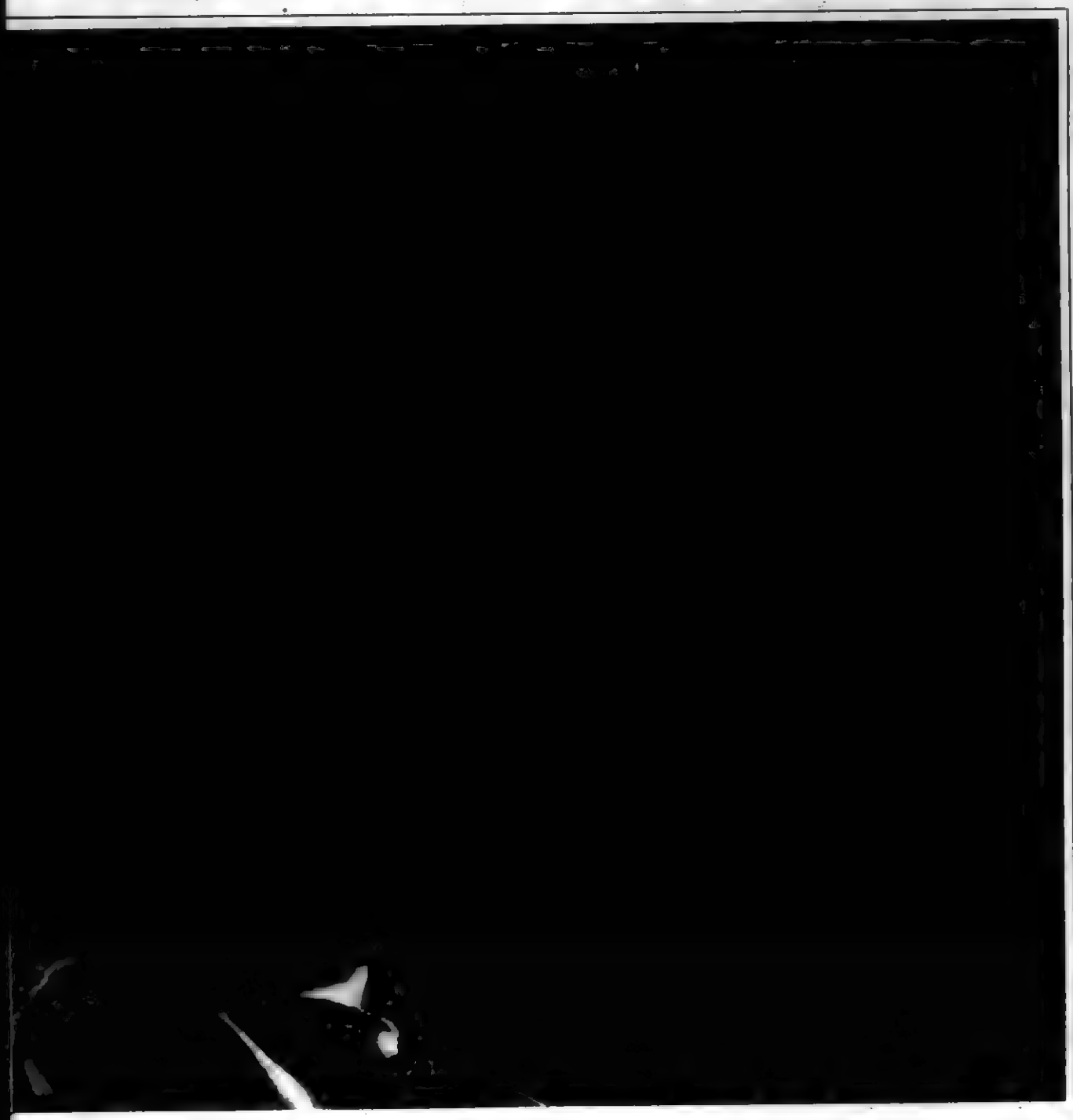
Huang Wei-teh, vice-president at the III, said that he thinks packaged software on the new Unix workstations poses a good opportunity for Taiwan. Five Taiwanese firms have already made plans to introduce Sun Microsystems, Inc.'s Scalable Processor Architecture (Sparc)-based Unix machines over the next five years.

Foreign attraction

This number will almost certainly grow. The III has just finalized its Sparc workstation and will soon be looking for firms that want to license the technology. However, many in Taiwan said they feel that one of the keys to developing the local industry is attracting overseas firms to do design work here. This, Huang said, would ideally be one stage of a broader move into Asian markets — especially an expansion into China.

The latter opportunity appears to be long-term at best. Several speakers predicted that Taiwan will one day oversee software code work and packaging on the mainland and then sell the end products overseas. However, this scenario could take 10 years to unfold, they said.

In the meantime, the III plans to submit proposals to the Ministry of Economic Affairs addressing ways to encourage software development in Taiwan. Investment incentives, especially at the Hsinchu Science-based industrial park and at a similar park to be built in Yunlin County, are likely to be one of the main tools proposed.



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INTERNATIONAL BRIEFS

Up, up and away

Japanese firm **Mitsubishi Electric Corp.'s** acquisition last month of UK-based personal computer maker **Apricot Computers Ltd.** marked the company's first purchase of an entire company rather than a division, asset package or product line. Now Mitsubishi has announced plans to use Apricot — complete with the newly launched Intel Corp. 80386SX-based diskless workstation — as a wedge into PC markets first in the U.S., then in West Germany and finally across Europe. Apricot, operating as a Mitsubishi subsidiary, will also run its new parent's first foreign-based research and development center in Birmingham, England.

■

Not so fast

The **Hong Kong** government is about to put its supercomputing project on hold for three to five years, according to reports last week. Neither the government nor its information technology subcommittee would comment officially, but sources close to the project said the committee was persuaded by a report prepared by a team of outside consultants that advised Hong Kong to plan ahead without making commitments to any one supercomputer strategy or vendor.

■

Meanwhile, in Malaysia . . .

The **Malaysian** government is expected to unveil a national technology policy at the International Conference on Information Technology and Information Technology Exposition that Malaysia will host in September. "In view of the fact that the information technology industry is [$370 million] in size and a hive of increasingly important activity," the announcement should draw a keenly interested audience, said Abdullah Abdul Rahman, director-general of the Malaysian Administration and Management Planning Unit.

■

Holding onto a good thing

UK-based computer-aided software engineering (CASE) tools developer **Intelligent Environments Ltd.** based its CASE products on OS/2; now, the firm said last week, it is also basing its European distribution strategy on IBM. According to Chief Executive Officer Laurence Shafe, distribution partnership agreements with IBM subsidiaries in Denmark, Switzerland and the Netherlands are only the beginning: Similar deals in other countries will follow. Shafe said his company's goal is to replicate in Europe the success its Application Manager tool set is having in the U.S.

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Maintenance is looking good

As a career, it offers challenge, education, stability and healthy pay

BY JANET RUHL
SPECIAL TO CW

Among the misconceptions that haunt the information systems field, none is more pervasive than this: A career in systems maintenance means going nowhere. The belief is that managers and programmers "stuck" in maintenance are not good enough to make it onto hot development teams.

A survey of 124 managers and programmers who attended the annual meeting of the Software Maintenance Association in April tells a different story. It suggests that, compared with many of their peers, maintenance professionals may be more experienced, better paid and more likely to have won a recent promotion.

According to the survey, the median salary of this group of self-defined maintenance professionals is $49,000. Fifteen members of the group earn more than $70,000 per year; the highest salary reported was a whopping $150,000. Sixty-eight percent have been working in the field for more than 10 years, and a surprising 23% have been in IS for 20 to 35 years. Finally, the results suggest that these careers are still viable: A full two-thirds of the group reported being promoted within the last two years. (To learn more about the activities, publications and chapters of the Software Maintenance Association, contact administrator Robin Gross at (707) 643-4423.)

Of course, maintenance people have suffered their share of layoffs and career setbacks in the recent push for corporate downsizing. Nicholas Zvegintzov, editor of *Software Maintenance News*, polled a sample of his readers in February and reported that 11% have left their jobs in the past year and another 23% plan to leave soon. He says many seem to have become "jumpier" over the last year, chiefly in response to layoffs within their company. Several managers he spoke with said they need to hone their technical skills and perhaps return to a more technical career path to keep moving ahead. However, Zvegintzov concludes that despite the unease, maintenance professionals are "holding their own."

One reason for their confidence is that maintenance can offer unparalleled opportunities for building both technical and business skills. In a tight job market, the more skills you possess, the more employable you are.

Maintenance pros develop these skills because maintenance groups are usually understaffed, leaving the responsibility for hundreds of modules and thousands of lines of code with a handful of people. Development teams may employ tiers of software engineers, systems analysts, business specialists, liaison personnel and coders, each with strictly defined boundaries in their roles. Meanwhile, maintenance staffers assigned to support a system often find that they must fill all these roles.

In addition, development groups must work within the constraints of rigid methodologies that limit the impact any one individual can make on the system. In their more unstructured environment, maintainers are expected to show initiative and use any available resources to foresee and solve problems.

People who succeed in this environment are flexible self-starters who can handle the unexpected. They teach themselves how to work in unfamiliar software environments armed only with manuals because they can't wait for the company to send them to a course. Good maintenance staffers design and develop the quick and dirty utilities that may save their companies thousands of dollars during the life of a system.

However, the maintenance environment teaches more than technical skills. Because their groups are understaffed, maintenance people usually interact directly with users without the intermediary groups typical of development teams. They also learn the workings of an entire system rather than focusing on the details of smaller units. For both reasons, they are more likely than developers to master the business issues relating to their systems.

Maintenance staffers must interact on a daily basis with the technical support staff as well as users at all levels, so they also may have more opportunity than developers to hone communications skills.

Finally, in this age of organizational downsizing, maintenance professionals have one further edge over developers: They produce a steady stream of achievements to add to their resumes. The individual achievements may not be as impressive as the accomplishments of a successful development team, but the truth is, not all development teams are successful. Many development projects never get implemented; they are canceled after developers have spent a lot of time and ink on the preliminaries, leaving little to show for their efforts. Even with successful development teams, the lion's share of kudos often goes to a small number of people while the rest of the team remains anonymous.

IN THIS AGE of organizational downsizing, maintenance professionals have one further edge over developers: They produce a steady stream of achievements to add to their resumes.

In contrast, says Judith Marx Golub, president of the Software Maintenance Association, maintainers experience the "constant gratification" of solving large and small problems day after day. Producing consistent and visible results can give the successful maintenance professional a high profile within the company and a reputation for competence. This kind of visibility can tip the balance when companies are making decisions about downsizing.

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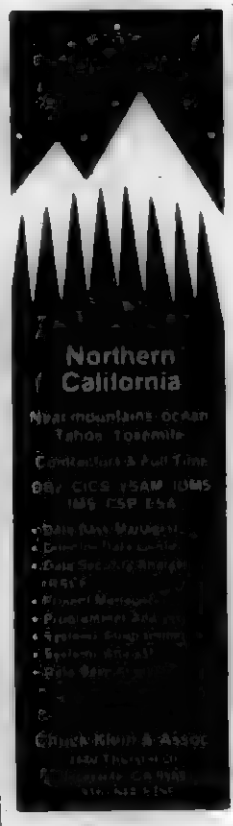
*Ruhl is a consultant and programmer in Connecticut and author of **The Programmer's Survival Guide: Career Strategies for Computer Professionals.***



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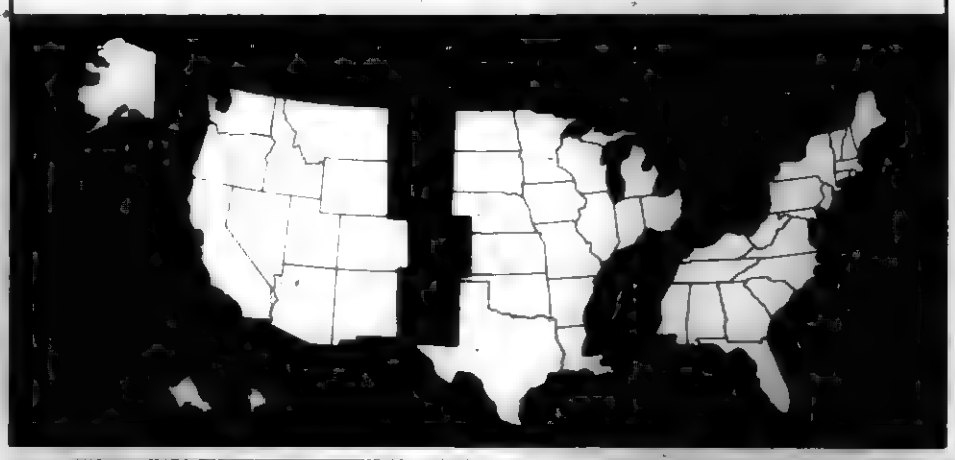

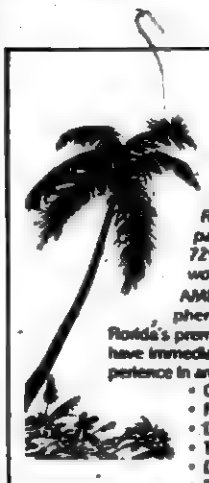

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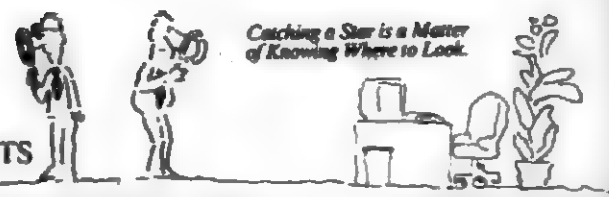

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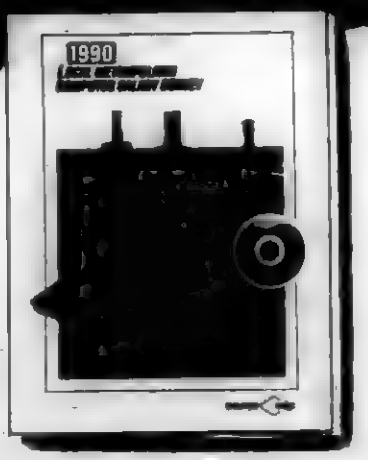

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1 column	1-1/4"	2"
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This is a sample ad for Computerworld's Computer Careers section. It will help you decide what size ad you'd like to run. Remember that you can run your ad either regionally or nationally in our recruitment section and that the minimum ad size is one column (1 4/16 inches wide) by two inches deep (like this sample). This ad would cost $415.80 in our national edition, $302.40 in the Eastern, Midwestern, or Western edition, and $378.00 in two regions; volume discounts apply.

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	One Region (East, Midwest or West)	*Two Regions (East/West East/Midwest, Midwest/West)*	*National Edition*
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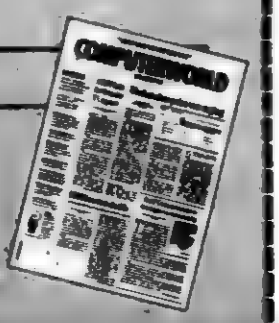

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MARKETPLACE

Picking appropriate technology

There are plenty of money-saving options; the trick is how to evaluate them

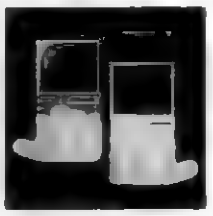
BY THOMAS D. OLESON
SPECIAL TO CW

To their detriment, many companies espouse a single philosophy for the acquisition of hardware and stick to it religiously. Some companies worship new technology regardless of circumstances. Others deny the value of new technology regardless of the implications. Still others stress mainframes and discourage or even forbid midrange and microcomputer-based systems for production applications.

These doctrinaire beliefs are totally inappropriate given today's requirements. Companies need solutions that are flexible, responsive to the user, cost-effective and serviceable by the organization — what I call appropriate technology. This approach avoids reliance on a single supplier, a single architectural philosophy and a single hardware platform.

The central proposition is to pay top dollar for systems only when the expense will yield a compelling advantage. Otherwise, companies should investigate a less expensive solution, such as used equipment, hardware from plug-compatible manufacturers (PCM) and perhaps midrange and microcomputer systems.

If you think this notion of appropriate technology is self-evident — like apple pie, motherhood and the American flag — I agree. The real question is how a company can apply the principle.



Acquisition decisions should be based on a cost/benefit analysis. The key to such decisions is to evaluate cost-effectiveness on a present value basis, considering expenses of hardware, software, maintenance, floor space and environmental controls.

The analysis must take into account any need for connectivity. It's important to realize that integration with an enterprise's technology infrastructure depends more on connectivity issues to be solved by in-house programmers than on vendor support. Managers must recognize the ability of their technical personnel to service the system and its network.

Last but not least, adoption of an appropriate technology strategy requires the people charged with hardware and software acquisition to align plans with users' requirements. In doing so, they must do the following:

- Consider the nature of the applications serviced by the equipment, particularly whether they are strategic.
- Provide sufficient initial compute cycles and weigh the need for growth in those cycles.
- Understand the software implications of the operating system and the development and application tools it supports.

Let's look at an organization whose mainframe processor begins to reach its limit. For most firms, the typical response is an expensive upgrade to the latest technology or replacement of the CPU with a larger one, whether new or used or from the same vendor or a PCM.

However, let's not limit our thinking to bigger processors. The move by many vendors to equate the cost of software with the size of the processor it runs on makes other options more appealing. By upgrading to a higher class CPU for the sake of a few applications, you're increasing the cost of all the software running on the processor. Consider a small machine — whether new or used — to run some of the applications.

In approaching this alternative, review the mix of applications on the processor. Could some of them run successfully on the current version of the operating system for years? If so, consider a smaller, used processor to relieve pressure on the main CPU. Are other applications so critical that they must stay current with technology? If so, you may want a second, small CPU that is state-of-the-art.

Compare the financial implications of a second processor and the larger state-of-the-art CPU in terms of all the relevant factors. Take into account the tendency for software and maintenance costs to inflate at a rate greater than the cost of borrowed money. Make certain you consider the shorter life of today's CPUs: You cannot justify 60-month depreciation with such rapid technological change, so you should not use it in the financial analysis.

The questions don't end with comparison of a single large CPU and two smaller machines. The appropriate move may not entail a CPU upgrade. Two such examples come to mind.

It may be better to upgrade the machine's memory or operating system rather than the CPU itself. Depending on the condition of the I/O subsystem, a memory upgrade could provide sufficient relief for a while. This option underlines the need for the equipment manager to work closely with the people charged with fine-tuning systems.

Many organizations operate around the clock. However, if your organization doesn't run three shifts and your CPU is bumping up against maximum use, a second or third shift to handle batch jobs might be far less expensive than a new, $8 million CPU. This step would lead to appropriate use of your current technology.

Of course, all of this analysis is dependent on several factors beyond costs: the users accepting the functionality of the alternative, its reliability and a judgment that any risks associated with a used machine or equipment from a PCM are appropriate.

Oleson is financial director of information processing at John Hancock Financial Services in Boston.

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The BoCoEx index on used computers

Closing prices report for the week ending July 6, 1990

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XT Model 086	$500	$700	$350
XT Model 089	$675	$825	$475
AT Model 099	$1,050	$1,375	$850
AT Model 239	$1,075	$1,325	$700
AT Model 339	$1,325	$1,400	$900
PS/2 Model 50	$1,300	$1,700	$1,050
PS/2 Model 60	$2,500	$2,600	$2,400
Compaq Portable II	$1,475	$1,725	$1,400
Portable III	$2,175	$2,500	$1,900
Portable 286	$1,500	$1,875	$1,300
Plus	$675	$750	$650
Deskpro	$625	$900	$600
Deskpro 286	$1,400	$1,625	$1,300
Deskpro 386/16	$2,500	$2,750	$2,475
Apple Macintosh 512	$375	$775	$275
512E	$450	$450	$350
Plus	$1,175	$1,275	$1,000
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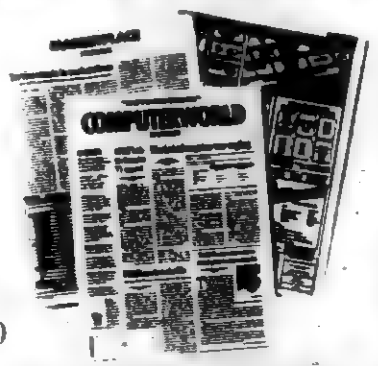

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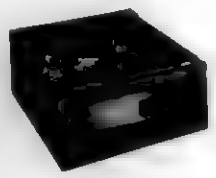

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Moving over from Cobol to C

Before training, think about your staff and its project schedule

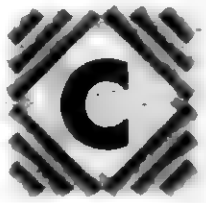
BY JESSICA KEYES
SPECIAL TO CW

For the last 20 years or so, Cobol has reigned supreme as the programming language of choice in most businesses. But today Cobol is facing some serious competition.

A few years ago, the typical Cobol shop ran centralized mainframes tethered to dumb terminals; today's organization is anything but centralized, featuring local- and wide-area networks, minicomputers, workstations and personal computers. With all this newfangled hardware, it's no wonder managers are looking for software tools that can run on all of it and handle increasingly complex requirements as well. For many companies, one answer has been C.

If your organization is planning the leap to the C language, it's going to take more than buying a new compiler. It's going to take careful planning and, most of all, training. The information systems manager must take into account a few unassailable points about the move from Cobol to C and plan a training program accordingly.

• **Cobol inertia.** First, there are billions of dollars invested in Cobol programs, so there will always be a need for Cobol programmers. The savvy manager realizes that he needs either bilingual programmers or both C and Cobol factions. He also realizes there are many programmers who just don't want to learn a new language. Generally, they have been writing Cobol for so long they know it as well as English; these people get their kudos from expertise in Cobol, and learning a new language would put them back at square one, a place they'd rather not be. If Cobol is where they'd rather be, leave them there. They'll revel in maintaining those billions of dollars of Cobol code.



• **Once trained — use it or lose it.** Once the programming manager has selected candidates for C training, he should take stock of the schedule of deliverables and modify it to accommodate new C programmers.

The manager should plan training to coincide with the launch of new projects. If a staff member is working on a Cobol project when he goes into a C class, putting him back on the project would negate the training — unless the manager has set aside some modules that can be coded in C.

Because new C programmers are on the low end of the learning curve, the manager must adjust the schedule accordingly. If he projected a three-week development effort for a Cobol module, he might try five weeks for this first attempt in C.

• **The dangers of C.** C is also a systems programming language; the operating system can be changed in ways that might make the traditional programming manager quite nervous. A change in one application, for example, might leave others running on the same processor inoperable. It's wise to tackle this sticky subject during training. Some of C's powerful constructs may not be needed in a given application. A thorough review of the features will let the programming manager develop a list of functions and libraries that programmers should avoid. Training can either bypass them or cover them with a warning not to use them without permission.

• **The distributed shop.** Although C is touted as the most portable of programming languages, differences creep in when it is run on different hardware platforms. If training is to cover C programming for both IBM and Digital Equipment Corp. hardware, for example, it must take into account differences in libraries, editors, compilers and linkage executions.

• **Implementation issues.** Once the manager has decided who to train and what to cover, he must decide how to train. There are three chief options: live training, video and disks. Live training is usually best; nothing beats human interaction and the camaraderie among students confronting the same tasks. While desirable, however, this approach may be impractical in many cash-starved firms.

Fortunately, there are quite a few vendors ready to step in. Nearly every PC-based C compiler comes with a tutorial on the language. While they're usually thorough, these tutorials are geared to the individual self-starter more than to a firm training a large number of people.

I can recommend two training programs, although I suggest shopping around before buying. The C Workshop, which is from Wordcraft in Oakland, Calif., and available at computer bookstores, includes a set of disks and a 350-page text. To use it, make sure that students are self-starters. If such people are not to be found, Zortech, Inc.'s video course may be the ticket. Zortech, located in London and Arlington, Mass., has combined 10 videos, text and a reference manual along with its C compiler.

There's no getting around it: C is becoming the programming language of choice. In luring staff members from Cobol to C, the wise manager needs to do some careful planning to balance the needs, wants and fears of his staff, new features of the language, the schedule of deliverables and training methodologies.

Keyes is president of New Art, Inc., a management and computer consulting firm in New York.

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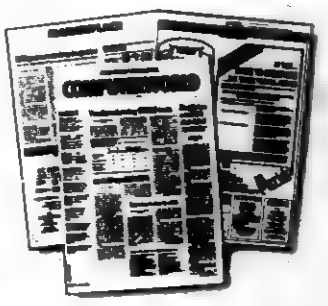

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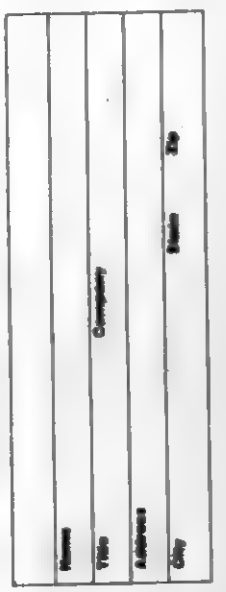

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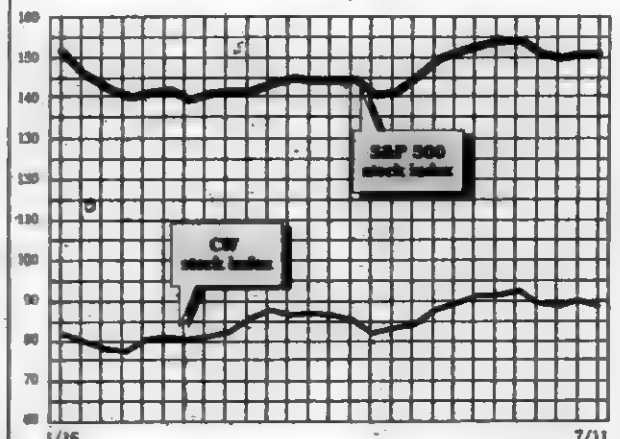

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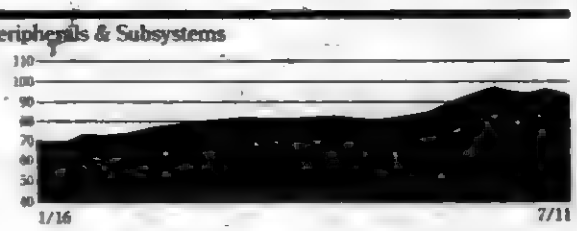
Computer Systems

Software & DP Services

Semiconductors

Peripherals & Subsystems



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CLOSING PRICES WEDNESDAY, JULY 11, 1990

EXCH		52-WEEK RANGE		PRICE CLOSE JULY 11, 1990	WEEK NET CHNGE	WEEK PCT CHNGE
Communications and Network Services						
N	AMERICAN INFO TECHS CORP	68	55	59.625	-1.4	-2.3
Q	ANDREW CORP	28	19	20.5	1.3	6.5
Q	ARTEL COMM CORP	10	4	4.875	0.0	0.0
N	AT&T	47	36	37.375	-1.3	-3.2
Q	AVANTEK INC	7	2	3	0.1	4.3
N	AYDIN CORP	21	13	14.5	0.3	1.8
N	BELL ATLANTIC CORP	57	43	46.5	-3.3	-6.5
N	BELLSOUTH CORP	59	49	50.625	-2.4	-4.5
Q	COMPRESSION LABS INC	16	7	16.125	1.5	10.3
Q	CONTEL CORP	37	23	28	0.4	1.4
Q	DATA SWITCH CORP	4	2	3.375	-0.1	-3.6
Q	DIGITAL COMM ASSOC	27	17	23.75	0.6	2.7
Q	DYNATECH CORP	21	15	16.125	-0.1	-0.8
Q	FIBRONICS INTNL INC	13	5	11.875	-0.6	-2.1
Q	GANDALF TECHNOLOGIES	7	2	3.75	-0.1	-3.2
N	GENERAL DATACOMM INDS	7	3	3.875	0.4	10.7
N	GTE CORP	36	28	31	-1.4	-4.2
Q	INFOTRON SYS CORP	11	3	3.75	0.0	0.0
N	ITT CORP	65	51	57.875	0.4	0.7
N	M/A COM INC	9	3	4.875	-0.4	-7.1
N	MCI COMMUNICATIONS CORP	49	31	40	-2.5	-5.9
N	NETWORK EQUIP TECH INC	34	9	8.25	-0.8	-8.3
Q	NETWORK SYS CORP	15	7	14.5	0.4	2.7
N	NORTHERN TELECOM LTD	30	18	28.875	0.5	1.8
Q	NOVELL INC	57	24	56.25	2.5	4.7
N	NYNEX CORP	92	75	79.75	-3.0	-3.6
N	PACIFIC TELESIS GROUP	52	41	42.25	-1.9	-4.2
A	PENRIL CORP	9	4	8.5	0.3	3.0
N	SCIENTIFIC ATLANTA INC	28	19	28.5	0.8	2.7
N	SOUTHWESTERN BELL CORP	65	51	51.875	-2.4	-4.4
Q	3 COM CORP	19	10	17.75	1.4	8.4
N	US WEST INC	41	33	36.875	-0.6	-1.7
Computer Systems						
Q	ALLIANT COMPUTER SYS	9	4	5.438	-1.0	-15.5
Q	ALPHA MICROSYSTEMS	8	2	2.5	-0.5	-16.7
Q	ALTOS COMPUTER SYS	8	5	8.25	0.9	11.9
A	AMDAHL CORP	16	11	18.125	1.0	5.8
Q	APPLE COMPUTER INC	50	32	47	3.0	6.8
Q	AST RESH INC	36	7	25.5	2.3	9.7
N	BOLT BERANEK & NEWMAN	9	4	5.125	0.0	0.0
N	COMPAQ COMPUTER CORP	65	37	64.5	-58.6	-47.6
N	COMMODORE INTNL	13	6	7.75	-0.4	-4.8
N	CONTROL DATA CORP	23	16	18.875	-0.1	-0.7
N	CRAY RESH INC	51	31	47.375	2.5	5.6
N	DATA GEN CORP	19	8	10.625	-0.8	-5.6
N	DATAPOINT CORP	6	2	2.5	0.3	11.1
Q	DELL COMPUTER CORP	14	5	13.625	1.3	10.1
N	DIGITAL EQUIP CORP	103	70	86.625	2.9	3.4
N	FLOATING POINT SYS INC	4	0	3	0.0	0.0
N	HARRIS CORP	40	28	32.75	-1.5	-4.4
N	HEWLETT PACKARD CO	58	40	47.25	-0.6	-1.3
N	HONEYWELL INC	105	73	104.5	2.4	2.3
N	IBM	122	98	119.125	1.5	1.3
Q	INFORMATION INTL INC	16	12	12.75	-0.4	-2.9
Q	IPL SYS INC	14	5	11.5	1.0	9.5
N	MAI BASIC FOUR INC	6	2	2	-0.3	-11.1
N	MATSUSHITA ELEC INDL LTD	180	123	144.25	4.3	3.0
Q	MENTOR GRAPHICS CORP	28	14	18.5	0.9	5.0
N	NBI INC	3	0	0.313	0.0	0.0
N	NCR CORP	72	53	64.25	0.3	0.4
Q	PYRAMID TECHNOLOGY	38	10	28.75	-0.3	-0.9
Q	SEQUENT COMP SYS INC	34	12	31	1.3	4.2
Q	SUN MICROSYSTEMS INC	36	13	35.5	2.4	7.2
Q	SYMBOLICS INC	2	0	0.313	-0.1	-28.5
N	TANDEM COMPUTERS INC	30	17	23.875	0.3	1.1
N	TANDY CORP	49	30	37	0.6	1.7
N	ULTIMATE CORP	11	5	7.375	-0.3	-3.3
N	UNISYS CORP	28	12	13.25	-0.3	-1.9
A	WANG LABS INC	7	4	4.375	0.3	6.1
Software & DP Services						
Q	AMERICAN MGMT SYS INC	18	11	17.75	0.1	0.7
Q	AMERICAN SOFTWARE INC	27	14	25.5	-0.5	-1.9
N	ANACOMP INC	7	2	2.75	0.1	4.8
Q	ANALYSTS INTL CORP	24	14	22.75	2.8	13.8
Q	ASHTON TATE	18	9	11.75	-0.9	-8.9
Q	ASK COMPUTER SYS INC	15	7	10.125	1.4	15.7
N	AUTO DATA PROCESSING	58	40	58.375	0.0	0.0
Q	AUTODESK INC	58	33	58.5	4.5	8.3
Q	BMC SOFTWARE INC	30	13	28.25	2.0	7.6
N	BUSINESSLAND INC	14	7	7.875	0.1	1.6
Q	COGNOS INC	9	4	9	-0.3	-2.7
N	COMPUTER ASSOC INTL INC	20	11	16.5	0.5	3.1
Q	COMPUTER HORIZONS CORP	16	7	14.5	1.0	7.4
N	COMPUTER SCIENCES CORP	58	40	44.75	-1.0	-2.2
N	COMPUTER TASK GROUP INC	14	9	10.25	0.1	1.2
Q	COMSHARE INC	25	15	23.75	-0.3	-1.0
Q	CORPORATE SOFTWARE	15	8	13.25	-0.8	-5.4
N	GENERAL MTRS (CLS E)	38	24	37.5	2.9	8.3
Q	GOAL SYSTEMS INTL	18	10	15	-0.8	-4.8
Q	HOGAN SYS INC	7	4	3.625	-0.1	-3.3
Q	INFORMIX CORP	17	8	16.75	1.1	7.2
Q	INTELLICORP INC	8	3	7.125	-0.6	-8.1
Q	LEGENT CORP	32	19	25	-1.5	-5.7
Q	LOTUS DEV CORP	39	21	32.5	-2.0	-5.8
Q	MICROSOFT CORP	79	28	75.5	3.5	4.9
Q	NATIONAL DATA CORP	35	13	15	0.0	0.0
N	ON LINE SOFTWARE INTL INC	11	6	8.5	-0.3	-2.9
Q	ORACLE SYS CORP	188	15	19.875	-2.8	-12.2
N	PANSOPHIC SYS INC	19	10	13.75	-0.5	-3.5
Q	PHOENIX TECHNOLOGIES INC	7	2	4.25	-0.3	-5.6
N	POLICY MGMT SYS CORP	43	30	41.875	0.6	1.5
Q	PROGRAMMING & SYS INC	25	16	23.5	-0.8	-3.1
Q	RELATIONAL TECH INC	11	5	6.375	-0.1	-1.9
N	REYNOLDS & REYNOLDS CO	27	19	20.125	-0.6	-3.0
Q	SAGE SOFTWARE INC	18	7	13.375	-0.3	-1.8
Q	SEI CORP	22	15	21.5	0.5	2.4
Q	SHARED MED SYS CORP	17	12	12.75	0.1	1.0
Q	SOFTWARE PUBS CORP	28	13	24	0.4	1.8
N	STERLING SOFTWARE INC	11	7	10.125	-0.4	-3.8
Q	SUNGARD DATA SYS INC	28	17	24.25	0.0	0.0
N	SYSTEM CENTER INC	28	17	17.875	-4.3	-19.2
N	SYS. SOFT INC	29	15	26.5	-0.8	-2.8
Q	WORDSTAR	2	1	1.094	0.0	-2.8
Semiconductors						
N	ADV MICRO DEVICES INC	11	7	9.375	-0.1	-1.3
N	ANALOG DEVICES INC	11	7	7.25	-0.1	-1.7
Q	ANALOGIC CORP	11	8	9.25	-0.3	-2.6
Q	CHIPS & TECHNOLOGIES INC	26	15	21.5	0.3	1.2
Q	INTEL CORP	49	28	49	0.5	1.1
Q	MICRON TECHNOLOGY INC	18	7	13.125	-0.6	-4.5
N	MOTOROLA INC	88	53	86.375	0.9	1.0
N	NATL SEMICONDUCTOR	9	5	6.875	-0.4	-5.2
N	TEXAS INSTRS INC	44	28	39.125	-0.1	-0.3
A	WESTERN DIGITAL CORP	15	6	13.75	0.3	1.9
Peripherals						
Q	ALLOY COMP	2	0	0.688	-0.1	-12.0
N	AM INTL INC	6	2	2.5	0.0	0.0
Q	AUTO TROL TECH CORP	5	2	3.313	-0.4	-11.7
A	BANCTEC INC	24	13	20.25	0.0	0.0
A	COGNITRONICS CORP	8	3	5.875	0.1	2.2
Q	CONNER PERIPHERALS	28	10	27.75	-0.3	-0.9
A	DATARAM CORP	22	8	20.875	2.4	12.8
N	EASTMAN KODAK CO	83	36	39.875	-1.1	-2.7
N	E M C CORP MASS	7	3	5.5	-0.3	-4.3
Q	EMULEX CORP	8	4	7.125	-0.1	-1.7
Q	EVANS & SUTHERLAND	35	18	27.75	-1.8	-5.9
Q	ICOT CORP	2	1	1.625	0.4	30.0
Q	INTERLEAF INC	9	6	6.625	-0.1	-1.9
Q	IOMEGA CORP	6	3	5.75	0.8	16.0
Q	LEE DATA CORP	3	1	1.375	0.1	4.7
Q	MASSTOR SYS CORP	4	1	1.063	-0.1	-10.5
Q	MAXTOR CORP	17	7	14.875	-0.5	-3.3
Q	MICROPOLIS CORP	9	3	7.875	0.0	0.0
N	MINNESOTA MNG & MFG CO	90	66	89.5	1.9	2.1
Q	PERSONAL COMP PRODUCTS INC	6	4	3.938	-0.1	-3.1
Q	PRINTRONIX INC	15	7	13.125	0.4	2.9
N	QMS INC	21	8	18.75	0.3	1.4
Q	QUANTUM CORP	25	9	24.875	2.4	10.8
N	RECOGNITION EQUIP INC	12	4	5.25	0.0	0.0
Q	REXON INC	10	6	7.375	-0.5	-6.3
Q	SEAGATE TECHNOLOGY	20	10	14	-0.3	-1.8
N	STORAGE TECH CORP	35	9	32.625	-2.0	-5.8
Q	TANDON CORP	4	0	3.813	0.1	1.7
N	TEKTRONIX INC	23	12	15.875	-0.3	-1.6
Q	TELEVIDEO SYS INC	1	0	0.313	0.0	0.0
N	XEROX CORP	69	45	45	-1.4	-3.0
Leasing Companies						
N	CAPITAL ASSOC INTNL INC	6	3	2.875	-0.3	-9.0
N	COMDISCO INC	34	17	18.125	0.0	0.0
Q	LDI CORPORATION	18	13	15.75	-0.3	-1.6
Q	PHOENIX AMERN INC	5	3	3.5	-0.3	-8.7
Q	SELECTERM INC	9	5	6.125	0.1	2.5

EXCH: N—NEW YORK; A—AMERICAN; Q—NATIONAL

Carnival rides

Some investors left the midway after low-earnings forecast

Step right up, folks, and take a look at the latest giant stock drop to follow negative earnings news — that of Computer Associates International, Inc. After the company said its first quarter financials would fall below estimates, CA lost 5⅝ points for the week, closing Thursday at a new low of 10¼.

CA was not alone, however. Although Oracle Systems Corp. showed bigger and better numbers on its fourth-quarter earnings statement, the improved figures were not enough to appease investors. The company's shares slipped 3½ points to 19, its first weekly drop in more than two months. Elsewhere in the software sector, Microsoft Corp. picked up 4¼ points to 77½. Novell, Inc. jumped up 3⅜ points to 57⅛ after announcing a two-for-one stock split. 3Com Corp. and IBM each climbed 2 points, to 18⅜ and 120, respectively, after news that the two will work together on network management products.

The ballyhoo surrounding this year's Decworld '90 exhibition and the unveiling of a new Microvax minicomputer may have helped boost Digital Equipment Corp.'s stock price to 86⅜, a 3-point gain. Amdahl Corp. also advanced, rising 1 point to 18⅜, while NEC Technologies, Inc. slipped ⅛ of a point to 66½.

The rash of semiconductor lawsuits continued as Texas Instruments, Inc. filed patent infringement actions against five smaller chip makers last week (see story page 103). TI closed at 40⅛, up 1⅛ points. Motorola, Inc., which agreed more than two weeks ago to settle its fracas out of court with Hitachi Ltd., racked up 1¼ points to 86⅛ on the tails of a positive earnings statement.

KIM S. NASH

Nynex eyes AI system savings

BY JOANIE M. WEXLER
CW STAFF

WHITE PLAINS, N.Y. — If Nynex Corp. can actually save its projected $4 million to $6 million per year with the expert system now running in 40 of its maintenance centers, customers could end up two-time winners.

Expert systems use artificial intelligence technology to capture the knowledge and experience of human experts and embed their decision-making rationale in software. Nynex announced last week that it has been using an expert system, the Maintenance Administrator Expert (Max), to diagnose problems with residential and small-business telephone services. The company said it plans to test a larger business version of Max — which would accommodate private branch exchanges and Centrex service — by the end of the year.

The savings will come primarily from "fewer erroneous dispatches," said Jim Euchner, expert systems director at Nynex. Users should reap improved customer service benefits, he said, because the system, which operates around the clock, takes 10 seconds to screen phone troubles, compared with five to 10 minutes by a human.

Customers may also see lower phone service rates or network enhancements, because Nynex is regulated by rate-of-return legislation, which caps regional Bell operating company (RBOC) earnings at about 12%, according to William Pomeroy, director of telecommunications public policy at the International Communications Association.

Rate-of-return legislation, he noted, mandates that any RBOC profits above and beyond that ceiling must be passed on to the ratepayer in the form of reduced rates, or the profits must be reinvested in upgrading and expanding the local network.

Other RBOCs are in various stages of developing similar expert system applications, Euchner said. For example, Bell Atlantic Corp. reported that it has realized "significant savings" for several years using its own expert system.

Euchner stressed that Nynex's immediate goal with its expert system is "not to eliminate manpower" but to free up testers' time to do more productive work, such as preventive maintenance. He added, however, that in the long run, "we may need fewer people to do the job."

Is this the party. . .?

Though Nynex acknowledged that the "tawdry" private parties reported in *The Wall Street Journal* last week did take place, the company denied suggestions that the activities may have translated into improper costs to Nynex customers.

In a statement, the telephone holding company responded to an article in last Thursday's *Journal* reporting that during closed regulatory proceedings in a state rate case for Nynex's New York Telephone unit, evidence emerged about "raucous" annual week-long gatherings at Florida resorts that were attended by employees of Nynex's purchasing unit, Materiel Enterprises Co., and several Nynex suppliers from 1984 to 1988.

The *Journal* report said the parties included illicit activities such as prostitution and that the evidence draws a correlation between suppliers' attendance at the conventions and the volume of Nynex business steered to them.

Nynex stated that corrective action, including the dismissal of two employees, was taken in 1988. The firm said the action was the result of investigations conducted by Nynex and non-Nynex professionals. Nynex said the investigation found that none of the Nynex family of companies engaged in business activities that resulted in improper costs to Nynex customers.

Weather

FROM PAGE 1

tornado in Limon, Colo., that they claimed went undetected by a Doppler system near Denver, 110 km away.

- Representatives of the National Weather Service Employee Organization said the new system creates a greater work load for meteorologists at a time when the government is streamlining its staff.
- Other meteorologists said the weather service, which has managed the project from its inception, has been overly secretive about system details.
- Supporters of Doppler radar criticize the slow flow of funds to the project.

The U.S. departments of Defense, Commerce and Transportation joined forces in 1979 to form the Next Generation Weather Radar Project, or Nexrad, the agency that has mothered the computer technology needed to develop WSR-88D.

Under the project, the 175 stations will be built by early 1996, Don Sarreals, special assistant to Nexrad's director, Samuel Williamson, said. Of that number, 120 will be managed in the U.S. by the National Weather Service, 38 will be used by the U.S. Air Force, and 17 will be operated overseas near U.S. military installations.

Nexrad is one to two years behind schedule, according to various government sources. However, it is not over budget, according to Sarreals.

Doppler radar itself has existed since the 1950s, according to Marvin Miller, National Weather Service area manager for Ohio. While conventional radar pictures are simply echoes bounced off objects, Doppler systems act like a police officer's radar gun trained on water, ice, insects and dust in the air. The systems can tell if objects are moving toward or away from the transmitter as well as their speed. In this way, Doppler systems can see phenomena such as wind shear, tornadoes and heavy rain as they form.

However, the complex and voluminous data revealed by Doppler equipment took days to process by previous computers, creating what amounted to "game films" for meteorologists to review, Miller said. Information output by Doppler systems "can fill up a wastebasket in a couple of seconds as it crunches algorithms [representing] how the atmosphere is believed to work," said Ken Crawford, director of the Oklahoma Climatological Survey.

"The [Nexrad] program is extremely software-intensive," said Art Hansen, formerly the Federal Aviation Administration's weather radar program manager.

Concurrent Computer Corp. in Tinton Falls, N.J., a Nexrad subcontractor, is providing one 3280 and two 3212 superminicomputers for each station to process all the data into color displays and weather forecasts. Concurrent's 3280, the larger of the two systems, has an I/O response rate of 40M byte/sec., providing real-time analyses of Doppler signals, according to a company spokesman.

All this may come as a shock to U.S. radar technicians and meteorologists accustomed to working with technology no more current than 1974. Much of the service's existing equipment, in fact, was purchased in 1957, Sarreals explained.

"You can't sit behind this thing with Piper Cub knowledge," Crawford said. "You have to have Stealth [aircraft] knowledge." Crawford was Oklahoma area manager at the National Weather Service for seven years, working closely with Nexrad at its Norman, Okla., Doppler prototype site until last year.

David Powell, president of the National Weather Service Employee Organization, said any knowledge of the system has been hard to come by. Powell, who said he supports efforts to update radars, reported that members have had to use the Freedom of Information Act to find out key features of the project.

One source who helped manage the project as it developed and who requested anonymity said that is a legitimate concern. "Employees have been kept in the dark for so long," the source said.

Resentment has built up, the source said, and that has made concerns grow into major contentions among many meteorologists.

Reasons for secrecy

Defending the secrecy, Ron Alberty, director of the Norman prototype, said, "There was a stage when we had to be very careful with the information publicly disseminated to preserve fair competition between Unisys and Raytheon as they prepared to bid on the project."

Powell said that what he has learned about the Doppler radar makes him cautious. Asked if the system could have saved any lives if it had been operating June 14 in Ohio, when Shadyside was washed from the face of the Earth, Powell said: "If it was being operated by a competent person, and the location of the radar was close enough to the storm, it might have." He said that 70 to 80 km is a Doppler's maximum accurate range.

A less sophisticated Doppler system in Pittsburgh, Miller said, was unable to predict or spot the Shadyside storm. A similar example is the Limon tornado earlier this year, he said.

Powell said that another such Doppler station near Denver saw only "mild [air] circulation." The operator of a conventional radar system noted severe weather, however, and issued an advisory.

Alberty admitted that there has been some "confusion" about Doppler's tornado-spotting abilities. Smaller tornadoes, he explained, can be clearly seen only to about 80 km. Larger funnels can be seen out to 230 km.

To be at its most accurate, the system must be used by sharp meteorologists, said Ed Berkowitz, chief of systems in Nexrad's engineering branch. "If you try to trust the computer guidance, you'll be disappointed," Berkowitz said. "If you combine the computer algorithm with the trained human brain, it's an unbeatable combination."

It is a matter of writing better software to accommodate limitations in radar hardware, Alberty said. He said he believes that software improvements will greatly extend tornado range within "a year or two." His own beef centers on what he said has been foot-dragging by bureaucrats holding the project's purse strings.

Meteorologists anxious to trash their current vacuum-tube systems are nonetheless worried that Nexrad's answer may be too much. Neal Marchbanks, fire and weather forecaster in Anchorage, Alaska, said Doppler systems may have "too many bells and whistles."

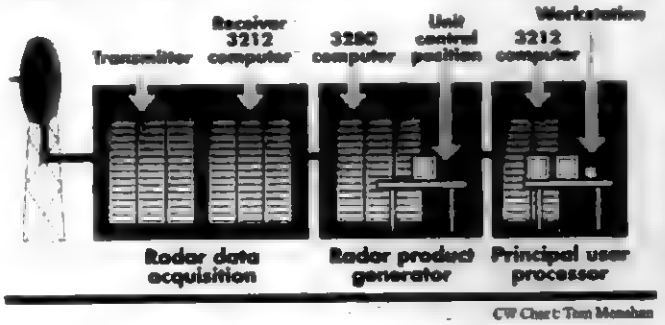
"It's very labor-intensive," said Marchbanks, who is national vice-president of the National Weather Service Employee Organization. It can take two or three people to keep up with it, Marchbanks claimed.

Doppler systems can produce literally dozens of ways of looking at any storm: hourly storm accumulation, large-scale wind patterns, microbursts of wind, storm tracking and other more esoteric aspects.

On top of that, Nexrad will increase the area each meteorologist monitors, Marchbanks said. "When you are working a short-fuse situation, such as a tornado, you have to be able to get a warning out to the people in a very short time," he said. "You may not be able to perform all the functions that this thing has to accomplish."

Weather watch

Doppler radar system uses Concurrent Computer processors



CW Chart: Tom Monahan

Stardent's Michels sues backer

BY NELL MARGOLIS and JAMES DALY
CW STAFF

SAN FRANCISCO — Stardent Computer, Inc. co-founder Allen H. Michels cast the word "pioneer" last week in a new light when he filed a $50 million lawsuit charging Kubota Ltd., a strategic ally and 22% stakeholder in his company, with conspiring to steal Stardent's technology.

Stardent itself was not a party to the suit. President and Chief Executive Officer J. William Poduska was also conspicuously absent from both the legal pleadings and the statements issued by Michels and Stardent Co-Chairman Matthew Sanders.

Stardent was formed in 1989 from the merger of then-rival supercomputing workstation makers Stellar Computer, Inc. — founded by Poduska and based in Newton, Mass. — and Ardent Computer, Corp., founded by Michels and based in Sunnyvale, Calif.

Naohisa Matsuda, vice-president of Kubota Corp. in Santa Clara, Calif., in a prepared statement Friday afternoon expressed disappointment with the suit. Matsuda rejected the charges and said Kubota "learned of these claims several weeks ago when Michels and Sanders approached us secretly — obviously hoping to extract a payment . . ."

Kubota, a 100-year-old agricultural equipment maker based in Osaka, Japan, was an Ardent investor and 44% shareholder. Under the merger agreement, which Michels claims was forced by Kubota, it became 22% owner of Stardent.

Analysts following the workstation arena, in which Stardent has scrambled with questionable success for player status, reported months' worth of rumblings of management-level discord at the firm. No one, however, reported being aware of ill will between Stardent and Kubota.

In the suit filed in Santa Clara Superior Court last Thursday, Michels and Sanders said that the merger was a shotgun wedding, forced by Kubota on threat of withholding critical financial aid from Ardent. Subsequently, according to the complaint, Kubota contrived to shift key personnel and technology from Stardent into a wholly owned Kubota subsidiary created this past spring and located in Santa Clara.

"This case is a flagrant example of the Trojan horse technique, by which small creative American companies are being controlled, then swallowed up by large Japanese concerns," said Joseph Alioto, attorney for Michels and Sanders, in a prepared statement.

Flammable comments

One Wall Street analyst who follows the workstation sector referred to Alioto's remarks as inflammatory. However, added Frederic Cohen, an analyst at Labe, Simpson & Co., "I expect that the [many] computer companies that are involved in partnerships with Japanese and other foreign investors — some of them, in fact, with Kubota — will simply take this in stride."

According to Sanders, he and Michels, who are suing Kubota in their capacities as minority shareholders of Stardent and as former Ardent shareholders, are not implying that either Stardent or Poduska were complicit in Kubota's alleged actions.

"Don't interpret that there is a split within the company," said Sanders. He said the allegations were brought to the attention of the Stardent board of directors, which, he said, is currently conducting its own investigation.

Not all people close to the parties subscribed to the image of veteran industry entrepreneur Michels and his colleagues as injured innocents. "Allen [Michels] went into this with his eyes wide open, so what's he trying to pull?" asked a source close to the former Ardent, who asked not to be identified.

"He went aggressively after Kubota money. When someone puts a lot of money into your company, they get a lot of control."

Sears puts foot down, insists on EDI ability

BY MICHAEL FITZGERALD
CW STAFF

"EDI will become a requirement for doing business with Sears."

That was the mandate delivered by Michael Bozic, chairman and chief executive officer of the Sears Merchandise Group, in a July 5 letter to all of the firm's estimated 5,000 suppliers that are not currently practicing electronic data interchange (EDI) with Sears.

Bozic said that parent company Sears, Roebuck and Co. expects all of its suppliers to be online by July 1992.

A four-page implementation plan accompanied Bozic's letter. Sears plans to have suppliers come on-line in stages, beginning in January 1991. Each stage will be given 90 days to implement EDI capabilities.

Sears said it will provide software worth some $3,300, along with free training. The plan is being offered in conjunction with Sears subsidiary Sears Communications Co., but suppliers will be able to link up with Sears through any system they choose.

Sears' Dailey *leads firm's EDI charge*

"We will spend $5 million over the full implementation period," said Lance Dailey, EDI project manager at Sears. Dailey has 12 people on his staff and said Sears Communications will provide 12 to 15 of its staff for implementation purposes. Dailey added that Sears expects to recoup its investment within three years.

Bozic's declaration ruffled few feathers in the supplier community. In fact, Sears was praised by every supplier contacted for its even-handed approach, which differs greatly from that of competitors such as K Mart Corp. [CW, July 9].

"K Mart is ramming it down our throats, and they want it basically overnight," said one source, who asked not to be identified. "Our experience with Sears has been more positive; they seem to recognize that you don't do this overnight, and they're not ramming all of the costs down our throat." The source said K Mart's plan requires major modifications to his order systems and "they're forcing us to eat the costs."

"To my knowledge there hasn't been anybody who has complained" about the K Mart requirements, responded Gary Sweetapple, senior director of corporate systems development at K Mart. He said he was very surprised to hear there was any resentment among suppliers.

Brad Gaylord, manufacturing systems coordinator at Norgren Co., said Sears "is taking a good approach." Norgren, a subsidiary of UK-based International Metal Industries that has plants in Littleton, Colo., and Rockford, Ill., manufactures compressed air accessories. "There's not a single deadline; they're offering help through free software and free training . . . I think it's reasonable."

"I'd say Sears is meeting us more than halfway," agreed Robert Hille, director of MIS at Northvale, N.J.-based MEM Company, Inc., a supplier of men's and women's toiletries. "I had a favorable reaction, especially compared with our other customers, like Toys 'R Us, which said they're going to charge us $25 for every piece of paper they have to process, or all those firms that say we have to be up by such-and-such a date."

The biggest concern expressed by suppliers was how Sears would handle implementation schedules. Dailey confirmed that the retailer was still in the planning stages and had no schedule to offer the suppliers.

An easier way

Nearly all of the auto industry's estimated 20,000 suppliers use some level of electronic data interchange (EDI) with their customers, according to John C. Martin, managing director of the Automotive Industry Action Group (AIAG) in Southfield, Mich. So, their customers — the Big Three auto makers, truck manufacturers and off-road vehicle manufacturers — have agreed to try to make life easier for them.

A group of 28 AIAG member companies have agreed to make the necessary compromises to standardize oft-used EDI transaction sets in their industry. The move is expected to nearly eliminate the need for suppliers to bear the cost of maintaining several different EDI computer systems to meet the varied needs of their customers. The AIAG said it expects to have published implementation guidelines with 17 high-usage transaction sets by the end of the year.

CA stock takes 40% plunge after firm says revenue is off

BY JOHANNA AMBROSIO
CW STAFF

GARDEN CITY, N.Y. — Computer Associates International, Inc.'s stock dropped nearly 40% last Thursday, but users should not feel any fallout soon.

The firm's stock plunged from 16½ Thursday to 9⅞ at Friday's close after CA announced that revenue for the first quarter ended June 30 will be "significantly less" than the revenue for last year's first quarter. CA will not release specific revenue and earnings figures until July 24, a spokesman said.

CA said that product development plans will not be affected, however. "This quarterly result will not affect how we run our business," said Bryan Shepherd, executive vice-president of marketing. "CA '90s and our product development plans are still on track." CA '90s is the company's strategy for integrating its diverse product line.

In a teleconference with Wall Street analysts on Thursday, Anthony Wang, CA's president, attributed the lower revenue to several factors, including the longer sales cycle and higher prices for database products than for their usual systems software products. Also, CA salesmen spent a lot of time during the quarter explaining the CA '90s concept, Wang said.

Wall Street analysts did not buy that explanation. "I don't think salesmen are irrational enough to do something that's not revenue-generating," said Rick Sherlund, vice-president of investment research at Goldman Sachs & Co. in New York.

What is really happening, said Andrew C. Brousseau, vice-president of research at Cowen & Co. in Boston, is "their product line is largely focused on the mainframe systems market, and that's growing in the single-digit range."

Wall Street's reaction did not sit well with CA. "Wall Street requires a quarterly accounting, and we're focused more on the long term," Shepherd responded. "It's not reality to suggest that our company is worth 40% less today than it was yesterday. And we're not just in the mainframe world; multiplatform solutions is what CA '90s is all about."

Some analysts remained bullish on CA's longer term prospects. "They have the largest customer base and the largest product line of any software company in the industry," said Scott Smith, vice-president of Donaldson, Lufkin & Jenrette in New York. "Those are great assets. It will take some time, but things will improve."

Multivendor net slated for fall

BY ELISABETH HORWITT
CW STAFF

BOSTON — Digital Equipment Corp. stirred some users' hearts last week by promising a commercially usable multivendor network management system by November. To some, however, the most exciting features of the system are the ones slated for next year and beyond.

Decmcc Director for the VMS family of software, the vendor's first commercial implementation of its Enterprise Management Architecture (EMA), will be bundled with all Decnet VAX licenses beginning in November, DEC said. Included in the package or offered as options will be all the basic network management functions, DEC said, including the ability to collect alerts and alarms, control device parameters and analyze network performance.

Version 1.1 of Decmcc Director, which ships in February, will include a graphics-based, mouse-driven user interface.

In addition to managing DEC's own Decnet Phase IV and Phase V systems, bridges and routers, the initial release will be able to manage anything that complies with the Simple Network Management Protocol (SNMP) for managing Transmission Control Protocol/Internet Protocol networks, DEC said.

However, DEC's initial implementation of Open Systems Interconnect (OSI) network management protocols in Director diverges from the International Standards Organization's specifications, according to DEC product marketing manager Anthony Viola. As a result, some "minor modifications" may be necessary for Decmcc Director to manage OSI-compliant devices, he added. "Right now, there is little demand" for OSI as the basis for multivendor network management, Viola said.

Not all users agreed with the statement. "The OSI support will be helpful because it means we're not locked into any one vendor," and it also eliminates the need to have a different management product for each type of networking equipment, said Price Braddock, a telecommunications analyst at Hardee's Food Systems, Inc. Braddock also praised DEC's support of SNMP and Ethernet standards.

What seemed most exciting to users, however, was Microsoft Corp.'s announcement that it will deliver by early next year an access module that will allow Decmcc Director to manage Microsoft's LAN Manager. The product, for which no shipment date was given, "is fantastic," said John Payne, an analyst at Charles Schwab & Co. "The biggest hole in integrated network management architecture products is their inability to manage [local-area networks]."

In addition, DEC and Apple Computer, Inc. announced a joint project to develop a module that will allow Decmcc Director to manage Appletalk networks. Schwab is also interested in DEC's plans to migrate EMA to a true distributed processing environment, Payne said. "You, the end user, then get to choose what platforms [different components of] the system run on, instead of getting stuck on a $15 million mainframe."

DEC also announced packages for converting existing Decnet systems and earlier Decnet management tools to the new platform.

DEC is scheduled to introduce an Ultrix version of Decmcc Director by the end of next year and a Microsoft OS/2 version at an undisclosed date, Viola said.

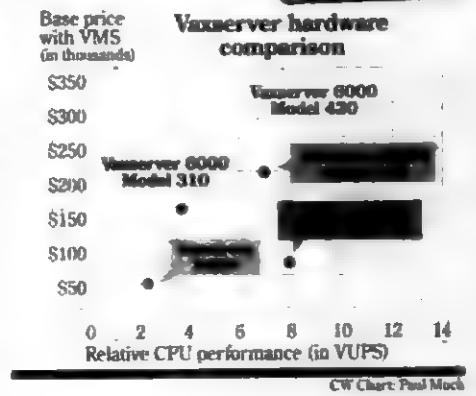
Senior writer Joanie M. Wexler contributed to this report.

Decworld '90 *promises of multivendor network management*

And, of course, products

DEC announced the following products and services at Decworld '90 last week:

- The VAX 4000 Model 300 is a replacement VAX for the Microvax 3900 that is optimized as a network server with up to 1,600 I/O requests per second. Prices for four different configurations range from $75,410 to $233,000.
- Vaxserver Base Platforms are newly packaged server platforms in the 4000 and 6000 lines, especially configured for dedicated file, print, application and compute services for personal computers and workstations. The servers, priced at 20% to 40% less than time-sharing systems, support desktop systems running MS-DOS, OS/2, Apple Macintosh, Unix and VMS operating systems. The servers come bundled with VMS licenses, DEC's RDB database and Decnet software.
- Specialized servers are systems earmarked for database access, multivendor electronic mail networks, messaging and office functions such as document processing. Prices range from $31,500 to $43,000.
- VAX Vector Compute Server is for large, numerically intensive applications. The price is $443,300.
- Decconcentrator 500, which is said to attach DEC workstations, systems or bridges to a 100M bit/sec. Fiber Distributed Data Interface (FDDI) backbone. Priced at $15,000, the concentrator is available now.
- A bridge that is said to link Ethernet networks to FDDI backbones.
- Decelms software, which is said to manage both 802.3 Ethernet and FDDI networks. The software package is priced at $1,800.
- A program to provide an FDDI adapter for VAX 6000s and 9000s. It is slated for release next year.



CW Chart: Paul Mach

DEC

CONTINUED FROM PAGE 1

Lawrence Livermore National Laboratories in Livermore, Calif. "It will not be a case of Suns and DECs staring at each other and not talking, although there may be a few rough spots."

DEC's architectural umbrella, Network Application Support (NAS), is a collection of DEC software products and services — 14 of them shipping now — that permit multivendor network integration and resource-sharing for database access, file and print services, for example.

Invited to this network party are the operating systems MS-DOS, IBM's OS/2, Apple Computer, Inc.'s Macintosh, Unix and DEC's own VAX/VMS and Ultrix.

The different user interfaces are one obvious stumbling block, users said, noting that Sun intends to keep its Open Look interface while OSF supports Motif. Yet in several areas where DEC and Sun are incompatible, each company and some third-party vendors already offer specific products enabling them to interoperate, Oberman said.

Sam Moore, a systems programmer at North Carolina State University's computing center, is using half a dozen Sun 380 workstations, as many Vaxstation 2100s and 3100s and a host of other DEC machines on a campuswide network.

"If DEC is using things now in OSF that are not in other standard Unix versions, that could cut out a lot of people," Moore said. "But if they come up with something really good, developers will port to the different platforms, and it won't be that big of a deal."

Overall, users at Decworld seemed acutely interested in the NAS strategy.

"Our requirements span a lot of what NAS is offering," said Edward Yodis, chief architect for the NASA Software Support Environment project in Houston, which uses DEC and IBM host machines for engineering workstations from IBM, Apple and Hewlett-Packard Co.'s Apollo division. "We need portability and applications communicating on a network. We'd like to be able to share project management and design information between the different platforms."

Clayton Foster, a senior consultant at Du Pont Co. in Newark, Del., said he will remain skeptical until he sees the NAS promises actually at work. "I expected to hear that it would require a lot of new investment and throwing stuff away," he noted.

However, DEC officials repeatedly assured users that the core idea behind NAS is integration of existing systems into a more productive, multivendor computing environment.

"Vendor-neutral is important to us. We want to be nonproprietary," said J. P. Johnson, manager of scientific systems at Texaco, Inc.'s exploration and production division in Houston. His shop includes a diverse collection of computer systems already in the client/server mode, with a Cray Research, Inc. XMP 216 as the main engine for workstations from Sun, DEC and IBM.

"I got the impression that when DEC says open, it means everybody," he added. "I hope that's true."

Second-class postage paid at Framingham, Mass., and additional mailing offices.
Computerworld (ISSN 0010-4841) is published weekly, with a single combined issue for the last week in December and the first week in January by CW Publishing/Inc., 375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171.
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TRENDS

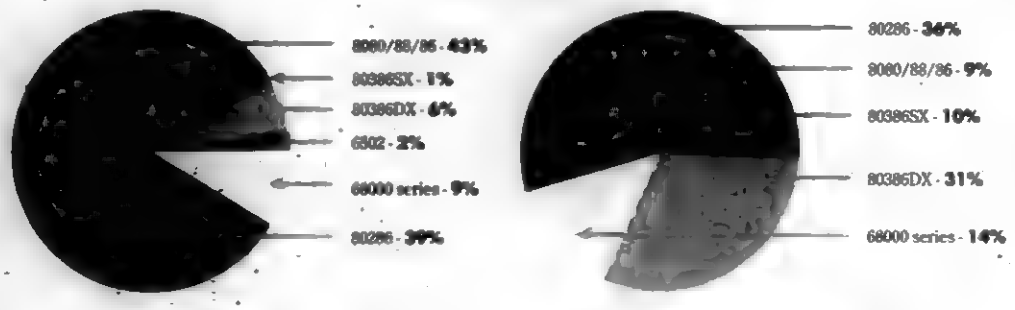
High-performance vs. Low-performance PCs

Despite achievements in processor speed, storage potential and display capabilities, procurements of high-performance personal computers have been less than overwhelming

PCs by processor type

Fewer than 7% of the PCs installed today are based on Intel's 80386 or 1486 processors. However, buying plans for the coming year indicate that 386 machines will be purchased more than any other (1486-based PCs accounted for less than 1% in each chart)

Percent of units



Installed*
Total of 4,651,435 PCs
*Installed figures based on a survey of 89,000 U.S. sites

12-month purchase plans**
Total of 288,508 PCs
**Purchase plans based on 14,000 U.S. sites

Planned PCs by industry

Although purchase plans of high- and low-performance PCs vary from industry to industry, common to all is that the majority of PCs that are bought will be low-performance models

Percent of sites
(Total of 14,000 U.S. sites)

Source: Computer Intelligence, La Jolla, Calif.

CW Chart: Tom Monahan

NEXT WEEK

"There's something about working here that gives me a special feeling," says **Lloyd Erickson**, an IS manager at the Johnson Space Center in Houston. Erickson is in charge of the Johnson Space Center Management Information Systems, a common interface for users to access multiple databases seamlessly. See Manager's Journal.

Nubar Fenny/SABA

Life at the elevation where strategic plans are made is no day at the beach. Just ask Joseph Brophy, once top IS executive at The Travelers Corp. and now president of The Travelers Insurance Co. He's barely had time to blow a note on his bagpipes since that first big promotion. For the inside story, turn to Executive Report.

INSIDE LINES

Moscow in the chips

Cypress Semiconductor chief T.J. Rogers, who is in the USSR pursuing joint ventures with indigenous chip makers, is faxing in a daily diary to a San Francisco newspaper. In the missives, we find that Soviet chip makers are impressed with the gadgets Rogers has brought them — most of which are made in Japan. Rogers has also engraved on prototype chips a tiny image of a Soviet flag and American flag linked by an integrated circuit.

Reshuffling the deck?

Deere Tech Services said rumors that it was scaling back its computer-integrated manufacturing business were completely wrong. Instead, the company is holding conversations with current marketing partner IBM, as well as with several other companies, to explore new combinations or new efforts that would gain the company more business outside of parent John Deere Co., which provides some 80% of Deere Tech's business. An official at Deere Tech said the parent company was giving it even more work than usual, giving the appearance that resources were shrinking.

Netware woes

The Computer Emergency Response Team, which tracks viruses out of the Software Engineering Institute at Carnegie Mellon University, issued an alert last Friday about a strain of the Jerusalem virus that infects Novell local-area networks running Netware 2.15C regardless of Novell file protections. The virus has hit at least one Netware user site, CERT said.

Rival to John Wayne International

He may not have made Semtech fly, but the late Robert Noyce may be commemorated with an airport. A group of Intel employees are trying to rename San Jose International Airport as Noyce International. It's reported he was infatuated with flying.

Perfect vision

Access Technology, Inc., a Natick, Mass.-based applications software vendor, is expected to introduce a new product called 20/20 Gold. The software, due out next week, is designed for use on DEC VAX/VMS-based machines and is expected to include 20/20, a data processing connection, a word processing connection, DEC All-In-1 integration and Access Openlink software. The big news is that it will all be bundled together at a 40% discount off the combined price of the individual products.

Still in the game

Covering its bets in the host-based networking management race, NCR Comten is expected to introduce today an interface between its network management product and Systems Center's Net/Master. The NCR Corp. subsidiary already has an interface between its Comten Support Facility and IBM's Netview, the dominant system for host-based network management.

Copywrite craft

Borland went on the offensive last week, peppering the media with a new ad campaign designed to counter Lotus Development's charges of copyright infringement. It noted that "according to Lotus' technical support, you cannot view a graph while in perspective mode in 1-2-3." Quattro Pro users can. Claiming that more than 300,000 users have switched to Quattro Pro, the ad copy goes on to note that "At Borland, we believe in software craftsmanship and are fighting for your access to real innovation."

With NASA seemingly intent on fumbling away budget support, defense contractors hoping for space station riches may need to turn to more mundane products. On the other side of the defunct Cold War, according to reports from Moscow, a nuclear missile design center was refitted to develop washing machines. Its first product was delivered recently — with 48 cycles. News Editor Pete Bartolik weekly cycles through the dregs of the industry to bring you these gems, and you can help brighten up his load by throwing dirty laundry at him. Call (800) 343-6474, fax to (508) 875-8931 or message COMPUTERWORLD via MCI Mail.

Due to a software error at the credit card company, the power lunch is now in hot water

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July 23, 1990 · Vol. XXIV · No. 30 · 128 Pages · $2/Copy · $48/Year

COMPUTERWORLD

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Stardent fires back, axing executives who sued Japanese sugar daddy. Page 4.

Blimey! Fujitsu shakes up European market, confirming talks to acquire UK vendor ICL. Page 116.

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Compaq revs up with 1486 power and bows to user demands for desktop upgrades. Page 10.

IBM keeps Wall Street happy with on-target profits. Page 93.

'Stealth' may be good for the Air Force, but malicious virus causes headaches for PC users. Page 4.

Anti-Lotus protester honored with MacArthur Foundation grant for software work. Page 116.

This technology's got the beat, and a *Computerworld Smithsonian Award* winner uses it to pull fans into record stores for customized music cassettes. Page 16.

IBM seeks new mainframe slot

BY ROSEMARY HAMILTON
CW STAFF

IBM sketched out its long-term plans last week to deliver a new kind of mainframe that will function as a corporate nerve center made up of tightly connected CPUs and processors dedicated to specific operations.

In other words, IBM said that more and more processing is being offloaded to smaller, cheaper systems, and the general-purpose mainframe — its cash cow — needs a new act.

While most users and analysts applauded this strategy, some suggested that it did not address one of the biggest problems with mainframes — cost.

"I'm not sure IBM has a good feel for where mainframes are going," said James Matsey, corporate information systems director at Reynolds Metals Co. "I know where they want to take them — they want to protect them. As long as they protect them and keep the cost so high, the economics will start forcing people off them."

IBM did not address pricing issues last week because the purpose of its strategy overview was merely to outline the new role of the mainframe. According to IBM executives, the goal is to capitalize on the mainframe's traditional strengths — including transaction processing, data management, security, large memory capacity and huge amounts of storage — for a corporatewide networked environment. Meanwhile, applications and interactive jobs can be moved to smaller platforms such as intelligent workstations.

"If they could just keep everyone buying mainframes, they would do that," said William Bluestein, an analyst at

Continued on page 6

Downsizing dilemma

BY JEAN S. BOZMAN
CW STAFF

The rush to downsize mainframe applications has led to a flood of confusing product claims by vendors and overblown expectations by end users, according to analysts and information systems professionals. Many users, in their haste to move host applications to personal computers, risk making fundamental mistakes that could be prevented with greater IS involvement.

"The technology has outstripped many people's ability to deal with it," said Paul Winsberg, a principal at Database Associates in Berkeley, Calif., during last week's Database World conference in Santa Clara, Calif.

Transferring IS skills to dispersed business units will be a growing issue in the 1990s as distributed database applications begin to be installed, analysts said.

Nevertheless, "very few organizations can carry out a high-level implementation of client/server architecture across a division, a

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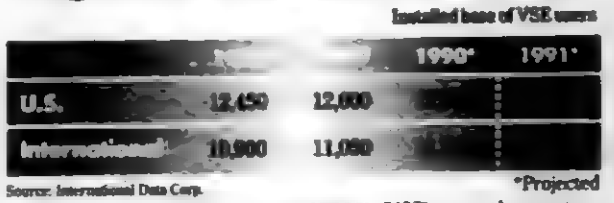
Big Blue to users: You win



Persistent loyalists, *users of IBM's VSE operating system will soon be rewarded with a major upgrade that has closer ties to MVS, according to IBM executives. Story, page 6.*

Few unions cutting bargain with high-technology 'devil'

BY J. A. SAVAGE
CW STAFF

Like John Henry, the burly character of legend who wields a hammer in a futile race against railroad machinery, labor unions that were faced with worker-displacing computer technology saw the end of the line as early as the 1950s. Yet only recently have most unions begun to use technology for their members' advantage.

With the notable exceptions of groups such as the Air Line Pilots Association and the International Association of Machinists and Aerospace Workers, most unions that offer technology training run it jointly with employers. At least one union has been so decimated by computer technology that it cannot afford to buy computers for training.

Calling for unions to negotiate "reasonable and human protections for workers against potentially adverse effects of job-destroying technological innovation," the AFL-CIO made its only policy statement on technology in 1979, with the position that mitigation could be found as long as technology prompted growth, said Markley Roberts, an economist at the AFL-CIO's research department. It was not until 1982, in the midst of the U.S. automobile industry recession, that a union first took steps to train members in computers and other basic skills.

"In the 1982 negotiations, when the union was making concessions, one of the tradeoffs was training," said Doug Fraser, former president of the United Auto Workers. The union launched some training efforts in 1983 and now has three

Continued on page 115

Blue-collar woes

Labor union membership continues to decline, although the trend has leveled off among white-collar workers

Source: Bureau of Labor Statistics
CW Chart: Paul Mock

Unisys bets on chip implant

BY ELLIS BOOKER
CW STAFF

BLUE BELL, Pa. — Unisys Corp. will unveil its latest computer today, a mainframe featuring a new architecture and components that analysts said is a clear precursor to Unisys' next-generation systems.

Dubbed the A16, the five machines in the new line span the upper half of Unisys' existing A series mainframes, now made up of the A12 and A17, which were introduced in 1985 and 1987, respectively. Not unexpectedly, Unisys continued a long tradition, announcing that the A16 will be object-code-compatible with the rest of the A family.

Without a doubt, though, the A16, which will range in price from $1.75 million to $5.9 million, is a step apart from the other members of its family. To start with, it uses Motorola, Inc.'s state-of-the-art bipolar logic chip, the MCA-III. Unisys

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Quotable

"You don't just go to the store and buy parts when they break. You call around and ask friends who might owe you a favor."

ANATOLY VOLKAN

Systems director at a Leningrad-based turbine factory, on the state of computing in the USSR. See story page 117.

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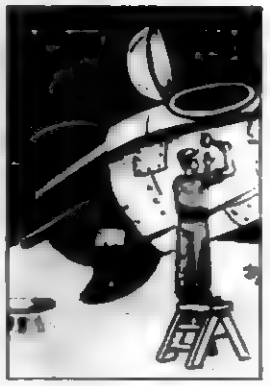
From *Spectacular Computer Crimes,* by Buck Bloom-Becker: "I've never put much stock in these so-called [software] licenses. The terms of these 'licenses' are almost invariably one-sided, taking as much as possible for the manufacturer and giving as little as possible to the buyer. Most significantly, many of the contracts also limit the warranty that comes with the software . . . A limited warranty, however, is a way for the manufacturer to avoid responsibility. It may say that if the software doesn't do what you reasonably expected it to do, that's too bad. Buy another product, but leave the manufacturer alone."



Cobol: Modernizing a trusty craft for the next decade. Page 87.

Joseph Brophy laid his bagpipes aside while adjusting to a new role. Page 81.

EXECUTIVE BRIEFING

■ **One by one, the clues are coming together** as people try to figure out what the mainframe of the future will look like. IBM offered a peek at its view of Tomorrowland last week when it said the mainframe will remain the corporate nerve center, but it also will be a collection of smaller special-purpose computers rather than the monolith of the past. Unisys will take its own step into the future today when it introduces its next-generation mainframe. Meanwhile, a snag could be lying in wait for the downsizing that most observers expect to happen as corporations move applications and processing power away from the mainframe and into the department. Experts say that downsizing depends on greater user understanding of IS issues and complexities of networks and security systems. **Page 1.**

■ **You've got to adjust to seeing the big picture** when you take on strategic planning duties in the top IS spot. Execs who have made the switch advise acclimating yourself to business operations and the business environment before trying to draw up any plans. When you do have things under control, they say, be prepared for a very different view. Even IS issues have a different slant from this angle, requiring more reliance on intuition, developing good communications skills with top managers and keeping an eye toward the future. **Page 81.**

■ **The search for a competitive edge** through network technology is raising the telecommunications manager — once thought of as a reactive administrator — to a level within the corporate structure comparable with that of the IS manager. **Page 73.**

■ **With compensation a major motive,** it's not unusual for IS people to jump into the business of recruiting their fellow technical professionals. Some never look back, but others find that the salesmanship required is not for them. Still others fear they could not return to IS because they have become technically obsolete. **Page 98.**

■ **The persistence of users may be paying off** in the form of a promised new version of IBM's VSE and IBM's assurances that the second-tier mainframe operating system it has often seemed to ignore is now considered a strategic product. **Page 6.**

■ **It can be a waste of time** to try to justify training with outrageous measures based on the notion of return on investment, at least until it becomes practical to use some form of testing to gauge an IS professional's performance. A better approach is to analyze the IS training organization as a business in itself. **Page 111.**

■ **Out of the laboratory,** down from Olympus and into the field, MIT's Project Athena — and the parts of it named for characters in Greek mythology — is a distributed network management system looking for a new home in other universities and the business field. **Page 68.**

■ **On-site this week:** Computers have found a home in the crime and grime of New York's transit system, taking control of functions ranging from fare collection to rail maintenance. **Page 59.** Platform independence is the operative phrase in the North Carolina Department of Crime Control and Public Safety's five-year plan for application development. **Page 25.** A distributed database is doing its part to save the Earth — or at least the tiny parts of the planet containing the endangered species of plants and animals that The Nature Conservancy is working to protect. **Page 28.**

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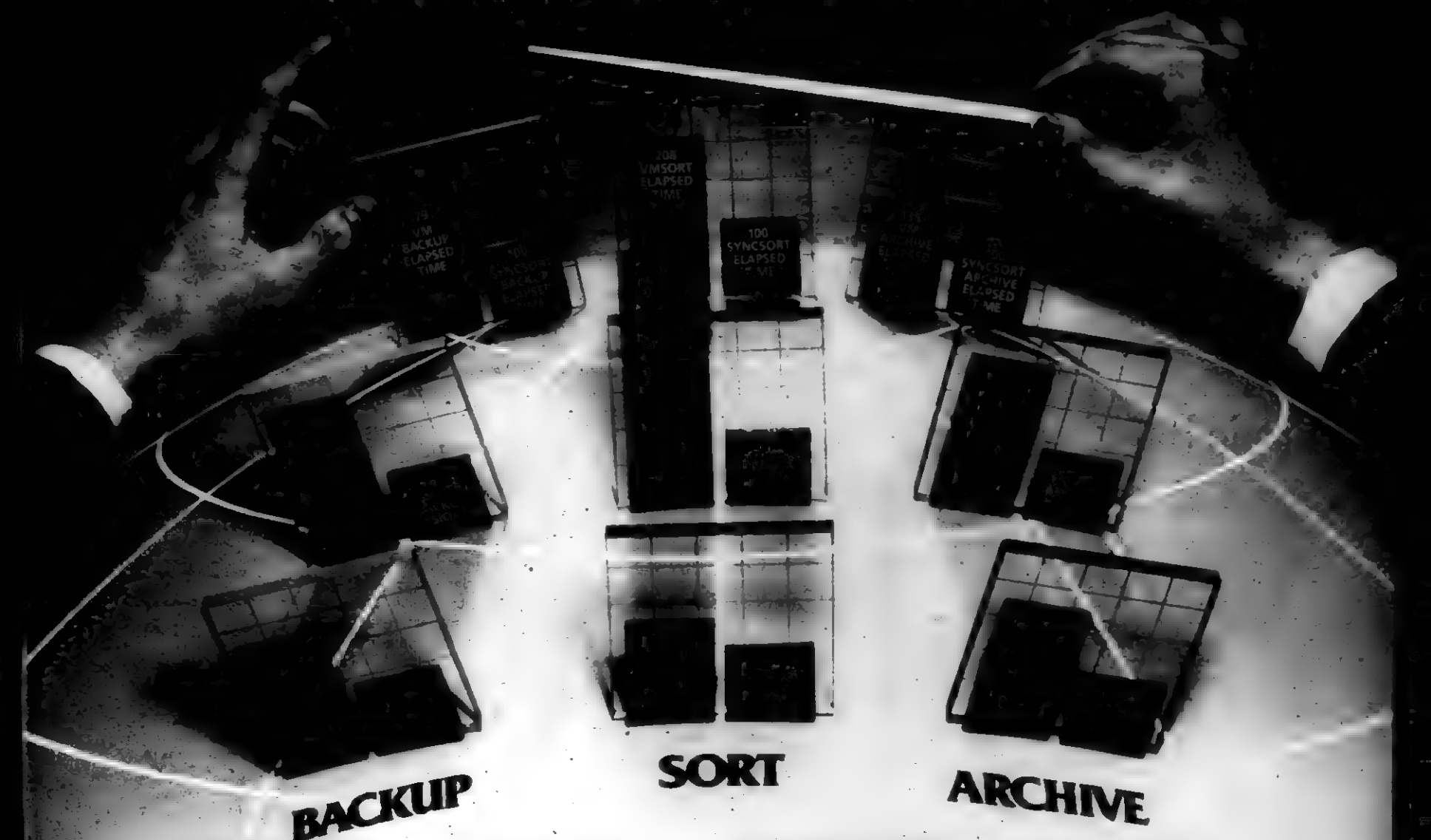

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Casualties of Stardent Wars

BY NELL MARGOLIS and JAMES DALY
CW STAFF

The $25 million lawsuit filed earlier this month by Stardent Computer, Inc.'s co-chairmen against the company's chief financier, Kubota Ltd., could blast the fledgling firm out of the sky just as its business is beginning to get off the ground, company insiders and analysts said.

For starters, it has blasted the plaintiffs out of Stardent in the wake of their allegations that Japan-based Kubota attempted to steal Stardent's technology.

The firm's board of directors voted last week to fire co-Chairmen Allen Michels and Matthew Sanders, citing "conflicting management styles." Leaving no ambiguity as to which side it was on, the board also voted to extend its partnership with Kubota strategically and financially.

Stardent *ex-Chairman Michels*

The lawsuit may become a public relations nightmare for Stardent, as it is poised to breathe new life into the graphics supercomputer market within the next 10 weeks by unveiling a new low-end model designed to take on competitors such as Silicon Graphics, Inc. "This is going to be a horrible saga," one Stardent staffer said.

The suit against Kubota was filed this month by Michels and Sanders. Neither Stardent itself nor Chief Executive Officer J. William Poduska were party to the action.

Late last week, Poduska announced that an investigation by the board, in which Kubota had cooperated, had turned up "no legal grounds for this action."

Michels and Sanders charged Kubota with having lured their former start-up, Ardent, into a shotgun marriage with Poduska's firm, Stellar; Kubota was a primary investor in Ardent. Subsequently, the two executives charged, the Japanese firm sought to siphon off the merged firm's best technology and technologists into a Kubota subsidiary.

The plaintiffs also accused Poduska of leaking to the press information calculated to force them out of the firm.

Kubota's first response to the lawsuit contained its own zinger: According to Vice-President of Business Development Naohisa Matsuda, Michels and Sanders turned to the court only after an attempt to turn their gripes into gold had fizzled. Matsuda charged that the lawsuit was filed after Kubota rebuffed attempts by Michels and Sanders to obtain multiyear, multimillion-dollar consulting contracts in return for not going public with their charges.

Stardent CEO *Poduska*

Kubota officials have broadly hinted that the firm will take legal action against Michels and Sanders.

Insiders said that the amount of time, money and energy a lawsuit of this nature typically entails will deflect critical energies from the firm's product line, which is reportedly beginning to sell well.

The Michels/Sanders charges raised some eyebrows among sources close to Stardent. "The only people who fulfilled their part of the bargain" was Kubota, said one seasoned industry observer familiar with the Stardent operation. "They provided the money and did a beautiful job of manufacturing. They did everything they were asked to do."

The source's sentiments echoed the reactions of executives at other firms partnering with Kubota. "We continue to have an excellent relationship with Kubota," said Robert Miller, president of Mips Computer Systems, Inc.

Peter Behrendts, president of Boulder, Colo.-based disk drive vendor Exabyte, in which Kubota holds an approximate 8% stake, said he has "no fear at all" that customers would shy away from Kubota-linked firms. He did admit to some initial concerns. "To be honest," Behrendts said, "I expected quite a few calls — but they haven't come."

Frodo Baggins: Rising from the dead

BY MICHAEL ALEXANDER
CW STAFF

When Frodo Baggins, the central character in *The Lord of the Rings* trilogy written by J.R.R. Tolkien, comes to life on Sept. 22, personal computer users may weep. That is the trigger date for the 4096 PC virus, a potentially destructive virus that signals its presence by displaying the message "Frodo lives."

The 4096 is designed to activate on Frodo's Sept. 22 birthday or any day after it, but some DOS commands may cause it to activate ahead of schedule, said James Rich, owner of James Rich Computers in Corsicana, Texas.

The 4096, named for its 4,096 bytes of code, is one of the latest generation of "Stealth" computer viruses, designed by their authors to avoid detection, much as the Stealth bomber is designed to elude enemy radar systems, according to Raymond Glath, president of RG Virus Software Systems, Inc. His firm, based in Willow Grove, Pa., publishes antivirus software.

"The virus was written by someone with extensive knowledge of the internal workings of the DOS operating system on the PC, as well as knowledge of the detection techniques used by many of the current antivirus products," Glath said.

The virus has a number of sophisticated features, including the ability to remove itself from an infected program file if the file has been called by an antivirus program for examination, Glath added.

"It can cause havoc in many environments that run other memory-resident programs," warned John McAfee, chairman of the Computer Virus Industry Association and president of Interpath Corp., an antivirus software publishing firm based in Santa Clara, Calif. In some instances, the 4096 may wipe files from a hard disk. At other times, it may prevent the computer from booting or cause a PC to "hang."

The virus is prolific and eventually infects every file that is opened. If the virus is in memory when the user runs a virus scanning program, for example, it will append itself to every program file on the system.

The virus is believed to have first been discovered in Israel about nine months ago by members of the Israeli Defense Forces, according to Glath, who recently published a white paper on this latest generation of viruses.

In the U.S., it was first discovered to have infected PCs at Washington University in St. Louis nearly six months ago and has since been reported at over 100 sites involving many thousands of computers, according to McAfee. Other recent infections include 13 Burger King franchises in Scotts Valley and Santa Cruz, Calif., numerous Internal Revenue Service offices in Seattle and a bank based in Houston, McAfee said.

The number of reported infections by the virus is "escalating but not rampant," McAfee said.

Convicted hackers to testify against editor

BY MICHAEL ALEXANDER
CW STAFF

CHICAGO — Three surprise witnesses and admitted criminal hackers are expected to testify for the prosecution in alleged hacker Craig Neidorf's trial, which begins today in Chicago's federal district court.

The witnesses, Robert J. Riggs, 21, Adam E. Grant, 22, and Franklin E. Darden, 24, pleaded guilty on July 10 and 11 to charges stemming from their roles in a scheme to break into computers at Bellsouth Corp. in Atlanta and steal documentation from a 911 emergency telephone system.

Neidorf was indicted with Riggs earlier this year on charges of wire fraud and transporting stolen documents. However, Neidorf has contended that he was not involved in the electronic burglary.

Neidorf published the documentation Riggs stole in an electronic hacker newsletter, said Sheldon Zenner, Neidorf's attorney at the Chicago law firm of Katten, Muchin & Zavis. Neidorf, who has used the moniker Knight Lightning on computer bulletin boards, is the co-editor of "Phrack."

In several motions for dismissal of charges, the defense has asserted that Neidorf's arrest and the seizure of his computer equipment is a violation of his First Amendment right to free speech, Zenner said.

The trial has attracted considerable attention because of the involvement of Lotus Development Corp. founder Mitch Kapor's Electronic Freedom Foundation (EFF), which is paying a New York law firm to assist in Neidorf's defense [CW, July 16].

The EFF filed a friend of the court brief in support of the defense's motion for dismissal on First Amendment grounds two weeks ago. The EFF's motion was denied, but the court allowed the defense to adopt the brief as its own, Zenner said.

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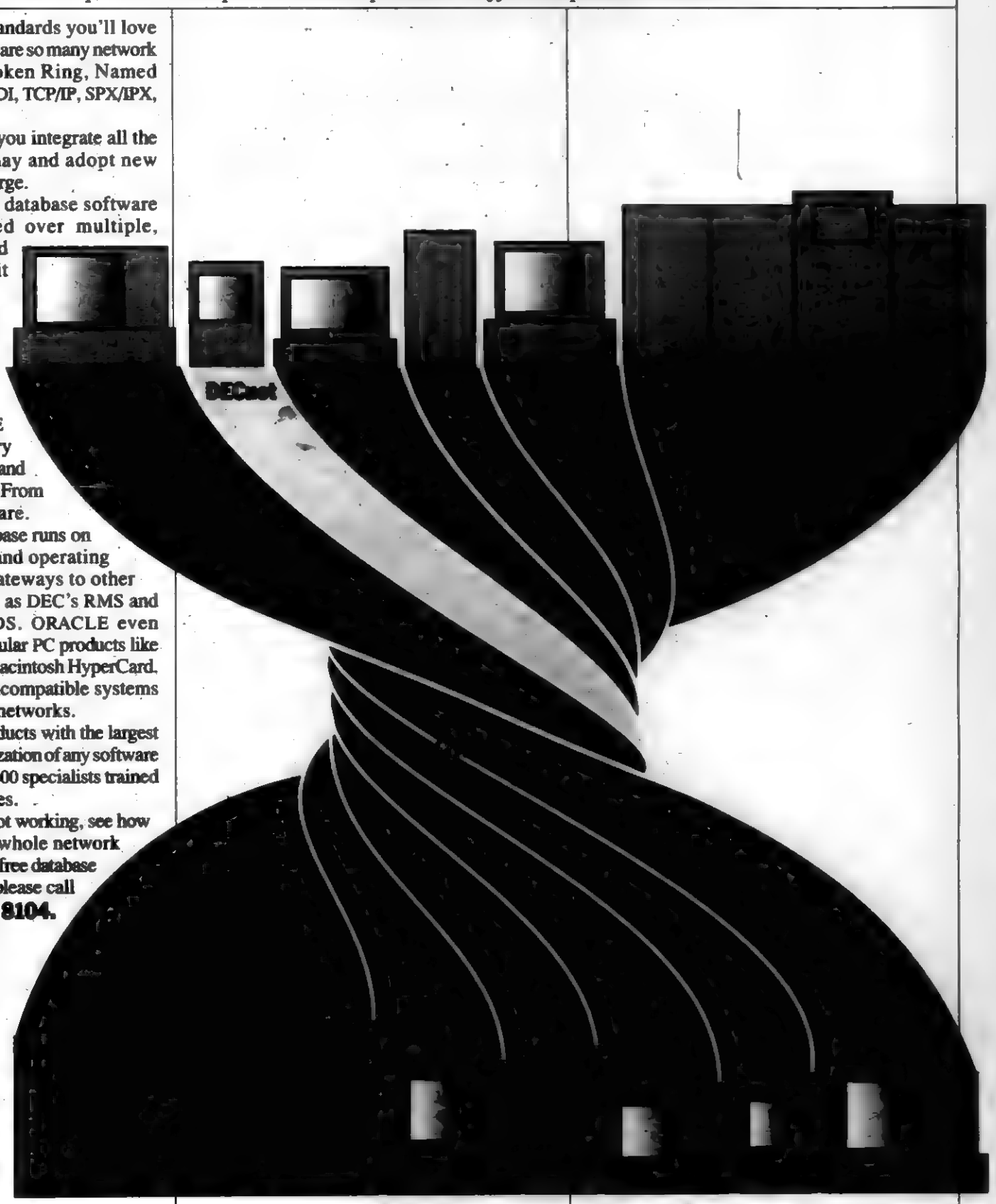

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VSE gets jumpstart with sequel

BY JOHANNA AMBROSIO
CW STAFF

SOMERS, N.Y. — IBM's VSE users may have lost a few skirmishes along the way, but it appears they have finally won the war. IBM executives interviewed last week labeled VSE a "strategic" product and said a major new version of the operating system will be introduced by the end of the year.

IBM's strategy, according to Kurt Geier, IBM's manager of systems management planning at the VSE development laboratory in Boblingen, West Germany, now includes the following:

- Helping users break out of existing VSE constraints by means of the new version of VSE.
- Committing to future VSE development.
- Positioning VSE as a sort of "little brother" to MVS and making it more compatible with MVS, partly by means of a new organization that oversees development at the key laboratories for both operating systems.

"You'll see when we position VSE at the announcement that it will be positioned with our other strategic operating systems," said Peter J. Tarrant, IBM's director of enterprise systems marketing.

The new VSE version will be announced in the fall, sources said, and will bring with it a name change. IBM confirmed that it will be called something other than VSE Version 5.1.

IBM announced plans for a new version of VSE a year ago, but there were lingering doubts in users' minds about what it meant for VSE's future [CW, July 10, 1989]. These doubts had been fed by IBM's reluctance for several years to enhance VSE.

Users no longer seem doubtful about VSE's future. Charles Rice, data processing manager at Carolina Steel Corp. in Greensboro, S.C., said, "It's been a long, tough fight. But now I feel very comfortable with VSE, and the other users I know do, too, through at least the end of this century."

Ben Parke, president of Guide International in Chicago, said: "This fulfills a lot of our users' requirements for VSE, and it's a clear signal that VSE will be in the mainstream of IBM's product line."

Pete Clark, a systems programmer at Olan Mills in Chatanooga, Tenn., said, "I'm very positive about this, and I think there are probably 22,000 happy people out there," referring to one commonly cited estimate of the worldwide VSE installed base. According to Geier, a little less than 40% of that base is in the U.S.

Users said the new VSE version will give them some practical help for the problems they have been facing. "It will help us grow our applications and our installation," Rice said.

Perhaps more important, Clark said, "instead of having to deal with the constraints of the operating system, we'll be able to develop new applications and do other things for our companies."

Geier said the new VSE version addresses the top 30 user requests, as articulated by Guide and by the IBM customer councils. Areas that will be "changed significantly," he said, include more real storage, an increased number of partitions that the operating system can address, and a larger number of I/O units that can be used. Over time, he said, users will be able to use more virtual storage. The new system will also handle native-mode 31-bit addressing.

Further, the new VSE will take advantage of the new computers that IBM will also be introducing later this year, Tarrant said. "VSE will take advantage of and exploit the new features and functions of the new hardware," he said. However, the IBM managers pledged, customers will not have to purchase new hardware or upgrade their old systems to use the new VSE.

With the new VSE and name change will come a repositioning of VSE as a low-end MVS, Geier and Tarrant said. Although both operating systems are intended for commercial on-line transaction processing, VSE is optimized for the lower end of the System/370 family — such as the 4300 and 9370 — and MVS for the higher end.

One of the "joint issues" to be resolved by the MVS and VSE development teams is a Job Control Language (JCL) that is more alike in both operating systems. Geier said IBM will smooth out the differences over time to allow for better applications portability between the two. "To the extent that new parts are added to JCL, we will make sure that they are developed to be the same. It's not likely we'll redo existing parts of JCL, because that could hurt existing customers," Geier said.

Other portability issues that IBM said it is addressing include the use of common telecommunications components and the ability to use the same disk drives for both MVS and VSE.

Also, to ease applications portability, IBM said it will bring portions of its Systems Application Architecture (SAA) to VSE. For example, Cobol2 and C will be options for VSE programmers.

However, IBM did not actually say that VSE is an SAA operating system. Instead, VSE will have interoperability with SAA operating systems but will not implement full SAA items such as Common User Access — at least not from the host.

IBM

FROM PAGE 1

Forrester Research, Inc. in Cambridge, Mass. "IBM is trying to develop strategies to deal with the shift in processing power that has occurred."

IBM's mainframe of the future will be delivered in phases during the next several years. Analysts said they believe initial capabilities will be released with the 3090 follow-on, commonly called Summit, which they expect to be announced later this year.

According to Bernard Puckett, president of IBM's Data Systems Division the future large system will have the following features:

- Coupled processors. Puckett claimed that a test version at Cornell University currently links two 3090 Model 600s that function as a single, 12-way processor complex. Analysts have expected IBM to deliver a mainframe with loosely coupled processors capable of sharing data as well as some system resources, such as expanded storage.
- Specialized processors. The goal would be to offload processing-intensive operations to a dedicated processor that could either snap into the mainframe as one or more thermal conduction modules or operate as a stand-alone box connected to the host. Puckett said operations such as database management, sorting, imaging and security and transaction processing are possibilities. It would be an extension of what IBM now offers with its vector processor for numeric-intensive operations, analysts said.
- Parallel processing. A prototype of a System/370-based parallel processor is scheduled to be delivered by the end of 1991, Puckett said. The company has built a 32-processor system based on the System/370 microprocessors.

"When I talk about large systems, I'm talking about something different than the isolated workhorse," Puckett said, adding that IBM will "very quickly have 500 [million instructions per second] systems and clusters of thousands of MIPS."

Cost-conscious

However, Matsey said the plan does not mean much unless IBM addresses the high cost of mainframe computing. According to Matsey, mainframe costs were "a third to half the reason why we've been moving applications to midranges and micros."

"I don't see the 3090 going away for at least five years," Matsey added, "but you don't have to upgrade as much each year. Eventually, it will come to no growth and then a negative."

Tom Loane, IS director at Alamo Rent A Car, Inc., is another user who said he is concerned about price.

"The ability to couple CPUs in a network of mainframes is a positive step forward," Loane said. "The question of price/performance will determine if this will be successful. It's fine and good, but it's got to have a price advantage."

Vaxstation, Decstation prices to slip

BY MAURA J. HARRINGTON
CW STAFF

An announcement by Digital Equipment Corp. last week that it will cut prices of its low-end Vaxstation and Decstation 2100 and 3100 workstations, among other products, is yet another symbol of the volatility and competitiveness of the workstation market, analysts said.

"It used to be that you could anticipate workstation prices and changes on an annual basis. Now, you can't even go on vacation without a change in the market," said Peter Kastner, vice-president of Aberdeen Group, a market research firm in Boston.

DEC's workstation price cuts — as well as cuts in prices of its memory upgrades, monitors and disk drives for the low-end models and bundling of factory-installed software in the Vaxstation 3100 — were announced for the VMS and Ultrix product lines, said Chris DeMers, DEC's marketing manager for VMS workstation products.

The price-cut announcements included that DEC will reduce the price of its Vaxstation 3100 Model 30 diskless workstation from $7,950 to $5,950 for the 19-in. monochrome monitor system and from $10,950 to $8,950 for the 15-in. color monitor system, DeMers said. DEC also will cut pricing on memory upgrades for the Vaxstation and Decstation 2100 and 3100 products to $250 per megabyte, DeMers added.

Good stuff cheap

A sample of the recent price slashes on DEC's workstation lines

digital

Price-reduction highlights

- Vaxstation 3100 family of workstations now starts at $5,960 (was $7,950)
- Vaxstation and Decstation 2100 and 3100 workstation upgrade memory now $250 per 1M byte (was $600)
- Memory upgrades for the Decstation 5000 now $550 per 1M byte (were $1,400)
- Factory-installed software for the Vaxstation 3100 workstation family, allowing unbox-to-login in 15 minutes. Factory installed software for Decstation workstations expected shortly

CW Chart: Paul Mock

"In all honesty, this really turns out to be a leapfrog [move] in the industry. We really see the workstation industry opening up for us . . . and I think that these offerings are very competitive," DeMers said.

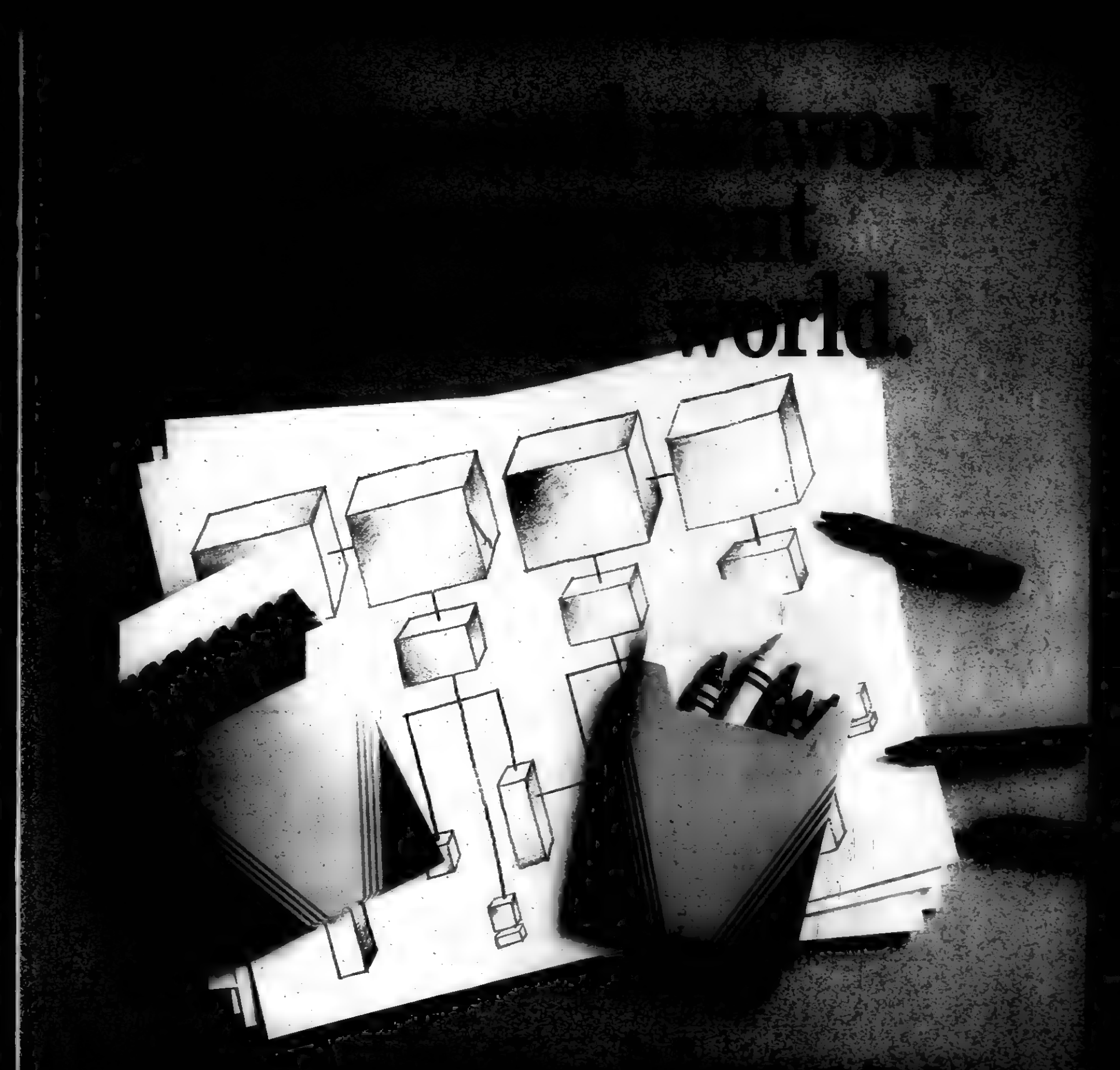
While the price cuts may not be considered earth-shaking news to workstation users, analysts said, they represent a necessary strategic move for DEC, which they said is facing more competition than ever since IBM announced its RISC System/6000 workstation last month.

Chuck Barney, an analyst at Workgroup Technologies, a market research firm based in Hampton, N.H., said DEC, Hewlett-Packard Co. and HP's Apollo division are all likely to lose some of their present workstation market share to IBM's RS/6000.

However, IBM probably will not leapfrog the two firms in market share by 1993 [see chart] if DEC and HP as well as its Apollo division continue their competitive strategies, Barney added.

"Workstation prices are falling fast across the board, so really, [vendors] almost have to keep slashing prices to stay in the same arena as their competitors," said Martin Ressinger, a vice-president at Duff & Phelps, Inc., an investment research firm in Chicago.

While the price cuts may seem like just another typical day in the fast-paced workstation arena, Ressinger noted that the market is so competitive that users — faced with price decreases and workstation products coming out almost every month — are no longer taking the first offer that comes along.



NEWS SHORTS

IBM rings up 'No Sale'

Published reports that IBM is considering the sale of its marginal businesses, such as electric typewriters and keyboards, may or may not be true, according to IBM. The company said in a prepared statement that it had not completed any transaction such as the one reported in *The Wall Street Journal* and elsewhere. However, the company neither confirmed nor denied that it was talking to an unidentified buyer, as reported by the *Journal*. The newspaper also reported that sales such as the one said to be under consideration are often followed by employee layoffs. IBM will not modify its long-standing full-employment practice, the company said in its announcement.

Senate looks at Euronets

The Senate Banking Committee has added a key provision on telecommunications to the Export Administration Act, according to the Computer and Business Equipment Manufacturers Association (CBEMA). The amendment, which was introduced last week by Sen. John Heinz (R-Pa.) and Sen. Tim Wirth (D-Colo.), is designed to ensure the availability of wide-area networks for computer systems sold in Eastern Europe, among other areas. "Wide-area networks that integrate computers at different sites are essential to Eastern Europe's commercial and democratic development," said William A. Maxwell, vice-president of CBEMA.

Service awards $138M pact

Martin Marietta Corp. snagged a $138 million contract from the U.S. Postal Service to build 614 high-speed sorting machines that will process letter mail by reading and sorting preprinted bar codes. The machines, which were developed jointly by Martin and National Presort, Inc., are operated through a computer interface using real-time window displays of system status and command menus. A spokesman for the defense contractor called the win an important signal of Martin's move into the civilian sector.

Emulex adds server

Emulex Corp. last week introduced a modular networking server that will reportedly allow network access for up to 128 users. The Performance 8000 Communications Server for the Ethernet local-area network market is expandable to allow different types of communications interfaces to be added in the future by means of plug-in controller boards, which could include interfaces to WANs. Costa Mesa, Calif.-based Emulex said the product also features high-speed data-transfer rates, printer sharing capabilities, redundancy in several component areas, extended security and a hot-swap capability that allows repair without shutting down the server. The base product with one 32-port terminal controller board costs $11,500.

Sprint parent hit by loss

United Telecommunications, Inc., the majority shareholder in US Sprint Communications Co., reported a 55.1% decline in its second-quarter earnings. The Kansas City, Kan.-based firm said it would lay off as many as 1,300 employees from its work force. The cuts will include some data processing personnel, the firm confirmed last week. The trouble at Sprint has apparently led parent United Telecom to delay — but not terminate — its plan to purchase the balance of Sprint from GTE Corp.

AT&T offers price info

AT&T last week belatedly provided pricing and availability information for the switched 384K bit/sec. service it introduced in May. The Accunet Switched 384 Service is scheduled to become commercially available on Sept. 1 and will initially be supported on 29 AT&T service nodes, with additional nodes to be phased in gradually, AT&T said. Pricing for the 384K bit/sec. service depends on distance and time of day, with a connection of 125 to 292 miles during the day costing $.725 for the first 30 seconds and $.095 for each additional six seconds.

More news shorts on page 116

Earnings bring no surprises

BY NELL MARGOLIS
CW STAFF

Second-quarter computer company earnings raised many smiles but few eyebrows last week as largely upbeat numbers hewed to well-marked trends rather than setting new ones.

Among the computer industry dictums once again validated in the recently closed quarter, "Give the people what they want" loomed perhaps the largest. Storage Technology Corp.'s well-received 4400 Automated Cartridge System spearheaded a second-quarter revenue surge of 17% for the Louisville, Colo.-based company. Improved service also added to Storage Tek's $197.7 million in sales, Chief Executive Officer Ryal Poppa said. Profits of $4.4 million marked a 263% boom over net income during last year's comparable quarter.

Lotus Development Corp. thundered in with a 33% revenue increase to $175.2 million and net income that skyrocketed 128% from last year's comparable period, to $23.5 million.

However, Lotus Chief Financial Officer Robert Schechter struck a note of caution with regard to "a clear understanding of the challenges we face in the second half and beyond."

Ashton-Tate Corp., still plagued with delays in getting its new Dbase product — which users clearly want — out the door, watched its second-quarter revenue drop 19% to $48.1 million and reported a quarterly net loss of $12.6 million.

Fault-tolerant systems player Tandem Computers, Inc. reported revenue of $472 million — a 12% increase over the $420.7 million it reported for the second quarter of 1989. Net income rose 160.5% to $11.4 million.

The revenue climb was less than anticipated, said Jean Orr, an analyst at Labe, Simpson & Co., because the company lost sight of economic realities. "Tandem was a little too optimistic," Orr said. Owing to "slower economies around the world, demand was slower than expected." Tandem also neglected that business world chestnut, "The bigger you get, the slower you grow." Aiming bigger — and bigger-ticket — equipment at new target markets rendered the firm more sensitive to the vicissitudes of the economy than was previously the case, Orr said.

Repositioning woes continued to show at Unisys Corp., which reported that revenue decreased 4% from last year's second quarter, to $2.4 billion. Net income of $11.8 million was down 78% from 1989's second-quarter profit figure. "I wasn't thrilled," said Rick Martin, an analyst at Prudential Bache & Co., referring to the revenue backslide. Nevertheless, he noted, Unisys is "still on target for 2% to 3% growth for the year."

Martin took a patient view of the struggling titan. "This is a company going through lots of restructuring," he said, echoing analysts' comments about Unisys for many consecutive quarters now.

Senior writer Richard Pastore contributed to this report.

Unisys

FROM PAGE 1

claimed it is the first production mainframe to employ the MCA chip, although analysts pointed out that Digital Equipment Corp. also uses the chip in its high-end VAX 9000.

Each MCA-III chip has 10,000 emitter-coupled logic (ECL) gates; the MCA-I, used in Unsiys' A12 and A, sports 1,200 ECL gates.

Thanks in part to the new chip, the A16 has performance specifications that, according to Unisys, "equal or exceed" that of the high-end A17 on many operations, and with 384M bytes it has more memory capacity than the A17. The new chips and packaging also enabled Unisys to shrink the size of the new box: The air-cooled A16 occupies just 9.6 sq ft, compared with 38.4 sq ft for the A17.

Replacement strategy

Jim Cassell, vice-president and service director for large systems at Gartner Group, Inc. in Stamford, Conn., rated the performance of the A16 as equivalent to that of an IBM 3090 Model 180-J. He said the latest system sets the stage for a replacement strategy for the current high end of the Unisys A Series.

However, Cassell said, Unisys is "introducing it in a way that minimally disrupts their installed base." He noted that while the A16 is clearly capable of supporting a three- or four-processor architecture, Unisys has currently announced only one- and two-processor models. This, he said, will keep current users of three- and four-processor A17s happy but, at the same time, point the way for all future migration.

Current A Series customer and former Cube user group President Robert H. Dever III also said the A16 anticipates a high-end machine in the wings.

"Sounds to me like they're getting ready to get rid of the 17 or ride it over the sunset," said Dever, who is also vice-president of information services at Liberty Travel, Inc. in Ramsey, N.J. He said the A16 is less a gap filler and more a "gap preventer," designed to fill the space between the current A Series and some as-yet-unannounced high-end box.

"Our view is [that the A16 is] a good announcement for Unisys' installed base," Cassell said, although he added that it remains to be seen whether the "totality of the offering" will enable Unsiys to gain market share against IBM for high-end 3090-class customers.

However, it was the DEC 9000 that attracted the most pointed comparisons from Unisys executives.

"We think we have more performance in one-third the footprint," said Chuck McIntyre, program development manager for the A Series.

Beta-test site customer Chuck Spooner, data processing manager at Roseville Telephone Co. in Roseville, Calif., said he has been delighted with the A16 Model 511 he received May 15.

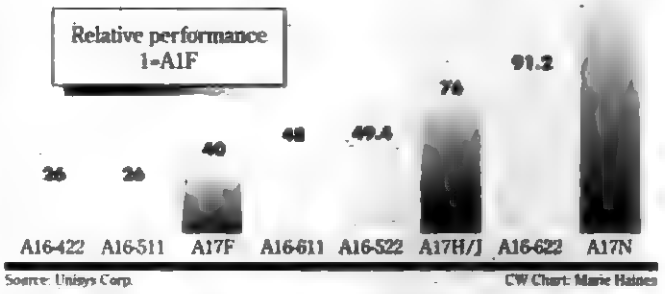
The telephone company, located 16 miles east of Sacramento, has been using its A16 as a test and development platform and as a disaster recovery processor for the A12 mainframe at its data center seven miles away.

Spooner said he is particularly excited about the prospect of upgrading the mainframe to a dual-processor system.

The two single-processor A16s are available immediately; the three dual-processor models will be ready in October, according to Unisys.

Enhanced lineup

The A16 line, priced from $1.75 million to $5.9 million, spans performance points of the older A12 and A17 mainframe lines



Source: Unisys Corp. CW Chart: Marie Haines

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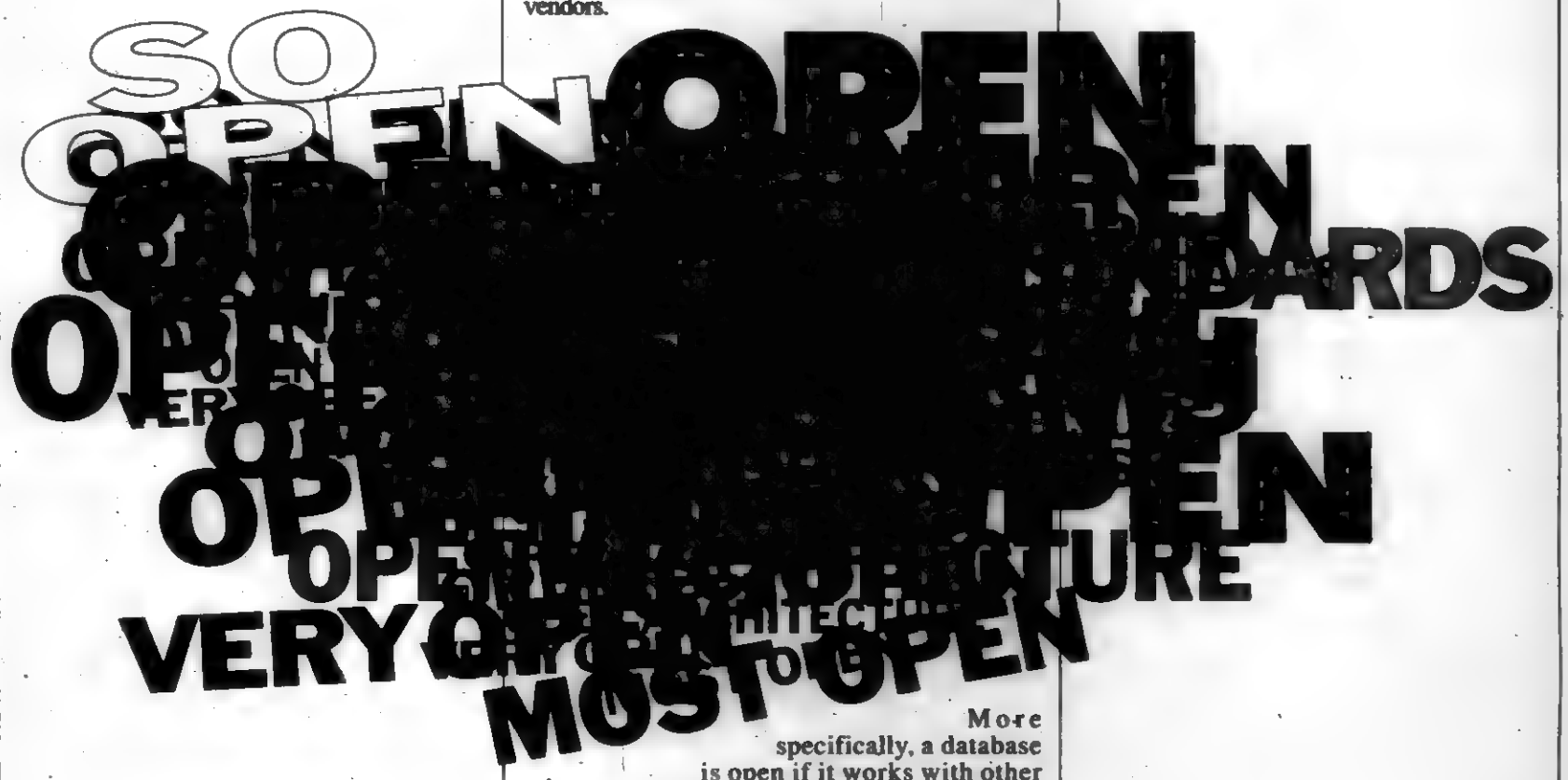

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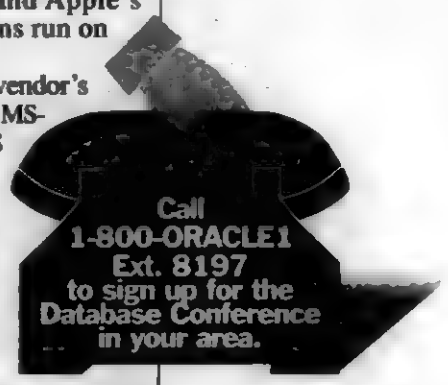

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Compaq's Systempros lean into 486 power curve

BY RICHARD PASTORE
CW STAFF

HOUSTON — Compaq Computer Corp. revved up its Systempro series to full 486 power and fleshed out its Extended Industry Standard Architecture (EISA) desktop line with an upgradable introduction last week.

Compaq delivered on its promise of Intel Corp. 1486 dual-processor power, delivering Systempro models based on the 33-MHz 486 chip as well as a 486 upgrade board for the few Systempros that have sold with Intel 80386 CPUs.

The 486 booster comes about a month later than promised, according to new product manager Lorie Strong. Design and testing delays held up the debut, she said. The lag also may have retarded Systempro sales, observers added.

"If I were putting in a Systempro, I wouldn't dream of putting in anything but a 486," said Seymour Merrin, president of Merrin Information Services, Inc. in Palo Alto, Calif. "I think you'll see a substantial pickup once the 486 is out." As of May, only 2,543 Systempros had been sold through U.S. computer specialty stores, according to Storeboard/Computer Intelligence in Dallas.

The native 486 systems will ship with 240M-, 420M- and 840M-byte disk drive arrays and will cost $20,999, $23,999 and $29,999, respectively. The upgrade board costs $6,999. Shipments are scheduled to begin this month.

Though Compaq cut prices on the 386-based Systempros by 12% to 15%, the company said it expects the native 486 models to be the better seller in the long term, Strong said.

The company also promised a storage boost within the next 12 months that will jack disk capacities from the current 1.68G bytes to over 10G bytes. "Our long-term direction is to provide over 40G bytes of storage," said Mike Swavely, Compaq president for North America.

Analysts said increased storage is essential to the success of the line. "If Compaq wants to position the Systempro as a network server, it has to support substantial amounts of storage," said Michael Goulde, vice-president of Open Systems Advisor, a consulting firm and newsletter publisher in Boston.

Compaq also announced two Deskpro machines based on EISA. One, the Deskpro 386/33L, allows users to swap the 33-MHz 386 CPU for a 33-MHz 486 board. The upgrade module costs approximately the same as the difference between the prices of the 386/33L and the Deskpro 486/33L, which also debuted last week.

In the past, Compaq has criticized the concept of upgradable personal computers offered by some competitors. Upgrading the CPU rather than buying a whole new box leaves users with mongrel machines hampered by slower disk drives and memory components, Compaq said.

Despite the new upgradable Deskpro, Compaq is sticking to its guns — sort of. "We would still be resistant to upgrading over a broad range," from an Intel 80286 to a 486, for example, Strong said. "Then you'd be so out of whack in the size of the machine and the drives."

The Deskpro 486/33L ships with 120M-, 320M- and 650M-byte hard disk drives and is priced at $13,999, $16,499 and $19,499, respectively. The 386/33L ships with the same drive configurations and costs from $9,999 to $15,499.

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AT&T's Unix unit spun off

BY JOHANNA AMBROSIO
CW STAFF

MORRISTOWN, N.J. — AT&T has completed the spinoff of its Unix Software Operation into a new entity that is completely separate from the hardware development unit.

The software group, renamed Unix System Laboratories, Inc. (USL), is now a subsidiary of AT&T instead of being a business unit of AT&T's Data Systems Group. "This allows us to formally distance ourselves from AT&T's computer systems business," a USL spokesman said. "Now, we're just one of their customers, and they're just one of ours. Our focus is to supply Unix source code to the entire computer industry."

There has been speculation that this new relationship will also allow AT&T's hardware group to more gracefully adapt the Open Software Foundation's standards, including the Motif user interface.

Top management at USL remains the same as it was in the Unix Software Operation. Larry Dooling is president, and other top executives include Michael J. DeFazio, vice-president of Unix System V software, and Joel A. Appelbaum, vice-president of open solutions software. This category includes AT&T's Tuxedo transaction processing monitor for Unix.

The "big story" about USL will likely come later this year, the spokesman said, when USL offers equity to other major players in the Unix world. USL is planning to keep 70% of the company for itself and its employees, and it will offer 30% to outside interests, according to the spokesman.

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U.S. flat-panel display firms decry Japan pricing

BY NELL MARGOLIS
CW STAFF

WASHINGTON, D.C. — A trade group made up of seven U.S.-based flat-panel display makers took a look at its imperiled industry niche last week and apparently borrowed a line from the late Bette Davis: "What a dump!"

The Advanced Display Manufacturers of America (ADMA) filed an antidumping petition against alleged unfair trade practitioners, including Matsushita Electric Industrial Co. Ltd., Sharp Electronics Corp., Hitachi Ltd. and Toshiba Corp. The group contended that it is acting to save the U.S. flat-panel display industry from extinction.

According to the ADMA's complaint, the firms named are dumping flat panels — in other words, flooding the market with underpriced flat-panel displays.

The practice is particularly threatening to young, entrepreneurial firms faced with high research and development and manufacturing costs — such as the members of the ADMA, which together have accounted for some 90% of all flat-panel display production in the U.S. since 1987.

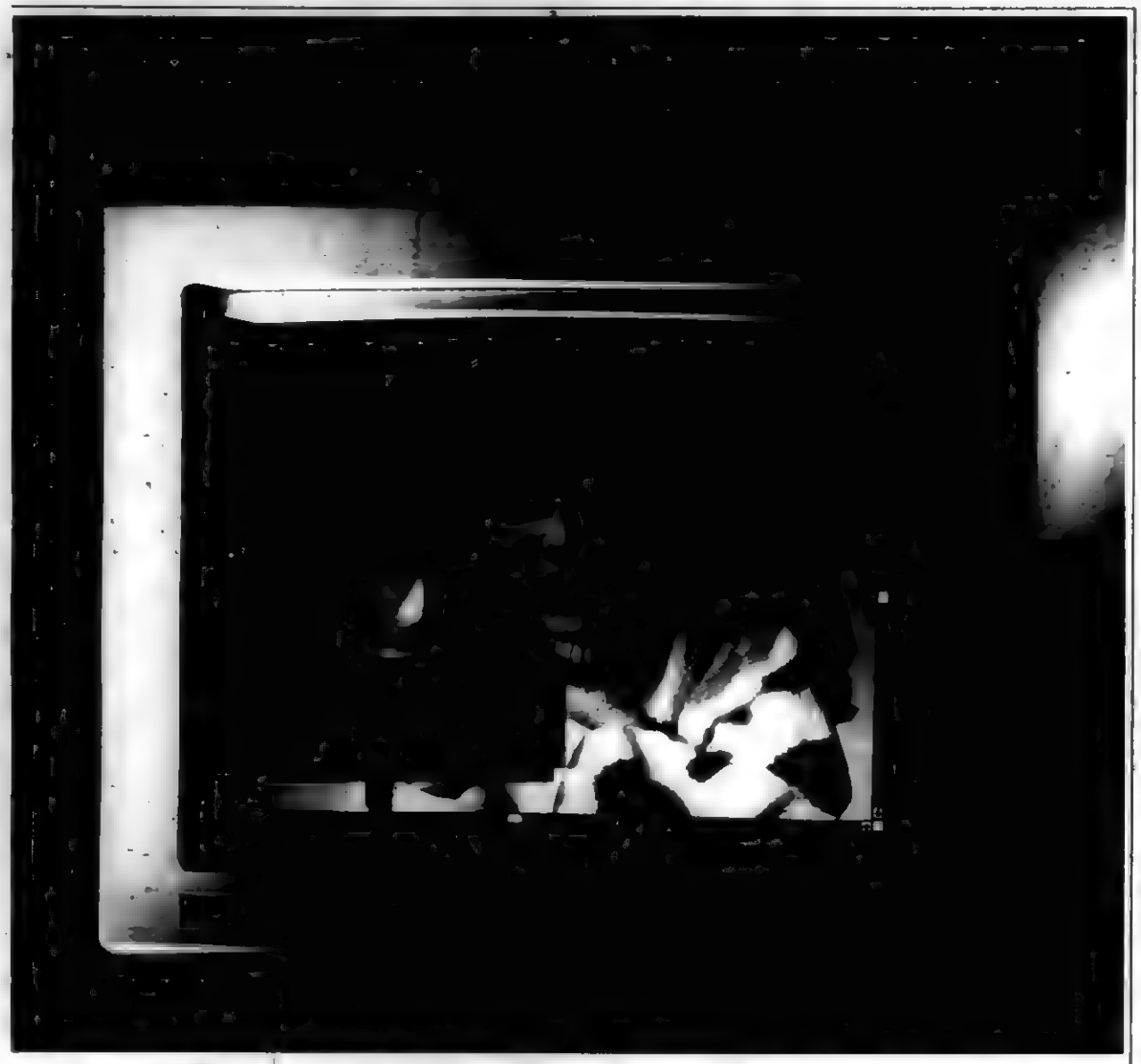
The flat-panel display market — founded on technology originally developed in the U.S. — is widely considered to be one of bright promise. Industry observers said they see it as key to a coming scenario in which consumer electronics and computers will merge in an interactive digital video marketplace supplying a panoply of "infotainment" devices.

Figures compiled by Stanford Resources, Inc., a market research firm based in Stanford, Calif., showed the flat-panel portion of the burgeoning worldwide market for high information content electronic displays at approximately $700 million in 1989, with projected growth to the $1 billion ballpark by 1996.

The corporate mortality rate among U.S.-based flat-panel display makers in the past decade has been alarming, with 15 either closing their doors or selling out. According to a Nikkei Sangyo Newspaper Survey published in February, eight leading Japanese electronics firms plan to invest an aggregate $2.24 billion in the technology by the end of 1993.

Moreover, an ADMA spokesman said, Japanese manufacturers have made no secret of their pricing strategy. He cited an article in the Dec. 23, 1989 issue of *Japan Economic Journal* in which a Toshiba executive, referring to the flat-panel display industry, stated that "We are prepared to accept red ink for the first five to six years."

However, not even a successful antidumping campaign will guarantee survival for the shaky U.S. flat-panel screen manufacturing sector, said Norman Weiser, an analyst at Cambridge, Mass.-based consultancy Arthur D. Little, Inc. "This is something the Japanese do very well," he said. "This technology takes long-term [research and development] commitments. It takes precision manufacturing."



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Go, IBM bank on pen-based tech

BY JAMES DALY
CW STAFF

Go Corp. moved to establish itself as the bearer of the de facto operating system standard in the emerging pen-based computer market with its announcement last week that IBM will be the first to license the still-unannounced software.

Both the Foster City, Calif., start-up and IBM plan to introduce models based on the fledgling technology, which allows users to enter data by writing rather than typing. However, officials from both firms refused to speculate on when these systems will become available.

"The industry will expand, but only if we rally around a standard we can all live with," IBM Vice-President Mike Quinlan said.

Go President Jerry Kaplan said that the two companies are already involved in pilot projects with selected corporate customers. Terms of the licensing agreement were not announced, however.

Kaplan said that Borland International, Lotus Development Corp., Wordperfect Corp., Slate Gorp. and Pensoft Corp. are also doing development work using the Go operating system but offered no specifics on delivery dates.

The arrival of the notepad-size computers has some analysts conjecturing that pen-based computers could have an impact on the industry unlike anything since Apple Computer, Inc.'s Macintosh. Users could range from insurance adjusters visiting the scene of an accident to store clerks taking inventory.

"The pen-based market could be as large as the PC industry in the long run," Kaplan said.

Firms such as Fremont, Calif.-based Grid Systems Corp. and Boston's Scenario, Inc. have already announced pen-based computers, while Momenta Corp. in Mountain View, Calif., is reportedly readying such a system. In Japan, Sony Corp. and Canon, Inc. have pen-based systems that they will presumably export stateside in the near future.

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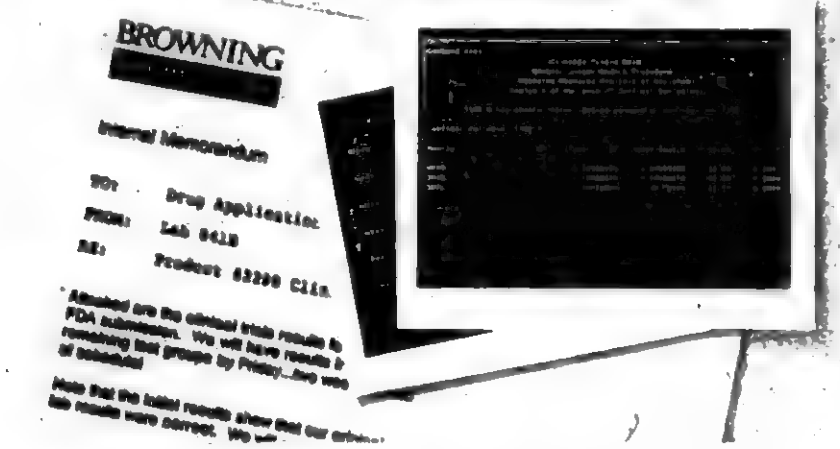

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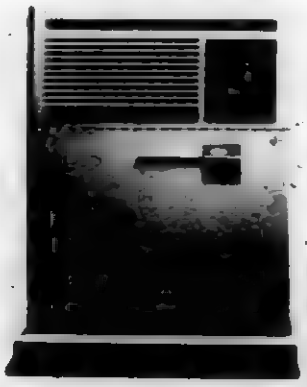

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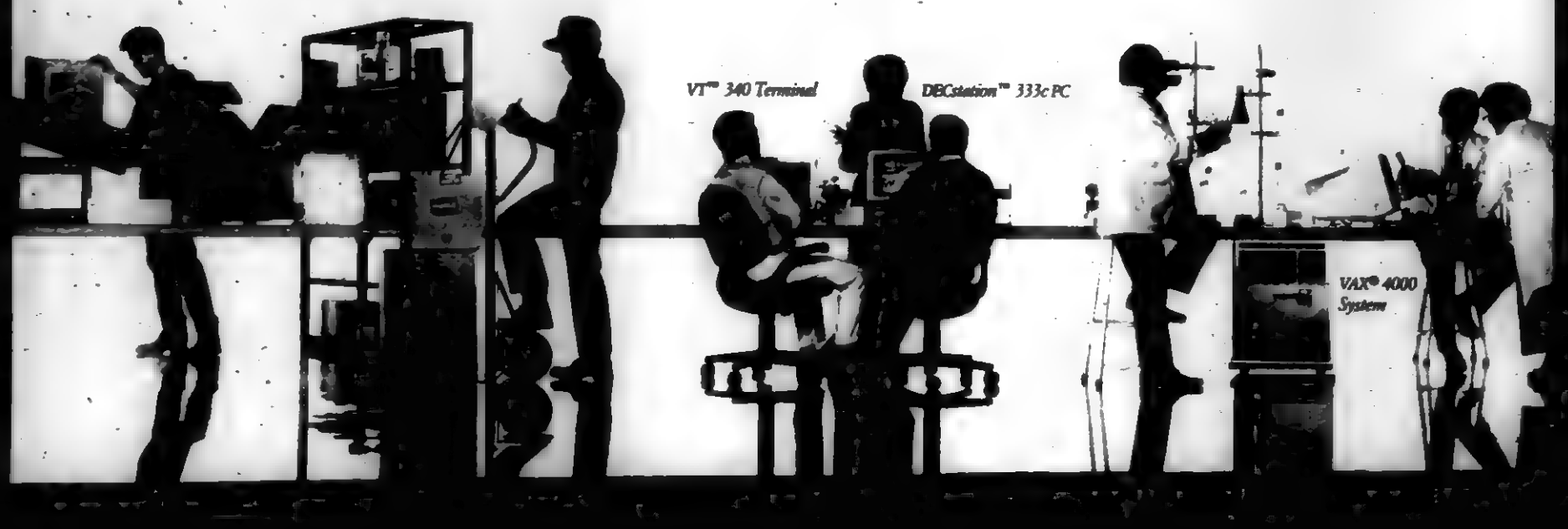

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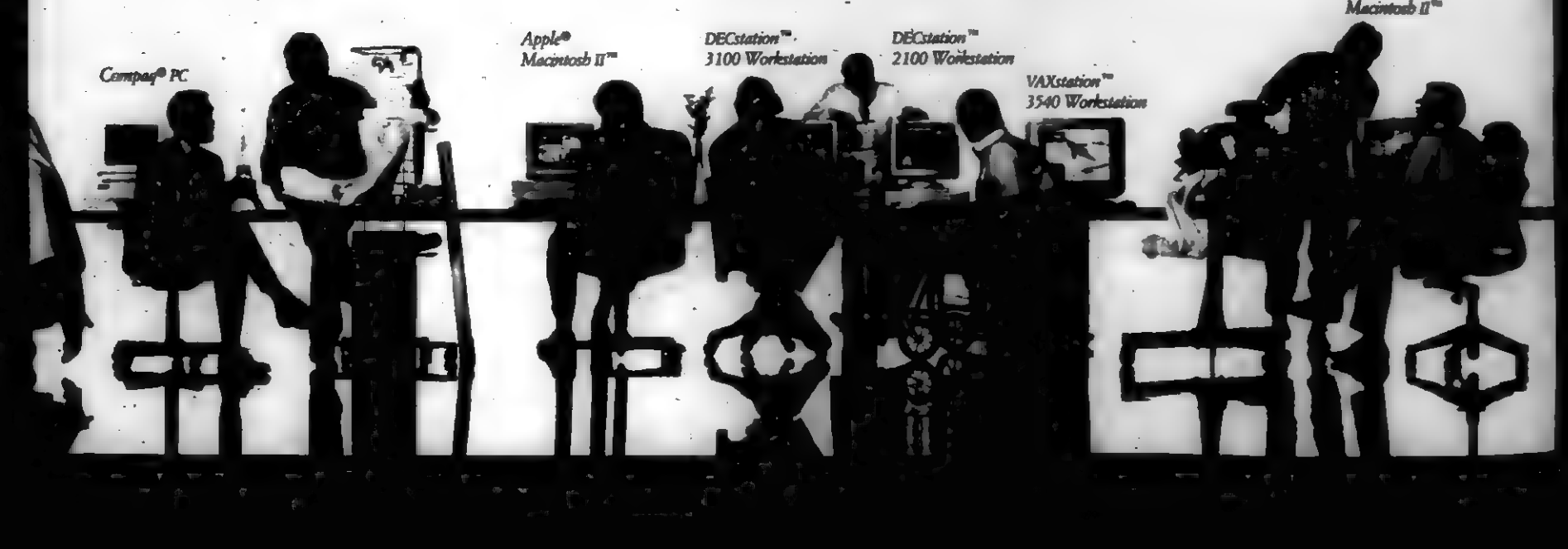

FCC aims to cut overseas rates

BY ELISABETH HORWITT
CW STAFF

WASHINGTON, D.C. — The Federal Communications Commission's (FCC) recent announcement that it would try to cut international calling costs by as much as 50% in the near future struck a major chord among U.S.-based businesses that have been restricting some types of overseas communications to keep their telecommunications budgets within bounds.

The FCC proposed to streamline the processes by which U.S. carriers implement reductions of international accounting rates. It also announced that it has "tentatively concluded that it has the authority to establish lower, more cost-based, international accounting rates."

Monopoly power

While competition among domestic carriers has steadily driven down the costs of international calls originating in the U.S., many foreign administrations enjoy monopolistic control over their countries' communications facilities and are accustomed to subsidizing other public services, such as the post office, with revenue from international calls, sources said.

As a result, the cost of directly dialing the U.S. from overseas can be as much as three times the cost of a comparable international call made from here. The disparity has resulted in an increase in the U.S.' network settlements deficit from $40 million in 1970 to $2 billion in 1988, according to the FCC.

The situation "scares us to death, to be honest," said Lars McKenzie, principal network engineer at The Foxboro Co. The Foxboro, Mass.-based manufacturer has gotten some major economies on calls originating in the U.S. "by jumping between AT&T, ITT and other carriers out there," McKenzie said. "But when we get to Germany or Holland, we absolutely get nailed by services that are three times the price [of foreign calls originating here] and immovable," even with 1992 in the offing, he added.

A commonly practiced economy measure is to pay a set price for leased lines to other countries, and then use those lines as much as possible. General Electric Co.'s international leased-line network, for example, has both saved money and increased quality of networking as compared with dial-up lines, according to Stan Welland, GE's manager of corporate telecommunications.

Foxboro has implemented an X.25 packet-switched data network on top of leased lines to the UK, the Netherlands, France and West Germany, McKenzie said.

The private network strategy only works, however, when there is enough traffic to a given country to cost-justify such a connection. Foxboro pays Postal Telephone and Telegraph authorities (PTT) a heavy fee for the use of leased lines — about $8,300 per month for a 56K bit/sec. line to the Netherlands, according to McKenzie.

Furthermore, countries such as West Germany deliberately charge outrageous private-line fees in order to keep users on their pay-by-use public networks, McKenzie said.

The inability to put all of their communications on dial-up lines has significantly altered — and in some cases hampered — businesses' communications practices. The result is that U.S. sites are more likely to dial up overseas sites than vice versa.

In addition, companies have been discouraging the use of communications applications that make use of dial-up connections. For example, Foxboro has been encouraging its users to transmit documents via electronic mail rather than facsimile, which "goes mostly over dial-up," McKenzie said.

At United Parcel Service, Inc. (UPS) employees are being encouraged to send E-mail rather than make a telephone call overseas whenever feasible, said UPS telecommunications manager Douglas Fields: "At times, we would rather have had person-to-person communication, but it has been cost-prohibitive."

A significant lowering of PTT direct-dial charges could set off an explosion because of pent-up demand for global communications services and applications, Fields said. "You might send more information; you might make a call you wouldn't make before," he added.

However, users expressed some skepticism as to whether the FCC will be able to "set rates for a foreign entity," Welland said. "My understanding is that statements like this have been made before, and it didn't work."

Mixing and matching musical tastes

BY LAURA O'CONNELL
CW STAFF

Maybe as a kid he dreamed of becoming a disk jockey. But somehow, Charles Garvin got the notion that everyone should be able to string together their favorite songs. So he developed a computerized system to do just that — it makes personalized cassettes at a record store while you wait.

Garvin's inventive way of tapping people's musical imaginations recently earned his 5-year-old brainchild, Personics Corp., a *Computerworld Smithsonian Award*.

What Personics accomplished, said Patrice Adcroft, editor of *Omni* magazine and one of the judges for the Awards, is "an entertainment innovation. It gives people a chance to be creative."

Most people "are used to being couch potatoes and sitting mindlessly in front of a television or a radio receiver and being entertained," Garvin said. In the future, he explained, fully interactive media will get an audience involved, "but between now and then, we have a population that still is used to extremely passive acceptance of entertainment. Personics may provide a map between here and there."

The idea of distributing customized music is not new, but Garvin's approach differs in that he is attempting to cooperate with the record industry. The Personics System pays royalties to record companies and artists from whom the music is licensed. Garvin hopes that this tack will assuage their fears that personalized cassettes would cannibalize album sales.

"It both benefits the artists by opening up markets for his or her music," Garvin said, "and benefits the customer by being able to let you try out genres."

A customer gets to "try out" this music at a "listening post" in the record store, where he can sample 10- to 15-second snippets of songs. He simply punches catalog numbers into the post's keypad and hears music through headphones.

A sales clerk then enters the numbers into a squat, boxy machine behind the counter. In five to 10 minutes, out pops the cassette, complete with a laser-printed label listing the songs as

Personics *lets customers personalize their cassettes*

well as the customer's name, copyright information and desired title.

This manufacturing at your fingertips is handled by a variety of computer systems.

Personics has 250 systems at 230 sites. Each system consists of an IBM Personal Computer AT-based industrial controller made by NCR Corp. and fitted with specialized boards made by Personics. The controller attaches to two compact disc jukeboxes, each containing 60 CDs specially recorded with digital compressed data to store more than three times as much music as standard discs. The 90G-byte database currently houses 4,000 to 5,000 songs but has a capacity of 8,000.

A control interface in the AT controller allows the compressed data to be decompressed and turned back into high-speed digital audio, which a modified Nackamichi Corp. tape transport records onto the cassette at eight times playback speed.

Back at Personics headquarters in Redwood City, Calif., a Sequent Computer Systems, Inc. S-81 running Unix keeps things humming. Overnight, the S-81 calls out to every controller via modem and downloads the day's sales data.

"The biggest [technical] challenge we had was to figure out how to archive a tremendous amount of music in a very small amount of physical space," said Tom Sharples, senior vice-president of engineering. Standard 16-bit CDs only hold 15 to 20 songs apiece. To overcome that limitation, Personics licensed and adapted a technique from Dolby Laboratories Licensing Corp. that offers approximately 3.2 times more efficiency to fit 50 to 70 songs on each disc.

Personics has faced more than technical hurdles. "By far, our biggest challenge has not been technical or operational but almost political," Garvin said. "It has been convincing an industry that is generally somewhat skeptical of new technology that we could increase overall revenues and royalties rather than threaten them."

So far, Personics has had measured success. Forty labels have signed on, including five of the six major companies in the U.S., and two firms with ties to record producers have provided financial backing.

"Personics has had to be quite patient with record companies putting their toes in the water rather than jumping in. But I think it's proving slowly to record companies that [Personics is] not a threat to their traditional business and in fact [will] be advantageous to them," said Stan Cornyn, president of Warner New Media, part of Time Warner Inc.

Meanwhile, Personics continues its rollout and has improvements in the pipeline. Boosting the system's recording speed and revamping the customer interface are on the agenda, as well as expanding services into channels such as mail order, telephone ordering and remote order entry.

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ADVANCED TECHNOLOGY

Philips' CD-I disc slips into market

Large-capacity technology is causing other firms to follow N.V. Philips' lead

BY MICHAEL ALEXANDER
CW STAFF

While many firms have been touting the merits of multimedia on personal computers, conglomerate N.V. Philips has been quietly inching into the market with an interactive machine that has a computer built in.

The Dutch firm, which co-developed the compact disc with Sony Corp., introduced a $2,500 multimedia machine late last year based on compact disc-interactive (CD-I) discs for business users. A 5-in. CD-I disc, which can store 650M bytes of information, can carry up to 300,000 typed pages of text, 7,000 photographic-quality images, 72 minutes of full-screen, full-motion animation or 19 hours of speech.

Philips, Matsushita Electric Corp. and Sony are also collaborating on the development of an extension of CD-I to accommodate full-screen, full-motion video. That capability will be available next year, according to Gerald Calabrese, vice-president of Philips Interactive Media Systems in Knoxville, Tenn.

A CD-I player, which looks like a CD audio player, plugs into a television set and is also capable of playing back audio CDs. The machine, whose brain is a Motorola, Inc. 68000 microprocessor, is controlled by a handheld remote control and joystick.

The primary business applications for the technology are training and point-of-sale merchandising and information. One advantage of CD-I is that it is an international format, so a multinational corporation could use one CD-I, with up to 14 different languages, at any of its global branches.

French auto maker Renault is developing four CD-I discs to train its workers in troubleshooting electronics, carburetion and ignition systems. The same discs will be used by service personnel worldwide and will contain seven languages.

At least 15 firms, including Rand McNally & Co., Time-Life Corp. and Harcourt Brace Jovanovich, Inc., are developing CD-I titles. When the hardware is officially launched next year, it will be accompanied by 23 to 25 titles, said Phillip Mittleman, president of CD-I Systems, Inc., a CD-I software development firm in Los Angeles.

Earlier this year, Philips Interactive Media Corp. and Capitol Video Communications, Inc. formed an equal partnership called Capitol Disc Interactive to develop CD-I programs for the business and government markets. Capitol Disc Interactive recently inked a pact with Museo Amparo Puebla in Puebla, Mexico, to build 28 point-of-information kiosks using CD-I technology.

However, CD-I players will be aimed largely at the consumer — not business — market, Calabrese said. Ten firms, including Philips, Sony, Matsushita and Fujitsu Ltd., have announced plans to introduce CD-I players, slated to sell for about $1,000, to the consumer market next year.

Sales of industrial and consumer CD-I players will top off at 4,000 units this year and climb to 35,000 units in 1993, according to Venture Development Corp., a market research firm based in Natick, Mass. In comparison, sales of consumer units will climb from 30,000 to 600,000 in the same period, the firm predicted.

The Japanese may ultimately have the edge in multimedia, thanks to their considerable control over the U.S. consumer electronics market. They are already the top suppliers of CD drives, computer monitors and color television sets. With an immediate foothold in the consumer market, the economics mass production will enable them to step up into the business world with a computer-controlled multimedia machine that is far less expensive than competing products.

CD-I has flaws that could hinder its acceptance, especially among consumers, analysts said. "One of the missing pieces is full-motion, full-screen video," said Walter Miao, vice-president of technology at Link Resources, Inc., a market research firm in New York. "The biggest stumbling block is a lack of software and tools to develop CD-I programs."

Miao also said that a competitive technology, Intel Corp.'s digital video interactive, may prove to be more alluring to businesses than CD-I.

The two interactive media can easily co-exist in business, and CD-I's lower cost "will be a tremendous advantage," Calabrese said. "Not every application, even in a computer environment, is computer-dependent."

SAIC designing mind-reading computer

BY JIM NASH
CW STAFF

Scientists are nearing completion of the first commercially viable computer capable of imitating rudimentary human thought.

This marks the next step in artificial intelligence's evolution, up from the endless quest for the best thought-duplication method. A San Diego-based defense contractor, Science Applications International Corp. (SAIC), is designing an artificial neural system based on integrated circuits that can learn by doing, without the assistance of a human operator.

The goal is to build a fast, portable computer that can learn from its experiences by developing its own problem-solving algorithms. Such a machine would be used for image, sound and pattern recognition in military and industrial settings. A chip capable of learning might be taught to look for enemy aircraft or cancer cells, for example.

Biomedical research involving image recognition at the University of California at Davis uses first-generation artificial neural systems. Wasyl Malyj, chief development engineer at the campus' veterinarian medicine serology lab, said his program could benefit from dynamically learning chips. Today, he uses an SAIC neural accelerator board on a personal computer to trace horse bloodlines by classifying blood cell characteristics.

Although satisfied with the 97% accuracy rate currently achieved by the equipment and his staff, Malyj said he will opt for neural chips that can reprogram themselves once they are proven and available commercially. Malyj said he expects the technology to do the work of six technicians who now look at 12,000 images of blood components each day.

Casey Klimasauskas, president of Neuralware, Inc. in Pittsburgh, develops software used to design nonlearning chips. Klimasauskas acknowledged the commercial importance of learning chips but said that military needs were receiving just as much attention. "The military needs to be able to write somebody's name on a bullet, fire it — fire it anyplace in the world — and have it hit that person in the head or the heart," he said.

Conilee Kirkpatrick, senior scientist on the neural chip project at SAIC, said, "By first showing it a processed image of an object and telling the computer what it is, the new neural chip would learn key features to look for in the future. Using degraded images of varying degrees," she added, "the computer would become more adept at picking out distinguishing features."

Problem-solving expert

Most important, however, is the computer's ability to solve novel problems on its own based on its training and subsequent operating experience, said Derek Stubbs, editor of "Neurocomputers" in Vicksburg, Mich. Previously, Stubbs said, neural chips had to be taken off-line and reprogrammed to deal with new situations.

According to Mickey Williamson, an author and consultant in Warwick, Mass., artificial neural systems (neurocomputers) write their own problem-solving algorithms based on what they have dealt with before. Williamson said SAIC's decision to go with artificial neural chips is significant, and companies are becoming more confident with the once-unfathomable science behind thought-process imitation. The firms are beginning to base products on systems designed thus far, Williamson said.

"Rather than try to delve into the secrets of the universe, we're making a real product," Kirkpatrick said. The firm's first commercial artificial neural chip products could come in early 1992, SAIC officials said.

Beyond the obvious advantages of having a computer that does not shut down when it reaches a novel situation, SAIC's chip would offer size and speed benefits — both critical to potential military and commercial markets. Being compact, the system would be portable and more easily hooked into a network of other neural chip computers.

Kirkpatrick said that prototype chips hit processing rates of about 150 million connections per second in recall — or nonlearning — mode and 64 million data updates per second. They are 20 times faster than SAIC's commercially available neural network accelerator boards.

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The Past, Present, and Future of Network Computing.

EDITORIAL

Trying times

IN *The War of the Roses*, Danny DeVito's character asks, "What do you call 5,000 lawyers at the bottom of the Atlantic Ocean?"

Answer: A good start.

OK, OK. So lawyers are an easy target, but the joke seems appropriate these days, given how a lot of us must be feeling about the industry.

Consider that three of the biggest news stories of the past three weeks have concerned a contentious patent dispute between Motorola and Hitachi, a decision in the four-year Lotus "look and feel" ordeal and a bitter lawsuit between two Stardent executives and the company's major inveator.

That's in addition to the myriad pending copyright lawsuits that have been filed during the last two years, the countless class-action suits that are filed by shareholders every time a company's earnings surprise investors, users suing vendors for failing to solve their problems, vendors suing developers for planting logic bombs in programs, vendors suing vendors for theft of trade secrets and so on.

What's going on here? This little industry has become a $260 billion machine, that's what. And in the process, it's litigating itself to death.

Not too long ago, the high-tech headlines were dominated by stories about technical breakthroughs and the ever-expanding markets for computer technology. Sure, there was the stray antitrust suit here and there, but there was still plenty of money to be made and more niches to fill than there were niche-fillers to go around.

Look around today. There are darned few niches left to be found (when was the last time you saw a personal computer software package that truly defied classification?); the big guys are holding on jealously to the positions they've got; and industries in decline are now looking to their legal departments for revenue that their research and development departments can't give them.

Texas Instruments, for example, has practically made a business out of suing chip competitors for patent infringement. IBM dusted off every PC patent it could find two years ago and used them to extract fees from clone makers. Lotus' attempt to vigorously protect its intellectual rights says as much about its inability to produce new breakthrough products as it does about the value of an interface. Apple's $5 billion weight rides squarely on the look and feel of the Macintosh, and it won't let Microsoft forget it.

Lawsuit mania is nothing new to American business. Practically every industry has gone through a similar phase as the competition shakes out and the big players stake out their turf. Unfortunately for U.S. companies, this latest round comes just as Japan is making highly visible progress in its campaign to become a high-tech innovator. Meanwhile, the largest U.S. companies are diverting R&D dollars into their legal budgets. Creativity often suffers when the lawyers get involved.

LETTERS TO THE EDITOR

Money talks

Corporate executives are no different from your 3-year-old child when it comes to behavior modification. You need to find out what motivates them.

For those reading Hugh Watson's "Avoiding hidden EIS pitfalls" [CW, June 25], I would like to share a personal philosophy. You can modify a person's behavior either by modifying their compensation or by providing them with a tool to facilitate performance improvement that will bring about increased compensation.

So, if you are looking for a champion for your executive information systems (EIS) project, find out how they are compensated and structure your project accordingly. Remember that most executive incentive compensation plans change periodically, depending on corporate goals, so modify your system to support these changes.

I will guarantee you that if your EIS efforts make it easier for the executives to earn increased compensation, you will have no problems getting the support necessary to develop and maintain an EIS. They won't let you fail if you satisfy their requirements.

Roger Nelson
CMS Professional Resources
South Bend, Ind.

Soviet strategy

Regarding your editorial "Talk is cheap" [CW, June 11], which discusses the ramifications of selling U.S. computer equipment to the Soviet Union at reduced prices, the emphasis was on buying and selling.

In the world of business today, some of the most important words used are "negotiate" and "compromise." Why, then, do the vendors not lease the computer equipment to them, with a buy option? With sophisticated Soviet programming services or Western-based programming services and the Soviet transfer to a market economy, a vast uncharted market could be better explored.

Business process development based on profit motivation is the key to highly effective utilization of any hardware and software programming service. This lack of business process knowledge will vastly decrease the efficiency of any capital expenditure, regardless of the capital application methodology employed. American understanding of this business process services the need for U.S. persons to be employed in this capacity.

Shows of good faith on both the U.S. and Soviet sides would increase the chance of global peace and productivity. Ultimately, this should be our common goal.

Chris James Michael
Vice-President of operations
Anna Christine Michael
Recruiter
Unisoft Corp.
Raleigh, N.C.

Kiitos very much

In "Password puzzlers" [CW, June 11], you suggested using words from other languages as passwords. I don't disagree with that suggestion.

However, you made an error in your spelling of the Finnish word for "thank you." It is not spelled *kiipos* as you have shown, but rather it is spelled *kiitos*.

As for the suggestions in the article, they are excellent. Although I don't have the same need for intricate passwords now, I did need them while I was a university student. One of my favorite tricks was to make palindromes, such as turning sin into sinnis or eng (short for engineer) into enggne.

Continue with these fine suggestions, but watch your spelling.

K. Matias Rautapuro
Environmental Group
Dearborn Chemical Co. Ltd.
Mississauga, Ontario

Slow going

Regarding your "Inside Lines" column [CW, June 18], while it is true that I am no longer associated with ACF2 or Computer Associates, I would like to point out that I left ACF2 in good hands with CA. The decision to leave and found a new company was both long and difficult, and throughout this time CA was very understanding. When I finally did decide to leave, CA — although disappointed — was very supportive. My so-called "bolt" was a long and slow one, but I certainly would not have left if ACF2 was not being properly looked after.

ACF2 will be just fine — even without me.

Eberhard Klemens
President
Eberhard Klemens Co.
Naperville, Ill.

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In search of a universal library

JANE RYLAND

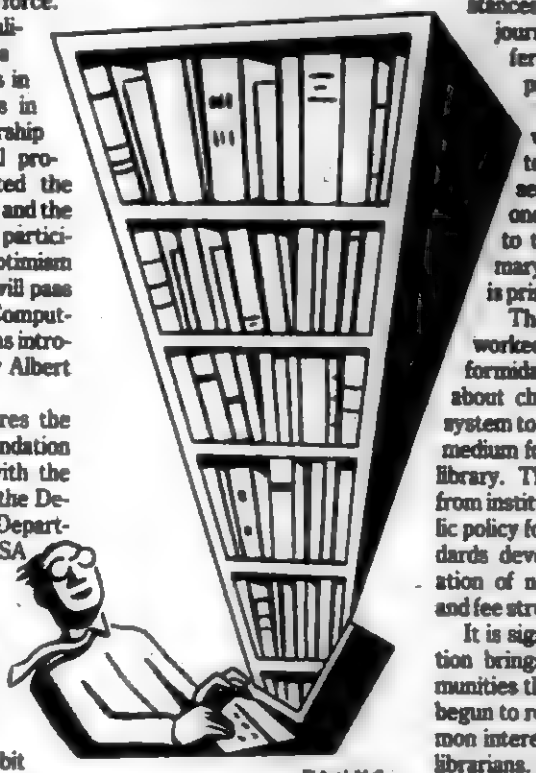
We are taking the first steps toward the creation of a virtual library, which could ultimately make the knowledge resources of the world accessible to every desktop workstation belonging to scholars, researchers, faculty members, administrators and students. This library will reach beyond colleges and universities to business and industry as well.

For information systems managers, it is easy to envision a world in which all publications are captured, organized, indexed and stored on magnetic or optical disc, available for computer search, access, display and print as readily as our internal databases. In fact, many organizations have begun to investigate the collection, acquisition and distribution of multimedia databases using optical-disc technology, especially compact disc/read-only memory.

Making this vision of the virtual library a reality is the primary objective of the recently announced Coalition for Networked Information, a project of three organizations — the Association of Research Libraries, Cause and Educom — whose members represent IS and academic computing professionals at colleges, universities, major research libraries and corporations. Since its formation in March, more than eight institutions and organizations have joined the coalition's task force.

The mission of the coalition is to promote access to information resources in networked environments in order to enrich scholarship and enhance intellectual productivity. What prompted the formation of the coalition and the eagerness of so many to participate is the growing optimism that this year Congress will pass the High Performance Computing Act of 1990, which was introduced into the Senate by Albert Gore (D-Tenn.).

This legislation requires the National Science Foundation (NSF), in cooperation with the Department of Defense, the Department of Energy, the Department of Commerce, NASA and other agencies, to establish a National Research and Education Network (NREN) that links colleges, universities, government agencies, industry and businesses at multigigabit speeds.



Richard McGuire

Users of more than 100,000 computers on more than 1,000 campus and regional networks nationwide are already experiencing a taste of what the NREN will make possible, through their connection to the existing NSF network, which with other governmental, commercial and regional networks, form the Internet.

The path to the ultimate virtual library, however, won't be an easy one. Conventional publication comes about through a complex and interwoven system, and we have become accustomed to it. University scholars, researchers and other authors develop material for publication, motivated by incentives of promotion and tenure. The works are often published in the varied scholarly journals of professional societies, each of which has its own method of editing and distribution. In many cases, the abstracted journal articles are offered by vendors of on-line services, and in a few instances, the full text of the journal articles may be offered on-line. Not surprisingly, the formats of these materials, as well as the languages to perform computer searches, differ from one information provider to the next. But the primary distribution medium is print on paper.

The Coalition for Networked Information has a formidable challenge to bring about changes in the current system to make the network the medium for creating the virtual library. These obstacles range from institution practices to public policy formulation, from standards development to the creation of new economic models and fee structures.

It is significant that the coalition brings together two communities that only recently have begun to recognize a set of common interests: IS managers and librarians. We have come to recognize that managing IS transcends computing and communications technology and is more appropriately the management of the information resource itself. Some colleges and universities are modifying their organizational structures to capitalize on the synergies and converging interests of these two communities.

This alliance, with roots in the higher education community, is only the beginning, however. Business and industry have everything to gain from the existence of NREN and its virtual library. With the potential to link business and industry to the network, the results of scholarly research and publication can be communicated immediately to those most likely to apply it to technological innovation.

The NREN is viewed by its supporters as a direct action the U.S. can take to enhance competitiveness internationally. Science Adviser Allan Bromley has indicated that development of the NREN is currently one of the top four science priorities in the U.S.

Bromley said: "A future national high-speed computer network could have the kind of catalytic effect on our society, industries and universities that the telephone system has had during the twentieth century."

In taking the first step toward a virtual library, our small community of college and university IS managers and librarians need to help make this vision a reality. We must bring to the table the publishers who have a significant stake in the publication process, and we must obtain the support and participation of business and industry, which will be vital links in the process of converting research results to intellectual and technological productivity.

Ryland is president of Cause, the association for the management of information technology in colleges and universities.

Innovators should make a strong case for patents

STEPHEN Y. CHOW

In the press, the warnings have been sounded: The increase in patenting computer software is stifling innovation. But now comes a new twist on the same theme — copyright laws. On June 28, the Federal District Court in Boston handed down a decision in the Lotus-Paperback Software dispute that may pose, through copyrights, a much more palpable threat to software innovation. Immediately following the decision, Lotus filed additional suits against competitors who expressly emulate aspects of Lotus' 1-2-3 spreadsheet.

The reward of property rights is an important incentive for innovation. However, the Lotus decision and others that may follow it place in sharp focus the competing concerns. Should the incentive granted for the development of an extremely popular user interface include the right to bar from the marketplace other innovative computer programs that were independently developed but which use the same extremely popular user interface?

The answer to this question should be based on consideration of all the available incentives, not just copyrights. I submit that the U.S. patent system, as applied to computer software, provides more safeguards for a subsequent innovator than the U.S. copyright system. Simply put, patents are a better incentive for promoting and protecting innovation than copyrights.

A U.S. patent may be obtained only after substantial examination by the U.S. Patent and Trademark Office for "novelty and nonobviousness in light of existing technology" and grants certain exclusive rights for 17 years. In contrast, a U.S. copyright exists automatically upon being recorded in some medium, including magnetic media such as software. This happens without examination by any government agency and continues (in the case of most computer software) for at least 75 years.

Even at the time of enforcement, copyrighted works are scrutinised only for minimal originality — not the novelty and nonobviousness of patented inventions. Because most software copyright owners keep source code versions of their software secret, there really is no scrutiny at all of the innovation in that package. In contrast, a patent is granted *only* in exchange for disclosing to the public what is determined by the patent office to be truly "new." This promotes subsequent innovation.

It is true that patent rights — exclusive rights for making, using or selling the invention as claimed — are more extensive than copyrights, which protect only against the actual copying of a work. However, court decisions such as the recent one in the Lotus case, may allow the achievement of patent-like exclusivity through copyrights by expanding what constitutes a copyrightable work.

In the Lotus decision, a portion of the popular 1-2-3 spreadsheet was found copyrightable and infringed upon. The infringed portion consisted of two parts: the sequence of keystrokes to initiate certain functions of the program package and the screen display. Because screen displays for spreadsheet programs are obviously — if not necessarily — similar, the focus was on the input sequence.

Copyright law expressly does not apply to processes, while patent law does. The court in the Lotus case did not consider the U.S. patent law, which does apply to "new and useful processes" even though what was protected in the decision could be likened to a process.

Love spreadsheet

If Lotus ultimately prevails on appeal and in its new lawsuits, it will have established the right to exclude any use of its extremely popular user interface for 75 years. This would happen despite the fact that the development of the interface came in part from its less successful forerunner, Visicalc. No examination of whether 1-2-3's user interface was truly innovative would have been made. The only test of whether Lotus was truly innovative was that it was successful in the marketplace. If Paperback Software had been allowed to continue, it would have potentially proven itself there as well.

Meanwhile, as the European Community approaches its 1992 target for the creation of a "single market," there is a significant effort to exclude copyright protection for software interfaces in the interest of promoting development of compatible software. Also, multilateral trade-driven negotiations among industrialised and developing countries are proceeding toward the international harmonization of patent laws.

It is too simple to say that patents are bad for software innovation and copyrights are good: Promoters of innovation, lawmakers and the public should be aware not only of the differences between our patent and copyright laws, but of how they actually promote innovation in the context of a globalized economy.

Chow, a partner in the law firm of Nutter, McClennen & Fish, is a patent and copyright lawyer, representing emerging and international technology firms.

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COMMENTARY

Rosemary Hamilton

Definitely a maybe

Do you want to hear lots of different theories? Ask someone how IBM will introduce what is commonly called Summit, its next-generation mainframe, later this year.

Whew. How about the opinion that it will come with a separate processor for expanded storage? No, make that a separate processor to handle those new, spiffy fiber-optic channels. Wait, that's not right. The separate processor will provide a data encryption/decryption function. But hold on — will this come with the real Summit or the mini-Summit? Yes. Absolutely not. Or, better yet, there is no mini-Summit.

The next-generation mainframe, like many expected products before it, is the source of plenty of gossip and rumor these days. IBM, for its part, is being characteristically mum on the subject. At a large systems briefing last week, IBM executives sketched out plans for future mainframes but would not specifically address the next generation.

Recent conversations with users and analysts produced all sorts of Summit scenarios, but they can be boiled down to a few. Even so, this is not the final word on Summit. Some observers suggested that IBM is still fine-tuning its plans for the next-generation mainframe, so at this point, the best we can do is examine the current thinking and look at what the possible op-

Continued on page 31

Firms move into the OOP lane

ANALYSIS

BY JEAN S. BOZMAN
CW STAFF

What's under the hood of your software application sports car? If it runs well, gets good mileage and needs little maintenance, it could well be object-oriented programming (OOP) technology.

Even though most end users do not realize it, many software vendors are already embracing OOP languages and database structures. However, most users, one step removed from the underlying code, still feel that OOP is in its infancy and do not plan on buying actual OOP packages until the mid-1990s.

Among vendors, the early adopters of OOP are using it to build icon-oriented graphical user interfaces or "hot-linked" applications that pass data back and forth. They include Hewlett-Packard Co., Apple Computer, Inc. and Microsoft Corp.

A forward guard of end users is already trying out the OOP sports coupe, including some at Citibank, Deere & Co., Combustion Engineering and General Motors Corp.'s EDS division, said Les Hellenack, director of new software technologies at International Data Corp. in Framingham, Mass.

One early user is Tom Soon, a research scientist at Pacific Bell's technology laboratories in San Ramon, Calif., who is using OOP to simulate the telephone networks of the 21st century. He works with the Parc Place Systems Smalltalk 80 programming language and the Servio Logic object-oriented database management system.

"The work I do involves data with very complex relationships," Soon explained. "I cannot force it into the table spaces that are used in relational databases. The object-oriented programming environment allows me to reuse the code I've created, and I can also use it to provide a super-friendly user interface [in the form of icons]."

Most corporate end users, however, remain mystified by the object-oriented technology and may turn to systems integrators to learn how to use it. That is because OOP languages require mastery of new programming skills. Object-oriented DBMSs also require users to learn new data types and storage/access methods.

"Most companies tend to stick with technologies they understand unless they've run up against a wall, because they can't accomplish what they want with the money they've got on hand," said Reed Phillips, president of Cary, N.C.-based Knowledge Systems Corp., which writes object-oriented applications for Fortune 500 companies. "They just want to get their application built, and they don't care that we're using OOP to do it."

OOP has many features to recommend it, including the way that sections of code can be reused from one application to another. Development time is shortened, and maintenance is simplified. In a process called encapsulation, the rules about sharing data are wrapped around the data itself, so the rules also become part of the object.

To some extent, object-oriented code maintains itself, because the emphasis is on up-front design and analysis rather than on implementation and repairs.

Early users in IS departments often have to develop their own OOP expertise, boning up on OOP techniques. Many have struggled to learn OOP languages, but the initial investment of time — however painful — can pay off by allowing users to create new applications.

Continued on page 31

FEATURE: 9370 UPDATE

IBM's misunderstood midrange

BY MARYFRAN JOHNSON
CW STAFF

Some computers get no respect.

That has certainly been the life story of the IBM 9370 midrange family — the stigmatized sibling of the popular Application System/400 and the staid 4381 lines.

Yet there seems to be universal agreement among users and industry analysts that the 9370 is basically a sound machine saddled with poor planning, misdirected marketing and inept public relations.

A few major sales — most notably to Sears, Roebuck and Co., Shell Oil Co., the U.S. Army and the U.S. Postal Service — have given the 9370 at least a touch of corporate respectability. And the machine has made a credible showing in revenue, adding $2 billion per year to IBM's coffers.

IBM will display its own brand of faith in the line with new high-end models and a major upgrade in performance this fall. Analysts are expecting two or three high-end 9370 models to be introduced, doubling or tripling the performance of the top-end Model 90.

"That gives me a warm, fuzzy feeling that our investment will be good for several more years," says Harvey Borden, director of MIS at Lerner Shoes, Inc. in Salisbury, N.C. His 9370 Model 90 is the primary processor for inventory control, financials and other business tasks at the fast-growing shoe store chain.

John R. Woods

Borden is in the midst of rolling out IBM 4684 point-of-sale terminals to a string of stores in the Northeast and South. Two IBM Personal System/2s will poll the stores each night to gather sales and inventory informa-

Continued on page 28

Spotlight

PROBLEMS: The DOS/VSE Label Area is a performance bottleneck. Slow disk, relative to CPU, limits performance.

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N.C. agencies eye independence

ON SITE

BY SALLY CUSACK
CW STAFF

RALEIGH, N.C. — The North Carolina Department of Crime Control and Public Safety is shifting its software development strategy into high gear, embarking on a five-year plan to develop a number of products in-house and evaluate numerous third-party offerings.

"We're posturing ourselves for achieving platform independence," said Ed Bottum, director of information systems, adding that the goal is to arrive at that point with "minimal pain."

Bottum *steps up in-house development*

He has found that it may be easier said than done. Currently, the Crime Control and Public Safety Department relies heavily on Data General Corp.'s AOS/VS-based MV hardware for office automation, word processing, data collection and reporting.

The department maintains and updates numerous records for its various divisions. Its computers have a wide range of applications, including tracking parolees assigned to community service and reporting tornado watch activity.

The department operates nine divisions, five of which are automated. Four of the automated divisions use DG systems; the fifth, the State Highway Patrol, relies primarily on an IBM 3090-300 mainframe running MVS.

"We're young in terms of applications. There's a lot of creative work to be done and a lot of variety available," Bottum said. He indicated that his staff will do as much in-house development as is deemed practical and that some development will be contracted out to third parties based on available funds. There is currently a DG MV/20000 responsible for the department's headquarters operations, an MV/15000 for the Emergency Management Division, an MV/2000 for maintaining the Governor's Crime Commission and three MV/1400s in the Division of Alcohol Law Enforcement. All the systems are linked via Zodiac, an X.25 communications product.

The state agency is in the early stages of trying to determine how best to help the field offices by providing the necessary tools. For example, Bottum said, some undercover agents still use notebooks, gathering statistics manually and reporting information back to the home office division.

"We're trying to move data collection out to where the action really is," he said. "We have a lot of end users with a car for an office." Future plans include using local-area networks in the Emergency Management Division and a microwave system for state police investigations.

Emergency Management is responsible for tracking emergencies in progress, such as tornado touchdowns or nuclear cloud movements. The state uses geographic, icon-based software systems to record such sightings and report them back to a centralized Emergency Information System.

Data collecting and reporting is currently handled by various departments via more than 250 terminals connected to the DG computers, along with a mix of Data General/Ones and Intel Corp. 80286- and 80386-based IBM Personal Computer clones. The majority of end users connected to the system also use it in an office automation capacity.

Approximately 75% of the North Carolina state agencies use DG machines for office automation activities, according to Bottum. His department has been using DG's Comprehensive Electronic Office for the past four years. Prior to that, "they used typewriters," Bottum said with a laugh. "Electronic mail and word processing were the first applications used around here."

Bottum said office personnel are especially pleased with the program's calendaring functions, which reportedly have streamlined scheduling activities and eliminated countless hours of telephone tag. Although Bottum said he believes that the hardware and software are "good, solid products," he noted that he doesn't perceive DG as making a substantial commitment to the future of CEO.

Bottum said the department will maintain its DG hardware investment for "as long as it makes sense to do so." However, he added, "we don't foresee using any other software that would lock us into DG's environment."

DG unveils speedier Unix-based system

BY SALLY CUSACK
CW STAFF

WESTBORO, Mass. — Data General Corp. recently unveiled DG/UX 4.30, a faster release of its Unix-based operating system that reportedly offers a 370% speed improvement over its predecessor.

According to the firm, Neal Nelson & Associates' Business Benchmark testing on an Aviion 6220 system indicated that the latest release reduced test time from 171 sec. on Version 4.20 to 36 sec. on Version 4.30.

The revamped operating system has reportedly been certified for the Binary Compatibility Standard by the 88open Consortium, which enables customers to run and generate 88open shrink-wrapped software. DG/UX 4.30 also includes Federal Information Processing Standard 151-1 Posix compliance.

Rivalry reinforced

The upgrade reinforces DG's head-to-head rivalry with Motorola, Inc. in the Motorola 88000 CPU-based small systems marketplace, and it brings DG a little closer to competing with Sun Microsystems, Inc.'s Scalable Processor Architecture products, according to David Card, an industry analyst at International Data Corp., a Framingham, Mass.-based market research firm.

DG/UX Version 4.30 also includes support for Novell, Inc.'s Portable Netware and comes bundled with The Looking Glass Desktop Manager from Visix Software, Inc. at no charge.

The latest release is available immediately and is priced from $400 on an AV 200 platform to $2,500 on the AV 5000 and AV 6000 family of servers and multiuser systems.

Epoch targets low end with 20G-byte storage server

BY MARYFRAN JOHNSON
CW STAFF

WESTBORO, Mass. — Epoch Systems, Inc. recently added an entry-level system to its network storage servers, aiming the product at smaller workplaces that cannot afford the larger, more costly models in Epoch's Infinite Storage server line.

At $82,900, the Epoch-1 20 Series provides 20G bytes of storage — about five times the capacity of comparably priced magnetic file servers — plus fully automated storage management, company officials said. The entry-level model can be expanded to 40G bytes of storage capacity and is available three months after order.

Epoch storage servers, which can be configured with 1G byte to 1 terabyte of on-line storage, are Sun Microsystems, Inc. Network File System- (NFS) and Transmission Control Protocol/Internet Protocol-compatible servers that use hierarchical storage techniques to transparently integrate optical and magnetic disks.

The company also introduced two new software options to increase file server performance and speed up full system backups.

"These new products are a logical extension to the growth of storage on NFS networks," said Jay Bretzmann, an analyst at International Data Corp. in Framingham, Mass. "Epoch is saying they can address not only large storage problems but also management of various activities on the network."

The first software product, Hyperwrite, improves the NFS write rate using a sophisticated caching technique that allows individual files written to disk to be grouped together automatically. The product costs $3,900.

Time saver

Hypersave is a $5,000 package that uses a disk-mirroring technique to cut the time required to back up large amounts of data automatically. It can reduce a 30-hour job to back up 30G bytes of data to 1½ hours, according to company officials.

"The Epoch people have some good insights into the marketplace," Bretzmann said. "Addressing performance problems for incremental new dollars is probably the strongest sell."

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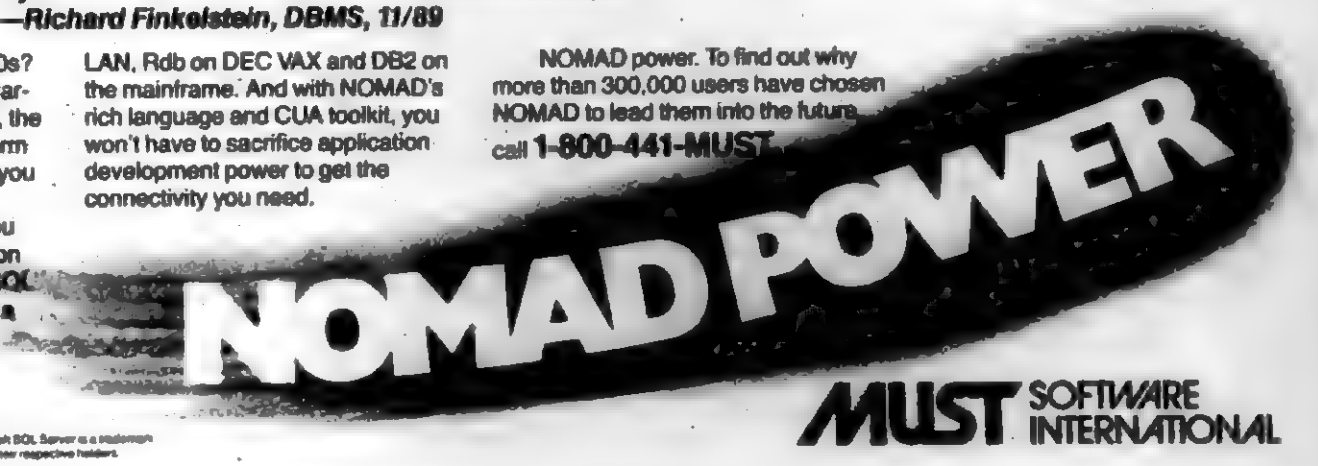

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The Sybase View

Business critical on-line applications can dramatically affect the competitiveness of an organization. They require an on-line RDBMS architected to integrate real-time decision support and transaction processing across networked environments.

Historically RDBMSs were designed only for decision support applications. Many vendors have tried to extend their architecture for on-line capabilities, but lack features critical to success. A true on-line RDBMS demands superior performance, integrity, availability, distributed data management, and integrated tools.

SCALABLE HIGH PERFORMANCE

For the best price performance and absolute performance, an on-line RDBMS must scale up, or down, as business needs dictate. Only an on-line RDBMS with a multi-threaded programmable server architecture has proven successful in handling peak loads, with subsecond response time, for large numbers of users, on a variety of platforms.

SERVER-ENFORCED INTEGRITY

An on-line RDBMS must enforce data security and integrity rules, including referential integrity *in the database* rather than in each application. This requires an intelligent, programmable server architecture. This architecture dramatically reduces enterprise-wide application development and maintenance time while improving protection and data consistency.

HIGH APPLICATION AVAILABILITY

An on-line RDBMS provides high application availability to avoid costly downtime. It performs backups, recoveries, and database administration changes while applications continue to run. And it supports fault-tolerance with mirrored logs and databases, as well as multi-CPU recovery to minimize exposure to hardware problems.

OPEN DISTRIBUTED DATA MANAGEMENT

An on-line RDBMS fully supports an open client/server architecture that lets you transparently distribute applications and databases over networks of multiple heterogeneous workstations and/or computer systems. It includes a two-phase-commit service to support distributed update transactions, as well as retrievals, across two or more servers. And it provides open interfaces for integrating third party tools as alternate clients and foreign data sources as alternate servers for a truly open computing solution.

ADAPTABLE WINDOWING TOOLS

An on-line RDBMS gives developers a set of window-based 4GL tools that are object-oriented, event-driven and portable. And it integrates these tools with the power of the programmable server. In addition, an on-line RDBMS gives users a set of window-based decision support tools that provide real-time access to live data with a highly intuitive graphical user interface.

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SYBASE. Architected from the outset as the on-line RDBMS.

[redacted]

This view of The On-Line RDBMS first appeared in The Sybase Forum (Computerworld, April 2, 1990).

SYBASE SQL Server® delivers the high throughput and fast response times needed for on-line applications. Moreover, SQL Server maintains performance levels as the number of users and the size of the databases grow.

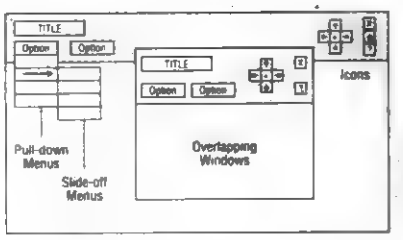
SYBASE performance is based, in part, on a multi-threaded server architecture that includes its own kernel and SQL task manager that are optimized to handle multi-user functions usually associated with the operating system. In addition, the SYBASE SQL Server architecture

SYBASE maintains maximum transaction throughput and fast response times over an extended range of users.

The on-line enterprise cannot afford an RDBMS that must periodically be taken off-line for routine maintenance activities, such as database backups, diagnostics, design, and integrity changes.

SYBASE SQL Server allows all such activities to be handled on-line, with system-supplied stored procedures, while applications continue to run.

SQL Server also protects against hardware problems by supporting *software-based* fault tolerance with mirrored logs and databases, as well as multi-CPU recovery.



SYBASE provides a highly intuitive graphical user interface to maximize productivity for developers and end-users alike.

SYBASE boosts productivity with powerful window-based tools that meet the needs of all users. Programmers get a state-of-the-art fourth generation language (4GL) programming environment. Overlapping windows, pull-down and slide-off menus, and icons help developers build complex, on-line applications in a fraction of the time it takes using traditional tools.

In addition, SYBASE offers a complete SQL life-cycle toolset for developers. All phases are supported, including design, prototyping, development, testing, administration, and maintenance.

ke To Add Some tive To Our View Of n-Line RDBMS.

has been extended to take full advantage of symmetrical multi-processor (SMP) hardware systems. The resulting benefits are greater throughput, more effective load balancing, extended multi-user capacity, and efficient operational control.

In Computerworld (March 5, 1990, "Buyer's Scorecard") SYBASE ranked first in eight out of eighteen categories, including "Performance in processing on-line transactions" and "Performance in decision-support applications."

One of New York's most respected investment research and management companies, Sanford C. Bernstein & Co., chose SYBASE because "Of all the systems we evaluated, SYBASE was clearly the fastest. It accommodated multiple users without losing performance and offered the most functionality both on the transaction processing end and the data management end."

This is what InfoWorld (March 5, 1990, "Dueling Servers") had to say about SQL Server's referential integrity: "The more power a multiuser relational database system has, the more potential there is for disaster. If you change a number on one table, any other table that depends on it may need to be changed. The risk lies in the failure to update all the appropriate related tables. The likelihood of this increases even more as more front-end applications that access the same data are added to the system.

"SQL Server offers effective countermethods. Its triggers, a type of stored procedure that executes whenever a given condition occurs, are attached physically to a table...and check all updates, inserts, or deletions for their effect on related tables. Since the trigger is installed at the server level — and not run through the front-end application — it doesn't matter which application updates the critical table. This is a critical feature as front ends multiply, and the potential for mismanaging data is increased. And since a given trigger need only be written once, at the server, it makes data integrity programming easy."

A final note: InfoWorld rated SQL Server referential integrity "excellent."

The on-line enterprise demands data and application integration and interoperability in a multi-vendor environment — *SYBASE Open Client/Server Architecture provides exactly that.*

SYBASE Open Client permits the use of a variety of front-end tools or applications, including SYBASE applications, independent software vendor's tools, and user written applications. SYBASE Open Server can seamlessly integrate hierarchical and relational DBMSs, third-party applications and real-time data feeds into SYBASE applications.

General Logistics International (GLI) is using SYBASE to help manage and distribute the volumes of data generated daily by one of the largest and busiest container carriers in the shipping industry — Mitsui/O.S.K. Lines North American. "The ability to distribute data among various locations combined with flawless data integrity when distributing that data was key to choosing SYBASE"

In the real, multi-vendor world, SYBASE preserves your prior investment in both hardware and software. SQL Server supports portability to a wide range of computing platforms, including VAX/VMS, UNIX, and OS/2, with PC and MAC connectivity, making it a natural for linking applications residing on different machines.

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Database keeps the Earth's inventory

ON SITE

BY GARY H. ANTHES
CW STAFF

ARLINGTON, Va. — The head of the Nature Conservancy's Science Division flashes pictures of rare plants and animals onto a wall of his office, pausing at one of a drab shrub tightly encircled by a fence. "That's the only Pitkin Marsh Paint Brush left on Earth," he says. "The only one."

"That's a depressing thought," someone replies.

"It's worse than that," snaps Robert E. Jenkins Jr. "The plant's a male."

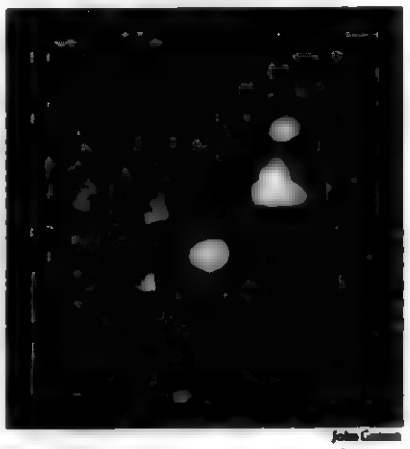
It may be too late for the Nature Conservancy to do anything for the Pitkin Marsh Paint Brush, but aided by an internationally distributed database containing the largest inventory of plants and animals in the world, the Conservancy is quietly and systematically saving endangered species by buying the land on which they live.

The database is the starting point for deciding how the Conservancy will allocate its $100 million-plus annual budget, allowing it to set priorities among thousands of potential land purchases. In the past 40 years, the Conservancy has bought or acquired through gifts some 5 million acres and has built assets worth $619 million.

The database is part of the Conservancy's Biological and Conservation Data System, distributed across 75 data centers in the U.S., Canada, the Caribbean and Latin America.

The database is actually a collection of some 45 integrated files encompassing 2,000 data fields. The key unit of information is an "element occurrence" — one of 65,000 plant or animal species or ecosystems at one of 400,000 locations. Some occurrences are incredibly detailed, with individual plants pinpointed on the globe to within 100 feet. Species and ecosystems are ranked according to their relative endangerment, both regionally and globally.

Each state or region keeps a detailed slice of the database applicable to its area, periodically mailing updates to a database at Conservancy headquarters in Arlington. Twice a year, headquarters sends out a new software release to the data centers.



John Gannon

The Nature Conservancy *tracks species such as the Green Larkspur*

The database is an important tool for setting land acquisition priorities. It produces scorecards, one for each state or region, showing conservation priorities in descending order of endangerment. "The scorecard has become a driving force in nature conservancy in the U.S.," Jenkins said.

Not long ago, a scorecard showed that an area in the state of Washington contained two endangered plants and one threatened animal — the extremely rare Oregon Checkermallow, the Green Larkspur and the Larch Mountain Salamander. The Washington area consists of several privately owned parcels and one piece in a national forest. "We're going after them one by one," Jenkins said. "The Green Larkspur is ugly as dirt, but maybe it will cure cancer."

The system began as a centralized mainframe application in 1974. Conservancy officials soon realized the data had to be closer to its source, so each state's offices brought up the application on local Hewlett-Packard Co. HP-3000 minicomputers running an HP proprietary database management system. In the mid-1980s, the remote offices cut over to personal computers running Ashton-Tate Corp.'s Dbase III, and they are now migrating to Revelation Technologies, Inc.'s Advanced Revelation DBMS. Meanwhile, headquarters is converting from its own HP3000 system to Advanced Revelation on a Banyan Systems, Inc. local-area network that includes Banyan and AST Research, Inc. servers.

Advanced Revelation is "the most capable DBMS I've ever seen," said Keith M. Carr, director of conservation systems and programming. It is exceptionally flexible, allowing variable length fields and records, multivalue fields and easy interfaces to other systems, he said.

According to Jenkins, the Conservancy has avoided pitfalls that doomed other ecological databases. Some had unclear objectives, trying to tie together too many things such as biology, scenery, recreational values and exploitable resources. Others failed because they focused on the short term or on sites rather than on plant and animal species, making analyses of species across different areas difficult.

9370

FROM PAGE 23

tion, feeding that data into the 9370 for processing. Eventually, the store clerks will sign in on the terminals rather than submitting time cards, eliminating one more paper-generating task.

"The machine has given us very few problems," Borden says, adding that he is awaiting IBM's fall announcements with particular interest in improvements to the VSE operating system.

The new VSE/ESA will provide better overall performance, improve memory management and block paging and make more effective use of expanded storage, says Susan Gannon, an analyst at Technology Investment Strategies Corp. in Framingham, Mass.

No new customers

"I think the fall announcements may cause people to take a second look at the 9370," Gannon adds, "but it's not likely to renew its life or make major inroads with customers who are not already in the 370 world."

Borden views the anticipated changes in VSE as his shot at getting "a miniature MVS — all the advantages of MVS on my VSE. That's another reason why the 9370 has turned out to be a good box."

Overall, the 9370 family seems to be enjoying some successes where IBM did not anticipate them, says George Weiss, director of midrange systems at Gartner Group, Inc. in Stamford, Conn. "Because of the 9370's complexities of installation and its user interface, it was just not a manageable system at the end-user level in departmental applications," Weiss notes. "But it's obvious that IBM has not given up on it."

After having spent several years figuring out whether the 9370 was a departmental machine or a 370 extension, IBM seems to have found a place for the midrange computer. The company has identified communications and application-specific computing as viable areas for the 9370 and also pitches the system as a replacement for outdated, low-end 4300s. It sees the 9370 as a platform for an assortment of niche operating systems such as MUMPS, Pick or DPPX, the operating system for the discontinued 8100 line.

"I think that by positioning it as a niche machine for specialized applications, IBM has been much more successful with it," says Karen Landis, an analyst at Computer Intelligence in La Jolla, Calif. "We saw some definite pick-ups in 9370 business in the last year or so."

Market researchers from International Data Corp. and Computer Intelligence estimate that IBM has sold about 7,000 of the machines since its debut in 1986. Yet when compared with the 67,000 AS/400s sold in just two years, the 9370 may look downright pitiful.

"It's a very niche role machine — a couple here, a couple there," says John McCarthy, an analyst at Forrester Research, Inc. in Cambridge, Mass.

However, comparisons with the AS/400 are not necessarily fair ones. The AS/400 is a minicomputer, whereas the 9370 is considered a small mainframe. Furthermore, AS/400 sales have essentially been upgrades from existing System/36 customers. The 9370 had no such ready-made customer base.

If anything, the 9370 has helped out the AS/400. While it seems a cruel joke now that the 9370 was once dubbed the "VAX killer," McCarthy points out that the 9370's arrival did slow Digital Equipment Corp. down "enough to allow IBM to close in with the AS/400."

"IBM's problem with the 9370 was that it raised the bar too high to begin with," says Robert Djurdjevic, president of Annex Research in Phoenix. "Then as the product began shipping, it was apparent it lacked many parts of the application software, so it got very bad press."

Bad is good

Some users leveraged those well-publicized difficulties to their own bargaining advantage, however.

"I think all the bad press did users a favor. It lowered the price," declares Michael Frodyma, vice-president of MIS at Richard Leahy Corp. in Silver Spring, Md. "We're very happy with the 9370 and have no plans to leave it. We think it's a treat."

The direct-response insurance marketer, a subsidiary of Lincoln National Corp., turned to the 9370 to help control escalating costs at its computer service bureau three years ago. Within six months after installing the 9370 Model 60, the business broke even on its in-house computing costs.

"We like the traditional System/370 tools," Frodyma explains. "We're running a shop with seven people, and we're able to support a $15 million company with a million and a half records on-line. We do have a few applications that don't have the response time we're looking for, but that's more of a tuning issue."

> "I THINK all the bad press did users a favor. It lowered the price."
>
> MICHAEL FRODYMA
> RICHARD LEAHY CORP.

Frodyma says the effectiveness of the 9370 in managing his business enabled him to cut back on the proliferation of personal computers at the firm. "We are kind of unusual in that we wanted to cut back on PC growth, and for the most part we've succeeded in controlling it to production systems," he says. "We have a Novell [local-area network] running and a few claims systems on the PCs, but for word processing we run [Wordperfect Corp.'s] Wordperfect on the 9370 with dumb terminal access."

In Knoxville, Tenn., Albers Healthcare Systems recently replaced its aging 4361 with a 9370 Model 90 to handle all the processing tasks for the $140 million firm. John O'Hara, vice-president of information systems at Albers, uses the system for all processing needs, from customer orders and financial applications to handling communications with distribution centers in Tennessee and West Virginia.

At Bozzutos, Inc., a food wholesaler based in Cheshire, Conn., MIS Director Donald Zagar is preparing to renew his lease on the 9377 Model 90 that runs in-house applications for inventory control.

Although system use has expanded from 10 to 80 users over the past three years, Zagar says he still has enough capacity left to stick with his current machine rather than upgrading to the new, more powerful models coming this fall.

"We are also looking more closely at PCs now," he adds. "We are thinking about moving some applications off to distribute the processing."

The 9370 may continue to gain respect as the new high-end models make their appearance this fall. They are considered to be a natural stepping-stone from the 4391 — the next generation of the 4381 line.

Some analysts speculate that IBM will unveil some sort of hybrid machine that serves to combine the two product lines, "but I just hope they don't give it the 9370 nomenclature," Landis says. "It's had such a bad reputation, I have a feeling a lot of users would be hesitant to take up a 9370."

Oddly enough, one of the 9370's image problems seems to be lack of any particular strong or weak point, Landis notes. "It's just a little workhorse that runs the same software as the big guys."

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Printer emulation	✓ IBM, HP PCL	HP PCL
Std. plotter emulation	✓ Yes	No
Font card slots	✓ 2	1
Std. input paper tray capacity	✓ 200	50
Std. output paper tray capacity	✓ 100	50
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Or if you decide you could use automatic collating of letterhead, second sheets and envelopes, the LaserPrinter E lets you add that, too.

Yet no matter how many features you add, the LaserPrinter E's unique stackable design takes up practically no more deskspace.

So whether your first requirement is price, performance or flexibility, the new IBM LaserPrinter E should be at the top of your shopping list. See it today by calling 1 800 IBM-2468, ext. 982, for the name of your nearest IBM Authorized Dealer.

The new IBM LaserPrinter E. Suddenly, nothing else measures up.

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Hamilton

CONTINUED FROM PAGE 23

tions for users are.

Let's start with the simplest option. It seems that many people are still expecting a huge IBM Enterprise System announcement early this fall.

IBM is expected to provide new models for all of its System/370 lines, analysts said. This includes new 9370 models at the low end, the follow-on to the 4381 and a new release of MVS/ESA.

However, it starts to get confusing when you get to the high-end mainframe component of this announcement. Some expect this portion to include three pieces. Others think it will be only two.

In the first case, IBM would introduce functional enhancements to existing 3090 J models and an initial Summit system — the so-called mini-Summit — as well as announce the real Summit for delivery in the second half of 1991.

In the second scenario, IBM would introduce the 3090 J improvements and announce Summit. There would be no in-between system, and the idea would be to get at least a few Summits out to early support sites by year's end and follow up with general availability next year.

Sorry, but I don't know which scenario is right. One information systems director, who said he was briefed by IBM, is counting on a mainframe announcement this fall that will include the mini-Summit. That system would include a new frame, power supplies and all the other environmentals but have the same 3090 J innards.

However, Frank Gens, a vice-president at Technology Investment Strategies Corp., said he thinks IBM will skip the mini-Summit and stick with a straight Summit announcement. He said he believes too many customers would say, "What's the point?" to an in-between system and not buy it.

If it does come down to these two scenarios, it seems that they both have the same bottom line. The Summit performance boost, which will supposedly take the uniprocessor performance up into the 40 million instructions per second range, will not be available to most customers until later next year.

THE NEXT-GENERATION mainframe, like many expected products before it, is the source of plenty of gossip and rumor these days.

In a sense, "customers are stuck," Gens said. If the real Summit isn't available until the second half of 1991, customers will have to wait because the alternatives from competitors will not be available until that time frame, either.

What it comes down to, then, is how many Summit-like features users want or need in the meantime.

A mini-Summit would have advantages for some users. By providing all of the Summit externals, a user could then do a CPU swapout to upgrade to the real Summit later on. Furthermore, it is expected to come with some of the newer mainframe functionality, such as fiber-optic channels. Although users won't have the raw performance boost, they will at least have some new features.

Still other users may see no reason to phase in Summit that way. Those fiber-optic channels, for instance, are one of the expected functional improvements for existing 3090 Js, anyway.

Hamilton is *Computerworld*'s senior editor, systems and software.

OOP

CONTINUED FROM PAGE 23

"We've developed an automatic programming system that turns [computer-aided design and manufacturing] designs into instructions for our board-fabrication machines," said Daniel Rasmus, manager of computer-assisted manufacturing at Western Digital Corp. in Irvine, Calif. Rasmus uses Nexpert Object, an object-oriented programming package from Neuron Data, Inc. in Palo Alto, Calif., to place object-oriented rules into ordinary C programs.

However, the steep learning curve still puts off many potential users. "One of the real problems is that the right language for the users doesn't really exist," Hellenack explained. "What you're seeing is a staging of the OOP technology. There are object-oriented programming languages and object-oriented databases, but the analysis and design tools aren't there yet."

However, Hellenack said he believes that the OOP revolution is not far off. Driven by a need to reduce development costs — and allow users to write their own applications — IS departments should be shopping for OOP products by the time 1992 rolls around, he said.

One systems integrator that works with Wall Street and the federal government sees a need for a go-between right now. "All we've done is to provide users with customized object editors," said Dan Stickle, director of decision support products at Delfin Systems, Inc., a federal contractor in Sunnyvale, Calif.

The benefits are there, he said, adding, "Users will find that manipulating objects is a far easier way to understand complex problems than using conventional application programs."

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NEW PRODUCTS — HARDWARE

Turnkey systems

Opus Systems has announced the Personal Mainframe/8000-33, a turnkey Unix workstation and multiuser system, and the Series 428 Personal Mainframe, a Unix workstation and multiuser subsystem.

Both models reportedly run at 44 million instructions per second and are based on Motorola, Inc.'s 33-MHz 88000 reduced instruction set computing microprocessor.

List prices are $21,495 for the Personal Mainframe/8000-33 and $13,557 for the Series 428 Personal Mainframe.

Opus Systems
Building 400
20863 Stevens Creek
Cupertino, Calif. 95014
(408) 446-2110

Stratasys, Inc. has announced a system that constructs plastic objects from three-dimensional wire frame, surface or solid computer-aided design (CAD) models.

3D-Modeler accepts 3-D data from CAD systems that support industry-standard Initial Graphics Exchange Specification format. It also displays real-time object slicing on Unix platforms running at 16 million instructions per second, according to the vendor.

The product is offered as a stand-alone unit for $130,000 or as a turnkey system with a Silicon Graphics, Inc. workstation and Stratasys' Strataslice software package for $178,000.

Stratasys
7411 Washington Ave. South
Minneapolis, Minn. 55439
(612) 941-5607

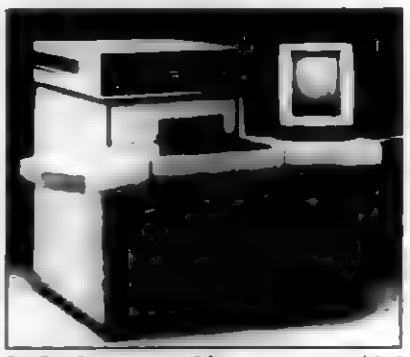
I/O devices

TDC has unveiled Docuscan Plus, a document capture subsystem developed specifically for users of IBM Imageplus who need to convert large volumes of data into digital images.

The product was designed to meet the demand for two-sided document capture capability for transaction processing on Imageplus. Options include a 200 dot/in. image display monitor for viewing images while scanning, a 220 char./sec. ink-jet endorser and a 1,500-page automatic document feeder.

System requirements include a Personal System/2 Model 80 server and a companion Imageplus software package from IBM.

TDC
5510 Cherokee Ave.
Alexandria, Va. 22312
(703) 750-3717



TDC's Docuscan Plus *meets two-sided document capture capability*

Cognex Corp. has introduced a machine vision system that enables manufacturing engineers without programming or machine vision experience to solve on-line gauging, robotic guidance, part inspection and part tracking problems.

On-Sight provides users with an interface that displays video images of an object on a color monitor. A palette of icons that represent various vision system capabilities is also displayed.

The system is housed in an Apple Computer, Inc. Macintosh II system. Single-quantity pricing starts at $25,000.

Cognex
15 Crawford St.
Needham, Mass. 02194
(617) 449-6030

Ideal Technologies has introduced a Texas Instruments, Inc. 8920 Forms Printer that is compatible with Digital Equipment Corp. systems.

The 8920 is a wide-carriage forms printer that features zero forms waste and a printing speed of 600 char./sec.

The product sells for $2,495.

Ideal
13101 Washington Blvd.
Los Angeles, Calif. 90066
(213) 827-9023

Power supplies

A fourth generation of uninterruptible power supplies (UPS) has been announced by Best Power Technology, Inc.

The company's Ferrups and Micro-Ferrups line of UPS now features artificial intelligence, the ability to test inverters and batteries, automatic smoothing of odd-order harmonics, a smaller footprint and 92% efficiency.

The products range in capacity from 500 VA to 18 KVA and cost between $895 (500-VA models) and $12,745 (18-KVA models). All prices include batteries.

Best Power Technology
P.O. Box 280
Necedah, Wisc. 54646
(800) 356-5794

Taesung Industries, Inc. has announced four uninterruptible power supplies (UPS) featuring a proprietary advanced standby technology that enables the UPS systems to switch from AC to backup power in less than 1 msec.

The UPS-3000 and 4000 were designed to support stand-alone personal computers and workstations. The UPS-5500 and 7200 were designed for network file servers and large workstations.

Pricing ranges from $299 to $619.

Taesung
2001 Westside Pkwy.
Alpharetta, Ga. 30201
(404) 664-8944

NEW PRODUCTS — SOFTWARE

Database management systems

Micro Trac Systems has released Version 4.0 of its Restrac employment management database system.

The product is being offered with the Restrac Professional applicant tracking system and includes an upgrade to the Restrac Resume Reader, an intelligent on-line resume scanning and retrieval package. It runs on Intel Corp. 80286- and 80386-based systems and supports Token-Ring and Ethernet local-area networks.

Pricing starts at $4,995 for a single-user installation and $6,995 for multiple-user network versions. The Resume Reader module costs $6,995.

Micro Trac Systems
19 Needham St.
Newton Highlands, Mass. 02161
(617) 965-4660

Computer-aided software engineering

Netron, Inc. has released Version 2.05 of Netron/CAP, a computer-aided software engineering system for developing and maintaining Cobol applications on Digital Equipment Corp. VAX systems.

The system includes an IBM IMS test facility for testing IMS mainframe applications built on VAX platforms and a Listing Annotator for use in debugging and impact analysis.

Pricing starts at $50,000.

Netron
99 St. Regis Crescent North
Toronto, Canada M3J 1Y9
(416) 636-8333

Utilities

Demax Software has announced a disk configuration to process striped disks.

The Squeezpack defragmenter was designed primarily for users of Digital Equipment Corp.'s VAX 9000 series machines. The product makes fragmented files contiguous to reduce the number of physical disk accesses, according to the vendor.

Pricing ranges from $245 to $3,395, depending on VAX configuration.

Demax Software
999 Baker Way
San Mateo, Calif. 94404
(415) 358-3800

Viasoft, Inc. has announced a documentation tool that understands the logic of Cobol.

Via/Smartdoc automatically generates comprehensive Cobol program documentation. It collects data directly from the program's source code, analyzes and organizes the information into detailed, accurate hard-copy documentation.

The product supports all versions of Cobol, including Cobol II, and runs in batch mode under MVS/XA, MVS/ESA or MVS/SP. It is available for $29,500.

Viasoft
3033 N. 44th St.
Phoenix, Ariz. 85018
(602) 952-0050

Applications packages

Cincom Systems, Inc. has announced Release 7.0 of Control:Manufacturing, its complete business system for manufacturing companies.

The software package includes an enhanced user interface and redeveloped screens modeled after the Common User Access standard.

A controlled release for Digital Equipment Corp. VAX/VMS platforms started last month, and general availability for IBM MVS and VSE environments has been scheduled for September.

Pricing for basic IBM configurations ranges from $125,000 to $400,000. VAX models cost between $70,000 to $260,000, depending on configuration.

Cincom
2300 Montana Ave.
Cincinnati, Ohio 45211
(513) 662-2300

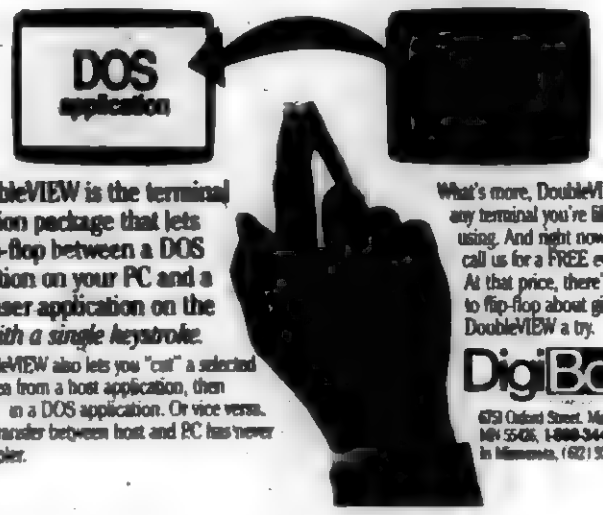
Banner Software, Inc. has announced Release 2.20 of its VSM/VM software package.

Features include the ability to transfer all output at channel speed, thereby improving transaction responses for real-time print tasks; reduced storage requirements for CICS or other types of monitors because of fewer concurrent print tasks; and the ability to block data to suit a destination printing device, according to the vendor.

The software runs on VM/IS, VM/SP, VM/HPO or VM/XA-SP. Pricing starts at $9,000.

Banner Software
9719 Lincoln Village Drive
Sacramento, Calif. 95827
(916) 364-0900

Flip Flop, Flip Flop, Flip Flop.



DoubleVIEW is the terminal emulation package that lets you flip-flop between a DOS application on your PC and a multi-user application on the host *with a single keystroke.*

DoubleVIEW also lets you "cut" a selected screen area from a host application, then "paste" it in a DOS application. Or vice versa. And file transfer between host and PC has never been simpler.

What's more, DoubleVIEW emulates any terminal you're likely to be using. And right now, you can call us for a FREE evaluation copy. At that price, there's no need to flip-flop about giving DoubleVIEW a try.

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6751 Oxford Street, Minneapolis, MN 55426. 1-800-344-4273. In Minnesota, (612) 922-8055

PRODUCT REVIEW

Making the case for Nomad

Must Software International

This is the second in a monthly series of performance benchmarks that for the next several months will focus on the integration of computer-aided software engineering (CASE) and fourth-generation language (4GL) products. The benchmarks are monitored by an independent team headed by David Whiteside, managing director of Computing Futures Ltd. and his associate, Prof. Eberhard Rudolph, formerly of the University of Auckland, for exclusive publication in Computerworld.

Each product is observed in action over a three-day period during which a vendor team solves the case study project costing system, an application that is familiar to most information systems professionals. The team's mission is to demonstrate the capability of the major CASE/4GL environments to deliver complete and complex business solutions under "live fire" conditions. In this issue, we look at Nomad from Must Software International.

•

For this benchmark, the "team" consisted of one person, who finished the test without fail in just under 27 hours, and thus the grade "excellent" was given for level of completion. Several estimating tools suggested that the task would require at least 120 hours using advanced development environments and experienced staff.

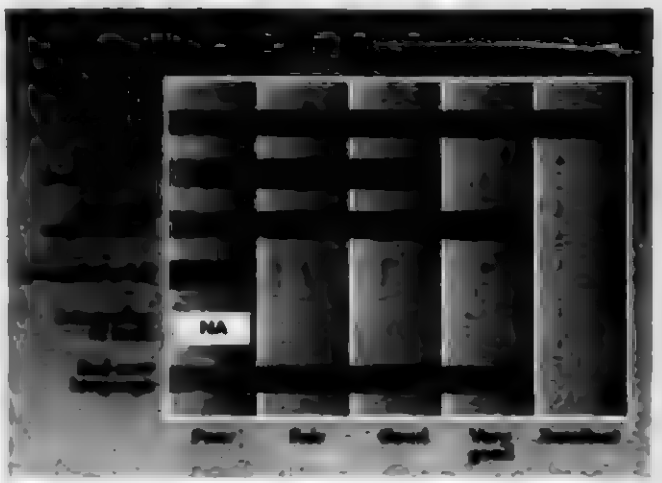
However, some of the speed achieved comes from the fact that only one person was involved, which reduced the communication overhead that is usually observed. Also, the development in Nomad is realistically restricted to one programmer. Without concurrent development, therefore, the elapsed times are rather lengthy. For these reasons, we regarded the speed of development as "good."

•

After completion, the developer had to modify the system. During this crucial test of the tools (the developer had no prior knowledge of the nature of the change), he was able to make the necessary modifications in a very short time, working almost without any documentation. The speed of development was clearly better in the maintenance phase, more than twice that of the initial development, justifying a "very good" rating for speed of maintenance.

•

The documentation produced during the test was minimal, and it consisted solely of program listings that were short but not easy to read. There may be documentation features that were not used in the test, but what was shown was rated "poor."



•

There were no tools to be integrated. Third-party CASE tools could be used up front, but their results have to be imported manually into the Nomad environment. Thus, a rating on integration of tools was not applicable in this benchmark.

•

Nomad's end-user support was strong, with a powerful inquiry and simple report generating feature that easily provided complete solutions to the case study problems. Because not much end-user guidance was provided and the end-user tool Nomad Assistant could not be used to help in one of the inquiries, end-user support was rated "very good."

•

In summary, Nomad could do the job, but it was sometimes stretched to its limit with the complexity of the benchmark. Without the experience of the developer, we may have had a less favorable result. This is an excellent information center product, but there are limitations to the size and complexity of the data processing tasks that Nomad could handle in a large development environment.

Development and maintenance report card

Performance in each area is graded from A (excellent) to F (poor).

ANALYSIS AND DESIGN: NA
In the absence of an integrated CASE tool, the Nomad solution was derived with a minimum of analysis and design. Instead, during implementation, the specifications were entered "as is," which required several structural changes.
Strength: Not applicable (NA).
Weakness: Design derived by CASE tools has to be re-entered manually.

DATABASE SETUP: C
Although entered manually, the data structures were implemented in a short time, and they included most of the validation rules. The schema presentation and debugging facilities were not user-friendly.
Strength: Powerful defaults.
Weakness: Limited to Nomad internal, DB2 and SQL-type database management systems.

FILE MAINTENANCE TRANSACTIONS: D
This step took longer than expected because Nomad provided little support in handling transactions that referenced more than one file. In addition, without an up-front design, on-the-fly coding was cumbersome.
Strength: Single file transactions are highly automated.
Weakness: There is a lack of structure supporting multifile processing.

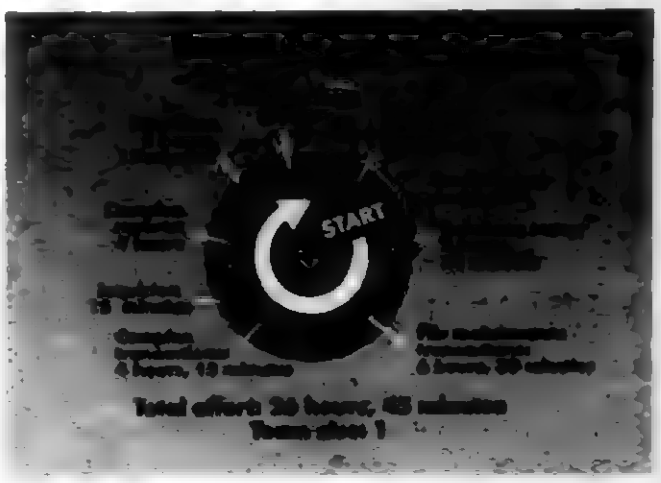
COMPLEX TRANSACTIONS: C
Getting into the more complex transactions, the limitations previously observed became even more evident. An embarrassing result could be avoided only by the experience and persistence of a top-notch developer.
Strength: A great deal of processing logic is handled at the schema level.
Weakness: Some defaults were too smart and caused serious errors.

INQUIRIES: B
The Nomad defaults were ideally suited to this type of application. A solution was developed on the fly with exceptional ease. End users, however, may find the Nomad language difficult, particularly because the end-user support tool Nomad Assistant could not do the job.
Strength: Nomad can provide a solution with a few lines of code.
Weakness: The end-user support tool could not handle the request.

COMPLEX REPORTS: B
The data structure needed modification to comply with the requirements. The program had to be rewritten several times to accommodate the staff assigned to a project.
Strength: Once the problem is well defined, an experienced Nomad programmer can provide a quick solution.
Weakness: It lacks a sophisticated report generator.

INTERFACE: A
The standard utility to input Ashton-Tate Corp. Dbase files transferred the external data with ease. After some time-format and date-conversion problems, a solution was developed in a very short time.
Strength: A Nomad schema was automatically created from Dbase files.
Weakness: There were some problems with date conversions.

ENHANCEMENT: B
The enhancement required changes to the schema, the program logic, screen and report layouts. Even without formatted documentation, the expert programmer and his knowledge of the initial solution provided a timely conclusion.
Strength: Substantial alterations were implemented fast.
Weakness: Experience with the initial code was necessary.



The solution was developed on an IBM 3038 running under VM with a link to a 4M-byte Personal System/2 Model 70. Operated in a time-sharing service, there were typically 80 to 120 active users competing for resources. The solution was derived entirely with Nomad.

Details of the products are available from: Must Software International, 4th floor, 101 Merritt 7, Norwalk, Conn. 06856. (203) 845-5000.

Development World product briefings are based on a series of full solutions to the case study. They are prepared by leading vendors and published along with in-depth product critiques and consultants' test reports in Development World. If you wish, Please use business reply card between pages 86 and 87 or FAX (508) 879-9346 for a brochure.

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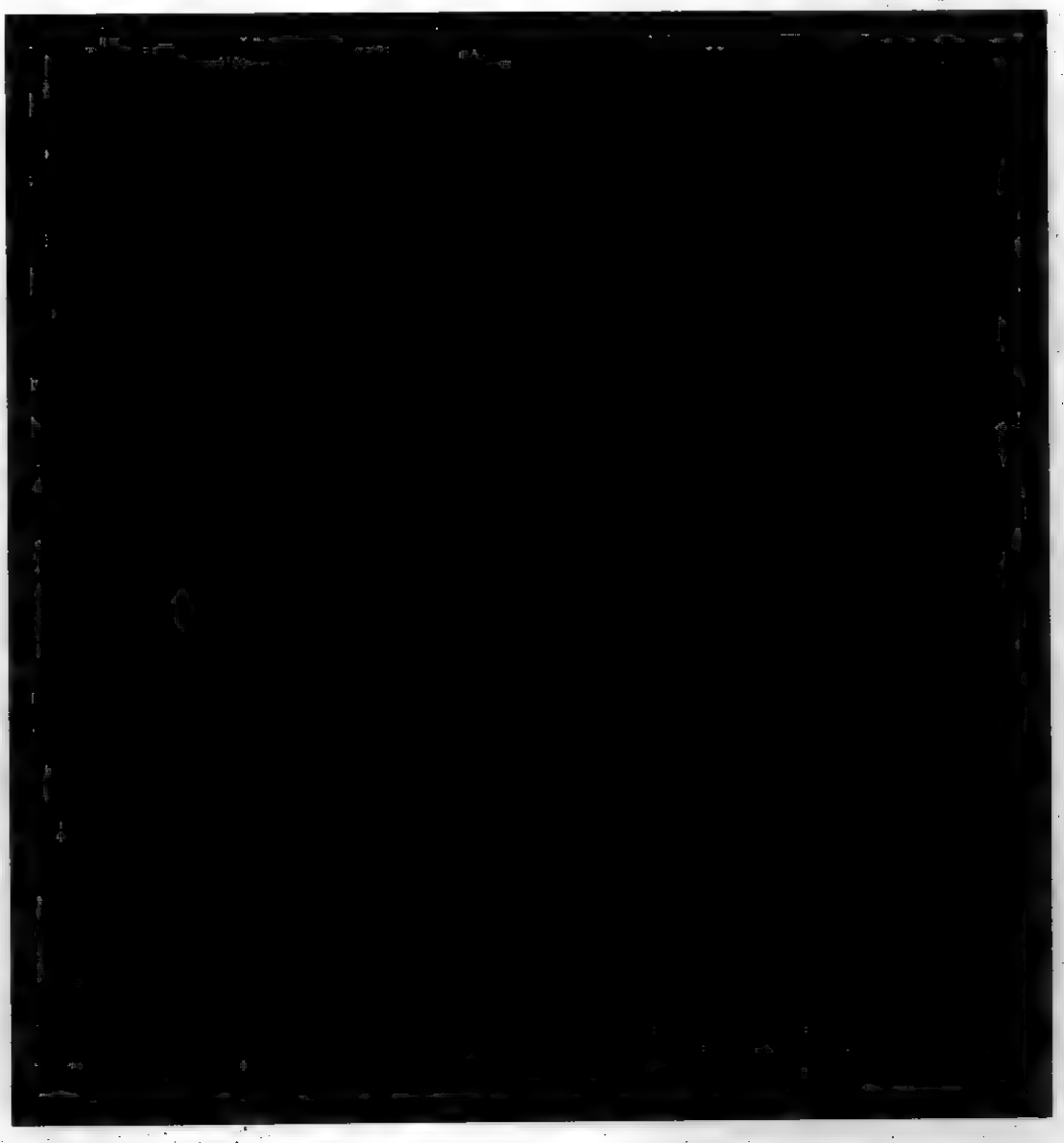
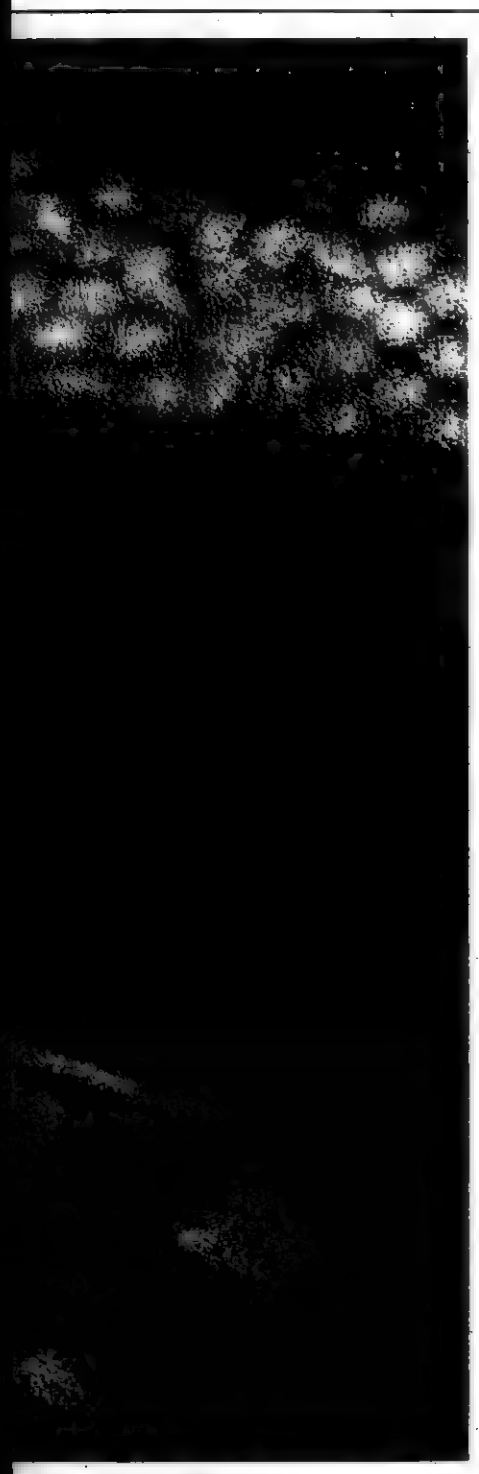
CATI: COMPUTER ASSISTED TESTING AND IMPLEMENTATION

AN IDC WHITE PAPER FOR INFORMATION SYSTEMS MANAGEMENT





CATI

THREE RECENT AND WELL-PUBLICIZED SYSTEMS FAILURES ARE LEADING CORPORATE MANAGEMENT TO RESTRUCTURE ITS APPLICATION DEVELOPMENT PRIORITIES. THESE EXECUTIVES ARE BEGINNING TO UNDERSTAND THAT BUILDING MISSION-CRITICAL APPLICATIONS THAT WORK EFFECTIVELY AND PREDICTABLY IS AS IMPORTANT AS INCREASING PROGRAMMER PRODUCTIVITY. ■ AT&T BEGAN TO NOTICE A PROBLEM. A MAJOR PROBLEM. ITS LONG-DISTANCE NETWORK WAS OUT OF COMMISSION. HOWEVER, HEAVY TRAFFIC WASN'T THE CAUSE. THE CULPRIT WAS A MAJOR FAILURE OF ITS NEW NETWORK SOFTWARE. AT&T REQUIRED MORE THAN A DAY TO CORRECT THE PROBLEM. IT

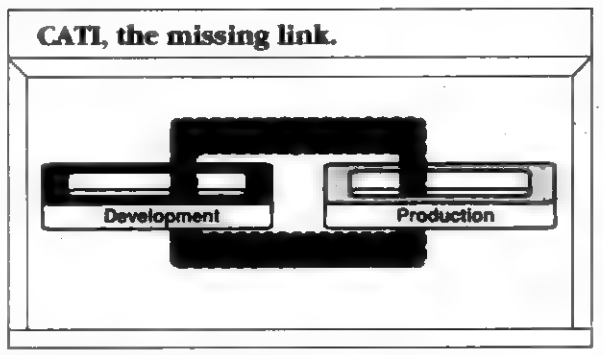
required longer than that to put its users at ease.

American Airlines recognized that it was not filling all of its available seats. A new software system indicated planes were full when substantial numbers of unsold seats remained. Revenue went out the window, and top management raised the roof.

The Internal Revenue Service was in a taxing situation. Its new digital, income-tax submission system wasn't working, and filers who expected immediate returns weren't getting them. The image of the IRS, already bad enough, got worse.

These highly publicized system failures and hundreds of less spectacular, less publicized examples highlight the need for more control in application development environments. Although its ability to rapidly generate code gives a predictable boost to application development, computer-aided software engineering (CASE) is not enough.

Increasingly, corporate managers are demanding computer-assisted testing and implementation (CATI) to ensure that mission-critical applications work as expected. CATI, an ally of CASE, is a set of coordinated and increasingly integrated tools used by application programmers to test and debug application software. Although less predictable in its productivity gains than CASE, CATI can be counted on to provide enhanced programs and fewer production problems in addition to detecting and correcting catastrophic system problems.



Computer-assisted testing and implementation can unite the application development and production environments.

CATI TODAY

The AT&T, American Airlines and IRS examples graphically depict the importance of online applications to both current and future business success. The importance of, and growing interest in, CATI flow directly from the increasing dependence of modern corporations on online, networked applications. A company's complex application environment often includes several different database management systems, different file structures and different operating systems that may span multiple time zones and continents.

Online applications are the entry point into mission-critical business information used to make tactical and strategic decisions. The quality of these decisions necessarily reflects the application's strengths and weaknesses. This complex environment places greater demands on the testing, integration and implementation of systems prior to their migration to production.

Despite the best efforts to prevent it, these crucial online applications do have problems. They can put the temporary fate of an entire company in the hands of an unfortunate applications analyst who is charged with finding a resolution while under unbearable pressure. When placed in a situation such as this, why attempt to cope without the protection offered by CATI?

HOW MISSION-CRITICAL APPLICATIONS FAIL

Mission-critical applications may fail in three general ways. First, the application may suffer from endogenous, or internal, failure. The errors arise from internal inconsistencies that can be identified in isolation. Standard testing and debugging tools and procedures can identify these problems and facilitate correction.

Second, the application may suffer exogenous, or external, failure. Exogenous failures frequently result from interactions with concurrent applications in large network installations. They cannot be identified in isolation. Exogenous failures must be evaluated in the actual production environment or in a simulated environment that effectively mirrors the actual production environment.

Finally, complex applications may suffer from internal inconsistency. In simple terms, the information output from the system may not properly reflect information that has been entered. Complex application environments with thousands, perhaps millions, of potential interactions cannot be validated directly. Recent testing advances use statistical regression techniques to test for valid replicative results.

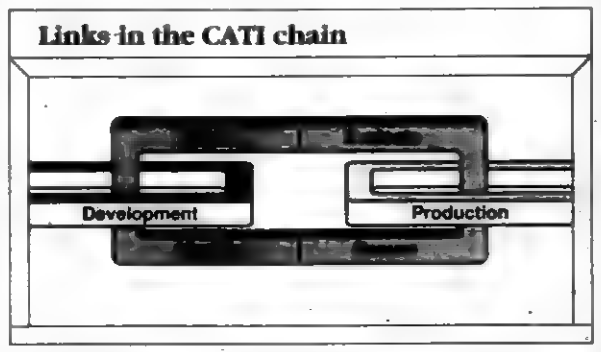
CASE has gotten a lot of attention in the wake of IBM's AD/Cycle announcement and the spate of related announcements from other vendors who want a piece of IBM's pie. Despite CASE's potential for developing new applications, however, it is often not the total answer to mission-critical application environments. IDC predicts AD/Cycle and its spin-off environments will lend themselves to CATI in the near future.

CATI – THE MISSING LINK BETWEEN CASE AND SUCCESSFUL BUSINESS RESULTS

Like CASE, CATI represents the natural evolution of well-known and widely used information systems testing and implementation tools into an integrated package. Those tools, described below, provide a wide range of capabilities.

Fault diagnostics, which rely on expert systems, or knowledge-based tools, intercept system error messages and other problems and immediately identify the nature of the problem. These tools essentially automate the time-consuming process of analyzing hexadecimal memory dumps and system error codes.

Network simulation tools do testing by replicating complex network environments. These tools help implementors who need to time-stamp processes in order to identify specific conditions that cause problems. They also help implementors stress test applications to determine the impact of imposing heavy loads on existing networks.



CATI is much stronger as an integrated entity than it is as a collection of its many individual tools

Some companies have an identity crisis.

We have an anti-crisis identity.

And what exactly is a software crisis? It's $50 million in lost ticket revenue to a major airline. It's a candy company coming up 11,000,000 chocolate eggs short at Easter. It's a telephone company losing half of their calls for nine very long hours.

These are actual software "glitches" that have had disastrous results. In terms of dollars *and* reputation.

That's why Compuware has devoted 17 years to developing products that detect errors and incompatibilities in IS systems. Our programs provide automated testing with clear, concise diagnostics that take you right to the source of any potential problem. Before it becomes a crisis.

Finding a solution *before* there's a problem. That's Compuware.

For more information, or additional copies of the IDC White Paper, call 1-800-521-9353.

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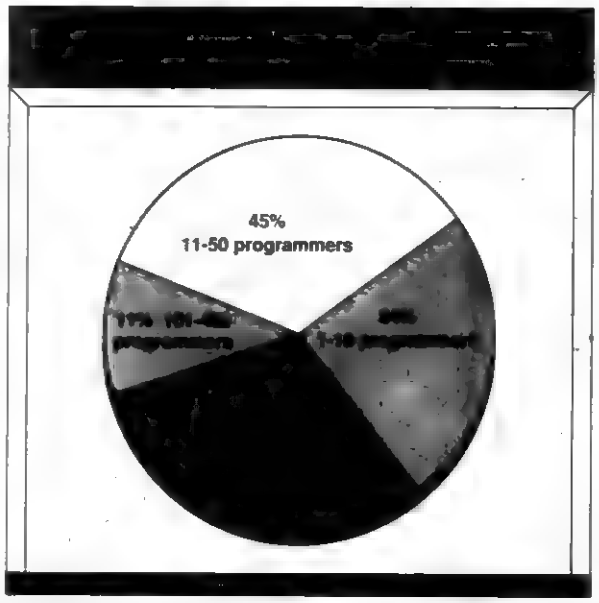
A typical network simulation tool can simulate a live, online CICS transaction processing environment. This allows programmers to do three things: test applications in environments with thousands of simulated transactions in progress, freeze specific snapshots of actual environments and modify simulated environments. Regression techniques permit evaluation of the accuracy and replicability of applications in complex environments.

Debugging tools facilitate immediate problem evaluation and resolution. They incorporate some sophisticated tools for isolating problems in complex network environments. On line editing tools permit rapid correction of application programs for both source code and data.

Without these CATI tools as a link, the benefits of CASE will not ultimately translate into bottom-line business benefits.



Almost 70% of IDC survey sites have between one and 50 programmers, while the remaining 31% have between 51 and 400.

THE IMPORTANCE OF INTEGRATED CATI

CASE and other application development tools measure their impact in terms of months and years. Development programmers can look months ahead to identify and resolve issues. In contrast, CATI measures effectiveness in minutes and hours. Once a problem is identified, management committees need not start counting the hundreds of thousands of dollars at risk, because CATI can identify, analyze and correct the problem swiftly.

Integrated CATI is beginning to establish the next plateau in testing and implementation. Integrated CATI offers two key facilities. First, it allows programmers to move easily between individual tools without logging on and off. This is provided – without extensive education and training – through common interfaces and instruction sets. As a result, solutions from one tool can be implemented within a second tool environment, seamlessly. This significantly reduces total programmer effort. Second, an integrated CATI environment permits construction of expert systems, which draw from common knowledge bases and information generated by multiple analysis tools.

The integrated CATI environment also allows IS and quality assurance people to capture the knowledge of programmers in a consistent and replicative manner. Integrated CATI, with diagnostics and simulation tools, enforces a testing and evaluation structure that remains with the corporation as programmers move to new levels, allowing maximum utilization of key people.

Although we may wish to believe otherwise, problem analysis and correction is an art, not a science. We rely on the expertise of individual technicians who have developed techniques for dealing with a finite number of specific problems. The technicians know the process, but IS typically neglects to capture that knowledge. Why? Many IS shops are so busy responding to, and solving, everyone else's requests and problems that they do not take time to step back and look at their own needs.

Specific problem types call forth common responses – the basic condition for developing an expert system. We are already seeing this methodology being developed in data centers with their "lights out" operations that allow the data centers to operate without humans on the premises. CATI capabilities such as fault diagnostics readily lend themselves to this type of intelligent environment. Why have a human responsible for recording and retaining solutions and responses to repeating problems? With CATI, this is accomplished faster – at machine speed – and more accurately. The integrated CATI environment employs reusable techniques and routines to analyze and correct errors. What could be simpler? In the volatile world of IS, CATI is a consistent buffer against the unpredictability of online systems.

Not too long ago, the major emphasis was on reserving processor resources with "desk checking," a labor-intensive, human-error-prone process. Today's approach is much different. In the quest to optimize the application development effort, there is still much concern for processor resources, but there is also concern for balancing human involvement with machine capabilities. The movement is toward minimizing human involvement, especially in repetitious tasks, while taking advantage of faster processors.

In operation, integrated CATI steps programmers and technicians through a specific sequence of diagnostic steps and possible fixes. In this environment, the problem of not incorporating the expertise of the IS staff is resolved, as CATI works best when synthesizing input from various sources.

Adding simulation capabilities to an integrated CATI environment moves testing and correction to a higher level. Simulation permits reconstruction of the environment in which the problem occurred. Problem resolution structures can require that revised applications pass tests in this simulated environment. This strict adherence to testing gives managers back the power to control their own computing fates.

CATI AS PART OF AN INTEGRATED APPLICATION DEVELOPMENT ENVIRONMENT

As integrated CATI moves upstream in the application development cycle, knowledge of specific problem areas and typical problem conditions will be built into the application development process. This procedure can happen in two ways.

First, new application development efforts can incorporate the knowledge contained in the integrated system. Development programs may be tested in simulated environments to ensure compatibility with existing application portfolios. IDC expects this will become increasingly seamless as application development tools become more sophisticated during the next 10 years.

Second, the knowledge can be incorporated directly into the application development engine. IDC believes this scenario, which is highly attractive to end users, will also occur within the next 10 years.

In either situation, integrated CATI represents a significant new plateau in the drive to automate software development. Leading-edge application development managers will increasingly use integrated CATI to amass application testing knowledge and remain at the forefront of application development practices. This leadership position will put them in a place to implement their systems with confidence, while possibly saving their companies millions of dollars.

CATI AND CORPORATE MANAGEMENT

IS enjoys a unique position in most organizations. Information systems increasingly represent mission-critical applications that help determine corporate viability. Few operating units with similar influence over corporate fortunes could consider moving directly from specification and development to operational status without a formal testing and evaluation process. The IS mystique, coupled with sometimes overwhelming application development backlogs, frequently leads IS to short cut their testing and evaluation procedures.

Despite knowledge of the aforementioned worst-case scenarios that struck AT&T, American Airlines and the IRS, corporate managers frequently overlook the comparative economics of CATI and CASE. CASE offers clear operational efficiencies, while CATI reduces the possibility of major loss and increases programmer productivity.

IDC's Software Research Group regularly monitors and forecasts IS application development plans. As part of its ongoing research, a group of 100 large IBM IS managers was recently surveyed. IDC discussed the users' application development environments and their plans and expectations for application development installations. Their responses, in combination with additional IDC user information, can be used to construct a typical IBM mainframe development installation.

Application development staffs at IDC survey sites range from 10 to 400 programmers, with an average of about 50. The average site programming budget is about $3 million. Using typical budget ratios, it is reasonable to estimate that the data processing budget at this average site will be in the $12 million range. This budget represents typical expenditures for a corporation with total revenue of approximately $500 million.

CASE users and vendors offer a broad range of estimates for sustainable productivity increases associated with CASE implementation. IDC estimates that new application development at large mainframe sites currently represents about 40% of total programmer effort. Total programmer expenditures for new application development would be about $1.2 million at our typical site. The site will probably find that new application development productivity increases by 25% after CASE implementation. CASE, therefore, offers a predictable benefit of approximately $300,000 per year for this shop. The site would also derive substantial indirect benefits from improved maintenance and program quality.

Assume that a specific mission-critical application is tied to 20% of corporate revenue. The mission-critical application at our typical site, therefore, would be integral to efforts generating approximately $100 million per year. In addition to boosting programmer productivity, CATI can help protect that figure from several potential losses.

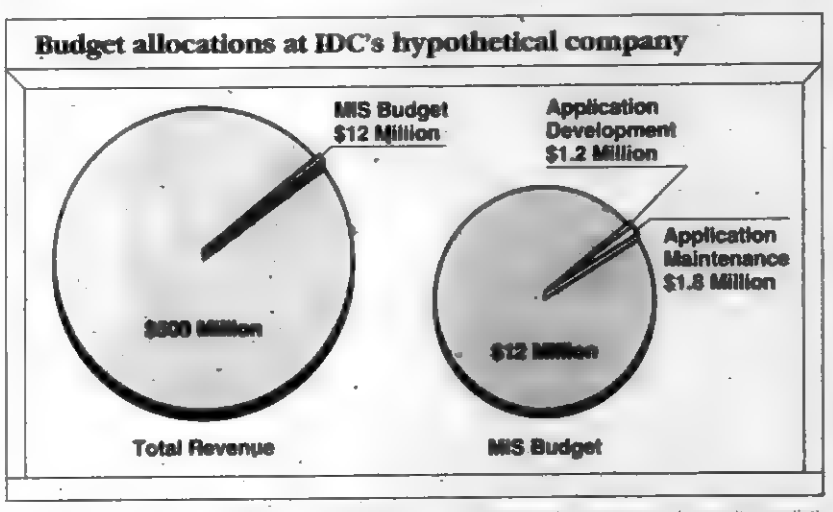
Every hour of downtime costs $2,000 if the system is running 24 hours per day. One day of lost operations per year would represent a total loss of $50,000. More insidiously, a 1% error rate – the equivalent of failing to sell three sellable seats on a 300-passenger airliner – would amount to $1 million per year. Detecting and preventing this error would generate savings equal to three times the expected savings from CASE implementation. With this type of savings, CATI payback periods can be measured in months, rather than years.

WHY DOES MANAGEMENT OVERLOOK CATI?

Today's systems are aging rapidly. This is a result of both business and technology advances. These existing systems are continually revised, and in many cases, completely redesigned and rewritten. The migration from hierarchical to relational database technology is an evolutionary phase that nearly everyone has made. Every effort was, and is, made to affect this process transparently to users. The next step is migrating from the current relational models to object-oriented databases. This step must also be accomplished with minimal impact on users. In order to guarantee this smooth and orderly conversion, the applications staff must have the automated assistance of CATI.

CASE offers clear economic justification in commercial applications – the reduction of existing programmer costs. CATI's benefits are more subtle, but once realized, can dominate those promised by CASE. One way to think of CATI is as an insurance policy. It may be expensive, and it may never be needed, but when it is, the payoff is large. IS setbacks occur in different forms. Some can appear as severe reductions in online system availability. Some will arise when systems experience high-volume peaks. Others will occur when migrating from one system to another. CATI can identify these problem areas before IS implements new applications. Despite these pronounced advantages, bottom-line-oriented top management may be reluctant to spend money on something that may or may not pay off.

Today, justifying CATI must go beyond



In order to illustrate the benefits of CATI, IDC set up a hypothetical company and gave it a realistic budget.

One programmer's phrase even upper management understands.

Ooops.

If you've heard it once, you've heard it a million times. Usually followed by a lengthy technical explanation. But what it all really means, in layman's terms, is problems. Big problems.

And no technical explanation is necessary. Because software program errors are no longer just technical problems. They're *business* problems.

The kind that can turn customers away. The kind that can show up in the papers. Or the annual report.

It's no secret that software development is a complicated and time-consuming process. What's not as well understood is the potential for problem—the long-term impact—of less than thorough software testing.

That's where Compuware comes in. With tools for automated testing, simulating real use, and quickly diagnosing and debugging errors.

Compuware offers your business something you may not expect from technical products. Results.

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the traditional piecemeal approach based only on productivity gained by each testing tool. This is perhaps easier than the detailed and sophisticated risk analysis that is also required. Ever conscious of their own bottom line, IS managers may be reluctant to incur these costs. Corporate line management responsible for financial performance must recognize that it is facing a huge risk by not implementing CATI. Management should work together with IS to evaluate potential losses and justify CATI installations.

WHAT ARE IS SHOPS DOING ABOUT CATI?

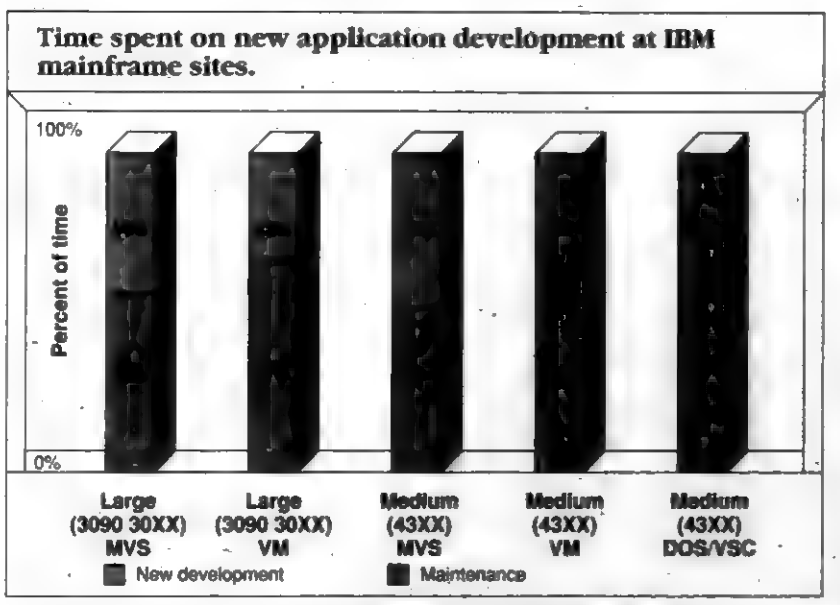
IDC application development survey respondents are typically and firmly stalled in the application maintenance quagmire. Overall, respondents are currently spending almost 60% of total programmer time on enhancements and repair of existing applications. Almost one-half of the respondents indicated that maintenance required 70% or more of their efforts. Despite the claims of CASE proponents, respondents say they expect little change by 1993. Overall, they expect to gain about 3% more time for new application development.

The continuing burden of maintenance and the application development crunch make it difficult for IS management to allocate resources for system testing and evaluation. Respondents' inability to balance their system development life cycles clearly demonstrates this problem. Managers at our survey sites indicate that they are currently allocating slightly over 50% of their total system development life cycles on code generation and program debugging. Less than 20% of total programming time is available for system testing and evaluation.

The number of shops that ignore testing and evaluation, or perform it on an ad hoc basis is alarming. Over 16% of those surveyed do little or no formal testing and evaluation for their new applications. As one industrial user stated, "We do our testing when we have time, or when we are introducing a critical new product. But overall our approach is strictly ad hoc."

Respondents in general report that older CATI tools, including debuggers and online editors, are important parts of their application environments, while newer tools, such as simulation tools and integrated environments, will become increasingly important during the next several years.

The increasing interest in CATI is spurring plans to acquire new tools and systems. Almost 50% of our respondents say they now expect to add new testing and implementation tools in the near future. Even more see a need to add integrated environments.



Maintenance continues to outweigh new applications development at Big Blue sites.

IS plans to install CATI will, in part, reflect the concerns of corporate chief executive officers and board members. The American Airlines problem emerged in a financial review by the board of directors rather than from IS. Financial shortfalls burden line management and corporate executives. They are the decision makers best able to evaluate the requirements for, and the economic viability of, enhanced CATI capabilities.

Survey respondents clearly expect senior management to recognize the need for application testing. The publicity that has accompanied recent system failures should significantly increase the visibility of testing and evaluation efforts.

A BRIEF HISTORY OF APPLICATION DEVELOPMENT

Early software developers in the late 1950s and early 1960s routinely automated manual processes by analyzing the work flow and duplicating the existing processes and procedures with computer programs. The emphasis was on understanding the process and then writing programs to significantly reduce both the time and personnel required to complete the manual processing effort. Little thought was given to process simplification, redundant functions and data, or interfaces to other systems.

The programmer functioned as business analyst, systems analyst, coder, tester and documenter of the system. Often the system design consisted of little more than pencil sketches of the process flow and identification of the programs and files required. The primary emphasis was on developing the program flowchart that explicitly defined the decision logic and actions required by each program in the system. Programming teams were small, typically one to five people, hence communication between team members was easily accomplished.

The Emergence of the System Development Life Cycle

In the mid to late 1960s, as organizations began to develop larger and more complex systems with larger programming teams, they found a need to formalize the system development process. System development life cycle methodologies began to emerge that addressed what steps or tasks had to be done and when, to ensure that the system would perform as required by the user community. Typically, most industrial-strength system development life cycles were broken down into life-cycle phases and tasks that defined the major categories and the necessary steps within each phase. The typical phases were planning, analysis, design, development, implementation and maintenance.

The use of this type of approach was characterized as "bottom-up" or "straight-line" development, as most practitioners fully completed phase 1 and obtained user sign-off before proceeding to phase 2. It was typically not until phase 4, which often

came months into the project, that any programs were written. Then it was necessary to fully develop and test each program, integrate programs into subsystems and integrate the subsystems into the overall system.

This often led to significant delays and frustrated users because bugs in the interface programs and the JCL were not found until late in the project. By then, time was short and most of the budget was spent. As a result of these factors and the lack of automated testing tools, test data development was typically left in the hands of the developers, not the users.

Throughout the 1970s, most corporations continued to focus on formalizing their system development life cycles to accommodate the structured design and programming methods being introduced by DeMarco, Yourdan, Gane and Sarson and their compatriots. These methods focused on specific techniques to develop high-level logical models of the system. Then, through a series of stepwise refinements, these techniques first decomposed the logical model into formal design specification requirements and finally into structured programs.

The use of these techniques gradually led developers to recognize that the programming effort could begin immediately after the system boundaries were set and the overall flow determined. However, getting programmers involved as early as phase 2 on such tasks as coding and testing high-level logic and all system interfaces, led to restructured development teams. More debugging aids were also used as testing was conducted throughout the development process.

In a new twist, many organizations also found that end users could become involved in the development process because of their ability to develop realistic test data.

Offsetting the "Waterfall" Approach

As analysts and designers gradually refined the specifications, program details were added to the skeleton programs already created. This process of specification refinement and programming enabled developers to show users increasingly complete results much earlier in the development process. It also allowed them to elicit user feedback while there was still time to make corrections.

Although this approach alleviated many of the problems associated with the "waterfall" system development approach – wherein work is completed in large clumps before feedback is received – developers were still prone to misinterpret requirements. Even though these misinterpreted requirements were normally found when the next version was demonstrated to users, a need for faster user feedback to control project costs and maintain the schedule became critical.

Rapid-prototyping evolved in the mid-1970s to meet this need. It counteracted the waterfall approach by getting users involved early and often. Now as then, a prototype may be an analytical model, a simulation of all or part of the proposed system, pseudo code or screen/report mock-ups with realistic data. In essence, the prototype is comprised of anything that helps the user and developer more fully communicate about the system to be built.

Also in the mid to late 1970s, fourth generation languages (4GLs) began to have an impact on system development methodologies. Fourth generation languages made it feasible to build a throw-away model that simulated key functions of the ultimate system. These key functions accepted input, produced output and for all practical purposes behaved as the final system for the set of functions modeled.

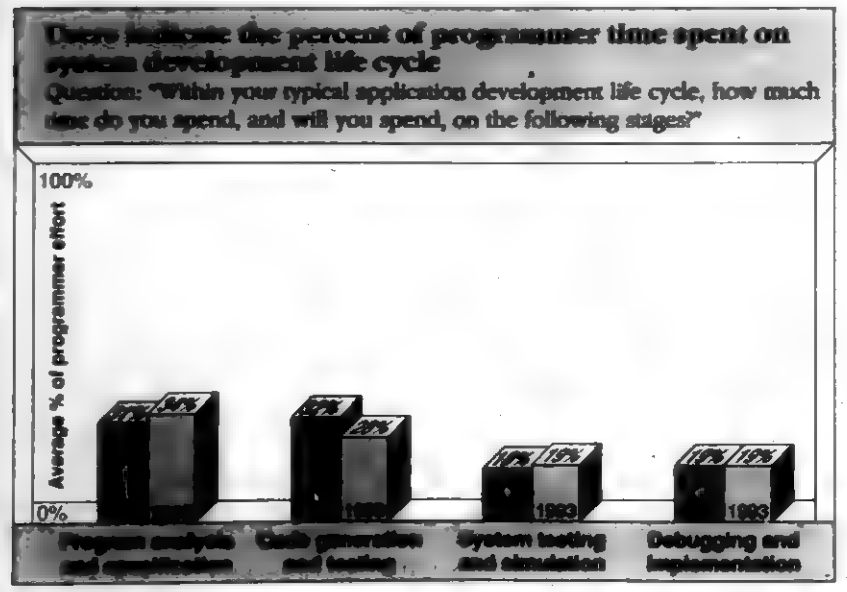
Application generators, or back-end CASE tools, also produced code rapidly. These products enabled developers to implement the rapid-prototyping methodology by rapidly developing incremental versions of a system, reviewing them with the users and incorporating their feedback in the next version. This process was repeated until the system was completed. Developers were in a sense programming in a specification-like language, which significantly reduced the necessary lines of code. Although a few of these back-end CASE tools were available in the late 1970s, they were only used by very early adapters and did not have a significant impact until the early 1980s.

Many prototypes may be built in the process of developing a complex system. Most will be aimed at clarifying/finalizing user requirements. Others may help developers and designers assess database design issues related to the placement of data sets for performance. Or they may define algorithms for complex mathematical calculations, assess final hardware requirements and determine overall system feasibility.

In the early 1980s, front-end CASE tools that performed initial analysis and design became commercially available. They provided graphic interfaces that enabled developers to improve their productivity as well as the overall quality of the development effort.

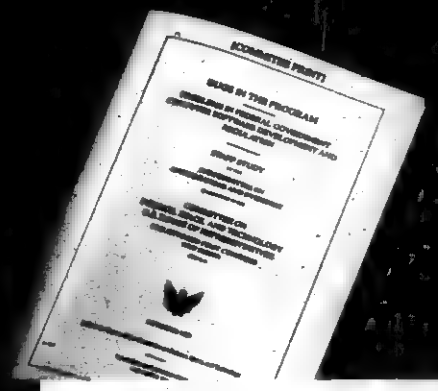
Although these CASE products were introduced with much fanfare, they did not meet with resounding success in the marketplace. Today, only 12% to 15% of mainframe shops are using CASE technology. This lack of market acceptance is primarily due to the failure of the early tools to meet the needs of developers. There are several reasons for this.

First, the tools were primarily focused on new systems development and overlooked systems maintenance. As mentioned systems



Program analysis and specification along with code generation and testing will continue to play prominant roles.

If *they've* issued a report on it, imagine how widespread the problem must be.



The U.S. government recently issued a report on the problems of software programming errors. By doing so, they showed *awareness* of the problem, as well as a *resolve* to do something about it. U.S. businesses have been slow to do either.

Is this just another government report? Is it a problem only the government is facing? Not by a long shot.

Then just how widespread *is* the problem? Is there reason to be alarmed? Only if your company uses any software programs.

If you do, we'll be happy to send you a copy of this government report. Along with some information on Compuware's automated testing tools for software programming.

Then you can learn more about the problem. As well as the solution.

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maintenance accounts for 60% of total man-hours within the average IS shop today.

Further, they did not support tool integration. For example, developers often used one CASE tool for analysis and another for design. And CASE productivity gains were difficult to quantify. Most IS shops did not have an adequate history of performance metrics to quantify and cost-justify the productivity gains from CASE.

Finally, CASE products did not support flexible applications. Developers needed flexible software that could be easily adapted to new technology and new methodologies.

Only recently are CASE products arriving that meet developer needs. Application development frameworks are being introduced that allow developers to integrate the tools from several vendors and perform all of the tasks associated with system requirements, design and code generation.

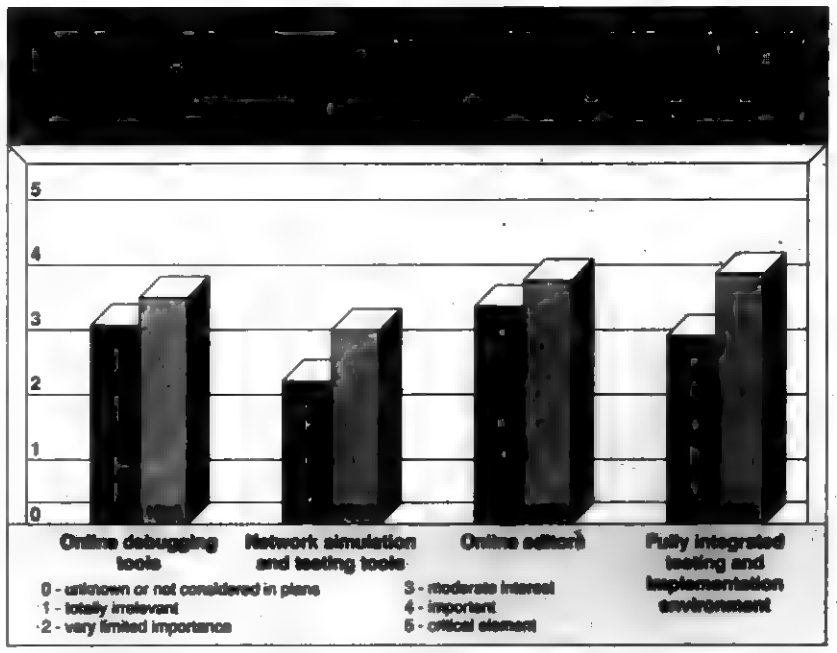
THE IMPACT OF SAA

IBM's Systems Application Architecture (SAA) emphasizes the need for meticulous test and evaluation procedures. SAA codifies IBM's view of the information processing environment of the 1990s by describing how all IBM computers will be able to intercommunicate. One key SAA concept describes distributed- and cooperative-processing environments. It will be implemented in both development and production processing arenas.

Developers working in an SAA environment will use programmable workstations as their primary development tools. However, the actual application development processing may occur on mainframes or servers connected to the developers' workstations. In order for this scenario to become reality, testing and debugging tools that are supported on all SAA platforms must be developed.

In the SAA world, users may enter their requests from a workstation running under OS/2. The requests will then be routed through a Unix server and transmitted via a Systems Network Architecture (SNA) network to a remote mainframe. It is unimaginable to think that anyone could design, develop, test and implement a quality application in so complex an environment without CATI.

Today, virtually all system failures can be traced to software, hardware or communications sources. Cooperative processing complicates these problems beyond simple comprehension. Software, hardware and communications are joined by the synchronization of data at the mainframe, server and workstation levels. Again, realistic problem resolution will not be possible without CATI.



Users indicate a clear, if gradual, movement toward integrated CATI.

LEADING-EDGE USERS

CASE and CATI are coming of age at about the same time. Leading-edge users are just beginning to realize the potential benefits of CATI tools. However, the situation is changing. Results from IDC's survey indicate that 60% of respondents will have some form of CATI installed by 1995.

We asked three leading-edge users to describe their experiences and help us convey the actual impact of CATI tools in their environments. These users represent a broad cross section of CATI users. The first user experienced significant programmer productivity gains in addition to increasing system availability dramatically. The second user used CATI tools to facilitate a major hardware/software conversion effort and retained the tools for application development. The third user determined that CATI tools offer a documented, supported alternative to internally developed utilities in a distributed application development environment.

Peerless Insurance Company

Peerless, a subsidiary of Nationale-Nederlanden North America, is an insurance company with offices in Keene, N.H. It is an IBM 3090 shop, which recently upgraded to a 3090-180E. Peerless handles most traditional insurance applications, including policy management and claims disbursal. It has experienced some normal problems with system availability. One problem in particular plagued the draft-processing program, which dispatches payments to claimants. As Russ Burns, systems consultant notes, "This is the type of application that generates a lot of heat when it goes down. Not much light ... but a lot of heat."

Peerless installed CATI tools to deal with these kinds of seemingly trivial problems that nonetheless were very difficult to pin down. Before CATI, IS was running at about 98% availability, with CICS regions going down approximately once every two weeks. Based on initial investigation and educated guesses, IS expected to find that 50% of the downtime resulted from storage violations under CICS. The group thought its CICS programs were looking for information that was either in the wrong place or the wrong form.

Peerless' management decided to bring in CATI tools to trap these storage violations. Storage violations are difficult to detect because they often lie buried in the logic of complex subroutines. They can be unearthed with storage violation trapping. This process traces the errors and pinpoints the errant code lines. The time-tested and highly unpopular alternative involves reading dumps that describe CPU memory contents.

Burns and other managers also recog-

Some companies spend more time planning for office parties than for devastating software crashes.

It's a rare company that doesn't spend weeks, even months, planning office soirees. And yet few companies devote the same energy to anticipating software problems that could quickly take them out of the party mood.

Why? It could be that time and other factors form a perceived barrier to thorough software testing. But the potential for problems from less than thorough testing is well known: a *single* software error can have serious effects on a company's business.

Compuware's automated testing tools for software programming work to eliminate these problems in a variety of ways. But they will only do so if they are a *planned* part of the testing and implementation process.

Plan to have Compuware get involved in your next project. Then, the only crashes you'll have to worry about are people who crash your office parties.

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nized that in addition to trapping storage violations, CATI tools would improve application programmer productivity. They knew these productivity gains would be icing on the cake if they could cost-justify the new software based on increased availability. Their calculations indicated that they could justify the software acquisition if the tools helped programmers find half of their storage violations.

"The hard justification would follow easily from increased availability," Burns notes. "Based on the hourly cost estimates we used for planning, we estimated that eliminating 25% of our downtime problems would result in a payback period of less than 18 months."

Their estimates proved to be conservative. Peerless programmers were able to identify storage violations that generated virtually all of the CICS region downtime. The problems were relatively simple. In one case a program placed information in a specific position and passed the address to another portion of the program. Unfortunately, still other parts of the complex program overwrote the information before it could be used. This and other storage violations were sometimes painfully obvious once the CATI tools highlighted problem sources. Without CATI, the best programmers may never have found the problems in the briar patch of assembler language code.

The fixes indicated by the CATI products increased availability to over 99%. The savings in CPU time alone justified their acquisition in less than six months. The fringe benefits, including better production programs, fewer production problems and increased application programmer productivity, continue to accrue for Peerless. "This was the best software acquisition decision we ever made," Burns declares.

IDC asked Burns which CATI features mattered most to application development programmers. He mentioned three. "First, application development programmers need source code-level debugging to facilitate corrections. Second, they need the ability to trap storage violations within macro assembler. And third, they need a user interface that's easy to learn. Our people who were used to CICS debugging were very pleased with our acquisition."

The bottom line, however, focused on availability and user issues. "The biggest impact of our acquisition was on our user clients," Burns says. "They saw better than a 50% reduction in downtime. And we save directly on system cost. A CATI purchase should be easy to justify to management based purely on hard dollars associated with availability without resorting to claims of increased programmer productivity. You can home in on the problem without tons of paper."

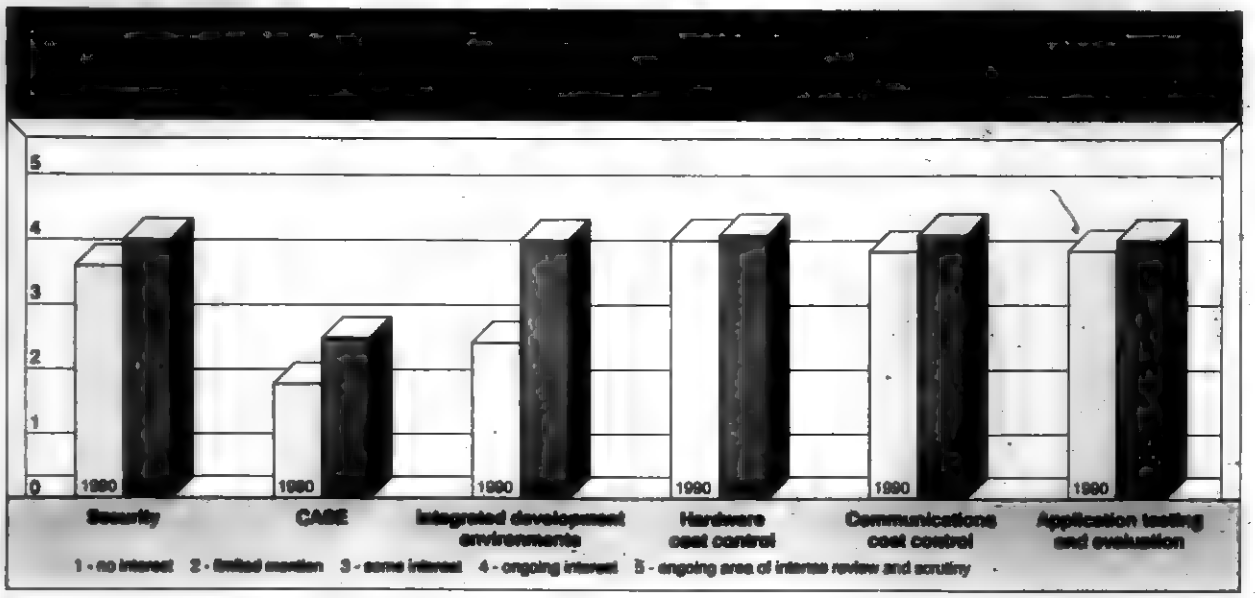
In mid-March 1990, the data center resources from Nationale-Nederlanden North America were consolidated in Indianapolis, Ind. While a significant portion of the application development staff from Keene was relocated to the new information home, a core application development group remained to supply local support. CATI tools have become increasingly important to this staff, as it will not have continual contact with a large number of associate developers.

Federal Home Loan Bank

The Federal Home Loan Bank (FHLB) concentrates on relatively low-volume/ high-value transactions. It was previously running check processing on several Burroughs systems at regional sites. IS developed software centrally and downloaded to remote systems. However, increasing loan volumes led the bank to a central IBM system linked via channel connect to check processing systems at the remote sites. The migration to IBM also led to changes in testing and implementation strategy.

According to Jerry Bassett, FHLB vice-president of MIS, "We recognized early in the planning stages that we would be moving to a very different testing and debugging environment. Our programmers were comfortable with the Burroughs environment, which provides considerable support for application testing and debugging. The IBM environment is quite different. We decided to use CATI tools as an alternative to working our way through the dumps from IBM."

CATI tools represented a key part of the bank's migration process. It had a relatively small application development staff, which was introduced to the IBM system and JCL. Several additional programmers came on board to handle some of the IBM system's



Users anticipate more top management interest in application testing and evaluation than they do in CASE.

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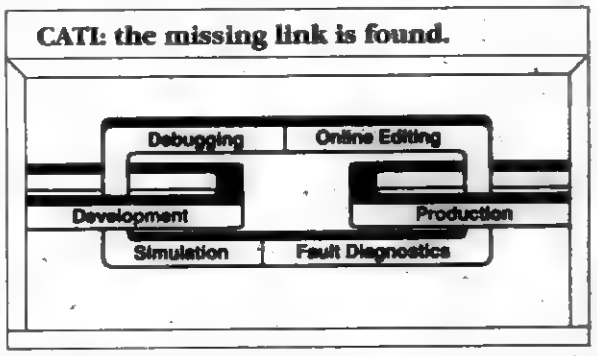
quirks. Testing tools significantly simplified their tasks.

The selection process was straightforward. The bank brought in the major contenders and quickly evaluated each product. Staff members were familiar with the products and reached a consensus on specific tools. FHLB also looked at larger, more complicated application software packages with some built-in assistance but decided that smaller was better for its needs.

The transition period went smoothly, although some programmers found the IBM environment difficult and cumbersome at first. Ultimately, however, they came to appreciate the greater power and flexibility at their installation.

The FHLB staff migrated 18 major systems onto the IBM hardware, working primarily with VSAM files and making extensive use of CATI tools. The staff complemented the testing environment with traditional parallel runs and test periods, permitting a final migration of all 18 new software systems in one day. As Bassett says, "We would have made it without the tools, but we wouldn't have done it in the same time frame."

CATI: the missing link is found.



Debugging, simulation, fault diagnostics and online editing are the key building blocks of CATI.

Boise Cascade

Boise Cascade offers a third perspective on the benefits of CATI. The company maintains a highly distributed application development environment. Central facilities provide support, training, consulting and new product evaluation for the distributed application development centers.

Programmers in the application development centers developed numerous utilities over the years. However, maintaining and documenting these utilities represents a significant problem. The programs offer various types of interfaces, including control cards and switch codes. Users must remember multiple interfaces and operating characteristics.

CATI offers the benefit of a single consistent user interface. Existing products also provide active vendor support and strong documentation. These latter qualities become even more important as Boise Cascade evaluates strategies for implementing the integrated approach of AD/Cycle.

The decision to install CATI tools was easy. According to Gerry Hough, lead programmer analyst, "We do not require extensive cost justification. We work by the seat of our pants, allowing us to use our collective experience and judgment to determine if specific software packages are worthwhile. Those of us who have been here long enough know."

Hough's staff set up procedures for users who were accustomed to specific capabilities in the old utilities. Application development programmers are now actively using the new tools. "We see lots of demand for resources to handle the utilities," Hough says. "This is one product that just serves their needs. And the vendors provide support and documentation."

Hough reports he realized significant savings during a recent conversion. "It happened that I was doing both the conversion and the evaluation, so I knew the product from both sides. We saved many hours during that particularly huge conversion job."

Boise Cascade still sees additional requirements. In particular, the company is interested in obtaining CATI capabilities on PC development systems. "We need to be able to develop and test using mainframe-size file structures. The lack of test file manipulation facilities and LAN change management control products is slowing our move to PC development platforms," Hough notes.

MANAGEMENT RECOMMENDATIONS

The overnight batch system of 10 years ago could easily absorb errors and ad hoc testing, evaluation and debugging operations. The networked online transaction processing systems that form the core of applications in the 1990s are far less tolerant. Errors that meant long night hours for systems programmers in the 1970s may mean millions of dollars in lost revenue in the 1990s. Corporate management must respond to the obvious economics of enhanced testing and implementation tools.

It must also recognize that CATI offers positive competitive advantages in addition to reducing the impact of problems. Systems that sustain unexpected loads through testing and planning can provide significant corporate advantages. How can management gain access to these benefits? There are several steps:

- Review your planned and installed mission-critical systems. Be sure that you and your board of directors understand the extent to which you rely on specific systems for the ongoing operations of your corporation.
- Evaluate the cost of downtime. Develop a clear, although not necessarily exhaustively detailed, concept of your financial loss if your systems are unavailable.
- Evaluate the cost of possible errors. What will your company lose if your systems sustain a 1% error rate?
- Develop a methodology for identifying possible systematic errors. How would you know if your system errs significantly? You should identify conditions that indicate potential problems. Many large shops have installed, or are installing, executive information systems that alert senior management to problems by department, operating group or functional activity. Recognize that mission-critical applications are as important as physical production processes. Develop the same types of alerts and exception reports for your systems.
- Ensure that IS recognizes the importance of thorough testing and evaluation – and provides the state-of-the-art tools for required monitoring performance.

Complex information systems will determine the ability of today's corporate leaders to deliver the quality their customers deserve and the profits their boards demand. However, increasing corporate reliance on these systems, and exponential increases in their complexity, are exposing these corporate leaders to tremendous financial risk from catastrophic system failures. IS executives must remain vigilant in their efforts to minimize these risks.

CATI provides a powerful weapon in the battle against system failure. Integrated testing and implementation tools complement emerging CASE technologies. They accommodate the mandates of SAA by easing the introduction of cooperative processing. And they are critical in large open systems environments. The next 10 years will reward leaders with strong development plans. It will deal harshly with the timid who procrastinate.

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COMMENTARY

Patricia Keefe

Not quite a landmark

Just a blip on the legal screen? Many copyright attorneys said they think U.S. District Court Judge Robert Keeton stuck to the middle ground in his decision against Paperback Software International and so are unwilling to grant the ruling "landmark" status.

"If he had ruled against Lotus, it would have been shocking," said attorney Lee Gesmer, a partner at Boston-based Lucash, Gesmer & Updegrove, which also publishes the "Technology Law Bulletin." "But he did the easy thing." Gesmer said that Keeton's 115-page ruling gives Lotus the foundation on which to sue competitors who copy, to a greater or lesser extent, the structure or sequence of its menu.

Meanwhile, Gesmer suggested that it would be a "smart thing" for Borland International to discontinue its Lotus 1-2-3 menu option until the copyright infringement suit is settled. Every copy Borland sells with that option could put profit into Lotus' pocket *if* Lotus wins, he pointed out.

To drop the option isn't necessarily admitting any wrong-

Continued on page 61

Users stick with diehard 286

Low price keeps 286-based machines selling, despite lack of power

ANALYSIS

BY RICHARD PASTORE
CW STAFF

If Bruce Willis is unwilling to star in a *Die Hard III*, Hollywood could cast the 286 chip in his place. The Intel Corp. microprocessor has been knocked out of the limelight and kicked around for more than a year, but it keeps on fighting and winning users over.

For the month of April, five of the top 10 best-selling computers sold through U.S. computer specialty stores were 286-based, according to Storeboard/Computer Intelligence in Dallas.

Why are so many people still buying the relatively slow 286? A lot of users simply want a bargain or cannot afford to pay more for power they do not yet need, said Dan Ness, personal computer analyst at Computer Intelligence in La Jolla, Calif.

Users validated the point. "As long as IBM makes the price attractive, and I have a limited number of dollars to work with, we'll continue to buy" 286-based business systems, said Tim Thompson, senior PC analyst at St. Mary's Medical Center in Evansville, Ind.

While the price of desktop PCs based on Intel's 80386SX chip has come within $200 of the cost of 286 boxes, the difference can add up. "If you're buying 5,000 of them, the nominal price difference can be an important factor," Ness said.

"You can pick up some of those [286 workstations] for around $1,000, so it's a very economical purchase," said Jane Kosek, microcomputer manager at Dekalb-Pfizer Genetics Corp. in De Kalb, Ill. Though the company has standardized on 386 technology, it is considering 286s to replace minicomputer dumb terminals. "These are for people who have never used a PC and only do word processing. We don't think they need anything more powerful," Kosek said.

286 justification

Applications such as word processing and simple spreadsheets are justifying 286 purchases in many companies that prefer to buy 386 CPUs.

"For those kinds of uses, it's a perfectly adequate machine," said Agnes Bacon, PC coordinator at the Cleveland Clinic.

To a limited extent, vendors are still paying attention to the 286 market. Even high-end champions such as Compaq Computer Corp. still offer a limited number of 286 machines, including a new model introduced this spring.

Zenith Data Systems has not totally written off the market. Two weeks ago, it unveiled a 286 desktop PC that can be upgraded to a 386SX [CW, July 16].

Zenith cited research that says 7 million 286 boxes will be sold worldwide this year.

"Anything that has that much volume is certainly still a viable market," said product manager Rusty Graham. "I see the 286 being the highest selling computer for the next couple of years" before the 386SX surpasses it.

In addition, at least 4.5 million 286s are expected to sell yearly through 1995, Graham said.

"It will still have a viable life," he added.

Dell Computer Corp. Chief Executive Officer Michael Dell said the 286 could be a hot seller at the right price. "If we get the 286 machine under $1,000, it becomes a throw-away item. Like a telephone, they'll buy it for everybody."

Yet many manufacturers are not putting their desktop development dollars where their mouths are. A Zenith spokesman said the new machine will likely be its last 286 developed for the desktop. NEC Technologies, Inc. is concentrating development efforts on the 386 and SX areas, not the 286, according to David Middleton, manager of PC product marketing.

The 286 "is a cash cow, and vendors want to milk it for what they can while it's still around," Ness said, referring to the lack of new development.

Street prices for 286 desktop PCs will continue to drop, analysts said, making the boxes even more attractive in the near term. But observers anticipated that the eventual rise of 32-bit applications will deal a final death blow to the desktop 286.

"The motivating factor is new software that uses the 386 memory-handling capabilities" such as Microsoft Corp.'s Windows 3.0, said Phil Mooneyham, microcomputer technician at Emerson Electric Co. Industrial Control Division in Santa Ana, Calif. The company stopped buying 286s three months ago, he said.

The portable computer arena will serve as a rest home for the chip for at least a couple of years after it retires from the desktop, observers said. "The portable tends to lag behind the desktop market, so for most applications the 286 is sufficient," a Zenith spokesman said.

Notebook-size PCs may be the final refuge for the 286, because the extremely small form factor and price pressure preclude the use of more advanced processor-based technology for the near future, observers said.

Where the chips fall

Despite gangbuster sales growth of Intel's 386SX, 286 unit sales will still predominate, according to a survey of buying intentions

Source: Computer Intelligence — CW Chart: Paul Moch

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2. Ability to meet needs and fit habits of skilled programmers (1.00)	10
3. Suggested integration of tools (1.00)	9
4. Quality of documentation (0.97)	10
5. Quality of support for enhancing applications on PC-based COBOL implementations (0.97)	9
Weighted Score	9.6

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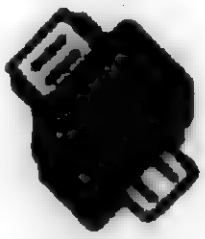

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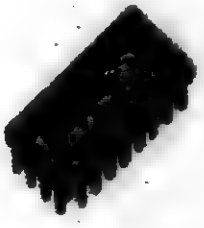
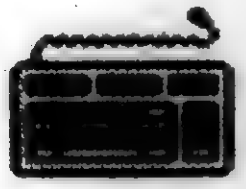


386 Enhanced

International



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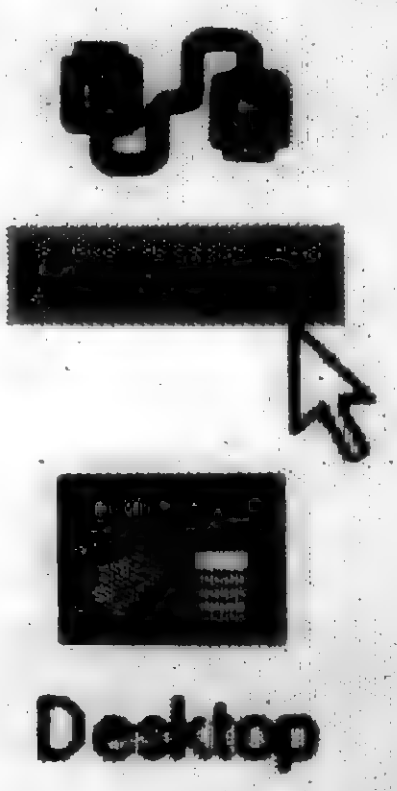
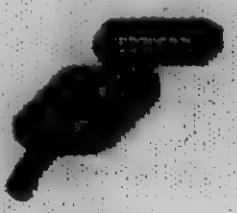


Desktop



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New York's fare-card system to stop foul play

ON SITE

BY RICHARD PASTORE
CW STAFF

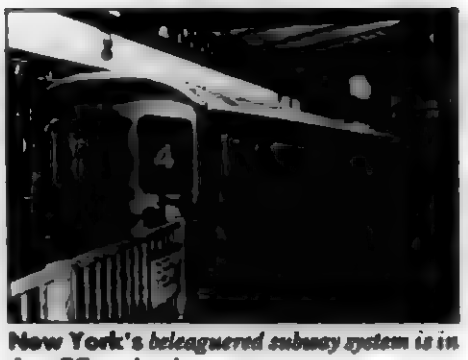
NEW YORK — "Token-sucking" is the latest scam New Yorkers have adopted to cheat the subway system. The thief wedges a piece of paper deep into the turnstile token slot and then uses his mouth to suck out the $1.15 tokens that passengers deposit in the jammed slot.

This revolting ploy, as well as the more serious token-booth robberies, should become a thing of the past after a personal computer-based fare-card system replaces the old token-based operation. This and several other PC applications are part of the New York City Transit Authority's long-range plan to derail its minicomputer infrastructure in favor of mainframes and decentralized, distributed client/server computing.

"We have eight different minicomputers," said William Heuser, vice-president of the information services division. With so many minicomputers from different manufacturers, "we have a difficult time moving data from one system to another," he said.

The goal is to migrate minicomputer applications to networked PCs or mainframes as appropriate and develop new applications to run on PCs and servers.

One of the newest applications involving PCs is the Gateways program, a six-year conversion plan that will have all New York public transit riders paying fares with magnetically encoded cards rather than coins or tokens.



New York's *beleaguered subway system is in for a PC overhaul*

New CPU-outfitted turnstiles and fare-card vending booths will accept and issue the plastic cards. Intel Corp. 80386-based PCs will collect fare data from up to 100 turnstiles and vending booths at each of 440 subway stations.

The 386 boxes will in turn upload the fare and ridership data in 5- to 15-minute intervals to a host Digital Equipment Corp. VAX, which will generate reports of passenger flow and fare totals. The Authority chose this multitiered system to ensure that communication failures on any particular tier would not bring the whole transit system to a screeching halt.

The card system offers several advantages over the tokens, according to Richard Trenery, assistant vice-president and manager of the project.

"In a token-based system, there is no data collected," Trenery said. "With the electronic turnstiles, we capture data on passenger flow, which we can use to optimize scheduling."

Savings on token manufacturing and handling costs combined with the reduced possibility of fare cheating and robbery will pay for the $700 million Gateways program in four years, Trenery said.

Another PC system in the making is the Rapid Transit Operations Decentralization Network, a series of three local-area networks linking 200 PCs. The LANs will be up and running by the summer of 1991 at each of the Authority's three independent subway organizations.

Train dispatchers will initially use the PCs to enter and update operators' route and scheduling information. Currently, driver routes and schedules are drawn up four months in advance and entered into a centrally located Prime Computer, Inc. 6350 minicomputer. Updates and changes take about four weeks to print and distribute to all the stations.

Under the present system, "By the time the dispatcher gets the computer printout, the schedule is three months old," explained Karl Klass, senior director of strategic planning. Resignations and vacations occurring within the lag time have been known to cause last-minute pandemonium at the stations, he said.

The decentralised LAN system "allows the computers to be where the action is," Klass said. "The best way to run efficiently is with decentralised systems."

Costly venture

Over a five-year period, total cost for the program ($5.4 million) will exceed expected total savings payback ($4 million).

"We're spending more than we're getting in the short term," Klass acknowledged, "but we're setting the framework for the future and improving the way we run our business."

Other PC applications already in place include a database containing information on the subway system's tracks and switches — repair histories, incline grades and type of steel used in particular rails, for example.

With the database, engineers can determine which sections of rail are ripe for repair. For example, the historical data reveals that one straight track on the Broadway line has not been repaired since 1936.

Previously, there was no systematic record of this information. Rail repair histories primarily resided in the memories of veteran track engineers, according to one subway official.

"Having it down in a computer database is a much more well-organised way of doing this," said Roger Hughes, manager of planning and information systems for track construction. "It gives us the ability to plan more than a year ahead."

Low-cost accounting tools begin to catch on

BY PATRICIA KEEFE
CW STAFF

"Good stuff cheap."

That's a marketing pitch just waiting to be co-opted by a growing raft of developers of low-cost accounting and financial software trying to attract both the bean counters and the number crunchers in Fortune 500 firms.

There was a short-lived trend about two years ago, when many of the leading software vendors, particularly in the database segment, hiked prices up 5% to 10%. There were some developers who were hoping to make a killing with high-priced OS/2 versions of their packages, but that market never took off.

More recently, Borland International took a page out of the price wars that have been decimating some microcomputer hardware segments. The firm launched an aggressive campaign that offered users who trade in Lotus Development Corp.'s 1-2-3 spreadsheet a copy of Borland's Quattro Pro for $99. Borland, which pioneered cut-rate pricing, claimed the promotion has significantly boosted its market share and revenue.

Companies such as Lotus and IBM, meanwhile, are making noises about addressing the low end. IBM introduced its Personal System/1 home computer, while Lotus has indicated it will pursue this market via new products and alliances such as its agreement with Great America Software Co.

Price-cutting pioneer

The spate of price cutting, along with the move to embrace the so-called Fortune 2 million, probably amuses Jose Hurtado. He developed Daceasy accounting software in 1985, which gained fame as a robust accounting package for less than $50 at a time when most accounting packages were selling in the $5,000 range.

Hurtado sold his interest in the then-$15 million DAC Software, Inc. in 1987 to found M-USA Business Systems, Inc. Daceasy is now priced at $149. In March, Hurtado introduced Pacioli 2000, an eight-module, network-ready, single-system accounting package that sells for $50. He claimed that Pacioli — named after Fra Luca Pacioli, the 15th century father of accounting — is even more robust than Daceasy and many higher priced systems.

He said his biggest problem lies in surmounting price prejudice: Users assume anything that inexpensive cannot possibly be any good. The product has received glowing reviews.

To hear Hurtado tell it, he can make a reasonable profit selling fully featured software, complete with free technical support, for $50. "The book, diskette, packaging, agreement and brochure all cost $8.50 to produce," he said. Plus, Hurtado is operating on an assumption that happy Pacioli 2000 buyers will bypass discounters and purchase his business forms.

"He's dreaming," scoffed Nancy McSharry, a software analyst at market research firm International Data Corp.'s Mountain View, Calif., office. Mosaic Software, Inc. tried that same tactic with Mosaic Twin, a low-end 1-2-3 clone that it expected would pull in sales for its other, more typically priced packages. It failed to do so, McSharry said.

She urged buyers to be careful. If it sounds too good to be true, it might be that either the support is shaky or that the base package is cheap, but add-ons punch up the price.

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XDB Systems, Inc.

Sun eases DBMS interfacing with new tools

BY JAMES DALY
CW STAFF

MOUNTAIN VIEW, Calif. — Sun Microsystems, Inc. recently moved to stitch together with a single interface the disparate and competitive relational database management system offerings of Ingres Corp., Oracle Systems Corp. and Sybase, Inc.

In other news, Solbourne Computer, Inc., a manufacturer of Sun-compatible computers, offered a new server model that contains up to eight CPUs, and Sun rolled out a series of hardware offerings that increase server performance.

Sun introduced SimplifySQL, a set of software tools that provide a single interface for the three RDBMS applications. Informix Software, Inc. products will be added to the fold by the first half of next year.

Through SimplifySQL, Sun can use the Open Look interface to access and manipulate the databases via pull-down menus and point-and-click mouse controls. In the past, users would often have to memorize and type in sometimes complicated SQL commands, which often differ from one DBMS to the next.

International Data Corp., a market research firm in Framingham, Mass., stated that nearly all Fortune 1,000 companies run two or more DBMS products.

Sun officials said they performed initial product development with Ingres, while Oracle and Sybase provided technical assistance.

Although SimplifySQL could feasibly be used on any non-Sun machine, product manager Jonathan Richards said such use would constitute a violation of the software license.

SimplifySQL is another attempt by Sun to work its way into the hearts of RDBMS users. Sun previously announced its Database Accelerator application, which increases the database performance of Sun's servers by boosting system throughput and cutting response time, particularly under heavy system loads.

Sun officials said that SimplifySQL costs $995 and will be shipped within 90 days.

Solbourne's Enterprise Server is a 40-MHz rack-mount setup that offers both a single-processor version and a dual-processor multiprocessing configuration. The Enterprise Server can be configured with more than 1G byte of memory. Starting prices range from $89,900 for a single-CPU system to $605,000 for an eight-CPU system.

The Longmont, Colo., firm also announced an array of price decreases in memory, CPU board and small computer systems interface disk storage.

Hardware enhancements from Sun included the Network File System-based accelerator board, which increases the number of workstations that can be supported by the Sparcserver 470 and 490 and promises to improve response time by up to 75%. It will sell for $5,995.

A faster version of Sun's standard Intelligent Peripheral Interface disk drive doubles I/O transfer rates from 3M to 6M byte/sec. The price will remain the same, $14,500.

A 128M-byte memory board for the Sparcserver 470 and 490 will sell for $45,000 and will give the Sparcservers up to 672M bytes of total memory. Sun also reduced the price of its 32M-byte memory board from $19,000 to $13,000.

Sun will now include its compact disc/read-only memory (CD-ROM) disk drive as a standard feature on many of its Sparcservers and Sparcstations. The company has also vowed to move all of its software onto CD-ROM by next year.

Full circle for Dbase Mac

TORRANCE, Calif. — What goes around comes around: Ashton-Tate Corp. has sold Dbase Mac, its database software for Apple Computer, Inc.'s Macintosh, for an undisclosed sum to a start-up that includes the product's original developer.

In 1985, Ashton-Tate purchased Dbase Mac from Michael Rossetti, who is now chief technical officer and president of the Software Products Division at New Era Software Group, Inc., a new venture specializing in Mac software that bought the package.

"It [cost] a lot of money — that's all I can say," said Chief Executive Officer Dean Meyer, who estimated Dbase Mac's installed base at about 35,000 users. A Dbase Mac user himself, Meyer said he became frustrated over Ashton-Tate's unwillingness to develop the product further and so initiated efforts to buy the program about 1½ years ago.

By Oct. 1, he said he'll have ported the package over to Apple's System 7.0 operating system. New features will be added so "people will feel that the product, which has been dead a long time, is back in circulation," he said.

A year from now, the product will emerge rewritten in object-oriented C++, sporting a graphical front end and a new name — Nubasemac.

PATRICIA KEEFE

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MICRO BITS

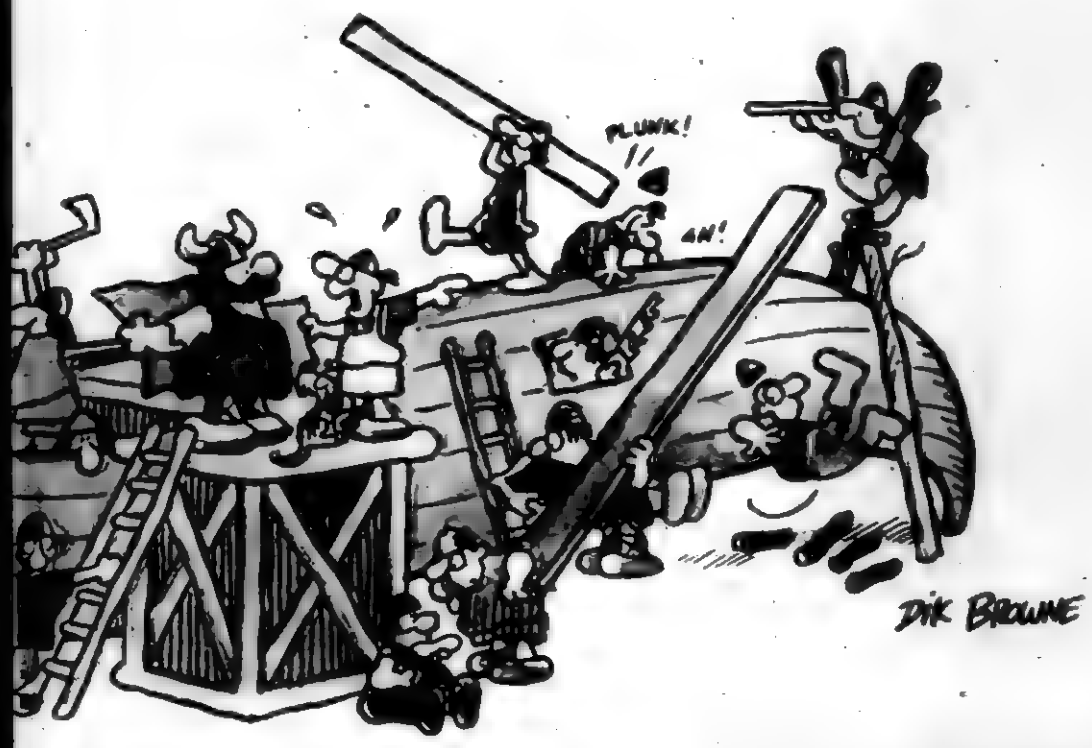
Compuadd to offer dial-a-consultant service

Compuadd Corp. plans to launch on Aug. 6 PC Direct Help, a 900-number support program said to cover IBM- and Apple Computer, Inc.-compatible products. Direct Help extends Compuadd's toll-free service to noncustomers for a fee; the first minute is free, with a $2 charge for each additional minute of consultation. For example, a 10-minute consultation would cost $18, which would be added to the caller's monthly phone bill. Compuadd claimed it should be able to determine within the first minute whether it can help the customer.

Mobil Oil Corp. has selected **Kinetic Presentations, Inc.**'s Words, Graphs & Art presentation software as a corporate standard. Mobil's decision was based in part on two factors: Kinetic developed and incorporated the Mobil typeface into the package, and Kinetic provided a single-vendor solution for both graphics creation and imaging. The software will be implemented worldwide by 374 Mobil automation support managers.

Microsoft Corp. will open an East Coast product support services site this fall in Charlotte, N.C. It will supplement the technical assistance now offered out of the Bellevue, Wash., site, which receives more than 8,000 calls per day. The new center is expected to attract at least 1,500 calls daily, and staffing is expected to hit 150 by the end of the first year of operation.

6000™ family.
will seem downright primitive.



cations from more than a dozen vendors.

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IBM

Keefe

CONTINUED FROM PAGE 55

doing, he added, "so why take the risk?" Especially since Spencer Leyton, Borland's senior vice-president of business development, claimed, "We feel strongly that when people try our menu system, they stick with it."

Borland's attempt to establish jurisdiction in California elicited a shrug from Gesmer. It's unlikely that a California court will issue a different ruling than the one Lotus won against Paperback Software in Boston, he said.

Nothing succeeds like success. Borland's stock took a dive after Lotus slapped the company with a copyright infringement suit. After losing about 20% of its value, the stock was inching its way back up when Borland reported record first-quarter revenue and earnings last week — up 78% from the previous quarter and 192% over the same quarter a year ago. Of course, the seemingly endless $99 Quattro Pro promotion has played a major role here, but at least one analyst thinks that campaign has just about run out of steam.

Calls to Quattro Pro users in the last few weeks revealed some small shops that have moved over from 1-2-3 and would rather fight than switch back. But most users who took the bait bought just a copy or two for evaluation purposes. At $99, why not?

In order to sustain its most recent earnings levels, Borland needs to convince the testers to become loyal users. This means that Quattro Pro has to be better than 1-2-3, maintain Lotus file compatibility and provide an easy transition for users. At least the latter is under attack from Lotus' infringement suit. Borland has gone on the offensive with a spate of newspaper ads aimed at users, which assert right off the bat that "Quattro Pro is radically different from Lotus' 1-2-3. Even if you . . . load the optional 1-2-3.MU demo file."

How to win enemies and lose friends. The most vocal users seem to be coming out against the Lotus copyright infringement suits. Some are so ticked off, they are threatening to ban future 1-2-3 purchases. This is certainly no way to attract potential customers or retain old ones. Most observers said Lotus wins will only impact users in the extreme event that a competitor is forced to withdraw a product from the market. So why the worry? Rick Sherlund, an analyst at Goldman Sachs, suggested that Lotus wins could help lock customers into its products if competitors can't offer similar interfaces.

Silence is golden. The usually talkative Borland Chairman Philippe Kahn has been off-limits to the press since Lotus filed suit. One source told us Kahn has been toning down his devil's advocate role not at the request of his lawyers, but at the bequest of Ben Rosen, now an investor in Borland.

It would seem this strategy forced Kahn to commit the worst faux pas possible during a teleconference with analysts recently — he didn't answer questions. Moderation in all things, we say.

Keefe is *Computerworld's* senior editor, PCs and workstations.

Information centers face change

BY JEAN S. BOZMAN
CW STAFF

SAN FRANCISCO — The information center, as we have known it for the past 10 years, is no more.

Once it was a corporate resource of personal computer specialists, responding to end users' technical questions and providing computer training. But now, calls to an end-user hot line are just as likely to ring at a data center help desk, because many information centers have closed shop, industry analysts at the seventh annual Information Center Conference said recently. The information centers that survive often change their mission, becoming in-house consultants.

The art of supporting corporate end users is changing rapidly, spurred by regional recession, corporate restructuring — and the migration of centralized information centers toward geographically scattered business units.

At one time, there were roughly 15,000 to 20,000 information centers in corporate America, said Naomi Karten, a Randolph, Mass.-based information center consultant to Fortune 500 corporations. Now, no one is sure exactly how many there are, due to geographic scattering of center personnel and the different names by which information centers go. However, they remain an obvious target for the budgetary ax.

"In [economic] tough times, [information centers] are one of the first things to be cut, because it's hard to measure the benefit they provide," Karten said.

The restructuring of large corporations, designed to save money by reducing layers of management, has had a dramatic impact on information centers.

"We're somewhere between the old-fashioned hierarchical organization and the flattened organization," said Kathy J. Welch, director of telecommunications and computer services at Browning-Ferris Industries, a $2.8 billion waste-management firm with 25,000 employees and 400 sites. As a result of corporate change, Welch has moved from information center management into an information systems function.

"I used to manage two [information centers], and they're gone," said Virginia Johnson, manager of staffing and development services at General Motors Corp. subsidiary Hughes Aircraft Co. in Los Angeles. "We've taken a different approach to [information centers], which is to make them based on teams of people with multiple skills." The teams, attached to various business units, meet frequently.

Not dead yet

However, the information center is not dead, Karten said. "The [information center] used to be a physical place, but that changed as personal computer technology infiltrated the workplace in the late 1980s. The [information center] isn't dead, but it is changing. Rather than providing ad hoc, on-the-fly help to end users, it's evolving into a resource that helps business units analyze problems and suggests remedies."

Those who staff today's information center should focus less on being technicians and more on becoming business-unit consultants, said Amy Wohl, president of Wohl Associates in Bala Cynwyd, Pa. They need to think in terms of applications projects that can keep them in business in the 1990s.

"Pick projects that have very high levels of payback very quickly," Wohl advised the hundreds of information center managers in her keynote address. "Management could change, and they may lose interest in your project if it takes three to five years to complete. Make sure the people in your organization support your project and that you have the endorsement of senior management, before you even start your project."

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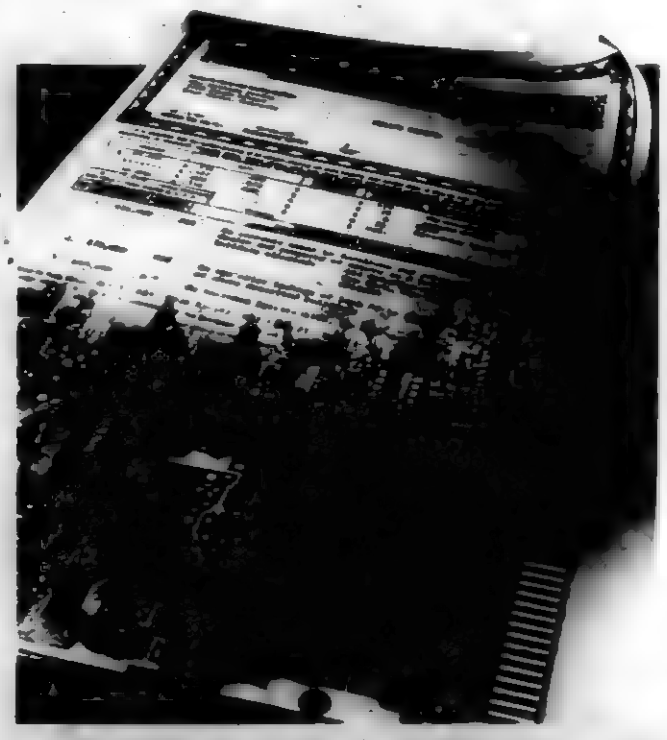

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NEW PRODUCTS

Systems

A 16-MHz IBM Personal Computer AT-compatible laptop system has been announced by Fora, Inc.

The LP-286C includes 1M byte of random-access memory, which can be expanded to 8M bytes, and 20M- or 40M-byte hard disks. The laptop also includes a 3½-in. floppy drive and an IBM Video Graphics Array backlit LCD screen. It features support for as many as 32 gray levels, and its optional expansion chassis allows the computer to take the place of a desktop system, the vendor said.

A 20M-byte hard drive version costs $4,195, and a 40M-byte hard drive system sells for $4,425.

Fora
3081 N. First St.
San Jose, Calif. 95134
(408) 944-0393

Software utilities

Easyshare, a terminate-and-stay-resident program that automates user procedures, such as transferring data by rekeying it, has been announced by Adisoft.

The product can reportedly control complex personal computer-to-mainframe sessions and operates with IBM and asynchronous terminal emulators.

System requirements include 18K to 28K bytes of memory, DOS Version 3.0 or higher and an IBM PC AT, Personal System/2 or compatible. Easyshare sells for $125.

Adisoft
664 Joaquin Ave.
San Leandro, Calif. 94577
(415) 483-5605

grams based on IBM Presentation Manager and most kernel applications, the vendor said.

The product runs on IBM Personal Computer ATs, XTs or compatibles and is being offered on request for no charge.

Elographics
105 Randolph Road
Oak Ridge, Tenn. 37830
(615) 482-4100

Selecterm, Inc. has announced a developer's edition of Microscript, a personal computer-based software package designed to act as an interface for disparate computer applications and systems.

The product reads data from a system's display buffer and writes it to the target system via a keyboard buffer. It can reportedly interface with any application that operates on a PC or that can be made accessible to a PC via terminal emulation.

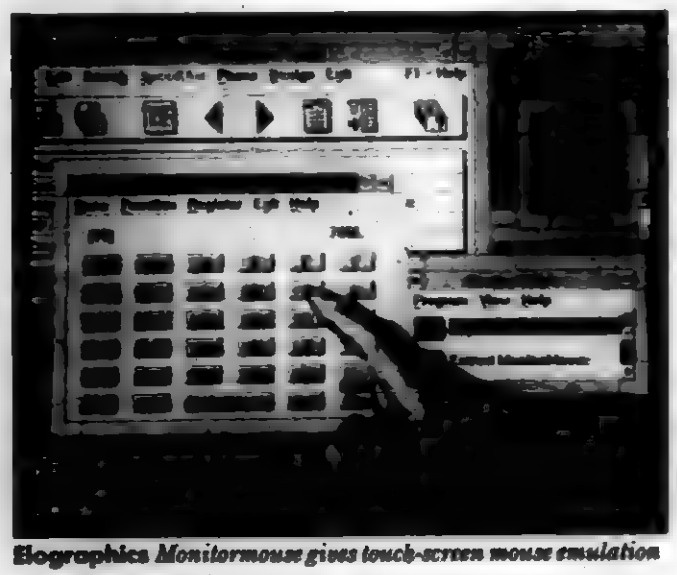
System requirements include an IBM PC AT, XT or Personal System/2 running DOS Version 2.0 or a later version. The price is $1,995.

Selecterm
153 Andover St.
Danvers, Mass. 01923
(617) 246-1300

Macintosh products

A software package that emulates Digital Equipment Corp.'s VT320 terminals on Apple Computer, Inc. Macintosh computers has been announced by Walker Richer and Quinn, Inc.

Reflection 2 Plus for the Macintosh includes a proprietary error-checking file-transfer feature, an easy-to-use graphical user interface that conforms to



Elographics *Monitormouse gives touch-screen mouse emulation*

Elographics, Inc. has introduced a software-based emulator designed to serve as a software driver for users of OS/2.

Monitormouse for OS/2 allows OS/2 programs to accept touch-screen input by emulating a mouse.

It is compatible with pro- Macintosh standards and the multitasking capabilities provided by Apple's Multifinder software.

The product requires a 512K-byte Macintosh Plus, SE, SE/30 or II. It is available immediately for $249.

Walker Richer and Quinn
2815 Eastlake Ave. East
Seattle, Wash. 98102
(206) 324-0350

OS/2 software

A debugger for OS/2 systems has been announced by OS Technologies Corp.

The Universal Device Driver Debugger enables users to troubleshoot device drivers, installable file system drivers and other system software on versions of OS/2 such as 1.1, 1.2 Standard or Extended Edition. It features an asynchronous port and a terminal to debug input and output.

The debugger sells for $249.

OS Technologies
532 Longley Road
Groton, Mass. 01450
(508) 448-3650

Data storage

CPI Industries has announced the Valiant series of disk storage systems for IBM RT workstations.

The series of Winchester storage systems includes the Storage Module Drive and small computer systems interface disk interfaces. All models feature 15-msec minimum access times and disk data transfer rates up to 3M byte/sec. Disk capacities include 374M bytes (R-9003), 689M bytes (R-9006), 820M bytes (R-9008) and 1.1G bytes (R-9009).

The R-9000 models are priced from $5,900 to $14,900. Optional tower or rack-mount configurations are available.

CPI
Suite B-135
11879 Dublin Blvd.
Dublin, Calif. 94568
(415) 829-9462

Pinnacle Micro, Inc. has introduced a 3½-in. erasable optical disc drive that features a 28-msec seek time and 128M bytes of data storage capacity.

The REO-130 small computer systems interface device is available in internal and external versions with interface kits offered for Apple Computer, Inc. Macintosh, Sun Microsystems, Inc., Digital Equipment Corp., IBM and compatible systems.

The drive lists at $2,995, with each cartridge priced at $129. The product is slated to begin shipping in October.

Pinnacle
15265 Alton Pkwy.
Irvine, Calif. 92718
(800) 553-7070

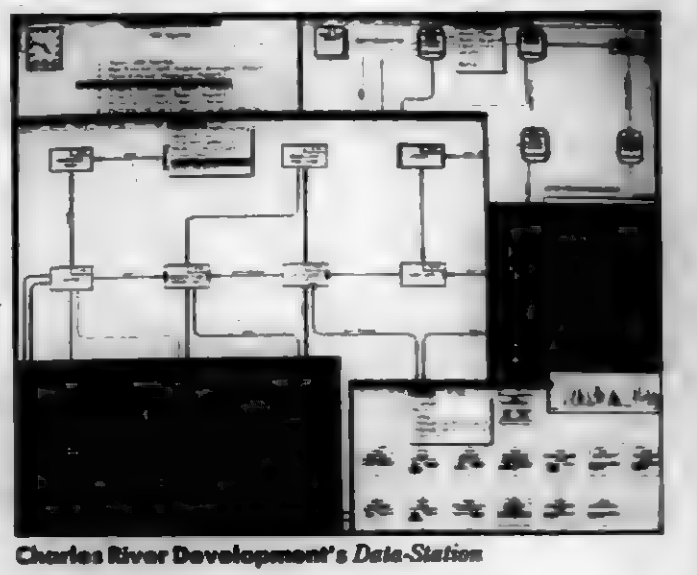
Peripherals

ACC Microelectronics Corp. has announced a single-chip controller designed for manufacturers of notebook-size Intel Corp. 80286- and 80386SX-based IBM Personal Computer AT-compatible systems.

The ACC-2036 chip integrates the logic and performance features of a 286- or 386SX-based system into a 208-pin package. The product supports 386SX microprocessors in pipeline mode at rates up to 25 MHz, and a standby mode allows the system to run as low as 1 MHz, the vendor said.

The chip lists at $100.

ACC Microelectronics
3295 Scott Blvd.
Santa Clara, Calif. 95954
(408) 980-0622



Charles River Development's *Data-Station*

Software applications packages

Charles River Development has introduced Version 2.0 of Data-Station for Sun Microsystems, Inc.'s client/server architecture for PC-DOS and OS/2.

Data-Station is a second-generation computer-aided software engineering tool and host/server dictionary that resides on a host or operates in a client/server mode to support project workstations.

Prices range from $13,400 to $100,000, depending on number of users.

Charles River Development
483 Beacon St.
Boston, Mass. 02135
(617) 424-1820

Minx Software, Inc. has introduced Minxware/RDB, an enterprisewide on-line transaction processing system for manufacturing companies.

The product is based on Minxware MRP II software and database software from Informix Software, Inc. It enables users of Unix workstations to use Informix's application development tools to create simple management reports, ad hoc queries or fully customized executive information systems, the vendor said.

Pricing ranges from $30,000 to $150,000, depending on number of users.

Minx
1762 Technology Drive
San Jose, Calif. 95110
(408) 453-6469

Ashlar, Inc. has announced Ashlar Vellum for Microsoft Corp.'s Windows Version 3.0, a computer-aided design package for Intel Corp. 80386-based personal computers.

Features include the Geometric Inference Engine, an interface technology that incorporates an expert system to create an interactive intelligent user interface.

Vellum runs on 386-based PCs running Windows 3.0 with 4M bytes of memory and a hard disk. It sells for $995.

Ashlar
1290 Oakmead Pkwy.
Sunnyvale, Calif. 94086
(408) 746-3900

Macola, Inc. has released a manufacturing package designed to interface with its accounting and distribution software products.

Standard Product Costing has been adapted to bring the capabilities of Digital Equipment Corp. VAX software into personal computer local-area network environments. The product maintains standard or estimated costs for manufacturing and accounting management.

The product runs on IBM PC ATs, XTs or compatibles with DOS 3.3 or higher. It is priced at $1,595.

Macola
P.O. Box 485
333 E. Center St.
Marion, Ohio 43301
(614) 382-5999

Development tools

Grid Systems Corp. and R2Z, Inc. have announced a software tool designed for use in developing graphical database applications on pen-based computers.

Padbase+ includes a pen interface that lets developers enhance database language applications compiled with Nantucket Software, Inc.'s Clipper database compiler.

The software runs on IBM Personal Computers or compatibles equipped with a mouse and a keyboard. It costs $450.

Grid Systems
47211 Lakeview Blvd.
Fremont, Calif. 94537
(415) 656-4700

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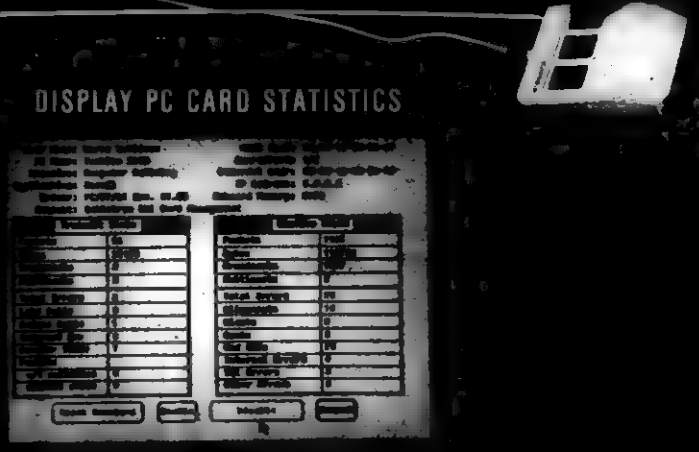


Ethernet *Token Ring*

CIRCLE 205 ON READER SERVICE CARD

COMMENTARY

Joanie M. Wexler

BOC blinders

If I were McDonald's, I'd be a little miffed if Burger King dropped by to borrow a pound or two of ground beef.

This is probably how the Bell operating companies (BOC) feel about the alternative local carriers hammering at their doors for equal access to the local public-switched network. After all, if I had spent a century building and honing my network, I wouldn't be too keen on some upstart strolling in with a pair of wires, hooking into my system and walking off with a chunk of my business.

But what if the alternative carriers are able to recognize demands that the Bell companies — in their complacent, monopolistic frame of mind — haven't gotten around to addressing? Could BOC myopia be limiting customer choices?

Customers are finding today's primary form of alternative local service — fiber metropolitan-area networks — particularly handy for disaster backup. Perhaps BOC customers could benefit if their carriers hooked into the metropolitan-area networks to provide that backup instead of spending millions to duplicate the effort and build

Continued on page 69

POS moves into networked PC era

BY ELLIS BOOKER
CW STAFF

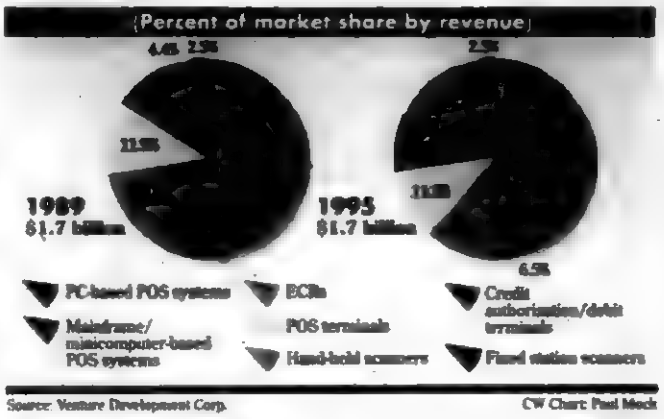
CH-CHING. The sound of an old-fashioned cash register ringing up a sale has become a nostalgic bit of Americana. In yet another sign of the times, retailers are exchanging older mainframe- and minicomputer-based point-of-sale (POS) systems with networked personal computers.

Cash registers — now often called POS terminals — have changed, too. Relatively inflexible electronic registers using proprietary software have given way to PC-based devices that feature large CRT screens, full keyboards and hard disks. Completing the puzzle, the communications links between these newfangled registers and the "in-store processor" are moving toward industry-standard local-area network protocols.

Market research firm Venture Development Corp., based in Natick, Mass., estimated that mainframe and minicomputer systems represented 16.6% of the $1.7 billion POS market last year but that this share will drop to just 6.5% by 1995. IBM held 35.6% of the $673.5 million PC-based POS market last year, followed by NCR Corp. with 23.6% and all other vendors with 27.4%.

PC takeover

Point-of-sale systems based on personal computer technology dominate the POS market



Source: Venture Development Corp. CW Chart: Paul Mock

Continued on page 72

Keep outsourcing control

Merrill Lynch holds tightly to MCI, IBM reins

BY ELISABETH HORWITT
CW STAFF

NEW YORK — Having backed away earlier this year from a $50 million agreement to outsource its network management to MCI Communications Corp. and IBM, Merrill Lynch & Co. is attempting to have its outsourcing cake and eat it too; or, to put it another way, to enjoy the benefits of outsourcing without having to entrust the management of its network entirely to vendors.

Merrill Lynch is accomplishing this through what might be described as a modified outsourcing relationship with MCI, under a $150 million contract signed a year ago. Merrill Lynch handed over much of its long-distance operations to MCI, but maintains an internal staff and IBM Netview system to manage the logical side of its network and to look over the carrier's shoulder and provide input, according to Thomas Byrnes, the firm's vice-president of telecommunications services.

Close interaction has been fostered by physical proximity. During the year-long effort to convert Merrill Lynch's 500 sites to MCI, some 70 MCI people worked on Merrill Lynch's premises, according to Robert Rouse, MCI vice-president of the Merrill Lynch implementation. About 40 MCI people remain at Merrill Lynch to take care of day-to-day operations, he said.

A similar arrangement was made for IBM staff members who work with Merrill Lynch on its IBM systems, according to Leonard Accardo, group manager of information processing at Merrill Lynch's West Street data center.

At a recent meeting with MCI, Merrill Lynch networking and systems executives discussed how they could obtain more direct access to network statistics and other data, partly by tying the Netview system to MCI's network control center, Byrnes said.

In addition, Merrill Lynch is trying to minimize the need for human intervention by commissioning IBM to develop programs that will automatically correlate network alerts, use expert systems to pinpoint the likely source of problems, and respond, Accardo said.

"The network is very complex, and it's impossible for a human to look at all of the connections," he added.

Automated network management is just one of several capabilities that Merrill Lynch hopes to obtain through its modified outsourcing agreements with MCI and IBM. The investment firm's overall strategy, Byrnes said, is to leverage its close ties with the two vendors in order gain the advanced functions it needs, without going through a costly internal development process.

Merrill Lynch is also discussing with MCI the implementation of virtual data networking and Integrated Services Digital Networking services that the carrier has yet to officially announce.

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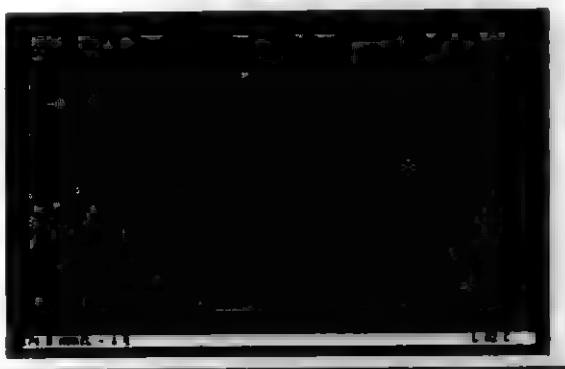
- *user interface*
- *utilities*
- *network support*



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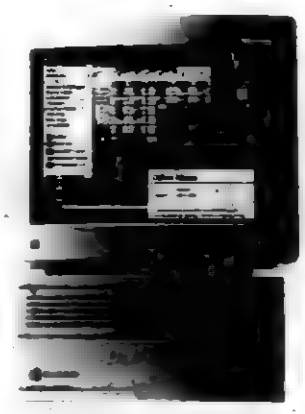

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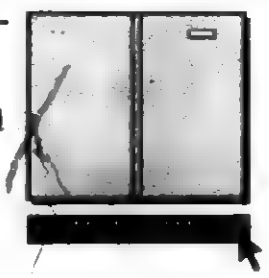

host applications that allow these applications to continue to evolve without modification of desktop software.

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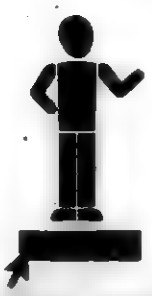

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*PC WEEK, May 7, 1990. **Direct LocalTalk connections dependent on NetWare 386 NLM due Fall, 1990. Macintosh connection achieved today via standard bridges.

DEC to bring Athena from MIT

BY ELISABETH HORWITT
CW STAFF

BOSTON — There is now hope for universities and corporations that have been wishing in vain for a distributed workstation management system just like MIT's Project Athena. Digital Equipment Corp. has been quietly implementing a commercial version of Athena at selected beta-test sites and is now making its products and services commercially available, the company has announced.

Better still, at least a couple of DEC's rivals reportedly have said they will work to implement Athena on their own systems for customers on a case-by-case basis.

Initiated in 1983 and operational since 1988, Project Athena is a joint IBM/DEC effort to design a distributed desktop system that would "improve the quality of education on the MIT campus," DEC marketing manager Barry Braunstein said. Proof of the system's management prowess is that it now supports more than 10,000 user accounts on more than 1,000 workstations, providing services to 90% of the undergraduates and 50% of the graduate students at MIT, Braunstein said. The system and network is managed by a staff of six, he added.

Among the capabilities that the vendors worked to incorporate into the system were support of up to 10,000 workstations, easy access to resources distributed across multiple networked servers, "time-share-quality security" and minimization of costs related to management, maintenance and operation.

Project Athena also sought to keep users' options open regarding the workstations they could choose. Athena is based on industry or de facto standards such as Unix and Transmission Control Protocol/Internet Protocol. The project also generated protocols that the industry has since adopted as standards, such as X Window System and the Kerberos security system.

Proof that Kerberos has fangs: On a campus famous for its computer wizardry, there have been no successful system break-ins.

North Carolina State University's engineering school is one of the sites at which DEC is implementing an Athena system. The sixth largest engineering college in the country, the school has been developing a plan to provide computer resources to students more effectively for the last five or six years, said William Willis, the college's director of computer operations. "When you have 7,300 students, this is nontrivial," he said.

The college evaluated a number of other workstation systems that required "installing a new cluster" and assigning an additional person to manage that cluster "once you got past 30 to 50 workstations," Willis said. "That's not affordable for us."

With Athena, the college found what it wanted: Software to run large distributed networks of computers so that they "looked like a single computer system" and could be managed by a minimal number of people, Willis said. Students can "walk up to any workstation on the network and get to their own files and applications," he added.

The college now has most Athena components up and running, Willis said. DEC's role of tailoring the system to the college's needs has proven critical, he added, because Athena "is not a finished product yet, and there are a lot of MIT-isms in there that don't necessarily apply to us." The school does not intend for its Athena network to be all DEC and has received assurances from Data General Corp. and Sun Microsystems, Inc. that they will "commit resources to porting Athena to their systems, although they didn't say they would sell it to the world," Willis said.

While DEC is targeting its Athena offerings at universities, several businesses have also expressed interest in the system, Braunstein said. In particular, large companies in the aerospace, electronics and chemical industries that "have many workstations and are wondering how to manage them" are strong candidates for Athena, he added.

Network of gods

The sponsors of Project Athena developed a series of modules for managing a distributed workstation environment and named them after various personae from Greek mythology and history. The cast of characters, which DEC plans to move out of MIT and into the public market, includes the following:

- Hesiod (the poet) keeps track of resources and translates a request for a logical destination to a physical location.
- Kerberos (the hound that guards the gates of Hades) prevents unauthorized users from making use of the system and is specially designed to provide security in an environment where many people may be using the same workstation.
- Zephyr (the god of wind) provides messaging services such as club notices, on-line conferences, bulletin boards and systems support notifications. Zephyr also controls access to printer services, keeping track of the number of pages each user prints for accounting purposes.
- Moira (the goddess of fate) is the master database and shell.

ELISABETH HORWITT

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Wexler

FROM PAGE 65

their own fiber networks.

Other competitive customer benefits may include the ability to switch traffic off non-Bell metropolitan-area networks into the long-distance network through the BOC central office. This is currently not happening much because the BOCs already bundle that switched access charge with local transport and switching charges. The alternative carriers maintain that this puts them at a cost disadvantage in supplying any one of those services, because the customer will be duplicating his payment in the Bell bundle.

Switched access to the long-distance network is also an issue because the BOCs are understandably reluctant to collocate competitors' equipment in their central offices and aren't racing to provide an equal quality of interconnection service. Alternative carrier Teleport Communications Group has successfully negotiated interconnections in New York and New Jersey, but the alternative carriers are having to tackle each local BOC and state public utility commission on a case-by-case basis to get the interconnection quality they feel they deserve.

The BOCs are struggling with the dilemma that all computer and networking vendors are facing in an era that has customers hollering for interoperability and ubiquitous connectivity: striking a delicate balance of competition and cooperation. Somehow, vendors must make their products and services more attractive by providing interoperability with competitors' offerings while minimizing the sales dollars forked over to the other guy in the process.

It's a mind-boggling task — and it leaves users floundering amid the politicking and gameplaying that goes on as vendors weigh their vested interests against customer demand.

Competition in the local loop is a complex issue that is not going to be easily resolved. The alternative carriers want to compete on a level playing field. But how much competition or regulation is needed in the local loop to keep the local carriers honest and responsive to customer needs? Do we need Divestiture II at the local level?

The seven BOCs complain that they're already collectively losing about $4 billion per year to "bypass" activity. This figure, however, includes bypass methods provided by the BOCs themselves — such as dedicated T1 links — and applications that were never intended to run through the BOC central office anyway, such as local-area networks.

Alternative carrier Metropolitan Fiber Systems moans that BOC competitors are able to vie for less than 1% of the $25 billion local telephone service market because of the BOCs' lack of cooperation. That doesn't sound a whole lot like competition — but then, how many wires do you need in the street going to the same place?

The BOCs do seem to want to have their cake and eat it, too. They want to enjoy the fruits of their monopoly status — who wouldn't? — but they continue to hound U.S. District Judge Harold H. Greene to let them get into other areas of business, such as manufacturing, long-distance and voice mail services. In short, they want to be deregulated without paying the price.

Perhaps they should pick a priority: Either cling to their monopoly or let up on the alternative carriers and gain some deregulatory ammo for getting permission to expand into new businesses.

Wexler is a Computerworld senior writer.

BIT BLAST

IMC Networks fires latest shot in Ethernet price war

IMC Networks Corp. has entered the Ethernet network adapter card price war by lowering the cost of its Ethernic 8-bit card to $199. The price war was kicked off in May when **Western Digital Corp.** started shipping its 8- and 16-bit Ethernet cards for $249.

BT Tymnet, Inc. said last week that its Tymnet value-added network now provides menu-driven access to more than 850 databases available from 13 worldwide information providers. The vendor said the service triples the information sources accessible to BT Tymnet customers.

Codenoll Technology Corp. has reportedly contracted with **General Motors Corp.'s Packard Electric Division** for the manufacture of Codenoll's fiber Ethernet local-area networks. Codenoll Technology said it expects to transfer the manufacture of its Fiber Distributed Data Interface LAN products to the GM division in the near future.

Polaroid Corp. has announced an agreement with **Nynex Corp.** under which Polaroid will resell Compaq Computer Corp.-based LANs to users of Polaroid's ID-2000 Digital Security and Identification System, and Nynex will install and service the LANs.

Unix server vendor **Auspex Systems, Inc.** recently announced that it has raised $12 million in equity investments and licensing fees from **Fuji Xerox Co. Ltd.** and **Nissho Electronics Corp. of Japan.**

Olicom USA said it retested its 4M and 16M bit/sec. token-ring network adapter cards after the recent **Madge Networks Ltd.** announcement that a faulty Texas Instruments, Inc. chip caused Madge to recall 2,000 boards. Olicom reported that its boards, which also use the TI Falcon chip, still work fine and are running in networks as large as 120 nodes.

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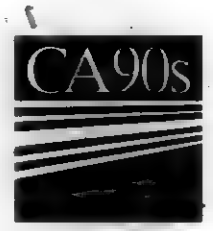

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POS

FROM PAGE 65

One advantage of standard networking and computer platforms is that it makes it easier to combine systems — a necessity in a retail marketplace marked by mergers and acquisitions, according to Steve Johnson, a partner at Andersen Consulting in Chicago.

"The most important trend has been the replacement of proprietary with industry-standard networking," Johnson said. Open architectures not only make "hardware a commodity," he said, they also make a wider array of technologies available to the store.

For example, stores can decide to employ commercial database software or move to more exotic POS concepts, such as the use of handheld, order-entry terminals — connected to the store's POS server over a radio frequency network — that roving salespeople can carry throughout the store to do inventory updates or actually process a customer sale.

Giant retailer JC Penney Co., for example, is revamping its POS system, replacing older checkout terminals and back-office servers at each of its 1,300-plus retail locations nationwide.

Dennis Teubner, manager of store systems support at the company's Dallas headquarters, said the back-room processors had run out of capacity for processing power and disk space, and that "maintenance was becoming a nightmare" when it came to the 10- to 15-year-old POS terminals. On average, each store has 55 registers.

In May, JC Penney announced it had selected NCR for the $45 million POS contract, which includes purchasing over 16,400 of NCR's top-of-the-line POS terminal, the NCR 7052. The 7052 features a complete alphanumeric keyboard, a specialized POS keypad and a 9-in. CRT, and it uses an Intel Corp. 80286 microprocessor.

The terminals are networked over an AT&T Starlan, then routed to PC-based concentrators, which do a protocol conversion to a token-ring network protocol. The token-ring concentrators and the Starlan were necessary, Teubner said, to get past the distance limitation of a token-ring.

Unlike a number of retailers who use a single in-store processor, JC Penney has opted to use two servers per store: one to handle administrative back-office functions and another containing the inventory price database.

This POS processor also acts as a communications gateway for credit authorizations and for connection to one of the chain's three national data centers. Both servers use NCR PCs.

Teubner said he considered Unix networking for the store networks but that "in the multitasking world of token-ring, if you want to expand, you can add another processor . . . and personally I think you can test new applications easier than this in a Unix configuration."

In addition, the NCR 7052 POS terminals include integrated magnetic stripe readers for credit cards and the ability to use bar-code scanners.

Previously, the retailer used OCR-A tags on its merchandise, but the scanning gave only a 50% read rate, according to Teubner. He said the bar-code readers should result in a 98% to 99% accuracy rate.

Teubner also said the fully programmable features of the terminals will make them easier for salespeople to use and that work will start soon on improving what he called the registers' "presentation services."

"Our long-term plan," he concluded, "is to push the interactive query down to the register level."

The deployment of JC Penney's new terminals and servers, begun last year, will be half done by the end of 1990 and finished next year, Teubner said.

Tools of trade

Taking full advantage of the personal computers at the core of their POS systems, some retailers have chosen to use commercial PC software as the basis of their homegrown applications.

Phar-More, Inc. in Youngstown, Ohio, for example, uses a fourth-generation database program from Informix Software, Inc. in Menlo Park, Calif., for its inventory management, videotape rental tracking and register system interface.

"There weren't systems to do the things we needed that we could buy over the shelf," said James Blake, Unix systems programming manager.

The 3-year-old applications, written by Blake's small programming staff, reside on in-store processors — an NCR Tower running Unix — in each of Phar-More's 200 outlets in 19 states.

AIAG drives closer to EDI standardization

BY ALAN J. RYAN
CW STAFF

SOUTHFIELD, Mich. — They may never agree on who makes the best cars, but Automotive Industry Action Group (AIAG) members recently agreed to make the necessary compromises to standardize often used electronic data interchange (EDI) transaction sets in their industry.

EDI specialists from 28 participating companies — including General Motors Corp., Ford Motor Co., Chrysler Corp., Deere & Co., Caterpillar, Inc., TRW, Inc., Allied-Signal, Inc. and 17 truck manufacturers and key suppliers — have been working to come up with ways to bring order to the automotive industry's EDI chaos since early this year.

The AIAG estimated that there are 20,000 suppliers that furnish production parts to the auto industry, and at least 80% to 90% of them are doing some level of EDI with their customers, according to John C. Martin, AIAG managing director.

By eliminating repetitious clerical operations and being able to transmit standardized computer-readable data, auto industry manufacturers and suppliers said they can trim significant "non-value-added" costs from each vehicle.

The auto industry has been moving to EDI — reportedly investing hundreds of millions of dollars in it — since the 1970s, and volume buyers of automotive materials and parts have developed their own EDI methods and imposed them on suppliers. Suppliers have often had to bear the cost of maintaining several different EDI computer systems, according to Michael Gerus, AIAG project team coordinator.

Chrysler and Ford eliminated their proprietary systems in the mid- to late 1980s, and General Motors is moving in that direction. However, there are many variations of the ANSI X12 standards that still create problems for the suppliers, according to Gerus.

Ongoing efforts

Early this year, the AIAG assembled 100 EDI specialists from member companies to discuss the problem. The proposed solution was to standardize EDI systems.

Many AIAG companies believe the entire industry should use standard transaction sets, the specific formatting codes for purchase orders, shipping notices, receipts, invoices, payments and other electronic transactions, according to Martin.

Gathering the member companies was the easy part, Martin said, but "the first meetings bordered on civil war." Agreement was reached on the first two transaction sets and progress accelerated. By the end of the year, the AIAG said, it expects to have published implementation guidelines for 17 high-use transaction sets.

Martin said the difficulty in standardizing is defining the information and terminology to be used. "Over the years, each company has established its own business practices and culture," and changing company culture is not easy, he said.

NEW PRODUCTS

Local-area networking hardware

Integrated Network Corp. has announced a shelf-mounted CSU/DSU system for use in high-density switched and dedicated digital data applications.

The CM-1000 includes a standard VME shelf that can support up to 21 CSU/DSU cards. It also provides dedicated digital service (DDS) CSU/DSU cards equipped with RS-232D and V.35 interfaces to support maximum DDS speeds of 56K bit/sec., the vendor said.

The system is scheduled to be available this month for a list price of $1,175. Switched service CSU/DSU cards are slated for a first-quarter 1991 release. Each DDS CSU/DSU card will cost $850.

Integrated Network
757 Route 202/206
Bridgewater, N.J. 08807
(201) 218-1600

Gateway Communications, Inc. has introduced an unshielded twisted-pair Ethernet local-area network adapter.

The G/Ether-Twist MC adapter was designed to provide efficient data transfer between Micro Channel Architecture-based IBM Personal System/2s and compatibles and an Ethernet LAN.

The product also features 64K bytes of extended on-board memory, drivers for several operating systems and support for Transmission Control Protocol/Internet Protocol, according to the vendor.

The suggested retail price is $460.

Gateway Communications
2941 Alton Ave.
Irvine, Calif. 92714
(714) 553-1555

Local-area networking software

AGE has announced a server that enables IBM Xstation Model 120 terminals to operate with Digital Equipment Corp.'s Decstations running Ultrix.

Xoftware Manager/DEC provides Ultrix users with features of the Xstation 120, including dynamic display configuration and serial and parallel device attachments.

All connections are via Ethernet and Transmission Control Protocol/Internet Protocol interfaces.

A Xoftware Manager/DEC binary host costs $625 for single-user and $995 for multiple-user Xstation licenses. It is scheduled to be available in the second quarter.

AGE
8765 Aero Drive
San Diego, Calif. 92123
(619) 565-7373

Mt. Xinu has announced K-A-Share, a software package designed to convert a Sun Microsystems, Inc. workstation into an Apple Computer, Inc. Appleshare file server.

The product fully implements Apple's Apple Filing Protocol for sharing files among networked Macintosh machines. K-A-Share puts the Appleshare host software in the background of a Sun workstation instead of in a dedicated Macintosh machine, thereby enabling each Macintosh system to be used as a complete personal computer. Each copy of the package can support up to 100 Macintosh systems.

Prices begin at $995.

Mt. Xinu
2560 Ninth St.
Berkeley, Calif. 94710
(415) 644-0146

Datability Software Systems, Inc. introduced a software program that converts IBM Personal Computer ports into terminal server ports to form a PC-based communications server.

Vistaware can reportedly convert any IBM PC or compatible, Personal System/2 or Digital Equipment Corp. Vaxmate system into a high-end dual-protocol local access and transport area and Transmission Control Protocol/Internet Protocol Telnet terminal server.

The product is priced at $695.

Datability Software Systems
322 Eighth Ave.
New York, N.Y. 10001
(212) 807-7800

MANAGER'S JOURNAL

EXECUTIVE TRACK

Raj Gupta was named to the newly created post of director of information management at Leo Burnett Co. in Chicago. He will oversee both the Chicago headquarters and the worldwide information operations at Burnett, which is one of the largest advertising agencies in the world.

Gupta has been at Burnett since 1975, starting as a program analyst in the information services department and then switching to the advertising side of the business, where he worked his way up to account director.

Gupta, 41, holds a bachelor's degree from Louisiana State University, a master's degree from Duke University and a Ph.D. in applied mathematics and electrical engineering from Duke.

First Trust Corp. in Denver has named **Don Skender** director of information services. In his new position, he will oversee the company's computer programming, word processing and computer operations.

Prior to joining First Trust, which specializes in the trusteeship and administration of self-directed individual and business retirement plans, Skender was the manager of information services at a subsidiary of Pulte Home Corp. in Houston.

Skender is a graduate of Austin College and received an MBA from the University of Denver.

Who's on the go?

Changing jobs? Promoting an assistant? Your peers want to know who is coming and going, and *Computerworld* wants to help by mentioning any IS job changes in Executive Track. When you have news about staff changes, be sure to drop a note and photo or have your public relations department write to Clinton Wilder, Senior Editor, Management, *Computerworld*, Box 9171, 375 Cochituate Road, Framingham, Mass. 01701-9171.

Rocketing past political barriers

BY MAURA J. HARRINGTON
CW STAFF

Even on a hot, humid Houston summer day, not a bead of sweat can be found on Lloyd Erickson's face as he strolls calmly about the National Aeronautics and Space Administration's grounds, admiring the enormous rockets on display at the Johnson Space Center (JSC).

"There's something about working here that gives me a special feeling . . . a feeling of being a part of history that makes me feel good," says Erickson, who has been working at the JSC — the U.S. space center for manned operations — for the past 25 years.

Erickson's job does not deal with training astronauts how to live in space, but like the astronauts at the JSC, Erickson spends a good portion of his time trying to communicate with JSC employees here on Earth.

Ralph Penny

NASA's Erickson *envisions expanded implementation of user interface*

A bit of a salesman

Erickson, an elegant southwesterner who is always willing to tell a tale, was not shy about saying that he has "just enough salesman" in him to convince upper management, his peers and other employees at JSC how they can benefit from the use of his newest project, called the Johnson Space Center Management Information Systems (JSCMIS). JSCMIS is a common interface designed for users to access multiple databases seamlessly through the use of IBM's Professional Office System (Profs) electronic mail system.

Although, technically, Erickson's title — electronics engineer for the data processing systems division, Mission Support Directorate at the JSC — doesn't make him an IS manager, he claims that two years on the JSCMIS project has taught him a great deal about being one.

Erickson conceptualized, designed and sold the idea for JSCMIS to upper management. He is also project leader and NASA Technical Monitor for JSCMIS and was responsible for finding the outside contractors for the systems development and research help from the University of Houston-Clear Lake. These are all tasks an IS manager would normally perform, he says.

The JSCMIS program has received favorable reviews from its users, who total about 100 so far, according to Peter Bishop, associate professor and director of the University of Houston-Clear Lake's Space Business Research Center.

"We think we've put ourselves in touch with the people who are using the system," says Bishop, who helped with the project.

However, it has not been easy to win such approval, Erickson says.

"When I told people I was going to build a common interface for access to multiple databases and make it accessible through Profs, people told me I was crazy," he says. Upper management "didn't want to chance anyone doing anything with the system because they were afraid this project might bring the system to its knees."

So far, nothing of the sort has happened, Erickson says. Precautions are being taken so that as JSCMIS becomes available to more users, the system will be protected from a crash.

Ideally, Erickson says he would like to implement his JSCMIS program throughout the entire center, embedding the concepts of JSCMIS into the system to become a JSC standard. But although this goal is feasible technologically, politics and the management structure of the JSC have slowed up the project's success so far, Erickson says.

For each JSC software application,

Continued on page 79

Telecom managers gaining increased stature

BY ALAN J. RYAN
CW STAFF

Managers of information systems, take note: With more telecommunications managers taking responsibility for the integration and operation of both wide-area and local-area networks, they are being elevated to a position equal with IS managers.

According to Arthur D. Little, Inc. senior consultants Michael D. Kennedy and David Rubin, the rise of corporate networking has moved telecommunications from a reactive administrative function into a vital, active operating position that can substantially affect a company's competitiveness and bottom line.

The consultants, writing in an issue of *Spectrum*, published by Arthur D. Little's Decision Resources affiliate, said the new role for telecommunications managers carries an increased responsibility to take an active, visible role in corporate decision-making.

The most effective telecommunications managers will be aggressive innovators who work with unit managers to find productive ways to exploit advances in networking, they said.

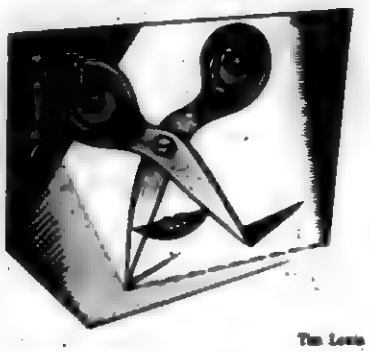
The key to using telecommunications to competitive advantage, the consultants added, is to be certain that the company's networks are as good or better than those of the competition.

To be sure the company remains competitive, the authors suggested that managers classify telecommunications systems into three categories — base, key and pacing — and compare the mix to that of the competition.

The authors said a lot of base technologies indicates a lack of competitive advantage; an emphasis on key technologies suggests that the telecommunications technologies are helping to make the company more competitive, but moving too fast into unproven technologies is not an advantage.

The authors further suggested that managers keep the telecommunications infrastructure costs below the industry average. For example, purchase bulk transmission capacity, which can save 10% to 15% of transmission service costs, and replace obsolete telephone systems, which can save 10% to 20% of telephone system costs.

CLIPS



Tim Lewis

Summaries from leading scientific and management journals

"Requirements for the next generation of DBMS"

By Gordon C. Everest

University of Minnesota
Management Information Systems Research Center
Working paper

■ Networked database management systems and relational DBMS fall short for future computing requirements. There are three areas driving the search for a new generation of DBMS: They must support the data management needs of computer-aided design and manufacturing and graphics applications, they must operate in an open distributed environment, and they must capture more complete semantics of a data structure.

Some of the principles of object-oriented programming show promise in the development of a database structure to meet those requirements. Object-oriented DBMS include the following notions:

- **Object identity.** The ability to distinguish objects regardless of their characteristics or location and to facilitate object sharing.
- **Object typing.** The ability to define new object types and associate objects with one or more object types.
- **Object assembly.** The ability to create arbitrarily complex and dynamic objects from other objects.
- **Inheritance.** The ability to define subtypes and supertypes so that subtypes inherit attributes of their supertypes.
- **Encapsulation.** The ability to define operations associated with an object type.

However, object-oriented DBMSs don't meet all needs for the future. DBMSs must also offer an interface that can manipulate objects in time and space.

"Planning and building strategic information systems"

By John Burch

Journal of Systems Management
July 1990

■ The following are steps to developing a strategic information systems plan:

- Establish IS goals. This step involves the review of company operations, system policies and business plans. There should be a lot of IS and user interaction. The aim is to align business and IS objectives. The idea is to solicit system project ideas from the business and IS side, as well as from outside consultants. Reviewing documentation such as previous systems plans and important memos can help in reaching an IS goal.

This investigative process should help IS to design and implement systems that support the organization's goals, to exploit business opportunities and to follow a systems development methodology that takes users into account and provides status and progress on all new systems projects.

- Elicit and prioritize IS project requests. IS can formulate a method to prioritize system requests. This entails filling out a systems project request form, preparing a systems project request priority worksheet and plotting a systems priority request grid. Requests should be judged on strategic and feasibility criteria. The planning team must judge how well each request is linked to the goals of increasing productivity, enhancing products and service and improving management decision-making.
- Assess IS resources and capacity. IS needs to make sure it has the resources to support current operating needs and take on new projects.

"Legal protection of information"

By Jeffrey A. Meldman

Sloan School of Management
Center for Information Systems Research
Working paper (May 1990)

■ As information becomes more important and relied on more often for business and personal use, concerns over its protection and privacy are cropping up. Legal protection of information finds its foundation in doctrines that have long protected people and their property. Legal protection from computer crime, from patent and copyright infringement and from theft of trade secrets are protections that treat information as intellectual property.

Protection of information as intellectual property can be done through copyright, trade secret and patent. Computer software falls into this category. Copyrights and trade secrets are the most popular forms of protection for software, because they are cheaper and faster to obtain than patents. A plus is that the courts have consistently upheld the applicability of copyright and trade-secret law to software.

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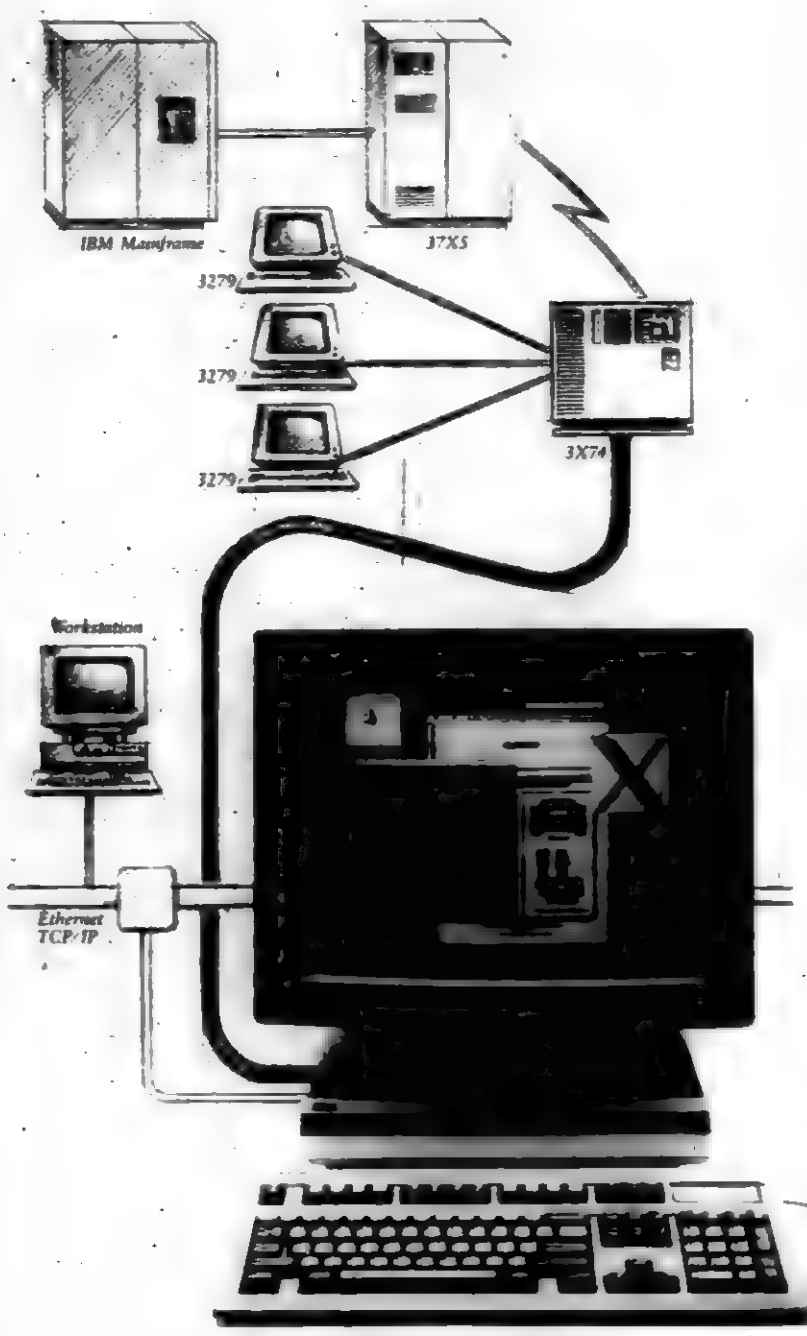

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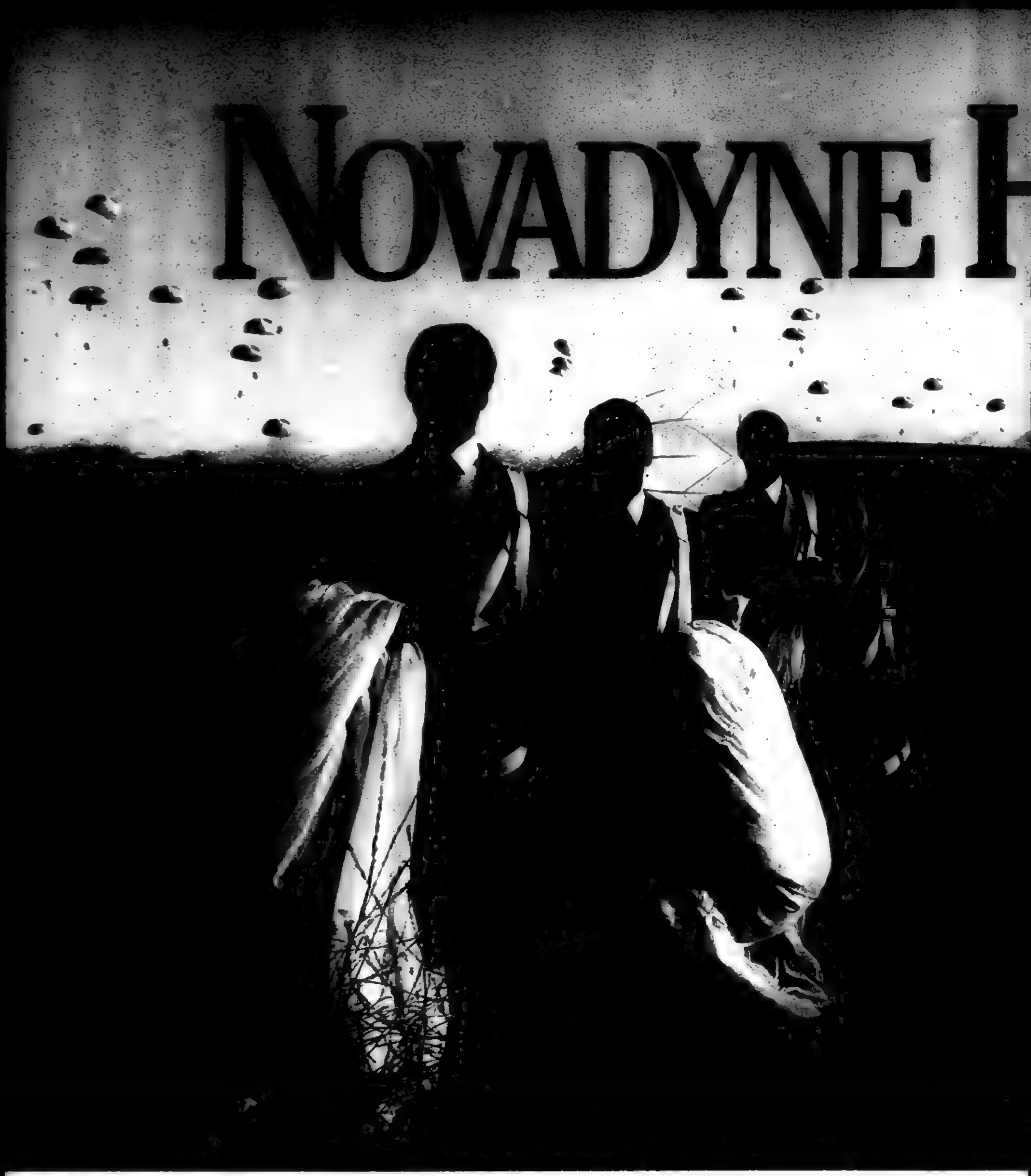

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COMMENTARY

Alan J. Ryan

Paying homage to the humble ant

In an ant colony, the big old queen finds a nice safe spot, kicks off her slippers, lays some eggs and is doted on by a few loyal males. Hers is a full-time job that ensures a future supply of workers for the colony.

Meanwhile, throngs of worker ants dig tunnels, move eggs from one chamber to another, venture outside to forage for food, try to avoid a host of calamities and basically keep the business of running an ant colony on track.

I don't pretend to fully understand the intricacies of ant colony life, but I suspect that old Queenie is not spending a lot of time thinking about her workers. It's even more doubtful she will recognize for bravery those ants who manage to outrun a can of Raid or sidestep a fast-approaching Converse All Star.

Fortunately, life for human workers can be more rewarding — if the queen, king, chief executive officer or some other top official wants to make it that way.

Anyone who has ever worked for a small company has seen it in action: The boss simply steps out of his or her office to pat the worker on the back (or some other ingratiating gesture) for a job well done. The employee beams, the boss exits, and everyone is pretty happy.

But in large firms, it gets trickier to honor good work beyond the local level; it takes a crafty executive to keep on top of the events that merit a pat on the back.

It can be done, however, even if the pat is not a physical one.

For instance, at Connecticut Mutual Life Insurance in Hartford, the chairman is tapped into an executive information system (EIS) that allows him to call up a file that lists "mega-achievers." The mega-achievers — those enterprising insurance salespeople who have sold major policies worth $1 million or more in the last day — then get personalized recognition for their efforts.

> IN LARGE FIRMS, it gets trickier to honor good work beyond the local level; it takes a crafty executive to keep on top of the events that merit a pat on the back.

The EIS mega-achiever listing includes the salesperson's name, office and phone number. The chairman can simply touch his screen; the number is dialed, and the congratulations are doled out.

If the call is placed but the deserving salesperson is not in, the executive can then send himself an electronic note that will pop up on his screen later in the day to remind him to try again.

Theoretically, the chairman could find out about the sale of the policy within minutes of the client signing the paperwork, and within minutes, he could have that salesperson on the phone — no matter where the salesperson is located.

Some will argue that the executive is taking an easy way out by having his computer alert him to big events. I disagree. They'll say that using a computer to track accomplishments is impersonal. And I'll say that argument is rubbish. After all, it is better to use a computer to track accomplishments than to recognize an important event weeks or months after it happens, or worse, not recognize it at all.

Connecticut Mutual's chairman is willing to spend the time and make the effort to follow what the employees are doing. And top executives at many companies have their own methods of doing the same thing — some write personal letters or send notes for a job well done. That there is a computer system that helps to make the effort timely and effective is an added bonus.

The outcome is the same: The worker feels good about his or her job and is pleased someone at the top took time to notice; the top executives feel good about their employees and show it; and the ants — well, be glad you're not an ant.

Ryan is a *Computerworld* senior writer.

MANAGEMENT BRIEFS

AMS seeking nominations for exec awards

American Management Systems, Inc. and the Graduate School of Industrial Administration at **Carnegie Mellon University** have announced that they are currently seeking nominations for the Fourth Awards for Achievement in Managing Information Technology.

The awards — which were launched in 1987 — are given to executives and professionals from the nation's leading organizations who have made outstanding contributions to their organizations through the effective use of computer and communications technology.

Nominations for the awards can be made by chief executive officers or other top executives of the participating organizations.

Nominations must be submitted before Aug. 15, and a first-level screening of the nominations will be completed by Oct. 31.

Finalists will be selected by Jan. 31, 1991, and the awards will be conferred in May 1991 at an awards ceremony in New York.

For more information, contact Jan Dodson, American Management Systems, Arlington, Va. (703) 841-5830.

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CONTINUED FROM PAGE 73

there is one manager responsible for making the application run smoothly. While this system helps keep the software up to date and running, it means that fingers can always be pointed if something goes wrong. That makes it more difficult for Erickson to convince these people that their software will not become any more vulnerable — as some fear — if it is on the JSCMIS system.

"The problem with implementing all products to this system is political and organizational — not technical. We in technology think that all you have to do is create a technology path and it will automatically flow, but that's not always true when political issues are involved," Bishop says.

> "WE DESIGNED it for the occasional user, not for the engineer-type user."
>
> LLOYD ERICKSON
> JOHNSON SPACE CENTER

However, Erickson is convinced that sooner or later more managers will want to have their application software on JSCMIS.

Presently, JSCMIS includes electronic access to the JSC's personnel system, which includes personnel statistics, registration information and financial — plan vs. actual cost — information. Erickson is also close to making the center's travel program accessible on JSCMIS, he says.

The program allows the user to access the necessary data without having to log in and out of various databases, even when the information desired is on more than one database. This is possible through the use of Nomad, a fourth-generation language from Must Software International that co-exists with Profs on an Amdahl Corp. 5890 Model 300 mainframe, Erickson says.

"Rather than have the user do a complete mind switch, we say let's just map these [Nomad keys] to be the same as the system they were just on" in Profs, he says.

It isn't a matter of technology, but of making a system that is easy to use and easy to access, with a user-friendly pick-and-choose environment, Erickson says. "When we designed this system we designed it for the occasional user, not for the engineer-type user."

The occasional user at the JSC is defined as any employee who needs to access data from multiple databases, but who uses the computer as a tool, not as a primary focus of activity.

Erickson says he is confident about eventually making the JSCMIS program a painless way for users throughout the JSC to access the data they need from multiple databases. "It's the most exciting project I've worked on here to date," he says.

Singing an IS song

Although Lloyd Erickson is a singer and bears a resemblance to Kenny Rogers, country music is not his bag. In his spare time, Erickson sings with a barbershop quartet that goes by the name "Deuces Wild."

However, Erickson — the singer/engineer and JSCMIS project leader — isn't always humming it up with the boys.

Lately, in his spare moments, Erickson has been reminiscing about the times when there wasn't always so much to sing about.

"This [JSCMIS] project was successful, I think, because of lessons learned from a similar project I worked on that failed," Erickson says. That was going to be a system for the center's budget that would have allowed users to access information in multiple databases via one main interface.

Confused users

"But the reason why [the project] failed is that we didn't give the users what they really wanted," he says. "The underlying data coming out of the accounting system wasn't really mature enough to be shown to people electronically," which means that users who beta tested the system were too confused when looking at the data in the manner in which it was presented.

"The accountants would have to hand-massage the data that came out of the computers before they showed it to anybody, because they knew that there were certain attributes in the system that were not representing reality," he explains.

"Once we gained electronic access we said, 'Whoa! We can't let people see this, the system's not right,' " Erickson adds, so he and his colleagues canned the project.

However, with the advent of relational databases, spreadsheets and windowing technology, Erickson said his new project, JSCMIS, could only be blocked by upper management, because the technology was there.

"I knew that with a little bit of support from management I would be able to build something that would be truly useful. Luckily, I had just enough salesman in me that I was able to convince the appropriate levels of management that this was a worthy risk. And the payoff has been enormous," Erickson says.

MAURA J. HARRINGTON

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CALENDAR

The Japanese concept of total quality management is making inroads in U.S. corporations, and information systems often play a vital role in the process.

"Customer-Driven Quality: Detailed Case Studies from Leading Manufacturers Successfully Utilizing Their Customers to Drive Quality Throughout the Organization" will be the theme of a Sept. 25-26 conference in Chicago.

The conference, sponsored by The Manufacturing Institute, a division of the Institute for International Research, will provide case histories to reveal what some large companies, including 3M Corp. and General Motors Corp., are doing in the area of the customer-driven quality process and the impact it has had on each business.

For more information, contact the Institute for International Research, Inc., New York, N.Y. (212) 826-1260.

JULY 29-AUG. 1

Mid-Atlantic Storage Management Association Forum. Philadelphia, Aug. 1 — Contact: Randall Lebedz, MASMA, P.O. Box 391, Manville, N.J. (201) 526-8325.

Computer Security in the '90s Conference and Exposition. Atlanta, Aug. 1-3 — Contact: Informa, Atlanta, Ga. (800) 343-5048.

Object-Oriented Design and Programming seminar. Montreal, Aug. 2-3 — Contact: Darcy Harrison, Interactive Software Engineering, Goleta, Calif. (805) 685-1006.

AUG. 5-11

Uniforum Open Systems Seminar. Chicago, Aug. 6 — Contact: Uniforum, Santa Clara, Calif. (408) 986-8840.

Managing Information Resources in the '90s: A Fresh Start. Princeton, N.J., Aug. 6-9 — Contact: Louise Spieler, National Association of State Information Resource Executives, c/o Council of State Governments, Lexington, Ky. (606) 231-1870.

North American ISDN Users' Forum. Gaithersburg, Md., Aug. 6-9 — Contact: Lori Phillips, NIST, Gaithersburg, Md. (301) 975-2937.

Siggraph '90. Dallas, Aug. 6-10 — Contact: Siggraph '90, Chicago, Ill. (312) 644-6610.

Introduction to AIX System Administration. Toronto, Aug. 8-10 — Contact: Bragen Group, Toronto, Ontario (416) 366-6363.

AUG. 12-18

The Urban and Regional Information Systems Association. Edmonton, Alta., Aug. 12-16 — Contact: URISA, Washington, D.C. (202) 289-1685.

SHARE 75. New Orleans, Aug. 12-17 — Contact: SHARE headquarters, Chicago, Ill. (312) 644-6610.

Downsizing Conference: Moving from Mainframes to PCs. Boston, Aug. 13-14 — Contact: Digital Consulting, Andover, Mass. (508) 470-3880.

Windows/Tell Conference and Exposition. Boston, Aug. 15-17 — Contact: CM Ventures, Emeryville, Calif. (415) 601-5900.

AUG. 19-25

Eastern Regional ISSA Conference. Washington, D.C., Aug. 19-21 — Contact: Ralph S. Poore, Baltimore, Md. (301) 783-3865.

Relational Today Seminar. Palo Alto, Calif., Aug. 20-21 — Contact: Codd and Date, San Jose, Calif. (408) 441-6400.

Strategic Information Systems Conference. Boston, Aug. 20-21 — Contact: University Seminar Center, Boston, Mass. (617) 248-8066.

Summer Workshops for the Information Processing Professional. Nashua, N.H., Aug. 20-23 — Contact: Ouellette & Associates, Bedford, N.H. (603) 623-7373.

SCO Forum '90. Santa Cruz, Calif., Aug. 20-24 — Contact: The Santa Cruz Operation, Santa Cruz, Calif. (408) 425-7222.

Early, Cloud & Co.'s Summer Conference on Telecommunications. Newport, R.I., Aug. 22-23 — Contact: Early, Cloud & Co., Newport, R.I. (800) 322-3042.

AUG. 26-SEPT. 1

National Computer Graphics Association Conference and Exposition. Houston, Aug. 26-29 — Contact: NCGA, Fairfax, Va. (703) 698-9600.

Unix Security Workshop. Portland, Ore., Aug. 27-28 — Contact: Usenix Conference Office, El Toro, Calif. (714) 588-8649.

SEPT. 2-8

FED Micro '90. Washington, D.C., Sept. 5-6 — Contact: National Trade Productions, Alexandria, Va. (703) 683-8500.

Strategic Planning for Information Systems. Toronto, Sept. 5-7 — Contact: Barnett Data System, Rockville, Md. (301) 762-1288.

SEPT. 9-15

Adding Image Processing to Information Systems. Toronto, Sept. 9-11 — Contact: Technology Transfer Institute, Santa Monica, Calif. (213) 394-8305.

Open Systems Applications Development Conference. San Jose, Calif., Sept. 9-12 — Contact: Unify, Sacramento, Calif. (916) 920-9092.

Implementing TCP/IP for Systems Integration. Washington, D.C., Sept. 10-11 — Contact: Data-Tech Institute, Clifton, N.J. (201) 478-5400.

Executive Information Systems: From Planning to Implementation. San Francisco, Sept. 10-12 — Contact: Technology Transfer Institute, Santa Monica, Calif. (213) 394-8305.

The Repository Conference. Orlando, Fla., Sept. 10-12 — Contact: Digital Consulting, Andover, Mass. (508) 470-3880.

Gupta Developers Conference: Opening Windows to SQL. San Francisco, Aug. 19-22 — Contact: Gupta Developers Conference, Andover, Mass. (800) 767-2356.

Optical Information Systems '90. Arlington, Va., Sept. 11-13 — Contact: Meckler, Westport, Conn. (203) 226-6967.

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Where the air is thin and the view is big

BY DAVID LUDLUM

When an information systems executive wins a seat at the big conference table with the cadre of top managers who devise strategy for his organization, he's bound to feel uncomfortable. And it could take a while before that feeling goes away.

No matter what one's abilities and accomplishments, moving into this circle calls for some adjustments.

An IS strategist must refine the way he looks at technology, his business and himself. He must hone new skills and personal characteristics. He must take on unfamiliar tasks while relinquishing more comfortable roles.

Brian Wil

Travelers' Brophy *says hobbies may have to take a backseat during adjustment to new responsibilities*

Shifting to high gear

The first thing a new holder of this post should be prepared for is intense work as he gets acclimated. "You work twice as hard initially to learn and understand the environment," says Joseph Brophy, formerly the top IS executive at The Travelers Corp. and now president of Travelers Insurance Co. "You just have to plow through."

While he was in that plowing stage, Brophy says he concentrated on doing the work that promised the best payoff. He also made use of time at home, reading science books and magazines that offered useful insights instead of engaging in more idle pastimes, such as playing the bagpipes.

For the past two years, Brophy has been acclimating himself all over again, this time to the jobs of business unit manager and president. Now he's easing up; he just spent a week at his vacation home in Lake Sunapee, N.H., relaxing and getting reacquainted with his neglected bagpipes. "This is the first time I've really forgotten about work," he says. "It feels great."

There is a steep learning curve at first in any new job, but a newly minted IS chief has a particularly difficult climb.

Probably the first item of business for anyone promoted to the top job is to figure out how to safely take his hand off the wheel and let others manage the day-to-day business of the IS department.

"There's a dichotomy," says Richard Koeller, vice-president of information technology at Whirlpool Corp. "You need to work with global issues. At the same time, if the data center goes down, you're the one that other people look at." In the background, there's pressure to maintain services and keep costs down.

The way that Koeller resolved this quandary was to settle responsibility quickly and squarely on his functional directors. He immediately rewrote their job descriptions, splitting his duties among them and giving them authority for nonstrategic decision-making. He also stopped attending staff meetings, which served to seal the transfer of responsibility. If the directors wanted his input, they'd have to ask for it.

What happened, Koeller says, is that the directors rose to the new responsibilities. The IS operation continued to run smoothly, and some positive new ideas came out of the situation. For example, one of the newly empowered directors implemented a program for management backup and succession, cross-training and long-term recruiting for his operation, which other units have now adopted.

There are more tactics that could be used to encourage others to assume the responsibilities you will have to give up, Koeller says. You could change the reports that the managers prepare or give them new offices. Basically, he says, it is just important to "do something dramatic to break the stride and let people know it isn't business as usual."

Of course, if you are coming in from someplace else to head up the IS function, the problem isn't breaking old habits to create distance but, rather, learning how things operate. You can't start thinking about strategic plans until you know where you are.

Every new organization calls for a period of assessment, says DuWayne Peterson, head of operations, systems and telecommunications at Merrill Lynch & Co. When people fail at a new company, it is usually because they neglect to adjust their views to it. He learned that lesson earlier in his career, he says, when Citicorp hired him, along with some other industrial managers, to apply manufacturing techniques to its operations.

Easy on the zeal

In retrospect, Peterson realizes that the group tackled the task a little too zealously. "We thought we were God's gifts to the world," he says. "We came in with an arrogance that made it much more difficult to get the job done."

One example of that arrogance, Peterson says, is the way the new arrivals scrapped an existing accounting system and replaced it with one they knew better. The problem with that, he explains, is that the new accounting system, which had been adequate for a factory situation, didn't track customer accounts as closely as users needed or even as well as the old system had. "We just blew past that [requirement]," Peterson says. "We thought it wasn't important. The customers were not too happy."

Whether you are coming from inside or out, most IS executives

Ludlum is a *Computerworld* senior writer.

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Sage advice for the IS warrior
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View

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who have moved into positions that include large components of strategic planning agree that it is important to take time to familiarise yourself with the business operations and the business environment before you start trying to draw up any plans. And the first and best way to start gaining that knowledge, they say, is by tapping into the experience base around you.

Get to know the 'smart guys'

Brophy says he learned to identify the "smart guys" around him — people with a record of consistent achievement — and synthesise their thinking into his own.

Of course, identifying managers with expertise and vision is more difficult when both the industry and the company are new to you. But, Peterson says, it does not take all that long to figure out "which people are stronger and which ones were terrific yesterday but aren't going to carry you forward."

Michael Zucchini, chief information officer at Fleet/Norstar Financial Group, agrees that the real trick is to network with people in the know. Sometimes it takes determination to seek these people out, but the effort pays off. Conversations with the right managers can reveal important subtleties, he says, such as the type of judgment calls a loan officer makes. Lunch is a good forum; Zucchini got into the habit of lunching with executives, spending an hour asking about their business.

Security Pacific's Heschel *made sure he visited customers*

Another good way to familiarise yourself with business issues, IS executives agree, is creating opportunities to meet company customers. "I don't think you can develop a strategic system without a good understanding of what customers value," Zucchini says.

When Michael Heschel, now chairman of Security Pacific Automation Co., was heading up IS at Baxter Healthcare Corp., he not only attended focus groups that the company held to obtain input on changes to its ASAP order-entry system but made a habit of checking in with customers during business trips. He forced himself to set up these customer meetings six months in advance to make sure they took place, he says, because this wasn't something he was expected to do, and it would have been easy to let it slide.

When you know IS operations are under control and you have a firm grasp on business issues and priorities, you can turn your attention to strategic concerns. But be prepared for the fact that the perspective may seem strange at first.

Even IS issues can look significantly different from this angle, says Max Hopper, senior vice-president of IS at American Airlines. "The issues are certainly less well defined," he says. "Methodologies are less precise; the time frame is longer, and you don't always know all the variables. You have to rely more on intuition."

You almost need a whole new mind-set, Koeller says. He likens an IS director adjusting to the role of strategist to that of a soldier moving from the front line to a military staff assignment. His reactions are geared to short-term survival when he needs to become almost philosophical.

There are other mental adjustments as well, such as figuring out how much innovation is really tolerable. While IS people are inured to constant change, senior business managers sometimes want tomorrow to be like yesterday. "When you're trying to put out 14,000 washers a day, you don't want change," Koeller says. "I had to recognize that, at this level, I'm not in the business of changing daily."

Levi Strauss' Eaton *tries to remain open-minded*

He has learned, he adds, to peg his planning to the readings he gets from managers reacting to his questions.

Keeping yourself in sync with business managers requires regular contact, however, which is one of the reasons why Metropolitan Life Insurance Co. formed a steering committee to help set technology strategies. Dan Cavanaugh, senior vice-president of IS, heads the committee, which is made up of business unit chiefs. They share experiences and talk about such things as the benefits of compatible systems and the potential impact of imaging or expert systems.

Cavanaugh makes sure that business managers are briefed before meetings by sending them reports and articles. He also ensures there's a worthwhile agenda. The group usually meets monthly but cancels two or three times a year because convening wouldn't be worthwhile. The managers also go off-site occasionally for briefings from vendors or consultants, sometimes for two days.

Bank of Boston's Simmons *believes in a sixth sense*

It really can help to get managers together and away from distractions, says Bill Eaton, CIO at Levi Strauss & Co. Top managers at that company build understanding with off-site meetings focused on issues they find hard to tackle in the midst of day-to-day activities.

Usually, however, dealings with the chief executive officer won't happen in that kind of relaxed and contemplative kind of setting. The process of communication takes on more urgency when dealing with the top executive. Issues are bigger and time more limited. "You have to do your homework well, know what you're going to communicate and, because of the time constraints, how you're going to do it," says Heschel, who recalls that his formal meetings with the CEO at Baxter typically lasted about half an hour.

Take a look at yourself

The flip side of dealing with and understanding other managers is crucial, too. An IS executive needs to know how fellow strategists view him.

"Information technology people are perceived as being a little weird," Koeller says. "We are totally challenge-driven. Style and social value don't mean much. The higher the risk, the more we like it."

Koeller has taken courses, which a number of training companies offer, that teach managers to recognise how their colleagues view them. This is a particularly important point when moving from a homogeneous IS group to a diverse top management team.

"I need to understand how my personality and style affects what I'm trying to achieve," Koeller says. "If you spend all your time around Americans, you aren't going to have a very good idea of how Europeans perceive you."

Koeller says he has found that the only way to dispell the notion that an IS person is "wierd" is to sit down with the skeptic and show an understanding of his business or a desire to learn about it.

Whomever you happen to be meeting with, certain diplomatic skills are crucial.

Eaton has found, for example, that it is important to maintain a healthy attitude toward conflict. Sometimes there's a need for a winner and a loser, he says, but part of the job of any planner is to encourage new ideas by creating room for

Upward mobility

Gaining strategic responsibility usually has less to do with luck than planning and a steady accumulation of skills and influence.

For many of today's strategists, the key has been to broaden experiences and expertise. They've taken advantage of training, study committees, job rotation programs, transfers and other opportunities.

When he was younger, Joseph Brophy had a philosophy that to get ahead, he needed to be a double or triple threat — to know more than one field. Brophy, formerly the top IS executive at The Travelers Corp. and now president of Travelers Insurance Co., started his career as an actuary. Combining that background with work in IS broadened his outlook and background, he says: "I had two disciplines I could bring to the equation."

Brophy also says he felt he could take on bigger jobs more quickly by making lateral moves; it would be tough just rising vertically. That notion seemed to be borne out two years ago, when Brophy made a lateral move from top IS executive to head of The Travelers' employee benefits business. Earlier this year, he was promoted to president of the company that handles that line.

One way to help accelerate the rise to the top is doing a stint as a planner. It's a good way to learn an organization, says DuWayne Peterson, executive vice-president for operations, systems and telecommunications at Merrill Lynch & Co.

A first move toward gaining a position in planning might be to pursue an MBA program, where one can learn the techniques involved, Peterson says. It's hard to learn how to implement plans from a textbook, however, because the process is different at every company. So the next step is to find an employer with a commitment to planning.

Strategic boost

Michael Heschel, chairman of Security Pacific Automation Co., got a career boost when he was chosen to lead a strategic planning project at FMC Corp. The project was highly quantitative; Heschel knew industrial engineering and statistics and held an MBA. "Someone from planning with a plain vanilla MBA wouldn't have had the right perspective," he says.

Participating in this kind of planning project can broaden perspective. Planning methodologies can get tactically oriented people thinking about strategy — how to gain market share, for instance, Heschel says. He found that the project he led made a good education program for managers.

IS executives also advance their careers by moving to a new company. In his early 30s, Brophy left The Prudential Insurance Co. for The Travelers, thinking he would move up more quickly as a bigger fish in a smaller pond. Likewise, early in his career, Max Hopper, senior vice-president of IS at American Airlines, left Shell Oil Co. to join Electronic Data Systems Corp. His goal was more freedom. "It was a chance to fail," Hopper says. "It was a chance to be entrepreneurial."

Taking chances and seizing opportunities is at the heart of learning the ropes. Michael Simmons, who has been top IS executive at Fidelity Investments, Bankamerica and Bank of Boston, suggests avoiding overly rigid career plans. Some people hold themselves back by planning too carefully and then passing up opportunities that aren't part of their plans, he says. "When opportunities present themselves, I take them."

DAVID LUDLUM

disagreement. For that reason, Eaton is careful to avoid signaling disagreement with gestures as he tries to maintain an open-minded stance.

Staying open-minded doesn't mean never taking a stand. If you are convinced that you understand everyone's point of view and still believe that the idea they are rejecting is good, many IS chiefs say that heavy lobbying is warranted. Everyone thinks about the future and prepares for it, Eaton says. Strategists must be willing "to put a stake in the ground" and share how they see the future.

"You really have to sell your plan," Peterson says. To do that at Merrill Lynch, he says, he makes sure to get the business benefit out front.

If that doesn't work, Brophy suggests dropping down a couple of levels to try to build a ground swell. In one instance in which he encountered entrenched resistance from a business manager, Brophy got his staff working with the business manager's people.

"You've got to try a lot of different ways," he says. "You work with his peers. You get other voices in the organization supporting your point of view. You can never do this as a one-man band."

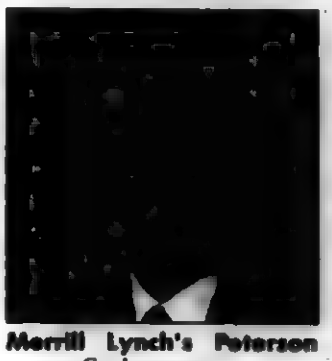
To test your own convictions, try doing some Walter Mitty-ish mental role-switching, says Eugene Bedell, until recently the top IS executive at First Boston Corp. and now president of the bank's technology spin-off, Seer Technologies, Inc. When in doubt about a strategy move, he says, he thinks about what he would do if he owned 100% of his company's stock. "That probably helps more than anything else," Bedell says.

Keeping an eye on the future also helps IS strategists be both active and effective. Brophy visits AT&T Bell Laboratories to follow technology. Peterson is studying changes to the Glass-Steagall Act, which would let banks and insurance companies compete with Merrill Lynch, and trying to figure out what the impact is likely to be on markets and market share.

Brophy reads about prospects for changes that are broader still — demographic trends, for example. "That stuff can be fun to read and make you much more knowledgeable about the business environment," he says. Changing management and organizational structures are among the areas that Brophy watches with particular interest.

Michael Simmons, who is in charge of systems and operations at Bank of Boston Corp., emphasizes the importance of peripheral vision and instinctual feel. Don't get in a position where you don't see everything and try to keep in touch with gut instincts, he recommends. He adds, "There's an underlying sixth sense that says, 'I haven't looked at this enough.'"

Of course, there is such a thing as being overly cautious. Simmons says he made a mistake in overlooking personal computers in the early 1980s. He regarded them as more hype than reality. "I missed some opportunities to do things sooner," he says.



Merrill Lynch's Peterson *warns: Curb your ego*

Learning to live with regrets, hard decisions and tension is part of the job, too. Some executives moving up the corporate ladder worry about losing touch with former peers.

Hopper started feeling the distance as he rose at Shell Oil Co., where he started his career as a systems engineer. "We played cards every day at lunch and had a good car pool. There was a lot of camaraderie," he says. To keep in touch today, he invites subordinates to dinner and parties.

However, there will always be moments when you just have to put up with people not liking you. At FMC Corp., Bedell had to deal with the fact that some business units, which top executives regarded as low priority, could not be supplied with new systems. "When you deal with the guys who run those divisions, they're not real happy with you," he says.

Bedell would emphasize that he didn't establish corporate priorities, although he might agree with them. There's not much else you can do, he says, except maybe get out of town.

The IS chiefs who intend to stay learn various tricks for successfully dealing with the bad days. Usually, Simmons keeps himself loose by taking brief walks. Last year he strolled up and down the stairs of the Bankamerica building in San Francisco pretty regularly when, as that organization's highest IS executive, he had to deal with the aftermath of the big earthquake. •

> "THE IS ISSUES are certainly less well defined. Methodologies are less precise; the time frame is longer, and you don't always know all the variables. You have to rely more on intuition."
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The Past, Present, and Future of Network Computing.

Tactical advice from an old soldier

BY AVERY CLOUD

The writings of Sun Tzu are touted in academic circles as a "must read" for any serious leader. Nearly 2,500 years after the Chinese general's death, *The Art of War* is required reading for Soviet political and military leaders, and American executives also find its advice useful.

The book teaches how to compete, implement strategy and defeat opposition — all critical skills for the business leader. Sun Tzu speaks to information systems managers as well, who likewise find themselves in an environment where being skilled strategists and competent combatants are critical factors for success.

The following are a few of the juiciest morsels of Sun Tzu's wisdom annotated for IS executives.

"He will win who knows when to fight and when not to fight."

The IS manager should choose his battles carefully. Winning some fruitless battle for the sake of ego may alienate important allies. Better to make sure the benefit is worth the risk and that victory is possible. The guiding light for selecting battles should be how important the issue is to corporate strategy and corporate welfare.

It is foolhardy, for example, to get involved in a hot debate over which software product to select when both are equally functional. I have seen technical wizards derail their careers over such small points — just to prove that they knew best.

When the issue is important, however, be willing to face conflict. I remember a brave IS professional who challenged a high-profile executive who wanted to move some key applications to a service bureau. This IS samurai believed that the move would be financially and strategically disastrous.

In the end, he won over the opposition, but before doing battle, this manager had checked his technical ammunition and ensured that his position and advantage were sufficient to deliver victory. He used his political network to win senior managers over to his side. He held informal meetings to garner support. Most important, he spent a lot of time assembling irrefutable facts and figures to support his position.

"He will win who knows how to handle both superior and inferior forces."

The method of engaging in conflict varies depending on the combatant's level of power and influence. When in an inferior position, the IS manager must use finesse and persuasion to get approval of his agenda. He must show that his approach will produce desirable benefits for the high-level decision-makers.

For example, after failing to gain approval for a new print technology in his company, an IS manager who saw he was outgunned politically and numerically changed his approach immediately. Instead of trying to prove the technical feasibility of his idea, he showed how this new technology could make the decision-makers look good.

He also made sure management knew that the company's chief competitors were already exploiting this technology. Soon management not only agreed but also demanded that the new technology be brought in.

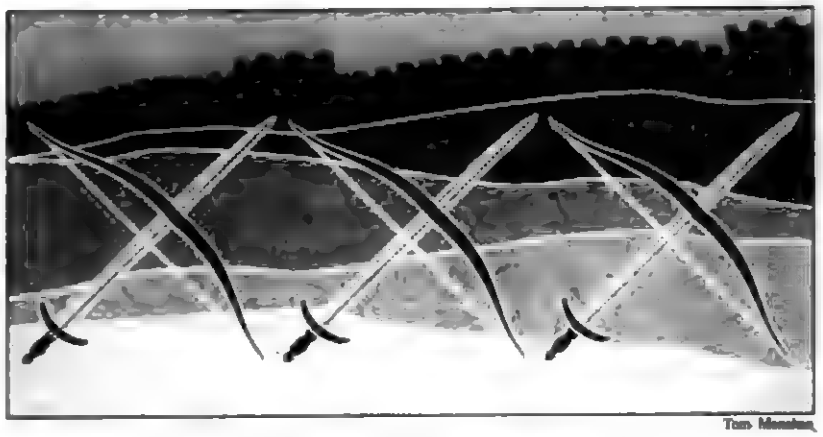
"He will win whose army is animated by the same spirit throughout all its ranks."

An IS manager should also be aware of the need to gather support and build morale among the troops.

If you have a sufficiently large staff of talented people, for instance, learn how to tap this resource and motivate them to innovate and produce. Work on improving staff efficiency and effectiveness by developing incentive and reward structures in your department. Monetary rewards are a good device, but simple things like posting accomplishments on bulletin boards, giving a day off after extra effort or sending a short complimentary note can motivate a staff to stellar performances.

If you have fewer staff resources to work with, learn to focus what is available on high-yield projects. Table projects with low return, or set them up with long completion cycles. Look for productivity tools to increase individual output. Train extensively, but make sure your training efforts are focused narrowly on skills critical to the success of strategic projects.

To animate their groups, managers must first develop a vision and purpose, then evangelically espouse the goals and ideals that they want workers to adopt.



Tom Moreton

When I was a system programmer at RJR Nabisco, Inc., we were continually told that we were a leading-edge, leader-of-the-pack IS operation. We were told how far ahead of our competitors we were and how important that was. Instilled with that kind of spirit and pride, I witnessed top-level technical performance and innovations consistently produced.

There is no better vehicle for communicating competitive spirit than the spirited words of IS leaders in meetings and conversation. Keep your employees — especially talented ones — happy by keeping them informed of the successes and failures of the company and how IS contributed.

"He will win who, prepared himself, waits to take the enemy unprepared."

Detailed knowledge about the issue being promoted or defended can be a lever to win control and influence. Achieving this superior preparedness quickly can catch the opposition in an indefensible position.

I was once called on to defend the chargeback billing rates to a senior executive. After talking to him, I noted that he had little foundation for his belief that he was paying too much for IS labor.

I let him think he had a case for a few weeks and lulled this executive into a false sense of security. During this time, I studied our billing system feverishly and found that only 3% of each penny billed went toward IS labor. I also identified a 60% increase in his processing load as the cause for his high bills.

I then called a meeting on short notice and presented the facts. Having no information to support his dispute, the executive graciously conceded his mistake and offered to buy me lunch, while my boss beamed.

"He will win who has military capacity and is not interfered with by the sovereign."

While developing the skills of your IS organization, also develop a relationship of trust between you and your superiors. Meet your deadlines and keep your promises.

A friend of mine, who is a competent IS professional, takes this philosophy to heart. When he took charge of the data center of a large firm, he immediately seized every oppportunity to perform duties that his boss used to have to worry about. He made sure that he kept his promises to his boss and his users. He consistently filed informative status reports. Soon he developed a reputation as someone who had the talent and dependability to get things done. Now his boss gives him everything he asks for and never interferes with his decisions.

Being responsible and encouraging your superiors to entrust responsibility to you will help your superiors see the importance of giving you the authority to complement your responsibility. Keeping your superiors well informed will make them more apt to allow you greater command.

"If you know the enemy and know yourself, you need not fear the result of a hundred battles. If you know yourself but not the enemy, for every victory gained you will also suffer a defeat. If you know neither the enemy nor yourself, you will succumb in every battle."

Know the opponent before stepping out on the field. Assess the IS strengths and weaknesses of other companies in the industry. Valuable competitive information can be procured from several sources, such as trade publications.

Becoming a member of good IS and industry professional organizations affords the opportunity to meet informally with competitors and sit in on revealing presentations and talks. Look for opportunities to tour competitors' facilities.

Regularly assess your own IS strengths and weaknesses. Compare available manpower, work-force skills, financial constraints and technological position with competitors to see if launching a competitive IS assault is feasible. If the answer is yes, it is time to market the ideas to senior management. Otherwise, focus on finding ways to manage current technologies more cost-effectively.

With the encroachment of global competition and current economic stresses, companies are fighting for survival. Sun Tzu's wisdom in *The Art of War* can help IS managers help their companies win this war. ●

Cloud is manager of technical services in the information services department at Bowman Gray/Baptist Hospital in Winston-Salem, N.C.

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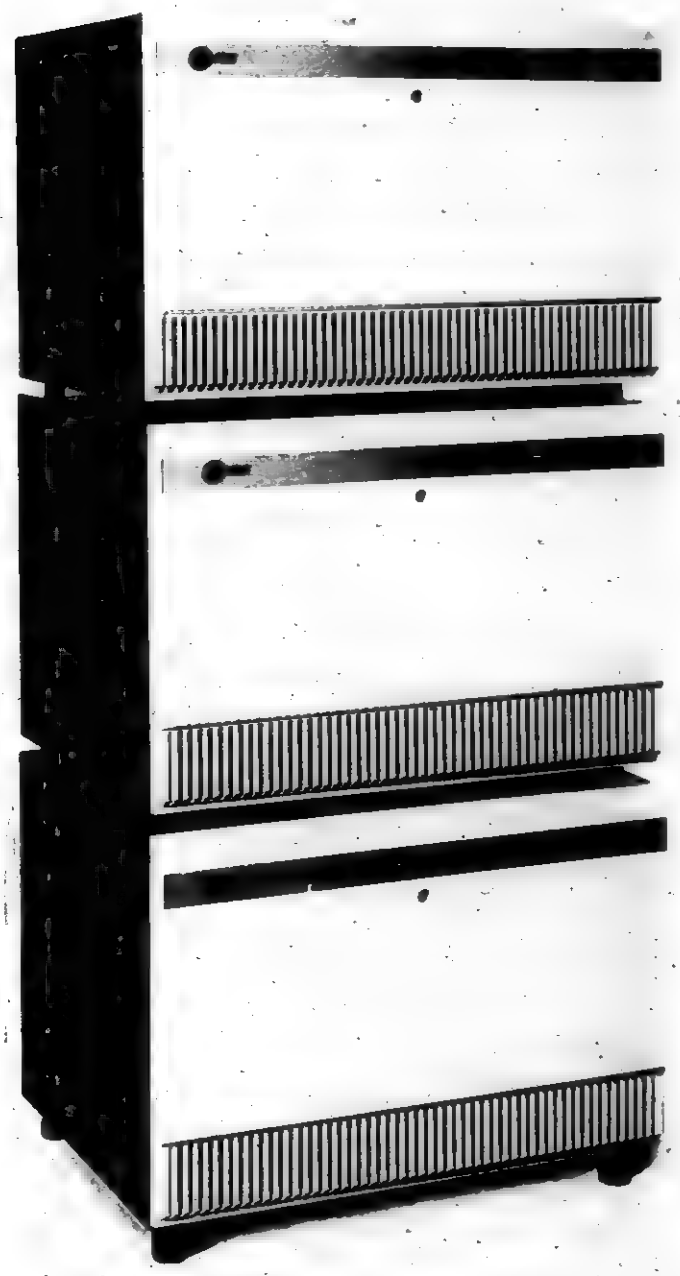

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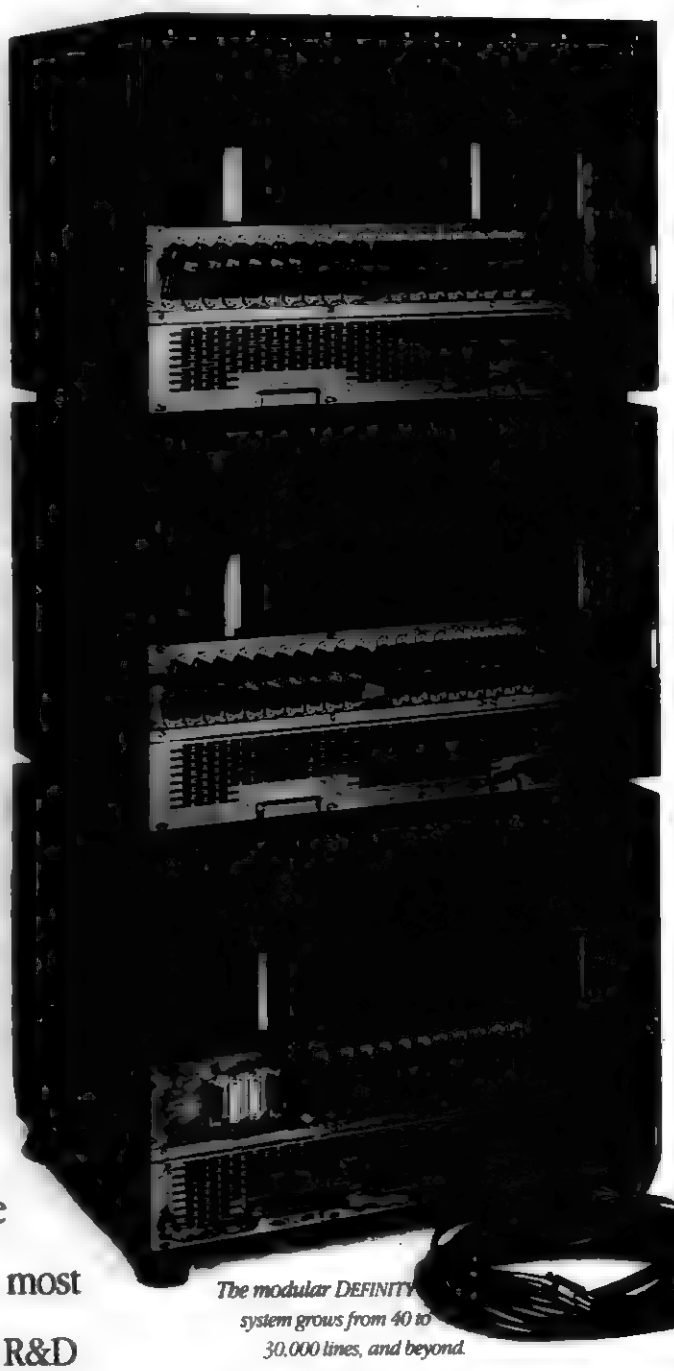

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Cobol — The next stage

It's time to modernize an old faithful by adding object orientation

BY JEROME GARFUNKEL

It's time to get COOL — Cobol object-oriented language, that is.

Object-oriented systems are viewed by software engineers as the next giant step in designing software to match real-world applications. By adding object orientation to the Cobol language, large Cobol sites can enjoy the improved software development ease and maintenance that reusable code provides.

The key issue today is to get object-oriented Cobol out of standards committees and into practice.

Object-oriented Cobol is a breakthrough in software engineering, and this will affect the information systems world in much the same way that structured methodologies and relational databases did in the '70s and '80s, respectively.

Object-oriented Cobol could cut down new program development time by 70% at large Cobol sites. In other words, 70% of all Cobol application code now written could be reusable as objects invoked by new programs. This has enormous implications for applications maintenance.

Cobol programs employing object-oriented designs would also be more readable because object orientation offers a real-world modeling facility for computers.

Ross MacDonald

Until we meet again

In November 1989, a significant meeting was held in Scottsdale, Ariz. It was a symposium sponsored by the Codasyl Cobol Committee to explore the relevance of object-oriented methodologies to the Cobol language.

Only once before in its 30-year history has the Codasyl Cobol Committee addressed a single issue at a special meeting. In 1975, the committee held a symposium in Los Angeles to solicit suggestions from software engineers around the world on how to change the Cobol language to accommodate structured programming techniques. Papers with specifics on how to add or modify syntax to the Cobol language to deal with these new theories were received from the likes of industry notables Ed Yourdon, Michael Jackson and Chuck McCooms.

Most of the new features added to the ANSI Cobol 85 language have their roots in that symposium held in 1975. Some of these features include nested programs, scopeterminators, the EVALUATE statement, the "in-line" PERFORM statement and the "Do-While" and "Do-Until" constructs of the PERFORM verb.

Leading software engineers from around the world were also present at the 1989 Cobol meeting. Representatives from major Cobol suppliers, as well as some of Cobol's largest users, were there too. Debate centered on making the Cobol language object-oriented.

How radical a change must the current Cobol language undergo to adopt object orientation? Attendees grappled with that question: Some felt that nothing short of revolutionary changes would accomplish the mission; others thought that Cobol already contained much of the syntax and semantics necessary to write object-oriented programs.

The discussion at this meeting centered on object-oriented concepts. One of the first tasks of the Codasyl Cobol Committee was to achieve general agreement concerning the meaning of these concepts as they relate to the Cobol language. Discussions took place in the following areas:

• **Orthogonality.** One of the key issues discussed at the Scottsdale symposium dealt with how to implement any new object-oriented functionality that may be introduced into Cobol. Should it be done consistently, using current Cobol syntax and expanding the semantic definitions wherever necessary? This method adds a minimum of new syntax. Should it be done orthogonally by adding an entirely new layer of object-oriented syntax to Cobol in harmony with current object-oriented terminology? Some in attendance felt that the latter suggestion was

Garfunkel is president of Jerome Garfunkel Associates, Inc., a Cobol consultancy in Litchfield, Conn.

• Standards issues loom

• Up to 70% of exisiting code reusable

• Object-oriented compilers seen by 1992

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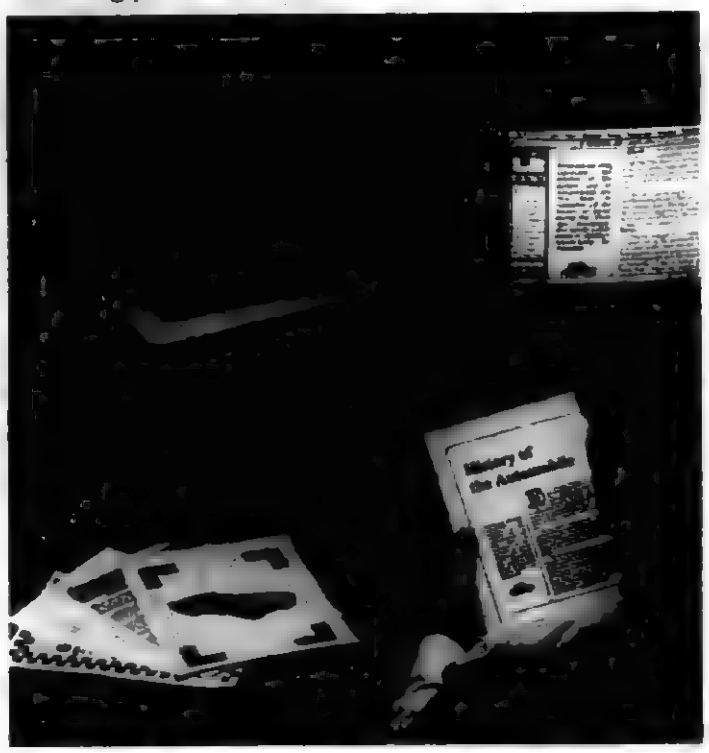

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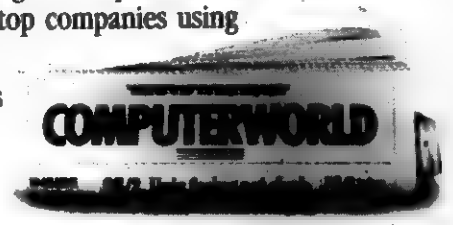

The Newsweekly of Information Systems Management

tantamount to adding a whole new language on top of the Cobol language. In that case, why not simply decide to use another language?

• **Recursion.** Recursion refers to the ability of a program (or subprogram) to be re-entrant; that is, to be able to have multiple copies executing simultaneously while keeping any passed parameters in a carefully controlled stack with each level in the stack linked to a specific instance of the subprogram.

• **Polymorphism.** Polymorphism is necessary for similar or identical objects to behave differently when passed different messages.

• **Encapsulation.** This is the ability to make old Cobol programs into objects that can be used by newly developed object-oriented Cobol programs. The concept of classes will need to be added to Cobol so that when an object is developed that is an offshoot of an already existing object, it may "inherit" the characteristics of that object and define additional characteristics that make it a specific, yet distinct, instance of the object.

A facility for Cobol programmers to define their own syntax, complete with verbs and formats, is one way to create objects and pass messages to them. This concept of user-defined Cobol syntax has been under investigation for more than a decade in the UK.

Unanimous agreement

While the debate raged about concept meanings, there was unanimity on one particular issue: The Codasyl Cobol Committee passed a motion to create an Object-Oriented Cobol Task Group by a vote of 11 to 0.

Codasyl's object-oriented Cobol goals include the following:

• Compatibility with existing Cobol language syntax. That is, no new syntax will be added to make older Cobol programs obsolete.

• Simplicity of language features, including "obviousness" of semantics with simple and direct syntax.

• Consistency with current Cobol syntax and semantics; that is, the behavior of any well-defined Cobol features will not change.

• Maximum power in language features (more bang for the buck).

• Readability (an objective of Cobol since 1959).

• Minimum changes to runtime operations.

• Encapsulation of old code in an "object wrapper," thereby allowing the current huge inventory of Cobol programs to potentially work with the newly created and designed object-oriented Cobol programs.

• Orthogonality of new features (distinct from old Cobol).

• High performance in runtime, compilation time and development time.

• Transformability, or the ability of an object to adapt to various different uses in different environments with a minimum amount of effort.

For object-oriented Cobol to become a reality, certain bureaucratic procedures must be followed, including a syntax and semantics proposal process, debates and presentations to the American National Standards Institute (ANSI) and International Standards Organization (ISO) Cobol committees.

The first step is for the newly created Object-Oriented Cobol Task Group to propose suggested object-oriented Cobol syntax and semantics for inclusion in the Cobol Journal of Development, the working document maintained by the Codasyl Cobol Committee. I often refer to this document as an Experimental (Conceptual) Cobol Model.

Once the full Codasyl Cobol Committee accepts these changes (after some debate, of course), it must then simultaneously present them to the ANSI X3J4 Cobol Committee and ISO [WG4] Cobol Committee for processing as an official U.S. and international standard. This, too, will surely require some debate.

It is estimated, however, that if the various committees were to follow normal procedures, it would take 10 years for the ANSI and ISO Cobol standard language to include new object-oriented syntax. It would take three to five years after that before it would come into mainstream use.

To speed the process, the Codasyl Cobol Committee could ask the Object-Oriented Cobol Task Group to prepare a draft of proposed changes to the Codasyl Cobol Journal of Development. The changes would be in a format consistent with an ANSI Cobol addendum.

Adding object-oriented Cobol syntax as an addendum to the ANSI Cobol language will accelerate the process by many years. This is exactly why the addendum process was created.

Having the Object-Oriented Cobol Task Group prepare its draft of proposed changes in the addendum format will also save the ANSI Cobol Committee from having to translate the Object-Oriented Cobol Task Group proposal into the addendum format later when it considers adding object-oriented syntax to the ANSI Cobol standard.

Furthermore, if the Codasyl Cobol Committee can closely monitor the progress of the Object-Oriented Cobol Task Group as it is debating and hammering out the new suggested object-oriented syntax during the next year or so, it will be able to make suggestions to the task group along the way.

This will prevent the likelihood that a proposal to Codasyl from the Object-Oriented Cobol Task Group will be sent back for a major rewrite following some lengthy debate at the Codasyl Cobol Committee's table.

Likewise, if ANSI closely monitors the development of the object-oriented syntax within the Codasyl task group, this will reduce the likelihood of major changes when the proposed new syntax is presented to ANSI for inclusion into the Cobol language as an addendum.

Fortunately, there are some members who serve on all three of the committees involved in this process (Object-Oriented Cobol Task Group, Codasyl and ANSI) and can thus provide this close monitoring function.

Note of encouragement

One other encouraging note is that although no Cobol vendor will commit today to an early release of object-oriented Cobol, it is likely that once the proposed object-oriented Cobol syntax is accepted by the Codasyl Cobol Committee, some Cobol vendors may go ahead and add this syntax (or similar syntax) to their Cobol compilers as vendor extensions. They won't wait for it to become an official ANSI Cobol standard.

This has been done in the past by some Cobol vendors anticipating the Cobol 85 extensions; there is no reason why it will not happen again with object-oriented Cobol extensions.

The bottom line of these procedural alternatives is that the Cobol community could have some usable object-oriented Cobol compilers sometime in 1992. •

Language barriers

The Codasyl symposium in Scottsdale aeroed in on key issues that the Object-Oriented Cobol Task Group as well as the Codasyl Cobol Committee must address. These include the following topics:

• Programmer re-education. Companies will have to re-educate an entire generation of Cobol programmers to take advantage of object-oriented methodologies. Re-education was an issue in the 1970s with the introduction of structured methods; this new methodology will require even more dramatic and traumatic re-education.

• How to deal with the installed base of Cobol programs.

• Prioritization of goals and viewpoints.

• Quickness of standards definition vs. completeness of specification (object-oriented programming systems design features).

• Orthogonality vs. consistency.

• Adding significant language features, such as pointers, recursiveness, user-defined functions, "garbage" collection, exception handling, persistence (long-lived programs), returning values from CALLs.

• Single or multiple inheritance.

FOR OBJECT-ORIENTED Cobol to become a reality, certain bureaucratic procedures must be followed, including a syntax and semantics proposal process, debates and presentations to the American National Standards Institute and International Standards Organization Cobol committees.

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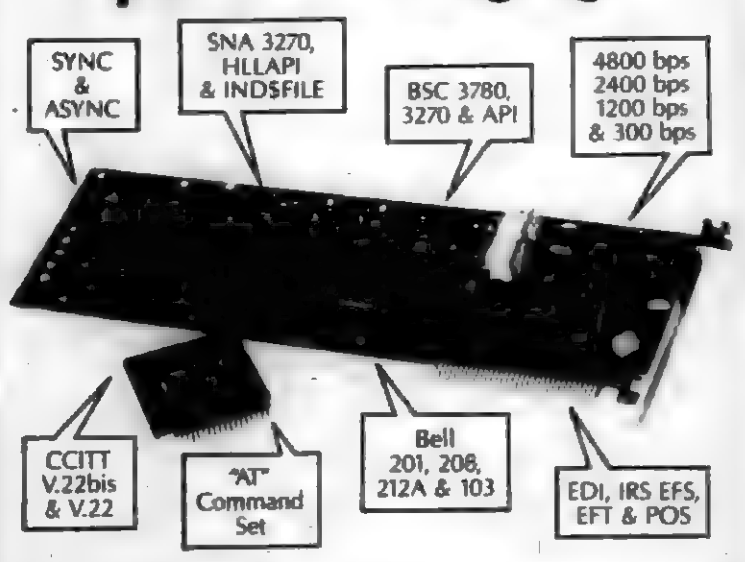

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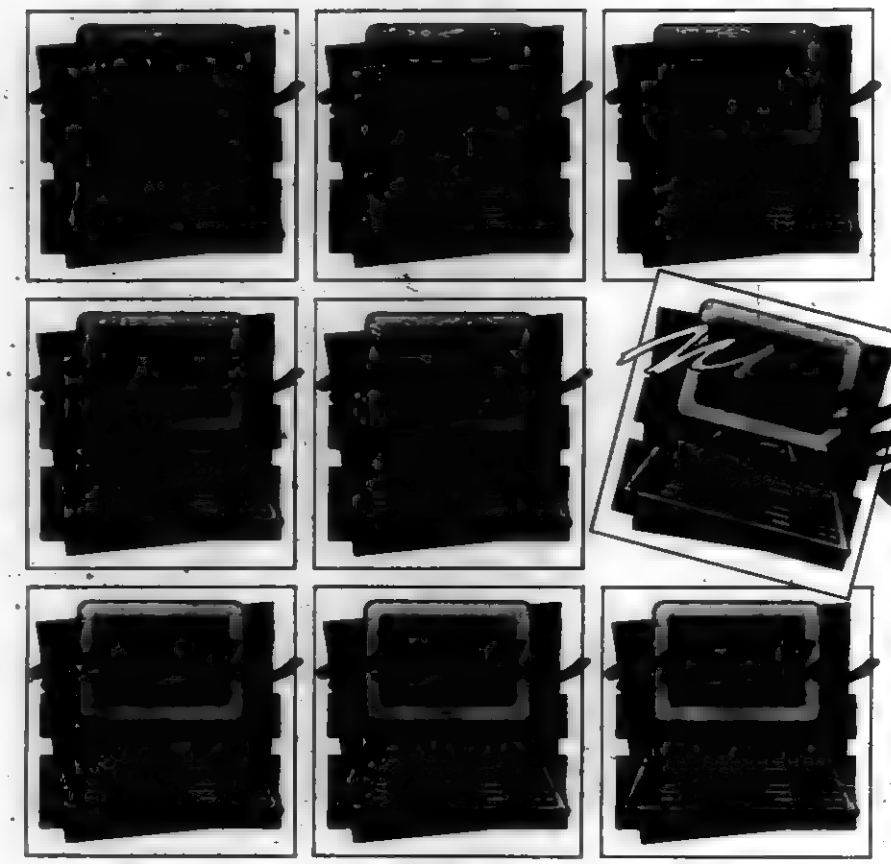

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Fireworks

Last year's vaunted "merger of equals" continued to give off sparks last week. Only days after **Stardent Computer, Inc.'s** chairman and co-founder hauled the company's strategic ally and 22% owner into court on charges of conspiring to steal technology [CW, July 16], **Legent Corp.** announced yet another shift in its management roster: this time, the resignation of President **Peter Barris** and the appointment of co-founder, former chairman and recent special projects manager **Mario Morino** as executive vice-president and general manager of the company's information systems division.

■

C-man

Mini- and microcomputer systems integration company **C3** wants a bigger slice of its target market, and now, according to its chairman, it has the money and the man for the mission. Along with a financial recapitalization, the Herndon, Va.-based company last week announced a new president, chief executive officer and director: **Anthony L. Craig**, an IBM veteran who was also credited with turning around General Electric Corp.'s then-troubled GE Information Services division. Most recently, Craig served as chief executive at **Prime Computer, Inc.**, presiding over the company as it battled a hostile takeover attempt by MAI Basic Four, Inc.

■

Round numbers

Radius, Inc., the San Jose, Calif.-based visual computing systems vendor that claims to have brought high-performance, graphics-intensive computing to the Apple Computer, Inc. Macintosh, is now bringing its stock to the public. The proposed initial public offering filed earlier this month contemplates an offer of 2 million shares that are priced from $11 to $13 per share.

In the right place at the right time?

Maybe — SCO ups distribution of potential DOS successor, hopes to bypass barriers

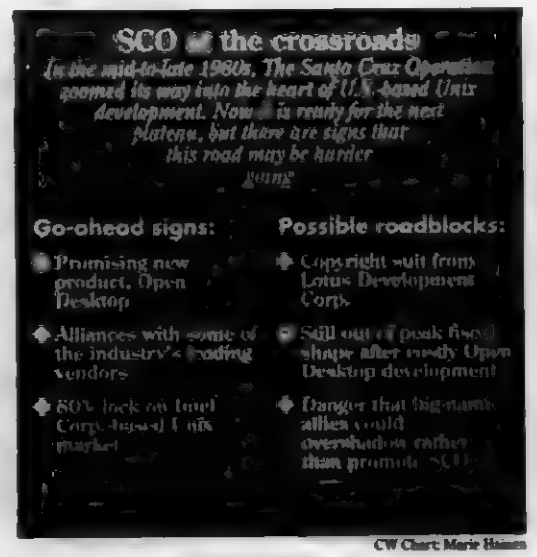
BY CHARLES VON SIMSON
CW STAFF

Politeness, and maybe the fact that Microsoft Corp. owns 20% of the company, keeps anyone from saying it out loud, but the feeling at The Santa Cruz Operation (SCO) these days is that OS/2 is finally dead.

Don't blame SCO executives for not wearing black. They make their money in the Unix world. By the end of this month, according to plan, SCO will dramatically broaden the distribution of Open Desktop, its personal computer-based front end to Unix. SCO's executives said they see the system as the logical successor to DOS and an option that could make OS/2 as it exists today a memory over the next five years.

"Open Desktop is like having sliced bread to sell," said Larry Michels, founder and president of SCO. "We are taking a graphical Unix to the lowly PC. We are talking to someone doing computer-aided engineering, or telephone operators or someone with machine tools to run. Here is software that does not require a huge productivity payoff to be cost-effective."

Analysts, however, cautioned that while Open Desktop is a strong product, sliced bread it ain't. "SCO dominates what will be a strong market for Intel-based Unix, but there are a lot of questions about where that market will go," said David Card, Unix analyst at market research firm International Data Corp. (IDC) in Framingham, Mass. "The retail channel hasn't worked for Next, IBM has too much at stake to let OS/2 disappear, and from all indications, SCO still isn't making much money."



CW Chart: Marie Haines

SCO's strategy during the last few years is a case study in the flexibility required to make a go of the treacherous Unix marketplace. For many years, the firm did a strong business in desktop applications, which it still sells. SCO rode its license of Microsoft's Xenix flavor of Unix for PCs. While the firm now only develops maintenance releases of Xenix, sales of the operating system still account for about 60% of operating system sales.

Michels said he expects that figure to drop to 50% by next year and to keep on sliding in favor of the more powerful Open Software Foundation Motif version of Unix that currently accounts for the other 40% of operating system sales. Ultimately, the company's executives think that sales of

Continued on page 97

Cheer and caution mark IBM's second quarter

BY NELL MARGOLIS
CW STAFF

Unfortunately for Kermit the Frog, it probably still is not easy being green. However, in light of IBM's second consecutive upbeat quarterly earnings report last week, it might be a lot easier being Blue.

Particularly strong Application System/400 sales, continuing gains in the leasing area and the beginning of the anticipated payback from corporate restructuring fueled IBM to revenue of $16.5 billion for its second quarter ended June 30 — an 8.4% increase over the sales figure logged for last year's comparable period. Quarterly profits of $1.4 billion marked a 5.2% increase over last year's second-quarter net income.

Favorable currency translation added a shine to the numbers, a spokesman noted. This advantage benefited every firm deriving a hefty chunk of revenue from overseas operations as a weak dollar swelled the gain from foreign sales when stated in U.S. dollars.

On the whole, the numbers exceeded analysts' expectations — although industry analyst Robert Djurdjevic, president of Annex Research, Inc., said the root causes for the encouraging quarterly results were foreseeable and, in fact, foreseen.

"I don't recall any other [IBM] quarter where things have turned out quite as predictably," he said. For example, he and other analysts noted, a 38.5% year-to-year increase in second-quarter rental and financing revenue was not the result of increased second-quarter 1990 leasing activity.

> "I DON'T RECALL any other [IBM] quarter where things have turned out quite as predictably."
>
> ROBERT DJURDJEVIC
> ANNEX RESEARCH

In fact, IBM reported that it wrote fewer operating leases in the quarter just closed than in the comparable quarter last year and slightly fewer than in first-quarter 1990, Montgomery Securities, Inc. analyst John B. Jones Jr. said. Rather, the revenue rolling in reflects the ongoing spoils of the slew of two- to three-year 3380 operating leases written in the second half of fiscal 1989 when IBM deferred shipment of the 3390.

"While first-half results are encouraging, much remains to be done this year," Chairman John Akers said in a prepared statement. IBM similarly warned Wall Street not to "get carried away in [its] estimates," Jones said.

1990 second-quarter earnings

Surprise rise for NCR and continuing strength on the desktop showed in the early reports

Company	Revenue April through June (in millions)	Percent change from '89	Net income April through June (in millions)	Percent change from '89
Qume	$57M	1%	($1.83M)	—
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
NCR	$1.6B	5%	$115M	5%
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Lotus	$175M	33%	$23.5	128%
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Intel	$968M	30%	$171M	72%

Parentheses indicate a reduction or loss

CW Chart: Marie Haines

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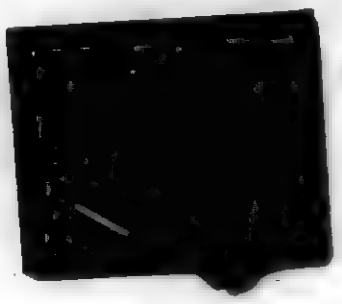

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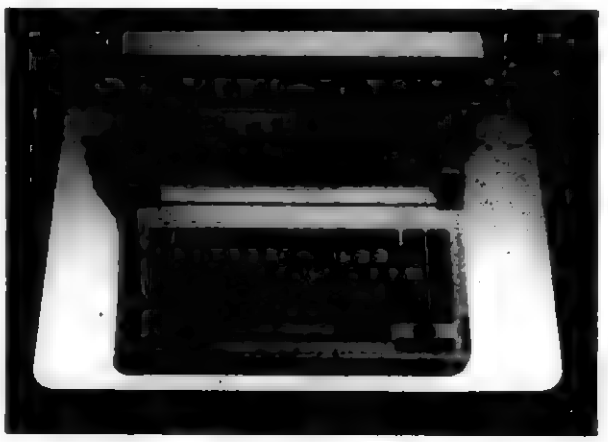

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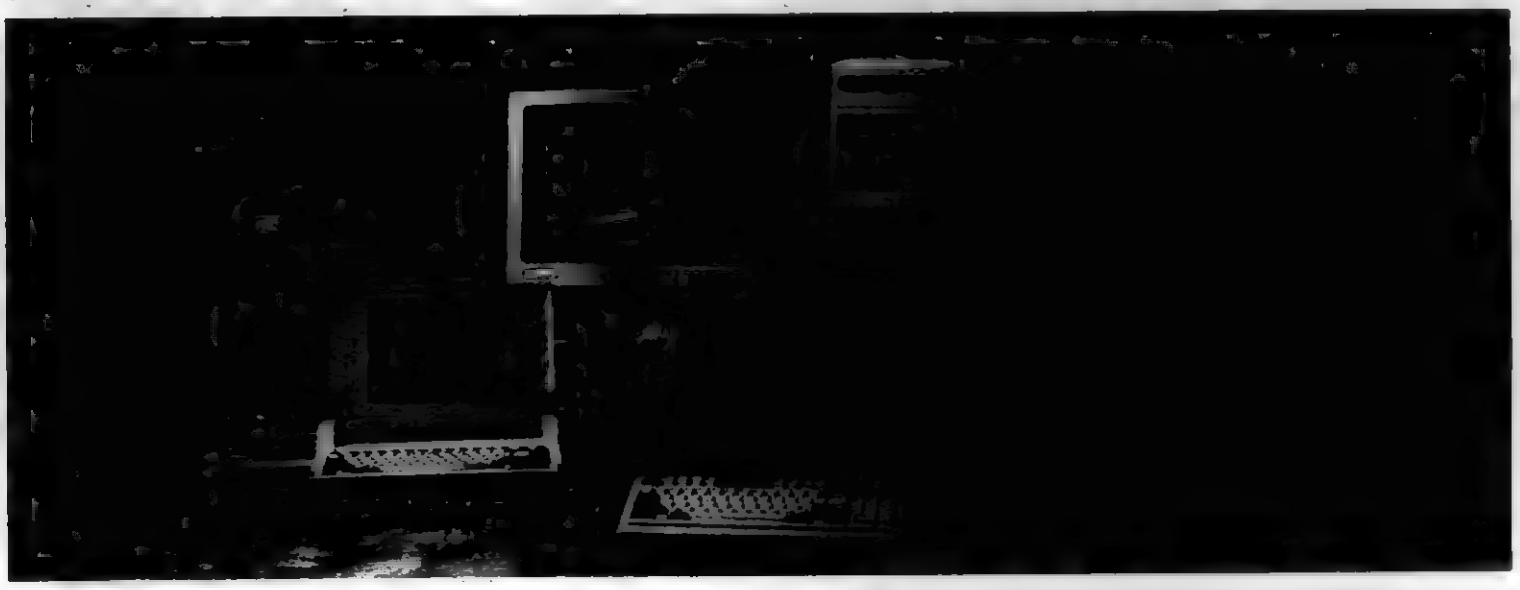

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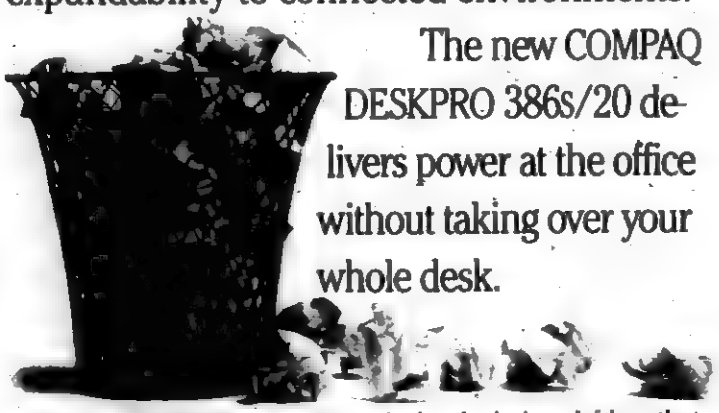

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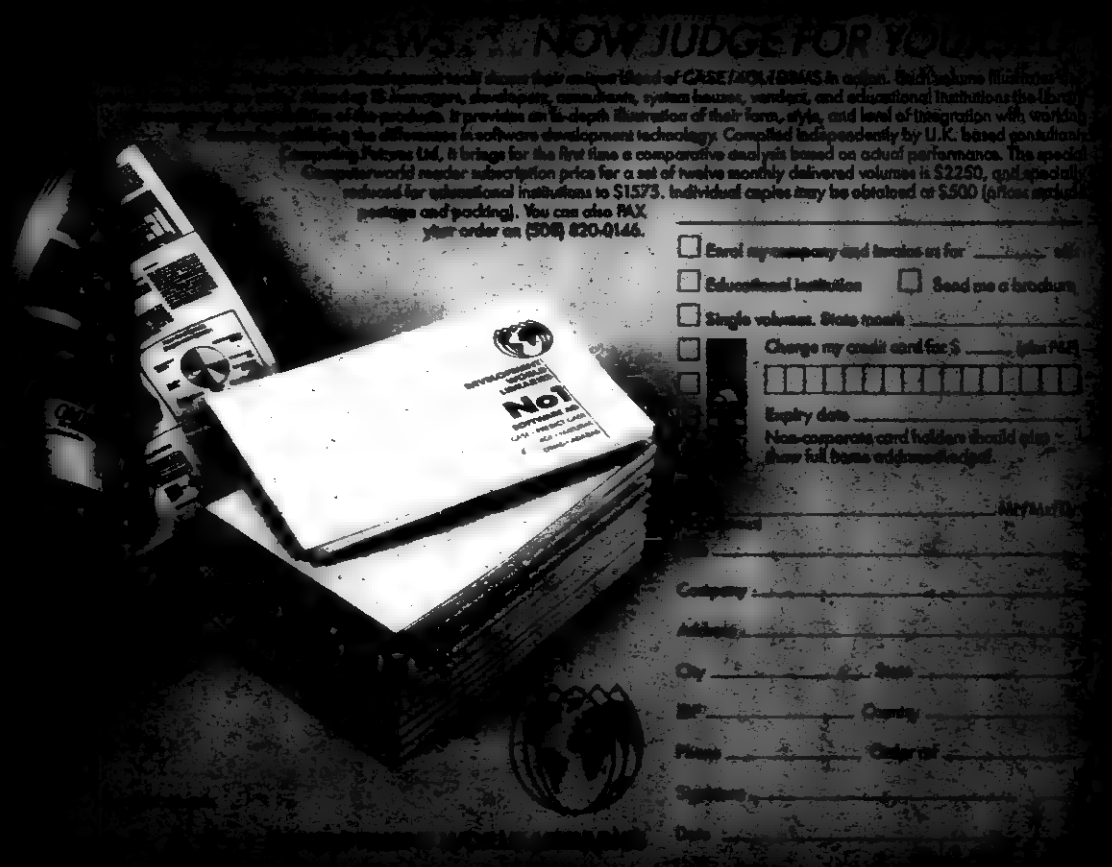
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INTERNATIONAL BRIEFS

First first

Among the latest in the ongoing list of Soviet business firsts: **Alcatel Bell**, the Belgian subsidiary of French telecommunications company **Alcatel N.V.**, has joined forces with Leningrad-based industrial group **Krasnaya Zarya** to give the Soviet Union what could be its first joint venture in the switching equipment arena. The coventurers put together $63 million to launch **Lambell Telephone**, which is owned 60% by its Belgian parent and 40% by its Soviet one. The new firm plans to start producing digital telephone lines in 1995.

■

Second first

Meanwhile, in East Germany, Japan planted its flag in the facsimile niche. Privately owned, Japan-based **Nissei Opto Co.** and **MEI Japan, Inc.** are partnering with Radeburg, East Germany-based **Robotron-Elektronik**, a state-owned electronics firm, to build fax machines in Radeburg. The joint venture, which aims at producing Nissei machines — and creating some 350 jobs — in 1991, would be the first such undertaking by a Japanese firm in East Germany, according to the companies.

■

Variation on the Golden Rule

A plan for breaking up Japanese telecommunications mammoth **Nippon Telegraph and Telephone Corp. (NTT)**, backed by Japan's Ministry of Posts and Telecommunications, is currently on hold, partly in light of a less-than-stellar stock market performance on NTT's part. One onlooker from across the Pacific apparently thinks the plan is right where it ought to stay. Earlier this month, **AT&T** Chairman Robert E. Allen warned Japan to think carefully before doing unto its phone company as his company was ordered to do unto itself. If polled, he reportedly claimed, U.S. phone users would have more bad than good to say about what the AT&T breakup meant to them.

Europe struggling in software

U.S. firms stand to dominate unified packaged software market in 1992

BY RALPH BANCROFT
IDG NEWS SERVICE

LONDON — Unless the European Community acts, U.S. software companies will walk away with the lion's share of benefit from the single European market, according to an executive of Ovum, a market research organization.

Launching its "Ovum 40" list of the leading packaged software suppliers, Ovum Chairman Tim Johnson said that aid should be given to companies that sell exclusively into their respective local national markets to help them build pan-European sales and distribution channels.

"Unless something is done to strengthen the position of European software product companies, it will be the Americans who get all the benefit of the single European market in this area," he said.

Ovum based its Top 40 list on published financial results, stripping out sales of hardware, services and custom software.

According to Ovum's figures, IBM is far and away the largest vendor of packaged software in Europe, with 1989 sales worth $2.12 billion. That figure includes system software (operating systems and utilities) and applications software.

European-based vendors with worldwide marketing operations fared well on the Ovum tally. Second on the the list is Siemens AG in West Germany with 1989 sales of $398 million. West Germany's Nixdorf AG, slated to merge with Siemens in October, ranked third with 1989 sales of $374 million.

ICL, based in the UK, took fourth with sales of $318 million, and France's Bull HN Information Systems, Inc. was fifth with sales of $314 million.

Software sales of $279 million took U.S.-based Digital Equipment Corp. to sixth place on the Ovum ranking, followed

by Italy's Ing. C. Olivetti & Co., which had sales of $236 million. Unisys Corp. was the third U.S.-based company on the list, taking eighth place with sales of $183 million.

Microsoft Corp. and Computer Associates International, Inc. tied for ninth place, each with $152 million in 1989 software sales.

The 40 companies listed — which, in the aggregate, accounted for 64% of European packaged software sales of $11 billion in 1989 — included 21 U.S. companies, six French, five German and four British. Italy, the Netherlands, Finland and Canada accounted for one company each.

"It is not just the number of American companies represented that is significant," Johnson noted. "It is also the fact that almost all the specialist software product suppliers are American."

Most of the European companies on the list are either big hardware manufacturers or systems houses whose main focus is on sales of hardware or computer services rather than packaged software products.

"We are too complacent about Europe's position in the software business," Johnson stated. "It is sometimes said we excel in software and services. But if that's true at all, it is only on the custom software side."

Europe is weak in software products, but its products offer the fastest growth, the biggest profits and the best opportunities for exporting to other parts of the world, Johnson noted.

Bancroft is a European correspondent at London-based IDG News Service.

SCO

FROM PAGE 93

Open Desktop will bring them into the $250 million-per-year range.

"Open Desktop changes the basic economics of this busines," Michels said. "Today, we sell the operating system, but with Open Desktop we have a product to sell to each user on the system. That will dramatically increase the revenue per site that is available to us."

While the company is poised for growth, positioning to get Open Desktop out the door last February caused dramatically slower growth than had been predicted just a few years ago. According to Michels, SCO will have revenue of just over $100 million this year, up from $75 million in fiscal 1989. The company predicted a $100 million year in 1989 and had been doubling in size every year for the past five years.

Open Desktop, the product on which SCO has been focused for the last six months, is a graphical front end that brings a good measure of DOS' ease of use to Unix-based PCs in the $3,000 to $4,000 range. Since 1979, SCO has been the leader in the market for Unix for PCs. While the lack of volume shipment has today slowed developer acceptance of the interface, many analysts said they were confident that it will take off.

Part of that confidence comes from SCO's lock on the Intel Unix market. According to IDC, the company currently commands about 80%; Interactive Systems Corp. has about 10% (including some lucrative deals with large OEMs), and a number of smaller players own the remaining 10%.

One of the PC Unix market segment's largest challenges is the distribution channel. The average PC dealer is not sophisticated enough to sell Unix, and most stand-alone PC users, the heart of the Microsoft Windows market, do not really need it.

Since shipping the product in February, SCO has controlled the number of outlets that could resell the product in an effort to get a better view of how the market would work. After shipping about 4,000 units, a microscopic amount in the scale of PC software, the company will open the product pipeline this month.

SCO will be relying on the likes of its current agreements with Hewlett-Packard Co. and Digital Equipment Corp., under which each of these vendors will resell SCO's Unix and Open Desktop into accounts that request it. The relationships give SCO a lot of sales leverage, but analysts voiced concern that relying too much on that channel may make SCO a second-class citizen in its own accounts.

"DEC wants to sell their own software on Decstations, which may already be their second choice if they can't sell a customer a VAX," Card said. "Open Desktop is not their top priority."

An additional question mark was written into SCO's plans for the coming year by Lotus Development Corp. The Cambridge, Mass.-based vendor hauled SCO into court earlier this month on charges of illegally copying the Lotus 1-2-3 interface for its SCO Professional.

So even while the company fields a decidedly strong product in the ascendant market for PC Unix, executives at The Santa Cruz Operation face a number of tough questions as they attempt to move their company to the next plateau.

3Com charts new networking course

BY PATRICIA KEEFE
CW STAFF

Sometimes you just have to call a spade a spade. In a reversal of last year's annual analyst meeting, at which edgy analysts had 3Com Corp. executives somewhat on the defensive, recently installed President Eric Benhamou took charge from the start this year, laying his cards on the table early.

3Com's new executive team gave notice via a "situation analysis" that it is aware of the challenges it faces. These translate into facts such as "the company's identity, both internally and externally, is unclear" and that "many prevailing perceptions about 3Com are inaccurate."

Some of this can be attributed to a seemingly endless change in focus that has had the company jumping from an emphasis on adapters to network operating systems to client/server technology to systems integration.

This flightiness, coupled with distribution problems, contributed to the company's malaise last year, but despite them, the company has seen a turnabout in its stock value and revenue.

Building momentum

3Com currently has about 2,000 employees, $419 million in sales and $85 million in cash with no long-term debt. Revenue from new products grew from 10% in its first fiscal quarter to 27% in its fourth quarter, which ended in May. Order momentum was up 9% over the previous year.

"They've got a solid balance sheet; they've done a terrific job," said Mary McCaffrey, an analyst at C.J. Lawrence, Morgan Grenfell, Inc. in New York. While 3Com ended fiscal 1990 at 70 cents per share, McCaffrey predicted it will end fiscal 1991 around $1.30 per share.

An improved financial picture has been attributed in part to a clearer sense of identity and purpose — 3Com said its "focus for the '90s" lies in becoming the leading independent, global data networking firm. This will require "a commitment to an open, unbiased approach" to solving customer problems, according to the company.

The "new" 3Com will focus its product development efforts in four areas: adapters, workgroup systems, enterprise systems and support services, according to the company.

COMPUTER CAREERS

Wearing the headhunter hat

Compensation is one consideration for IS pros who switch to recruiting

BY SHERYL KAY
SPECIAL TO CW

After seven years of rising through the ranks to the position of project manager at Electronic Data Systems Corp., Jim Combs felt the need to change direction.

"I was young, impatient and driven," Combs recalls. "I was tired of hearing 'Just hang in there. In five to 10 years you'll get a real management position.'"

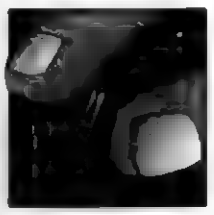
For Bob Jensen, 10 years in the information systems organization led to a position as project manager at Boise Cascade Office Products. Then he decided a career change could bring him better compensation, a more flexible schedule and a greater opportunity to shape his future.

Both men took a step that is not uncommon among their fellow IS managers: They turned to the recruiting of computer professionals as a second career.

Steve Joffe, a vice-president at Source EDP, says close to two-thirds of the people the firm hires are IS professionals.

"It took me two days to make the decision," says Combs, now a managing director at Robert Half International, Inc. in Philadelphia. "I've never looked back."

Earning potential is one motive for this kind of move. George R. Martin, now president of his own recruiting firm in Atlanta, learned that lesson in 1977 when he managed corporate systems at Rollins, Inc. A friend with credentials similar to his became a recruiter; after a year, the friend was making three times as much as Martin.



It is not uncommon today for particularly productive IS recruiters to earn six-figure compensation. By contrast, within IS organizations, only vice-presidents and chief information officers average more than $100,000 per year, according to the most recent *Computerworld* salary survey.

Recruiting calls for evening hours because some job candidates can't talk to recruiters while they are at work. To compensate for this requirement, recruiting firms tend to be flexible about the hours their staff keeps; flex time is usually fine for people who are sufficiently productive.

Of course, nothing comes easily. "Recruiting is a sales job," says Jensen, now director at the Rolling Meadow, Ill., office of Source EDP. "Any sales position has its ups and downs. There are a lot of external forces that can affect a placement, not all of which are under your control."

The external forces are wide-ranging: a company might cancel its job requisition; a candidate's spouse might not like something about the job in question; the candidate might get another offer at the last minute.

There is little recruiters can do in this kind of situation. Even when they believe a candidate should take the job they are trying to fill, they may have to wait patiently on the sidelines to avoid the appearance that they put their own interests above those of a job candidate. "The frustration can sometimes be quite intense," Jensen says.

The leap from IS to recruiting isn't as great as some people think. Martin discovered that his 12 years of technical experience helped him a lot. He understood the requirements in job descriptions. He also knew several of the companies he would be placing people with, as well as a lot of qualified candidates.

Combs found his first month as a recruiter frenzied. However, training helped him settle in, and once he placed his first candidate he felt more confident.

The ideal traits for a recruiter include drive, organization, intuition, superior communications skills, a professional manner and honesty. The last item can be particularly important.

Martin has learned that success flows from one's reputation. "If you treat people the way you want to be treated, you'll be a successful recruiter," he says.

IT IS NOT UNCOMMON today for particularly productive IS recruiters to earn six-figure compensation. By contrast, within IS organizations, only vice-presidents and chief information officers average more than $100,000 per year.

Of course, recruiting isn't for everyone — even someone with all these attributes. Cynthia Boaseman, a technical consultant at United Services Automobile Association in San Antonio, spent three months as a recruiter and said it was the worst 90 days of her life.

Several years ago, Boaseman left a technical management position to join a recruiting firm in Austin, Texas. The firm gave her an assignment to recruit someone she knew who was perfectly qualified for the job in question.

However, the job was five states away, and Boaseman felt that the individual was perfectly happy with his current job. She didn't want to encourage him to pick up and relocate his family.

"I felt like I was being used for who I knew," Boaseman says. She started to lose her self-respect, feeling that she might be "conning" one-time acquaintances for her monetary gain. "I'd never do it again," she says.

Other recruiters say they don't want to leave recruiting to return to an IS organization. "I enjoy what I do, it's fun, and I'm successful at it, so why leave a good thing?" Jensen says.

For would-be recruiters who may find themselves yearning for a return to IS work, the ability to make the move back is an issue to consider.

Combs says he thinks the return trip might be difficult, if not impossible: "I've been away from the firing line too long; I'm an antique," he says.

He says that he believes he would lack the technical credibility that someone fresh from an IS department would possess. As a result, he would probably not be able to land a technical position that offers the income he would want.

Kay is a business consultant and freelance writer specializing in emerging technologies and human resources.

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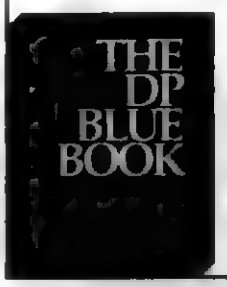

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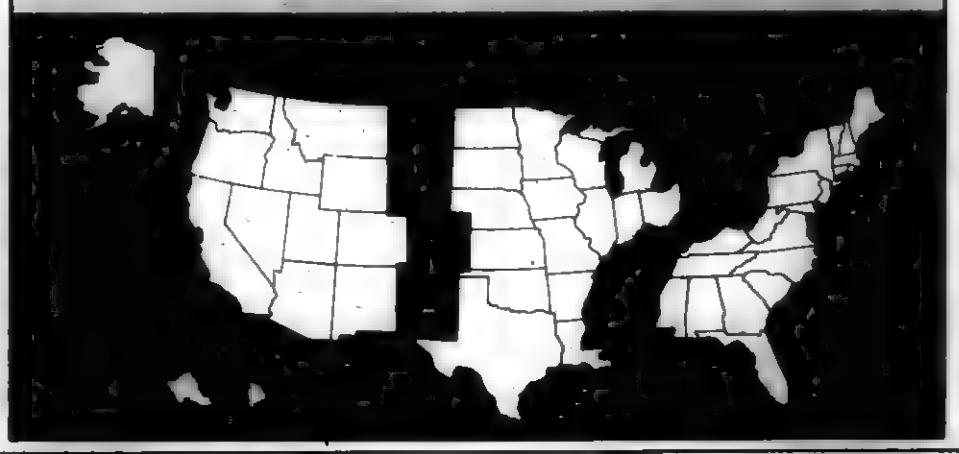

AIRLINE OPPORTUNITIES

USAir, America's Most Frequent Flyer, is seeking experienced data processing professionals and managers for our rapidly expanding MIS department in Arlington, VA, Pittsburgh, PA, and Winston-Salem, NC.

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IMS PROGRAMMERS/ANALYSTS/MANAGERS (VA, PA)
2-7 years programming and/or systems analysis experience in COBOL, and IMS is required with a strong business background assisting users with various automated financial, accounting, payroll, airport operations, and inventory control systems in a project oriented environment is required. A four year degree is preferred, with experience with SAS, 4GL, DB2 and mainframe software packages a plus.

DATABASE ADMINISTRATOR (NC)
Work with logical and physical database design methods associated with application development projects. Requires 3+ years experience with DB2. Degree preferred.

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Design, develop, and implement large reservations application systems. 4+ years experience in a TPF development/programming environment, with knowledge of large systems interactions necessary.

PRODUCTIVITY PROGRAMMER/ANALYST (NC, VA)
Research, create and maintain standards and procedures within a MIS department. 2-3 years experience working with lifecycle methods and CASE tools. A background using SCRIPT, GML, CMS, and TSO is preferred.

NETWORK OPERATOR (NC)
Monitor and operate multiple data communications network. Provide technical support to MIS functions and user departments. Requires education/experience in electronics, communications and computer sciences.

Catch a career you can fly with by forwarding your resume with salary history and position/location desired to: USAir Employment Services, Dept. COMPWLD, P.O. Box 15866, Arlington, VA 22215. EOE/M/F. PRINCIPALS ONLY.

USAir

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The LOCKHEED AERONAUTICAL SYSTEMS COMPANY currently seeks INFORMATION SYSTEMS SPECIALISTS for the following positions:

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  Positions require either IBM or DEC experience with strong analysis/programming skills. Knowledge of IEW workstation is required. Additional understanding of VM, MVS, VMS, VTAM, TCP/IP and/or DB2, SQL/DS, Ingres and WINDOWS.
- **DATABASE MANAGEMENT ADMINISTRATION**
  Provide overall support for IBM Database functions to include IMS DL/I, DB2, APS for the IMS environment.
- **MANAGEMENT SYSTEMS SUPPORT—VM**
  Provide VM-based user support to include the creation of prototype database applications and test and installation of new Nomad releases and other 4GL's. Ramis experience is desirable.
- **MANAGEMENT SYSTEMS SUPPORT—PC**
  Provide PC technical support to include preparing advanced PC configurations and design/support of local area networks such as Novelle and IBM Token Ring.
- **PROGRAMMING**
  Develop computer applications for IBM 3090 using IMS/DB-DC, UNISYS 1100 using DMS-1100/TIP or DEC VAX using VMS/BASIC-PLUS. COBOL/FORTRAN.
- **EQUIPMENT EVALUATION**
  Review and evaluate computing and peripheral equipment to include recommending acquisitions and negotiate lease/purchase.
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  Install and maintain database/data communications products in the MVS operating system environment, particularly IMS, CICS and DB2.
- **TELECOMMUNICATIONS/PHOTOGRAPHIC SUPPORT**
  Investigate and recommend technologies and equipment for cost effective systems to support either state of the art voice communications or photographic/reproduction systems.

The above positions are career opportunities for individuals seeking a challenging professional environment. LOCKHEED AERONAUTICAL SYSTEMS COMPANY is located in Marietta, Georgia, an attractive suburb of Atlanta, and offers excellent salaries and a comprehensive benefit program. Please forward resume for immediate consideration to:

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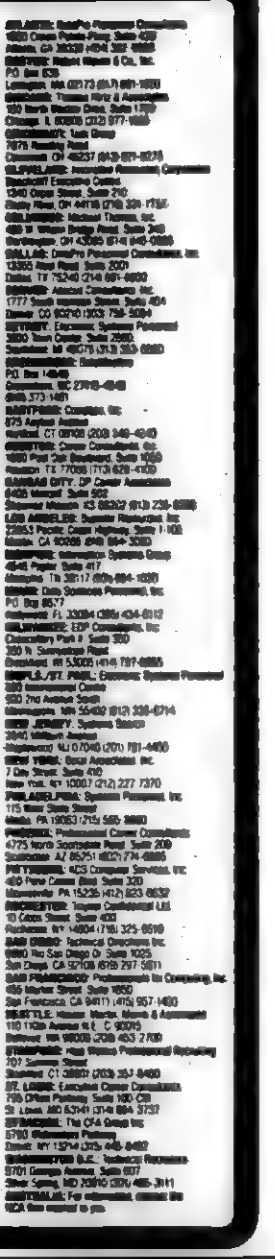

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Alaskan regional referral hospital has an opening for a Manager of Information Systems. **Fairbanks Memorial Hospital**, licensed for 177 beds, serves a local community of 75,000 and the vast interior region of Alaska. Fairbanks was recently rated as the #4 small city in the US for overall quality of life.

Position requires BS/BA degree and five years progressive system procedures analysis, programming, and computer operations experience. Excellent communication skills for interactions with clinical and financial personnel. Three years management experience preferred. Hospital strategic systems planning and installation, LAN configurations, IBM S/38 & AS/400, and Data General experience preferred.

Closing date is August 15, 1990.

Send resume to:
Fairbanks Memorial Hospital,
Human Resources Department,
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Fairbanks Memorial Hospital

We are a Leading Software Consulting firm and have immediate availability of experienced professionals in the following areas:

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DEAN

College of Engineering, Computer Sciences and Architecture

Applications and nominations are invited for the position of Dean of the College of Engineering, Computer Sciences and Architecture at Temple University.

The dean is the chief executive officer of the college. In administering the college, the dean interacts with the faculty who govern the academic aspects of the college. The dean is an advocate for the college and faculty.

Temple University is a member of the Pennsylvania Commonwealth System of Higher Education and presently has an enrollment of more than 34,000 students in 14 schools and colleges. Located in Philadelphia, at the heart of the northeast corridor, Temple offers a broad range of quality academic programs that attract students from all over the United States and from more than 60 foreign nations.

The College of Engineering, Computer Sciences and Architecture is comprised of 71 full-time faculty who, in conjunction with adjunct faculty, serve an enrollment of more than 1900 undergraduates and 200 graduate students. The College is strongly oriented towards professional studies, graduate work and research activities, with programs offered in architecture, civil engineering, computer and information sciences, electrical engineering and mechanical engineering.

Applicants must have a proven record of scholarship or professional recognition and have had significant management experience. An advanced degree and experience in university management are important assets but are not required. Applicants should have demonstrated expertise in managing resources, especially people, in an organization of shared authority and responsibility. The applicant must be an innovative leader capable of taking the initiative and promoting new ideas. At the same time, the applicant must understand the nature of the university, academics and scholarship, and the balance of authority and responsibility between the faculty and the administration.

Applicants or nominators should submit a letter summarizing qualifications, a current vita, and the names, addresses and telephone numbers of at least three references to:

Leonard J. Garrett
Chairperson, Dean Search Committee
Computer and Information Sciences
(038-24)
College of Engineering, Computer Sciences and Architecture
Temple University
Philadelphia, PA 19122

A review of applications and nominations will begin September 1990.

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Nat'l consult firm seeks indivs w/3-10 yrs DB2, Case Tools, or Data Modeling. Ex. benefits, full relo. Opptys for SRS/MGRS. Positions in ATL, BALT/WASH, CALIF. Call San Diego for details.
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SR PROG/ ANALYST
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COBOL CICS PROS
Established San Francisco area clients are looking for seasoned programmers and analysts with experience in IBM VM, MVS and DOS systems. 2+ yrs COBOL & CICS experience required.
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COBOL CICS MVS SR P/A
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Outstanding oppty's for programmers & DB analysts in established San Jose based electronics company. Requires 2+ yrs solid INGRES exp in a DEC VAX environ. Excellent career growth potential.
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NY-NJ Fortune 100 firm seeks 5+ yrs systems and programmer/analysts with skills in the following technical disciplines: COBOL DOS/VSE VSAM, TANDEM TAL/PATHWAY, UNIX "C" AS/400 networking and PC support.
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AS400 COBOL
International Conglomerate looking for programmer analyst with 2+ years experience on the AS400. Batch and on-line COBOL required. Queens, NY location. Call Jericho, NY office for details.
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($4245 - $5162 Monthly)

Immediate position available for Director of the Information Systems Office located in the Santa Clara County Health Department/Mental Health Bureau. The position will supervise 13 employees and oversee an on-line patient tracking and billing service system, utilizing the DEC VAX 8550 and providing linkage with approximately 200 computer terminals located throughout the County.

Applicants must possess a baccalaureate degree in computer science, mathematics, business administration, or related field and five years experience performing computer system design and programming, including two years of project leader responsibility in an information systems department. Experience in health care systems is preferred.

For information on application procedure, contact:

Dave Wytsack or Pat Garcia at

(408) 299-5935

County of Santa Clara

Information Services Opportunities

Orlando Regional Medical Center is a leading 1100-bed, multi-facility, tertiary care organization with more than 200,000 annual outpatient visits.

We are now in the process of expanding our multi-hospital Clinical Information Systems Network, and are seeking qualified professionals for the following positions. Individuals with TDS experience are highly desired.

Applications Support

Clinical Analysts and Instructors are now required for the installation of order entry, results reporting and advanced nursing functions using the TDS HC 7000 applications software package. Instructors will participate in system development, and teach system applications to a broad variety of our clinical staff, utilizing PC-based modules and mainframe software.

We are especially interested in professionals from various clinical disciplines who have experience installing the TDS package or other patient care systems in a similar hospital environment. Additional experience with screen and report formatting is desirable, along with previous involvement in the implementation process (data collection, design, specifications, etc.). Knowledge of adult learning concepts and CBI is desired for Instructor positions.

Programming Support

All levels of Applications Software professionals, from Programmers to Senior Systems Analysts, are invited to apply. We are especially interested in those candidates with experience on IBM 3090 MVS mainframe systems, and proficiency in COBOL, CICS, IMS/DB and EASYTRIEVE PLUS. Additional experience in developing, implementing and supporting TDS patient care applications is a definite plus. Effective communication skills are a must, as is the willingness to work across organizational disciplines and functions.

In exchange for your specialized talents, we provide an attractive salary/benefits package along with an exceptional Central Florida location. You'll be sure to enjoy the added advantages of abundant recreational/entertainment activities, and no state income tax or snow.

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Orlando Regional Medical Center

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SENIOR SOFTWARE ENGINEER for Cincinnati area engineering/software design consulting firm to be responsible for program analyses; implementation of software module for Predictive Maintenance programming; the design, development, and testing of variety driver for Predictive Maintenance programming; and the documentation of all designs, programs, analyses, and tests; uses C and Assembly languages. No exp. required in above duties but applicants will qualify with an MS degree in Computer Science or Informational Science, and have as part of graduate or undergraduate education at least four credit hrs. in Engineering Materials. In addition two and a half yrs. exp. is required in programming/system analyses in C and Assembly languages. 40 hrs/wk., 8AM-5PM, $680.00/wk. Must have proof of legal authority to work permanently in U.S. Qualified applicants send resume in duplicate (NO CALLS) to J. Davies, JO# 1099700, Ohio Bureau of Employment Services, P.O. Box 1618, Columbus, OH 43216.

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Yuma County Arizona is seeking a Programmer/Analyst who is experienced in designing either Financial Accounting applications or GIS applications. The applicant must be an experienced RPG programmer preferably with background in IBM System 30/ AS400. County Government experience is desirable. Salary range is $30,529 - $42,696 with raising at beginning step. Direct any phone inquiries to MIS Director (602) 329-2071. Send resumes to Administrative Services Department, 198 South Main Street, Yuma, Arizona 85364. Closing date is August 6, 1990 for applications.

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SENIOR P.A. 4-6 yrs. exp. Heavy VSAM Utilities, CICS. 45K

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SENIOR P.A. IDMS/ADSO, or DB2. Excellent analytical skills. 45K

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MARKETPLACE

The new look of leasing systems

State laws will redefine 'sale' and 'lease' and change the terms of each

BY RAYMOND T. NIMMER
SPECIAL TO CW

"Don't buy it, lease it."

Whether this popular advice is sound when acquiring a computer hinges in large part on a company's economic condition. But the decision also depends on how our laws treat purchases and leases. Those seemingly arcane but important differences have been undergoing some significant changes recently.

Although companies sometimes describe a purchase as a lease to get more favorable tax treatment, state contract law sets its own standards for distinguishing a purchase from a lease, and the outcome determines various rights and obligations of the parties.

New standards

The changes in state law have to do with the standards for distinguishing a purchase from a lease. They also establish implied warranties, specify obligations that apply to the lessee's acceptance of the hardware and spell out the lessor's rights in the event a lease is broken.

The changes are contained in an addition to the Uniform Commercial Code known as Article 2A, which essentially rewrites the law of leasing. The Uniform Commercial Code provides a set of standard guidelines for state laws regulating business dealings. Although Article 2A is controversial and its standards have not yet been tested in court, it is expected that in 10 years some form of it will be law in all 50 states.

In general, the difference between a purchase and a lease revolves around who owns the computer and who gets to keep it after the contract expires. In a purchase, the seller transfers ownership of the machine to the buyer in return for a sum of money. Under a "true lease," the lessee operates a machine owned by the lessor in return for rent. The lessee avoids the up-front cost, but like any other renter, he is left only with rent receipts at the end of the lease.

In another kind of lease, known as a "tax lease," the lessee wants to buy the computer and pay for it over a period of time. But the parties describe the purchase as a lease to control the tax impact. They can alter which party claims depreciation and investment credits and how the rent payments are taxed. The lessee can usually buy the computer when the agreement expires by paying a small sum. When tax rates and investment credits are high, tax leases dominate the marketplace.

Even though the parties to this kind of agreement call the transaction a lease for tax purposes, state contract law may treat it as a sale. Today, state law classifies a lease as a sale if the lessee has an option to buy the computer at the end of the lease for payment of a "nominal" price.

For example, if a lessee can buy a $50,000 computer for one dollar after a three-year lease, the lease is a sale under contract law; one dollar for a $50,000 machine is nominal. If the lessee must pay market value for the computer at the end of the lease, the contract is a true lease.

Article 2A considers the transaction a sale under three conditions: if the lessee has the computer for its entire useful life, if it is obligated to pay the rent whether or not it keeps the machine or if the lessee can purchase the machine at a nominal price at the end of the lease.

How would a different classification affect the users and lessors involved in a transaction?

If the transaction is considered a sale, the "lessee" must pay all rent for the full lease even if it returns the computer. If the transaction is a sale, the "lessor" does not own the computer; it is a creditor. As a result, if the "lessee" fails to pay rent, the "lessor" can only foreclose and sell the computer. It cannot simply take back the machine.

Classification as a sale or lease also affects maintenance. Most commercial leases are explicit about which party must maintain the system or provide updates. If a contract is not explicit, however, the classification is important. A seller does not have an obligation to maintain or update a system unless it agrees to do so.

In the case of a true lease, the lessor's obligation to keep the system in shape is an important issue. It involves numerous considerations that result in disputes, including the following:

- Standards of maintenance required.
- Warranties of performance.
- Precoonditions that require the lessee to accept the machine and pay rent.
- Requirements for upgrades and the costs they entail.
- Obligations of the lessor regarding programming.
- The rights of the lessee if the system becomes obsolete.

The lessee in a true lease must evaluate each of these aspects of the agreement and deal with them in the contract. Unless the contract spells them out, the rights of the lessee are currently governed by ambiguous and obscure law.

Article 2A changes this situation with its implied warranties, which apply to all leases, and the obligations it imposes on lessees in accepting a computer and on lessors when a lease is broken.

Because the business of distinguishing a true lease from a sale can be an uncertain one today, contracts that approach the line between the two should contain all of the safeguards that the user would want if the transaction were a sale on credit. They should include all the standard warranties and acceptance tests.

Nimmer is Foundation Professor of Law at the University of Houston Law Center.

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The BoCoEx index on used computers

Closing prices report for the week ending July 13, 1990

	Closing price	Recent high	Recent low
IBM PC Model 176	$400	$660	$250
XT Model 086	$500	$700	$350
XT Model 089	$675	$825	$475
AT Model 099	$1,050	$1,375	$850
AT Model 239	$1,075	$1,325	$700
AT Model 339	$1,375	$1,400	$900
PS/2 Model 50	$1,300	$1,700	$1,050
PS/2 Model 60	$2,500	$2,600	$2,400
Compaq Portable II	$1,050	$1,150	$875
Portable III	$2,175	$2,500	$1,900
Portable 286	$1,500	$1,875	$1,300
Plus	$675	$750	$650
Deskpro	$825	$900	$800
Deskpro 286	$1,400	$1,625	$1,300
Deskpro 386/16	$2,500	$2,750	$2,475
Apple Macintosh 512	$375	$775	$275
512E	$450	$450	$350
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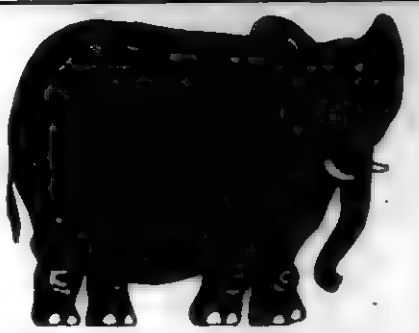

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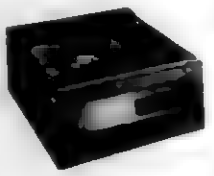

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Return-on-investment blues

Look at training value as a business, but from a broad perspective

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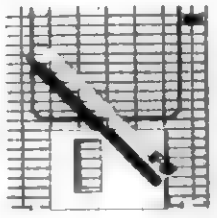
SPECIAL TO CW

I don't view myself as a clairvoyant, but I'm sure that in the near future, senior managers will force training organizations to come up with hard numbers to measure their performance.

Most companies see themselves pursuing one business — financial services, manufacturing or whatever. But with greater competition, more automation and a less-experienced work force, more companies are heavily into the business of training as well. As top executives realize the size of the investments they are approving, they will demand proof that those expenditures are worthwhile.

Companies have used calculations based on the notion of return on investment to come up with the payback from training. In its common form, return on investment is a formula that divides a company's profits, usually for a year, by the value of it assets (excluding people).

Over the years, technical training managers have used this concept to develop two techniques for evaluating their organization's performance. One measure focuses on cost-effectiveness; it divides the quantified benefits or cost savings from training by the cost of the training. The second technique looks at productivity levels. It takes the difference between the productivity of employees before and after training and divides it by the cost of training.



These two techniques can produce some pretty hokey percentages, which is why a lot of companies don't use them. In the first case, identifying benefits is tricky enough; attaching realistic dollar figures to them is even more difficult.

For some types of training, it's relatively easy to demonstrate improvements in performance: An employee couldn't write Cobol code when he was hired but can do so after training. The task is much more difficult for less concrete subjects such as DB2 concepts or writing. In such cases, it's difficult to put improvements in dollars. Some managers point to lower costs for a specific development effort but have difficulty nailing down the portion attributable to training. Managers also cite better performance from the system in question, but the task of quantifying the benefits presents its own problems.

Training managers also contend that their programs lead to reduced turnover. But it's hard to link a change in the turnover rate to training. Also, the cost of turnover is subject to debate.

The second return-on-investment technique also generates its share of arguments and disbelief. First, we rarely have any measure of productivity before training, let alone right after it. Second, the only way to convert the numbers to dollars is to use individual salaries (including overhead). Managers find the resulting figures quite the opposite of the hard numbers for which they are looking.

For both measurements the divisor — the cost of training — is a problem as well. What is the cost of a given course? It certainly includes the compensation of the students while in the class. It includes some piece of the training budget as well as direct costs of the course. But what about lost output while the student is attending the class? What about lost opportunities? All these costs need to be included to provide accurate justification.

Until it is practical to use some form of testing to gauge an individual's performance, it is not useful to chase justification by developing outrageous, unbelievable or unsubstantiated measures of return on investment. A better solution is for management to take a sharp look at training as a business in itself.

This approach calls for using standard performance measures for any activity: history against current performance, comparisons with competitors and performance against plan.

It also requires use of some performance measures developed for business. They cover tasks in administration, operations and strategy.

In administration, the measures should address functions such as production, staffing and organization.

In operations, appropriate measures include the following:

- Liquidity, the ability of training to meet the demands of clients.
- Leverage, the extent to which training uses other resources effectively.
- Activity, the degree to which the department produces and delivers courses.

Strategy is probably the most important consideration. Measurements in this area should address the organization's stage in the training life cycle, its growth in relation to capacity and its reaction to change. The idea is to look at training in relation to future needs.

Any competent training manager can assess the costs of training. It is the worth of the training that we have so much trouble proving. With training costs rising as they are, we need to do more work on ways to measure its impact. We need to put it in terms that senior management will understand and appreciate. We need to relate it to the bottom line.

Sebrell is a vice-president at Data Base Management, Inc., a subsidiary of American Management Systems, Inc. in Manchester, Conn.

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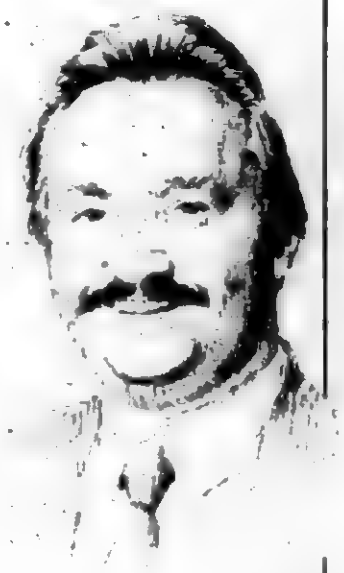

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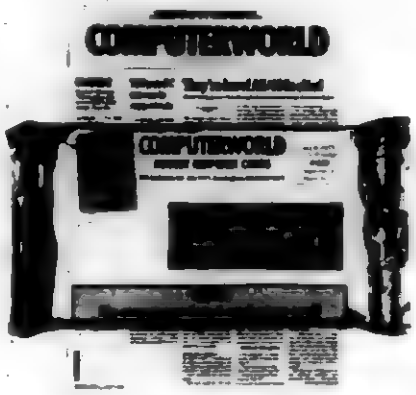

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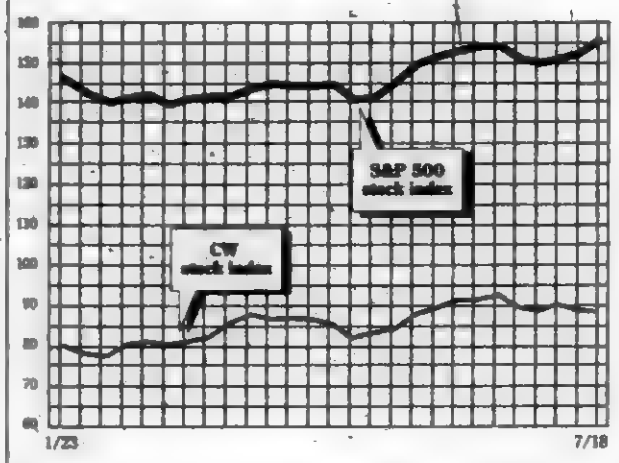

Indexes	Last Week	This Week
Communications	121.4	121.5
Computer Systems	87.0	87.0
Software & DP Services	130.0	127.2
Semiconductors	61.0	59.8
Peripherals & Subsystems	93.3	96.1
Leasing Companies	76.4	75.4
Composite Index	88.9	88.5
S&P 500 Index	152.6	155.3

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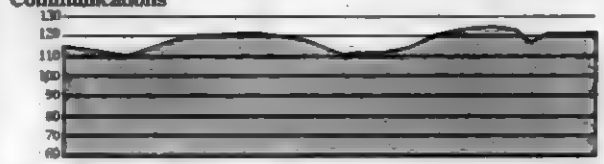

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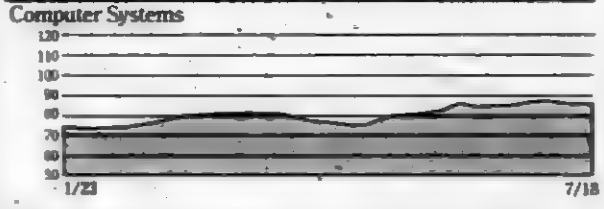

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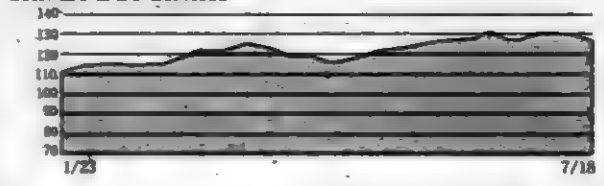

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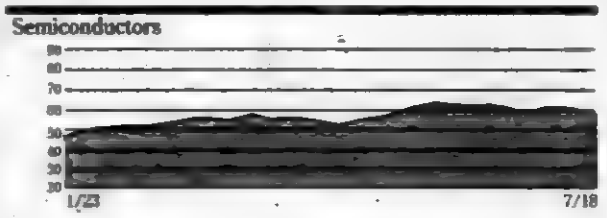

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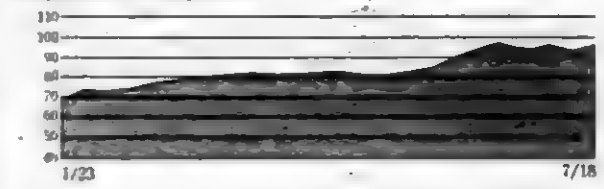

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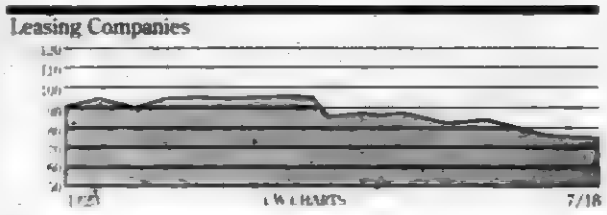

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CLOSING PRICES WEDNESDAY, JULY 18, 1990

EXCH		52-WEEK RANGE		PRICE CLOSE JULY 3, 1990	WEEK NET CHNGE	WEEK PCT CHNGE

Communications and Network Services

N	AMERICAN INFO TECHS CORP	68	55	60.125	0.5	0.8
Q	ANDREW CORP	26	19	22	1.5	7.3
Q	ARTEL COMM CORP	10	4	4.625	-0.3	-5.1
N	AT&T	47	36	37.125	-0.3	-0.7
Q	AVANTEK INC	7	2	3.25	0.3	8.3
N	AYDIN CORP	21	13	14.5	0.0	0.0
N	BELL ATLANTIC CORP	57	43	45.375	-1.1	-2.4
N	BELLSOUTH CORP	59	49	52.5	1.9	3.7
Q	COMPRESSION LABS INC	16	7	14	-2.1	-13.2
Q	CONTEL CORP	37	23	33.26	5.3	18.8
Q	DATA SWITCH CORP	4	2	3.5	0.1	3.7
Q	DIGITAL COMM ASSOC	27	17	25.5	1.8	7.4
Q	DYNATECH CORP	21	15	16.25	0.1	0.8
Q	FIBRONICS INTNL INC	13	5	11.75	-0.1	-1.1
Q	GANDALF TECHNOLOGIES	7	2	3.375	-0.4	-10.0
N	GENERAL DATACOMM INDS	7	3	4	0.1	3.2
N	GTE CORP	36	28	27.875	-3.1	-10.1
Q	INFOTRON SYS CORP	11	3	3.6	-0.3	-6.7
N	ITT CORP	85	51	58.625	0.8	1.3
N	M A COM INC	8	3	4.875	0.0	0.0
Q	MCI COMMUNICATIONS CORP	49	31	36.5	-3.5	-8.8
N	NETWORK EQUIP TECH INC	34	8	8.75	0.5	6.1
Q	NETWORK SYS CORP	15	7	14.625	0.1	0.9
N	NORTHERN TELECOM LTD	39	19	28.375	-0.5	-1.7
Q	NOVELL INC	59	24	55	-1.3	-2.2
N	NYNEX CORP	92	75	78.125	-1.5	-2.0
N	PACIFIC TELESIS GROUP	53	41	43.125	0.9	2.1
A	PENRIL CORP	9	4	8.625	0.1	1.5
N	SCIENTIFIC ATLANTA INC	29	19	28.375	-0.1	-0.4
N	SOUTHWESTERN BELL CORP	65	51	53.875	2.0	3.9
Q	3 COM CORP	19	10	17.125	-0.6	-3.5
N	U S WEST INC	41	33	36.25	0.4	1.0

Computer Systems

Q	ALLIANT COMPUTER SYS	9	4	5.5	0.1	1.1
Q	ALPHA MICROSYSTEMS	8	2	2.375	-0.1	-5.0
Q	ALTOS COMPUTER SYS	8	5	8.25	0.0	0.0
A	AMDAHL CORP	19	11	17.75	-0.4	-2.1
Q	APPLE COMPUTER INC	50	32	44.625	-2.4	-5.1
N	BOLT BERANEK & NEWMAN	9	4	4.875	-0.3	-4.9
N	COMPAQ COMPUTER CORP	68	37	64.375	-0.1	-0.2
N	COMMODORE INTNL	13	6	7.25	-0.5	-6.5
N	CONTROL DATA CORP	23	16	19	0.1	0.7
N	CRAY RESH INC	51	31	47.625	0.3	0.5
N	DATA GEN CORP	19	8	10	-0.6	-5.9
N	DATAPOINT CORP	6	2	2.375	-0.1	-5.0
Q	DELL COMPUTER CORP	14	5	13	-0.6	-4.6
N	DIGITAL EQUIP CORP	103	70	83.5	-3.1	-3.6
N	FLOATING POINT SYS INC	4	0	2.625	-0.4	-12.5
N	HARRIS CORP	40	28	34.125	1.4	4.2
N	HEWLETT PACKARD CO	58	40	47.5	0.3	0.5
N	HONEYWELL INC	112	73	109.625	5.1	4.9
N	IBM	123	93	119.875	0.8	0.6
Q	INFORMATION INTL INC	16	12	13.25	0.5	3.9
Q	IPL SYS INC	14	5	11.75	0.3	2.2
N	MAI BASIC FOUR INC	8	2	1.875	-0.1	-5.3
N	MATSUSHITA ELEC INDL LTD	180	123	147.888	3.4	2.4
Q	MENTOR GRAPHICS CORP	26	14	17.75	-0.8	-4.1
N	NBI INC	3	0	0.281	0.0	-10.2
N	NCR CORP	72	55	70.875	6.6	10.3
Q	PYRAMID TECHNOLOGY	35	11	29.25	0.5	1.7
Q	SEQUENT COMP SYS INC	34	13	30.5	-0.5	-1.6
Q	SUN MICROSYSTEM INC	37	13	34.75	-0.8	-2.1
Q	SYMBOLICS INC	2	0	0.5	0.2	59.7
N	TANDEM COMPUTERS INC	30	19	21.5	-2.4	-9.9
N	TANDY CORP	49	30	38.875	1.9	5.1
N	ULTIMATE CORP	11	5	7	-0.4	-5.1
N	UNISYS CORP	24	12	12.625	-0.6	-4.7
A	WANG LABS INC	7	4	4.25	-0.1	-2.9

Software & DP Services

Q	AMERICAN MGMT SYS INC	20	11	18.875	1.1	6.3
Q	AMERICAN SOFTWARE INC	27	14	23	-2.5	-9.8
N	ANACOMP INC	7	2	2.625	-0.1	-4.5
Q	ANALYSTS INTL CORP	24	14	21.5	-1.3	-5.5
Q	ASHTON TATE	18	9	10.375	-1.4	-11.7
Q	ASK COMPUTER SYS INC	15	7	9.25	-0.9	-8.6
N	AUTO DATA PROCESSING	60	40	59	2.6	4.7
Q	AUTODESK INC	60	33	57.5	-1.0	-1.7
Q	BMC SOFTWARE INC	30	14	27	-1.3	-4.4
N	BUSINESSLAND INC	14	7	7.625	-0.3	-3.2
Q	COGNOS INC	10	4	9.5	0.5	5.6
N	COMPUTER ASSOC INTL INC	20	9	9.5	-7.0	-42.4
Q	COMPUTER HORIZONS CORP	17	7	16.75	2.3	15.5
N	COMPUTER SCIENCES CORP	59	40	44	-0.8	-1.7
N	COMPUTER TASK GROUP INC	14	9	10.25	0.0	0.0
Q	COMSHARE INC	25	15	22.75	-1.0	-4.2
Q	CORPORATE SOFTWARE	15	8	15.25	2.0	15.1
N	GENERAL MTRS (CLS E)	38	24	38	-1.5	-4.0
Q	GOAL SYSTEMS INTL	18	10	15	0.0	0.0
Q	HOGAN SYS INC	7	4	3.875	0.3	8.9
Q	INFORMIX CORP	18	8	14.625	-2.1	-12.7
Q	INTELLICORP INC	8	3	5.5	-1.6	-22.8
Q	LEGENT CORP	32	19	24.75	-0.3	-1.0
Q	LOTUS DEV CORP	39	21	31.25	-1.3	-3.8
Q	MICROSOFT CORP	81	26	76	0.5	0.7
Q	NATIONAL DATA CORP	35	13	14.25	-0.8	-5.0
N	ON LINE SOFTWARE INTL INC	11	6	8.25	-0.3	-2.9
Q	ORACLE SYS CORP	188	15	17.75	-2.1	-10.7
N	PANSOPHIC SYS INC	19	10	13.125	-0.6	-4.5
Q	PHOENIX TECHNOLOGIES INC	7	2	4	-0.3	-5.9
N	POLICY MGMT SYS CORP	43	30	43.375	1.5	3.6
Q	PROGRAMMING & SYS INC	25	16	22	-1.5	-6.4
Q	RELATIONAL TECH INC	11	5	5.75	-0.6	-9.8
N	REYNOLDS & REYNOLDS CO	27	19	20.875	0.8	3.7
Q	SAGE SOFTWARE INC	16	7	15.25	1.9	14.0
Q	SEI CORP	22	15	20.5	-1.0	-4.7
Q	SHARED MED SYS CORP	17	12	12.875	0.1	1.0
Q	SOFTWARE PUBG CORP	28	13	27	3.0	12.5
N	STERLING SOFTWARE INC	11	7	10.375	0.3	2.5
Q	SUNGARD DATA SYS INC	28	17	25.25	1.0	4.1
N	SYSTEM CENTER INC	20	17	17.375	-0.5	-2.8
N	SYS. SOFT INC	29	15	25.25	-1.3	-4.7
Q	WORDSTAR	2	1	1.063	0.0	-2.8

Semiconductors

N	ADV MICRO DEVICES INC	11	7	9.125	-0.3	-2.7
N	ANALOG DEVICES INC	11	7	7.25	0.0	0.0
Q	ANALOGIC CORP	11	8	9.375	0.1	1.4
Q	CHIPS & TECHNOLOGIES INC	26	15	19.5	-2.0	-9.3
Q	INTEL CORP	52	28	48.5	0.5	1.0
Q	MICRON TECHNOLOGY INC	17	7	12	-1.1	-8.6
N	MOTOROLA INC	88	53	85.875	-0.5	-0.6
N	NATL SEMICONDUCTOR	9	5	6.875	0.0	0.0
N	TEXAS INSTRS INC	44	28	38.875	-0.3	-0.6
A	WESTERN DIGITAL CORP	15	6	13.375	-0.4	-2.7

Peripherals

Q	ALLOY COMP	2	0	0.688	0.0	0.0
N	AM INTL INC	6	2	2.5	0.0	0.0
Q	AST RESH INC	26	7	25.5	0.0	0.0
Q	AUTO TROL TECH CORP	6	2	3.375	0.1	1.9
Q	BANCTEC INC	24	13	21.75	1.5	7.4
A	COGNITRONICS CORP	8	3	5.75	-0.1	-2.1
Q	CONNER PERIPHERALS	31	10	30.25	2.5	9.0
A	DATARAM CORP	22	8	19.75	-1.1	-5.4
N	EASTMAN KODAK CO	82	38	40.75	0.9	2.2
N	E M C CORP MASS	7	3	6.125	0.8	11.4
Q	EMULEX CORP	9	6	8	0.9	12.3
Q	EVANS & SUTHERLAND	35	18	28.5	0.8	2.7
Q	ICOT CORP	2	1	1.5	-0.1	-7.7
Q	INTERLEAF INC	9	5	8.75	0.1	1.9
Q	IOMEGA CORP	6	3	5.688	-0.1	-1.6
Q	LEE DATA CORP	3	1	1.5	0.1	9.1
Q	MASSTOR SYS CORP	4	1	1.313	0.3	23.5
Q	MAXTOR CORP	17	7	14.375	-0.5	-3.4
Q	MICROPOLIS CORP	10	3	10.125	2.3	28.6
N	MINNESOTA MNG & MFG CO	91	68	89.75	0.3	0.3
Q	PERSONAL COMP PRODUCTS INC	5	4	4.063	0.1	3.2
Q	PRINTRONIX INC	15	7	11.75	-1.4	-10.5
N	QMS INC	21	9	19.125	0.4	2.0
Q	QUANTUM CORP	28	9	24.5	-0.4	-1.5
N	RECOGNITION EQUIP INC	10	4	5.25	0.0	0.0
Q	REXON INC	10	6	7.375	0.0	0.0
Q	SEAGATE TECHNOLOGY	20	10	14.25	0.3	1.8
N	STORAGE TECH CORP	35	9	34.5	1.9	5.7
Q	TANDON CORP	4	0	3.313	-0.5	-13.1
N	TEKTRONIX INC	23	12	16.125	0.3	1.8
Q	TELEVIDEO SYS INC	1	0	0.375	0.1	19.8
N	XEROX CORP	69	44	47.875	2.9	6.4

Leasing Companies

N	CAPITAL ASSOC INTNL INC	8	3	2.75	-0.1	-4.3
N	COMDISCO INC	34	17	18.375	0.3	1.4
Q	LDI CORPORATION	18	13	15.25	-0.5	-3.2
Q	PHOENIX AMERN INC	5	3	3.688	0.2	5.4
Q	SELECTERM INC	9	5	5.125	0.0	0.0

EXCH: N—NEW YORK; A—AMERICAN; Q—NATIONAL

Heat rash

No fun in the sun for tech firms after releasing earnings figures

The heat is on — and not just because of the summer sun. Earnings report time can produce sweat on even the coolest of executive brows. That said, the power brokers at some technology firms must have gone through no small number of super-absorbent hankies last week.

Among the larger losers was Lotus Development Corp. Although officials at Lotus reported substantial earnings gains for the quarter, the company's stock still plunged 7⅝ points to close Thursday at 25⅛.

Dire financial reports from United Telecom, Inc., including a loss at its U.S. Sprint Communications Co. unit, set United Telecom stock back a whopping 11⅜ points to 27⅜. MCI Communications Corp. also suffered, losing 1⅜ points to 37⅛, while AT&T gained ½ of a point to close at 37⅝.

NCR Corp. was one of the few technology issues to come out ahead last week, and it did so by a mile, picking up a cool 6⅛ points to end at 71 after posting positive figures for the quarter.

For others, however, earnings news did indeed set off a round of sell-offs (see stories pages 8 and 93). Despite quarterly gains, Apple Computer, Inc. fell 5 points to 41⅛, and Intel Corp. gave up 2¼ points to 47⅞. Ashton-Tate Corp. slipped 2⅛ points to 9⅛ on news of a quarterly loss. IBM reported increased profits but saw a 1-point decrease in its stock price to 120.

Elsewhere, Digital Equipment Corp. dropped 1⅝ points to 82⅛. Sun Microsystems, Inc. slid 2⅜ points to 34, while Compaq Computer Corp. fell 2⅜ points to 63½. Novell, Inc. lapsed 3½ points to 54⅛, and Microsoft Corp. declined 1⅛ points to 76¾.

KIM S. NASH

Unions

FROM PAGE 1

main training centers — one each for Chrysler Corp., Ford Motor Co. and General Motors Corp. The UAW sites, called the National Education, Development and Training Centers, are financed by the auto makers and co-managed with the union. "The company has resources that we don't have," Fraser said. Computer skills is the most popular offering.

While some of the joint project's training is offered to employed members during work hours, most unions can only negotiate for computer skills to be developed during workers' off hours or after members have been laid off.

Promoting training

AT&T, which has laid off thousands of union workers in the last two years, established a training center with the International Brotherhood of Electrical Workers and the Communications Workers of America. The Alliance for Employee Growth and Development, Inc., based in Somerset, N.J., teaches a variety of computer and other job skills including Unix, X.25, networking and C programming.

More than 30,000 people have used the training in the past year, according to Ken Ross, the co-executive director appointed by AT&T. He said that the high number — compared with 20,000 the previous year — was only partially a result of layoffs. Ross said that workers will often not develop new skills unless they are forced to. "Unless there's some pain in the system, not much changes. Layoffs have caused people to look to enhance skills," he said.

Instead of using technology training to resuscitate members whose skills are being passed by, the pilots and machinists unions have embraced technology to further the goals of their unions as well as to keep members abreast of computer skills.

"We're trying to provide the same information to our members that management has," said Bob Kalaski, director of communications for the machinists union.

By integrating technology into its overall operating scheme, the machinists attempt to direct which systems its members will use, instead of the above cases in which management either picks the technology on which workers will be trained, or workers employ the scattershot approach, choosing courses and hoping their skills will be applicable to new technology.

"Technology presents a choice," said Don Kennedy, educational representative for the machinists union at the Placid Harbor Education & Technology Center in Hollywood, Md. "It can be exercised alone by management, or it can be exercised jointly. If the choice is jointly made, unions and workers will embrace technology."

Kennedy said the first thing he teaches members to do is find out how their employer plans to implement technology. Then they develop their own plan — in which technology can make the company more efficient without costing jobs.

In its alternative technology program, the union attempts a long-term business plan and specifies the types of systems they want used. "Most often, the company people are looking at the bottom line in the short run," Kennedy said. By projecting long-range markets, the union hopes to avoid making wage and benefit agreements with employers that eventually lose market share and shut down, leaving workers without jobs.

Kennedy estimated that one-third of employers cooperate with his union in implementing technology; another third say, "It's none of your damn business"; and the rest are "small employers who don't understand the need to bring in technology to keep them competitive."

The machinists union is apparently the only large union that aims to use technology on the union's terms, hoping to convince employers to join with them. Joint agreements such as the UAW's are more likely to educate members on the systems used by employers and thus have more direct benefit, according to Irving Bluestone, professor of labor studies at Wayne State University in Detroit.

Computer literate

Unlike workers in other labor unions, members of the pilots union are already well-versed in computers. Their union has established services for members to access information about new technologies as well as to facilitate communications and negotiations with employers.

In 1985, the union had a skeletal bulletin board-style communications system set up. "We wanted to test it under fire. Little did we know a fire was [already] brewing," said Jim Barnett, director of information systems and services for the union in Herndon, Va. That fire was a strike against United Airlines.

Using home computers or computers at 10 union offices, members could find the latest information within minutes of it occurring, from picket lines to press releases.

Now in its third version, the bulletin board offers members technical information as well as shareware to analyze contracts and tools to manipulate data.

The pilots union has a relatively wealthy and steady membership to allow it to cope with the expensive prospect of keeping up with technology. At the other extreme is the Printing, Publishers and Media Workers Sector of the Communications Workers union.

"It's definitely hurting us," said Dave Gray, assistant to the president. That union, primarily comprised of typesetters, has one-third the members it had in the mid-1980s, before computerized printing and desktop publishing became common.

Declining membership caused it to merge with the Communications Workers two years ago.

The union does not train its members in desktop publishing or computer printing operations because it does not have the resources. "We used to, but new technology came so fast that we, as a union, couldn't afford to keep up with computers. You buy one, and six months later it's obsolete," Gray said.

Nearly every union, even the typesetters, claimed they have never resisted technology. But at least one organization that was vociferous in its crusade against office automation has come full circle and now offers training in computer use.

In 1982, 9 to 5, the National Association of Working Women, crusaded against office automation, telling Congress that unless it intervened, office automation would cause "irreparable harm to office workers' jobs, health and quality of working life."

In 1988, it began what it called the Job Retention Project for displaced clerical workers.

Union offices on trailing edge

BY J. A. SAVAGE
CW STAFF

By leading-edge standards, labor union offices are still in the Dark Ages when it comes to implementing current technologies such as networking or electronic data interchange, and many still have no office automation.

In the AFL-CIO, however, there is a new movement to push automation for efficiency into member locals. Called Labortech, the movement was launched by 14 union locals in California in May.

"The rank and file are very open to making the [International Association of Machinists and Aerospace Workers] union high-tech. They would question our effectiveness if we weren't trying," said Dennis Hitchcock, a Labortech organizer.

The Machinists union is one of the more computer-savvy unions. So far, about half the locals now use computers to some extent, according to Jim Moran, a systems analyst at the union's international office in Washington, D.C.

The union will provide its custom software to any local, although locals must purchase their own hardware, according to Moran. Locals also have to send their floppy disks to the international for updates on the mainframe.

"We're looking into doing it through phone lines and client/server architecture," Moran said.

Mixed blessing

In other union offices, desktop publishing has been a boon to intraunion communication, although it has put its share of union members out of work. "It was a real tough decision to go to desktop publishing," said Bob Kalaski, director of communications at the Machinists' international.

"A few years ago, when we moved into it, we were still setting hot type," he said, referring to the old method where hot lead formed an impression of each letter for printing. Hot type was replaced by a photographic process called cold type, which is in turn being replaced by computerized typesetting. "I sat down with our printer and said that I have a commitment to be as efficient as possible to my members and management," he said.

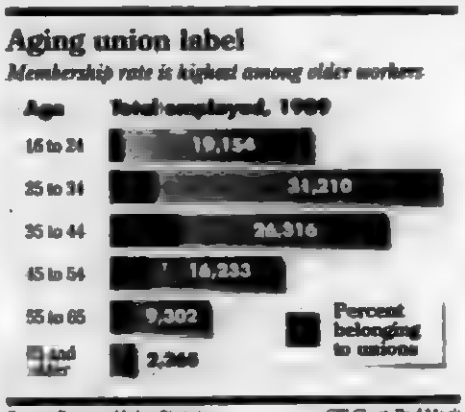
Because computers have replaced workers, some union officials appear understandably reluctant to embrace technology.

While not following an official policy, the California Labor Federation, AFL-CIO, is loath to implement computers in its own office because of the personal resistance of its president, Jack Henning, according to union staffers. Henning did not return *Computerworld's* phone calls.

"We're an old-fashioned office," said Floyd Tucker, editor of the union's newsletter. Although there are four stand-alone computers in the office for word processing and bookkeeping, the office has eschewed desktop publishing.

"Leadership is going to have to be made more secure," said Hitchcock, who is editor of the Machinists union local newsletter for workers in the San Francisco airport area.

"There's the element of control — the international organizations are concerned about the locals using technology, and one way of controlling the unions is to control the level of information available," Hitchcock said.



Low-tech

Bringing in a new personal computer for word processing or spreadsheets is not a clear-cut business decision for an office whose "pink collar" staff is represented by the Office and Professional Employees union.

Most sensitive to the effect of computers on their clerical work force are likely to be the union offices themselves, which in turn hire union-organized office workers. If, for example, a union local such as the International Association of Machinists and Aerospace Workers at the San Francisco airport wants to bring in a new computer for its office staff, its contract with the office union must be renegotiated.

Most contracts only require negotiations when an office is first computerized, with ongoing contract clauses to prevent layoffs of senior personnel who may be unfamiliar with computers and to accommodate training, according to Kitty Simmons, a business representative at the office union's Local 30 in San Diego. But some, like the machinists union local, have to negotiate over each new computer.

"It would be ludicrous to defy automation, but it creates a greater demand on people, and we have to negotiate for the increased worth of the work," said Gwen Newton, secretary-treasurer at the office union in Los Angeles.

NEWS SHORTS

Copyright hearing set for fall

U.S. District Judge Robert Keeton said he will hold a Nov. 12 hearing on damages in the *Lotus Development Corp. v. Paperback Software International, Inc.* suit, after which he will issue a permanent injunction and award damages to Lotus. Last month, Lotus won a copyright infringement suit against Paperback. "The judge has to finish his work on the case before Paperback can appeal," said a Lotus spokesman. Keeton also set Oct. 25 as the opening date of a similar Lotus suit against Mosaic Software, Inc.

CA adds Datacom/DB for micros

With an eye toward downsizing, Computer Associates International, Inc. took the wraps off a personal computer version of its Datacom/DB database management system last week. In addition, the company enhanced the PC version of its IDMS DBMS. Release 2.3 of IDMS/PC is now completely compatible with the mainframe version, the company said. IDMS/PC is slated to be available in the third quarter and Datacom/DB/PC in the fourth. Prices for single workstation versions of both will start at about $4,800.

Sequoia, Samsung strike deal

Sequoia Systems, Inc., a computer manufacturer based in Marlboro, Mass., announced a two-part marketing and development agreement with Samsung Electronics Co. last week. Under the agreement, Samsung will be the sole OEM in South Korea for Sequoia's existing Series 300 fault-tolerant computer system. Samsung will also pay for the development of a new low-end Unix-based computer to be called the Series 40, based on Pick. Sequoia's multiprocessor architecture. The future machine will be based on Motorola, Inc.'s 68040 microprocessor and is expected to be completed by the first quarter of 1992. The machine will be marketed under the Samsung name in South Korea and under the Sequoia name elsewhere.

Symphony on the road

Lotus Development Corp. shipped the server and node editions of Symphony 2.2, the company's integrated desktop package, last week. A stand-alone version of Symphony 2.2 had shipped previously. The server edition is licensed for shared use from a central file server and includes a local-area network administrator's guide, documentation, a license for one network user and software in both 5¼- and 3½-in. media. Suggested retail is $895. The node edition costs $595 and provides for an additional concurrent Symphony user on the network. It includes a single license for network use and documentation. Users who purchase server and node editions of Version 2.0 until Aug. 16 can receive free upgrades of 2.2 counterparts until Dec. 31.

Timeplex takes T1 to Taiwan

Timeplex, Inc. announced last week that Taiwan Telecommunications Network Services Co. (TTN), a private carrier, has contracted to install 21 Timeplex Link/2+ multiplexers in 16 cities. The multiplexers will reportedly allow the carrier to offer high-speed digital access to users who cannot justify the cost of a full T1 (1.5M bit/sec.) link, which is the only increment currently available from the Taiwanese public telecommunications authority. TTN will lease the full T1 pipe from the public carrier and divide it into increments as small as 9.6K bit/sec. In the U.S., fractional T1 is available in 64K bit/sec. chunks, although dedicated leased-line alternatives at the slower speeds are also available.

AT&T chips serve 10Base-T

AT&T Microelectronics announced last week that it is shipping a three-chip product set that complies with the latest version of the nearly complete IEEE 10Base-T standard for running 10M bit/sec. Ethernet networks over unshielded twisted-pair wiring rather than coaxial cable, which is specified in the original Ethernet standard. The three chips consist of a twisted-pair medium attachment unit, twisted-pair port receiver and multiport repeater.

Fujitsu aiming to purchase ICL

BY AMIEL KORNEL
and NELL MARGOLIS
CW STAFF

In the most brazen move yet made on the European market by a Japanese computer maker, Fujitsu Ltd. is negotiating to buy a controlling interest in the UK's biggest domestic computer manufacturer, International Computers Ltd. (ICL).

The two companies last week confirmed that negotiations are under way, following a report to that effect in Thursday's *Financial Times*. Analysts last week estimated the deal as potentially worth $907 million to $1.63 billion.

Fujitsu's move to acquire ICL, analysts said, could set off a spree of cross-border mergers and acquisitions in the European computer industry.

"This may speed up the rationalization of the computer industry in Europe," said Charles Burrows, a London-based analyst at stock brokerage James Capel & Co. "Everyone was talking about it before; maybe now they'll be spurred into action."

Peter Labe, an analyst at Labe, Simpson & Co., said he did not view the action as foreshadowing a more aggressive assault by Fujitsu on the U.S. mainframe market, possibly through Amdahl Corp., in which it now holds a 44% stake. "That's over — that's last year's news," he said, referring to past speculation of such a move.

However, the acquisition would immediately rocket Fujitsu into the second place in the UK computer market. "Fujitsu's target is to contain IBM," said Peter G. Wolff, vice-president of Kidder, Peabody International Corp. in Tokyo.

The deal would turn the UK computer market into something of a foreign preserve before the opening of the united European market in 1992. This spring, UK-based personal computer maker Apricot PLC was purchased by Japanese giant Mitsubishi Electric Corp. IBM, West Germany's Siemens AG, Digitial Equipment Corp., Unisys Corp. and France's Groupe Bull are major players in the UK market.

European manufacturers have suffered rough times in the past two years as foreign competition heated up in what has truly become a global industry. Italy's Ing. C. Olivetti & Co., N.V. Philips in the Netherlands, Norway's Norsk Data A/S and Sweden's Nokia Data A/S are all having trouble staying profitable. Nixdorf AG, the troubled West German minicomputer maker, is being aquired by Siemens AG.

The Japanese have traditionally maintained a low profile in Europe, hoping to avoid roiling the fiercely nationalistic Europeans. But the lure of Europe's increasingly lucrative market seems to be removing that hesitancy.

ICL, a subsidiary of telecommunications equipment maker STC Ltd., accounts for 60% of its parent company's revenue and about 55% of its profits. Sales of $2.195 billion last year placed ICL ninth among European vendors. Profits were $237 million or nearly 11% of sales.

An ICL spokesman said the deal was necessary because the company, which derives some 50% of its revenue from mainframes manufactured at a highly automated plant, could not support the massive research and development cost required to keep it competitive.

Lori Valigra, Tokyo bureau chief for the IDG News Service, contributed to this report.

Protesters to march against 1-2-3 suit

BY MICHAEL ALEXANDER
CW STAFF

CAMBRIDGE, Mass. — The League for Programming Freedom is on the march again, with plans to demonstrate in front of Lotus Development Corp.'s headquarters Aug. 2.

The group opposes attempts by software publishers such as Lotus, which is trying to copyright the look and feel of 1-2-3, its best-selling spreadsheet. Last month, Lotus won a lawsuit against Paperback Software International, Inc. and filed new lawsuits against Borland International and The Santa Cruz Operation.

Dire threat

Lotus' courtroom victory set a precedent that threatens to bollix up the entire software industry, said Richard Stallman, who in May 1989 led a similar march on Lotus and founded the league in October with Chris Hofstader and Denis Filipetti. Stallman, who recently received a coveted MacArthur Foundation Award (see story at right), and Hofstader are programmers; Filipetti is a consultant.

Other league members include MIT Professor Marvin Minsky, founder of MIT's Artificial Intelligence Laboratory; Stanford University Professor John McCarthy, inventor of the LISP computer language; and University of Texas Professor Robert Boyer, co-developer of the Boyer-Moore fast string search technique and a researcher in computer theorem proving.

"It's like copyrighting the layout of keys on a typewriter," Stallman said. If new typewriter manufacturers had to design different layouts, hardly anyone would buy a nonstandard typewriter, even if it was superior, he added.

Many hundreds of protestors are expected to walk a picket line and listen to speeches by Stallman and MIT Professor Patrick Winston, director of the Artificial Intelligence Lab, Stallman said.

Lotus officials do not plan to meet with the protesters or "participate in any way in their event," a Lotus spokesman said. "They are entitled to pursue their rights while Lotus pursues its rights."

Path to freedom

Richard Stallman, one of the organizers of next week's Cambridge, Mass., demonstration in front of Lotus, has long been recognized for his unconventional views on computer software.

Two weeks ago, those views earned him a $240,000 fellowship from the MacArthur Foundation of Chicago, an annual award to gifted people from all walks of life.

"I believe that software ought to be free," Stallman, 37, said last week. He is the developer of Emacs, a widely used programming editor, and is currently working on a Unix-compatible operating system called Gnu.

Stallman is also founder of the Free Software Foundation and co-founder of the League for Programming Freedom.

This year's recipients of the MacArthur Foundation Awards will receive from $150,000 to $375,000 over five years and can spend the money as they choose. Other winners this year include a choreographer, photographer and farmer, as well as academics from several fields of study.

MICHAEL ALEXANDER

Downsizing

FROM PAGE 1

department or the entire organization," Winsberg said. "They often can't come to grips with the issues of standardization, access and network management across the enterprise."

The same issues that end-user departments are grappling with are the ones that IS professionals handle best, said Tyler Band, a systems integration consultant at Vanguard Business Solutions, Inc., which assisted in downsizing projects at Eastman Kodak Co. and TRW, Inc.

"Issues like security and high-performance networks were solved on the mainframe for the last 20 years," Band said.

One obvious way to bridge the knowledge gap, Band said, is for IS staffers to team with the PC developers, many of whom work in the business units far from the central computer room.

It is the promise of a client/server architecture, in which PCs or workstations share the processing tasks with powerful local-area network servers, that is enticing many businesses to think about downsizing.

"PCs and workstations with from four to 15 MIPS are emerging that are aggressively moving into the minicomputer range," said conference chairman George Schussel, president of Digital Consulting, Inc. in Andover, Mass. "Now you can get serious, industrial-strength software to run on those PCs and do the jobs only mainframes and minis could do until now."

Just the beginning

After years of debate, key products that could deliver distributed database solutions are only beginning to be shipped. These enabling products include network management systems from IBM and AT&T, fourth-generation application generators and a wide variety of relational database management system computer-aided software engineering (CASE) tools.

Many users at last week's conference said they are unsure about the dozens of new client/server products that have appeared on the market during the last two years. Some said they were confused about the relative merits of many vendors' claims about the products. "I'm shopping around for products that support OS/2 applications," one California user said. "So far, I'm not sure which ones work with OS/2 and which don't."

Even when users understand the products, distributed applications must be planned carefully, or they will not deliver the desired functionality, others said.

"Users must learn to analyze their systems without regard to the particular products involved," Winsberg said.

Some organizations, including Levi Strauss & Co. in San Francisco, stress the importance of planning and analyzing before writing a single line of code. However, Winsberg said he believes Levi's CASE process is unusual, adding: "I believe that not more than 10% of MIS organizations have a feel for what that kind of analysis is all about."

The technology itself must be put together in a cohesive way, argued Richard Finkelstein, president of Performance Computing, Inc. in Chicago. "You don't want to try to combine products that were never meant to work together," he said. "All these products have some problems, and people should make it their business to know about the problems before they buy."

Corvus edges toward fiscal solvency

BY JIM NASH
CW STAFF

SAN JOSE, Calif. — Outrage has been replaced by acceptance — even gratitude — at Corvus Systems, Inc. following its emergence from Chapter 11 bankruptcy protection.

The local-area networking company announced last week that its new owner, Carl Berg, had taken it out of Chapter 11. It was Berg, Corvus' single largest shareholder and secured creditor, who sent a panic through the company and its stockholders in May in his successful bid to take control of the company.

"He brought us out of Chapter 11," company spokeswoman Gloria Leonard said, "and he's putting quite a bit of his own money toward paying off secured and unsecured creditors." Leonard was one of the company employees who expressed disbelief last spring at Berg's take-all reorganization plan.

Under Berg's new plan, which was approved by Corvus creditors and the U.S. Bankruptcy Court this month, he becomes the company's president and chief executive officer. Berg, a former Corvus director, serves as a general partner at Berg & Berg Industrial Developers in Cupertino, Calif.

All current equity investors will be issued shares in a newly formed California firm, Ceron Corp., as part of the plan, according to Leonard. Ceron was set up by Berg, Leonard said, and will have sole rights to license all Corvus technology developed before July 16.

It will also receive royalties from company technology sold before July 16 to Nippon Electronic Corp. Two Corvus directors, Roger Mosher and Robert Butche, became interim directors of Ceron as of July 16.

Former Corvus shareholders will receive Ceron stock in the same proportion that they held in Corvus. The stockholders' profit will rise or fall depending on the licensing sales by Ceron of old Corvus industrial and intellectual property rights and patents.

Berg's previous reorganization plan would have stripped equity investors of all Corvus stock without compensation. Under the new plan, Berg & Berg will become the sole Corvus stockholder in exchange for the $3.2 million it claimed it was owed by Corvus.

Unsecured creditors will be paid 25 cents on the dollar for their debt claims, Leonard explained. A maximum of $1.2 million will be paid from Corvus' cash on hand, with Berg & Berg picking up any shortfall, according to a statement issued by Gregory Coplans, legal advisor for Corvus.

Founded in 1979, the maker of networking hardware and software petitioned for relief from its creditors in 1988.

EDITOR'S NOTEBOOK

PC Computing: Back in the USSR

MOSCOW — Crack open the classified ad pages of almost any U.S. personal computer magazine and you will find that a fully configured mail-order PC based on the Intel Corp. 80386 chip can be yours for less than $3,000. That same machine costs the equivalent of $35,000 in the Soviet Union — if you can find one. Blank floppy disks can fetch $50. PC software is pirated at an alarming rate. Computing at large sites can grind to a halt while operators wait for spare parts, which are in universally short supply in the USSR. The local phone system can make simple data transmission between systems an excursion to frustration. International data communications is virtually out of the question.

Despite these and other overbearing facts of computing life in the USSR, the Soviets are making some strides in acquiring more state-of-the-art hardware and software. The U.S. has recently greatly relaxed the export restrictions on equipment bound for the Soviet Union. The pool of Soviet programming talent is deep. However, foreign currency to buy computer equipment remains scarce, and fluid product distribution channels do not exist.

With this backdrop, International Data Corp. co-sponsored the first PC World Forum earlier this month, held on the site of the USSR's economic achievement park. While it would be difficult to give even an overview of the computing scene in the Soviet Union, much can be gleaned from the words of conference speakers and attendees.

"The Soviet economy now is at a very complex point. In forming business relations, we don't expect you [Americans] to deal in our currency." — Dr. Boris Antoniuk, adviser to the chairman on international economy of the USSR State Committee.

"The best thing is to find a friend with a PC and buy some time from him. Who can afford to buy them? And the bigger machines are available only on allocation [from the state]. We'd like to think optimistically, but change is not happening very fast." — Alexander Shudkoff, operations manager at a fishing cooperative near Riga.

"We've spent more energy in the past on ways of distributing currency internally than on earning it. Our foreign economic relations mirror our internal economic state . . . If we are going to learn to swim, we must be in the water." — Ivan Ivanov, deputy chairman, Foreign Economic Commission.

"You don't just go to the store and buy parts when they break. You call around and ask friends who might owe you a favor. We try to do things in software that might get us around hardware problems, but there are limits to that I'm sure you can appreciate." — Anatoly Volkan, systems director at a Leningrad-based turbine factory.

"There are today areas of fundamental difference in our economies . . . The USSR must extend copyright and patent protection to U.S. and Western-made products." — Bradley Holmes, director of international communications and information policy at the U.S. State Department.

"We have a huge market here, a huge market. You'd probably be very surprised at the use we make of what we have. But our own system does not make it easy to change, despite *perestroika* and the reforms. If we could sell our programming skills easily, we'd be better off." — Revaz Mesarkishvili, vice-president of Tbilsoft, a Soviet/U.S. computer reselling venture.

"Like Donald Trump, the Soviet Union is in the middle of a cash-flow problem. Here they must create a class of investment bankers and venture capitalists to identify the best investment opportunities in this very rich country." — Bill Chastka, president of Washington, D.C.-based Resources International.

"I have to be optimistic about the future here. True, we have so to go to up in computing. But we have very bright people. Yes, I am optimistic." — Grigori Gromov, Moscow consultant and 20-year veteran of USSR Academy of Sciences.

BILL LABERIS

Second-class postage paid at Framingham, Mass., and additional mailing offices.
Computerworld (ISSN 0010-4841) is published weekly, with a single combined issue for the last week in December and the first week in January by CW Publishing/Inc., 375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171.
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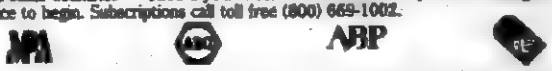
Subscription rates: $2.00 a copy; U.S. — $48 a year; Canada — $110 a year; Central & So. America — $130 (surface), $250.00 (airmail) a year; Europe — $195 a year; all other countries — $295 a year. Four weeks notice is required for change of address. Allow six weeks for new subscription service to begin. Subscriptions call toll free (800) 669-1002.



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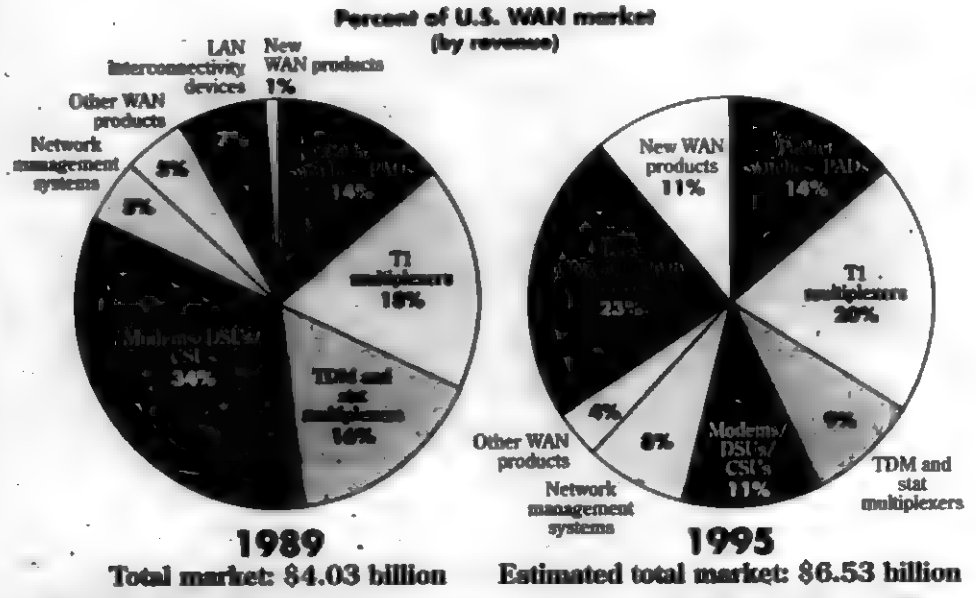
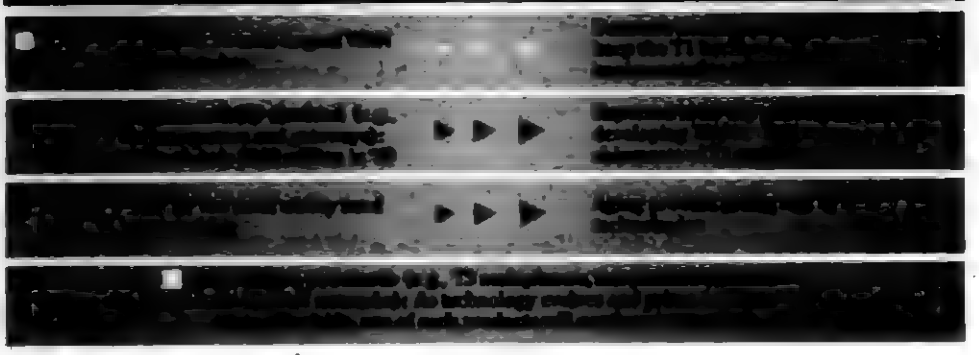
TRENDS

Private Wide-Area Networks

After years of building stand-alone local-area networks in remote locations, the future of computer systems architectures is in interconnection



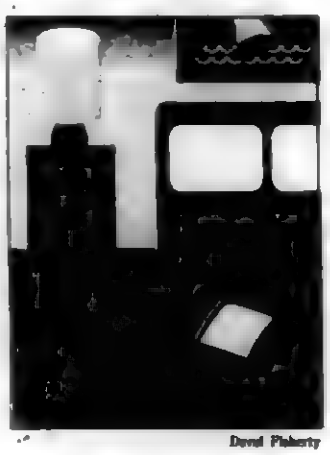
Market Happenings



Source: Frost & Sullivan, Inc., New York, N.Y. CW Chart: Paul Mock

NEXT WEEK

In the 1990s, the hotel industry will turn aggressively toward computer technology to help fill empty rooms and upgrade service. Finding the balance between cost efficiency and customer service is the critical need that information systems must help fill for hotels. Read about the changing hotel industry in Manager's Journal.



David Flaherty

ISDN and LANs? Sounds like two favorite but unrelated buzzwords knocking together, right? Not so fast. The University of West Virginia has created an innovative, low-cost ISDN LAN gateway service that links remote users. Designers say the system has wide applicability for all kinds of groups. Read the inside story in the In Depth section.

INSIDE LINES

Tinkering under the hood

Hewlett-Packard and Ford are soon expected to announce that they're getting together to provide manufacturing systems for automakers. Betting that the auto industry is no longer cutthroat but has learned humility in the face of unrelenting competition, the two companies will develop software that can be used in generic assembly lines.

'Anything you can do, we can go under'

In a bold(?) move to undercut IBM's Personal System/1 in the home market, Tandy will introduce a new home computer tomorrow that is "designed from the ground up for people who have never touched a computer keyboard," a spokesman said. Tandy must be hoping to sell to the underinformed, because the system will undershoot IBM's low-tech offering with a configuration that, according to one insider, uses an Intel 8086-based processor and offers an 8-MHz clock speed, 512K bytes of memory and bundled versions of DOS and productivity packages. It will also undercut IBM's prices, reportedly retailing for about $750.

Global naming: Late

Significant problems continue to plague development of Novell's Netware Naming Service and Remote Management software. A beta-testing site scheduled to receive Naming Service last month has been told that it will be delayed. Novell, which has declined comment on queries about its Naming Service, gave its beta-test user no date for its arrival. Instead, the user was offered beta dibs on the remote network management software. Both items were supposed to be delivered last month.

On the move

Martin Goetz, former president of Applied Data Research, is thinking of changing jobs again. Goetz left ADR two years ago to go to Syllogy Corp., which he left nearly a year ago to become an independent consultant. So what's next? Goetz attended a recent CASE conference on behalf of a company he wouldn't name, saying only that it is "a possible competitor to AI Corp." and that its interest is in so-called fuzzy logic. Goetz said he was at the conference to try to raise money for the company but added that he "will probably" go over to the company full time. Stay tuned.

Just the fax, ma'am

McDonnell Douglas' highly unpopular unplugging of Douglas Aircraft's IBM Professional Office System (Profs) electronic mail system in Southern California [CW, July 16] was followed last week by an acute shortage of fax paper, insiders reported. The Profs system, cut as part of a $700 million austerity move, was accompanied by a deliberate shutdown of the IBM mainframe "notes facility," which ran under the VM operating system, employees said. "They're grasping at straws to save money," said one exasperated manager at the Long Beach, Calif., site. On July 16, McDonnell Douglas' St. Louis headquarters announced 17,000 more layoffs, 9,000 of them at California sites.

Fear-mongering

A Novell marketing executive took a look at the calendar this month and saw that the 13th fell on a Friday. Though not the superstitious sort, he sent out a memo to employees alerting them that the 13th was the trigger date for some strains of computer viruses. The memo seemed to suggest that a new virus had been discovered specifically targeting local-area networks running Netware, a source said. A Novell public relations person alerted the firm's distributors and put them into a panic until the mess was straightened out. One distributor even claimed it had been hit by the new virus.

One Stardent intimate brimming with insider knowledge pulled no punches in despair over the inner turmoil. "On one side we've got a ninny, and on the other we've got someone who's immoral," the source said. If you can document how the shoe fits the respective bosses, pass the information on via News Editor Pete Bartolik at 800-343-6474, fax us the facts at 508-875-8931 or whisper confidences to the COMPUTERWORLD address on MCI Mail.

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COMPUTERWORLD

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Novell offers simplified LAN protocol analyzer product to automate appli-cation tests and ease trou-bleshooting. Page 87.

Grandma's Packard Bell radio and those PC clones wearing the same label have very little in common. Page 65.

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Thailand's demographic database earned a *Com-puterworld Smithsonian Award* for Ministry of the Interior's ef-forts to com-puterize social planning. Page 14.

Tomorrow is D day for Dbase

BY PATRICIA KEEFE
CW STAFF

NEW YORK — The fix is on, but will it take?

A shaky Ashton-Tate Corp. will have its fingers crossed to-morrow when a reportedly sta-ble and able Dbase IV, Release 1.1 — 18 months in the fixing — hits retail shelves, lobbing the ball into the users' court.

The Torrance, Calif.-based developer's credibility, as well as that of thousands of corporate users who urged their compa-nies to standardize on Dbase IV, is on the line, said Adam Green, a Dbase author and owner of Adam Green Seminars in Lex-ington, Mass.

"This will be the most thor-oughly tested product in micro-computer history," Green pre-dicted, noting that its pre-decessor, Dbase IV, Release 1.0, tended to crash "spontan-eously" because its memory

Continued on page 6

DEC set for $400M cutback

BY MARYFRAN JOHNSON
CW STAFF

BOSTON — Moving to offset fourth-quarter losses that gave Digital Equipment Corp. its first bitter taste of red ink last week, DEC will announce "within a matter of days" the details of its plan to cut more than 5,000 em-ployees from the payroll, a DEC official said last week.

Jack Smith, senior vice-presi-dent of operations, said the next phase of a voluntary severance program will move faster and be far less generous than past in-centives. The first program end-ed July 1 with 3,000 DEC em-ployees opting to take what company insiders call "the buyout."

"We want to get this behind us by the end of the year," Smith said of the goal to trim back from 124,000 employees worldwide to 119,000 by January 1991. "This is really a gut-wrenching business."

Pressure cooker
Throughout a year of stagnant sales growth, DEC has made little progress in cutting overhead

6/89	[illegible]	[illegible]
9/89	$3.13	[illegible]
12/89	$3.18	[illegible]
3/90	$3.26	$1,014
6/90	$3.26	$1,056

CW Chart: Paul Mock

DEC's $256.7 million loss in the fourth quarter ended June 30 was caused mainly by its decision to set up a $400 million cash reserve to cover severance packages, employee retrain-ing and office space consolida-tions. Yet even without the drain of the cash reserve, net income in the final quarter was down to $85.2 million, which is 73% lower than the $313 million profit for the corresponding quarter in 1989.

In discussing the compa-ny's financial troubles at a press conference last week, Smith steered away from sug-gestions that the financial downturn meant disaster for the world's second-largest com-puter company.

"Certainly, we don't feel good about it," Smith acknowl-edged. "But we do feel our prod-uct strategy is intact and

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Clouds on the horizon

- Microsoft shoots through $1 billion sales ceiling but warns that new investment in networking products distribution will cut into profit margins next year.
- European market keeps earnings up for Compaq and other vendors, but signs of a slowdown across the Atlantic could sad-dle already anemic domestic sales. Stories, page 4.

No 18-minute gap with Nixon on-line

PC-driven reminiscences run gamut from Henry the K to The King

BY JAMES DALY
CW STAFF

YORBA LINDA, Calif. — It has been 16 years since Richard M. Nixon disappeared in a helicop-ter into the muggy skies over Washington, D.C., after he re-signed the presidency. Yet he re-mains one of the more contro-versial figures the 20th century has produced.

So if you are still puzzling over any of the old familiar questions — what he knew and when he knew it, for instance — there is finally a way to get answers: at the newly opened Richard Nixon Presidential Library and Birth-place. With the aid of computer technology, you can practically ask the man himself.

Tucked within the limestone, Spanish-style building on a patch of suburban Los Angeles once dotted with orange and lemon trees is The Presidential Forum, an interactive video theater. State-of-the-art computer de-sign and some imaginative flair create the experience of a casual yet intimate meeting with the former presi-dent in a way in which he has never been seen before.

President Nixon's departure *from the White House left much unanswered*

John Kalb, business administrator at Ex-hibit Technology, Inc., which put together the presentation, said the exhibit will not only fas-cinate the day-tripper but will also serve successive generations of historians. "It's im-portant to question his-torical figures," he said. "Imagine if we could ask Lincoln about the reality of the Emanci-pation Proclamation or what General Lee

Continued on page 87

ISDN gear still doesn't play in Peoria

BY JOANIE M. WEXLER
CW STAFF

While businesses are expressing a decided willingness to explore the viability of Integrated Ser-vices Digital Network, market conditions are tying users' hands and leaving ISDN customer pre-mises equipment vendors in the lurch.

As the local telephone compa-nies plod along, upgrading their equipment to ISDN, users are settling into other wide-area communications solutions, mak-ing ISDN-only approaches for start-ups risky. ISDN end-user products make more sense for full-service vendors that offer the products as only one seg-ment of their business, accord-ing to analysts, because such companies can better afford to wait a year or more before they see any volume sales.

They'll be waiting, users said, because without widespread availability of ISDN lines, many companies are simply not candi-dates for the technology.

"ISDN might fulfill our price/performance requirements, but our locations are in rural areas

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Quotable

"ISDN might fulfill our price/performance requirements, but our locations are in rural areas where the only twisted pair is barbed wire."

TOM TERRY
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On the limited availability of ISDN lines. See story page 1.

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90 Trends

From a recent report on the business desktop by London-based Ovum Ltd.: "The PC software boom of the 1980s, which enriched suppliers, will give way in the 1990s to a hard slog as vendors try to provide consistent user interfaces and links among products . . . In 1995, desktop systems will run MS-DOS buried under a graphical user interface layer, and packages from different vendors will share and exchange information. Users will be able to create compound documents, which combine text, image, data, graphics and spreadsheet formulae in a single object without losing the data originally contained in the different formats."

An ISDN/LAN gateway can delight scattered users. Page 59.

Rich Frishman

The Pacificorp IS team, including Brian Hedman and Wayne Horscroft, has dealt with cutting back on systems while expanding access to those that remain. Page 25.

EXECUTIVE BRIEFING

■ **The viability of ISDN for far-flung organizations** remains hampered by the trailing-edge technology of many local phone companies. Telecommunications managers at user companies are impressed with the price/performance and applications potential of ISDN but figure it will be about two years before phone lines in remote areas are capable of carrying ISDN traffic. That market lag is making it rough for small vendors of ISDN customer premises equipment. **Page 1.**

■ **"High-tech, high-touch"** is the new motto of the hotel industry, which is attempting to use information systems to upgrade and customize personal service. After simply automating reservations and other functions in the 1980s, the major chains are now taking the next step with IS. Innovations range from providing employees with data on guests' past preferences to check-in terminals on hotels' airport shuttle buses. **Page 51.**

■ **DEC jarred the industry** with the first quarterly loss in its history and will slash more than 5,000 jobs, but analysts and customers don't believe the bottom has dropped out. Blaming a sluggish economy and increased competition rather than internal problems, they expressed confidence in DEC's ability to bounce back. **Page 1.** Throughout the industry, U.S. sales are slow; even high-flying Compaq reported barely increased domestic revenue. **Page 4.**

■ **There was good news and bad news** from a Washington, D.C., group studying U.S. technology policy. Its report said the U.S. lags in high-tech manufacturing and chip production but leads in creativity-intensive areas such as architecture and software. However, foreign competitors are chipping away at that lead, too. **Page 88.**

■ **Four independent Pepsico subsidiaries** have come together to coordinate a critical piece of IS strategy — a point-of-sale data collection system. Taco Bell, Kentucky Fried Chicken, Pizza Hut and Pepsico's food supply units inked a joint contract with tiny vendor Corporate Microsystems, marking the first major cooperative buying decision in IS among Pepsico units. **Page 7.**

■ **Unisys may be struggling financially,** but the new products, from mainframes to departmental computers, keep on rolling out. **Page 89.**

■ **CIO turnover is indeed on the rise,** according to a New York executive search company. The organization says the average tenure of an IS boss has dropped to 2½ years. **Page 51.**

■ **The core of Federal Express'** fabled package tracking system is none other than good old IMS. Fed Ex is currently migrating to IBM's IMS Version 3.1, which is slated to handle some 13 million transactions per day. **Page 23.**

■ **Software vendor protection against copyright infringement lawsuits** is very difficult, according to legal experts. Although some standard protections exist, there is nothing comparable to real estate title insurance to guarantee immunity. **Page 68.**

■ **On-site this week:** A hardware philosophy of "interchangeable parts" helped Pacificorp in Portland, Ore., merge two separate IS operations. Formed by the 1989 merger of Pacific Power and Light and Utah Power and Light, Pacificorp maintained both IBM and DEC systems while consolidating staffs and data centers. **Page 25.** The U.S. Public Health Service believes that electronic exchange of information could be a life-or-death matter. The agency has developed an interagency electronic mail system, based on software from Softswitch, that allows disparate government agencies to share research data on AIDS and other diseases. **Page 42.**

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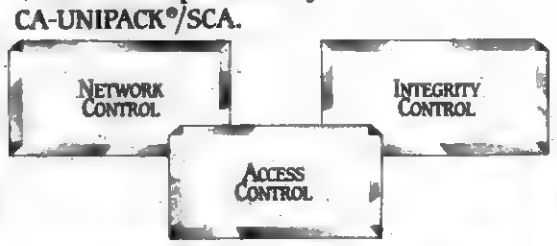

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Microsoft planning LAN attack

BY JIM NASH
CW STAFF

Microsoft Corp. reported last week that it had soared over the $1 billion sales milepost, but executives said profit margins may be lower next year when the company starts an all-out offensive on the local-area network market.

"No one's going to lose as much, invest as much in networks as we will next year," Microsoft Chief Executive Officer Bill Gates told reporters after year-end financial figures were released last Wednesday.

Frank Gaudette, Microsoft's chief financial officer, told analysts Thursday that revenue hit $1.18 billion, 47% greater than 1989's $803 million total. The Redmond, Wash.-based software giant chalked up an after-tax profit margin of 23%, Gaudette said.

In the fourth quarter, the company posted revenue of $336.9 million, up from $220.2 million a year earlier, with profits climbing to $79.9 million from $45.3 million.

Continued strength in sales, particularly that of the company's newly released Windows Version 3.0, accounted for the bulk of Microsoft's rise, said Mike Hallman, president and chief operating officer. Systems Software Senior Vice-President Steve Ballmer said 800,000 copies of Windows 3.0 have been sold or upgraded worldwide so far.

However, it was Ballmer who declared a jihad, or holy war, on the LAN front. As announced in April, Microsoft will abandon its reliance on direct-sales and OEM strategies for LAN Manager Version 2.0 in favor of retail sales.

While refusing to say how much Microsoft will put into its effort to dislodge LAN leader Novell, Inc., Gates said the company is planning to hire 3,000 new employees this year. "Hundreds and hundreds" will be going to networking development and sales, Gates said.

About $16 million will be spent marketing LAN Manager Version 2.0, Ballmer said, with another $2 million going to outside development. Microsoft is culling 600 resellers to sell the new product in the U.S.

Gates explained that Microsoft will specifically target key LAN attributes in its development work: remote administration, distributed software, naming services and security.

Some analysts attending the meeting said the strong hints that margins may be lower next year did not bother them. Nancy Zevenbergen, principal at Zevenbergen Capital, Inc. in Seattle, said she was confident that Microsoft will continue to perform well above expectations for a high-tech company of its size.

"In terms of what they have told Wall Street over the years, they have delivered," Zevenbergen said. "They haven't stumbled yet."

U.S. Steel and Carnegie Pension Fund analyst P. Janet Ramkisson expressed more caution, particularly about Microsoft's new emphasis on LAN Manager: "PC software and networking software are two different markets." Dethroning Novell "is a lot bigger challenge than is being let on here," she said.

Very happy birthday

Microsoft kicked off its 15th anniversary celebration by breaking the $1 billion sales barrier

Fiscal year	Sales	Net income
1986	$197.51	$39.52
1987	$345.89	$71.88
1988	$590.83	$123.91
1989	$803.53	$170.54
1990	$1,183.45	$279.18

CW Chart: Marie Haines

U.S. market still a drag for computer industry

BY NELL MARGOLIS
CW STAFF

New trends remained in scant supply as computer industry companies continued to post second-quarter earnings last week, noted one Wall Street analyst. However, he added, two oldies but baddies reasserted themselves with vigor.

"The first trend is that the U.S. market is still bad for just about everybody," said Rick Martin, an analyst at Prudential-Bache Research. "The second is that Europe is great for most of them, but it's slowing down."

Take Compaq Computer Corp. The personal computer company reported revenue of $862 million, up 19% over the same quarter last year. Second-quarter sales would have been even stronger, said Chief Executive Officer Rod Canion, had they not been curtailed by product shortages triggered by an inventory drain brought on by strong first-quarter sales. Compaq's net income for the quarter increased 24% to $104 million.

Despite the apparently encouraging numbers "even with real highfliers like Compaq," Martin said, the domestic and foreign growth percentages are discomforting. "Compaq's U.S. revenues grew 1.6% — whoop-de-doo," he said.

International sales, which were responsible for 46% of Compaq's overall 1989 revenue and are contributing 53% of the firm's bottom line, grew 42%. "That's great growth," Martin said, "but it's not as great as it was last year."

On the other hand, said Jean Orr, an analyst at Labe, Simpson & Co., commenting on the industry as a whole, "We came into the year expecting that demand from Europe would be somewhat lessened. It's mostly economy-related."

So said Data General Corp., which pointed to sluggish industrywide demand for proprietary systems and overall pricing pressures as largely responsible for a $21.4 million quarterly net loss and a 1% revenue decline to $302.4 million for the struggling minicomputer maker.

DG CEO Ronald Skates conceded disappointment but looked on the bright side: Revenue from DG's reduced instruction set computing (RISC)-based Aviion line increased significantly, he said. In addition, operating expenses were down by almost $14 million compared with last year's third quarter, Skates said.

Once-dazzling Network Equipment Technologies Corp. (NET) reported a net loss of $13.3 million on revenues down 38% to $26 million. NET's sheen was tarnished last April by bookkeeping infractions, which caused the company to revise previous quarterly statements downward, and allegations of insider trading at the managerial level. The company and analysts alike largely attributed the poor showing to a notable slackening among the firm's sales force and an apparent buying freeze in the wake of the winter-quarter brouhaha.

Easy to target, such problems could be difficult to reverse, several analysts said last week. NET is making a good stab at it, they added: Its earnings report also included the announcement of a substantial management overhaul that puts recently appointed company President Daniel Warmenhoven, an IBM and Hewlett-Packard Co. veteran with a good reputation on Wall Street and in the industry, into the CEO's office as well. Former CEO Bruce Smith will remain as chairman of the board until Dec. 31, when he will leave NET "to pursue venture capital activity." Chief Financial Officer Barrett Roach resigned both his office and his board seat; Vice-President of Finance Craig Gentner stepped up to the CFO post.

"The company has excellent products and a new management team," noted Steven Levy, an analyst at Hambrecht & Quist, Inc. While NET "did not sell a lot of equipment and systems in April and May, June was a very strong month," he said.

Other earnings news included the following:

- Amdahl Corp. posted revenue of $519 million and a $46.3 profit, respective increases of 10% and 41% over revenue and net income reported for last year's comparable quarter.
- RISC pioneer Mips Computer Systems, Inc. reported a 75% revenue jump to $39.6 million and net income of $4 million, compared with last year's second-quarter net loss of $2 million.
- Systems integrator Electronic Data Systems Corp. logged an 18% revenue increase to $1.5 billion and a 19% rise in net income to $125 million.
- Waltham, Mass.-based AI Corp. had good tidings to include in its first quarterly earnings report as a public company: a $516,000 profit, in contrast with last year's second-quarter net loss of $614,000, and revenue up 82% to $5 million.

CORRECTIONS

Summation Legal Technologies, Inc.'s Summation II litigation support software is priced at $1,595 [CW, April 30].

Software 2000, Inc.'s Environmental Management 2000 series helps customers manage their responsibilities for environmental compliance rather than helping them track and manage recyclable products [CW, July 2].

A news short [CW, July 23] incorrectly stated that Samsung Electronics Co. would pay for the development of a low-end workstation based on Sequoia Systems, Inc.'s proprietary multiprocessor architecture. The development efforts will go toward a low-end, Unix-based workstation, Sequoia said.

The minicomputer that will host the New York City Transit Authority's Gateways system has not been selected; it will not necessarily be a Digital Equipment Corp. VAX as was incorrectly stated [CW, July 23].

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NEWS SHORTS

S&L agency has IS mess

The U.S. General Accounting Office (GAO) said last week that Resolution Trust Corp. (RTC), established by Congress last year to oversee the liquidation of hundreds of failed thrifts, lacks the information systems leadership, strategic plan and systems architecture needed for the $300 billion cleanup. RTC is relying on a hodge-podge of existing systems from other financial agencies but has no comprehensive plan for moving to its own integrated systems, the GAO said. RTC's oversight board is not reviewing IS activities, and no senior IS official has yet been hired, the GAO added. The GAO said RTC is taking corrective actions.

OS/2 2.0 tool kit ships

Microsoft Corp. is now shipping an OS/2 2.0 Software Development Kit Update for Version 2.0 of the OS/2 Presentation Manager system. The update includes the necessary prerelease components to give corporate and third-party developers the ability to write 32-bit applications for OS/2 Version 2.0.

Baxter, Comdisco team up

Baxter International and Comdisco, Inc. will cooperate in helping hospitals finance high-technology capital equipment purchases and managing this equipment once in place. Comdisco agreed to become part of Baxter's Access program, a group of alliances that includes Spectrum (a joint venture with IBM), Kraft Foodservice Group and Waste Management, Inc. Through Access, Baxter offers value-added services to hospitals.

Price cuts from HP, AST

Claiming both manufacturing effectiveness and market competition, Hewlett-Packard Co. reduced prices on its Vectra 286/12s and Vectra QS/16s by about $400 on most configurations. The HP Deskwriter laser printer was reduced from $1,195 to $995. Meanwhile, AST Research, Inc. slashed prices 4% to 26% on some models of its Premium line of PCs.

ALR takes bus downstream

In the past, when users of Advanced Logic Research, Inc.'s Intel Corp. 80386SX-based machines chose to upgrade the units with 32-bit 386 or 1486 boards, they wound up constrained by the box's original 16-bit I/O bus. The Irvine, Calif.-based PC maker is avoiding this potential bottleneck by designing its latest 386SX PC with the 32-bit Extended Industry Standard Architecture bus. The Business VEISA 32CSX machine is based on Intel's 20-MHz 386SX chip and is upgradable to the Intel 33-MHz 1486 chip. Scheduled to ship next month, the models range from $2,799 to $4,999, depending on hard disk capacity.

Bell Atlantic targets AS/400

Bell Atlantic Business Systems Services in Frazer, Pa., has announced a new computer maintenance program for the IBM Application System/400 midrange. The AS/400 Xtra Support program, like Bell's other midrange services, includes telephone consultation and technical advice on performance, communications, systems operation, configuration and temporary program fixes. Bell is also offering a "total system lease program" for midrange users.

Layoff estimates pared at AT&T

AT&T's Network Services Division (NSD) — the unit that operates long-distance lines — will lay off 3,900 fewer people than was originally announced, a spokeswoman said. In May, NSD said it would lay off some 6,000 technical workers; through early retirement offers and attrition, that number is now down to 4,300, NSD officials told the Communications Workers of America on July 10. Given that there are 2,200 vacancies on which the employees can bid within NSD, the final number of people who may be laid off is close to 2,100.

More news briefs on page 87

Sun enlists resellers in business foray

BY JAMES DALY
and JOHANNA AMBROSIO
CW STAFF

NEW YORK — Sun Microsystems, Inc. stepped up its bid for the corporate marketplace last week. The company announced its first plans for widespread domestic distribution through computer reseller chains and a new workstation to lure business users.

These moves position Sun — once known almost exclusively as a supplier for scientific and technical customers — to compete head-on for the commercial marketplace with the likes of IBM, Compaq Computer Corp. and Apple Computer, Inc. "Sun is really going after the high-end PC market; there's no doubt about that," said Martin Ressinger, an analyst at Duff & Phelps, Inc., a research firm in Chicago.

Within the commercial market, Sun is targeting networked applications as its mainstay. "Our mission is to empower the work group and provide easy work-group computing," said Scott G. McNealy, Sun president and chief executive officer.

To help accomplish that, Sun inked reseller pacts with Nynex Business Information Systems Co., Microage, Inc. and Exton, Pa.-based Intelligent Electronics. In addition, Xerox Corp. has agreed to resell Sun systems, a deal Sun officials said could be worth $200 million per year. Until now, Sun has sold its machines through its own sales force and value-added resellers.

Sun's latest entry in its Unix-based reduced instruction set computing line is the Sparcstation IPC, a $9,995 machine that includes a 207M-byte hard disk drive and a 16-in. color monitor. The cake-box-size model can process 15.8 million instructions per second, runs at 25 MHz, includes a DOS-compatible 3½-in. floppy drive and offers from 8M to 24M bytes of memory. A diskless version costs $8,995.

Sparcstation IPC, *Sun's lowest cost color RISC workstation*

Central to Sun's commercial systems strategy is its software. Its plan is to sell enough IPCs to attract independent software vendors to port their commercial applications onto the Sparcstation family. That, in turn, will drive more sales, according to McNealy.

Out of approximately 2,100 applications packages for the Sparcstation, some 120 have been announced or are shipping for the commercial market. Around 300 more commercial packages are in development, according to Wayne Rosing, vice-president of Sun's desktop systems and graphics group.

Another important segment of Sun's commercial software strategy is the new release of its Open Windows environment, which will make "Unix computing as easy to use as the Macintosh," Rosing said. It also includes a new release of the X11/News Window System. All Sparcstation IPCs will be shipped with the new Open Windows Version 2.0, Sun said.

Both Sun and the retail channel will concentrate on selling networked computers. "We're not going to compete against stand-alone PCs, because there are companies that do that much, much better than we do," said Eric Schmidt, vice-president of marketing.

Large companies that have already installed the IPC include Merrill Lynch & Co. in New York, Nynex Network Services in White Plains, N.Y., Healthcare Affiliated Services, Inc. in Pittsburgh and the *Houston Chronicle*. Those sales were made through Sun's direct sales force.

Dbase

FROM PAGE 1

management was so bad.

Ashton-Tate has a lot of ground to make up to recapture its former hold on the hearts and minds of users. "We didn't have that many problems with Dbase IV 1.0, but [at this point] we feel they've missed the boat. We've gone over to Foxbase," said Rocco Esposito, a personal computer coordinator at Maidenform, Inc. in Bayonne, N.J.

"We're skeptical," said Brian Williamson, PC services manager at the First Security National Bank & Trust Co. in Lexington, Ky. "What was so wrong with the product that it took them so long to fix it? How confident can I be now that it's OK?"

Yet the issue is not whether there will be problems — no program is bug-free. The key is how Ashton-Tate deals with problems. "To maintain the customer base, they have to prove they can get a stable product out," said Barbara Isgur, an analyst at Needham & Co.

"The issue is trust," said Michael Irwin, a successful Dbase IV user and a police officer/systems analyst at the Metropolitan Police Department in Washington, D.C. He claimed Release 1.1 has been stable for months but was held back because Ashton-Tate did not know when to close the door on new enhancements. Irwins said he has done some major programming with Dbase IV and will upgrade to Release 1.1.

Analysts estimated that as many as 500,000 users will migrate within the first few months to a stable Release 1.1. Without it, long-time loyal users will become "discredited laughingstocks," and a core of key corporate programmers will be forced to switch to clones, taking an average of five to 25 users with them each time, Green said.

Release 1.1 is a follow-up to a very buggy Dbase IV 1.0. First shipped in October 1988, Release 1.0 thudded to the ground and never got up, the victim of scathing reviews.

Tomorrow — almost two years of feverish development and four quarters of red ink later — it's "Truth or Consequences" time for Ashton-Tate's newly installed management team of President William Lyons and Dbase general manager David R. Procter.

The company will also release Dbase IV for Digital Equipment Corp.'s VAX/VMS.

Although beta-test users of Dbase IV Release 1.1, including Green, have been giving it a thumbs-up, developers will walk away empty-handed.

Developers, who were at the forefront in denouncing predecessor Dbase IV 1.0, face a long wait for 1.1's Professional Compiler, which has not even entered beta testing. Green predicted it will be eight months to a year before it is ready.

While developers stew, the big question for most observers is how much of the installed base will migrate upwards and how much it will cost the company in free upgrades to Dbase IV 1.0 users. Release 1.1 ordinarily will be priced at $175 per copy.

A few more than 350,000 copies of Dbase IV were sold, with a couple thousand more given away as evaluation copies. Ashton-Tate reportedly has reserved $5 million to cover the cost of upgrades to 1.1. Only registered users are eligible.

Ashton-Tate said its total installed base is about 3 million. If Release 1.1 lives up to the accolades of such users as Rock Blanco, an IS vice-president at Boston-based Garber Travel, it could trigger a large user migration, which in turn could prove costly for Ashton-Tate, which is coming off a $12.5 million loss.

Pepsico units rally around uplink

BY ELISABETH HORWITT
CW STAFF

LEBANON, N.H. — In an unprecedented move toward interdivisional solidarity last week, Pepsico, Inc. announced that its three giant restaurant chains and food supply subsidiary cooperatively chose a tiny New Hampshire vendor's point-of-sale (POS) polling system.

Under a $1 million, three-year exclusive contract signed last month, Corporate Microsystems, Inc. will supply Taco Bell Corp., Kentucky Fried Chicken Corp., Pizza Hut, Inc. and Pepsico Food Systems with software to coordinate communications among their IBM hosts and domestic, company-owned fast-food outlets, according to the firm's president, Richard Green.

The purchase of Mlink represents the first major cooperative buying decision that the restaurant chains have made and will form "a piece of a large strategic direction" that all three chains are following in parallel, said George La May, telecommunications manager at Taco Bell.

Initiated in the early 1980s, the strategy involves implementing personal computer-based POS and restaurant management systems and improving communications with those outlets in order "to lessen the restaurant manager's administrative burden, which in turn improves service," La May said.

Mlink will poll microcomputers at the Pepsico-owned outlets, upload sales and other day-to-day operations data to an IBM mainframe and download time-sensitive information such as menu and pricing changes to the various sites.

Pizza Hut chose the package in the spring of last year and brought it to the attention of the other subsidiaries. All three were close to choosing either GTE Retail Systems or Xcellenet, Inc. as their POS management supplier. However, they eventually agreed to be part of the Mlink contract.

Service sells

Both Taco Bell and Kentucky Fried Chicken indicated that a desire to reach a consensus with their sister companies was a minor factor in their choice of Mlink. A much more important consideration, both said, was Corporate Microsystems' technicians' technical ability and willingness to go the extra mile.

Butch Dulaney, director of restaurant systems development at Kentucky Fried Chicken, said he was particularly impressed when the vendor successfully ported Mlink to Microsoft Corp. OS/2, at his request, in a matter of weeks.

Corporate Microsystems also impressed Taco Bell by migrating 120 of the chain's outlets from GTE's Winning Connection to Mlink in 72 hours, La May said.

Among Mlink's functional advantages were a superior security system and the fact that it seemed "more oriented toward polling files in batch mode rather than in interactive mode, which requires someone at the screen," Dulaney said.

Mlink's recently announced support of IBM's LU6.2 protocol also provided more flexible two-way communication with the IBM host, Dulaney said.

Pepsico has a policy of not influencing its subsidiaries in their information systems buying decisions. However, peer, if not corporate, pressure apparently played its part in Pepsico Food Systems' decision to buy the software, according to Douglas Cothern, the subsidiary's director of applications systems.

Pepsico Food Systems had originally decided to go with Xcellenet after evaluating all three packages, Cothern said. The package's interactive orientation was a boon to the food supplier, which is used to taking orders from Pepsico's franchise outlets on an as-needed basis. In contrast, the restaurant chains tend to collect data and download updates in batch form to their outlets, Cothern said.

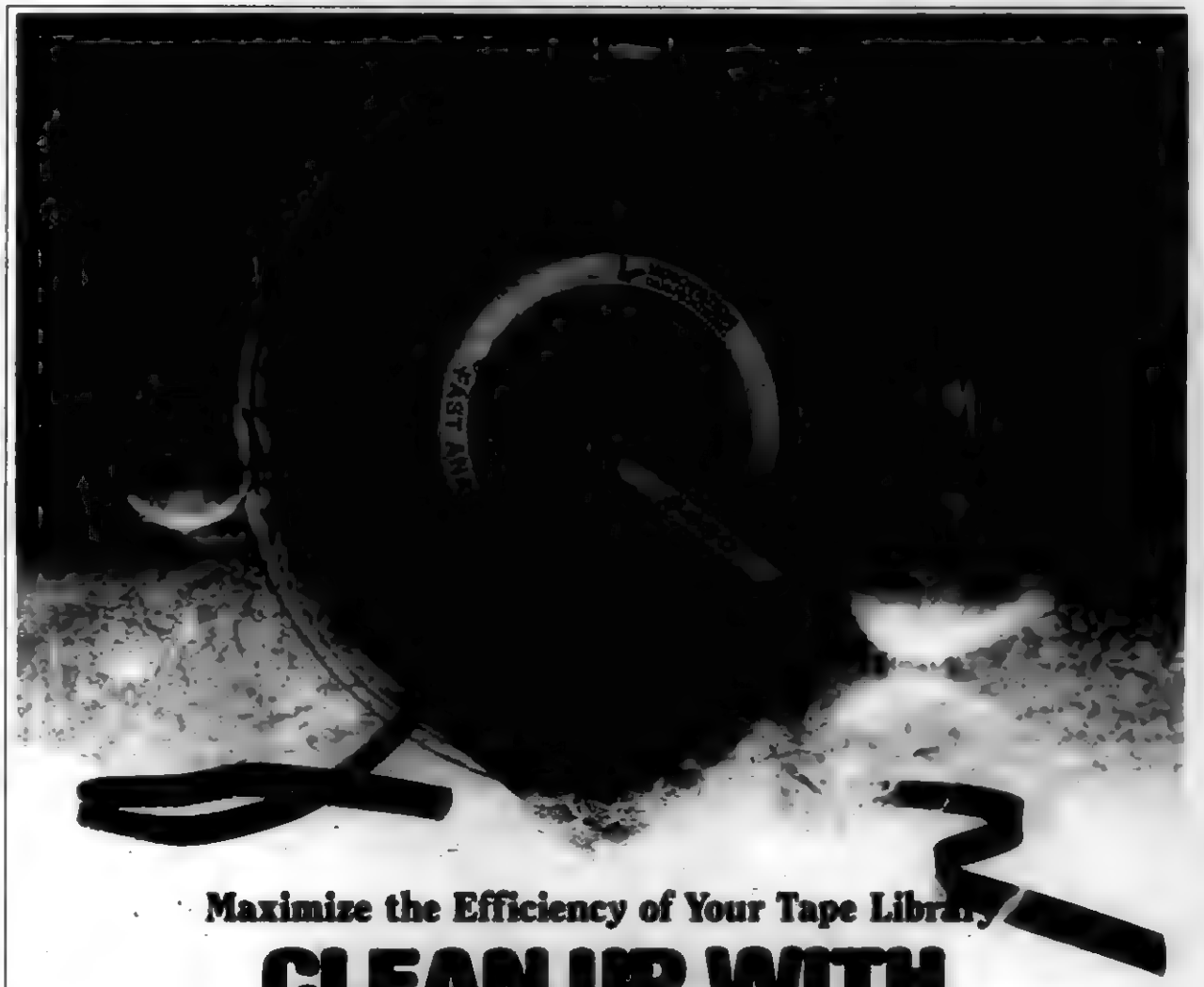
Pepsico Food Systems also liked the windows-based, mouse-driven user interface that Xcellenet provides through its support of IBM's Presentation Manager, Cothern said.

Nevertheless, the subsidiary agreed to go with Mlink in order to "be a good corporate citizen and to allow ourselves the flexibility to communicate with other company locations in the future and because the pricing was very attractive," Cothern said. "It was entirely voluntary on our part."

Pepsico Food Systems is getting essentially the same capabilities on Mlink as it would have gotten on Xcellenet, although "Xcellenet makes it easier," he added.

Taco Bell and Pizza Hut have cooperated in technological implementations prior to this, La May said. For example, Taco Bell "took pieces from Pizza Hut's labor management system and learned from their mistakes," he added. However, this is the first time that all three restaurant chains have "worked together as a team" to choose a technology, La May said.

Nor will it be the last: The three chains are now working together to implement very small-aperture terminal-based links to provide adequate bandwidth for distributing new software and updates to company-owned outlets, La May said. The links will also support video and Muzak.



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Hacker trial begins in Chicago

BY MICHAEL ALEXANDER
CW STAFF

CHICAGO — The trial of Craig Neidorf, a 20-year-old editor of a hacker newsletter, opened last week with charges from prosecutors that he plotted with a hacker to steal an "extensive road map with all of the stops along the way" to an enhanced 911 (E911) emergency telephone system and that he distributed the information to the hacker community.

Neidorf's defense attorney countered that his client was merely a journalist using an electronic bulletin board to disseminate a "meaningless . . . bureaucratic" document.

William Cook, assistant U.S. attorney, told the jury in his opening remarks, "This road map to the E911 system was stolen by Robert Riggs, a member of an organization known as Legion of Doom, and transferred to Craig Neidorf." Neidorf, Cook charged, "distributed this extensive road map to the hacker community."

The text file that detailed the inner workings of an E911 telephone system was stolen from Bellsouth Telephone Co. in Atlanta sometime around September 1988 and published in "Phrack," the newsletter edited by Neidorf, in February 1989.

Neidorf has been *accused of stealing 911 system information*

"Mr. Neidorf never broke into any computer system, never stole any file and never profited from this," countered Neidorf's attorney, Sheldon Zenner. "Craig has never been accepted as one of the group. He is not a hacker — he's a journalist."

Zenner downplayed the value of the E911 text file, calling it "meaningless" and a "bureaucratic document of administrative procedures." Bellsouth security personnel knew that the file had been posted on a bulletin board in Rockport, Ill., where it stayed for a year, before they contacted the U.S. Secret Service, Zenner told the jury.

David Bauer, a prosecution witness and a computer security expert at Bellcore who was asked by Bellsouth to assist in the investigation of the stolen file, conceded on cross-examination that investigators delayed looking into the theft of the file. Bauer admitted that the inaction was "irresponsible."

Robert Kibler, a security manager at Bellsouth, told the court how Riggs and at least three others repeatedly penetrated a data network linking 23,000 computers and telephone switches and rerouted telephone calls, planted Trojan Horse programs and disrupted telephone service. Although there are parts of the 911 service that are "vulnerable to intrusion," the hackers did not interrupt the service, he added.

Neidorf and Riggs were indicted last February. A superceding indictment in June charged Neidorf with 11 violations of wire fraud and stolen property statutes. If convicted, Neidorf faces a possible maximum prison sentence of 31 years and a fine of $122,000.

Last month, Riggs pleaded guilty to charges stemming from the 911 plot in Chicago and Atlanta, where he was indicted with Adam E. Grant, 22, and Franklin E. Darden, 24. Grant and Darden have also pleaded guilty to the Atlanta charges. The three are slated to testify for the prosecution in the Neidorf trial.

A test for the law

The trial of Craig Neidorf, which began last week, raises new legal issues that highlight the difficulty of applying existing laws to crimes involving the use of new technology.

This is the first time that a federal district court has been asked to decide whether the electronic transfer of confidential, proprietary business information from one computer to another across state lines constitutes a violation of the federal stolen property act.

Neidorf sought to have the charges against him dismissed on the basis that he merely transferred "electronic impulses" and not "goods, wares or merchandise" across state lines as detailed in the federal stolen property act. He also argued that the transferred item — the E911 text file — never took tangible form.

U.S. District Judge Nicholas Bua denied those motions, citing cases in which the courts have upheld convictions involving the electronic transfer of stolen funds. The judge added that if the information can be stored and is readable, then it falls within the definition of "goods, wares or merchandise" under the stolen property act.

Neidorf also filed a motion arguing that criminalising his publication of the E911 text file in "Phrack" violates his First Admendment right of free speech.

However, Judge Bua noted that Neidorf has been charged with scheming to steal and disseminate the file and that this sort of activity is not protected by the First Amendment.

MICHAEL ALEXANDER

ISDN

FROM PAGE 1

where the only twisted pair is barbed wire," quipped Tom Terry, director of network planning and design at Norwest Technical Services, Inc. Norwest is running a 14-multiplexer T1 backbone throughout 11 states.

June Hoffman, telecommunications supervisor at Kaiser Permanente, Inc., a Denver-based health-maintenance organization, said she would like to evaluate ISDN for use in a 24-hour urgent-care application that would allow radiologists to read films from home and make quicker diagnoses.

"Unfortunately, not all our central offices can support that," she said. "We'll probably have to wait another two to three years."

Michael Prince, MIS director at Burlington Coat Factory Warehouse Corp., said he considered ISDN about six months ago, but because of limited availability of ISDN lines in New Hampshire, he opted for MCI Communications Corp.'s Vnet virtual private network offering.

"We'll revisit ISDN in about two years," he said. "I'd like the on-demand setup and switched flexibility ISDN offers."

Vendors with broader product lines are willing to ride out the initial ISDN ramp-up phase. Codex Corp., a maker of T1 multiplexers, modems and other networking equipment, recently announced its 8860 ISDN terminal adapter, acknowledging that "over the next 12 months, sales will be very small," said Ray Wright, director of ISDN marketing. "But we feel we can improve our total product approach by offering our user base a migration path to ISDN."

Less resilient was Vadis, Inc., a 2-year-old Richardson, Texas, ISDN-only company focusing on products for the Basic Rate, end-user market. Vadis decided last month that it could not wait any longer for its ISDN personal computer adapter card to turn lucrative.

The company slashed two-thirds of its work force and refocused its strategy on developing ISDN applications software and porting ISDN-like functionality to digital private-branch exchanges, according to Matt Blanton, Vadis' president.

Vadis left the ISDN hardware business because the market "only reached 10% to 15% of our expectations," Blanton said.

Users cited ISDN service pricing as one roadblock to those expectations.

U.S. Bancorp, a regional financial services organization headquartered in Portland, Ore., evaluated Primary Rate pricing last year against the economies of its existing T1 network and found ISDN to be cost-prohibitive, according to Earl Vogt, telecommunications manager.

"There's also a lack of innovative ISDN applications with associated customer premises equipment to justify swapping out my T1 gear," he added.

Joseph Tsalik, a project manager at Shearson Lehman Hutton, Inc. in New York, noted that while the technology "seems adaptable to Shearson's requirements," he is unable to determine if ISDN is cost-effective because there is no ISDN tariff yet in his area. He added that the tariff would need to fall in the $30-to-$40-per-line range for ISDN to make economic sense for his firm.

Ascend Communications, Inc., a recent entrant to the ISDN CPE arena, is risking an end-user focus and is backed by one of the same venture capital firms that invested in Vadis: San Francisco-based Kleiner Perkins Caufield & Byers. Ascend is targeting the data side of ISDN only and has a leg in both the Basic Rate and Primary Rate ISDN camps — a possible advantage over Basic Rate-focused Vadis, since Primary Rate lines are more widely deployed and offer greater bandwidth (1.5M bit/sec.). Ascend is offering products that allow hosts and local-area networks to access Primary Rate ISDNs.

Timing-wise, newcomer Ascend has another advantage in that it is getting into the market at the point where Vadis has already waited two years for the regional Bell operating companies to widely deploy ISDN Centrex, which was the foothold for its product strategy.

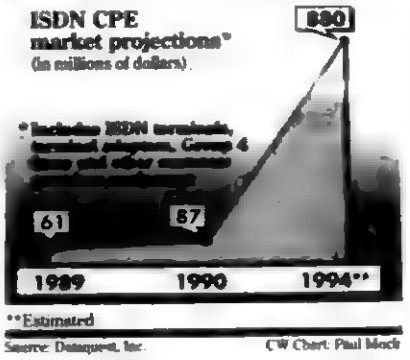
However, Larry Cynar, a senior telecommunications analyst at Dataquest, Inc. in San Jose, Calif., noted that "the danger in being totally on the data side of ISDN is competition by private networks. There are many powerful networks out there handling data, and it may not make economic sense for users to move over to ISDN now that they have that T1 monster sitting over there to pay off."

Jerry King, manager of telecommunications technology at General Electric Co. in Bridgeport, Conn., believes ISDN will catch on, but not quickly. "I doubt ISDN is going to proliferate fast enough for the existing CPE companies to hang in there," he said. GE is running one pilot Basic Rate ISDN installation.

"ISDN will evolve to a wide-area solution in a couple of years, but in the meantime, it will be smaller companies with local and regional applications that will be able to use it," King predicted.

At their mercy

Because they must wait for telephone companies to deploy a critical mass of ISDN lines, there won't be room for multiple ISDN equipment vendors until mid-decade



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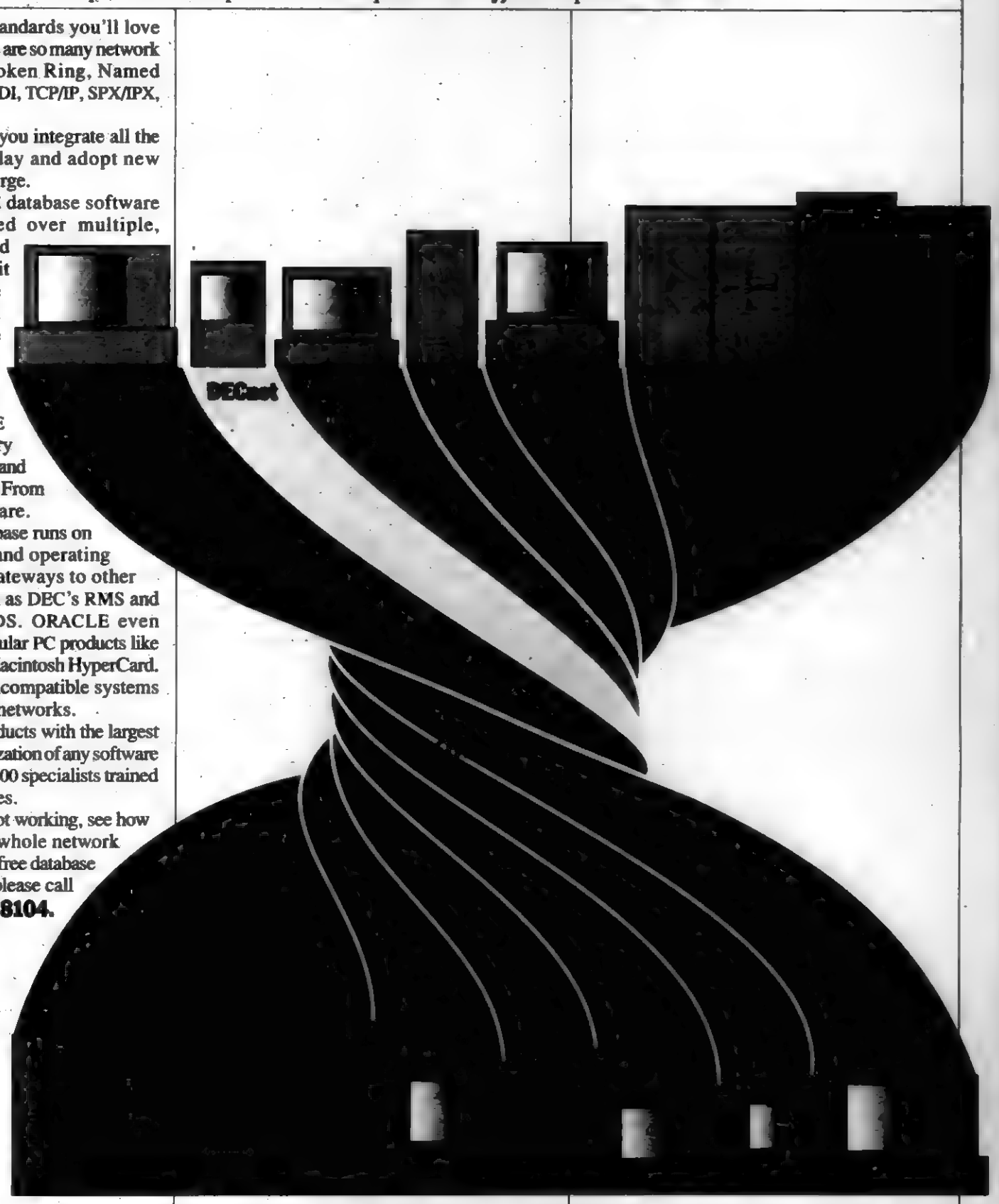

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Manufacturers planning for low-emission VDTs

BY J. A. SAVAGE
CW STAFF

VDT manufacturers are publicly leaving the issue of health standards to the American Electronics Association and the Computer and Business Equipment Manufacturers Association. Privately, however, some are planning to take advantage of concerns about potential health effects by introducing low electromagnetic field-emission monitors.

In a meeting last week in San Jose, Calif., representatives from seven U.S. manufacturers agreed to support the two official organizations' research and information exchange on VDT health effects. They also agreed to look to those organizations to set test and measurement standards for low-emission VDTs, if needed.

"We didn't see any need to form another group," said Marianne Lettieri, Apple Computer, Inc.'s meeting representative.

Separately, Apple testified last week before the House Committee on Science, Space and Technology, encouraging Congress to support "comprehensive research of the potential human health effects of emissions, especially those found in and around VDTs."

Unless government or industry groups act quickly to set standards, there will be low-emission VDTs on the market with no agreement on what constitutes "low-emission." Some of the manufacturers at last week's meeting said they plan to introduce low-emission monitors to capitalize on consumer concern.

Apple, for instance, is "looking into ways to lower emission rates, not because there's any scientific basis [for health problems], but because we want to be responsive to consumers," Lettieri said.

Sun Microsystems, Inc. is "not sitting on it" either, said Gulab Sharma, manager of Sun's CRT display group.

One firm, Sigma Designs, Inc., already has a low-emission monitor for one type of electromagnetic radiation based on Swedish standards and plans to announce a monitor for both types of emissions early next year. For monitors to be sold to the Swedish government, they must meet low-emission standards, said Thinh Tran, president of Sigma.

VDT manufacturers are in the thorny position of wanting to capitalize on an emerging market for health-conscious consumers while insisting there are no health problems associated with current monitors. Acknowledging the latter could raise concerns over potential liability.

There have been no conclusive studies on health effects from VDT emissions, but an early version of an Environmental Protection Agency report recommended that extremely low frequency electromagnetic fields be classified as a "probable" cause of human cancer. That recommendation was rescinded pending further review, according to Louis Slesin, editor of "Microwave News."

The second type of emissions — very low frequency — has been under suspicion for several years and has been the focus of other, still inconclusive, studies.

Sigma's brand of safety

Filtering out electromagnetic radiation from VDTs has been attempted in the past through metal shielding around the display, but that has largely been ineffective.

Sigma Designs, Inc., a Fremont, Calif.-based manufacturer, is filtering one type of emission by creating an opposite electromagnetic field to cancel out the existing fields.

When a VDT is powered up, fields are created by electricity running through coils at the yolk of the machine, according to Charles Waters, Sigma's senior marketing manager. To cancel out very low frequency (VLF) radiation, Sigma adds a second set of coils. The trick, he said, is positioning the two fields to cancel each other in space.

Sigma announced it would have monitors that also are low in extra-low frequency (ELF) emissions by early next year. Those monitors would have yet another set of coils for canceling the second type of electromagnetic field.

ELF in the range of 1Hz to 30Hz is the principal frequency range of the earth's magnetic field. Man-made ELF is slightly higher, about 60Hz. VLF is 15,000Hz.

IBM has a similar approach to reducing VLF emissions in a patent issued in the UK in 1987. The company would not say, however, what technology is employed in its low-emission Infowindows display sold in the U.S. and Canada.

Low-emission monitors are not cheap. Sigma adds about $400 to the cost of its displays for low-VLF versions and would not venture as to how much more expensive a low-ELF/VLF version would be. IBM's displays run between $995 and $1,620.

J.A. SAVAGE

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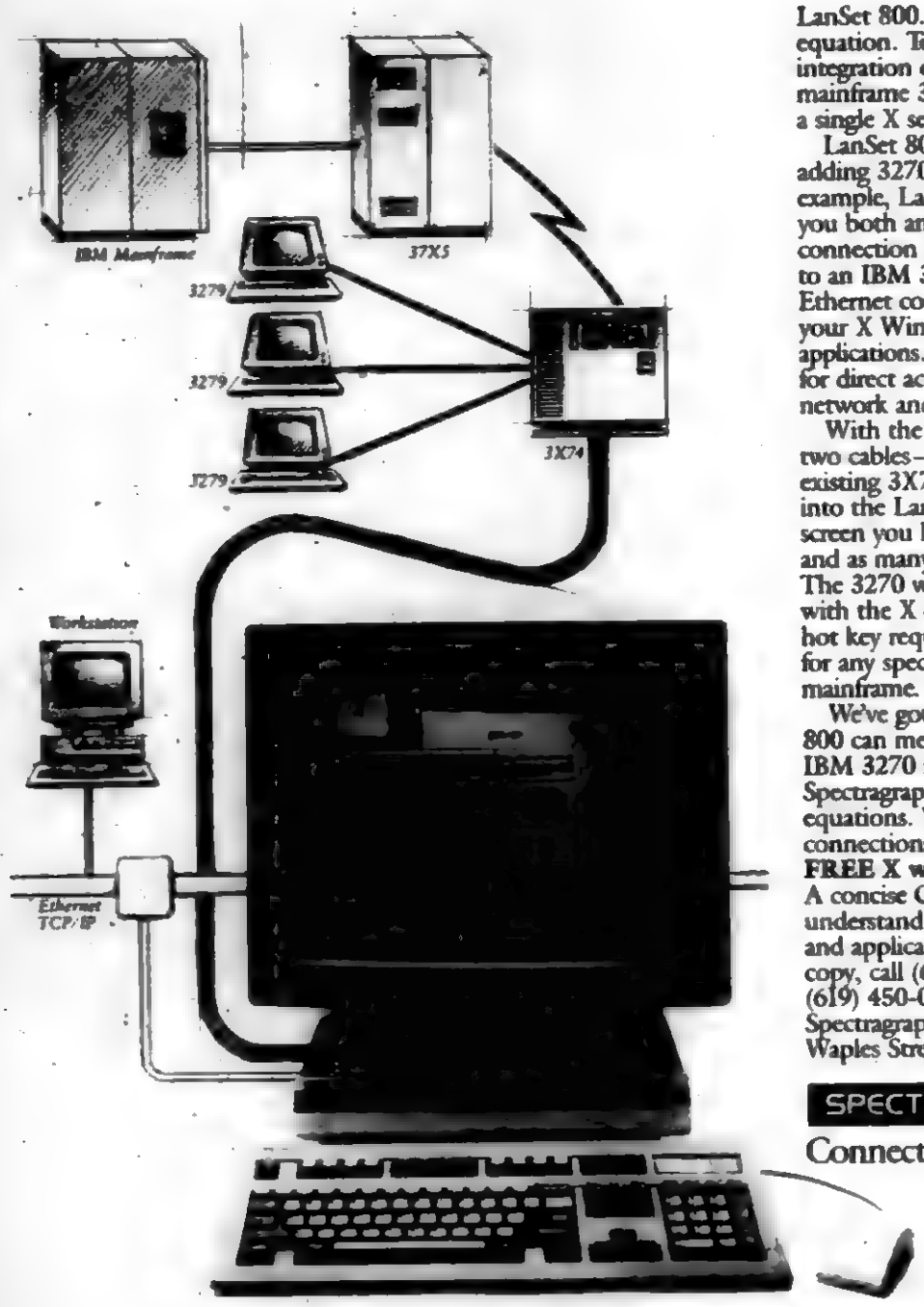

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Wyse multiprocessor challenges rivals

BY MARYFRAN JOHNSON
CW STAFF

SAN JOSE, Calif. — Wyse Technology extended the high end of its Unix-based multiuser systems line today with the introduction of the Series 9000I Model 940, intended as a database engine and server for distributed processing.

Based on the Intel Corp. 1486 chip, the new system can support up to eight 486 processors and scale up to performances of 100 million instructions per second.

Wyse also announced a new release of its own version of AT&T Unix System V Release 3.2, as well as a number of enhancements for earlier models, including a 486-based CPU upgrade board for the Model 920, a small computer systems interface hard disk and tape drive support for the entry-level Series 5000I.

All of the products are available immediately. The 9000I Model 940 ranges in price from $38,000 to $215,000, depending on configuration, and can support 48 to 64 users with one CPU.

The underlying architecture of the 9000I series is symmetrical and linearly scalable, so users adding CPUs gain a 100% performance increase, or double power, with each CPU, said Mary Ann Winchester, senior marketing manager at Wyse's advanced systems group. "That's important when managing large amounts of information on a server," she noted.

Richard Shaffer, editor of the "Technologic Computer Letter," said Wyse has been popular among value-added resellers of small multiuser systems because of its upgradability, multiprocessor operating system and historic strength as a supplier of terminals and personal computers among minicomputer VARs and distributors.

Aim Technology, a Unix benchmarking firm located in Santa Clara, Calif., gave the Wyse 9000I Model 940 a performance rating of 6,030% and a user load rating of 902, which Wyse officials said is an indication that it significantly outperforms other Unix-based multiprocessing systems from competitors such as Sequent Computer Systems, Inc., Pyramid Technology Corp. and NCR Corp.

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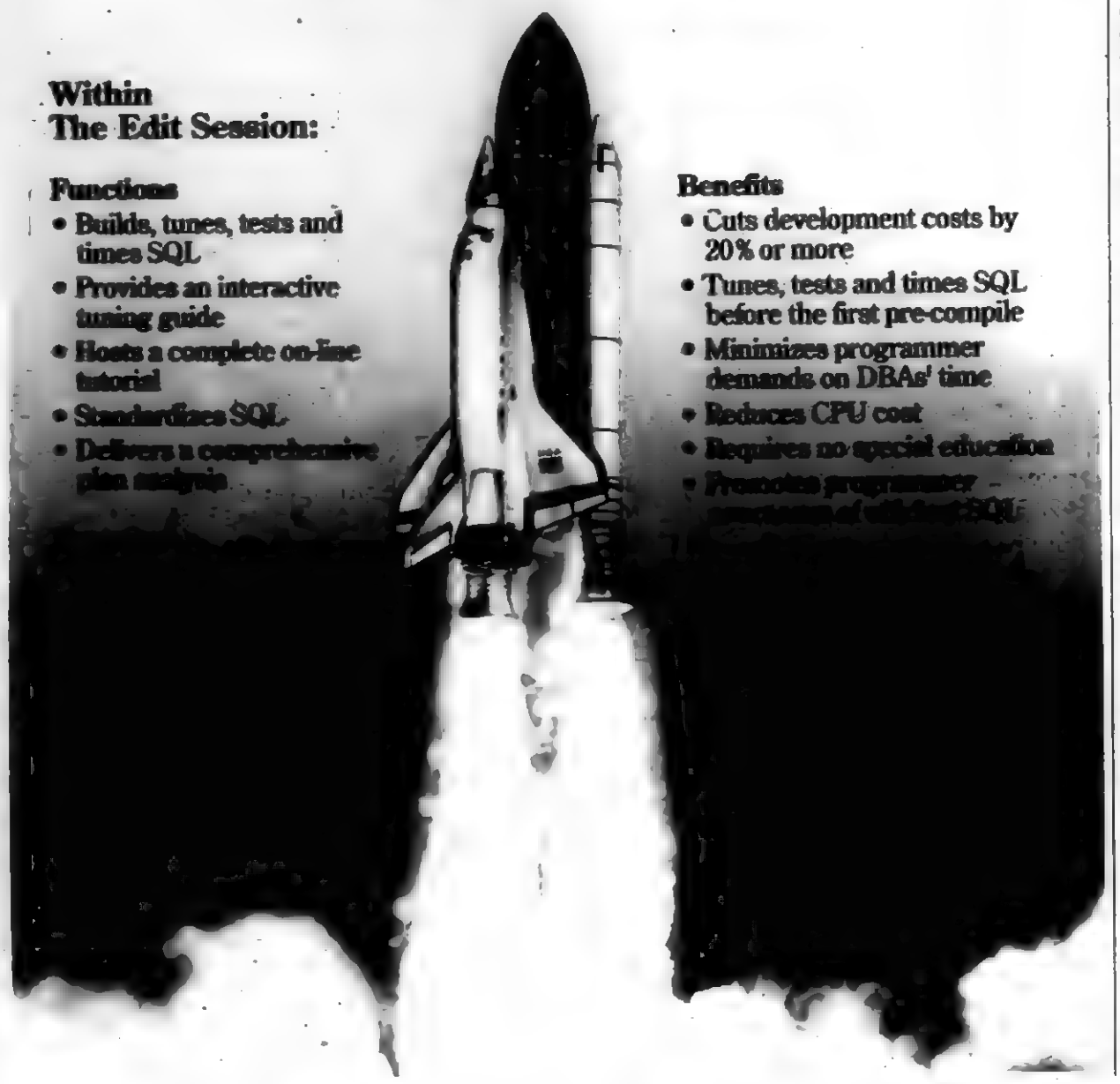

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Wang paves Unix migration path

BY SALLY CUSACK
CW STAFF

LOWELL, Mass. — Hoping to salvage the business of some of its earliest customers as well as snap up some new users in the bargain, Wang Laboratories, Inc. formalized an agreement last week that will help users of the Wang 2200 migrate to Unix.

Under terms of the marketing agreement, Wang will distribute Niakwa Management Services of America, Inc.'s Basic-2C Development and Runtime software packages.

The Mundelein, Ill.-based developer's software will provide a migration path to AT&T Unix System V and The Santa Cruz Operation's Xenix for Wang 2200 and CS/386 system users and value-added resellers (VAR).

"Not a lot of Wang 2200 users migrated to the VS platform back in the '70s and early '80s," observed Tim VeArd, president of VCR, Inc., an independent consulting firm in Austin, Texas.

Wang estimated that more than 70,000 of its Model 2200 computers have been installed worldwide since their initial debut in 1972. An upgraded version of the system, the 32-bit CS/386, was unveiled in 1986.

Investment insurance

The Wang/Niakwa agreement will allow Wang users and VARs to protect their existing Basic-2 software investments while providing an optional migration path from proprietary Wang systems to industry-standard platforms.

Basic-2C is an enhanced implementation of the Basic-2 language used on Wang's 2200 and CS/386 systems. It reportedly has 40,000 end-user sites to date.

The software can also be ported to Wang's Dynamix line of multiuser Unix servers, as well as industry-standard personal computers and PC local-area networks running under Xenix or SCO Unix System V/386, Release 3.2.

"I think this will definitely increase Wang's sales," said VeArd, adding that there are Basic-2C users scattered across a diverse range of vertical markets — from construction management to graveyard tracking. "Wang will be able to walk into the Unix arena with thousands of existing software products."

The Basic-2C program is divided into two modules: a development package and a runtime package. Slated for availability next month for Wang's Dynamix line, the development package license fees will range from $695 to $995. The Runtime package is also scheduled for delivery next month, with fees ranging from $395 for a single-user system to $9,160 for systems supporting more than 64 users.

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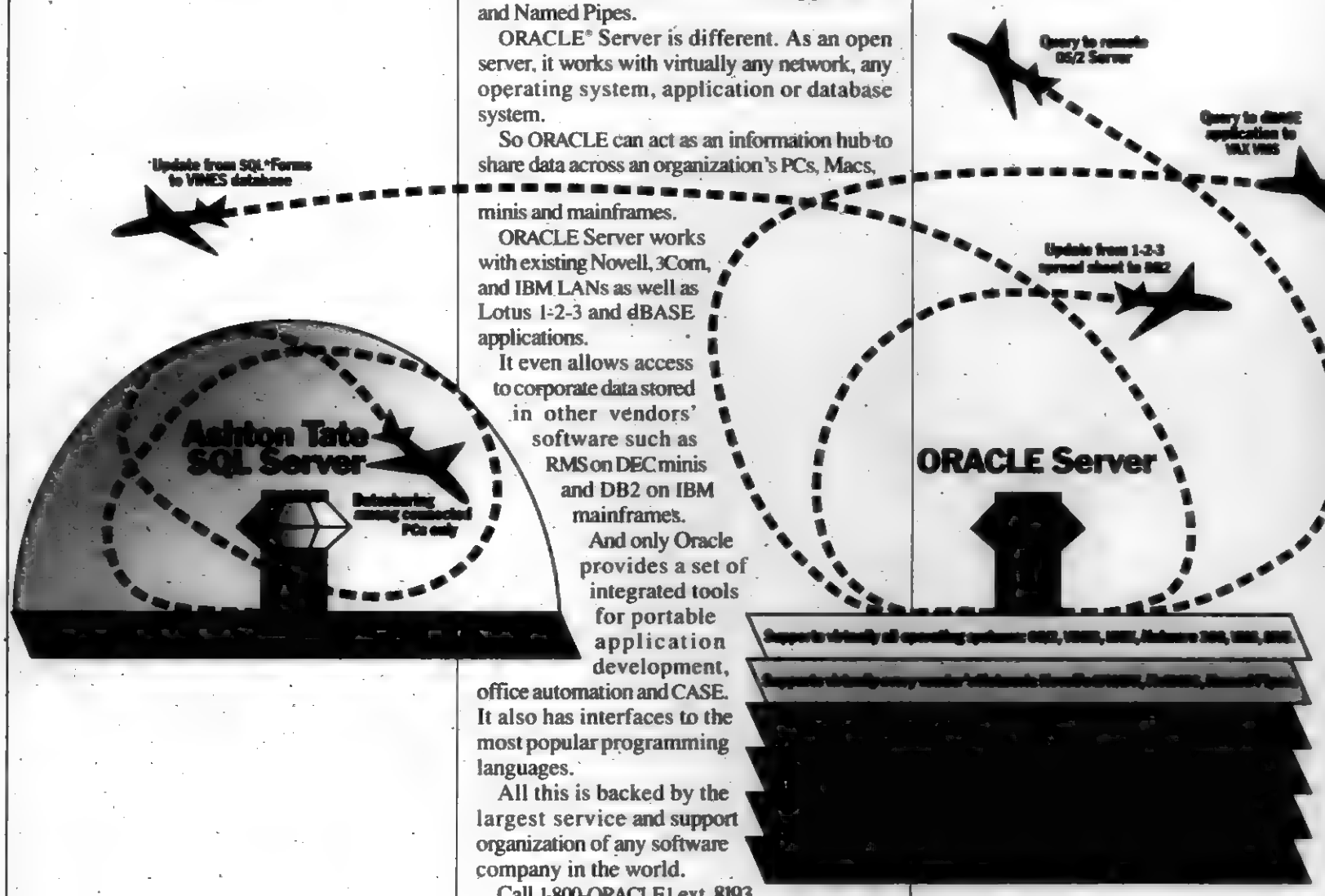

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Thailand's database aimed at social needs

Last in a series of reports profiling winners of this year's Computerworld Smithsonian Awards.

BY CAROL HILDEBRAND
CW STAFF

A look through your wallet can reveal just how deeply embedded in informational databases you are.

How many identification cards can you come up with? License. Social-security card. Credit cards. Each represents a different computer database where personal information about you has been stored. Think of the possibilities — both good and bad — if all those sources of information were compiled into one database for an entire nation's population.

Thailand's Ministry of the Interior has created such a system. Its Central Population Database (CPD) closely tracks the 55 million Thais living in 10 million households nationwide. The database, which is the only fully integrated demographics database system in the world, can be used to improve the country's standard of living, and it has netted the ministry a *Computerworld Smithsonian Award*.

"We can plan various parts of Thai society in hundreds of categories," said Surachai Srisaracam, director of the CPD Center in Bangkok. For example, public health planning can be improved by providing accurate and timely statistics on births and deaths, he said.

The database is designed to generate accurate information on a nationwide basis. The detailed demographic information can aid greatly in such areas as urban educational planning, health care and benefits administration, as well as tax collection and law enforcement. "The payback will be in terms of the improved efficiency or the work performance of government agencies," Srisaracam said.

Before the CPD was initiated five years ago, educational and development planning was done on a regional basis. Statistical reports, produced manually at the ministry, were often outdated before their completion. "Now we have an automated information system that covers every area," Srisaracam said.

A vital part of the system is the personal identification number (PIN) project, which has set up a computerized system for processing personal ID cards for each Thai citizen. These cards, which contain both a thumbprint and a head-and-shoulders photo, are being produced at a rate of 6 million annually. The system has been operating since January 1988 and has produced about 12 million cards thus far. They will eventually become the official Thai ID document.

Thailand, which is bordered by such politically unstable countries as Burma, Cambodia and Laos, also uses data from the PIN project to combat illegal entry into the country. Applications being developed include passport, immigration and refugee control systems.

Such close governmental tracking of its citizens can conjure up shades of Big Brother, but this is not the case, Srisaracam said. "It's a system that people need. They accept it." CPD also complies with government privacy laws, he said.

Bill Bailey

Thai citizens *are subjects and beneficiaries of the world's largest database*

The database is housed on three Control Data Corp. Cyber 960 mainframes and two Cyber 830 multiprocessors with 100G bytes of disk capacity. Four hundred IBM-compatible workstations running DOS are linked to the Cybers. The center now receives updated information on paper monthly from its 1,000 provincial offices. The local offices are expected to be linked on-line to the main data center within six years, and they will be able to send a daily update of the data.

Tandy PC takes on IBM PS/1

BY RICHARD PASTORE
CW STAFF

FORT WORTH, Texas — Attempting to counter IBM's latest incursion into its traditional home computer turf, Tandy Corp. last week unveiled a personal computer that undercuts the new Personal System/1's base price by $250.

The Tandy 100/RL hopes to be all things to home users by bundling 24 home productivity applications in addition to DOS. These include personal and financial management utilities that allow users to balance a checkbook, manage investment portfolios and compute changes to recipes based on the number of servings needed.

While IBM chose the late-model Intel Corp. 80286 chip for its PS/1, the Tandy box runs off the even more outdated Intel 8086 chip. Memory starts at 512K bytes and is expandable to a maximum of 768K bytes. The unit supports IBM Color Graphics Adaptor graphics and includes one expansion slot, joystick and mouse ports and parallel and serial interfaces.

Tandy does not require its customers to purchase an expansion chassis to add memory or drives, as is the case with the PS/1 [CW, July 2]. Tandy claimed that total accessory charges for its box will cost the user $350 less than that of IBM's accessories.

The $750 base model includes a 720K-byte, 3½-in. floppy disk drive and a monochrome monitor. A color monitor and 20M-byte hard disk bring the price up to $1,300.

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ADVANCED TECHNOLOGY

TECH TALK

Squeeze on color

■ Eastman Kodak Co.'s electronic photography division has developed image compression software that it said reduces the cost of storing and transmitting large Apple Computer, Inc. Macintosh color images by as much as 93%. "Kodak Colorsqueeze image compression software can be used to reduce 24-bit PICT and TIFF files by factors of approximately 5-to-1, 8-to-1 and 14-to-1," said Robert Bensman, marketing manager at the division. Once restored to its original size, the file can be saved in either PICT or TIFF or copied to the Scrapbook of Clipboard on the Macintosh. The software is available now at a suggested retail price of $179.

Hardy new diamond

■ Researchers at General Electric Co. recently announced that they have created a synthetic diamond that conducts heat and laser more effectively than natural diamonds. The new diamond could be used in future generations of microchips and lasers, the company said. It could also be used to create microchips that feature closely packed components that would be more impervious to potentially destructive effects of heat.

A logical language

■ Bellcore has developed what it said is a highly efficient, object-oriented computer language called Laure that uses logical deduction to solve complex programming problems. "Laure programmers need only describe the software-writing result they are seeking, and Laure will determine the best way to reach that goal," said Bellcore researcher Diane Hoffoss. The new programming language can automate up to 50% of a programmer's work, according to Yves Caseau, the software's inventor. Laure organizes facts and related instructional data into sets and then defines specific relationships among all the sets in a program.

Rut-roh! High-tech helps The Jetsons

Universal Studios uses computer-generated animation to bring back an old favorite

BY MICHAEL ALEXANDER
CW STAFF

George Jetson, the central character in the once-popular, animated television show, *The Jetsons*, spent much of his time on-screen tussling with futuristic technology that had run amok.

Now George is back on-screen in the recently released Universal Studios' and Hanna-Barbera Productions' film, *Jetsons: The Movie*, and he has modern technology in part to thank for his comeback.

The film's opening titles, as well as several minutes of backgrounds, were created by deGraf/Wahrman, a West Hollywood, Calif., software design and film production firm. The company used Symbolics, Inc. workstations running Symbolics' two- and three-dimensional paint and animation software.

Symbolics, based in Burlington, Mass., designs high-end graphics production systems and software for broadcast, video production, film, engineering and corporate markets.

Universal Studios and Hanna-Barbera wanted a "cartoon look" for the Jetsons movie, but they also wanted backgrounds that had accurate, 3-D perspectives. Traditionally, the backgrounds in animated films are flat; to suggest movement, the filmmaker may pan the camera from side to side, explained Michael Wahrman, president of deGraf/Wahrman. To create a sense of movement into or out of a background, the filmmaker must build a 3-D model.

The drawback is that the model lacks the cartoonish look of the rest of an animated film. Computer-generated animation overcomes that limitation and offers additional advantages, such as permitting the filmmaker to use the same background repeatedly.

DeGraf/Wahrman, which had previously made an animated film for an amusement ride at the Universal Studios Theme Park in Orlando, Fla., created eight minutes of background animation for the movie, including a 46-second establishing shot that carries the viewer in a jet car through Orbit City, the Jetson family's hometown.

Photos: ©1990, Universal City Studios. Jetsons property ©1990, Hanna-Barbera Productions, Inc.

deGraf/Wahrman *used graphics workstations from Symbolics to create animated footage that retained the feel of cartoons*

More firms are turning to high-end workstations to put the finishing touches on film and productions, according to Joseph Plonski, director of applications marketing at Symbolics.

Last December, for example, Apple Computer, Inc. used Symbolics' Macivory animation and paint system for Macintosh II systems to create in only two months a 90-second computer-animated video to introduce the Macintosh IIFX, Plonski said.

Advances in high-resolution video technology, such as high-definition television (HDTV), are also driving the demand for razor-sharp computer-generated graphics in medicine, scientific research and other areas, he said.

Media Productions in Pompano Beach, Fla., uses a Symbolics workstation to convert motion picture film to HDTV, which is then broadcast over fiber-optic cables to high-definition electronic cinemas, said James Haney, the company's president. Club Theater Network, the production firm's parent company, aims to install the electronic cinemas in exclusive clubs, resorts and high-rise apartment complexes, Haney said.

"Many retirees, especially here in Florida, live in secure communities and do not normally go to the movies," said Bob Kemmerer, vice-president of marketing at Media Productions. "This way they can see movies in their own living or vacationing environment."

The cinemas will show first-run and classic movies plus live entertainment and sporting events shot in HDTV.

Cutting costs with computer-based training

BY MICHAEL ALEXANDER
CW STAFF

When Carousel Mediaworks found itself in competition for a corporate contract with five video production firms, the small developer of training programs had a pretty good idea it could get the business. The reason: Carousel offered a bid of $30,000, a mere quarter of the cost of any other bidder.

The Honeoye, N.Y., firm develops training programs on personal computers using multimedia authoring software for clients such as Eastman Kodak Co. and Xerox Corp. "The quality is not the same, but it doesn't need to be," said Denny McElroy, Carousel's founder and president.

Computer-based training (CBT) is finally coming of age, thanks to low-cost PCs and object-oriented programming (OOP) software that turns course developers into multimedia producers.

OOP technology-based software authoring tools are a "monumental step forward in generating computer-based training programs," McElroy said. "Now the subject matter expert has the tools that allow him to sit down and do a presentation just like an author uses a word processing program."

"In the last two years, things have gotten a lot easier in CBT development, and it is largely because we don't have to have people with a dedicated programming background to do it," said James Hite, manager of instructional system development at Northern Telecom, Inc. in Nashville, Tenn. "What we're able to do now is have people keep their eyes on instructional design and pay more attention to meeting the client's learning needs."

The time saved in programming is shifted into producing more sophisticated programs that blend audio, graphics and text.

Northern Telecom uses a software authoring program called Authorware, published by Minneapolis-based Authorware, Inc. The program can create marketing presentations and training programs, Hite said.

"Once you have the source material, it is extremely easy to create an application," said William Bayer, educational services manager at Richard D. Irwin, Inc.

"The biggest challenge is getting source material," he said. "We recently had a situation where we were working on [an Apple Computer, Inc.] Hypercard stack, and the author wanted to include a sound resource. We were floored by the cost of permission to use a small snippet of sound. It was unbelievably expensive, and we could not afford to pursue that option."

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EDITORIAL

Strategy stew

YOU'VE PROBABLY HEARD this one, but in case you haven't . . .

A woman appears three times in front of a divorce court judge, each time saying her marriage had never been consummated. Her first husband, she said, had been hurt in the war and just, well, couldn't. Her second husband was too old and wasn't interested. Her third? An IBM salesman who sat on the end of the bed telling her how great it was going to be.

These days, you can replace the Big Blue suitor with any number of salesmen from companies that have proclaimed various and oftentimes grandiose statements of direction. There's CA '90s from Computer Associates International; Network Application Support from DEC; AT&T's Unified Network Management Architecture; OCCA or Open Cooperative Computing Architecture from NCR and on and on. The list is prodigious.

In most instances, there are two reasons why vendors make such pronouncements. The publicly stated reason is that the large customer bases of such companies need to know what the future will bring from major suppliers. These customers want assurances that investments made today will be protected with architectural enhancements and continued support in the future. They also want to know where their suppliers' strategies fit into the framework of emerging standards. And third-party software companies need this advance information to gauge and direct their development efforts.

So these statements of long-term direction are good for the customer, you are told, even if they involve opening the kimono to other competitors as well as to the customer base.

The second reason is grounded in the harsher realities of doing business in an increasingly difficult world, in which the vendors are many, the real technology breakthroughs few and the customer demand waning in some key markets.

As the world grew more complex and competitive during the 1980s, vendors threw all sorts of products and product strategies at it, casting lines in whatever pools looked to have the biggest fish. Then buying preferences changed. Customers began aggressively downsizing. "Proprietary" began to be a dirty word, even though it characterized most large vendor strategies and, in fact, still does.

The result was a crying need on the part of some vendors to show that there was some purpose to what seemed like random strategies. This purpose was part of a continuum known as the "statement of direction," which always includes a promise of how good it's going to be.

These pronouncements certainly do serve a useful function in IS planning. Just remember that the strategies themselves, especially those that extend several years out, will be influenced and altered by dynamics no one can foresee. Also ask if yours is a vendor whose long-term strategy is a sensible articulation of direction or just a company casting about to justify the lack of a cohesive product strategy in the past.

LETTERS TO THE EDITOR

Vexed for Next

As a registered developer for the Next computer, we take strong exception to "Next finds revolution a Long March" [CW, June 18]. First, the purchaser of the Next computer receives an amazing variety of powerful applications bundled with the machine: Writenow, Tex, SQL, Mathematica and Digital Librarian, to name only a few.

Many other attributes such as Nextstep, Megapixel display, hardware Ethernet and Objective C under Mach make the Next personal computer the most powerful PC available.

The article dwelled on the lack of sales. You would have done better to discuss Businessland's marketing plan for Next: Its clients are large businesses, and large businesses are hardly the best place to sell innovation or increased productivity.

Steve Stalos
Oliver Industries
Laurel, Md.

Eyes on D&B

Having attended the McCormack & Dodge conference in San Francisco, I can relate to the concerns expressed by various users in "M&D users still fuzzy on D&B support plans" [CW, June 25]. Concern about support for M&D products began over a year ago with the introduction of the Professional Services Organization and the concurrent departure of several experienced field support personnel. At nearly the same time, changes were announced to the telephone support policy, and GL 2.0 users began to realize that there was no pathway forthcoming to migrate to the GL 3.0 version.

With the merger, most users have taken a wait-and-see approach. We are all interested in what Dun & Bradstreet Software means when it says it will "support" all existing products. The announcements made in the opening session are the first visible evidence of their intentions.

John Imlay was given the clear edict to make Next-Gen an evolutionary product, not a revolutionary one. However, should the implementation of Next-Gen require more resources than a normal upgrade, it will still be less expensive than purchasing, installing and learning someone else's software.

Scott Y. Davey
Assistant Controller, Planning & Systems
Fairchild Fastener Group
Culver City, Calif.

Group dynamics

Your article "Meetings that aren't hard to take" [CW, June 25] brings deserved attention to computer-supported meetings.

I take exception, however, to the assertion that "If the group processes are already poor, then the technology can only make matters worse." This is simply not true. An otherwise dysfunctional group can often effectively make a decision because it used a group decision support system. This occurs because the support system imposes an effective decision-making process.

Group processes are critically important to successful meetings. Effective group decision support systems do not presume that existing processes are good. Their success results in part from the temporary imposition of a "good" decision-making process on the group. By focusing attention on process issues, group systems can help executive and management teams improve their everyday decision-making processes as well.

Sandor P. Schuman
President
Executive Decision Services
Albany, N.Y.

Computer cops

Supporters of hackers claim that the act of electronically wresting confidential information from computer files is a valuable learning experience [CW, June 25]. What odd thinking! Do we let teenagers pick locks on our doors and safe deposit boxes so they can learn about keys and combinations?

Information is a firm's most valuable asset. It deserves protection. I doubt that Mitch Kapor would want information about products under development at his company published in a hacker newsletter or on an electronic bulletin board. It's true that law enforcement officials sometimes seize more equipment and information than is necessary in their raids on hackers; they don't have enough training in this area to know what to look for. This is an argument for providing more law enforcement training, not for allowing criminals to run rampant.

John Tuomy
President
Leeman Datacom Security
Hayward, Calif.

Computerworld welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor, Computerworld, *P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701. Fax: (508) 875-8931; MCI Mail:* COMPUTERWORLD.

Avoid the escalating 'soft-war'

JOHNNY MOO

Is Washington inadvertently entering into a software trade war that will hurt U.S. companies far more than it will help them?

I am afraid the answer to that question may be "yes," based on my company's recent experiences with the U.S. Department of Commerce. It conducted a seven-month investigation of my company, Computer Systems Advisers Group (CSA) in Singapore, to determine whether one of our software products was an "unfair" competitor in the U.S. marketplace.

Being from Singapore — a small country that is not only a very law-abiding society but one which owes its economic success to a vigorous belief in free and fair trade — some of my national pride was at stake in this investigation. We Singaporeans like to think we take Adam Smith as seriously as you Americans do.

I am therefore very pleased to say that we won our case. The Commerce Department investigators who came to Singapore and combed through our records ultimately found nothing unfair about our business practices.

One of our competitors in Massachusetts, Visible Systems, alleged that the government of Singapore gave us a subsidy for the development of CSA's software development tool, Pose. This "smoking gun" simply didn't exist.

However, the way the case was brought, the burdens it posed on my small company during the months of inquiry and some parts of the final decision are quite troubling to me. They are also troubling to many U.S. software companies, to the U.S.-based software trade association, Adapso, and to all who are concerned with preserving free trade for one of the most important products of our time — software.

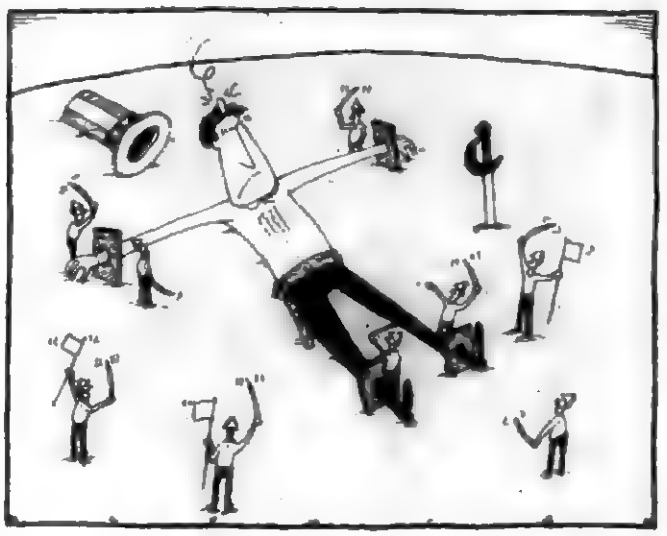
Moo is chairman of Computer Systems Advisers Group, a Singapore-based firm.

Hindrance to free trade

Of greater consequence than CSA's victory was the Commerce Department's ruling that software, on a carrier medium such as a disk or magnetic tape, is merchandise. With this decision, the U.S. unilaterally turns software into a potentially dutiable item, creating a big setback for free trade in intellectual property. By treating software as ordinary merchandise — different from other intellectual property such as books — the U.S. contradicts its own position of enhancing free trade.

The majority of software vendors worldwide, and especially in the U.S., depend on software exports for a significant portion of their revenues. In raising barriers to the export of U.S. software by raising barriers to the import of software, the U.S. harms itself most of all. How can U.S. software firms possibly benefit, when protectionism initiates duties and higher prices for all exports?

Another issue troubles me: Software has been praised as an entrepreneurial, small-scale business. But when one company can cry wolf and, in doing so, bring the massive weight of the U.S. Department of Commerce down on another, the result is rather like a witch hunt, and someone gets burned.



Mark Hannah

I fear for the rights of the accused when such a grievance, particularly one from another country, brings the invisible hand of U.S. protectionism slamming down. The damage to a company the size of CSA is substantial in terms of costs, lost sales and reputation. Had CSA been a lesser company, this investigation could have meant the death of a viable U.S. company: CSA, Inc., our U.S. subsidiary. With this practice, we will effectively be encouraging only giant companies with big international legal staffs and lobbyists to be in the software business.

Isn't the reason behind U.S. trade laws to protect U.S. firms against unfair competition? How ironic and fruitless that such laws, written with major U.S. competitors in mind, end up being applied to Singapore — a country with no global clout that poses no threat.

Most troubling of all is the charge of subsidy against CSA. CSA did not receive any subsidies from the Singapore government, but many countries trying to jump into the information age are using government subsidies. After all, the U.S. has done this for years, albeit in a different form. Isn't it true that U.S. Department of Defense (DOD) contracts with private corporations support research and development activities at those corporations? When most software is developed under a DOD contract, it remains the property of the developing firm, to be marketed and sold commercially. Should the definition of subsidy — of what is fair or unfair — be revised?

Law unto themselves

What will happen if other countries, which now let U.S. software in duty free, start imposing duties? What if other countries decide that U.S. software developed by companies with Pentagon contracts or other indirect subsidies is being "unfairly subsidized" and start imposing their own standards of fairness and retaliation?

Often in trade disputes, as in this one, supposed injured parties call for a level playing field. I would love one. To enter the software business, a Singapore company, unlike its counterpart in the U.S., has no domestic market to speak of. Building a customer base and field testing the product in Singapore takes much too long. Only with access to a larger market such as the U.S. can a company like CSA hope to survive.

To convince the venture capitalists to support this kind of activity with built-in disadvantages is very difficult and further tilts the playing field. Yet when a U.S. company with a U.S. subsidized product sells into my territory, my government does not interfere because of its principle of free enterprise. Yes, I really wish I had a level playing field.

Amiga: It's not just for games anymore

DOUGLAS BARNEY

If you ask any information systems professional about Commodore, after laughing for a few minutes, he will rattle off two major stereotypes. "They make game and home machines," he will say confidently.

Then ask about the Commodore Amiga. "Oh yeah. I hear that's a pretty decent little game and home machine," he'll say. And he'll be correct. Some people do buy Amigas to track baseball cards and play Techno Cop or Sex Vixens from Space.

What few realize is the technology that makes the Amiga a good game machine also allows it to do graphics, sound, animation and video work.

Barney is editor in chief of *Amiga World*.

The almost 5-year-old Amiga has multitasking, the ability to address many megabytes of random-access memory and three to seven dedicated custom processors (techies call this true multiprocessing) that speed disk access and graphics processing. It also has built-in stereo sound and video compatibility. Although largely proprietary, it can run MS-DOS, OS/2, Unix 5.4 with Open Look, X Window System and even Apple Macintosh software with the right add-ons.

These features have attracted a fanatical, ingenious and sometimes motley group of users. So while personal computer users were sorting data and filling in rows and columns, Amiga users were quietly running cable television stations, creating three-dimensional, real-time animations and building interactive touch-screen-driven kiosks.

Amiga also has a variety of IS style users including Northrop, NASA, NBC, ABC, the U.S. Treasury Department and Hewlett-Packard.

Escaping oblivion

Despite these users, the Amiga remained an underground and relatively minor computer phenomenon. That was largely because no one cared about niche markets such as video, TV, animation and kiosks. In fact, the Amiga came close to joining the ranks of the Radio Shack Model 100 and Osborne portable in total computer oblivion.

Then some marketing ace invented the term multimedia, which is simply the pulling together of all video, animation, graphics, text and sound.

Like any well-constructed buzzword, multimedia caught on. So Apple and IBM began to work on multimedia-ready hardware, and third parties worked the software and peripheral side.

This was the lifeline the Amiga market had been waiting for. The Amiga was designed with multimedia-style applications in mind. And with the recent announcement of Commodore's CDTV product, which combines an Amiga and an interactive compact disc/read-only memory device, Commodore also has a sub-$1,000 multimedia delivery platform. All of a sudden, people began to notice the Amiga.

In a perfect world, technology and logic would be enough to ensure Commodore's role in this market. But IBM and Apple are throwing around marketing and development mega-dollars. And every time they sneeze they get press.

Eighteen months ago, Commodore's attempt to penetrate untapped professional markets with the Amiga seemed hopeless, even laughable. There had been years of well-documented marketing and public relations neglect. Even its advanced technology had begun to stagnate.

It was the perfect time for a complete management shakeup, an all new true 32-bit Amiga 3000 and an icon-driven multimedia package called Amigavision. Slowly but surely the new Commodore executives recruited from Prime, Cullinet, NCR, IBM, Canon and Apple have begun to dispel the Child World image. They have also started to satisfy the corporate checklist with networking and open operating systems such as Unix.

There are new third-party products as well. Tops on my list is the Video Toaster from Newtek, a company based in Topeka, Kan. The $1,595 board slides into an Amiga, giving you a complete TV studio on your desk. At first blush, the product is a confusing array of special effects, video switchers, digitizers, two frame buffers (which capture video frames in super high-resolution), a genlock (for synching the computer signal to a video signal) and a point-and-click interface. At second blush, it is a remarkable tool for desktop video and multimedia.

Despite the more recent attention and fancy new products, the Amiga is still either shrouded or openly disparaged. But as IBM and Apple continue to educate the market about video, animation and multimedia, the Amiga's shroud will start to lift.

NAS. The pe
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Digital's Network Application Support (NAS) lets you integrate applications and share information across your multivendor environment.

Up to now, the dream of getting all your applications to work together has been just that – a dream. Digital's NAS now makes it a reality.

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NAS. How it works.

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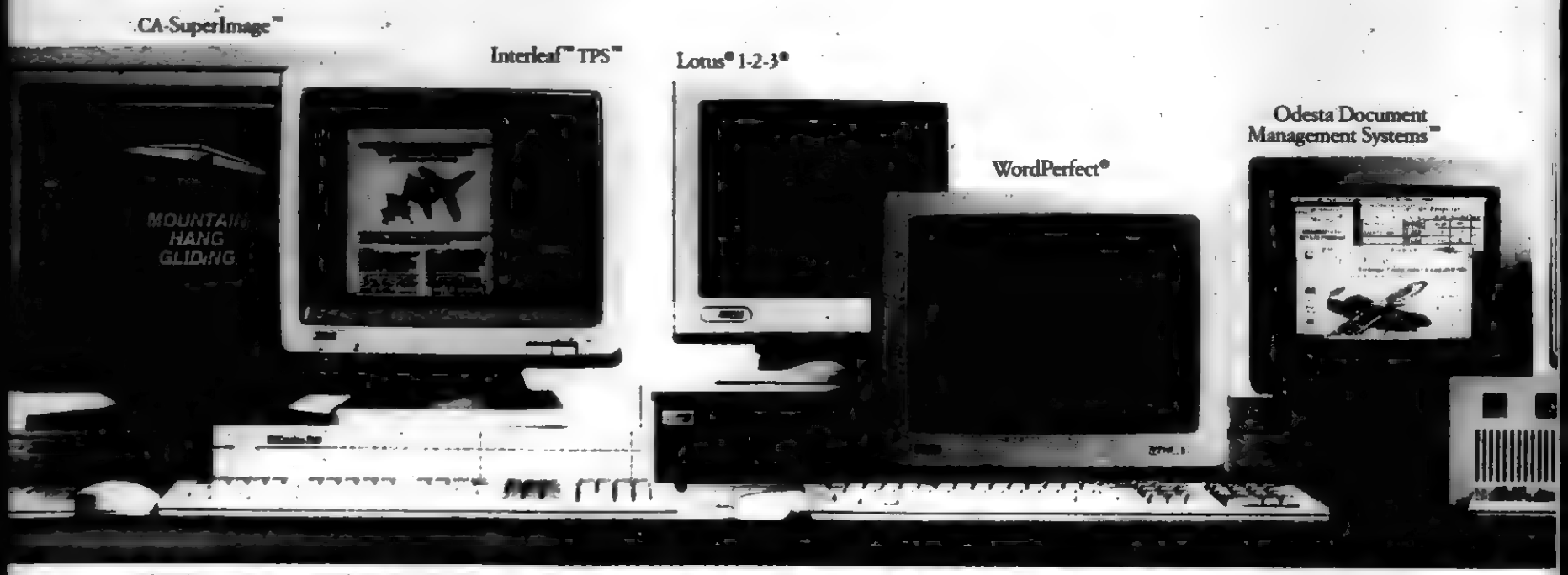
NAS. Why it works.

Achieving integration like this requires just the things Digital is very, very good at. Like networking. And



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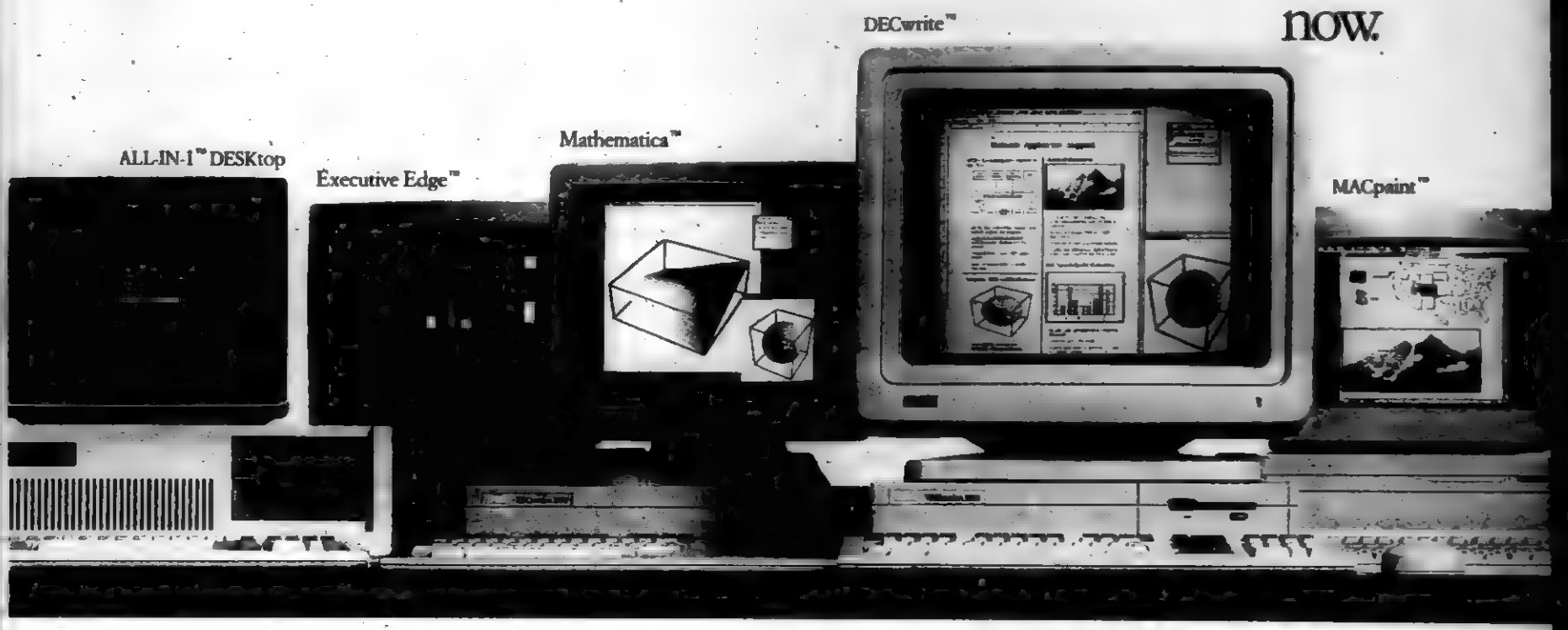

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COMMENTARY

Jean S. Bozman

Rude awakening

A report by a British consultancy is throwing some cold water in the face of the primarily U.S. relational database management system industry. The report, titled "Database, an Evaluation and Comparison," attempts to sort out the often misleading claims of DBMS vendors — and to make some general statements about the usefulness of RDBMS technology itself.

Now making the rounds of industry analysts and reporters, the $800 report, by Butler/Bloor Ltd. in Hull, UK, calls into question the on-line transaction processor performance claims of RDBMS vendors. A key tenet of the report is that RDBMS technology has been available for 20 years but still has not been proved in large, complex applications. The report notes that users associate these products with poor system performance, even though they may be flexible and easier to implement.

The report goes on to assert that the speed of nonrelational DBMSs, such as IBM's IMS/Fast Path and Hewlett-Packard's Turboimage, outweighs the flexibility and query orientation that RDBMSs provide. The authors raise the possibility of a market backlash in which the performance limitations associated with RDBMSs could lead to the reemergence of nonrelational options.

Continued on page 28

Federal Express counts on IMS

For packages and delivery, it doesn't get better than IBM's old DBMS

BY ROSEMARY HAMILTON
CW STAFF

Federal Express Corp. uses IBM's DB2, but when it comes to any job that involves packages and delivery, it still counts on IBM's IMS database management system.

The overnight delivery firm is now completing an upgrade to Version 3.1, the newest release of IMS. Most applications will run under IMS/Fast Path, a high-performance option. IMS Version 3.1 was introduced in late 1988 and made generally available in December 1989.

When Federal Express finishes the migration, IMS will be handling close to 13 million transactions per day. Its package tracing system alone does 6 million transactions each day, according to Tim Robertson, a systems manager at the firm.

For such high-volume transaction processing, Federal Express needs to rely on a trusted old workhorse like IMS, Robertson said. As a result, the firm was waiting for the improved release of IMS and installed it as soon as it became available. The new release provides several performance boosts, including virtual storage constraint relief.

Federal Express has been installing Version 3.1 in phases since March. The only major glitch occurred earlier this month when one of the last applications, a revenue system, was being brought over. Robertson said Federal Express does some "unique processing" with this system — which includes customer billing and accounts receivable — and Version 3.1 apparently cannot handle it. It goes into a "processing loop" that cannot be controlled.

Don Halpern

Robertson *sings Version 3.1's praises*

"IBM is working on it with us right now," Robertson said. "That's our No. 1 priority problem."

Other than this recent glitch, all other applications have moved over to Version 3.1 without much fuss, Robertson said.

"It's fairly stable and it's doing a pretty good job for us," he said.

The newest release brings several performance boosts, Robertson added. It provides virtual storage relief, allowing the IMS databases to expand beyond the 16M-byte line. Previously, the IMS databases were confined to what had been a 16M-byte architectural limit. With newer operating system releases, including MVS/XA and then

Continued on page 29

The best-laid plans of CASE and expert system vendors

BY JOHANNA AMBROSIO
CW STAFF

NEW YORK — Index Technology Corp. will introduce Excelerator Series 2.0 with a reaffirmed commitment to IBM's Systems Application Architecture (SAA) later this year.

This was part of the information shared at a recent computer-aided software engineering (CASE) conference sponsored by the San Francisco-based investment banking firm of Volpe, Welty & Co.

Richard Carpenter, president of Index, said his company will announce the next generation of its Excelerator systems analysis and design tool by the end of the year. It will be "a series of fully compatible products" for OS/2 workstations, he said.

In addition to supporting SAA and IBM's Repository Manager, the new tools will be based on an object-oriented architecture, Carpenter said.

The first version of Excelerator 2.0 will run under OS/2 Presentation Manager. Versions will then be introduced for Unix and Digital Equipment Corp. VAX computers, Carpenter said.

Other CASE products the firm will unveil later this year include a code-scanning tool "to read Cobol code of existing applications into Excelerator," Carpenter said. The firm will also introduce a full life-cycle CASE family for DOS computers.

Finally, Carpenter said that IBM has paid Index "a $1.5 million license fee for a new AD/Cycle product to be announced later this year." He did not specify what that IBM product will be, however.

Knowledgeware, Inc. Vice-President Gene Ellis said his firm is also developing a CASE product with IBM. Knowledgeware has already licensed "certain portions of our Intelligent Encyclopedia" to IBM, he said.

Knowledgeware will support Repository when the time is right, Ellis promised. "As the migration to IBM's AD/Cycle progresses, our tools will share information via Repository just like they do today with our dictionary," he said.

Bachman Information Systems, Inc. in Burlington, Mass., will "broaden our capabilities into the process side," said Arnold Kraft, president and chief executive officer.

Upcoming CASE products from other companies include the following:

- VIA/Renaissance, a re-engineering tool for IBM mainframes, will be available in December from Viasoft, Inc. in Phoenix.
- Reverse engineering software for computers running OS/2 Presentation Manager from XA Systems Corp. in Los Gatos, Calif. The package, written in C, is in the prototype stage; it will be several months before it is available.
- An OS/2 version of PowerCASE from Cognos, Inc. is due later this year. The analysis and design tool will be available for Unix platforms next year.

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Merger recipe blends systems

Pacificorp moves toward open systems architecture for its future

BY JEAN S. BOZMAN
CW STAFF

PORTLAND, Ore. — As a merged company, $3.7 billion Pacificorp ended up with two of everything: two computer rooms, two mainframe security packages and two information systems staffs. However, the economy of scale brought about by the 1989 merger of Pacific Power and Light and Utah Power and Light did not mean everything could stay twice as big.

On the contrary: Management had to choose which parts to keep and which to eliminate. Now, 18 months after the merger, there is just one primary computer room that remains, located in Portland.

There is one security package, Computer Associates International, Inc.'s Top Secret — IBM's RACF is gone. The IS staff, reduced from 400 to fewer than 300, is awaiting further cutbacks. And the total work force is about 7,000 — 1,000 fewer than the original merged work force of 8,000.

In the central computer room, IBM's IMS and DB2 databases reside on two IBM mainframes, supporting most administrative functions; Utah's aging IBM mainframes have been decommissioned.

The corporate accounting, financial and warehouse database management systems are IMS systems, while the sales and marketing information is consolidated on IBM's DB2 relational DBMS.

There is also a second, distributed tier of computing. Dozens of Digital Equipment Corp. VAXs, scattered throughout Pacificorp's power grid in Oregon, Utah, Washington and Wyoming, store power-generation and engineering data in flat-file databases.

Both Pacific Power and Light and Utah Power had used VAXs before the merger. Under a new RDBMS strategy, however, Oracle Systems Corp. databases have been installed on two VAXs in Oregon and on one VAX in Utah.

Due to a corporate directive to move toward an open-systems architecture, this mixture of DEC and IBM machines does not pose a problem. "We want to leave ourselves open to bring in many products," said Wayne Horscroft, director of data management. "We feel any part should be interchangeable. We will avoid having any vendor bundle us into just one solution."

Linked together by Decnet, Ethernet and Transmission Control Protocol/Internet Protocol network protocols, the VAX systems access the central IBM hosts through custom interfaces. Moreover, the DEC and IBM host systems can be accessed from Apple Computer, Inc. Macintoshes and IBM Personal Computer clones.

"If you believe data is a corporate resource, it should be available for anyone to query, providing they have a need to know," Horscroft said. "People should not have to wait a week for MIS to generate a report from the databases."

Flexibility is key to Pacificorp's computer strategy while the firm repositions itself as an energy-services company. Approximately 75% of the company's revenue comes from power generation, but the firm also owns several mining operations and an independent telephone company, Pacific Telecom, which operates in Alaska and the Pacific Northwest.

To support that business strategy, Horscroft wants to squeeze more business information out of data already on hand. Future projects will strengthen links between the IBM and Oracle databases.

"We're striving to have a blend of systems," he said. "If you organize your data correctly and do your analysis properly, then you can focus on data presentation. That's where SQL, which gives you access to multiple databases, begins to shine."

Rich Frishman

Pacificorp's Horscroft *blends DEC and IBM machines*

Easy EIS access

PORTLAND — Managers in a flattened organization such as Pacificorp need to keep their hands on the steering wheel. To detect any shifts in their business as soon as they occur, 30 Pacificorp executives have Apple Macintoshes on their desks — and the ability to peruse corporate databases at will. The in-house-developed executive information system (EIS) is designed to make such access easy, without the distractions of log-on sequences and SQL statements.

The EIS system came on-line in June 1989, and a second phase is due in October. "We've designed a point-and-shoot system," said Brian Hedman, information systems administrator, who works on user-friendly interfaces based on the Mac II hardware platform. "The intent is to provide access for executives to many corporate databases, without them having to know how to navigate or to read the documentation." Another 30 users, all assistants to the executives, also use EIS.

Rich Frishman

Pacificorp's Hedman

A first version of the EIS automatically logs executives onto the IBM mainframe. By clicking on icons, the managers gain access to electronic mail, a phone directory, the marketing DBMS and other system resources. To get power-generation data, users point and click their Mac II mouse on color maps of the Pacificorp power grid. A second EIS version, still under development, will link the underlying RDBMSs and will allow users to combine data from IBM's DB2 and an Oracle database in a single query.

JEAN BOZMAN

Rivals vie for room in hotel business

BY JOHANNA AMBROSIO
CW STAFF

The battle of the hotel reservations systems rages on, with two major competitors trying to outdo each other in features and services.

The two coalitions' plans for centralized hotel reservation systems began to take shape recently. The emerging picture shows both groups trying to provide the same services using different marketing strategies. One group, Covia Loews Automated Services (CLAS) in New York, is backed by the Loews Hotel chains and Covia. Its turnkey reservation system is called Reserve and is based on Covia's existing system, Covia Reserve.

The other group, ABHM, has a system called Confirm 800 that has been on the market since March 1988. ABHM, based in Carrollton, Texas, is a joint venture among AMR Information Services, Budget Rent-A-Car Corp., Hilton Hotels Corp. and Marriott Corp., the initials of which form the acronym ABHM. Both groups' systems provide a means for hotels to track and confirm reservations, and both rely on a centralized mainframe to update a database about each hotel and the rooms available.

Once a reservation is made, the central database is updated, and hotels can get the information through on-site terminals or daily reports. Hotels can also let vendors know how they want the room listings to read, and if the rates change, the database can be altered accordingly.

Both systems can interface with property-management software and offer links to airline reservation systems such as American Airlines' Sabre. This allows travel agents to access hotel information while booked into the airline systems.

Some confusion has resulted from ABHM's announcement that it is developing a new system to be ready in 1992 [CW, May 28], but an ABHM executive said the new system is simply an enhancement of the old one. "We will be adding functionality to our existing Confirm 800 system," said Chris Riga, vice-president of reservation systems marketing at Confirm 800.

In two years, Confirm 800 will include automated yield management and the ability to determine which travel agents booked which guests and how many nights the guests actually stayed in the hotels. This will help hotels pay agents accurate commissions, Riga said.

However, he acknowledged at least one shortcoming of ABHM. "We should never have positioned the new system as a separate one from the existing system. They're actually the same product," Riga said.

CLAS is trying to capitalize on that mistake. "You have to ask yourself why they are developing a new system if what they have is totally acceptable," said Tom Caudill, general sales manager at Covia Reserve.

However, Riga said, "We are doing exactly the same thing as they are. The only difference is that the Reserve system is physically resident on the same computer that houses the Apollo system, and ours is on a different mainframe than the Sabre system."

Riga also said there are differences in how both groups package and market their products. For example, both vendors sell private-label reservation services, which include personnel to answer phones and book reservations.

Reserve and Confirm may run into similar roadblocks trying to talk hotels into outsourcing what is perceived to be a strategic component of hotel operation. Executives from both ITT Sheraton Corp. and Best Western International said they consider their reservation systems to be too important to consider outsourcing [CW, May 28].

Darrel D. Waite, an information management consultant for Ramada International Hotels & Resorts in Phoenix, said, "That's the biggest question asked in the hotel industry today — who owns your reservation system? It's not a technical issue. If franchisers don't own and operate their system, they have no means of differentiating what they offer to the franchisees."

On the other hand, firms that own and operate hotels instead of running franchises may be attracted to the outsourcing option if it proves to be less expensive than doing it in-house.

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Bozman

FROM PAGE 23

The report, written by experienced database consultants Robin Bloor and Martin Butler, appears to have hit on a basic market truth: Users have been hedging their bets on RDBMS.

That much can be seen in IBM mainframe users' attitudes about unplugging IMS, the IBM transaction-processing engine, in favor of the relational IBM engine, DB2. "We run our business on IMS," one Midwestern user told me. "We had it 10 years ago, and I predict [we] will have it 10 years from now."

Well, if users won't unplug their IMS in favor of DB2, what are they doing with DB2? For many, the answer is this: They put DB2 into production for query-oriented, decision-support applications or for the corporate warehousing of inventory and historical data. User meetings across the country have documented this pattern in oil and pharmaceutical firms.

What about those firms that have added RDBMS to their satellite locations where the systems run on VAXs or on Unix machines? The various RDBMSs are popular, and sales are brisk as distributed servers of corporate data multiply. Most RDBMS firms, including Informix, Oracle and Sybase, are still growing fast, regardless of concerns about a recession.

But rarely is any brand of installed RDBMS the only one in the shop. Instead, companies such as Pepsico and Liberty Mutual use different RDBMSs in different divisions and for different applications. As distributed DBMS applications evolve during the next two years, applications will be designed to "pick off" data from multiple RDBMS sources.

If all this is true, will RDBMS technology have to change in the near future? Perhaps not immediately, the Butler/Bloor report says, but RDBMS vendors will probably have to tinker with the physical storage methods that underlie the logical DBMS design if they want to address performance deficiencies. That could take years to accomplish.

For the time being, many vendors recommend hardware and memory upgrades as a way to compensate for poor response times. Such "fixes," however, are temporary, the report notes. "Hardware price/performance improves by around 15% a year," the report says. "Since the overhead associated with relational database increases exponentially with size and complexity, hardware has no chance of keeping up with this performance overhead."

Bozman is *Computerworld*'s senior West Coast editor.

Unisys/Sun alliance signals Unix move

BY JEAN S. BOZMAN
CW STAFF

SANTA CLARA, Calif. — Unisys Corp. recently nudged its heretofore proprietary fourth-generation languages (4GL) and computer-aided software engineering (CASE) tools into the open systems world of Unix when it struck a deal with Sun Microsystems, Inc. to comarket Unisys' Ally and Mapper products.

Because of Unix' wide portability, the move at the Database World conference is expected to reach beyond Sun's Scalable Processor Architecture workstations and to bring additional alliances with other Unix vendors.

"We knew for about a year that Unisys was going to license their 4GLs," said George Lindamood, a Unisys watcher at Gartner Group, Inc. in Stamford, Conn. "The only surprise was that they chose to do this through a subsidiary [called Foundation]. That's almost like Apple Computer, Inc. forming Claris [Corp.]"

The agreement gives Unisys a new workstation platform for its installed base, since the Blue Bell, Pa., mainframe vendor does not currently market any engineering workstations. In addi-

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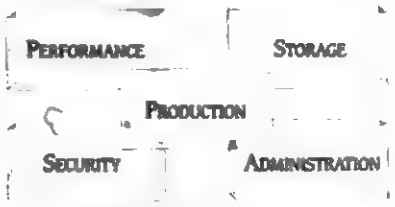

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tion, Sun gets to sell Ally, an information systems tool for developing distributed database applications, and Mapper, a 4GL for end users.

Because both Ally and Mapper have C compilers, applications generated by the products will be portable to many hardware platforms.

Ally, which had been used within Unisys to import data from multiple databases, will allow Sun workstations to act as "clients" for many "server" databases.

"Ally and Mapper bring us a [way to] have a consistent interface to multiple databases," said Nancy Colwell, group market development manager at Sun. Unisys representatives said Ally has links to relational database management systems made by Oracle Systems Corp., Informix Corp. and Unify Corp., among others.

Both products will be available in September. Ally will be priced at $11,000 for each Sun workstation supported, and Mapper will cost $1,100 per workstation, Unisys said.

Ally software for larger Sun servers will be priced as high as $39,000.

IMS

FROM PAGE 23

MVS/ESA, data storage areas within the processor were greatly expanded. Now IMS can take advantage of them.

"We are now building two more IMS systems because the storage relief is so great," Robertson said.

A second benefit comes from what Robertson referred to as hot region support. This allows for more efficient scheduling of transactions and has resulted in a 30% less CPU utilization with the company's dispatch system, Robertson said. This feature provides IMS with a method of searching for like transactions that requires either similar data or system resources to complete the transaction. The result is less time spent searching for data for each individual transaction.

Currently, most of the Federal Express IMS applications run under Fast Path, which has fewer features than the full-function IMS but is optimized for transaction processing. Less critical administrative applications run under the full-function IMS. Meanwhile, DB2 is "its own animal," for which Robertson is not directly responsible.

"We are basically trying to get it to be an end-user-type product," he said. "It doesn't have its own system yet."

Robertson said Federal Express uses a "ratio of 1-to-2-to-4 to determine with which database an application belongs. What IMS Fast Path takes one second to do, IMS will take two seconds, and DB2 will take four," he said. "There's a trade-off to all of that. With DB2, the coding may be quicker, but with IMS you have more options. Everything is weighed. So, we try to make the best fit here."

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SOFT NOTES

Sablesoft, IBM ink pact

Sablesoft, Inc. in Boulder, Colo., said it signed a deal with IBM to become part of the IBM Cooperative Software Supplier Program. This gives IBM nonexclusive rights to market Sablesoft's Compile/QMF, a utility product for IBM's QMF that converts QMF queries into a Cobol program.

Asoft Development, Inc. has ported its Nu/TPU programmable text editor to the Convex Computer Corp. minisupercomputer platform. The text editor will allow users to work in a Digital Equipment Corp. VMS-like environment on the Convex platform, according to the company.

Touch Technologies, Inc. in San Diego announced an agreement with Winchester Systems in Woburn, Mass. Touch develops tape acceleration software technology, which Winchester plans to use with its Archive 4mm tape drives. Touch's technology prevents the start-and-stop process of a tape drive, which can wear out a tape.

NEW PRODUCTS — SOFTWARE

Applications packages

Data 21 has announced CICS Help 4.2, an IBM Systems Application Architecture (SAA) Customer User Access help authoring and display system for CICS applications.

The product facilitates the creation, maintenance and display of SAA CUA help panels for CICS applications without program changes. It supports SAA CUA requirements that control panel design and user interaction for Field Help, Extended Help and Field Prompts.

A site license costs $10,995 for MVS and $6,995 for VSE platforms.

Data 21
3838 Carson St.
Torrance, Calif. 90503
(213) 543-5599

Service Data Management Corp. has announced an add-on module for Service Edge, a field service management system that runs in Prime Computer, Inc.'s Primos, AT&T Unix System V and Digital Equipment Corp. VAX/VMS environments.

The Technical Assistance Center Management module was designed to assist individuals whose primary jobs are telephone or help desk support. The software package enables users to sort and manage open calls and provides an efficient way to reference historical data as a troubleshooting aid.

The product costs $15,000 for an unlimited number of users.

Service Data
4112 Locust Lane
Fairfax, Va. 22030
(703) 385-3939

Utilities

Outpost, a printing utility program from Trax Softworks, Inc., enables users of IBM mainframes to generate predefined forms on demand.

The program converts any printable file into Adobe Systems, Inc.'s Postscript. Users can select fonts such as Zapf and Chancery in large and small point sizes and specify typographical effects such as bold and italic typefaces. Graphics support is also offered, allowing boxes, arrows, circles and horizontal or vertical lines to be created.

Outpost is available for IBM VM and MVS systems for $4,000 to $6,000, depending on CPU size.

Trax
5840 Uplander Way
Culver City, Calif. 90230
(213) 649-5800

NEW PRODUCTS — HARDWARE

MAI Basic Four, Inc. has announced its GPX Series 70 systems.

The series includes Models GPX 5070 and GPX 6070, both of which feature a symmetrical multiprocessor architecture. The 5070 can support up to 192 users and the 6070 can accommodate 256.

Pricing starts at $89,500, and typical end-user configurations range from $190,000 to $540,000.

MAI Basic Four
14101 Myford Road
Tustin, Calif. 92680
(714) 731-5100

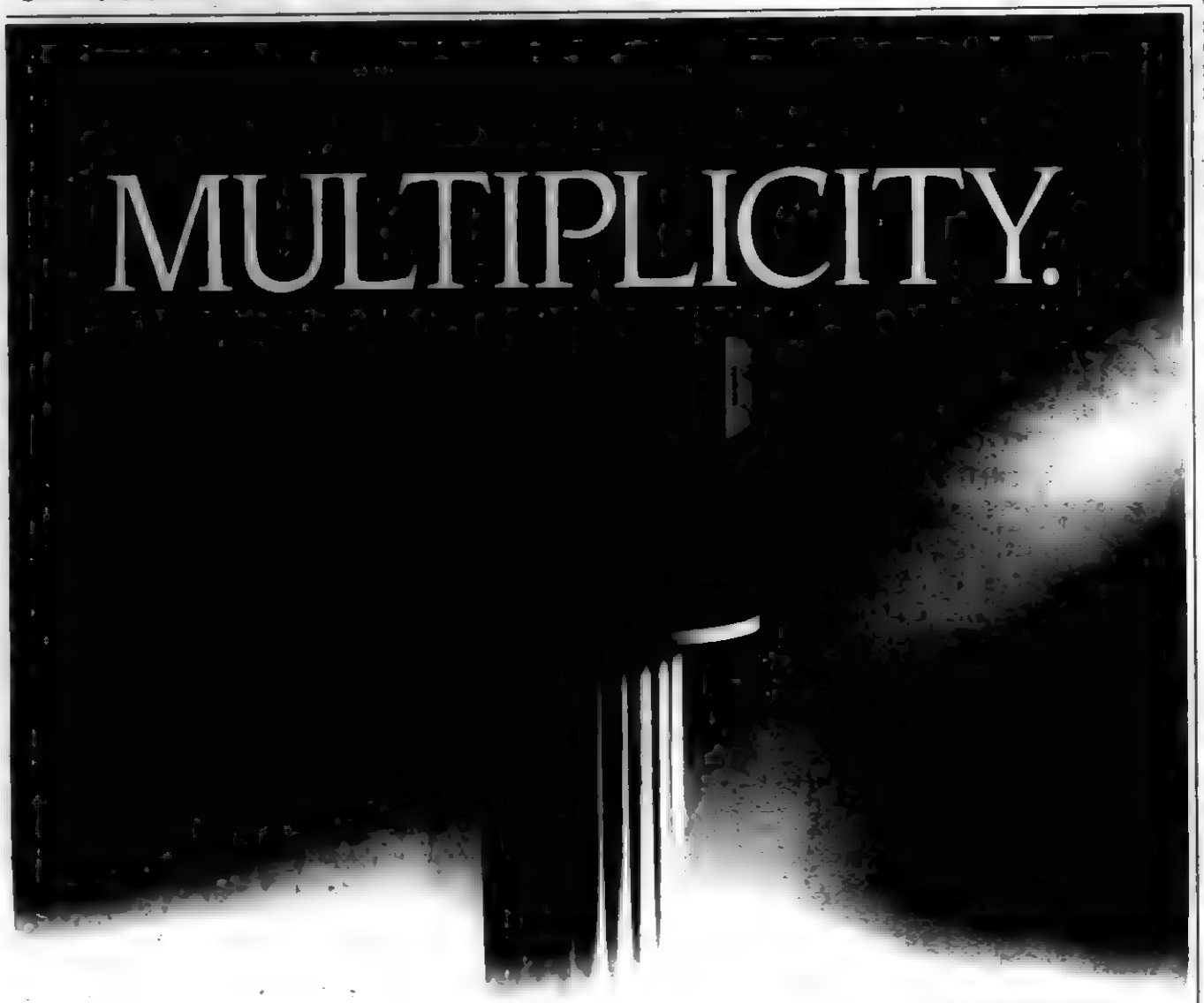
Data storage

Distributed Logic Corp. has added a tape status panel to its line of 4mm and 8mm cartridge tape subsystems.

The panel incorporates an LCD and an LED to indicate the status of tape-handling operations. The company's line of tape subsystems work with any computer equipped with a small computer systems interface (SCSI) bus.

A 4mm digital audiotape drive in a shoe box tabletop enclosure with a controller and SCSI cabling lists at $5,495. An 8mm subsystem in a single-drive configuration has a list price of $6,295.

Dilog
1555 S. Sinclair St.
Anaheim, Calif. 92806
(714) 937-5700



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COMMENTARY

Douglas Barney

Multimedia misfit

Microsoft has a truly uncanny ability. I mean, who else can so nearly dominate a market without even announcing or shipping a product? All Microsoft has to do, it seems, is announce an intention or two, and it gains instant market position.

In the latest instance, Microsoft announced an approach to multimedia. Based on a few vague proclamations, and even more vague Microsoft third-party announcements, the firm is suddenly considered a leader in the market. But what exactly did Microsoft announce a couple of months ago? When will this strategy truly unfold? And what are the limitations of the Microsoft Multimedia Manifesto?

Answering these questions will involve a certain amount of conjecture, because Microsoft neglected to announce real products or give real timetables.

As one can imagine, Windows is the cornerstone of Microsoft-style multimedia. The company pledges to build in extensions that will allow Windows to handle video, graphics and sound. Of course, Windows will be running on an enhanced personal computer with compact disc/read-only memory

Continued on page 37

Rivals put heat to Apple's feet

Low-end lasers may not be enough to fight off competitors' onslaught

ANALYSIS

BY JAMES DALY
CW STAFF

In the military, it is called a protective reaction strike. In the computer industry, they say you are "becoming committed to a market." Either way, it adds up to the same thing: Go after your enemy before he builds up enough strength to chew your head off.

When Apple Computer, Inc. unveiled a pair of entry-level laser printers earlier this month, the Cupertino, Calif.-based company was moving aggressively to protect a valuable but vulnerable gem. Threatened by increasingly intense low-cost competition, Apple has embarked on an ambitious campaign to shore up its embattled position in a printer market that was once nearly free of competitors.

But some analysts are already criticizing Apple's defensive pace and have criticized the new Apple printers as too slow and too expensive. "Apple is watching as others eat its lunch," said Benny Lorenzo, an analyst at San Francisco-based investment firm Volpe, Covington & Welty.

It is a tasty meal at that. Printers are a cash cow at Apple, accounting for approximately $850 million of the firm's $5.3 billion in revenue last year, First Boston, Inc. analyst Charles Wolf said.

But Apple has seen others devouring its base in the laser printer market's low end, particularly among the printers that use the popular Postscript page description language software offered by Adobe Systems, Inc. Hewlett-Packard Co. has scored with printers designed for Apple Macintosh systems that start at just over $1,000, which is almost $2,000 less than Apple's earlier low-end laser printer. Texas Instruments, Inc., NEC Corp. and QMS, Inc. have played off Apple's traditionally higher prices to chop away at its sales.

In the less sophisticated applications that use the Quickdraw routines residing in each Macintosh, GCC Technologies in Waltham, Mass., has gobbled up 40% of the Macintosh printer market, according to BIS CAP International, Inc., a research firm in Norwell, Mass.

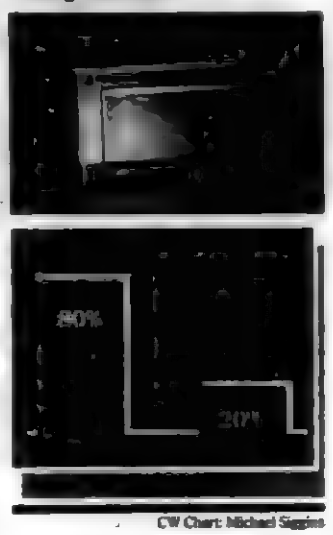
Today, Apple still owns approximately 80% of the Macintosh laser printer market, BIS CAP analyst Rob Auster said, but that could slip dramatically during the next few years unless Apple moves aggressively to lower its prices and pack more into its laser printers.

The cloud looming over Apple's printer division contrasts with a blissful past. In 1985, Apple hooked up with Mountain View, Calif.-based Adobe, which

Continued on page 40

Nibbling Away

Apple still dominates the Macintosh-Postscript laser printer market, but other suppliers are now making their mark



CW Chart: Michael Siggins

Multiuser DOS group plans to compete with LANs

BY PATRICIA KEEFE
CW STAFF

User indifference and concern over lost market opportunities have driven a collection of hardware and software vendors specializing in multiuser DOS-based systems to form a coalition designed to promote their minicomputer-like approach as a cheaper alternative to local-area network-based work groups.

Members of the newly launched Multiuser DOS (MDOS) Federation want to increase awareness and acceptance of their terminal-based approach to work groups. It will also define programming guidelines, standards for peripheral interfaces (video, terminal and serial I/O) and DOS memory-management techniques.

"For years, the industry has fostered the myth that the LAN is the only way for businesses to get work-group computing," complained Peter Davis, president of Sunriver Corp., based in Austin, Texas.

LANs may not be the only way, but they are the right way for users who plan to migrate to graphical user interfaces and client/server architectures, according to Gartner Group, Inc. analyst Leslie Fiering, formerly a personal computer manager at a New York bank.

Several users and analysts contacted last week suggested that the MDOS Federation faces an uphill climb in corporate accounts already saturated with PCs and would be better off focusing on small businesses.

"Multiuser DOS sounds like a contradiction in terms," said a skeptical Brian Ilari, a vice-president in charge of LANs at Citicorp in New York. That is just the attitude that federation member Joe Tyner, president of Minneapolis-based Starpath Systems, Inc., is trying to combat.

While conceding that users are unlikely to give up their intel-

Continued on page 37

Micro Focus COBOL/2 Workbench™ Is a Hit!

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PC WEEK PRODUCT EVALUATION

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3. [illegible] (1.00)	9
4. Quality of documentation (0.97)	10
5. [illegible]	9
Weighted Score	9.6

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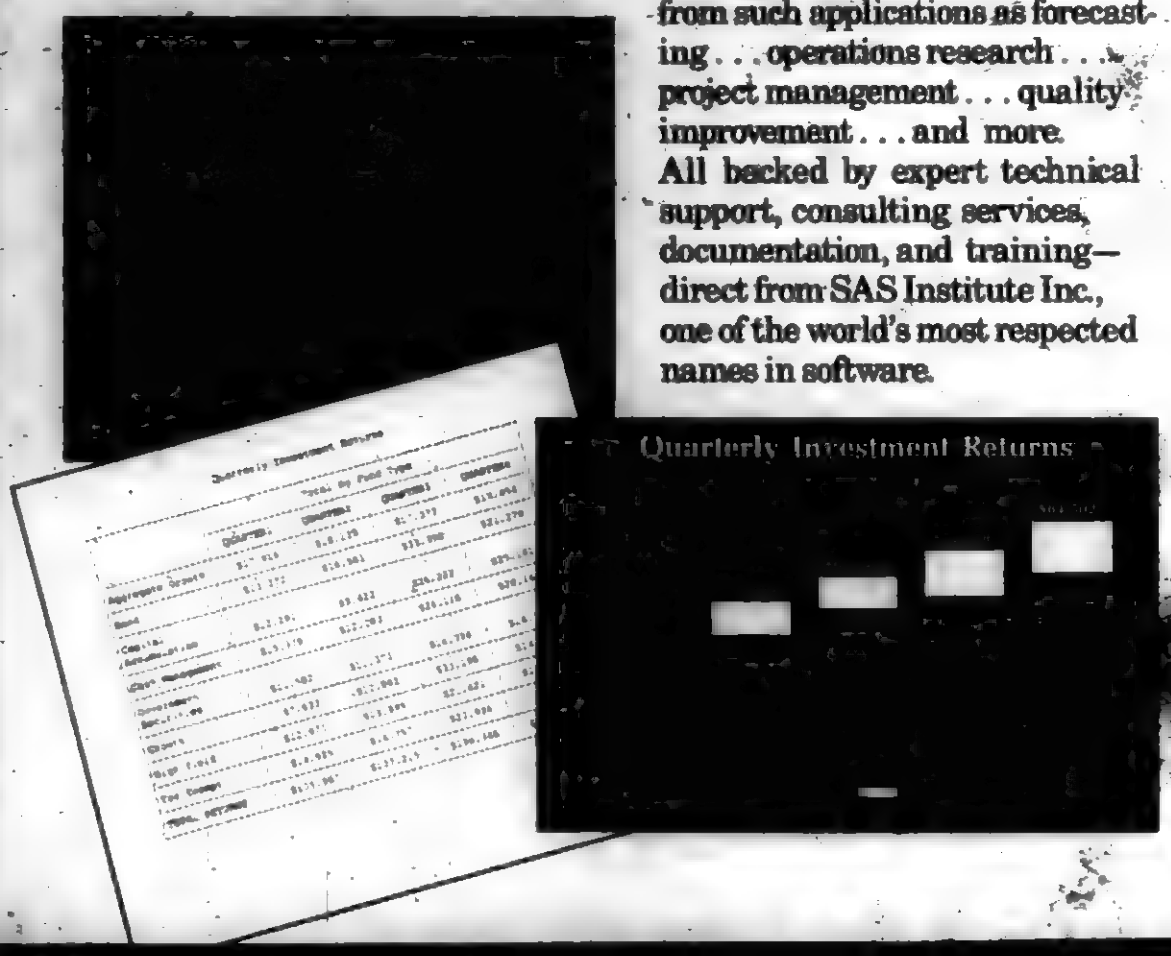

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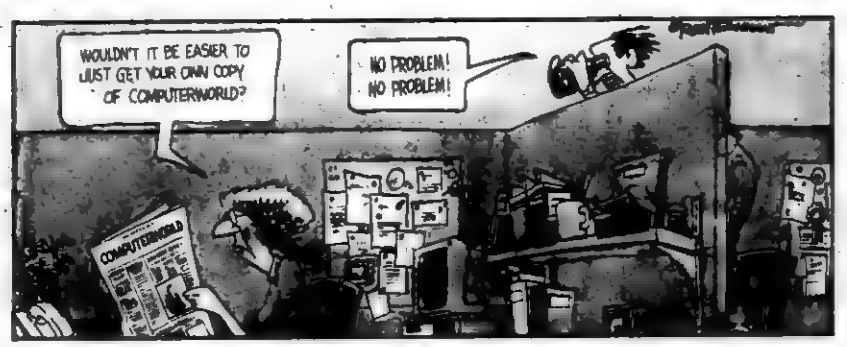

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PRODUCT REVIEWS

Windows 3.0 ends the wait

Advanced memory management allows for more powerful applications

Microsoft Corp.'s Windows 3.0 is, in many respects, an entirely new environment that will provide users with many of the features they have wanted for years but thought they would have to switch to OS/2 or Unix to get. Many users will now be able to use Windows as their primary operating environment for running both Windows-based and traditional DOS-based applications.

Although Windows 3.0 does not have the memory management features of OS/2 or Unix — limited as it is by running on top of DOS — its most significant feature is its advanced memory management capabilities. The environment uses the protected-mode features of the Intel Corp. 80286 and higher CPUs, providing access to extended memory, better multitasking and more powerful applications.

Windows 3.0 can run in one of three modes. Real mode runs much like Windows did before; standard mode requires a 286 and at least 1M byte of memory; and a 386 enhanced mode lets the system act as if it had more memory than it really does by swapping to disk. In enhanced mode, multiple non-Windows applications can be run, each in its own "virtual machine."

Windows 3.0 sports a much-improved user interface, including a better three-dimensional look to buttons and controls, more colors on-screen and new icon-based ways of launching applications and managing files.

The old MS-DOS Executive has been replaced by three new applications: The Program Manager, the File Manager and a Task List. The Program Manager makes it easier to start applications; the File Manager makes it easier to find files; and the Task List simplifies switching among running applications.

With a few notable additions and changes, Windows 3.0 has the same native accessories as previous versions.

Paintbrush is a color painting/drawing program that is a great improvement on the old black-and-white Windows Paint. The Calculator includes a simple arithmetic machine as before, but there is also a new model with statistical, scientific and programming capabilities. The Clock looks the same in analog mode, but now there is also a digital mode. The terminal has been substantially revamped with new communications capabilities, and four COM ports are now supported.

Windows Version 3.0

Price: $149

- Performance: Good - Excellent
- Documentation: Very good
- Ease of setup: Very good
- Ease of learning: Very good
- Ease of use: Very good
- Error handling: Very good
- Support: Poor - Good
- Value: Excellent

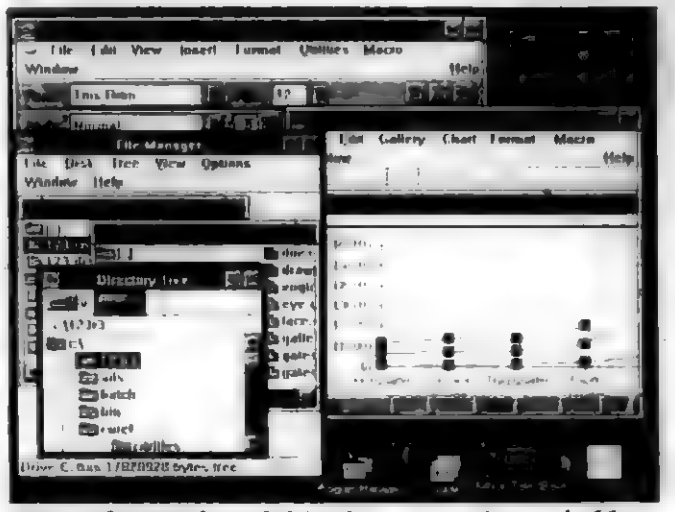
The Program Information File (PIF) editor has been expanded to cover memory management and multitasking capabilities. Also new is the Recorder, which lets users capture keystrokes and mouse movements and save them as macros. Macros can span applications.

The Spooler has been replaced by the Print Manager, which tells users which file is currently printing and what percentage of it is completed; it also lets users pause or terminate printing and alter the priority of local printing jobs.

Windows does not have preemptive multitasking and multithreaded applications. However, Windows 3.0 does let users run multiple Windows or non-Windows applications simultaneously. In 386 enhanced mode the PIF editor can be used to assign application priorities and foreground and background settings.

Microsoft includes network connectivity out of the box for industry-standard networks. During installation on a workstation, Windows recognizes the existence of a network driver and installs the correct utilities on users' systems. In general, this release handles networks much better than the previous version. Users do not have to exit Windows to perform common tasks such as attaching to a server or changing drive mappings. In the File Manager, specially marked icons designate network drives.

A final addition to the Windows features set is the new Help facility. This hypertext-like system provides indexes and in-depth discussions on virtually all Windows capabilities. However, it is not context-sensitive.



Microsoft's Windows 3.0 *has features users have waited for*

Windows continues to offer terrific data integration capabilities. Utilizing the Clipboard, users can cut and paste data between applications; this extends to copying text to and from non-Windows applications. Even graphics can be copied from non-Windows applications into Windows applications. Furthermore, a growing number of Windows applications now support Dynamic Data Exchange (DDE), which lets users create hot links between files so that when information in one file is changed, the change will be reflected in the other file.

Advanced guidance

The Windows Users' Guide covers all of Windows' features, operation and accessories and is complemented by a number of useful advanced sections on system optimization, networking and memory management.

Installing Windows has been streamlined to the point that it reads the information it needs directly from your system. There is also a Setup program that can be run within Windows to update the system configuration. Unfortunately, for nonsupported hardware devices that typically come with their own Windows driver, users will still have to resort to changing the SYSTEM.INI file.

Microsoft offers unlimited, free technical support on a toll line, as well as support via an electronic bulletin board. Phone lines are open Monday through Friday from 6 a.m. to 6 p.m. Pacific Standard Time. The technical support staff is adequately helpful.

Windows 3.0 costs $149, which is inexpensive considering its performance and capabilities. It costs only $50 to upgrade from any previous version or runtime version of Windows; however, applications for previous Windows versions may not run. While virtually all older applications will run in real mode, it is anybody's guess whether they will run in standard or enhanced mode, so the real cost will come in upgrading applications.

Microsoft, 16011 N.E. 36th Way, P.O. Box 97017, Redmond, Wash. 98073. (206) 882-8080.

Speed, clarity come in notebook-size package

Toshiba America Information Systems, Inc.'s T1200XE notebook computer is sleek and compact.

It weighs 9 pounds with its 1-pound battery and comes standard with a 20M-byte hard disk and a crystal-clear, 640- by 400-pixel, color graphics adapter, 9½-in. Sidelit Supertwist LCD. It has an Intel Corp. 80C286 processor running at 6 or 12 MHz with 1M byte of standard random-access memory, expandable to 5M bytes.

Toshiba supplies software to convert any RAM above 640K bytes to expanded memory. The hard disk and the 1.4M-byte, 3½-in. floppy drive are both very quiet and have fast access times, for a snappy and responsive feel.

Although its dimensions, 12.2- by 11- by 2 in., are somewhat large for a notebook, the T1200XE is exceptionally thin. Other standard features include a port for an optional 2.4K bit/sec. modem, one parallel port/external floppy drive port, one nine-pin serial port and an external video and keyboard port. External ports are easy to access.

Toshiba's T1200XE's *status lights are easy to read*

The T1200XE's battery runs for just over two hours. The Toshiba's resume mode capability shuts the system off when it is not in use and makes the system usable for longer periods.

The Toshiba keyboard has a firm feel, and with the exception of the half-size function keys, the keys are large and comfortable. It has separate cursor and Page Up/Down keys. The numeric keypad is overlaid onto the alpha keys. There is an external jack on the back of the machine that allows for an external keyboard or keypad as well.

Documentation consists of two DOS 4.01 manuals, two Toshiba T1200XE manuals and a set of "first time" manuals. All are well illustrated and clearly written. Also included is a troubleshooting guide, glossary and index. Setup consists of plugging in the power source and turning the computer on. The hard disk is preformatted with Toshiba DOS 4.01 and is ready to boot.

The LED status lights are bright and easy to read, and the power button is conveniently located in the rear. It ignores taps, so the system will not be turned on accidentally in transit. However, the latch that opens and closes the screen is too small.

Toshiba offers a one-year warranty that covers parts and labor and, at no additional cost, next-day turnaround on repairs with return by next-day air.

The T1200XE comes with an impressive list price of $3,999 and is backed up by outstanding documentation, support policies and technical support.

Toshiba America Information Systems, Computer Systems Division, P.O. Box 19724, 9740 Irvine Blvd., Irvine, Calif. 92713. (800) 999-4273.

Toshiba T1200XE

Price: $3,999

- Performance: Good - Excellent
- Documentation: Excellent
- Setup: Excellent
- Ease of use: Very good
- Serviceability: Very good - Excellent
- Value: Very good

MONO

Traditional PC LAN

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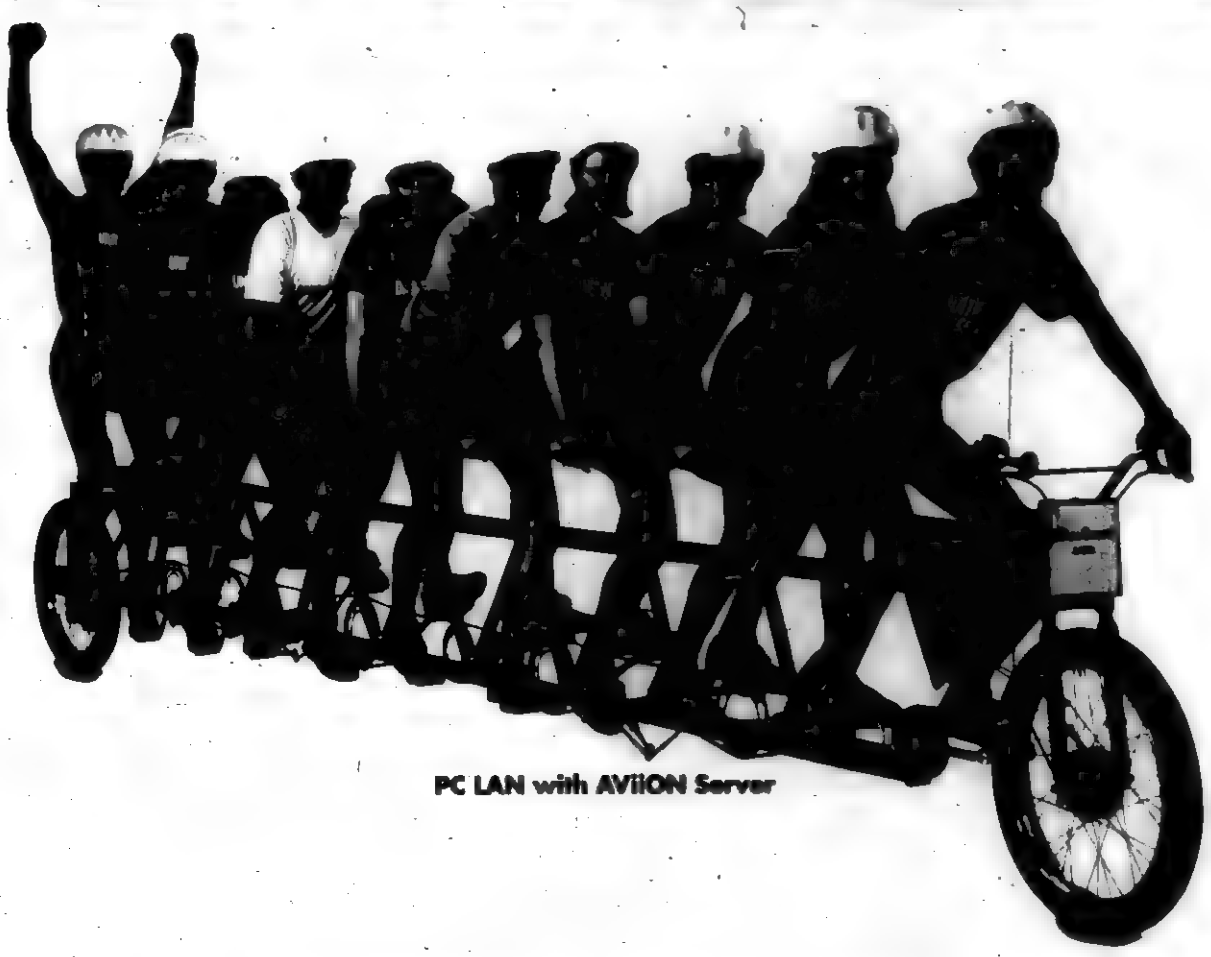
VS. MULTI

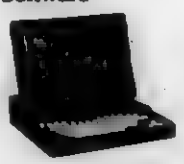


PC LAN with AViiON Server

Call 1-800-DATAGEN to learn how Data General and Novell NetWare let your PC LAN do more.

Data General has a host of Novell Portable NetWare® solutions that let your existing PC LAN run multiple applications simultaneously. Novell Portable NetWare on a Data General AViiON™ gives your PC LAN the power to share MS/DOS®, OS/2®, MAC/OS®, and UNIX® files. The power to cruise through MS/DOS, OS/2, and UNIX applications. And, the power to share peripherals.

Data General's NetWare for AViiON is the first RISC-based NetWare platform. It's fully scalable and can share the server with major standards like TCP/IP. It also uses the standard NetWare client software and Novell's IPX/SPX Networking Protocol, so it interoperates with existing Novell LANs. It lets users access scores of applications. And, Data General offers a Software Developer's Kit to facilitate the development of client-server applications.



Data General's line of Novell NetWare solutions brings transparent networking and distributed applications to all your PC clients.

To learn more about how an AViiON server with Novell's Portable NetWare can bring more power and more applications to your LAN, call the distributors listed below or 1-800-DATAGEN. Also, ask about Data General's full line of PCs.

Data General
3400 Computer Drive, Westboro, MA 01580

DATA GENERAL'S NOVELL NETWARE DISTRIBUTORS

GATES/FA Distributing
121 Interstate Blvd.
Greenville, SC 29616
Sales: 800-332-2222
Customer Support: 800-332-2299
Technical Support: 800-332-2315
Credit: 800-332-3497

Western Microtechnology, Inc.
National Sales Office: 800-634-2248

1637 North Brian Street
Orange, CA 92667
(714) 637-0200

6837 Nancy Ridge Drive
San Diego, CA 92121
(619) 453-8430

28720 Roadside Drive
Agoura Hills, CA 91301
(818) 707-0377

20 Blanchard Road
Burlington, MA 01803
(617) 273-2800

264 Passaic Avenue
Fairfield, NJ 07006
(201) 882-4999

14636 N.E. 95th Street
Redmond, WA 98052
(206) 881-6737

12900 Saratoga Avenue
Saratoga, CA 95070
(408) 725-1660

1800 N.W. 169th Place
Beaverton, OR 97006
(503) 629-2082

2545 Tarpley Road
Carrollton, TX 75006
(214) 416-0103

Four Eves Drive
Marlton, NJ 08053
(609) 596-7775

Power, flexibility 1-2-3/G's strong suits, but not speed

REVIEW

Lotus Development Corp.'s 1-2-3/G, intended for use with IBM and Microsoft Corp.'s OS/2 Presentation Manager, is intended for advanced spreadsheet users who demand analytical power, flexibility and speed.

It fares very well in the first two categories; however, it lacks the speedy responsiveness of its text-based counterparts, especially on midrange systems. A 25-MHz system is necessary to achieve optimum responsiveness with 1-2-3/G.

1-2-3/G is a large program that is distributed on both 3½- and 5¼-in. high-density floppy disks and requires 12.5M bytes of free disk space. It uses a multipage, three-dimensional spreadsheet model and can work with up to 16 spreadsheet or graph windows at a time. A group of related worksheets and graphs can be saved as a desktop, which also retains the window sizes and placement.

In general, the program includes all the functionality of 1-2-3 Release 3.0, as well as such other analytical tools as regression, matrix functions and "what-if" table

1-2-3/G Version 1.0
Price: $695
• Performance: Satisfactory - excellent
• Documentation: Excellent
• Ease of learning: Very good
• Ease of use: Excellent
• Error handling: Very good
• Support: Satisfactory - very good
• Value: Very good

capability. It also adds several attractive features and makes use of multithreading by allowing some operations to occur concurrently. Support for any type of add-in or user-defined functions is noticeably lacking in this product.

Perhaps the most exciting addition to the program is the Solver utility for advanced "what-if" modeling. It can greatly enhance 1-2-3/G's ability to solve complex problems in which users must adjust several variables to arrive at an optimal value. For less complex needs, there is a more traditional goal-seeking feature.

This product is highly compatible with previous versions, and 1-2-3 veterans will have few problems adapting to 1-2-3/G. Despite the substantially different look and feel, most of the familiar keystroke combinations still work. The program will read files from all prior versions of 1-2-3 and can save files in .WK1, .WK3 or its own .WKG format. There is still no support for Microsoft's Excel files.

The database features generally mimic those found in Release 3.0. When sorting a range, there is virtually an unlimited number of sort keys available. Data cannot be sorted by columns, and true query templates are not to be found.

The area that shows the greatest departure from earlier 1-2-3 versions is that of graphics. Users can now graph as many as 23 ranges of data. 1-2-3/G offers the same variety of charts as Release 3.0 but includes a new 3-D bar graph type. Unfortunately, users cannot control the orientation or rotation. Graphs can be generated with the Graph command in the Worksheet tool or directly by using the Graph tool. The Graph tool also lets data be graphed from multiple worksheet files. A "printer view" displays the graph as it will appear in print. 1-2-3/G can export graphics metafiles to the clipboard, but it cannot write .PIC files.

1-2-3/G's what-you-see-is-what-you-get orientation, support for an unlimited number of fonts in a single worksheet and slick multipage preview mode all ensure quality output with minimal effort. However, although 1-2-3/G can print graphs on top of or below a spreadsheet output, it cannot print them side by side.

A new feature lets users define numeric formats using a format description language. Two dozen macro commands have been added to accommodate the new windows orientation. Lotus provides a macro translator that will automatically modify more complex macros to run smoothly in 1-2-3/G.

1-2-3/G carries forth the superior file-linking capabilities pioneered with Release 3.0. The product also supports Presentation Manager's dynamic data exchange.

1-2-3/G's printed documentation consists of seven well-indexed, illustrated paperback books, including a quick-start guide and a tutorial. The on-line Help system is excellent. The installation process is automatic and makes all appropriate modifications to the OS/2 configuration file.

Lotus provides six months of toll-free phone support at no charge. Support via electronic bulletin board and facsimile are also available. Registered users of other versions of 1-2-3 can upgrade for $75. Support representatives were friendly and answered questions satisfactorily.

At $695, 1-2-3/G costs more than Excel, but it meets or exceeds the capabilities of Excel in nearly every area.

Lotus Development, 55 Cambridge Pkwy., Cambridge, Mass. 02142. (617) 577-8500.

Wyse sets the standard in terminals again. And again. And again.

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Barney

CONTINUED FROM PAGE 31

(CD-ROM) and sound capabilities, IBM Video Graphics Array and a couple megs of random-access memory. This will happen whenever IBM or any other important vendor sees fit to build one without forcing the buyer to look to Phil Rizzuto for a home equity loan.

Yet Windows is one of Microsoft's biggest problems. Windows is great, or almost great, for things like databases and spreadsheets. It can even whip out some pretty nifty charts and drawings. It is not great, or even good, for mixing sound, graphics, video and animation. That's the "multi" in multimedia.

The PC architecture is another part of the problem. The original PC was designed with text in mind. Later versions are much faster but are still not up to the rigors of multimedia. They have enough trouble just running Windows. Even worse, there is very little sound capability and no video compatibility. And there isn't enough horsepower to drive real-time animation. How then is the PC to do all this stuff simultaneously?

Faster chips help but do not completely solve the problem. The PC must be augmented with a set of specific chips designed to handle the various needs of multimedia. A true multitasking operating system must be layered on top. Then the work can begin. But this is not Microsoft's plan. Instead, it is simply trying to retrofit the existing PC to handle multimedia tasks — all in the name of market share.

These are specific and clear-cut technical issues. The history of Microsoft's product development is more disturbing.

Take Windows, for instance. It only made the grade a couple of months ago with Windows 3.0, seven years after its announcement. And only in the past year has it gotten around to shipping a Windows word processor.

How about OS/2? It's been out for a few years, and only IBM employees seem to be using it. Sure, Microsoft Word is making its mark in the PC word processing market. But it took Microsoft several versions to get it right.

So how long will we wait for Microsoft to deliver the multimedia goods?

In addition, Microsoft has largely failed in its attempts to create and lead the market for CD-ROM. Sure, it still holds a swell conference or two. But what Microsoft has not done is to ship any products that create a compelling need for CD-ROM.

Funny enough, the only PC software vendor with any role in CD-ROM is Lotus Development, which quietly pockets millions off the stuff.

Beyond that, Microsoft has failed to define multimedia, explain exactly what is needed to produce multimedia applications or presentations and has not distinguished between the process of creating and the process of running multimedia. These are mere details, I guess.

Through hard work, ingenuity and plenty of luck, Microsoft earned its place in the world of systems software. It has even more clearly earned its leadership role in productivity applications. In both cases, the firm delivered products that enabled users to get jobs done.

In the case of multimedia, however, Microsoft is getting ahead of itself. Sorry guys. This time you've got to earn market leadership the old-fashioned way — with actual products.

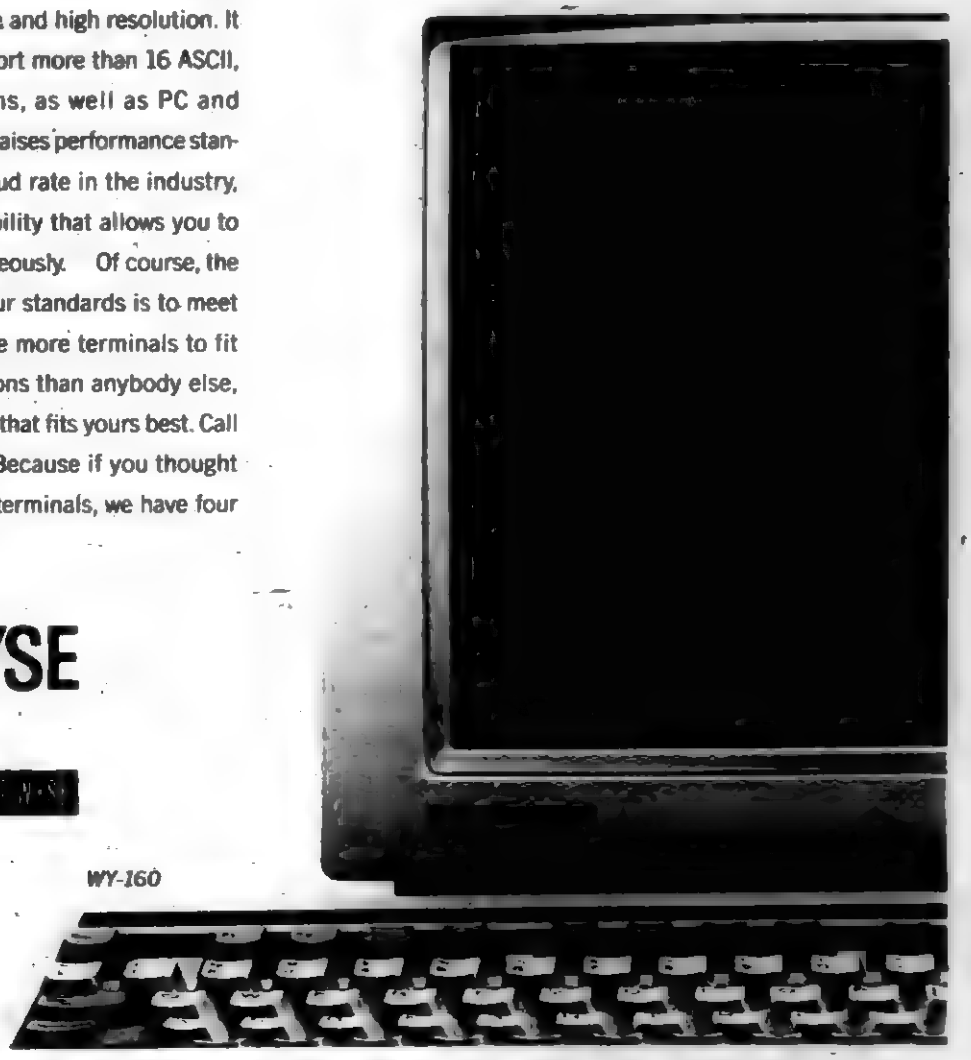
Barney is editor in chief of Amiga World.

Wyse became the number one manufacturer of general purpose terminals by repeatedly redefining the state of the art in terminal design. Not just in one category, but across the board. And with the four terminals that make up our fourth generation, we've done it again. Each one represents the ultimate achievement in its class. Our WY-150 sets the standard for alphanumeric monochrome terminals. The WY-370 brings unprecedented functionality in color. And the WY-185 is the most advanced DEC-compatible. Our newest entry, the WY-160, offers a combination of features found in no other monochrome terminal. It lives up to Wyse's well-known ergonomic standards, with its full-screen overscan, fast refresh rate and high resolution. It has the flexibility to support more than 16 ASCII, ANSI and PC emulations, as well as PC and Tektronix graphics. And it raises performance standards with the fastest baud rate in the industry, plus a dual-session capability that allows you to access two hosts simultaneously. Of course, the reason we keep raising our standards is to meet yours. And since we make more terminals to fit more system configurations than anybody else, we're sure to have the one that fits yours best. Call us at 1-800-438-9973. Because if you thought you'd seen everything in terminals, we have four reasons to look again.

THE WORLD IS GETTING WYSE

WYSE

WY-160



Multiuser

CONTINUED FROM PAGE 31

ligent PCs, Tyner predicted the two approaches will coexist.

"Proliferating PCs is crazy when you can use our collective technologies to share one fully configured PC," Davis said. However valid, Davis' point becomes moot in countless sites long overrun with PCs.

Many PC managers are trying to tie their PCs together. Both attempting to remove the intelligence from the desktop and taking a traditional mini-based approach to connectivity are steps backward, Fiering said. "You're asking the processor to time-share, and PC applications weren't designed to do that."

"If you go with a terminal-based solution, you throw away any chance you'd have to move up to a client/server environment," she added. "And as we move to a graphical user interface, you're going to need power on the desktop to handle the user interface."

Federation members represent a number of technologies that together facilitate the use of DOS applications in shared-processing environments.

A typical multiuser DOS system consists of an Intel Corp. 80386-based host equipped with serial port boards, multiple text or graphics terminals, a multiuser DOS environment and standard DOS applications.

Federation members claimed that this approach cuts the per-user cost in half when compared with a LAN — without compromising performance. This is attributed to displaying applications on low-cost terminals or graphics workstations instead of on intelligent PCs.

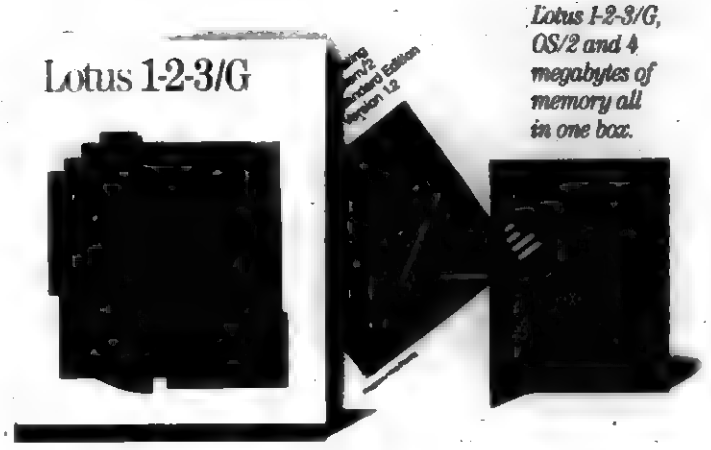
The 15-member federation includes Digital Research, Inc.; Advanced Micro Research, Inc.; Alloy Computer Products, Inc.; Sunriver; Theos Software Corp.; Link Technologies, Inc.; The Software Link; and Digiboard, Inc.

Thanks to Lotus® and IBM,® you now have an opportunity, as well as a reason, to move to OS/2.®

The opportunity? For one incredibly low price we'll not only give you OS/2, we'll also give you four megabytes of memory to make use of all its speed and power.

And to make it all worthwhile? You guessed it. Lotus 1-2-3/G.™ The spreadsheet that's so easy to use, and so exciting, PC World called it "a new high in spreadsheet technology."

Now one of the best reasons to get on a computer in the first place is the best reason to upgrade to OS/2.



How To Get Everything You Need To Run OS/2 And Why You Should Even Bother.

The best part is that all of these things are available in one box. Under one roof (your local participating IBM authorized dealer). But only for a short time (from June 5th through August 31st). And at a price so attractive, you could wind up saving as much as $2000.

That information alone should get you to leap off the fence and dash out to buy a 1-2-3/G Bonus Pack.

But for those of you who might not be ready to make the leap to OS/2, may we offer you some more reasons why you should?

Save a couple of grand when you buy them all together.

First of all, if you're a 1-2-3® user, 1-2-3/G will feel familiar, with menu commands and keystrokes you already know. But look a little closer. You'll begin to notice a lot that's new. Like full mouse support. Pull down menus. And dialog boxes. There's even a WYSIWYG display. And that's just the beginning.

We've also added features like previews and palettes in dialog boxes, dramatic new graphing capabilities and the capacity to directly move objects on the screen, making 1-2-3/G extremely responsive to the way you work.

The more you get to know 1-2-3/G, the more you'll like it. The advanced functionality helps you do better business analysis, with bonuses like file linking, network support, true 3D worksheets, and the new advanced goal-seeking technology of Solver.

Solver helps you solve complex "what if" problems by showing you "how to" achieve desired results. Rather than going through a lengthy trial-and-error process, just ask Solver to present you with alternatives, given whatever variables or constraints you define in your spreadsheet. It will not only give you a choice of solutions but will also point out the optimal one.

IBM

If you're a current 1-2-3 user, you'll be happy to know that all data and macros created in existing versions of 1-2-3 can be retrieved directly into 1-2-3/G. So a move to OS/2 will only serve to enhance any investment you may have already made in 1-2-3.

But how does OS/2 make 1-2-3 better? Well, besides introducing 1-2-3 to a graphical environment, OS/2 works harder and faster, so 1-2-3 can work harder and faster for you.

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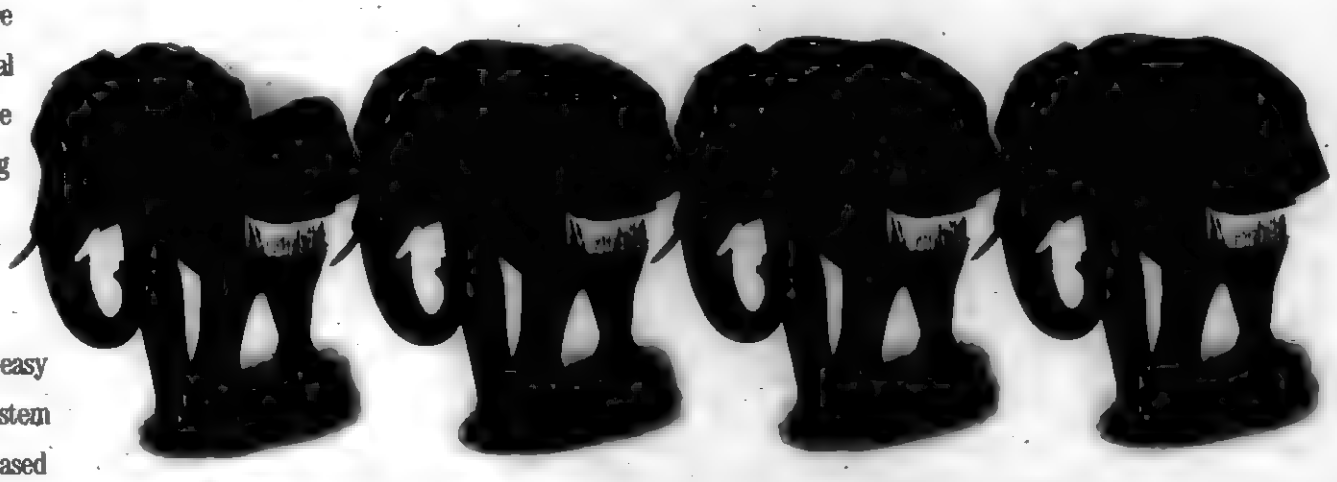
With OS/2, 1-2-3/G can give you Dynamic Data Exchange. DDE provides live links to other Presentation Manager™ applications for true application integration.

For example, you can include a graph from 1-2-3 in a word processor document. And when the data in your graph changes, the word processor document will automatically be updated as well.

What's more, we've made sure 1-2-3/G complies with IBM Systems Application Architecture. Which not only makes its interface consistent with other PM applications, but also means that once you know how to use 1-2-3/G, you'll be able to learn other PM products more rapidly.

At this point, you're probably thinking, "Enough, I'm convinced." But just in case, we'd like to bring you up to date on OS/2.

OS/2 1.2 is better than ever. And before long, no one will be without it. It's more than just a graphical environment for the PC. Or an operating system for a handful of power users. It's a high performance, easy to use operating system that provides increased memory addressability and true multitasking.



4 megabytes of memory will give you plenty of room to operate OS/2.

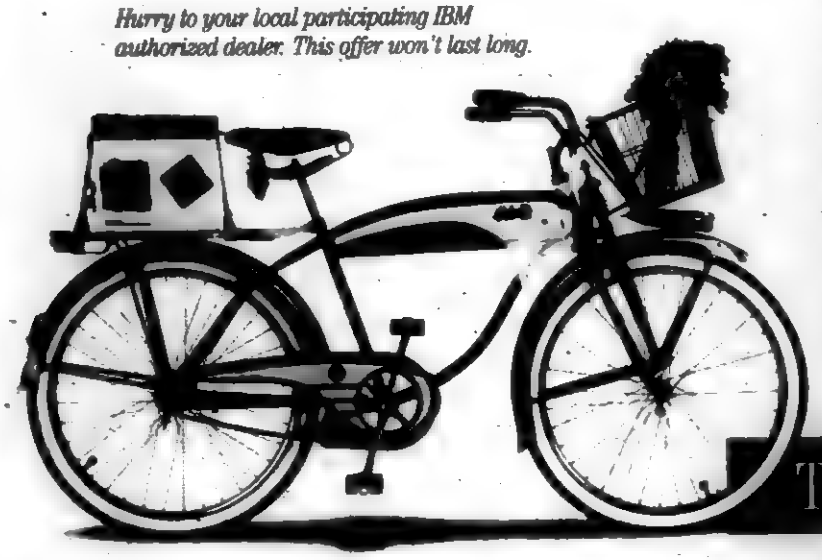
Multitasking in OS/2 lets you get your job done more efficiently by allowing you to work with several applications at once, or even perform several functions at once. Instead of having to end one program before retrieving another, you can open as many OS/2 windows as you need, in any size. And not only view them concurrently, but also transfer data among them. You can also do things like print a spreadsheet and run Solver at the same time.

Plus, with a capacity of up to 16Mb of real memory, you can run larger, complex programs concurrently. And reliably. That means your computer is more efficient for you, not just more fun.

If you're worried that a move to OS/2 will mean sacrificing the investment you've made in DOS-based applications, this should put your mind at rest: The DOS compatibility mode in OS/2 allows you to run most of the existing DOS-based programs you already own. Which means the transition to OS/2 involves great gain, without any pain.

And don't think for a minute that we've forgotten about memory. We understand that the biggest obstacle to expanding your system's capabilities is the expense of expanding your memory. That's why we've included 4Mb of high quality, IBM memory in our Bonus Pack. If you're a PS/2® user, it's all you need to get up and running with OS/2 and OS/2 applications like 1-2-3/G.

Hurry to your local participating IBM authorized dealer. This offer won't last long.



Now you've heard the whole story. The computer environment of the nineties is here. With an application to drive it right off the shelves. So don't waste any time. Call 1-800-447-4700 for the local participating IBM authorized dealer near you. And pick up the Lotus 1-2-3/G Bonus Pack, with OS/2 and four megabytes of memory, while you have the chance. After all, while the window of opportunity may be brief, IBM and Lotus have opened the door to the future.

Lotus

Offer good through local participating IBM authorized dealers. Offer expires August 31, 1990.

The Lotus 1-2-3/G Bonus Pack.

and Presentation Manager is a trademark of International Business Machines Corporation.

Apple

FROM PAGE 31

was just beginning to market its Postscript application. Postscript allows users to accurately print the text and graphics they display on their screens.

Apple became Adobe's first OEM, and both firms were out of the blocks quickly in the desktop publishing market. "The Macintosh interface and Adobe's Postscript made a terrific system," Auster said. "It was a marriage made in heaven."

Trouble was, Adobe knew it had a good thing and began licensing Postscript widely. Printer makers began focusing on the popular Macintosh environment, and it has been a struggle for Apple ever since.

Apple's two new introductions in the embattled niche are aimed at both single users and small work groups. The $1,999 Personal Laserwriter SC is designed for individuals requiring basic text and graphics, while the $3,299 Personal Laserwriter NT is aimed at larger groups with more sophisticated needs, Apple officials said. The SC will use Quickdraw graphics routines while the NT employs Postscript software.

Both machines will incorporate the Motorola, Inc. 68000 microprocessor. The SC includes 1M byte of random-access memory — the amount needed for imaging a full page of text and graphics at 300 dot/in. resolution — while the NT offers 2M bytes of RAM.

"There was some question as to how committed we are to the printer market, but this announcement should answer that," product line manager Duane Schulz said.

While the iron's hot

Competitors are striking back fast. During the same week as the Apple introductions, Mobile, Ala.-based QMS moved quickly to steal some of its thunder with the rollout of the QMS-PS, a Postscript-based laser printer that will retail for $2,795.

HP, too, will continue to pose a tough competitive threat, being the only competitor with the resources and reputation to take on Apple's marketing clout. Last February, for example, HP announced Macintosh compatibility for their Laserjet printers.

"No one in this area is sitting still," Auster added. "It's going to be a tough market."

Rallying around Lady Liberty

Callers define meaning of freedom to support Statue of Liberty museum

BY SALLY CUSACK
CW STAFF

NEW YORK — A $15 donation and some basic computer technology will allow people from all over the world to participate in "A Call for Liberty," a program initiated earlier this month to benefit the Statue of Liberty museum on Liberty Island.

By dialing a toll-free phone number, a caller can permanently record his personal sentiments on the meaning of liberty in an electronic thesaurus.

Each caller will reach an operator who, in exchange for a credit-card number, will transcribe the message into a computer database. The database will become an electronic thesaurus and a component of the museum.

The thesaurus resides on AT&T's 6386/25 Workgroup Systems, which were donated by the vendor for the project. The software system itself was designed by AT&T Bell Laboratories.

Statue of Liberty *goes online with America*

According to Barbara Wheeler, a project leader at AT&T Bell Labs, visitors access messages by entering an individual country or person's last name. They can also read all of the recorded messages via a search function.

"The system has been customized for this application," Wheeler said. "For example, the function keys have been made inoperable, and the keyboard has been color-coded for ease of use."

Simple functions

The specialized software was developed with Nantucket Software Corp.'s compiler Clipper and incorporates menus for easy query and read functions.

There are two telephones located adjacent to the computer systems at the museum, and by pushing a single button, a visitor can reach a telemarketing data operator.

The operator takes the message, which cannot exceed 50 words, stores it and updates it in batch mode. The project relies on Clyde Digital Systems' Carbon Copy for remote system and registration updating, according to Wheeler.

The program is the brainchild of George M. White, the architect of the Capitol, who is heading a grass-roots campaign to raise money for the museum and its outreach programs.

NEW PRODUCTS

Development tools

Meta Software Corp. has released a version of Design/IDEF that is compatible with Microsoft Corp.'s Windows 3.0.

The product is a computer-aided system modeling tool that supports and automates IDEF activity and data models. Its features include work-group support, rearrangeable hierarchies, automatic box creation, an integrated data dictionary, arrow routing, level balancing as well as consistency.

The product runs on MS-DOS/Windows and the Apple Computer, Inc. Macintosh operating system. It costs $2,995.

Meta Software
150 Cambridge Park Drive
Cambridge, Mass. 02140
(617) 576-6920

Integrated Computer Solutions, Inc. has unveiled the Builder Xcessory, an interactive, paint-like software tool designed for prototyping, building and testing the Open Software Foundation's Motif graphical user interface for X Window System.

Users of the tool are able to construct complex Motif user interfaces by clicking icons and moving them within the interface. No compiling is necessary to test or modify the interface, the vendor said.

Builder Xcessory can run on platforms such as Sun Microsystems, Inc. workstations and Digital Equipment Corp. Decstations running Ultrix. The product is priced at $2,500.

ICS
163 Harvard St.
Cambridge, Mass. 02139
(617) 547-0510

Which leading company has developed the last branch automation systems you'll ever need to buy?

Systems

Boss Technology has announced the Boss 386SX 20-MHz desktop personal computer.

A basic configuration comprises an Intel Corp. 80386SX 20-MHz motherboard in a bay king case with a 200W power supply; a 101-key keyboard; a 1.2M- or 1.44M-byte floppy disk drive; two serial, one parallel and one game port; and 1M byte of memory.

It is available with a rapid-access 40M-byte hard drive for a list price of $1,995.

Boss Technology
6050 McDonough Drive
Norcross, Ga. 30093
(404) 368-2077

Veridata Electronics, Inc. has announced a laptop that operates at 16- or 8-MHz clock speeds.

The Lappower 286/40 is equipped with 1M byte of random-access memory and a black-and-white backlit IBM Video Graphics Array screen that provides 640- by 480-pixel resolution. It also features a 16-color graphics capability that produces a 32-level gray scale.

The product operates under MS-DOS 3.3 or higher, OS/2, Dr. DOS or Xenix. It is priced at $3,150.

Veridata
11901 Goldring Road
Arcadia, Calif. 91006
(818) 303-0613

Veridata's laptop *offers 16-color graphics capability*

Software applications packages

Kital Software has introduced Version 2.0 of its Super Macros Library for Lotus Development Corp.'s 1-2-3 spreadsheet.

The product contains two Macro Library Managers that use the Macromgr.Adn add-in supplied by 1-2-3 Release 2.2. More than 200 *.WK1 macros and 200 *.MLB library macros are offered.

System requirements include an IBM Personal Computer AT or XT, Personal System/2 or compatible and Lotus' 1-2-3 Release 2.0 or higher. A hard disk is also recommended.

The package is available for $70, and upgrades to earlier versions cost $25.

Kital Software
P. O. Box 748
Karmiel 20100
Israel
(972) 498-7255

Unix software

Terry Keene, Inc. has announced the availability of five versions of Menumagic, its Unix system interface.

The product is offered for The Santa Cruz Operation's (SCO) Unix System V 386, Release 3.2; Interactive Systems Corp.'s 386/ix; Intel Corp.'s Unix System V/38, Release 3.2; AT&T's Unix System V/386, Release 3.2; and IBM's AIX for Personal System/2, which was developed in conjunction with Dickens Data Systems.

Menumagic features more than 120 library functions. It also includes a developer's tool kit for creating custom library functions.

Pricing is $495 for all Unix versions, and an SCO Xenix version costs $345.

Terry Keene
P.O. Box 2049
Roswell, Ga. 30077
(404) 640-1515

COMMENTARY

Jeffrey N. Fritz

Assume nothing

It's time for communications software to grow up. It is often presumed that basic functionality is pretty much the same from package to package. This assumption is not nearly as correct as it may seem.

Until very recently, our department selected communications software based largely on a cost vs. features analysis. We supposed that the major software vendors had basics such as file-transfer protocols and terminal emulation down pat.

However, there are subtle but very important differences among the communications packages available for personal computers. Sometimes even a small difference can result in major problems.

For example, most packages support common file-transfer protocols. However, the ability to configure these protocols is not always the same. For that matter, a protocol in one package may not be as robust as the same protocol in another package.

A case in point is the Kermit protocol developed by Columbia University and named in honor of that renowned Muppet character. Kermit is one of the most

Continued on page 42

Foxboro sidetracks standards

Manufacturing firm chooses Sun's NFS for global communications

BY ELISABETH HORWITT
CW STAFF

FOXBORO, Mass. — Rather than wait for industry standards to mature, The Foxboro Co. recently decided to use Sun Microsystems, Inc.'s Network File System (NFS) as the basis for information and resource sharing across its global, multivendor distributed network.

The manufacturer is currently about halfway through the initial stage of a project to implement PC-NFS at all of its major global sites. The objective is effortless communication and information sharing across geographically dispersed sites and key work areas such as field services, manufacturing, industry engineering, research, design and sales, said John Puckett, Foxboro's manager of technical operations.

One major goal of the project is to "create library-type systems" that make designs and applications "available to the whole engineering community, not just the U.S.," Puckett said. The intent is to "create a high level of efficiency, quality and consistency through reusable engineering," Puckett added.

Puckett is working to communicate effortlessly

"The key is to stop reinventing the wheel, to share not just product designs but applications, such as graphics, that are built for a particular refinery or customer," he said.

Foxboro chose Sun's PC-NFS primarily for its ability to support Foxboro's large installed base of MS-DOS-based microcomputers and a growing installation of Unix-based workstations from Sun, Digital Equipment Corp. and Hewlett-Packard Co., Puckett said. The only Foxboro systems that NFS does not currently support are HP MPE hosts and certain factory automation systems, he added.

Having recently decided to migrate to a multivendor Unix environment, Foxboro's "initial thrust was to bring our PC environment up to the same level of connectivity" as that of its Unix machines, Puckett said.

Foxboro has approximately 1,000 personal computers on Ethernet local-area networks. Formerly it used 3Com Corp.'s Ethershare software to access files on 15 servers running DEC's Ultrix. The company is approximately halfway through its effort to migrate the PC LANs to PC-NFS, with gateways providing connections to a handful of Novell, Inc. Netware and Apple Computer, Inc. Appletalk users.

PC-NFS has provided users with the ability to access files without worrying which vendor's platform the server runs on or whether it is located next door or overseas, Puckett said. Sun's Lifeline electronic mail package is said to exchange files with other Unix-based mail systems as well as HP Desk.

Continued on page 44

Extensions to LU6.2 take wide Spectrum

BY ELLIS BOOKER
CW STAFF

NEW YORK — Spectrum Concepts, Inc. recently extended its LU6.2-based communications tool to provide data transfer between applications on a transaction-by-transaction basis.

While LU6.2 is a well-documented protocol for connecting applications across a Systems Network Architecture (SNA) network, Spectrum's software "shelters users from having to program these communications," marketing manager Mitch Davis said.

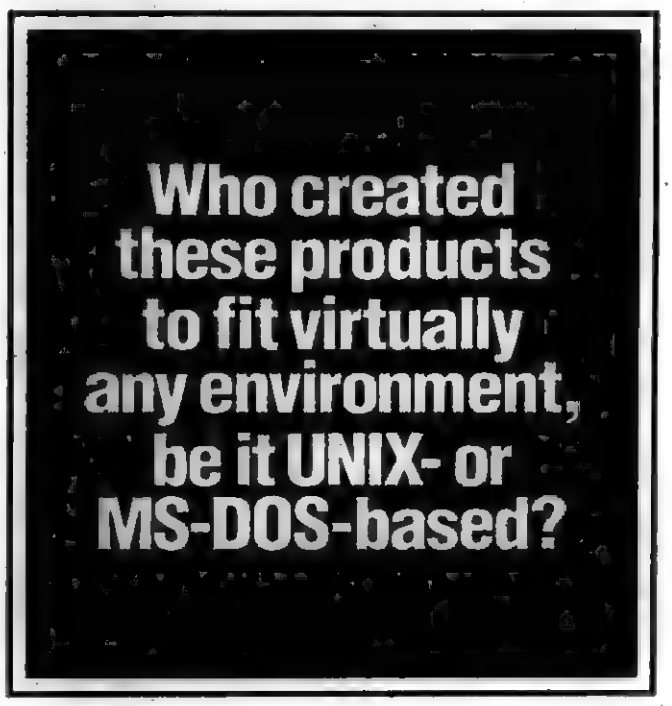
Since 1987, Spectrum has been selling XCOM 6.2, a bulk data transfer product using the LU6.2 scheme; the company claimed about 250 company installations for this product.

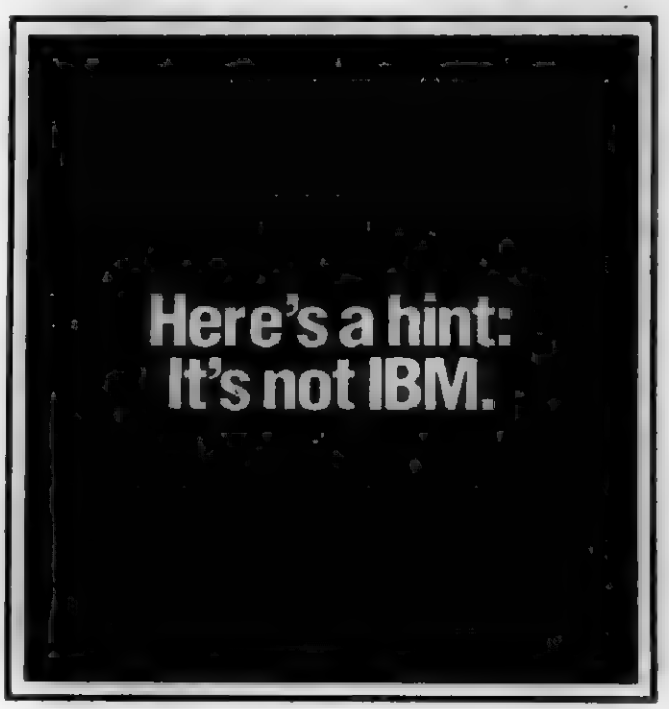
The software, Transaction Processing Manager (XCOM-TPM), acts as a go-between for applications running on two or more computers: Transactions are handed off to XCOM-TPM, which then passes them across the SNA network to other computers for processing. As communications subsystems, XCOM and XCOM-TPM mean that the original program need not know how the data transfer is accomplished, but it can receive information about the status of the transfer, Spectrum said.

Spectrum added that XCOM-TPM is targeted at transaction-oriented applications, including stock quotations, credit authorizations and ticket reservations.

Like the original bulk-transfer product, XCOM-TPM will support MVS and VM mainframes, IBM and Digital Equipment Corp. midrange systems, DOS, OS/2 and Apple Computer, Inc. Macintosh personal computers and Unix workstations. Also, like its predecessor, XCOM-TMP offers programmers a choice of menu, command line or application programming interfaces.

Spectrum said XCOM-TPM has entered beta testing and will be available in the fourth quarter. Although pricing has not been finalized, company officials said the server and workstation implementations will be priced from $35,000 to $70,000.





Research joins hands with progress

Public Health Service links agencies by E-mail to speed disease research

ON SITE

BY JOANIE M. WEXLER
CW STAFF

Using automation to improve productivity is generally viewed in the context of boosting the bottom line through cost cutting or better customer service.

The U.S. Public Health Service, however, hopes that connecting its agencies' disparate electronic mail systems will also speed progress toward finding cures for diseases such as acquired immune deficiency syndrome and bringing needed drugs to market.

The Public Health Service, which falls under the Department of Health and Human Services umbrella, is the parent of nine discrete agencies.

Public Health Service and its agencies are supported by 11 mainframes, more than 600 minicomputers and 17,000 personal computers all running on different hardware platforms.

The department is currently implementing software from Softswitch, Inc. on IBM host hubs to allow a slew of proprietary electronic mail systems to intercommunicate.

Peter Alterman, senior management analyst at the Public Health Service in Rockville, Md., commented that the administrative benefits of interagency E-mail pale in comparison to the more socially redeeming benefits of sharing the "real work" generated by researchers.

He said, "The people at the National Institutes of Health are doing AIDS research; the Centers for Disease Control are doing AIDS epidemiology, and the FDA [Food and Drug Administration] is doing AIDS drug reviews. Bringing these efforts together is where there's a real benefit in data connectivity."

He added, though, that "it's nice for me to be able to get a strategic plan downtown in eight minutes instead of four days."

The hub mail software, called Softswitch Central, converts standard electronic mail protocols, including X.400 and Simple Mail Transfer Protocol, into the E-mail format of the receiving network.

If the sending network does not use a standard E-mail protocol, a gateway must sit on the sending network to convert from the proprietary format — say, Wang Office — to a neutral format. Softswitch Central then converts that neutral format into the receiving E-mail format and sends the message on its way.

The agencies run proprietary E-mail systems such as Wang Laboratories, Inc.'s Wang Office, Digital Equipment Corp.'s All-In-1, 3Com Corp.'s 3+Mail and Banyan Systems, Inc.'s Vines Mail.

Some of the E-mail exchange takes place over a wide-area leased-line network, which consists primarily of T1 links reaching from a central hub in Rockville to 10 regional offices.

Public Health's *Alterman appreciates E-mail*

Alterman said that the Public Health Services identified a need two years ago for data connectivity among the jumble of offices and spent about nine months discussing options.

"We decided the first strategic step should be electronic mail. E-mail is to networking what the word processor is to the PC: the application that makes sense," he said.

Alterman added that the department measures productivity gains in time, not money, since as a government entity, "we'll never have enough people and dollars to get the job done." He estimates, though, that E-mail is on average chopping three working days off "any communications-related activity."

Alterman said the department is also planning to expand the system to allow drug companies to electronically forward their mounds of new-drug documentation to the FDA for approval.

The department is installing X.400 gateways in a couple of computer centers to comply with the government mandate that all procurements after Aug. 15 must be compatible with Open Systems Interconnect (OSI) standards.

Alterman explained that new procurements must only include the capability to communicate via OSI protocols. "I could still buy another 3+Mail package, but I'd also have to buy a 3+Mail/X.400 gateway or make sure my new system had access to such a gateway."

Fritz

FROM PAGE 41

popular and common protocols in use today. However, Kermit's performance over packet networks can be poor. In recent tests, Kermit managed a throughput of only 1.3K bit/sec. over a 9.6K bit/sec. digital link.

This gross inefficiency isn't entirely Kermit's fault. It has a lot to do with the typically small size of Kermit packets, which tends to conflict with the size of packets provided by the digital links. This means increased overhead and lowered efficiency. Some programs give the user flexibility in selecting the packet size that Kermit uses. However, most communications packages limit the maximum packet size to less than 100 bytes.

If the packet sizes handled by Kermit approach 2K bytes, the time it takes to transfer large files is dramatically reduced. For example, a 260K-byte Kermit file transfer to an IBM host over Datastorm's Procomm Plus took nearly 30 minutes. The same Kermit file transfer to the same host took less than five minutes using Synergy's Versaterm Pro. The only difference was that both Versaterm Pro and the mainframe software were set to use a 1,910-byte packet. Procomm Plus, however, limited the maximum packet size to 94 bytes.

If Kermit is one of the most popular file-transfer protocols, then Digital Equipment Corp.'s VT-100 is certainly one of the most popular terminal emulations.

Even when the host is an IBM mainframe, the emulation of choice is very often VT-100. In fact, nearly every communications package contains a VT-100 emulator. Unfortunately, not all do the same job emulating this popular terminal.

Our department regularly accesses a local telephone company database called Macstar. This database displays a screen that allows entry of specific features on any one of the university's 4,900 telephone lines.

There is nothing magical about Macstar. It expects to connect to something that looks like a VT-100 terminal. However, not every software package understands the nuances of character codes used by the VT-100. Only one tested package, Crosstalk by Digital Communications Associates, allowed our operators to enter all the characters in Macstar's data fields.

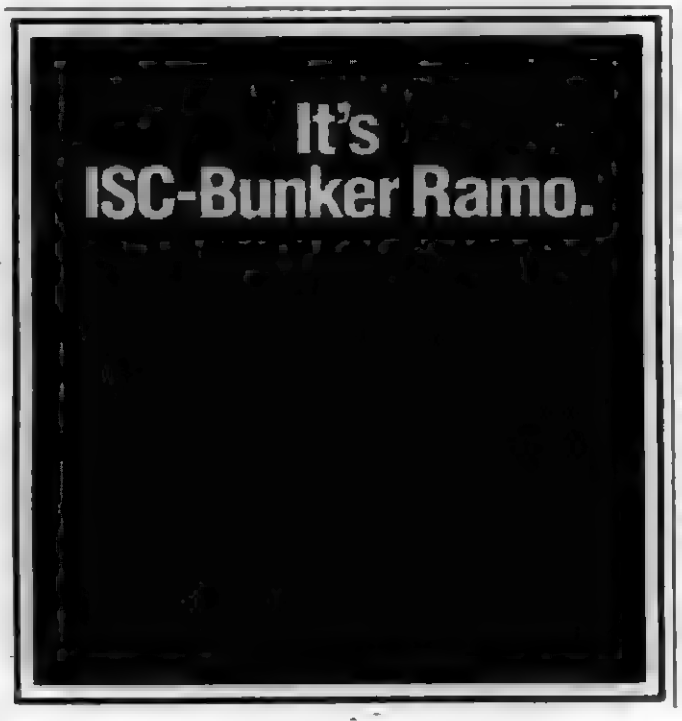
Most users do not have much of a preference for data format. After all, there is nothing inherently better about eight bits no parity over seven bits even parity. However, software packages can have substantial preferences. In fact, some popular packages cannot handle eight-bit parity correctly.

One package presented garbage at the log-in prompt whenever eight bits was selected, even though the host supported eight bits. A call to the vendor's technical support line resulted in a meek admission that "some other packages do handle eight-bit data a little better than us." There was no indication if a fix was available or even in the offing.

Communications tasks are becoming more sophisticated and demanding. What is needed today is not extra bells and whistles in communications software. Most users do not need the additional confusion of yet another protocol with only an extra letter to differentiate it from its predecessor. Much more important are reliable, flexible packages with robust protocols and accurate terminal emulations. Once commercial packages can handle the basics, selections can be made based on features and cost and not on simple operability.

Fritz is a data communications analyst at West Virginia University in Morgantown, W. Va.

> IF KERMIT IS one of the most popular file-transfer protocols, then Digital Equipment Corp.'s VT-100 is certainly one of the most popular terminal emulations.



3Com offers extended warranties

BY JIM NASH
CW STAFF

SANTA CLARA, Calif. — 3Com Corp. has extended the automatic three-year warranties on its Etherlink adapter product line to limited lifetime policies.

The Santa Clara-based networking firm announced on July 23 that defective adapters that have been sold since June 1, 1990, will be repaired or replaced for free as long as they remain in their original personal computers.

All adapters will continue to have a three-year warranty from the date of purchase regardless of whether they are removed from their original equipment.

Returning completed three-year warranty slips to 3Com automatically extends the time limits to lifetime warranties.

The policies apply to equipment sold by original equipment manufacturers, value-added resellers, company dealers and distributors.

3Com officials claimed that Etherlink adapters average 70 years between failures.

The company manufactures adapters for IBM Personal Computers and Personal System/2s as well as Apple Computer, Inc. Macintoshes.

It has two adapters for 10BASE-T equipment.

Businesses urge first global EDI user group

BY JIM NASH
CW STAFF

SAN FRANCISCO — A group of Canadian businessmen recently proposed what they claimed would be the first international electronic data interchange (EDI) group comprised solely of users, an idea that has drawn mixed reviews.

The Chamber of Commerce of Metropolitan Montreal and the EDI Council of Canada announced the formation of a multinational working group of EDI users. The 13-member group is to define issues, roles and priorities for what would become the International EDI Institute.

Representatives of both groups at the Second International Congress of EDI Users said a study they funded indicated a global user group is necessary to focus attention on EDI and its implementation and distribution worldwide.

The institute, said Marshall Spence, president of the EDI Council of Canada, would become an arbiter of EDI issues. Spence said he foresees it as one way to organize international support among government agencies, universities and private firms. He said the institute also would focus on North-South problems of technology implementation and diffusion.

"The idea in general is OK," said Bruce Haney, telecommunications systems engineer at Upjohn Co. in Kalamazoo, Mich. He said it would be most useful if it did not "get bogged down in philosophical debates" about EDI standards.

Decisions, decisions

Hank Granse, IS director at the Port of Tacoma, said, "If [the institute] can function and have some power, then it's a good thing. We have so many user groups that we have to be rather selective with what we belong to."

Spence said the 13-member working group will convene for two sessions this fall to discuss specific needs and goals for the institute. The 13 will be drawn from 10 regions, including the U.S., Canada, Western and Eastern Europe, South America and the Pacific Rim. Representatives are expected to be chosen by existing groups in each of the regions.

Jerry Dreyer, president and chief executive officer of the Electronic Data Interchange Association in Alexandria, Va., said the working group's schedule was too ambitious. He questioned the group's ability to crystallize the pertinent issues, consult their constituencies and make lasting decisions.

International EDI users were generally more positive. Ariovaldo Pesse, a representative of Colgate-Palmolive Ltda. in Vila Mariana, Brazil, said, "If you never try, you never arrive."

An Easylink to Pacific Rim

BY ALAN J. RYAN
CW STAFF

UPPER SADDLE RIVER, N.J. — Just one week after announcing earlier this month that its Business Services unit would be sold to AT&T, Western Union Corp. expanded the unit's Easylink electronic mail function to both South Korea and Taiwan.

Sal Noto, director of international marketing planning at Western Union, said that business at the company is continuing as usual. "We have been told not to change anything until the closing" of the sale to AT&T, he said.

According to Steven Graham, vice-president of marketing for Business Services, Western Union employees appear to be optimistic about the AT&T buyout of the unit. "If you look at global business — messaging and the opportunities that exist in the decade of the '90s — the alliance makes one heck of a lot of sense," Graham said.

Extending Easylink

The activities required to bring Easylink to the Pacific Rim — the service is also available in Japan — had been under way for months, and the contracts had been signed prior to the announcement that AT&T would purchase Western Union's Business Services [CW, July 9], according to Noto.

Noto said that the expansion of Easylink will be beneficial to existing Easylink customers.

Western Union has appointed local distributors to facilitate the use of Easylink messaging services to multinational companies doing business in the Pacific Rim.

The distributors will allow both local and multinational companies and U.S. multinationals in the Pacific Rim region to receive support for Easylink services from a nearby source, according to Western Union.

Until the sale of Business Services to AT&T is completed, Noto explained, he will continue to refine the globalization plan he has set for Western Union's Easylink.

When Easylink becomes AT&T property, Noto said, he will present his plan to AT&T "to see if they want to keep it along the same lines, modify it, or say, 'we have one of our own.' "

"I HAVE TO FREE $750,000 FROM MY DATA CENTER BUDGET NOW..."

A USER'S CHALLENGE:

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INTERNATIONAL BRIEFS

Sprint to build USSR video link

U.S. Sprint Communications Co. has signed an agreement to supply what it claims will be the USSR's first commercial, international videoconferencing system. Under an agreement between Sprint and the **Soviet Ministry of Communications**, the telecommunications carrier will provide a link between a newly constructed digital videoconferencing room in Moscow and its Meeting Channel videoconferencing service, which currently serves 26 countries. Multinational businesses, government agencies and other organizations will have access to the room's facilities.

Timeplex, Inc. has been selected by the **Taiwan Telecommunications Network Services Co. Ltd.** (TTN) to provide the T1 switches for Taiwan's first national data network. Timeplex will install Link/2+ T1 switches in 16 Taiwanese cities, providing a backbone to connect TTN customers' computers, personal computers and terminals. TTN is one of eight value-added network providers recently formed in Taiwan as part of the government's move to deregulate the nation's telecommunications industry.

BASF AG, a West German chemical company, has placed an order with **Northern Telecom, Inc.** for an integrated services digital network system based on the vendor's Meridian private branch exchange line. With more than 30,000 lines, the Meridian 1 network will be Germany's largest private communications network, Northern Telecom said.

British Telecom has announced the closing of its last old-style electromagnetic exchange, which is located in Thurso, Scotland. This will make the UK-based carrier's network entirely digital, British Telecom said.

Newbridge Networks, Inc. has received orders to install corporate voice/data networks in Korea. **Lucky Goldstar International Corp.**, a U.S.-based $6 billion trading company, has placed an order for Newbridge's 3600 Mainstreet Bandwidth Manager in Hong Kong, Los Angeles and Korea. **Daewoo Corp.**, a Korean trading firm and manufacturer of electronics and appliances, has signed up for Newbridge 3612 Mainstreet switches to link New York and Seoul, Korea, with plans to expand the network in North America and Asia in the future.

Japanese systems integrator **Intec, Inc.** has signed an agreement to distribute **Osiware, Inc.'s** Open Systems Interconnect software in Japan and internationally. Intec will distribute a version of Osiware's Measenger 400 that has been modified to support Japanese character sets. The electronic mail system is said to be based on the CCITT X.400 standard.

Stratus Computer, Inc. has announced the availability of **Simpler Trade Procedures Board's** (Sitpro) electronic data interchange (EDI) software on Stratus XA 2000 Continuous Processing computers. The agreement between Stratus and Sitpro, an independent agency sponsored by the United Kingdom Department of Trade and Industry, allows the use of XA 2000s as EDI gateways between trading partners around the world, Stratus said.

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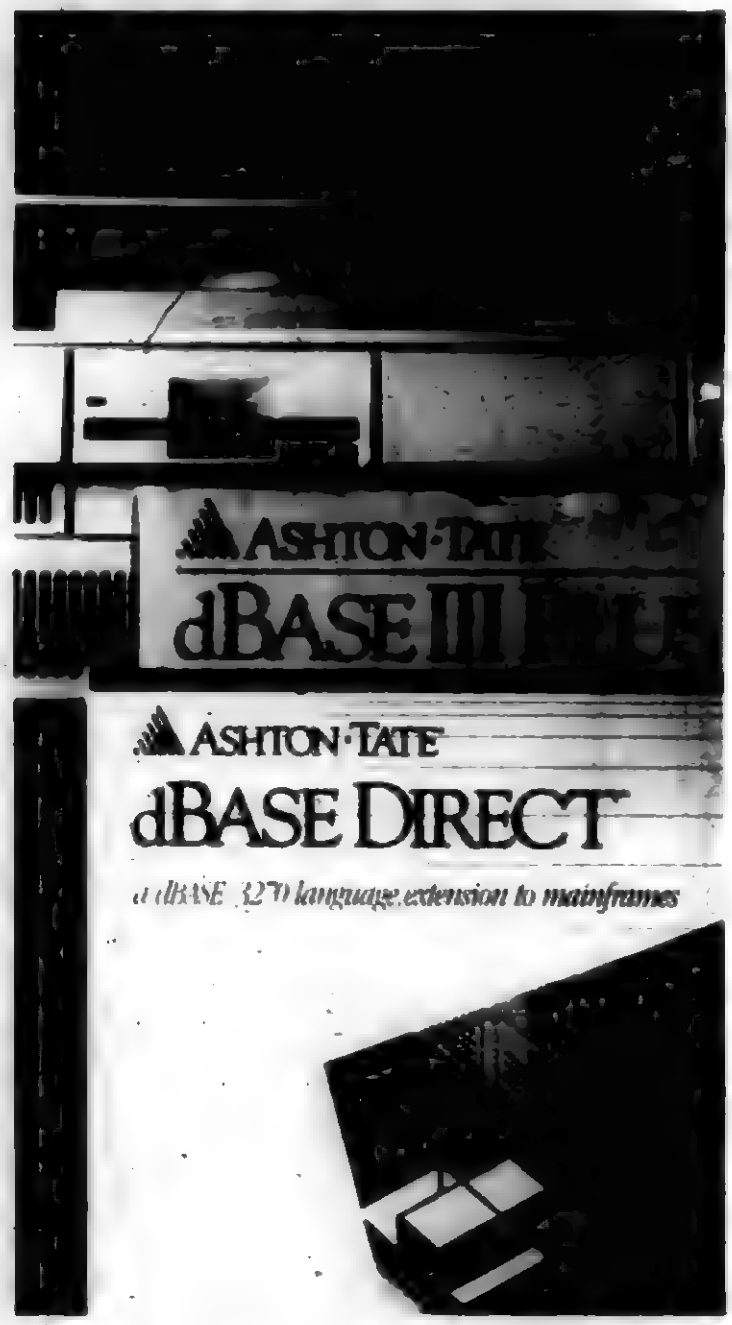

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Foxboro

CONTINUED FROM PAGE 41

Foxboro's underlying network protocol is Transmission Control Protocol/Internet Protocol. Physical links between global sites are based on the X.25 packet-switching protocols, Puckett said.

A Design for Manufacturability project now under way at Foxboro uses PC-NFS as a "common thread between workstations," allowing users in design, engineering and manufacturing to access and update the same databases, Puckett said. The fruit of the project will be a prototype that will be modeled after other Foxboro manufacturing sites around the world for possible implementation, he added.

While Foxboro's initial implementations of PC-NFS will not make use of Sun's Remote Procedure Call (RPC), the distributed computing tool "will obviously play an important role for us down the road," Puckett said.

Foxboro plans to implement a system within the next 12 months based on Sun's RPC that will automatically search databases for computer-aided design files and other data needed to build a particular product, Puckett said. Today, users on the shop floor must build such requests and enter them manually, he added.

Incompatibilities between Sun's RPC and the Open Software Foundation's (OSF) Distributed Computing Environment are not a major concern at Foxboro — for the moment, at least. The firm is "committed to standards," but only when they become "commercially viable from a corporate standpoint," Puckett said. "We have needs and an installed base today," whereas organizations such as the International Standards Organization, OSF and Unix International "promise standards for tomorrow," but offer specifications that are still in a state of flux, he added.

For the near term, Puckett said, Foxboro can integrate its Sun-based implementation with OSF's standard via PC-NFS, which the OSF has endorsed.

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FDDI: Concentrating on cost

Previous claims of FDDI concentrator cost savings come under scrutiny

ANALYSIS

BY JOANIE M. WEXLER
CW STAFF

Now that Fiber Distributed Data Interface (FDDI) concentrators are hitting the shelves, age-old prophecies that such products will slash network connection costs and fuel the market are under scrutiny.

An intelligent device that connects to an FDDI local-area network, an FDDI concentrator hooks workstations in a star configuration to the 100M bit/sec. fiber ring, much the way a terminal server links personal computers and terminals to an Ethernet or Token-Ring network.

A report last year from market research firm International Data Corp. (IDC) suggested that the high price per connection to an FDDI LAN — now about $11,000 and prohibitively high for many user companies — would be less of an inhibitor once concentrator products appeared on the scene.

However, prices still may not be low enough for commercial users. In fact, the author of the IDC report, Rick Villars, manager of computer networking systems, cited "the protection of the network rather than cost savings" as the main advantage to using a concentrator.

Digital Equipment Corp.'s FDDI product rollout this month included an eight-port, $15,000 concentrator, which, when coupled with the vendor's $6,000 FDDI network adapter card needed for each workstation, gets the per-port cost down to about $8,000.

Timeplex, Inc. introduced a $30,700, eight-port FDDI concentrator in January. The DEC and Timeplex products dual-attach to the backbone to protect the inherent redundancy afforded by FDDI's dual, counterrotating ring topology.

However, Timeplex's concentrator cost nudges $4,000 per port and still requires an FDDI adapter card for each attached workstation ($6,000 to $10,000, according to IDC). These are hefty price tags for users accustomed to hooking their computers to an Ethernet network with a $200 adapter card. In addition, some high-performance workstations are now $4,000 to $5,000 — half the price of an FDDI connection.

There is still progress being made to cut connection costs, however. This week, two working groups formed at last month's FDDI standards committee meeting will convene in Boston to explore less expensive

means to FDDI's high data transmission rates. One group will consider a new component to the FDDI standard specifying shorter distances between nodes in concentrator configurations, according to Bruce McClure, the group's chairman.

McClure, who is also chairman of FDDI start-up Synernetics, Inc. in North Billerica, Mass., said his group will discuss reducing the concentrator-to-station distance from 2km to 100m, which would ease performance requirements for products and possibly lower the cost to users by 30% to 40%.

In the meantime, users and analysts are touting other concentrator benefits — enhanced network management, wiring flexibility and protection of the FDDI backbone — as more germane to network concerns than cost savings.

"The dual ring is important for the backbone, but the concentrator will let us transparently reconfigure our network without having to pull new runs," commented Warren Fugate, director of systems and networks at the University of Pittsburgh. Fugate has been beta testing DEC's FDDI product line and said he "certainly intends to buy" the Decconcentrator 500, which, like Timeplex's Time/LAN FDDI Concentrator+, accommodates single-attached workstations only.

Different thoughts

Opinions vary about the benefits of single-attached vs. dual-attached workstations. Single-attached workstations, which run just one pair of fiber wires to the concentrator, require less intelligence on their FDDI network adapter cards — rendering the cards less expensive — and reduce the amount of fiber cabling needed.

However, the number of fiber-optic connections involved in concentrator configurations is, ironically, greater. While only one fiber-optic connection is required on the workstation side, a counterpart connection is required on the concentrator, and an additional two connections are required from the concentrator to the dual ring.

The single-attached workstation approach also does not take advantage of the full redundancy capabilities inherent in the dual-ring concept of FDDI. If a cable running to the single-attached workstation breaks, that node is out of commission. In a dual-attachment scenario — advocated by such workstation vendors as Hewlett-Packard Co.'s Apollo division, Prime Computer, Inc. and Silicon Graphics, Inc. — the workstations would be backed up by the secondary ring.

One problem with using all dual-ring attachments without a concentrator is that if there is a fiber cut on the active ring, the network will default to the backup ring, wrap and "self-heal." If two devices malfunction, the two wraps would isolate a section of the backbone from the rest of the network, pointed out Mark Leary, director of communications and networking research at Technology Investment Strategies Corp. in Framingham, Mass. A concentrator, on the other hand, allows the ring to bypass the malfunctioning node.

NEW PRODUCTS

Network management

Isicad, Inc. has introduced a stand-alone software package designed for IBM Personal Computer XTs, ATs and compatibles.

Command 2000 can be used throughout network design, installation and change management processes. It features help desk and troubleshooting capabilities and a graphics-to-database link that ties graphical data to a nonproprietary relational database system.

The package is available for $12,950.

Isicad
1920 W. Corporate Way
Anaheim, Calif. 92803
(714) 533-8910

Octocom's *OSI821N offers access security*

Octocom Systems, Inc. has introduced the OSI821N Desktop Access Security and Network Management System.

The system allows network managers to surveil and control dial and two- or four-wire leased-line data networks from a desktop. Features include a menu of event and alarm monitoring and logging capabilities, device configuration and control, four levels of host access security and a system log that provides an audit trail of network activity, alerts and alarms.

OSI821N is priced at $3,200; a personal computer software license costs $500.

Octocom
255 Ballardvale St.
Wilmington, Mass. 01887
(508) 658-6050

Triticom has announced an Ethernet real-time traffic monitoring tool that was designed to operate with any Ethernet local-area network.

Ethervision enables network managers to monitor traffic and errors in real time, display network usage and assign user names to network addresses.

The product was designed to operate with Novell, Inc.'s NE2000 or a compatible Ethernet adapter. DOS Version 3.1 or higher is also required.

Single workstation versions that include a user manual and 3½- or 5¼-in. floppy disks sell for $225. Versions with Ethernet adapters cost $525.

Triticom
P.O. Box 11536
St. Paul, Minn. 55111
(612) 937-0772

Codex Corp. has introduced the 9110 Dial Monitoring System.

The system lets users monitor and control dial modem pools from a central site or through remote access. It supports up to 960 dial modems simultaneously and is available as a software kit or as a system equipped with a Hewlett-Packard Co. Vectra personal computer.

The 9110 is scheduled to ship in the third quarter. Pricing will be based on configuration and will begin at approximately $3,000.

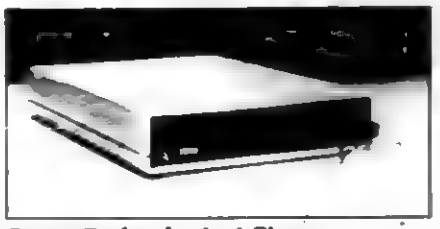
Codex
20 Cabot Blvd.
Mansfield, Mass. 02048
(508) 261-4655

Microtronix Datacom Ltd. has announced a Digital Equipment Corp. VMS-based communications system designed for performing applications over wide-area networks.

The Packet Miser minimizes the cost of transferring packet-switched data over X.25 or public switched networks. The product enables users to communicate with VAX/VMS-based host processors without relying on network echoing to be performed by a host.

Pricing for the product begins at $4,500, depending on configuration.

Microtronix
125 Bessemer Road
London, Ont.
Canada N6E 1P9
(519) 681-3430



Group Technologies' *Glo-worm*

Links

Group Technologies Corp. has announced a digital encryption/decryption device that features modem, key management and remote user capabilities.

The Glo-worm can be connected to any computer equipped with an RS-232C interface. It transfers data at 9.6K bit/sec. and incorporates personal identification keys and remote user modules.

Glo-worm is priced at $2,995.

Group Technologies
10901 Malcolm
McKinley Drive
Tampa, Fla. 33612
(813) 972-6000

Pacer Software, Inc. has announced Pacer-Share, Pacer-Link and Pacer-Print.

Pacer-Share acts as an Apple Computer, Inc. Appleshare server that enables Apple Macintosh users to store files on a Digital Equipment Corp. Ultrix host. Pacer-Link is an integrated communication device for linking Macintosh and IBM Personal Computers to supported hosts. Pacer-Print is print server software that enables Macintosh and Unix users to print to Postscript-compatible printers.

Minimum license fees for Pacer-Share and Pacer-Link are $1,200. Pacer-Print prices start at $1,000 per VAX or reduced intruction set computing CPU.

Pacer
1900 W. Park Drive
Westboro, Mass. 01581
(508) 898-3300

Local-area networking hardware

Fresh Technology Group has announced a product that allows authorized users of Novell, Inc. Netware-based local-area networks to view the screen and operate the keyboard of a file server console from any workstation on a network.

Remote Console uses 2K bytes of server memory and is compatible with Netware 286 2.1 and later versions. It allows access to the console of a non-

dedicated file server even during DOS mode, the vendor said.

The product runs on an IBM Personal Computer XT, AT or compatible with DOS Version 2.0 or higher. It is priced at $249.

Fresh Technology
1478 N. Tech Blvd.
Gilbert, Ariz. 85234
(602) 497-4200

Intel Corp.'s Personal Computer Enhancement Operation has announced a compact print server designed for Novell, Inc. networks.

The Netport server enables users to locate printers by a direct connection to the network's wiring. It can simultaneously support two printers on a Novell Netware thin-wire Ethernet network, the vendor said.

The server is priced at $696 with a three-year warranty.

Intel
CO3-7
5200 N.E. Elam Young Pkwy.
Hillsboro, Ore. 97124
(503) 629-7354

Emerson Computer Power has announced a local-area network interface cable option designed to be used with its Accupower Model 40 and 50 uninterruptible power supplies (UPS).

The cable provides an intelligent link between the UPS and a LAN file server that can extend battery life during power outages.

The LAN interface option is priced at $179. Accupower Models 40 and 50 sell for $798 and $998, respectively.

Emerson Computer Power
P.O. Box 19786
15041 Bake Pkwy.
Irvine, Calif. 92713
(714) 380-1005

Gateways/Bridges/ Routers

Digital Equipment Corp. has announced a hardware and software routing product designed to find the most efficient paths for data to travel on a network.

The Decrouter 250 works within DEC's 802.3/Ethernet-based local-area network or between two LANs that are far apart. The product can operate with Decnet Phase IV networking software and with Decnet/OSI Phase V. The router provides both synchronous and asynchronous connectivity and supports eight lines at 19.2K bit/sec. or one line at 56K to 64K bit/sec., the vendor said.

Decrouter 250 is available for $6,000.

DEC
146 Main St.
Maynard, Mass. 01754
(800) 344-4825

The Software Group Ltd. has announced Netcom-Router, a local-area network/ wide-area network connectivity tool for users of Unix-based personal computers.

The product can reportedly link LANs using leased lines or packet-switched communications services at 64K bit/sec.

Netcom-Router was designed for Intel Corp. 80386-based computers running Unix or The Santa Cruz Operation SCO Xenix 386. It is priced at $600.

The Software Group
2 Director Court
Woodbridge, Ont.
Canada L4L 3Z5
(416) 856-0238

A 10-port multiprotocol Ethernet terminal server has been announced by Cisco Systems, Inc.

The STS-10x supports Transmission Control Protocol/Internet Protocol and Digital Equipment Corp.'s Local Area Transport (LAT) protocol. It features 256K bytes of read-only memory and a one-word connection method of linking users with appropriate protocols.

The product is priced at $2,995, and a LAT option costs $250.

Cisco Systems
1525 O'Brien Drive
Menlo Park, Calif. 94025
(415) 326-1941

Xyplex, Inc. has announced the Maxserver 6510 Remote Bridge Card, a product jointly developed with Vitalink Communications Corp.

The bridge improves interactive traffic among users at work group levels who need to access a host local-area network or corporate backbone network. The 6510 supports the IEEE 802.1D Spanning Tree Protocol and is compatible with Vitalink's Wan-manager network management system. It is scheduled to begin shipping in September for approximately $4,000.

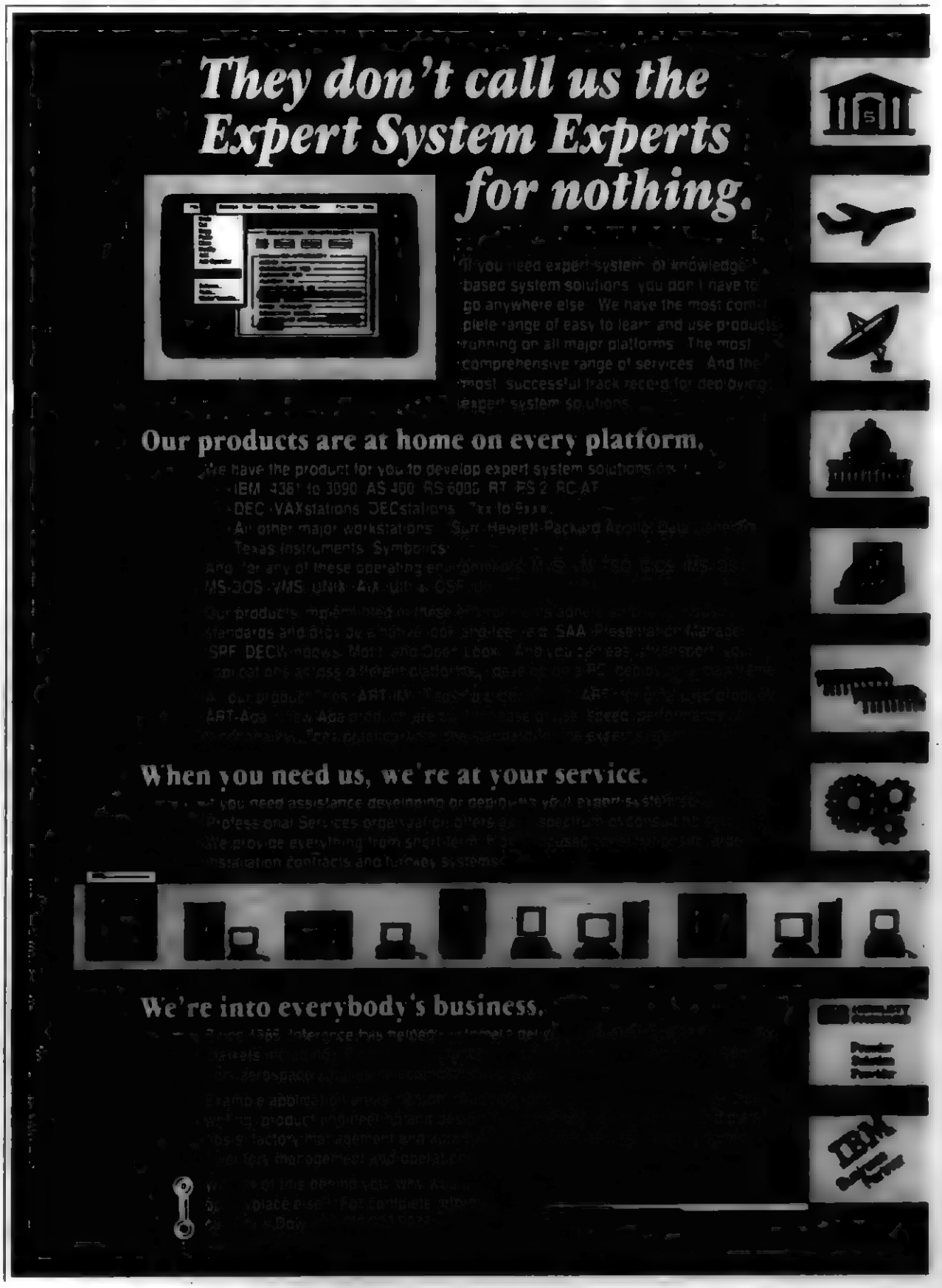
Xyplex
330 Codman Hill Road
Boxboro, Mass. 01719
(508) 264-9900

Cabletron Systems, Inc. has introduced a repeater, bridge and analyzer module that merges analysis functions and network management capabilities into a single hub.

The Intelligent Repeater Bridging Module (IRBM) was designed to be integrated into Cabletron's Multi Media Access Center (MMAC) hub to connect 10M bit/sec. Ethernet local-area network segments, according to the company. It comprises an IEEE 802.3 repeater, an Ethernet bridge, LAN-analyzing technology and network management software onto a single card that fits into a slot in an MMAC Model 8 or Model 3 hub.

The IRBM module costs $6,500.

Cabletron
35 Industrial Way
Rochester, N.H. 03867
(603) 332-9400



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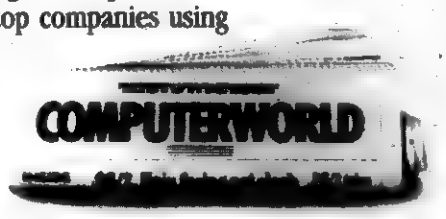

The Newsweekly of Information Systems Management

MANAGER'S JOURNAL

EXECUTIVE TRACK

Nathan O. Lowell has been promoted to manager of MIS in the Buffalo, N.Y., office of **Exchange Insurance Co.**, a property and casualty insurance subsidiary of Niagara Exchange Corp.

Lowell joined Exchange Insurance in October 1989 as a systems analyst. Prior to that, he was a senior systems analyst at Bath Iron Works Corp. in Bath, Maine. He lives in Tonawanda, N.Y.

.....

John M. Granger has been named corporate vice-president of MIS at **Roundys, Inc.**, a food wholesaler in Pewaukee, Wis. He is responsible for the design, development and installation of all systems in Roundys' 12-state marketing area, with specific emphasis on retail support systems development.

Granger was most recently vice-president of MIS at Richfood Holdings, Inc. in Richmond, Va. Before that, he was vice-president of the information systems division for eight years at The Stop & Shop Cos. in Boston.

Granger reports directly to President and Chief Executive Officer John R. Dickson.

.....

B. Lynn DeLeo, director of benefits at Depository Trust Co. in New York, has been named president of the **Human Resources Information Management Society**. The New York-based society is a nonprofit association of approximately 600 human resource and IS professionals.

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Who's on the go?

Changing jobs? Promoting an assistant? Your peers want to know who is coming and going, and *Computerworld* wants to help by mentioning any IS job changes in Executive Track. When you have news about staff changes, be sure to drop a note and photo or have your public relations department write to Clinton Wilder, Senior Editor, Management, *Computerworld*, Box 9171, 375 Cochituate Road, Framingham, Mass. 01701-9171.

Restoring the personal touch

The hotel industry is attempting to balance automation with customer service

SPECIAL INDUSTRY FEATURE

BY HELEN PIKE
SPECIAL TO CW

Who hasn't seen hotel clerks with their noses buried in terminal screens looking up only to ask for a credit card? And who hasn't disputed charges for phone calls that were never connected? Or worse, who hasn't been told his room is ready only to find the previous guest still there — sleeping?

That was the 1980s, an era in the hospitality business that saw development costs rise, buildings age and a growing gap between room availability and occupancy rates. There was a 40% increase in new hotel rooms that, in many areas of the country, could not be filled consistently.

Many hotels automated their accounting and reservations procedures during that time, hoping to streamline operations and boost efficiency. In the drive to computerize, something was often lost, however — the personal touch that can mean so much in building repeat business.

During the '90s, the lodging industry will be using information systems even more aggressively. However, it will also be trying to strike a better balance between cost efficiency and customer service.

IS executives are implementing new cost-control techniques for the back office, but these are complemented by and, in many instances, linked to ambitious red-carpet strategies to help put that personal touch back into operations.

The industry as a whole is readjusting the way it does business, says Larry Chervenak, a hotel consultant and president of Chervenak, Keane & Co. in New York. Hotels are using systems to simplify work, to improve the bottom line and to personalize attention to guests.

David Flaherty

Marriott Corp. in Bethesda, Md., a hotel and resort chain that operates more than 400 properties in the U.S., is regarded by many as a bellwether of the industry. A couple of years ago, Marriott executives decided to rethink the corporate statement.

They are now restructuring the organization, putting systems at the heart of it and adding a new emphasis: guest-focused employees empowered by technologies that enable a new level of personalized service.

Marriott's far-reaching corporate plan includes the following:

- A new human resources information system that will have the ability, among other functions, to help "associates" — as Marriott prefers to call its employees — with their career decisions if they decide to pursue a career in the hotel industry.
- A worldwide data network.
- A relational database of frequent Marriott guests.
- A new property management system that will encompass check-in and check-out, food and beverage, sales, catering and accounting.
- New IS tools developed through a joint venture called Confirm Central Reservation System, whose partners include American Airlines' AMR Travel Services, Hilton Hotels Corp. and Budget Rent-A-Car.

These plans attest to Marriott's emphasis on balanced integration of customer service and efficient operation. "We used to be focused on cost savings. Now we're most interested in improving service and making smarter decisions," says Charles L'Esperance, IS vice-president at Marriott.

One example is a recently implemented Guest Recognition System, which provides information that can be used to improve both customer service and profitability.

The system allows personnel to call up information about guests who have stayed at a Marriott before. This means that a staffer taking a reservation can spontaneously offer special

Continued on page 54

Turnover: The IS occupational hazard

BY CLINTON WILDER
CW STAFF

Everything you've heard is true. Turnover among information systems executives is increasing — and the average tenure of an IS chief is down to a mere 2½ years.

So concluded John J. Davis, president of New York-based IS executive search firm John J. Davis & Associates, Inc. In the mid-1980s, Davis pegged the average tenure of a vice-president, chief information officer or equivalent at three years; now it is about 2½ years. He based his conclusion on experiences with clients, which include financial services, media and transportation firms in major cities such as New York.

Davis admitted top management may be trigger-happy when it comes to firing the CIO but strongly emphasized that IS professionals must shoulder some of the blame. It is not enough to become good strategists; IS executives must deliver on projects and promises in the short term if they hope to establish credibility for their long-term vision for the firm's IS group.

"It's tough to find a CEO with five years of deep faith and deep pockets," Davis said. "As the CIO, you'd better prove in the near term that you're going in the right direction."

In addition to failing to set attainable near-term goals, Davis said, there are four other common complaints about IS chiefs from senior business executives that often lead to a parting of ways:

- IS executives are empire builders who want to create sophisticated technology environments — and then keep end users away from them.
- They are inflexible — continually defending turf, lines of reporting, budgets, investments and personnel.
- They do not streamline, and they resist efforts to reduce staffing and technology requirements and costs.
- They are out of touch with the company's business and view their main function as maximizing information systems — instead of profits.

"It's often a catch-22 situation," Davis admitted. "The CEO sometimes doesn't understand the role he's asked the CIO to play, then makes him a scapegoat."

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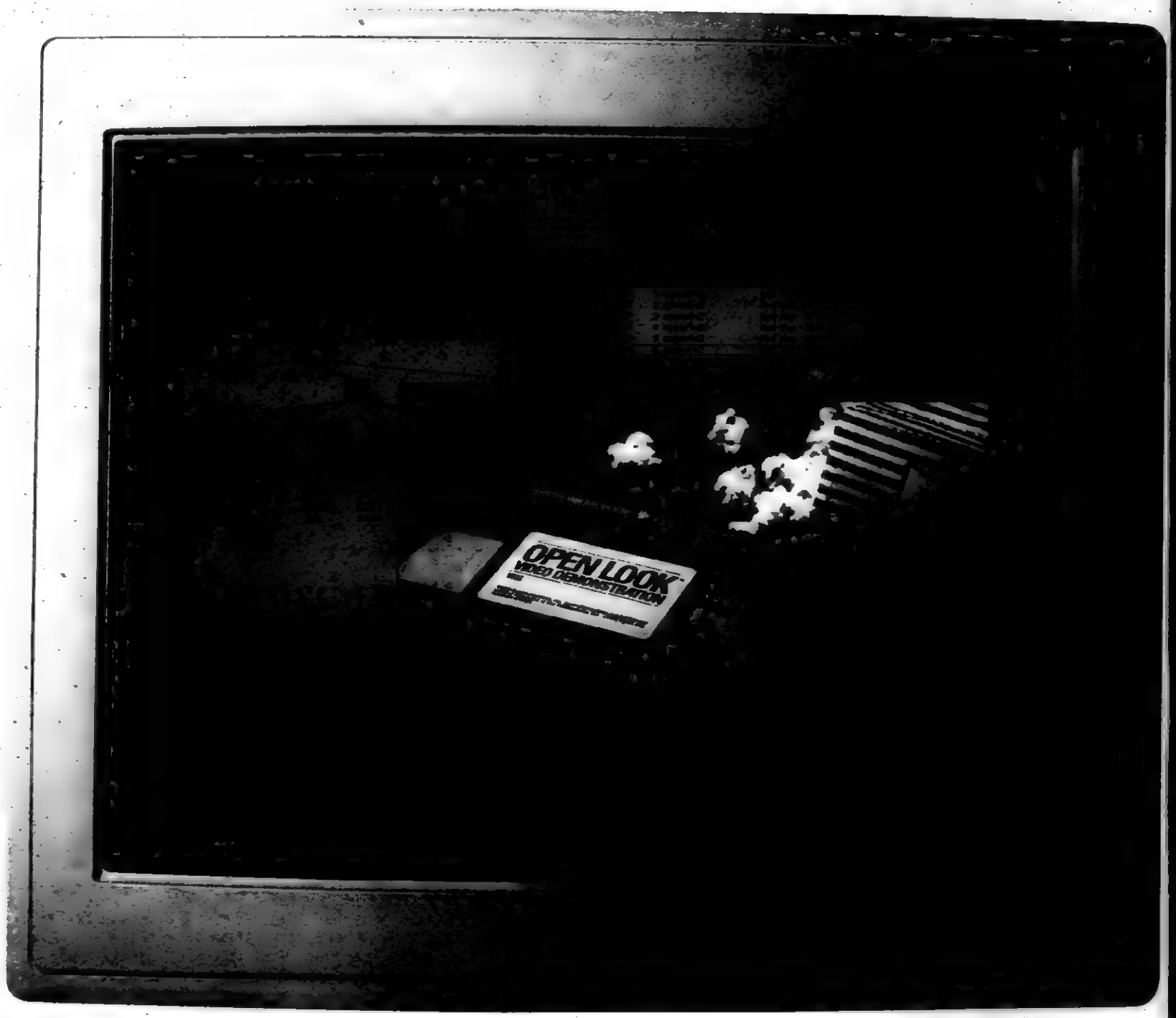

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Hotels

FROM PAGE 51

rates to those who qualify, such as senior citizens and participants in the chain's frequent traveler program. Because the client history contains information about rates paid, as well as dates and locations of stays, hotel employees can cut short any price haggling based on cheaper deals supposedly obtained at other Marriott facilities.

On the road again

Hotels fall short in several areas that frequent business travelers deem important, according to a survey of 400 executives

Source: Opinion Research Corp. CW Chart: Michael Siggins

Another example of Marriott's use of technology to deliver efficient service is a check-in program being used at the hotel's O'Hare International Airport location outside Chicago. Thanks to a terminal in the courtesy van that communicates via cellular technology with the information systems at the hotel, guests can check in and receive keys to their rooms during the ride from O'Hare.

One key to using IS as a means of improving guest service is to bring the systems and information they contain to the local level — putting information in the hands of individual hotels and staff members who interact with guests. Earlier this year, Marriott began decentralizing its IS department, moving its functions closer to the individual business departments at corporate headquarters.

Quality Inns' *Jim Yoakum puts personal touch in low budget, too*

Hilton Hotels in Beverly Hills, Calif., reaps value from its property management system locally with preventive maintenance scheduling. Devices attached to the air conditioners in hotel rooms and the saunas in health clubs, for example, monitor the equipment's use and automatically print out work tickets that schedule engineers to perform maintenance before the machines break down. According to Peter Salazar, systems planning director, this use of the system has produced a drop in guest complaints.

Further proof that guest satisfaction and operational efficiency can be effectively combined is the front desk check-in system employed by The Breakers, a luxury resort and conference center in Palm Beach, Fla.

The system allows a front desk clerk to register a guest by running his credit card through an electronic reader. Behind that simple action is a more complex transaction — a paperless one between The Breakers and a bank holding company acting as a third-party credit-card firm that immediately handles payment when the guest checks out.

In terms of a guest interface, the system drastically reduces check-in time and lets customers proceed to more important things, such as "a meeting, the pool or the golf links," says Paul Leone, chief financial officer.

The hotel also uses administrative software designed in-house and now sold by Flagler Computer Software. Among other features, the program automatically estimates guest charges and verifies available credit as part of the nightly audit.

Leone estimates that these systems produce the following cost savings for The Breakers:

- Between $50,000 and $100,000 annually from reducing the bank's service charge by electronically transmitting credit vouchers rather than mailing in the paper slips.
- $20,000 in salaries for two clerks previously needed to manually separate slips and total charges each day.
- $25,000 in savings from nonpayment or chargebacks because of expired credit cards or inaccurate billings.

The Breakers also managed to combine guest service and cost reduction by creating a business center as a spin-off of its IS operation. The center functions as both an administrative service for the hotel and a business service for guests. Guests can order everything from the use of a cellular telephone to someone to crunch numbers for them through Lotus Development Corp.'s 1-2-3 spreadsheet. It also reduces total IS departmental operating costs by $100,000, according to Leone.

Service with a byte

Breakers guests making arrangements for such amenities as the business center present another opportunity for tuned-in customer service. When a guest calls from the phone in his room, a data terminal automatically identifies the caller by room number, and Breakers employees address him by name.

Dusting off the electronic welcome mat is not restricted to premier hotels. Quality Inns International, Inc. in Silver Spring, Md., is automating its low-budget Sleep Inns to boost staff efficiency at the motels. Like elegant resorts, Sleep Inns are targeting check-in and check-out procedures. They use credit-card check-in systems based on cellular technology. The credit card acts as the room key and allows a guest to check out at an automated self-check-out box made by Cap Data in Phoenix.

Both services are designed so that Sleep Inns employees can spend more time "delivering the personal touch," explains Jim

The Breakers' *CFO Paul Leone and IS director Alesh Chandra favor speedy check-in*

Yoakum, IS vice-president at parent firm Quality Inns. If its test run with these systems gets a thumbs-up from guests, he adds, the firm will probably ask operators of the higher priced Quality Inn franchises to consider implementing the labor-saving technology.

The 1990s will be an era of finding new ways to use the data that hotels have collected through the use of systems during the past two decades to both attract and satisfy customers.

Jules Sieburgh, IS vice-president at Sonesta International Hotels Corp. in Boston, says the challenge is to find new combinations of information that hotels can exploit to sell rooms and generate repeat business. "We have all these databases," he says, "why can't we use them to do more business?"

Personal attention

Marriott thinks it can. The chain plans to start doing some predictive things with information it collects from its Guest Recognition System, such as knowing that a particular guest will want a nonsmoking room with a king-size bed, an iron and a hair dryer, or that he does not particularly like chocolates.

Besides using this information to provide customized services at a hotel, Chervenak says, great potential exists for using technology for marketing.

What hotels have now, Chervenak explains, is "good guest history information. Hotels can selectively send direct mail about golf or tennis tournaments or Marlin fishing expeditions" to guests who stayed for similar events in the past.

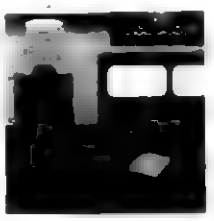
"There are dozens of ways to home in and take care of your market," he says.

Pike is a free-lance writer based in the Boston area.

Please be my guest

Conrad Hilton knows a thing or two about getting maximum return on investment. In his autobiography, *Be My Guest*, the hotel magnate recalls carving up a dining room to create more rentable space. Beds, he explains, are where the profits are for a hotel.

That piece of wisdom is hardly news to anyone in the industry, where strategy meetings often center on the importance of maintaining or increasing the "rack rate." Still, the lodging business has tended to concentrate more heavily on the relatively simple task of keeping beds full rather than on the much trickier science of obtaining the optimum balance between high occupancy and maximum room rates.



Airlines and car rental companies excel at this, says hotel consultant Mark Elbe. They have devoted a lot of thought and resources to figuring out how to intelligently fill the maximum number of seats and vehicles while getting the best obtainable price. The hotel industry, on the other hand, is just starting to get hip to the fact that yield management pays.

Obtaining just $1 more per room on the average daily rate could translate into $100,000 in additional annual revenue for a 400-room hotel with a 70% occupancy rate, says Jules Sieburgh, IS vice-president at Sonesta International Hotels Corp. in Boston.

Hotels use a variety of systems to better their odds in this high-stakes guessing game. Sonesta, for example, uses a front-office package from Computerised Lodging Systems, Inc. that runs on an MAI Basic Four, Inc. minicomputer. The front-office software is Compusystem, which costs $18,000 and includes a yield management feature.

Separate programs specifically designed for that purpose are also available. A Holiday Inn in Atlanta's chic Buckhead neighborhood uses a yield management system from Elbe's consulting firm, Laventhol & Horwath, to forecast the number of walk-in guests it should anticipate at a higher room rate compared with groups booked at a lower price. The inn had traditionally set aside 150 of its 221 rooms for group sales, says Art Beaulier, general manager. Based on results from the yield program, the inn now sets aside 25 fewer rooms and can quote room rates two months in advance.

The types of forecasts involved in yield management do not necessarily require a dedicated commercial package, Elbe says.

Much of the information needed for yield analysis, he explains, is collected in hotels' property management systems. "But most people just use it statistically," Elbe says.

Best Western International, Inc. in Phoenix has noted the connection. It is currently writing a personal computer-based property management system that will incorporate a feature to perform yield management predictions.

Best Western, which provides IS services to its 3,300 affiliate hotels, is also writing software to provide a local events database to some of those affiliates. Keith Barlow, systems development vice-president, regards this system as an extension of yield management. Hotels, he explains, will be able to correlate special local events with the dates of a planned stay, possibly convincing business travelers to add an extra leisure day to their stay.

HELEN PIKE

BOOK REVIEW

H. Ross Perot: Devil, saint — or a little of both?

PEROT: AN UNAUTHORIZED BIOGRAPHY
By Todd Mason
Dow Jones-Irwin, $19.95

Somewhere on his way to completing a biography of H. Ross Perot, veteran journalist Todd Mason ran into two roadblocks, either of which might understandably have sent him packing.

First, someone beat him to the punch. Fellow journalist Doron Levin penned the 1989 book *Irreconcilable Differences*, which offered a lively account of the unholy alliance between Perot's Electronic Data Systems Corp. (EDS) and General Motors Corp.

The second blow came when Perot refused to bless or aid Mason's project.

However, Mason — armed with an impressive amount of secondary views of his subject, not to mention his own memories and notes left over from his days as *Businessweek*'s Dallas bureau chief — soldiered on.

The result is a book that bears the scars of its impediment-ridden birth. Factually, there is little that is new to anyone who read Levin's book, and nothing comes from Perot. Moreover, the narrative is burdened by an organization (or lack of it) that borders on surrealism. Characters, themes and points wander in and out, disappearing inexplicably only to pop up in a later chapter.

Nevertheless, Mason ultimately succeeds in delivering a work that should fascinate those interested in Perot. Readers are given front-row seats at a hands-on, 290-page demonstration of the ambivalence aroused by Perot's charismatic personality. They can feel the frustration inherent in trying to capture in writing a person whose acts defy the kind of one-dimensional, instant sound-bite characterization on which we are increasingly and perilously coming to rely.

Consider, for example, Mason's attempt to convey the high price of Perot-style entrepreneurialism at EDS, the first of his corporate creations: "Despite Perot's gestures, families bore the brunt of EDS zeal. The company was something of a family life neutron bomb." Stop here, and you see Perot as hypocrite and tyrant.

But the author continues: "Most of the marriages and homes were standing afterward — EDS didn't hire men with faint-hearted wives — but Dad was nowhere to be found." Well, maybe not quite a tyrant. After all, can't many of us recall nights when our parents — heck, when our kids' parents — missed dinner because of work?

However, the author continues: "Perot's own family turned out well despite his brutal hours. His family had first claim on the rest of his time. Perot had the right attitude. He startled the counselors at his daughter's summer camp several years ago when he stuck out his hand and announced, 'Hi, I'm Nancy Perot's father.' " The transformation is complete: Perot has segued from Simon Legree to Alan Alda without the reader turning a page.

It is a pattern that is repeated again and again throughout the book. The reader can almost feel the author's internal tug-of-war as he struggles to be honest with himself, his subject and his audience. A chapter titled "Down and Dirty" begins by likening an angry Perot to a bird of prey and states that encounters with "the Eagle" were "aversion therapy at its finest." Less than three paragraphs later, however, the reader — who might justifiably expect a juicy anecdote or two to illustrate the assertion — is made to swallow a moral apologia: "There's nothing inherently good or evil in Perot's full-tilt persecution. Perot is implacable, relentless Perot." Then, he's served a comparison of Perot with Winston Churchill as a chaser.

Perot, Mason tells us, demands absolute faith on the part of his followers; those not 100% for him, he consigns to the ranks of those 100% against him — and we are assured there are plenty of folks lined up on both sides. Mason's inability to join either camp and the debate he wages with himself as he tries to sell himself and us on a comfortably polar position is at once his book's structural weakness and its thematic strength.

Unfortunately, the book runs the risk of disappointing readers who come to it with great expectations of the very polarity Mason won't/can't/doesn't deliver. Barely was the book out on the shelf before the word was out on the street: This was the report from the Dark Side, the warts-and-all version. The very title of the book — *Perot: An Unauthorized Biography* — spoke volumes. If the book was going to be complimentary, the logic ran, why wouldn't Perot sit down and talk to its author?

The logic was impeccable. It was also wrong. Warts? With enemies like this, Perot doesn't need any friends.

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Margolis is *Computerworld*'s senior editor, industry.

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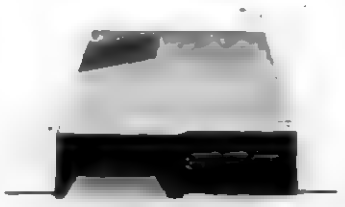

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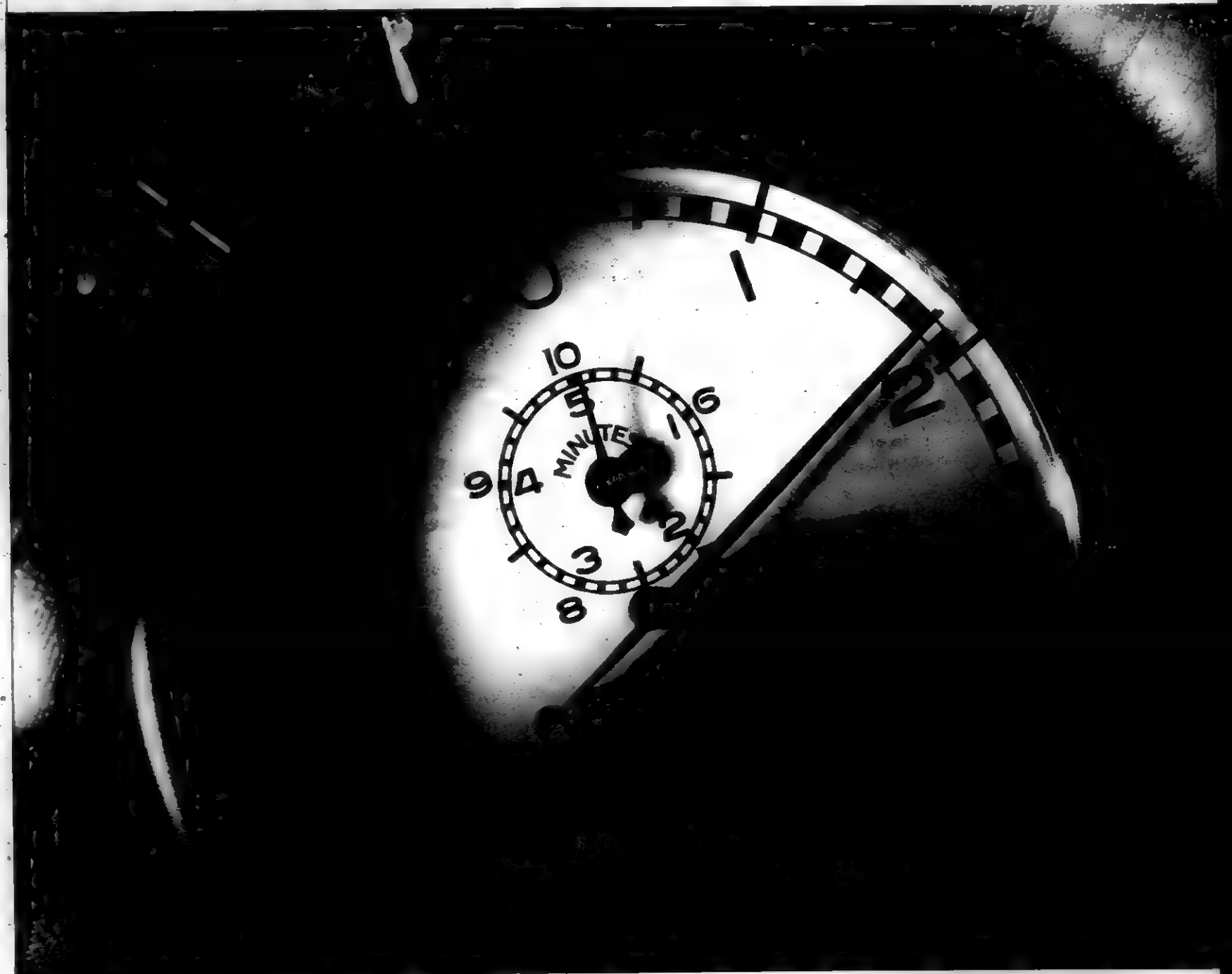

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AUG. 12-18

The Urban and Regional Information Systems Association. Edmonton, Alta., Aug. 12-16 — Contact: URISA, Washington, D.C. (202) 289-1685.

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Downsizing Conference: Moving from Mainframes to PCs. Boston, Aug. 13-14 — Contact: Digital Consulting, Andover, Mass. (508) 470-3880.

Windows/Full Conference and Exposition. Boston, Aug. 15-17 — Contact: CM Ventures, Emeryville, Calif. (415) 601-5000.

AUG. 19-25

Eastern Regional ISSA Conference. Washington, D.C., Aug. 19-21 — Contact: Ralph S. Poore, Baltimore, Md. (301) 783-3865.

Gupta Developers Conference: Open-ing Windows to SQL. San Francisco, Aug. 19-22 — Contact: Gupta Developers Conference, Andover, Mass. (800) 767-2356.

Relational Today Seminar. Palo Alto, Calif., Aug. 20-21 — Contact: Codd and Date, San Jose, Calif. (408) 441-6400.

Strategic Information Systems Conference. Boston, Aug. 20-21 — Contact: University Seminar Center, Boston, Mass. (617) 248-8086.

International HP Computer User's Conference. Boston, Aug. 20-23 — Contact: Ann Pavlik, Interex, Sunnyvale, Calif. (408) 738-4848.

Summer Workshops for the Information Processing Professional. Nashua, N.H., Aug. 20-23 — Contact: Ouellette & Associates, Bedford, N.H. (603) 623-7373.

SCO Forum '90. Santa Cruz, Calif., Aug. 20-24 — Contact: The Santa Cruz Operation, Santa Cruz, Calif. (408) 425-7222.

Early, Cloud & Co.'s Summer Conference on Telecommunications. Newport, R.I., Aug. 22-23 — Contact: Early, Cloud & Co., Newport, R.I. (800) 322-3042.

AUG. 26-SEPT. 1

National Computer Graphics Association Conference and Exposition and GIS '90. Houston, Aug. 26-29 — Contact: NCGA, Fairfax, Va. (703) 698-9600.

Unix Security Workshop. Portland, Ore., Aug. 27-28 — Contact: Usenix Conference Office, El Toro, Calif. (714) 588-8649.

CASE for the 1990s. Boston, Aug. 27-29 — Contact: Extended Intelligence, Chicago, Ill. (312) 346-7090.

Auto-Tech '90. Detroit, Aug 28-30 — Contact: AIAG, Southfield, Mich. (313) 358-3570.

SEPT. 2-8

FED Micro '90. Washington, D.C., Sept. 5-6 — Contact: National Trade Productions, Alexandria, Va. (703) 683-8500.

Strategic Planning for Information Systems. Toronto, Sept. 5-7 — Contact: Barnett Data System, Rockville, Md. (301) 762-1288.

Telecommunication Management. Chicago, Sept. 5-7 — Contact: Business Communications Review, Hinsdale, Ill. (800) 227-1234.

SEPT. 9-15

Adding Image Processing to Information Systems. Toronto, Sept. 9-11 — Contact: Technology Transfer Institute, Santa Monica, Calif. (213) 394-8305.

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ISDN and LANs? Huh?

An innovative experiment at West Virginia University promises good news for scattered network users everywhere

BY JEFFREY N. FRITZ

As local-area networks continue to grow in importance, users and vendors are scrambling for new techniques that can provide LAN services. The latest, somewhat unlikely sounding, LAN alternative? The Integrated Services Digital Network (ISDN).

That's right. Because it supports services that can be deployed in a LAN-like manner, ISDN can actually be an effective substitute for LANs. As it exists today, ISDN cannot replace Ethernet or token-ring networks because it simply does not deliver high enough throughput speeds or offer the degree of connectivity found on most LANs. However, the fact is that ISDN *can* play an important role as a means of providing LAN extension services.

During the next two weeks, West Virginia University, the state's largest school, will complete testing of an innovative new ISDN/LAN gateway service application at two campuses in Morgantown, W. Va., and at the West Virginia Network for Educational Telecomputing (WVNET). WVNET serves as a computing hub for all state colleges and universities in West Virginia.

The system links remote users in buildings or offices without LANs and lets them access servers and mainframe data at speeds of 9.6K bit/sec. or 38.4K bit/sec. — all without extra hardware or network wiring. Besides reducing hardware requirements, the approach also reduces contention. It funnels analog-to-ISDN, ISDN-to-analog and Ethernet traffic through a common hub, eliminating the need for bridges. The overall benefit, of course, is that on- and off-site users alike can now be guaranteed faster access from any location equipped with ISDN.

After several months of testing, it is clear that ISDN is a feasible and desirable networking solution for any institution, public or private, that has remote computing users. The initial results indicate that ISDN/LAN gateway service is a viable way of providing remote LAN connectivity. In fact, it may well prove to be one of the more important ISDN applications.

Fritz is a data communications analyst at West Virginia University in Morgantown, W. Va.

The idea of using ISDN for LANs sprang up last fall. The information systems staff is continually looking for ways to make ISDN better serve the computing environment. West Virginia University has had ISDN on campus since August 1988, and several people in the telecommunications department simultaneously got the notion of using it as a LAN replacement that could bridge two Ethernet networks.

A local problem

The basic networking problem stems from a simple fact: Most local-area networks are just that — local. LANs commonly do not extend beyond the confines of a single building. Connecting users who are great distances from a LAN backbone is problematic.

For example, one off-campus user at West Virginia University, the Cooperative Extension Department, has nearly 200 staff members that access shared information on a Digital Equipment Corp. VAX attached to an Ethernet LAN. Normally, this would require enough extra hardware and cabling to add the workers to the existing Ethernet network. The problem is that these staff workers are not located in the same place. In fact, they are scattered throughout different departments and across two separate campuses.

Currently, they use campus mail to send floppy disks back and forth. Obviously, this is not an efficient way to communicate critical data and is prone to all kinds of problems: Disks frequently cross in the mail, the latest version of the data files is not always known and, of course, there is a time lag of several days produced by the campus mail. Providing each worker with remote connectivity to a common Ethernet network would result in a major increase in the department's productivity and accuracy.

In a university, as in many environments, key users need connectivity to critical LAN services at all hours — even at 3 a.m. or during a major winter snowstorm. System analysts, writers and research scientists rarely live by a 9-to-5 regimen. In fact, many say their most creative energy often occurs during what might be considered off hours. Ironically, because such users generally spend their off hours at home, they have the least efficient connectivity during their most productive hours.

Analog modems, by far the most common form of remote connectivity, usually do not offer fast enough throughput for LAN applications. Even modern 9.6K bit/sec. modems can be excruciatingly slow for large file transfers, complex graphics or downloading such applications as Lotus Development

Deborah Wiley

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Digital services such as T1 or 56K bit/sec. lines do offer faster throughput, but they are not generally available to residential customers and are rarely economically feasible for remote user applications. On the other hand, ISDN, when used as a gateway service, can provide remote users with instant connectivity to existing LANs.

At West Virginia University, an installed private-branch exchange (PBX) that was once adequate had long since seen its day. There were significant performance problems, such as throughput restriction at certain times of day or users who simply could not get connected. The challenge was to figure out a way to get improved service for the various professors and staff members, many of whom worked at home during odd hours. There had to be a better way.

Two approaches

The ISDN idea made sense, so after some discussion, an agreement was made between the university and WVNET to test a pilot application.

Even before the project began, it had an advantage: The university's president actively encourages new and innovative uses of ISDN. The basic test criteria were for improved connectivity and better service to our users while still maintaining very low costs.

ISDN, WHEN USED as a gateway service, can provide remote users with instant connectivity to existing LANs.

Approval came quickly, and testing began in June at ISDN Application Laboratories, the university's engineering science department and WVNET.

The university staff evaluated two different configurations of the ISDN gateway. One method was designed to connect multiple users through a common link at speeds up to 9.6K bit/sec. The other method supported fewer users, but it did so at higher speeds — typically 38.4K bit/sec.

For the higher speed application, a Telrad MPA-19 multiport ISDN terminal adapter was connected to an Ethernet terminal server. Connection was supported over an ISDN B channel at 38.4K bit/sec. This method provided circuit-switched connectivity at decent speeds.

Circuit switching is a connecting method that is very similar to making a telephone call. The user connects to a terminal server by placing a data call over the ISDN B channel. If multiple terminal servers on different Ethernet LANs are available, the user can select and dial the Ethernet of interest. A session can be established and last as long as desired. It is then a simple matter of the user disconnecting from the first terminal server and connecting to another Ethernet LAN for a second session.

The second configuration offers a wider connectivity base but at reduced individual throughput rates. It uses an ISDN packetized CCITT X.25 link that provides multiple logical user channels. This rather impressive-sounding concept is really quite straightforward. An ISDN Basic Rate Interface (BRI) line can be set up so that it uses the X.25 protocol to communicate with a packet assembler/disassembler (PAD) at the destination. Users are each assigned a logical channel number. In that way, a single link can support up to 50 users. This lowers the equipment and monthly line costs for the Ethernet side of the link.

Hard numbers

Typically, the ISDN switch gathers all the users and places them on a common B channel. The PAD breaks the users apart and routes each to their individual destinations. Thus, users simply dial a common ISDN number from their ISDN D channel terminal. A logical channel is assigned by the ISDN switch for each user and maintained for the duration of the session. To the user, this is all very transparent. A single ISDN B channel can support a number of individual users.

In theory, ISDN will support up to 127 users, but in practice, the number of users is much smaller — typically 50 or fewer. This is because a single B channel has a total bandwidth of 64K bit/sec. The X.25 protocol bandwidth increases as the number of users actively transferring data over the link increases. Once the total 64K bit/sec. aggregate bandwidth is exceeded, X.25 link saturation occurs. Packets from all users become damaged, causing substantial communications problems. Thus, it is necessary to place some limits on the maximum number of simultaneous users on the link.

In this case, the user can actually mix and match the services, depending on what is available, the needed throughput speed and the choice of ISDN B or D channels.

Three different devices were tested for the common gateway service on two heavily used Ethernet networks. 3Com Corp. in Santa Clara, Calif., provided a GS-1 Gateway on one of the Ethernets. A Canadian company, Develcon Electronics, Inc. in Saskatoon, Saskatchewan, installed an I Gate unit on a second Ethernet, and Datability, Inc. in New York sent its Vista Server, which was installed on the same Ethernet network as the I Gate. Most of the devices were able to support up to 50 users via a single X.25 ISDN B channel.

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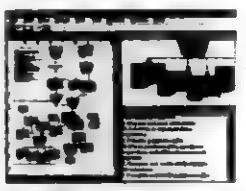

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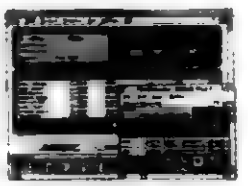

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The most challenging part of implementing this application was coordinating the myriad parameters between the packet handler in the ISDN switch and the PAD in the gateway. These complex parameters are not for the faint-hearted or inexperienced.

With each new vendor, it was necessary to go through the same laborious process of aligning each gateway PAD parameter to the telephone company's central office ISDN switch. This was further complicated by a general lack of familiarity with ISDN X.25 service on the part of some vendors.

In time, this will change as vendors become more familiar with ISDN X.25 service. However, all vendors were quite willing to provide any necessary extra support, and the end result always justified the work and frustration that went into setting up the links.

Each device offered a slightly different set of advantages, and all of the devices confirmed that the application was indeed viable. One device, the 3Com GS-1, revealed a significant but little-known benefit of the gateway service.

A hidden surprise

When CCITT defined the ISDN D channel dialing protocol, it appended a 12-digit data field to the telephone number. We learned, almost by accident, that ISDN will accept a number such as 5551234D1-29071012001. The first seven digits are simply the telephone number of the destination gateway. The "D" signals the start of the data field. The central office switch connects the call to the 555-1234 destination and then passes the data field to the gateway.

In this case, the data field contains 129071012001, which is an Internet address for a specific Transmission Control Protocol/Internet Protocol (TCP/IP) device. The gateway immediately connects the user directly to the Ethernet destination. In fact, all the user sees is the log-on prompt for the specific TCP/IP device. This is a significant advantage, because the gateway becomes completely transparent to the user. Transparency enhances network security and greatly simplifies connectivity.

Unfortunately, not every ISDN device accepts the extra data. Many standard communications packages will accept and transmit the additional 12 digits as part of their dialing capability, however, thereby making transparency an easy task. This feature makes it possible to write simple scripts that automatically connect to a selected destination. Little involvement is required on the user's part, making it additionally attractive.

Extending the extension

The ISDN gateway service immediately caught the attention of campus and network communications personnel. It occurred to several people in the department that the ISDN LAN extension concept could be expanded to a larger hub gateway service.

In this configuration, the gateway hub could replace a data PBX switch at WVNET that was out of date, as well as adding supplementary services to WVNET's users. To see if such a configuration would work, the Develcon I Gate was configured for the connectivity hub configuration.

With the hub gateway configuration, multiple services can be made accessible through a common interconnection point. The hub can support ISDN and analog services as well as LAN connectivity. Although remote LAN access is an important element of this application, the gateway hub is not limited to inbound LAN connectivity.

BY USING THE hub gateway service, an Ethernet user can connect directly to an ISDN user or, via the modem pool, to an analog user anywhere in the country.

For example, by using the hub gateway service, an Ethernet user can connect directly to an ISDN user or, via the modem pool, to an analog user anywhere in the country.

In a similar fashion, an analog user can use the modem pool to gain access to the gateway and connect to an ISDN user. The analog user dials the number associated with the gateway modem pool. Once connected, the user selects the ISDN service prompt and then simply dials the ISDN data number. And the ISDN user dials the common X.25 link number of the gateway hub and selects the modem pool service.

The user is then connected to an available modem and can issue standard modem AT dial commands. Thus, true interconnectivity among a large variety of different services can be realized. Users on analog, ISDN or LAN services can have direct access to mainframes, minicomputers and servers residing on the LAN.

With a hub gateway configuration, ISDN simply becomes integrated as part of a much larger network fabric. Having the ability to connect from any service to any service forms the basis for true interconnectivity. While this ISDN-inspired hub gateway service does not completely fulfill this goal, it is a credible step in the right direction. Individual circumstances may differ, but the principles successfully tested at West Virginia University can easily be adopted by many other organizations as a low-cost LAN alternative. ●

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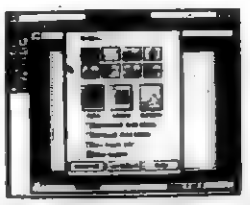
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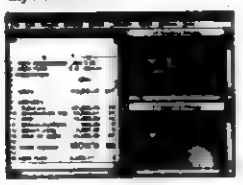
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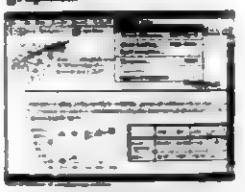
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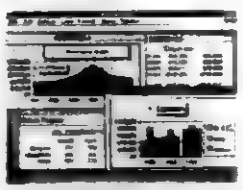
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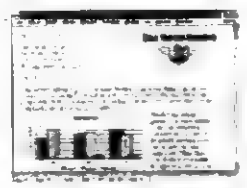
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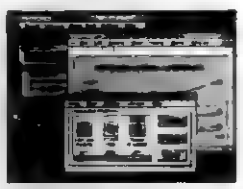
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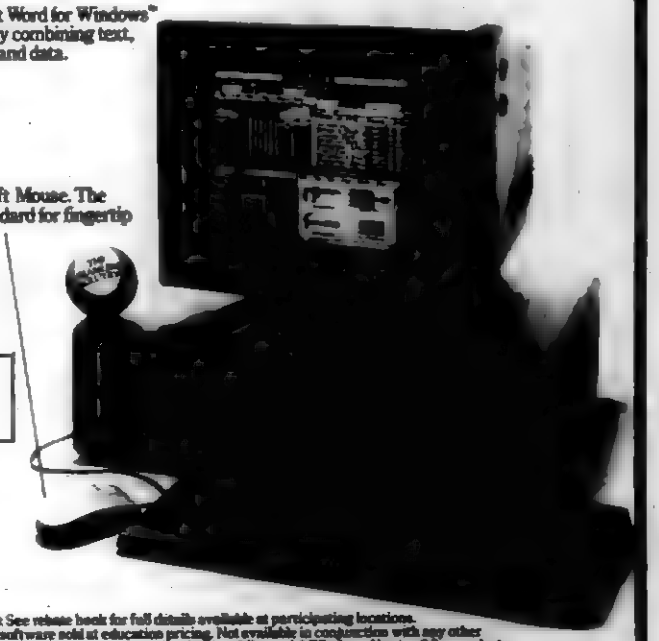

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NATIONAL
BRIEFS

Read my MIPS

Two weeks after **Stardent Computer, Inc.** co-founder and former co-chairman **Allen Michels** went to court to call **Kubota Corp.** a technology thief, Stardent is calling its Japanese investor/partner "partner" — and then some. Last week, the allies made an announcement of the imminent opening of Sunnyvale, Calif.-based **Kubota Pacific Computer, Inc.** — created, a Kubota spokesman stressed, "to manufacture supercomputer products for [Kubota's] strategic partner, Stardent." Kubota also announced that its vice-president of business development, **Naohisa Matsuda**, will head the new subsidiary.

■

Deja vu all over

Meanwhile, back in San Francisco, **Michels** and co-plaintiff, co-founder and, until their mid-July termination, co-chairman of **Stardent** Matthew Sanders, stated their take on the firm's latest move. "Our terminations are unlawful and retaliatory," they said. "This compounds the illegal acts alleged in our complaint, and we plan to seek immediate redress in the courts."

More briefs on page 68

The name of the game

Packard Bell is banking heavily on good old American nostalgia to win clone war

BY JAMES DALY
CW STAFF

What's in a name? In the faceless sea of IBM Personal Computer clones, sometimes it can be worth the whole shootin' match.

Take Chatsworth, Calif.-based Packard Bell, for instance. Its ads recall the company's early pioneering days in radio and television, evoking the winsome nostalgia of grandma listening to one of Franklin Delano Roosevelt's fireside chats or Dad guffawing at Uncle Miltie in a dress on the tube. The sales pitch: "America grew up listening to us. It still does."

A great old American company with a grand old heritage, right? Well, not quite.

"The name is really quite a marketing ploy, but I guess it beats calling yourself something that sounds vaguely Korean," said John Venator, executive vice-president at Schaumberg, Ill.-based ABCD: The Microcomputer Industry Association. "It gives consumers the impression it's a U.S.-built machine when in fact it's made in Asia, just like most of the other clones."

The original Packard Bell is long gone, having crumpled like most of the rest of the domestic consumer electronics industry in the 1960s. It was swallowed up by Teledyne, Inc. in 1968 and, by the mid-1970s, was little more than a twinkle in the eye of the geriatric set.

That's when Beny Alagem stepped in. Alagem, an Israeli immigrant and co-founder of a Southern California semiconductor distribution business, teamed up with a pair of financial investors and in 1985 plunked down a reported sum of $100,000 and bought the Packard Bell moniker and all its historical associations.

"Although Packard Bell products hadn't been in the public eye for a while, we discovered there was still a lot of name awareness," said director of marketing Dennis Cox. Company researchers discovered that older customers remembered the old Packard Bell radios, younger ones recalled the TVs and some folks even confused it with Hewlett-Packard Co.

Shelley Gazin

Alagem uses name recognition to his advantage in marketing Packard Bell products

With half the recognition battle in the PC clone market already won, Alagem put together a battle plan to sell his systems. He figured that Asian suppliers could make the parts inexpensively and to order, and he signed on with a number of Asian component manufacturers, including Taiwan's Tatung Co. and South Korea's Samsung Electronics Co.

"Our goal was very simple," said Alagem, who is now president of the firm. "Bring a high-quality turnkey product into the marketplace and back it up with a high level of support."

Was it dishonest to play on the customer's familiarity with the original firm when, in fact, the only thing that remained was the name and fond memories?

"No, of course not," Alagem said. "We continue to maintain the spirit and the high-quality product of the original company."

By late 1986, Packard-Bell was shipping the parts to its headquarters, where they were assembled and sent off to an array of home electronics and consumer goods stores.

But Packard Bell was not about to bank its fortune on misty-colored memories. The systems range from Intel Corp. 80286-powered laptops to the Froce, 38625, which packs an 80386 processor running at 25 MHz with a color monitor and 60M-byte hard disk. Prices normally start at less than $1,000, and a home video is included with each system to smooth computer setup.

"Although they are not as strong a name as NEC, Epson or Zenith, the perception is that Packard Bell is a quality low-cost PC supplier," said Mark Levitt, an analyst at Framingham, Mass.-based market research firm International Data Corp. (IDC). "They're also unique in that they offer a wide range of performance in channels formerly limited to the low range of performance. Their presence has

Continued on page 68

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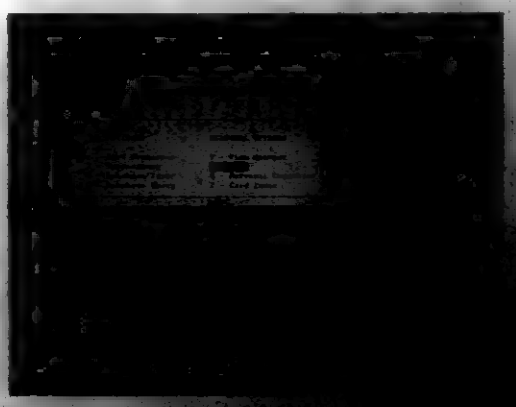

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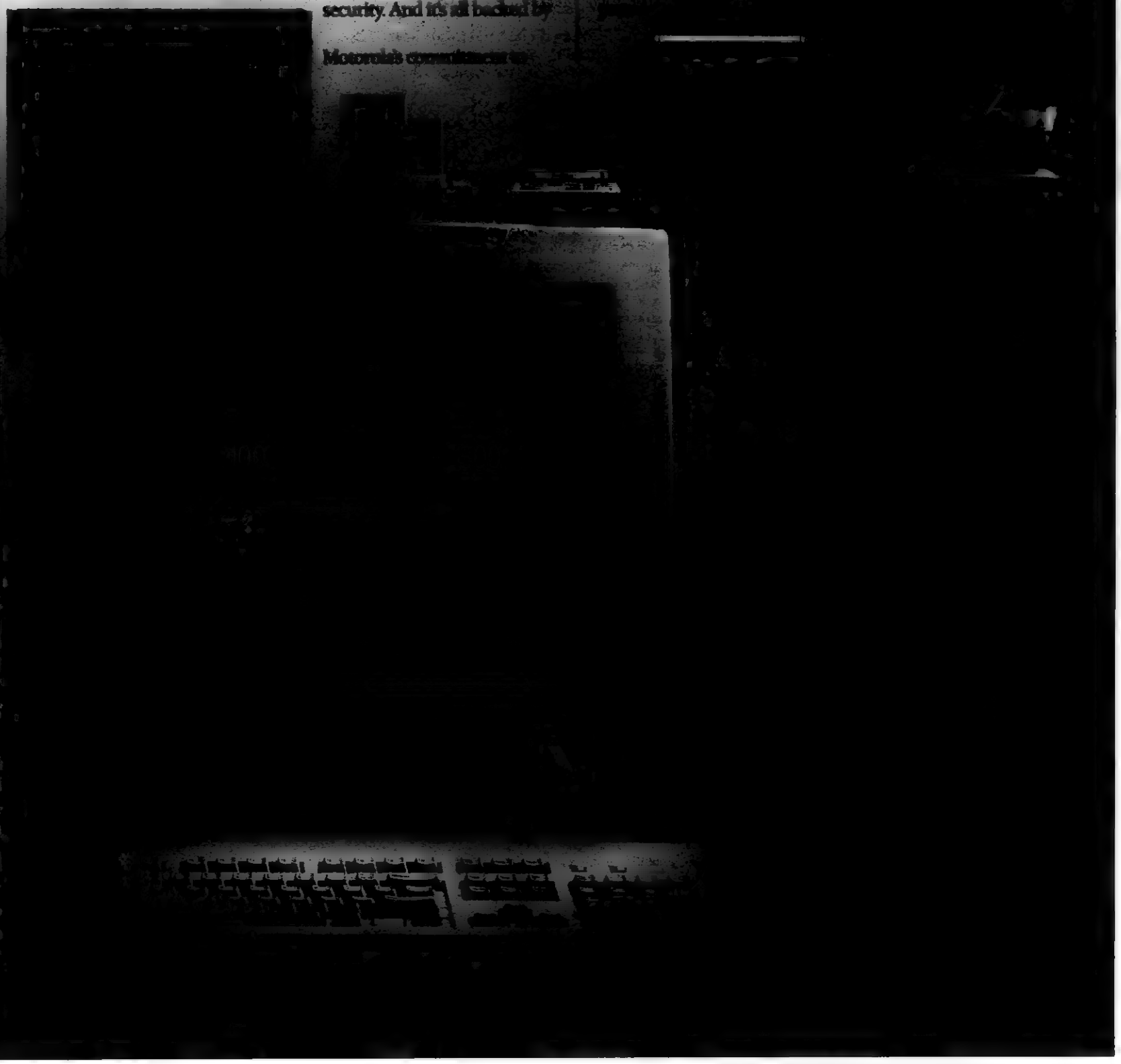

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'Buyer beware' for software

Vendors purchasing code must watch for infringement to avoid lawsuits

BY JOHANNA AMBROSIO
CW STAFF

The ancient Romans did not have software vendors in mind when they coined the phrase *caveat emptor*. But the sentiment "let the buyer beware" seems especially applicable when a software vendor sets out to acquire a product. There is no way, legal experts say, to guarantee that the product is completely aboveboard and free of code that infringes on another vendor's product.

This sticky issue was recently brought to the fore by the lawsuit filed by Computer Associates International, Inc., alleging copyright infringement by Goal Systems International, Inc. [CW, July 2]. The package in question, which Goal has conceded does indeed infringe on CA's copyright, was one that Goal purchased from an individual developer in 1988. The infringing code, Goal said, goes back to when the company first bought the package.

"The Goal-CA lawsuit underscores the risk that some rightful owner will come forward unexpectedly somewhere down the line and stake their claim," said Barry D. Weiss, an attorney at the Chicago law firm of Neal Gerber & Eisenberg.

So what is a software vendor to do? There are some standard protections, collectively known in the legal trade as "due diligence," which say to the world and to the courts that the buyer has done all it can to ensure that the product is clean.

One commonly used device is the insertion of something called an indemnification clause into the purchase contract. That means the seller guarantees the product to be free of infringing code — or, if it turns out not to be, the seller guarantees to repay the buyer for legal fees and other costs.

Practically, however, indemnification often does not work that way. Typically, the seller is a one-person operation or a very small company. When the lawsuit hits, that person or company has no resources with which to pay back the buyer.

> "IF A GUY really wants to cheat you, he can. You just have to be extremely cautious."
>
> CHARLES WANG
> COMPUTER ASSOCIATES

Another tack is to hold a portion of the payment for the company or product in escrow for, say, seven years or for however long the statute of limitations holds. That money can be used to pay legal fees and damages, although this strategy may not be popular with the principals of the selling company.

Also, the acquirer generally sends business people and technical people to check out the package.

"Your technical people go nose to nose with theirs, and you ask a lot of questions," said Charles Wang, CA's chief executive officer, who has been through this process once or twice himself. "You can tell whether the other guy knows the code like he should."

James A. Rutherford, Goal's chairman, said, "Before an acquisition, you look at the source code. But you can't look at every line of code in a large product. So you rely on the warranties in the contract and on the general feelings you get from and about the principals of the other company. You want to make sure the other people have the same ethics and ideas about doing business that you have."

What the issue ultimately comes down to is the relationship between the principals involved in the deal. "If a guy really wants to cheat you, he can," Wang said. "You just have to be extremely cautious."

Still, it does not behoove the negotiations process to make the other party too uncomfortable. "You ask too many questions, and the seller thinks you think he's a crook," said Daniel T. Brooks, an attorney at Cadwalader, Wickersham & Taft in Washington, D.C. "And if you ask who wrote which portions of the code, the CEO looks at you like you're crazy."

"There's only so much you can do," Weiss said. "There's no title insurance for software, like you have with a house. And you can search through copyrights, but that process is unwieldy." In addition, many vendors copyright their software only when they're about to file suit against someone; in view of this practice, a copyright search provides only something less than a reliable guarantee.

Money maker?

Insurance is something that the software industry might consider, said John C. Lautsch, an attorney in Orange, Calif. "My guess is that it may be possible to arrange some kind of insurance policy to protect against this. If the market is large enough, and the policies are written so that the insurance companies will make money off this, then maybe it can be done," he said.

Lautsch suggested that there might be "fruitful discussions between insurance companies and bigwigs in the software industry. People tend not to deal with software companies because they don't realize the market and because they don't know how to approach it. It's up to the software industry to show them how."

Super bowl

Supercomputer vendor Cray Research showed exponential profit growth in the second quarter

Computer Sciences	$407.6M	15%	$13.7M	4.6%
Convex	$51.8M	38%	$4.4M	69%
Index Technology	$13.2M	41%	$494,000	(15%)
Northern Telecom	$1.7B	12%	$80M	28.8%
Seagate**	$668.1M	80%	$29.7M	24%
Stratus Computer	$94M	13%	$7.1M	(21%)

Parentheses indicate a reduction or loss

* Revenue decline reflects sale or discontinuance of several operating units, including Imprimis Technology; also, results include pre-tax gain of $4.3M on sale of Silicon Graphics stock.

**Results include operations of Imprimis Technology from Oct. 2, 1989 date of acquisition.

CW Chart: Paul Mack

Packard Bell

FROM PAGE 65

grown tremendously. More and more stores carry them. People have recognized the name and the history that goes with them, and you see a lot of people buying and selling them."

Packard Bell also offers four months of on-site service as well as a one-year carry-in guarantee on parts and labor.

So far, the strategy has worked. Last year, the 600-employee company pulled in more than $600 million in revenue; its business products division is growing 30% annually. Research firm IDC ranks them among the top six U.S. suppliers of IBM PC-compatibles, and in the home office segment, Packard Bell is the No. 1 supplier of desktop computers, according to Personal Technology Research, based in Boston.

> "ALTHOUGH PACKARD BELL products hadn't been in the public eye for a while, we discovered there was still a lot of name awareness,"
>
> DENNIS COX
> PACKARD BELL

Packard Bell's Dennis Cox

Part of its success evolves from its ability to sell its machines everywhere from Sears, Roebuck and Co. to Highland Superstores — a strategy that sometimes causes consternation among retailers.

"They try to be all over the place, so they sometimes run into availability problems," said Doug Hickman, vice-president of marketing at Fretters, a $231 million electronics and appliance store chain based in Livonia, Mich., that also stocks Packard Bell systems. "We've learned our lesson with Packard Bell: You better take it while it's there because if you go back next week it might not be there."

Packard Bell officials said they hope to ride this high-demand wave into the next century.

"The PC in the 1990s will be like the TV in the '50s; everyone will want one," Cox said. If that happens — as historians have been saying for years — the past will indeed be prologue.

NATIONAL

BRIEFS

Letting go

Under the terms of an agreement expected to take effect this week, Chicago-based **Andersen Consulting** is selling database marketing consulting firm **Kestnbaum & Co.**, acquired in 1982, to the Kestnbaum management team. Terms of the sale were not disclosed. Once managerial independence is reestablished, the firms plan to continue working together.

■

Keeping Lotus out of court

If you hear the sound of feet midweek, it may be the programmers and researchers who are planning to march on **Lotus Development Corp.**'s Cambridge, Mass., headquarters to protest the Lotus-engendered string of lawsuits that is currently threatening to extend the reach of software copyright protection. The recently established League for Programming Freedom, which is sponsoring the march, is leaving little to chance: A backgrounder sent out to prospective protesters includes instructions on how to conduct a potent but polite march ("Please remember not to litter, not to block pedestrians and to stay out of the street") and suggestions for placards ("Keep your lawyer off my computer.")

■

Hauling Lotus into court

When last seen, **Refac Technology Development Corp.**'s attempt to sue six leading software vendors, including Computer Associates International, Inc. and Microsoft Corp. for patent infringement on behalf of the patent's owner, Canadian **Forward Reference Systems Ltd.**, had fallen afoul of a New York law against plying another's claim for profit. Earlier this month, however, Refac was back in court, with **Forward Reference** as a formal co-plaintiff and a request to dismiss its claims against five of the defendants. This time, the judge said yes. Refac and Forward's suit will continue against the one remaining defendant: **Lotus.**

Stalking the ethical businessperson

BY J. A. SAVAGE
CW STAFF

PALO ALTO, Calif. — Ferreting out ethical businesspeople from a stack of 400 nominations — some hand-typed, others complete with videocassettes and boxes of supporting material — will not be an easy task for the Business Enterprise Trust, an organization launched recently and premised on the idea that "business ethics" is not an oxymoron.

While the 1990 nominations for the five ethics awards that the trust will present cover most types of business, the trust — whose board of trustees includes the chief executive officers of IBM and Hewlett-Packard Co. — has few nominations from the world of high technology.

Searching for a reason why the high-tech industry is so underrepresented, the trust's president, Kirk Hanson, said, "There is a single-mindedness in many high-tech companies toward product development that can leave little time for innovative management practices, the balancing of work and family and the integration of a business and a home identity."

Established by television producer Norman Lear ("All in the Family" and "The Jeffersons"), the trust is dedicated to applauding principled business. "In the wake of the decade of greed, people are searching for meaning beyond winning," said Kathleen Meyer, executive director of the trust. "That search has people asking about how their business institutions can serve society more effectively."

The trust does not yet have categories yet for its awards, which it hopes to present in early 1991. The award categories will shape up as the screening committee and the board of trustees rifle through nominations. "The first award will probably not go to someone who has sacrificed a job and career to do good," Hanson said. "The majority of the board believes you can be ethical and also be profitable."

Hoping to be the Pulitzer Foundation of the business world, the trust is looking for a "major endowment" to be able to continue its work, but financing is secure for the near future, Hanson said.

The trust's staff also hopes that the trust can be used as a clearinghouse for information and, in turn, is building a database.

As to the scarcity of high-technology nominations, Meyer said that the nominations are already open for next year's awards, and they are anxious to hear from the industry — but please, hold the videotapes.

INTERNATIONAL
BRIEFS

Suddenly, this summer

The **European Economic Community** (EC) recently issued a reminder that open systems meant something important even before it became a computer industry buzz phrase. An EC directive published in the EC's official journal on July 13 marked the end of national monopolies over the supply of telecommunications services. Transition periods have been provided to allow the phasing in of competition for some services.

■

French connection

When French software and services provider **Cap Gemini Sogeti** goes into acquisition mode, it doesn't kid around. Only two days after paying $66 million for **Scientific Control Systems**, the troubled West German subsidiary of UK-based **SD-Scicon**, Cap Gemini announced plans to buy a 69.5% stake in UK-based computer services firm **Hoskyns**, currently owned by **General Electric Corp.** and West Germany's **Siemens AG**. Valued at approximately $520 million, Hoskyns reportedly will go to Cap Gemini for some $363 million.

■

Talking with your hands

Kenkyusha Limited Publishers, purveyor of bilingual dictionaries in Japan for more than 80 years, has entered its first licensing agreement with a U.S.-based information publishing company, according to a Kenkyusha executive. The deal, inked earlier this month with Mt. Holly, N.J.-based **Franklin Electronic Publishers, Inc.**, aims to put quick translation in the palm of your hand — literally. Franklin now holds the worldwide rights to publish Kenkyusha's *New Little English/Japanese, Japanese/English Dictionary* in handheld electronic form.

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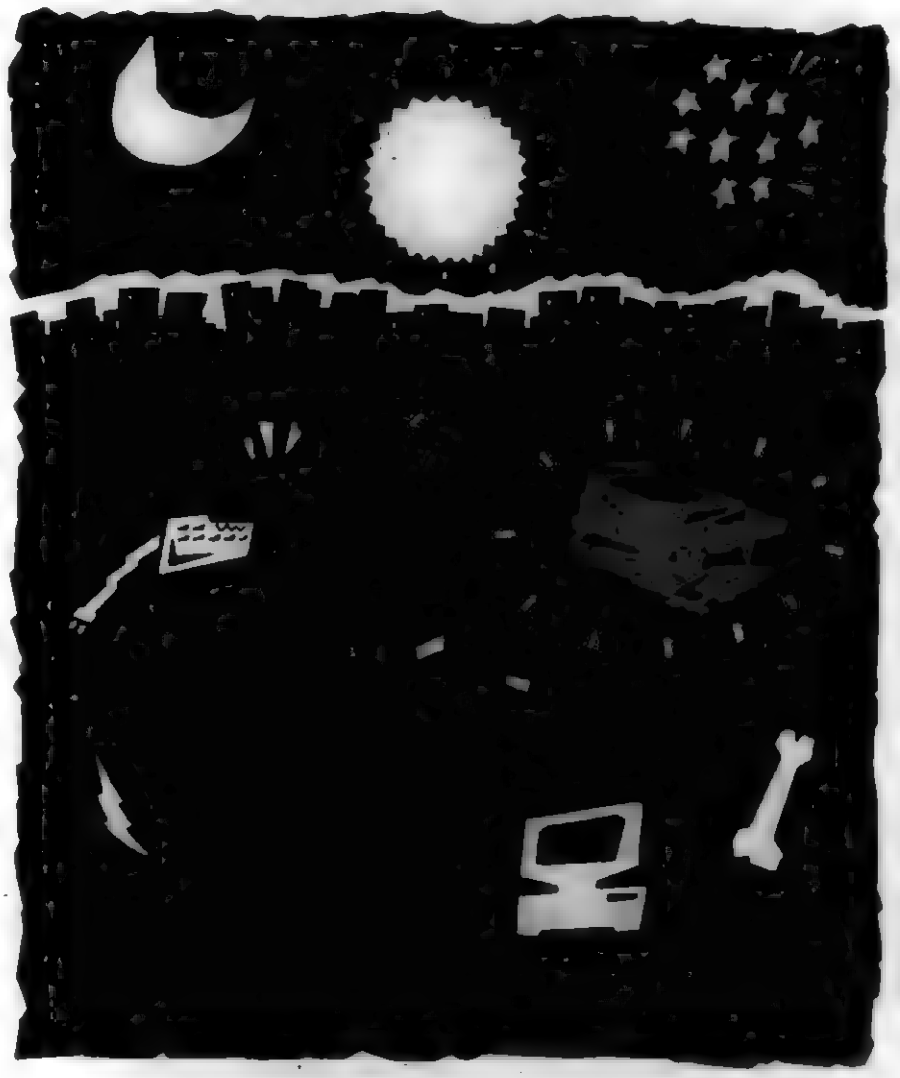

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Lotus warning sours Wall Street's mood

ANALYSIS

BY PATRICIA KEEFE
CW STAFF

CAMBRIDGE, Mass. — Wall Street clobbered Lotus Development Corp. after the firm cautioned analysts two weeks ago to expect a weak third quarter. Despite a record-breaking second quarter, the spreadsheet maker's stock lost almost 20% of its value in the first two days of trading following that warning.

"Anytime a company loses 20% of its value in one day, it's a problem," said William Bluestein, an analyst at Forrester Research, Inc. in Cambridge, Mass. "There is a lot of doubt and anxiety about whether Lotus can jump the next hurdle, which is finding a successor to 1-2-3." The failure to merge with Novell, Inc. heightens the concern, analysts said.

"I think [Wall Street's reaction] is an interpretation that the basic Lotus strategy — 1-2-3 for everyone — is not working," added Bruce Lupatkin, an analyst at Hambrecht & Quist, Inc. located in San Francisco.

Fueling Wall Street's panicked reaction was the fact that Lotus officials publicly admitted that the competition has made inroads into 1-2-3's user base.

This concession sent up a red flag for analysts who view the company as too reliant on one product line. Also worrisome, analysts said, is the fact that Robert Schechter, Lotus' chief financial officer, said the firm will cut expenses.

Bluestein claimed that Lotus operates under a high overhead and predicted the firm "will go through a cost-cutting binge." David Bayer, who tracks Lotus at Montgomery Securities, conceded that Lotus' net earnings are about 13%, compared with 23% for rival Microsoft Corp.

"Lotus historically has not demonstrated an ability to control costs," said Robert Therrien, an analyst at Paine Webber, Inc.

Technology analysts have been saying for several weeks now that 1-2-3's market share is under increasingly successful attack, with market share estimates ranging from holding steady to actually slipping as much as five percentage points.

For the most part, analysts are unwilling to attribute the stock's drubbing to either the malaise currently infecting tech-

> "THERE IS A lot of doubt and anxiety about whether Lotus can jump the next hurdle, which is finding a successor to 1-2-3."
>
> WILLIAM BLUESTEIN
> FORRESTER RESEARCH

nology stocks in general or to the series of copyright infringement suits filed by Lotus. Many of them see the suit against Borland International as little more than a defensive reaction to Borland's aggressive marketing campaign.

Instead, the stock's swift downward descent is seen as directly attributable to concerns about Lotus' overall vision, and more specifically, to uncertainty regarding two announced, but undelivered products: 1-2-3 for Microsoft's Windows, which is slated for delivery in the first half of 1991; and 1-2-3 Version 3.1, which provides limited Windows support while adding graphical capabilities missing in Version 3.0. It is slated to ship at some point in the third quarter.

"Their high-end strategy initially spurted with 3.0 and then tailed off," said Bayer, who thinks sales momentum will be "hard to come by" until Lotus ships its Windows spreadsheet.

As a result, Wall Street remains split over the impact of Windows. It is just too early to tell, analysts said.

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Wang fills out the middle

LOWELL, Mass. — Joseph M. Tucci, a 20-year industry veteran who most recently served as president of U.S. Information Systems at Unisys Corp., is scheduled to start this week as Wang Laboratories, Inc.'s executive vice-president of operations.

Hailed by Wang Chairman and Chief Executive Officer Richard Miller as a multitalented executive with a particular knack for building productive partnerships with customers, dealers, distributors and value-added resellers alike, the 42-year-old Tucci will hold sway over all North American sales, marketing, service and support at Wang.

In addition, he will chair the company's newly minted Worldwide Sales and Marketing Council and will take his place on the Wang executive committee alongside Miller and fellow Executive Vice-Presidents Mike Mee, who is chief financial officer, and Horace Tsiang, who serves as chief development officer.

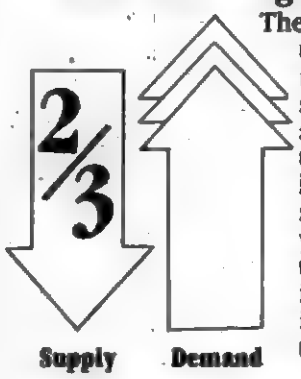
A few important tips on recruiting computer professionals

Finding computer talent isn't as easy as it used to be. In fact, there was a time when you'd just run an ad in the local newspaper and you could make a hire without waiting too long or spending too much.

But times have changed. And like so many facets of today's business, so has the effectiveness of traditional recruiting methods.

What's more, many of today's recruiters *don't use* today's most efficient methods — methods that save time and money for some widely unknown reasons.

The supply of qualified professionals isn't meeting demand



The American Council on Education reports that the number of college students choosing computer careers is down two-thirds since 1982. To make matters worse, there are more computers in today's business that require the skills of this shrinking market than ever before. And while you may never consider the company next door your competitor, it likely *is* competing for the same computer talent today. The result is a classic supply/demand problem that isn't changing for the better -and that's sure to make your recruiting tougher in the '90s.

Ads in local papers don't reach your major hiring market anymore

That's because they generally reach "active" job seekers — those who actively seek out the local newspaper to find jobs — and who a recent *Computerworld* job satisfaction survey found to represent 2 in 10 of today's computer professionals. The study also found that 7 in 10 of today's computer professionals are "passive" job seekers — those who would *consider* new job options, but likely never look for them in the local newspaper. (The remaining small percentage are "non-movers" content with long-term jobs.)

For every 10 of today's computer job seekers . . .
2 are Active
7 are Passive
1 is a Non-mover

In short, this means that your ad in today's local newspaper reaches no more than 20 percent of today's computer job seekers. What's worse, if you're not using other vehicles that reach far more job seekers, your local newspaper expenses are as inefficient as their limited audience.

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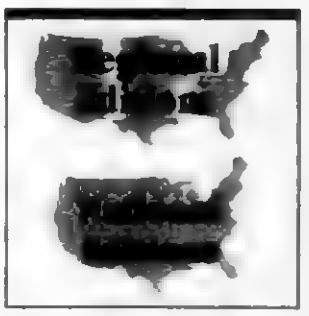

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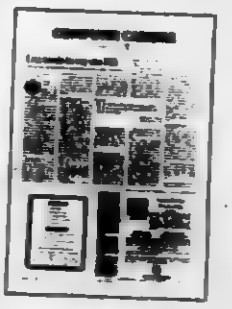

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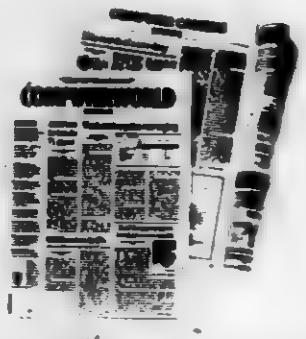

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The hotel welcome mat is out

Hospitality industry needs new technology experts to drum up business

BY HELEN PIKE
SPECIAL TO CW

There may be more than the usual number of "Vacancy" signs flashing outside hotels and motels across the country this year because of overbuilding. However, the firms that run these hostelries say there's room at the inn for computer professionals. They hope people who understand new information technologies help design systems that leave the "No Vacancy" sign out more often.

Hotel and motel operators are looking for information systems professionals with expertise in the Unix operating system, the C programming language, relational databases and telecommunications.

The companies are turning to distributed processing, including personal computer networks, in modernizing the so-called property management systems that support most of a hotel's operations — such as yield management, guest services, registration, payroll and night audits.

In five years, guests at deluxe hotels will be able to order a "PC room" with a microcomputer, modem and facsimile machine, according to Dave Berkus, president of Computerized Lodging Systems, Inc. in Long Beach, Calif. More hotels will offer videoconferencing, too, he says.

At the corporate level, more and more hotel and motel firms are exploiting large-scale transaction processing systems to manage reservations. They're also relying on large databases to build customer relationships.

Ray Valla

With the business highly decentralized, communications is also a big concern. Communications professionals should have little difficulty finding work if they can help hotel firms navigate the thicket of deregulation, especially carrier rates, says Jules Sieburgh, vice-president of IS at Sonesta International Hotels Corp. in Boston. He sees a lack of job applicants with these skills and fills the gap by hiring consultants.

Managers at other hotel and motel operators describe similar requirements. Quality Inns International in Silver Spring, Md., needs business and technical people who can help lease communications lines from carriers and knit them into a network, says Jim Yoakum, the company's vice-president of IS. Ramada, Inc. in Phoenix could use people experienced with dial-up or leased networks, according to Jim Strong, vice-president of information services.

Integration will be another important area in the 1990s as hotel companies tie together databases and applications as well as networks. In coming years, Hilton Hotels Corp. will be looking for people who understand different systems and can help build bridges between them, says Peter Salazar, director of systems planning at the Beverly Hills, Calif., company.

Managers emphasize the need for IS professionals to understand the hotel business. This applies to an individual hotel's situation as well as the corporation, at least at companies such as Marriott Corp., which is decentralizing its IS operations. Marriott needs people who can help bring in more customers by analyzing a particular hotel, says Charles L'Esperance, vice-president of IS.

At a Marriott hotel near Chicago's O'Hare International Airport, for example, the company has exploited cellular telephone technology in developing a system that lets guests check into their rooms from the airport courtesy van.

Hotel and motel operators count on IS people to help explain the role of IS to nontechnical managers. At Quality Inns, an IS professional may need to convince the manager of one of the company's franchised, low-budget Sleep Inns that self-service checkout systems can cut labor costs and improve customer service, Yoakum says.

WITHIN FIVE YEARS, guests at deluxe hotels will be able to order a "PC room" with a microcomputer, modem and facsimile machine.

DAVE BERKUS
COMPUTERIZED LODGING SYSTEMS

A background in the hotel industry can be almost as important as technical experience in landing a job. Salazar's ideal candidate has three to five years of experience in the industry and a minimum of two years working with systems. However, a track record in the airline industry or another part of the travel business can make it easy to get up to speed, he says.

Pay for corporate IS directors in the hotel industry is comparable to compensation in other businesses. The IS director at an 800-room luxury hotel in a major city, meanwhile, would be likely to earn a salary of about $60,000 per year, says Larry Chervenak, president of Chervenak, Keane & Co., a hotel consulting company in New York.

The software vendors that develop and sell property management systems provide another career option for computer professionals interested in the hotel business. A job with one of the vendors can provide an introduction to the way the industry works, Sieburgh says. However, working for one vendor is likely to provide a limited view of the business, Berkus says.

IS professionals with experience in the hotel business will find that the vendors need that industry expertise, Sieburgh adds. The vendors don't provide all the functions some hotel operators need, prompting the hotel companies to heavily customize off-the-shelf software packages.

One drawback to certain jobs with hotel IS groups and their vendors is the hours. Hotels operate around the clock, which means IS professionals and the vendors' customer support people must be available for troubleshooting at odd times. "It's not a glamorous field," Sieburgh warns. "You work when everyone else parties."

Pike is a free-lance writer based in the Boston area.

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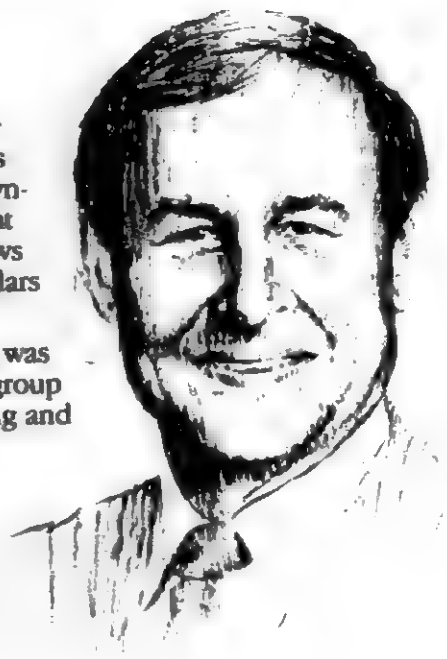

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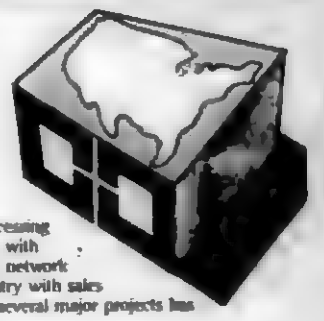

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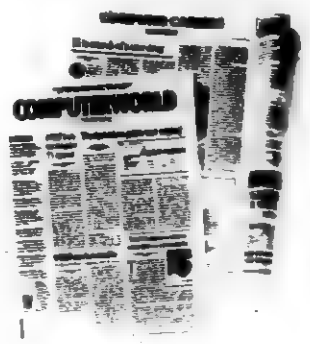

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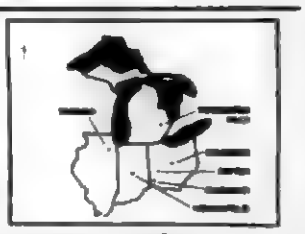

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MARKETPLACE

Making presentations graphic

PC presentation software offers a myriad of functions to sort through

BY JESSICA KEYES
SPECIAL TO CW

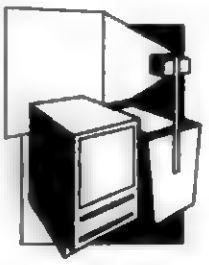
Gone are the days when information systems professionals could be content with ho-hum presentation materials such as hard-to-read overhead transparencies.

Today there is a wide array of computer-driven presentation devices to choose from. Even the meaning of "presentation" has changed as technology has yielded such goodies as personal computer slide shows, LCD projection panels and video add-in boards.

The common denominator for the new media is the software used to create the images. The marketplace is chock full of these tools. Most of them are quite similar; in fact, they tend to be competitively priced at about $495. However, as you start investigating them, it's a good idea to use a checklist of features to see how your tool of choice stacks up against the others.

The selection of a display technology might affect the choice of an appropriate software package, so let's take a brief look at the options in that area first.

The majority of presentations still rely on overhead transparencies or 35mm slides, with overheads the more popular choice. The reason is that overheads are easier to make. Just load transparency paper into the laser printer or photocopier and voila — a presentation.



Slides are often the mode of choice for the discerning presenter looking for a more professional touch. Until now, however, this method has been expensive and usually has been assigned to a specialized department. But that's no longer the case. Service bureaus that are popping up all over will take a PC image file and, for $3 to $10, have a 35mm slide of it on your desk overnight.

Overheads and slides don't always cut the mustard, however. With occasions calling for something more elaborate, "real time" presentations might be just the thing. Try using a PC to display a slide show with an LCD projection panel.

The PC slide show has nothing to do with 35mm slides. It's a software function that directs the computer to display a series of images after you've determined the sequence and the timing for the show.

In the past, it was impossible to present a PC slide show to more than two or three people at a time. Now, however, you can hook your PC to an LCD panel, place the panel on top of an overhead projector and display the images on the wall. Instantly, that puny PC screen is displayed in full color at 10 times its size.

For some people, this medium still is not enough. They may go for the latest presentation device — video boards. Picture a videotape of a manufacturing plant. Now hear narration describing how your new inventory system will save $2 million per year. Suddenly, a chart appears on top of the live action with financial data in color. How is it done? With a PC add-in board that lets you superimpose computer graphics on live-action video.

If you plan to use one of these technologies to put on an intensive multimedia production — a marketing pitch to users, for instance, or a presentation to top managers — make sure to get software with the capabilities to handle it. Your checklist should include the following items:

- **Color.** While spreadsheet graphics are fine for reports and informal presentations, there's nothing like vivid color to add spice to a presentation — or to help illustrate a point.
- **Chart types.** It's nice to be able to draw a good pie chart, but what other types of charts does a package accommodate? Surface? Scatter? Bar?
- **Freehand drawing.** When a preset chart is not enough, the ability to use a mouse to sketch in an additional consideration is invaluable.
- **Paint features.** These features are used like freehand drawing but provide the whole range of functions available in screen painting packages. They can let you draw a circle, rectangle or square; erase; point and color; point and fill; and rotate, invert, magnify or edit an object.
- **Data import.** Can you import data from a spreadsheet? What about a database package? Without this capability, you are reduced to rekeying the data.
- **Slide-show support.** You need to link together images to put on a show. What is the maximum number of images you can line up? You may want to run them in an unattended mode rather than press the enter key each time.
- **Fonts.** Packages vary in the number of fonts, or typefaces, that they support. Some, but not all, can rotate this text.
- **Clip art.** Check to see whether the package comes with a library of images that you can use as part of your presentation — a picture of a computer, for example.
- **Art import.** Does the package permit the import of graphics other than the ones it creates? Standard graphics images, for example, are stored in the Tag Image File Format or PCX format. Does the package import these formats? This function is especially important if you use a scanner to scoop up images.

Think of the presentation you're planning in terms of a recipe. You might need a pinch of color, two dashes of good clip art and an interesting font or two. Combine in a slide slow and present with an LCD projection panel. What audience could resist?

Keyes is president of New Art, Inc., a management and computer consulting firm in New York.

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XT Model 089	$675	$825	$475
AT Model 099	$1,050	$1,375	$850
AT Model 239	$1,075	$1,325	$700
AT Model 339	$1,375	$1,400	$900
PS/2 Model 50	$1,300	$1,700	$1,050
PS/2 Model 60	$2,500	$2,600	$2,400
Compaq Portable II	$1,050	$1,150	$875
Portable III	$2,175	$2,500	$1,900
Portable 286	$1,400	$1,875	$1,300
Plus	$675	$750	$650
Deskpro	$825	$900	$800
Deskpro 286	$1,400	$1,625	$1,300
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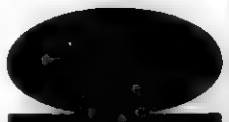

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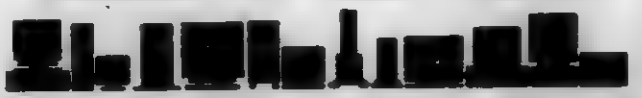

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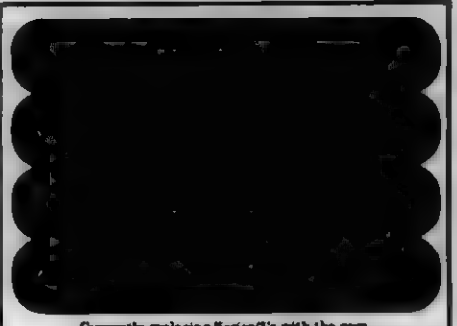

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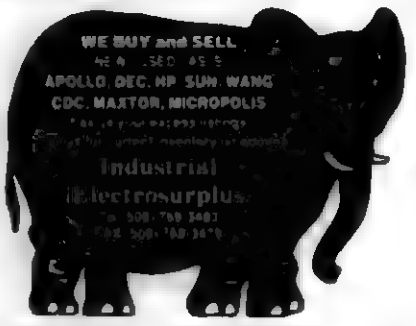

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Detecting training deficiencies

A questionnaire is only the first step in identifying training needs

BY MARK DUNCAN
SPECIAL TO CW

People in the business of information systems training are comfortable with the traditional means of identifying training needs: The staff conducts a needs analysis, or management hires a consultant for the job.

With this tried-and-true method, staff members or consultants circulate questionnaires to collect information on training needs. Then they match the needs with courses to develop departmental or personal training programs for an appropriate time frame — six months, perhaps, or a year.

This technique is easy, and it works. However, total reliance on it might leave the need for some training undetected. IS organizations should consider a number of other methods that could shed light on these needs.

Production and test error statistics. Most IS groups collect data on production errors, but a lot of them don't log errors uncovered during testing of systems. Statistics on both production and test errors can point to deficiencies on the part of analysts and programmers who develop and maintain systems.

Recurring errors can indicate training needs in specific areas, such as development of a particular type of transaction or the use of a certain development utility. It is relatively easy to measure the effectiveness of the resulting training by looking for a reduction in the number of these errors.

Long-range automation plans. Whether "long-range" means one, two or even five years, future automation plans are an important tool in identifying training needs. The plans typically document individual IS projects, hardware and software requirements and schedules. They point not only to specific training needs but also to the times when skills will be required.

Corporate business models. These models, generally developed by a data administration unit, describe current and planned business activities and the related information requirements. A model is typically a four-level hierarchy that identifies business functions, the processes within each function, the activities within each process and the information needed to accomplish each activity.

In the IS organization, for example, "data processing" might be the function that includes the "administer application projects process." This process in turn spawns a number of activities: assisting users in defining requirements; developing cost estimates; designing, developing, testing, installing and maintaining application systems; and so on.

Activities are an excellent tool for identifying training needs because they are the lowest level of detail in the business model.

Software portfolio analysis. An examination of the software portfolio produces a global view of an organization's information systems. It categorizes systems by type, size, age, language, complexity and other relevant characteristics.

This kind of analysis might show that an old but reliable system written in an obscure fourth-generation language is completely without support. As a result, managers would decide whether to modernize the system, rewrite it or train someone in the language so he can provide the needed support.

Job profiles. Formal job descriptions are almost mandatory at most organizations, but they are often underused — even for their intended purpose. Once hired, many programmers and analysts never see a formal job description; convention makes it acceptable to work without one.

As a means of identifying training needs, job descriptions are vital. They indicate the skills an individual needs in his current position and make it easier to plan for career advancement. If someone aspires to a position that requires additional skills, learning about them via a job description might prompt him to ask for the proper training.

Trade journals. The traditional needs analysis typically identifies what training is required. However, identifying how to deliver the training is an essential part of the process too. Professional journals for trainers and educators tend to focus on the "how" of training by covering the latest in technologies, delivery techniques and methods of measuring effectiveness.

Networking. It's legitimate and almost essential to "keep your eyes on the other guys." Training professionals should network with people from other organizations to learn about their training and education needs and how their organizations are handling them. Conferences, vendor seminars and local professional associations all afford ample opportunity for tapping information from peers.

In an era of tightening corporate budgets, education and training are still the areas most susceptible to untimely cuts. If IS organizations are to get the most out of the time and money available, they must identify their training needs in a comprehensive way. They should use the traditional needs analysis — but only as one of many means of accomplishing the goal.

Duncan is a quality assurance manager at a large Dallas bank.

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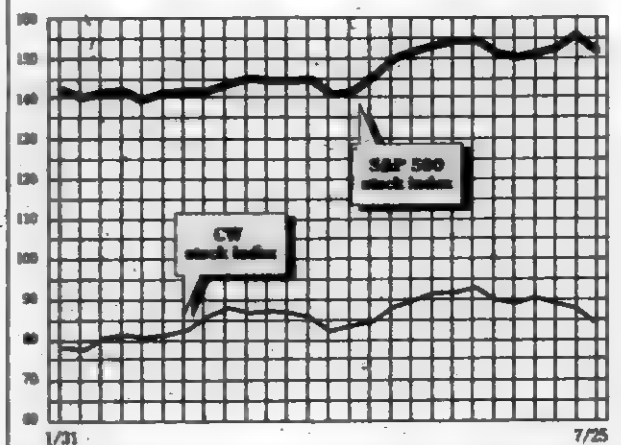
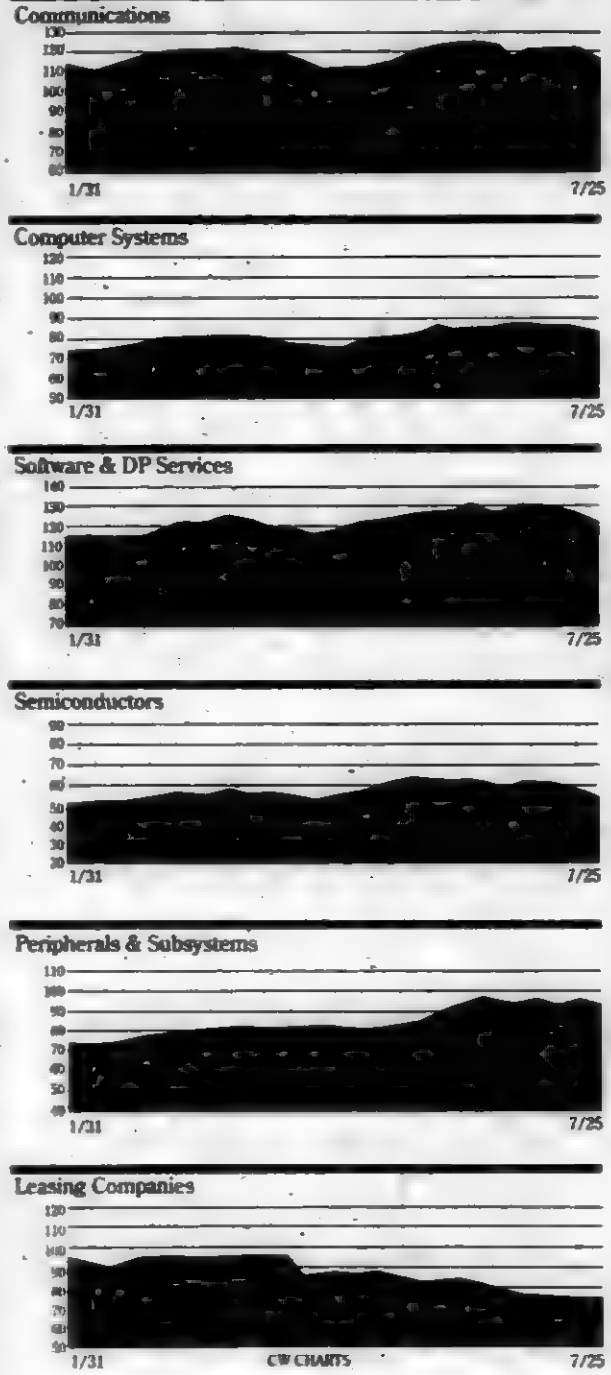


Indexes	Last Week	This Week
Communications	121.5	117.2
Computer Systems	87.0	83.1
Software & DP Services	127.2	120.6
Semiconductors	59.8	54.0
Peripherals & Subsystems	96.1	92.3
Leasing Companies	75.4	75.7
Composite Index	88.5	84.6
S&P 500 Index	155.3	150.89



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CLOSING PRICES WEDNESDAY, JULY 25, 1990

E x c h		52-WEEK RANGE		PRICE CLOSE JULY 25, 1990	WEEK NET CHNGE	WEEK PCT CHNGE

Communications and Network Services

N	AMERICAN INFO TECHS CORP	66	55	58.375	-1.8	-2.9
Q	ANDREW CORP	26	19	21.5	-0.5	-2.3
Q	ARTEL COMM CORP	10	4	4.25	-0.4	-8.1
N	AT&T	47	36	37.375	0.3	0.7
Q	AWANTEK INC	7	2	3	-0.3	-7.7
N	AYDIN CORP	21	13	13.5	-1.0	-6.9
N	BELL ATLANTIC CORP	57	43	47.375	2.0	4.4
N	BELLSOUTH CORP	59	49	52.125	-0.4	-0.7
Q	COMPRESSION LABS INC	18	7	14.875	0.9	6.3
Q	CONTEL CORP	37	23	32.75	-0.5	-1.5
Q	DATA SWITCH CORP	4	2	3.5	0.0	0.0
Q	DIGITAL COMM ASSOC	27	17	23.25	-2.3	-8.8
Q	DYNATECH CORP	21	15	18.125	1.9	11.5
Q	FIBRONICS INTNL INC	13	5	11.125	-0.6	-5.3
Q	GANDALF TECHNOLOGIES	7	2	3.313	-0.1	-1.8
N	GENERAL DATACOMM INDS	7	3	3.625	-0.4	-9.4
N	GTE CORP	36	28	28.125	0.3	0.9
Q	INFOTRON SYS CORP	11	3	3.125	-0.4	-10.7
N	ITT CORP	65	51	58	-0.6	-1.1
N	M A COM INC	8	3	4.625	-0.3	-5.1
Q	MCI COMMUNICATIONS CORP	49	31	39	1.5	4.1
N	NETWORK EQUIP TECH INC	34	8	7.75	-1.0	-11.4
Q	NETWORK SYS CORP	16	7	11.875	-2.8	-18.8
N	NORTHERN TELECOM LTD	30	20	26.25	-2.1	-7.5
Q	NOVELL INC	59	24	49.25	-5.8	-10.5
N	NYNEX CORP	92	74	75	-3.1	-4.0
N	PACIFIC TELESIS GROUP	52	40	41.5	-1.6	-3.8
A	PENRIL CORP	9	4	7.875	-0.8	-8.7
N	SCIENTIFIC ATLANTA INC	29	19	27.75	-0.6	-2.2
N	SOUTHWESTERN BELL CORP	65	51	52.125	-1.8	-3.2
Q	3 COM CORP	19	10	16.375	-0.8	-4.4
N	U S WEST INC	41	33	36.5	-0.8	-2.1

Computer Systems

Q	ALLIANT COMPUTER SYS	9	4	4.375	-1.1	-20.5
Q	ALPHA MICROSYSTEMS	8	2	2.625	0.3	10.5
Q	ALTOS COMPUTER SYS	8	5	8.25	0.0	0.0
A	AMDAHL CORP	19	11	16.75	-1.0	-5.6
Q	APPLE COMPUTER INC	50	32	42.25	-2.4	-5.3
Q	AST RESH INC	25	7	22.625	-2.9	-11.3
N	BOLT BERANEK & NEWMAN	9	4	4.625	-0.3	-5.1
N	COMPAQ COMPUTER CORP	68	37	58.375	-5.0	-7.8
N	COMMODORE INTNL	12	6	7	-0.3	-3.4
N	CONTROL DATA CORP	22	16	18.875	-2.1	-11.2
N	CRAY RESH INC	51	31	46	-2.8	-5.5
N	DATA GEN CORP	18	8	8.875	-1.1	-11.3
N	DATAPOINT CORP	8	2	2.125	-0.3	-10.5
Q	DELL COMPUTER CORP	14	5	11.75	-1.3	-9.6
N	DIGITAL EQUIP CORP	103	70	74.875	-8.6	-10.3
N	FLOATING POINT SYS INC	4	0	2.5	-0.1	-4.8
N	HARRIS CORP	40	28	32.75	-1.4	-4.0
N	HEWLETT PACKARD CO	58	40	46.125	-2.4	-5.0
N	HONEYWELL INC	112	73	104	-5.6	-5.1
N	IBM	123	93	114.75	-5.1	-4.3
Q	INFORMATION INTL INC	16	12	13	-0.3	-1.9
Q	IPL SYS INC	14	5	10.25	-1.5	-12.8
N	MAI BASIC FOUR INC	6	2	2	0.1	6.7
N	MATSUSHITA ELEC INDL LTD	180	123	140	-7.7	-5.2
Q	MENTOR GRAPHICS CORP	36	14	18.75	-1.0	-5.6
N	NBI INC	2	0	0.313	0.0	11.4
N	NCR CORP	72	58	69	-1.9	-2.6
Q	PYRAMID TECHNOLOGY	38	11	25	-4.3	-14.5
Q	SEQUENT COMP SYS INC	34	13	28	-1.5	-4.9
Q	SUN MICROSYSTEM INC	37	13	33.5	-1.3	-3.8
Q	SYMBOLICS INC	2	0	0.438	-0.1	-12.4
N	TANDEM COMPUTERS INC	30	18	19.25	-2.3	-10.5
N	TANDY CORP	49	30	36.375	-2.5	-6.4
N	ULTIMATE CORP	11	5	7.125	0.1	1.8
N	UNISYS CORP	23	11	11.875	-0.8	-5.9
A	WANG LABS INC	7	4	4.125	-0.1	-2.9

Software & DP Services

Q	AMERICAN MGMT SYS INC	20	11	17.25	-1.6	-8.6
Q	AMERICAN SOFTWARE INC	18	9	15.125	-7.9	-34.2
N	ANACOMP INC	7	2	2.5	-0.1	-4.8
Q	ANALYSTS INTL CORP	24	14	20	-1.5	-7.0
N	ASHTON TATE	16	8	10.5	0.1	1.2
Q	ASK COMPUTER SYS INC	15	7	10	0.8	8.1
N	AUTO DATA PROCESSING	60	40	55	-4.0	-6.8
Q	AUTODESK INC	60	33	53.375	-4.1	-7.2
Q	BMC SOFTWARE INC	30	14	26	-1.0	-3.7
N	BUSINESSLAND INC	14	7	7.25	-0.4	-4.9
Q	COGNOS INC	10	4	9.75	0.3	2.6
N	COMPUTER ASSOC INTL INC	20	8	9.5	0.0	0.0
Q	COMPUTER HORIZONS CORP	17	7	16.25	-0.5	-3.0
N	COMPUTER SCIENCES CORP	59	40	43.5	-0.5	-1.1
N	COMPUTER TASK GROUP INC	14	9	10.5	0.3	2.4
Q	COMSHARE INC	25	15	21.75	-1.0	-4.4
Q	CORPORATE SOFTWARE	16	8	14.125	-1.1	-7.4
N	GENERAL MTRS (CLS E)	38	24	33.75	-2.3	-6.3
Q	GOAL SYSTEMS INTL	18	10	15	0.0	0.0
Q	HOGAN SYS INC	7	3	3.375	-0.5	-12.9
Q	INFORMIX CORP	16	8	11.125	-3.5	-23.9
Q	INTELLICORP INC	6	3	5.125	-0.4	-6.8
Q	LEGENT CORP	32	19	24.75	0.0	0.0
Q	LOTUS DEV CORP	39	21	23	-8.3	-26.4
Q	MICROSOFT CORP	81	26	71.5	-4.5	-5.9
Q	NATIONAL DATA CORP	35	13	14	-0.3	-1.8
N	ON LINE SOFTWARE INTL INC	11	6	7.5	-0.8	-9.1
Q	ORACLE SYS CORP	188	15	17.625	-0.1	-0.7
N	PANSOPHIC SYS INC	19	10	12.875	-0.3	-1.9
Q	PHOENIX TECHNOLOGIES INC	6	2	3.5	-0.5	-12.5
N	POLICY MGMT SYS CORP	43	30	43.375	0.0	0.0
Q	PROGRAMMING & SYS INC	25	16	19	-3.0	-13.6
Q	RELATIONAL TECH INC	11	5	5.5	-0.3	-4.3
N	REYNOLDS & REYNOLDS CO	27	19	20.25	-0.6	-3.0
Q	SAGE SOFTWARE INC	16	7	14.5	-0.8	-4.9
Q	SEI CORP	22	15	22	1.5	7.3
Q	SHARED MED SYS CORP	17	12	12.875	0.0	0.0
Q	SOFTWARE PUBG CORP	28	13	26.75	-0.3	-0.9
N	STERLING SOFTWARE INC	11	7	9.25	-1.1	-10.8
Q	SUNGARD DATA SYS INC	26	17	23.75	-1.5	-5.9
N	SYSTEM CENTER INC	25	17	17	-0.4	-2.2
N	SYS. SOFT INC	29	15	25	-0.3	-1.0
Q	WORDSTAR	2	1	1.063	0.0	0.0

Semiconductors

N	ADV MICRO DEVICES INC	11	7	7.25	-1.9	-20.5
N	ANALOG DEVICES INC	11	7	6.875	-0.4	-5.2
Q	ANALOGIC CORP	11	8	9.25	-0.1	-1.3
Q	CHIPS & TECHNOLOGIES INC	26	15	16.25	-3.3	-16.7
Q	INTEL CORP	52	28	43.5	-5.0	-10.3
Q	MICRON TECHNOLOGY INC	17	7	11.625	-0.4	-3.1
N	MOTOROLA INC	88	53	79.75	-6.1	-7.1
N	NATL SEMICONDUCTOR	9	5	5.5	-1.4	-20.0
N	TEXAS INSTRS INC	44	28	33.25	-5.8	-14.5
A	WESTERN DIGITAL CORP	15	6	12.25	-1.1	-8.4

Peripherals

Q	ALLOY COMP	2	0	0.828	-0.1	-9.0
N	AM INTL INC	6	2	2.25	-0.3	-10.0
Q	AUTO TROL TECH COMP	5	2	3.063	-0.3	-9.2
Q	BANCTEC INC	24	13	20.25	-1.5	-6.9
A	COGNITRONICS CORP	8	3	6.5	0.8	13.0
Q	CONNER PERIPHERALS	31	10	27.875	-2.4	-7.9
A	DATARAM CORP	22	6	18.75	-1.0	-5.1
N	EASTMAN KODAK CO	52	36	38.5	-2.3	-5.5
N	E M C CORP MASS	7	3	5.625	-0.5	-8.2
Q	EMULEX CORP	9	4	7	-1.0	-12.5
Q	EVANS & SUTHERLAND	35	18	29.25	0.8	2.8
Q	ICOT CORP	2	1	1.5	0.0	0.0
Q	INTERLEAF INC	8	5	6.125	-0.6	-9.3
Q	IOMEGA CORP	6	3	5.25	-0.4	-7.7
Q	MASSTOR SYS CORP	4	1	1.188	-0.1	-9.5
Q	MAXTOR CORP	17	7	10.25	-4.1	-28.7
Q	MICROPOLIS CORP	10	3	8.5	-1.6	-16.0
N	MINNESOTA MNG & MFG CO	91	66	90.875	1.1	1.3
Q	PERSONAL COMP PRODUCTS INC	6	4	4.25	0.2	4.8
Q	PRINTRONIX INC	16	7	11.375	-0.4	-3.2
N	QMS INC	21	9	18.25	-0.9	-4.8
Q	QUANTUM CORP	26	9	22.375	-2.1	-8.7
N	RECOGNITION EQUIP INC	10	4	5.125	-0.1	-2.4
Q	REXON INC	10	6	7.375	0.0	0.0
Q	SEAGATE TECHNOLOGY	20	10	12.5	-1.8	-12.3
N	STORAGE TECH CORP	35	9	27.125	-7.4	-21.4
Q	TANDON CORP	4	1	2.813	-0.5	-15.1
N	TEKTRONIX INC	23	12	16.25	0.1	0.6
Q	TELEVIDEO SYS INC	1	0	0.406	0.0	8.3
N	XEROX CORP	69	44	46.625	-2.3	-4.7

Leasing Companies

N	CAPITAL ASSOC INTNL INC	8	2	2.375	-0.4	-13.6
N	COMDISCO INC	34	17	18.375	0.0	0.0
Q	LDI CORPORATION	18	13	15.25	0.0	0.0
Q	PHOENIX AMERN INC	5	3	3.625	-0.1	-1.7

EXCH: N—NEW YORK; A—AMERICAN; Q—NATIONAL

Bad reviews

Positive earnings reports were not enough for Wall St. critics

Earnings Time: The Sequel played to packed trading floors last week but garnered a big thumbs-down from technology investors. Digital Equipment Corp. held center stage after announcing its first quarterly loss ever. Although it started to rebound at the end of the week, DEC stock still dropped a total of 5 points, closing Thursday at 76⅛. IBM was not far behind, losing 4½ points to hit 113⅛.

After hearing of the company's big quarterly loss, investors dumped Data General Corp., and its share price slid to 7⅛, down 1½ points.

Some stocks fizzled even after firms such as Microsoft Corp. turned in star performances for the quarter. Microsoft may have made great profit strides, but its stock fell 4½ points to 68¼ after bleak projections for next year's earnings. Compaq Computer Corp. was an enigma. After issuing both positive financials and new personal computers, Compaq stock still crashed to 57⅛, down 2⅛ points. A new mainframe did not help Unisys Corp. either, which slipped ⅛ of a point to 11⅝.

When the spotlight shone on Apple Computer, Inc. and Sun Microsystems, Inc., however, they rose to the occasion, albeit slightly. Each gained ⅛ of a point, lifting Apple to 41⅜ and Sun to 32⅛.

Storage Technology Corp. showed real star quality, overcoming disappointing profit news and picking up 2⅛ points to finish at 28. In what may be a preview of earnings statements yet to come, Wang Laboratories, Inc., Class B stock eased down ⅛ of a point to 3⅛, hovering just above its 52-week low.

KIM S. NASH

NEWS SHORTS

Infonet to go international

Infonet is expected to announce this week what is reportedly the first virtual private data network service to be offered internationally. Virtual Private Data Network is said to allow users to enjoy the advantages of a private T1 backbone without having to pay the personnel, maintenance and equipment costs associated with a private network. Offered in both star and mesh topologies, the service includes daily, weekly and monthly facsimile reports of network traffic statistics and trouble ticket status. Users can transmit at rates of up to 19.2K bit/sec. Infonet currently has T1 nodes in about 15 countries, with plans to expand in Asia, the vendor said.

Amadeus pact is music to Bytex

Bytex Corp. announced last week that Amadeus, the European reservation system consortium, has awarded the matrix switch vendor a $1.4 million contract to install its Unity 50 Network Switching Systems in sites in four countries. Fault-tolerant matrix switches like those offered by Bytex are generally used as "insurance policies" in mission-critical environments. If a front-end processor on a mainframe should fail, one command to the matrix switch would allow several communications lines to be switched to a backup front-end processor.

CA enhances manufacturing system

Computer Associates International, Inc. has upgraded its CA-CAS/R manufacturing software. Version 1.3, for IBM mainframes, allows companies to build repetitive products on a schedule. Enhancements include on-line electronic mail, on-line help, multilingual screen functions and common report writers.

DEC claims benchmark win

Digital Equipment Corp. last week announced benchmark results that claimed superior performance for its new Decstation 5000 against comparably priced Unix-based workstations from IBM and Sun Microsystems, Inc. DEC measured the $26,900 Decstation 5000 Model 200CX against Sun's $20,195 Sparcstation 4/65, and claimed its own workstation had twice the overall performance of the Sun workstation and 1.4 times the performance of IBM's Powerstations 320 and 520, priced at $24,090 and $35,340, respectively.

TI ready to ship CASE tools for OS/2

Texas Instruments said last week it would begin shipping the first commerical release of its computer-aided software engineering products for OS/2 on Aug. 22. With a workstation running OS/2, programmers can develop and test applications using the Information Engineering Facility (IEF) Construction Toolset for OS/2 and then move them to the host-based IEF Central Encyclopedia for MVS, where CICS, IBM, TSO and batch codes will be reconstructed and placed into production. The complete OS/2 package, including Planning, Analysis, Design and Construction Toolsets, lists for $23,800; the Construction Toolset, which generates COBOL, source code and relational database definition statements, sells for $9,900. According to TI, customers will be able to upgrade from the MS-DOS to the OS/2 version of IEF at a special price for a limited time.

Sears loses federal pact

A federal appeals board last week threw out a contract to buy IBM and Apple Computer, Inc. personal computers and related software and networking products awarded in May by the U.S. Treasury Department to Sears, Roebuck and Co. The award, worth up to $400 million and Sears' first big government computer win, stunned more experienced government contractors, two of whom filed formal protests. The board agreed that equipment bid by Sears did not meet government specifications as claimed by Sears. Earlier this month, Sears sued bid-protester Sysorex Information Systems, Inc. for allegedly stealing Sears trade secrets used in the bid protest.

Novell simplifies Lanalyzer

BY JOANIE M. WEXLER
CW STAFF

SAN JOSE, Calif. — With the potential for network snafus increasing in direct proportion to the proliferation of local-area networks, Novell, Inc. said it will introduce today a version of its Lanalyzer protocol analyzer designed for the less technically savvy network manager.

A protocol analyzer provides a network administrator with a description of what is happening at the various "layers" of a communications system. It then helps the administrator locate and resolve network problems.

Novell's product — part of the dowry Novell received when it acquired Excelan, Inc. one year ago — is designed to analyze Ethernet or token-ring LANs running protocols such as Novell's Netware, Apple Computer, Inc.'s Appletalk, Digital Equipment Corp.'s Decnet and Transmission Control Protocol/Internet Protocol.

Novell will now add the Application Test Suite, a spreadsheet-like feature that automatically runs more than 40 preprogrammed application tests. A menu-driven troubleshooting guide leads users through the testing process by suggesting — in English — probable causes for network disruptions and then recommending the test procedures to confirm a diagnosis.

"This is a really good feature because it will tell network administrators what might be wrong and what to try next. Otherwise, it takes a lot of expertise — that's tough to develop — to figure it out," said Greg Drusdow, director of information services at Agency Company Organization for Research and Development Corp., a not-for-profit association running a 32-node Novell network.

Technically impractical

One problem with protocol analysis is that it has traditionally been a task reserved for highly technical personnel. This is becoming less practical as LANs proliferate.

"Typically, an organization will have one or two network gurus, but the majority of the day-to-day work is done by a nonexpert," explained Kevin White, vice-president of product development at Novell's Lanalyzer products division. "We're aiming our product at that user."

Drusdow, who is also the president of Netware Users International-North America, said, "I saw a beta version of [Lanalyzer] at PC Expo, and it's definitely a breakthrough. It ought to reduce start-up and training time, which is where it leapfrogs Network General's Sniffer."

Network General Corp.'s Sniffer Network Analyzer, Lanalyzer's main competitor, takes a more top-down approach, emphasizing analysis of upper layer communications protocols, while Novell's offers fuller analysis at the physical layers.

"While Sniffer is undoubtedly an excellent product for high-tech engineers and applications developers, business users experience more lower-level problems," Drusdow said.

He explained that before purchasing Lanalyzer, he rented the Sniffer analyzer, but it "told us information about our network that we couldn't understand."

Tom Nolle, president of CIMI Corp., a consultancy in Haddonfield, N.J., agreed that a common problem with protocol analyzers has been "that they tell you what's wrong with the protocols but not what you can do about it."

Nolle added that less than 1% of all LANs are currently analyzed. However, he predicted that use of protocol analyzers will expand to 7% to 8% of all LANs during the next two years.

Nixon

FROM PAGE 1

thought about the night before a major battle."

Visitors ask Nixon questions via computer and get answers on a big-screen television set. The 400 most commonly asked questions about Nixon's life and political fortunes have been programmed into computers with his videotaped responses ready to appear.

Hugh Hewitt, executive director of the $21 million library, said 320 questions were culled from tapes from Nixon's many TV appearances, with 80 more questions dreamed up by presidential scholars and put to him in the past few months.

The screen clips come from interviews he did with a former speechwriter shortly after leaving office, and the TV clips come from interviews such as the ones he did on *The David Frost Show*, as well as a session filmed just two months ago.

Twenty-two categories are offered, including Nixon's years in Congress, the Vietnam War and Watergate. Using a touch-screen monitor, a category is selected, such as the Soviet Union. The system offers up to three levels of subcategories (Salt I, Detente, Salt II and so on) until the closest question is hit.

The system maintains a queue that includes the length of each response in waiting, then states the amount of time it will take to hear the answer. The user steps into the 40-seat theater to listen to Nixon's response on a 45-in. screen.

Answers are provided via a combination of five Intel Corp. 80386-based IBM-compatible personal computers running customised software and linked to 10 Pioneer Electronic Corp. laser disc players. The master computer selects the narration of the questions from one of the laser disc players. A videodisc computer locates the appropriate disc player, and the video is routed through a switching system to a 45-in. video projector/screen combination.

TWENTY-TWO CATEGORIES are offered, including Nixon's years in Congress, the Vietnam War and Watergate.

The atmosphere within the theater is that of a running press conference. A narrator's voice introduces the question, accompanied by an LED display of the question at the top of the viewing screen. Nixon then responds in his classic baritone.

The questions span a broad range: his opinion of Watergate ("Wrong, illegal and very stupidly handled"), his first memory (falling out of a buckboard and cracking open his head), which losing presidential candidates would have made good leaders ("Tom Dewey of New York and John Connolly of Texas"), how he spent his last evening with Henry Kissinger (drinking Cour-voisier) and what it was like meeting Elvis ("a very shy and sincere man who used flamboyance to cover that up").

Kalb said that although some in the Nixon camp were aware that they would have to deal with sensitive political issues, "we were able to entertain just about any kind of question. I can't think of one question where he said 'I won't answer that.' "

So long as Nixon, 77, is alive, new questions and answers will be added. The system can hold more than three times the amount of responses it now contains, which represents more than five hours of interview time. "With Nixon, there's always a lot to talk about," Kalb added.

A mixed bag for U.S. high tech

Policy Project analysis of 16 vital technologies sees good and bad

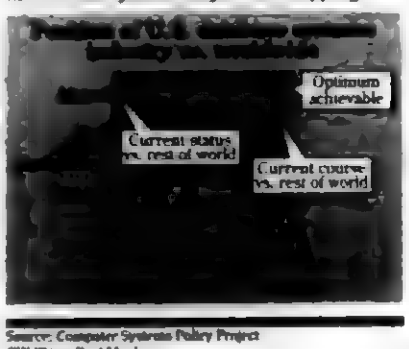
BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — The chief technologists of the computer industry, making their first contribution to the nation's debate over technology policy, issued a report last week analyzing the 16 technologies critical to the future of the U.S. computer industry.

There is good news and bad news for the U.S. The bad news, according to the report by the Computer Systems Policy Project (CSPP), is that the U.S. is lagging in capital-intensive technologies such as integrated circuit fabrication, microelectronics and manufacturing. In the field of computer displays, the U.S. is well behind the rest of the world, and based on its current course, will be losing badly by 1995, the report added.

Storm warning

While foreign competition has tended to focus on components, executives say the U.S. lead in database systems may also be slipping



Source: Computer Systems Policy Project
CW Chart: Paul Mock

The good news, the technologists said, is that the U.S. has the lead in technologies that stress human creativity and are not capital-intensive, such as processor architectures and several areas of software technology. But even in those categories, the U.S. lead is "rapidly diminishing," the report said.

The conclusions are remarkably similar to reports issued by the U.S. Departments of Commerce and Defense, which have provided ammunition to members of Congress who want to beef up federal programs aiding high-technology industries [CW, June 25].

CSPP was formed one year ago by 11 industry chief executives — led by John Akers of IBM, John Young of Hewlett-Packard Co. and James Treybig of Tandem Computers, Inc. — to lobby the government on technology and trade policy [CW, July 3, 1989].

The next step in CSPP's project is to issue, by the end of 1990, specific recommendations for changes in government policy. Kenneth R. Kay, executive director of the group, hinted that the policy proposals are likely to fall into the areas of education, applied research and development and capital formation.

Kay said the report's most important addition to the competitiveness debate is that it identifies the critical success factors, such as advanced manufacturing techniques and skilled personnel, for each of the computer technologies.

Instead of asking the government to "fix" one or two specific technologies — which is vehemently opposed by the Bush administration — CSPP will be asking the government to address critical success factors that cut across many technologies and industries, Kay said.

At a press conference, John Young, chairman of CSPP and chief executive officer at HP, acknowledged that the report contains few surprises. However, he said it is part of CSPP's effort to build a case with "specific actionable items" that are compelling enough to result in policy changes.

"What I find difficult is to find the will and interest [among policymakers] to attack old problems," Young said.

The CSPP report, compiled by the chief technology officers at each of the member firms, comes at a time when the U.S. computer industry is under intense pressure from foreign competition. While U.S. companies' share of the world computer systems market fell from 81% to 61% between 1983 and 1989, Japan's share rose from 8% to 22%, and Europe's share grew from 10% to 15%.

Smith: The shape of DEC to come?

BY GLENN RIFKIN
and MARYFRAN JOHNSON
CW STAFF

On perhaps the darkest day in Digital Equipment Corp.'s history — when it was forced to announce its first quarterly loss in 33 years — the man stepping into the media spotlight was not the one everyone expected.

DEC President Kenneth H. Olsen stayed quietly on the sidelines, while Jack Smith, his second-in-command and senior vice-president of operations, played a competent game of verbal tennis with the press.

"No one should read any significance into that," Smith insisted later in an interview with *Computerworld*. "I just happened to be available."

Commanding presence

Yet there is no denying that the 55-year-old Smith, who has been working at DEC since 1958, is now responsible for virtually all of the company's day-to-day activities.

No one in DEC history has ever been granted such vast responsibility by Olsen, fueling speculation that the personable, easygoing Smith will one day lead the company.

"Jack Smith will come out of this a hero," said Stephen Smith, an analyst at Paine Webber, Inc. in New York. "He's in a great position when things turn around. He has a huge and loyal customer base, and the technology is in place."

Talk of him as the heir apparent, however, makes Smith visibly uncomfortable. "Terms like that, we don't use inside the company," he explained. "The successor to Ken Olsen, whoever that may be, is the board of directors' responsibility. They don't talk about it to me."

Peter Schay, an analyst at Gartner Group, Inc. in Stamford, Conn., said he views Smith as a strong operating manager "but not particularly a visionary or a strategist.

"DEC has fundamentally been successful because it has superior technology," Schay said. "While you need a CEO who understands the role of marketing, perhaps better than Ken Olsen has, the company needs a replacement who will be a visionary, strategist type of person."

In the meantime, DEC is slowly reshaping its internal organization into 24 individual business units — with each unit's vice-president reporting to Smith. Unit managers have the power to hire and fire, but they are also directly responsible for profits and losses.

Good product managers, Smith said, are the ones who "learn to deliver the revenues."

That is the kind of talk that makes Wall Street glow with approval for Jack Smith.

"The spotlight is on Smith, where it ought to be," said Byron Walker, an analyst at Moody's Investors Service in New York. "It's worth something to your stock and your market credibility to have the proper persona out there dealing with the press and the analysts."

For his part, Smith seems to be ignoring all the sound and fury about succession.

"I don't see my relationship with Ken [Olsen] as any different now than it was 10 years ago," he said.

"I'm very comfortable doing what I'm doing. I understand what has to be done, and I'm going to go do it. History will take care of itself."

"I DON'T SEE my relationship with Ken [Olsen] as any different now than it was 10 years ago."

JACK SMITH
DEC

DEC

CONTINUED FROM PAGE 1

strong. We understand what the problems are and what we have to do about them."

Some of DEC's large customers agreed with that view, and industry analysts generally applauded the Maynard, Mass.-based firm's bite-the-bullet approach to cutting thousands of staff members.

Stephen Smith, an analyst at Paine Webber, Inc. in New York, said a personnel cut should translate into $2 to $3 per share in cost savings. "I think that unless the economy totally falls apart, that will be enough," he said.

"The profitability problems are the result of DEC getting flabby, a lot of price pressure and the generally competitive pressure of the marketplace," added Peter Schay, an analyst at Gartner Group, Inc. in Stamford, Conn. "This is a good step for DEC in the long term. This is a one quarter event, and its customers are not going to be deterred because of it."

"I suspect they are doing what they have to do. I don't view it with alarm," said William Anderson, chief information officer at Prudential-Bache Securities, Inc. in New York. Anderson said he was confident that DEC would not cut its field engineering or support services.

Mohammed Mosaad, senior vice-president of information systems and telecommunications services at Prudential-Bache, added that customers "would always prefer our vendor to make money and prosper."

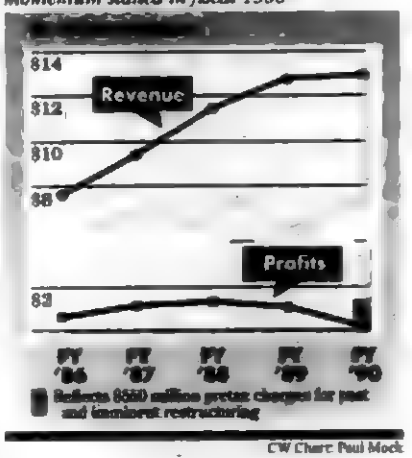
"But it's tough competition today," Mosaad said. "DEC probably has more competition than anyone else, and it's also the economy: People are not buying as much."

DEC's recovery strategy is to cut operational costs and increase revenue, with an influx of profits expected from upcoming sales of the mainframe VAX 9000. Smith said 100 VAX 9000s will be installed at customer sites during the next few months, delivering about $200 million to the bottom line during what is usually DEC's weakest financial quarter of the year.

"Maybe this is DEC's darkest day from an earnings standpoint," said Byron Walker, an analyst at Moody's Investors Service in New York, which knocked DEC's credit rating down one notch from its top rating of AAA last week. "But the company is getting its product line in shape, getting salespeople behind the program, straightening out senior management and finally rationalising how to sell open systems in proprietary environments. There are a lot of pluses there."

Signs of strain

After heady growth in the late 1980s, DEC's momentum stalled in fiscal 1990



CW Chart: Paul Mock

Federal groups urge openness

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — Two government advisory units have called on federal agencies to give businesses and individuals greater access to the U.S. government's vast databases of public information.

The U.S. Congress' Office of Technology Assessment (OTA) said agencies need to resolve several policy issues and exploit technologies such as on-line information networks, compact discs and electronic publishing to disseminate scientific and technical data.

Independently, the 15-member U.S. National Commission on Libraries and Information Science unanimously approved an "Information Age Bill of Rights" to serve as a guideline for the government and industry in developing information policies (see story this page). The statement, developed after a year of study and two public hearings, is based on the principle that public information is owned by the people and held in trust by the government.

An OTA report criticised the government in general, and the White House in particular, for not doing more to distribute the information from $65 billion in annual spending on federal research and development. The congressional agency called on the government to foster the establishment of low-cost, user-friendly electronic databases and distribution media for information in areas such as earth and space sciences and energy.

The OTA said the government is missing an opportunity to bolster U.S. high-technology competitiveness in part because the Office of Science and Technology Policy (OSTP) has "failed in its mission" to provide leadership in furnishing access to scientific and technical information.

The OSTP has failed to implement a provision of a 1976 law calling for it to improve the flow of government information to the private sector, the OTA said.

The OTA said success of a public information program requires progress in the following areas:

- Technical standards for databases and documents so that information can be easily moved to users.
- Indexing databases and documents so that users can easily find information.
- Increased funding to ensure quality, storage and dissemination of technical and scientific information.
- User involvement to ensure that federal agencies meet user needs and technical capabilities.

Some critics of the report said there is already far more federal information available than is put to good use.

"Scientific and technical information in general is the weakest form of technical transfer in the U.S. The only ones who make use of it are the Japanese," said C. Gordon Bell, chief scientist at Stardent Computer, Inc. and former director of computer science programs at the National Science Foundation. "If the government were any better than it is, it would only help the Japanese."

Addressing the Japanese issue, Fred B. Wood, a senior associate at the OTA, said, "Yes, that's a risk, but you have to take some risks if you want to be competitive. I'd like to sit down with [White House Chief of Staff John] Sununu and say, 'You're taking heat about industrial policy. Here's an opportunity to do something good for the U.S. without having to pick winners and losers.' "

John Lorenz, acting executive director of the U.S. National Commission on Libraries and Information Science, said the statement on public information is not a blueprint for action. "But we want to lay a groundwork — we want the principles to be there when others plan improved access [to public information] based on more complicated technology," he said.

A call for rights

The U.S. National Commission on Libraries and Information Sciences recommends that the federal government should do the following:

- Guarantee the availability of public information.
- Guarantee the integrity and preservation of public information.
- Safeguard the privacy of information users and people on whom information is maintained.
- Ensure a wide variety of sources and methods of access to public information.
- Refuse to allow cost to hinder access to public information.
- Ensure that information is readily found through use of a single catalog or index.
- Facilitate widespread geographic access to information through national networks and other means.

Source: U.S. National Commission on Libraries and Information Science

Unisys entries don't relax financial scrutiny

BY ELLIS BOOKER
CW STAFF

BLUE BELL, Pa. — Unisys Corp. unwrapped a new mainframe line, upgraded some others and launched a departmental-level version of its 2200 mainframe last week, but the hoopla was not enough to distract some users from the financial troubles of the nation's third largest computer company.

A week earlier, Unisys posted a 78% drop in earnings for the second quarter ended June 30, with net income of $11.8 million compared with $53.6 million in the corresponding quarter one year ago [CW, July 23]. Although citing weak U.S. sales for the drop, Unisys said operating income had improved, up from $86 million to more than $100 million for the quarter, and net income in the second quarter was positive against a small loss in the first quarter.

Joe Dale, president of Formula Consultants, Inc., an Anaheim, Calif., Unisys systems software developer, said, "The numbers are disappointing to Wall Street and investors, [but] I believe the customer base is looking at other things . . . they're in the frame of mind to give Unisys another quarter or two to straighten things out."

Dale also said Unisys' attitude toward third-party hardware and software developers had improved significantly in the past few months. Formula Consultants is a beta-test site for the new Unisys 2200/100 and is using the departmental-level processor as a test and applications development platform.

However, better customer relations and new technology have not offset the worries of Duquesne University in Pittsburgh, which is migrating from its Unisys 1100 mainframe to a Unisys-marketed Sequent host.

"Rather than go with another Unisys box, it seemed to make more sense to go through them to another hardware vendor," said Linda Barner-West, director of communications and information technology.

Unisys introduced three new series of mainframes last week. Leading the pack is the A16, which Unisys said is the first mainframe to incorporate Motorola, Inc.'s latest high-density gate array chip. The five A16 models span the upper half of Unisys' A series line and cost from $1.7 million to $5.9 million [CW, July 23].

Unisys also unveiled six models of the 2200/600 Evolutionary System that give users 15% more performance and a 60% reduction in power and cooling requirements over the existing 2200/600 models. The 600ES versions range in price from $2.3 million for a one-processor model to $8.8 million for the four-processor model.

The departmental system, the 2200/100, will "allow users to add new site-specific applications or offload applications from a central DBMS," said Dennis Kosinski, vice-president of mainframe program management at the Unisys Computer Systems Products Group. The 2200/100 ranges in price from $115,000 to $200,000.

Unisys also unveiled four new models of its A12 mainframe that are field-upgradable to the top-of-the-line A17. The new A12s range in price from $496,000 to $2.4 million.

BART computer systems should work OK, panel says

BY J. A. SAVAGE
CW STAFF

OAKLAND, Calif. — Despite being over budget, overdue and obsolete in its hardware, a computer system that will run the Bay Area Rapid Transit (BART) trains should perform to minimum expectations, according to a blue ribbon panel report issued to BART's board of directors.

Embroiled in politics, the $42 million Integrated Control System was designed by Logica Data Architects, Inc., based in Waltham, Mass., to handle 64 trains. However, the BART board refused to pay Logica a fixed price of $1.1 million late last year to finish the system because the board said the system was supposed to be designed for a future capacity of 74 trains, not 64. Logica had been paid approximately $19 million for its work.

The outside panel, headed by Paul Bassily, assistant general manager of operations at the Washington, D.C., transit system, told the board that when the system is completed at an additional cost of $2.5 million, it should be able to handle the current minimum load of 55 trains.

The rejected fixed-price bid "doesn't reflect the same dollars as the $2.5 million projection," said Dave Warwick, manager of computer science engineering at BART. "The [Logica] estimate relates more to $3.3 million due to a number of caveats."

Now being completed in-house with a staff of 19, the system is currently operating alongside its 21-year-old predecessor during off-peak hours. Warwick said the completion is under budget and ahead of schedule.

To handle expansion of routes to suburban centers in the 1990s, the system's hardware will have to be upgraded, the panel said. It is currently operating on a Data General Corp. MV 10000 with a proprietary operating system purchased for BART in 1964. That computer is no longer being sold.

Second-class postage paid at Framingham, Mass., and additional mailing offices.
Computerworld (ISSN 0010-4841) is published weekly, with a single combined issue for the last week in December and the first week in January by CW Publishing/Inc., 375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171.
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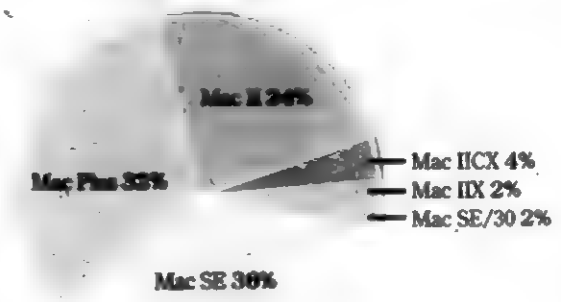
TRENDS

Macintosh

1989 installed base

Although older machines such as the Plus, SE and II still govern the present installed base, increased interest in the Motorola 68030 chip should boost the market share of the SE/30 and IICX

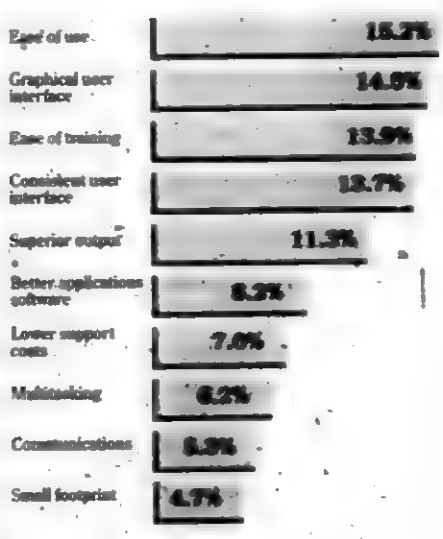
Percent of installed base among 200 survey respondents
Total units installed: 6,476



How respondents justify the purchase

Reasons why users choose the Mac over IBM PCs are its ease of use and the consistent and graphical nature of the interface. Users may soon be saying the same about Windows and OS/2 Presentation Manager

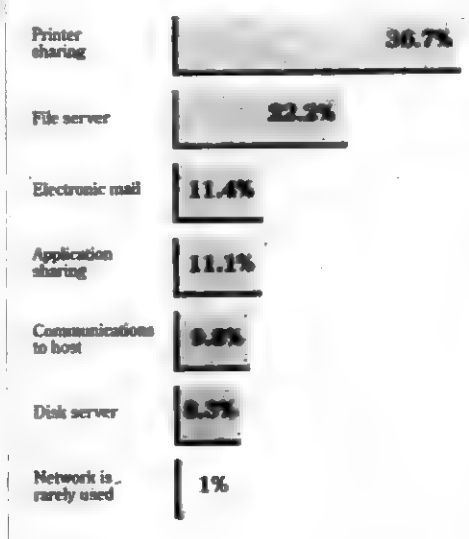
Percent of respondents
(Base: 200)



Functions of Macintosh LANs

Why are Mac LANs set up? Most often they're meant for sharing files, printers and applications, although type-talking also rates highly

Percent of respondents
(Base: 200)



Source: International Data Corp., Framingham, Mass.

CW Chart: Tom Monahan

NEXT WEEK

Levi Strauss is looking at systems design and the IS function in bold new ways, thanks to director of information engineering **Donna Rund.** Rund believes that both the people and the applications must be more flexible, and the approach is paying off for the world's largest apparel manufacturer. Turn to Manager's Journal for a profile of Rund.

Cindy Charles

Integration Strategies takes a look at the challenge of integrating imaging systems and also features articles on TWA Getaway Vacations, Jones Trucking, the quest for desktop integration, an interview with Digital Equipment Corp.'s integration boss, plus an exclusive *Computerworld* survey on integration priorities.

INSIDE LINES

Splicing the tapes

Dun & Bradstreet Software has merged the internal mainframe- and midrange-based information systems operations of Management Science America and McCormack & Dodge at its brand-new headquarters in Framingham, Mass. The switchover occurred during the first weekend in July and involved moving some 30,000 tapes and leasing Boeing 707s to fly two IBM 3090s in from Atlanta, according to new D&B Software Chief Information Officer Ray Dicaudi.

The secret's out

The National Computer Security Center, a computer security research branch of the National Security Agency (NSA), is being disassembled, a source said last week. "It's been gutted, at least on paper, and folded into the NSA," the source said. The source added that a major overhaul of the "Rainbow Books," the manuals detailing the design of computer security systems for federal government and military computers, is also in the works. The NSA, meanwhile, is as closemouthed as ever.

Distributed computing twist

Hard copies of "Phrack," an electronic newsletter for hackers and phone phreaks, have turned up in every major hacker investigation (15 in all) since 1988, according to David Bauer, a computer security expert at Bellcore. One of the techniques detailed in the newsletter is the way to modify the log-in program for Unix 3.2 so that it collects passwords of superusers, allowing the hacker to take control of the system. The password-capturing program has turned up on some 50 computers operated by telephone companies, Bauer said last week at the trial of Craig Neidorf, co-editor of "Phrack."

You want help?

IBM is readying a new service that will automate and standardize software problem determination and resolution, an industry source said last week. The service, designed to help IS managers run a smoother data center by detecting problems before the system goes down, will include software facilities for capturing failures in a system in real time, hardware and on-site training, the source said.

Preaching to the converted

It might have surprised some people to see 2,800 members of Guide International, a group of midrange and larger IBM systems users, thronging to hear Microsoft's Bill Gates deliver a Windows sales pitch for their keynote address last week in Chicago. But when Gates started off by asking how many of them had a PC on their desk that they used regularly, 80% raised their hands. More than 40% kept their hands up when Gates asked if they had at least seen a graphical interface in operation on a PC.

Printer needs attention

The Computer Emergency Response Team, a virus-fighting squad based at Carnegie Mellon University's Software Engineering Institute, is trying to track down a rumor of a new computer virus that attacks Apple Computer laser printers running Adobe Postscript and alters the default password contained on an EPROM in the laser printer. The only way to reset the password is to send the board to Apple for a $600 fix or write a routine that allows the user to decode the new password and then follow instructions in the manual for changing the password, wrote one virus newsletter reader.

The Franklin Institute Science Museum in Philadelphia is struggling with ways to make its computer system attractive and interesting when it allows visitors to peek through a window into the computer room, which houses the institute's Unisys minicomputers. "A gray box is still a gray box," said Richard Freedman, systems analyst. We, on the other hand, try our best to make Computerworld *attractive and interesting, so let's get together and swap data. Tips and queries should be directed to News Editor Pete Bartolik, (800) 343-6474, fax documents to (508) 875-8931, or dial up* COMPUTERWORLD *on MCI Mail.*

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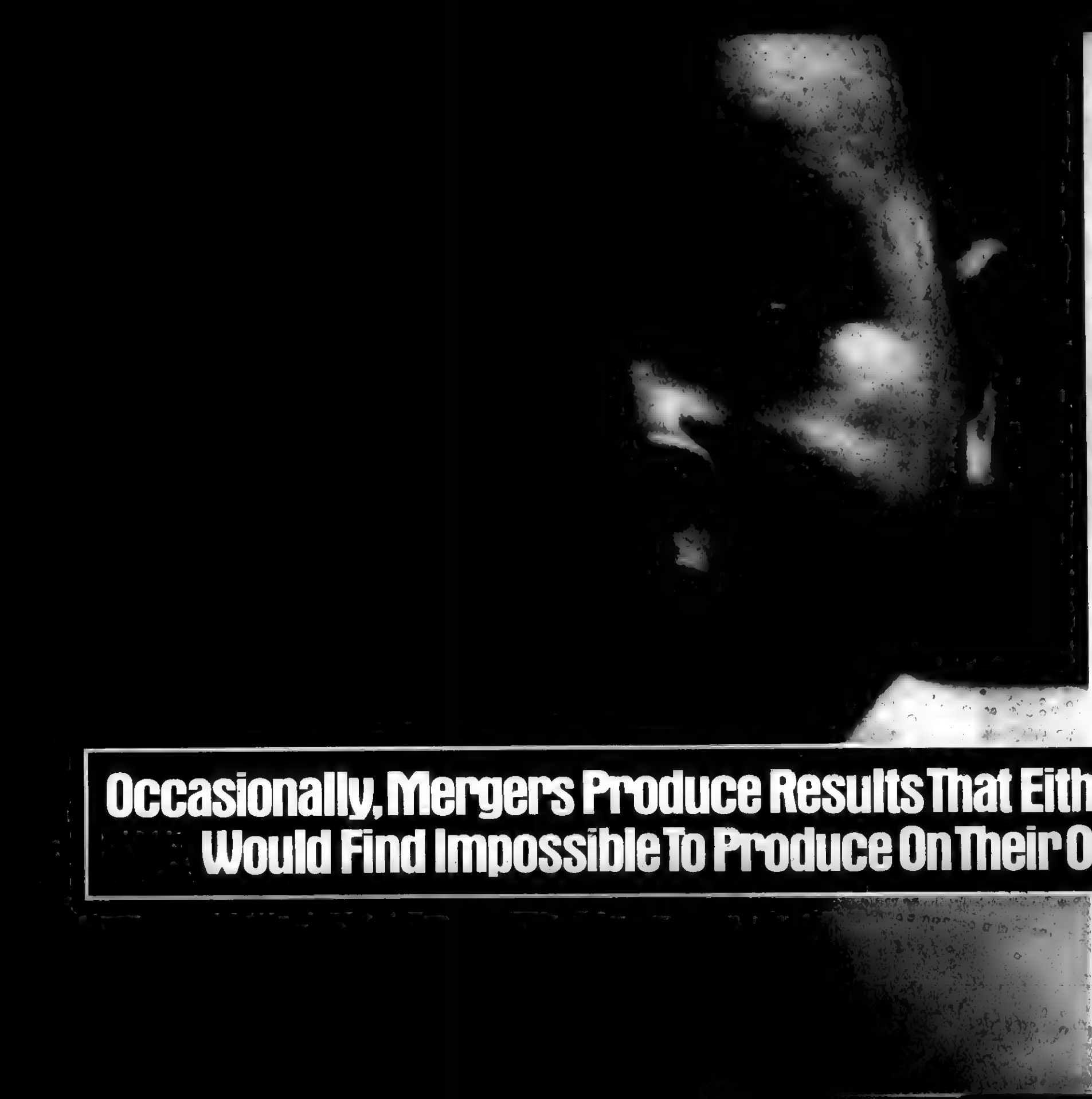

Occasionally, Mergers Produce Results That Either Party Would Find Impossible To Produce On Their Own.

It's not surprising that two can sometimes accomplish things that one never could. What is surprising, however, is just how beneficial the merger of McCormack & Dodge and Management Science America (MSA) promises to be.

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COMPUTERWORLD

Computerworld Smithsonian Awards celebrate the search for new heroes

Second annual awards gala honors winners in nine categories for the innovative use of technology in making our world a better place to live

BY CLINTON WILDER
CW STAFF

Against the dramatic setting of the National Building Museum's spacious Greek Revival atriums and massive Corinthian columns, technology innovators from three continents were honored with the second annual *Computerworld Smithsonian Awards* in Washington, D.C..

Honorees ranged from billionaire H. Ross Perot to a 10-employee company whose software enables the blind to benefit from graphical interfaces on computers. Innovators from Thailand and Switzerland became the first winners from outside the U.S.

International Data Group, Inc. Chairman Patrick J. McGovern touched on this global theme in his closing remarks, noting the power of information and information technology in reshaping the political landscape of Eastern Europe in the past year.

Perot, founder of Electronic Data Systems Corp. and Perot Systems Corp., received the first *Price Waterhouse Lifetime Achievement Award.* The *Siemens Award for the Advancement of Science* went to Robert Tinker, chief scientific officer at the Technical Education Research Centers.

There were 220 award nominees. The awards "celebrate the capacity of our species to strive to do things better," said Roger Kennedy, director of The Smithsonian Institution's National Museum of American History.

And the winners were:

• **Business and related services — Berkeley Systems.** The tiny Berkeley, Calif., firm developed Outspoken, a "talkback" program that responds audibly to mouse or keyboard commands. It guides blind or visually impaired users through icon-based interfaces.

• **Education — The Jason Foundation for Education.** The foundation pioneered the Jason Project, a system that allows U.S. students to view and interact with undersea exploration projects in real time. In two years, Jason's broadcast technologies have allowed approximately 225,000 schoolchildren to experience sunken shipwreck explorations in the Mediterranean Sea and Lake Ontario.

• **Environment, energy and agriculture — Environmental Systems Research Institute.** Redlands, Calif.-based ESRI developed ARC/INFO, software that helps environmental planners analyze databases of geographic information. Among its users are Third World governments attempting to balance economic development with ecological preservation.

• **Finance, insurance and real estate — Swiss Options and Financial Futures Exchange.** Soffex links 50 Swiss financial firms into a single national exchange located in Basel, removing the need for a trading floor. The three largest Swiss banks and stock exchanges jointly developed the system, increasing the capabilities of Switzerland's largest industry, financial services.

▲ **Federal Express'** *Cosmos II system took transportation honors. (Left to right) Gene Farrar, Harry Dalton, Jim Turpin and David Dietzel accept award from* CW's *Fritz Landmann and Smithsonian's Roger Kennedy.*

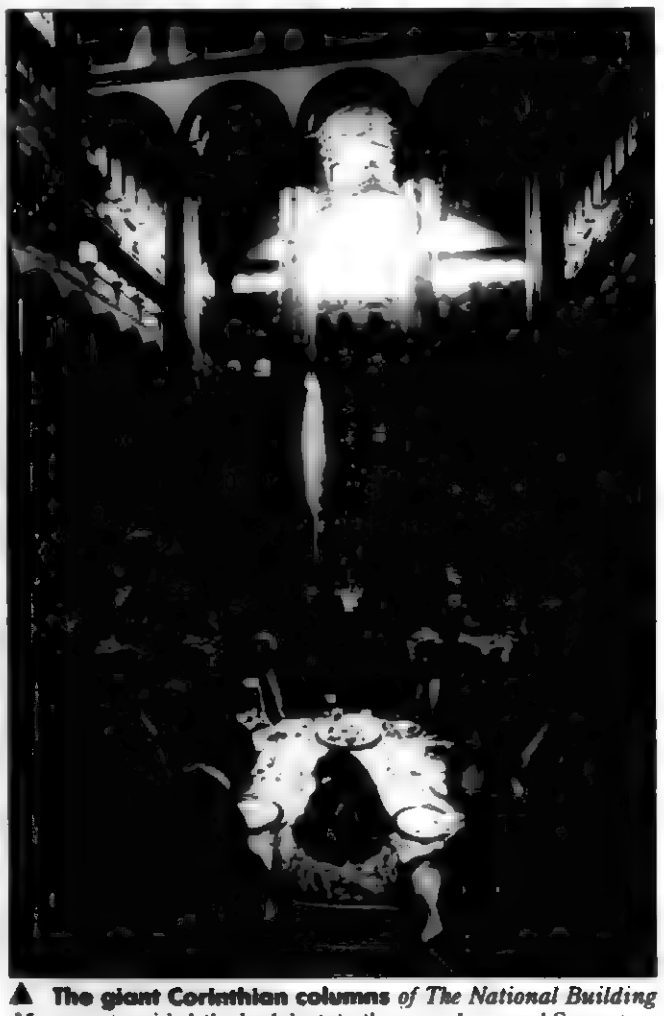
• **Government and nonprofit — The Government of Thailand, Ministry of Interior.** The Thai Ministry in Bangkok automated its demographic data collection, developing five different subsystems to track Thailand's 50 million people. The system, storing more than 100G bytes, enables more accurate planning in education, health care and economic development.

• **Manufacturing — Lubrizol Corp.** The Wickliffe, Ohio-based chemicals firm implemented the Material Safety Data Sheet, a database of all chemicals used in the workplace, their dangers and required handling methods. The data is used by employees, federal and state regulators and customers.

• **Media, arts and entertainment — Personics Corp.** Personics, based in Redwood City, Calif., developed a popular system that lets music buyers create customized audiotapes in record stores.

• **Medicine — Department of Biological Sciences, Purdue University.** Purdue professor Michael Rossman used supercomputer technology to create detailed models of human viruses. First applied to the rhinovirus — a common cold virus — the technique has the potential for greater understanding of more complex strains, including the HIV virus that causes acquired immune deficiency syndrome.

• **Transportation — Federal Express Corp.** Federal's fabled Cosmos II Tracking System enables the Memphis firm to track more than 1.4 million packages daily. Its heart is a pocket-size, full-function computer that links to huge central databases.



▲ **The giant Corinthian columns** *of The National Building Museum provided the backdrop to the second annual* Computerworld Smithsonian Awards *gala in Washington, D.C..*

Continued on inside back cover and back cover

THE NEWSWEEKLY OF INFORMATION SYSTEMS MANAGEMENT
August 6, 1990 · Vol. XXIV · No. 32 · 118 Pages · $2/Copy · $48/Year

COMPUTERWORLD

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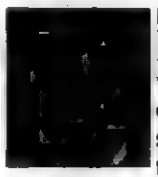
Integration Strategies — TWA Vacations, an exclusive DEC interview and much more. Page 63.



Profile: Donna Rund weaves cloth out of CASE software threads for Levi Strauss. Page 57.

Bellsouth blasted after feds drop hacking charges in connection with computer file that wasn't so confidential after all. Page 8.

OSF seeks cross-platform network management approach. Page 111.

An era passes as IBM prepares to unload Selectric typewriter division along with low-end printer manufacturing. Page 112.

$200 million gusher comes in for Andersen Consulting in outsourcing contract with Sun R&M. Page 4.

It's spreading! After two decades in the isolation wards, the MUMPS operating system begins to infect commercial operations. Page 25.

Despite more red ink at Wang, customers say embattled firm has turned the corner on servicing their needs. Page 4.

Fujitsu move rattles Europe

BY AMIEL KORNEL
CW STAFF

For the ever-so-polite British, Fujitsu Ltd.'s deal last week to acquire 80% of the UK's national computer champion, International Computers Ltd., was no less than an appalling breakdown in decorum. "Cheeky," trumpeted the front-page headline of one British tabloid.

Indeed, the polite competition that has characterized the European mainframe computer market is giving way to a no-holds-barred free-for-all that could leave vendors — particularly IBM — bruised and bleeding.

European buyers seem more open to moving to alternative suppliers. Plug-compatible mainframe vendors such as Amdahl Corp. — 44% of which is owned by Fujitsu — and Hitachi Data Systems Corp. have seen improvements in their European dealings during the past two years.

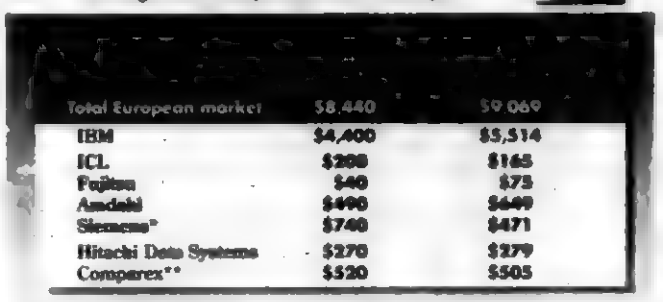
"People are much more prepared to use PCM machines than three to five years ago," said George Goodwin, who was chairman of the UK IBM Computer Users Association until last April. "What they're saying to IBM is that [IBM's] machines don't command a premium anymore."

Market leader IBM — which last year earned 37% of its revenue in Europe — could find itself in for a pummeling. Several factors are converging to put

Continued on page 113

The changing face of Europe

Already partial owner of and main components supplier to Amdahl, Fujitsu is rapidly building a more potent team to challenge IBM mainframe sales in Europe



Total European market	$8,440	$9,069
IBM	$4,400	$5,514
ICL	$200	$165
Fujitsu	$40	$75
Amdahl	$400	$449
Siemens*	$740	$471
Hitachi Data Systems	$270	$279
Comparex**	$520	$505

* Fujitsu reseller ** Hitachi reseller

Source: International Data Corp. CW Chart: Paul Mark

Spiffier AS/400s in wings

BY MARYFRAN JOHNSON
CW STAFF

SOMERS, N.Y. — Two weeks from now, IBM will roll out a summertime bonanza of new low-end systems, storage and software products for its mid-range Application System/400 customers.

In an interview with *Computerworld*, IBM officials confirmed last week that at least six low-end AS/400 and AS/Entry models, a new release of the OS/400 operating system and performance "kickers" for the high-end Model 70 will be included in the announcement, which is scheduled for the week of Aug. 20.

The company will also float a raft of connectivity products for multivendor networking and unveil new storage and backup options such as disk-mirroring capabilities for the AS/400.

In his first interview since assuming the top management job for the AS/400 line, Robert LaBant said that rumors of a slump in the fortunes of the AS/400 were dead wrong. Not only is the box selling well at IBM shops, but it is also winning

Continued on page 6

Deficit debate growing old for nervous industry chiefs

BY NELL MARGOLIS
CW STAFF

The staggering federal deficit has generated a ton of lip service but received only an ounce of debt service.

Last week, however, as Democratic and Republican congressmen once again appeared incapable of dealing with a budget estimated to be $169 billion in the red for 1991, several technology executives said that ignorance and inaction are luxuries that the computer industry can no longer afford.

Moreover, computer industry leaders — their nerves steeled, many said, by similar bullet-biting at their own companies — appeared ready to face the overwhelming probability that both spending cuts and tax hikes, rather than one or the other, will be needed to achieve any meaningful deficit reduction. While those leaders differed as to emphasis and priority, the bottom-line results they were seeking were the same.

"We need to reduce the federal deficit. It's been a millstone around our necks for the past decade," said Everett Ehrlich, vice-president of financial and economic planning at Unisys Corp. "It's economically absurd to think we can have a robust business sector in a country that spends more than it earns."

The computer industry, many

Continued on page 111

Key contracts pay for MCI data push

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — Driven by demands from its largest customers, MCI Communications Corp. is evolving from a low-cost provider of voice services to a full-service telecommunications vendor. Along the way, the company has borrowed a philosophy from another industry: When you're No. 2, you have to try harder.

MCI is using the big bucks of its key accounts to develop data-oriented capabilities such as bandwidth on demand, customer control of the network and applications that include videoconferencing and electronic data interchange. Donald M. Heath, vice-president of data marketing, a position established last year, said the firm's emerging data strategy is based on landing customers whose $1 million-plus annual billings can justify custom development work while funding product development.

The focus on specific market opportunities works to the advantage of both parties, said Hugh Hoffman, network manager at Northwestern Mutual Life Insurance Co. Two years ago, the insurer teamed up with MCI in what at the time was a unique arrangement to locate NML's packet switches at MCI facilities. That became the basis for a 10-node nationwide backbone connecting local-area networks at more than 100 of the firm's agencies. MCI's willingness to undertake the arrangement was decisive in NML's choice of

Continued on page 8

Spanning the country **MCI**

MCI has been on an investment binge in an effort to cement its role as the No. 2 long-distance carrier

CW Chart: Paul Mark

NEWSPAPER

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Quotable

"I don't think this is the last case of a Japanese takeover."

MARTIN HINGLEY
IDC EUROPE LTD.

On Fujitsu's purchase of ICL. See story page 1.

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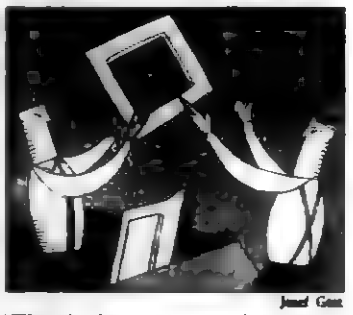
"The key to competitive advantage is taking the technology and applying your own value-added and executing it. And the key to executing it is trained people who understand that technology better than somebody else does . . . Simply taking that box is not where the competitive advantage is. . . Providing the technology tools to seize new business opportunities has always been our strength, the creativity of the new products we come up with. And those products? They're nothing more than information services." DuWayne Peterson, IS chief at Merrill Lynch & Co., from a recent keynote address.



Janet Gotz

Tips for better systems implementation. Page 79.

Jon Levy-Liberman

User groups lobby to influence product directions. Page 47.

EXECUTIVE BRIEFING

■ **Outsourcing claimed another major convert** as Sun R&M handed over its data center and network management to Andersen Consulting for the next 10 years. The $200 million contract came after the firm, a division of $10 billion oil giant Sun Co., decentralized its IS and found it had excess CPU capacity and personnel. Andersen will acquire Sun's Dallas data center and an unspecified number of operations employees; Sun will retain applications development. **Page 4.**

■ **IBM's AS/400 line will get a big boost** later this month with a major new product rollout. IBM executive Robert LaBant confirmed that the midrange bulwark will get at least six new low-end models, a new release of the OS/400 operating system and performance upgrades for the high-end Model 70. LaBant also said that IBM has resolved any internal political woes resulting from customers using the AS/400 to replace their mainframes. **Page 1.**

■ **Thirty expert systems users** described their applications at the annual AAAI conference on artificial intelligence. Such companies as Eaton, Sears and Owens-Corning Fiberglas are trying to expand the use of expert systems within their organizations, while vendors say the trend is just beginning to take off. At the conference, IBM unveiled a new family of expert systems development tools. **Page 10.**

■ **Michael Lanier, a former Charles Schwab executive,** will take over the top IS post at DHL Worldwide Express. Lanier, who has been a consultant since leaving Schwab two years ago, will replace retiring IS chief William Pigott at DHL. **Page 6.**

■ **The city of Dallas and Bergen Brunswig** copped the fourth annual SIM awards for IS innovation resulting from management partnerships. Dallas was honored for the integration of several information technologies in its police department, while Bergen Brunswig was cited for almost 20 years of automation leadership in the distribution industry. **Page 112.**

■ **The mainframe market battle in Europe** is heating up. Fujitsu's acquisition of a controlling stake in Britain's ICL signals a more aggressive Japanese push, while a growing movement toward open systems and downsizing is putting the squeeze on margins. IBM pricing reflects the brewing battle, with mainframe discounts reaching 45% in some cases. **Page 1.**

■ **Ever think of pitching a systems proposal** on the basis of its impact on earnings per share — or even the price of your company's stock? Fourth Shift Corp. uses such an approach to sell its LAN-based MRP II software. **Page 57.**

■ **Systems implementations often fail** because of poor or inappropriate participation by top executives, especially in midsize firms with sales between $40 million and $100 million, according to a new study. Critical success factors include good staffing, structure, organization, timing, control, communication, vendor relationships and training. **Page 79.**

■ **On-site this week:** Automation is no fish story at Mrs. Paul's Kitchens. Approximately 35% of the Philadelphia-based seafood products firm's brokers now place their orders electronically, replacing a facsimile/manual data entry system and enabling one-day turnaround. **Page 50.** New York Life has provided 1,000 of its 10,000 independent agents with a PC-based sales system, allowing them to do policy sales "paperwork" electronically at the customer site. **Page 39.** Paperwork is also on the wane at Grumman Corp.'s legal department, thanks to a Wang-based imaging system. Document research and retrieval have been sped up dramatically. **Page 29.**

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Sun R&M opts for outsourcing

BY ELLIS BOOKER
CW STAFF

PHILADELPHIA — Sun Refining and Marketing Co. last week became the second energy company to pass the torch for its information systems department to Chicago-based Andersen Consulting.

The 10-year, $200 million outsourcing deal follows a decentralization at Sun R&M last year that moved IS employees closer to the various business units [CW, June 18].

That restructuring, which reduced the operations staff from more than 100 employees to about 70, still left the IS department with excess capacity, personnel and building space, according to Sun R&M officials.

"We had a good building and a staff capable of more than we asked," said Jack Donohue, director of IS. At the beginning of the year, he said, the firm began looking for someone "who'd value staff and the center."

Asked about staff levels for the data center it plans to acquire, an Andersen spokesman said that because the deal had yet to be cemented, the firm had no comment on any plans regarding personnel or staffing.

Donohue confirmed that Andersen was one of three companies who bid on the deal but would not name the others.

The letter of intent signed by Sun R&M and Andersen last week calls for Andersen to acquire Sun R&M's Dallas Computer Center, hire its employees and manage the firm's data processing and Systems Network Architecture backbone network. Sun R&M is one of several units that make up Sun Co., a 105-year-old energy firm headquartered in Radnor, Pa.

Sun R&M's *Donohue: excess CPU*

An Andersen spokesman said that the contract, which should be finalized soon, was one of its largest facilities management jobs to date. Andersen's "systems management" business contributed $100 million — about 7% — to its total of $1.44 billion in revenue last year. At Andersen, systems management includes traditional facilities management as well as software re-engineering, network management and disaster recovery services.

The Sun outsourcing contract is Andersen's second with an energy firm. Last March, it took over management of data processing and data communications for Dallas-based Maxus Energy Corp.

"We're realizing about 20% annual savings" on a $5 million to $8 million annual IS budget, said Maxus Director of IS John Seifrick. Seifrick said he believes he received a particularly good deal because Andersen wanted to establish a beachhead in the area.

Andersen hired 30 of Maxus' 70 IS employees to run the Amarillo, Texas, data center. However, within six months this center had been relocated to a new Andersen facility in Irving, Texas, where it now supports the back-office computing for Maxus and at least two other companies.

"We kept database administration, applications development, help desk and scheduling [functions]," said Seifrick, whose development work these days is focused on cooperative networked applications using personal computers and workstations. Sun R&M will retain its applications development in-house, as well as management of local-area networking and departmental computing.

Outsourcing the highly specialized and often proprietary scientific computing functions of an energy company could be difficult, observed Dudley Cooke, former chief information officer at Sun Co. "When it's just refining and marketing, it's more of a factory operation — traditional data processing as opposed to scientific [processing]," he said.

Cooke, who left Sun in late 1988 and is now president of The Executive Insight Group, a management consultancy in Bryn Mawr, Pa., said that in Sun's case, this problem was eliminated in 1988 when the parent corporation divested its exploration and energy production operation. Oryx Energy Co. in Dallas now handles Sun's scientific computing jobs.

Like many outsourcing customers, Sun elected not to hand over its applications development to an outsider. This function will remain inside Sun R&M, located primarily in Philadelphia. The remaining IS staff numbers approximately 380.

Andersen's services will be sold back to Sun on a variable cost basis, although Donohue declined to share the size of the company's IS budget. "The savings will be substantial," he said. The 15-year-old Dallas data center contains four IBM mainframes — an IBM 3090 Model 400E, a 3090 Model 120E, a 3084 and a 4381 — that last year supported about 5,500 users.

Users root for Wang rebound efforts

BY SALLY CUSACK
CW STAFF

LOWELL, Mass. — Users greeted Wang Laboratories, Inc.'s predicted fourth-quarter loss with a strong show of support last week as the minicomputer maker posted a net loss of $496.7 million, or $3.01 dollars per share.

"It wasn't unexpected," commented Matt Gillman, president of the U.S. Society of Wang Users. "We realize Wang needed to take strong steps over the past 12 months, and we're optimistic about the upcoming year. Wang is taking care of the basics."

Among those basics, Wang is continuing to prune its work force. According to a spokeswoman, the company plans to cut between 1,000 and 1,300 positions at 100 offices worldwide this quarter. No specific groups have been targeted. Wang currently has 20,900 employees on its payroll, down 27% from one year ago.

Revenue from continuing operations totaled $652.2 million in the fourth quarter, compared with a restated $750.9 million in last year's fourth quarter. Revenue for the year totaled $2,497.2 million, compared with a restated $2,909.9 million in fiscal 1989.

Referring to Wang Chief Executive Officer Richard Miller's Operation Customer campaign of the past year, Gillman said that Wang certainly has done a better job of servicing the user community but feels that it still has a long way to go to achieve total turnaround. "The type of change Miller is orchestrating does take time," he noted, adding that the results he has already seen seem "most encouraging."

Declining realities

Reduced shipments in 1989 hampered Wang's growth in the midsize systems market and eroded its presence in the small systems market

WANG	Worldwide shipments		Worldwide installed base	
	1988	1989	1988	1989
Midsize systems	1,480	1,014	9,106	8,483
Small systems	8,860	7,460	73,277	66,999

Source: International Data Corp. CW Chart: Paul Mock

According to Hugh V. Naughton, director of information systems at the Gas Research Institute in Chicago, Wang has made an "outstanding" effort to improve customer relations. The Gas Research Institute has been a Wang customer for more than 10 years. Naughton indicated that Wang has provided users with demonstrations of products being beta-tested — something almost unheard of two years ago.

"Now they even apologize for the roughness of the beta-test versions," Naughton said. "Before, if you did see a product at that point in development, you had to sign multiple nondisclosure agreements."

With more than 50,000 proprietary VS system installations worldwide, Wang must provide existing customers with an upward migration path and simultaneously establish itself as a significant player in the imaging applications marketplace to reach its goal of profitability for the fiscal year that began July 1.

"They are getting ready to make the open systems push," said David Card, an analyst at International Data Corp., a market research firm based in Framingham, Mass. "Wang is not a start-up; they have to network entire companies and be able to solve a variety of needs. And they are making a serious effort to know their customers — it's not just hype."

Stephen L. Koller, a Wang 7010 computer user and director of information services at Stamford, Conn.-based International Executive Service Corp., said he believes that Wang has "really turned the corner on customer service. There is no more passing the buck. When there has been a problem with either a product or an individual, Wang has seen it resolved."

Wang's net loss for the quarter included restructuring and other special charges totaling $417 million and year-end adjustments representing changes in estimates to annual expense and income items of $24.2 million. Last year's fourth quarter ended with a loss of $374.7 million, or $2.29 per share.

CORRECTION

Second-quarter net income for Tandem Computers, Inc. was incorrectly stated [CW, July 23]. Tandem's net income rose 5.5% to $32.4 million.

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STANDARDS	ANSI SQL	✓	✓
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NEWS SHORTS

Schwab's Lanier takes DHL wheel

Michael Lanier, former senior vice-president in information systems at Charles Schwab & Co., will take over the top IS slot at DHL Worldwide Express this week following the retirement of Senior Vice-President of MIS William Pigott. Lanier left Schwab shortly after the resignation of Executive Vice-President of Information Services Woodson Hobbs in the summer of 1988, according to a Schwab employee. Mark Barmann replaced Hobbs as the San Francisco investment firm's CIO. Lanier reportedly spent the interim between his resignation from Schwab and his appointment at DHL working as an independent consultant.

Layoff at Bull

Bull HN Information Systems, Inc. confirmed last week that Groupe Bull plans to reduce its work force by as many as 3,000 people worldwide in the coming year. According to David Dotlich, executive vice president for corporate relations, the majority of the layoffs will occur in Europe. While the company currently has no plans to reduce the stateside staff, Dotlich did not rule out that possibility as the company continues to downsize throughout the year.

Nynex to test radio links

The Nynex Science and Technology unit of Nynex Corp. applied to the Federal Communications Commission for an experimental license to test and evaluate digital radio technologies last week. The tests are intended to determine whether these technologies can be used to transmit telephone calls between customers and telephone company sites. Deploying digital radio technology in the local exchange carrier distribution system or local loop could result in better overall service and significant cost savings, the company said.

Norton Utilities gets LAN support

Symantec Corp.'s Peter Norton Computing group last week announced Version 5.0 of its Norton Utilities package for IBM-compatible MS-DOS machines, extending support to Novell, Inc.'s Netware operating system in an effort to broaden Utilities' estimated current base of 1 million personal computer users. Utilities 5.0 "rides" Netware to access remote disk drives scattered throughout a Novell local-area network. Users see simulated disk drive lights on their screens that indicate whether remote drives are being accessed, according to the vendor. Users reportedly can use Utilities' Unerase capability, for example, for any drive they are able to access through Netware.

Data Switch eyes LAN business

Data Switch Corp., a maker of matrix switches and other management and control systems for data processing and communications applications, said last week it has entered into a technical agreement with token-ring and internetworking vendor Proteon, Inc. Data Switch will reportedly incorporate Proteon router technology into its products in an effort to link LANs to the corporate data center. The company said it will also resell Proteon products such as token-ring network adapter cards as accessories. The announcement falls on the heels of matrix switch rival Bytex Corp.'s comparable move to expand into the LAN business with its acquisition of Chantilly, Va.-based Vance Systems Corp., maker of the ATS LAN 1000 protocol analyzer.

Daisy shrivels

Workstation pioneer Daisy Systems Corp. was dragged into bankruptcy court by its creditors and responded with a voluntary reorganization request last week in San Jose, Calif. The involuntary Chapter 11 proceedings began in May when six creditors asked the Federal Bankruptcy Court in Colorado to initiate reorganization. Except for 1988, Daisy has shown losses since 1986, with a $140 million loss last year.

More news shorts on page 112

Lotus litigation draws protest

BY MICHAEL ALEXANDER
CW STAFF

"1-2-3-4, kick that lawsuit out the door; 5-6-7-8, innovate don't litigate; 9-A-B-C, interfaces should be free; D-E-F-O, look and feel has got to go."
— League of Programming Freedom "hex chant."

Stephen Sherman

League of Programming Freedom *launches demonstration at Lotus last week, insisting that 'look and feel has got to go'*

For the second year in a row, Lotus Development Corp. was the target of demonstrations last week by the League of Programming Freedom, a group formed to protest litigation over the look and feel of user interfaces.

About 300 demonstrators — twice as many as last year — assembled in a small park next to Lotus' Cambridge, Mass. headquarters to listen to speeches by Richard Stallman, the league's founder; Patrick Winston, director of MIT's artificial intelligence laboratory; and other well-known figures in academia and the computer industry.

"We have come to warn the public of the terrible harm that Lotus is trying to do to computer users," said Stallman, developer of Emacs, a widely used programming editor. Stallman recently received a MacArthur Foundation fellowship for his efforts to promote free software.

Copying and using computer interfaces is as old as the software industry itself, said Stan Kugell, founder and former president of Javelin Software Corp.

"The irony is that Lotus and Apple probably would not exist today if there had been look-and-feel copyrights," Kugell said. The look and feel of Lotus 1-2-3 is closely based on Visicalc, and that of the Apple Macintosh is based on work by Xerox Corp. and others, he said.

Stallman and other league members charged that look-and-feel lawsuits by Lotus, Apple Computer, Inc. and Ashton-Tate Corp. will stifle innovation and force programmers to develop incompatible interfaces simply to avoid copyright litigation.

In June, Lotus won a copyright infringement lawsuit filed against Paperback Software International, Inc. and Mosaic Software, Inc. Lotus has also filed similar suits against Borland International and The Santa Cruz Operation.

"Unfortunately, Lotus has won the first battle," Stallman told the gathering. While it is possible that the Supreme Court may eventually overturn the Lotus decision, the League hopes to prod Congress into "letting us continue doing what we have always done," Stallman said.

The protestors walked a picket line in front of Lotus for about 30 minutes, carrying signs and chanting slogans.

Asked to comment on the complaints that lawsuits stifle innovation, a Lotus spokesman said: "We disagree with that position because we feel that copyright law provides a legal framework that encourages the innovation that has driven the software industry's success."

AS/400s

FROM PAGE 1

back lost accounts from other vendors at an escalating rate, the vice-president of application business systems said.

Just a few weeks past its second anniversary, the AS/400 has sold twice as many systems as the wildly popular System/36 did in its first two years, LaBant said. Revenue growth for the line was 27% last year.

LaBant also spoke frankly of the AS/400 as a replacement system for other IBM platforms, such as the aging 3080 mainframe line, indicating that IBM has resolved whatever internal strife the "downsizing" trend may have caused.

He and other IBM managers insisted that the RISC System/6000 Powerstations and servers pose no threat to their midrange darling. Just as Digital Equipment Corp. officials say their Unix-based workstations will not erode their commercial systems base, so does IBM believe that the RS/6000 will snare mainly technical and scientific users while the AS/400 remains the choice for business use.

"Actually, I think the market will decide it for us, as usual," said Bob Dies, a marketing manager for AS/400s. While there are no plans to add Unix to the AS/400, IBM does intend to improve connectivity between the AS/400 and the RS/6000, he added.

IBM's LaBant

The overall strategy for the AS/400's future also includes greater emphasis on customizing applications, such as imaging and voice/data transmission. Users can expect IBM to keep expanding the power of high-end processors, LaBant said, while dropping low-end entry-level prices into the workstation arena between $10,000 and $15,000.

Users who have topped out on their Model 70s, however, will have to wait until 1991 for IBM's new high-end models — and for the multiprocessing capabilities IBM has promised.

LaBant spent many of his first 90 days on the job visiting customers, including a handful of large customers who are installing hundreds — in one case, thousands — of AS/400s. Most of the AS/400 sales have gone into what IBM calls "multiples" accounts, where customers install anywhere from a few to several hundred machines and most use PC networking software.

"What has not been well publicized is the role the AS/400 is playing at large multiples," LaBant said.

In his talks with customers, LaBant also heard requests for the long-promised distributed database capabilities — one of the features on the list of Systems Application Architecture (SAA) pledges. The AS/400 is also late in providing Rexx, a high-level procedural language that is part of SAA.

However, LaBant and his managers insisted that other than those two features, the AS/400 is on schedule. "My lab in Rochester, [Minn.], has to provide those SAA functions," he said. "I have to make sure we are moving down the SAA path as fast as possible and along with everyone else."

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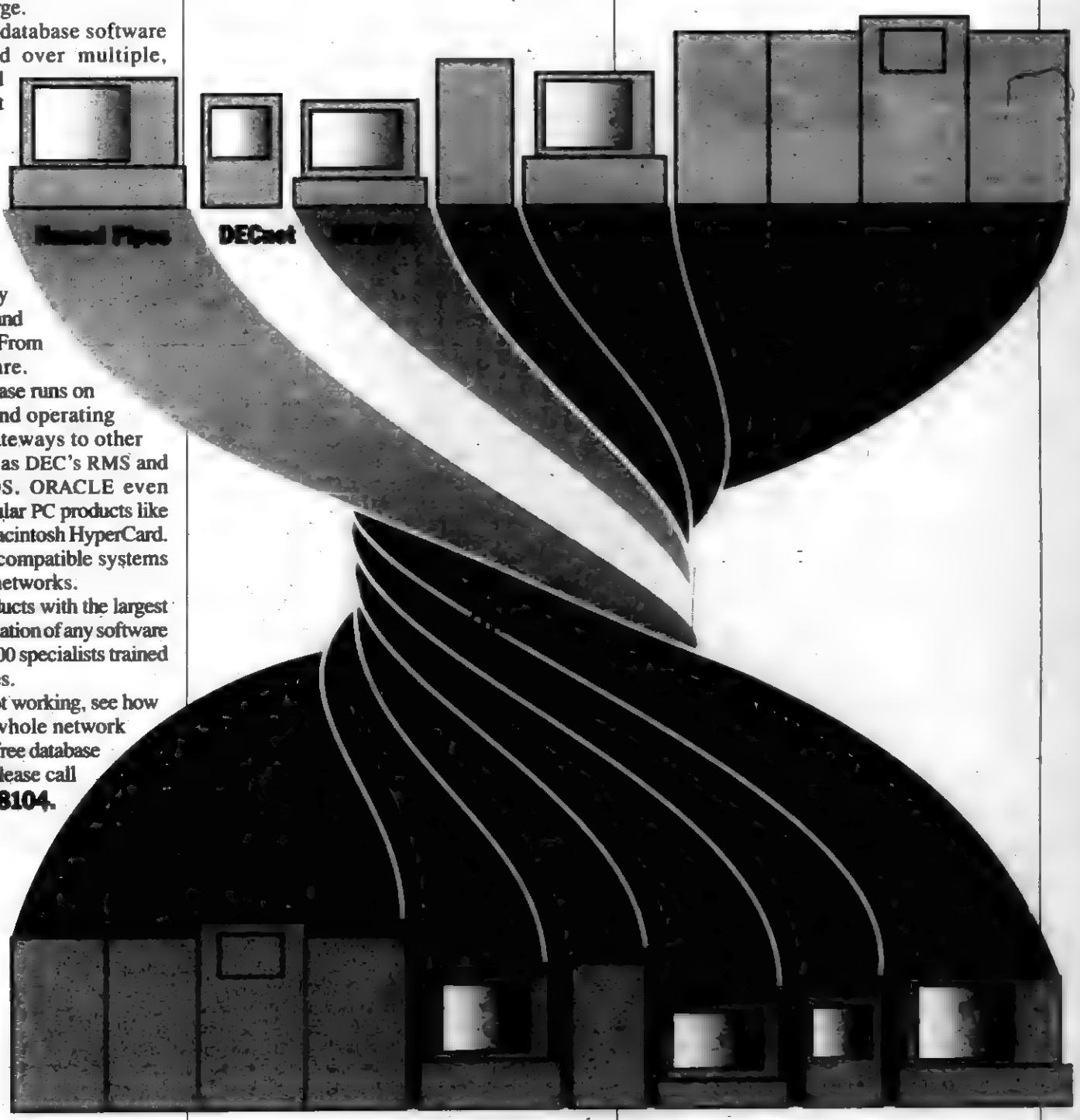

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Dial 1-800 . . . for Bellsouth 'secrets'

BY MICHAEL ALEXANDER
CW STAFF

CHICAGO — The attorney for Craig Neidorf, a 20-year-old electronic newsletter editor, said last week that he plans to file a civil lawsuit against Bellsouth Corp. as a result of the firm's "irresponsible" handling of a case involving the theft of a computer text file from the firm.

Federal prosecutors dismissed charges against Neidorf four days into the trial, after prosecution witnesses conceded in cross-examination that much of the information in the text file was widely available.

Neidorf may sue *for 'irresponsible' trial effort*

Neidorf, the co-editor of "Phrack," a newsletter for computer hackers, was accused by federal authorities of conspiring to steal and publish a text file that detailed the inner workings of Bellsouth's enhanced 911 emergency telephone system across nine states in the Southeast [CW, July 30].

"What happened in this case is that the government accepted lock, stock and barrel everything that Bellsouth told them without an independent assessment," said Sheldon Zenner, Neidorf's attorney.

One witness, a Bellsouth service manager, acknowledged that detailed information about the inner workings of the 911 system could be purchased from Bellsouth for a nominal fee using a toll-free telephone number.

A Bellcore security expert who was hired by Bellsouth to investigate intrusions into its computer systems testified that the theft of the file went unreported for nearly a year.

Last week, a Bellsouth spokesman said the firm's security experts delayed reporting the theft because they were more intent on monitoring and preventing intrusions into the company's computer systems. "There are only so much resources in the data security arena, and we felt that it was more urgent to investigate," he said.

He also disputed assertions that the document was of little value. "It is extremely proprietary and contained routing information on 911 calls through our nine-state territory as well as entry points into the system," he said.

A quick ending

The case unraveled after Robert Riggs, a prosecution witness who had already pleaded guilty for his role in the theft of the document, testified that he had acted alone and that Neidorf had merely agreed to publish the text file in "Phrack."

Neidorf and his attorney agreed to a pretrial diversion, a program under which the government voluntarily dismisses the indictment but could reinstate it if Neidorf commits a similar crime within a year.

The case has stirred up national debate on the rights of computer users in the age of electronic information. The Electronic Frontier Foundation, a civil liberties group set up by Mitch Kapor, founder of Lotus Development Corp., may participate in the filing of a lawsuit against Bellsouth, said Terry Gross, an attorney at the New York law firm of Rabinowitz Boudin Standard Krinsky & Lieberman.

"The Electronic Frontier Foundation is concerned by the irresponsibility of Bellsouth of claiming from the outset that this was confidential material when it should have known that it was not," Gross said.

Too much access

PENSACOLA, Fla. — A former U.S. Air Force airman, alleged to be a member of the Legion of Doom, pleaded guilty last week in U.S. District Court to possession of at least 15 access codes with intent to defraud.

Peter J. Salzman, 19, an airman at Elgin Air Force Base, used an Apple Computer, Inc. IIE to enter telephone systems operated by Bellsouth Corp., Bell Atlantic Corp. and other carriers, said Stephen Preisser, assistant U.S. attorney for the Northern District of Florida.

A device that logs outgoing calls indicated that Salzman was "burning the wires" without paying for the telephone calls, Preisser said.

The airman is alleged to be a member of the Legion of Doom, a group of hackers under investigation by federal and state authorities. Authorities searching Salzman's home uncovered correspondence that indicated Salzman was a member of the group, Preisser said.

Salzman will be sentenced on Oct. 5 and could receive a maximum of 10 years imprisonment and a $250,000 fine.

MICHAEL ALEXANDER

MCI

FROM PAGE 1

vendor, Hoffman said.

Chrysler Corp. recently chose MCI to provide an interstate 1.5M bit/sec. network for business and engineering data. Chrysler asked MCI to develop a knowledge-based system for automatically responding to routine network problems.

The capability being developed is a data-oriented version of MCI's Integrated Network Management Services, which is designed mostly for use with MCI's voice-based Vnet service. Heath said it will be turned into a product with general availability within a year or so.

Heath said 70% of the MCI communications network is now geared for high-speed data communications. The balance, while able to support data transmission, does not yet have all of the reconfigurability, intelligence and fault tolerance desirable for the most demanding data applications, he said.

MCI would seem to have little choice but to jump on the data bandwagon. It lags behind archrival AT&T in the breadth and depth of its data services, and its data offerings now account for less than $1 billion of its annual revenue. Meanwhile, the market for data services is growing at 35% annually while demand for voice rises at a 3% to 5% rate, said Berge Ayvazian, a vice-president at The Yankee Group.

"MCI has not been successful in stealing [data] market share from AT&T," Ayvazian said. That is partly because MCI's services are less mature and customers have traditionally felt more comfortable trusting their mission-critical data applications to AT&T, he said.

"We absolutely must become a full-service supplier in global markets — data and voice," Heath said. "We could be a nicely profitable, slow-growth company, but MCI's objectives are to win market share and to grow rapidly."

One Fortune 500 firm uses MCI, AT&T and U.S. Sprint Communications Co. for its data network backbone, but it uses mostly AT&T for its low-speed, point-to-point analog and digital data circuits. The firm's director of data communications, who asked not to be named, said, "With T1, MCI and Sprint have proven very effective. But below T1, MCI and Sprint can't respond as effectively as AT&T. If AT&T says they'll be there [for an installation] on July 7, they'll be there. The ability to deliver services on time is a problem with MCI."

MCI has one of the most sophisticated data processing and networking environments in the world, Ayvazian said. "But so far, MCI has not allowed that focus to penetrate into product management. They have not taken their transaction processing expertise to market."

Heath said MCI is moving toward "universal dial tone for data," by which applications such as videoconferencing can be invoked as readily as a long-distance voice call. He said MCI will increasingly offer high-speed switched services in which customers can instantly boost transmission capacity to meet peak loads for applications such as computer-aided design and manufacturing and interconnection of local-area networks.

Some users are apparently willing to wait for MCI to round out its data offerings. One year ago, Merrill Lynch & Co. handed MCI a $150 million telecommunications outsourcing contract. Thomas Byrnes, telecommunications vice-president at Merrill Lynch, recently said, "MCI has shown that it is moving to a state-of-the-art network delivery. We feel we do not have to absorb the risk of buying gold technology. We say to MCI, in effect, that if something new comes along, we'll use it."

Applications such as electronic mail and EDI will become an increasingly important part of MCI's strategy, Heath said. "Value-added applications can potentially double our market."

The data market is less price-sensitive than the voice market, Heath said. "In our surveys, price is forgotten. It's functions, features, reliability."

At a glance

MCI looks at data-oriented services as a chance to stay on a fast-track growth path

1989 revenue: $6.5 billion
1989 earnings: $558 million
Average annual growth in revenue (1985-1989): 26.9%
Total assets: $8.3 billion
Rank in U.S. long-distance market: No. 2
Market share (of $55 billion market): 12%
Employees: 19,000

CW Chart: Paul Mock

Giving 'inn' to net needs

Now that it has accumulated 133 properties under its hotel management umbrella, Prime Motor Inns, Inc. has decided to leverage its position as a large user of network services with a customized MCI Communications Corp. Vnet package.

The contract is a $30 million, three-year exclusive agreement. Douglas Holloway, vice-president of technical services at Prime, said "substantial" savings and improved services to hotel guests were the impetus behind the deal.

Vnet is MCI's virtual network offering, a long-haul transport option that allows customers to allocate a portion of the public network between their premises and the carrier's central office to a mix of services. Virtual networks offer the channel allocation the flexibility of a private network without forcing users to make large investments in equipment, dedicated lines and telecommunications personnel.

Prime Motor Inns in Fairfield, N.J., owns and/or operates hotels of various franchises, including Howard Johnson's, Ramada, Inc. and Holiday Inns, Inc. The firm intends to use Vnet as a dial-up network for voice and modem applications, credit-card authorizations and call accounting functions, Holloway said. Management of the network will be handled entirely by MCI.

Holloway said a contributing factor to the MCI selection was the carrier's flexibility in its billing system. He said the other two bidders — AT&T and U.S. Sprint Communications Co. — did not offer the flexibility in aggregating the billings of individual locations and sending them to a central location.

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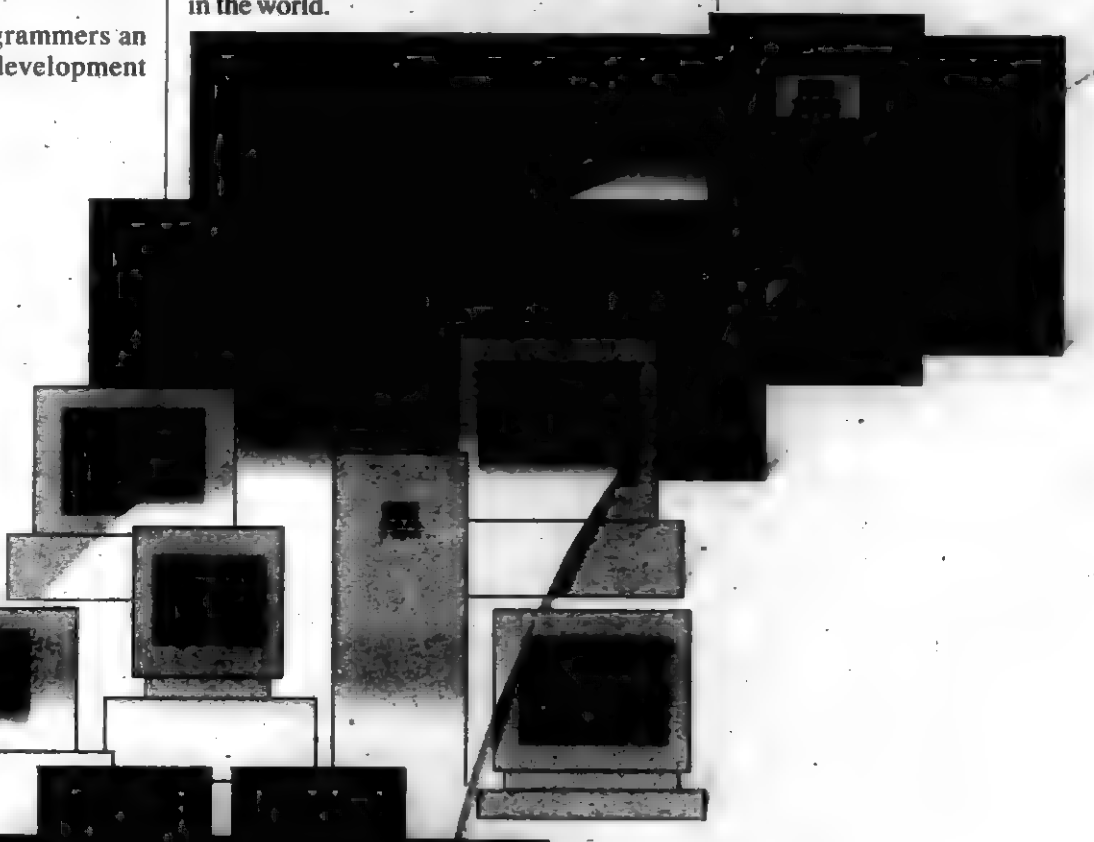

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Expert systems make their mark in corporations

BY JOHANNA AMBROSIO
CW STAFF

BOSTON — Expert systems are on the move again. Although the technology has not lived up to the hyped expectations of previous years, large information systems shops around the country have implemented production applications using expert systems tools.

Representatives from some 30 user organizations talked about their applications at the AAAI-90 National Conference on Artificial Intelligence, held here last week.

Eaton Corp. in Milwaukee has deployed more than 20 expert systems companywide, said Michael L. Smith, a senior AI specialist at Eaton's corporate research and development group. "Our goal is to have 20,000 people using expert systems by year-end 2000," he said.

Owens-Corning Fiberglas Corp.'s expert system helps factory workers diagnose and fix problems that occur on the production line. It runs on personal computers in the factory and hooks into the corporate database. Once the system has helped diagnose the problem, a video shows the user how to fix the problem.

Sears, Roebuck and Co.'s Merchandising Group has several pilot expert systems that are slated to go into production within the next year or so. Applications include merchandising, marketing and auditing.

"We've been involved with the technology for two years," said Mike Rogalski, a Sears software specialist. "We believe the technology can be useful for us; it's not just for rocket scientists." Benefits so far include improved customer service and "flexible and responsive development tools," he said.

Themis Papageorge, corporate AI marketing director at Digital Equipment Corp., estimated that about 100 of the Fortune 1,000 firms have "mission-critical production applications that use expert systems technology. This trend started around three years ago but became significant in the last nine months."

Different factors are coming together to spearhead this trend. Robert N. Goldman, president and chief executive officer of software vendor AI Corp. in Waltham, Mass., said, "IS directors are realizing there are problems in their organizations that this technology can address. These are generally adaptive kinds of problems — implementing corporate policies and applying those rules to applications such as pricing, allocation, scheduling. Predictive technology just can't be built into the older programming tools."

The first generation of expert systems required dedicated hardware and new languages and programming methods. However, today's tools run on-standard hardware and do not require programmers to go through as steep a learning curve as did older expert systems.

Technology Applications, Inc., a Jacksonville, Fla., custom software house that specializes in expert systems development, has implemented approximately 30 commercial expert systems, about 10 of which are in production. "Most of these are spearheaded by an AI champion within the company who knows about a particular need and knows that need cannot be solved with existing technology," said President Bob Touchton. "More and more, though, the philosophy is 'Just give me a solution, and use whatever technology is appropriate.' "

David Wise, a senior systems analyst at Frito-Lay, Inc., said that although expert systems software "is not yet mature and can't do everything you want it to do, it does enough. We've been very satisfied; our payback has been millions of dollars and the ability to make better decisions."

IBM gets strategic with AI tools

BOSTON — IBM introduced a family of expert systems tools last week that spokesmen characterized as its strategic products in that arena.

The introduction took place at an artificial intelligence trade show held in Boston, where IBM demonstrated its new software, called The Integrated Reasoning Shell (TIRS). It allows developers to build applications that incorporate reasoning.

IBM will continue to sell its older expert system software, including Knowledgetool and the Expert System Environment. However, the company's "future investments will be in TIRS," said Alex Lilley, IBM's manager of knowledge-based systems marketing. "TIRS is our multiplatform, high-performance expert systems tool."

TIRS will initially run under OS/2, AIX, MVS and VM, and all the Systems Application Architecture environments will eventually be included, Lilley said. This will allow users to develop expert systems applications on any of the supported platforms and run the application on any of the other platforms.

Links with IBM's IMS database management system and CICS are already provided, while DB2 support is on its way, Lilley added.

JOHANNA AMBROSIO

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Ashton-Tate puts credibility on the line with upgrade

BY JAMES DALY
CW STAFF

TORRANCE, Calif. — The rules of baseball do not necessarily apply to the software development business. Screw up the release of an important program a second time, and it could be two strikes, *"you're out!"*

So when Ashton-Tate Corp. officials pulled the curtain back on a debugged and revamped Dbase IV Release 1.1 last week, not only were 18 months of redevelopment efforts and the fortunes of thousands of users on the line, but analysts said the company's financial future was also hanging in the balance.

"There's been a lot of pressure on us, but I think this time we got it right," said Joe Budge, Dbase product development manager.

Release 1.1's predecessor was a failure of spectacular proportions, which tended to crash spontaneously because its memory management was so bad. It was lambasted in the press and tipped the company toward four quarters of red ink.

Whereas some firms might have chained their programmers to their desks and subjected them to ungodly working hours in a rush to get the program out the door, Budge said he knew that slow and steady was the way to win this race. "We knew it was not going to be an overnight process," Budge said of the rewriting efforts, which began in early 1989. "The priority was to do it correctly, not cut corners to just get software out."

Although Budge would not comment on the problematic Release 1.0 development effort because of pending litigation, he said new procedures were used to create Release 1.1 because "Dbase became far too complex for traditional PC [application development] methods."

Budge said his team needed to tweak the rules of personal computer software development at first because they wanted to bring minicomputer- and mainframe-level testing procedures to the new releases. "Minis and mainframes frequently use emulator environments where they throw software against the emulators and run automated tests like there is no tomorrow," he said. "That's not done on a PC."

The team put together a network of several minis driving a series of PCs to accomplish the same thing, Budge said, and created an environment in which the PC was an extension of the mini. The new version would be able to be tested on a number of platforms, including OS/2, Unix, Digital Equipment Corp. VAX/VMS, DOS Extender, DOS and Apple Computer, Inc.'s Macintosh environment.

Development and testing of software is inherently a complex process. Dbase IV Release 1.1 is no exception: It consists of 500,000 lines of code that control more than 440 commands and functions. New code needed to be carefully incorporated into constantly updated prerelease versions of the software, called baselines, to avoid triggering new problems elsewhere, called a regression.

Code was often developed in chunks, each of which represented a different part of the product, Budge said. Once a new code module was ready to test, an elaborate series of safety checks kicked in.

A significant new testing addition was a phase called pre-integration testing (PIT), which allowed code to be comprehensively tested before integrating it into the baseline. A PIT crew built an executable version of the module and incorporated it into a simulated Dbase IV environment. Tests were then run until the module passed and was incorporated into a new baseline or was returned to the development team for improvements.

Beta testers also received a progression of Dbase IV Release1.1 builds, tested them in real life and shipped their reviews back to Ashton-Tate scientists.

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Compaq fights notebook PC pressure with lower prices

BY RICHARD PASTORE
CW STAFF

A recent wave of price cuts in notebook-size portable computers culminated last week as Compaq Computer Corp. cut prices of its market-leading LTE for the first time. The cuts indicated that the pricing structures of first-tier notebook vendors are starting to crack in the face of mounting competitive pressures, observers said.

Compaq cut the prices of its Intel Corp. 8088-based LTEs by 10% to 16%, bringing the cost of the Model 1 below the $2,000 mark. It also reduced the prices of the LTE/286 line by 12% to 16%.

Compaq's move follows cuts by fellow portable leaders NEC Technologies, Inc. and Toshiba America Information Systems, Inc. NEC knocked 33% to 36% off the prices of its Ultralite notebook personal computers last month. In June, Toshiba reduced prices across its line by 6% to 16%.

The reductions are largely a case of the big boys swatting at the swarm of new, low-priced gnats, observers said. Aggressive new players have "caused these vendors to sit up and take notice," said Richard Horan, editor of "Portable Technology Update" in New York.

A typical example is Chicago-based Airis Computer Corp., which announced a $1,900 full-function notebook computer in June. Others are on the way, particularly from the Far East. "There are products coming from Hong Kong and Taiwan running under $2,000," said Peter O'Connor, president of Laptop Expositions in New York.

Compaq appears to be somewhat "worried about their market share and the ability of clone machines to offer an attractive alternative to their systems," said Stephen Rood, manager of microcomputer technology at Coopers & Lybrand in New York.

Indeed, Compaq North America President Mike Swavely said the price reductions were initiated to "maintain our notebook market leadership."

> "THE portables have lost their magic — it's now a real product affected by real laws of supply and demand."
>
> RICHARD HORAN
> "PORTABLE TECHNOLOGY UPDATE"

Such moves were not necessary a year ago, when notebook PCs were such a novelty that users were willing to pay almost any price, observers agreed. That is no longer the case.

"The portables have lost their magic — it's now a real product affected by real laws of supply and demand," Horan said.

In addition, users are demanding and receiving lower, more "real" prices. "We're into austere times," Rood said. "We're more interested in the bottom line than in trying to buy something because it's a novelty."

"The downward price pressure has been tremendous," added Claude Rankin, manager of MIS at the New York office of Deloitte & Touche.

Price is becoming one of the few distinguishing selling points remaining in notebook PCs. Because most users desire transparent compatibility with their desktop PCs, they tend to favor laptops with standard, vanilla features rather than innovative technologies, according to Horan.

Despite tighter finances in corporate America, notebook systems trail only Intel 80386SX-based boxes as the fastest selling PCs this year, according to Dallas-based Storeboard/Computer Intelligence, a Dallas firm that charts sales through U.S. computer stores.

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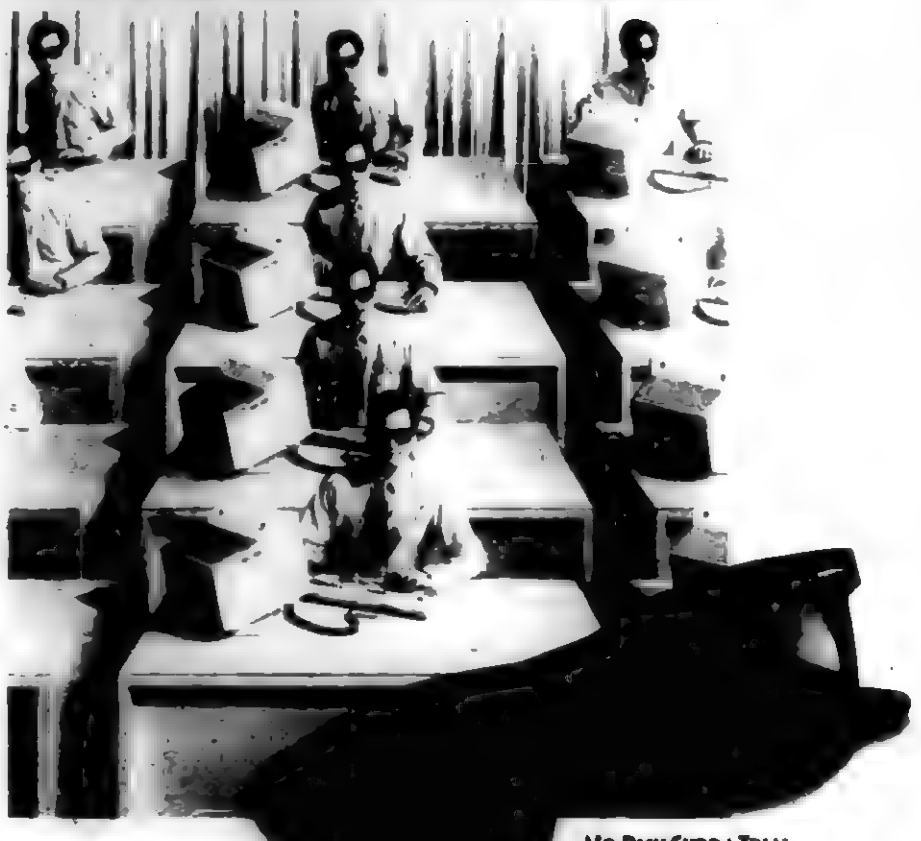

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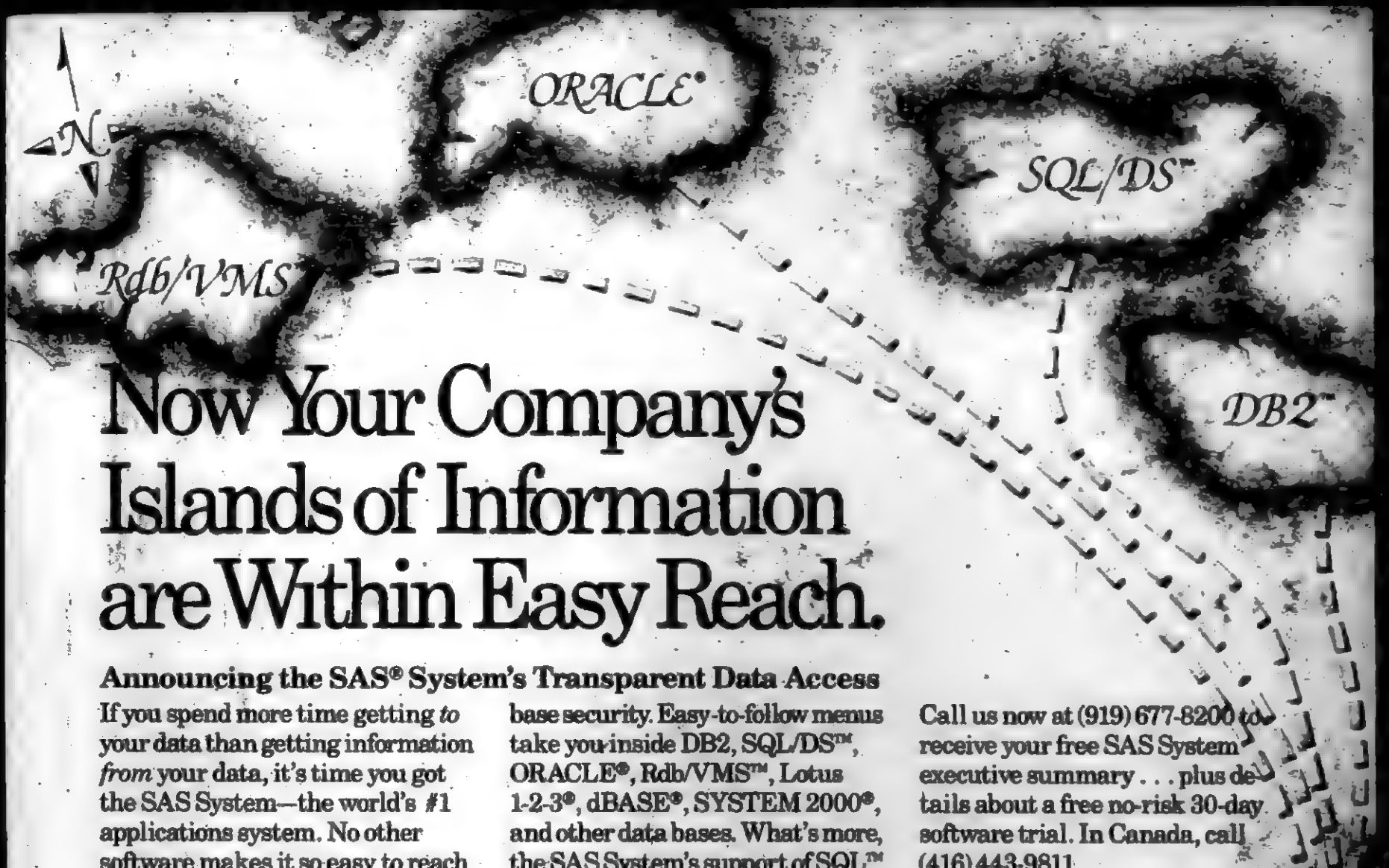

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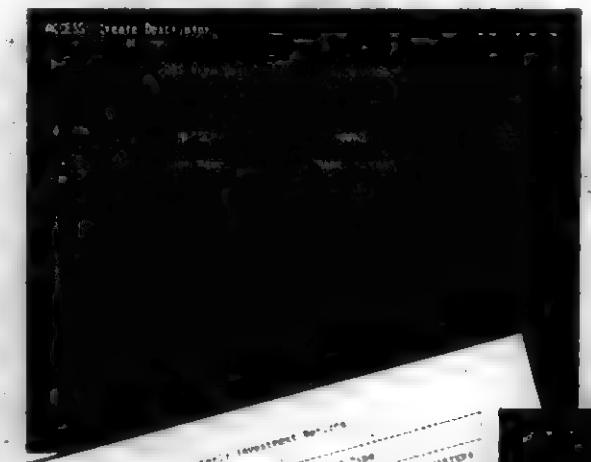

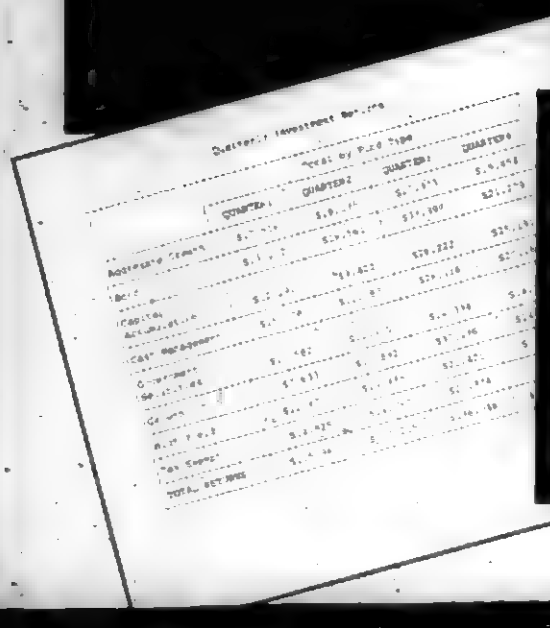

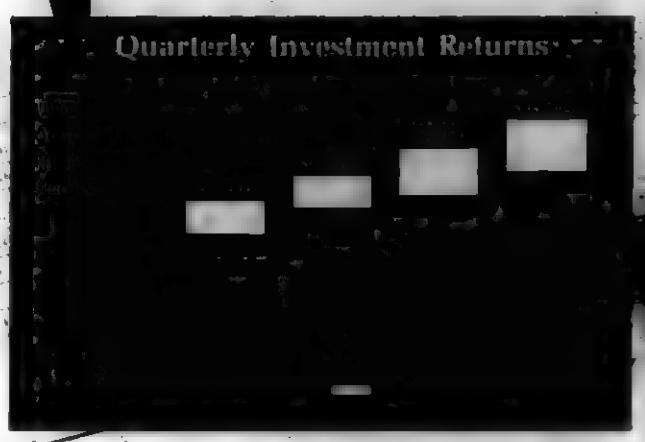

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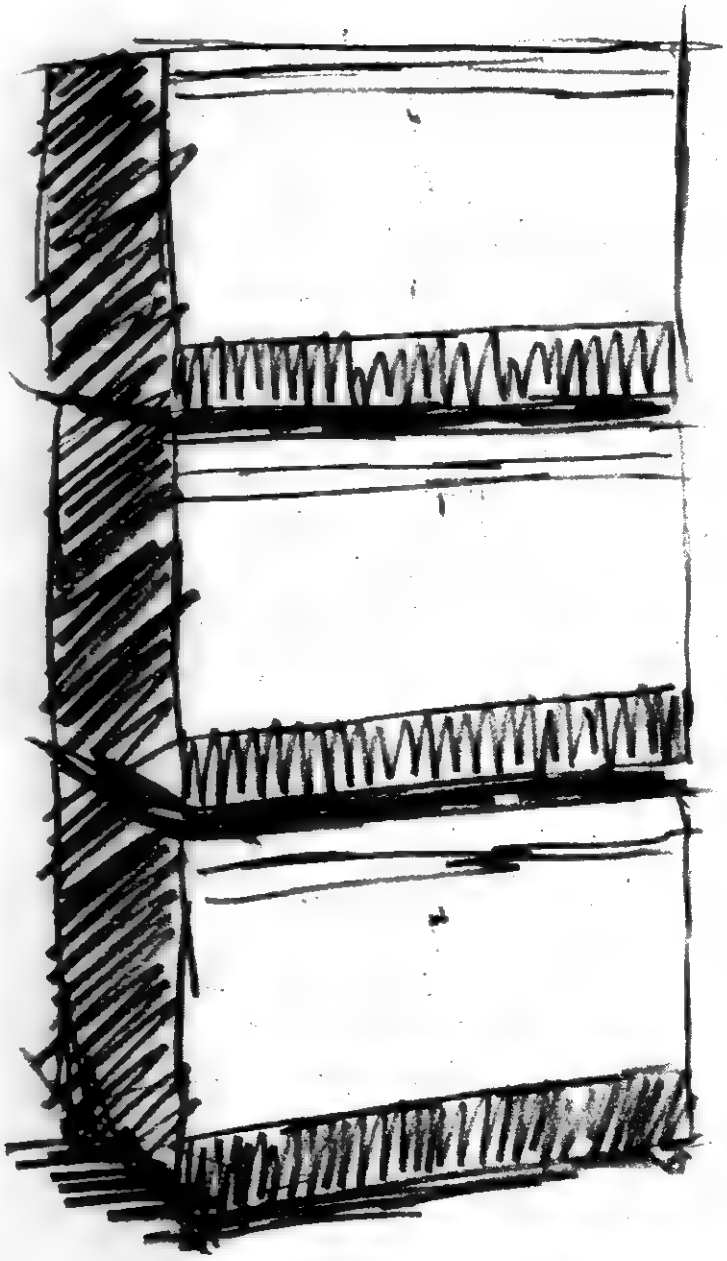

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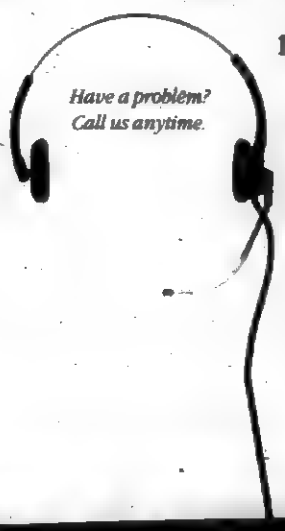

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ADVANCED TECHNOLOGY

TECH TALK

Lightning competing

■ Researchers at MIT have developed a technique that may make it possible to produce switches for optical computers at lower cost than was previously thought possible. Optical switches require expensive crystals and other materials that react to certain intensities of light. Scientists have hit on a process to make "microclusters" that could be substituted for the more costly materials. Microclusters are ultrasmall particles — only 10 atoms wide — of semiconductor materials that fit inside plastic molecules.

Handwriting database

■ The National Institute of Standards and Technology (NIST) has developed what it claimed is a first-of-its-kind database containing more than 1 million handprinted characters. The database is being used to help measure the performance of computer systems designed to recognize handprinted letters and numbers. Developing a standardized way of measuring the performance of character-recognition systems is a big step toward finding ways to objectively and rigorously test recognition software, NIST said. Researchers at NIST have also developed algorithms based on neural network technology that can be used on a parallel computer to recognize characters.

SPECtacular results

■ The Systems Performance Evaluation Cooperative (SPEC) last week announced the latest benchmark results for 18 workstations and servers, including its first results for computers from AT&T and Intel Corp. The results were generated by running Release 1.0 of the SPEC Benchmark Suite, a collection of engineering and scientific benchmarks. The third-quarter results will be published in the "SPEC Newsletter," the cooperative's quarterly publication, which features performance data for machines from SPEC members.

Packing your data in — and fast

New storage technology promises incredible retrieval speed and space-saving ability

BY RICHARD PASTORE
CW STAFF

Skulls, eyeballs and busts of Elvis seemingly protrude in three dimensions from glass frames. For most of us, these are typical holograms — 3-D images created by split beams of light. But the folks at Microelectronics and Computer Technology Corp. (MCC) have no time for Elvis; they are applying holographic techniques to create a new generation of computer data storage that could blow away the standard Winchester disk drive.

Holographic storage, which uses laser light to record data on light-sensitive crystals, will potentially yield access speeds that are 100 times greater than those of magnetic disk drives. Also, because data is stored and retrieved in "pages" of up to 100,000 bits rather than one bit at a time, transfer rates of 100M to 800M byte/sec. will be possible. Today's top-of-the-line magnetic drives manage about a 4.5M byte/sec. transfer rate.

The need exists for such a radically new storage technology, the Austin, Texas-based researchers at MCC argued. Image processing, high-bandwidth fiber-optic networks and faster processing speeds are all putting greater demands on I/O, explained Jerry Willenbring, program manager of the project.

"From the 1950s right up to today, one of the major problems in the design of any computer system is mass storage I/O," Willenbring said. While CPU processing speeds have increased one hundredfold since 1980, disk device performance has only improved by a factor of three. The limitations are inherent in the moving parts — the spinning of the disk and the tracking of the drive head, he said.

"If you've got something that has the capacity of a disk drive but is a hell of a lot faster, people will jump on it in a minute," Willenbring said.

A diverse group of anonymous industry players has done just that, teaming up to sponsor development of this core technology for which MCC received its first U.S. patent this summer. The researchers have promised their backers a prototype demonstration in two years and said they envision a commercial product in three to six years. No other laboratory in the U.S. or Japan is delving as deeply into holographic storage, Willenbring said.

James Minor

Co-inventor Steve Redfield *holds model of holographic storage device*

MCC has had to overcome several obstacles in the four years it has already spent on the project. The most basic was finding the proper materials. The group has worked closely with the Center for Materials Research at Stanford University to create crystal fibers with diameters small enough to be commercially cost-effective.

Indeed, cost is one of two major drawbacks of the technology. MCC estimated that prices for quantity prototype units will cost $4,000 per 2G bytes of storage capacity. By 1995, the group hopes to bring the cost down to twice that of comparable magnetic or optical devices.

The second drawback is the relative lack of longevity of data stored on the crystals. "On magnetic disk, you can pretty well be sure that a couple of years from now the information is still going to be there," Willenbring said. "With this material, we can't be assured of that."

Consequently, MCC's brainchild is not intended for long-term, archival data keeping. Rather, it will complement magnetic and optical storage as the best-suited technology for ongoing, dynamic applications that require lightning-fast access and transfer rates.

Holographic storage should be a boon to applications that arise with high-definition video and audio technology, such as real-time image processing, transaction processing and multimedia applications, Willenbring said. The devices will likely appear first on supercomputers and large database machines, he added.

The technology's lack of moving parts adds the benefits of reliability and durability. Holographic storage devices would be ideal for systems located in harsh environments such as on-board aircraft, spacecraft or military vessels and manufacturing lines.

Smart glass shatters traditional technology

BY MICHAEL ALEXANDER
CW STAFF

A team of U.S. scientists at Isotec Limited Partnership in Tucson, Ariz., has hit on a way to manufacture "smart" glass and lenses that they said could revolutionize computing, telecommunications and traditional uses of optical technology.

Smart glass, which is made from gradient refractive index (Grin) material, can be used to control light beams precisely as well as to allow several functions to be performed by a single piece of material.

The technology could be used in the manufacture of optical computers, in which photons traveling at the speed of light would replace electrons in optical integrated circuits, said Richard Blankenbecler, head of the theoretical physics group at the Stanford Linear Accelerator Center and an Isotec consultant.

"When transistors were developed, the necessary basic material was silicon of the right quality and purity," Blankenbecler said. "I look upon this optical development as a fairly large step in the development of the basic material that will be used to make optical integrated circuits."

Smart glass could also be used in lenses for lasers and fiber-optic cables, he said. The light pulses generated by laser could be stronger and less susceptible to error as well as travel longer distances before decaying, Blankenbecler said.

The Isotec process organizes the atoms by which glass is made into specific patterns so that light traveling through the lens follows a designated path.

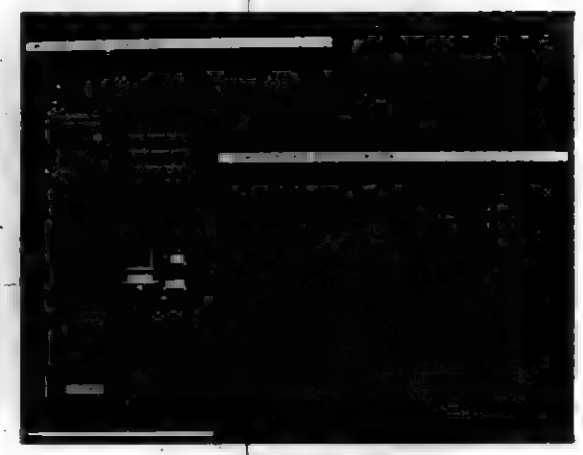
A smart glass lens consists of a stack of several layers of glass powder that has been heated to a temperature determined by the powders used and then cooled at a controlled rate.

The process is similar to current methods of making glass and is thus relatively inexpensive, Blankenbecler said. The breakthrough was in learning how to precisely heat and cool the stack of glass powders, he said.

Isotec developed the process in four years at a cost of $6 million, beating several larger and better funded companies that were also working on developing glass using Grin materials, President Leslie Danziger said.

HP and Apollo proudly announce the birth of five new workstations.

As you'd expect, compatibility runs in



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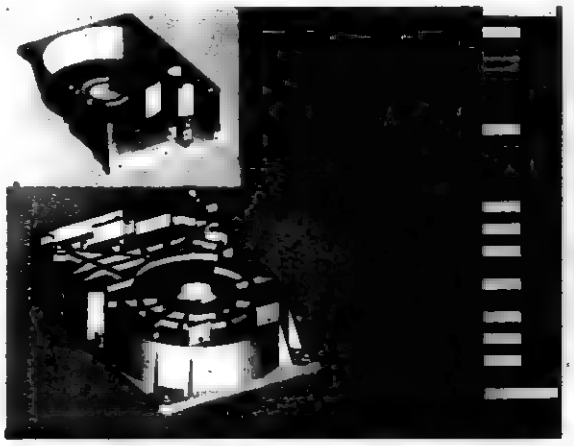
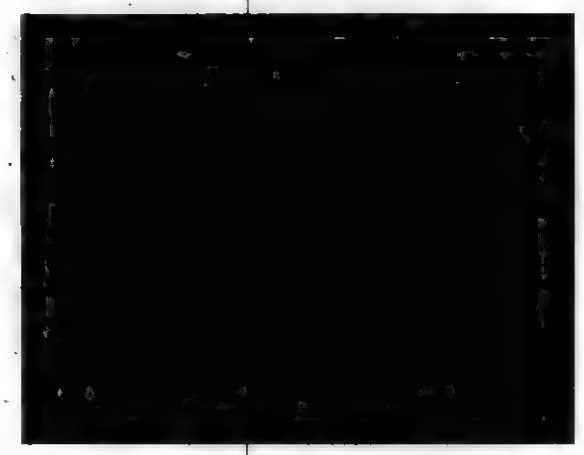


Solid modeling for mechanical engineering

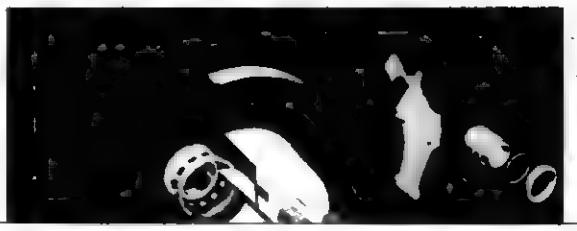
Graphic information

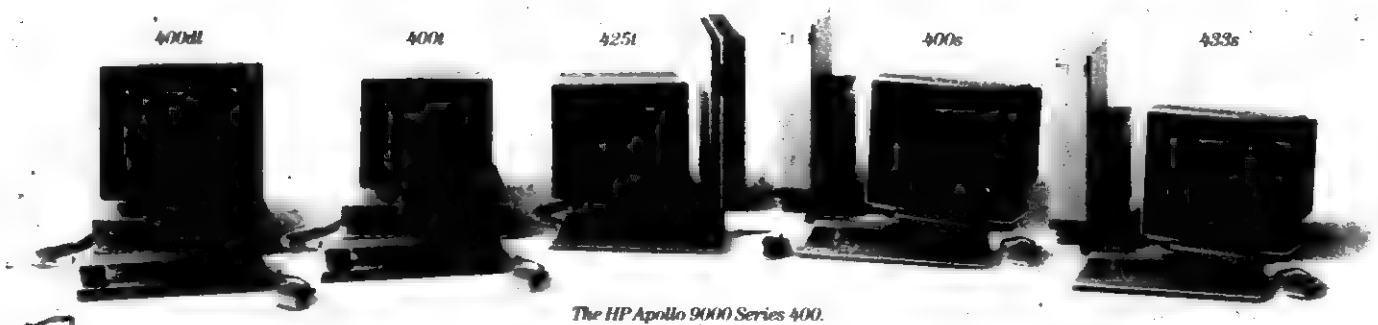


Graphic information system

Advanced 3D graphics

Mechanical computer-aid

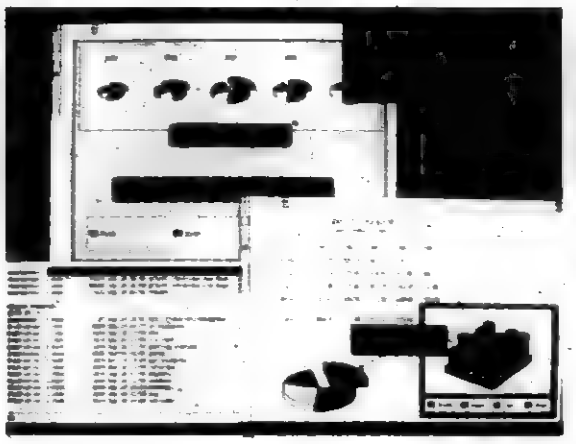




The HP Apollo 9000 Series 400.

the family.

system



Presentation spreadsheet

Mechanical CAD and manufacturing

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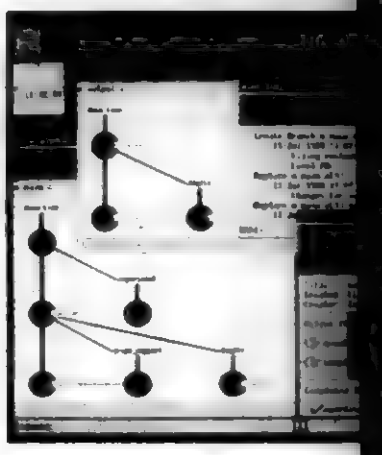
CASE configuration management

Electronic design automation



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EDITORIAL

Global challenge

THE FEDERAL GOVERNMENT'S decision to break up AT&T seven years ago must surely be counted as one of the greatest enablers of competition and most significant catalysts of innovation in business history.

If you want proof of this, just ask any number of information systems chiefs, some of whom spend up to half of their budgets on communications outlays. For them, the breakup resulted in steadily declining communications unit costs, communications contracts specially designed for big customers, a flood of new services and other benefits from the one thing that was so sorely needed yet was so sorely lacking for decades: competition.

Recently, U.S. Sprint, the third horse in a three-horse long-distance race, stumbled badly, suffering a $42 million quarterly loss. While the company has dismissed the loss as an aberration, communications analysts have started wondering whether Sprint has the right stuff to go the distance with AT&T and MCI. At a minimum, the firm has to rethink its marketing strategy.

Analysts pointed to AT&T's recent service hikes, the first since the company shed its local operating companies, as evidence that competitive pressures on AT&T are waning and that the industry is headed toward a lopsided oligopoly. These kinds of concerns will undoubtedly bring out the worst in the pro-regulation crowd, who will clamor loudly for a review of competitive restrictions on AT&T that have been eased in the last few years. That's the old baby-with-the-wash-water mentality.

The massive long-distance market is not for the faint of heart or light of wallet. This means that it's unlikely you'll ever see five or six domestic companies competing for a slice, as the costs of entering the market and sustaining operations "naturally" limit entry.

However, the impact on pricing and innovation in an oligopolistic or quasi-monopolistic situation can't be ignored either. As a monopoly, AT&T was a bloated, overweight entity for which innovation was a struggle, funded by the public through a cost-plus rate structure.

Clearly, the way to ensure that customers reap the benefits of true competition in this vital area is to begin to lay the same groundwork that characterizes every other industry, and that is a groundwork for international competition.

The argument that the phone system is an integral part of our national defense, and therefore must be domestically based, is absurd. It's not like a foreign competitor could simply pull the plug on an installed network to apply political pressure. The European PTTs and Japan's NTT would be happy for a shot at accounts the size of Citicorp's, and AT&T, today a far more aggressive marketing machine than in the old days, would no doubt like doing business in countries whose economies are still growing.

Eventually, the artificial barriers will fall. There's no time like the present to aggressively explore the means to bring this about.

LETTERS TO THE EDITOR

Avast, ye swabs! Piracy outlooks differ

Your article "The upside of software piracy" [CW, July 2] neglected a very salient point — namely, that piracy allows users to evaluate a product before spending their money on it. The "sealed-disk" warranty does not allow an examination of a product, and a 30-day return policy is not sufficient.

Most software products require many hours of concentration (difficult to achieve under ordinary working conditions) to totally evaluate. In many cases, a software package is unsuitable, not because it does not do the job as advertised and not because it has fatal bugs or flaws, but because it does not do the job in the manner that the user wants it to be done.

I have between $500 and $1,000 worth of software that I have purchased, tried and then abandoned because I felt that it was either not suited for my needs or had a fatal flaw. It is particularly significant when you consider the fact that a similar amount was spent on replacements.

I frankly do not like the idea of using pirated software; all of my "working" software packages were purchased. However, I feel that "borrowing" a copy of a package for evaluation is a natural outcome of being "burned" once too often by unsuitable, if not totally unusable, software.

C. O. Fredregill Jr.
Houston

Jay Zagorsky has taken supply-side economics to a new extreme in "The upside of software piracy" [CW, July 2]. According to Zagorsky, software publishers are supposed to provide the supply and not complain when it is pirated on the side. Somehow, Zagorsky has concluded that the software industry should embrace piracy because it promotes future sales.

Wrong. Software piracy is theft, pure and simple. It's not a question of economics but rather one of ethics. Copying Version 1.0 of Product X doesn't give you an economic incentive to legitimately acquire Version 2.0, any more than stealing this year's Honda Accord LX gives you an economic incentive to buy next year's Honda Accord LXI. If anything, software piracy suggests to the user that if he or she didn't buy Version 1.0, he or she needn't buy Version 2.0 or, for that matter, any commercial software.

Zagorsky fails to mention that users of pirated programs do not receive documentation, technical support or legal upgrades. The ultimate victims of software piracy are users who rely on original, virus-free software products and full-scale services.

The newly merged Software Publishers Association and Business Software Alliance are committed to fighting software piracy. This will foster a free-market environment in which software publishers are encouraged to continue supplying the demand for reliable software solutions with creative products and full services that truly meet users' needs.

Ken Wasch
Executive Director
Software Publishers Association

Tom Lemberg
Chairman
Business Software Alliance
Washington, D.C.

The waiting game

Imagine that a General Motors division develops a car that looks and rides like a Cadillac, gets far better mileage and performs like a sports car. Further, imagine that GM resists marketing the car because it might hurt Cadillac sales.

It seems this is what Microsoft is doing with OS/2. In their feverish attempt to protect Windows, Microsoft is losing sight of some important facts of life. Windows provides an excellent shell for DOS and will enjoy a huge personal computing market. Under the glitz, it's still DOS, which is fine for most PC users.

The corporate computing market is a lot different. DOS was a "make-do" solution at best. OS/2, on the other hand, is a real operating environment platform for business systems. Microsoft should not resist IBM's optimized, tuned and markedly smaller version of 1.2.

The corporate world will be requiring distributed systems and have little use for terminals. Thus, it shouldn't be forced into a "make-do" operating system because Microsoft can't do product differentiation. This raises serious questions about the OS/2 Version 2 holdup. Are we waiting until it can run Solitaire?

Walt Corey
Senior Systems Engineer
North Scituate, R.I.

Computerworld *welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor In Chief,* Computerworld, *P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701. Fax: (508) 875-8931; MCI Mail:* COMPUTERWORLD.

High technology's peace train

RICHARD GEPHARDT

The exciting advanced technologies provided by the computing services industry have helped to break down once almost inviolable barriers between nations. Modern communications and computing technologies were not the sole reason for the recent revolutions in Eastern Europe, but they played an important part.

Modern communication such as computer-to-computer, facsimile, satellite and other media helped bring the truth about Western life to people who were previously blinded by the restrictions of national censorship.

These same technologies have created the potential for tremendous increases in trade between nations. That is of obvious importance to the "bottom lines" of your enterprises and your industry. But it is also of importance to all of us in its implications for world peace.

Logic and history teach us that peoples and nations isolated from each other far more frequently develop conflicting practices and ways of life than do those in constant touch through trade and commerce.

Gephardt is the U.S. House majority leader (D-Mo.). This piece is excerpted from a speech in June to the World Computing Services Industry Congress.

Despite this potential for significant increases in world trade, many serious barriers persist.

I have outlined an eight-point program that will help reduce those barriers for the computing services industry. It is not a "U.S. or American" program, contrived to benefit my nation or continent over any other. Rather, it is an international program, calculated to enhance the production and distribution of goods and services worldwide.

First, there must be a level playing field. All competitors must be on the same competitive footing. They must gain advantage only by skill, hard work and other real advantages, not by "stacking the deck" through contrived laws and practices.

Second, unfairly restrictive tariff barriers must be eliminated. In those few cases where legitimate reasons of national security or national interest predominate, they should be expressed openly and fully, with fair opportunity for negotiation.

Third, nontariff trade barriers must be eliminated. Such considerations as national security and individual privacy are often the justifications for restrictive trade practices that limit the transfer of technology to Eastern Bloc nations or prohibit the flow of information across national borders.

Fourth, we must work toward the development of uniform international standards for the protection of computer software intellectual property rights. The software developers must have a fair opportunity to exploit their developments, to advance the developments of others and to assure reasonable compatibility and ease of use.

Every technologically advanced nation recognizes the importance of protecting the proprietary rights of those who create computer software. Yet the laws regarding copyright, patent and trade-secret protection of computer software are an international hodgepodge, standing in the way of software creation, distribution and use. We still have a long way to go before we have the necessary common international basis for the recognition of substantive computer software rights.

Fifth, we need effective national and international antipiracy enforcement. Whatever limited activity there is takes place by virtue of the work of private companies and trade associations and in the face of active governmental opposition.

Law enforcement organizations must recognize that enforcement of computer-related rights is just as important as enforcement of any other crimes against property.

Sixth, we must encourage the development of international standards for communication between different computer systems, without impeding technological development.

Communications barriers will not finally yield until all major computing systems worldwide can interact, a goal far beyond our present reach.

Tom Payne

Seventh, we must develop international standards for the protection of individual privacy, for the security of computer systems and their data, for the performance of computer systems and for the protection of consumer interests.

The concerns of so many about a Big Brother data resource that will infringe civil liberties; the virus and worm problems that have threatened computer systems worldwide; and the growing complaints of inadequate performance and misrepresentation to the public are all examples of problems that will continue to block full exploitation of the technologies.

Eighth, we must improve the number and qualifications of persons who can design, make and use the computer systems of this decade and the next century. There is already a shortage of skilled computer talent in the U.S., and the projections for the future are frightening. A coordinated international educational effort is important if we are to realize the promise of the technology. I've called for many changes, beginning with a relaxation of restrictions on high-tech exports to Eastern Europe.

Today, we sell more high-tech equipment to the repressive communist regime in China than we sell to the new democracies of Poland, Czechoslovakia and Hungary combined. Surely, the progress these brave nations have made in terms of economic and political reform would be enhanced by additional sales of such technology from our nation.

If we remain ever vigilant in our commitment to freedom and democracy, the new technologies will continue to advance those goals.

IS needs to learn new rules to play innovation game

PETER OGNIBENE

There are certain incontrovertible rules in life: Don't walk down Fifth Avenue on Saint Patrick's Day wearing orange. Never play high-stakes poker with a man named Doc. And don't risk a promising idea on the information systems department.

As someone who makes his daily bread from a relatively new technology — smart cards — I have had that last rule driven home to me time and time again. I'm not sure why, but perhaps, like infant and mother, the techie bonds mystically to his mainframe for life. Whatever the force, woe to the individual, inside or outside the organization, who would dare to step between the two with (gasp!) a new idea.

Ogniben is vice-president for corporate development at Applied Systems Institute, a Washington, D.C.-based firm specializing in smart card applications.

Automated source data. Decentralized processing. Distributed database. Oh, how MIS (Muzzlers of Innovative Solutions) loves those buzzwords. The problem comes when somebody gets serious about actually putting those concepts into practice. As soon as there's even a hint you might be serious about something new, the IS masters draw their CPUs into a circle and take aim.

Speaking from experience

Consider a recent personal experience. I tried to convince the vice-president of marketing at a major hotel chain to consider the possible benefits of using smart cards to automate its frequent traveler program.

All the customer's data — credit-card accounts, frequent flier number, room preferences and even a listing of his or her sizes to facilitate gift buying — could be carried in the microchip on a single smart card. Frequency points could be redeemed at the hotel — thus saving the chain the high administrative cost of sending out statements. The customer's card could carry an electronic key to the room. Check in and checkout could be done by a clerk, at a self-service kiosk or from a handheld unit in the hotel van taking travelers to or from the airport.

Finally, at the end of the stay, all those travel costs could be gathered electronically in the smart card's microchip and imported instantaneously into an electronic spreadsheet to simplify expense reporting for the business traveler.

After months of silence, the hotel marketer sent me a letter, raising my hopes, only to dash them when I got to the sentence: "While the issues described in your letters are intriguing to be sure, I must refer you to our vice-president of IS."

I knew better but seeing as my job description demands I regularly suffer rejection, I called and gave the VP my best shot. The response was not dissimilar from that of a toddler in his terrible twos: "No No No!"

At first I tried to counter his reflexive negativity with reason, but it was no go. His tongue had switched to automatic pilot: "We looked at that and decided it wouldn't fit . . . We thought of that but decided it wouldn't work . . . What do we care after the business traveler has left the hotel; that's his problem."

When he made that last remark (in response to the system's expense reporting feature), I threw in the towel. Any hotel chain executive — even one in IS — who does not appreciate the importance of attracting and satisfying the frequent business guest is beyond redemption.

Negative connotation

I encountered similar negativity at a major naval depot responsible for inventory worth $6 billion. The senior engineer described to me an inefficient microfiche system for cataloging parts for every ship, plane and power unit in the Atlantic Fleet. It was taking a week or more just to verify that the right-hand widget listed on the invoice was, in fact, a right-hand widget.

At the engineer's invitation, I drafted a proposal describing how smart cards could identify a part from delivery through repair and return to service, but instead of discussing the merits of the proposal I got a brief letter from his superior with this kiss-off: "After a review by management and technical personnel, we have concluded that this concept should be placed on 'hold' pending development of other basic applications." And on "hold" it has permanently remained.

More often than not, the IS department simply avoids innovation — unless, of course, the ideas originated in-house. Chief executive officers who find their IS departments infected by this deadly "not invented here" syndrome may well decide the only cure is to "outsource" their data processing to organizations that regularly incorporate a healthy dose of innovation.

To some extent, all of us are captives of our own experience. Although there are dynamic individuals in IS departments, I have encountered many who appear estranged from the firms that employ them. Then again, maybe I'm wrong. Maybe these companies really are in business just so the IS department can manufacture and manipulate data.

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COMMENTARY

Rosemary Hamilton

A hint of large systems

At the IBM large system briefing last month, James McGroddy, IBM's director of research, dropped several hints about what these new mainframes will be based on.

The new mainframes have been described by IBM as a cluster of high-performance processors dedicated to specific operations. The idea is to replace the current general-purpose, do-everything host with a corporate nerve center. This would handle centralized tasks, such as network management or database management, while many traditional mainframe applications would be offloaded to smaller processors. To achieve this, IBM claims it will eventually deliver processors running at 500 million instructions per second (MIPS) and clusters that clock in at the thousands of MIPS range.

Some of the work for which McGroddy is currently responsible will likely show up in these future nerve centers. Although CMOS chip technology gets most of the industry attention today, McGroddy said that the key to mainframe progress continues to be the older bipolar technology. Despite recent advancements in CMOS chips, they are still about four times slower than bipolar, he said.

Expect System/370 microprocessor chip sets to play a roll, particularly to achieve parallel operations. McGroddy said

Continued on page 30

Index, partner unveil CASE tool

Deloitte & Touche inaugurate Index partnership with life-cycle CASE family

BY ROSEMARY HAMILTON
CW STAFF

For Index Technology Corp., IBM is apparently not the only big business partner in town.

Index last week introduced a full life-cycle computer-aided software engineering (CASE) family of tools in conjunction with Deloitte & Touche.

Company executives said this is the start of a long-term deal between the two companies, from which several other products will result. The first product, 4Front, includes a project management component in addition to the standard CASE tools, including tools for planning, design and analysis. The companies also plan to address the re-engineering phase of CASE with a product to be announced later this year.

In addition, Index executives said they will soon announce a code generator. Currently, the 4Front product provides links to Microfocus' Cobol code generator and IBM's Cross System Product.

While several companies have recently promoted their full life-cycle products as IBM AD/Cycle alternatives, Index is positioning 4Front more as an extension of the AD/Cycle concept. While it will likely compete with IBM or other AD/Cycle business partners on a component basis, it will eventually tie into the IBM Repository.

Index is one of the IBM inner-circle business partners for AD/Cycle. Index not only has a marketing arrangement with IBM, but it has also worked on the development of AD/Cycle. Its latest arrangement with Deloitte & Touche does not present a conflict with the IBM relationship because IBM's plan is for many different products to tie into AD/Cycle, Index officials said. The goal is to eventually provide AD/Cycle compatibility for the 4Front product.

"AD/Cycle recommends no one methodology," said Vaughan Merlyn, chairman of CASE Research Corp. "In some respects, these are two very different situations. It's compatible with AD/Cycle and not in conflict."

The companies will initially offer 4Front based on information engineering methodology. Index has long promoted the flexibility of its tools, such as Excelerator, and claimed that they can be easily customized to a variety of methodologies.

Other methodologies

Index hopes to accommodate other methodologies because different phases of the life cycle are suited to various approaches, said Mike Deverell, a partner at Deloitte & Touche. The re-engineering product will support a different methodology than information engineering, which is more geared for up-front design, he said.

The advantage of having a flexible approach rather than committing to one methodology is that flexible tools are more likely to fit into a customer's existing environment, Merlyn said. The downside is that the tools tend not to be as highly integrated and automated as a set of tools built with one methodology in mind, he added.

Commercial shops exposed to MUMPS

ANALYSIS

BY MAURA J. HARRINGTON
CW STAFF

As though it were actually the disease, MUMPS, the Massachusetts General Hospital Utility Multi-Programming System, has been avoided by most markets outside the health care industry in the U.S.

However, after two decades with a relatively low profile, users and vendors agreed that MUMPS may be gaining use in commercial information systems shops, which is partially because of IBM's and Digital Equipment Corp.'s efforts and their strongest marketing support to date, vendors claimed.

Last May, IBM announced full support for its MUMPS operating system, and DEC upgraded its MUMPS software implementation in June.

MUMPS is a multipurpose, multiuser, interpreted or compiled high-level programming language, formally accepted by both the American National Standards Institute and the Institute for Computer Science and Technology as a Federal Information Processing Standard, according to a spokeswoman for the MUMPS User Group.

MUMPS was designed by Octo Barnett at Massachusetts General Hospital in 1966. Barnett, then director of the information systems department at the hospital, developed MUMPS as a means to make an easy-to-use, hospitalwide information system that would combine all of the best features of other languages, he said.

MUMPS — half language, half built-in database — is

Continued on page 31

It's spreading

While MUMPS is still somewhat of a niche market product, its user base is expanding into other markets, said IBM, which recently announced new support for MUMPS. Richard Wingo, manager of MUMPS marketing at IBM, said MUMPS products from IBM are being used across several industries including shipping, health care, banking and more.

"We upgraded our support for MUMPS to be treated like all of our other products in the end of May [1990] because it is a strategic product for us now," Wingo said, adding that he has sold the product to several different businesses, including a prison in Canada, a credit union, a trust company and in the banking industry, in addition to the health care industry.

However, Wingo agreed that the language is still not completely accepted in the commercial market sector.

MAURA J. HARRINGTON

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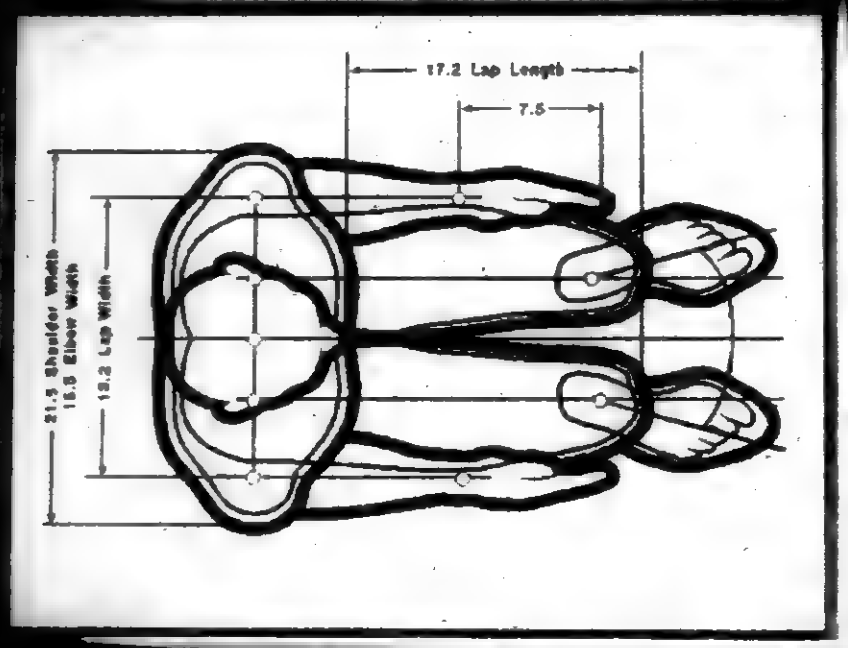

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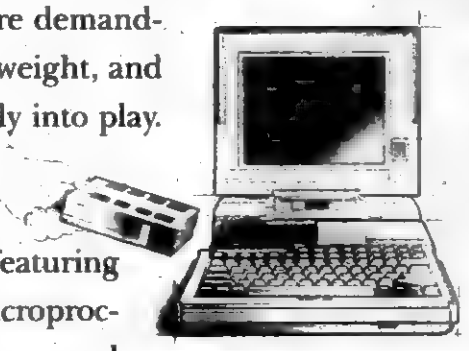

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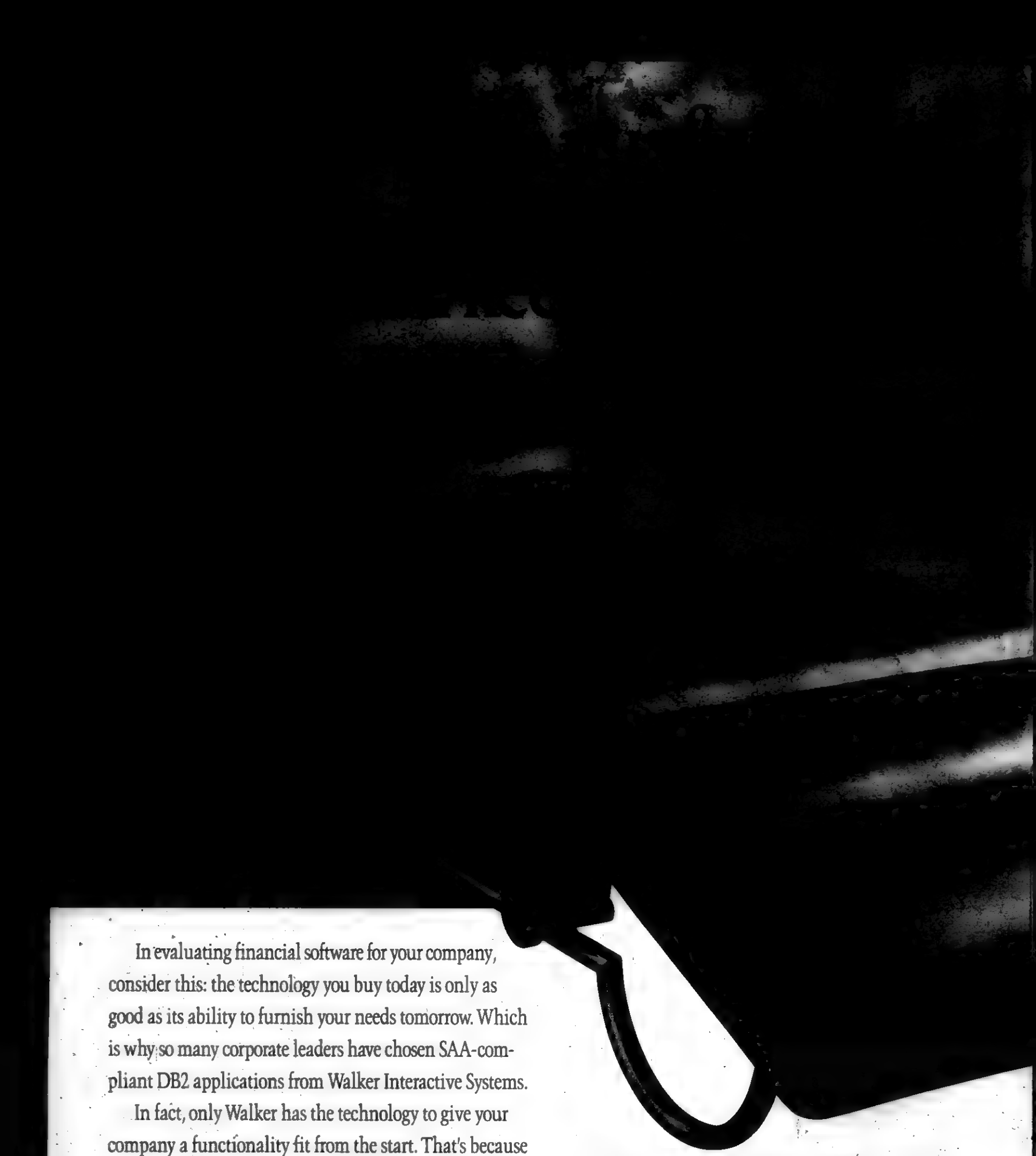

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The birth of a new benchmark

Benefits may be swift for vendors, but users should not expect much yet

BY JEAN S. BOZMAN
CW STAFF

SAN FRANCISCO — A new benchmarking test for the database industry is about to be born: the Transaction Processing Council's TPC/B benchmark is intended to provide the "level playing field" that would help users sort databases by relative performance.

However, the immediate benefits may be reaped by vendors rather than users, and the results may still have to be taken with a grain of salt.

The specification is in the final approval stage, said Peter Friedenbach, a Hewlett-Packard Co. database management system (DBMS) product manager and chairman of the TPC's executive steering committee. The 34 members of the 2-year-old council will either have to approve the specification or submit proposed changes to it. The council's first benchmark, TPC/A, was released in November and is already being used. However, only two vendors — HP and Digital Equipment Corp. — have submitted test results for public inspection. TPC/A measures full system throughput while TPC/B tests only the DBMS performance.

"We finally have something of a level playing field [with these benchmarks in place]," said Jon Davis, an HP 3000 product manager involved in the TPC/A testing. "Some vendors will publish their results because they believe their price/performance is very good, while other vendors would not be inclined to publish unfavorable results."

Still, users are skeptical about most benchmarks, including the ones from TPC. Many prefer to write their own, believing that they better reflect everyday work loads. "We don't trust benchmarks generally," said a database manager in the Pacific Northwest. "We are much more interested in knowing how a given system responds to what we throw at it."

USERS ARE SKEPTICAL about most benchmarks, including the ones from TPC.

Praful Shah, marketing manager at Tandem Computers, Inc., agreed: "Most users want to see how their own workload runs on our machines. Benchmarks are more widely used in selling situations, when vendors are bidding against each other."

Other users accept vendor benchmarks — or even request them. "We look at [HP's] own benchmarks," said Ed Wiggins, manager of operations at Dreyer's Grand Ice Cream in Lafayette, Calif. "But we evaluate machine performance by using the Powerhouse package from Cognos [Inc.]. That way, we can see how many CPU cycles were used by each batch application we run."

TPC/B is aimed at replacing a widely-used benchmark called TP1, which critics said was misused in vendor ads claiming high transaction rates for DBMS products. TPC/B works by "firing" transactions at the DBMS being tested, whether that DBMS is relational or not. Because it is aimed at software performance, TPC/B is expected to be more widely used than TPC/A — and less expensive to run.

The TPC/A test is considered to be both time-consuming and costly. For example, the TPC/A test of the HP 3000 Model 900 series took months to complete, HP managers said. "We attempted to make the TPC benchmarks very, very rigorous tests," said council member Tim Negris, group product manager of Sybase, Inc.'s SQL Server. "Users' confusion about benchmarks hurts us more than than someone making up their mind [to purchase] based on the TPC numbers."

If the TPC benchmarks are to become industry standards, users have to be brought into the process, Friedenbach said. However, there are some obstacles: Seats on the Council cost $5,000 each, he said, and each member has to send delegates to six three-day meetings per year. "We've had a problem trying to make the user community aware that we exist," Friedenbach said.

Open systems AWOL in military computing

BY J. A. SAVAGE
CW STAFF

Open systems have not yet made it through basic training in the world of military computing, where the emphasis has been on compatibility with proprietary systems, a recent report indicated.

Most of the military mainframe purchases made in the last five years reflected a preference for compatibility with IBM, Unisys Corp. and Bull HN Information Systems, Inc. mainframes, according to a report by the General Accounting Office (GAO).

Only 15% of the 155 procurements during the last five years were made without compatibility being an issue, the report said.

While commercial business is moving toward open systems, the GAO saw no such trend toward more open systems or toward more compatible procurements for the Department of Defense.

Of the $82 million spent on computers, the largest share — about $24 million — was spent on IBM and IBM-compatible equipment.

Amdahl Corp. received the biggest percent increase in spending, going from about $500,000 in 1986 and about the same in 1987 to nearly $6 million in 1988.

During those same years, IBM showed the biggest dollar increase, from $4 million to $15 million.

The years since the start of 1986 brought in some military business for Storage Technology Corp., which racked in $9.2 million — $6.5 million of which was brought in during the first year. NCR Comten, Inc. reached a total of $3.1 million in 1986 and $1.3 million in the following years.

Control Data Corp. had enough business with the military to be mentioned by name but did not make it into the charts. It was only noted that the company gained "less than $50,000" in contracts.

Sole source and single-offer contracts accounted for only a small percentage of the money spent on data processing, totalling $2.7 million in the last three years. In competitive bids, the government spent $10.4 million.

The cut of the budget going to developers or systems integrators grew in the last few years. In 1986, those contracts were only $100,000, but in 1987, the amount grew to $600,000. In 1988, it leaped to $6 million. Last year's figures, however, were incomplete.

The GAO did not analyze the procurements; it only reported raw numbers for the House Committee on Government Operations.

Image gets thumbs-up verdict from attorneys

ON SITE

BY SALLY CUSACK
CW STAFF

BETHPAGE, N.Y. — Attorneys working for Grumman Corp.'s legal department spend more time planning strategies these days, thanks to an imaging system that drastically reduces the amount of time previously devoted to paper-intensive research and documentation procedures.

Using a Wang Laboratories, Inc. imaging-based system, firm lawyers and paralegals can now accomplish in a day what used to take weeks with traditional type-and-file office methods, said Arthur J. Kingfield, program director of information systems at Grumman Data Systems.

"We've increased productivity tenfold in the document retrieval area," Kingfield said, adding that specialized searches that used to take days can now be completed in minutes. The firm still archives the paper documents as backup instruments, but the imaging system accommodates all of the legal department's routine procedural needs.

Imaging is a rapidly growing market, with system sales generating $360 million in revenue for 1989, said Jane Stanhope, an industry analyst at BIS CAP International, Inc., a research and consulting firm in Norwell, Mass. Stanhope indicated that imaging system revenue is expected to hit $2 billion by 1993. While no specific numbers are available, it is anticipated that the legal and medical professions will account for a fair percentage of these sales.

The system at Grumman has been in production for nine months, and according to Kingfield, the employees are extremely satisfied with its performance. The installation was accomplished after an extensive, 12-month internal needs analysis. During this time, Kingfield and his staff worked closely with the legal department, analyzing the paper flow process and dissecting other contributing factors, such as outside-contractor labor procedures and individual litigation phases.

GRUMMAN

Kingfield and his staff discovered that a mind-boggling 100,000 to 500,000 pages of documentation are generated for each litigation procedure.

"We didn't come out of the gate with imaging in mind, but after witnessing file after file after file being accessed, processed, stored and reviewed, and accessed again — that's what really made the decision," Kingfield said.

The department is using a Wang VS 7120 and a Wang optical jukebox. Sixteen Wang 280 personal computers are used as imaging terminals, and 15 Wang 4430 terminals are devoted to data processing and office automation applications. The system also incorporates Wang automatic sheet feeders and scanners and uses a fiber-optic network to handle image transfer functions.

Aside from some minor problems with the jukebox installation, Kingfield said, the installation process went quite smoothly. However, he indicated that it was software — not hardware — that drove the decision-making process.

"We were looking for an off-the-shelf solution, and we finally had it narrowed down to several applications," he recalled. The packages were brought to the legal staff for hands-on evaluation.

At the time, IBM's Image Plus was deemed too immature and too cumbersome to fit the department's needs. The staff was already familiar with Wang's office and word processing packages, and the Wang Integrated Image System seemed to fit the bill for both application and integration purposes.

The company also wrote an in-house imaging tool, using a fourth-generation language database generator called the Litigation Tracking System, a package purchased from Minicomputer Interactive Systems of California. According to Kingfield, it provided a very flexible database function and was extremely useful in creating and testing pilot applications.

Referring to the overall transition, Kingfield said he feels that the "long pull" was getting the documents themselves abstracted and into the system — an extremely time-consuming task. Now that all is said and done, however, everyone seems happy, he said.

"The system is very popular with the attorneys, and we're getting a lot of great internal press," Kingfield said. "We've gained tremendous efficiency in the paper-shuffling process."

What do you get with a supercomputer times 2?

Scientists hope to discover if two architectures are twice as effective at solving problems

ON SITE

BY ELLIS BOOKER
CW STAFF

PITTSBURGH — If you combine the qualities of a cheetah and a Ferrari, do you get a fabulously fast hybrid creature or an average-speed sports car with a taste for gazelle meat?

The Pittsburgh Supercomputer Center is attempting to merge two fast supercomputers — one with a massively parallel architecture, one without — that some might say were never intended to work as one.

The center recently acquired a 32,000-processor Connection Machine from Thinking Machines Corp. in Cambridge, Mass., that it hopes to run in combination with its 1½-year-old Y-MP supercomputer from Cray Research, Inc. in Minneapolis.

The two machines, already tethered over a relatively sluggish 10M byte/sec. Ethernet local-area network, will eventually be equipped with a high-performance parallel interface and will be linked over a 1G byte/sec. fiber-optic LAN.

"I don't have a religious preference for machines of one type or another," said Ralph Roskies, scientific co-director of the center. "The real goal is to allow people to get their scientific work done."

It is clear that for different computational problems to run at top efficiency, different types of equipment are required, Roskies explained. He added, "The more interesting question is: Are there *pieces* of problems that run more effectively in different architectures?"

That is what the Pittsburgh center hopes to discover by the end of the year, when the Y-MP and Connection Machine will be connected over a 1G byte/sec. LAN from Ultra Network Technologies. The two supercomputers will then, hopefully, communicate at about 800M byte/sec.

Code chopping

Getting the Y-MP and the Connection Machine to work together will involve more than a network cable between them. As with all parallel architectures, programming tasks for a Connection Machine involve "parallelizing" the computer code — chopping the code into relatively simple bits that both processors can attack independently.

This inherent complexity will be increased when the two supercomputers are operated in tandem. A new operating system will likely be needed to automate the job of deciding which parts of a computation should be handed to the Connection Machine with its parallel architecture, and which parts are best left for the vector-processing Y-MP.

Computing concern

Cray has hinted for some time about its interests in parallel computing.

However, Roskies said, "We weren't prepared to wait a couple of years [for a massively parallel system from Cray], so we looked elsewhere." Even so, Cray, which has always had an on-site staff at the Pittsburgh center, stands to benefit from the results of the center's experiment.

Roskies' ultimate goal is what he calls "a heterogeneous computing environment" — one that seamlessly integrates the best and fastest technology from a number of vendors.

Founded in 1986, the center is a joint project of Carnegie Mellon University, the University of Pittsburgh and Westinghouse Electric Corp. Purchase of the $5 million Connection Machine was made possible by grants from the Defense Advanced Research Projects Agency and the National Science Foundation.

The Cray and Thinking Machines supercomputers will work on a host of projects, including gene sequencing, air pollution modeling and molecular dynamics computations used in drug design.

SOFT NOTES

JAM supports Ultrix/SQL

Jyacc, a New York-based software manufacturer of application development tools, announced that its Jyacc Application Management (JAM) tools product will now support **Digital Equipment Corp.**'s Ultrix/SQL, DEC's port of Ingres Corp.'s database management system Version 6.2. JAM was designed for developers to create front-end user interfaces to applications and data integration to SQL databases, a company spokeswoman said. The product, available now for $4,275 per copy, also includes a data dictionary, Jyacc's proprietary fourth-generation language and a library of C subroutines, according to the company.

Raxco Software, Inc. said it will incorporate graphics capabilities into its Raxmanager Systemwide Resource Management System Version 3.0 this month, the company said. The graphics package, which the company acquired from Multiware, Inc. in Davis, Calif., includes line, bar, pie, scatter and stacked bar chart capabilities.

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MICROGATE CORPORATION

Hamilton

CONTINUED FROM PAGE 25

these processors are now used in the low-end Enterprise System/9370 but "will make their way to the mainframe line."

Mainframe DASD is being readied for huge capacity improvements. Currently, a disk on a high-end 3390 can hold 62 million bits of data per inch. In the lab, "we've shown in a real device that you can get above 1G byte per square inch," McGroddy said.

The 4M-bit memory chip is in use with the latest generation of 3090s. McGroddy said IBM has built and manufactured some 16M-bit chips, but they aren't running off the production line in any significant quantity. So, will the chip be used in the next-generation mainframe? "We haven't scored yet, but we're within the 10-yard line," he said.

Then what about the 64M-bit chip? "The 64M-bit chip is further down the field," McGroddy added.

To create these more dense and powerful chips, McGroddy said IBM is increasingly relying on X-ray lithography, which gives a more detailed look at the chips than current optical lithography. He said IBM has made "big investments" here, and he suggested X-ray lithography "could be a watershed. If you haven't invested in it, you could be left behind."

It's interesting that he suggested companies might be left behind. Some industry analysts said recently that IBM's overall large systems strategy is intended to create more distance between it and and its competitors than exists today.

The new IBM systems will eventually include processors that will be optimized for specific operations. That could create some big headaches for both the traditional mainframe competitors — Amdahl and Hitachi Data Systems — and those firms that have focused on specific operations, such as Teradata with database machines and Tandem Computers with on-line transaction processing.

"This really raises the ante, but IBM isn't doing it just because of them," said Rick Martin, an analyst at Prudential-Bache Securities.

Plug-compatible makers Amdahl and Hitachi could find it difficult to re-engineer the optimized processors and stay compatible, analysts said. Furthermore, they may not want to spend the money to provide such a variety of dedicated processors. IBM has tossed out several possibilities for dedicated processors in addition to database management and network management.

"They have to decide if the market is broad enough [for each specialized processor] to get into that business," Martin said. "Database, for instance, is broad enough. On the other hand, IBM also talked about an encryption processor. So [the competitors] may not decide to put their resources into that."

Companies that specialize in specific operations could get hurt if a customer eventually has a choice between snapping an IBM dedicated processor into the IBM large systems complex or buying one of their separate systems.

The competitors, however, are taking their usual stance on IBM's efforts — they've caught up with them before, they said, and they will again.

"We've done it eight times over the life of this company," according to an Amdahl spokesman.

Hamilton is *Computerworld*'s senior editor, systems and software.

MUMPS

CONTINUED FROM PAGE 25

known by its users as a comprehensible and easy-to-use language, with one of its best features being the way in which the language processes string command codes.

"[MUMPS'] language syntax has all sorts of things built-in that lets the user manipulate the string data," said Timothy Wheeler, a systems analyst at the Analytical Information Management System at Chevron Research and Technology Co., the research arm of Chevron Industries, Inc.

Wheeler said the company uses Digital Equipment Corp.'s version of MUMPS to track more than 100,000 petroleum samples per year and manage the accounting for the company's 22 different analytical laboratories.

MUMPS' ability to manipulate the string data is important because it allows a user to write a given program more efficiently in MUMPS than in other languages, because the programmer can change any line of code without having to rewrite the entire program, Wheeler said.

Chevron Research has MUMPS installed on a DEC PDP-11/34 minicomputer, Wheeler said. However, the company is planning on porting its system to a Microvax 3600 in the near future, he added.

However, while MUMPS is gaining interest by users outside of the health care industry, it is still considered by analysts to be no more than a niche-market language for the health care environment industry.

Computer analysts deem MUMPS "a relic of the past" and "a floundering language" that had not been accepted by IBM until a few years ago.

A user group spokeswoman, however, claims that MUMPS is not a language designed for any one specific industry. She said while a $100 million federal contract won by DEC in 1988 to install a MUMPS-based decentralized health care medical facility for the Veterans Administration's 31 largest locations throughout the country created a lot of publicity, the language has received a bad rap in the U.S.

"In Europe, MUMPS is more widely used across all industries," the group's spokeswoman said. "It's just in the U.S. where the stereotype exists."

While the user group has no statistics on how many or in which industries MUMPS has been used in the U.S., group Chairman and MUMPS consultant Richard Davis said there are presently about 1,350 members in the MUMPS User Group, including companies and individuals.

"We know there are lots of users writing in MUMPS out there, but there is no way to know exactly how many users there are because there aren't any analysts who follow MUMPS closely. Also, we can't seem to get the information from the vendors because to them, it's proprietary information," Davis said.

"People are reluctant to tell you they program in MUMPS. I think it's because they like to think with the mainstream," which has not included MUMPS in the past, said Richard Wingo, manager of MUMPS marketing at IBM.

Wheeler, a MUMPS user himself, agreed. "When I tell people I program in MUMPS they laugh at me . . . it is kind of embarrassing," he said, "but I don't care."

Tandem plans revamp for commercial Unix

BY J. A. SAVAGE
CW STAFF

Attempting to place its Unix fault-tolerant machine beyond the telecommunications industry, Tandem Computers, Inc. recently began making calls on commercial accounts six months after the computer began shipping.

The company — which "was dragged kicking and screaming" into open standards with its Integrity S2, according to Rikki Kirzner, an analyst at Dataquest, Inc. — appears surprised at the commercial opportunity for its machines.

"There is a tremendous amount of curiosity on the part of MIS managers in immature [commercial] Unix markets," said Shirley Henry, Tandem's director of Unix product marketing. "They are taking an evaluation-intensive approach to Unix."

"Many of these people are people we've done business with in the past [with the company's proprietary operating system on-line transaction-processing computers]," said Bruce Dougherty, Tandem's director of Unix marketing.

Tandem has sold about 150 Integrity systems, according to John Jones, an analyst at Montgomery Securities in San Francisco.

Of those, the company has sold at least one into the commercial market, according to Dougherty, who would not elaborate further on the sale. The rest have been to phone companies for fault-tolerant switching systems.

If the company does not do well in commercial systems, it still has a future in telecommunications, according to Nili Young, vice-president of midrange system strategies with the Meta Group. She said that AT&T "3B" computers will eventually be replaced throughout the network with Tandem's Integrities.

"The commercial applications just aren't out there yet for Integrity," she said.

XEROX

Motorola wrote the book on cellular phones. A Xerox system lets them rewrite it in minutes.

Motorola is the world's largest producer of cellular phones. Not to mention cellular phone manuals. For which they turn to a company called Rich Graphics.

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Working with Rich Graphics, Xerox developed a solution that integrated both hardware and software, Xerox products and other suppliers' products. And the resulting phone manual production is something to talk about—to say the least.

The manuals are now printed on Xerox laser printers just minutes after the revisions flash across the screen of a Xerox workstation. Turnaround time is 80% faster. Costs are down 50%. And the documents produced are 99.99966% perfect.

Of course, Motorola isn't the only client that Rich Graphics uses Xerox for. And the resulting improvement in customer satisfaction has helped Rich Graphics *double* their printing business every year since they came to Xerox.

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Model 2300 Winchester disk drives have been added to Distributed Logic Corp.'s RDA series of 8-in. SMD/SMD-E storage subsystems designed for Digital Equipment Corp. VAX systems.

The drives offer a formatted capacity of 1.7G bytes per port and are plug-compatible with DEC's KDA50, KDB50, UDA50 and HSC50/70 controllers, the vendor said. The RDA series is also being offered with Model 1130 drives, which provide a formatted capacity of 848M bytes and a 15-msec. average seek time.

An RDA subsystem with a single Model 2330 drive sells for $16,595.

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Power supplies

Exide Electronics has announced a generation of uninterruptible power supplies designed for IBM's Application System/400 and Digital Equipment Corp.'s Microvax systems.

The Powerware Plus 5 series includes Models 3 and 5, both of which offer continuous on-line operation to protect single and multiuser microprocessor-based systems from input line surges, sags, brownouts and blackouts. The devices feature power ratings from 3 to 6 KVA and frequency input variations of 45Hz to 65Hz.

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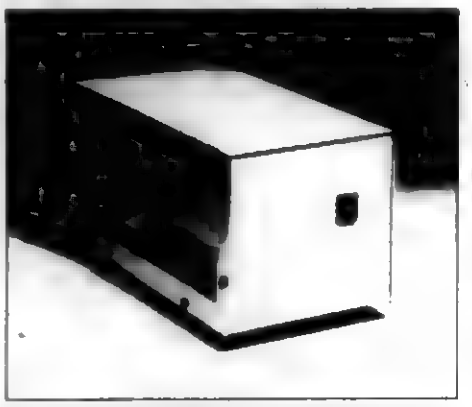

Sola's MPC *series for medical applications*

A line of 60Hz medical power conditioners has been introduced by Sola Electric.

The MPC series provides a regulated, quiet power source that protects medical equipment such as imaging systems, monitors, diagnostics and patient care equipment from electrical surges, sags, spikes and brownouts.

The series features automatic overload protection and operates at 120 dB in common mode and 60 dB in normal mode, the vendor said.

The MPC series sells for $353 for 250-VA models, $489 for 500-VA models and $721 for 1000-VA models.

Sola
1717 Busse Road
Elk Grove Village, Ill. 60007
(312) 439-2800

I/O devices

QMS, Inc. has announced a non-impact printer designed for bar-code and label applications in retail and industrial environments.

The QMS Magnum CF 2215 features a 15-in. wide web print area, a flat paper path for forms handling, 15.6 ft/min. print speed and 240 dot/in. print resolution.

The printer was designed primarily for use with IBM Application System/400, System/34, 36, 38, IBM mainframes and 370 hosts.

The QS Magnum CF 2215 is available 90 days after receipt of order for approximately $60,000.

QMS
P.O. Box 81250
One Magnum Pass
Mobile, Ala. 36689
(205) 633-4300

Interface Systems, Inc. has announced a plug-compatible dot matrix printer designed to print bar codes and oversized labeling characters via IBM's Graphical Data Display Manager software at a rate of 400 char./sec.

Model 7224-202 supports IBM's Intelligent Printer Data Stream page description language and features an 18-wire print head that provides resolution of 144 by 144 dot/in. The printer connects to IBM 3174, 3274 or 3276 controllers via a coaxial port. It includes an RS-232/422 serial port for simultaneous connections to IBM Personal Computers, Personal System/2s or compatibles.

Pricing begins at $4,950.

Interface Systems
5855 Interface Drive
Ann Arbor, Mich. 48103
(313) 769-5900

Ideal Technologies has introduced a customized version of Texas Instruments, Inc.'s 820 Keyboard Send Receive Data Terminal that is equipped with Digital Equipment Corp.'s Model LA120 emulation.

The 820 KSR serves as an interactive telecommunications terminal, as a remote I/O unit in DEC Timeshare environments or as a send/receive device in other data entry/retrieval applications.

The product's features include a preprogrammed self-test diagnostics capability to verify that power is on and maintenance diagnostics such as unit memory status.

The product costs $2,165.

Ideal
13101 Washington Blvd.
Los Angeles, Calif. 90066
(213) 827-9023

NEW PRODUCTS — SOFTWARE

System software

Accelr8 Technology Corp. has announced a suite of Digital Equipment Corp. VMS transparency software for Data General Corp.'s Aviion computers.

The products include Libr8, a library that provides the functionality of the VMR Run-Time Library and System Service calls on Unix systems; Transl8, a utility for moving text and binary files between VMS and Unix; DLC8, a command interpreter to process VMS command procedures on Unix; and EDT8, an editor that provides emulation of DEC's VMS EDT editor on Unix systems.

Site license prices start at $11,888 for DCL8 and EDT8, $49,888 for Libr8 and $29,888 for Transl8.

Accelr8 Technology
303 E. 17th Ave.
Denver, Colo. 80203
(303) 863-8088

Silden Software has announced two performance software packages designed for IBM System/36 machines.

The first product, 36/Life, provides users with performance software, toll-free support, a technical manual called "Extending the Life of Your System/36" and a newsletter that highlights System/36 performance tuning.

The second product, 36/Life Support, was designed to deliver three levels of performance tuning support.

A one-time license fee that includes unlimited use of support lines and a newsletter subscription costs $1,275.

Silden Software
P.O. Box 35282
Los Angeles, Calif. 90035
(818) 716-1117

UIS has announced an enhanced version of V-X Manager, its Digital Equipment Corp. VMS operations management and reporting tool.

Version 2.0 includes a privilege control security mechanism that enables system managers to allow access to system management functions and site-written DCL procedures without granting VMS privileges to users. A reporting component that features graphics capabilities is also included.

The product is priced at $2,650 for DEC's Microvax systems and $21,000 for VAX 9000 machines.

UIS
420 Bedford St.
Lexington, Mass. 02173
(617) 861-6262

Database management systems

BMC Software, Inc. has released Version 2.0 of its Pointer Checker Plus software package.

The product validates pointers with a hash checking technique, which runs during an image copy process, and a full checking technique. Both features generate complete, concise reports on a database, the vendor said.

Version 2.0 includes a Database Zip Utility for displaying, altering and verifying prefix and

Continued on page 34

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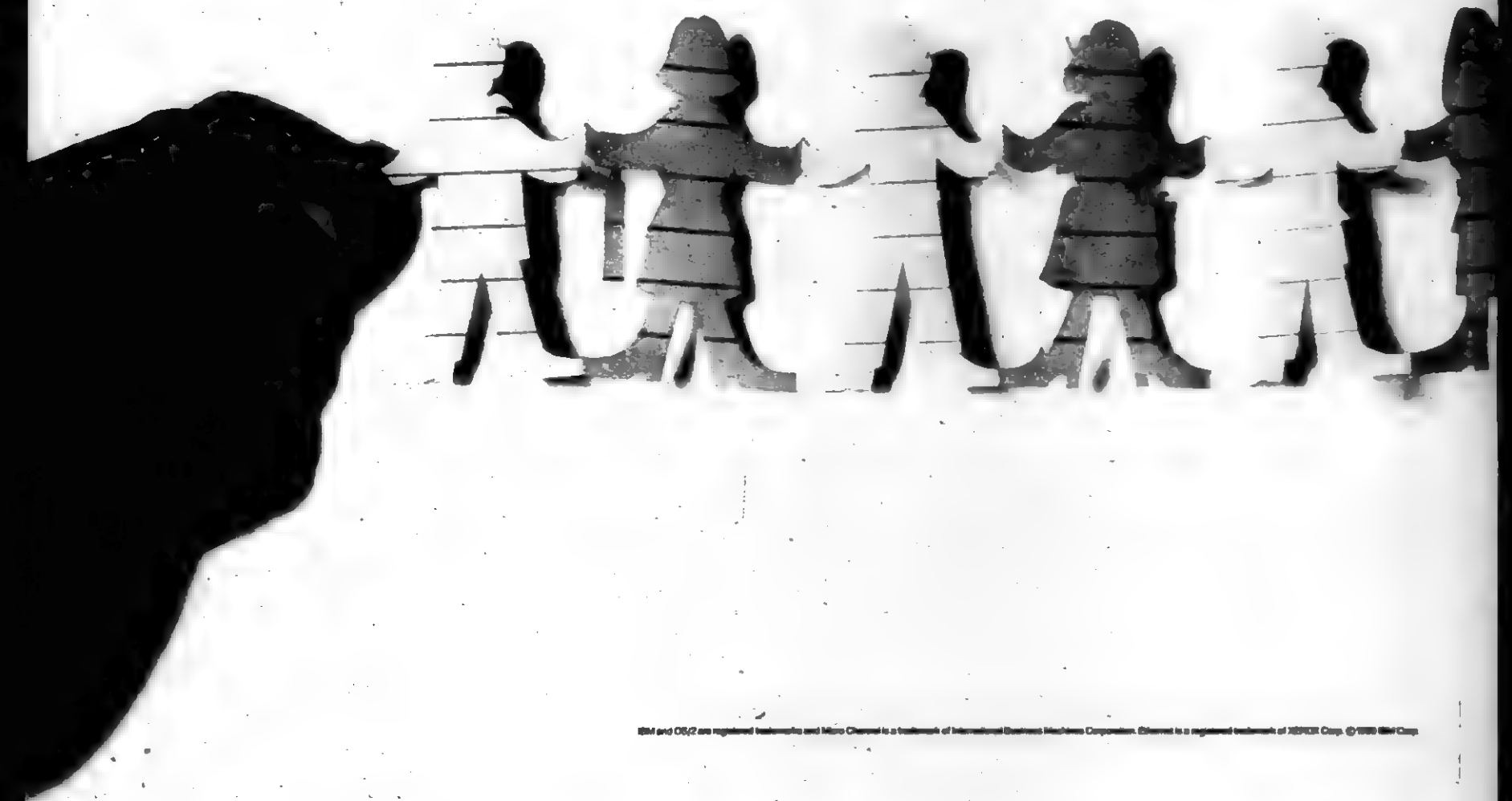

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Continued from page 32

data segments of a database.

A perpetual license for Pointer Checker Plus ranges from $12,000 to $46,000, depending on CPU size.

BMC
P.O. Box 2002
Sugar Land, Texas 77487
(800) 841-2031

The Dylakor division of Sterling Software, Inc. has announced an upgraded version of its DYL-280-II relational software package, which was designed to manage data residing in Teradata Corp.'s DBC/1012 database machines.

The new version supports the full range of Teradata's ANSI-standard SQL syntax. It also enables data from one source to be mixed with data from another source, the vendor said.

The product runs on any IBM MVS operating system and is available for $23,760 to $38,700, depending on group processor size.

Dylakor
P.O. Box 2210
9340 Owensmouth Ave.
Chatsworth, Calif. 91313
(818) 718-8877

Cincom Systems, Inc. has added a Query/Report-Writer option to its Comprehensive Planning and Control System (CPCS), which is a guidance tool for information systems.

The Query/Report-Writer allows IS executives and project managers to access data on the CPCS and import, export, add, modify or read the information. The option enables users to build and execute procedures on-line and execute them in batch mode the vendor said.

Pricing for the CPCS with Query/Report-Writer ranges from $3,100 to $14,990, depending on software and hardware configuration.

Cincom
2300 Montana Ave.
Cincinnati, Ohio 45211
(513) 662-2300

Servio Corp. has announced Version 2.0 of Gemstone, its commercial object database management system.

Version 2.0 can run in a heterogeneous distributed environment and can reportedly be configured with client and servers running on the same systems, depending on application. It runs on Sun Microsystems, Inc. workstations and Digital Equipment Corp. VAX/VMS machines and Decstations. The product is scheduled to ship in October, and a version for the RISC System/6000 is slated for a fourth-quarter release.

Pricing starts at $12,000 for a four-user license.

Servio
1420 Harbor Bay Pkwy.
Alameda, Calif. 94501
(415) 748-6200

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Software applications packages

Dynax Resources, Inc. has announced an interactive, menu-driven system designed for textile converter applications prepared on IBM Application System/400 hardware.

The Textile Distribution Software package enables users to manage all aspects of converting — from greige goods processing and finishing to customer service, sales, order entry, warehousing, shipping and billing. It includes an inventory control module and features the ability to convert invoices prepared in foreign currency to U.S. dollars, the vendor said.

Pricing ranges from $50,000 to $75,000, depending on system size.

Dynax
2 Jericho Plaza
Jericho, N.Y 11753
(516) 932-9080

Russell Information Sciences, Inc. has announced the release of Calendar Manager Version 3.4.

The enhanced software package enables users to arrange meetings and multiple standby meetings for simultaneous time slots. Video or telephone conferences can reportedly be scheduled with automatic worldwide time-zone adjustments. The package includes a link to Digital Equipment Corp.'s Vaxmail in all its print windows, and Decnet users can use the product without a need for a separate interface, the vendor said.

Version 3.4 is available in DEC VMS stand-alone, All-In-1 and X-O integrated versions. Pricing ranges from $795 to $34,995, depending on CPU size.

Russell Information
25201 Paseo De Alicia
Laguna Hills, Calif. 92653
(714) 768-5000

Software utilities

Compuserve Data Technologies has announced the addition of Computer Associates International, Inc.'s menu-driven CA-Tellagraf and Access Technology, Inc. 20/20 interfaces to its Digital Equipment Corp. VAX/VMS-based System 1032 fourth-generation relational database management system.

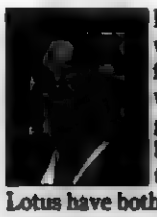
The interfaces enable users of System 1032 to access data and transfer it to CA-Tellagraf for graphing or 20/20 for spreadsheet analysis. The System 1032/CA-Tellagraf interface is now available. The System 1032 20/20 began beta testing last month. Prices range from $500 for Vaxstation configurations to $15,000 for a VAX 9000 series license.

Compuserve
1000 Massachusetts Ave.
Cambridge, Mass. 02138
(617) 661-9440

COMMENTARY

Patricia Keefe

Money for nothing



It's a mad, mad world out there for software vendors struggling to make a buck. Borland International and Lotus have both sustained major hits to their stock value despite profitable quarters. Borland investors were unnerved by Lotus' copyright infringement suit, while Lotus shareholders damned that company for predicting a weak third quarter.

Ashton-Tate continues to hang by a thread, bolstered solely by a committed user populace. Even Microsoft, which managed to top the billion-dollar mark in sales for fiscal 1990, is predicting lower profit margins next year while it pours good money after bad in an effort to crack Novell's grip on the LAN-locked.

So what gives? All of these companies have come to one crossroad or another, and savvy users should realize that they not only hold the key to these vendor's financial futures but that they are in a position to help shape the way their product futures will look.

If users choose not to buy the cross-product platforms, the cleaned-up, revved-up or reduced-price products, or even to support forays into new

Continued on page 42

EISA misses bus — for now

ANALYSIS

BY MICHAEL FITZGERALD
CW STAFF

While Extended Industry Standard Architecture (EISA) bus-based personal computer makers expect to sell tens of thousands of the machines this year, it will take EISA several years to catch on, say users and analysts. EISA boxes are also unlikely to be used as stand-alone machines, at least not for the next couple of years.

The 40 or so EISA vendors will ship approximately 160,000 machines in 1990, a fraction of the more than 7 million PCs that will be sold this year worldwide, said San Jose, Calif., market research firm Dataquest, Inc.

Despite this quiet beginning, and after almost two years of vigorous debate on the merits of EISA vs. IBM's Micro Channel Architecture (MCA) bus, analysts predict that EISA machines will eventually overcome the two-year MCA head start and outsell MCA machines, both in this country and throughout the world.

Still, neither architecture is expected to establish itself as the standard for microcomputers.

"The two of them are going to coexist, period," said Robert Charlton, an industry analyst at Dataquest.

"I don't see a fight happening for a de facto standard," said Andrew Seybold, publisher of "Andrew Seybold's Outlook on Professional Computing," an industry newsletter based in Santa Clara, Calif.

IBM offers MCA in both 16-bit and 32-bit versions, with the 16-bit Intel Corp. 80286-based machines driving sales. The low end for IBM will continue to keep its sales above those of EISA vendors for some time to come. Meanwhile, both the 32-bit MCA and EISA computers have limits that make them hard sells for vendors. In addition, MCA is offered only on strict licensing terms from IBM, so

Continued on page 43

MCA's head start

IBM's Micro Channel Architecture is expected to hold its lead over the Extended Industry Standard Architecture, at least through 1994

	MCA		EISA
	16-bit	32-bit	
1989	838,000	311,000	1,000
1990	724,000	463,000	62,000
1994	988,000	1,255,000	1,832,000
1989	1,221,000	603,000	2,000
1990	1,463,000	864,000	156,000
1994	2,059,000	2,979,000	3,716,000

Source: Dataquest, Inc. CW Chart: Michael Siggins

Sony pulls CD-ROM out of magnetic gutter

BY RICHARD PASTORE
CW STAFF

SAN JOSE, Calif. — Sony Corp. unveiled a new generation of optical storage drives late last month with features it hopes will dispel CD-ROM's image as the poor, slow cousin of magnetic drives.

The four new compact disc/read-only memory (CD-ROM) drives deliver average access times of 0.38 seconds, which is a 25% improvement over the previous generation of Sony drives, the company said.

Two of the drives also support the small computer systems interface II (SCSI-II), an advanced version of the SCSI standard that offers faster throughput, ability to connect more devices and an expanded command structure.

Support for the interface "will help advance the use of CD-ROM and other peripherals in the future," said Jay Bretzmann, a storage analyst at International Data Corp., a Framingham, Mass.-based research firm.

Sony has tweaked the drives' error-handling capability with new layered correction code and automatic internal dust cleaning. The four drives will be available in the fall, the company said. Prices have not yet been announced.

Also in the lineup

Sony also introduced a write-once read-many (WORM) optical drive. The unit allows users to encode data permanently on special CDs for playback and retrieval.

According to Sony CD-ROM product manager Alan Sund, the WORM system could be particularly useful to government agencies and other users of highly sensitive information who, for security reasons, would prefer to bring the CD-ROM production process completely in-house.

The $30,290 WORM drive will be available in the fall, the company said. The WORM disks retail for $30 apiece.

To prod the development of multimedia optical software, Sony also announced a CD-ROM XA audio encoder and personal computer interface card. CD-ROM XA is a standard supported by Sony, N.V. Philips Telecommunications and Microsoft Corp. for creating interactive multimedia training, point-of-purchase and electronic catalog applications.

The encoding card is available now at a developer's price of $2,695; the interface card sells for $399, according to the company.

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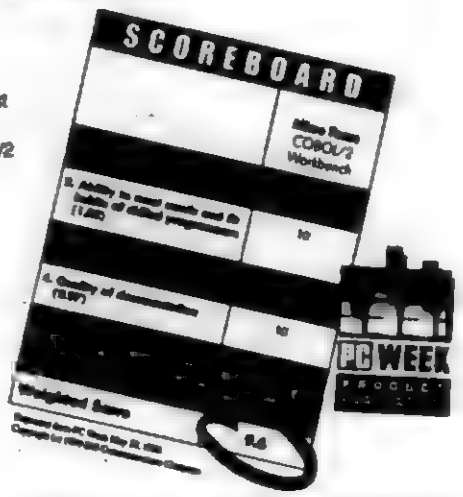

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And although the technology is IBM-reliable and IBM-compatible, the warranty exceeds Big Blue's Model 55SX by eight months. This 20-month warranty gets even better if you become a D3/MC customer before September 30, 1990. You'll receive free on-site maintenance by experts from GE Service.*

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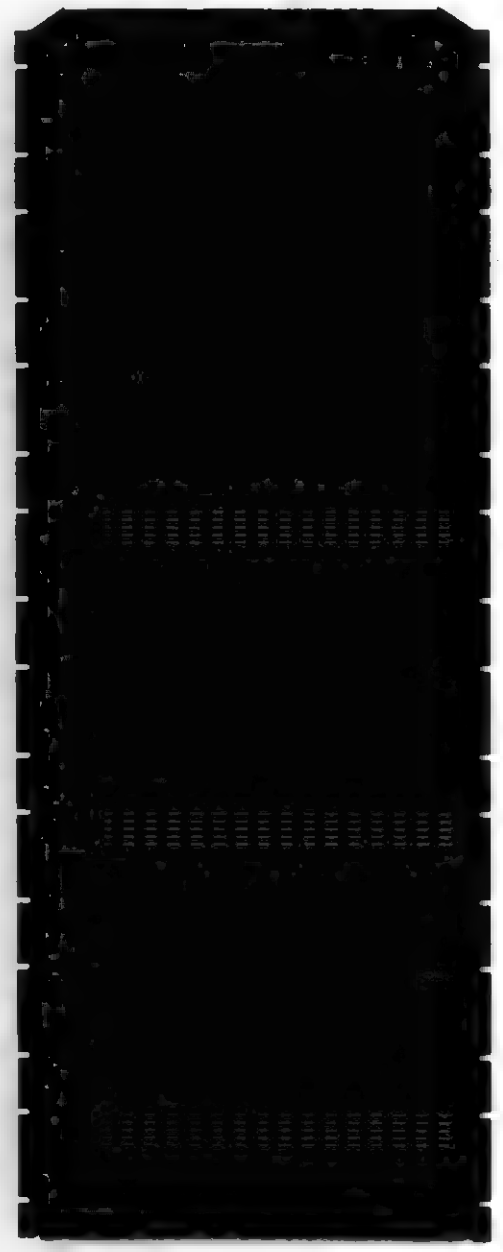

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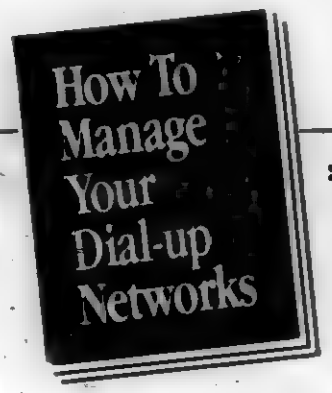

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New York Life sold on laptops

Insurance agents use PC-based underwriting as strategic sales tool

ON SITE

BY MARYFRAN JOHNSON
CW STAFF

In its own computerized version of one-stop shopping, New York Life Insurance Co. is rolling out an integrated sales system, with personal computers and laptops playing a pivotal role for agents in the field.

Roughly 1,000 of New York Life's 10,000 independent agents are already using the customized PC-based sales system, which enables them to plow through days' worth of paperwork in a matter of minutes.

"We can take an application and underwrite it right there on the spot, as long as the policy is for less then $250,000," said Donna O'Driscoll, assistant vice-president of New York Life's agency department. "We don't just take the information and send it into the home office anymore."

Within the next year or so, all 10,000 of the agents should be using the new sales system, she added. "Insurance applications will never be a 15-second operation," O'Driscoll said, "but this helps the agent get all the correct information and not miss anything."

Whether the PC is generating payment schedules or graphically displaying a family's financial picture, it "really holds a client's attention," said Richard Paules, an Allentown, Pa.-based agent who was the first to test the new system. He uses an IBM Personal System/2 Model 60, which was recently upgraded to 80M bytes of memory on hard disk and 3M bytes of random-access memory.

"The whole logical series of steps just keeps people riveted to what you're doing," said Paules, a 30-year veteran of New York Life. "I think when the computer makes the calculations, it has a great deal more credibility."

Working with Logica Data Architects, Inc. in Waltham, Mass., New York Life's agency department set out to revitalize its existing sales system without moving to a new computing platform. The agency department is the main coordinator in recruiting the independent agents and supplying them with software programs and tools to aid their sales efforts.

Central to the challenge of designing the integrated sales system was the independent nature of the agents themselves. Most of them buy and maintain their own PCs and laptops, using a variety of commercial software packages recommended by New York Life. The idea was to patch together this disparate number of sales and illustration packages, client databases, financial needs analysis programs and even telemarketing scripts into one coherent system operating under Microsoft Corp.'s Windows.

New York Life's *Donna O'Driscoll: Sales system provides credibility*

"We were trying to use the good stuff we had and develop what we knew we wanted," O'Driscoll said. While the system is known internally as NYL Express, the company's attempts to copyright the name have been unsuccessful so far.

In pulling the various applications under its own "software umbrella" development tool, Logica integrated New York Life's custom software with the PC packages that the agents were already using. Everything had to be seamlessly integrated so data could be moved from one application to another with a minimum of fuss and redundancy, said Shirley Singleton, project manager at Logica.

"These agents are not computer gurus. They didn't want to be rekeying data into nine different packages," Singleton said.

On-line expert

The new system also includes an artificial intelligence-based "underwriter-in-a-box," which is customized from an expert system applications development package from Palo Alto, Calif.-based Aion Corp.

The Aion package is preprogrammed with underwriting rules, so an agent can type in information about a person's age, health habits and medical condition and get an immediate answer on whether the client is a good insurance risk.

The underwriting piece also gives NYL Express a cooperative processing spin, since it enables the insurance firm to offload some of the duties once performed by corporate mainframes.

Rather than manually filling out forms at the field offices and sending that information to be keyed into the mainframe database, the PC-based underwriter completes those steps in the field, Singleton said.

The bulk of New York Life's mainframe processing is done on IBM 3090s in its Clinton, N.J., data center or at the home office in New York. The 180 regional offices are equipped with IBM Series/1 minicomputers as well as some IBM Personal Computer-compatible PCs available for the agents' use.

Agents can dial into the Series/1 for security checks on potential clients or to download client files from the mainframe.

Paules said the new sales system is already well liked by the agents because their commissions arrive faster, fewer mistakes occur, and the whole process is telescoped into a few days rather than weeks.

The underwriter-in-a-box is particularly fascinating to many of the agents, he added. "It's great to be able to illustrate things and run a financial needs analysis, but the idea that a machine can decide whether someone is healthy enough or not for insurance is amazing to me," Paules said.

While many of the agents take their portables right into clients' homes, Paules said just as many insurance salespeople are probably working at the office.

"Years ago, the insurance man always went to the client, but I'd say now it's 50-50 with people coming into the office. I know I use the PC as a way of getting people to drop by my office," he said. "After they leave, I just upload all the information to the home office."

Ogivar system combines power, portability

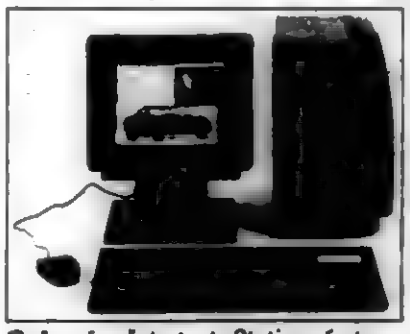
BY PATRICIA KEEFE
CW STAFF

QUEBEC — Devoted laptop users who do not want to deal with the cost of having a second, stationary computer on their desk might want to check out a planned September offering from Ogivar Technologies, Inc.

Ogivar recently unwrapped the Interport Station, which is said to combine the portability of a 9.8-pound laptop with the capabilities of a full-size, IBM Personal Computer-compatible workstation.

The Interport Station consists of a desktop docking module that comes with a 101-key keyboard, a color IBM Video Graphics Array (VGA)-compatible monitor and a mouse; the module does not contain a microprocessor.

The module is mated to either Ogivar's Industry Standard Architecture bus, 20-MHz Intel Corp. 80386SX-based laptop computer or to its Extended Industry Standard Architecture 33-MHz 80386-based laptop. The expansion module also provides the laptops with six expansion slots for communications, networking and add-in cards, as well as additional floppy or hard disk drives and tape or laser optical drives.



Ogivar's *Interport Station features laptop portability and desktop power*

The laptop segments can run MS-DOS, OS/2 or Unix and come standard with a 9-in. backlit VGA LCD screen; 1M byte of memory with 384 bytes of shadow random-access memory; a 3½-in., 1.44M-byte floppy drive and a 40M-byte hard drive; a serial interface and parallel port; a mouse interface; and an AC adapter connection. The laptops snap in and out of the station module.

The 386SX model costs $5,395 and comes with a detachable two- or four-hour battery pack and an internal, half-size expansion slot. The higher speed 386-based model costs $6,995 and runs on AC power only. Prices for both models include the docking station, keyboard and 15-in. VGA color monitor.

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Borland spreadsheet makes a move

BY MICHAEL FITZGERALD
CW STAFF

The jury remains out, but Borland International appears to have some votes in its favor, with several market research firms reporting that Quattro Pro has surpassed Microsoft Corp.'s Excel as the No. 2 spreadsheet.

More copies of Quattro Pro sold than copies of Excel in May, according to figures from La Jolla, Calif.-based research firm Computer Intelligence's (CI) PC Market Monitor Service, a monthly survey of 1,500 sites having 500 or more employees. The survey combines Excel sales for DOS and the Apple Computer, Inc. Macintosh, whereas Quattro Pro runs only under DOS.

The fact that Quattro Pro does not run under Microsoft Windows Version 3.0, released at the end of May, has boosted sales of Excel, according to distributors.

Dan Ness, a microcomputer industry analyst at CI, said that Quattro Pro sales have been climbing steadily and that he expected it to remain at No. 2.

However, sales of Excel are flat, not dropping, and Lotus Development Corp.'s 1-2-3 spreadsheet, the target of Borland's slash-and-burn marketing attack, appears virtually unaffected.

"Lotus is slumping only slightly; most of [Quattro Pro's] growth is coming from the 'other' category, like [Computer Associates International, Inc.'s] Supercalc 5," Ness said.

"[Borland has] achieved some success, but not as much as it needs if it wants to continue chasing the leader the way it is," said Marshall Moseley, an analyst at Dataquest, Inc. "It needs to get into corporate accounts with multiyear, multiunit commitments."

A Borland spokeswoman said that since last October, the company has signed up 150 companies to commitments to buy 100 or more copies of Quattro Pro.

Several major distributors failed to confirm Quattro Pro's lead, however. Dataquest projected that Quattro Pro and Excel will each grab approximately 14% of the spreadsheet market this year, while Lotus will continue to hold a 52% share.

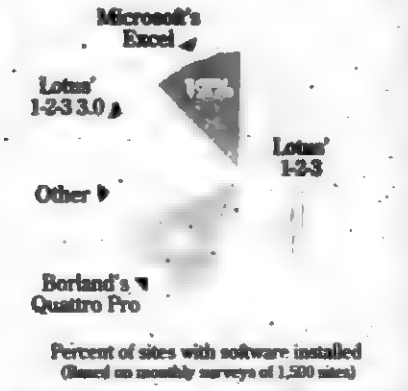
Ingram/Micro D in Santa Ana, Calif., showed Excel placing eighth and the Quattro Pro upgrade ninth on its charts. It also ranked the full-priced version of Quattro Pro 25th. Bruce Frederickson, Ingram's vice-president of marketing, declined to comment on whether the two combined were outselling Excel and added that the rankings did not reflect the release of Windows 3.0, which has "accelerated Excel sales 100%."

He also said that "Lotus is still clear and away the market leader, and 3.1 will be a good product when it comes out."

Two other distributors ranked Excel substantially higher than Quattro Pro. El Segundo, Calif.-based Merisel rated Excel No. 5 and Quattro Pro No. 17, and Corporate Software, Inc., a personal computer software and board reseller in Canton, Mass., does not even have Quattro Pro on the charts, while Excel consistently makes its Top 10.

Spreadsheet shift

Borland has edged ahead of Microsoft into second place in the spreadsheet market



Percent of sites with software installed (based on monthly surveys of 1,500 sites)

Source: Computer Intelligence — CW Chart: Marie Hattes

Little folks pass on power

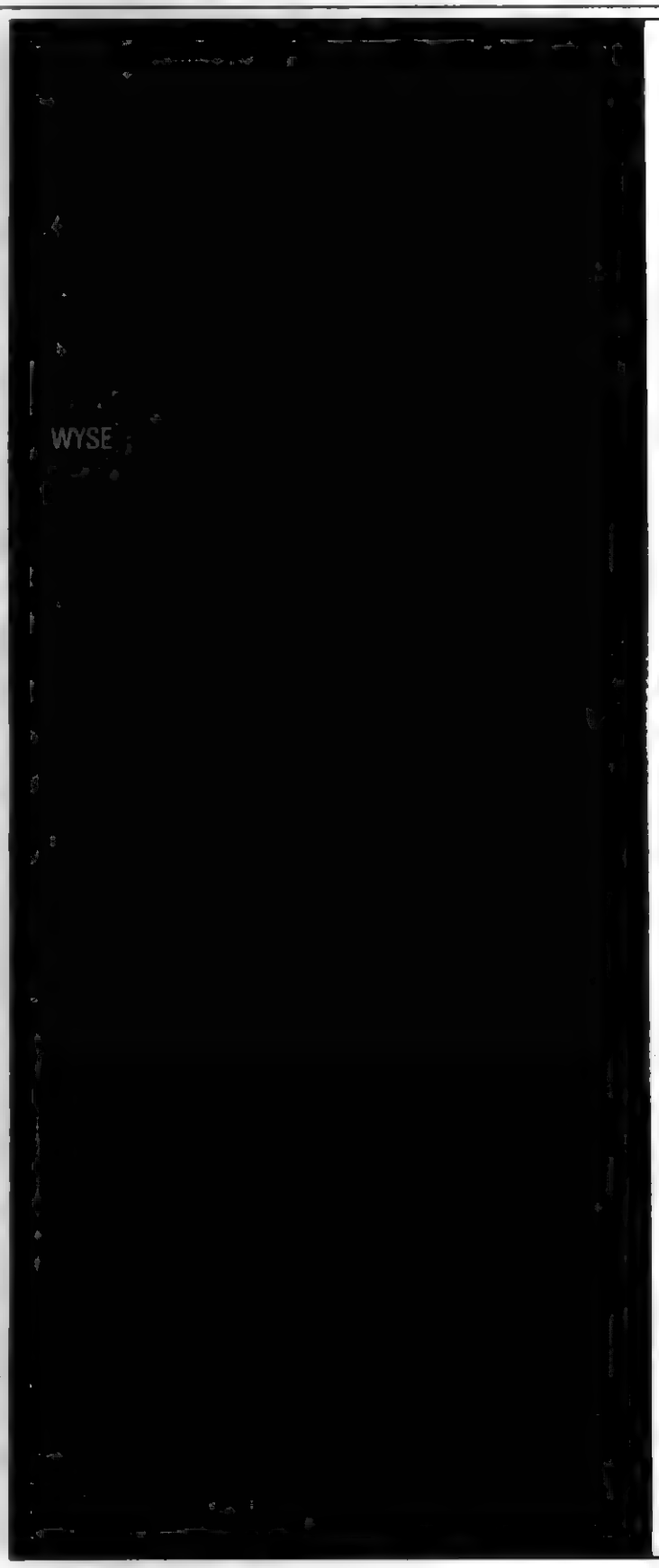
U.S. businesses with fewer than 100 employees will spend $2 billion on personal computers by 1991, but the majority of the boxes will be low-end IBM Personal Computer-, XT- and AT-class machines, according to a recent study.

Among the 700 firms surveyed, 55% said they would purchase the low-end boxes, according to Business Research Group, a market research and consulting firm in Newton, Mass. However, a healthy 39% are also considering buying PCs based on Intel Corp.'s 80386 chip.

The high end of the PC range — Intel 1486-based systems — interest only 9% of small business decision-makers, according to the survey. A similar percentage intend to buy IBM Personal System/2s specifically, while 15% will opt for Apple Computer, Inc.'s Macintosh, the study showed.

The study went on to suggest that the small business market, which constitutes 98% of all U.S. business enterprises, is a vast untapped market for PC networks. Only 27% of those surveyed said they use local-area networks.

RICHARD PASTORE



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Info managers form platform for application development

BY PATRICIA KEEFE
CW STAFF

A distinct class of software, which includes personal information managers and groupware-based software environments, is being used by vertically oriented developers as an application platform.

Third parties can only be encouraged by reports such as one that appeared in a recent edition of the Windows Users Group Network's newsletter, which claimed IBM is telling select corporate customers that the Microsoft Corp. Windows version of Current, its personal information manager, may become the standard interface for a Windows version of Officevision.

There appears to be "a good rationale" for creating a relationship between the Windows version of Current and Officevision, conceded Carmine Cordella, manager of personal information management and Officevision products at IBM's Desktop Software Group in Milford, Conn. "We have announced that we are building a front-end version of Current that connects into Profs and Officevision/VM at the request of a large customer," Cordella said.

Also facilitating developer interest is the arrival of Windows Version 3.0. According to the June edition of "Andrew Seybold's Outlook on Professional Computing," Windows 3.0 has made it "possible to have a fully functional set of applications running directly under Windows 3.0 with the ability to get in and out of standard DOS applications without having to close them and store the files."

In short, Windows 3.0 has paved the way for more powerful and useful information managers. Personal information managers provide users with a personalised desktop environment that enables them to categorize their information and files in such a way that, when working on any one subject, they are able to automatically access or pull together all related files and data.

For example, when using Current to prepare a budget meeting, the user is automatically linked to all of his electronically stored data pertaining to that budget. However, before personal information managers such as Current, Lotus Development Corp.'s Agenda and Polaris Software's Packrat can be used, users must create categories and build directories and databases.

In the case of a groupware environment such as Lotus' Notes, which functions less as a group application focused on a particular task and more for linking a user community together through various modes of communication, parameters must be set up before the package can really be used. This can be quite time-consuming.

Ahead of time

A third-party market, along with some users, is just now beginning to address this problem by providing application "shells" that lay on top of these environments and take advantage of their capabilities. The shells address a particular need, such as trade-show planning, with built-in categories, directories and databases already in place.

"Customers can literally create a vertical application inside one of Current's data directories," Cordella said.

Richmond, Va.-based Positive Image Software has developed two vertical overlap applications for Current. One package assists trade-show exhibit managers in planning and managing related details, and a second package targets meeting planners.

"We have created data fields, task lists, form letters and categories that are relative to various aspects of trade-show and meeting planning; developed links between the files; and developed reports that take advantage of Current's capabilities," said Martin Darby, director of sales and marketing at Positive Image.

"We used Current as a development tool. If the user knows Current, then he already knows how to use the package," Darby added.

Darby started out developing a high-end application under Borland International's Paradox, only to find that many of the features he was developing under Paradox were already included in Current. So he decided to switch platforms and converted his application into an overlay for Current.

Agenda developer, reseller and newsletter publisher Eyeon Associates is also working on some customized shells for Agenda.

Users throughout New York-based Price Waterhouse have already written over 100 applications specifically for Notes, covering all aspects of the organization, National Technology Director Sheldon Laube said.

New Notes users are seeded with a few applications to get them going, and before long, they start creating new applications that tie into Notes' capabilities, Laube said. "These are the same people who are writing Lotus 1-2-3 macros," he said. "I used to worry about who would write the applications, and now I can't keep up with what's being produced."

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*AIM Technology Suite III Benchmark, Dec. 1989

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Keefe

CONTINUED FROM PAGE 35

markets, then there's going to be a lot of red ink flowing from software giants.

Now is the time to get involved. Ashton-Tate, for example, last week released Dbase IV 1.1, the long-awaited fix for Release 1.0's bugs. Incredibly, Ashton-Tate not only held onto most of its installed base, but user purchase surveys like the ones done monthly by Computer Intelligence in La Jolla, Calif., show that sales have continued to grow.

Users had such a heavy investment in Dbase code that many had no choice but to keep the faith and wait with toes tapping for Dbase IV 1.1. Dbase consultant Adam Green estimates there are thousands of backlogged Dbase IV applications ready to roll — if 1.1 works.

"If there are any problems with this release, Ashton-Tate is a goner," predicted Will Fastie, who edits "The Fastie Report," a Baltimore-based newsletter. "Any major problems will prove a major blow to Ashton-Tate's chances to continue as a major software company," agreed David Cearley, a software analyst at Gartner Group.

> "IF THERE ARE any problems with this release, Ashton-Tate is a goner."
>
> WILL FASTIE
> "THE FASTIE REPORT"

Even if there aren't any problems with Release 1.1, Ashton-Tate users still aren't out of the woods. Release 1.1 goes beyond the eight enhancements originally promised, providing 30, but the package is still dismissed as anywhere from two to four years behind the times.

Ashton-Tate's new management team has committed to interim releases every four to six months. "If it takes another two years for the next new product, they will lose more of their market," warned Michael Irwin, a police officer and systems analyst at the Metropolitan Police Department in Washington, D.C.

Irwin and other users said Ashton-Tate is reaching out to developers and users to get their input on what those new products should be and what features they should have. Here is the chance to make sure there are no more surprises.

Of course, Ashton-Tate is already hobbled from the start by one crucial blunder — denying for months that any bugs existed in 1.0. "That can only be viewed as having lied," Green insisted.

Once a promise for an upgrade was extracted, the ship date for 1.1 came and went with the changing of the seasons. This time around, if the company fails to listen, deliver or both, there will be no future for Dbase. Many users will just give up and walk away.

Lotus has been accused of being a one-product company and confusing its installed base with too many flavors of 1-2-3. But it's also true that Lotus has made investments in database, networking, groupware and CD-ROM technology.

Most of these efforts are still in the swaddling stage, and the company admittedly is picking its way through a mine field of unfamiliar territory. Users who run their companies on 1-2-3 should get involved now.

Tell Lotus what you need to adopt these new technologies — features, pricing and platforms. Tell it how you want the products sold and supported. With Notes, for example, it hasn't a clue. Lotus has said so. So the "new" Lotus can't afford not to listen. They've already felt the sting of ignoring user interest in Microsoft Windows.

Borland has the marketing down pat. But how far can it go on the cheap? The competition discounts large orders, and sales from evaluation units of Paradox and Quattro Pro are running out of steam, Cearley noted. Then what? Does Borland have what it takes to support and service corporate accounts? What will Borland have to do to get you to abandon your current platforms? We're going to find out during the next 12 months.

Mighty Microsoft faces an uphill battle with its obsessive need to take over the networking market. So far, users have been pretty indifferent to its efforts to field both a database server and a client/server architecture. OEMs haven't fared much better. The company has been forced to turn to the reseller channel, where fly-by-night network quacks abound. Microsoft expects to take it on the chin next year, so we know it's being realistic.

Microsoft is going to knock itself out trying to catch network managers' eyes. Users might as well take their best shot. Only a fool would spend the kind of money Microsoft is going to have to spend and not listen to the buying public.

Users might start off by telling Microsoft that unless they see some clear evidence that the software developer and IBM will quit the Laurel and Hardy act and follow through with unity pledges on both LAN servers and OS/2, they'll patronize the Novell Netware show. Microsoft does a good job of making IBM look foolish, but many users are more inclined to follow IBM's lead.

Users have never been in such a position to exert influence over the arbiters of microcomputer software. They'll have only themselves to blame if they don't.

Keefe is *Computerworld's* senior editor, PCs and workstations.

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Nynex, Apple announce advertising system

Nynex Information Resources Co. recently teamed up with **Apple Computer, Inc.** to showcase integrated electronics and print advertising technology that is designed to enable marketers to seamlessly run multimedia advertising campaigns. Apple's Macintosh provided the hardware platform, and Nynex's Macrominds Director software served as the authoring system.

Computer Associates International, Inc. has opted to incorporate **Rational Systems, Inc.**'s DOS/16M DOS extender into several of its DOS-based products, including database and applications development packages. The extender allows CA to overcome DOS' 640K-byte memory access barrier.

Computerland Corp. customers now have greater rental options than before, thanks to an agreement between the retailer and **A.I. Credit Corp.** The computer retailer's 750 stores will have the option of offering both customized leasing programs and rental equipment financing provided by A.I. Credit.

Coopers & Lybrand and **Applied Business Technology Corp.** (ABT) are finalizing a licensing agreement that will integrate their systems development software into one combined system called Summit/Bridge. With the combined project management tool kit, managers can reportedly create a plan, assign resources and estimate each task in hours instead of days.

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EISA

CONTINUED FROM PAGE 35

some users consider it a proprietary system. Both architectures may be providing more than users really want right now.

"We simply don't need the power," said Hugh Naughton, Gas Research Institute's director of information systems.

Other corporate IS directors contacted concurred, saying that neither EISA- nor high-level MCA-based machines figured in their near-term plans. The prices of the systems — at least $10,000 for a 32-bit, 80386-based EISA machine — have also dampened buyers' enthusiasm.

Newly available second-generation EISA chip sets are expected to allow EISA vendors to produce boxes in the $5,000 price range, but this still may not make a difference.

"I don't think there is a market for EISA machines in the low end," Seybold said. "The only way I could rationalize it is as a high-end machine for file serving or intensive graphics use, and the difference in the cost of the chip set doesn't excite me one way or another."

Those companies that have looked into the architecture give EISA mixed reviews. Continental Bank Corp. in Chicago, for instance, recently shunned EISA to standardize on MCA.

"We had originally planned to use Compaq's [EISA-based computers] but along the way decided that MCA was going to be more flexible for us in the long run, given IBM's Systems Network Architecture environment," said Marty Burns, local-area network administrator at Continental's Trust Division.

At the New York City Transit Authority, however, MCA was barely considered when the authority went looking for a file server to run a distributed application for scheduling subway operators.

"We liked what we saw" on a visit to Merrill Lynch & Co., which is using Compaq Systempros, said Patrick Farley, network administrator for the authority. "It outran the [IBM Personal System/2] Model 80, and for the critical nature of our application and future potential, the Systempro seemed fairly viable."

While there are probably less than 50 add-in cards available for EISA computers, mostly for network servers, at least one user was sold on EISA because of a specialized addition. David Klugman, executive vice-president of Tranzact Systems, Ltd., bought a Zenith Data Systems' Z-386/33E because it was so much faster than a 286 system that his firm was able to aggressively expand its market, as well as improve service for its regular clientele. Tranzact is a Homewood, Ill.-based on-line service bureau that processes freight bills for large corporations.

Klugman said Zenith's proprietary disk controller, rather than the EISA bus, made the difference for his company, giving customers the ability to do what would have been 40-minute searches on an Industry Standard Architecture 286-based system in less than five minutes.

It will be a while before EISA machines, or high-level MCA machines, make a splash in the market. Those companies that are buying such systems may not actually need the machines today.

"There's a lot of large corporations that know they're going to have to do something," Seybold said. "The others are the people who've succumbed to the [marketing hype for] a 32-bit bus."

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*PC WEEK, May 7, 1990. **Direct LocalTalk connections dependent on NetWare 386 NLM due Fall, 1990. Macintosh connection achieved today via standard bridges.

NEW PRODUCTS

Systems

Altima Systems, Inc. has announced a 16-MHz laptop computer.

The Altima Three incorporates an Intel Corp. 80386SX processor and includes a 40M- or 120M-byte internal hard disk drive. A cold cathode fluorescent tube LCD features 640- by 480-pixel resolution and offers support for IBM's Video Graphics Array.

The product's list price is $4,999 for the 40M-byte model and $5,400 for the 120M-byte version. Both models are scheduled to be available next month.

Altima Systems
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Texas Microsystems, Inc. has announced a Sun Microsystems, Inc. Scalable Processor Architecture-based workstation for use in harsh environments.

Hardsparc Model 9001 is compatible with IBM's Personal Computer XT and AT Industry Standard Architecture bus-based machines. It can run the MS-DOS or Unix operating systems and was designed to withstand shock, vibration and airborne contaminants. A rack-mounted color monitor with 1,280- by 1,024-pixel resolution is also available.

Pricing for a Model 9001 equipped with 8M bytes of random-access memory begins at $16,995. The monitor costs $5,995.

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The MAX 386SX, a 14-pound, battery-powered portable computer announced by Transpacific Distribution Ltd., is now available for less than $3,500.

The product includes an Intel Corp. 80386SX processor, a 40M-byte hard disk and a 1.4M-byte floppy disk. Other features include 1M byte of random-access memory (expandable to 5M bytes), an IBM Video Graphics Array LCD screen and a removable keyboard.

Each system is being shipped with MS-DOS Version 4.0.

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4224 California St.
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(415) 221-6044

Software applications packages

Evolution Computing has begun shipping Fastcad, its three-dimensional computer-aided design and manufacturing program, for $2,995.

The package includes Fastcad 2D and Fastcad 3D and incorporates Pixar's Renderman. The bundled package enables users to create 3D photo-realistic images. A depth-mode feature allows users to place 3D points with a cursor, the vendor said.

It runs on an IBM Personal Computer AT or an Intel Corp. 80386- or I486-based Personal System/2 operating under MS-DOS Version 2.0 or higher.

Evolution Computing
437 S. 48th St.
Tempe, Ariz. 85281
(602) 967-8633

Board-level devices

Dialogic Corp. has announced its multiline voice-processing boards for use with IBM's Personal System/2 Micro Channel Architecture (MCA)-based computers and compatibles.

The boards enable MCA-based computers to serve as a platform for voice-processing applications developed under the MS-DOS or OS/2 operating systems.

The Dialog/81-MC ($2,550) records and plays back voice and performs outbound call analysis functions on eight channels. The LSI/80-MC ($775) is an analog telephone interface board that connects to a D/81-MC to connect as many as eight telephone lines.

Dialogic
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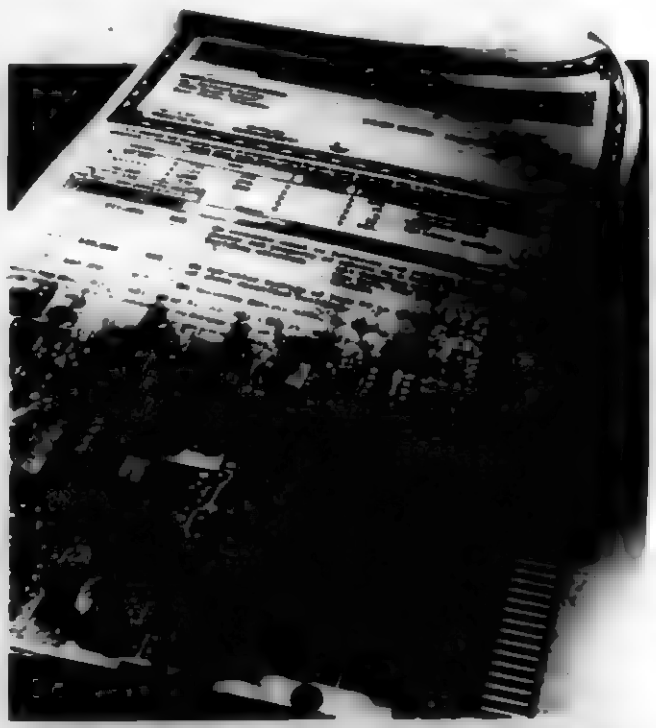

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COMMENTARY

Elisabeth Horwitt

Best of both worlds

We seem to be on the verge of a shining new era, which could technically be defined as virtual voice and data networking but strategically comes down to users being able to outsource their networking needs to carriers while still getting the benefits of private networks.

This is bad news for T1 equipment vendors like Network Equipment Technologies and Newbridge, both of which have reportedly had a rough time of it profitwise these last couple of quarters. But it's very good news for users.

An Amtrak project manager recently told me why his company switched from dedicated voice lines to AT&T's Software-Defined Network (SDN). "With SDN, we could tie our stations into our own four-digit network" and stop paying for unused dedicated bandwidth, he said. Furthermore, Amtrak is happy to "let somebody else" manage its voice operations, he added. "We're not a telephone company."

Asked whether his company is interested in AT&T's recently announced Software Defined Data Network, the manager said yes but added that he had

Continued on page 49

Virtual nets hold overseas promise

BY ELISABETH HORWITT
CW STAFF

EL SEGUNDO, Calif. — Those currently paying through the nose to use overseas public networks saw a break in the clouds last week, as Infonet announced its full virtual private data network offering.

Virtual Private Data Network (VPDN) is a family of network services that lets users enjoy all the benefits of owning their own T1 backbone without having to pay the personnel, maintenance and equipment costs associated with a private network, according to Vice-President of Product Marketing Michael Radice. The service is targeted at companies that are evaluating leased-line networks, as well as those currently paying $15,000 or more per month for public data network services, he added.

Services such as VPDN are "a budding market that's waiting to happen," particularly in the international arena because of the high charges levied by foreign Postal Telephone and Telegraph (PTT) authorities [CW, July 23], said Frank Dzubeck, president of Communications Network Architects, Inc.

"Private international networks are extremely attractive because costs are embedded in there, but you've seen few of them because of the difficulty of reaching agreements with PTTs," he said.

However, Infonet's special relationship with PTTs — the company is jointly held by 10 of them, as well as MCI Communications Corp. — has enabled it to "set the stage" for a new era of virtual private networking that will include other U.S.-based carriers and gradually will integrate PTTs' local services as well, Dzubeck said.

VPDN is virtually private in the sense that customers actually share bandwidth on Infonet's international T1 backbone of Network Equipment Technologies, Inc. IDNX switches. The advantage of this setup is that Infonet takes care of maintaining and managing the switches, while customers gain private networking advantages such as fixed cost connections, sophisticated management features and rapid line deployment, Radice said.

Such pluses are particularly important in an international environment, according to Frank Catalfamo, manager of corporate telecommunications at Storage Technology Corp. in Louisville, Colo. The international vendor of information storage and retrieval subsystems recently signed a $1 million-plus, two-year contract for a customized VPDN network that links its headquarters to 10 subsidiary locations throughout Europe and Asia.

Since Feb. 1, when Storage Tek switched from a public data network to VPDN, the company

Continued on page 51

FEATURE: USER GROUPS

The new activism

BY MICHAEL HURWICZ
SPECIAL TO CW

Digital Equipment Corp. probably didn't know what it was getting into when it began planning a Decnet upgrade with Open Systems Interconnect support. "User group members said, 'No. We will make a slow, orderly transition, and in the meantime, we must have TCP/IP,' " says Leslie Maltz, director of computing and communications resources at Stevens Institute of Technology in Hoboken, N.J., and chairperson of the Digital Equipment Computer Users Society (DECUS) product directions committee.

DECUS organized sessions on the topic at its national meetings and flooded DEC with electronic mail, Maltz says. DEC got the picture. Today, Transmission Control Protocol/Internet Protocol support is a key part of the networking product. "DEC listened," she says.

This scenario is being re-enacted around the country. Activist communications and networking user groups are becoming the rule today, often with encouragement from vendors who have become aware of the value of vigorous user participation in shaping product and policy decisions.

For instance, when the Affiliation of Netware Users (ANU) broke off from Netware Users

Continued on page 51

Jose Lopez-Liberman

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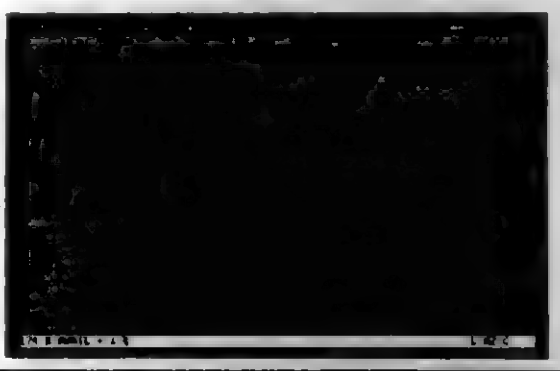

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Study says need for price caps waning

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — Users of long-distance data communications services would see lower prices and richer product offerings if the Federal Communications Commission (FCC) removed all price controls from AT&T, according to a report published by a consulting firm specializing in industry regulation. The reason is that there is now vigorous competition at all levels of the long-distance market, said Multinational Business Services, Inc. (MBS), author of the report.

The analysis challenges a widely held view that the giant AT&T enjoys economies of scale that give it an unfair advantage as it attempts to fight off some 500 competitors in the long-distance marketplace. For example, MBS said that MCI Communications Corp.'s total operating costs are 13% lower than AT&T's on a per-minute-of-service-provided basis. That is based on public data from sources such as FCC filings and annual reports, MBS said.

The study goes further to say that even the smaller service providers are making inroads against AT&T. "The new accounts the small carriers are winning are their competitors' larger and more profitable customers," MBS said.

No need for a watchdog

The FCC views price caps as one step on the way to a deregulated AT&T. The caps, which are paired with price floors, recently replaced the rate-of-return concept by which AT&T was allowed to base rates on a percentage markup of costs. The FCC said that caps protect consumers while passing on to the carriers the benefits of increased efficiency. The floors are intended to prevent predatory pricing.

Now, however, industry watchers and many users are saying the price caps and floors are an idea whose time has passed, if it ever arrived. "Most large users don't think price caps have much effect on prices or services," said Henry D. Levine, a Washington, D.C., attorney.

Bruce Levinson, co-author of the study, claimed that price caps are actually harmful to telecommunications consumers: "If they were removed, prices would decrease, probably significantly. That's why [AT&T competitors] oppose removal of price caps. They're not afraid AT&T will raise prices. They're afraid it will lower prices, and they're afraid of a price war."

Deregulation would also substantially stimulate the development of new services, Levinson said. He said that the burden of red tape as well as the price caps themselves put a damper on AT&T's enthusiasm for bringing out new services. To the extent AT&T holds back, its competitors have less of an incentive to be innovative, he said: "Large businesses have special needs to combine voice, data, video and teleconferencing. They are suffering because these services are slow to come out and because they are priced too high."

Some user groups are not so sure. Larry Blosser, an International Communications Association official, said, "It's not time to remove price caps." Giving AT&T complete pricing flexibility would encourage it to engage in "strategic pricing," in which prices are set to achieve long-term corporate goals, not necessarily the best interests of the consumer, he said.

However, Blosser acknowledged that the effects of more deregulation are not really known and that unleashing AT&T might work to the consumer's benefit in some areas but not others. In particular, he said, the FCC has not focused on the effects that deregulation would have on data services for large users, concentrating on services aimed at small business and residential customers.

The report, "Interexchange Competition in the Price Cap Era," is published by Phillips Publishing Co. in Potomac, Md., and is priced at $795.

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Horwitt

FROM PAGE 47

heard it was quite expensive.

A lot of communications and information systems managers have been echoing the thoughts I heard at Amtrak. More importantly, they have been doing something about it, taking their voice off T1 lines and leaving data to justify the price of dedicated connections. The Yankee Group recently projected that data will be responsible for a 35% growth per year in private-line bandwidth for the next few years, so it seems like the T1 equipment vendors have little to worry about.

However, the private T1 equipment market faces a far more serious threat now: increasingly affordable virtual private data networking services such as AT&T's Software-Defined Data Network and Infonet's Virtual Private Data Network, or VPDN (see story page 47).

Like virtual voice networks, virtual data networks essentially offer users the chance to have a private network without having to buy, maintain and manage a bunch of NET or Timeplex switches. The carrier owns the network and does all that for you. Users have the illusion of a private network but are actually sharing it with other companies.

Virtual data networks also promise to fulfill users' desire for on-demand bandwidth in flexibly sized chunks, as well as their desire to pay for just that chunk of a T1 line they happen to need at any given time.

The idea is to get the best of both worlds: fixed costs for lines that support consistently heavy traffic; per-use costs for smaller sites that have sporadic traffic; and the ability to order up a chunk of bandwidth — say an hour's worth of 384K bit/sec. for a videoconference — with just a few minutes' notice.

Users are more apt to trade in their private networks for virtual network services now that carriers have proven their ability to keep networks up and running with only an occasional software glitch or backhoe disaster. This means that users can more confidently turn over the maintaining, operating and managing of their networks to the carriers — in effect, outsourcing their communications needs.

Of course, not all users will want to gut their internal telecommunications and network management staffs. Once you've done that, you are totally at the carrier's mercy, and there is no turning back.

OF COURSE, virtual networks have a way to go before they deliver on all their potential benefits to users.

Some users, such as Merrill Lynch, have opted to keep a staff to look over their carrier's shoulder. The vendors themselves are responding to this need by offering direct hooks between their network control centers and users' Netview systems as well as on-line access to traffic and error statistics for any user with a PC.

Of course, virtual networks have a way to go before they deliver on all their potential benefits to users. This is particularly true on the international front, where Postal Telephone and Telegraph (PTT) authorities still reign supreme, and on the local loop, where the regional carriers are bringing out switched digital services with their customary snail-like pace. Since Infonet must resell PTT's lines, VPDN offers no price break over private networks. It will take time for U.S. carriers to gain the international presence they need to offer comparable services.

The lack of virtual services on the local loop means you still have to pay dedicated prices to get to the long-distance carrier's virtual network. Since Infonet only offers virtual networking overseas, "local loop" access VPDN consists of a leased line across the Atlantic.

Horwitt is a *Computerworld* senior editor, networking.

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Campbell soups up Mrs. Paul's EDI systems

ON SITE

BY JOANIE M. WEXLER
CW STAFF

PHILADELPHIA — At Mrs. Paul's Kitchens, Inc., operational costs — not fish — are scaled using automation.

It all began with the construction of a new data center last fall, which included replacing an IBM System/38 with an IBM Application System/400 midrange system, donated by the company's $6 billion corporate parent, Campbell Soup Co.

The AS/400 is enabling the $175 million subsidiary to bring its sales force — including brokers — up on an electronic data interchange (EDI) system for same-day turnaround on orders. The company is also using the system in conjunction with two ruggedized IBM Personal Computer AT clones from Nematron Corp. to track ingredient yields on the plant floor so a supervisor can adjust equipment in time to minimize waste.

Mrs. Paul's, which markets packaged frozen fish sticks and fillets to supermarkets and wholesale grocery warehouses, is currently conducting business electronically with 25 of its 70 brokers. The brokers — as well as Mrs. Paul's direct sales staff — can now tie into the Campbell system via the BT Tymnet, Inc. value-added network, using laptop computers to check on the status of their orders.

Mrs. Paul's can take an EDI order keyed in by a broker at 9 a.m. and ship it from the appropriate warehouse by 3 p.m. that day, according to Vince Melchiorre, director of information systems at Mrs. Paul's. "The savings in the system are unbelievable," Melchiorre said.

Melchiorre pointed out that the fast turnaround is critical during the Lent season, when the company does 60% of its business.

Before bringing its brokers up on the EDI system — which is based on the Uniform Code Standard, a format for electronic business transactions in the grocery industry — brokers would fax their orders to Mrs. Paul's, and the company would enter them manually into Campbell's system.

"If we needed to ship an order the same day, we had to grab it, send it directly to the warehouse, and the warehouse had to manually take the order," Melchiorre explained.

The advantage of EDI to brokers, he explained, is that they receive a daily packet of electronic invoices delineating the orders they have brought in, so they can stay on top of their commissions.

In addition, "the brokers using the EDI system have the bigger percentage of orders," Melchiorre noted.

He said the company plans to have 50% of its orders received via EDI by the end of the year.

Other efforts at Mrs. Paul's this year are focusing on giving supervisors and plant managers yield numbers on primary ingredient use every four hours. Previously, yields were unknown until the following morning — "too late to do anything but beat up the supervisor," Melchiorre said.

Fish arrives at Mrs. Paul's in preprocessed blocks, and the company cuts, breads, fries and packages it. "We need to know if we put 100 pounds in at the beginning of the sawing operation, and we get 90 out of the finished product, what happened to the other 10 pounds," Melchiorre explained.

Factory workers in the sawing room now enter into the Nematron the number of pounds of fish they cut and the amount lost to fish "sawdust" and scraps. In the packing room, workers enter the number of pounds of finished cases they assemble. Using 5250 emulation, the data is sent into the AS/400, where an application program compares actual and standard yields.

"We need to know how much we're wasting because during the day, it's possible for the saws to get out of line and not cut the fish to spec," Melchiorre explained. "If we were to run all day in that situation, we could be yielding 80% or 85% — and that adds up to dollars."

Melchiorre said his next step is to automate the process by installing scales and counters so personnel don't have to enter in the data. "The scale would weigh each block as it goes by on the assembly line and record the weight right into the computer," he said.

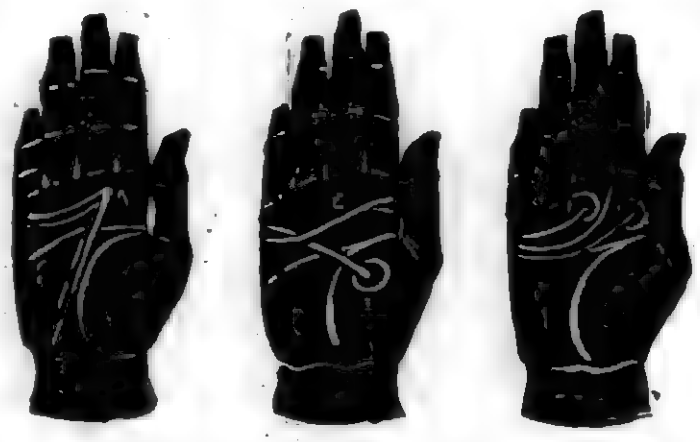
In addition, Melchiorre said he is looking to install a local-area network to link the Nematrons and PCs "so the plant manager and everyone else have access to the same information the plant supervisor has."

One worry he has, though, is integrating his 80 PCs with his 15 Apple Computer, Inc. Macintosh computers on one network.

"There seems to be a need for someone to integrate the Mac and IBM worlds in LANs; the people who do that best are going to make a hell of a business for themselves," Melchiorre predicted.

Eli Aharonoy

Mrs. Paul's Melchiorre *finds savings from the firm's EDI system "unbelievable"*



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Demand for internetworking may work to nullify vendor strategies

BY JIM NASH
CW STAFF

It is a case of learning the answer only to find out the question has been changed. Major players in the local-area network field have begun redefining their product strategies and, in some cases, their images to exploit the growth in network operating systems.

Even before networking companies can fully reposition themselves, however, IS administrators and analysts are discussing a second generation of networking products, one step up from LANs, that will manage networks of networks.

Provo, Utah-based Novell, Inc. recently began marketing itself as a LAN operating system outfit and licensing away its hardware products. Microsoft Corp., long the slumbering giant with its network operating system LAN Manager, has awakened to declare its long-term intention to usurp Novell's position as the nation's dominant LAN maker.

Both are out of step, according to some observers.

"Ten years out, I don't think people will be singing about some enhancement to [Novell's] Netware," said Karen Soskin, telecommunications specialist at Miles, Inc. in Elkhart, Ind.

Soskin said that market excitement will likely be sparked by a system integrator's breakthrough with multiplexers, bridges, fiber-optic backbones and multiple-protocol communications software.

The next generation

A report written by Mary Modahl, an analyst at Forrester Research, Inc. in Cambridge, Mass., referred to the next generation of networks as LAN internetworks. Modahl said administrators will be preoccupied with deciding whether to build internetworks in the image of LANs — with a variety of protocols — or to impose a single standard such as Open Systems Interconnect (OSI) or Transmission Control Protocol/Internet Protocol.

Boeing Computer Services, Inc. is already delving into the matter. Laurie Bride, manager of Boeing's network architecture, said she is working to organize the company's 14-plus protocols under the OSI banner. Bride said the company is currently building the Boeing Enterprise Network.

As part of the project, she is putting pressure on vendors such as Apple Computer, Inc., who have yet to adopt OSI compatibility.

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   - 65. Communications Systems/Public Utilities/ Transportation
   - 70. Mining/Construction/Petroleum/Refining/Agric.
   - 80. Manufacturer of Computers, Computer-Related Systems or Peripherals
   - 85. System Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
   - 90. Computer/Peripheral Dealer/Distr./Retailer
   - 75. User Other _____
   - 95. Vendor Other _____ (Please specify)

2. **TITLE/FUNCTION** (Circle one)
   IS/MIS/DP MANAGEMENT
   - 19. Chief Information Officer/Vice President/Asst. VP IS/MIS/DP Management
   - 21. Dir./Mgr. MIS Services, Information Center
   - 22. Dir./Mgr. Tech. Planning, Adm. Svcs., Data Comm. Network Sys. Mgt., Dir./Mgr. PC Resources
   - 23. Dir./Mgr. Sys. Development, Sys. Architecture
   - 31. Mgrs., Supv. of Programming, Software Dev.
   - 32. Programmers, Software Developers
   - 99. Sys. Integrators/VARs/Consulting Mgt.

   OTHER COMPANY MANAGEMENT
   - 11. President, Owner/Partner, General Mgr.
   - 12. Vice President, Asst. VP
   - 13. Treasurer, Controller, Financial Officer
   - 41. Engineering, Scientific, R&D, Tech. Mgt.
   - 51. Sales & Mktg. Management

   OTHER PROFESSIONALS
   - 70. Medical, Legal, Accounting Mgt.
   - 99. Educator, Journalists, Librarians, Students
   - 99. Others _____ (Please specify)

3. **COMPUTER INVOLVEMENT** (Circle all that apply)
   Types of equipment with which you are personally involved either as a user, vendor, or consultant.
   - A. Mainframes/Supermins
   - B. Minicomputers/Small Business Computers
   - C. Microcomputers/Desktops
   - D. Communications Systems
   - E. Local Area Networks
   - F. No Computer Involvement

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Activism

FROM PAGE 47

International last year to pursue an independent agenda, Novell, Inc. Chief Executive Officer Ray Noorda sanctioned it and Novell provided half the group's first-year budget of $68,000.

Today, says Glenn Fund, president of the ANU, the group remains on good terms with Novell. For instance, Novell is participating in a new ANU service called the Family of Automated Central Technical Services (FACTS). FACTS will function as a clearinghouse where user recommendations will be collected, organized and submitted to ANU members, who will vote on the importance of each recommendation. The results will then be submitted to participating vendors for comment.

Meeting users needs

Whether vendors encourage it or not, user groups are coming at them, sometimes in a spirit of quiet cooperation, sometimes with banners unfurled and trumpets blowing. Their express purpose is to get their needs met.

There are many examples of symbiotic relationships between vendors and communications user groups. The North American ISDN Users Forum, which acts as an information pipeline between ISDN users and vendors, has a close link with vendors.

W. Edward Hodgson, manager of computing and communications at Schindler Elevator Corp. and chairperson emeritus of the forum, says there is a free exchange of ideas between vendor and user. He attributes the open attitude of ISDN vendors to the fact that ISDN is a relatively new market in which vendors are aggressively seeking new ideas.

In the forum's case, user members submit ideas for ISDN applications. If an idea is adopted by the group, vendors create a specification for how that application will be implemented. Once the application has been tested and stabilized, it is published in the Federal Register and in the proceedings of the forum. Morristown, N.J.-based Schindler has had 10 applications approved by the forum, according to Hodgson.

Automatic IDs

One application that Schindler has already implemented is automatic number identification for customers calling a service center. Also accepted by the forum and slated for implementation at Schindler is an application that enables the firm to send Group IV facsimiles over ISDN, giving them a 64K bit/sec. fax network based on a central "fax PBX."

Once the forum accepts an application, Hodgson says, it has the weight of the whole user organization behind it. Thus, a small company with a good idea can have just as much impact as a large company.

Other user groups in more mature communications markets are not as fortunate. Hodgson contrasts the forum's experience with that of the Association of Data Communications Users (ADCU), for which he is chairman of the standards committee. The ADCU addresses the well-established general data communications market, in which vendors are not as actively seeking new applications. The ADCU's influence is more often a matter of several large users "getting on a vendor's case" than of vendors welcoming user ideas with open arms.

Sometimes, in fact, vendors don't welcome the ideas at all. Once, Hodgson says, the ADCU pressed several vendors to make their 56K bit/sec. digital devices compatible. "We did press and jump up and down and wave our arms, insisting that we needed a 56K bit/sec. standard. The result was that a Bellcore paper came out saying [the area] is undefined."

When changes do occur in mature markets, they are oftentimes incremental and undramatic. While users of large IBM systems in the Share user group are effective in influencing IBM, their influence usually extends to subtle points of highly technical products, according to John Cannie, a senior systems manager at Merrill Lynch & Co. in New York and formerly a chairperson of Share.

Cannie says that IBM implemented enhancements to CLIST, the Netview programming language, in response to input from Share members. While not earth-shattering or even easily summarized, the changes were important to Cannie.

The most significant user group interventions often take many years to bear fruit. For example, Share issues white papers that outline users' requirements for various network and communications functions. Generally, such white papers take one to three years to complete, says Daniel A. Nottke, manager of systems software and communications at Arthur Andersen & Co. in Chicago and division manager of the Share Communications Division.

IBM typically stays in touch with users during the development of the white paper, Nottke says, so that products satisfying the requirements are often available almost simultaneously with the white paper's release.

This occurred when the Share communications division developed a network security white paper that consisted of a number of requirements aimed at securing the network as a resource as opposed to securing just the data or the computer system, Nottke says.

"I worked closely with 10 other IBM customers and several people at IBM," Nottke explains, "developing requirements, making sure IBM understood what those requirements said and what was the meat of the requirements — what we needed immediately and what could wait."

Within three months of the release of the white paper, two products were introduced that substantially embodied the recommendations of the white paper: Netview Access Services, which enables MVS or VM installations to connect terminals to applications; and the SNA Application Monitor, which allows terminal users to be notified of the status of applications they can access.

User lobbying

Lobbying has become user groups' weapon to get their point across. For instance, Nottke says, Share developed a requirement for dynamically reconfiguring an Systems Network Architecture network without having to bring the computer or the network down. IBM responded to the initial proposal by saying that this was a long-range goal for IBM. That wasn't good enough for Share.

"We went back to IBM and told them exactly what we were looking for," Nottke says. "We refined the requirement to show why it was important and to state exactly what we needed to be able to do in specific instances."

In response, IBM gave a higher priority to the requirement. "Eight years ago, when I first got involved with Share, IBM was not as open as it is under its current market-driven philosophy," Nottke says. "Today, IBM comes out and talks to us, not revealing details of future products, but saying, 'We may be looking at this; what would you need to be effective in this area?' "

Harwicz is a free-lance writer and consultant at the MTI Group in Eastsound, Wash.

A market resource

One reason that vendors often respond favorably to user groups is that they perceive them as a convenient and inexpensive market research resource. "DEC would come to us and say, 'We need people like the following — commercial people, people with particular expertise or from a particular market segment. And we would put together a focus group for them," says C.W. Goldsmith, a former president of DECUS, and now vice-president of Advanced Software Technologies in Los Angeles.

IBM uses Share in the same manner, Daniel A. Nottke says. "IBM knows the structure of the Share Communications Division. They know which group to talk to in Share if they're looking for input on 3745s, VTAM or Netview, for instance."

However, the effectiveness of such meetings oftentimes depends on the vendor's belief that the focus group reflects the buying preferences of a large potential market, says Thomas Nolle, president of CIMI, a technology assessment company in Voorhees, N.J. Lacking that belief, the vendor may be indifferent, says Nolle, who has been involved with a number of user groups, both for small and large systems.

A communications/networking user group can be a powerful lever for moving a vendor to a new position in product direction or policy, provided that the vendor believes the group represents an important market segment. In all, user groups say, their influence on vendors seems to be strengthening.

MICHAEL HURWICZ

Virtual

FROM PAGE 47

has been saving $20,000 per month," Catalfamo estimated.

"We now have dedicated lines, two to Europe, one to Asia, that we can pound through as much traffic as line capacity can handle without incurring any additional costs for the increase in volume," he added.

Infonet, which is still primarily an international packet-switched carrier, permits customers such as Storage Tek to employ packetization as a way to maximize use of its VPDN lines.

Storage Technology could have realized similar benefits by setting up its own private network. However, Catalfamo said, "I would have had to put considerable up-front money for equipment and leasing of the circuitry.

"One other major benefit is the fact that I have access to Infonet experience in network management, which is especially important when you're dealing with foreign PTTs" and often coping with language barriers and customs differences, Caltafamo added.

"With the staff I now have, there was no way I could provide net management capabilities that my end users required."

More staff needed

Catalfamo estimated he would have had to add a minimum of four people to his staff in order to provide the seven-day-a-week, 24-hour-a-day network support that is a prerequisite for an international private network.

Infonet currently has implemented IDNX nodes in 15 countries and plans to expand to other countries, particularly in Asia, Radice said.

User networks can be implemented in 21 days, Radice said. However, when networks involve countries where bandwidth is typically hard to come by, lead time can be quite a bit longer, he added.

VPDN is available in decentralized or centralized topologies. Users of the network receive facsimile reports on network availability, usage, and problems transmitted on a daily, weekly, and monthly basis. An optional service provides a customer's personal computer with on-line access to such statistics at one of the carrier's network control centers.

BIT BLAST

Compex bundles Netware

Compex, Inc., a Novell, Inc. OEM, has announced that it will offer Advanced Netware 286 Version 2.15 bundled with two 8-bit Compex Ethernet network adapter cards and a cc:Mail Express 8 electronic mail package at no extra cost. Compex sells primarily to distributors and resellers, who could elect to hand the freebies down to their customers.

A lifetime warranty on all Racal-Interlan Ethernet network adapter cards shipped after July 30 reportedly covers any defect in materials or workmanship for the life of the card, according to the vendor. The company said it will repair or replace any defective card at no cost to the customer.

Internetworking vendor Advanced Computer Communications said it has signed a network support agreement with Hewlett-Packard Co. to provide technical assistance to customers' networks incorporating both vendors' products. The companies will reportedly work together to diagnose and resolve network problems "with no finger-pointing."

NEW PRODUCTS

Local-area networking hardware

Morton Management, Inc. has announced that it is now shipping an Intel Corp. 1486-based, 33-MHz Extended Industry Standard Architecture local-area network file server.

The Gigaserver 486/33 was designed for heavy industrial applications and data collection applications that require prolonged service. It supports operating systems such as Novell, Inc.'s Netware 386 and Banyan Systems, Inc.'s Virtual Networking Software. Other features include up to 16M bytes of random-access memory and 2.3G bytes of internal disk storage.

The product began shipping last month for $15,995.

Morton Management
12079 Tech Road
Silver Spring, Md. 20904
(301) 622-5600

BICC Data Networks, Inc. has introduced a two-port repeater equipped with one thin coaxial BNC port and one standard AUI port.

The Isolan 1121 Thin Ethernet Diagnostic Repeater supports direct connections on thin Ethernet networks to a 10Base-T thick or thin coaxial or optical-fiber network. It is priced at $1,250.

BICC also added diagnostic features to its 1120-2 and 1150-2 fiber-optic repeaters, which sell for $1,250 and $1,995, respectively.

BICC
1800 W. Park Drive
Westboro, Mass. 01581
(508) 898-2422

Local-area networking software

A network modem-sharing software package has been announced by Fresh Technology Group.

Modem Assist lets users of local-area networks access up to 20 modems from any workstation on a LAN. Applications can continue to be run on a workstation while other users access the modem, the vendor said.

The product requires less than 10K bytes of memory and runs on an IBM Personal Computer AT, XT, Personal System/2 or compatible. It costs between $495 and $995, depending on number of modems used.

Fresh Technology
1478 N. Tech. Blvd.
Gilbert, Ariz. 85234
(602) 497-4200

Connectworks Co. has introduced a product designed to link up to 16 IBM Personal Computers, compatibles or laptops in a work group by using standard telephone wire, a central switching unit and a software package.

Chainlink enables users to exchange files, send and receive electronic mail and share peripherals. A package that includes software for four PCs, a central switching unit, two 20-ft cables and four modular connectors costs $395. Connections for eight or 16 PCs sell for $595 and $795, respectively.

Connectworks
P.O. Box 497
Wrightsville Beach, N.C.
28480
(919) 256-2366

Corvus Systems, Inc. has announced a software program designed to enable a personal computer's hard drive to be shared by users of Apple Computer, Inc. Apple II and Macintosh systems or IBM PCs and compatibles.

Omnishare can accommodate up to 256M bytes of data, depending on the type of PC configuration. It was designed for networks running Corvus' Constellation network operating system, but it is also compatible with Novell, Inc.'s Netware.

The product is priced at $995.

Corvus
160 Great Oaks Blvd.
San Jose, Calif. 95119
(408) 281-4100

Network management

Triticom has announced Arcvision, an Arcnet real-time traffic monitoring tool designed to operate with any Arcnet local-area network.

The device runs on any PC- or MS-DOS machine equipped with a standard Microsystems Corp.-compatible Arcnet adapter card. The product can track station, broadcast or total packet counts; instantaneous packet/sec. and peak packet/sec.; elapsed monitoring time; and reconfiguration bursts.

A single workstation version that includes a user manual and a 3½- or 5¼-in. floppy disk costs $150. Versions with Arcnet adapters sell for $325.

Triticom
P.O. Box 11536
St. Paul, Minn. 55111
(612) 937-0772

Microtonix Datacom Ltd. has announced a VMS-based communications system designed to increase efficiency of applications over wide-area networks.

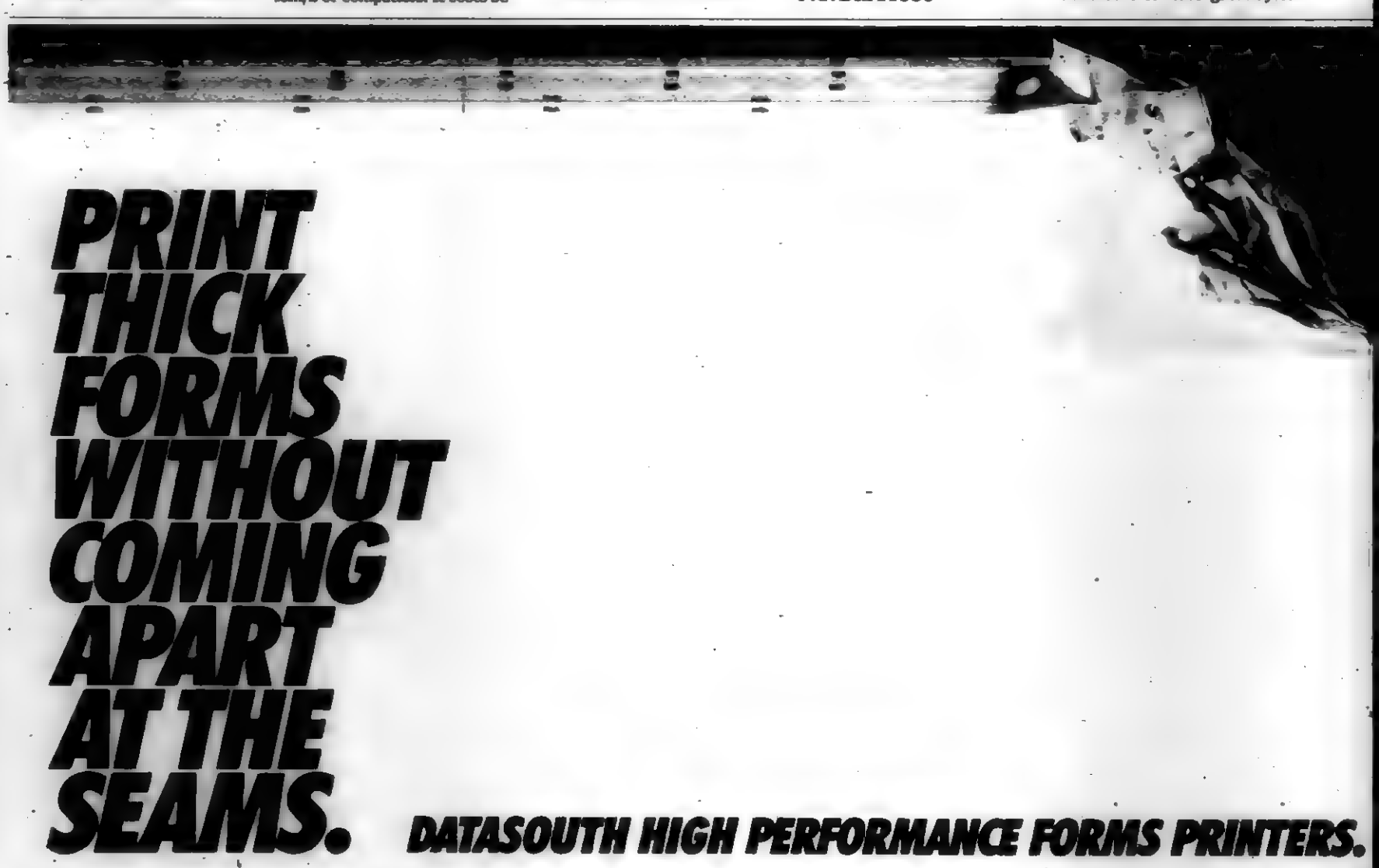
The Packet Miser implements standard VAX/VMS terminal functions at end users' sites, thereby enabling hosts to channel I/O requests to remote sites for processing, the vendor said. Pricing starts at $4,500 and varies according to configuration.

Microtonix
125 Bessemer Road
London, Ontario
Canada N6E 1P9
(519) 681-3430

Gateway Communications, Inc. has introduced a multiuser, multiprotocol communications system designed for users of Novell, Inc. Netware and Netbios local-area networks.

Comsystem provides LAN users with real-time access to diverse systems and remote data through one communications system.

The product can be installed on a Novell Advanced Netware or Netbios LAN and configured as an IBM Systems Network Architecture or X.25 gateway for



these environments.

The product is available for $6,995 and comes with a one-year warranty.

Gateway
2941 Alton Ave.
Irvine, Calif. 92714
(714) 553-1555

Network Software Associates, Inc. has unveiled an enhanced version of its Adapt-SNA local-area network-to-mainframe gateway.

The product features complete IBM Systems Network Architecture (SNA) 3270 emulation using 58K bytes on each LAN workstation and was designed to meet requirements for low memory use for PC-DOS LAN workstations.

Adapt-SNA can be used on Token-Ring or Nethios-compatible LANs. Pricing starts at $995.

Network Software Associates
39 Argonaut
Laguna Hills, Calif. 92656
(714) 768-4013

Network Resources Corp. has begun shipping IP-Gate and Multi-Gate Mac, two gateways that provide connectivity between Apple Computer, Inc. Appletalk networks and Transmission Control Protocol/Internet Protocol (TCP/IP) networks.

Multi-Gate Mac ($795) features Appletalk and TCP/IP internetworking capabilities and runs on any Apple Macintosh II system.

IP-Gate ($395) can be downloaded to a Multi-Gate 2000 router to provide an Appletalk-to-TCP/IP gateway.

Network Resources
2450 Autumnvale Drive
San Jose, Calif. 95131
(408) 263-8100

Cryptall's Series 3000 CB *connects LANs to WANs*

Cryptall Communications Corp. has announced the Series 3000 CB, a high-compression bridge for connecting local-area networks to wide-area networks.

The product provides transmission speeds ranging from 4.8K to 64K bit/sec. and features compression ratios of 6-to-1 for database files, 4.5-to-1 for text files and 2-to-1 for binary object files.

Standard features include a single 56K bit/sec. link for ASCII file transfers and advanced network diagnostic functions, the vendor said.

The list price is $8,400.

Cryptall Communications
1110 Wellington Ave.
Cranston, R.I. 02910
(401) 941-7600

Fibermux Corp. has introduced an Ethernet learning bridge that links Ethernet local-area networks via RS-449 or -442 interfaces operating at 10M bit/sec.

The FX709 features a transmission speed of 13,000 packet/sec. and provides users with packet filtering and the ability to self-learn network configuration tasks. It was designed for Ethernet transmissions through encryption equipment but supports connections through other devices. The product costs $9,500.

Fibermux
9310 Topanga Canyon Blvd.
Chatsworth, Calif. 91311
(818) 709-6000

Links

Photonics Corp. has announced a product that uses infrared light to link computers in one building with systems in another up to 600 feet away.

Building-to-building Photolink is mounted inside a window glass or near a window, rather than outdoors, and a Photolink transceiver is positioned at the end of each connection. RS-232 versions and versions compatible with Apple Computer, Inc.'s Appletalk routers and bridges cost $3,390 per connection.

Photonics
200 E. Hacienda Ave.
Campbell, Calif. 95008
(408) 370-3033

Modems

Microcom, Inc. has announced a family of MNP modems designed for use in cellular environments.

The line includes Models C96 and M96, both of which are based on MNP Class 10. Both models yield throughputs of more than 9.6K bit/sec. over cellular telephone circuits.

C96 ($899) was designed for central sites with fixed land-line connections on one end. M96 ($999) was designed for mobile environments.

Microcom
500 River Ridge Drive
Norwood, Mass. 02062
(617) 551-1006

Front ends, multiplexers

Bytex Corp. has announced a cable management system that concentrates and extends multiple digital channels.

The Bytex Cable Manager supports remote port access for matrix switch applications, and two units can be combined as a stand-alone point-to-point cable multiplexing system, the vendor said.

The Bytex Cable Manager is scheduled to be available in September for $2,995.

Bytex
Southboro Office Park
120 Turnpike Road
Southboro, Mass. 01772
(508) 480-0840

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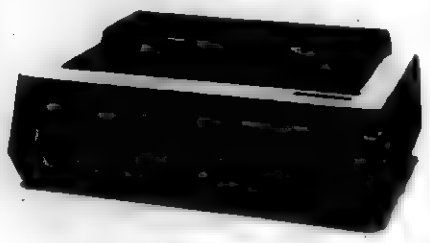

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P.O. Box 240947, Charlotte, NC 28224

CW 8/90

My network in marketing won't share

Now what?

The latest directive from senior management is a doozy. Marketing and manufacturing must now share applications. As for all those different PCs and systems in place, management is "confident you can meet that challenge without incurring significant additional capital expense."

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with the network in manufacturing.

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to more types of systems.™

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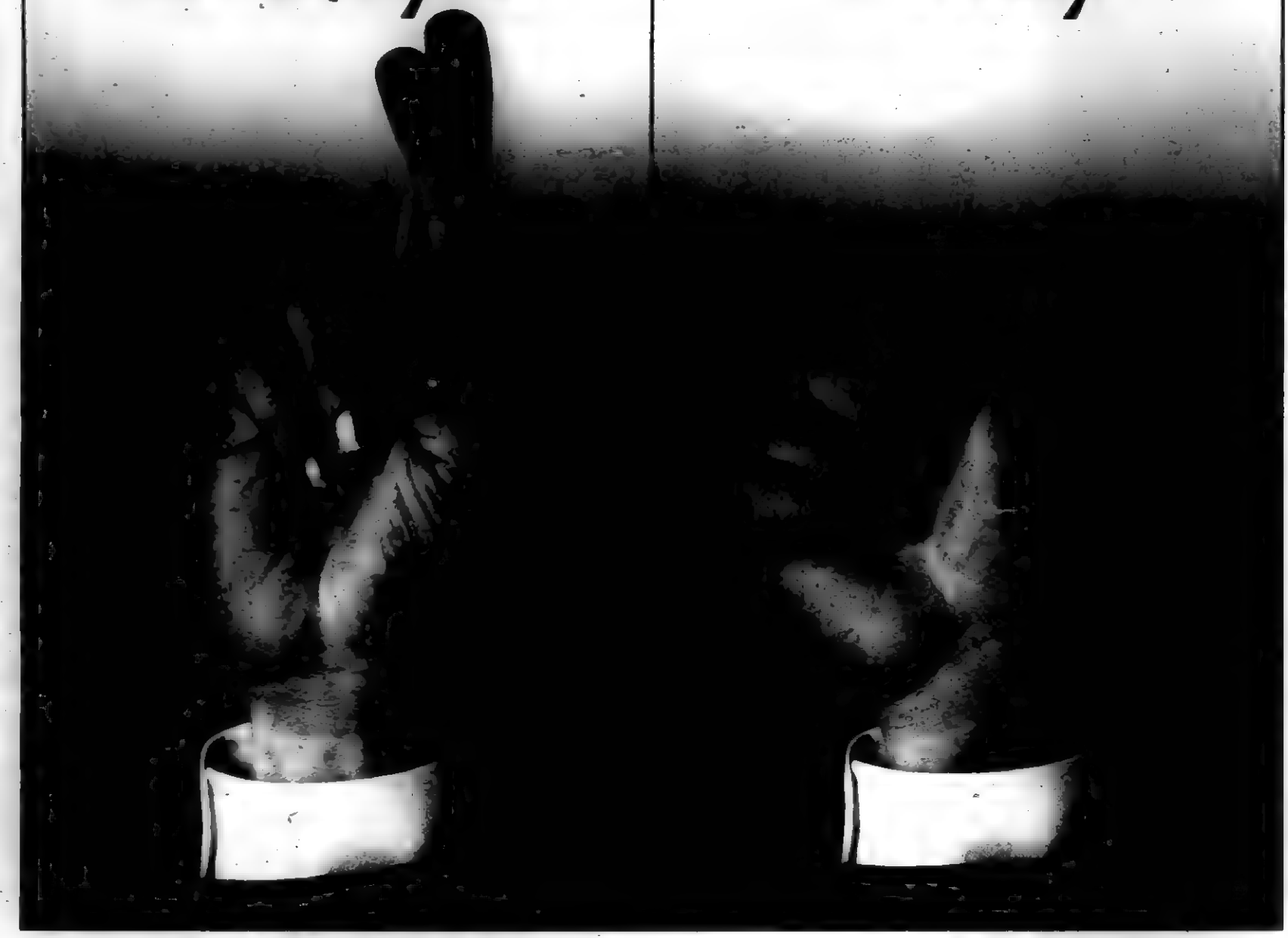

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EXECUTIVE TRACK

Ray L. Dicasali has been named senior vice-president and chief information officer at **Dun & Bradstreet Software** in Framingham, Mass.

He is responsible for all internal computer services, information systems, technical support, telecommunications and corporate services at the applications software vendor. He is a 15-year veteran of Management Science America, Inc. and will continue to be based in Atlanta.

Dicasali had been chief administrative officer at MSA since 1987, responsible for IS, legal and personnel functions. Before that, he was vice-president and general manager of MSA's Manufacturing Systems Division in Winston-Salem, N.C. He started his career as a systems engineer at Electronic Data Systems Corp. in Dallas.

Dicasali holds a bachelor's degree from the Georgia Institute of Technology and an MBA in finance from Florida State University.

.....

C. William Schleicher Jr. has been named senior vice-president at **First Tier Data Services**, the IS subsidiary of **First Tier Financial, Inc.** in Omaha.

Schleicher was most recently an associate director at the Federal Reserve Board in Washington, D.C.

Schleicher holds a bachelor's degree and an MBA from Ohio State University and is a graduate of the Stonier School of Banking.

.....

Jon A. Baake has been appointed director of the information resources management department of **Pension Benefit Guaranty Corp.**, a federal agency located in Washington, D.C.

Most recently, Baake was director of the U.S. Small Business Administration's office of information management. He also worked in IS development capacities for the U.S. Patent and Trademark Office. He holds an MBA from the University of California at Los Angeles.

Fashioning systems for the future

Levi Strauss' Rund designs readiness for change into world's largest apparel firm's IS

BY JEAN S. BOZMAN
CW STAFF

The art of managing information systems starts with the task of designing them well. That is the thesis of Donna Rund, vice-president of information engineering at Levi Strauss & Co., who believes that thinking about computer-aided software engineering (CASE) is just as important as having programmers crank out lines of code.

To illustrate her point, Rund draws pictures of her business model of San Francisco-based Levi Strauss. It is a functional representation of intersecting circles, matching all the business units to the systems that support them. It is really a blueprint of the underpinnings of the world's largest apparel company. With annual revenue of $3.6 billion, Levi Strauss operates on four continents and distributes its products around the world.

"If you don't have a clear picture of where you're taking your company, you tend to react to each new piece of technology for the sake of the technology itself," she says, sitting in her brick-walled office overlooking San Francisco Bay. "Our challenge in the '90s is to focus on *what* you do in DP and not on how you do it."

The very nature of IS is changing, and the people who work at information engineering, as Rund calls it, must change their job descriptions. "We're moving our people to be designers and systems integrators," she says. "There's still a need for technicians. But we're going to have a merging of skill sets between IS and the end user. People skills — like the ability to negotiate, facilitate and elaborate — will make our people into knowledge workers."

Those workers have to be able to extract systems requirements from business unit managers who have never programmed a personal computer. They have to be able to listen — and to travel, if necessary — to where the business units are located.

They also have to build systems in a modular fashion so that, in Rund's words, "applications development products can be popped in and out without affecting the overall systems design." They can no longer afford to be cloistered technicians, toiling away in isolation, she adds.

For example, Rund envisions that applications written for an IBM 3090 mainframe at headquarters will one day be transferable to IBM Applica-

Continued on page 60

PROFILE: Donna Rund

Cindy Charles

Position: Vice-president of information engineering, Levi Strauss & Co.
Mission: Leading Levi's IS staff to gain new business skills and develop more responsive, flexible systems

New IS yardstick: Earnings per share

BY CLINTON WILDER
CW STAFF

Perhaps you have tried pitching a new system to the chief financial officer with a detailed, quantified rundown of its bottom-line impact. Have you ever thought of translating those numbers into actual annual earnings per share for your company?

One Minneapolis-based vendor of manufacturing resource planning (MRP) II software uses just that approach in its marketing. Fourth Shift Corp. pitches its MRP II system, Fourth Shift, with a formula to arrive at what it calls "MIS' magical elusive statistic" — the actual projected dollar value of its system translated into the user company's earnings per share.

"We've had some success with it," said Mike Naas, marketing manager at Fourth Shift, which has about 1,500 customers worldwide, including Eastman Kodak Co.

"MIS costs are so large in most companies that they are a significant portion of sales. Savings can be large enough to translate into cents per share," Naas said.

At a time when effective measurement of IS value in quantifiable terms is a key issue for credibility with senior management, Fourth Shift's approach is certainly worth noting.

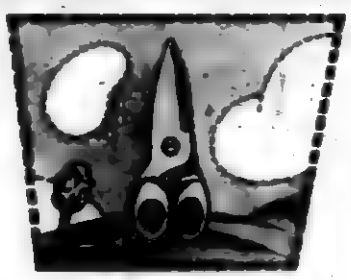
This is how it works: Fourth Shift presupposes that because its MRP II system runs on networked personal computers rather than a mainframe or minicomputer, it is much cheaper to purchase and maintain. It does a cost comparison and tells the sales prospect how much his company could save compared with a mainframe- or mini-based system.

It then figures those savings as a percentage of the company's projected profits for the year. Since profits divided by the number of outstanding shares equals earnings per share, the IS savings figure, divided by the number of shares, results in the increased earnings per share gained from using the software.

Fourth Shift does not stop there, however. It then figures the company's stock price/earnings ratio based on its current stock price, multiplies the P/E ratio by the system savings and produces the figure showing how much its MRP II could actually raise the company's stock price.

If only Wall Street investors were so predictable — and had as much understanding of the value of cost-effective information systems.

CLIPS



Tim Lewis

Summaries from leading scientific and management journals

In its latest issue, the *Harvard Business Review* devoted a majority of its articles to information technology management topics. The following is a sampling of pieces from that HBR.

"The 'centrally decentralized' IS organization"

By Ernest Von Simson

Harvard Business Review
July-August 1990

■ The pendulum seems to be swinging from decentralized information systems organizations back to centralized ones. The current challenge for today's companies is how to recentralize IS without losing the responsiveness to users that decentralization offers.

A hybrid organizational model is emerging that will transcend the trade-offs between centralization and decentralization. The key to this new model is the sharing of power between IS managers and users.

In this organizational setup, the central IS group operates the consolidated computing and communications network, takes responsibility for staff and sets standards. However, individual business units determine the number of systems developers their areas can afford and set their own project priorities.

The hybrid organization gets the best of all worlds — the cost savings and control of centralization and the responsiveness and flexibility of decentralization.

"Computers and the coming of the U.S. *keiretsu*"

By Charles H. Ferguson

Harvard Business Review
July-August 1990

■ Despite being the leader in innovative technologies, the U.S. faces a bleak truth: Without imminent changes, U.S. and European hardware vendors risk becoming the subordinate research, prototyping and distribution arms of their Japanese competitors.

Reasons for this phenomena stem from our own technological advances. Digital technology has paved the way for mass-produced, inexpensive personal systems. Survivors in this market will need to excel in process technology, capital-intensive components, production and flexible high-volume assembly; in other words, companies able to manufacture components are gaining ground.

With this in mind, firms such as NEC Technologies, Inc., Canon U.S.A., Inc. and Sony Corp. have distinct advantages. Diversified, vertically integrated corporate complexes, they are embedded in financial industrial groups (known as *keiretsu* in Japan). They are able to make long-term investments in technology and manufacturing, command the supply chain from components to end products and coordinate their strategic approaches to block foreign competition and penetrate world markets.

The U.S. industry has failed to develop the tools for success in markets they have created by their own innovations. Several U.S. companies have made progress by creating special alliances, but to compete, they must continue to work toward a U.S. version of the *keiretsu*.

"No excuses management"

By T. J. Rogers

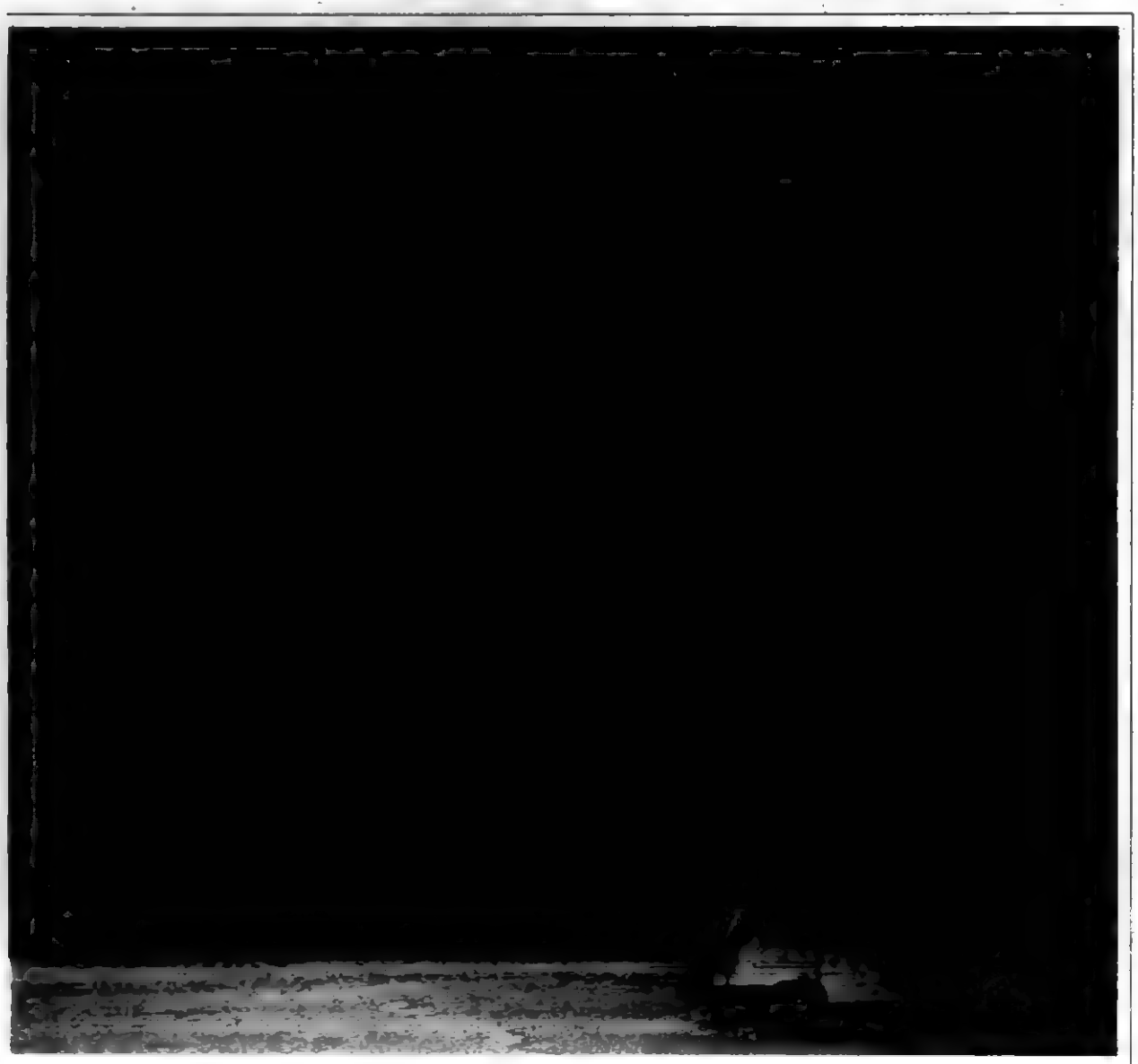
Harvard Business Review
July-August 1990

■ T.J. Rogers, founder and chief executive officer of Cypress Semiconductor Corp., says information systems have allowed him and other executives at the firm monitor business, anticipate problems, resolve difficulties and identify successful practices.

Rogers focuses on systems related to four critical activities: hiring outstanding people, setting individuals' goals and monitoring their progress, approving expenditures and granting pay raises that maximize motivation.

For example, employees enter goals and completion dates into a system every Monday. Managers and then top executives review these goals to eliminate conflicts and set priorities. Then Rogers and the top executives review reports on critical project goals, delinquent goals and employees without goals. Managers use monthly reports on individuals' achievements in performance reviews. The system uses a minicomputer, personal computers and standard PC software.

Rogers can get up to speed on a facility he wants to visit by reviewing goal reports for its people. He can peer into the bowels of the company to see what's going on. But the fact that he can do so means he seldom has to. "No vice-president or general manager wants to be in the awkward position where the CEO knows more about a situation than he or she does," he says.



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FAA takes heat for LA's air traffic control danger zone

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — The Federal Aviation Administration (FAA) is playing Russian roulette with air traffic in the Los Angeles area, hoping that patches to its 1960s-era computer systems will allow controllers to keep pace with burgeoning air traffic until a new system is in place several years from now.

That is the major conclusion of the latest in a series of reports from the U.S. General Accounting Office (GAO) that berate the FAA for problems in its mammoth overhaul of the nation's air traffic control systems.

According to congressional auditors, the Los Angeles basin, with 21 airports supporting 6.5 million flights per year, is one of the busiest and most complex airspaces in the world, and from 1986 to 1988 it saw the highest number of midair near collisions in the U.S.

Growth in air traffic has saturated the airspace and the computers that monitor it, the GAO said. Computers at the region's four large Terminal Radar Approach Control (Tracon) facilities have suffered from the sudden disappearance of critical aircraft identification from controllers' screens, along with flickering displays and slow system response, auditors said in a recent report.

Officials at the FAA would not comment on the report, saying the agency was reviewing it.

According to the GAO, the FAA has a plan for upgrading its existing systems on an interim basis, but it has no rigorous method for determining whether system enhancements will be adequate until a comprehensive new system is installed nationwide sometime in the mid- to late 1990s.

One aspect of the plan, according to the GAO, would have Unisys Corp. upgrade existing computer systems. To do the upgrades, Unisys will have to restart a production line for the 1960s-vintage Univac 8303s. The units have 256K bytes of main memory and can operate at 500,000 instructions per second. However, both figures are far short of those boasted by modern high-end personal computers, according to the GAO.

The computers are programmed in, and will be enhanced with, Ultra, a proprietary assembly language from Unisys that the GAO called "antiquated and cumbersome."

The GAO said the FAA is unable to measure computer capacity and predict performance needs. "Consequently, FAA did not recognize capacity shortfalls until controllers' ability to maintain safe separation of aircraft was impaired," the congressional agency said.

The FAA is beginning to use new software for determining the real-time performance of the systems, the GAO said.

The GAO report suggested that the Tracons are reacting to capacity problems rather than anticipating them. Reactions have included lowering system demands by reducing the number of controller training displays and the length of time that systems retain flight data.

The GAO said the FAA had considered other options, including using a more modern system at a New York-based Tracon and considering proposals for new systems from IBM and BDM Corp. However, the FAA rejected these options because they were deemed too risky or slow to implement. As a result of the latest GAO probe, however, the GAO said the FAA has agreed to reconsider the New York Tracon option.

The GAO recommended that the FAA consider a broader range of systems options and that it establish a computer capacity and performance management program to pin down current and future requirements for the Los Angeles area.

MANAGEMENT BRIEFS

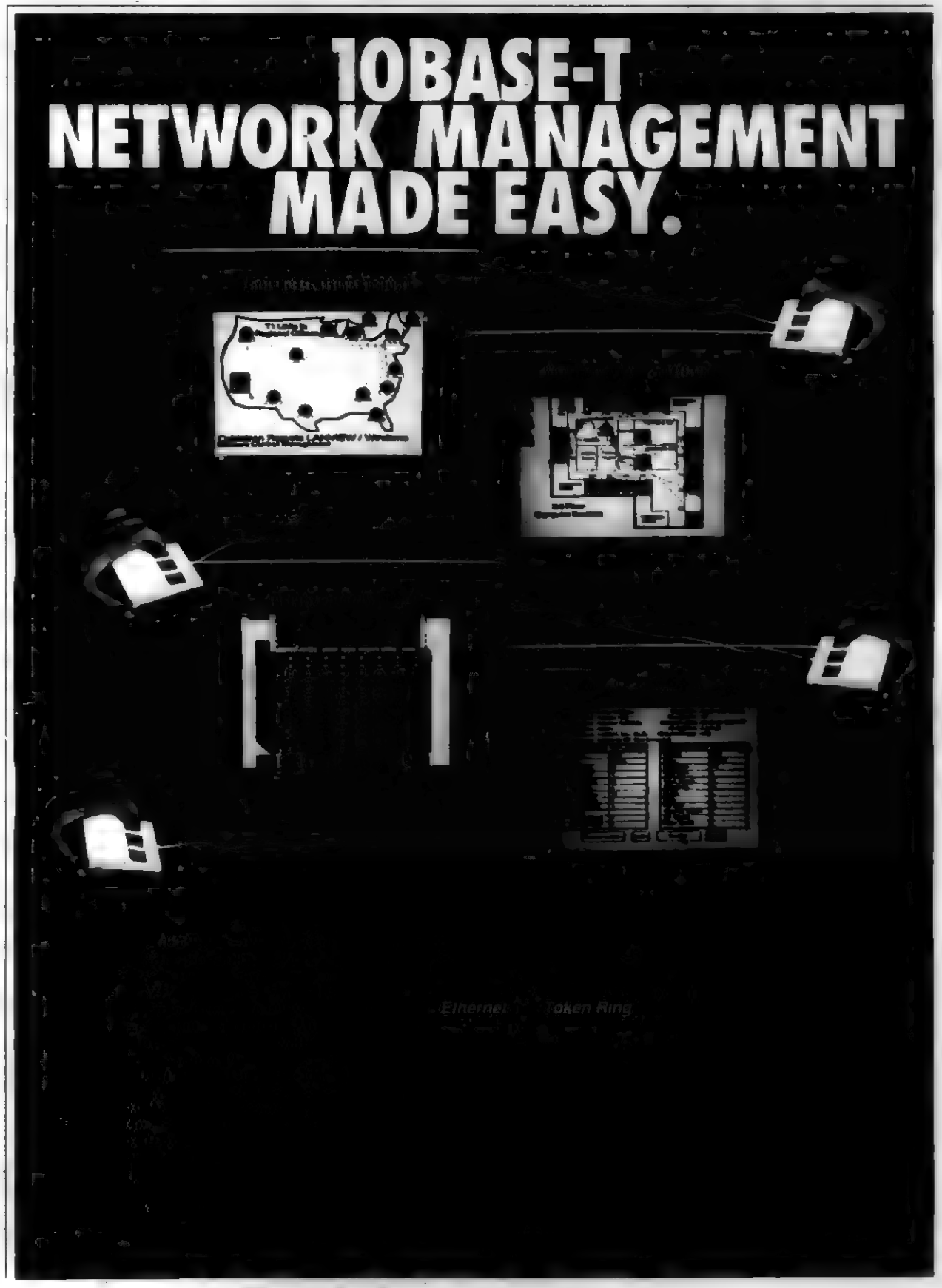
Salary survey results released

Analyst- and programmer-level professionals received an average raise of 8%, increasing their salaries to $33,400 this year, according to the annual information systems professionals salary survey by the **Administrative Management Society** in Trevose, Pa.

In the survey of five job levels, programmer/analysts received the largest average increase of 10.9%, while senior programmer/analysts, the highest level surveyed, averaged a 10% raise to $38,300.

Personal computer specialists were included in the survey for the first time and earn an average of $29,500, the survey said.

Victor Terranova at **Geneva Generica**, located in Broomfield, Colo., was elected president of **Assist**, the association of Andersen Consulting software users, for 1990-91. Former President Chip Lombardo at Trane Co. in Tyler, Texas, will serve as immediate past president.



COMMENTARY

Les Gilliam

Burnout blues

Being an information systems manager is certainly not getting any easier. The strain on both professional and personal life becomes more than many can take. Hence, burnout continues to be a major problem.

Admittedly, every case is unique. But there are some common factors that seem to contribute to the high turnover among IS managers.

Dissatisfaction can be caused by an inadequate salary, a limited budget or antiquated technology. But rarely does the IS manager reach the stress limit because of these.

The greatest challenge to the IS manager is probably the unreasonable demands from both superiors and users. Most IS managers are not miracle workers and cannot design, develop and implement quality systems overnight. Neither can the IS manager predict or avoid all human errors or software bugs.

Much of this lack of understanding by senior management and users can be solved through education, illustration and communication.

Some vendors and consultants offer seminars for both senior and line managers regarding the process and complexity of the system development and IS functions. Books and articles from periodicals may also be used to improve their knowledge of what are reasonable expectations for the delivery of products and services from IS.

Another wise step by IS management would be to prepare and maintain a list or database of system development projects, along with time, cost and staffing information on each. Gathering such information from outside sources would also be helpful. There are some products on the market that have gathered such information and can be used for estimating purposes.

This illustrative data can be used to show user management the time and cost of various actual projects, helping to bring their expectations more in line with reality.

The third tool to use in battling misunderstanding is communication. This communication involves both procedures and progress.

The IS organization, which does not have or use sound methodologies for conducting its work, can expect less than outstanding results. Assuming such procedures exist, informing both superiors and users of the methodologies and their benefits will aid greatly in gaining their support.

Good communication also involves keeping others informed about the status of projects or processing that affects them. This includes telling the bad news as well as the good.

Senior managers and users should know that perfection is an unrealistic expectation. If credibility has been established, users will usually be supportive through good times and bad.

Often, however, the one who places the most unreasonable demands on the IS manager is himself. The happiest person is usually one who knows his own strengths and limitations and just tries to do his best within those boundaries.

A second major challenge to the IS manager is time management, especially when a significant degree of control is in the hands of someone else. The farsighted IS manager will block out certain periods of each day or week for reading, research, planning and creative thinking. He will also devote certain periods to physical exercise and recreation in order to maintain both physical and mental health. The use of a daily prioritized task list, which correlates with the monthly and annual planning calendars, will increase efficiency and effectiveness in the use of time.

Another challenge to the IS manager is when others make decisions or take actions that affect IS significantly, without giving IS an opportunity to contribute. Quite often, these decisions call for sudden action by IS. It could be a large arbitrary budget cut, forced layoffs or a corporate merger.

Although such corporate action may force the IS manager to execute steps with which he may not totally agree, the future of the company, as well as his own career and that of his employees, may depend on a calm and positive response.

And finally, another challenge to the IS manager is the feeling of not being appreciated. William James, the 19th century psychologist said, "The deepest principle in human nature is the craving to be appreciated." Some superiors and users are not free with compliments. But seeking a performance review or asking for a critique may be a way to elicit a response, which hopefully will convey an appreciation for the IS manager's services.

Gilliam is president of Gilliam Associates, a computer management consulting firm based in Ponca City, Okla.

Levi Strauss

FROM PAGE 57

tion System/400s at Levi Strauss factory sites around the world. Levi Strauss is currently using Knowledgeware, Inc.'s Information Engineering Workbench as the basis for its CASE design.

"Beyond that, the challenge will be to manage applications as the business changes," Rund says. One way to do that, she believes, will be to issue new applications "releases" in much the same way that software vendors do.

Adaptable attitude

Her statements are in sync with the evolving management philosophy at Levi Strauss, which has undergone a leveraged buyout and drastic downsizing in recent years in an effort to stay competitive.

The watchword at the firm is flexibility, as IS planners employ electronic data interchange, IBM mainframes and relational databases to keep pace with other clothing manufacturers in Europe and the Far East.

"We are shifting the corporate asset from being the application code to being the design [of that application], which has lasting value," says Bill Eaton, chief information officer at Levi Strauss and Rund's boss. "The specific products you use to write that code are not as important."

Rund, he says, practices enterprise modeling: "In the information-engineering area, Donna is providing the vision of the kind of systems we want to build: flexible, durable and responsive to changes in the technology environment. She is the glue that holds all of that together."

Today, Levi Strauss' worldwide IS staff numbers just 400, with about 325 in San Francisco and the rest supporting business units in Tokyo, Toronto and Brussels. "We've cut out many management layers, so that it's really a very, very flat organization," says Bob Mann, director of applied information technology. Mann manages Levi Strauss' CASE strategy and works closely with Rund on data design issues.

To make that flattened organization work, Rund and the other 13 IS managers reporting to Eaton have to work on motivating their staff to act as a team. "Donna has a lot of energy," Mann says. "She's able to get a lot of buy-in across [information resources] rather than vertically. Flattening the organization only works if people feel empowered, if they feel they are creating part of the destiny of Levi Strauss." That feeling is enhanced by an employee stock ownership plan that was established after the buyout in the mid-1980s.

Rund, who was named to her present position 2½ years ago, has been at Levi Strauss since 1980. Previously, she worked at several large banks and insurance companies as a software manager. In her off hours, she trains and shows horses. "It's like teaching a horse ballet, when you do it right," she says.

Rund wants IS workers to get out of the office occasionally so they can step back from their programming and concentrate on the larger issues of information architecture. "We've had two-day off-sites in which we discuss the role of a manager and what it will be like in the future," she says. "Systems analysts will be working in the user environment. And with the new technology that's coming along, you won't have to be a programmer to design a system."

Rund's IS leadership sessions complement those of the rest of the company, which has a 2-year-old "Aspirations" program handcrafted by Levi Strauss' top management. The Aspirations mission statement, endorsed by Chief Executive Officer Robert Haas, lists six key management touchstones: new behaviors, diversity, recognition, ethical management practices, communication and empowerment.

Relaxed and casual

The atmosphere at the Levi Strauss Plaza headquarters, along San Francisco's Embarcadero waterfront area, is relaxed. There is modern art on the walls, and attire is casual — often Levi Strauss jeans or jackets, in fact. Programmers work on IBM DB2 applications during the day, but they sit by the plaza fountain or sip capuccino at a nearby cafe at lunch.

The same messages are brought home at periodic off-site leadership weeks led by top Levi Strauss managers. In June, Rund took her turn leading a week-long off-site session in Santa Cruz, Calif. "Our off-sites are moving us ahead," says Hank Ahlgrim, manager of database administration.

"Our management has made it very clear to us that if you're not activating creativity and empowerment, if you're not pushing authority and responsibility to those nearest the action, you won't survive in the 1990s," he adds.

In the end, Rund says, it is the people of Levi Strauss' IS group that will enable the overall business plan — or slow it down. "It doesn't matter which hardware we're on or which telecommunications gear we have as long as that gear doesn't get in the way of moving the company forward," she says. "You have to have a vision of where you want to go and start working your way toward that vision. What we've been doing is learning how to adjust our internal business processes to a brand-new world."

Levi's works on its element of comfort

Personal computer and terminal users at Levi Strauss will soon be getting the ergonomic treatment in work spaces specially designed to prevent repetitive stress injuries.

As the company remodels its work areas — the current ones are about nine years old — it is working with an architect to engineer adjustable and comfortable work spaces, according to Sherry Ryan, director of end-user computing. Ryan sits on a 1-year-old committee, called the Video Display Terminal Task Force, which is designing educational materials for employees and providing ergonomic input.

The 325 employees in information services have some custom work spaces now, Ryan says. "Employees come in all sizes. Some use different PC stands, some have nonglare screens and flat-panel displays," says Ryan, who has suffered from carpal tunnel syndrome, a repetitive stress injury of the hand, since 1984.

Although another member of the task force, company spokeswoman Mary Gross, says that Levi Strauss would invest in nonglare screens "only if shown to be necessary to health," Ryan says that there was little problem finding the money for such items in her department. The same goes for flat-panel displays, which some believe prevent potential health problems that may be caused by the electromagnetic field created by VDTs.

In conjunction with workplace redesign, the task force is also putting together an exercise video for at-the-desk activity — primarily stretching exercises.

J.A. SAVAGE

CALENDAR

The MIS Training Institute will hold its 10th Annual Conference on Control, Audit & Security of Information Systems in Washington, D.C. Oct. 1-4.

The conference will feature speakers from Novell, Inc., IBM, the National Computer Security Center, General Dynamics, Computer Associates International, Inc., Lawrence Livermore National Laboratory, the National Institute of Standards and Technology and others. Topics concerning security issues from the standpoint of IBM systems software, networking, midrange systems, new technology, personal computers, productivity and legal issues will be addressed in 80 sessions.

For more information, contact Pamela Bissett at the MIS Training Institute in Framingham, Mass., at (508) 879-7999.

AUG. 19-25

Chipcard Seminar on Smartcard Applications. Boston, Aug. 21 — Contact: Ben Haag, Amphenol, Harden, Conn. (203) 281-3200.

Data Administration and Information Resource Development. Boston, Aug. 22-24 — Contact: Julie O'Conner, Andersen Consulting, Andover, Mass. (508) 470-3870.

AUG. 26-SEPT. 1

Implementing Distributed Databases. New York, Aug. 28-29 — Contact: Digital Consulting, Andover, Mass. (508) 470-3880.

Marketing Information Systems Seminar. Orlando, Fla., Aug. 29-30 — Contact: Judy Price, Infomarketing, Tampa, Fla. (813) 376-6547.

SEPT. 2-8

Achieving Success in Strategic Planning. St. Louis, Sept. 4-7 — Contact: Bonnie Sen, Washington University, St. Louis, Mo. (314) 889-5380.

Focus on Automation. San Francisco, Sept. 4-6 — Contact: Bonnie Walsh Associates, Staten Island, N.Y. (718) 979-1012.

Foos's CD-ROM Conference and Exposition. Washington, D.C., Sept. 5-6 — Contact: National Trade Productions, Alexandria, Va. (703) 683-8500.

Great Southern Electronics and Computer Expo. Jacksonville, Fla., Sept. 7-9 — Contact: Great Southern Shows, Jacksonville, Fla. (904) 743-8000.

SEPT. 9-15

Adding Image Processing to Information Systems. Toronto, Sept. 9-11 — Contact: Technology Transfer Institute, Santa Monica, Calif. (213) 394-8305.

Open Systems Applications Development Conference. San Jose, Calif., Sept. 9-12 — Contact: Unify, Sacramento, Calif. (916) 920-9092.

Automated Operations Symposium and Exhibit. San Diego, Sept. 10-11 — Contact: Association for Computer Operations Management, Orange, Calif. (714) 997-7966.

Data Storage '90. San Jose, Calif., Sept. 10-12 — Contact: Cartlidge and Associates, San Jose, Calif. (408) 554-6644.

Executive Information Systems: From Planning to Implementation. San Francisco, Sept. 10-12 — Contact: Technology Transfer Institute, Santa Monica, Calif. (213) 394-8305.

The Repository Conference. Orlando, Fla., Sept. 10-12 — Contact: Digital Consulting, Andover, Mass. (508) 470-3880.

Networld '90. Dallas, Sept. 10-13 — Contact: H.A. Bruno, Inc., Englewood Cliffs, N.J. (201) 569-8542.

Video Expo. New York, Sept. 10-14 — Contact: Debbie Totolo, Knowledge Industry Publications, White Plains, N.Y. (914) 328-9157.

Unix International SIV Seminar. Boston, Sept. 11 — Contact: Miller Communications, Boston, Mass. (617) 536-0470

Business Intelligence Conference. New York, Sept. 11-12 — Contact: Richard Bennett, National Expositions, New York, N.Y. (212) 391-9111.

Optical Information Systems '90. Arlington, Va., Sept. 11-13 — Contact: Meckler, Westport, Conn. (203) 226-6967.

Printed Circuit Board Expo '90. Minneapolis, Sept. 11-13 — Contact: PMSI, Alpharetta, Ga. (404) 475-1818.

Integrating Image and Information Processing. Washington, Sept. 12-13 — Contact: Digital Consulting, Andover, Mass. (508) 470-3880.

AD/Cycle Evaluation and Implementation. Boston, Sept. 13-14 — Contact: Digital Consulting, Andover, Mass. (508) 470-3880.

SEPT. 16-22

Telecom '90 — The Evolving Telecommunications Environment. Montreal, Sept. 16-20 — Contact: Kimberly Maughan, Canadian Business Telecommunications Alliance, Toronto, Ont., Canada (416) 865-0993.

Mapping the Future of Computing and Communications. Cambridge, Mass., Sept. 17-18 — Contact: Patricia Seybold's Office Computing Group, Boston, Mass. (617) 742-5200.

DB/DC Users Group Conference. Grand Rapids, Mich., Sept. 17-19 — Contact: The Fox Group, Troy, Mich. (313) 689-6777.

Design Engineering Show & Conference/West. Anaheim, Calif., Sept. 17-19 — Contact: Design/West, Stamford, Conn. (203) 964-0267.

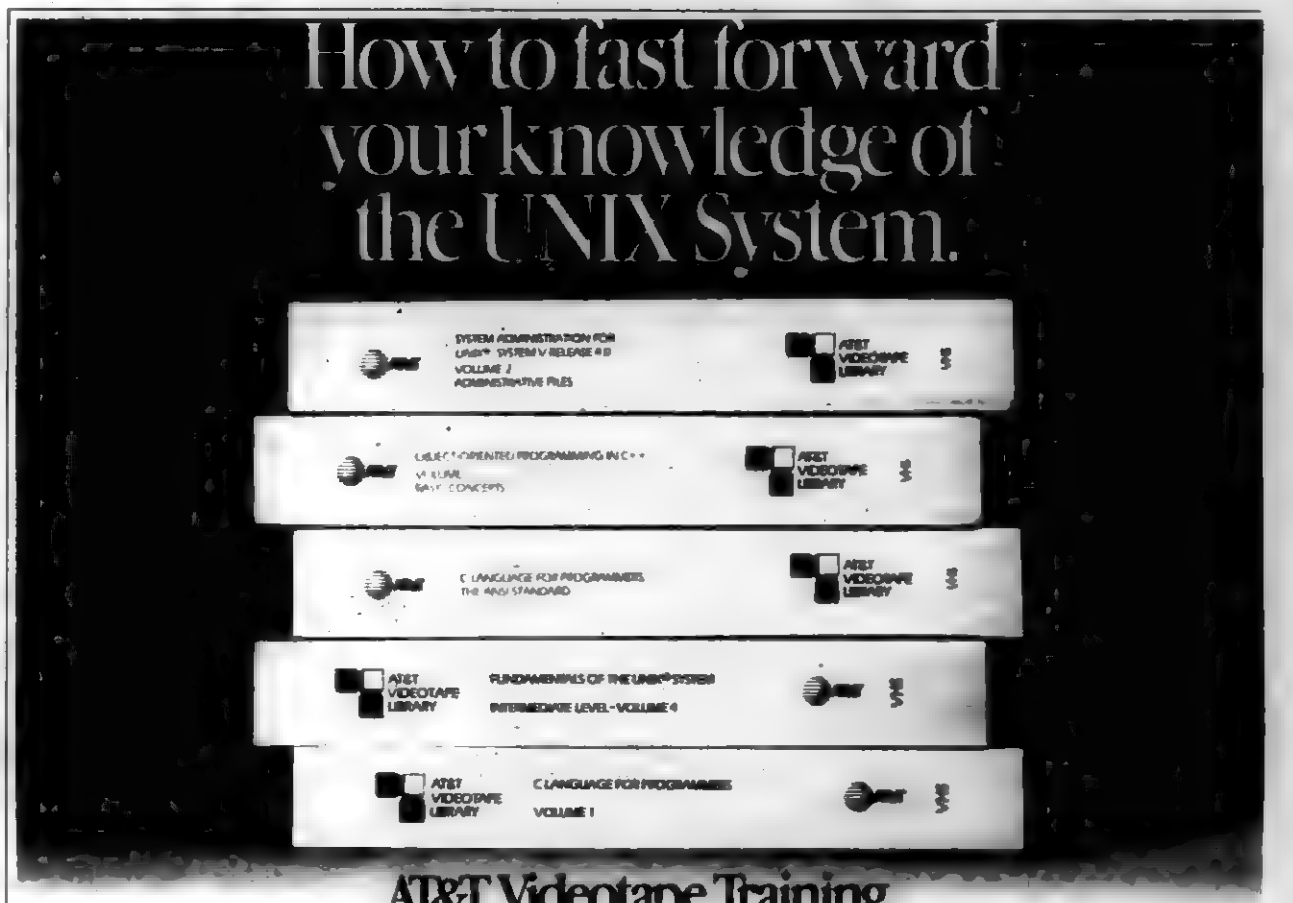
Graphics & Multimedia Conference and Exposition. Long Beach, Calif., Sept. 17-19 — Contact: Exposition Management, Waltham, Mass. (617) 290-0400.

Ink-jet Printing Conference. Boston, Sept. 17-19 — Contact: BIS CAP International, Newtonville, Mass. (617) 965-9130.

Datatech '90. Manchester, N.H., Sept. 18-19 — Contact: Beverly Gove, New England Telephone, Manchester, N.H. (603) 641-1648.

DISKCON '90. San Jose, Calif., Sept. 18-19 — Contact: DISKCON, Sunnyvale, Calif. (408) 739-9353.

Electronic Publishing '90 Conference. Gaithersburg, Md., Sept. 18-20 — Contact: National Institute of Standards and Technology, Gaithersburg, Md. (301) 977-6711.



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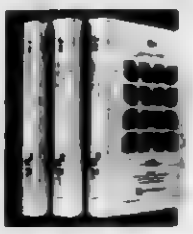

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INTEGRATION STRATEGIES

'Soft' issues challenge imaging roll-in

BY ALAN J. RYAN
CW STAFF

As summer drags nearer to autumn, parents of 5-year-olds in Houston are preparing to send their children to school for the first time. Beyond buying Teenage Mutant Ninja Turtles lunch boxes and new school clothes, parents must obtain their child's birth certificate for school enrollment — a test of patience that previously meant waiting up to three hours at city hall.

Thanks to a new imaging system at Houston's Department of Health and Human Services, however, long lines will soon be forgotten. This fall, imaging technology in the Office of Vital Records will reduce the wait for most birth certificates to less than 15 minutes.

In many ways, integrating imaging technology into a business is a little like bringing young Houston school children into the classroom: Both have huge potential and are relatively easy to get in the door. It's only after the new arrivals are in place, according to imaging users and consultants, that the real work begins.

After installing imaging, "you've got a cultural change that is not to be taken lightly," warns John Koopman, vice-president and manager of the PNC Education Loan Center at PNC Financial Corp in Pittsburgh, which put in an imaging system 18 months ago. At PNC, for example, clerical workers were previously assigned to handle repetitious jobs in an effort to maintain consistency and reduce errors. Now, Koopman says, with the chance of errors nearly eliminated by imaging, job rotation is encouraged to keep workers from getting bored.

Other users and consultants experienced with introducing imaging systems into organizations agree. They say that the so-called "soft" dimensions of imaging integration are often far more important than the mechanics of linking various systems.

Ronald W. Hanks, registrar of vital statistics at the Department of Health and Human Services, expects that imaging will greatly alter daily work. Because of imaging, he says, "our total operation is going to change, and most of the job duties are going to change."

Setup is the easy part

The concept behind imaging systems is fairly simple: "Electronic filing cabinets" are used to store scanned images of anything from letters, files and legal documents to mechanical drawings and X-rays on an optical disc. A single 5¼-in. disc can hold the equivalent of one four-drawer file cabinet.

Proponents of imaging technology say that wise choices of technology and projects can yield impressive results, including a rapid return on investment, improved customer service, savings in personnel costs and more efficient work flow — all without much disruption of existing computing systems.

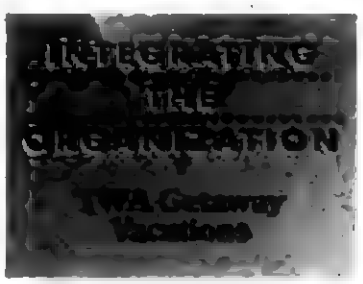
Moreover, even greater gains are possible when imaging systems are linked or connected with other information resources, experts say. This linking is a tough technological challenge, according to users and consultants, but one that is doable and worth the trouble. That is clearly the belief of commercial systems integrators, many of whom are flocking to get into the imaging business (see

Continued on page 66

Phil Hayden

Custom tours at package prices? No problem

New reservation system helps TWA travel unit and vacationers find a place in the sun



BY PAUL GILLIN
CW STAFF

If lying on the beach in some exotic, sunny locale is your idea of a great vacation, your hotel and travel options have always been pretty limited.

You could sign up for one of those five-night, $399 vacation packages and take whatever limited hotel and air options the tour operator gives you or fork over thousands of dollars to design just the trip you want.

TWA Getaway Vacations, Inc. is using integrated information systems to give travelers the best of both worlds. "We are aiming for mass customization, giving the benefits of a mass-produced product on an individual basis," says Brad Corrodi, director of MIS at TWA Getaway.

The trend toward customized tours at package prices is a significant one for the travel industry. The primary barrier to customized tours has always been informational. There are simply too many options and schedules to coordinate and still keep costs low. "This kind of business is substantially growing," says Robert Whitley, president of the U.S. Tour Operators Association in New York.

TWA Getaway has seen business jump 40% in the year since it installed a Digital Equipment Corp. VAX-based tour automation system linking data from an airline computer reservation system (CRS) to a complex database of hotel and entertainment options.

Can the Getaway vacation system really give travelers a custom vacation for $300 to $3,000 — the price of a packaged tour? "Try me," Corrodi says with a laugh. "In some cases, we can do better."

For example, TWA may offer a five-day Waikiki vacation package while a competitor sells a seven-day package. Previously, TWA Getaway would have lost a customer who wanted a seven-day vacation, Corrodi says. But now, it can simply add two nights to its existing package and still do it at a competitive price.

To understand the difficulties TWA Getaway faced, it's helpful to know how packaged tours are managed. Tour operators typically buy large blocks of hotel rooms, airline seats and entertainment tickets for specific dates in exchange for volume discounts from suppliers. They bundle those options into a package and sell the package for a fixed price.

Alan S. Orling

TWA Getaway's Pavlus *welcomes cost-cutting innovations*

The reason the packages are such a good deal is that the tour operators get price breaks through economies of scale. The reason travelers usually have limited options is that the operator has to make sure it fills up all those rooms at the same time.

TWA Getaway, a subsidiary of Trans World Airlines, runs a centralized tour booking service from its Mount Kisco, N.Y., offices. Most of its 225 employees are tour agents who deal with customers over the telephone and build vacation packages on the spot. The margins in the packaged tour industry are razor-thin, says company President Craig Pavlus. That's one reason tour packages have always been so inflexible.

TWA Getaway set out last year to create a system that "could mix and match all the components of a tour — airlines, hotels, surface transportation and entertainment options — on

Continued on page 69

MONO

Traditional PC LAN

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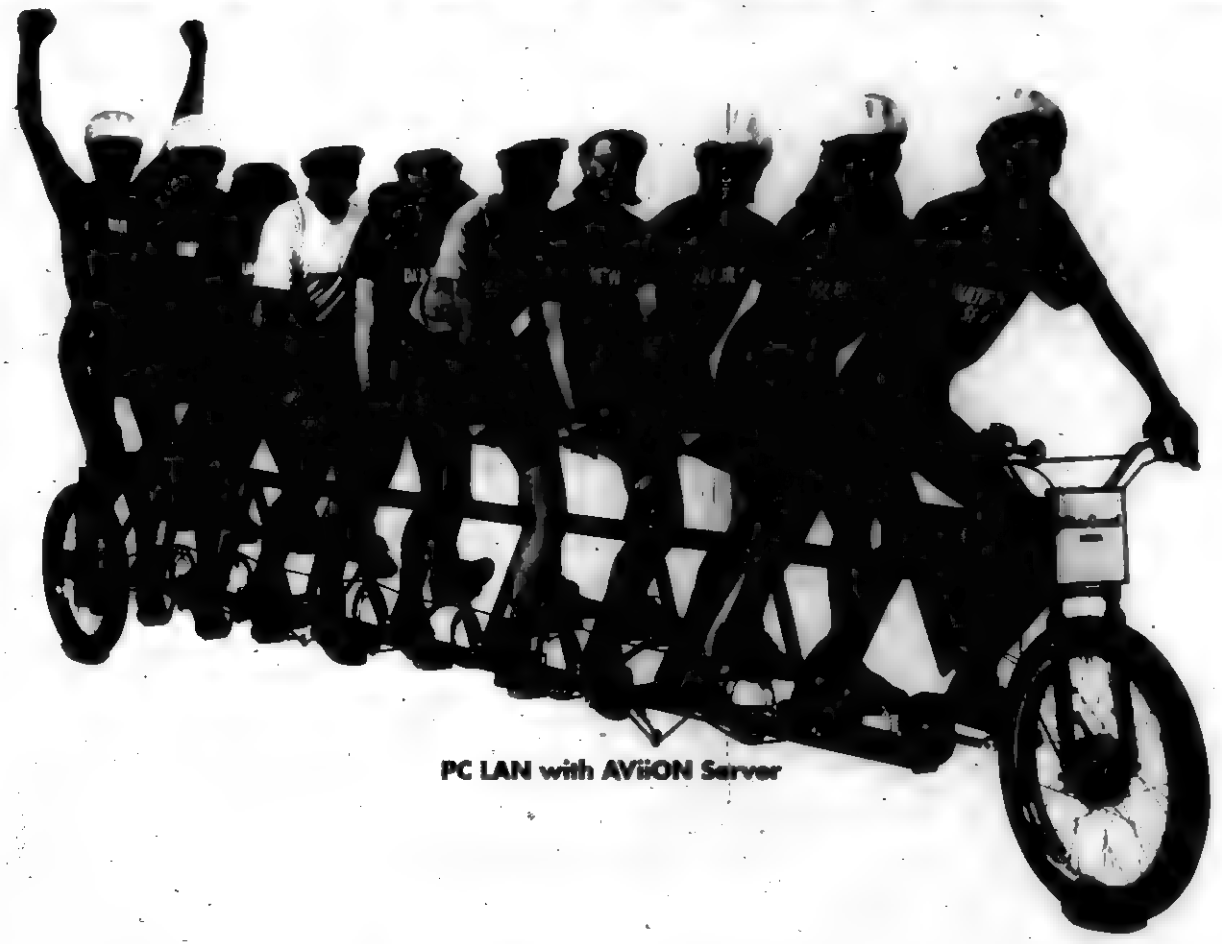

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story this page. The nontechnical challenges are said to be tougher — and can start early in the integration process, even before the system has arrived.

Managers may offer resistance to imaging systems simply because they are difficult to cost-justify in hard costs, says Jane Stanhope, senior industry analyst at Norwell, Mass.-based consulting and research firm BIS CAP International, Inc.

Cost is definitely an issue. Systems prices vary widely depending on the project, with some climbing to considerably more than $1 million.

Despite the high price tags, imaging is hot in many industries, notes Wick Keating, vice-president of American Management Systems, Inc., a systems integrator in Arlington, Va. Insurance, banking, government and medicine are some.

Figures from the Association for Information and Image Management (AIIM), an industry group, suggest the boom will continue. In 1993, imaging revenues will reach $6.8 billion, AIIM predicts.

Imaging scrimmaging

But experienced integrators warn that as more executives look to imaging as a way to cut costs and boost efficiency, IS managers and executives must be aware of the not-so-obvious integration challenges. Among them are the following:

• **Cultural changes.** Strange as it sounds, Koopman says, managers need to realize that there are some workers who enjoy the paper shuffle and the interoffice and intercompany interactions it creates. Imaging can rob those employees of this particular kind of "job satisfaction."

The new environment means fewer errors, Koopman says, "but we're also taking away that warm feeling of being able to touch and see" your work load.

• **Elimination of jobs.** Job elimination is another concern, says S. Lamont McEvitt, vice-president of operations at systems integrator Dataimage, Inc. in Glastonbury, Conn.

One customer had 27 people in its microform department, he says. "After the system went in, the number dropped to five," because end users could look up files right from the desks. Those clerks didn't lose their jobs, but workers at other companies may not be so lucky.

• **Changing jobs.** Experienced users say that job changes can be felt at many levels of any company that brings in imaging. Many organizations have all paper documents scanned in right in the mail room, entirely changing the nature of the mail room and the jobs there.

• **Heavy dependence on the system.** After using it, some workers do not want to settle for anything less.

For example, at Gateway Bank's operation center in Newtown, Conn., an imaging system was put in place in 1987 that allows users to store bank records. "If you ask a clerk to go back and look at the old microfiche," says Martin Brennan, senior vice-president of operations, "they cry. People hate to go backwards."

• **Standardization.** When imaging gets its start in a user department, consultants say it can create problems down the road. Once other departments see the advantages of a system, they may decide to bring in systems of their own.

Eventually, that can lead to problems of who should be in charge of the systems and whether or not they should or could be linked, Keating says.

While technical problems are less troublesome than for some technologies, users caution that successful integration of imaging systems isn't exactly a plug-and-play affair, either.

For some, like PNC's Koopman, the technical aspect of integrating imaging was relatively simple. That's because there was no immediate need to integrate the system's optical disc with an existing IBM Personal Computer network.

"How much [integration] do you take on at once? Do I make sure I've got all the things integrated the day I start?" Koopman asks hypothetically. For him, the answer was no. "I want to bring the system in, automate my filing and retrieval. Once I've done that, then I want to be able to automate my work flow. I'll get onto the bells and whistles later," he says.

The integration of a PC-based imaging system at the operations center of Gateway Banks was similarly smooth.

Brennan says when the bank wanted to update the expensive microfiche process in 1987, "We told the imaging vendor it would have to take the microfiche or offload tapes from our Florida software, take it into the imaging system and then read it in there and store and index it. We didn't change our system at all."

The imaging company wrote software programs to allow for the conversion; the integration was seamless, Brennan says.

Today, Brennan says the imaging system is completely integrated into all aspects of the bank's records. "Anything we produce in the way of a report is put in the laser system."

Once systems are installed, retraining workers to use them is not too difficult or time-consuming, user companies say. To prove his point, Brennan says that a clerk unfamiliar with the imaging system was brought in and told to follow the instructions on the screen to find a particular file. It took her less than five minutes. "We then gave the same statement to an auditor and told him to find the statement in the microfiche — it took him 28 minutes."

In fact, users say that in most instances, imaging's benefits can easily outweigh all the potential headaches of integrating it.

"In the past, it was tough to get people to stay here more than three or four months," says Capt. Paul Titus of the records division at the New Orleans Police Department. Pulling police files and searching for paper documents was time-consuming and dull, and the work load was so large that it could never be completed.

Now, Titus says, civil service employees are actually looking to his department for employment opportunities.

In addition, he adds, the division took in $750,000 by selling police reports produced on the imaging system to the general public, compared with about $60,000 the previous year. To boot, he says, the department is saving nearly $50,000 a year on microfilm paper and repairs. •

Ryan is a *Computerworld* senior writer.

Integrating imaging involves:

Organizational change. Imaging changes the nature of jobs, from the mail room on up. This in turn sparks changes in company culture, as work flows and job responsibilities shift. Management needs to consider how employees will react to the new environment and new jobs.

Money. Imaging is not an inexpensive technology. Systems range in price from less than $20,000 to more than $1 million.

Clear need. Like all computing projects, imaging works only if it is truly the right solution. Simply having mounds of paper does not necessarily mean you need imaging.

Long-range vision. Nearly all vendors of imaging hardware and software see open systems on the horizon. Look for products that can be linked to existing systems or future plans.

A measured approach. Start slowly. Biting off more than you can chew is the quickest route to failure.

Good vendor relationships. A good vendor can help you smooth over political difficulties and be a great aid in systems integration.

Good politics. Control over an imaging project does not necessarily belong to the IS department. A clear company direction on who will control imaging projects can avoid confusion and misunderstanding early on.

ALAN J. RYAN

New breed of commercial integrators flocks to fast-growing imaging market

One sure indication that imaging is a hot technology is the booming interest in the area by commercial systems integrators.

Many firms — including big names such as Andersen Consulting and Electronic Data Systems Corp. — recently have begun offering imaging integration as part of a wide range of commercial services.

Unlike their predecessors in the imaging integration marketplace, who often built hardware and software systems, most of the new crop of integrators take a different approach, explains Jane Stanhope, a senior industry analyst at BIS CAP International in Norwell, Mass.

Stanhope says that today's imaging systems integrators "aren't playing the conventional role most people think of when they think of systems integration." Operating as middlemen, they help system buyers as well as vendors, who often lack the time or specific knowledge of the user's industry.

Put simply, these new middlemen create single imaging systems from vendor hardware and software, Stanhope says. They then provide applications development, project management and consulting help to the client and anything else that gets the system from the box to a production system.

The incentive is money. While it's difficult to find exact figures, industry analysts say it's clear that commercial vendors are onto what they consider a lucrative market. Sales of imaging systems are expected to quadruple to $2 billion by 1993, according to BIS CAP.

Joe Carter, a partner and head of the imaging practice at Andersen Consulting, says imaging integrators have become more popular simply because there is so much integration to do.

"There are lots of vendors out there at this stage in the marketplace [whose products] don't readily talk to each other," Carter says. "But it isn't anything that should scare anybody away, because it can be done. It involves opening the hood and getting down into the internals to get the scanners and jukeboxes and software and workstations to work together," he says.

Carter adds that "You can't assume you can walk into your local computer store, buy all the parts and have it running together."

The demand for imaging integrators is also fueled by the need to bring imaging into a company's information processing environment rather than treat it as a stand-alone island of technology, Stanhope says. Many imaging integrators are now looking to nonproprietary systems that can be integrated, or turnkey systems.

According to Carter, however, even open systems will not eliminate the need for imaging integrators.

The need for integrators to develop applications rather than connect discrete pieces of imaging systems will grow. "As things become more shrink-wrapped," Carter says, "people will be able to easily get the basic infrastructure in place but will need the development of applications to go with it."

Some of the imaging integrators include American Management Systems, Arlington, Va.; Andersen Consulting, Chicago; Bell Atlantic Systems Integration Corp., Arlington, Va.; Boeing Computer Services, Seattle; Dataimage, Glastonbury, Conn; Electronic Data Systems, Detroit; Ernst & Young, New York; Genesis Imaging Technologies, Valley Forge, Pa.; Grumman Infoconversion, Woodbury, N.Y.; Litton Integrated Automation, Alameda, Calif.; Scientific Applications International Corp., San Diego; and TRW Financial Services, Berkeley, Calif.

ALAN J. RYAN

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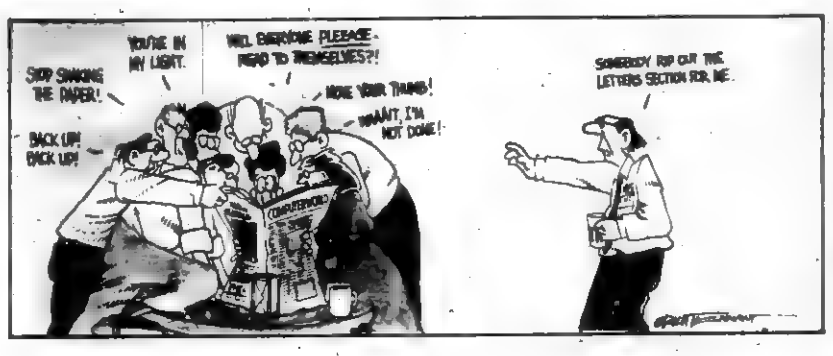

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EXCLUSIVE COMPUTERWORLD SURVEY

Integration priorities

A whopping 81% of you peg network security as the integration issue most on your minds, according to a recent *Computerworld* survey of 194 IS chiefs. PC-to-mainframe connections trail closely at 76%.

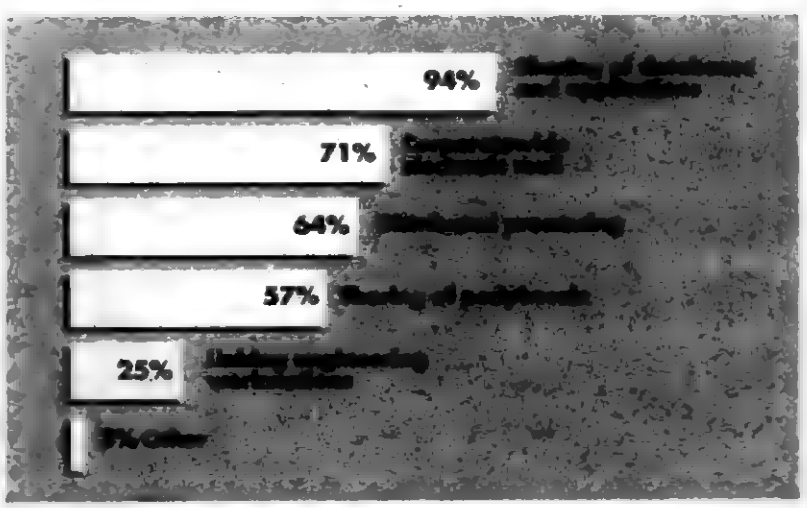
No wonder. Having a virus, dishonest employee or outside perpetrator fiddling with your network has enterprisewide repercussions these days — more people are getting more access to more data. And that data sharing will become more widespread, according to your responses. You say your integration to-do list includes access to corporate resources as well as linking users and departments.

Once you've brought disparate parts of the organization together, 94% of you say you'll be able to achieve database and applications sharing, electronic mail (71%) and distributed processing (64%).

Ambitious plans, for sure. Here's hoping the Bombastic Bombay virus doesn't hit just when you think you've got it all together.

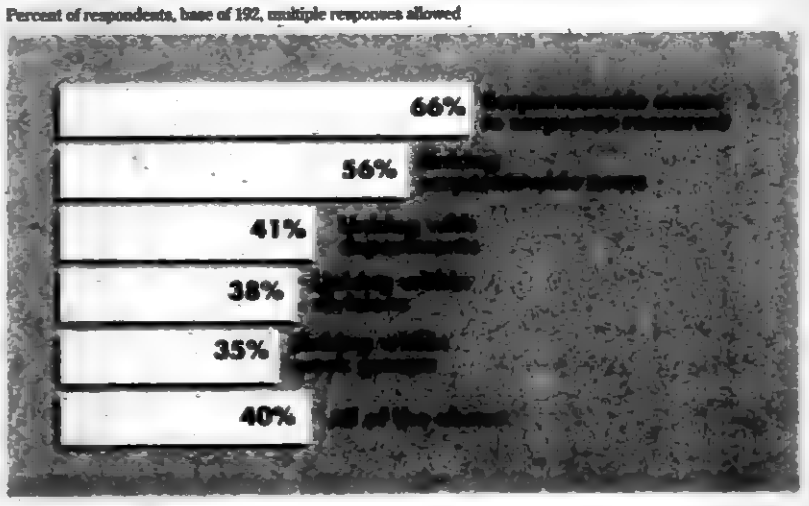
"What types of applications will be made possible by your integration strategy?"

Percent of respondents, base of 190, multiple responses allowed

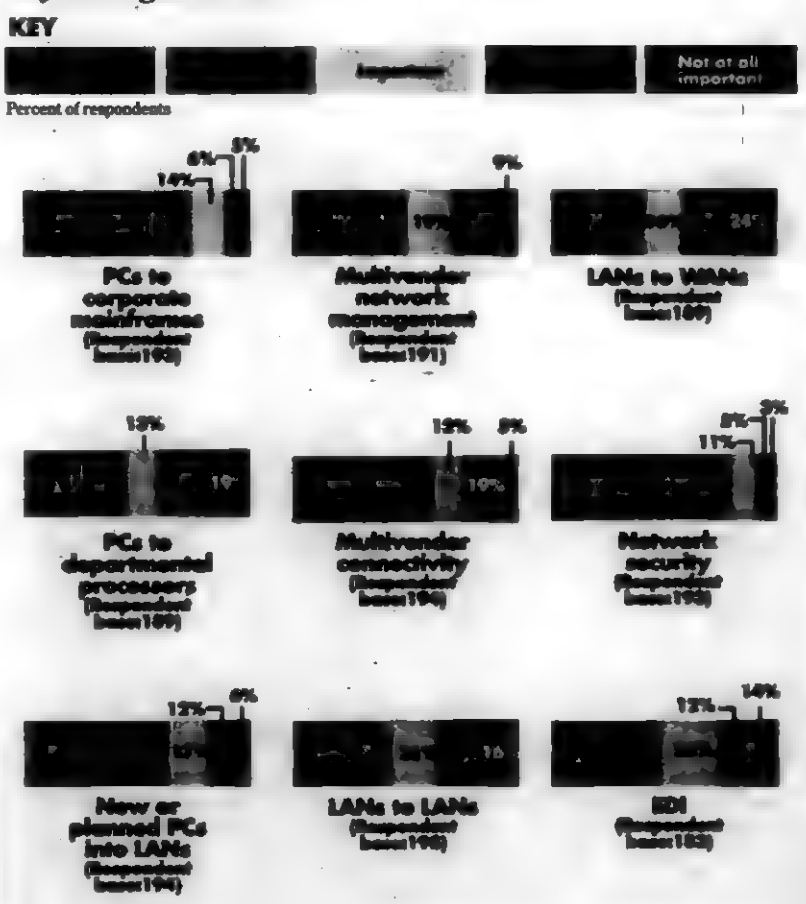


"What are the most important aims of your IS integration strategy?"

Percent of respondents, base of 192, multiple responses allowed



"How important are each of the following communications-related integration issues to your organization?"



In other words . . .

"We have been connecting LANs into a wide-area network. We have about 18 to 20 LANs already connected. While doing this has allowed more data to move electronically with more speed and accuracy, it's expensive. And security has become an issue as modems enable people from the outside to have access internally. To combat any security breaches, we recommend a callback procedure."

Jim Appleyard
Manager of Information Security Services
Duke Power Co.
Charlotte, N.C.

"We are working on tying an Apple network into a DEC VAX network. Security will be an issue in this kind of setup, as will how fast we can get information to the end user."

Walter Perkowski
First Vice-President of Computer Operations
Republic National Bank of New York
New York

"We plan to standardize everything into a DEC network on which will run manufacturing, engineering, financial and word processing applications. This setup will give us worldwide integration, saving us money and increasing our competitive edge."

Diane Coleman
Director of MIS
Fleetguard, Inc.
Nashville

Due to a software error at the credit card company, the power lunch is now in hot water

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a real-time basis and bring back a single price for the customer within six minutes," Pavlus says. The company also wanted to do it within four months in order to hit the Sept. 1 start of the winter vacation season.

Pavlus and Corrodi listened to a pitch from a Digital Equipment Corp. salesman, liked his message about portability and communications and contracted the whole project out to DEC and Autofile Software Ltd., a British provider of customized software for the travel industry. DEC and Autofile met the four-month deadline, and the $4 million package they put together has changed TWA Getaway's way of doing business.

Foremost among the innovations is what Corrodi calls a "floating hotel inventory." Now, instead of selling hotel rooms in large fixed blocks, the tour operator allocates them flexibly as requested by the customer. "It's like the difference between keeping an inventory of watches and keeping an inventory of watch parts which you use to make custom watches," Corrodi says. "Before, we had to tell customers, 'Sorry, it's these nights or not at all,' " he says.

The other innovative aspect of the TWA Getaway system is its link to TWA's Pars CRS. While CRSs have revolutionized the travel industry, they aren't renowned for their user-friendliness. Most simply present users with screens of data accessible only through arcane commands. In fact, Pavlus says, the way tour agents usually capture information from a CRS screen is to write it down by hand.

Autofile developed a computerized interface to the Pars CRS that, in effect, mimics a human operator. Now, instead of confronting an on-line CRS screen, the agent fills in menus detailing things such as how many people are traveling, when they want to fly between what cities and at what prices.

The agent then moves on to other things while the software hums away in the background assembling the necessary information from the CRS.

"We're at the point that the sales agent does not need to know a single airline system command," Corrodi says.

Adds Pavlus: "It's cut our agent training time from eight to four weeks. No other project has achieved this level of application integration with an airline CRS."

A recent upgrade to the TWA Getaway system extends the Pars interface to automatically book reservations and update the traveler's itinerary when flight schedules change. Previously, schedule changes had to be entered into the customer record by hand, Pavlus says.

The TWA Getaway system has several other cost-cutting innovations. Back-office automation enables tour agents to generate boarding passes, hotel confirmation slips and entertainment tickets on the spot and mail them in a single overnight package. TWA Getaway sends as many as 800 Federal Express packages per day to customers.

Still, the Getaway system is far from perfect, Corrodi says. Communications with hotels are still awkward, involving a tangle of facsimiles, telexes and telephone calls to reserve blocks of room and send periodic reports. Corrodi would like to see the whole process automated via electronic data interchange but says the travel industry is still far from agreeing on formats that are acceptable to everybody.

The system's CRS interface is also limited to TWA's Pars, which is a small player in the airline reservation market. Pavlus says his company is close to concluding an agreement with Worldspan, a joint CRS venture of TWA, Northwest Airlines and Delta Airlines, to extend the interface to that system. ●

Gillin is Computerworld's executive editor.

No place like home

While TWA Getaway sometimes has as many as 600 concurrent on-line terminal sessions running simultaneously, the company doesn't have a host computer on-site. The DEC VAX 8550 cluster that supports its tour package system is 1,000 miles away in Kansas City, Mo., which is where parent company TWA's Pars reservation system is based.

The site choice was made for network reliability reasons and because the Kansas City center already had computer room facilities in place, says Brad Corrodi, director of MIS. The VAX links to TWA's Pars system through a combination of Decport software and Simpact, Inc. hardware, also giving programmers a set of tools they can use to write applications around the Pars airline database.

Tour agents connect with the system over a wide-area Ethernet network. TWA Getaway uses Vitalink network bridges linking backbone networks to its Mount Kisco, N.Y., headquarters, Marleton, N.J., reservations center and Kansas City data center over two 56K bit/sec. communications lines with two 56K bit/sec. lines for backup. Tour agents work on Falco 5220 terminals, which let them switch back and forth between two full-screen sessions. The terminals are linked to Decserver 500 series terminal servers.

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THE POWER IS ON

Keeping up with Jones

Regional freight hauler uses integrated freight tracking system to outmaneuver the competition

INTEGRATING THE CUSTOMER

Jones Truck Lines

BY LORY ZOTTOLA
CW STAFF

Jones Truck Lines, Inc., which bills itself as the "No wait, hate to be late, first-rate freight company," takes its customers very seriously — and with good reason. When results of Jones' annual customer satisfaction survey come in, the company's 3,400 employees hold their breaths. Incentive bonuses at the $250 million freight hauling company — from top management on down — are tied to that review. What the customer has to say means something here.

Besides criteria such as service, on-time performance, condition of freight and accuracy of the freight bill, Jones asks customers to rate the company's technical capabilities. That's the part that Mick Crowder, vice-president of administration, has watched very closely during his four-year tenure at the Springdale, Ark.-based firm. And he's happy with what he sees. Customer satisfaction with Jones' information systems operations has gone from a grade of B to B+/A since the firm implemented a $9 million integrated database and freight hauling application in 1988.

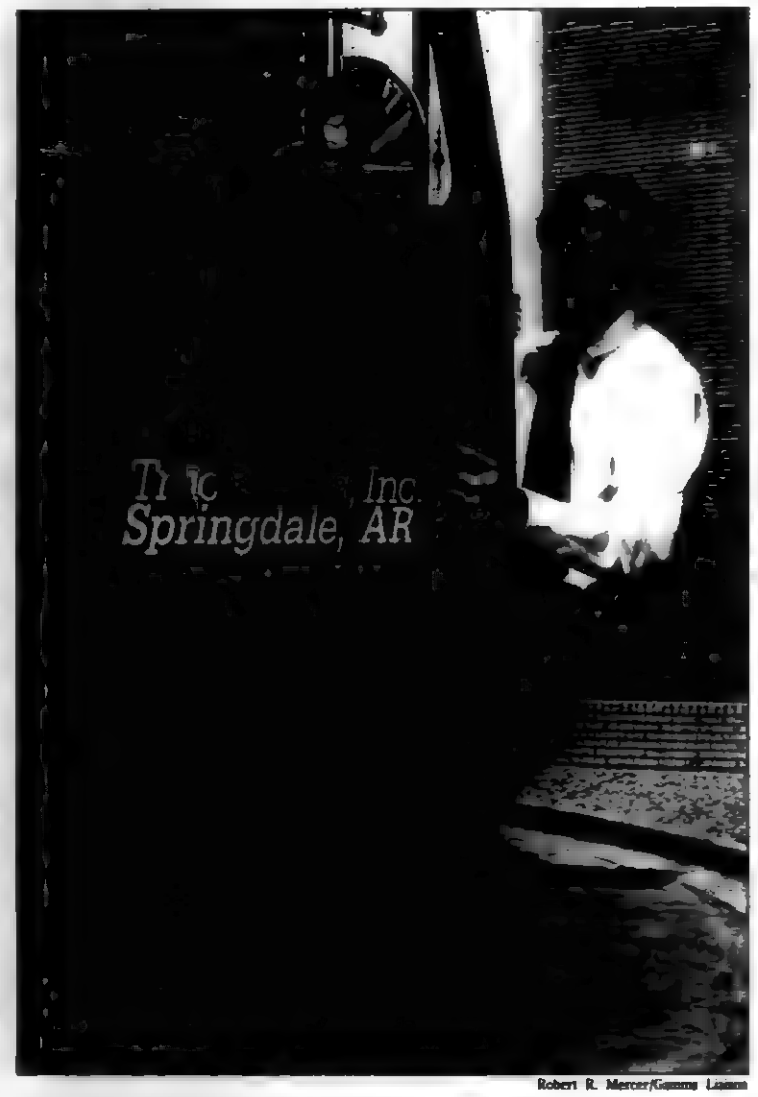
The system lets 90 of the company's 125 freight terminal locations identify and trace freight, as well as make on-line inquiries about its status, via AT&T leased lines.

Moreover, 200 of Jones' freight customers can dial into the menu-driven system using their personal computers and modems to get up-to-date tracking, billing data and freight terminal information residing on the mainframe 24 hours a day, seven days a week. They can also use such electronic data interchange capabilities as electronic invoicing.

Rough terrain at times

But it hasn't been all smooth riding for the 72-year-old carrier. Jones competes in what is known as the less-than-truckload (LTL) market, a segment made up of haulers that move freight weighing less than 10,000 pounds from multiple shippers to multiple consignees.

During the deregulation of the 1980s, competition became fierce in the $16 billion per year LTL arena. For Jones, the pressure of being a regional company in a deregulated trucking environment was made even worse by the company's outdated information systems.



Robert R. Mercer/Gamma Liaison

Jones' *system performance earns high marks, Crowder says*

After deregulation, many freight haulers, including Jones, began offering individual customer discounts on industry tariffs as a way to be more competitive. While discounts helped business, they also greatly complicated the manual billing process. Frequently, it was tough to identify the customer and to determine quickly the proper rate at which to bill them, according to Crowder.

The whole system, he says, "left a lot of room for error." This was especially bad news because Jones was in the midst of a regional cat fight that already had put two competitors out of business.

Watching the shakeout, Jones' management "was alternately yelling, screaming, begging and weeping" for vital customer information, explains Chris Steward, project manager during the year-long system overhaul at Jones.

With the sanction of his boss, Jones President Elliott Burnside, Crowder and a seven-member technical team set out to put Jones' house in order.

The first big move was to scrap an old DL/1 database system running on an IBM 4381 mainframe in a DOS/VSE environment. In its place came a Software AG Adabas database and Natural2 fourth-generation language, running on an IBM 3090 under MVS/XA. The database holds information on customers, freight and rates.

The new system — dubbed the Fast, Accurate and Certain Transportation System (FACTS) — went on-line in April 1988.

Today, the FACTS database handles 350,000 to 400,000 on-line transactions daily from its freight terminal locations and customers, according to Jon Sutton, Jones' manager of database administration.

The system helps answer common customer questions concerning freight location and delivery time for the 200,000 shipments typically handled by Jones in a month. As freight moves across Jones' 23-state route, information is entered by staff at the freight terminals and updated in real time along the way.

Another benefit, says Tom Morehouse, vice-president of marketing, is that customers can now make special information requests using FACTS. For example, a customer can now obtain any combination of data on shipment, weight, charges, pieces, service time, inbound/outbound transit times and statistical information within a day or two, compared with the several weeks previously needed.

Jones says that internal business management can also get the same kind of custom data and no longer needs to beg and weep for crucial information.

Morehouse explains: "A sales manager can go to a new client with a special report and say, 'Here's the data on your first 15 shipments. They were all rated accurately, the transit times are up to snuff.' It's a very powerful marketing tool that reinforces the client's decision to use our services."

Rather switch than fight

By switching to a modern integrated database system, Jones says it has realized labor savings. In the past, rate clerks could take up to five minutes to establish a rate. Today, the same information is delivered on-line in nanoseconds and is 99% error-free, Crowder says.

But FACTS doesn't stop there; 50 of Jones' large customer accounts use the company's transportion industry-standard EDI connection to receive rate and shipping information, Crowder says. These users exchange information directly or through a third-party mailbox.

Early each morning, five days a week, EDI customers receive customized shipping and freight status reports, delivery schedules and an electronic invoice for billing of freight charges. Customers can also make payments to Jones' bank account via a third-party clearinghouse.

While the road appears smooth for Jones right now, managers say that the company can't afford to become complacent. Nonunion competition from two of the top three national trucking companies, Roadway and Consolidated Freightways, is bearing down on Jones' regional business, says Al Konrad, president of Traffic Consultants, Inc., a freight movement consulting company in Memphis. Konrad says that Jones needs to keep its customer base content by pushing such business staples as EDI. ●

Project Manager Christopher Steward gives an insider's view of the Jones project. See column, facing page.

Zottola is *Computerworld*'s managing editor, special projects.

HANDS ON

Christopher Steward

Integration: Just do it

When I came into Jones Truck Lines as project manager for its database integration project, the company's survival was being threatened by a patchwork of outdated information systems built on a foundation of outdated technology. Jones needed to completely replace its outdated and inflexible systems with something sleeker and more modern.

From our work on the Fast, Accurate and Certain Transportation System (FACTS) project, we derived the following suggestions for systems integration projects:

Just do it. From the beginning, problems, issues, egos, politics and other killers that reduce projects to a crawl — if not a dead halt — were discussed, decided on, dealt with, acted on or dismissed. Nothing was permitted to stand in the way of the project's success. The message was quite clear to all participants: Just do it.

Get commitment at the highest levels. At Jones, senior and executive management considered the FACTS project to be the No. 1 priority in the company and for one simple reason: The very future of the organization was depending upon its success. Without this kind of support, the project team might abandon its "just do it philosophy" for its close cousin: "Just have nothing to do with it."

At Jones, a commitment was made from President Elliot Burnside on down. A direct report to Elliot, then vice-president of information systems Mick Crowder was designated as the executive manager with ultimate responsibility for making the project happen. As a result, when called on, managers at all levels always made themselves available for meetings and decision-making.

Don't fix, build anew. If you want a Ferrari, you wouldn't start with a Volkswagen Beetle and try and fix it up.

Integrated systems are constructed from the ground up on the principle of data sharing.

Choose the right people. All the methods, tools, commitment and philosophies in the world won't help you unless you have the people to just do it.

Jones did everything right in this area:

- It hired expertise in the new technology. Instead of trying to build the new system entirely by itself, Jones looked for some help from the outside. It put together an outstanding team of people.
- It didn't use the same people who built the old system. Too many large-scale systems development efforts fail because the same people who built the old system are the same ones picked to build the new one, with the reasoning that "they know the business."

It's hardly surprising that in the end, the system is basically the same as the one that went before. The only difference is that it is constructed with inappropriate use of the new technology, which compounds the problems experienced with the old system.

- It created a team atmosphere. Jones had its own systems development team members, assigned full-time user representatives and took on the mammoth tasks of data conversion, user training and hardware and systems software replacement.

This meant that the ultimate success of the project was also dependent on Jones staff — it wasn't simply dumped in the lap of the hired help.

This approach had another huge benefit: Once the system was built, Jones supported it on its own with its trained users and trained IS staff.

- It went lean and mean. The trainee army approach to systems development just doesn't cut it. I'll take six smart, experienced people with something to prove any day of the week.

Have a method. Data sharing is vital to the development of stable, integrated information systems capable of providing timely and accurate information at all levels, operational through executive management.

Some years ago, Detroit came to the conclusion that you can put the same engine in different car bodies and provide different car models without undergoing the expense of custom designing a new engine every time.

The same holds true with data. If you design a good data engine — a database — it can support many different uses without having to custom design a database every time.

Make sure you have the right tools. If you want to build a system quickly, you use a modern, fourth-generation language, not Cobol.

Also, don't buy a product line in which the individual products are not designed to work together.

There is no magic to this process. Once you realize that, you're in good shape.

Steward is currently director and co-founder of Candec Data Solutions, Inc., a New York-based company specializing in data consulting services. He served as project manager during Jones' integration effort.

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INTERVIEW

DEC's big integration umbrella

Integration chief Russell Gullotti says a global reach and top-notch partners will help DEC weather an industry shakeout

In early 1989, Digital Equipment Corp. formalized its systems integration effort, creating the Enterprise Integration Services group. The move united 18,000 DEC employees who had been doing systems integration in one form or another for years and put them under an umbrella organization. Russell Gullotti, vice-president of the EIS group, says that DEC's annual systems integration revenue now exceeds $1 billion. Gullotti recently spoke with Computerworld *Features Editor Glenn Rifkin.*

How do you respond to people who contend that computer vendors, acting as systems integrators, push their own hardware and software?
There are those customers who say, "You can never be objective. I wouldn't expect you to be objective. Therefore, you will never be my management consulting arm."
There are customers at the other end of the spectrum. They say, "Don't talk to me about bias, everyone is biased, no matter who they are. They are trained in some set of hardware and software and they are always going to recommend those, so you are no worse than any of the others. What I want is my problem solved, and if you have to sell me your hardware to do it, go ahead."
I contend that nobody in this business is neutral. Everyone has a preference going in about how something ought to be solved.

How much do you involve end users in a project?
There are those systems integration efforts that are mission-critical. In those instances, I don't want my people to go ahead and do that work unless we have a senior Digital person — a vice-presidential level person is required sometimes — to close the door with the equivalent-level person in that company, one-on-one, and say, "Do you know what you are getting into? Do you understand we will have some bumps in the road ahead? Do you understand the mission-criticality? Are you committed to it for the long haul? Are there internal wars going on that will prevent success? Are you committed to prevent that from happening?"
When given clear, crisp responses, we go. When there's a lot of equivocation or we sense a lot of internal politics and fighting that would prevent success, I caution my folks not to do that work.

You turn work down?
Yes. We've said to the customer, "We can't go ahead the way things are. You don't have a person who is responsible for this effort inside your company. You have multiple organizations that think they are running it. Therefore, it can't succeed. Or you don't know yet what you want to do. Let's work with you on a planning stage to pin it down." If they can't, we shouldn't do it, because we're not going to deliver what they want.

Do you run into internal IS staff who resent your presence?
Yes, we do. The first thing we have to do is to make sure that if that happens, it will not stop the effort from succeeding. Frankly, we'll find a way to bring IS into it. They're crucial to success, and we want their support. I look for a single point of contact.

Stella Johnson

Is that contact usually IS?
Often it's IS — probably half the time. Our job is not to go around the people responsible for this stuff; our job is to work with them as often as we can.

Whom do you most often encounter in competitive situations? IBM?
Yes, IBM for sure. They have positioned themselves to be able to solve these problems, and because they are who they are, we see them a lot. We also see Arthur Andersen, Deloitte, CSC — those three are alliance partners with Digital.

What is an alliance partner?
We sit with Andersen or Deloitte or CSC and say, "We don't have this particular set of skills, and you are very good at it. Can we come to some agreement whereby we can train some of our people in your capabilities, and when we call, you'll respond in this time frame?"
With these agreements in place, we can now make the phone call from our local district and cause activity to begin immediately, because we've eliminated the month-long mating dance we used to go through. If this works perfectly, we can be responding to a request for proposal within a week.

What happens in the case of a project such as Eastman Kodak, in which you work with IBM? What do you do when you run into a problem and it's not clear which vendor's equipment is at fault?
If that were to occur, both parties would just sit down and figure out what the problem is technologically. It's either in the data center or it's on the network. We'd do what needs to be done to fix it.

Everybody out there is now calling himself a systems integrator. What distinguishes DEC?
The word systems integration is so imperfect and ill-defined that everyone has their own twist on it. We're really a full-service systems integrator. We can provide the consulting, supply the design and the implementation, maintain it and do the facilities management all ourselves, in multiple industries, across oceans on a global basis with a wide breadth of resources. There aren't many who can make that claim.
There are niche systems integrators who, if they were ever faced with a $50 million integration effort spanning multiple countries, could not do it. Are they systems integrators in their niche? Sure. Will they compete with the DECs of the world? No. It is systems integration at a different level, and there's plenty of room for them to do their work.

How fast are you growing each year?
The market is growing in excess of 20% a year. We're growing faster — over 25% in the past year. I'm a little worried that the growth is so high. I hope I can staff up and get the skills in place quickly enough.

DEC has a lot of people internally in transition, basically moving out of jobs that no longer exist. Is your group a place where people are trying to go?
Yes. We have "pitchers" in our company — people who have employees whose work has gone away. We also have "catchers." I'm a catcher, and I have a great big mitt. The piece of the company that I manage is growing, and I am getting the cream of the crop. Our strategy is "send me the best, and then backfill from within your own organizations."

Is money a big issue, or are your customers so big that it is not a factor?
By the definition of systems integration we use, I can have lots of $50,000 efforts going on. So projects are not all big and mission-critical, but they are all important. A $50,000 integration effort that may be used to port a piece of application software to another piece of equipment can cause a lot of problems in the company. When I talk systems integration, most people immediately think big. I don't. I think complicated, risk-sharing, global.

Is there an average-size job?
I'd say that the average size is slightly over $5 million. The folks in my group say it's closer to $10 million.

The future?
In five years, people may not even use the words systems integration. That's where I'm taking it. ●

The integrated desktop: Hit or myth?

Users say that blending Unix and OS/2 is helpful, but easier said than done

BY AMIEL KORNEL
and MICHAEL FITZGERALD
CW STAFF

Information systems integration can sometimes seem like a chimera, and perhaps nowhere more than in personal computing.

While long promised by the computer industry, tying together PCs and workstations running disparate operating systems has remained difficult and uncommon. Few users have seamlessly linked Apple Computer, Inc. Macintoshes, Unix boxes or OS/2-based workstations to PCs running DOS.

The snail pace of desktop integration is mostly because of low user demands, says Mary Chin, a PC analyst at Dataquest, Inc. "It is simply based on the fact that there isn't that much out there besides DOS; OS/2 has not happened, and the market for connecting DOS and Macintosh is just starting to emerge," she said.

Users wishing to integrate desktop operating systems are dogged by technical problems and a lack of software tools. Integration is usually limited to data sharing or DOS emulation on Unix. Even then, users often must have the same package on both sides of the technical fence, such as Mac and DOS versions of Microsoft Corp.'s Excel. Additionally, problems with keeping even the simplest networks up and running have proven daunting to managers trying to span multiple operating systems.

At the Apollo Group, a Phoenix-based parent of several companies in the adult education market, difficulty in running a network that includes an OS/2 development system, PC local-area network servers and clients and a Sequent Computer Systems, Inc. Unix minicomputer has led to a reassessment of future directions.

"We initially wanted to migrate PC LANs out to the campus locations so that student records would be more quickly accessible," says Matt Anticevich, Apollo Group's vice-president of operations, "but just keeping the system up has been so difficult that we are thinking about using dumb terminals to connect directly to the Sequent system."

Despite the problems, users needn't despair. A few products that can help them integrate PCs are appearing. Sitka Corp., the former Sun Microsystems, Inc. TOPS Networking division, is probably the furthest along in its capability to place Macintoshes and IBM PCs on the same network.

Novell, Inc., the leading supplier of MS-DOS network software, has promised Macintosh facilities in its flagship Netware 386 product by the end of the year.

The need of the growing number of Unix users for more general-purpose applications has pushed a few developers to offer software bridges between Unix and DOS.

"Unix has a lot of power for development and graphics," says John McHugh, a PC specialist with Stasys, a consultancy in Hudson, N.H., "but a lot of general business applications have not been moved over from DOS." As a result, "The interconnect between Unix and DOS systems is becoming *the* thing to do now."

Talman-Home Savings and Loan Association, a $6.5 billion thrift based on Chicago's Southwest side, opted for that route. Last year, the organization finished a project to automate all 51 of its branches. The

bank chose Intel Corp. 80286 and 80386-based NCR Corp. PCs running DOS for all of its tellers and officers. The PCs are hooked into an IBM 3084 mainframe running MVS/XA under CICS via NCR Motorola, Inc. 68040-based Tower 400 and 600 servers running AT&T Unix 5.3. Files are converted from DOS to Unix through NCR's Branch Integration System software bridge.

The goal of Talman's approach was to take advantage of distributed client/server capabilities that now allow loan officers, for instance, to quickly access files from multiple databases on the host machine.

Marie Nadt

Unix gives Talman, an institution that is heavily dependent on monetary transactions, "more reliable security features and a more robust multitasking environment," than competing environments, says Jim Wegmann, senior vice-president of Corporate EDP and Systems.

At the same time, keeping DOS on the desktop gives Talman significant cost-savings as well as a number of stable applications.

Replaces 'floppy shoebox'

Another company connecting DOS and Unix machines is Hotelecopy, a Miami-based nationwide facsimile transmittal service. The company installed an Ethernet network that connected seven DOS-based systems with two file servers running The Santa Cruz Operation, Inc.'s Xenix System V.

Hotelecopy uses the PCs to track usage on its 2,100 remote fax machines. The PCs collect the data under DOS, but Hotelecopy analyzes the data in SBT Corp.'s Six Plus Database Accounting Library, which runs under Xenix. The company originally transferred the data via floppy disks, but this proved "cumbersome," according to Chris McMorrow, director of IS for Hotelecopy.

"We got to the point where we had shoeboxes full of floppies on a nightly basis," McMorrow says. Today, floppies are hardly used at all. Hotelecopy began talking with Atlantix Corp. (then CNA Information Systems) about its Coconet software connectivity product. Coconet allows PCs to give DOS commands to gain access to the Xenix servers, the solution Hotelecopy needed.

Often, DOS-Unix interconnectivity is being done with the help of software that allows DOS emulation within the Unix environment.

Like data transfer, however, emulation is a less-than-perfect way to integrate differing systems. "Any time you're trying to emulate, it really can end up costing you more headaches," said Dan Ness of Computer Intelligence in La Jolla, Calif.

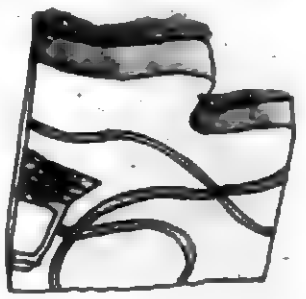
One company that nonetheless chose such an approach is the Optifacts division of Vision-Ease Corp., a maker of unfinished lens blanks for eyeglasses. Optifacts, in St. Cloud, Minn., supplies optical calculation software to lens laboratories to allow for precise fitting of glasses.

Bridging the world of Unix and DOS in its software development labs lets Optifacts widen the market for its products. Jeff Mo, lead programmer/analyst for the company, says that while most of its customers use its Xenix software product, many wanted a cheaper DOS version.

The company now writes all its source code in Xenix, then translates it through SCO's VPIX DOS under Unix tool, essentially a DOS emulator. The executable code is tested and copy-protected within DOS, then shipped to the customer.

While Unix connectivity is hot now, blending OS/2 and DOS remains an important issue for some users. "Today, all LAN development assumes a mix of OS/2 and DOS in the future," says Monte Jones, MIS director at Kentucky Fried Chicken. "Microsoft has done a great job for us, but true DOS and OS/2 integration is still a way off." ●

Charles Von Simson, a former CW senior correspondent, contributed to this report.



Kornel is a *Computerworld* senior editor, features. Fitzgerald is a *Computerworld* Chicago correspondent.

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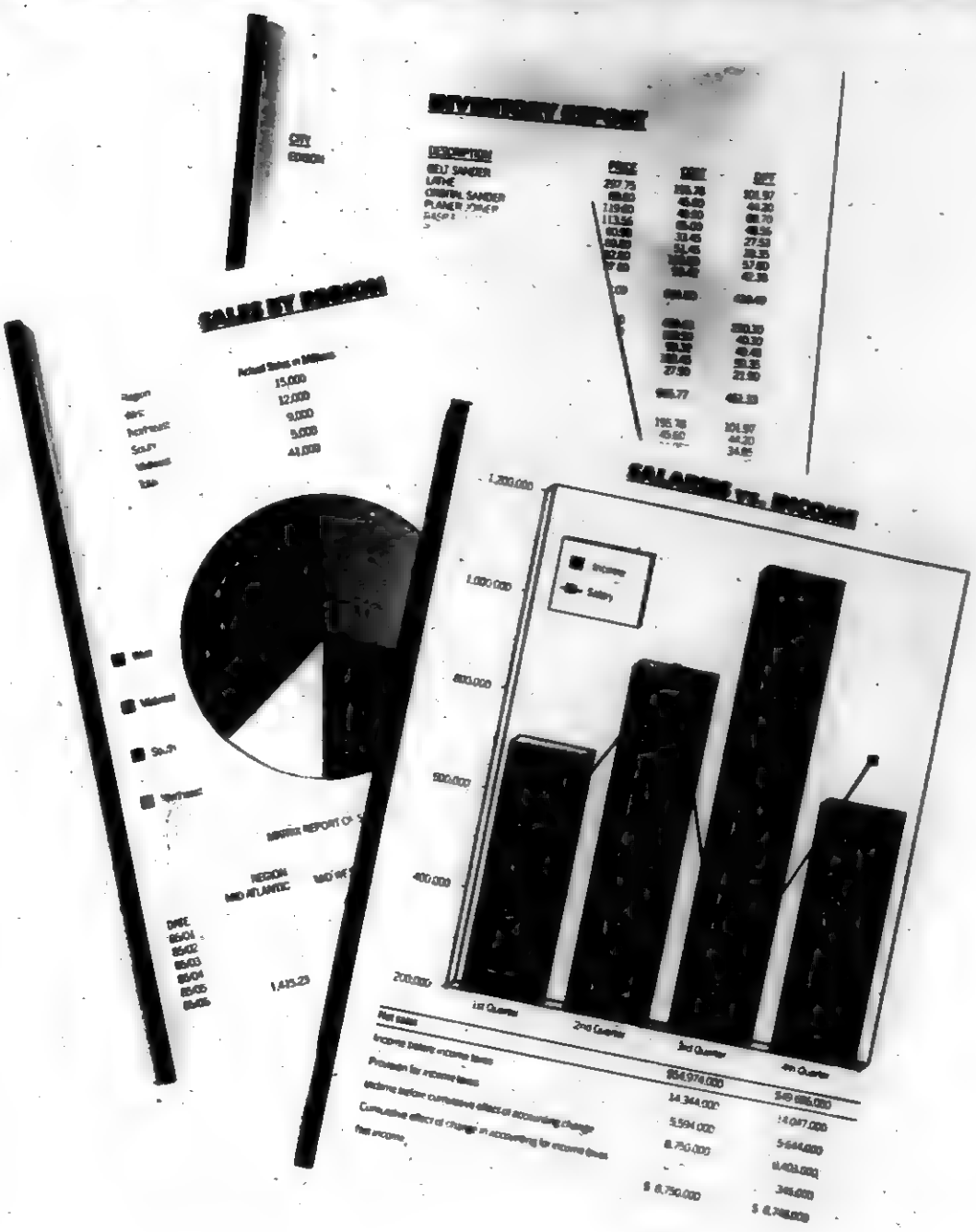

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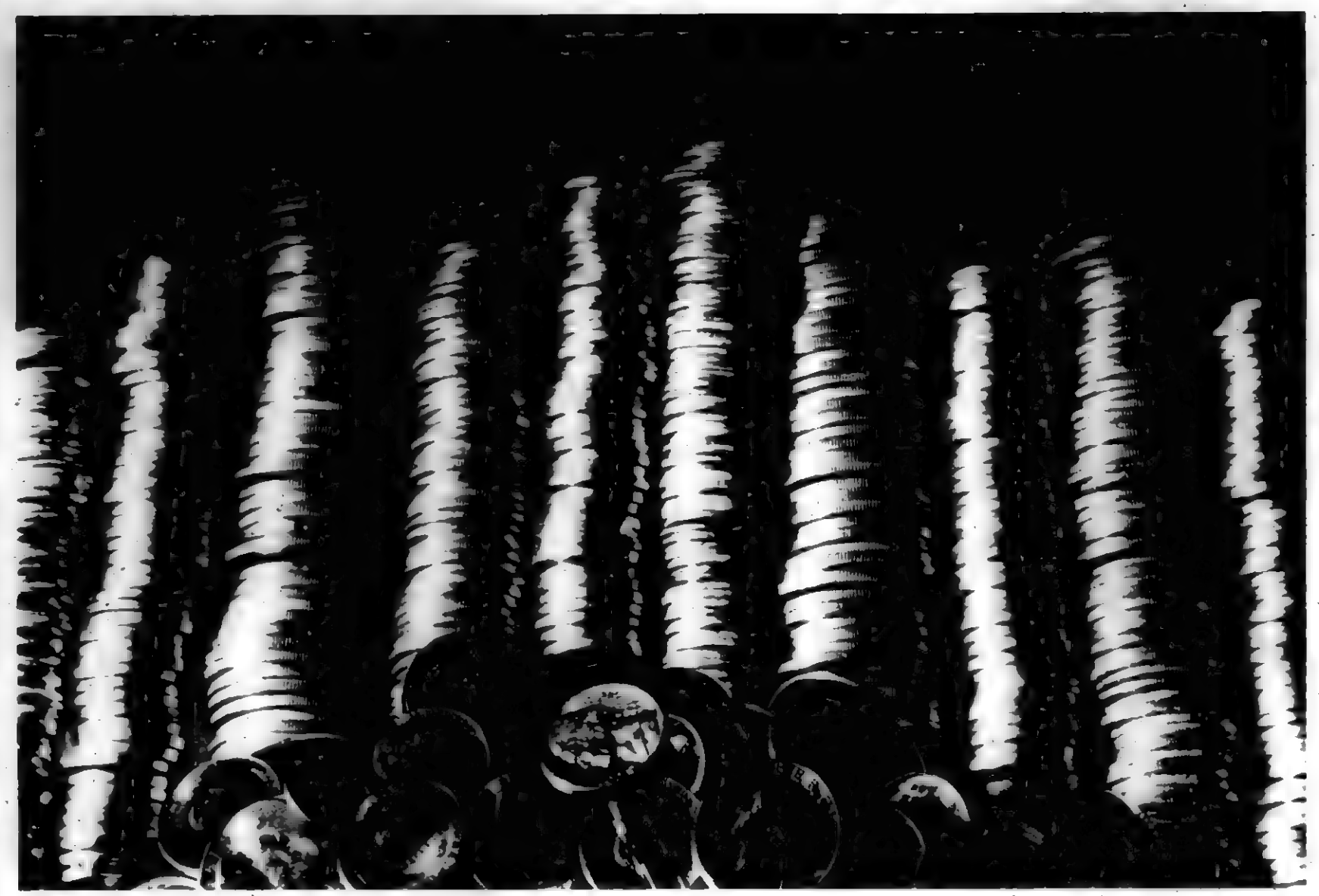

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12 tips for better systems implementation

A dozen ways to help executive management keep projects on track

BY GLEN B. BECKLEY and MICHAEL GAINES

"Sorry, it's not my job."

Few self-respecting chief executive officers or top executives would be caught dead making that remark. Yet that's exactly what happens on many systems implementation projects, particularly in midsize companies.

In many medium-size organizations — those with annual sales between $40 million and $100 million — senior management fails to take responsibility for a new information system, often delegating it to the vendor. In larger companies, the same thing occurs between a senior vice-president and the IS department.

The sad result? A good system from a competent vendor goes up in smoke or is only marginally useful. The portion of the system supporting strategic applications is often never implemented.

What executive behaviors doom system implementation projects? More importantly, what can IS organizations do to improve their success rate in implementing new systems?

To answer this question, we interviewed 15 software and hardware companies — including IBM, Hewlett-Packard Co., Digital Equipment Corp., NCR Corp., Unisys and ADP — along with implementation consultants and technical personnel in user organizations. Discussion focused on a typical midsize, closely held manufacturer or distributor with a small in-house data processing capability.

What emerged were seven critical success factors. These are problem areas that user management needs to focus on to ensure successful systems implementation: staffing, project organization, project structure, project timing, project control, project communication, vendor relationships and training.

From these factors flowed several concrete suggestions for IS managers working with CEOs and other top executives in companies of every size. Following these tips can greatly improve an organization's chances of success in implementing new systems.

Josef Gast

1) Realize the boss may be wrong. CEOs in many midsize organizations tend to draw on their experience with other kinds of projects. All too often, these prior experiences mislead the CEO into underestimating the complexity of a systems implementation project.

As a result, the company is vulnerable to implementation failures — even after successfully completing the design and acquisition stages. The end result is that projects often are not financed, staffed, managed or prepared properly for the changes inherent in implementing a new system.

2) Encourage CEO ownership. The single most important implementation problem is management's tendency to avoid "ownership" of the project.

Two types of executives typically abrogate responsibility: Skeptics tend to be overly conservative, questioning each decision and step along the way. The skeptic often appears to be resistant to the project. This confrontational style makes employees distrustful, vendors defensive and ultimately poisons the whole atmosphere.

Optimists are usually busy CEOs active in sales or business operations who simply ignore IS implementation. To vendors or the IS department they say: "I'll bet my company on your ability to install the system." They then promptly disregard the whole process and hope for the best.

Both of these extreme types have one thing in common: They place the responsibility for success in the lap of the system vendor or IS staff rather than with top management. Predictably, this tactic usually fails, because outside vendors lack the authority and detailed familiarity with the user organization to make successful implementation happen. Clearly, a careful delineation of responsibilities between the vendor and the user is very important.

3) Help the CEO pick a good project leader. A horrifying anecdote: One vendor reports that after brief consideration, the owner of one customer company gave project management responsibility to his favorite receptionist.

Projects will not get off the ground without a competent manager. This leader must create a climate of trust and remove FUD: fear, uncertainty and doubt. While technical competence in data processing is not usually a prerequisite, a broad understanding of

Beckley is a Portland, Ore.-based management consultant specializing in IS planning and implementation. Gaines is a professor of accounting information systems at Portland State University.

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company operations and good attention to detail is crucial.

The project leader must be a person who can work comfortably with top management. The person needs sufficient stature within the firm to motivate all personnel involved. Assigning someone with less clout sends the wrong message to employees about the importance of the project and the commitment of management to successful implementation.

4) Encourage appropriate CEO involvement. The right amount of CEO involvement is directly related to the size of the company and project. The depth of involvement will vary depending on specific circumstances.

Minimally, the CEO should attend key milestone meetings and participate in major design decisions, if appropriate. The CEO also should be encouraged to drop in on training sessions or other meetings related to the project to get a sense of how well the new system and related changes are being accepted. If the CEO sees bickering going on, then he should get more directly involved.

FOCUS MORE on creating a partnership with the vendor's representatives rather than viewing them as adversaries.

Expanded duties may include assigning competent personnel, creating a project organization structure, establishing a project control approach, setting up channels to ensure good communication, establishing of a vendor relationship and managing follow-up to ensure that the above processes are working as intended.

It is also useful for the CEO to participate in giving awards to employees to recognize the extra effort required in systems implementation. Small gifts, such as tickets to sporting events or the theater, demonstrate top management's recognition of and appreciation for a job well done. It also reinforces the employees' impression that top management really cares about the systems project.

While CEO involvement is crucial, too much can be just as bad as none at all. Getting top management involved in technical details such as part-numbering schemes or monitor screen designs, for instance, can frustrate employees, lead to inappropriate decisions and generally bog down implementation.

5) Establish good vendor relationships. A badly needed attitude change was summed up by one interviewee: "Americans often expect the vendor to take primary responsibility for computer projects, especially when there is a lot of money involved. Orientals, on the other hand, tend to view the vendor as an intimate partner in the project and work hard to define mutual responsibilities and to keep a good relationship going."

There's a clear lesson here for executives and IS managers: Focus more on creating a partnership with the vendor's representatives rather than viewing them as adversaries. The goal should be to establish a relationship that is more like a partnership than a traditional supplier/vendor relationship.

The CEO should establish a relationship with the vendors in which frank communication is encouraged. This lets the vendor use the CEO's knowledge of the organization to bring about a successful implementation.

6) Encourage the executive to manage the vendor's time. Vendors' charges are often based on time spent, so it is crucial to see that their time is not wasted. Yet, smaller companies often fail to manage the vendor's time, which can lead to inefficient meetings.

For example, suppose the vendor plans to meet with the controller to discuss the design of the chart of accounts. The project leader should encourage the controller to prepare a draft chart of accounts before the vendor arrives. Taking this initiative to work on the task first will ensure that the vendor's contribution will be maximized.

To keep company control, CEOs should be encouraged to give the project leader control of the vendor's on-site support time, as well as off-site billable time. The project leader should make sure that the project team understands precisely what the vendor proposes to do. The team should evaluate which tasks the vendor can do most cost-effectively and which should be done in-house.

7) Create an open climate. Many interviewees cited situations in which the CEO made the IS purchasing decision without asking for input from company personnel responsible for implementing and using the system. In this case, the CEO may own the project but the employees do not.

When they have not been convinced of the benefits of the system, employees are likely to feel insecure about the changes that a new system may bring. Ultimately, this strategy is wasteful, because it forces the vendor to go through a second sales cycle to convince users that the system will not threaten their jobs and will improve their efficiency. The company ends up paying in extra time and dollars for this form of implementation support.

Clearly, the time to gain employee support is during the sales cycle by inviting participation in system evaluation, selection and design. Users will then feel that it is their system from the very beginning.

8) Don't forget politics. CEOs should be reminded of the ever-present potential for political problems. Internal politics were cited as one of the most difficult problems to overcome during

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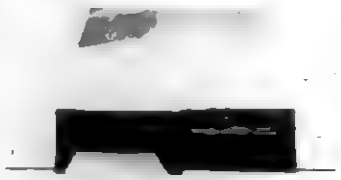

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systems implementation. One interviewee stated that as much as 25% of her firm's implementation support fees were spent dealing with internal political issues.

One of the best ways to minimize political problems is to keep all participants informed through frequent project status meetings attended by the CEO. When factional opinion leaders emerge, they should be singled out by the project leader for special attention to ensure that their concerns are being addressed.

Worries often crop up because system implementation projects can change the work environment, which threatens the internal pecking order. For example, new system responsibilities might elevate a person with relatively low status into a highly visible position. This kind of change can cause serious political battles as some individuals or groups try to maintain the status quo while others try to manipulate change to further their political interests. The remedy is to continually emphasize commitment to the project rather than commitment to an internal political faction.

9) Get the right project structure. In general, larger companies need more formal organizational structures than do smaller firms. In big companies, overall

ONE OF THE best ways to minimize political problems is to keep all participants informed through frequent project status meetings attended by the CEO.

direction of the project team usually comes from a steering committee. Typically, this committee is made up of department heads from each of the departments affected by the new system.

The committee controls the setting of priorities, major expenditures and significant design decisions. The project team reports to the steering committee on a regular basis regarding project status, major milestones reached or missed and other issues deemed important by the project team. Structure is needed because the new system requires detailed coordination between most departments in the organization.

It's very important that project leaders report to a top-level manager with clout. This person must have the authority to alter and reorder individuals' work assignments and jump-start projects stalled by organizational politics.

For example, the project leader may not have the organizational clout to convince a department to spend the necessary time getting ready to convert to the new system. He therefore must have direct access to someone who does have the necessary clout to get the job done in order to keep the project on track, on time and on budget.

In some organizations, the chief financial officer may not be the right person for this job for two reasons. First, the CFO may lack the needed clout, especially when compared with line executives in sales and operations. Second, the CFO might be more focused on the accounting systems than the operations systems.

10) Encourage realistic expectations. CEOs often do not understand or appreciate the substantial effort required of their employees in implementing a new system. They may view the installation as a "slam dunk." This unrealistic attitude is usually caused by overzealous sales professionals who underestimate the level of commitment required. Or it may be a failure of the CEO to become sufficiently involved in the project to develop an understanding of the implementation tasks.

The CEO should be advised to understand staffing needs during the sales cycle. This can be accomplished by asking the vendor to recommend a level of support consistent with the capabilities of the organization.

11) Encourage executive follow-up. When employees know that management checks their progress at project status meetings, they are much more apt to focus on getting their assigned tasks done on time.

12) Encourage good project timing. It is typical for user management to start the project too late — for example, to meet a year-end deadline — and to be optimistic regarding the effort required. After all, the sales representatives may have instilled a "warm fuzzy" feeling by creating expectations that prove to be unrealistic.

New systems often change the way a company does business, so major changes require careful planning, setup, testing and execution. Done properly, such activity takes time.

A recommended way to get a good idea of the actual time required is to ask the two or three finalist vendors during the presale period. They can work individually with user staff to develop a realistic implementation plan. Each vendor probably will have a somewhat different perspective, offer different ideas and emphasize different aspects of the project. Reconciling these differences should form the basis of a reasonable estimate of the number and type of user personnel actually required for the job.

Momentum is an important aspect of project timing that is often overlooked. Companies usually lose momentum after the first application of the system is implemented. IS managers must keep the project alive and overcome the natural resistance to starting the next application project. •

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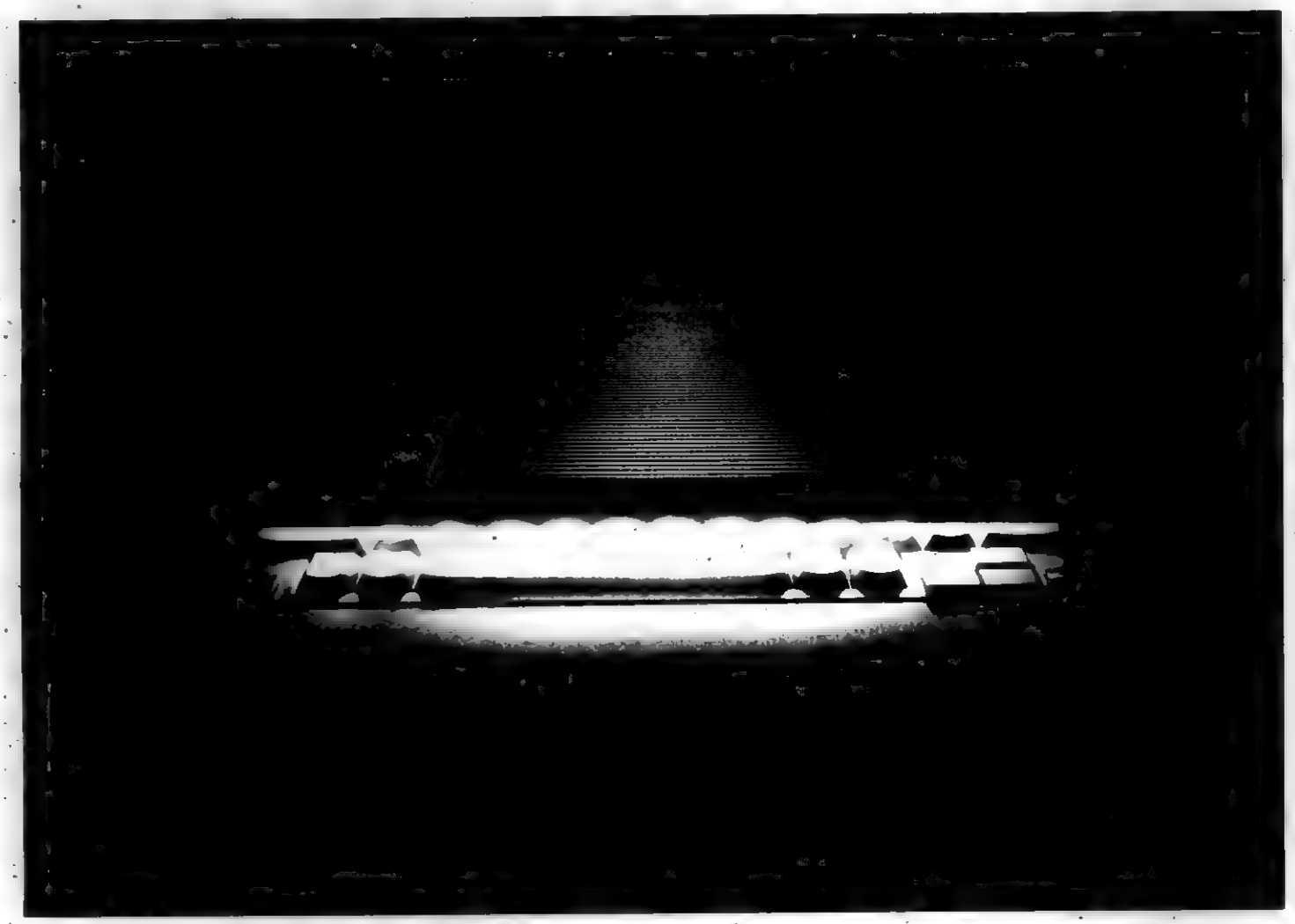

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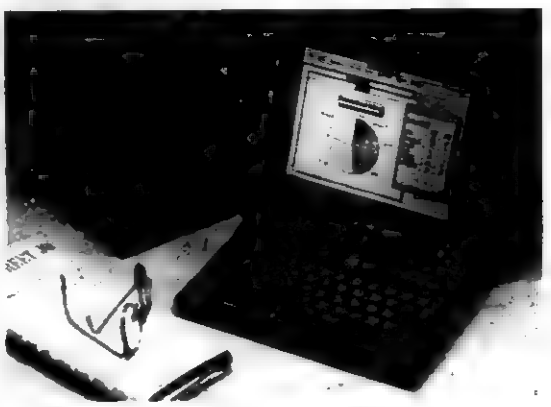

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NATIONAL

BRIEFS

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Despite a blizzard of words declaring their devotion to the customer's needs, U.S. computer firms are falling short of satisfying customers. So said market research firm **The Sierra Group, Inc.** in a recent report. Based on a survey of 1,862 information systems executives, "this year's study illustrates an across-the-board decline in customer satisfaction in all categories of vendor performance over 1989 levels," it said. Consistent user-pleaser **Hewlett-Packard Co.** topped the ratings, but on the scale of one to 10 used by Sierra, HP's score dropped from last year's 8.3 to 7.9.

■

Big Bluegrass

The **University of Kentucky** zoomed last month into the top ranks of U.S.-based universities with academic computer support, courtesy of its research partner, **IBM**. The firm sealed its new supercomputing research alliance, expected to move into full gear over the next few months, with one of the largest gifts the university has ever received: $4.9 million toward purchase of an IBM Enterprise System/3090 Model 600J.

More national briefs on page 92

Apple's savior across the sea

European branch's success keeps U.S. parent organization on growth track

BY RICHARD PASTORE
CW STAFF

With the U.S. personal computer market plodding along at a turtle's pace, vendors are leaning more heavily on jackrabbit-fast international sales. These markets, therefore, are also looming larger for U.S. users concerned about the health of their suppliers.

Robust markets in Europe and elsewhere are "crucial to the growth of these companies," said Peter Rogers, an analyst at Robertson, Stephens & Co. in New York. "That relative [U.S.] weakness has been offset by better growth in Europe and Asia."

A case in point is Apple Computer, Inc., which garnered 42% of its total net sales from overseas last quarter — a rise of 3% from the previous year. The European market generated the vast majority of this revenue.

A $1.2 billion enterprise in 1989, Paris-based Apple Europe has been logging year-to-year growth figures in the 40% ballpark — a number most mature U.S. vendors only dream of.

The major secret of Europe's success is that the market is two to three years behind the U.S. in maturity, according to Jean Calmon, Apple Europe's director of strategic business development. "There is no saturation in Europe; there is a huge potential in large corporations," he said.

Still, analysts with their ears to the European track have said that the gravy train may be slowing for the big players.

Smaller firms such as Dell Computer, Inc. and AST Research, Inc. are eating into Apple's and Compaq Computer Corp.'s European market share, according to Jim Poyner, an analyst at William K. Woodruff & Co. in Dallas.

Apple's international growth slowed 9% year-to-year this past quarter. Western Europe's business and professional PC demand is expected to grow 36% this year — down 16% from last year's growth figure, according to London-based IDC Europe.

Calmon admitted that Apple Europe's growth in corporate accounts has leveled off, but he attributed this to a redirection of company resources toward expanding the dealer channel.

"Maybe we did not devote enough resources [to the corporate market], but we had to attract some new players in the channel, and that's not an easy job," Calmon said.

"There are not a lot of people in our organization," he added. "We can't do everything at the same time."

To offset the market slowdown and competitive incursions, Apple is concentrating on expanding existing markets and penetrating new frontiers.

Currently, about 21% of the firm's revenue is derived from the education market. Growth in this niche has been "just average," according to Calmon. The problem is educational software — or, rather, the lack of it. The solution, Apple said, will come from the establishment of support programs to encourage curriculum software development.

The firm is moving slowly to establish a beachhead in Eastern Europe as well. "We don't want to get in, make money and run," Marketing Director Guerrino De Luca said of the Eastern European markets. "We will find partners and build an infrastructure."

The firm is counting on long-term rather than near-term profits from the region. "We're not expecting to make much money in the next two years," De Luca said. He added that Apple's first foray will be launched in West Germany and Stockholm. The first Apple resellers will likely open their doors in East Germany, Budapest and Moscow sometime this year, De Luca predicted.

While it may share a diluted version of the problems that beset its parent, Apple Europe is still doing well enough

Continued on page 89

Apple Europe: Future windfall?

The U.S. entrepreneurial prototype is looking to seed overseas territory

Europe offers Apple the chance for a rich harvest:

- A business and professional market that grew 52% last year and is estimated to grow 36% this year
- The lion's share of Apple's overseas revenue, which accounted for 42% of corporate sales last quarter
- A market that has yielded annual growth figures of approximately 40% for Apple

Jean Calmon

CW Chart: Marie Haines

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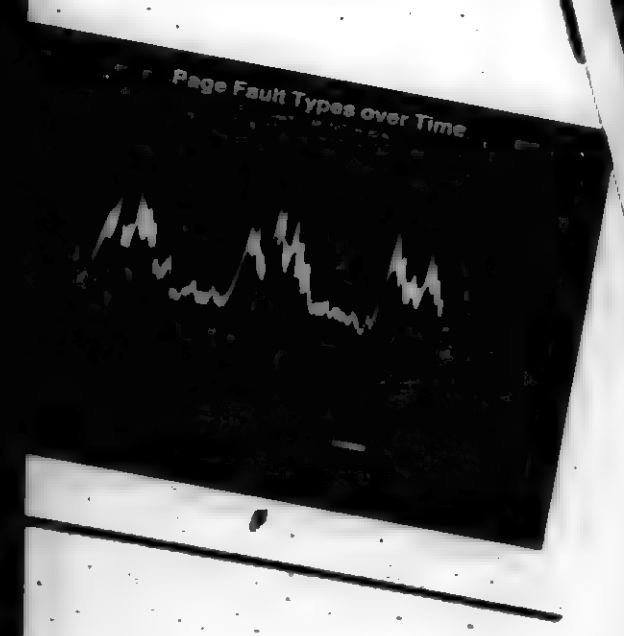

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Look-and-feel suits: Not just for spreadsheets

BY NELL MARGOLIS
CW STAFF

CHICAGO — Last year, Innovis Interactive Technologies' backyard deck designing software won its company a *Computerworld Smithsonian Award* for technology innovation. Now the Tacoma, Wash.-based division of forest products giant Weyerhauser Co. is looking for another award — this time, from a federal district court jury.

Weyerhauser late last month filed a "look and feel" copyright infringement competition suit against Buffalo, N.Y.-based Osmose Wood Preserving Co. of America, Inc., a wood treatment company with a deck design package whose user interface and visual display are, Weyerhauser contends, suspiciously familiar.

Innovis' Designcenter package, created particularly for use in lumberyards and do-it-yourself centers, was designed to appeal to even the most naive end user, said Innovis President Mark Lembersky. By following a prescribed sequence of visually indicated steps, the Weyerhauser complaint said, the would-be builder can create on a computer screen a backyard deck of his own custom design, tailored to his yard and house.

In addition to an opportunity to try out the deck on-line before building it, Designcenter supplies the would-be builder with materials and hardware requirements for the planned structure.

User confusion?

In its complaint, Weyerhauser charged that Osmose copied the copyrighted Innovis design for its Backyard Designer Series deck design software. Furthermore, Weyerhauser said, Osmose's placement of its product in the very same lumberyards and do-it-yourself centers that were scoped out as Designcenter territory is potentially confusing to users, who might not know which is which. Weyerhauser added an unfair competition count to its complaint, which seeks an injunction against Osmose and monetary damages as well.

"Our copyright and the system itself represent a significant investment for our company and an unmatched standard for retail applications of visual design technology," Lembersky said, adding that the copyright will be vigorously protected.

At least one Innovis user no doubt was left applauding the sentiment. Innovis was nominated for the *Computerworld Smithsonian Award* by Lotus Development Corp. Chairman Jim Manzi — who, with his own firm currently blazing legal trails in the much-debated area of software copyright protection, is no stranger to look-and-feel cases.

Sybase demurs on stock IPO

BY JEAN S. BOZMAN
CW STAFF

EMERYVILLE, Calif. — Sybase Inc., the 5-year-old relational database company, has decided to defer an initial public offering of its stock despite widespread Wall Street expectations that the firm would go public sometime this quarter.

"Once you go public, there's no going back," said Stewart Schuster, Sybase's marketing vice-president. "There's more than one way to raise money, but there's no way to run at 100% growth rates without having to raise the cash to finance that growth."

Analysts last week put their own spin on Sybase's retreat from the public market. "I'm suspecting they ran into short-term profitability problems," said Kenneth Burke, an analyst at Alex. Brown & Sons, Inc. "If revenues are going through the roof, [but] you're not making any money, then you come off looking deficient to potential investors."

The firm took an alternative route to additional funding and extended an investment option with Cambridge, Mass.-based minority owner Lotus Development Corp. Lotus owns 15% of Sybase's stock and has an option to purchase 10% more. Terms of the option extension were not disclosed.

Sybase executives said that they have decided to grow their $57.3 million business "substantially" in 1990, possibly doubling its size, on the strength of privately raised funds. In addition to Lotus, its list of private investors includes TRW Corp. and Apple Computer, Inc.

Still, Wall Street had been eagerly awaiting a Sybase initial public offering for months. "It's a well-known firm that's done a very good job of marketing," said Bruce Lupatkin, senior technology analyst at Hambrecht & Quist, Inc., which has made an investment in Sybase.

Sybase has not ruled out a future initial public offering, Schuster said, but as of now, there is no official target date. "One of the advantages of being a privately held company is that you are able to execute a long-term strategy rather than a quarter-to-quarter strategy," Schuster said. There is another advantage, he added: "If you can raise money at attractive prices in a private market, as opposed to a public market, it typically takes less time to consummate the deal."

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Users from Italy to Iceland rely on SAS

BY SALLY CUSACK
CW STAFF

CARY, N.C. — Norwegian officials rely on it to analyze the fishing season in the Bering Sea, financiers use it for banking applications in Rome, and an Iceland-based supermarket chain runs it for report analysis.

It is the SAS System, an integrated applications software package developed by the SAS Institute, Inc., a privately owned firm reputed to be the 11th largest in the industry. The software vendor grossed $205.6 million in 1989 worldwide sales and seems to be maintaining its upward spiral.

The firm, whose U.S. staff was increased by 220 last year, said there has never been a layoff or attrition program since it was founded in 1976.

Perhaps the steady growth pattern can be attributed to a successful combination of the marketplace, the product line and the firm's somewhat unique approach to management/employee relations.

James Goodnight, president and co-founder of SAS, said he implements a liberal brand of management. "I try to listen to what developers and managers are saying," he said. "Granted, management-by-consensus is more time-consuming, but it tends to keep people motivated and helps to satisfy their creativity. New ideas lead to new products."

The SAS System is the organization's flagship product, built on a multivendor architecture that allows it to operate with as well as under a variety of hardware and software platforms, such as those from IBM, Digital Equipment Corp., Sun Microsystems, Inc., Oracle Systems Corp. and Computer Associates International, Inc.

Originally developed as a statistics package, the product has expanded over the years to provide data access, data management and graphical presentation capabilities. The program found its first niche among graduate students in the U.S. and has gained much of its solid reputation via their word-of-mouth endorsements.

Larry Pohlman, an associate at Blackstone Financial Management in New York, said he remembers being introduced to the SAS System as a graduate student at Columbia University back in 1979. "I was really impressed with the easy-to-use language," Pohlman said, adding that whenever he has changed jobs or positions, he has always asked for the SAS System to be installed on at least one of the computers to which he has access.

The firm has attracted a very large and very loyal user base over the years. However, with the establishement of 21 subsidiaries overseas, — starting with one in the UK in 1980 — it is working on establishing the same kind of trust on an international basis.

"We're going to do it through strong, local support," said Barrett Joyner, director of U.S. marketing at SAS. "It's a combination of local employees plus technical support via our satellite network. The literature, interfaces and tutorials have been retooled in different languages, and the subsidiaries will always have access to the actual software developer."

The firm's European operation in Heidelberg, West Germany, accounts for 32% of new sales, Goodnight said.

Home support

SAS extends the same intensive support commitment to its users at home. An entire building at the SAS is devoted to classrooms for seminars, lectures and hands-on training classes; another building is under construction for producing video tutorials. The organization sends out a quarterly video newsletter to its regional user groups. The videos include question-and-answer sessions, product previews and how-to tips.

"We are continually listening to our customers' needs through surveys, ballots and over the phone," said Goodnight, who still devotes approximately 45% of his time to software applications development. He keeps a manual of documented user feedback on his desk.

"Research and development are our strongest assets," said Wink Swain, SAS' marketing communications at the Institute. "We don't want our users to hit a brick wall when they reach the culmination of a program." Swain said. SAS relies on users for a "broad-based view" of the world and allocates 45% of its revenue spending for R&D.

There are 1,400 employees at the North Carolina headquarters, which covers more than 100 acres of land and encircles a six-acre lake. Employees call it "the campus," because of the facility's unusual ambiance: Canoes float on the lake, children play on swings, and employees play chess and listen to music played softly on a grand piano. Among the large buildings "on campus" is a full-scale gymnasium complete with a Nautilus room, a two-tiered cafeteria, tennis courts, and several on-site child-care centers.

The feeling that the headquarters is a campus reflects not only the general atmosphere of the place but also the firm's origins. Before coming to SAS, Goodnight was a professor of statistics at North Carolina State University in Raleigh.

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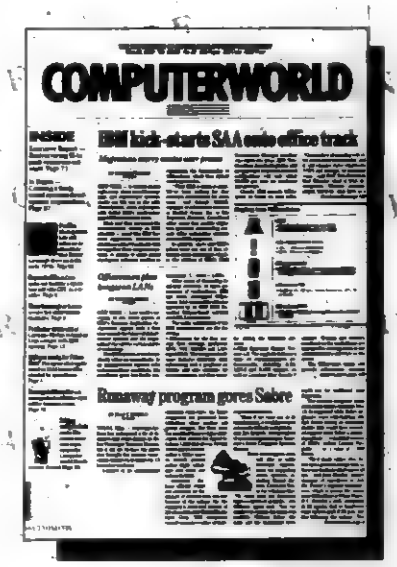
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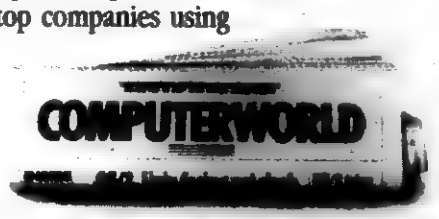

The Newsweekly of Information Systems Management

Systems integration rings bells

Regionals brand systems integration as the hottest business niche to hit

BY ELLIS BOOKER
CW STAFF

The urge to branch out is not new to telephone companies. Diversifying beyond basic telephone services, the nation's regional Bell holding companies have entered many businesses, including cellular, telephone directory publishing and telecommunications equipment sales.

Recently, however, a number of them have embarked on what is perhaps the hottest computer service niche: systems integration. Some have entered the market through acquisition; others have established partnerships with established players.

However, all are faced with defining themselves in a crowded arena while leveraging off the considerable presence of their local phone companies among potential customers.

With their cash reserves, the regionals "have no problem bellying up to the bar and spending a couple hundred million," said Rich Peterson, head of Impact Research, Inc. in Upper Montclair, N.J.

Inflated expectations

Even so, he said, the expectations of the regionals for this market may be inflated. Chicago-based Ameritech, for example, said it believes the regional market for its kind of information systems solutions will reach the $600 million ballpark by 1992. "Traditional systems companies have taken maybe 20 years to get there," Peterson said.

The leader of the pack, Peterson and others said, is Nynex Corp.'s AGS Information Service, Inc. The $200 million systems integrator became a wholly owned subsidiary of New York-based Nynex in October 1988.

Sue Luster, senior vice-president at the Mountainside, N.J., firm, said Nynex has wisely followed a hands-off management approach, letting AGS pursue its specialities in banking, manufacturing and utility firms.

"[The Nynex name] has assisted us in opening doors," Luster added, noting that AGS can and has collaborated with other nonregulated Nynex subsidiaries in jobs for its 300 or so customers.

Meanwhile, the peculiar regulatory restraints that bind their parent corporations mean these integrators must tiptoe around certain subjects. While they can build two local-area networks, for instance, they are prohibited from constructing the long-distance connection between them or even from recommending a long-distance provider.

In the case of AGS, the company was forced to spin off its manufacturing arm at the time of the Nynex purchase. In addition, like all the other regional Bell holding company-owned integrators, it is prohibited from doing facility management for customers, such as running a network management or data processing center.

Under the Modified Final Judgment that broke up Bell System in 1984, the regionals cannot manufacture equipment, process information (although a recent ruling allows them to transport it) or provide long-distance services.

When it comes to questions about complying with the Modified Final Judgment prohibitions, Luster concluded, "We have a policy: 'If in doubt, shout.' "

Last July, Philadelphia-based Bell Atlantic Corp. founded Bell Atlantic Systems Integration Co., acquiring Arlington, Va.-based American Management Systems.

According to Executive Vice-President Al Smith, the move was necessary because Ameritech was trying to capture the broader needs of Bell Atlantic's customers. "They have a very large client base with a lot of information needs that go beyond basic voice," said Smith, a former American Management Systems executive.

The unit, now with 10 customers, will concentrate on imaging, network integration and interoperability and public safety systems, Smith said, adding that his company hopes to generate about $6 million in revenue this year and $50 million within the next four years.

Smith said regional Bell holding companies can logically pursue IS jobs "because most have large, sophisticated departments." However, he added, most lack a knowledge of vertical industries — the special needs of a hospital, an insurance company or a bank, for instance.

"By and large, we're not in that business," said Dave Reberry, vice-president of systems engineering and development at US West Advanced Technologies.

The US West unit, founded in 1985, was established to serve the information and systems integration needs of US West. "I think we would suffer a little as a [systems integration] supplier until we demonstrate more internal usage," Reberry said.

US West and other regionals, he said, are undergoing a common migration toward more flexible, enterprisewide information systems.

For Chicago-based Ameritech Information Systems, Inc., a partnership with Ottawa-based systems integrator SHL Systemhouse, Inc. provided an entry point into the market. Ameritech began working with SHL in January 1988, a relationship that was continued a year later when Ameritech Information Systems was formed.

"Early on, SHL wrote the proposals," Ameritech Information Systems Vice-President of Marketing Stephen R. Nelson said. "This year, more than half of the proposals were designed and written by Ameritech people."

The Indianapolis Metropolitan Communications Agency is using the Ameritech subsidiary to design and install a $25 million countywide radio and computer-aided emergency dispatch system. The system will work in conjunction with a $10 million enhanced 911 system being provided by Indiana Bell.

However, the fact that both parts of the project come from Ameritech subsidiaries — one a systems integrator, one a phone company — "had nothing to do with our choice," said Deputy Director for Operations and Administration Jack Spriggs, who added that he selected the systems integration proposal on its own merits.

INTERNATIONAL BRIEFS

Free for all

The issue is still evolving through court decisions in the U.S., but pro-software interface copyright forces in Europe were disappointed last week. The **European Economic Community** said no to copyright protection for interface software with a draft by the European Parliament of a uniform software copyright law that contains a specific exclusion of program interfaces.

■

Lapping up the market

Next year, Tokyo-based **Nippon Steel Corp.** will be bringing a laptop or notebook-size computer to market, the firm said. When the first of the lines — most likely the laptop — hits the shelf, it could make its manufacturer the first Japanese steel firm to enter that market. If Nippon realizes its expectations, the launch will also boost the firm's computer division to fiscal 1993 sales in the $1.8 billion ballpark.

■

Sharing

It is not unusual for a growing young firm to go public; it is, however, if the firm in question is one in which **IBM** holds a stake. Nevertheless, officials at **IBM Japan Ltd.** said IBM has given a green light to **Japan Business Corp.** (JBC) to offer its shares in Japan's over-the-counter market. IBM currently owns 35% of JBC.

Apple

FROM PAGE 83

to have escaped much of the cost-cutting that trimmed U.S. operations earlier this year.

"We were not impacted by the [cost-cutting] measures," De Luca said. "I don't see that happening here."

Apple Europe has also been shielded from the low-end product vacuum that has sucked away a lot of Apple's original low-end market in the U.S., said Dan Byrne, director of European operations.

"We're less vulnerable to not having something at the low end" because Europe has never been as big a market for low-end machines as the U.S., he said. "Many countries have never even marketed the Apple II."

Adding European spice to Apple

Can a dose of imported European mind-set help turn things around at struggling Apple? Observers said that new Chief Operating Officer Michael Spindler should be able to transplant some winning strategies across the Atlantic. But even Apple executives pointed out that the former Apple Europe chief will find more than an ocean separating the U.S. and European markets.

Spindler brings to the U.S. a perspective of market differentiation he acquired dealing with the diverse nations of Europe. This will serve him well in the U.S., which presents its own market diversity in the form of corporate, education and home markets.

"In part, Spindler is the right guy for the job because he's used to localizing Apple's selling and marketing strategies across Europe," said Peter Rogers, an analyst at Robertson, Stephens & Co. in San Francisco.

Part of Spindler's job will be to pull the corporate organization together, something he has already effected in the European organization, according to Apple Europe marketing director Guerrino De Luca. However, Spindler cannot expect to find his new territory a mirror image of Europe. "What is good for us is not good in the U.S.," said Jean Calmon, director of strategic business development at Apple Europe.

One of the key differences is the dealer channel and customer makeup. Apple Europe has a close network of loyal dealers in Europe, including the highly successful Apple Centers that sell nothing but Apple products. The formula works well for the European buyer, who requires more services and guidance from dealers.

In the more mature U.S. market, however, customers are concerned with price and do not need the handholding that Apple Centers provide, Calmon said. Though Apple U.S.A. is reportedly considering the establishment of its own Apple Centers, "it's a concept that will be difficult to implement," he predicted.

Some analysts agreed. U.S. customers "like to go to a dealer that can offer them multivendor solutions," said Eric Zimits, an analyst at Rauscher Pierce Refsnes in Dallas. "I'm not sure [Apple Centers] will work over here."

RICHARD PASTORE

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BY PETER YOUNG
SPECIAL TO CW

SYDNEY, Australia — A New South Wales government authority has rejected a terminal designed and made in Australia in favor of a similarly priced, fully imported terminal.

Bull HN Information Systems, Inc., which is backing the Australian terminal, said it is so angered by the decision that it plans to reassess its participation in the Partnership for Development Program (PDP).

The terminals were being considered by the New South Wales Roads and Traffic Authority (RTA) as part of a $2.35 million to $3.9 million upgrade of its registry offices. The new machines passed technical tests with flying colors, according to several sources, but the RTA recommended that the order for 1,500 units be placed with either Italy's Ing. C. Olivetti & Co. or U.S.-based NCR Corp. Neither company has plants in Australia, so presumably their terminals would have to come in from overseas.

Bull HN general manager Graham Moore said the decision made a mockery of the PDP, of which his company was the first member.

"This was an example of how things were supposed to work under the program," he said. "ARDC, the Brisbane-based company making the terminals, is a small, battling Australian operation with an innovative product. At considerable expense, we put in the resources to validate it and make it a reliable world-class product. But in the end, RTA told Bull it considered the Australian terminal 'too risky.' "

The decision was made the same week as the first units began rolling off the production line in Bull's North Ryde plant, which has been certified by both Standards Australia and Telecom.

"The government hasn't met its side of the bargain," Moore claimed. "How can I go to my parent company and convince them to pick up a product if an Australian state government isn't even willing to pick it up?"

Geoff Deacon, director of registration and licensing for the RTA, said the ARDC terminals have a bright future. However, they formed only one part of the integrated point-of-sale systems going into the RTA's 137 registry offices, he said. Other components included optical character recognition and printers connected to Fujitsu Ltd. systems based on Intel Corp. 80386 chips.

In addition, the ARDC system existed only in prototype form until recently, and the RTA project called for all offices to go on-line simultaneously in real time by February 1991.

"Looking at that time frame, there were risks. Combined with that, Bull did not have as good an overall proposal as other companies," Deacon said. He confirmed that a final recommendation has been made on the project, but that contract negotiations with the chosen supplier have not yet been finalized.

Young is Queensland editor at Computerworld Australia.

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NATIONAL BRIEFS

Executive shuffle

An executive reorganization at Mips Computer Systems, Inc. — aimed, according to Mips, at positioning the Sunnyvale, Calif.-based reduced instruction set computing pioneer to break the $1 billion barrier before the decade's end — last week put former Apple Computer, Inc. executive **Charles Boesenberg** in the president's office. With the new president concentrating on customer-related issues, Chairman and Chief Executive Officer **Robert Miller** said he will focus on the strategic/competitive/technical side of the business. Looking out (and out looking) for strategic allies will be former Executive Vice-President of Field Operations **William Jobe** — as of last week, president of the newly formed Mips Technology Development Group.

■

Like parent, like sub

Norristown, Pa.-based computer maintenance vendor **Granada Computer Services, Inc.**'s recent acquisition of React Corp., a $10 million maintenance firm in Menlo Park, Calif., extends the acquisitor's presence into 50 U.S. cities and some 1,000 customer sites. Granada's president said that he was pleased; so, no doubt, is $2.5 billion UK conglomerate **Granada Group PLC**, which owns not only the Norristown firm's British parent but also Granada Computer Services International, reputed to be Europe's largest independent computer maintenance firm.

COMPUTER CAREERS

Is integration all it seems?

A boon to excellent managers may be a threat to corporate also-rans

BY CHRISTOPHER LINDQUIST
CW STAFF

In the private sector, the U.S. systems integration business will grow at a compounded rate of 29% per year through 1994, according to a study by market research firm Input, Inc. In the government arena, systems integration will grow 17% per year, the company says. Worldwide, the overall growth should come in at 24% per year.

The future certainly looks rosy for systems integrators. But will the industry's growth create a booming demand for information systems professionals? Not necessarily.

Companies are hiring systems integrators to improve the efficiency and connectivity of their information systems. As a result, they will expect to get by with fewer IS professionals on staff, says Jay Gaines, an executive recruiter in New York. Integrators will be hiring, but they will also be displacing IS professionals employed in-house today.

"To the degree that systems integration is successful, it probably means that there are going to be fewer overall jobs," Gaines says. Growth of systems integration will eliminate opportunities for "marginal" IS professionals. Middle managers who made it to their positions without distinguishing themselves will bear the brunt of the cutbacks, he adds.

Not everyone totally agrees. That scenario may unfold but not anytime soon, says Ed Hogan, a managing associate at the consulting firm Coopers & Lybrand, based in Washington, D.C. IS staffs will keep busy with day-to-day maintenance and operations, Hogan says. Furthermore, systems integration projects may even add a little to the head count at corporate IS organizations rather than reducing it as firms hire people to take care of new applications.

Don't expect the growth of systems integration to lead to the creation of a lot of start-up companies either, says Len Doherty, vice-president of Gustin Partners, an executive search firm specializing in the field. The jobs that systems integrators create will tend to be at big, established players such as Computer Sciences Corp. and Andersen Consulting, he says.

The firms that will be prime players are already established because of the deep pockets it takes to finance the business, Doherty says. Executives at some integrators are already having second thoughts about the business because profit margins are slimmer than expected, he says: "The bloom is off the rose. While systems integration is a natural evolution of the industry, it is not a field for small players."

IS professionals who would like to update their resumes to get in sync with the systems integration trend would be wise to consider the requirements of specific firms. "I've seen a lot of mismatches," according to Doug Aldrich, a vice-president at Booz, Allen & Hamilton, Inc., a New York-based consulting firm that has branched into systems integration.

People should find an integrator whose methods match their own, he says. In general, systems integration people must be more flexible than corporate IS professionals, Aldrich adds. They must focus on delivering a working system on schedule rather than on controls and procedures, even when it means bending rules or cutting corners.

A recent survey of systems integration executives by the trade association Adapso identified skills that systems integrators look for in employees.

The executives pointed to project management as the most critical skill: One-third cited it as the most essential one for their business. They said that lack of systems integration management skills is the leading reason for refusing to take on a project.

> **GROWTH OF SYSTEMS integration will eliminate opportunities for "marginal" IS professionals. Middle managers who made it to their positions without distinguishing themselves will bear the brunt of the cutbacks.**
>
> JAY GAINES
> EXECUTIVE RECRUITER

A good project manager can plan, organize and control systems integration projects, extracting the best performance from numerous groups with help from "a large portion of people skills," Hogan says.

Some integrators like to see people with project management experience who can hit the ground running, Aldrich says. Others, however, prefer to take people directly out of college — they find experienced IS people have to "unlearn" inappropriate methods. Such employers usually provide extensive training for their recruits.

People with a master's degree in business are often very valuable to systems integrators, Aldrich adds.

Other skills identified in the Adapso survey include the following:

- Knowledge of systems design and architecture.
- Software requirements analysis — the ability to work with users in determining software features and functions.
- Personal communication — reading, writing, speaking and listening skills.

Integrators are also keen on people who understand a particular client's business, especially as they seek to forge long-term relationships with their customers. Companies hire people to work under a specific contract after identifying the skills the contract will call for, such as knowledge of banking or manufacturing, Doherty says.

There are many industries that interest integrators, Aldrich says. "It is not important what business you know, as long as you get one and get good at it."

Lindquist is a Computerworld copy editor.

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Senior Computer Systems Analyst wanted to analyze complex systems requirements; design, develop and implement banking, financial, accounting and government systems on IBM 3090 mainframes using DB2, SQL, CICS, JES, CSP, ORACLE and ADABAS/NATURAL software. COBOL, PASCAL and C languages on MVS, VM and DOS operating systems. Requires Bachelor's degree in Electrical Engineering, Computer Engineering or Computer Science and two years experience in the job offered or two years related experience as a Computer Systems Analyst, Computer Software Engineer or Computer Consultant. $48,000.00 per year, 40 hrs per wk. Send resume to 7310 Woodward Ave., Rm 415, Detroit, MI 48202. Ref #53290 Employer Paid Ad.

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A Monsanto Company plant seeks an entry-level Programmer/Analyst to directly support the implementation of a Computer Integrated Enterprise plan in the process chemical manufacturing business. We require programming and PC applications experience (COBOL, 4 GL preferred). Network management, data communications, HP3000 and IBM OS JCL experience highly desirable. In addition, candidates should be customer-focused, capable of handling multiple responsibilities, and demonstrate initiative and willingness to learn. There is potential to move into applications development utilizing networking technology.

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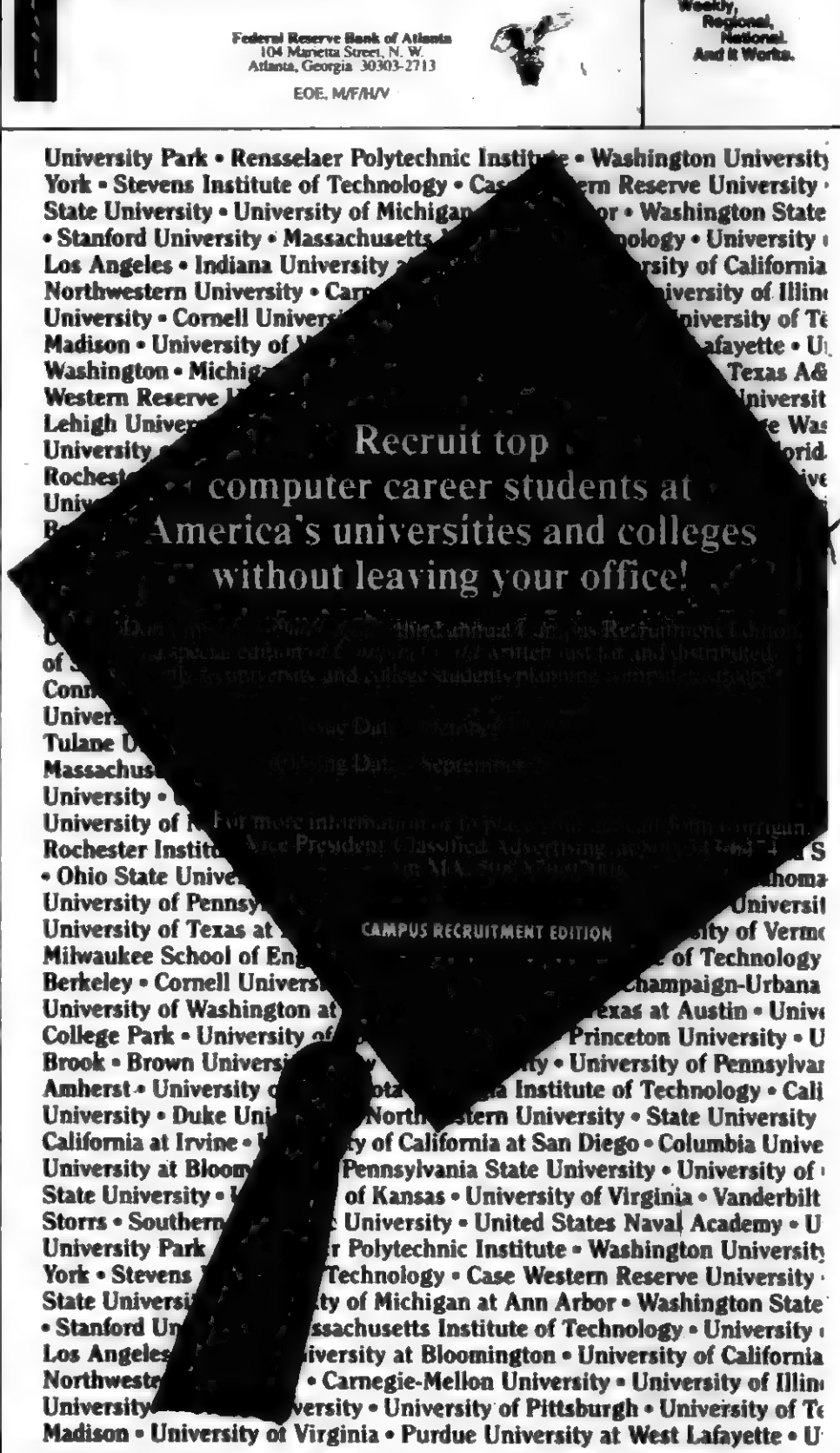

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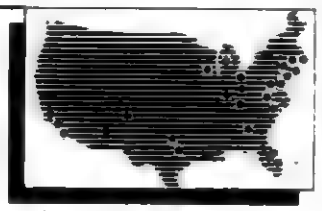

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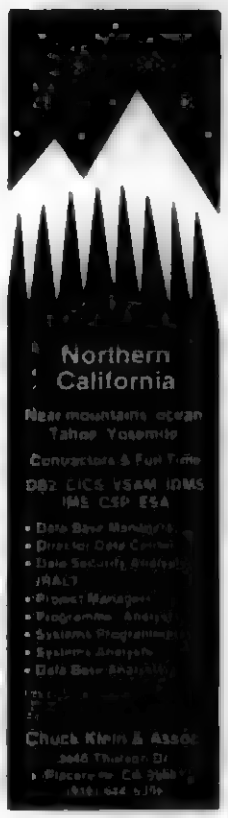

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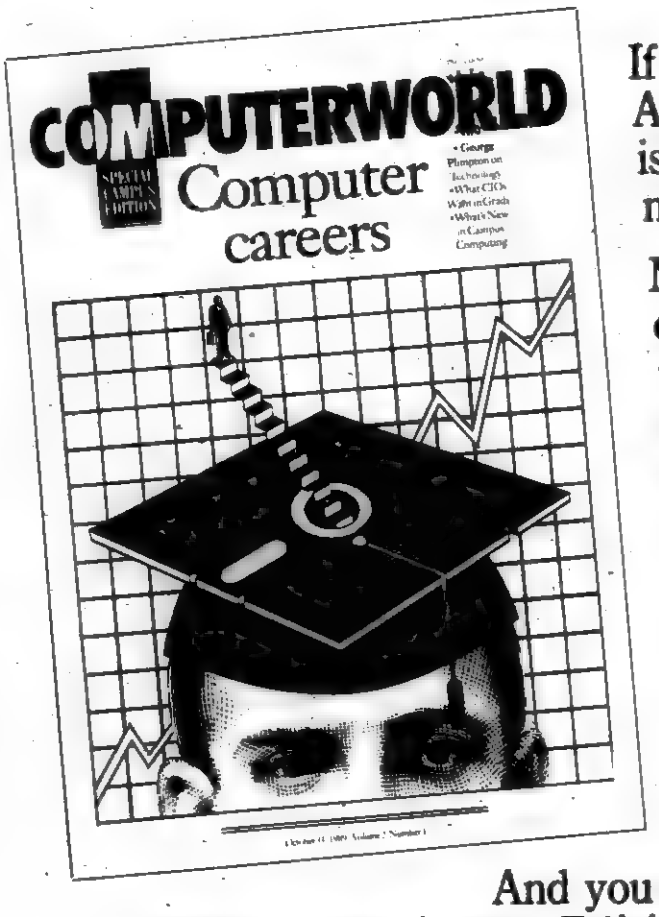

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(subject to revision)

- MIS salary and job satisfaction survey
- Where are the best jobs?/What positions are hot?
- Experiences of recent MIS graduates in their first jobs and what helped them in school
- The MIS career ladder
- Profiles of acclaimed top level MIS executives
- The strategic advantage of computers and how they play a key role in running a company

Get ready for GNU software

Free Software Foundation has created a suite of giveaway programs

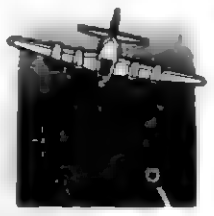
BY SIMSON L. GARFINKEL
SPECIAL TO CW

To Richard M. Stallman, one of the world's most prolific programmers, proprietary software has put millions of people in a dilemma. As computer users, we are routinely faced with the choice of becoming criminals by making copies of programs for friends or being bad neighbors by refusing to make copies.

Six years ago, Stallman set out to change that situation. "My fundamental motivation," he says, "was to be part of a software sharing community in which people can give copies of programs to their friends without having to hide it and without having to be sneaky. I decided that I was going to do it even if I had to write all the software myself."

What might have been an unthinkable task for others has been a mere matter of coding for Stallman, who by many accounts may be the world's best programmer. He set out to create an entire suite of computer programs — word processing packages, spreadsheets, compilers, debuggers and the like — and an operating system on which it would run. He modeled his project on the Unix operating system and called it GNU, a tail-chasing acronym for Gnu's Not Unix.

Stallman's first program, a powerful text editor called GNU Emacs, is becoming the standard Unix programmer's editor. GNU Emacs runs on more than 50 different computer systems, and anyone with a copy of it can give one to anyone else.



Stallman, now president of the Free Software Foundation in Cambridge, Mass., coordinates seven paid programmers and more than 200 volunteers across the country. Other paid employees write documentation and fill orders for manuals and tapes. The foundation earned $330,000 in 1989 and received $267,000 in gifts from companies and individuals. Last month, Stallman was awarded a $240,000 "Genius Grant" from the MacArthur Foundation.

Stallman's second program, the GNU C Compiler (GCC), has been ported to more than 13 microprocessors. In many cases, it generates code that is faster and more compact than the output of compilers that cost thousands of dollars. GCC comes with workstations sold by Data General Corp. and Next, Inc., while Lotus Development Corp. uses it to compile its Unix-based applications.

Firms use free software because it is better than the commercially available programs it replaces. Because users have the source code, they can isolate and repair bugs themselves. Fixes are incorporated into the master sources at the foundation and are made available over computer networks. The programs are brimming with features and options added by thousands of programmers from all around the world.

Nevertheless, many firms are hesitant to use free software because of one concern: support. The Free Software Foundation has no telephone support lines, no customer applications engineers and no accountability to its customers. The programs come as source code; customers must compile and install the programs for themselves.

Stallman and others do answer questions and fix bugs, generally faster than their commercial competition, and the foundation distributes a list of more than 50 consultants who have made GNU software a speciality. For years, Stallman has maintained that as soon as his software becomes popular, firms will be started up to support it.

One such company has already appeared — Cygnus Support in Palo Alto, Calif. The company is headed by Michael Tiemann, author of G++, which is the GNU compiler for the object-oriented C++ programming language. Tiemann says that his company will "satisfy the need that free software is generating."

Like GNU software in general, customers can use a Cygnus program on machines from a multitude of manufacturers. They can also redistribute it without paying royalties or signing licensing agreements. In its first quarter, Cygnus wrote $200,000 worth of support contracts.

Meanwhile, back in Cambridge, Stallman and his band of programmers press on. Programs currently under development include an X Window System-based spreadsheet and a symbolic math system. The group expects to turn out an entire Mach-based operating system for IBM machines based on Intel Corp.'s 80386 and for Sun Microsystems, Inc. workstations before the end of next year.

One thing that might put a damper on the GNU project is the increasing prevalence of software patents. Since the mid-1980s, the federal government has been granting patents on computer algorithms. Last year, Refac Technology Development Corp. in New York filed suit against Lotus and several other spreadsheet vendors, claiming that their best-selling programs infringe on a patent Refac purchased.

"We are asking what is considered a reasonable royalty: 5% on the net selling price," Refac Chairman Eugene Lang says.

While such patents present problems for all software developers, they could pose an insurmountable barrier to developers such as Stallman who want their programs freely distributed and thus could not pay royalties.

Garfinkel is a free-lance writer and computer consultant based in Cambridge, Mass.

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AT Model 239	$1,075	$1,325	$700
AT Model 339	$1,375	$1,400	$900
PS/2 Model 50Z	$1,650	$2,000	$2525
PS/2 Model 60	$2,500	$2,600	$2,400
Compaq Portable II	$975	$1,150	$875
Portable III	$2,175	$2,500	$1,900
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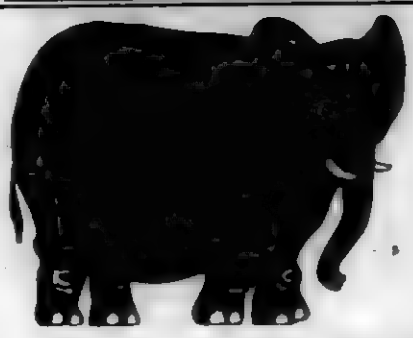

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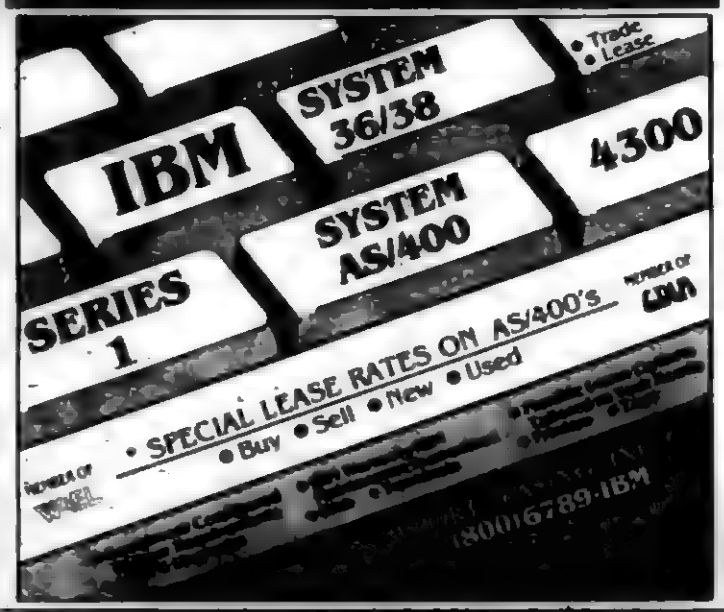

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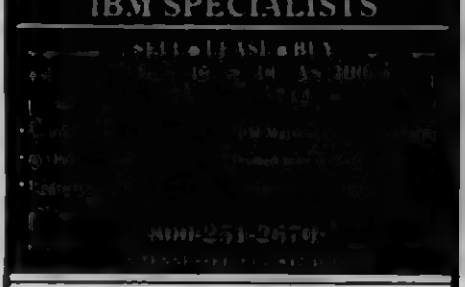

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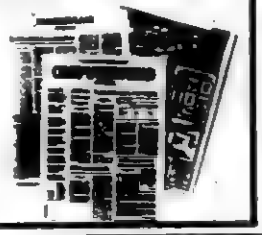

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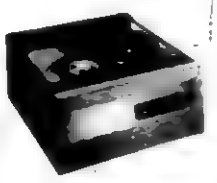

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Building a computer teacher

Innovative tools let teachers create their own computer-aided instruction

BY CHARLES P. LECHT
SPECIAL TO CW

Let's face it: Until now, the sensory experience of computer-aided instruction (CAI) has been limited. We hear a few robotic sounding words and whiny beeps, both of which soon become more of an annoyance than a help. As for graphics, what we view is hardly more than what an ill-prepared teacher might write on a chalkboard.

To date, most CAI programs have been a bore. The exceptions often involved expensive technology that most people could not afford. Some companies have created credible courses, but too frequently the programs are the subsidized offspring of other money-making endeavors. We are still waiting for the day when we can routinely unwrap a training program as we do a new spreadsheet program, load it into a personal computer and begin an enjoyable learning experience.

The major obstacle to effective CAI is not technology. It is the difficulty of writing scripts that don't require a teacher to be present during study to explain things and to motivate the student.

It should come as no surprise that this problem defies a straightforward technological solution. Just as word processors do nothing to help an author devise a good plot, CAI authoring systems offer little assistance in the creative aspects of designing a course. Despite an awareness of this situation, many companies assign the preparation of CAI programs to people who aren't qualified in these creative areas.

This lack of respect for content is aggravated when companies develop CAI programs for courses that have not been taught in the classroom. In CAI, overcoming the technical problems is a big enough chore; trying to design new roads without a map is too much to take on. Companies should not try to develop CAI programs where there is no classroom experience with the material involved.

The issue of CAI authoring languages also rears its ugly head. Most of the ones that I've seen are awful. They suggest that their creators have had too much experience at programming and not enough at teaching. They discourage the educated and creative scriptwriter from helping prepare a course. Instead, they encourage the involvement of people skilled at the manipulation of programming symbols. Indeed, many companies hire CAI scriptwriters for their understanding of an authoring language rather than teaching acumen. The result is programs that emphasize style and minimize substance.

Given these problems, there seems to be no substitute for a human teacher. However, there is some hope for improvement in CAI in the immediate future. The problems of hardware technology and authoring languages are well on their way to being overcome in today's computer world.

The stage has been set for a quantum leap in CAI quality by two developments: the latest increases in processing power of relatively inexpensive desktop computers and the emergence of readily available, off-the-shelf multimedia boards for them.

There are sound boards that allow capture and storage of voice and music onto a hard disk. The boards replay the sounds through standard speakers that can be found just about anywhere. The memory capacity needed to store this sound is still too large, but it's just a matter of time before this obstacle will be overcome.

Then there's compact disc technology. For the moment, this technology is limited to read-only discs, but some companies have already developed rewritable optical discs and will announce their availability this year. Thus, today's sight-only systems will soon be augmented by sound.

There are also new video capture boards that let a computer store full-motion video on a hard disk and replay it on today's high-quality computer displays. This video footage also takes up too much memory; again, however, it's only a matter of time before this situation will be improved.

With these technological developments, we will see substantial improvement in CAI graphics through the use of recently developed graphics tools. Companies will create great charts, pictures and even movies that they can store and re-call for use in CAI courses.

With the problems of sound and sight overcome, we only have to deal with the authoring language. It isn't surprising that this software technology lags far behind the hardware. However, this shouldn't be the case for long.

Today's icon-driven office systems offer a clue to the future of CAI authoring systems. The complicated coding and spreadsheet scheduling that characterize today's authoring systems will give way to the simple selection of icons on a screen in a process familiar to creators of educational materials.

With this development, we will overcome most of the problems hindering CAI. There's a bright future for CAI users and an even brighter one for good educational scriptwriters.

Lecht is an IDG News Service correspondent based in Tokyo.

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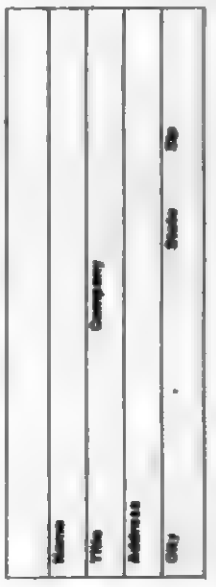

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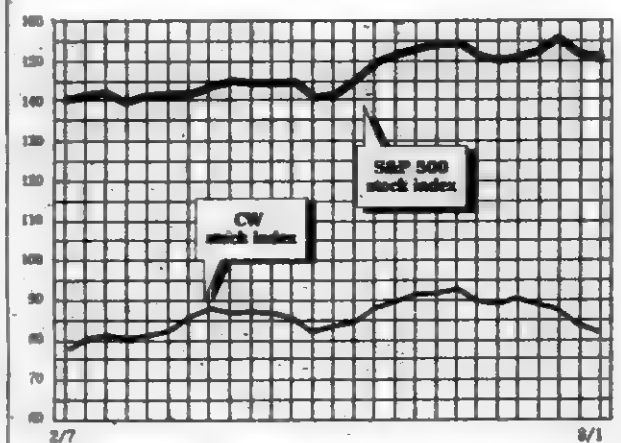
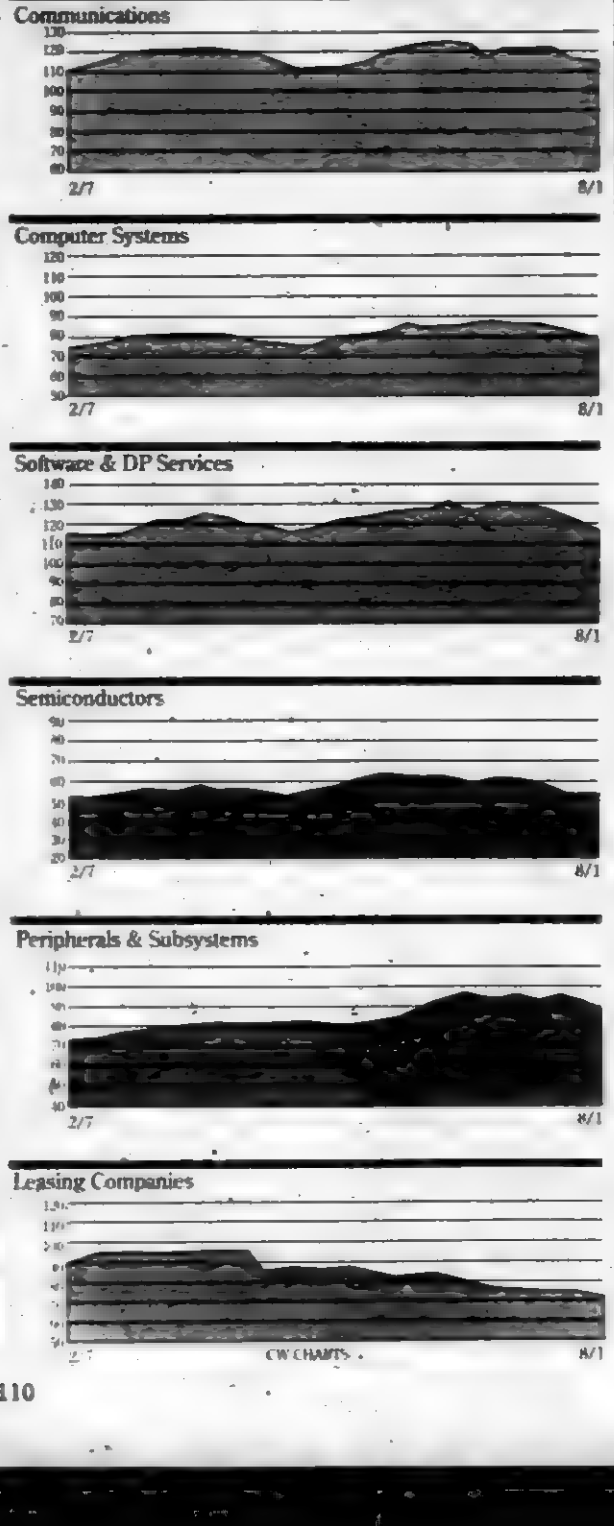


Indexes	Last Week	This Week
Communications	117.2	116.7
Computer Systems	83.1	79.3
Software & DP Services	120.6	117.7
Semiconductors	54.0	53.3
Peripherals & Subsystems	92.3	89.9
Leasing Companies	75.7	71.8
Composite Index	84.6	82.3
S&P 500 Index	150.9	150.2



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Communications and Network Services

EXCH		52-WEEK RANGE		PRICE CLOSE AUGUST 1, 1990	WEEK NET CHNGE	WEEK PCT CHNGE
N	AMERICAN INFO TECHS CORP	68	55	61.625	3.3	5.6
Q	ANDREW CORP	28	19	19.25	-2.3	-10.5
Q	ARTEL COMM CORP	10	4	4	-0.3	-5.9
N	AT&T	47	36	38.75	-0.6	-1.7
Q	AVANTEK INC	7	2	2.875	-0.1	-4.2
N	AYDIN CORP	21	13	13.25	-0.3	-1.9
N	BELL ATLANTIC CORP	57	43	49.875	2.5	5.3
N	BELLSOUTH CORP	59	49	56	2.9	5.5
Q	COMPRESSION LABS INC	16	7	14.5	-0.4	-2.5
Q	CONTEL CORP	37	23	33.625	0.9	2.7
Q	DATA SWITCH CORP	4	2	3.75	0.3	7.1
Q	DIGITAL COMM ASSOC	27	17	22.5	-0.8	-3.2
Q	DYNATECH CORP	21	15	18.125	0.0	0.0
Q	FIBRONICS INTNL INC	13	5	10.75	-0.4	-3.4
Q	GANDALF TECHNOLOGIES	7	2	3	-0.3	-9.4
N	GENERAL DATACOMM INDS	7	3	3.625	0.0	0.0
N	GTE CORP	36	28	29.25	1.1	4.0
Q	INFOTRON SYS CORP	11	3	3.25	0.1	4.0
N	ITT CORP	65	51	58	0.0	0.0
N	M A COM INC	8	3	5.125	0.5	10.8
Q	MCI COMMUNICATIONS CORP	49	31	37	-1.0	-2.6
N	NETWORK EQUIP TECH INC	34	7	7	-0.8	-9.7
Q	NETWORK SYS CORP	15	7	10.875	-1.0	-8.4
N	NORTHERN TELECOM LTD	30	20	27	0.8	2.9
Q	NOVELL INC	58	24	46	-0.3	-0.5
N	NYNEX CORP	92	74	76.625	1.6	2.2
N	PACIFIC TELESIS GROUP	52	40	42.875	1.4	3.3
A	PENRIL CORP	9	4	7.625	-0.3	-3.2
N	SCIENTIFIC ATLANTA INC	29	19	25.625	-2.1	-7.7
N	SOUTHWESTERN BELL CORP	65	51	54.75	2.8	5.0
Q	3 COM CORP	19	10	15.875	-0.5	-3.1
N	U S WEST INC	41	33	37.5	2.0	5.6

Computer Systems

EXCH		52-WEEK RANGE		PRICE CLOSE AUGUST 1, 1990	WEEK NET CHNGE	WEEK PCT CHNGE
Q	ALLIANT COMPUTER SYS	9	4	4.25	-0.1	-2.9
Q	ALPHA MICROSYSTEMS	8	2	2.407	-0.2	-8.3
Q	ALTOS COMPUTER SYS	8	5	8.25	0.0	0.0
A	AMDAHL CORP	19	11	15.25	-1.5	-9.0
Q	APPLE COMPUTER INC	50	32	42.375	0.1	0.3
Q	AST RESH INC	26	7	21.125	-1.5	-6.6
N	BOLT BERANEK & NEWMAN	9	4	4.25	-0.4	-8.1
N	COMPAQ COMPUTER CORP	66	37	54.75	-4.6	-7.8
N	COMMODORE INTNL	12	8	8.875	-0.1	-1.8
N	CONTROL DATA CORP	22	18	15.625	-1.3	-7.4
N	CRAY RESH INC	51	31	43.5	-1.5	-3.3
N	DATA GEN CORP	17	7	7.5	-1.4	-15.5
N	DATAPOINT CORP	6	2	1.625	-0.5	-23.5
Q	DELL COMPUTER CORP	14	5	12	0.3	2.1
N	DIGITAL EQUIP CORP	103	70	74.375	-0.5	-0.7
N	FLOATING POINT SYS INC	4	0	2.375	-0.1	-5.0
N	HARRIS CORP	40	28	30.375	-2.4	-7.3
N	HEWLETT PACKARD CO	58	40	42.375	-2.8	-6.1
N	HONEYWELL INC	112	73	101.75	-2.3	-2.2
N	IBM	123	98	111.625	-3.1	-2.7
Q	INFORMATION INTL INC	18	12	12.625	-0.4	-2.9
Q	IPL SYS INC	14	5	11.5	1.3	12.2
N	MAI BASIC FOUR INC	6	2	2	0.0	0.0
N	MATSUSHITA ELEC INDL LTD	180	123	136.5	-3.5	-2.5
Q	MENTOR GRAPHICS CORP	26	14	15.75	-1.0	-6.0
N	MSI INC	2	0	0.281	0.0	-10.2
N	NCR CORP	72	55	69.25	0.3	0.4
Q	PYRAMID TECHNOLOGY	36	12	23	-2.0	-8.0
Q	SEQUENT COMP SYS INC	34	13	26.5	-2.5	-8.6
Q	SUN MICROSYSTEM INC	37	13	31.5	-2.0	-6.0
Q	SYMBOLICS INC	2	0	0.375	-0.1	-14.4
N	TANDEM COMPUTERS INC	30	18	18.875	-0.4	-1.9
N	TANDY CORP	48	30	37.375	1.0	2.7
N	ULTIMATE CORP	11	5	6	-1.1	-15.8
N	UNISYS CORP	23	11	11.125	-0.8	-6.3
A	WANG LABS INC	7	4	4	-0.1	-3.0

Software & DP Services

EXCH		52-WEEK RANGE		PRICE CLOSE AUGUST 1, 1990	WEEK NET CHNGE	WEEK PCT CHNGE
Q	AMERICAN MGMT SYS INC	20	11	17.5	0.3	1.4
Q	AMERICAN SOFTWARE INC	18	10	14.125	-1.0	-6.6
N	ANACOMP INC	7	2	3	0.5	20.0
Q	ANALYSTS INTL CORP	24	14	19.5	-0.5	-2.5
Q	ASHTON TATE	15	8	10.375	-0.1	-1.2
Q	ASK COMPUTER SYS INC	14	7	9.625	-0.4	-3.8
N	AUTO DATA PROCESSING	60	40	52.75	-2.3	-4.1
Q	AUTODESK INC	60	33	53.25	-0.1	-0.2
Q	BMC SOFTWARE INC	30	14	25.5	-0.5	-1.9
A	BUSINESSLAND INC	14	7	6.875	-0.4	-5.2
Q	COGNOS INC	10	4	9.625	-0.1	-1.3
N	COMPUTER ASSOC INTL INC	20	8	8.375	-1.1	-11.8
Q	COMPUTER HORIZONS CORP	17	7	16	-0.3	-1.5
N	COMPUTER SCIENCES CORP	59	40	43.125	-0.4	-0.9
N	COMPUTER TASK GROUP INC	14	9	10.5	0.0	0.0
Q	COMSHARE INC	25	15	21	-0.8	-3.4
Q	CORPORATE SOFTWARE	16	8	14.5	0.4	2.7
N	GENERAL MTRS (CLS E)	38	24	33.25	-0.5	-1.5
Q	GOAL SYSTEMS INTL	18	10	14.875	-0.1	-0.8
Q	HOGAN SYS INC	7	3	3.25	-0.1	-3.7
Q	INFORMIX CORP	18	8	10.375	-0.8	-6.7
Q	INTELLICORP INC	8	4	4.875	-0.3	-4.9
Q	LEGENT CORP	32	19	23.5	-1.3	-5.1
Q	LOTUS DEV CORP	39	21	23	0.0	0.0
Q	MICROSOFT CORP	81	27	66.75	-4.8	-6.6
Q	NATIONAL DATA CORP	35	11	12.875	-1.1	-8.0
N	ON LINE SOFTWARE INTL INC	11	6	7	-0.5	-6.7
Q	ORACLE SYS CORP	188	15	17.125	-0.5	-2.8
N	PANSOPHIC SYS INC	19	10	12.625	-0.3	-1.9
Q	PHOENIX TECHNOLOGIES INC	6	2	3.25	-0.3	-7.1
N	POLICY MGMT SYS CORP	43	30	43.375	0.0	0.0
Q	PROGRAMMING & SYS INC	25	16	18.25	-0.8	-3.9
Q	RELATIONAL TECH INC	10	5	4.875	-0.6	-11.4
N	REYNOLDS & REYNOLDS CO	27	19	19.625	-0.6	-3.1
Q	SAGE SOFTWARE INC	16	7	13	-1.5	-10.3
Q	SEI CORP	22	15	20.25	-1.8	-8.0
Q	SHARED MED SYS CORP	17	12	14.375	1.5	11.7
Q	SOFTWARE PUBG CORP	28	14	26.25	-0.5	-1.9
N	STERLING SOFTWARE INC	11	7	9.5	0.3	2.7
Q	SUNGARD DATA SYS INC	26	17	22.5	-1.3	-5.3
N	SYSTEM CENTER INC	25	16	15.625	-1.4	-8.1
N	SYS. SOFT INC	29	16	23.25	-1.8	-7.0
Q	WORDSTAR	2	1	0.969	-0.1	-8.8

Semiconductors

EXCH		52-WEEK RANGE		PRICE CLOSE AUGUST 1, 1990	WEEK NET CHNGE	WEEK PCT CHNGE
N	ADV MICRO DEVICES INC	11	7	6.875	-0.4	-5.2
N	ANALOG DEVICES INC	11	7	6.875	0.0	0.0
Q	ANALOGIC CORP	11	8	9.375	0.1	1.4
Q	CHIPS & TECHNOLOGIES INC	26	15	16.25	0.0	0.0
Q	INTEL CORP	52	28	42.5	-1.0	-2.3
Q	MICRON TECHNOLOGY INC	17	7	11.125	-0.5	-4.3
N	MOTOROLA INC	88	53	80.375	0.6	0.8
N	NATL SEMICONDUCTOR	9	5	5.625	0.1	2.3
N	TEXAS INSTRS INC	44	28	31.625	-1.6	-4.9
A	WESTERN DIGITAL CORP	15	6	12.125	-0.1	-1.0

Peripherals

EXCH		52-WEEK RANGE		PRICE CLOSE AUGUST 1, 1990	WEEK NET CHNGE	WEEK PCT CHNGE
Q	ALLOY COMP	2	0	0.625	0.0	-0.2
N	AM INTL INC	6	2	2	-0.3	-11.1
Q	AUTO TROL TECH CORP	5	2	3.25	0.2	8.1
Q	BANCTEC INC	24	13	19.25	-1.0	-4.9
A	COGNITRONICS CORP	8	3	6.25	-0.3	-3.8
Q	CONNER PERIPHERALS	31	11	27.125	-0.8	-2.7
A	DATARAM CORP	22	8	19	0.3	1.3
N	EASTMAN KODAK CO	52	36	42.375	3.9	10.1
N	E M C CORP MASS	7	3	5.625	0.0	0.0
Q	EMULEX CORP	9	4	7.125	0.1	1.8
Q	EVANS & SUTHERLAND	35	18	26.25	-3.0	-10.3
Q	ICOT CORP	2	1	1.563	0.1	4.2
Q	INTERLEAF INC	8	5	6.375	0.3	4.1
Q	IOMEGA CORP	6	3	5	-0.3	-4.8
Q	MASSTOR SYS CORP	4	1	1.188	0.0	0.0
Q	MAXTOR CORP	17	7	10.75	0.5	4.9
Q	MICROPOLIS CORP	10	3	8.375	-0.1	-1.5
N	MINNESOTA MNG & MFG CO	91	88	91	0.1	0.1
Q	PERSONAL COMP PRODUCTS INC	5	4	3.969	-0.3	-6.6
Q	PRINTRONIX INC	15	8	11.375	0.0	0.0
N	QMS INC	21	8	17.5	-0.8	-4.1
Q	QUANTUM CORP	28	9	21.75	-0.6	-2.8
N	RECOGNITION EQUIP INC	10	4	5.25	0.1	2.4
Q	REXON INC	10	6	6.75	-0.6	-8.5
Q	SEAGATE TECHNOLOGY	20	11	12.625	0.1	1.0
N	STORAGE TECH CORP	35	9	25.875	-1.3	-4.8
Q	TANDON CORP	4	1	2.563	-0.3	-8.9
N	TEKTRONIX INC	23	12	18	-0.3	-1.5
Q	TELEVIDEO SYS INC	1	0	0.344	-0.1	-15.3
N	XEROX CORP	68	44	47	1.4	3.0

Leasing Companies

EXCH		52-WEEK RANGE		PRICE CLOSE AUGUST 1, 1990	WEEK NET CHNGE	WEEK PCT CHNGE
N	CAPITAL ASSOC INTNL INC	7	2	2.125	-0.3	-10.5
N	COMDISCO INC	34	17	19.375	1.0	5.4
Q	LDI CORPORATION	18	13	14.5	-0.8	-4.9
Q	PHOENIX AMERN INC	5	3	3.625	0.0	0.0
Q	SELECTERM INC	9	4	4.5	-0.8	-14.3

EXCH: N=NEW YORK; A=AMERICAN; Q=NATIONAL

Guns of August

Revenue bombshells continue to take their toll on tech firms

Shrapnel from earnings report artillery continued to rain on Wall Street last week, although most of the heavy shelling is over until next quarter. Even the major players were blasted. IBM, for example, lost 1⅝ points to close Thursday at 109¾.

NEC Technologies, Inc. was hit hard, giving up 3⅜ points to end at 58¾. Rival mainframe makers also stumbled, including Amdahl Corp., which closed at 14⅛, down 1 point for the week, and Unisys Corp., which slipped to a new low mark of 10½, down ⅝ of a point.

Sellers bombarded the hardware sector as well. Compaq Computer Corp. was driven down 2⅝ points to 53⅛, and Sun Microsystems, Inc. lost 1¼ points to 30½. Apple Computer, Inc. fought back, however, and gained 2⅛ points to close at 43½.

Gun-shy investors also invaded the software arena. Both Microsoft Corp. and Novell, Inc. declined. Microsoft dipped 3 points to 66, and Novell lapsed 2¼ points to 46¼, its third consecutive weekly decrease. Computer Associates International, Inc., still struggling to recover from its recent earnings-related dive, fell to a new low of 8¼, down ⅛ of a point.

Despite Ashton-Tate Corp.'s release of a revamped version of its flagship product, Dbase IV, the company's stock fell 1 point to 9¾. Lotus Development Corp. was among the few gainers for the week, picking up ½ a point to 22½, its first step forward after five weeks of stock price tumbles.

Both Hewlett-Packard Co. and Texas Instruments, Inc. backpedaled 1⅞ points, to 42¼ and 30⅛, respectively.

KIM S. NASH

OSF eyes open net management

Seeks to fill need for consistent net, systems management infrastructure

BY JOANIE M. WEXLER
CW STAFF

CAMBRIDGE, Mass. — The Open Software Foundation (OSF) set a lofty network management goal last week that could produce a godsend for customer sites sometime in 1991.

The OSF, which aims to deliver standards-based, interoperable software, has issued a request for vendors to submit technologies for what it has dubbed its Distributed Management Environment (DME). DME would provide a consistent infrastructure for integrated network management and systems administration across multivendor platforms and operating systems.

The OSF's efforts address a key problem in today's computing environment: the lack of a centralized system for controlling all computing resources and networks.

"If the OSF can pull this off, I can almost guarantee it will sell," said John Amidon, manager of technical support and communications at the Arizona Department of Transportation. "I'm running three different networks supported by three different staffs, all trained in their respective niches. If my people could work on all the networks simultaneously, that would be ideal."

Michael Prince, MIS director at the Burlington Coat Factory Warehouse Corp., said he could use such a product right now: "The two network vendors I use both purport to be developing similar software, but the idea of doing it as a cross-vendor product is even more appealing. The way it is now, we have to be more reactive than proactive with some of the workstation problems in our stores."

One analyst said that managing systems with one consistent approach is generally among users' top three current priorities. Michael Goulde of Open Systems Advisor, a Boston-based consultancy, said that companies committed to or seriously evaluating open systems would be likely beneficiaries of the OSF's efforts.

"There's a proportional increase in the intensity of a company's interest in DME and the size and complexity of its computing environment," Gould said.

Jonathan Gossels, OSF's business area manager, added that for software vendors, the DME package will provide tools for simplified development of portable applications that no longer have to be designed for just one platform. This should foster a wealth of management applications for both stand-alone and distributed systems, according to Gossel.

IBM and Digital Equipment Corp., both of which are OSF members and have invested heavily in proprietary network and applications management schemes, were instrumental in developing the specifications for the OSF request, Gossel said. He said that presumably each of those major vendors would submit its own proposal to the OSF.

The DME concept parallels that of the group's Distributed Computing Environment, an integrated set of technologies aimed at allowing transparent computing in heterogeneous environments. DME could be available sometime during 1991, but the target date is dependent on how many vendors submit proposals, which will affect the time needed for the evaluation process, Gossels said.

Deficit

FROM PAGE 1

executives pointed out, has a particularly urgent stake in swift and sure deficit reduction. The soaring deficit, said Sun Microsystems, Inc. Chief Executive Officer Scott McNealy, "makes the cost of capital very high. It costs me three times more for capital than it costs in Japan. And that makes it very difficult to compete against the Japanese."

The deficit inhibits our ability to compete overseas in more ways than just spiking the cost of capital, Ehrlich added: "It also puts upward pressure on interest rates, and raises uncertainty about the future." As a final irony, he said, creditor nations "are so busy buying our bonds, they have no money to buy our goods."

As surely as it is sabotaging U.S. industry's international competitive position, the deficit is sinking morale at home, industry leaders generally agreed.

"The budget deficit hangs like a dark cloud over the economy," AT&T Chief Financial Officer Morris Tannenbaum said. "It's a sign of our inability to run the country."

Not all technology firm executives see deficit reduction as a burning issue for the technology business community. Computer Associates International, Inc. President Anthony Wang, for instance, acknowledged the deficit's negative impact on the business climate in general but noted that "historically ... the software industry has been relatively immune to down cycles in the economy."

> "MAYBE THE Gramm-Rudman cuts have to be implemented."
>
> GEORGE SCALISE
> MAXTOR CORP.

For most, however, the sense of urgency is mounting. "President Bush has put taxes on the table, and Congress has put entitlements on the table," said Hewlett-Packard Co.'s CEO John A. Young in a joint statement released by the heads of 11 major computer vendors earlier this summer. "Now that these two stumbling blocks are behind us, the president, his administration and the bipartisan leadership of both houses of Congress should seize this opportunity and draft a meaningful deficit reduction plan."

> "THE PRESIDENT and the bipartisan leadership of Congress should seize this opportunity and draft a meaningful deficit reduction plan."
>
> JOHN A. YOUNG
> HEWLETT-PACKARD

The self-proclaimed "unprecedented joint statement" was issued by Young and industry leaders including, among others, IBM's John Akers, Digital Equipment Corp.'s Kenneth Olsen, Compaq Computer Corp.'s Rod Canion and Apple Computer, Inc.'s John Sculley. The executives applauded what appeared to be a giant step toward real action on the budget and threw their support behind President Bush's emphasis on capital gains and education.

Unfortunately, however, the computer industry leadership suffers from the same problem that plagues the congressional leadership: There is a lot more consensus on where to go than on how to get there.

Richard Carpenter, CEO at computer-aided software engineering products vendor Index Group, Inc. in Cambridge, Mass., advocated enforcement of the $100 billion worth of automatic spending cuts mandated by the Gramm-Rudman Act as enacted. "I was optimistic [about Gramm-Rudman] at the outset," Carpenter said, "but there are just too many loopholes as it exists now."

Maxtor Corp. CEO George Scalise also looked to Gramm-Rudman, albeit reluctantly. The U.S. has spent too much time and effort trying to disguise the actual size of the deficit, he said, citing as an example the fact that the current "S&L debacle is not being considered a part of it." What we can't face, we can't fix, Scalise said. "Maybe the Gramm-Rudman cuts have to be implemented," he concluded. "Maybe that's what it will take."

"I've got mixed emotions on that issue," said Robert Paluck, CEO at minisupercomputer market leader Convex Computer Corp. "I think the government needs to do *something*, but I also know that government spending, and defense spending in particular, affects the overall economy dramatically." Gramm-Rudman in full gear, Paluck said, could trigger a recession.

Further mixing the emotions of computer industry executives, Ehrlich noted, is the prospect that "[research and development] credits will probably be among the oxen gored" in a spending cuts program.

Consequently, many are focusing on taxation as the preferable path. "You fix the deficit by raising revenues," Ehrlich said. "This has been the sole and obvious solution since the deficit first appeared 10 years ago, but we've refused to do it for purely ideological reasons."

Two alternatives that garner widespread computer industry support are government actions geared toward enhancing U.S. competition in the global market — relaxing current export restrictions and antitrust law modifications, for example — and measures aimed at retrieving the massive amounts of money reputed to be slipping through assorted federal government cracks.

At the end of the day, McNealy said, "there are no simple solutions. But voters have to get upset, learn more about the issue and make their choices." In a complex situation with no perfect answers — and, without a doubt, no free rides — most of the executives agreed that the only action that would be completely incorrect is no action at all.

Senior Correspondent Johanna Ambrosio, Staff Writer Sally Cusack and Correspondent Michael Fitzgerald contributed to this report.

To get from here to there

In a recent survey, a majority of the 250 members of the National Association of Business Economists said the probability of a major deficit-reduction deal is improving. However, they remained skeptical about how that improvement might be brought about:

- More than 80% of the panel members saw deficit reduction as "important" or "very important." However, only 7% thought that a major ($30 billion to $40 billion or more per year), multiyear deficit reduction package was the best bet. Smaller changes or a one-year deal are more likely, they said.
- Defense cuts and so-called "sin taxes" are likely to lead the way in any deficit package, the survey said. More than 90% of the panel members said that taxes on alcohol and tobacco are likely to be raised if there is a major budget agreement, while 91% believed that defense cuts will be included in a deal. A majority thought gasoline taxes will also be raised. Only 8% saw no major spending cuts ahead; 2% predicted that there will be no tax change.
- The panel sees positive change from a major budget agreement: In three or more years, inflation and interest rates will fall while real GNP will grow, members said. In the short run, however, a majority (61%) said that real growth will be lower even though interest rates and inflation will also be reduced.

SOURCE: NATIONAL ASSOCIATION OF BUSINESS ECONOMISTS, CLEVELAND, OHIO

NEWS SHORTS

Mideast fears swamp stock trades

Fear that Iraqi leader Saddam Hussein's thirst for conquest will trigger a U.S. and possibly a worldwide recession prompted heavy trading Friday on the New York Stock Exchange and kicked off "circuit breakers" that temporarily halted trading at two Chicago exchanges.

The Dow Jones Industrial Average dropped precipitously 122 points by 2 p.m. before recovering to down just 55 from the previous day, with more than 293 million shares trading hands.

Computerized circuit breakers kicked in early Friday at both the Chicago Mercantile Exchange and the Chicago Board of Trade, halting trading for short periods. At the Merc, an automatic 10-minute halt in trading was called at 8:37 a.m. Central Standard Time, when the Standard & Poor's 500 index fell by five points in early trading. A second circuit breaker kicked in when the S&P 500 fell 12 points below its opening level; trades below this level were halted for 30 minutes. At the CBOT, futures trading was halted for 30 minutes at 8:50 a.m. Central Standard Time, after an index fell 20 points.

Technology stocks dropped precipitously, keeping pace with the market in general, analysts said. Ironically, when panic invades the market, the most profitable stocks get hit the hardest, noted David Wu, an analyst at S.G. Warburg & Co. "There are profits to be taken, and investors want those profits while they can still get them," Wu said. Last week was no exception, he said. Motorola, for example, dropped 10 points but recovered 8½ points by the close.

NELL MARGOLIS and MICHAEL FITZGERALD

DEC whacks VAXft prices

Digital Equipment Corp. dropped the price of its fault-tolerant VAXft 3000 last week and tacked a scaled-down server onto its "never-fail" VAX line in what industry analysts said was an admission of overpricing on DEC's first foray into the fault-tolerant market. The VAXft 3000 model was sliced from $229,000 to $168,000 just weeks after it was first shipped in June. The newly configured server machine will sell for $132,000.

Closeout sale on PS/2s

IBM last week discontinued several Personal System/2 boxes and announced closeout price cuts of up to 34%. The PS/2 Model 60 041 has been reduced from $4,195 to $2,750. The Model 60 071 was cut from $4,645 to $3,085. The PS/2 Model 80 041 will sell for $4,000, down from $5,395. The Model 80 071 has been reduced from $6,095 to $4,500. IBM effectively displaced these machines when it introduced the Model 65SX and Model 80 back in March. The lower prices are in effect through Oct. 31, while supplies last.

AD/Cycle gets midrange backing

Systems Software Associates, Inc. added its name last week to the roster of dozens of software companies supporting IBM's AD/Cycle strategy. However, it is one of the few midrange suppliers to do so. SSA, which sells applications to the IBM Application System/400 market, launched a set of computer-aided software engineering (CASE) products in January and now claims to have approximately 200 CASE customers. SSA plans eventually to provide tools compliant with AD/Cycle and move its users to the AD/Cycle repository in the future.

AT&T on track with Amtrak

AT&T Computer Systems said last week that it has won a $14 million contract to assist Amtrak in improving its reservation and ticketing systems. AT&T's role will reportedly be to install and maintain over 2,100 networked computers, custom software and peripherals in more than 300 Amtrak stations, reservation centers, ticket offices and administrative offices around the country. The contract relates to Amtrak's Terminal Replacement Project, which includes installation of AT&T's 6286/EL Work Group System entry-level workstation introduced earlier this year. Installation is reportedly scheduled to begin late next month and take 18 months.

SIM toots innovative horns

Honors city of Dallas, pharmaceutical distributor for technological savvy

BY CLINTON WILDER
CW STAFF

Every user wants a system that responds quickly with accurate information. But if you are a police officer or a crime victim, those technology attributes can mean a lot more than improved profits or productivity.

City of Dallas' David J. Morgan

The Dallas Police Department has proved this during the past two years, and last week the city of Dallas was named one of two winners of the fourth annual Society for Information Management (SIM) Partners in Leadership Awards.

The second winner was a more traditional business user and renowned technology leader, Orange, Calif.-based wholesaler Bergen Brunswig Corp. The $4 billion distributor of pharmaceutical and electronic products was cited for nearly 20 years of information systems innovations resulting from the close relationship between its IS and business leadership.

The Dallas Police Department's cruiser-based mobile data terminals have direct links to the city's 911 phone system, which transfers an emergency caller's phone number and address directly to the screen in the cruiser. Patrolmen know the caller's location and can respond when the caller cannot speak English to the dispatcher, is lost or confused or cannot speak at all.

On-line data access means that when a cruiser stops a car on the highway, the patrolman can key in the license number and access the criminal records database, which responds within five seconds if the license plate registrant is already wanted in the Dallas area. That helps the officer decide whether the driver is likely to be armed or dangerous; there have been several past incidences of Dallas policemen killed or wounded by gunmen in cars they had pulled over, said David J. Morgan, the city's director of information services.

Bergen Brunswig's Vallario

In addition to law enforcement benefits, Morgan said, the terminals save money by transferring much of the person-to-person communications on the city's overburdened radio dispatch system to on-line transactions. The $3.5 million investment in terminals saved the city from having to replace the $20 million radio system.

Morgan will share the SIM award with Leslie R. Sweet, assistant chief of police. Morgan attributed the technology success to "a chief who was not afraid to delegate" and cooperation between the IS staff and the users — the police officers.

At Bergen Brunswig, the SIM award was a fitting capstone to the career of Senior Vice-President Anthony A. Vallario, who will retire next year after 40 years in IS-related positions at the company. Vallario and business partner Emil P. Martini Jr., the company's chairman, pioneered the Pharmacy Automated System Entry on-line order entry system in 1973.

Since then, Bergen Brunswig has continually expanded the system's capabilities. One of the most recent innovations is a fully automated warehouse in Valencia, Calif., that allows an order to be sent by the customer, stocked, processed, routed and loaded onto a truck without any human intervention.

The Clayton & Dubilier Selectric?

BY NELL MARGOLIS
CW STAFF

ARMONK, N.Y. — IBM last week announced plans to spin off the division that originally electrified the American office.

With negotiations pending for a final deal with New York-based leveraged buyout firm Clayton & Dubilier, Inc., the IBM typewriter business, which made IBM a household name and saw "Selectric" become a common noun, will be held — along with certain printer and related supplies businesses — by a wholly owned IBM subsidiary, a company spokesman said.

In the near future, however, it is expected that the majority of shares in the new corporation — to be known in the interim as the IBM Information Products subsidiary — will be owned by Clayton & Dubilier. IBM plans to retain a minority stake.

The contemplated move would shift a quantum portion of the costs of developing, enhancing and marketing a set of nonstrategic product lines away from IBM while allowing the company, through its minority interest, to share in the growth anticipated for IBM Information Products.

IBM declined to place a dollar value on the deal. However, U.S. Marketing Director of Information Products Douglas R. LeGrande said the subsidiary will immediately join the ranks of the top 250 firms in the Fortune 1,000, with revenue in excess of $2 billion.

With Clayton & Dubilier as controlling stakeholder, he said, the new subsidiary's product mix and the users who rely on it will be well positioned to get the attention they need.

Clayton & Dubilier is a privately held, 12-year-old investment firm whose stated strategy is to take over "divisions that a large company no longer considers to be part of its strategic business" and grow them through entrepreneurial techniques, such as employee stock ownership. IBM's prospective business partner has an established track record of boosting the profitability of its acquisitions by approximately 70% during its first five years as a majority owner.

"Our philosophy is really quite simple: to support management, improve operations and build value that would benefit the new company's employees, customers, business partners, investors and the communities in which we operate," Clayton & Dubilier Chairman Martin Dubilier said in a prepared statement.

IBM provided some insurance of its own, in this case to users and employees who might otherwise see "leveraged buyout" as a euphemism for canceled product lines and plummeting service levels. For starters, the firm announced that current Vice-President Marvin Mann, who in the past headed IBM Information Products and is a trusted figure to many of its employees, will be the chief executive officer of the new subsidiary. In addition, IBM executives last week repeatedly stressed the extent to which Clayton & Dubilier reflects what IBM Chairman John Akers called "a set of values very similar to those of IBM."

The spin-off will cost some 1,200 Information Products employees their jobs, paring the total work force to approximately 3,500 by the end of 1990, IBM said.

Europe

FROM PAGE 1

pressure on the company's mainframe margins, the most profitable part of its business. Downsizing and open systems, as well as more aggressive competition from Japan, Inc., will increasingly squeeze the profitability of its European operations.

"It's becoming harder for computer suppliers to get the gross margins that could cover their costs," said Angela Dean, an analyst at Morgan Stanley & Co. in London.

Growing Japanese aggressiveness was signaled last week when Fujitsu and STC PLC, ICL's parent firm, announced the signing of a $1.37 billion deal giving Japan's biggest supplier an 80% stake in what has been, until now, the flagship of the UK's indigenous computer industry. The two companies have a long-standing technology-sharing agreement under which Fujitsu supplies key components for ICL-designed mainframes.

Although $2.2 billion ICL is STC's crown jewel — providing 64% of corporate revenue and 68% of operating profit — the British government is not expected to oppose the acquisition. Pending shareholder approval, the deal is likely to be completed Nov. 30.

A number of observers speculated that other acquisitions will follow in Europe.

"I don't think this is the last case of a Japanese takeover," said Martin Hingley, an analyst at IDC Europe Ltd. in London.

Once they have greater control of their European distribution and marketing, the major Japanese players clearly intend to squeeze IBM in the mainframe market through a price war, analysts said.

With 52% of the European mainframe market, IBM could be in for a rough fight. In Japan, where IBM once dominated, it now stands in the No. 2 spot behind Fujitsu.

Putting on the pressure

Fujitsu and Hitachi could turn the screws even tighter on IBM if they link their various European activities. Since Fujitsu also sells through Amdahl Corp. in Europe, observers speculated the company would eventually force ICL and Amdahl into cooperation. The British trade press reported last week that, once the deal takes effect, ICL would begin selling PCMs — normally Amdahl's turf — in addition to its own proprietary boxes.

Although ICL officials denied that they knew of any such plan, they refused to rule it out.

"It does seem to me that if you are controlling the technology, you would want to leverage it as much as you can," said Gary Hegna, president of ICL, Inc., the company's North American affiliate. "But that's a decision that will be made in Tokyo."

IBM mainframe sales are also coming under pressure from a growing movement to downsize data processing operations and switch to open systems.

The open systems movement, born in Europe, has gained substantial momentum there in recent years. Fear of IBM hegemony across the continent, as well as governments' wishes to control their procurement costs, have incited users, both public and private, to demand products from their suppliers that conform to the Open Sytems Interconnect (OSI) model.

"Competition is in performance and not in having differences that lock the customer into specific suppliers," said Frank Taylor, who until last year was chairman of the Confederation of European Computer User Associations.

"In Europe, a number of the very large blue chip organizations have made it clear that open systems is the direction they're going to take," said Harvey Parr, managing director of British systems integrator ACT Logsys Ltd.

He pointed to the UK Civil Aviation Authority, British Petroleum Co. PLC and the Department of Social Security as examples of organizations employing OSI in campaigns to reduce their dependence on mainframes. The protocols serve to tie together department minicomputers and networks of personal computers to any remaining mainframes.

British Telecom PLC presents perhaps the most spectacular case of downsizing in the UK. The telecommunications carrier plans to reduce the number of mainframe-based data processing centers from 57 to less than 10 within the next 2½ years. The centers principally house IBM and Amdahl mainframes. To take up the processing slack, the number of PCs in the company is expected to rise from roughly 60,000 currently to about 95,000 in three years.

Europe is for buyers

In response to new competitive pressures in Europe's mainframe market, IBM is negotiating terms more aggressively, observers said. The result is deep discounting unlike any ever seen before in Europe.

"IBM is becoming more aggressive in their war with us," said Emmanuel Dewitt, Amdahl product marketing manager in France. "They prefer making business at small margins rather than none at all."

According to Chris Peacock, an analyst at IDC Financial Services in London, discounts are reaching as much as 45% of list price for some large customers.

"There is very little differentiation in products right now," he said, "so IBM has to differentiate on prices. The pricing book has gone out the window."

"We're entering a period of much more wheeling and dealing," said Geoff Sewell, director general of the European Computer Leasing and Trading Association in London. If European prices drop far enough, he said, a transatlantic gray market might develop in which brokers and leasing companies buy equipment in Europe for sale in the U.S.

AMIEL KORNEL

Japanese line up as Europeans seek suitors

BY AMIEL KORNEL
CW STAFF

Analysts say that any remaining illusions of a tripartite control of world computer markets — split between U.S., Japanese and European vendors — are dissipating.

A growing puddle of red ink on the financial statements of European suppliers is forcing some companies to question whether aspiring to independence is still realistic. The Europeans, who for a number of years have come to rely on Japanese technology, might bind their destinies even more tightly with their Japanese suppliers as competitive pressures grow.

As they seek partners or white knights, European computer companies are more likely to wed Japanese than American firms, analysts say.

"Americans are the obvious competition in Europe," said Angela Dean, a London-based analyst at Morgan Stanley & Co. "The Japanese can bring components, technology and cash to the partnership." U.S. firms have been either unwilling or unable to come up with this kind of dowry.

U.S. and Japanese suppliers have been jockeying for position in Europe, anticipating market growth after the post-1992 opening of trade barriers among the 12 nations of the European Community.

Rather than sell products carrying their own brand name, Japanese firms have made technology agreements over the years with most major computer firms in Europe. Groupe Bull in France relies heavily on NEC Technologies, Inc. for its mainframes; West Germany's Siemens AG sells Fujitsu Microelectronics, Inc. computers; and West Germany's Comparex GmbH and Italy's Ing. C. Olivetti & Co. ship Hitachi Ltd. mainframes.

According to New York-based "Translink's European Deal Review," only five of 115 cross-order acquisitions made in the European electronics and computer sectors last year involved Japanese companies. Prior to the Fujitsu-ICL deal, the most recent was last May, when Mitsubishi Electric Corp. bought the hardware manufacturing activities of UK personal computer maker Apricot Computers PLC.

A new Japanese boldness — signaled by Fujitsu's move on ICL — suggests that the rules of the game will be changing.

"Hitachi might be interested in acquiring Olivetti and Comparex," speculated Hank Powell, an analyst at Nomura Research in London. He pointed out that Hitachi landed the European operations — and installed base — of Hitachi Data Systems Corp. (formerly National Advanced Systems) when it acquired the company along with EDS Corp. last year. Hitachi officials would not rule out such a scenario in the long term.

"We don't need to consolidate the three into one — for the time being," said Soji Endo, division manager of Hitachi's overseas computer business in Tokyo.

Army awards $700 million contract to EDS, Prime

BY GARY ANTHES
and SALLY CUSACK
CW STAFF

The U.S. Army handed a contract worth up to $700 million to Electronic Data Systems, Inc. (EDS) for as many as 20,000 multiuser microcomputers with related equipment, software and systems integration services. Much of the money will flow to financially troubled Prime Computer, Inc., which will supply its Intel Corp. 80386-based systems under a subcontract.

The contract calls for an unspecified number of Unix-based Prime EXL 320 systems to be delivered over a period of one to eight years. The computers will be used for defense branches.

A spokesman for EDS refused to give details about the contract. "We aren't talking until after acceptance testing has been done, in 60 to 90 days," he said.

"The situation is interesting. Prime has never had a good thrust in the office automation marketplace," said George Weiss, an analyst at Gartner Group, Inc.

A year ago, most of the outstanding shares of Prime were bought by J. H. Whitney & Co. in a $1.1 billion "white knight" rescue after a protracted and bitter struggle against would-be acquirer MAI Basic Four, Inc. [CW, Aug. 28]. Prime posted an operating loss of $94.7 million on sales of $1.5 billion last year, and a loss of $37.1 million on revenue of $369.8 million for its first quarter this year.

Second-class postage paid at Framingham, Mass., and additional mailing offices.
Computerworld (ISSN 0010-4841) is published weekly, with a single combined issue for the last week in December and the first week in January by CW Publishing/Inc., 375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171.
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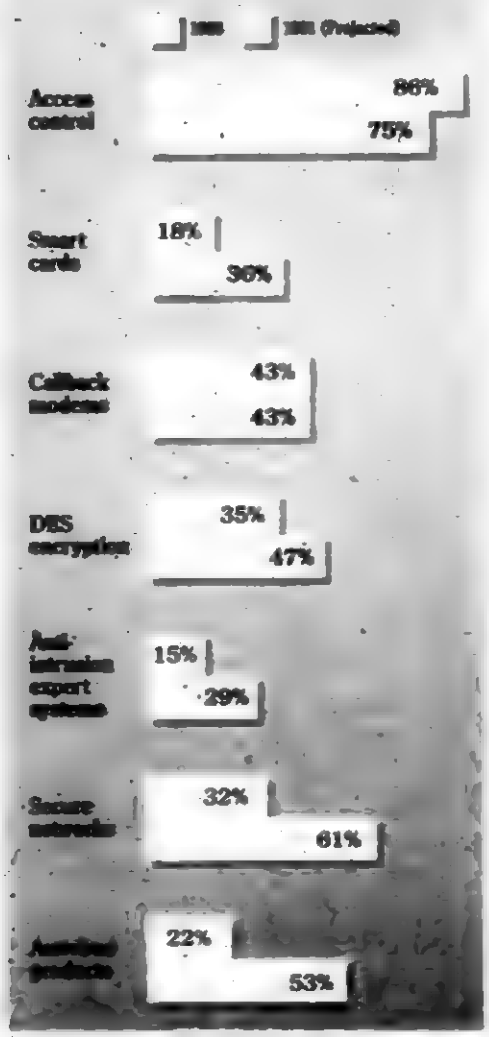
TRENDS

SECURITY

Disgruntled employees, malevolent outside hackers, the antics of ignorant staffers and the accessibility of PCs are making companies throw more attention and money at security issues

Security technology use

Access controls are by far the most common method of security and the easiest to implement, but securing networks is currently a major issue

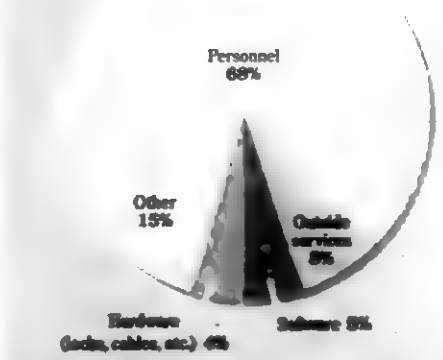


Source: Electronic Trend Publications, Saratoga, Calif.

Security budget

To prevent damaging accidents as well as calculated offenses, most of a company's security budget is spent on educating its personnel

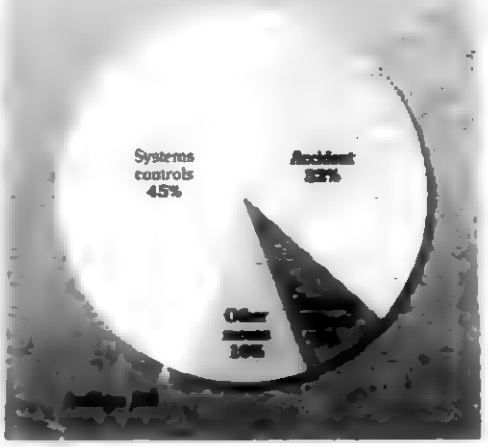
Percent of security budget by expenditure



How abuse has been discovered

Although most abuse is detected by the system's controls, one-third is still uncovered by accident

Percent of respondents



CW Chart: Tom Monahan

INSIDE LINES

Convalescent time

Robert T. Morris, convicted earlier this year for creating a worm program that shut down thousands of computers on the Internet network in November 1988, is "at a local hospital pushing a broom" to fulfill his court-ordered 400 hours of community service, according to his lawyer, Thomas Guidoboni. Morris also has a programming job at an unnamed Cambridge, Mass.-based software company. Guidoboni said he plans to file a brief in the court of appeals but has been waiting for the court reporter in Syracuse federal district court to turn over court transcripts of the trial.

You go first. No, you go first!

Ingres will add a little seasoning to its Ingres 6.3 relational database engine today. A new automatic two-phase commit feature is being packaged with Ingres 6.3's Ingres/Star distributed component, company sources said last week. The new Ingres feature will allow transactions to be coordinated across an enterprisewide network, preventing incorrect updating of systems in multiple locations. The extra ingredient is likely to sour the soup at archrival Oracle, which lacks two-phase commit in its Version 6.0 product. Oracle's two-phase commit is set for inclusion in Version 7.0, due out later this year.

Lightening up

Tandy will reportedly unveil a new notebook-size personal computer in New York today that will pack a floppy disk drive, hard disk and battery into a six-pound package. Laptop users are undoubtedly hoping Tandy will be a bit more aggressive with its processor choice than it was with the Intel 8086-based home computer it introduced a couple of weeks ago.

Time on our hands

Don't try prying off the backplane of your Personal System/2 for a look-see anytime soon at the Intel I586, Intel's follow-on to the I486 chip. "You're getting way ahead of yourself," Chief Executive Officer Andrew Grove told a *Computerworld* staffer last week while awaiting a plane at Boston's Logan Airport. "It's a 1993 product."

Brazil . . . Nuts!

"Anywhere but Brazil!" could become the battle cry of network managers trying to support their firms' expansion efforts in exotic lands. According to Federal Express telecommunications honcho Pat Greenish, South America is tough, but Brazil is a special case. The government insists that outsiders use the local computer products, which, unfortunately for Federal Express, don't happen to include IBM Systems Network Architecture controllers and printers, Greenish said. There is a several-year waiting list for local private lines to some airport locations, Greenish added. There is also a 5-year backlog for personal phones. The common way to get a telephone there is to have the phone number willed to you by a close relative.

Is there a doctor in the house?

Add "antivirus virus" to the list of potential ailments to your PC. Antivirus viruses spread like viruses and are designed to attack and eradicate viruses. That's the idea in theory, anyway. The handful of programs that have been released thus far reportedly have not been particularly effective or reliable. One program had a bug that caused it to delete instead of protect files. There is also the risk that the antivirus viruses will be altered to become full-fledged viruses.

Craig Neidorf — the electronic newsletter editor whose publication of a "secret" Bellsouth file wasn't such a federal case after all (see page 8) — apparently had at least a partial electronic alibi. U.S. Secret Service agents attended Summercon, a hacker convention held in July 1988, to surreptitiously videotape Neidorf drinking beer and eating a pizza with his alleged co-schemers on the same date that the government alleged he was carrying out the scheme. Before the trial abruptly concluded, prosecutors succeeded in preventing use of the tape as evidence. If you've got facts that shouldn't be quashed, contact News Editor Pete Bartolik at 800-343-6474, fax the incriminating lingo to 508-875-8931, or address concerns to COMPUTERWORLD on MCIMail.

NEXT WEEK

Floods of ink have been devoted to analyses of Japan's economic dynamism. One area left conspicuously unexplored, however, is the state of information systems in this powerhouse nation. *Computerworld's* Special Report on IS in Japan supplies that missing piece of the puzzle with a firsthand look at IS management in the land of the yen.

Kimiko Y. Craft

Figuring out how to cost-effectively cope with growing stores of data is becoming a major corporate headache. Luckily, new technologies are emerging that can help. You can read about these developments in Product Spotlight and check Buyers' Scorecard for user evaluations of triple-density direct-access storage devices.

A DEBT OWED TO PEOPLE, NOT TO BANKS.

Like a lot of companies, we ended the '80s in a financial mess.

We had a mountain of debt. And some customers started to wonder: what's most important?

My needs? Or their next debt payment?

At the new Wang, there's no question whatsoever.

Ten months ago, we launched "Operation Customer" and began rebuilding our entire organization around the needs of our customers.

But to make good on that commitment, we had to get our financial house in order.

Since last August, we've cut our bank group debt from $575 million to $30 million—soon to be fully repaid, ahead of schedule.

We cut our operating expenses by over $400 million a year—without laying-off a single development engineer.

Today, our balance sheet shows cash and cash equivalents of $165 million.

While tightening our belts, we haven't cut corners. Quite the opposite. We've dramatically raised quality and service.

For example, software bugs have been slashed by over 34%. And on-time deliveries to customers have risen to 92%—up over 15% in less than a year.

People are noticing the difference.

The just-ended fourth-quarter was our best quarter of the fiscal year for revenue. For new system orders. And for sales of our mid-range computer systems.

To complete the repositioning of the new Wang to compete effectively in the radically different marketplace of the '90s, we took restructuring charges and year-end adjustments of $442 million.

Before those charges, the new Wang achieved near break-even from operations—with a loss of only $5.6 million in the fourth-quarter vs a $61.1 million loss in the same quarter a year ago.

We've kept an important promise to our customers.

With that, we believe the slate is clean. Entering fiscal 1991, the playing field is level.

Who made it happen?

The 20,000 people of the new Wang who reached down deep and pulled a company up by its bootstraps.

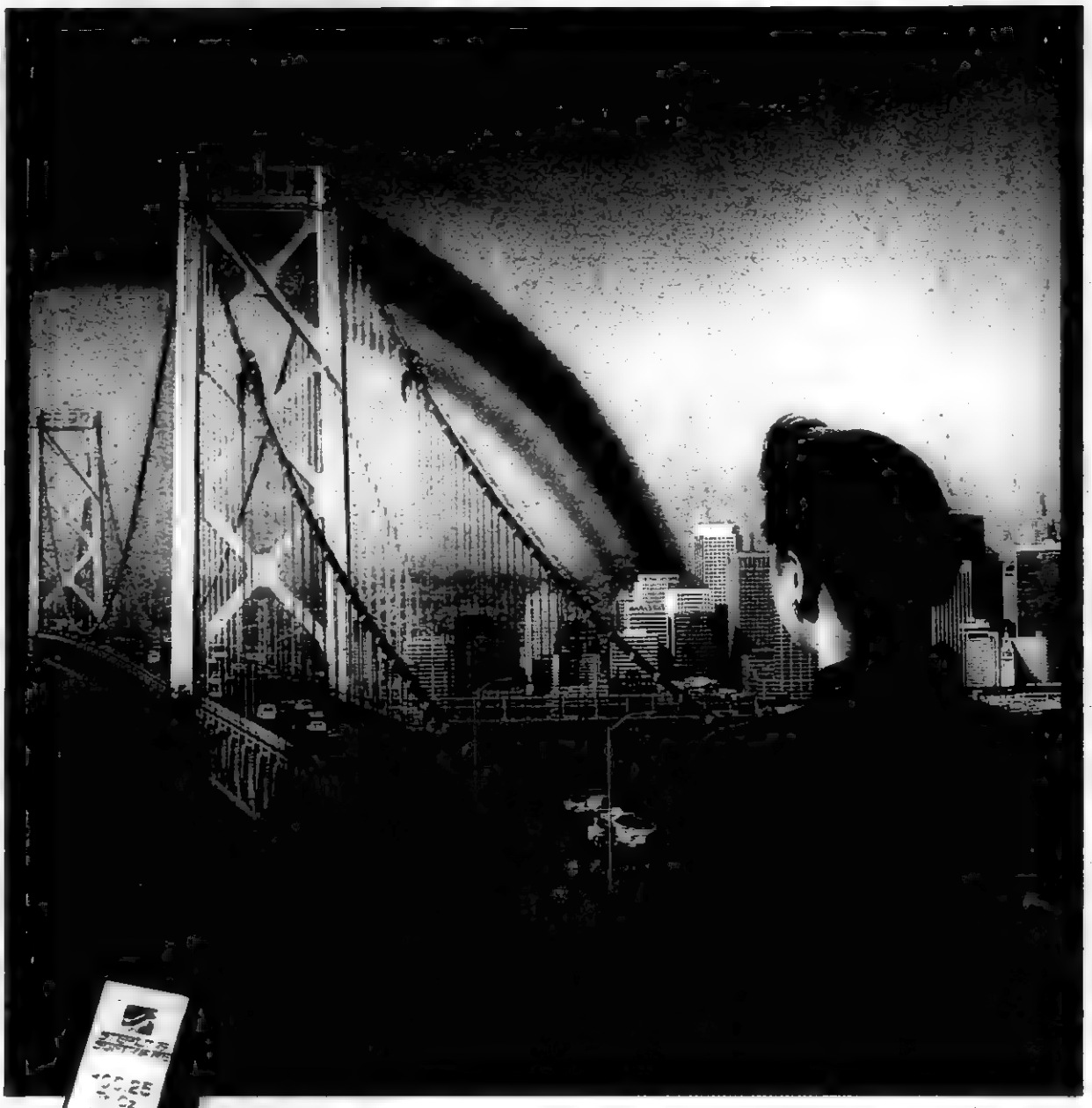
And the people who are our customers—people who, at 50,000 organizations around the world, hung in there while we got our act together.

We're in their debt. But that's the kind of debt we can work with in the '90s.

LET'S GET TO WORK.

WANG

SOLUTIONS TODAY. AND TOMORROW.



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▲ **H. Ross Perot's** *accomplishments both in and out of the computer industry earned him the Price Waterhouse Lifetime Achievement Award.*

Giorgio Sorani *of Lubrizol oversaw development of a database that made safety data about hazardous chemicals more accessible.* ▼

Ernst Mollet *represented Soffex,* ▲ *one of two international winners. His association's national exchange system has boosted Switzerland's financial services prowess.*

S. J. Camarata *accepted the* ▶ *award for the Environmental Systems Research Institute, which helps manage geographic databases.*

Perot *with* ▶ *Computerworld Publisher Fritz Landmann.*

▲ **Judy Woodruff,** *chief Washington correspondent of the MacNeil/Lehrer NewsHour, emceed the ceremony.*

◀ **Charles Garvin** *accepted for Personics, which developed an innovative technique for recording customized audio tapes.*

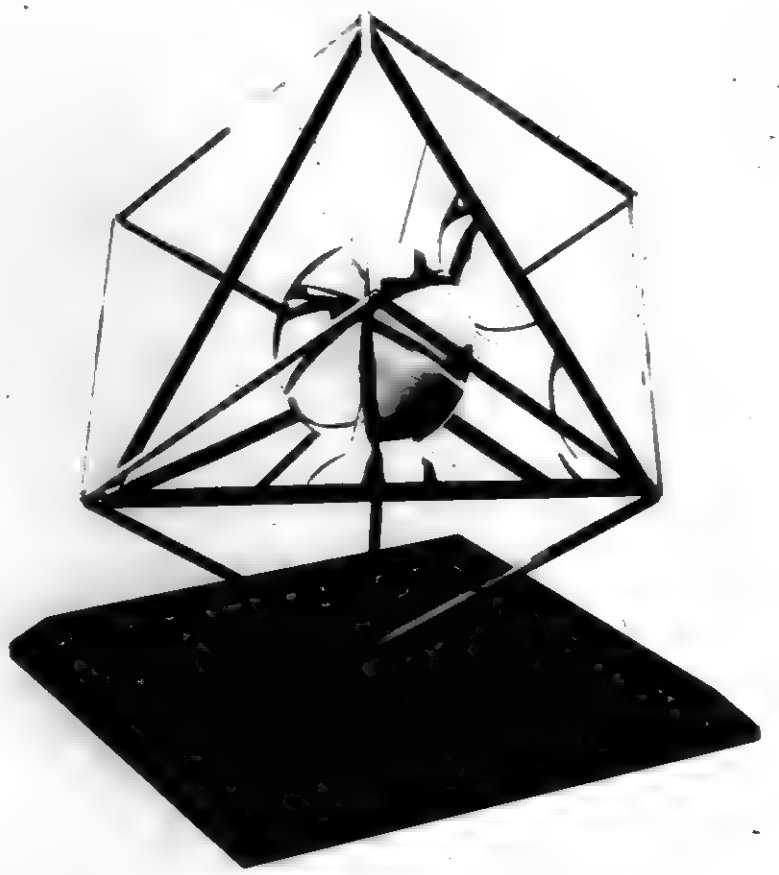
Patrick McGovern, *chairman of International Data Group and founder of Computerworld.* ▼

▲ **Sharon Wilder** *accepted the Medicine award for Purdue University Professor Michael Rossman, who was honored for his research on modeling viruses.*

▲ **Surachai Srisaracam** *of the Thailand Ministry of the Interior worked on a demographic database that tracks 50 million people.*

Larry Boyd's *Berkeley Systems* ▶ *has built a link between the Apple Macintosh and blind users.*

The Computerworld Smithsonian Awards were established in 1989 to communicate the positive impact of information technology. The only awards honoring the innovative use of information technology, the Computerworld Smithsonian Awards were created to recognize heroes of technological innovation, to demystify public perceptions of technology and to clearly identify the benefits technology brings to the lives of the general public. Each year, recipients' awards are included in the Smithsonian's permanent exhibit, "The Information Age: People, Information, Technology."



We salute the 1990 winners of the Information Age

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VOL 24
ISS 33
AG 13 1990
UMI

THE NEWSWEEKLY OF INFORMATION SYSTEMS MANAGEMENT
August 13, 1990 · Vol. XXIV · No. 33 · 114 Pages · $2/Copy · $48/Year

COMPUTERWORLD

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Product Spotlight — 'Fast-enough' storage devices can take the byte out of DASD. Page 61.

Next week's AS/400 push is expected to reach beyond SNA with support for LAN protocols, ISDN and fax transmission. Page 101.

E-mail lawsuit raises issue of employee communications privacy vs. employer property ownership. Page 7.

Mixed emotions: Few admire IBM's Cross System Product, but more and more are buying it as a critical piece of the company's application development strategy. Page 8.

Cincom joins Unix wave, announcing Supra availability for Sun, IBM's RS/6000 and others. Page 14.

Small layoff at Lotus is part of broad cost-cutting effort in face of weaker profit outlook. Page 10.

Largest child care system in the Western world is run by the U.S. Army, which uses Unix-based PCs to keep the records straight. Page 39.

All eyes are on Compaq as clone leader increasingly becomes target of low-cost competition. Page 6.

Mini elite struggle to ride Unix wave

BY SALLY CUSACK
CW STAFF

Ten years ago, Wang Laboratories, Inc. led the world in office automation and was growing at a rate of 45% per year. Down the road, Prime Computer, Inc. and Data General Corp. were both checking in with 35% yearly growth, and Honeywell, Inc. was holding its own with a strong minicomputer base.

Now, each of these companies is fighting for survival in today's market; to stay alive, all must move from selling proprietary software-based technologies to an open systems platform.

"They're finding it a tough row to hoe," said Wayne Kernochan, a senior analyst at The Yankee Group, a Boston-based research company. "It's not always clear to their installed base just how to get to Unix from these proprietary platforms, and the companies themselves must learn how to deal with lower-margin markets, as opposed to the high-margin numbers generated from past mainframe and minicomputer sales."

Lessening expectations

Generally speaking, minicomputer sales generate a 50% to 60% gross margin, compared with the estimated 40% gross margin generated by typical workstation sales, according to Kernochan.

In some cases, customers cannot sit and wait for vendors to catch up with open systems technology. Jim Knowles, senior operating officer in charge of application development at Salomon Brothers, Inc. in Rutherford, N.J., has been a Prime minicomputer user for eight years. Now that the company is moving to a distributed Unix environment, Knowles said he feels that Prime does not currently have a box that competes with Digital Equipment Corp. and Sun Microsystems, Inc. in the 490-class machine market.

Knowles added that while he will continue to evaluate any box that meets his price and performance standards, he does not want to be locked into the kind of proprietary software environment that characterized early minicomputers. Salomon

Continued on page 101

Eclipsed stars

Formerly fast chargers in the minicomputer market, Wang, Data General and Prime have seen their proprietary edges dulled

Midrange computers

	1988	1989
DG	1.7%	1.6%
Wang	2.1%	1.9%
Prime	1.4%	1.3%
Total market:	$46.67B	$47.61B

(Percentage of worldwide market by revenue)

CW Chart: Marie Raines
Source: International Data Corp

Users bolster AIX case

BY JOHANNA AMBROSIO
CW STAFF

WHITE PLAINS, N.Y. — As more information systems departments adopt Unix for software development, IBM appears to be rethinking its long-held position that Unix, CASE and business software do not mix.

Until recently, IBM's message had been that AD/Cycle is for development in IS shops, and its AIX brand of Unix is for technical work. In fact, when IBM announced its RISC System/6000 workstations in February, its accompanying computer-aided software engineering tools were clearly positioned for use in scientific, engineering and other technical applications.

Now, however, IBM is broadening its message. "There is nothing inherent in the architectures of either AD/Cycle or AIX that will

Continued on page 8

Tech firms dig in behind Saudi border

BY MAURA J. HARRINGTON
and GARY H. ANTHES
CW STAFF

Iraq's Aug. 2 invasion of Kuwait effectively shut down one of the computer industry's most lucrative markets along the Persian Gulf and caused many companies to move abruptly to neighboring Saudi Arabia, where business continues, but at a cautious pace.

"Business is finished in Kuwait," said Hooshang Kaen, president of Intergulf Services, Inc., a Fairfield, N.J.-based company that represents Gulfnet Kuwait, a computer distribution company formerly based in Kuwait. "The Iraqis are literally looting everything . . . there are people and companies that really got hurt. The companies hurt the most were those that had outstanding letters of credit."

Meanwhile, businesses and recruiters in Saudi Arabia said their plans have not changed.

"Naturally, I'm not sending anyone to Kuwait right now, but we have three more people going to Saudi Arabia," said John Leslie, president of The Leslie Corp., a Houston-based employee placement firm that works with U.S. companies placing computer professionals in Middle East operations.

"We've got two families flying into Saudi Arabia this weekend," said Larry Leens, vice-president of operations at Holmes & Narver Services, Inc., an Orange, Calif.-based firm that operates a major utility in Yanbu, Saudi Arabia.

"We are business-as-usual," Leens said, mostly because the power plant is located in Saudi Arabia's Western province, far from the Kuwait border. "We've had some [recruitment candidates] fall out because of concerns about going over there, but probably less than 5%."

Continued on page 99

Software vendors rip Apple

BY RICHARD PASTORE
CW STAFF

BOSTON — Simmering disputes between Apple Computer, Inc. and other software developers spilled over into the public forum of Macworld Expo last week when software company executives upbraided Apple for its pricing, product line, positioning and management upheavals.

While independent software developers have long chafed under the control that Apple exerts over the third-party Macintosh market — compared with the relatively wide-open personal computer-compatible market — last week's rebellion included Apple's own applications software chief.

In a panel forum with executives from firms such as Microsoft Corp., Aldus Corp., Symantec Corp. and T/Maker Graphics, William Campbell, president of Apple subsidiary Claris Corp., breached Apple's party line, which holds that the Macintosh is unaffected by the recent challenge of Windows 3.0, Microsoft's graphical user interface for DOS.

"I really believe Apple is out of whack in the price/value relationship," Campbell said.

Continued on page 4

COMPUTERWORLD BUYER'S SCORECARD

DASD loyalists

Most users of IBM's 3380-K and compatible disk drives would buy the same product again

See page 68 for Buyers' Scorecard ratings

Would you buy the product again?

IBM 3380-compatible

Response base: 289

CW Chart: Patti Mack

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4 Little green Apples: The fledgling **System 7**'s first public airing is met with cautious optimism.

6 A host of competitors draw a bead on **Compaq**'s Systempro and notebook PCs.

6 **NEC**'s new Ultralite adds features at the expense of a few ounces.

7 A class-action suit alleging invasion of privacy raises questions about the rights of E-mail users.

8 More and more people are using **IBM**'s **Cross System Product**, but nobody is quite sure why.

10 **Lotus** layoffs planned in anticipation of a weak third quarter.

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101 **IBM** is slated to cast a wider communications net for its AS/400.

Quotable

"I really believe Apple's out of whack in the price/value relationship."

WILLIAM CAMPBELL

President of Apple's software subsidiary, Claris Corp., at last week's Macworld Expo. See story page 1.

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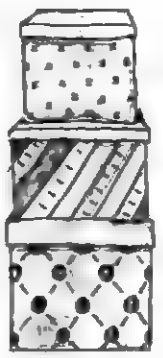
As Yogi Berra once said about baseball, the game is 50% mental, 50% physical and 50% luck. So from the You-Can-Make-Statistics-Prove-Any-Point-You-Want Department comes this vignette by William J. Edwards, an Arthur D. Little vice-president, in a recent Tokyo speech criticizing fears of Japanese investment in the U.S.: "The U.S. is not becoming a colony of any foreign nation . . . foreign direct investment/control has actually decreased from almost 100% in the 1700s to less than 10% today."



Stack, hang, fold, store. Where do you put all the data? Page 61.

David Joel

A complete business transformation enabled by IS is the goal of Continental Bank CIO John Gigerich. Page 51.

EXECUTIVE BRIEFING

■ **Computer business in Kuwait** dropped to virtually zero after the Iraqi invasion. Computer vendors there, selling almost exclusively through third-party distributors, were forced to cut their losses and move on. Business continued pretty much as usual in Saudi Arabia, as most major computer operations are located far from the Kuwaiti border. However, employees at Saudi-based U.S. firms are ready to leave if necessary. Ross Perot, who led the legendary rescue of EDS employees from Iran in 1979, said he would never do business in the Middle East again. Meanwhile, business is booming at St. Paul, Minn.-based Computer Petroleum, which tracks the current price of oil on an electronic database. **Stories, pages 1, 99.**

■ **Is electronic mail private correspondence or corporate property?** That is the issue in a class-action suit filed last week against Epson America, Inc. The suit stems from the January firing of an Epson employee, allegedly because she protested management's reading E-mail messages. But some argue that the requirements of corporate network management and troubleshooting cannot guarantee privacy. **Page 7.**

■ **The three minicomputer stalwarts** — Wang, Prime and Data General — are all attempting the difficult transition from proprietary architectures to open systems. While some users are growing impatient, most remain loyal, giving the companies a good chance to survive if they can adjust to slower sales growth. Meanwhile, IBM appears to be embracing Unix as a CASE environment much more than it did at first. **Stories, page 1.**

■ **Continental Bank is in the midst of a massive business transformation,** and its IS department is playing a major role with database and distributed processing technology. The former Continental Illinois, one of the nation's worst banking disasters, is evolving toward much more flexible product and service offerings. **Page 51.**

■ **AS/400 users who have non-SNA networks** or multivendor environments should be pleased this week when IBM announces additional connectivity capabilities for the midrange platform. A slew of announcements is expected to include better connections to Ethernet, ISDN, TCP/IP, the RS/6000, PCs and facsimile machines. **Page 101.**

■ **Capacity requirements are soaring in data centers,** and people are getting creative about where they store all the data. Aiding them in their venture beyond DASD are new options for faster and "fast-enough" access — namely, expanded memory, solid-state disks, array technology, automated tape libraries and optical/magnetic, optical/tape combinations. **Page 61.**

■ **Downsizing and belt-tightening** have knocked some rungs out of the corporate ladder at many companies. As a result, ambitious IS professionals need to find new ways to get ahead. One route they can take is to create their own promotion by writing a new job description. But they'd better go about it the right way. **Page 83.**

■ **On-site this week:** Who runs the biggest day-care system in America? The U.S. Army. And it runs more efficiently because of Filepro, a Unix-based database management system/application development tool running on PCs at Ft. Benning, Ga. **Page 39.** Flexible CAD software helps Synthes in Paoli, Pa., design more flexible surgical implants. The firm uses Computervision's Medusa software, and a global link on a DEC network enables sharing of design data among Synthes plants and laboratories in Pennsylvania, Colorado and Switzerland. **Page 29.**

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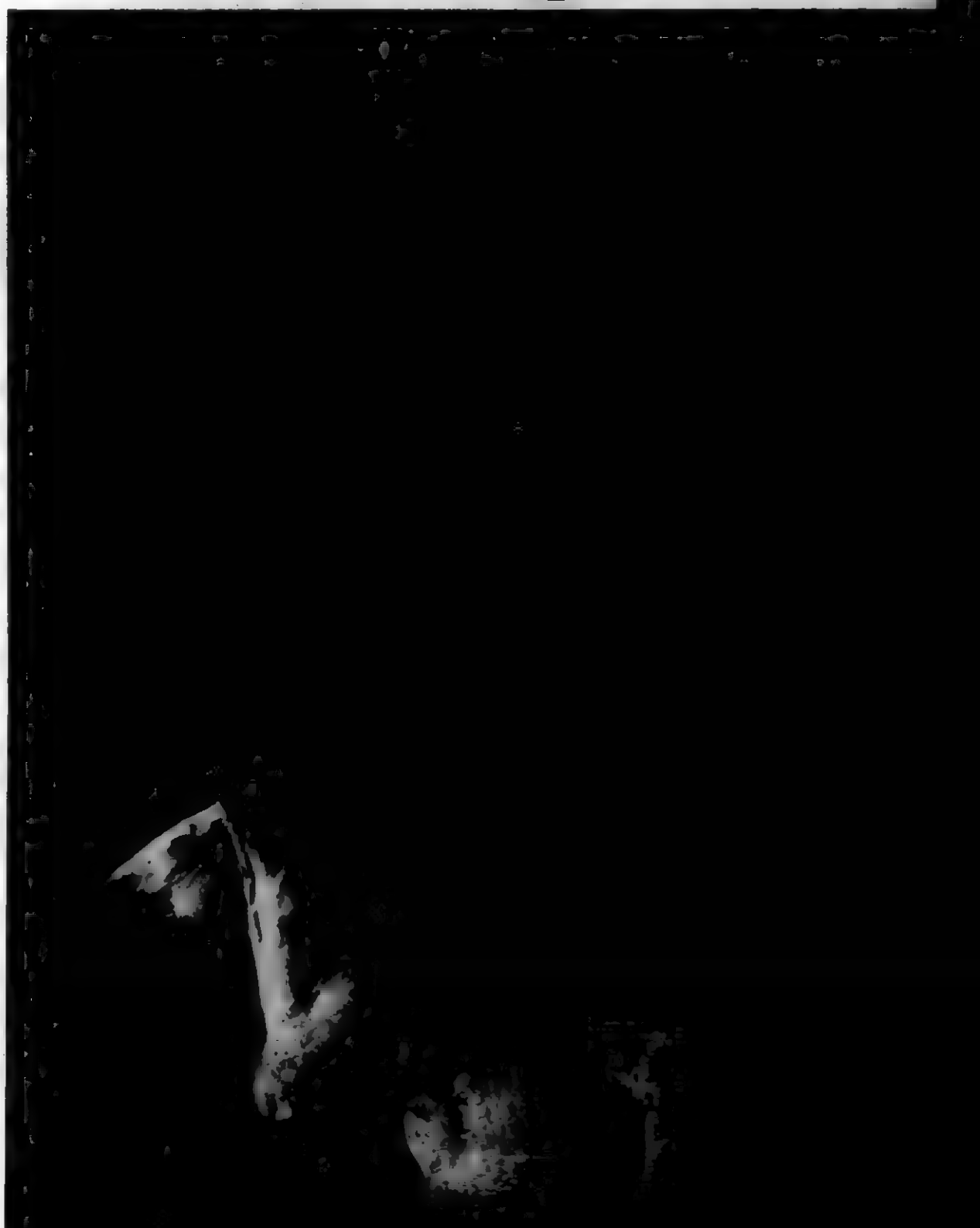

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System 7 demo soothes user fears

BY RICHARD PASTORE
CW STAFF

BOSTON — Skittish Macintosh users and developers got their first public look at the System 7 operating system last week and apparently liked what they saw.

Many who were interviewed said they were nervous about compatibility issues but are relieved by Apple Computer, Inc.'s promise that all existing Macintosh applications will run under System 7.

"After the introduction of System 6, our fingers were seriously burned" because of incompatibility problems, said Chris Espinosa, Apple's systems software product manager. "This time, developers had eight to nine months to test compatibility, rather than the four or five weeks they had with System 6."

As expected, Apple has included virtual-memory capability in the release. If the system memory overloads, the operating system can use hard disk space for memory. However, this process will slow the system down, Espinosa noted.

The feature that captured the most attention was a new file-sharing ability. With it, Macintosh users connected over Apple Localtalk links can share designated file folders with other individual users or groups of users. The feature also allows Macintosh users to access their hard disks from remote locations simply by logging on to another Macintosh and typing in the appropriate passwords.

> "THIS TIME, developers had eight to nine months to test [System 7] compatibility, rather than the four or five weeks they had with System 6."
>
> CHRIS ESPINOSA
> APPLE COMPUTER

With the file-sharing capability, managers can install System 7 remotely on any number of Macintoshes.

Despite its apparent convenience, file sharing raised security concerns. "The government and military will be resistant to some of the features in System 7. They won't be able to take advantage of [file sharing] right off," said Stephen Broughall, president of the Pentagon Macintosh Users Group.

Most users, however, expressed excitement about file sharing. "Having the Macintosh connected to a network makes more sense with System 7," said Max Minkoff, workstation and local-area network support specialist at chemical maker Rohm & Haas Co. in Philadelphia. Users will be able to share disks and files without the need for intervention by a network server administrator, making interoffice cooperation a lot easier, he said.

Minkoff, whose company has 1,000 to 1,500 Macintoshes, also praised the remote installation feature: "It'll be fantastic for installing applications."

A few members of the audience were put off when Espinosa told them that the Multifinder feature will no longer be an option but will be constantly turned on under System 7.

"I'm going to stay with System 6 because I have users who are confused with Multifinder now," one micro manager said. "You're adding a layer of complexity to a computer that was supposed to be easy to use."

Smoothed out

As expected, the upgrade includes Apple's new Truetype outline font technology, which renders alphanumeric figures without the jagged edges of bit-mapped fonts. However, much to the relief of users with heavy investments in Adobe Systems, Inc.'s Postscript fonts, System 7 will support all Macintosh-compatible bit-mapped fonts as well.

System 7 will cost about $50 when it becomes available. Beta-test versions will soon be sent to national user sites.

The requirements to run System 7 will be a Macintosh Plus or higher with at least 2M bytes of memory and a hard disk drive. A Motorola, Inc. 68030 microprocessor is needed to use the virtual memory feature.

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Apple

FROM PAGE 1

"There is no longer such a differentiation [with DOS-based PCs] that it takes a no-brain decision to spend many more thousands of dollars for a Mac." A hail of applause from the packed house of Expo-goers endorsed Campbell's opinion.

Apple recently announced that it had decided to retain Claris as a subsidiary rather than spinning it off as an independent company as Apple had long promised.

Many Macintosh software developers have taken umbrage at Apple's reversal on retaining ownership of Claris. T/Maker Graphics President Heidi Roizen summed up third-party developers' fears of unfair competition: "In the short term, I worry about what Claris can do with inside knowledge from Apple."

Opening another crack in Apple's public facade, Campbell complained that the Macintosh is mired in a desktop publishing niche — the applications segment that many credit for Apple's ability to break into the MS-DOS-oriented corporate market. "That image should be put aside," Campbell said. "The Mac must be marketed as a machine for all facets of users."

Apple's product line must be broadened to become competitive, said Symantec President Gordon Eubanks Jr. "You need to introduce laptops that someone other than Bo Jackson can carry around," he said.

In a swipe at Apple's penchant for protecting its proprietary edge by suing alleged copyright infringers — such as Microsoft for its Windows 3.0 and Hewlett-Packard Co. for its New Wave product — Eubanks offered Apple Chairman John Sculley this recipe for renewed success in the product arena: "A pound of innovation for every ounce of litigation."

Another notion proffered by the Symantec chief was that Apple contract with outside developers to provide a second source for Macintosh technology.

The idea of second sourcing or licensing the Macintosh's read-only memory has also been proposed recently by other industry analysts. The argument is that third-party machines running Macintosh software would increase the installed base and attract more software development.

Aldus President Paul Brainerd chided Apple for its recent executive suite upheavals.

"The internal turmoil has made it more and more difficult to work with them," Brainerd said."

Benny Lorenzo, an investment analyst at Volpe, Welty & Co. in San Francisco, was not surprised at the public airing of grievances. "These folks are getting much more vocal and public about sentiments that were expressed in private," he said.

However, Lorenzo added, "It is pretty clear that Apple is addressing them, maybe not as quickly as the various audiences would like."

Microsoft's Mike Maples, vice-president of the applications software division, seemed reluctant to take his turn after listening to the other panelists refer to the threat posed by Microsoft's DOS-based Windows 3.0.

"You'd think I represent the evil empire here," he said.

Maples called on Apple to increase its efforts in cross-platform communication and coexistence with the DOS world — both from a technical and a marketing standpoint.

Sculley, who took the stage shortly after the panel discussion, stuck to his keynote script and made no reference to the panel. He walked through nine new third-party application demos and concluded by saying: "The Mac is alive and well."

Stipulating terms

Macintosh software developers are demanding a series of Apple concessions

- Cut prices on existing line
- Introduce lower-cost Macintoshes
- Broaden the product line
- Help developers work with customers
- Stabilize management
- Sell the Mac as a business box, not as a desktop publishing machine
- Spin off Claris
- Second-source Mac technology
- Increase connectivity with DOS world

CW Chart: Paul Mock

Correction

"A chart on European mainframe shipments [CW, Aug. 6] mislabeled 1988 figures as 1989 and 1989 figures as 1990. Additionally, the source of the information has revised its shipment figures. The corrected chart appears below.

Total European market	$8,440	$9,069
IBM	$4,400	$5,514
ICL	$196	$289
Fujitsu	$36	$73
Amdahl	$493	$449
Siemens*	$530	$471
Hitachi Data Systems	$274	$279
Compares**	$516	$505

* Fujitsu reseller ** Hitachi reseller

Source: International Data Corp.

CW Chart: Paul Mock

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NEWS SHORTS

No winner seen in Intel chip spat

Both Advanced Micro Devices, Inc. and Intel Corp. claimed that a court decision last week was on their side. Court documents, however, granted Intel's preliminary injunction against Advanced Micro's claim that its 80287 math co-processor is a "genuine Intel equivalent" or "100% Intel-compatible." The San Jose, Calif., District Court allowed Advanced Micro to keep its 80287 name, however. The decision was in advance of a February 1991 trial to decide whether Advanced Micro could use Intel's microcode in products. Intel claimed an agreement between the firms allows microcode to be used within Advanced Micro.

AS/400 users get software shell

IBM quietly unveiled a new software tool last week that could prove a boon to its Application System/400 users running software from multiple sources. The Application Program Driver, which sits like a shell over the OS/400 operating system, is a cross-application utility tool that IBM claimed will enhance security controls, automate system backup and job scheduling more efficiently and let programmers create simplified menu screens so users can navigate more smoothly between applications with the same "look and feel."

OSF upgrades Motif interface

The Open Software Foundation (OSF) is due to introduce Version 1.1 of its Motif user interface today. Some 40 new features have been added, according to OSF's Craig Lamont, business area manager. These include "significant" performance enhancements, cached gadgets, improved color coordination and the ability to scroll through text faster. In other OSF news, the group said it is still on schedule to ship its Unix OSF/1 operating system in November.

AT&T cuts back its systems division

AT&T's Computer Systems division is reorganizing and will lay off up to 500 people unless they can be reassigned, a spokesman said. The group is consolidating all of its units, including sales, service and technical support. Also, where product development, product management and product marketing were previously in separate organizations, cross-discipline teams will now be deployed for specific products.

Poland, U.S. sign import pact

Poland has signed an agreement with the U.S. that will free it to import high-technology goods denied it under Communist rule. The agreement is aimed at guaranteeing Polish importers access to the most modern U.S. goods and technology, according to a Polish customs spokesman. He added that Poland pledged not to re-export these goods to third countries without U.S. agreement. The accord with Poland follows a June decision by the Coordinating Committee for Multilateral Export Controls to ease limits on exports to Poland, Czechoslovakia and Hungary.

OSF member opts for AT&T Unix

Unix International scored a public relations victory last week when Siemens AG, a founding member of the Open Software Foundation, announced two weeks ago in Europe that when its MX 300 multiuser workstation ships in October, the underlying operating system will be Unix System V Release 4.0 from OSF rival AT&T. Siemens still plans to provide a Motif interface on top of Unix System V, spokesman Jan Buchmann said. The reason for the switch is that the OSF/1 operating system will not ship until November and Siemens wants to sell its machines now. "They are the first significant member to bow to customer pressure on availability," said Chuck Barney, an analyst at Workgroup Technologies, Inc. "Basically, they just couldn't wait for OSF/1." Unix International President and Chief Executive Officer Peter Cunningham added: "We applaud their decision."

More news shorts on page 100

Contenders challenge Compaq

Opponents hope to chip away at Compaq's success with low-priced clones

BY RICHARD PASTORE
CW STAFF

The competition is increasingly gunning for Compaq Computer Corp. Last week, the Houston firm's flagship Systempro personal computer, LTE notebook PC and network node boxes joined its high-end desktop PCs on the list of recent targets.

"Everybody is going after Compaq," said JoeAnn Stahel, market analyst at Storeboard/Computer Intelligence in Dallas. Observers said that the competition covets Compaq's sustained success and believes the market is ready to accept advanced technology from low-priced cloners.

Compaq co-founder and Chief Executive Officer Rod Canion said the competition, though fierce, does not have him worried. "Unless the competitor has the reputation and channel presence to ship a high volume of product, it really isn't a big deal," he said. "They come in and get a little business for a while, but it doesn't last unless one of them emerges as a leader of some sort."

High-end high stakes

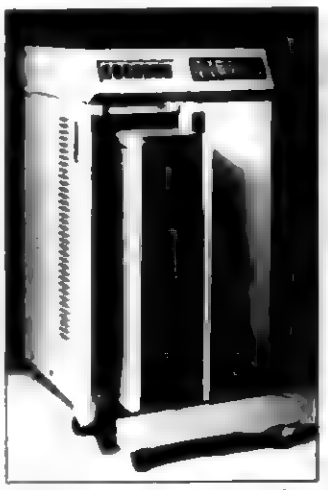
Hoping to prove itself a leader in high-end systems, Advanced Logic Research, Inc. fired a salvo last week at Compaq's dual-CPU Systempro. ALR's new Business Server line is designed for large Novell, Inc. networks or multiuser, data-intensive environments.

The servers' hardware configurations run the gamut from Intel Corp. 33-MHz 80386 CPUs with AT-style buses to Intel 33-MHz 1486 processors with Extended Industry Standard Architecture or IBM Micro Channel Architecture buses. The systems are all preconfigured for Novell Netware installation, the Irvine, Calif., company said.

The minicomputer-style chassis features eight storage bays, six small computer systems interface hard disk drives and a built-in uninterruptible power supply. Disk storage begins at 330M bytes or 650M bytes and is expandable to 10G bytes of capacity. Prices range from $15,000 to $22,000, compared with the Systempro's range of $14,000 to $30,000.

Tandy Corp. last week took its best shot at Compaq's market-leading LTE notebook-size PC. The new Tandy 1500 HD packs a 3½-hour battery, 20M-byte hard disk and floppy drive into a package weighing a hair less than six pounds. At $1,900, the 1500 HD undercuts the slightly heavier LTE by $700.

With a 10-MHz Intel 8086-comparable processor, 640K bytes of memory expandable to 1.64M bytes and IBM's Color Graphics Adapter graphics, the 1500's features closely shadow the main components of the LTE. For added value, Tandy throws in an AC charger and MS-DOS Version 3.3 — two options that Compaq charges for. However, the Tandy model lacks the LTE's external key pad and video ports, so users cannot plug the 1500 into their desktop monitors.



ALR's servers *plug into Novell Netware sites*

The Tandy machine will be available at Radio Shack stores in September, the company said.

Mail-order and superstore retailer Compuadd Corp. took aim at Compaq's high-end Deskpro 386/33 last week. Based on Intel's 33-MHz 80386 chip, the Compuadd machines ship with Microsoft Corp.'s Windows 3.0 and DOS preloaded.

The Austin, Texas-based firm said its 333T tower unit and 333FP desktop model will ship in September. With a 150M-byte hard disk, the tower and desktop models will sell for $5,975 and $5,795, respectively. Compaq's 33-MHz 386 box with an 84M-byte hard disk retails for $9,999.

Earlier this month, American Mitac Corp. launched a salvo at Compaq's low-priced 386N and 286N network node workstations. The Intel 80286-based Mistation 2 and 80386SX-based Mistation 3 are both available in diskless versions.

The Mistations offer higher resolution graphics than the Compaq machines, and the 200M-byte hard disk option eclipses Compaq's 40M-byte disk offering. However, the Mitac machines offer memory expansion only up to 8M bytes, whereas Compaq offers expansion up to 16M bytes.

The San Jose, Calif., firm is pricing its diskless Mistation 2 and Mistation 3 at $1,345 and $1,695, respectively. With 1M byte of memory and a floppy drive, the PCs cost $1,445 and $1,795, respectively.

An Ultralite, please

WOOD DALE, Ill. — NEC Technologies, Inc. is expected to take the wraps off its long-rumored Ultralite follow-on today and introduce a high-performance laptop PC as well.

Not quite as ultralight as its 4.4-pound predecessor, the new notebook PC will weigh in at 6.5 pounds. The extra ounces come from the addition of a 20M-byte hard disk and a more robust Intel 12-MHz 80286 chip.

The Ultralite 286V improves on the original's IBM Color Graphics Adapter graphics, offering IBM Video Graphics Array (VGA) with a resolution of 640 by 480 pixels. The $4,000 units include an external 3½-in., 1.44M-byte floppy disk drive, DOS Version 4.01 and 1M byte of system memory that is expandable to 2M or 5M bytes.

Like its predecessor, the new model incorporates a slot for NEC's proprietary random-access memory cards and third-party read-only memory software cards. The dual, rechargeable batteries have a life expectancy of 2½ hours, according to NEC.

Options include a 2,400 bit/sec. modem and a small computer systems interface adapter. The notebook PC will ship next month, according to the company.

NEC also announced shipment of a laptop PC based on Intel's 20-MHz 80386SX chip. The 12.9-pound Prospeed SX/20 features a 40M-byte hard disk, VGA graphics and 1M byte of RAM, expandable to 5M bytes. It ships with DOS Version 4.1 and a three-hour battery and charger.

The Prospeed is NEC's second laptop designed to connect to a docking station — a 14-pound, desk-resident expansion chassis that features two AT-style expansion slots, extra serial and parallel ports and graphic display connectors. The computer costs $6,000, while the docking station is priced at $1,199.

RICHARD PASTORE

E-mail lawsuit cranks open privacy rights can of worms

BY JIM NASH
CW STAFF

Privacy v. *Property* might be a better case name for the invasion-of-privacy suit filed last week against Epson America, Inc.

The suit, born out of a personnel dispute last January at Epson's Torrance, Calif., headquarters, pits those who hold electronic mail to be as inviolate as U.S. mail against those who consider E-mail company property.

Attorney Noel Shipman filed the class-action suit in Los Angeles Superior Court on behalf of Alana Shoars, Dick Flanagan, Lee Cheaney, Glen Mosby — all former Epson employees — and hundreds of other Epson employees who have used the company's E-mail since August 1989. Shipman claimed that it was at about that time that Robert Hillseth, manager of Epson's Hewlett-Packard Co. computer system, illegally tapped messages passing through a gateway between the HP system and its external MCI Communications Corp. E-mail service.

Shipman seeks damages of $3,000 per person for each alleged violation of a California statute barring the interception of an electronic communication without consent of all parties in the communication.

A spokesperson for Epson dismissed the claims, saying Epson's unofficial policy has been to read only those messages snared through routine network administration or troubleshooting. Shoars claimed she was fired Jan. 25 as E-mail administrator at Epson after she protested the alleged capture and printing of "thousands" of password-protected messages by Hillseth, who was her manager.

An internal memorandum distributed to all Epson employees last month stated that "all . . . data transmission equipment and services are intended for authorized business use only." It also stated that Epson's need to maintain network operations, prevent system misuse and curb software piracy means it "cannot guarantee the privacy of documents and messages" stored anywhere in the company.

Users at other firms contacted last week about the issues raised by the suit said they honored password-protected E-mail. "As a network administrator, I have no ability to review mail. I suppose it's possible to break the code, but I'm not going to ask many questions [of the vendor] about how to do it," said Roger Stucke at Pacific Resources, Inc. in Honolulu.

"I can't imagine an instance when I would need to know what's in a message in order to manage the system," Stucke said. He added that some networks without password protection as a standard feature, such as IBM's Professional Office System, might end up revealing a message's contents in troubleshooting.

Stephen Odo, manager of systems programming at the University of Hawaii's Honolulu computing center, said his staff accesses E-mail only when a problem in the network requires it. Odo explained that such an instance would be when a new vendor's network server has been hooked up and needs debugging. "It does bother us," he said. "[Users] trust us not to go poking around for curiosity."

Peter Drewliner, vice-president of Bank of Hawaii in Honolulu, said the bank has no written policy on intercepting E-mail. All messages are either shielded by individual or group passwords. Drewliner said that to his knowledge, no sampling has been conducted.

Sun profits back to high altitude

MOUNTAIN VIEW, Calif. — Sun Microsystems, Inc.'s first annual earnings report since a botched orders brouhaha, which threw the firm $20 million into the red in last year's fourth quarter, proved a decisive victory for the Bible, Ernest Hemingway, a slew of Wall Street analysts and anyone else who has ever said The Sun Also Rises.

The workstation maker logged net income of $111 million on revenue of $2.5 billion for the fiscal year ended June 30 — increases of 83% and 40%, respectively, over net income and revenue reported for fiscal 1989.

Sun's fourth-quarter revenue shot up 62% over sales in last year's comparable quarter; a quarterly profit of $49 million contrasted with last year's fourth-quarter loss.

In a prepared statement, Chief Executive Officer Scott McNealy credited Sun employees across the board with "returning the company to levels of service, quality and profitability we can be proud of." He cited an all-time high in revenue per employee: $215,000, up 24% from the 1989 figure.

McNealy also emphasized Sun's solid year-end balance sheet. The company ended the fourth quarter with a cash balance of $394 million, short-term debt down $104 million and inventory levels down approximately 33% from last year's closing tally.

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CSP push winning customers

BY ROSEMARY HAMILTON
CW STAFF

More and more mainframe shops are using IBM's Cross System Product (CSP), but many of them still do not think much of it.

CSP seems to be catching users' eyes more for its strategic positioning than its usefulness. While the software has long been heavily promoted by IBM, it has received even more of a push recently. In addition to playing a key role in both DB2 and the Systems Application Architecture (SAA) strategy, CSP is now a critical piece of the company's grand plan for application development, AD/Cycle.

"We looked at it in the past, and we were not particularly impressed with it," said Vince Hilly, director of data administration at Depository Trust Co. in New York. But the company has a big commitment to AD/Cycle and installed Repository Manager earlier this year. As a result, "we will re-examine CSP, probably in the not-too-distant future," Hilly said.

The strategic position, combined with slow but steady product enhancements, has given CSP a new lease on life.

Not so long ago, CSP was dismissed as a feeble application development environment that would never be a big success. However, Computer Intelligence polls on mainframe purchase plans now show CSP pulling far ahead of the competition. What's more, worldwide licenses now number 5,000, with one-third of those in the U.S., according to Martha Rivers, a CSP product manager at IBM.

However, numbers do not tell the whole story. Users contacted recently gave the product lukewarm ratings. While they said IBM has made progress from the mid-1980s — when the software was written off as too slow and clumsy — there is still room for improvement. They most often cited DB2, AD/Cycle or other product-related reasons for selecting CSP.

Consultants contacted recently suggested that the mediocre product's success is a classic case of IBM's marketing might — it works when you ride the coattails of DB2 and AD/Cycle.

"IBM's been telling the world it's strategic, so it goes into people's buying plans," according to Vaughan Merlyn, chairman of CASE Research Corp.

While current CSP users are not exactly a thrilled bunch, some contacted recently said they believe IBM will make great strides to improve CSP because it is so strategic.

"In some ways, it is a dog, but for low-volume transaction processing [applications], it makes sense," said Adam Backenroth, a vice-president of Geoserve, the information systems arm of Manufacturers Hanover Trust Co. "I wasn't involved in the selection, and if I had been, I probably wouldn't have selected it. Now, looking to the future with the IBM statements gives us assurance that it will get better."

Richard Dixon, manager of inventory management systems at Book of the Month Club, Inc. in Mechanicsburg, Pa., has similar hopes. He said CSP has been productive, but he stopped short of giving it a big thumbs-up. It was installed around the time DB2 was delivered to the firm.

"I was probably one of the biggest bigots against it," Dixon said. "We were selecting not only an on-line development tool but a database and looking to minimize vendors. We wanted something higher level than command-level CICS, and we knew IBM would always be there."

CSP was first released in the late 1970s as an application development tool for the IBM 8100 series, which has since been discontinued. Initially, IBM converted CSP to the System/370 world for VSE users. This was partly because of CSP's ability to accommodate other operating environments, allowing users working under one operating system to write code for another.

IBM expanded CSP to both MVS and VM in the mid-1980s and focused on its ability to address multiple System/370 operating systems. This concept was highlighted again in 1987 when IBM rolled out its SAA concept, which was intended to create a more seamless environment across the diverse IBM platforms.

CSP, as part of SAA, would allow a programmer in one SAA operating environment to write a program for any of the other SAA ones. The development would be done in a CSP execution mode on one platform and transferred to a CSP runtime mode to a different platform.

More recently, the multi-operating system facility, along with the newer code generation capability, was featured in CSP's positioning with the AD/Cycle rollout. CSP is now the official AD/Cycle code generator. While IBM acknowledged that CSP has suffered from an image problem, it points out that it has been steadily improving the product.

"The enthusiasm is still building," said Dick Johnston, a CSP marketing manager at IBM. "For many of those large customers that have looked at it in the past years and months, they need to look at it again, because it's a different product."

Climb to success

Annual buying plan surveys indicate a strong shift toward IBM's CSP over competing mainframe application development tools

	1985	1987	1989
Computer Associates*	29%	23%	14%
Cincom's Mantis	14%	5%	4%
IBM's CSP	9%	32%	39%
Panaophic's Telon and General	17%	18%	12%
Software AG's Natural	9%	12%	13%
Other	22%	10%	10%

*Target vendor a variety of products, including those of acquired companies ADR and Cullinet Software

Source: Computer Intelligence — CW Chart: Marie Haines

Rival camps

One thing is certain about CSP: It has its share of reluctant users.

At Reynolds Metals Co. in Richmond, Va., CSP has divided users into two camps: those who back it and those who would like to see it go, according to information systems director Jim Matsey.

"We have a mixed bag here, with some saying it's an adequate product and other people who think it isn't good because it has limitations and consumes resources," Matsey said. "But we are still using it and still anticipating that IBM will improve the product. We aren't sure where it's going to go."

Dan Cavanagh, a senior vice-president at Metropolitan Life Insurance Co., said CSP "seemed like a product that we shouldn't just ignore, given IBM's position on it."

So the company installed it, but it is only used in one development area.

Other users are considering it with no urgency. "We looked at it a year ago and didn't think it had enough functionality," said Gavin Taylor, senior vice-president of the information services division at Putnam Cos. in Boston. "But we intend to [look again]. We just formed a team to look at AD/Cycle."

Anchor Systems Corp., the IS services division of Anchor Savings Bank, used CSP, got rid of it and plans to look at it again sometime in the future, according to President Joseph Talka.

"We found it wasn't good for batch," Talka said. "We were writing half [our code] with conventional Cobol. Our general philosophy is to stay close to the Blue line, if you will. It just didn't work out."

However, Anchor is ramping up for a computer-aided software engineering strategy and will likely review CSP again.

Strategic saga

CSP's strategic role with other key products and plans at IBM continues to be fine-tuned.

The original goal was to provide both CSP runtime and execution modes for the four IBM SAA platforms. Now IBM is focusing on the mainframe and microcomputer platforms. It will not provide CSP on the Application System/400.

"Our strategy now is to take [the CSP] functions down to the OS/2 platform and not propagate it across all SAA platforms," said Martha Rivers, an IBM CSP product manager.

The reason, she said, was "because the ability to provide a generator [on the AS/400] was so far down on our plans that we decided it was better to make an arrangement with Synon."

With AD/Cycle, CSP's application development capabilities will still be featured, but the newer code generation function will get more attention in the future.

AIX

FROM PAGE 1

prohibit you from developing any kind of application you want on either platform," said Jack Clemons, IBM's manager of technical CASE solutions. "High-performance [reduced instruction set computing] workstations are becoming very popular, and we're beginning to see IS development work on these platforms."

Clemons said what separates the AD/Cycle and AIX development platforms is "tradition — IS traditionally is mainframe-oriented, and the technical market traditionally is workstation- and Unix-oriented. But as these traditions start to blend, we will evolve the strategy on both sides." IBM's overall strategy, he said, is to "allow customers to move around and do IS or technical work on both types of platforms."

In this scenario, customers could use either OS/2 or Unix on workstations to develop applications that are targeted to run on IBM mainframes. Also, IBM has committed to building bridges between AIX and its Systems Application Architecture (SAA) operating environments so that both use common languages, user interfaces and communications protocols.

IBM seems to be taking its cues from the industry as a whole. Some non-IBM shops are already using Unix as a development platform. The Burlington Coat Factory Warehouse Corp. in Lebanon, N.H., is "in the process of taking our applications and bringing them up in a Unix environment," said Michael Prince, MIS director. The applications currently running on the company's Bull HN Information Systems, Inc. mainframe are being rewritten for Sequent Computer Systems, Inc. computers running Unix.

The Mellon Bank Corp. in Pittsburgh is looking into Unix to build applications, said George DiNardo, executive vice-president of information management and research.

"We're looking into OS/2 and Unix because of their graphical approaches to programming. You can see where other problems are," DiNardo said.

For its part, IBM will "let the customers tell us what they want" in this still-developing market, Clemons said. "There aren't customers yet doing heavy development work in either AD/Cycle or AIX, so the strategy is to get them installed, build the bridges between the two environments and let the market lead us."

For example, he said, it is unclear at this point whether IBM will build a separate repository for AIX or let AIX developers use the one on the host, or some combination of both. Industry observers note that many IS shops will inevitably be using both Unix and proprietary platforms for software development. "IBM mainframes have the hearts and minds of IS directors, but little by little, when they have to program for a complex application like networking and distributed processing, all these things will migrate to Unix," said Brian Boyle, director of research at Novon Research Group in Berkeley, Calif.

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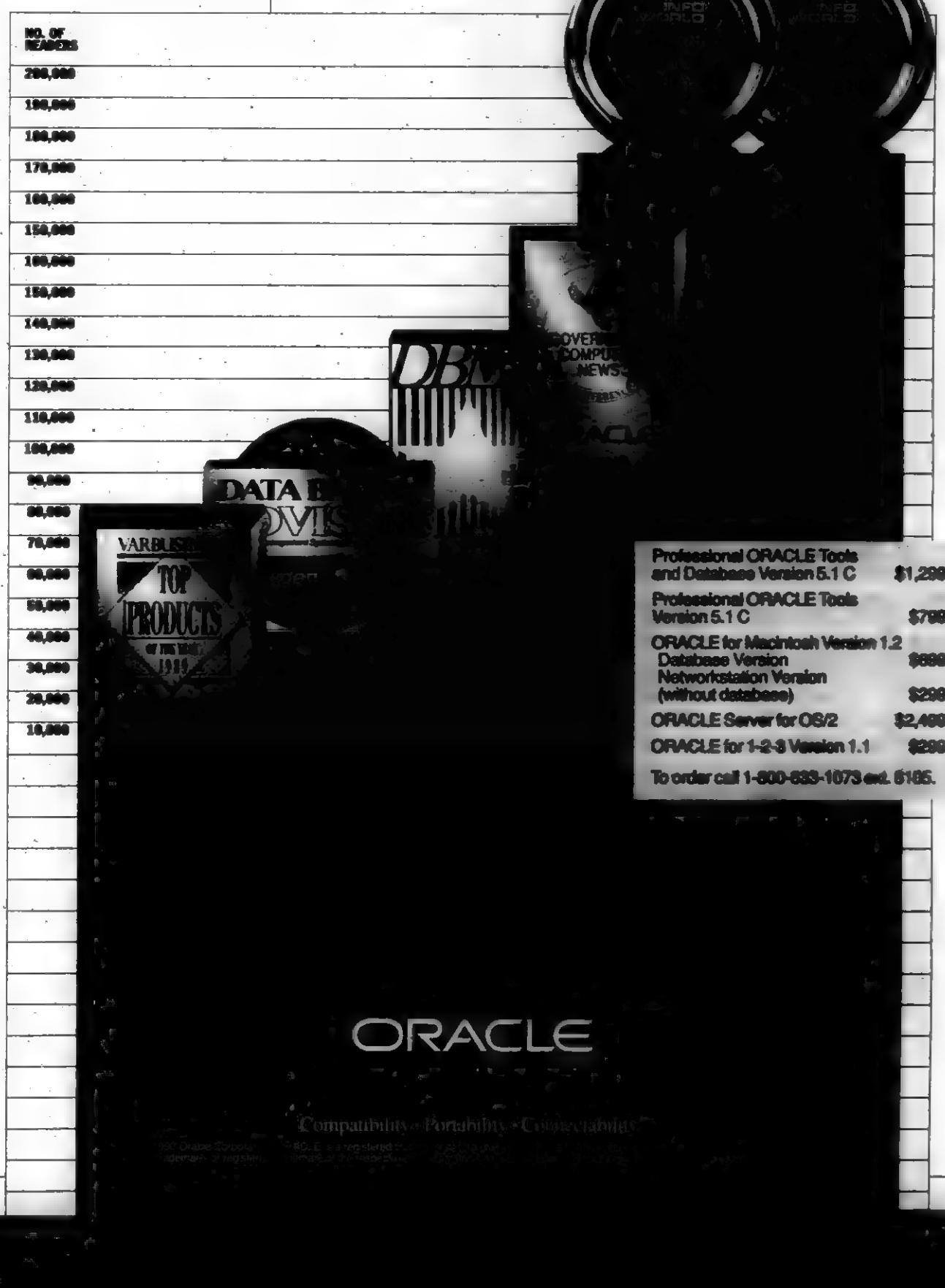

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Lotus preparing to tighten fiscal belt

BY PATRICIA KEEFE
CW STAFF

CAMBRIDGE, Mass. — Lotus Development Corp. appears to be battening down the hatches in preparation for a potentially rocky third — and perhaps fourth — quarter. The spreadsheet maker confirmed last week that it is eliminating 40 positions through job consolidation and has instituted an almost companywide hiring freeze.

Moreover, "there is clearly a process in place where we are trying to identify areas in which we could do more with less," Lotus spokesman Richard Eckel said. For example, Lotus wants to cut its travel and entertainment costs by 50%, he said.

Eckel attributed these cutbacks in part to fallout from a recent reshuffling at the executive level resulting in a number of consolidations among departments [CW, July 16]. However, he admitted that expectations for the third quarter "are clearly an element."

Asked whether this is a one-time layoff, Eckel would only say that "no more cuts are planned at this time." He also claimed that only 20 employees will actually lose their jobs. Lotus currently has a total of 3,100 employees.

One Wall Street analyst suggested that Lotus' current divisions could get along with as much as 25% fewer staff, adding that those employees could probably be deployed into new areas. In fact, Lotus does plan to add between 150 and 200 staff members to the international, consulting and product support areas by year's end.

In an analyst meeting last month, Lotus Vice-President of Finance Robert Schecter cautioned that the company was expecting a weak third quarter and would "continue" to look at cost-cutting measures. Since then, Lotus stock has lost over 20% of its value and continues to inch slowly down the ticker.

Many Lotus analysts are also expecting a so-so fourth quarter.

> EXPECTATIONS for the third quarter "are clearly an element."
>
> RICHARD ECKEL
> LOTUS

Some, such as Robert Therrien, an analyst at Paine Webber, Inc., think that even the revised revenue estimates are still too high. "Historically, Lotus has never been very good at cost cutting, even when the company says they are seriously looking at it," Therrien said. He added that Lotus' costs per employee are too high.

"We don't think our cost structure is out of line. One man's investment is another man's expense," Eckel argued, adding that Lotus is investing in new areas aimed at expanding the spreadsheet market. He also cited a revenue-per-employee figure of $198,000 for 1989, noting that 1990 projections are a little higher, falling in at about $200,000 per employee.

"That figure should be a lot higher — closer to $240,000 to $250,000 per employee," Therrien insisted. "In a mature market that is growing slower than initial expectations, if you want to keep profitability up, you need to cut your cost structure."

Still, although software firm layoffs are rare and Wall Street continues to express caution, most analysts are not reading much into the layoffs and hiring freeze. They are more interested in Lotus' long-term marketing and product strategies.

"The layoffs are a tiny number, and its [significance] shouldn't be overblown," said Charlotte Walker, an analyst at Labe Simpson & Co.

"These are minor layoffs — more adjustments than anything else," agreed David Cearley, a software analyst at Gartner Group, Inc.

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Cincom takes Supra a step in the Unix direction

BY JEAN S. BOZMAN
CW STAFF

SAN FRANCISCO — Cincom Systems, Inc. recently broadened the reach of its Supra relational database management system beyond the IBM mainframe and the Digital Equipment Corp. VAX and into the Unix arena. The move, announced at last week's Cinteract '90 user meeting, is intended to support distributed database applications, Cincom executives said.

Supra will be available for Sun Microsystems, Inc. Sun-4 workstations, the IBM RISC System/6000 Unix machine, IBM-compatible personal computers based on the Intel Corp. 80386 chip and machines made by Sequent Computer Systems, Inc. and Pyramid Technology Corp. The Unix versions of Supra will be available in the fourth quarter, and pricing for the software will not be announced until then, Cincom said.

Users at the conference, most of them from IBM data centers, seemed interested in the possibility of hooking up Unix workstations to their mainframe systems. However, most who were questioned said they were not sure whether they would take that step anytime soon.

"Of course we're interested in the fact they're branching out to Unix and to PCs, but I just don't know when we're going to use those products," one Philadelphia customer said. Another East Coast user with multiple IBM mainframes seemed concerned about the announcement, adding, "I hope this doesn't mean they're going to lose their focus on their traditional base of large IBM sites."

Of more immediate interest, users said, was Cincom's announcement of a new version of Comprehensive Planning and Control System (CPCS), which allows users to manage their software systems according to IBM's AD/Cycle architecture. CPCS Version 3.0 addresses users' concerns about security and

USERS AT the conference seemed interested in the possibility of hooking up Unix workstations to their mainframe systems.

reporting facilities, said Dale Potter, manager of the CPCS product group. CPCS, priced from $24,700 to $119,000, allows users to document their software systems and coordinate application development by multiple programming groups, the vendor said.

CPCS 2.0, introduced at last year's Cinteract, only gained 30 users worldwide because of perceived deficiencies among early users. However, one of these users, Vic Gilks, an information systems director at Lloyd's Bank PLC in London, said he is pleased with the enhancements. "We find it's quite responsive now," said Gilks, who has been evaluating CPCS for nine months.

At the same time, Cincom Chief Executive Officer Tom Nies said he hopes to employ Cincom's new Unix technology to forge strategic alliances with major systems vendors — thereby boosting the privately held $168 million business.

Cincom, which has been unable or unwilling to make a public offering of its stock, now faces a need for additional funding, said industry analysts at International Data Corp. in Framingham, Mass., and Digital Consulting, Inc. in Andover, Mass. Earlier this year, Cincom sold its Net/Master business to Systems Center, Inc. for $43 million. Even without Net/Master, Cincom executives said they expect revenue to grow by 11% this year.

William Dorece, vice-president of strategic alliances at Cincom, said the Unix venture was one way to increase profits.

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ADVANCED TECHNOLOGY

TECH TALK

World's smallest lasers

■ Researchers at Bellcore in Middletown, N.J., have created an experimental array that combines 160 of the world's smallest surface-emitting lasers into a single powerful beam. The energy generated by such arrays could be used by microchips in optical computers and neural networks or to create holograms. The lasers, measuring about one-tenth the diameter of human hair, direct light off their surfaces instead of horizontally, making it possible to pack more of them onto a chip. "This most recent development could spur the continuing trend toward nearly quantum-size electronics, offering equipment that is smaller, less costly and often more reliable," said Hoi Jun Yoo, principal researcher.

Security LANs

■ Polaroid Corp. and Nynex Corp. have signed a pact to market and install Polaroid's ID-2000 Digital Security and Identification System in local- and wide-area networks. Under terms of the agreement, Polaroid will resell Compaq Computer Corp. LANs to its ID-2000 customers; Nynex Business Centers will install and service the LANs; and Polaroid will retain responsibility for supporting ID-2000 hardware and software.

Desktop video editing

■ Digital F/X in Mountain View, Calif., introduced last week what it claimed is the industry's first desktop video production system. The Video F/X system combines video, audio and graphics editing on an Apple Computer, Inc. Macintosh II with 8M bytes of memory, a 40M-byte hard disk and a color monitor. The system, which also includes two videotape recorders, video/audio control box, buffer card and video monitor, will retail for $9,995. Digital F/X also said that it is the first to license Adobe Systems, Inc.'s Postscript for exporting any Postscript graphic onto videotape.

DTM brings good things to 3-D life

Desktop manufacturing systems create 3-D prototypes instantly and inexpensively

BY MICHAEL ALEXANDER
CW STAFF

Computer-aided design and engineering (CAD/CAE) software has dramatically increased the ease and speed with which an industrial designer or engineer can create realistic representations of parts or complete products.

The problem is that a computer-generated design cannot match the look and feel of an actual, three-dimensional model, and making a prototype is often as long and laborious as CAD/CAE is speedy and easy.

A growing number of companies are finding ways to get around this prototyping bottleneck with "instant prototyping" or "desktop manufacturing" (DTM) systems that quickly translate computer images into 3-D models almost as easily as a laser printer or plotter generates hard copy from computer data.

There are several DTM technologies under development, including stereolithography, photochemical machining, laser sintering and laminated-object manufacturing.

DTM systems, which combine personal computer, laser and other technologies, are being used to sculpt objects from computer-generated models created on CAD workstations. Prototype parts can be made from plastics or with laminates, paper and other materials in a matter of hours or days rather than weeks or months.

"A lot of the processes have existed for a long time — laser, photochemistry and computer software — but no one has really been able to put them together," said Stephen Amick, international sales and marketing manager at 3D Systems, Inc. in Valencia, Calif. "Technically, it is easy to understand; it's combining them that is not easy."

3D Systems is the leading U.S. maker of Stereolithography Apparatus (SLA) systems using technology that it patented and has been marketing since 1988. The company reported revenue of $17.5 million in 1989, up from $4.6 million in 1988. Until recently, no other company sold 3-D production systems.

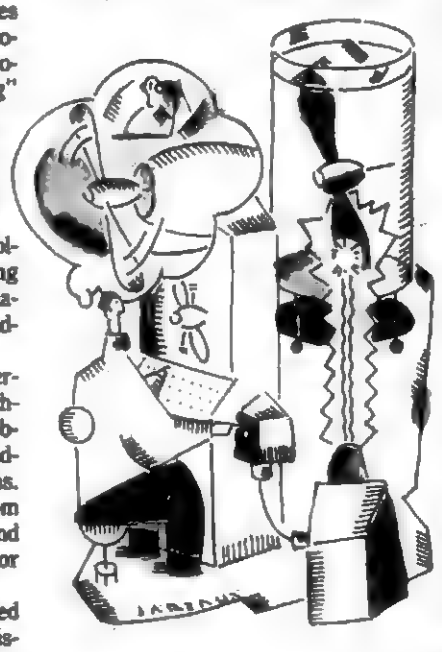
The first step in the process is to transfer the design for the model, which has first been created on a Unix-based workstation, to what 3D Systems calls a "slice computer" — a Unix-based, Intel Corp. 80386 PC that strips down the computer-generated model into cross sections.

The SLA creates a plastic model by training a computer-controlled laser beam on the surface of a liquid polymer that hardens when exposed to the laser beam. The model is then built up in successive layers, which can be as thin as 1/5000 of an inch, by drawing one cross section at a time. An elevator in the vat of liquid plastic lowers the model after each cross section has been made.

The computer that controls the laser is a standard, off-the-shelf IBM Personal Computer compatible with either an Intel 80286 or 80386 microprocessor running MS-DOS.

3D Systems markets three versions of the SLA, ranging in price from $95,000 to $385,000. The systems vary in workstation performance and the size of the model that they create. The models range from 7 by 7 by 10 in. on the low end to 20 by 20 by 24 in. at the high end.

Larger models must be manufactured in sections and then bonded together. That is how Mercedes-Benz, for example, created a prototype of a complete exhaust system.



Robin Jaroszek

Stereolithography and other technologies can be used to produce parts considerably faster and of greater complexity and size than can be achieved using machine tools. "We can build systems to any accuracy, taking into account such variables as the width of the laser beam, the amount of shrinkage as the liquid polymer is transformed in a solid plastic, curing after production and more," Amick said. The down side is that it is difficult to design parts to extremely close tolerances, and because the prototypes are made of a brittle plastic, they often cannot be machined or used in actual testing.

Eastman Kodak Co., Digital Equipment Corp., Apple Computer, Inc., Texas Instruments, Inc. and other companies that use SLA technology said that the production systems shorten their product design cycles — saving money and enhancing their competitive abilities. Designs can be created and altered easily, thus allowing them to work out refinements that would otherwise be impractical to attempt.

A task that would normally take weeks or months to complete can be accomplished in hours or days, said Timothy Gornet, computer-aided engineering and manufacturing executive at General Electric Co.'s appliances division. The appliances division creates prototypes of knobs, handles and other parts with aesthetic value for evaluation by consumer focus groups.

Some firms that have the machines are reluctant, for competitive reasons, to talk about how quickly the machines have paid off. TI, which has four of the systems, paid them off at a rate of at four months each, Amick said.

Time over money

Companies that use DTM systems are more intent on saving time than money, Amick said. "The biggest problem in the manufacturing world is that it takes time to build prototypes in clay, steel, wood."

At Johnson & Johnson's orthopedics division, an SLA system is used to create prototype prosthetic implants for evaluation by medical organizations.

The system has enabled the firm, the leading maker of hip and knee replacement parts, to build strategic alliances with key medical organizations largely because of its rapid turnaround capability, said Salvatore Caladarise, product development manager. "We can create parts in the same week they have a meeting."

Automotive and aerospace manufacturers have been especially interested in the technology because models are expensive to produce, requiring costly tooling and lengthy manufacturing cycles. Those industries are also likely to combine in a single product a large number of complex components that have been designed and produced separately.

No one really knows how large the potential market is for stereolithography and other systems — partly because they are so new and partly because they combine a variety of technologies — so comparisons to existing industries are difficult.

3D Systems has had the field to itself for the better part of two years, but competition is showing signs of picking up.

Du Pont Co. in Wilmington, Del.; DTM in Austin, Texas; Quadrax Laser Technologies, Inc. in Portsmouth, R.I.; and Hydronetics in Chicago, as well as a number of European and Japanese firms, are developing DTM systems.

The companies working on stereolithography and similar desktop manufacturing systems hope to someday use the technology to produce finished goods, a feat that cannot be carried off easily with existing methods.

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CW

EDITORIAL

The real Japan

WHEN WE DECIDED early this year to assemble the first in-depth look at information systems in Japan, we had plenty of reservations. We had heard a lot about the "closed" Japanese culture, reluctance to open up to foreigners, arrogance about the country's economic success and the subjugation of the individual to the group.

We couldn't have been more surprised. In fact, so many Japanese companies were willing to be interviewed that we couldn't get to them all. The managers we met were gracious, open and eager to share information. While their company loyalty was unquestioned, they also took great pride in individual achievement. Perhaps most important, they were fascinated by what's going on in the IS field in the U.S.

The obsession American business has with Japan has spawned plenty of misinformation. Americans tend to dismiss Japan's success as being a function of its culture and traditions. Lifetime employment and consensus-style decision-making won't work in this country, we say. Japan, Inc. doesn't play fair because government exists only to support industry.

Hogwash. There's a lot the Japanese do that can work here as well — for example, the attitude that markets should be viewed strategically rather than in rigid cost-justification terms. The Japanese rationale for entering a new line of business may simply be, "We have to be there."

The Japanese concentrate on meticulously fine-tuning manual procedures before automating them, with the result that automation has a dramatically greater impact on efficiency. Their investment strategies rely on relatively stable debt vehicles rather than the volatile equity markets. Government does promote investment in growth industries, but it is also quick to bail out of declining markets rather than propping up uncompetitive companies with big contracts.

The Japanese have their share of competitive disadvantages as well: poor job mobility, the low status of women, language barriers, a high cost of living and an international image problem, to name a few. There is plenty of room for American companies to gain a competitive edge in Japan, as successful firms such as Procter & Gamble and IBM can attest. But it will take an open mind about what the U.S. can do better.

Two characteristics of Japanese business professionals especially impressed our Japan reporting team. One was the nearly insatiable appetite for information about what's going on over here. Japanese IS professionals admit that they lag behind their Western counterparts, but they are determined to close the gap by adapting good ideas to their own business culture. Another was reverence for education. Japanese children attend school year-round and are subjected to brutal college entrance examinations. Firms rotate employees through different departments and overseas divisions so they can learn the business from the inside out. Nearly everyone we met spoke or read English. This is a business culture preparing to compete in a global environment.

LETTERS TO THE EDITOR

The right numbers

Jay Zagorsky's Viewpoint column, "The upside of software piracy," [CW, July 2] states that economically, software developers can ignore piracy. He claims stolen software does not have a large effect on a computer company's profits because only a small fraction of illegal software represents lost sales and because piracy increases demand for future products.

Using the example of a small company with less than $10,000 in revenue, Zagorsky tries to show that a) if piracy were prevented, only a 7% revenue gain would result; b) the 7% revenue gain would be offset by the costs of the engineering talent required to prevent piracy; and c) pirated software has a positive effect on future sales, because pirates who like a product often buy future releases.

First of all, software piracy is flat-out illegal, period. Assuming Zagorsky's 7% number is valid, how would he like it if someone broke into his house and took 7% of his belongings or emptied his savings account of 7% of his money? That's exactly what piracy is to the software companies.

Let's take a $150 million software company with profits of around $10 million to $15 million annually. If I were chief executive officer, I'd gladly invest a couple of engineering man-years at maybe $125,000 per year to gain 7% more revenue. That's $250,000 worth of engineering to get $11 million in revenue — a very worthwhile deal.

Most of that $11 million in new revenue would go right to the bottom line. After allowing for the minor additional engineering costs and cost of goods sold, let's say incremental profits after taxes (we're in the 50% bracket) are $5 million. Now we are adding almost 50% to the profits! Our hypothetical company's stock price should take a healthy jump over that 50% profit increase.

Zagorsky says that, ethically, the pirating of software is a social dilemma. My friend, I hope your article was written strictly from an academic viewpoint and does not reflect your activities as "an independent software consultant."

Steven Farber
Director,
Business Development
Intellicorp
Mountain View, Calif.

Not just a PBX

The article "Defense giant pulls Profs plug" [CW, July 16] thoroughly took me aback. I didn't think extricating Profs from even a moderate-size customer would have been possible, much less from such a large organization.

The courage it took to make that decision is quite commendable. Most Profs users take the system for granted, giving no thought to the underlying costs.

I have had the experience of watching Profs grow from an IBM 4341-II to an entire 3084 processor supporting nothing else. Early on, it was apparent that the base operating system was not well-suited to the application.

It was also too late. Once infected, there was no cure, despite IBM's assurances that the next release would alleviate the pain. Management was hooked.

There is no question of the benefits of Profs and Office Automation, only a question of matching needs and requirements alongside good business practices. Profs has excellent potential but requires strict management to keep it from devouring an inordinate amount of resources. It isn't just another PBX.

Guy Goubeaux
Computer Co-operative Services
Phoenix, Ariz.

No competition

Regarding your recent article on Lotus and its legal action against Borland [CW, July 9], I think it will be a travesty of justice if Lotus wins. Borland's Quattro Pro is user-friendly, faster and a better all-around product than Lotus' 1-2-3.

Lotus doesn't seem to give a damn about the user. What logic, for instance, is there in hiding the printer set-up commands three or four layers deep in abstract menu names? The logical place for those is in a menu item labeled "PRINT," as it is in Quattro Pro.

If Lotus prevails, then I think that new and better software is gone forever, for if Lotus prevails and someone develops a new software product, that is competition. Companies won't improve their product; they will simply go whining to the courts to curb that competition.

B. J. Thomas
Sparks, Nev.

Computerworld welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor In Chief, Computerworld, *P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701; Fax: (508) 875-8931; MCI Mail:* COMPUTERWORLD.

Airing both sides of the 'look-and-feel' debate

DAVID REED

"Keep your lawyers off our computers!" cry the new prophets of doom in the personal computer industry. Shrill voices would have us believe that copyright protection of interface designs of successful software products will halt innovation and put small software companies out of business. The "spin doctors" of the trade media encourage the misconception that you can accidentally violate the copyright on a program you have never seen. Others claim that the only way to improve upon a product is to copy part of its design and add features to it.

These arguments don't make sense. I am no lawyer, but as a professional software designer for more than 20 years, I've had experience with lots of small companies, and I have seen how software innovation works.

Since the 1700s, copyright and patent laws have evolved to recognize that when an author, artist or designer creates something original, he or she is given certain ownership of the fruits of that labor. It seems fair that software designers who carefully create a useful organization of screens and menu choices should be able to prevent unlicensed use of their design. The copyright statute itself puts it best: Copyright protects "original works of authorship fixed in any tangible medium of expression, now known or later developed, from which they can be perceived, reproduced, or otherwise communicated, either directly or with the aid of a machine or device."

There at the beginning

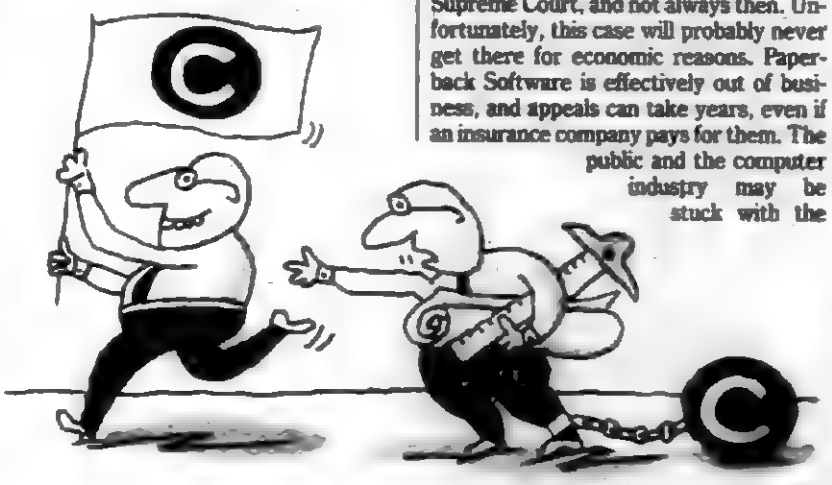
I remember the evenings I spent in Bob Frankston's attic looking at demos of an Apple II program that became Visicalc, the first electronic spreadsheet. Dan Bricklin, who originally conceived the idea, amazed me with the time and care he took to make sure that each command, keystroke and displayed prompt response would fit together into a structure that would be powerful, flexible, aesthetically pleasing and easy to learn.

Visicalc helped create the PC industry, and I remember thinking how much of the value of a good product was in the user interface design.

When Judge Robert Keeton recently affirmed the copyrightability of Lotus' 1-2-3 user interface and menus, he reaffirmed that application designers such as Bricklin own the original results of their work. This ruling is incredibly important, because it is often much easier for a group of programmers to implement a copy of a design than to come up with a good original one. While code that implements a design well is essential, there are lots of ways to implement it. It seems only fair that someone like Dan Bricklin should own the results of his authorship.

As a designer, I don't have to worry about infringing on the copyright of a program I've never seen — you have to copy significant portions of someone else's work to violate the copyright. You need to be cautious when you find yourself studying another product and copying elements of its design. It makes sense to be extremely careful if your goal is to compete with that product. If you are only using abstract ideas from that product, there should be no problem. But if you find yourself transcribing the expression of those ideas that distinguish that product from others, watch out.

Without copyright protection, small software companies would take an enormous risk introducing products. Had another company merely copied the Visicalc design and added a minor feature or two, Bricklin might not have earned even enough money to cover his expenses.



Nicolas Asco

If the only way to better a product was to copy its user interface, copyright might indeed halt innovation and restrict competition, because copyright prevents including all or part of a copyrighted work in another. As a designer, I'm challenged by trying to do something significantly better than the competition.

Most products succeed because they embody original approaches that allow you to do something an order of magnitude better, rather than offer a little bit more of the same old thing. There are many ways to add functionality to a product without copying: Companion products, add-ins and add-ons, are well-known approaches that can be very profitable.

Plagiarism is prohibited in the "free press," "free speech" and even in the much fuzzier notion of "academic freedom." Why should programming be any more (or any less) free? The notion that "programming freedom" precludes designers owning their original works seems like pure demagoguery. It is an attempt to build an emotional case by likening the issue to the causes of human rights and civil liberties.

Designing and developing great business software is not a game — it's a serious business. Millions of users spend billions of dollars not to satisfy my creative urges, but to buy useful software products. The argument that companies ought to be allowed to reduce their business risk by copying another's successful design is not a good reason to change the idea that an author owns his original works.

Copyright protection allows and encourages me to make the maximum commitment to my design work, knowing that the time-honored tradition of copyright will protect my creations from developers driven more by money than muse.

Reed is chief scientist, spreadsheets, at Lotus Development Corp.

G. GERVAISE DAVIS

The recent court decision in *Lotus Development v. Paperback Software* is wrong for so many legal and technical reasons that it is difficult to know where to start discussing it. It is living proof that the adversarial jungle of a trial court is an unsatisfactory place to present highly technical concepts to a judge, who rarely has time to develop a clear understanding of the complex subject.

Hard cases like this are seldom resolved correctly until they reach the U.S. Supreme Court, and not always then. Unfortunately, this case will probably never get there for economic reasons. Paperback Software is effectively out of business, and appeals can take years, even if an insurance company pays for them. The public and the computer industry may be stuck with the many fallacies of the decision.

Emotionally, it may not seem "fair" for a second company to profit from the market created by Lotus' 1-2-3 simply by producing a "clone" program that sells for less and is based on the "ideas" of Lotus. It just so happens, however, that it is quite legal to do so unless the first program is covered by an issued patent or the second program is *substantially* a copy of the first. It is also the historical way that U.S. law has sought to foster competition and improve the availability of better products for its citizens.

Tragically, any well-funded plaintiff (such as Lotus) knows you never let the judge cut through the emotional argument that the smaller defendant is a thief trading on all the time and money spent by the plaintiff. Every time the defendant points to the applicable law, the plaintiff obfuscates the technical arguments, dazzles the judge and plays the "fairness" violin. The judge, confused but proud, looks for a rational way out of his quandary. He accuses the defendant of "strained analysis and word games," as this judge did.

The result is a decision based on rough frontier justice, in which the white hats prevail over the bad guys — regardless of the applicable law and sound public policy reasons behind legal principles.

You have to carefully study the 110-page Lotus decision to appreciate the intellectual foreplay leading to the startling conclusion that Lotus owns the exclusive right to the use of a set of common English words that describe functions (such as PRINT or GO). This even includes the particular order in which they appear and the one-letter symbols used for them, which just happen to be the first letter of each. To accomplish this legal sleight of hand, the court accepted Lotus' position that it owns: (1) the menus and all of the one-word commands on them; (2) the long prompts that describe the function of each command; (3) the form of the screens on which they appear; (4) the function key assignments; and (5) all of the macro commands.

Both the court and Lotus call this protection of the "user interface" and conclude that copyright covers the Lotus "command structure as a whole." Magnanimously, the decision agrees with Paperback Software that Lotus does not own the inverted "L" shape of a spreadsheet, but you'd better not use the F1 key for a Help function if you want to avoid the long arm of Lotus' lawyers.

The court expressly stated that the computer-using public has no right to use or develop industry standards or achieve program compatibility, based on concepts disclosed or involved in a copyrighted computer program.

This prohibition applies, according to the court, "even if no other technological way of achieving macro and menu compatibility" exists.

Chaos would result

Other evidence of a total lack of understanding of computer concepts is the court's rejection of Paperback Software's (correct) argument that a computer language is not copyrightable.

Can you imagine the state the computer industry would be in if Intel could preclude programmers from using the mnemonics of its assembly language without a license, or if AT&T required a license to use the verbs and specialised functions in C? No other company could develop its own compiler, and each computer company would have to adopt its own, completely different terms and representation of commands and functions in order to avoid copyright infringement.

The fundamental misconception of the court in Lotus/Paperback Software is that this level of copyright protection for computer programs necessarily prevents others from accomplishing the same functional result by use of the same English language commands. Lotus managed to convince a very bright but technologically unsophisticated judge that, because its one-word commands and macro functions were found somewhere in the underlying program, the use of those functional commands and similar command structure in a competing program was an infringement of 1-2-3.

This confuses protection of the underlying program with protection of the functions the program is intended to perform. One key section of the copyright law, Section 102(b), expressly states that copyright never protects functionality or the way you do things, no matter how they are expressed. The judge chose to ignore this major element of established copyright law.

What this industry needs is a little common sense on the part of the major players. You don't fight competition by filing lawsuits; you do it by making better mousetraps or spreadsheets. Lotus might try that for a change.

Davis is a founding partner of Schroeder, Davis & Orline, a Monterey and San Jose, Calif.-based law firm specializing in computer industry cases.

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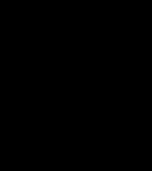

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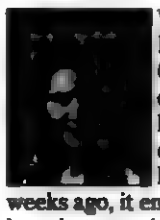
COMMENTARY

Maryfran Johnson

New prices, new buyers?



When Digital Equipment Corp. wound down its month-long Decworld exhibition in Boston two weeks ago, it ended not with a bang but a yard sale.

In lopping off nearly a third of the $229,000 asking price on the fault-tolerant VAXft 3000, DEC may have set a company record for the steepest discount ever slapped on the youngest product.

Here it is, only six months after its glitzy rollout in Paris and a handful of weeks actually shipping, and the VAXft is now $168,00 for a full system or $132,000 for a server configuration.

Such a dramatic drop in price may lead to the obvious conclusion that the VAXft has been a flop on the customer front. But that's far too simplistic and probably wrong.

DEC insists it is quite happy with sales right now, and analysts figure at least 100 customers have ordered the crash-proof VAX — not a shabby showing for a new midrange machine that nearly everyone seemed to think was quite overpriced.

The party line at DEC is that the VAXft is being "reposi-

Continued on page 32

IMKA slow to attract backers

Expert-systems standards pioneer forges ahead, hoping others follow

BY JOHANNA AMBROSIO
CW STAFF

Standards — can't live with them, can't live without them.

That might be the lament of a consortium that is getting mixed results in its bid to attract backers for its proposed expert systems standard. The group, called the Initiative for Managing Knowledge Assets (IMKA), first announced its standard in March. Since then, only one company that was not among the initial founders has signed up.

The original five-member coalition consisted of Carnegie Group, Inc. in Pittsburgh; Digital Equipment Corp.; Ford Motor Co.; Texas Instruments, Inc.; and US West Advanced Technologies, Inc. in Englewood, Colo. Carnegie is acting as lead developer, while the other four are investors in Carnegie as well as members of IMKA. Ford and US West are users of knowledge-based systems. The new signee is AI Corp., an expert systems software vendor in Waltham, Mass.

IMKA engine

IMKA is developing an architecture to store, represent and manage knowledge in all of its forms. Robert N. Goldman, president of AI Corp., likens it to an engine for knowledge assets similar to the way a relational database engine works for data. It will incorporate a model, a language and a specific implementation that vendors and users who license the technology will be free to build on.

The objective is "to learn from the mistakes we've made with database and other technologies, where we installed different [database management systems] and found out later that they couldn't communicate," said Ted Smith, technical director of knowledge-based systems at US West. "This way we can all start off with the same base and move the industry forward."

At US West, for example, standardising on the knowledge representation layer will allow the company to reuse chunks of knowledge in various applications. "That way we'll only have to capture knowledge once," Smith said.

IMKA released the specifications for its technology, as yet unnamed, early this month. A beta-test version for the coalition's partners is scheduled to be ready by the fourth quarter, and a product is slated to be available for sale during the first quarter of 1991. Under the terms of the IMKA agreement, any of the partners can license the technology to any party.

However, AI Corp. is the only vendor signed up that has an ex-

Continued on page 36

Imaging to help scholars — eventually

ANALYSIS

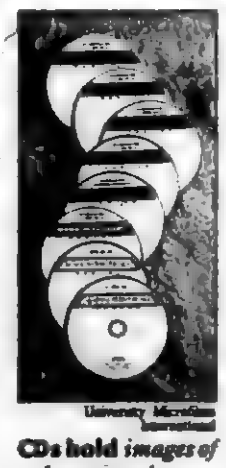
BY ELLIS BOOKER
CW STAFF

Libraries will ultimately use computer-based imaging as a way of storing, trafficking and delivering information to students and scholars.

However, the venerable hardcover book and microfilm will survive inside the library's ivy-covered walls for the foreseeable future, according to experts in the field.

"The key thing for the market to understand is that microfilm is not going to go away," said Don Willis, director of advanced technology at UMI, a reference works publisher in Ann Arbor, Mich., that has moved in recent years to digital, on-line and imaging products. "Even if we started to convert everything to image," Willis said, the process would take until the 21st century.

UMI's microfilm catalog explains the reason why. The publisher claims to have archival copies of nearly every issue and page of 17,000 periodical titles and 7,000 newspaper titles, plus nearly one million dissertations and 125,000 out-of-print books.



University Microfilms International

CDs hold *images of reference works*

Meanwhile, a handful of libraries are experimenting with the technology. The advantage of image storage is that unlike text-based databases, image databases offer viewers a faithful representation of the original document, including any photos or graphics.

Online Computer Library Center (OCLC) in Dublin, Ohio, for example, is at work on an automated system for scanning and indexing text.

"Basically, we scan the document and decompose it into its functional elements, text and graphics," explained John Handley, a research scientist at the non-profit organization. OCLC, which claims more than 10,000 library members in the U.S. and 38 other countries, will conclude its automated document architecture processing and tagging project in the fall.

Handley and others pointed out, however, that the current generation of scanning devices, with their typical 300 by 300 dot/in. resolution, are not yet capable of accurately capturing both text and gray-scale (photographic) images.

Thus, virtually all these imaging projects separate the full page image and its text at some point, sending the text to an optical character recognition (OCR)

Continued on page 33

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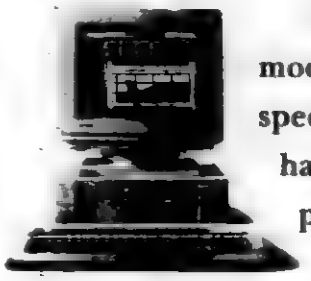

In the terminology of the modern workplace, power and speed have become the shorthand by which personal computers are measured.

The test of the designer's art, though, is to wring the greatest *performance* out of available megabytes and megahertz.

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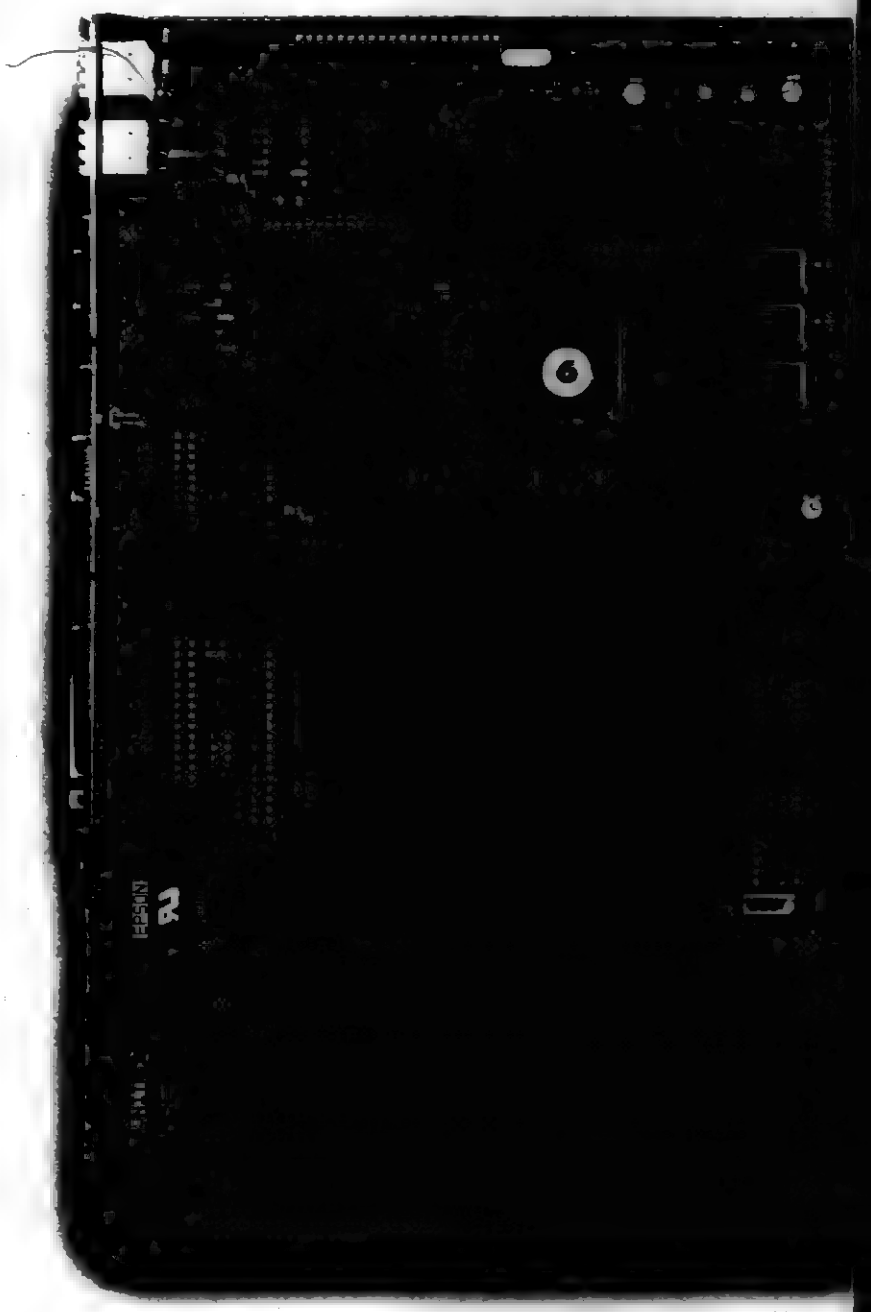
2 ***Surface Mount Technology. Used only by the most advanced manufacturers, SMT techniques protect the structural integrity of the board, which increases overall reliability.***

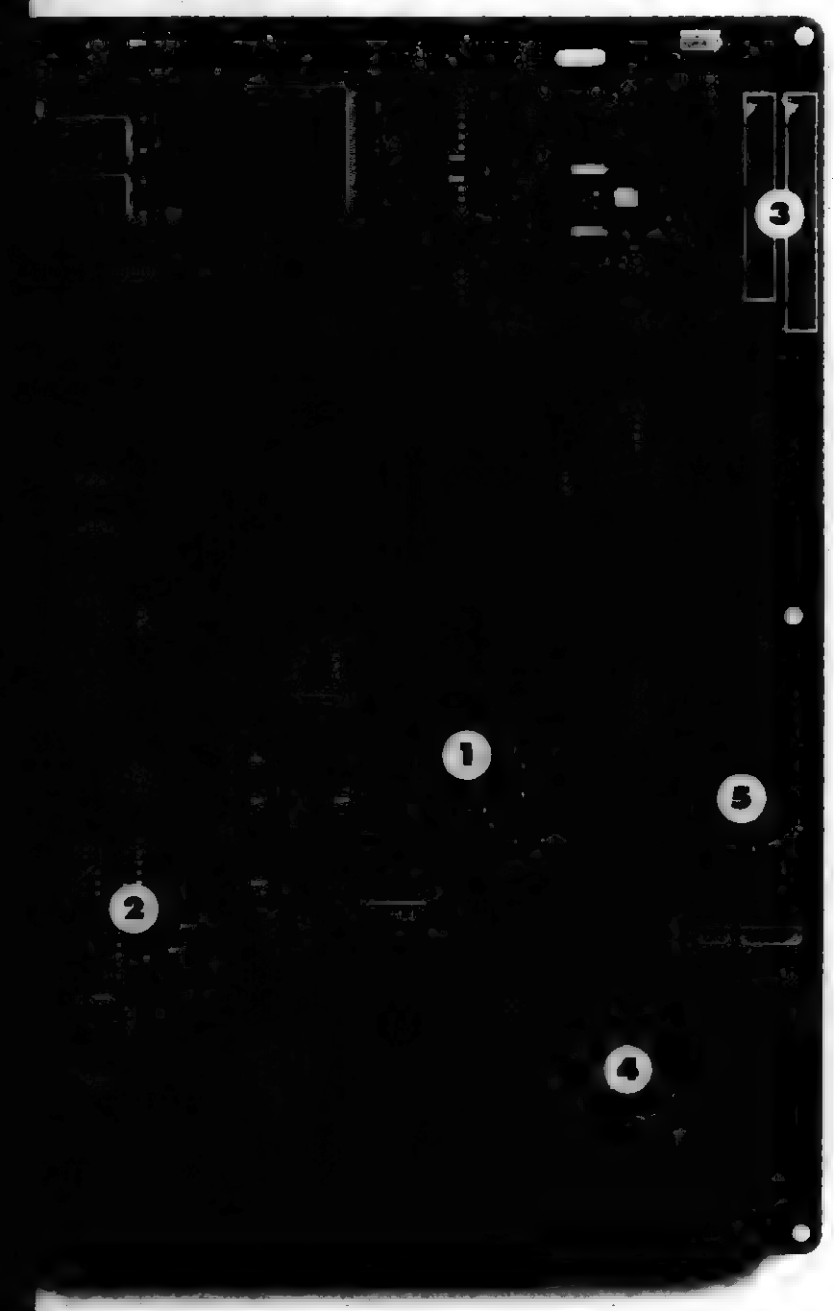
3 ***Hard Drive Controller. The use of Integrated Drive Electronics on the hard disk eliminates the need to add a hard disk controller board. This simplified design means faster throughput and greater reliability.***



Epson's 386SX motherboard displays the elegant architecture necessary for optimal performance.

Feature configurations may vary with different models. Board shown is not actual size. 386 is a trademark of Intel Corporation. Epson is a registered trademark of Seiko Epson Corporation. © 1990 Epson America, Inc., 2780 Lomita Blvd., Torrance, CA 90505. (800) 922-8911.

t in a world obsessed ed, neatness counts.



4 *Epson's proprietary BIOS. Epson has elected to develop its own BIOS, customized for each individual system, simply to-ensure that your software will get the most out of our hardware.*

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6 *Super VGA video graphics are embedded on the motherboard. The result: more efficient data transfer, more reliable circuitry, optimized video performance.*

What the Epson design team has discovered is that *less* is very definitely more. By reducing the number of separate components through integration, performance is increased. The result is a flexible tool which is elegant, efficient and allows the effortless application of power and speed to the task at hand.

In fact, there is only one word that adequately describes the innovative design of these new Epson computers. Neat.

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CAD helps doctors mend bad breaks

ON SITE

BY SALLY CUSACK
CW STAFF

PAOLI, Pa. — If you've ever broken an arm or leg, you know how it feels to be confined in a plaster cast — damned uncomfortable.

At least one company is working to reduce the amount of time patients must spend encased in plaster of paris. Jim Hearn, an engineer and systems manager at Synthes, is part of a team that designs surgical implants for the skeletal system, including plates and screws that hold together a fracture zone without restricting the joint area.

The company relies on a combination of Digital Equipment Corp. VAX/VMS computers and Computervision's CIS Medusa computer-aided design software for creating implants.

These allow for movement, Hearn said, and eliminate the need for the traditional cast. Synthes is a privately held international firm in Paoli. Founded in 1975, the corporation designs and sells implants directly to both doctors and hospitals.

Both the hardware and software were installed in 1988, replacing an Autodesk Corp. Autocad system running on standalone AT&T personal computers.

"We had, and still have, two sister companies and a laboratory in Switzerland using CIS Medusa," Hearn said. "We realized we needed a similar software and hardware system to make communication transmission easier between us and them."

A global link

Now there is an international link between the two sister companies, and headquarters has also been connected with its two U.S. manufacturing plants in Exton, Pa., and Monument, Colo. All are communicating via DEC's Packetnet System Interface (PSI) public network information system over 4.8K bit/sec. lines. So far, Hearn said, the system works well. It was brought online six months ago.

The company will be sending Hearn to its laboratory in Davos, Switzerland, next month to install a Medusa system on a DEC Vaxstation 3100 Model 38 and to link the system to the newly installed company network. In addition to designing implant parts, the laboratory creates structural designs for surgical instruments.

"The big thing about Medusa is that it doesn't establish boundaries for the user," Hearn said. "It says, 'Here is the core system — change it, modify it, see what you can do.' It's a very flexible product."

Explaining that his first experience with Medusa came with the company's purchase of the product back in 1988, Hearn said that he and fellow design engineers were sent to the Prime/Computervision training center in Chicago to learn how to use the new software.

Newcomers to Medusa usually find it a bit overwhelming and complex, Hearn said, because of the large number of commands incorporated within the package. However, he said, this is beneficial in the long run because it allows for a great deal of user modification. The user can modify menus, write programs and modify the command structure.

The system also uses Clumps technology, whereby it takes both lines and text and combines them into a single group for moving design assemblies and individual components within those assemblies.

"We can actually move a screw in a screen drawing to see if it rotates or moves the joint the way it is supposed to," Hearn said. At headquarters, Synthes has installed a DEC Vaxserver 3600 as the main node for all systems, which incorporates the company's drawing and prototyping files.

Synthes' implants *hold together a fracture zone*

In Paoli, there are four satellite nodes — two Vaxstation 2000s and two Vaxstation 3100s — spread among the eight engineers. All the systems run under VMS. The company uses an IBM System/38 for payroll and other administrative activities, and there is an IBM PC-compatible network throughout the building.

The firm is also examining additional design and manufacturing technologies, such as stereo lithography, to solidify prototyping models into plastic samples for customers. Citing auto makers as one industry taking advantage of this rapid-prototyping design method, Hearns said it could also be used as an effective sales tool.

"We could bring the part to the doctor and have him or her make on-the-spot modification recommendations," he said. "It would cut down on the prototyping stage and save money on the turnaround process."

IS shop moves smoothly into $22M data center

BY ROSEMARY HAMILTON
CW STAFF

JACKSONVILLE, Fla. — The information systems staff at CSX Technology must be feeling like kids on Christmas morning.

Not only did the company recently open a new $22 million data center, but it stocked the center with all new equipment, from mainframes to tape drives, to the tune of $70 million.

But the new digs are hardly gifts from the corporate offices, noted Doug Underhill, assistant vice-president of technical services. The company, which functions as the IS division of railroad operator CSX Corp., simply timed its equipment upgrades with the move to the new data center.

The top-to-bottom switch also allowed CSX a fairly risk-free move because there was no possibility of systems being damaged as they were hauled to the new location, Underhill said. The only items physically moved were tape cartridges loaded with data for the new systems.

The IS staff began the move on a Saturday night in early July and had all 1.3 terabytes of data in the new shop early Sunday morning. By noontime Sunday, all applications were up and running.

Currently, four 3090 600Js, 16 3390 control units, 56 3490 tape drives and 100,000 tape cartridges are housed in the new center. The company had installed the new CPUs and storage devices two months prior to the move and ran a dress rehearsal to make sure there were no major equipment glitches at move time, Underhill added.

Some of the equipment at the old data center, which included 3090 S models, 3380 disk drives and 3480 tape drives, was shipped to CSX's smaller data center in Baltimore. The remaining equipment, for which CSX held leases that were about to expire, was returned to the leasing companies.

CSX had been planning to build a new data center because the older one, which was opened 30 years ago, was set up at the company's corporate offices in downtown Jacksonville. Space was in short supply, and neither the security nor the weather circumstances of a multiuse building weren't really adequate for our need anymore."

> THE TOP-TO-BOTTOM switch also allowed CSX a fairly risk-free move because there was no possibility of systems being damaged.

The new center was designed to achieve continuous operations, added Jack Cooper, president of CSX. It includes three generators, a well to provide an isolated water supply and enough diesel fuel to last four days, he said.

CSX chose a dry sprinkler system instead of a halon system for use in most of the data center. However, halon will be used in a few select areas where coaxial cable is installed. Water will only enter the sprinkler system when the temperature in the data center reaches 160 degrees, according to Richard Mason, assistant vice-president of computer operations. This should prevent any false alarms that could trigger the system and douse equipment with water, he said.

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The Open RDBMS

The Sybase View

Today's changing business environment demands full exploitation of multi-vendor network computing. The challenge is to integrate existing applications with new on-line systems, preserve past investments and create an open, flexible architecture for the future.

The allure of standardizing on a single RDBMS and migrating existing applications is tempting, but utopian. This "one-size fits all" strategy will not preserve existing investments. And it raises the specter of being locked into a single software vendor.

The solution: an Open RDBMS. One that provides hardware and software interoperability. One that offers a true open architecture and provides integration of decision support and transaction processing. One with the support of leading hardware and software manufacturers to provide heterogeneous interoperability. And one with a full range of technology integration services that can weave these heterogeneous environments into a unified computing enterprise.

OPEN ARCHITECTURE. Open architecture gives hardware and software companies—customers and competitors—access to comprehensive open interfaces. These open interfaces must be based on standards and available for extension and industry adoption. Only a network based client/server architecture, with such open interfaces, can unify an array of operating systems, networking protocols, and applications into a seamless computing enterprise.

DECISION SUPPORT. To handle real-time decision support across multiple systems, an Open RDBMS must provide interfaces that can:

- send data from any RDBMS, non-relational DBMS, or file system
- communicate with all dialects of SQL and with non-relational data manipulation languages

TRANSACTION PROCESSING. To integrate production transaction processing applications, an Open RDBMS must provide interfaces that can:

- control inter-system transactions for concurrency, consistency and recovery
- provide access to application programs, as well as databases, to ensure complete data consistency for updates
- integrate application-specific logic for custom functionality and performance
- transparently access such external data sources as real-time feeds, process control data, electronic document exchange, and mail services

MULTI-VENDOR INTEGRATION. An open system requires the full backing and support of industry leaders to ensure customers the benefits of direct interoperability. It creates a vendor-independent, open architecture that is more flexible than a single, vendor-centric approach.

TECHNOLOGY INTEGRATION. Making the open system work requires the assistance of a professional support organization with multi-vendor experience in DBMSs, operating systems, networks, and hardware.

Only SYBASE delivers on all of these requirements.

The SYBASE open client/server architecture is based on a commitment to standards. It provides enterprise-wide integration of decision support and transaction processing that accesses SYBASE and non-SYBASE data, applications and services. Alliances with industry leaders like Apple, AT&T, DEC, IBM, HP, Intel, Microsoft, NCR, Pyramid, Sequent, Stratus, Sun and over 100 independent software vendors ensure interoperability — not just portability. And Sybase's professional services division, SQL Solutions, Inc., also provides complete integration services and customer support for single or multi-vendor environments.

SYBASE. The Open RDBMS to make the open computing enterprise a reality.

This view of The Open RDBMS first appeared in The Sybase Forum (Computerworld, March 28, 1988).

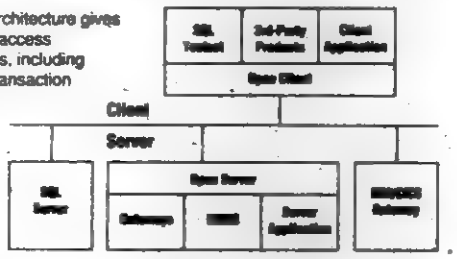
Look W
You O

SYBASE Open Client/Server Interfaces allow data and application integration and interoperability in a multi-vendor environment.

SYBASE Open Client provides an application programming interface (API) for accessing and updating data using a variety of front end tools or applications—including SYBASE applications, independent software vendor's tools, or user-written applications. **SYBASE Open Server** provides an API for accessing and updating a variety of foreign data sources and application services. Open Server can seamlessly integrate hierarchical and relational DBMSs, third party applications and real-time data feeds into SYBASE applications.

Together, Open Client and Open Server interfaces and gateways make real-time access to various data sources and application services across networks completely transparent regardless of protocol—the essence of the on-line enterprise.

The SYBASE Open Architecture gives transparent, real-time access to various data sources, including DB2 and CICS, with transaction processing capability.



INFO WORLD

"An impressive piece of work, SQL Server delivers on its claims for high-performance transaction processing. Fast, powerful, with many innovative features that are useful yet surprisingly easy to learn and use, this multiuser database server has a promising future."

SQL Server was designed to help give continuous OLTP application availability 24 hours a day, 7 days a week.

It handles maintenance operations (backups, diagnostics, design and integrity changes) while all other applications continue to run.

It protects against loss of integrity during a system failure so that all changes to the database can be rerun quickly and accurately.

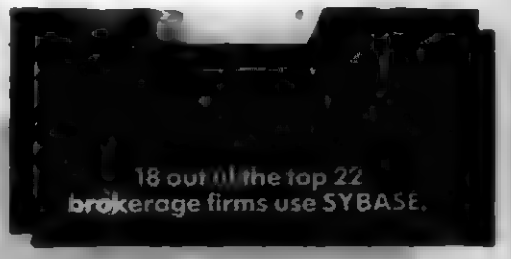
It also supports fault tolerance in media failures even when the hardware doesn't.

Sybase's professional services division, SQL Solutions, focuses exclusively on providing relational database services and tools.

SQL Solutions provides customized solutions with a complete line of SQL productivity tools that ease every step of the application development life cycle.

SQL Solutions' products support all major DBMSs across all major hardware platforms. The firm has designed, developed and integrated more relational systems in the on-line enterprise-wide network computing arena than all of the leading RDBMS vendors combined.

hat Happens When pen An RDBMS.



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For example, a typical on-line application for foreign currency risk managers must track fluctuations in a rapidly changing market, where over 15,000 currency price changes occur daily. Concurrently, decision support applications need to analyze on-line data to reduce potential risks.

What's needed is an on-line database system powerful enough to handle real-time decision support analysis—and that system is SYBASE.

That's why 18 out of the top 22 brokerage houses have chosen SYBASE. One firm uses SYBASE to track market fluctuations and to analyze appropriate responses. "With SYBASE, the system can suggest the best combination of corrective trades under current market conditions."

COMPUTERWORLD

"In a preference test pitting some of the most advanced SQL-based relational database management systems against one another, SYBASE... came out on top in overall user satisfaction." March 5, 1990.

SYBASE earned top ratings in eight out of 18 categories:

- **Performance in processing on-line transactions**
- **Performance in decision-support applications**
- **Providing effective user-defined integrity**
- **DBMS enforced integrity**
- **Useful SQL extensions**
- **Distributed updating, recovery and remote administration**
- **Extensions to the relational database management system such as semantic, object oriented text and image modeling**
- **Performance and system monitors**

Strategic alliances with other industry leaders are critical to successful interoperability. With SYBASE, the results have been impressive.

In commenting on SQL Server, Microsoft stated: "Microsoft surveyed the entire SQL database market and chose SYBASE technology as the most powerful. SYBASE is the perfect partner to help Microsoft apply the power of OS/2 to multi-user database environments."

And Lotus, in announcing its alliance with SYBASE, said: "This partnership with SYBASE demonstrates our belief in the importance of database products as an extension of our core business, and is an important step in our effort to provide our spreadsheet users with access to diverse sources of data."

Lotus | Microsoft

In the real world of multi-vendor environments, SYBASE preserves your prior hardware and software investment while keeping your future options open.

SYBASE SQL Server supports portability to a wide range of strategic computing platforms, including VAX/VMS, UNIX, and OS/2, with PC and MAC connectivity, making it a natural for linking applications residing on different types of machines.

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Johnson

CONTINUED FROM PAGE 25

tioned" at a more sensible cost to establish new markets in midrange fault-tolerance: government, telecommunications and manufacturing, in particular.

This is really a glimpse of long-term strategy a la DEC.

On the surface, the company is scrambling to recover from a marketing misstep that allowed its competitors to sneer at the VAXft 3000 as a "point product" or single offering, with ludicrous price/performance to boot.

Farther out on the horizon, however, DEC officials see the cost to produce fault tolerance dropping while the customer appetite for crash-proofing certain applications is growing.

"In some applications, the additional benefit of fault tolerance outweighs whatever the cost is," says Jim Hammons, an analyst at The Sierra Group, Inc. "But the fact that cost is now falling suggests that as the difference between benefit and cost drops, the willingness to spend a little extra will appeal to a broader range of the marketplace."

What DEC hopes to do is sprinkle the VAXft 3000s like seeds over fertile user ground where VAX/VMS is already the proprietary operating system of choice. As yet, there are no signs that DEC will provide Unix-based fault tolerance, which several of its competitors are already supplying. So rather than trying — and very likely failing — to proclaim itself a dedicated fault-tolerant vendor such as Stratus or Tandem, DEC envisions an affordable crash-proof VAX wiggling its way into existing Vaxclusters.

The company may make a publicity fuss about plowing virgin ground with new accounts, but with 15,000 clusters already out there, that business alone could keep DEC profitably occupied for years. The VAXft 3000 may also wedge the company into new accounts with sales potential for regular VAXs, particularly where users need the large-scale database absent from the VAXft.

"Fault tolerance is like the camel's nose in the tent," says Wayne Kernochan, an analyst at The Yankee Group. "[DEC] hopes to get the whole camel in there by sticking fault tolerance in and getting the Vaxcluster to follow."

"DEC has identified fault tolerance as something that will eventually be ubiquitous throughout the VAX line," says Terry Shannon, an analyst at International Data Corp. "This is no longer a niche market for them."

The price plunge is certainly great news for users as well, though it would be tough to find any who paid full price for the VAXft in the first place.

DEC customers are happily reporting a good bit of IBM-style wheeling and dealing from their vendor these days. In the aftermath of the Decworld yard sale, the firm is promising to do right by any customers who feel they got a raw deal by buying a VAXft early on.

With the addition of the server configuration, DEC is also acting on its observation that fault-tolerant users were employing the machine as a server anyway.

The only real difference between the two machines is software licensing. Users cannot log on to the server; instead they must access it through other computers on the network, while the multiuser system has direct connection through user terminals.

"This is like what DEC is saying with its minicomputers now," Hammons observes. "If minis aren't for everyone, well, here's a server instead. DEC is giving the market what it wants rather than trying to tell it what it *should* want."

Johnson is a *Computerworld* senior writer.

NEW DEALS

GSA grants $48M contract

Computer Sciences Corp. won a $48 million contract from the General Services Administration (GSA) to provide software development and support services for scientific and engineering applications. The work will be done for the GSA's Pacific zone, which includes the Western states, Hawaii, Alaska and Guam. The deal is a one-year contract with three one-year options.

Nippon Steel Corp. in Tokyo bought a Tandem Computers, Inc. Nonstop VLX system for use with its sales and distribution network.

The company also sold several Nonstop systems to the Sumitomo Trust and Banking Co. in Tokyo. The bank will install the systems in its Tokyo, New York, London and Singapore offices. Initially, the systems will be used for the bank's international financial transactions applications.

NCR Corp. won a $10 million contract from Fleet/Norstar Financial Group to provide its branch offices with automation systems.

Money Quik selected NCR automated teller machines (ATM) for retail locations on the West Coast. The $5 million contract will provide 180 NCR 5070 interior ATMs in its department stores.

Wyse sets the standard in terminals again. And again. And again.

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Imaging

CONTINUED FROM PAGE 25

device for conversion into computer-readable ASCII code. Typically, this text is stored in a database that can search for key words. The user can also see the associated page image, which is generally stored on compact disc/read-only memory (CD-ROM).

The library imaging projects deal primarily with periodical literature or portions of books. Experts said current OCR systems are too slow — taking several minutes per page — to be feasible for book-length documents.

Nevertheless, the possibilities of imaging in library settings continue to be explored and demonstrated. During the past 1½ years, for example, Apple Computer, Inc. has explored the possibility of an image-based library system as part of the Apple Library of Tomorrow project, in collaboration with the University of Michigan.

"We wanted to demonstrate it was feasible," said Victor Rosenberg, a professor in the school of information and library studies at the University of Michigan. Rosenberg, who is also president of Personal Bibliographic Software, Inc., a company he founded to develop retrieval software for libraries, said he saw a line pointing in the direction of library imaging.

Right now, he observed, libraries are able to get bibliographic citations on-line and can use these to order the original text from reference publishers such as UMI or from other libraries.

"They order photocopies that come through the mail," Rosenberg said. "The next step is, instead of mail, to get them over the fax." The final phase will be to have documents faxed as images directly into the personal computer or workstation.

Such an application is currently being tested at the National Agricultural Library in Beltville, Md. In conjunction with North Carolina State University in Raleigh, the library is using the Internet data network to move selected works among workstations.

"The idea," explained Sarah E. Thomas, associate director for technical service at the library, "is that a scholar at North Carolina can put in a request and get an image on his or her workstation." Digitized images, she added, will be of a better quality than the faxes the libraries now send to one another.

One vendor hoping to take advantage of the library imaging trend is UMI. Formerly known as University Microfilm International, the firm has begun moving to other media. Last March, UMI introduced its eighth digital product, Business Periodicals Ondisc — a CD-ROM database containing indexes and abstracts for articles from more than 800 business and management journals. In addition, the 160-disk set features a full text image database for more than 300 journals.

"High usage" works will increasingly be available in a CD-ROM format that users will access through a workstation, Willis predicted. However, a single electronic index will point to both the microfilm and electronic text or image databases, he added.

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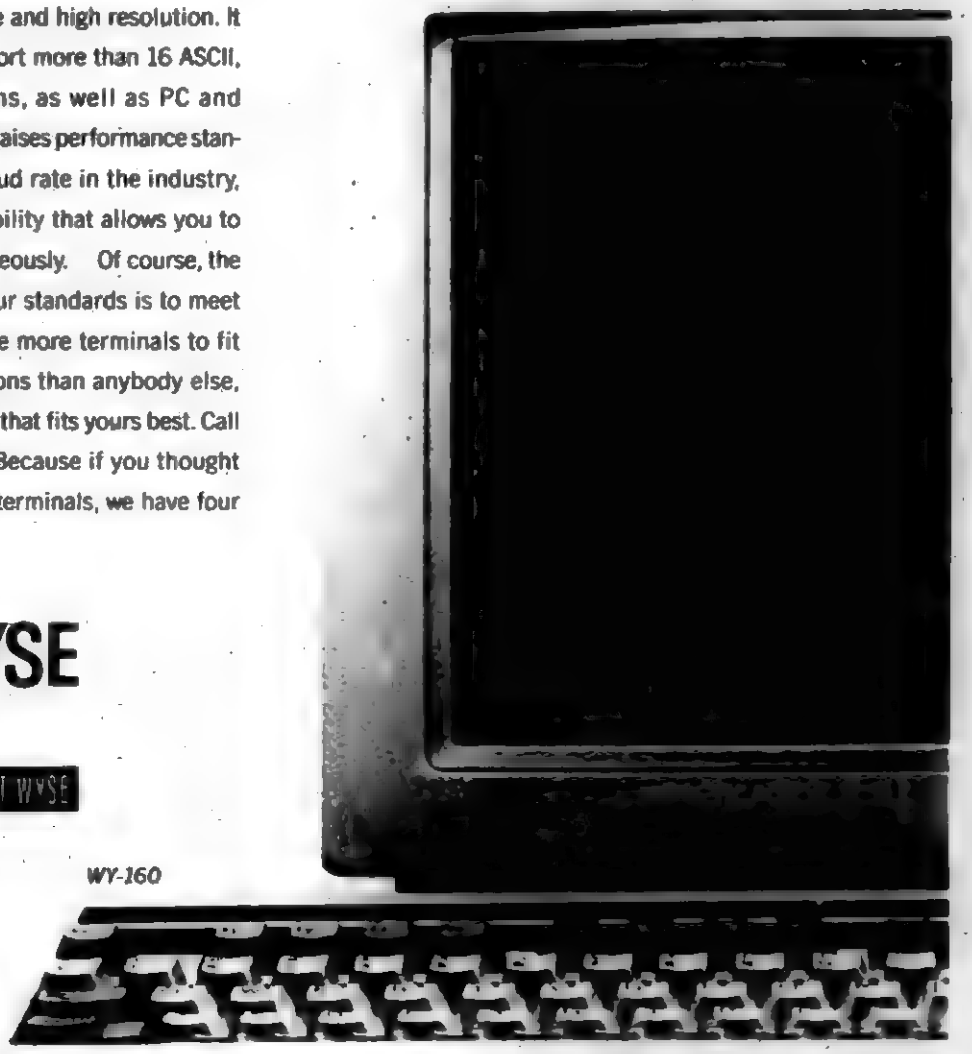


WY-160

Supercomputers for tomorrow

BY GARY H. ANTHES
CW STAFF

State-of-the-art supercomputers in the year 2000 will have more than 256 processors, each no bigger than 16 cubic centimeters, according to a report from The Superperformance Computing Service (SCS). Those systems of the future will have one terabyte to 100 terabytes of memory and will boast speeds of 10 trillion floating-point operations per second (TFLOPS) to 100 TFLOPS, SCS said.

Getting there will require heroic feats of engineering, the report said. The processor in the forthcoming Cray Computer Corp. Cray-3 occupies 16 cubic inches and boasts a cycle time of 1 nsec. To get to ½ nsec would require shrinking the CPU to one cubic inch, SCS said.

The supercomputers and other parallel processors will move toward standard architectures but will allow specialization through field additions of customized processing modules for graphics, superscalar computations, animation, speech input and output, image and data compression and encryption, according to the report.

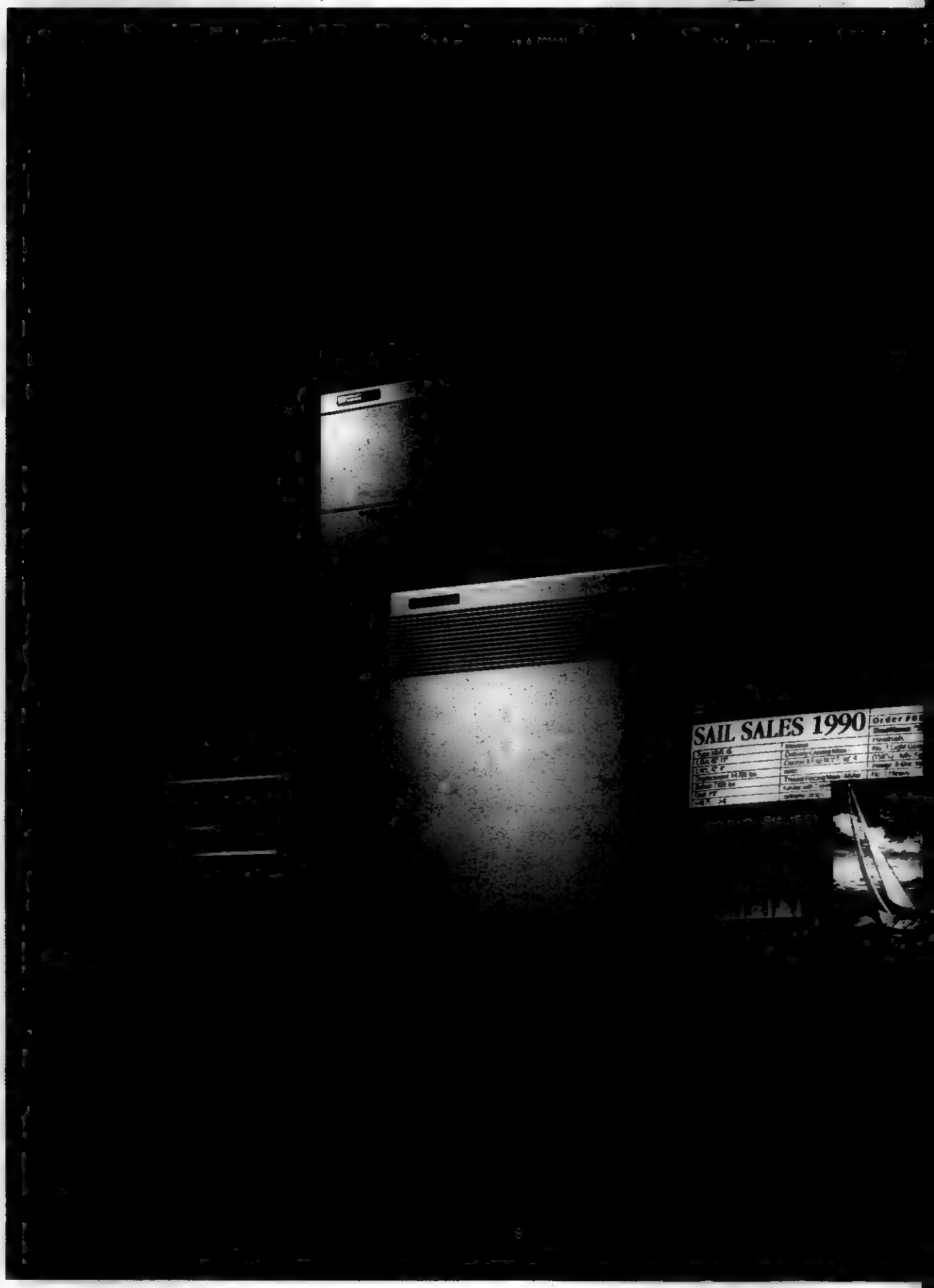
At $100 per MFLOP, a high-end supercomputer's price tag of $100 million will seem cheap, the report said.

Switching times in the fastest systems will decline from a range today of 60 picoseconds to 150 psec to as low as 10 psec by the year 2000, SCS said. Chip densities will grow to one million gates per chip, compared with 1,000 gates per chip today.

Despite these impressive gains, the SCS report said that supercomputers will have to wait more than 10 years for wafer-scale integration, photonic switching and computing, superconducting switches and quantum-effect switches. "Brute force will reign," SCS said.

SCS, a market research firm in Mountain View, Calif., said it based its projections in part on the goals of the Semiconductor Research Corp., whose members include IBM, AT&T, Control Data Corp., Digital Equipment Corp., Hewlett-Packard Co., Texas Instruments, Inc., Intel Corp., National Semiconductor Corp. and Motorola, Inc.

HP's RISC puts unprecede
HP's NewWave Office puts



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Of course, the initial price is only one part of the equation. Since RISC architecture is simpler, it's fundamentally more reliable. And that means lower maintenance and service costs. In short, a dramatically lower cost of ownership.

If you think you can get these advantages from DEC and IBM, think again. DEC doesn't offer a complete range of RISC systems. And IBM only offers RISC technology in workstations.

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IMKA

CONTINUED FROM PAGE 25

isting product that will be retrofitted with IMKA technology. TI and DEC are building their systems from scratch, with the IMKA architecture as their base.

Complicating things even more is the fact that IBM is developing a potentially competing expert systems standard, the Knowledge Representation Language. It is part of IBM's recently announced The Integrated Reasoning Shell, a tool kit used to build expert systems applications.

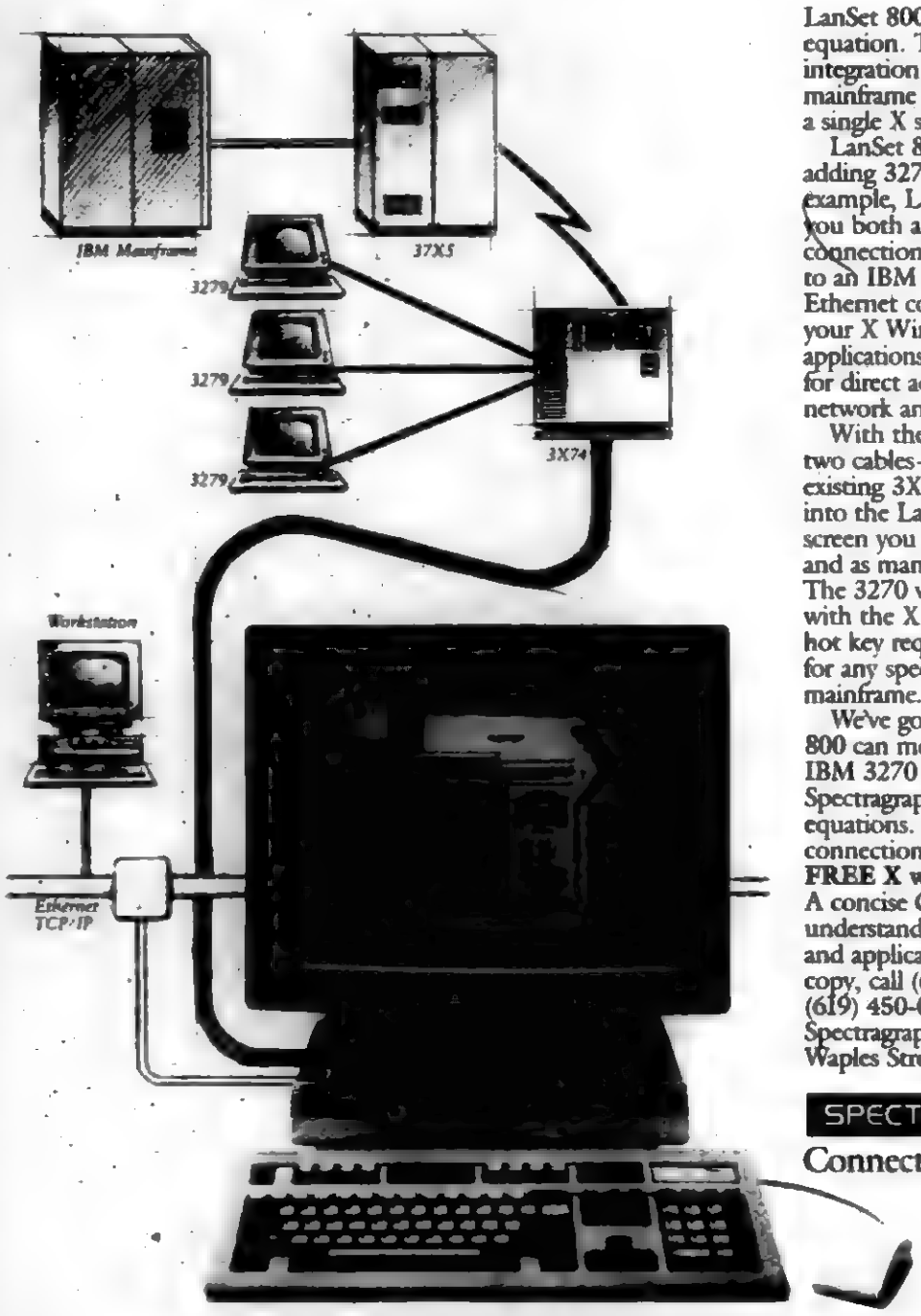
Not all vendors seem willing to rebuild their products. Garry Hallee, chief technical officer at Aion Corp., said, "We have been talking with IMKA through the Carnegie Group and are continuing to look at their proposals. But there are certain conflicts with the technologies used in our product and their specifications. For example, ours is object-oriented; theirs is more semantic. Ours is backward-chaining; theirs is forward-chaining."

The basic problem, Hallee said, is that "it's hard to say something is a standard when the major players weren't involved in developing it. If a whole bunch of us had gone off together and worked on this, then it might be more of a group process. I'm not saying we're not going to work with them, but it's difficult when you've got an existing product and nobody consulted with you when they were developing their standard."

Smith said, "The IMKA proposals include low-level, common denominator-type technologies used by a fairly large portion of the industry. We're encouraging the participation of both vendors and large users to develop the technology even further." He said Fortune 1,000 firms are considering joining IMKA.

Alex Lilley, IBM's manager of knowledge-based systems marketing in Palo Alto, Calif., said, "We've talked to IMKA in a preliminary manner. We haven't seen their spec yet, but we'll look at it. It does sound like there's some commonality between what we're doing, but it's too early to say anymore." He added, "Over time, there will be an evolution of standards in this area, but I'm not sure we have all the technology locked down yet to be able to really define those standards."

X+3270=LanSet



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LanSet 800 has several ways of adding 3270 functionality to X. For example, LanSet 800/3270dc gives you both an Ethernet TCP/IP connection and direct connection to an IBM 3X74 controller. Use the Ethernet connection for access to all your X Window and other UNIX applications. Use the IBM connection for direct access to your SNA network and SNA applications.

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NEW PRODUCTS — HARDWARE

I/O devices

Decision Data Computer Corp. has announced the DDCC 6550, a dual-tractor dot matrix printer that can process twinaxial or parallel data for multiform dual-printer applications.

Features include four paper paths and print speeds of 500 char/sec. in data processing mode and 150 char/sec. in letter-quality mode. IBM 4214 emulation allows twin-axial attachments to IBM System/36, 38 and Application System/400 hosts. IBM Proprinter emulation allows the printer to be connected to an IBM Personal Computer via a parallel interface, according to the vendor.

The printer is priced at $3,900 with a single tractor. Additional tractors cost $135 each.

Decision Data
410 Horsham Road
Horsham, Pa. 19044
(800) 523-5357

NEW PRODUCTS — SOFTWARE

Applications packages

Contemporary Software Concepts, Inc. has announced an integrated software package designed for use by membership organizations.

Cameo enables users to perform word processing, membership activities and organization accounting with a minimal amount of data entry, according to the company.

A membership module can be interfaced with a proprietary accounting software package and Office, an office automation software package from Wang Laboratories, Inc.

Cameo runs on any Wang VS expandable system. Pricing ranges from $8,000 to $14,000, depending on CPU size.

Contemporary Software
6 Valley Forge Executive Mall
676 E. Swedesford Road
Wayne, Pa. 19087
(215) 687-6000

Development tools

Chestnut Software, Inc. has announced the release of Lisp-to-C Translator, a tool designed to assist artificial intelligence developers who work on standard Lisp computing platforms such as Sun Microsystems, Inc. Sun 3 or Symbolics, Inc. machines.

The product can reportedly translate Common Lisp language into ANSI standard C language. Developers can compile the generated code on a target platform and link it to a runtime library to produce a complete application, according to the vendor.

A single-copy, original-platform license costs $75,000, and a project team license that includes 10 copies sells for $100,000.

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COMMENTARY

Richard Pastore

Put a plug in it

Has anyone ever sat through a personal computer trade show conference and learned anything useful? These shows are always described in brochures like this: "A panel of experts from leading organizations will discuss major trends in personal computing and provide you with a peek at upcoming products." Baloney.

The "experts" listed in the program invariably turn out to be high-level marketing hacks from four or five PC vendors. Usually one or two get replaced by low-level marketing hacks at the last minute. And the one guy you halfway wanted to hear doesn't show up at all.

The panel of experts has only two goals in mind: 1) Plug the company. 2) Plug the company's products.

This two-hour slide-and-dance show is typically emceed by an editor of some trade journal you don't read. The host, who seems embarrassed to be there, has all the charm of Regis Philbin with a bad head cold and a hangover.

I recently attended such a conference at the Engineering Workstation show in Boston. The host apologized for the late start, made some insightful

Continued on page 44

IXL locates missing data links

Database analyzer finds correlating data to form decision support rules

BY RICHARD PASTORE
CW STAFF

Finding the proverbial needle in the database haystack is tough enough. But finding broken pieces of several needles and matching them up seems impossible. However, a database analyzer from Intelligence Ware, Inc. claims the ability to locate and put the pieces together and provide users with decision-support rules to boot.

The program, IXL, uses statistical analysis and artificial intelligence to search databases automatically for patterns and correlations of data. Then it uses algorithms to generate pattern-based rules that users can employ for decision support. Version 1.0, a beta-test version, was released two years ago. Version 2.0 debuted May 1.

IXL differs from a query language such as SQL because it forms its own queries and executes them automatically. Though users can suggest specific search parameters such as ZIP codes, they need not know a query language or statistics to operate the program, the Los Angeles-based firm said.

Users said the software automatically found valuable information they would have had difficulty discovering manually.

However, they complained that the relatively unique product concept is difficult to explain and document.

At the U.S. Army and Air Force Exchange Service in Dallas, IXL is searching military personnel demographic data to find buying patterns. The Exchange is the main retailer for U.S. military installations throughout the world, controlling about 17,000 stores and serving 2 million to 3 million customers.

The program examines the age and sex of military personnel and correlates them with pur-

Continued on page 44

FEATURE: HIGH-END PCs

The psychology of an innovator

BY JAMES DALY
CW STAFF

Call it the new car syndrome. There has always been something about the look, smell and lines of next year's model that makes hearts pound. Desire shifts into overdrive as the old gets swept away by the new in a passionate drive for the latest and the greatest.

That same heady feeling also exhilarates those driving the leading edge of personal computer technology.

What is in an organization's makeup to cause it to go where few have gone before? It runs the gamut from researchers who harbor a childlike fascination with the experimental to users with more philanthropic goals, observers say.

"There's something very intoxicating about going into new technological waters," says Dr. Dan Masys, director of the Lister Hill National Center for Biomedical Communications in Bethesda, Md., which is exploring the brave new world of artificial reality for advanced surgical procedures and education.

The center uses a networked arrangement of graphics-intensive Sun Microsystems, Inc. and Silicon Graphics, Inc. workstations for educational and diagnostic purposes. Artificial reality, however, would make these procedures seem Neanderthal.

The still-experimental three-dimensional technique involves the ability to program a custom universe into a computer. Users throw on a high-tech bodysuit that senses body motions and feeds them into a computer that interprets movements as commands. Video display goggles are worn that reflect the commands, and the newly created world suddenly snaps to life.

"It would be a real-life *Fantastic Voyage*," says assistant director Chuck Herbert, referring to the old science fiction movie in which scientists are miniaturized, placed in a capsule and injected into an ailing man. "There would be the sense of actually moving around within the human body."

For a customer base that once waved the slogan "You'll never get fired buying IBM" as its conservative banner, sparkling innovation

Continued on page 40

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Unix sorts Army day-care files

World's largest child-care system was developed with portability in mind

ON SITE

BY SALLY CUSACK
CW STAFF

FORT BENNING, Ga. — Six years ago, John Bush decided that AT&T's Unix System V operating environment was the platform best suited for coordinating the U.S. Army's voluminous day-care records.

"We thought Unix would become a multiuser standard," said Bush, deputy director of personnel and community activities at Ft. Benning, "but at the time, the army thought in terms of mainframes and personal computers."

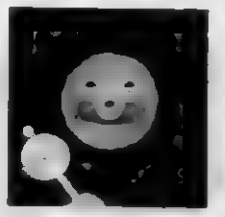
Initially, the Army's Community and Family Support Center in Washington, D.C., had the idea that the program should be maintained on databases and stand-alone PCs in a DOS world, Bush said.

The U.S. Army has the largest child-care system in the Western world and has been providing day-care services in one form or another since the turn of the century. However, the army did not begin to coordinate the programs and automate data collection records until approximately five years ago.

Bush, who said he had been planning to automate several child-care facility operations on a Tandy Corp. 6000 machine running The Santa Cruz Operation's Xenix at Ft. Benning, put together a demonstration package for the Washington staff based on the Filepro Plus software package from The Small Computer Co. in Hawthorne, N.Y. Bush said he has been using Filepro successfully since 1984.

Filepro is a combination database management system and application development environment. It operates with several different versions of Unix, including Xenix, IBM's AIX, Digital Equipment Corp.'s Ultrix and Sun Microsystems, Inc.'s Sun OS, as well as DOS and OS/2 platforms. The product was designed with portability in mind, according to the vendor, and an application developed on one platform can be easily ported to any operating system supported by the Filepro Plus package.

"Back then, our main concern was true Unix-to-DOS portability," Bush said. "It was a bigger issue than it is now. We had looked at a couple of other software systems, including [Barrington Systems, Inc.'s] Clarion and [Fox Software, Inc.'s] Foxbase, before we committed to the Filepro program."



Bush and senior programmer Steven Von Neumann have now seen the software system installed at approximately 100 of the Army's 300-plus day-care centers across the country. Operating essentially as a point-of-sale (POS) system on Intel Corp. 80386-based machines, the software generates a bar-code label to identify each child.

This is transferred to a laminated card, which in turn is used for logging arrival and departure times at the centers. The bar code is also used to record the child's age, sex, immunization records and billing history, as well as pertinent information on U.S. Department of Agriculture food support programs.

"We had to convert a DOS installation at Ft. Carson. There were several sites out there using Filepro Plus on DOS-based machines, and they all wanted to use Unix," Bush said. "Von Neumann was able to go in and convert the entire Ft. Carson system over in a three-day Memorial Day weekend. The software just rolled right over onto Unix and looked, felt and acted the same as the program under DOS," he said, adding that beyond learning a few commands under the new system, no employee retraining was needed.

The typical center has between 100 and 300 children and maintains a 386-based PC that serves as the central computing device for an average of four or five terminals. Smaller sites, serving less than 50 children, use a single PC.

Keeping the records current and accurate is an ongoing challenge for the military. Programs are offered in a variety of flavors — full time, part time, before school, after school, summer camp and field trips — and are always changing to suit the fluctuating needs of the highly mobile clientele.

"The system saves us days and weeks of administrative functions at the back end," Bush said. "For example, if a commander wants to know day-care usage by junior enlisted personnel, we can provide the numbers without having to pull out a pen and pencil and tons of files."

Though the army's primary objective was to eliminate manually collected statistics reporting, Bush said that the real trick was to get a bar-coded POS system that was not cumbersome or complicated and didn't slow things down when checking children in and out of the centers.

The number of posts using Filepro is expected to increase to more than 200 within the next few years.

Dearth of trade skills stymies Soviet PC flow

BY LINDA LEWIS
IDG NEWS SERVICE

MOSCOW — Many exhibitors at the first PC World Forum held two weeks ago in Moscow said they are taking a wait-and-see approach as the country tries to move toward a regulated market economy.

The major problems hindering business with the Soviet Union, show exhibitors said, are financing contracts with hard currency and the lack of a distribution infrastructure for products and services [CW, May 28].

Soviet professionals attending the fair "don't know how to do business because they don't have hard currency, and everything is controlled by the government," said Daniel Hsu, project manager at Acer Technologies, Inc. One Soviet researcher agreed, saying that the brand of the computer was not as important as the cost.

Nonetheless, a substantial and untapped market awaits Western suppliers. The total Soviet demand for personal computers is expected to hit anywhere between 17 million and 30 million by 2000.

Yet, according to the USSR State Committee for Computer Engineering and Information Science, of the 1.1 million computers the country plans to produce in its 1985-1990 Five Year Plan, only about 350,000 currently exist. That number is expected to grow to no more than approximately 400,000 by the end of the year, compared with the 515,000 initially forecast.

The largest foreign exhibitor at PC World Forum is no stranger to the Soviet market. West Germany's Siemens AG has offered PCs on the Soviet market since 1989 and has sold electronics and telecommunications there for several decades.

Like Italy's Ing. C. Olivetti & Co., Siemens is targeting the Soviet educational market with its PCs. Given its financing difficulties, Siemens' three-year pact to supply this market with 300,000 PCs could take up to five years, said Hans Holger Moskopf, Siemens' manager for Central and Eastern Europe.

Siemens has already had orders canceled because of payment problems. Moskopf said the deal would not be expanded to include Intel Corp. 80386-based machines, even though export restrictions were relaxed in early June.

Olivetti said it plans to provide Soviet schools with machines from its UK-based subsidiary, Acorn. "The future PC market is in the educational sector; 90% of the company's current contracts come from the Soviet Ministry of Education," an Olivetti spokesman said.

However, he said he anticipates problems because of nonexistent distribution channels, currency problems and the lack of any legislation governing business deals. One solution — bartering, whether in coal, oil or bee poison — is so wrapped in red tape that the government must now give a go-ahead for all barter licenses.

Other exhibitors are focusing on a more modest strategy: France's SMT-Goupil recently introduced its seven-model G6 PC line, which ranges from an Intel 286-based computer running at 12.5 MHz to an I486 unit. It already markets 286 machines in the Soviet Union and will sell 386-based computers, a company spokesman said. He added that 5,000 to 6,000 PCs are scheduled to be delivered by June 1991.

However, an SMT-Goupil spokesman admitted that his company's PC prices will likely be undercut by other "modest" players on the Soviet market — notably Taiwan's Acer and South Korea's Goldstar Software Ltd.

Targeting the Soviet PC market with 8088-, 80286- and now 80386-based machines, Acer exhibited at the show primarily to emphasize awareness of its brand. "Our main competitors [in the USSR] are Taiwanese firms," Hsu said.

Goldstar, however, said it fears that in the long term, Soviet users will be unwilling to acquire hardware from Asian clone manufacturers that cannot ensure long-term maintenance and other services.

MICRO BITS

Televideo, USSR sign deal

Televideo has signed two joint venture agreements that will enable it to market its computers in the USSR. The first pact will provide computers to the city of **Moscow**, starting with 2,000 per month and eventually building up to 10,000 systems per month within two years. The second agreement will set up a computer retail chain that will enable the **Ministry of Construction** to resell computers and parts.

Ventura Software, Inc., a Xerox Corp. subsidiary, has announced a deal with **Sun Microsystems, Inc.** to produce a version of Ventura Publisher for the Sun Unix workstation environment that takes advantage of **AT&T**'s Open Look graphical user interface. The Open Look edition is slated for release in the second half of 1991.

Altos Computer Systems said it is offering a multiuser version of **The Santa Cruz Operation**'s Open Desktop graphical operating system. The Altos version is now available on its new Extended Industry Standard Architecture-based Intel Corp. I486 Multiuser System 5000 product family.

Intergraph Corp. recently announced that it will base the operating system for its workstations and servers on the **Open Software Foundation/1** operating system. Intergraph's initial release is scheduled for 1991. OSF/1's capabilities will also provide the foundation for Intergraph's plans for an enterprisewide distributed computing environment.

Novell, Inc. and **Hewlett-Packard Co.** said they will develop a version of HP's New Wave environment that can be shared by multiple users on Novell's Netware network operating system and will also extend New Wave's Object Management Facility to link objects across a Novell network. The two firms will work to provide an easy migration path for Netware's integration into the New Wave environment.

Adobe Systems, Inc. has signed agreements with **Xerox** and **Eastman Kodak Co.**, giving both companies licensing rights to Adobe's Postscript Language interpreter. Xerox said that it is developing products for the electronic printing and publishing market. Kodak will develop electronic imaging products that incorporate the Postscript interpreter.

Innovator

CONTINUED FROM PAGE 37

now seems the rule. Front-line innovators are not always the wild-eyed nutty professors with wire-whipped hair or kids with soldering irons in the garage. They are often professionals in the technological trenches who are looking to hone and maintain an edge. For them, the old methods simply don't work.

Thomas Hutchinson, a physicist at the University of Virginia in Charlottesville, began work on an eye-controlled IBM Personal Computer AT simply because "we have so little ability to communicate" with standard graphical user interfaces.

With the Eyegaze Response Interface Computer Aid in place during a word processing application, users can select and move paragraphs simply by looking at them instead of fumbling with clumsy DOS commands. The setup uses an IBM PC AT and about $3,000 worth of additional hardware, Hutchinson says.

The design offers several high-resolution squares set against a low-resolution background on a computer display. An infrared LED connected to a video camera mounted beneath the monitor beams a light into the user's eye, which then reflects off the back of the eye, triggering an effect called "bright eye."

The video camera records the light reflected off the retina, which moves as the user shifts his gaze, as well as light reflected off the cornea, which remains stationary. By measuring the distance between the two points of light, it is possible to determine where the user is focused. Users operate optical switches that control various devices by focusing their eyes on specially designed areas.

The information is then relayed to an analog-to-digital expansion board on the PC, which in turn triggers the software to carry out the command indicated by the square.

Some progressives push the technological envelope because of an innate joy in making things that are useful to others. "We are the patient's advocate, so we are always yelling for things that our patients couldn't ever imagine asking for," says Dr. Bruce Kall, a senior analyst at the Mayo Clinic in Rochester, Minn., which is also exploring work in artificial reality procedures.

Others bound into the future after languishing for a long period in the past. For years, agents at the William Morris Agency, Inc. talent agency used an interoffice system of Rolodexes and memos that had been around since the days when Bogey and Bacall were box office dynamite.

They now have an advanced system developed by Next, Inc. in which specially designed software enables them to view videos of the entertainers they represent. The setup has fundamentally changed the character of the office, says computer systems director Alex Henry. Workers now hold on-line staff meetings that are "open and wide-ranging discussions that can last for days, as opposed to just an hour-long exchange of small facts."

In the past, new technological procedures were normally reserved for upstart companies hoping to get a quick leg-up into the big leagues. "It's often easier to graft a new technology onto a new organization than mutate an existing organization to take advantage of a new technology," says Paul Saffo, research fellow at the Institute for the Future, a Menlo Park, Calif.-based consulting think tank.

> "THE ASSIMILATION of new technologies is going at a tremendously accelerated rate."
>
> PAUL SAFFO
> INSTITUTE FOR THE FUTURE

While that is changing — the Big Eight accounting firm of Peat Marwick Main & Co., for instance, was an early adapter of the Apple Computer, Inc. Macintosh technology to streamline office procedures — some types of firms are more likely than others to take new technological bait. Product-oriented companies tend to take more of a risk because they're serving an end customer, Saffo says.

New methods may also require an organization that can deal with controversy. Such was the case at The Discovery Channel, the rapidly growing cable network that needed to get the inside track on new quality programming before its competitors. "If we can say yes on a program before PBS or A&E or National Geographic, then we get that program," President Ruth Otte says.

In a typical year, the program coordinator looks at about 5,000 hours of programming but is only able to purchase and show about 1,000. When Otte moved into the struggling start-up network nearly three years ago, she helped devise an elaborate PC-based electronic-mail system that includes a function called "conversation management," which some of its detractors characterize as "fascist." The feature requires its users to state explicity what they're going to do, what they ask others to do and when they agree it will be accomplished.

Otte, however, does not see the system as fascist. "If we don't keep our promises to each other, we're not in business." The flip side, Otte says, is that the system encourages risk, trusts subordinates and allows for ownership of projects.

While some fear that the inherent risk in using pioneering PC technologies is still great, those on the front lines usually disagree. "We aren't using anything that hasn't been pretty well proven," says Martin Klaver, manager of operations analysis at Lenox, Inc., a china and crystal company in Pomona, N.J., that uses a voice recognition system developed by Newton, Mass.-based Dragon Systems, Inc.

Several employees use the voice recognition hardware, Dragon's Voice Scribe-1000, plugged into Compaq Computer Corp. Deskpro 286s and IBM PC XTs with Intel Corp. 80386 add-in cards. "The problems usually come in the development cycle. Maybe we're the first on the block to have this, but it doesn't mean [we're] the biggest risk takers."

Instead, those who sit languidly by while technology sprints past are the most likely losers. "The assimilation of new technologies is going at a tremendously accelerated rate," Saffo says. "The first pioneers in desktop publishing set forth only a few years ago because they wanted something new and different, but now people are getting into desktop publishing because they know they'd better do it or they'll go out of business."

The chief hurdle still to leap, however, is the fact that the computational foundation in many organizations has often been cast in concrete. Some new methods must fit into old molds. "There are an awful lot of people out there marrying new technologies with a hope, a prayer and a lot of enthusiasm, but the trick is balancing that with a way to accomplish the corporate mission," Saffo says.

Unfortunately, that is becoming increasingly more difficult because so many computational foundations have already been poured. "A lot depends on how wedded an organization is to a particular standard," says John Rizzo, vice-president of marketing at Mountain View, Calif.-based Momenta, Inc., which is developing a new pen-based PC system. "If a company has a proprietary approach, it's more of a challenge to find those people who are the zealots who will carry the torch internally and convince others why this technology is new and different and better."

Typically, those people are in a position to authorize the funding and have the power to allow their firm to sign off on new technology, Rizzo adds. They must also be ready to put their heads on the chopping block if the system fails — or be on their toes and quickly find their way out of a dead end.

"If you hit a dead end, you have to be prepared to find the one little thing that maybe you did right and can turn into another idea, and suddenly, away you go," Kall says. "That's what is so exciting."

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NEW DEALS

Pratt & Whitney, Sun strike deal

United Technologies Corp.'s **Pratt & Whitney** division has selected **Sun Microsystems, Inc.**'s Scalable Processor Architecture-based computers as the platform of choice for all of the aerospace firm's workstation and server needs. Under a three-year pact, Sun will supply hundreds of Unix workstations, servers and peripherals. A key selection requirement was the ability to run **McDonnell Douglas Corp.**'s Unigraphics software, which is Pratt & Whitney's preferred computer-aided design and manufacturing package.

The **U.S. Government Printing Office** has selected **Knowledge Access International, Inc.**'s Kaware Disk Publisher, encompassing the Text/Imaging and Fielded/Image disk publishing systems, for producing compact disc/read-only memory on behalf of federal agencies.

Automated Business Systems and Services, Inc. and **Compucom Systems, Inc.** said their joint venture has won a contract worth a potential $17 million to supply the **U.S. Department of Administrative Services** with microcomputers and related support.

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IXL

CONTINUED FROM PAGE 37

chase habits. "If I knew your age and sex, I could tell you probably what you would spend in each of our store's 40 departments," said David Barnhart, chief of sales analysis.

For example, IXL studied the demographics of personnel stationed in West Germany and determined that they would spend much less than was predicted by a homegrown sales projection program. Consequently, the exchange was able to avoid wasting money constructing facilities that would go underutilized.

Previously, the exchange employed one person at a $30,000 salary to analyze the demographics statistically. A single analysis required two to three weeks to complete manually, while IXL gets the job done in two to three hours, Barnhart said. He runs the program on an Intel Corp. 80386-based IBM-compatible running Ashton-Tate Corp.'s Dbase 3.0.

Although he is happy with IXL, which he said is the first of its kind, Barnhart complained that the concept of the product is so unique that it is difficult to explain in the documentation. "The manual is not very clear as to how to control the parameters," he said. "They've got a gold mine here if they could explain to people what it does."

At Wisne Design, a division of Progressive Tool & Industries Co., estimators use IXL to provide more accurate and consistent job estimates to customers.

For example, the program will look at the historical costs of hole-boring machines and the number of holes it was expected to bore to come up with a probable cost for a similar new machine.

"You can't put a price on a hole, but the number of holes is a function of the complexity of the system and the overall cost of the machine," said David Jambor, manager of computer-aided engineering.

Time saver

IXL also takes less time than the manual method to complete an estimate. "It cuts a substantial fraction off our time to estimate," Jambor said. He runs the program on an IBM 386-compatible, with the raw data entered in a Lotus Development Corp. 1-2-3 spreadsheet.

Jambor agreed with Barnhart that the product concept is relatively unique and hard to grasp. "I think a person has to be mathematically-minded to appreciate what it is doing," he said.

He added that IXL is "very finicky" in the way it reads a database file. Unlike 1-2-3 and Dbase, IXL will not tolerate a blank space in a field name, he said. "That threw me for a loop because it's not in the manual."

The $490 program works on DOS, OS/2, Unix, Apple Computer, Inc.'s Macintosh and VMS operating platforms and supports most common database platforms. Databases can have an unlimited number of rows but only up to 64,000 columns.

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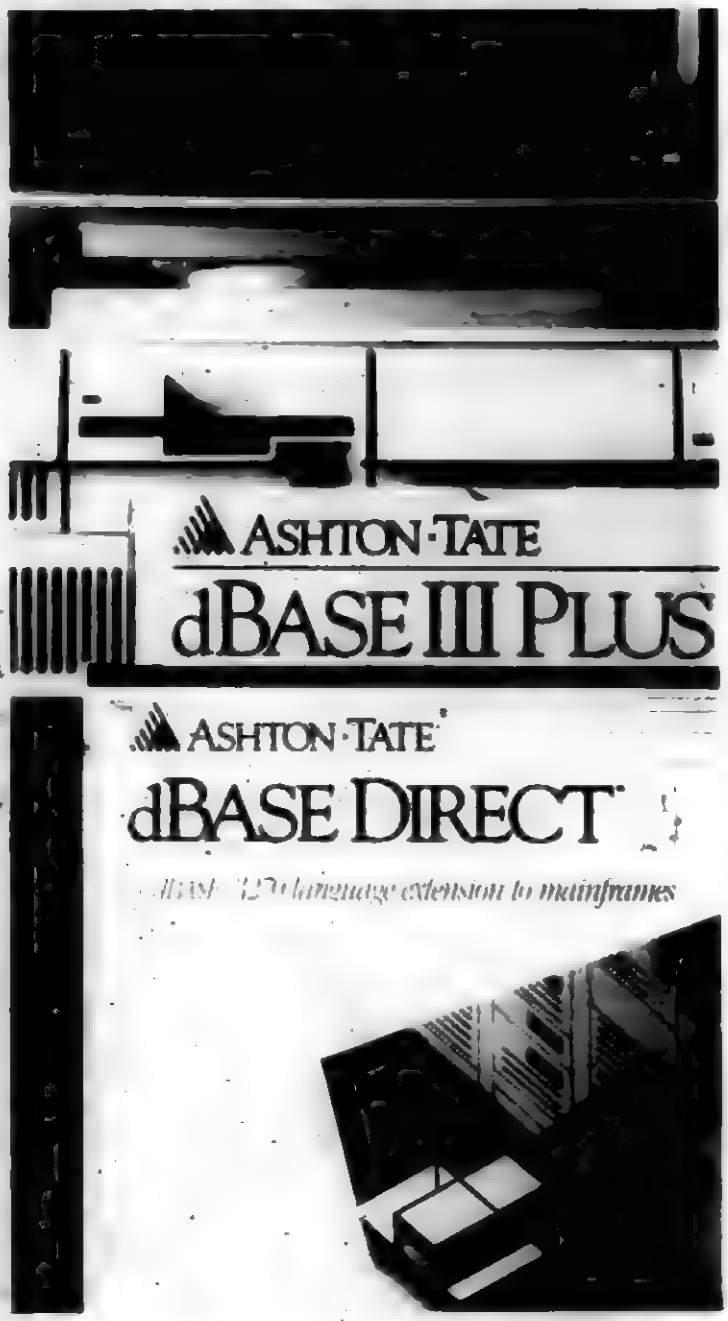

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Pastore

CONTINUED FROM PAGE 37

remark about the July heat and then introduced the experts.

A guy from DG started the ball rolling, saying DOS and other open standards are not what will drive PCs into the '90s. (DG, like a lot of old-guard mini vendors, is trying to milk its proprietary-system standards.)

Following this, an AST Research pitchman stood up and said multiprocessor PCs will drive the industry into the '90s. (AST is working on a multiprocessor PC.)

Then it was Apple's turn. The Apple rep spent a good deal of his alotted time predicting that Microsoft's Windows won't be the interface that powers the PC into the '90s. (Apple is burning up over this graphical interface, which is bringing Mac-appeal to IBM-style PCs.)

Finally, there came the substitute spokesman for the original spokesman who was scheduled to speak for Intel. He threw on his slides and launched into the inevitable rendition of Moore's Law. I've probably seen Moore and his Law trotted out by Intel six times in the last couple of years, and I still don't get it. The Law, handed down from an Intel founder, says that the number of transistors on a CPU chip doubles every two years, or something like that. This means that in the year 2000, we'll have single chips with umpteen million transistors.

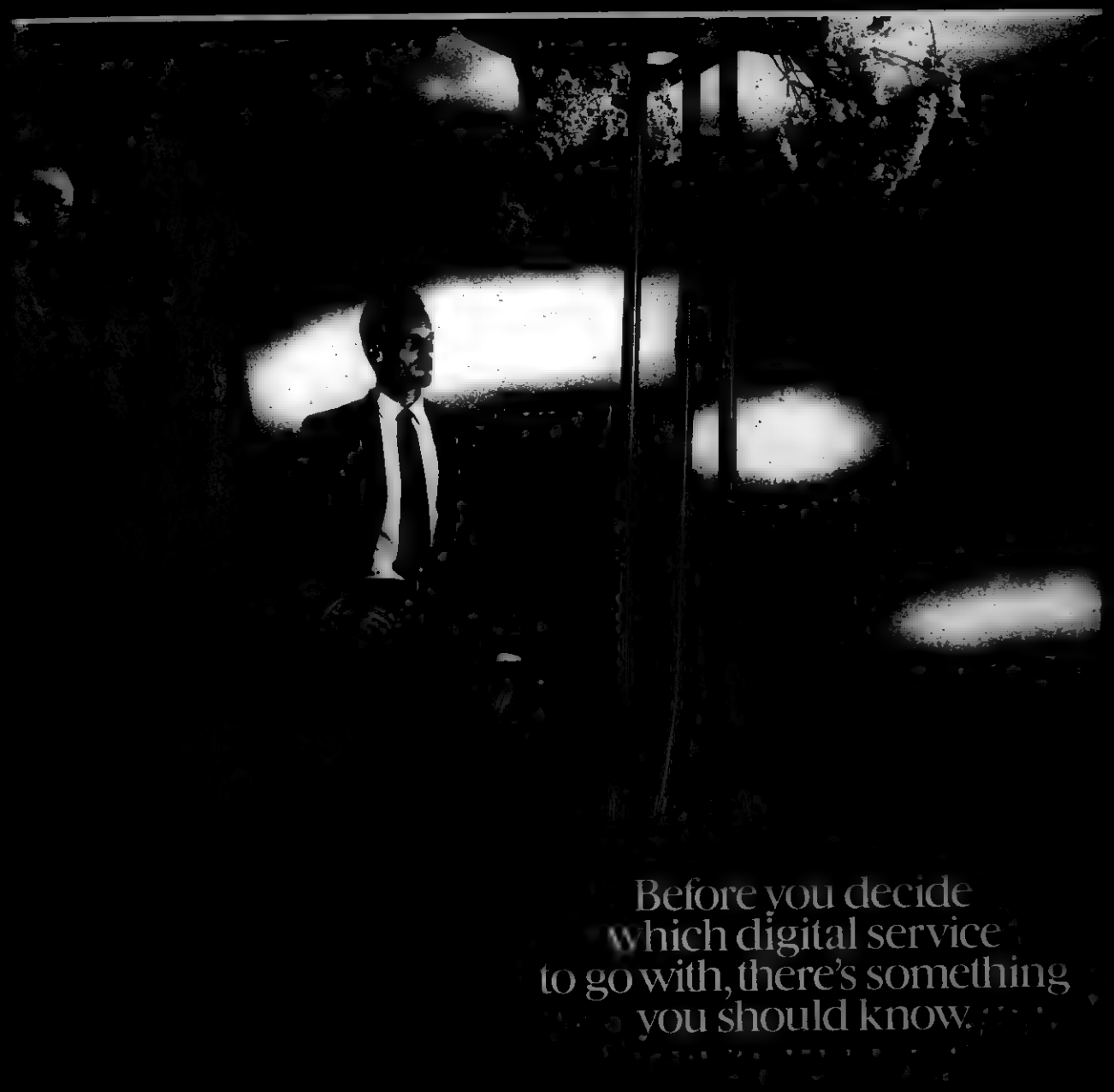
Having learned that, I'm sure the information systems managers in the audience who were wondering why they needed a 486 PC slept better that night.

But these hucksters aren't the only letdowns at the conferences. The audiences rarely exercise their golden opportunity to put vendors on the spot. We don't hear many direct, tough questions like "Why should I buy a Micro Channel box over an EISA machine?" or "Why can't my Macs communicate more smoothly with my Compaq servers?"

Instead, we hear a few murmurs about esoteric techie concerns and the high price of laptops. Then everyone hustles out of the room with the zeal of sailors headed for shore leave after a year-long tour in the Bermuda Triangle.

As far as I can see, these conferences are only good for a chuckle — and that only if the slide projector impishly decides to chew up the presenter's slides and throw those meticulously memorized spiels into a state of chaos.

Pastore is a *Computerworld* senior writer.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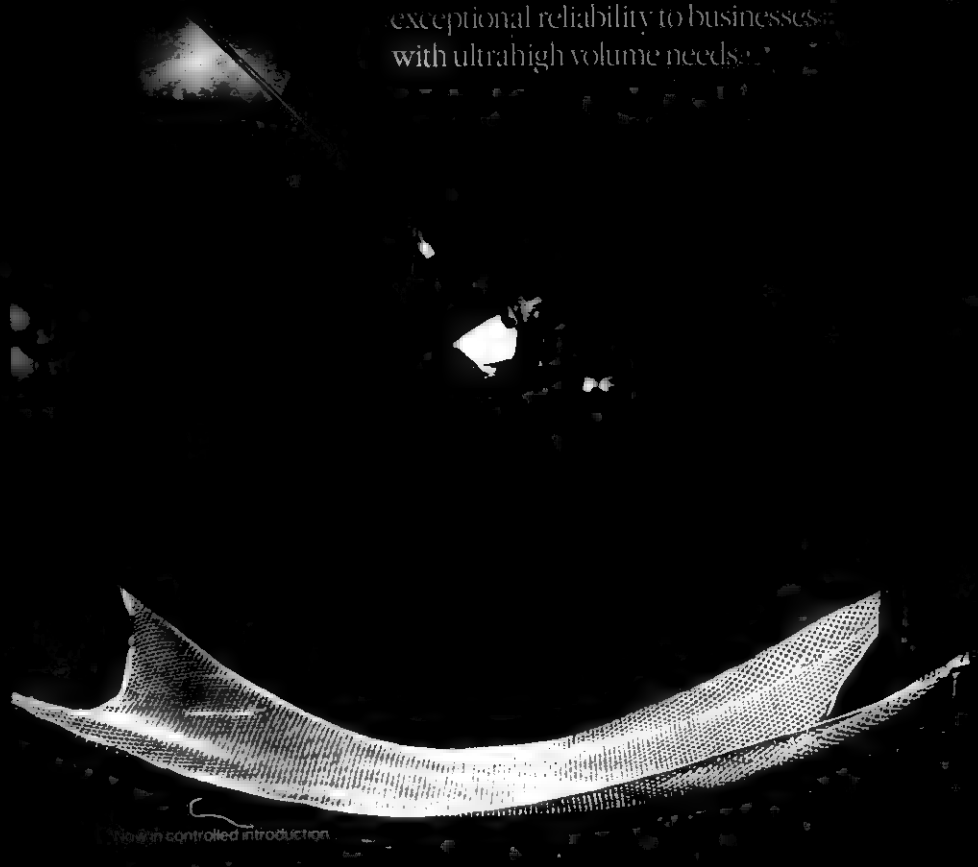

*Tariffs controlled introduction.

Only AT&T gives private line users so many capacity and bandwidth options to so many locations.

Besides offering more digital voice and data locations than any of our competitors, we also give you a choice of any number of single channels at either 9.6, 56 or 64 kbps or Intermediate Bit Rates of 128, 256, 384, 512 or 768 kbps. Not to mention a wealth of features, including Subrate Data Multiplexing, Multipoint Capability and Route Diversity.

So to get exactly the locations and capacity you want with your choice of either digital or analog access, AT&T is definitely the way to go.

With AT&T ACCUNET Reserved Digital Service, you can extend your private network whenever you need to.

You can have your own private network, anytime and anywhere you want it. All you need is private line access to our reserved digital service. And now you can even buy Intermediate Bit Rates of 384 and 768 kbps. Perfect for spur-of-the-moment video needs, bulk data transfer and disaster recovery. ARDS can also give you expanded capabilities for managing and reconfiguring your network.

Only AT&T Switched Digital Services lets you transmit data on-demand to almost anywhere.

As the only public switched digital network available today, AT&T's ACCUNET SDS lets you do things on a dial-up basis you never could before.

Like bulk data transfer, video conferencing, image retrieval, Group IV Fax and CAD CAM transmission to over 500 locations around the world.

Our big news on SDS is that in addition to transmission at 56 and 64 kbps, we now have ACCUNET Switched 384 Digital Service. For applications where wider bandwidth really counts.

ACCUNET SW384 gives you the capability to transmit data (including video, bulk data and CAD CAM files) six times faster than any comparable service.

AT&T ACCUNET Family of Digital Services is now available at easy-to-reach prices.

If you'd like to go the ACCUNET route but you're under the impression that our prices are out of range, consider this:

- Over the past 18 months, ACCUNET T1.5 prices have dropped from 30% to 60%. Our term plan, for instance, offers 31% off our monthly charges to any T1.5 customer who commits to five years of service.
- As an ASDS customer, you only pay for the bandwidth you need. With the ASDS multiple channel option, the more capacity you use between locations, the less you pay per channel.
- Due to a simplified rate structure and new added volume discounts, our ACCUNET Reserved Digital Service is now more affordable than ever.
- Since 1989, we've lowered our ACCUNET Switched Digital Services prices by 56% to 74%.
- Customers using more than one of our dedicated services can take advantage of even more savings through our Multi Service Volume Pricing Plan.

The bottom line is there's really no reason not to go with the carrier that covers digital territory like no one else.

ACCUNET Family of Digital Services. Another AT&T advantage.

For more information on AT&T digital services and products, call your AT&T Account Executive or 1 800 247-1212, Ext. 352.

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COMMENTARY

Ellis Booker

Sprint slows to a crawl

U.S. Sprint's long-distance customers did not abandon their carrier en masse last month after hearing of its $42 million loss in the second quarter.

Experienced telecommunications managers at large corporations have seen this sort of thing before. Some remembered, no doubt, a few years ago when MCI's viability was being questioned — when its robust founder Bill McGowan was recovering from heart transplant surgery, and its stock had slid to $6 per share.

Other telecom managers probably took the Sprint news in stride, patiently reminding their bosses that, for reasons ranging from the corporate policy against single-vendor relationships to the simple need for network redundancy, they hadn't used a sole provider of long distance for years.

But if the Sprint shortfall did not cause a cataclysm among its customers — who will likely stick by the carrier as long as its rates are competitive and its service quality acceptable — the company's second-quarter performance did cause a shiver to go through the regulatory machine that has been grinding forward ever since the Bell System was dismantled.

In the realpolitik of long-distance public policy, AT&T lost the most when Sprint reported its second quarter.

Since divestiture, AT&T has

Continued on page 48

Virus bill raises hopes, fears

Updated laws could hold unwitting transmitters liable for damages

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — A panel of computer and legal experts at a congressional hearing praised the goals of a Senate bill that would modernize the Computer Fraud and Abuse Act of 1986 but raised troubling issues for owners and users of networked computers.

The bill extends the act's definition of computer "access" to include the intentional transmission or distribution of unauthorized software that damages computer data, software or hardware. Felony penalties could run as high as five years in prison and a $250,000 fine.

However, the bill goes further, saying that anyone who unknowingly but "recklessly" transmits destructive software could face a misdemeanor penalty of up to one year in jail and a fine of $5,000.

The new legislation would extend the reach of the earlier law beyond "federal interest computers" to include any computer used in interstate commerce or communications. It would also allow civil actions that could result in the payment of compensatory damages to people who suffer losses caused by computer abuse.

An official from the U.S. Department of Justice testified that the misdemeanor provision would give prosecutors added flexibility.

"[It] could be employed against computer hackers and persons responsible for computer viruses where the intent to damage a system or defraud can't be shown conclusively," Deputy Assistant Attorney General Mark Richard said.

But David Johnson, a partner at the Washington law firm Wilmer, Cutler & Pickering, said expansion of the law's scope and the provision for civil action would encourage lawsuits against blameless enterprises. He said that "large, deep-pocket institutions" that fail to scrub every disk and data transmission for the presence of a virus could become the targets of lawsuits.

"Regrettably, many institutions have failed to take even minimal precautionary measures because they are loath to interfere with computer users' prerogatives and because no crisis has brought the seriousness of the threat home to top policymakers in a concrete way," Johnson testified. He said these institutions are likely to be penalized unfairly when their systems inadvertently become "Typhoid Marys" during outbreaks of computer viruses.

"The reason for the recklessness provision is to make clear to computer users that they should not engage in experiments that place other users at risk," said Marc Rotenberg, director of the

Continued on page 47

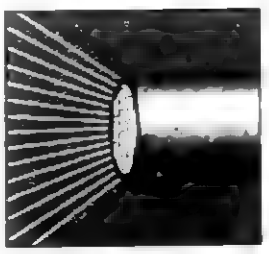
Southwestern self-healing net debuts

BY ELISABETH HORWITT
CW STAFF

ST. LOUIS — Following in the footsteps of US West, Southwestern Bell Telephone Co. has announced a fiber-based, high-speed digital network that promises customers long-term cost savings and guaranteed diverse routing for backup purposes.

Users of Southwestern Bell's Securenet will pay a premium for each 1.5M bit/sec. T1 or 45M bit/sec. T3 line they want "secured," or provided with a backup fiber-optic line that runs through a different Southwestern Bell central office from the primary line, according to Ed Wilkison, a Southwestern Bell spokesman.

Securenet will automatically reroute lines to the backup facilities, insuring customers against loss of service if the primary line were severed or if a fire or other disaster were to hit the primary central office, Southwestern Bell said. The service addresses a long-standing demand from major users that regional operating companies provide diverse routing and other reliability features on the local loop, according to John Saccente, a Houston consultant. "I think Southwestern Bell is trying to go up against would-be bypassers" among its major customers, as well as aggressive alternative access carriers such as Metropolitan Fiber Systems, which has already established itself in Houston, Saccente said. Such carriers specialize in high-speed, self-healing fiber-based networks for large companies concentrated in metropolitan areas.

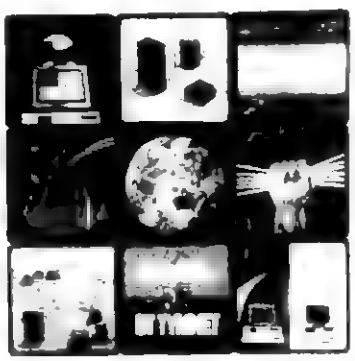


Southwestern Bell has already cut its T1 rates in response to threats from Metropolitan Fiber and other alternative carriers, according to a telecommunications manager at a major oil company. He added that his company is discussing Securenet with Southwestern Bell, "although we're a long way from signing." The oil company set up its own private fiber and digital microwave network years ago to ensure local loop reliability, the telecommunications manager said: "We're more interested in pricing, and Southwestern Bell has talked in generalities so far."

Southwestern Bell has not yet determined prices but is targeting Securenet at between 25% and 30% over its existing T1 rates, Wilkison said. He added that the company has yet to determine the "crossover point," or minimum number of T1 lines that will enable a user to cost-justify the fiber-optic service. The service does require that a fiber-optic line be installed from the central office out to the user's premises.

Securenet is scheduled to become available in September in Houston and Dallas.

While the local carrier has been aggressively installing fiber in its major cities for several years now, Securenet represents Southwestern Bell's first attempt at leveraging the fiber's high bandwidth and reliability features in commercial services, Saccente said. Securenet will form the basis for other broadband network services such as Synchronous Optical Network, broadband Integrated Services Digital Network, and Switched Multimegabit Digital Service, Southwestern Bell said.



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Analysts rely on software package to mince distributed financial data

BY JOANIE M. WEXLER
CW STAFF

It slices! It dices!

A consolidated financial management and reporting package called Control from Kay Consulting International, Inc. in Los Angeles is allowing financial analysts in at least two large firms to chop, puree and blend corporate information in whatever combinations they choose.

The complex task of quickly accessing distributed information is getting even trickier for companies that must mix data stored on remote local-area networks running in multiple business units. Enter the latest version of Control, introduced in late 1989, which runs on a variety of LAN topologies and network operating systems.

William Schaefer, a senior financial analyst at Arco Transportation Co., moved from a small, stand-alone version of Control to the networked version shortly after it became available. He said he decided to install four token-ring LANs at his three corporate sites — each running Novell, Inc.'s Netware — because his mainframe applications were "no longer flexible enough to meet new requirements."

"In the new configuration, we have a system that is very easy to modify," Schaefer said. "We can add organizations and mix and match how we look at them. We're able to isolate detail levels down to different segments of the business."

Consolidated combinations

Control software, which is both a database and database manager, performs large-scale consolidation tasks from general-ledger data — a composite of financial data from various corporate departments and divisions. This allows users to view subsets of information in a variety of comparative and analytical combinations.

The package aids in budgeting functions; draws comparisons of actuals to plan; budgets and forecasts; and produces financial reports.

Schaefer explained that his group is responsible for "looking at the performance of a division and determining why it did or didn't make budget. Then we make projections for the rest of the year."

Arco's mainframe systems, which were developed about 10 years ago, would have required a major upgrade in order to adequately handle those tasks in today's environment, Schaefer said. He added that he expects to pay back the entire cost of the Control product in six to nine months. The savings will come from reduced mainframe use fees and related costs, he said.

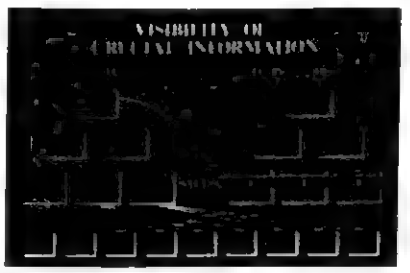
In Arco's mainframe-based environment, to recalculate a model took approximately 15 to 20 minutes, Schaefer said. To do the same calculation using Control, he said, takes under five seconds.

The network versions of Control start at $12,000 for Intel Corp. 80286-based networks and $16,500 for 80386-based networks, according to the vendor

A major difference between Control and competing packages is that Control is an application package, said John Torell, manager of group financial systems in the space and communications group at Hughes Aircraft Co. in Los Angeles. Most others, he explained, arrive as fourth-generation programming languages with common accounting commands and functions that users must customize. Hughes has been using the mainframe version of Control for about four years.

Torell said Hughes was able to radically improve the timeliness of reports when it replaced four overhead control systems with the Control product.

"Data is now available on the sixth workday of the accounting close instead of the 19th," Torell explained. "It was important to improve that timeliness because otherwise the trail was cold; it was too late to act on the information."



Control *functions as a networked database and a database manager*

Torell said that while Hughes saves "$100,000 per year in programming and computer costs alone," the main benefit of using the product has been improved morale at the company.

"We used to have analysts becoming clerks," Torell said. He explained that this was because analysts had to re-enter data from seven different sources using different spreadsheets. Control uses an intelligent mapping facility to convert any ASCII flat file into the Control database, saving analysts hours in rekeying time.

"Now our MBAs forecast overhead expenses much more accurately and don't have to spend large amounts of time inputting data. We've reduced a lot of overtime and had much less turnover."

Torell said 300 workers at Hughes use Control and that the package allows users to expand the system without doing any of their own programming.

Comdisco makes backup flexible

BY ELLIS BOOKER
CW STAFF

ROSEMONT, Ill. — Planning for disasters, an unpleasant but vital job, rests on a simple rule: Expect the unexpected.

With that in mind, Comdisco Disaster Recovery Services (CDRS), a $100 million subsidiary of leasing firm Comdisco, Inc., recently began migrating from dedicated to switched links between its centers, so as to give customers flexibility as to which of its disaster recovery facilities they can use in an emergency.

Two elements make up CDRS Net. Business recovery facilities, which include workstations and other business systems, are where users go to conduct business when the disaster hits. "Lights-out" computer recovery facilities contain the Comdisco hosts that take over processing when a customer's computers are taken out.

CDRS originally co-located business and computer recovery facilities in the same physical location. More recently, it located the two types of centers in different places and linked them with dedicated lines. In this next phase, CDRS has begun to implement a switched network that will allow users in any business recovery facility to access any computer recovery facility.

One of the first of CDRS' 2,100 customers to test the network was 20th Century Insurance in Woodland Hills, Calif. "We were a little concerned response time wouldn't be adequate," data security administrator Sam Armas said. However, the 8-hour test in February, which linked an IBM mainframe in San Ramon with a control center in Cypress, Calif., went off without a hitch.

"In the traditional method, you'd be at the same location as the CPU," Armas said, adding that running the host from a remote location "saves money because you don't have to relocate a lot of people." In addition, using a network adds a degree of redundancy to CDRS' service, ensuring that two nearby companies declaring a disaster on the same day need not share the same physical hot site, he said.

"We're sticking the [computer] console function into the user environment instead of sending an army of people to the CPU," said John W. Schladweiler, senior vice-president of business development at CDRS.

The next step in CDRS Net, due to be completed by July 1991, will involve integrating CDRS's Canadian and European centers into the network, Schladweiler said.

Because a "survivable" network is so essential to this approach, CDRS has three paths into each center, including a very small-aperture terminal (VSAT) for accessing a backup satellite network.

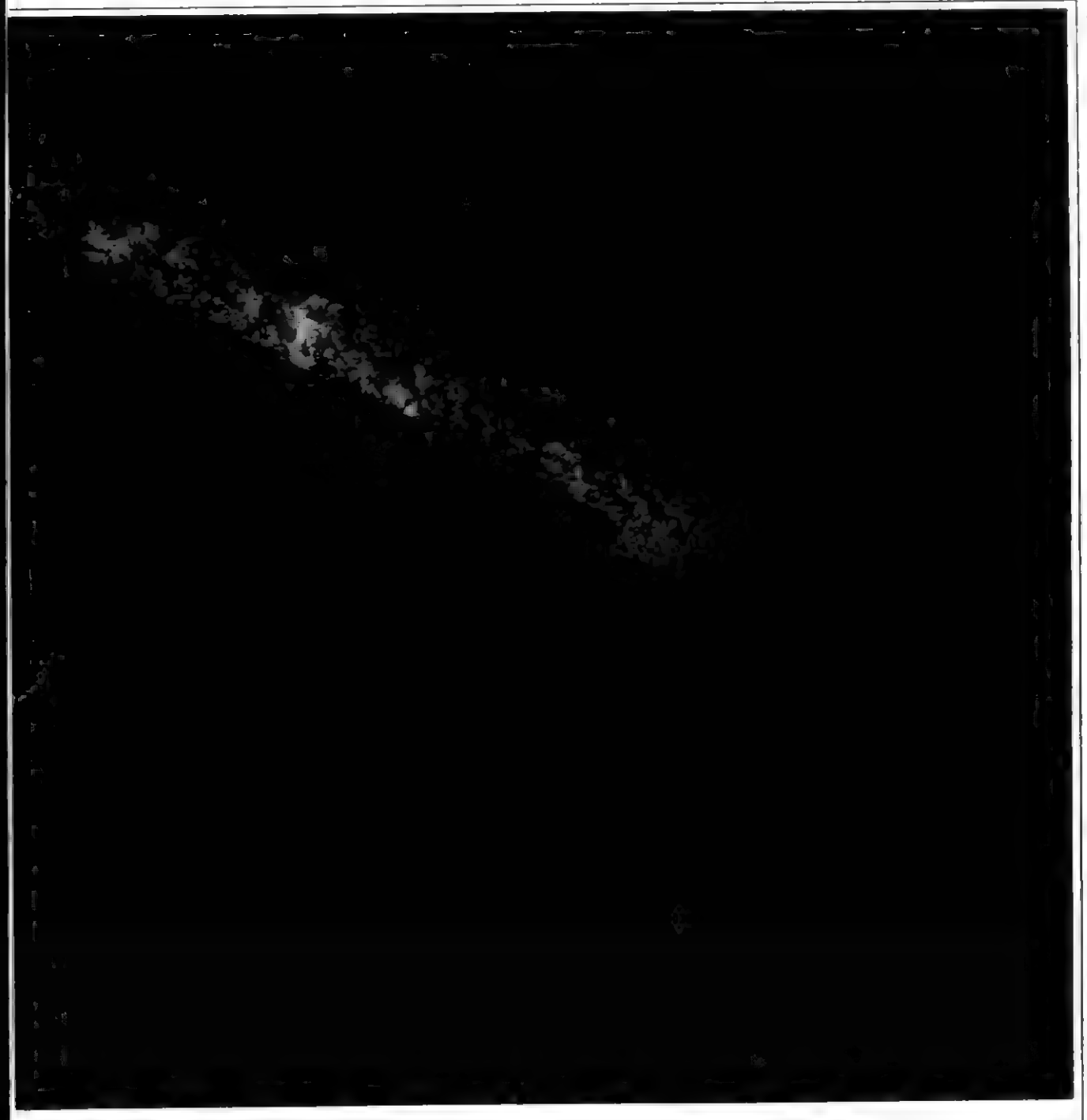
Long-distance access

The "blue sky" use for such a network, Schladweiler said, would be to distribute processing and storage even more — for example, connecting a CPU, data tapes and users located in three separate locations. Users can already remotely access the remote computer control center over dial-up lines.

That is exactly what Miami-based American Savings and Loan Association in Florida did in its test of the network in April, said contingency planning coordinator Robert Suarez.

"We didn't send people to the business recovery center [in Texas], where we'd normally have to go," Suarez said. "We sent our data tapes, and the CDRS staff loaded them."

Nor did Suarez's 50-person information systems staff go to their normally designated CDRS control center in Atlanta. Instead, they remained in Miami and accessed the Atlanta facility over dial-up phone lines using a single workstation.



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Virus

CONTINUED FROM PAGE 45

Washington, D.C., office of Computer Professionals for Social Responsibility (CPSR), which supports the provision. "The law should make clear to computer users that potentially dangerous experiments cannot be conducted in an environment that puts users at risk."

However, Rotenberg said CPSR opposes the provision that would extend the law's reach to all computers used in interstate commerce or communication. Rotenberg said it had not been shown that the existing law is inadequate.

He also said that expansion in scope invites violations of First Amendment and due process rights. Searches of computer systems are inevitably broader than physical searches and are more easily abused.

In addition, Rotenberg said that monitoring computer communications and bulletin boards should be subject to the same sorts of civil liberties safeguards as now apply to wiretapping.

Two U.S. House of Representatives bills, introduced 1½ years ago, would beef up the felony penalties for willful computer mischief but are currently locked in a jurisdictional dispute and are not likely to go anywhere, a Judiciary Committee staffer said.

Booker

CONTINUED FROM PAGE 45

waged a rhetorical battle on Capital Hill and at the Federal Communications Commission (FCC), asking for relief from the oversight that it said hinders its business. Paradoxically, until AT&T seems to falter, lawmakers will be reluctant to permit a change in the status quo. At the same time, cynics have suggested that AT&T today has little incentive to develop startling new services to take market share from its competitors, since this would incline policymakers to tighten AT&T's regulatory bonds.

Those opposing a freer AT&T can now point to a financially struggling Sprint and to MCI's announcement earlier this year that it plans to acquire Telecom USA as proof that the long-distance market is shrinking, not expanding.

The stiffening resolve of legislators was evident earlier this month, when a skeptical House telecommunications subcommittee asked FCC Chairman Alfred Sikes why the commission was bent on lifting AT&T's "dominant carrier" status. Sikes replied that he still views AT&T as the industry's dominant player, but he added that the FCC could still consider easing some regulations for services in which AT&T faces competition.

But we must also consider the possibility that regulations designed to protect consumers may have the opposite effect. Take the "price cap/price floor" regulation that AT&T now operates under. According to a recent report from Multinational Business Services, this scheme may actually be keeping prices artificially high, preventing a price war that would ultimately benefit consumers.

> REGULATION designed to protect consumers may have the opposite effect.

Moreover, Sprint's woes should not be placed at the feet of a partially untethered AT&T, analysts said. "They are losing because of ineptitude," declared Frank Dzubeck, president of Washington, D.C.-based Communications Network Architects. Sprint's cost structures, he said, are out of whack: "[Service] costs them more than anyone else, but they still want to sell it for less."

The FCC and its chairman are walking on a political razor blade. Predictably, legislators can take easy shots, bellowing about "monolithic" AT&T. (Actually, FCC figures show that AT&T has a 67% market share overall, 46% to 52% for high-end services.) But Sikes' position that all policies are worthy of review is reasonable and should not be rejected because of a stumble at Sprint.

Booker is Computerworld's Chicago bureau chief.

BIT BLAST

Wollongong taps reseller

The Wollongong Group, Inc. said it intends to add **Vitek Systems Distribution** to its list of resellers of Wollongong Integrated Networking Solutions (WINS) and Pathway software. WINS is based on the Transmission Control Protocol/Internet Protocol and Open Systems Interconnect protocols to provide microcomputer-to-mainframe integration. Pathway software integrates desktop computers into a companywide network. The vendor also said it has signed a distribution agreement with Philips Information Systems in Apeldoorn, Netherlands, for integrating selected WINS products into the semiconductor manufacturer's computers for international distribution.

About 8% of **AT&T**'s business customers would reportedly be affected by a proposed 2% rate increase for the carrier's Software-Defined Network, Megacom WATS and Pro WATS offerings. The carrier said the proposed increase reflects its network investment and inflation costs.

Siemens Communications Systems, Inc. said it will participate in a public metropolitan-area network field trial with **Bell of Pennsylvania, QPSX Communications Ltd.** and **Temple University** to provide engineering and logistical support to QPSX throughout the trial, slated for sometime this summer.

Chip maker **Advanced Micro Devices, Inc.**'s Advanced Networking Test Center for Fiber Distributed Data Interface interoperability announced results of its first multivendor test involving nine vendors' products. The company said that the test revealed that different implementations of Station Management 6.1 — the standard for managing the fiber local-area network at the physical layer — were interoperable and that 6.1 can be backward-compatible with Version 5.1.

Shiva Corp. is offering a deal throughout this month allowing owners of a Fastpath 1, 2 or 3 gateway or Cayman Gatorbox to trade in their units and purchase a Fastpath 4 for $999 (regularly $2,795). The gateways link Ethernet and **Apple Computer, Inc.** Localtalk networks, and Fastpath 4 supports both thick and thin Ethernet cabling.

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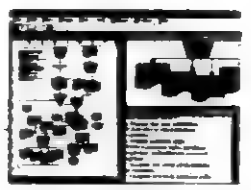

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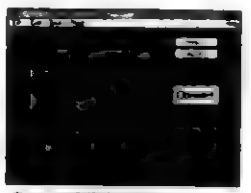

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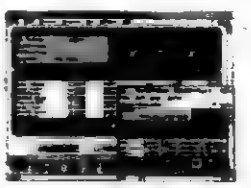

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NEW PRODUCTS

Local-area networking hardware

Hewlett-Packard Co. has announced the HP 18226A International Standards Organization (ISO) protocol interpreter for the HP 4972A local-area network protocol analyzer.

The interpreter monitors and displays ISO protocol headers in descriptive formats that enable LAN managers to analyze the network's ISO protocol operation and isolate problems.

The product can also decode several types of protocols through the Session layer of the Open Systems Interconnect model, the vendor said. The 18226A is priced at $960; the 4972A sells for $18,540.

HP
3000 Hanover St.
Palo Alto, Calif. 94304
(800) 752-0900

Local-area networking software

Unipress Software, Inc. has announced Macnix, an Apple Computer, Inc. Macintosh software package that enables users to access Unix-based systems in a Macintosh-style graphical user environment.

The product was designed to be used with serial or Ethernet connections. It enables users to simultaneously access Unix operating systems and Unix applications. It can emulate Digital Equipment Corp. VT100 and VT220 terminals and permits Macintosh systems to communicate with Unix hosts over dial-up and local RS-232 lines at speeds up to 19.2K bit/sec.

Pricing begins at $800.

Unipress
2025 Lincoln Highway
Edison, N.J. 08817
(201) 985-8000

Viewstar Corp. has announced the Entry Level System, a document image processing software package designed to run on Novell, Inc. networks.

The product includes software modules for capturing, storing, retrieving, managing, processing and outputting document images; two 19-in. monitors; and an optical disc storage unit.

The Entry Level System is priced at $130,000 or $97,500 without hardware.

Viewstar
5820 Shellmound St.
Emeryville, Calif. 94608
(415) 841-8565

Omni Solutions, Inc. has announced a file system designed to enable users to move large files in the Sun Microsystems, Inc. Network File Systems (NFS) client/server environment.

The Omni File System connects to a standard interface in the Sun operating system. It is compatible with NFS and completely transparent to NFS client workstations. The system can be used on file systems where files containing more than 96K bytes of data predominate.

The product lists at $9,950.

Omni Solutions
381 E. Evelyn Ave.
Mountain View, Calif. 94041
(415) 966-1024

Network services

BT Tymnet, Inc. has announced a family of bundled, port-based synchronous X.25 services that provides users with X.25 host access to a Tymnet network.

Xlinks Express includes leased-line private access port services for X.25 interfaces at speeds up to 19.2K bit/sec.

Xlinks provides users with all elements needed for an X.25 host-to-Tymnet connection for $900 per month.

BT Tymnet
2560 N. First St.
San Jose, Calif. 95161
(408) 922-0250

Front ends, multiplexers

Racal-Vadic has introduced two series of multiplexers that allow for up to 32 synchronous or asynchronous data channels.

The Racal-Vadic 7500 and 7600 series of multiplexers provide network consolidation by integrating voice, facsimile and data on digital links in multivendor environments.

Pricing ranges from $1,495 to $6,770 for the 7500 series and $1,790 to $2,385 for the 7600 series, depending on number of channels available.

Racal-Vadic
1708 McCarthy Blvd.
Milpitas, Calif. 95035
(408) 432-8008

T3plus Networking, Inc. has announced a 45M bit/sec. T3 data service unit designed to provide T3 channel access for network elements that require wide bandwidth.

The DSU45 enables geographically dispersed computers, peripherals and high-speed local-area networks to be interconnected via standard T3 lines. The product provides framing, electrical interfaces and rate conversions necessary to link high-speed data terminal equipment with private or public T3 services.

A standard configuration is priced at $12,500.

T3plus Networking
2840 San Tomas Expy.
Santa Clara, Calif. 95051
(408) 727-4545

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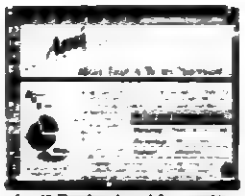

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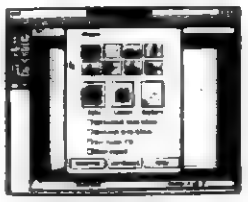
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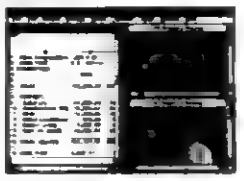
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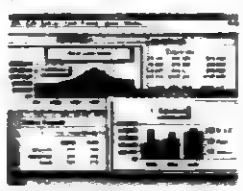
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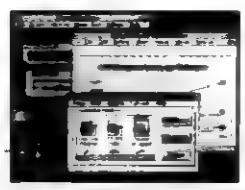
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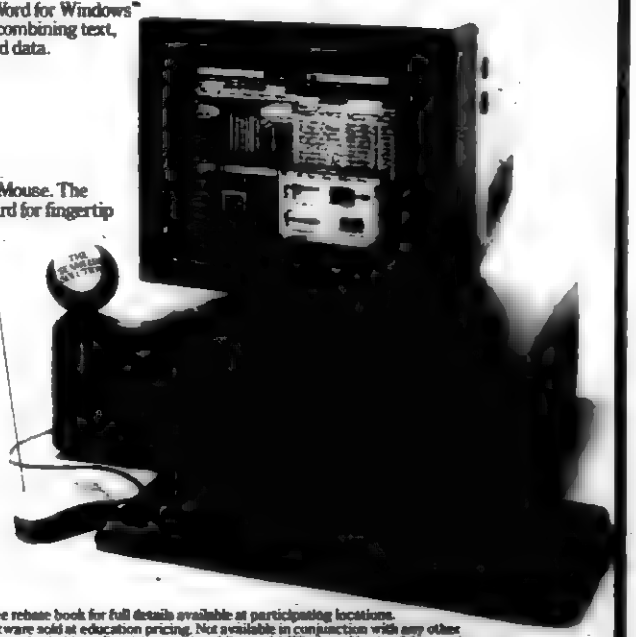

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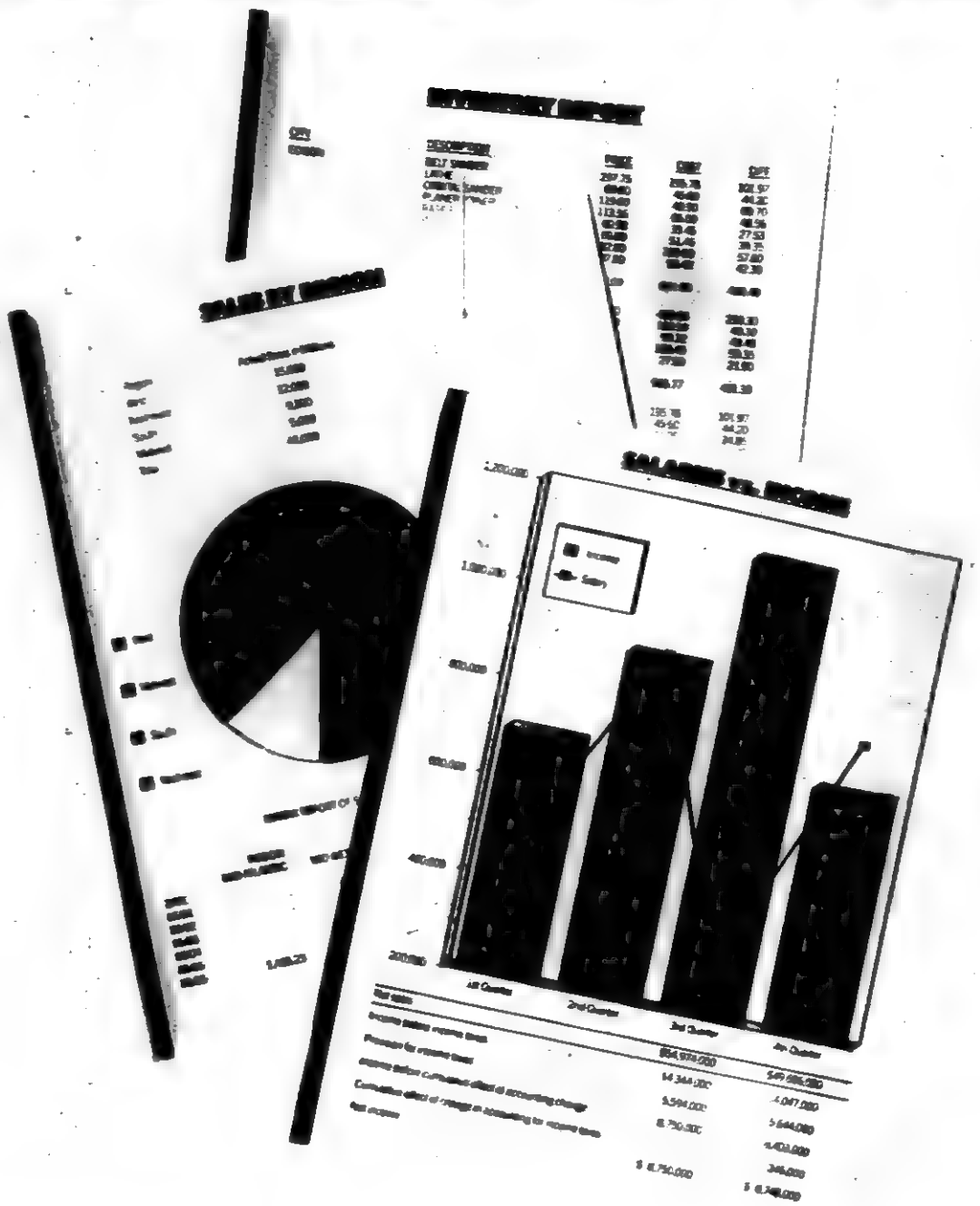

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MANAGER'S JOURNAL

EXECUTIVE TRACK

James R. Kinney has been named vice-president and chief information officer at **Carlson Companies, Inc.** in Minneapolis.

Kinney, 51, had been vice-president of information management at General Foods-USA in White Plains, N.Y. He spent 11 years at General Foods, rising from manager to vice-president.

Prior to that, Kinney was a management consultant at Northwest Industries and at Cresap, both in Chicago. He also spent six years at IBM.

Kinney holds a bachelor's degree in naval engineering from the U.S. Naval Academy and a master's degree in marketing from Northwestern University.

He is a member of the board of directors of the Society for Information Management.

D. P. "Pat" Payne has been named senior vice-president of strategic planning, sales and marketing, information systems and quality programs at **Waste Management, Inc.** in Oak Brook, Ill.

Payne, 47, had been with IBM since 1969. He started as administrative assistant to the chairman of the board and worked his way up to the senior executive position for the Midwest region, a post he had held since 1987.

Payne holds a bachelor's degree in business administration from Texas A&M University.

Edward Fischer has been appointed manager of microsystems support at Chicago-based **Tribune Broadcasting Co.**

Fischer was promoted from director of business affairs for Tribune's Independent Network News in New York, where he will continue to be based.

Before joining Tribune, Fischer was a financial manager at CBS News. He holds a bachelor's degree from Carnegie Mellon University and an MBA from the University of Pennsylvania's Wharton School.

Clear VISTAs for Continental Bank

CIO Gigerich is serious about building a new IS architecture to match bank's new mission

BY MICHAEL FITZGERALD
CW STAFF

John Gigerich is a man who unquestionably has his ducks in a row. In fact, he has them in five rows, 26 ducks in all, with a California Raisin or three thrown in for good measure.

Gigerich, chief information officer at Continental Bank Corp. in Chicago, has marked the completion of various projects throughout his career with small Donald Duck figures in various poses, each signifying some major aspect of the project. Gigerich collects them because "you've got to keep a sense of humor about it and not take this stuff too seriously," he says.

But Gigerich is dead serious about radically reshaping the way Continental does business, and he has the mandate of Chairman Thomas Theobald to implement his plan for VISTA, or Vision for Information Systems Technology Architecture.

VISTA is just that: a broad, sweeping change that will affect the way Continental does business for years to come, if implemented successfully. Other banks have made plans for similar projects but failed to bring the job to fruition. Those who know Gigerich give him at least even odds to make it happen.

"Most banks have big plans and back off, and John has actually been able to stick with it," says Stewart A. Richards, director of the business architecture practice at Nolan Norton & Co., a Lexington, Mass.-based information systems consultancy that has worked with Continental. "Whether John is going to be the first to break the sound barrier, I don't know, but I think they have a good chance to do it."

David Joel

Continental's Gigerich *gets good odds on succeeding with his IS plans*

For the bank, it's a shift in image and style from a full-service bank that competed for both retail and commercial customers to one that concentrates solely on corporations, institutional investors and high-income individuals. For IS, this means a change from a mainframe-based, transaction-processing organization to one in which information is processed primarily through workstations.

Gigerich joined Continental in January 1988 to make the IS shift. Formerly chief administrative officer with IS responsibilities at First Bank Systems, Inc. in Minneapolis, Gigerich had turned down a Continental job offer in 1985, after the Federal Deposit Insurance Corp. had rescued what was then Continental Illinois Bank and Trust Co. from the brink of bankruptcy. The FDIC had intervened in 1984, when the hard-driving, loose-dealing reign of former Continental Chairman Roger E. Anderson was disintegrating.

"In effect, what we're trying to do is take a conventional commercial bank that went through a nightmarish expe-

Continued on page 57

Programmers find more in vendor paychecks

BY CLINTON WILDER
CW STAFF

Vendors of software and services pay their programmers and analysts more than user companies do — and give bigger raises. But if you're a telecommunications specialist, you are probably better off working on the user side.

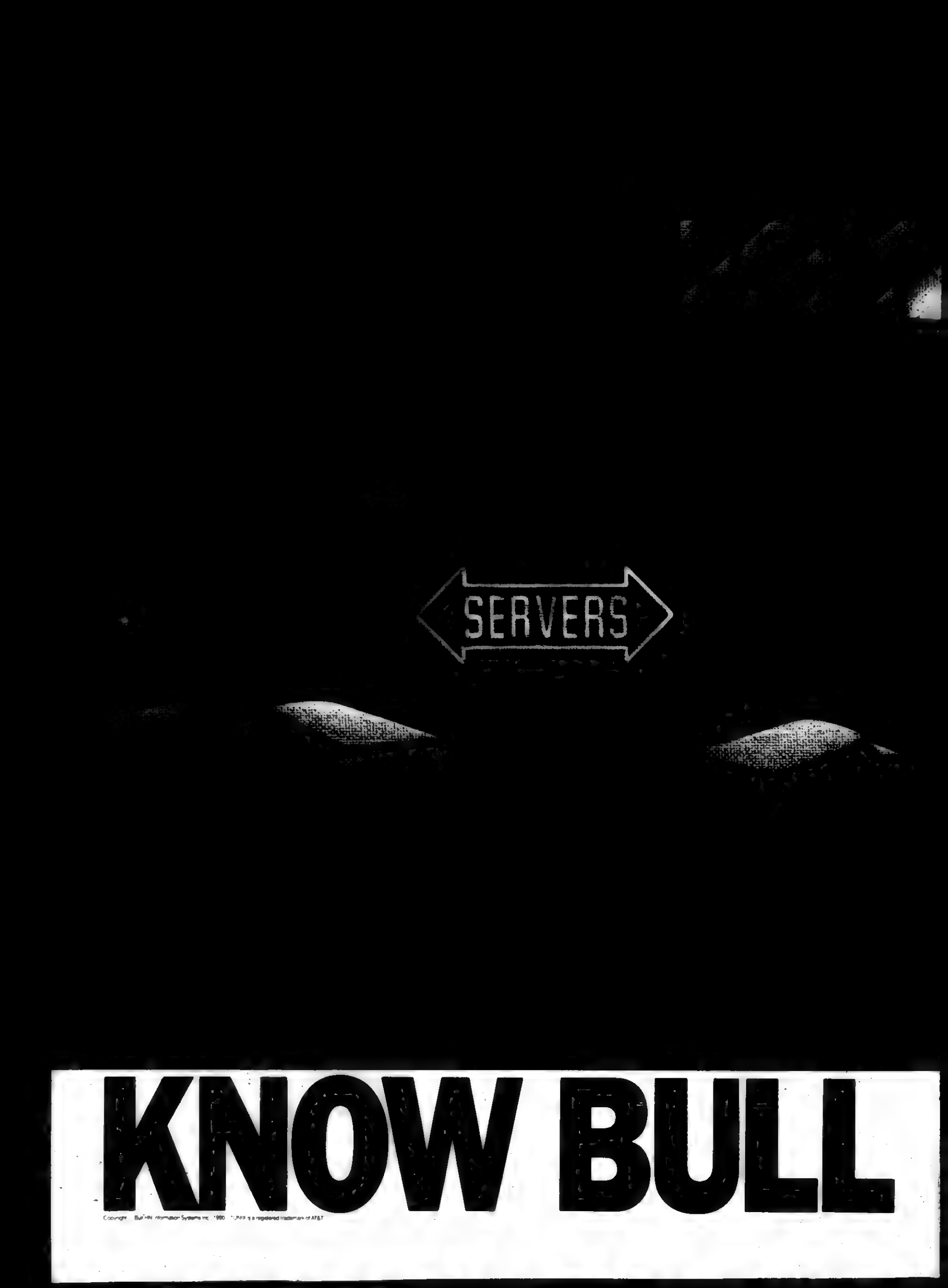
Those are conclusions of two employee compensation surveys completed by New York-based actuarial firm William M. Mercer, Inc. Mercer surveyed 12 programmer/analyst job categories in 110 vendors that belong to the trade association Adapso, then compared their total compensation with that of similar positions in information systems departments of more than 1,300 "general industry" firms.

In the 12 job categories, the average vendor-paid salary of $36,100 was 2.4% higher than the $35,200 found in user companies. Mercer surveyed associate, intermediate and senior programmer/analysts in four areas: operating systems, software development, telecommunications and applications. The software development category referred to actual product development and was not included for user companies.

Furthermore, salaries will increase at a higher rate for vendor-employed IS professionals, the results said. At executive, supervisor and programmer levels, those working for software and services firms received raises between 5.9% and 6.2% in 1989, while raises for those in general industry were 5.3% to 5.8%. Mercer found similar results for increases budgeted for this year and projected for 1991.

"The services firms tend to lead the market in those types of positions because they're dedicated to that business," said Mary Lowe, Mercer's project manager for the survey.

In two out of three telecommunications categories, however, the tables are turned. The average senior programmer/analyst in telecommunications in a user's IS department earns $47,600, compared to $43,800 at a services vendor. An associate programmer/analyst at the user company averages $29,300, compared with $28,500 at a vendor.



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BOOK REVIEW

Not-so-spectacular computer crimes by not-so-surely criminals

SPECTACULAR COMPUTER CRIMES
By Buck BloomBecker
Dow Jones-Irwin, $22.95

I picked up *Spectacular Computer Crimes* with considerable enthusiasm because its author, Buck BloomBecker, is considered to be one of the country's top experts on computer crime. I was certain that it would be informative — even fun — to read.

BloomBecker is the director of the National Center for Computer Crime Data (NCCCD). His research on the magnitude and nature of computer crimes has been especially valuable to me, and I have referred to his findings in several articles that I have written for *Computerworld*.

Despite its name, *Spectacular Computer Crimes* is far from spectacular. This recounting of computer-related crimes does not go much beyond reporting information that has already appeared in dozens of newspaper articles over the past several years. Some of the cases in the book are arguably not even computer crimes.

There is one case about Katya Komisaruk, whom BloomBecker dubs "The Princess of Computing," a young woman who trashed an IBM 3031 mainframe at Vandenberg Air Force Base with a crowbar. Yet another case attempts to make a computer criminal out of Oliver North on the basis that the Marine lieutenant colonel used electronic mail in carrying out the acts he was ultimately found guilty of committing.

That is not to say that the crimes related in the book are not intriguing — certainly readers who know little about computer crimes will find most of these cases fascinating. Unfortunately, these same readers will also find too much irrelevant autobiographical material and personal observation mixed in with the crimes.

This is one of those books that seems to have been written while the author stood on a soapbox. BloomBecker is consistently preachy and at times places too much importance on his views on computer crime. For example, after telling readers that this book is a "gift," he adds: "I wish that you could have benefits like those I've experienced in my 10 years of involvement studying the social implications of computing."

He takes several potshots at Donn Parker, a computer security consultant at SRI International and a rival of sorts. The two have aired their differing views on computer crimes at considerable length at industry events in recent years.

For example, early in the book BloomBecker details Parker's stereotype of a computer criminal as someone who is "usually bright, eager, highly motivated," and then labels the depiction as "at best a historical relic and at worst an invitation to ignore the realities that confront us in the war against computer crime." Yet later in the book he bolsters his views with Parker's when it is convenient.

In BloomBecker's defense, Parker has repeatedly scoffed at the data generated by the NCCCD, particularly BloomBecker's estimate that computer crime costs $500 million per year. Parker maintains that because so few crimes are reported, it is thus impossible to accurately calculate the magnitude of the problem. That BloomBecker wants to return the potshots is understandable, but this sort of caterwauling is absurd in the context of this book.

Even more bothersome is that BloomBecker says his center has spent considerable time studying the makeup and motivations of computer criminals, yet he adds little insight to that body of knowledge. He defines computer crime by saying what it is not and then reluctantly hands out a definition that some readers will find overly broad. BloomBecker's position is that anything related to a computer that is either the target or instrument of a crime should be categorized as a computer crime. Thus he would consider, for example, the theft of blank floppy disks or electronic components or the physical destruction of computer hardware as computer crimes.

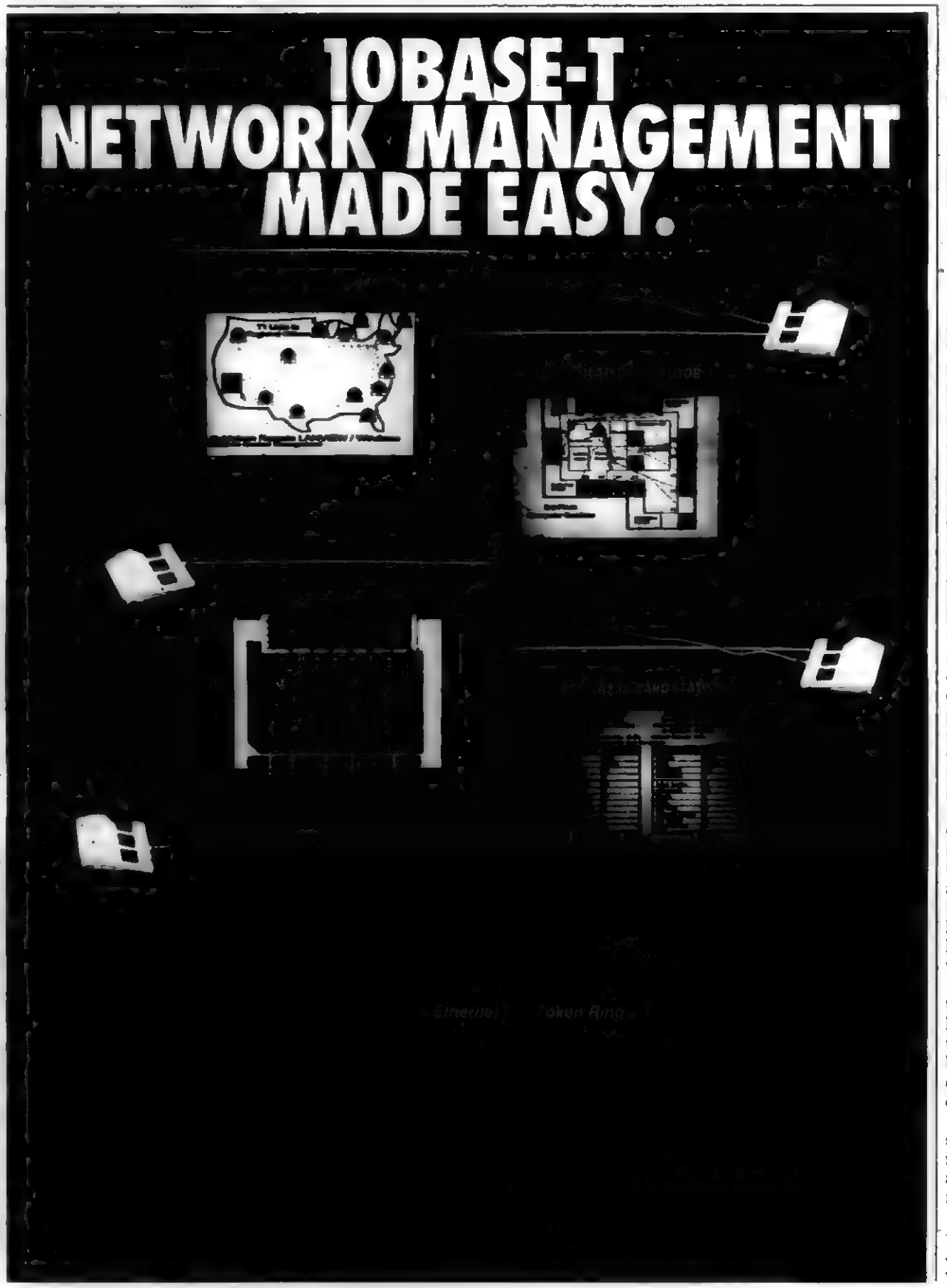
He places the motivations of computer crooks in such categories as "the playpen," "cookie jar" and "land of opportunity" and concludes that these categories are not exhaustive or chiseled in stone. He then encourages readers to write to him, particularly those who feel that he has missed a "signficant attitude." Just who is the expert here anyway?

At other times, BloomBecker snipes at the media for sensationalizing the problem of computer crime, and undoubtedly that is a valid complaint. But to tag one's book "spectacular" seems to be a case of engaging in the same sort of hyperbole he condemns.

Had BloomBecker stuck to what seemed to be the original premise — that is, to relate stories of computer crimes in an entertaining fashion — this book might have lived up to its title.

MICHAEL ALEXANDER

Alexander is *Computerworld*'s senior editor, advanced technology.



COMMENTARY

Thornton A. May

Following Galileo's lead

Information systems executives who are seeking to introduce imaging technology into their organizations may be surprised to learn that the challenges they face are very similar to those that faced the astronomer Galileo as he championed a new worldview in the 17th century.

Early in his career, Galileo recognized that reality as interpreted by authority figures (for example, the church, the board of directors, vendor sales literature or senior management) was frequently at wide variance with the reality observed. Galileo came to this conclusion not because he was a free thinker and something of a belligerent — which he was — but because the telescope that he pointed to the heavens provided an entirely new data set that seemed to disprove official doctrines regarding the cosmos.

In a very similar manner, imaging provides IS executives with an entirely new set of data to chew on. The implications of this expanded data set seem to disprove, or at least call into serious question, the official doctrines regarding how systems should be planned, built and managed. Many of the traditional procedures for planning and building systems are not relevant in an image-enabled environment.

For example, the managerial ballet associated with generating a "yes" decision on introducing imaging technology — even on a limited departmental basis of eight to 10 workstations for less than $1 million — can take anywhere from 18 to 23 months. This is just the approval process; nothing has even been built yet.

With imaging, the process whereby new technology enters the organization must be fundamentally rethought. The business community is demanding just such a rethinking. This rethinking must reflect the sad reality that in a rapidly changing world, vendors are no longer able to write manuals fast enough regarding what constitutes effective technology management. There is no one to copy anymore.

With regards to imaging technology, the state of the art exists in the user environment, not in the vendor lab — and certainly not in the vendor's support literature. Technology managers are going to have to discover their own realities based on empirical experimentation with emerging technologies. For many, this is a frightening thought.

While many of young Galileo's contemporaries at the University of Pisa continued to devour the dated texts and teachings of Aristotle, he based his emerging knowledge on trial-and-error observation. This represented a new paradigm — one that involved creating his own truth — observing and measuring what he saw.

We are seeing a similar distribution of behaviors among IS executives. Some executives continue their lemming-like adherence to vendor-created nostrums, but a growing minority are seeking to get in front of the power curve by creating their own knowledge base grounded on firm specific experience.

Galileo was enough of a realist to recognize that being "right" technically wasn't enough. He understood that the princes of the day were not lying awake at night worrying about what celestial body revolved around another. They had practical considerations to deal with, such as how to keep the peasants from revolting. Similarly, do you think the chairman of your organization really cares whether you code in C++ or Cobol?

Our Renaissance change agent also orchestrated a multiyear publicity strategy that would be the envy of any publicist on Hollywood Boulevard. Galileo's understanding of court intrigue led him to present a persona to patrons that significantly differentiated him from other Italian mathematicians of the age. He was not a propeller head. He positioned himself as a Florentine patrician, with superb Latin and Florentine language skills. He was not pedantic. He not only spoke multiple languages, he spoke the tribal dialects internal to those languages as well.

Galileo recognized that by publishing a pamphlet announcing a telescopic universe of infinite space, he was antagonizing a powerful societal element — the church. A business unit moving forward with a non-IS sponsored imaging initiative can be expected to come under some hostile scrutiny as well. Galileo handled the political dilemma astutely.

First and foremost, he allied himself with the senior line manager of the day by naming the newly discovered moons of Jupiter the "Medicean planets" after the family of Duke Cosimo II de Medici of Florence. He also sent the grand duke a telescope with which he could view his namesake moons.

Galileo also initiated a dialogue with the church powers-that-be to convince them that their worldview might need some minor recalibration, but here he failed. The clergy was very reluctant to look through the telescope to view the data that might convince them. Contemporary technologists face the same dilemma. Even when one has the facts, rational behavior does not necessarily follow in others.

The Medici rewarded Galileo's discoveries not because of their technological usefulness or scientific importance but because of their political impact. The political handlers of the Medici regime saw in Galileo's new worldview something they could use.

GALILEO UNDERSTOOD THAT having the right message was meaningless unless he also had the right audience.

A rule of thumb in court society was that one's status was determined less by one's discipline than by the prince's favor. By enabling the realization of the prince's objectives, Galileo ensured a flow of research dollars. It may have bothered him that his science was periodically cheapened to provide spectacles and exotic marvels to the hoi polloi. But it did not bother him that the funding stream had become an annuity.

Organizations moving forward with imaging technology must place the technology in a context of maximum business impact. Placing the executive dining room menus on optical disc is not going to buy you much mind share in the boardroom. The initial business application of imaging technology has to be real — frighteningly real.

Galileo understood that success and effectiveness depended on placing his arguments in a context conducive to acceptance. He understood that having the right message was meaningless unless he also had the right audience.

Galileo is most famous for his contributions to our understanding of the celestial world. But when we read between the lines, we find that he also had a unique and sophisticated appreciation of how the terrestrial world functions. We might go so far as to say that Galileo would have made a heck of a chief information officer.

May is director of imaging research at the Nolan Norton Institute, a research branch of IS consultancy Nolan, Norton & Co. in Lexington, Mass.

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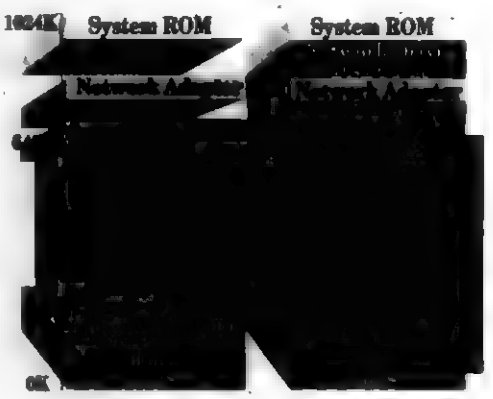

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VISTA

FROM PAGE 51

rience and completely change it to a different kind of financial services company," Gigerich says.

Theobald's vision, and the challenge it meant, drew Gigerich to Continental. "Tom had a different strategy, a different view of how the financial services market was going to evolve, and I saw it as an opportunity to be part of something new and different," Gigerich says.

"The profile of what you do with technology is a dramatic change — it's almost like I changed industries," Gigerich adds.

Dramatic change is certainly in keeping with Theobald's vision of making Continental a bank that does high-volume transactions for a limited customer base. The job of IS, Gigerich says, is "very simple: Give us a technology strategy that supports the business strategy."

Simple to say, but harder to do. Gigerich is faced with the task of selling radical change to a $29 billion organization that is still more than 25% owned by the FDIC. He acknowledges the project will be "difficult" while lounging with his foot over the arm of a comfortable easy chair in his office.

"What really gets exciting is that you move from thinking of the bank as a transaction processor to an information-based company where you get information in a rifle-shot one-off" type of transaction, Gigerich says. "One-off" is lingo for a custom transaction built to meet a specific customer's needs, rather than a standard product offering.

Such a strategy demands applications that put up no barriers to bank employees who seek information on a customer, regardless of whether they sit on the network, in a branch or with a laptop in a customer's office. Continental will create an overarching central database of customer information based on IBM's DB2. Account officers will be able to download everything the bank knows about the customer, then tailor the appropriate financial services to that person or firm.

According to the agenda

Continental has an aggressive development plan to meet its five-year goal of implementing VISTA. The strategy features heavy emphasis on computer-aided software engineering tools such as Knowledgeware, Inc.'s Information Engineering Workbench and Easel Corp.'s Easel.

Thanks to these tools, Gigerich says, no piece of the applications puzzle should take more than six months to design and implement. The first project, an application to support Continental's agency loan distribution group, took less than 60 days.

Gigerich is trying to engineer a complete change in the way IS personnel think about development, Richards says. Gigerich defines change by saying that "you gotta kill what is before you bring in what the new thing is."

"Killing what is" has required a complete rethinking of the business' architecture, and that has occupied most of Gigerich's time since he came to Continental and immediately restructured the entire IS organization.

But the shake-up he started was just the beginning. He's working now to keep the plan on track and get 6,000 Continental Bank employees to learn how to change with the new system.

This process has taken the better part of a year. Gigerich directed the interviewing of hundreds of key employees, got loan officers and other employees assigned from other parts of the business to IS, ran more than 50 focus groups and pounded out miles through Continental's hallways talking up the plan. The rollout plan included a three-hour presentation that was shown to 1,200 Continental employees at different times..

"It wasn't a cakewalk," Gigerich says. "It was cantankerous, argumentative, emotional during the process. You're dealing with things like 'How can we afford to sit here for 10 hours and talk about what we want to do in 1992 when we can't get what we need today?' Or, 'You guys in technology have never done anything right before; why in the hell should I waste my time talking to you?' And those were the kind opening shots."

VISTA's success depends on this all-out selling effort. Critical to that effort is the role played by Ruth Moederson, hired by Gigerich to serve as managing director of information technology services (ITS) strategic technical planning, and Theobald's belief that technology is second only to the bank's employees in making his vision come true.

"I think most people don't take the time to do it the way Ruth and John did," Richards says. "They worked at the very highest levels and kept [Theobald and his vice-chairmen] involved all the way through. Second, they focused on the things that were essential to Theobald's vision."

Richards notes that systems people, usually express initial enthusiasm for a project, but when things become difficult, they revert to familiar habits. He says Gigerich "refused to yield to that."

"Thirdly, they spent a lot of time and care on the rollout and getting the buy-in, which I think is going to pay off in the long run," Richards says.

If you're John Gigerich, it's all part of adding ducks to your row.

The challenge of change

Continental Bank is in the process of significantly changing the way it does business, but CIO John Gigerich points out that it is also changing "the way technology has done business."

"When you're building standard products, you think about technology from the perspective of scale, consistency, cost and replication," he says. "When you're building a technology platform to support customer-driven [strategy], it's a whole different mind-set. You're thinking about flexibility, repackaging and information accessibility."

With the mind-set comes the challenge of change, and managing that change within the realm of the IS department can be the most difficult task a manager can face.

"The toughest part of the change in many ways is within technology itself, because we trained people to do things standard ways, with a high level of replication," Gigerich says.

"What we're really trying to do now is learn a different way of doing analysis, of doing systems design, to be dependent on other people for key parts of their system, to use somebody else's code or trust somebody else's data file."

Gigerich adds that IS people now have to focus on "what the business is trying to do and not on the technology and how to use it."

The staff of Continental's IS department has reacted in predictably mixed fashion: Some hate it, some love it, most are in between. Gigerich is happy with his staff and has worked hard to make sure that the huge change doesn't prompt walkouts.

Members of the IS department are receiving extensive training and are rotating between the divisions that implement VISTA and those that support Continental's current IS needs. Employees receive frequent evaluations, to help curb feelings of being left behind.

MICHAEL FITZGERALD

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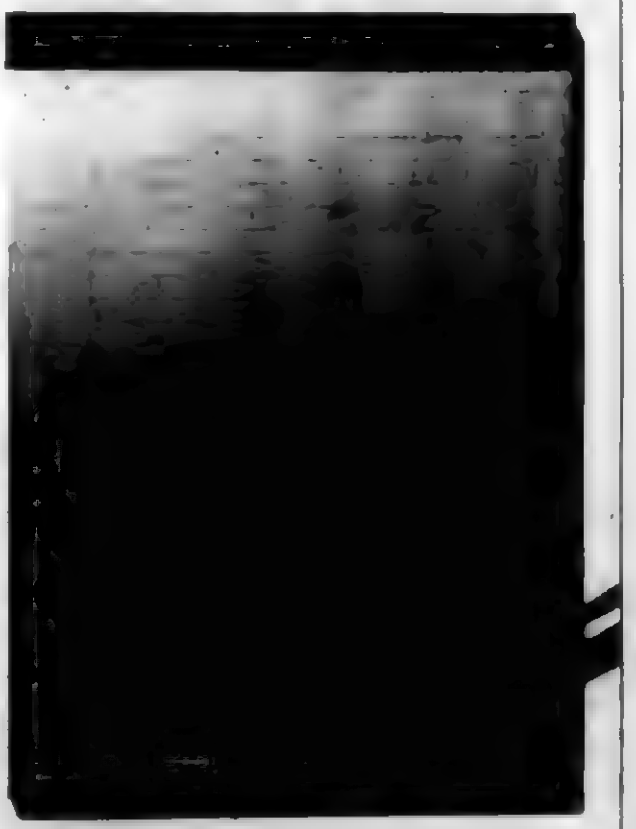

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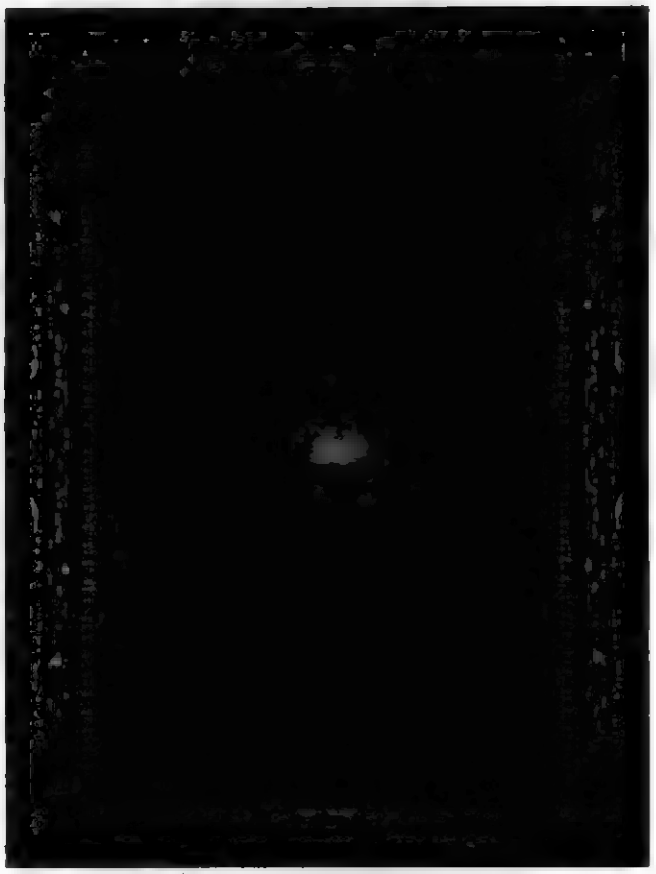

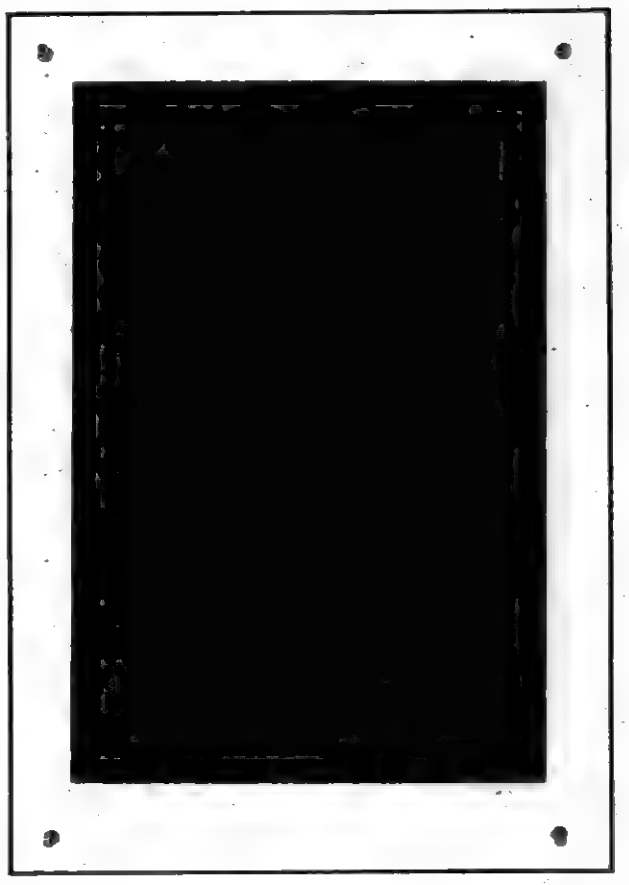

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SEPT. 2-8

Focus on Automation. San Francisco, Sept. 4-6 — Contact: Bonnie Walsh Associates, Staten Island, N.Y. (718) 979-1012.

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Great Southern Electronics and Computer Expo. Jacksonville, Fla., Sept. 7-9 — Contact: Great Southern Shows, Jacksonville, Fla. (904) 743-8000.

SEPT. 9-15

Adding Image Processing to Information Systems. Toronto, Sept. 9-11 — Contact: Technology Transfer Institute, Santa Monica, Calif. (213) 394-8305.

Open Systems Applications Development Conference. San Jose, Calif., Sept. 9-12 — Contact: Unify, Sacramento, Calif. (916) 920-9092.

Automated Operations Symposium and Exhibit. San Diego, Sept. 10-11 — Contact: Association for Computer Operations Management, Orange, Calif. (714) 997-7966.

Data Storage '90. San Jose, Calif., Sept. 10-12 — Contact: Cartidge and Associates, San Jose, Calif. (408) 554-8644.

Executive Information Systems: From Planning to Implementation. San Francisco, Sept. 10-12 — Contact: Technology Transfer Institute, Santa Monica, Calif. (213) 394-8305.

The Repository Conference. Orlando, Fla., Sept. 10-12 — Contact: Digital Consulting, Andover, Mass. (508) 470-3880.

The SAA Office. Chicago, Sept. 10-12 — Contact: Technology Transfer Institute, Santa Monica, Calif. (213) 394-8305.

Networld '90. Dallas, Sept. 10-13 — Contact: H.A. Bruno, Inc., Englewood Cliffs, N.J. (201) 569-8542.

Video Expo. New York, Sept. 10-14 — Contact: Debbie Totolo, Knowledge Industry Publications, White Plains, N.Y. (914) 328-9157.

Unix International ISV Seminar. Boston, Sept. 11 — Contact: Miller Communications, Boston, Mass. (617) 536-0470

Business Intelligence Conference. New York, Sept. 11-12 — Contact: Richard Bennett, National Expositions, New York, N.Y. (212) 391-9111.

Optical Information Systems '90. Arlington, Va., Sept. 11-13 — Contact: Meckler, Westport, Conn. (203) 226-6967.

Printed Circuit Board Expo '90. Minneapolis, Sept. 11-13 — Contact: PMSI, Alpharetta, Ga. (404) 475-1818.

Integrating Image and Information Processing. Washington, D.C., Sept. 12-13 — Contact: Digital Consulting, Andover, Mass. (508) 470-3880.

AD/Cycle: Evaluation and Implementation. Boston, Sept. 13-14 — Contact: Digital Consulting, Andover, Mass. (508) 470-3880.

Symposium on Object-Oriented Programming. Poughkeepsie, N.Y., Sept. 14-15 — Contact: The Association for Computing Machinery, New York, N.Y. (212) 869-7440.

SEPT. 16-22

Telecom '90 — The Evolving Telecommunications Environment. Montreal, Sept. 16-20 — Contact: Kimberly Mungham, Canadian Business Telecommunications Alliance, Toronto, Ont., Canada (416) 885-9993.

Mapping the Future of Computing and Communications. Cambridge, Mass., Sept. 17-18 — Contact: Patricia Seybold's Office Computing Group, Boston, Mass. (617) 742-5200.

DB/DC Users Group Conference. Grand Rapids, Mich., Sept. 17-19 — Contact: The Fox Group, Troy, Mich. (313) 689-6777.

Design Engineering Show & Conference/West. Anaheim, Calif., Sept. 17-19 — Contact: Design/West, Stamford, Conn. (203) 964-8287.

Graphics '& Multimedia Conference and Exposition. Long Beach, Calif., Sept. 17-19 — Contact: Exposition Management, Waltham, Mass. (617) 290-0400.

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Working with Personal Computer Local-Area Networks Seminar. Milwaukee, Wis., Sept. 19-21 — Contact: John Snedeker, Center for Continuing Engineering Education, University of Wisconsin-Milwaukee, Milwaukee, Wis. (414) 227-3120.

SEPT. 23-29

Networking/Unix '90. Atlanta, Sept. 24-25 — Contact: Sue Fredricks, Informa, Atlanta, Ga. (404) 220-8711.

Third-Party Computer Maintenance. San Francisco, Sept. 24-25 — Contact: Frost and Sullivan, New York, N.Y. (212) 233-1080.

PC Expo. Chicago, Sept. 25-27 — Contact: H.A. Bruno, Inc., Englewood Cliffs, N.J. (201) 569-8542.

C++ at Work '90 International Conference. Secaucus, N.J., Sept. 25-28 — Contact: Richard Friedman, SIGS Publications, Conference Division, New York, N.Y. (212) 274-0640.

Internetworking for the '90s. Washington, Sept. 25-28 — Contact: U.S. Professional Development Institute, Silver Spring, Md. (301) 445-4400.

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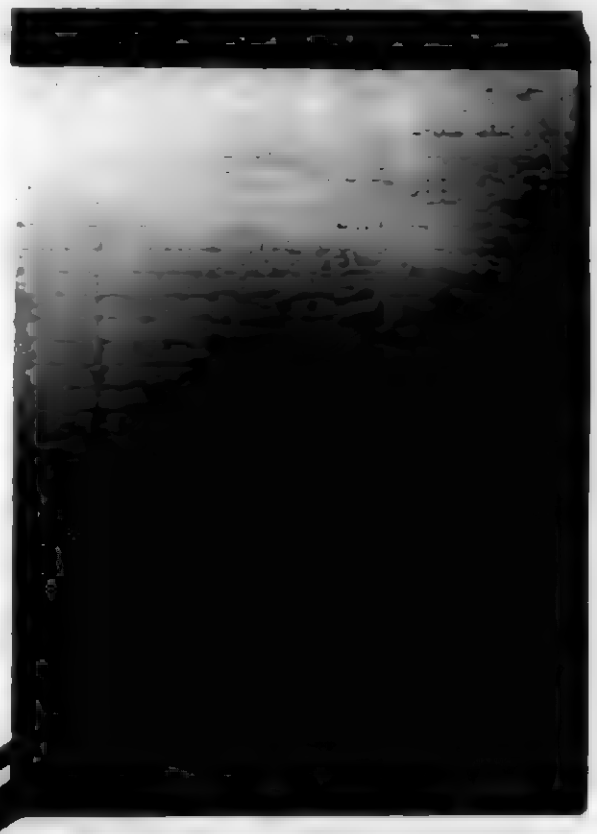

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STORAGE TECHNOLOGIES

Putting data in its proper place

BY ALAN RADDING

Name a storage device, and George DiNardo probably has it — be it an automated tape library, an optical-disc jukebox, a disk-array setup or a solid-state disk. As executive vice-president of information management at Mellon Bank in Pittsburgh, DiNardo juggles billions of bytes on a daily basis for the money center bank itself, as well as for several hundred client banks.

Conventional direct-access storage devices (DASD) could never fill Mellon's storage bill. Magnetic disks provide quick access and read/write/erase functionality. At $10 to $20 per megabyte, however, they are expensive, especially when you consider that a tape or optical system is $1 and $5 per megabyte, respectively.

Furthermore, each time you add more DASD, it eats up more floor space, system power and air-conditioning.

Storage managers today have the luxury of exploring other media — either paying more for faster performance and a smaller form factor or paying less for something that's "fast enough."

New technologies — such as redundant arrays of inexpensive disks (RAID) and extended memory — are entering the picture, along with new formats and ways to set up tried-and-true media such as solid-state disks, tape and optical media. These are making the once-straightforward progression from random-access memory to magnetic disk to tape more complex.

Nobody is about to pitch his DASD out the window; in fact, 926,750G bytes of DASD will ship worldwide in 1994, totaling 23% growth from 1990, according to Jay Bretzmann, program manager of storage research at International Data Corp. (IDC), a market research firm in Framingham, Mass.

The days are gone, however, when people routinely buy more DASD media to solve every bottleneck. "We've gotten to the point where we just can't add any more DASD. We can't manage it," Bretzmann says.

"Explosive growth in the amount of data generated by increasingly faster and more powerful processors has resulted in the need for efficient, cost-effective mass-storage systems," says Sanjay Ranade, a computer scientist at ST Systems Corp., a systems integrator in Lanham, Md., who wrote a paper on the subject in the "Optical Information Systems" journal.

The resultant storage systems, he says, fall not into the traditional storage hierarchy consisting of on- and off-line storage but add a new dimension; namely "in-line" and "near-line" storage.

"Managers are only just beginning to understand what a storage hierarchy buys them," Ranade says; namely, a chance to trade higher performance for lower costs.

In-line storage tops the new storage hierarchy, in the form of RAM disks, disk cache and solid-state disks. These technologies offer speeds of 0.3 msec — faster than the 15 msec promised with DASD — but for a very high premium.

Currently, only DASD occupies the second tier — on-line storage. A rival is appearing on the horizon, however, in the form of RAID, which is based on 5¼-in. disk technology and is said to near and even beat DASD on-line speeds. Most DASD vendors plan to offer this technology by 1992.

Near-line storage, a term copyrighted by Storage Technology Corp. in Denver, sits on the third level of the hierarchy and is available in two forms, both of which combine storage media with robotics: automated tape libraries (ATL) and, for some purposes, optical-disc jukeboxes.

Near-line systems typically respond within 10 to 20 seconds — the time it takes the robotic arm to locate the cartridge or optical disc and load it into a drive.

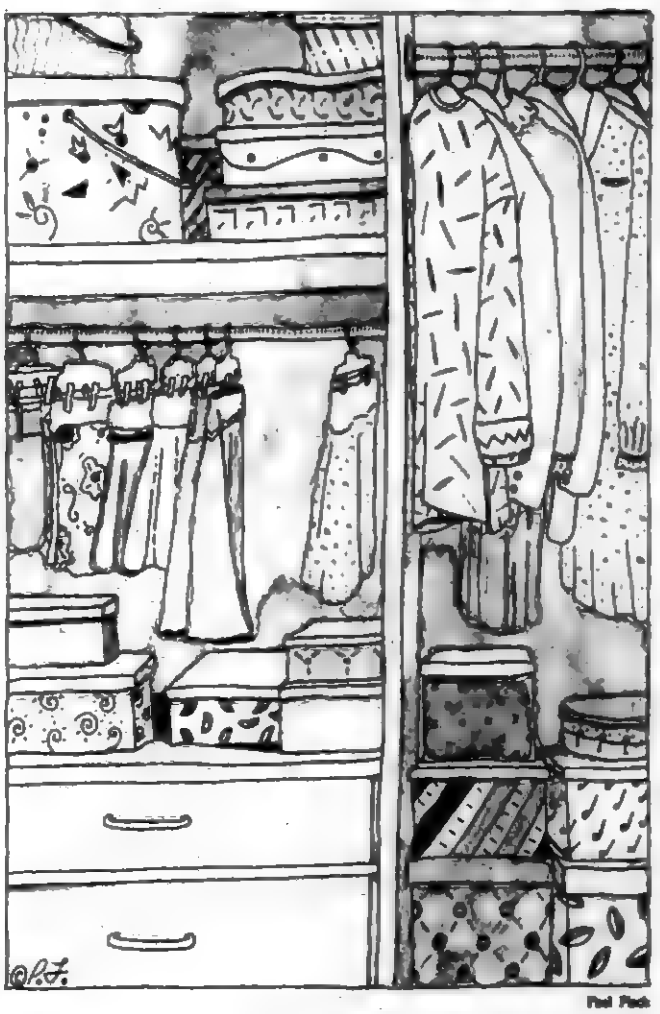
Most people consider optical media too slow to be considered near-line storage in the data center, although its speed is acceptable in specialized applications or when used in conjunction with magnetic storage. It is often placed more toward the fourth tier of the hierarchy — off-line storage.

Joining optical media at this level are reel-to-reel tape and microfilm, with a cost of pennies per megabyte. These are ideal for archiving historical data that may rarely, if ever, be accessed. Access times can be minutes, hours and even days.

For applications that cannot tolerate any type of performance slowdown or for which even the mechanical process of DASD is too slow, data managers pay the premium for in-line storage. "In today's economy, [in-line storage] is something of a luxury," Ranade says.

RAM disk and cache memory — also known as expanded memory — are built into systems by the computer manufacturer. They reside on the CPU side of the controller and as such are not prone to channel bottlenecks as is DASD storage, because the system never has to cross the channel to access files.

Solid-state disks, on the other



Paul Fisch

Radding is a free-lance writer in Newton, Mass.

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Proper place

FROM PAGE 61

hand, treat files very similarly to DASD except that, being silicon-based, there are no mechanical parts involved in locating files, making performance much higher. Solid-state disks are slower than expanded memory, because they reside on the DASD side of the channel.

This technology has been available for about 10 years from several storage vendors (see chart). Because of today's multi-dimensional storage hierarchy, however, they are receiving renewed interest. By 1991, IDC predicts that solid-state disk shipments will increase to more than 700,000 units, from about 500,000 this year and nearly 400,000 in 1989.

What has traditionally inhibited people from purchasing either technology is the high cost. Solid-state disks are $700 to $1,700 per megabyte, and the price for expanded memory is even higher — three to four times that of solid-state disks and 30 to 60 times higher than

Alabama's Benton *looks forward to introduction of RAID*

DASD on a per-megabyte basis, Bretzmann says.

DASD is also considered expensive but not nearly to the same degree. It also satisfies a larger majority of needs. That is why there is much excitement about the possibility of a lower cost alternative in RAID.

The basic idea behind RAID is to "replace a single large drive with an array of many smaller drives" to obtain the same or better performance levels, according to researchers David Patterson, Peter Chen, Garth Gibson and Randy Katz at the University of California at Berkeley, where much of the theoretical research on RAID was done.

The arrays are made up of 5¼-, 3½-in. or larger format magnetic disks. Equivalent or better performance than DASD is achieved because many small requests can be serviced independently, while large requests are handled in parallel, spread across several disks. Speed can be increased further through data-striping and other techniques.

With the increased number of disks comes a higher likelihood of failure. To offset that, developers build in fault tolerance through either redundancy (disk mirroring) or parity checking. The array dedicates one disk to tracking parity information and uses that information to restore any data lost because of the failure of another disk in the array.

Some analysts, such as Bretzmann, predict that RAID will ultimately replace DASD because of its lower cost and higher reliability but not until the late 1990s.

Almost every DASD vendor has plans in the works to announce a RAID system in the 1992 time frame, including IBM, Storage Tek and Memorex Telex N.V. Aptec Computer Systems, an OEM in Beaverton, Ore., currently packages Storage Tek's RAID technology in its high-performance storage subsystems used in government and military supercomputing situations.

RAID drawbacks

Because it is not a completely tested storage concept, however, RAID draws some criticism. "If the system works right, then it is great, but as soon as something goes wrong, you've got a severe migraine," says Kenneth Hallam, a partner at ENDL Consulting, a San Juan Capistrano, Calif.-based market research firm. The problem, he continues, is that "arrays don't match anything that the software is set up for," so if a problem occurs, users cannot readily determine where the problem lies because they are no longer operating in a standard storage software environment.

Nevertheless, some users are drooling for this supposed DASD alternative. For the State of Alabama, DASD capacity is expected to double to 240G bytes this year, according to Rod Benton, director of data systems management. While RAID won't be available soon enough to help him in this instance, Benton does expect to use it when products appear.

For large data centers, the main storage action is currently in the near-line storage market.

"There is an awful lot of data on DASD that doesn't need to be there," says Raymond C. Freeman Jr., president of Freeman Associates in Santa Barbara, Calif. "People need to get at [it], but they don't need it on-line."

The ATL approach has been particularly successful for this type of data, with many companies accepting the slower access times to free up DASD resources. "The movement to automate tape handling is picking up a lot of speed," Bretzmann says.

Storage Tek staked out the leading position with approximately 1,500 units sold to 700 data centers since the product has been available. Memorex Telex in Tulsa, Okla., recently entered the market with its own ATL approach, and Masstor Systems Corp. in Santa Clara, Calif., has carved a niche for itself using a proprietary tape cartridge design.

It was a tape library of 40,000 cartridges that spurred Daniel Kaberon, manager of computer performance at employee benefits consulting company Hewitt Associates in Lincolnshire, Ill., to first consider the use of an ATL in 1987. Hewitt's tape library has since grown to 100,000 cartridges.

Currently, Hewitt rotates 5,000 tapes through an ATL from Memorex Telex. Without the ATL, Hewitt would have had to double or triple its DASD, Kaberon says.

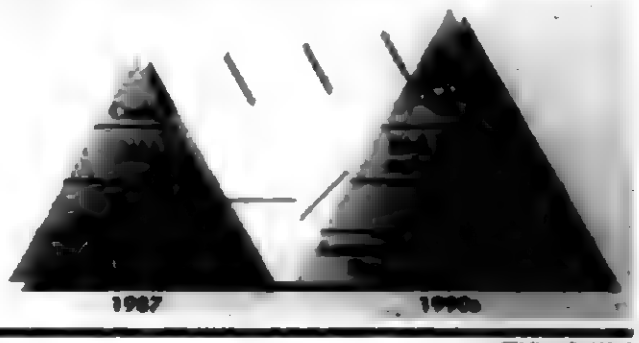
Memorex's system uses a "dynamic caching" technique based on frequency of tape use. Only a small percentage of the total number of tapes are reloaded in the unit, and after about seven days, if a tape isn't requested, it gets replaced by another. According to Kaberon, only 20% of stored tapes are used in 90% of all tape mounts.

Before the system was implemented, however, Memorex staff performed an extensive analysis of Hewitt's tape use. Such analysis is necessary because the system is modeled according to a company's file use — i.e., which files are most and least often accessed.

When Howard Miller at Boston University bought Masstor's ATL, he wanted to reduce the amount of labor involved in handling the 16,000 tapes in his library and eventually move to

Storage evolution

The traditional storage hierarchy – random-access memory to disk to backup tape – has become more complex as disk cache, solid-state disks, faster tape media and optical media enter the scene



CW Chart: Paul Mock

Beyond 9-track for tape backup

BY DALE BASTIAN
SPECIAL TO CW

A few years ago, selecting a tape backup device for large DEC VAX or IBM sites was a simple matter: The only viable choice was 9-track tape.

Now, this technology is neither the only nor the most obvious choice in many situations. Many companies are considering alternative ways to back up magnetic disks, including 4mm tape, also known as digital audio tape (DAT), 8mm helical-scan tape and ½-in. cartridges of 18-track tape on IBM 3480 systems.

VAX shops seeking a less expensive or smaller alternative to 9-track are evaluating DAT or 8mm tape. Both media were initially designed for video and audio applications, but while 8mm subsystems became available for backup approximately two years ago, DAT has been available for only about six months.

Whereas you would spend $35,000 to $80,000 for a 9-track system, a complete two-drive 8mm or 4mm subsystem is priced from $15,000 to $20,000.

The trade-off on both these media is their lower capacity for unattended backup and lower speed. While 9-track devices can store 140M bytes on a complete subsystem, 8mm tape and DAT offer capacities of 3G to 4G bytes. Eight millimeter tape is actually higher in capacity than DAT, storing 2G bytes per cartridge as opposed to 1.3G bytes. Both are best used in data centers with disk capacities no higher than 5G bytes.

While neither achieves the 9-track's transfer rate of 600K to 1.25M byte/sec., 8mm tape is the faster at 230K byte/sec., compared with 180K byte/sec. on DAT.

Eight millimeter tape has less potential than DAT in data interchange applications, however, because it stores data in a nonstandard analog format. Virtually all DAT vendors plan to support the Digital Data Storage standard.

Eight-millimeter tape has gained some popularity in VAX shops in its two years of existence, even on large Vaxclusters and mainframes. Now that DEC has announced that it will adopt DAT, this 6-month-old technology should also begin to see increased popularity.

IBM and VAX shops seeking faster speed or a smaller form factor are moving en masse toward 18-track tape on ½-in. cartridges on IBM's 3480. Its transfer rate (300M byte/sec.) is more than double that of 9-track systems, while its capacity (200M bytes per cartridge) is 1½ times that of 9-track. Cartridges are about three times smaller than 9-track devices.

While 3480 technology has been on the market for more than four years, it was always considered very expensive at $100,000 per unit and large in size.

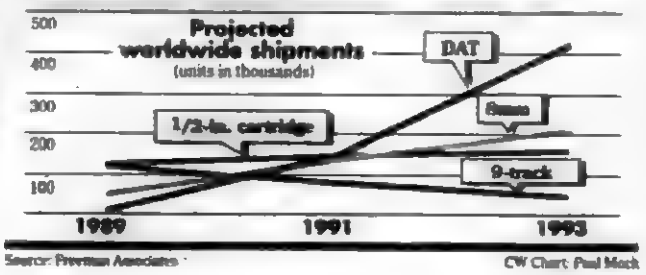
The introduction earlier this year of rack-mountable 3480-compatible devices, however, will bring its price closer to a 9-track system range at $50,000 or less. In addition, the cartridges are now 5¼-in. Primary OEM dealers of these devices are Fujitsu Ltd., Storage Tek and LMS. Vendors such as Systems Industries, Inc. and Micro Technology offer systems that can be linked to VAX machines.

Nine-track systems have their strong points, and for that reason, most companies have yet to give them up, especially for file-exchange applications and for receiving software updates. It may be years before 9-track fades completely.

Bastian is a computer support analyst at Jeppesen Sanderson in Englewood, Colo.

Tape turnover

As the focus turns away from older technologies such as 9-track tape, DAT and 8mm experience a high percentage of growth, but ½-in. cartridge will get increased attention



Source: Freeman Associates

CW Chart: Paul Mock

"My ultimate PC system? Well, for starters, it's got to be compatible with everything I've got already... so you can take a floppy from an old PC, pop it into a new one, and it will work."

"Networking PCs is a major pain. I'd like to see PCs designed to do networking without lots of configuration work... and still connect with all the networks I've already installed."

"We've got plenty of data... the challenge is to put it in the hands of decision makers in a form they can use. The perfect PC would be an ideal client to all my information systems."

"Every time I turn around, vendors change the operating system or interface. I want to be able to drop the hottest new box on my executives' desks and know their software will run."

Hidden camera reveals the se

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They wanted a graphical user interface with no compromise in performance. Like Macintosh.

And they wanted all their software to have a single way of working, so training and support costs could be dramatically lower. Like Macintosh.

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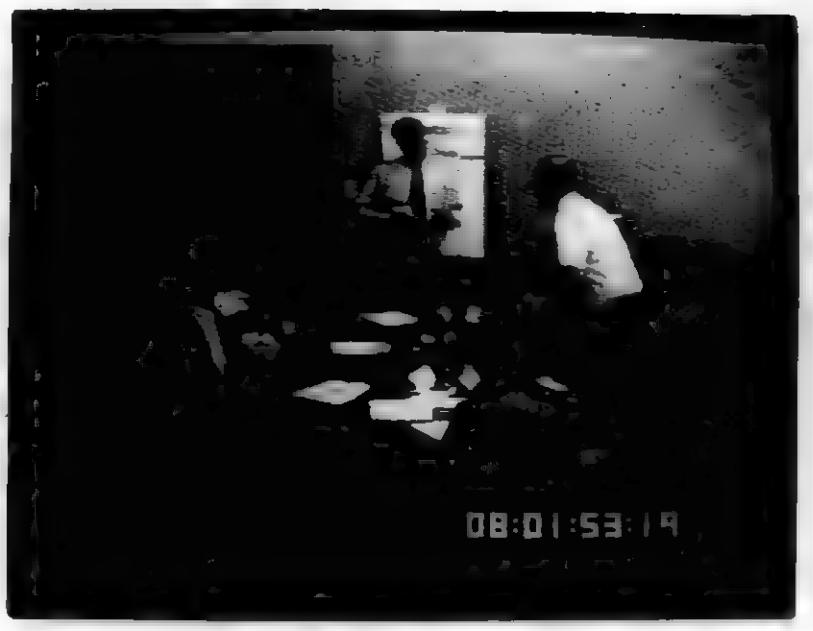
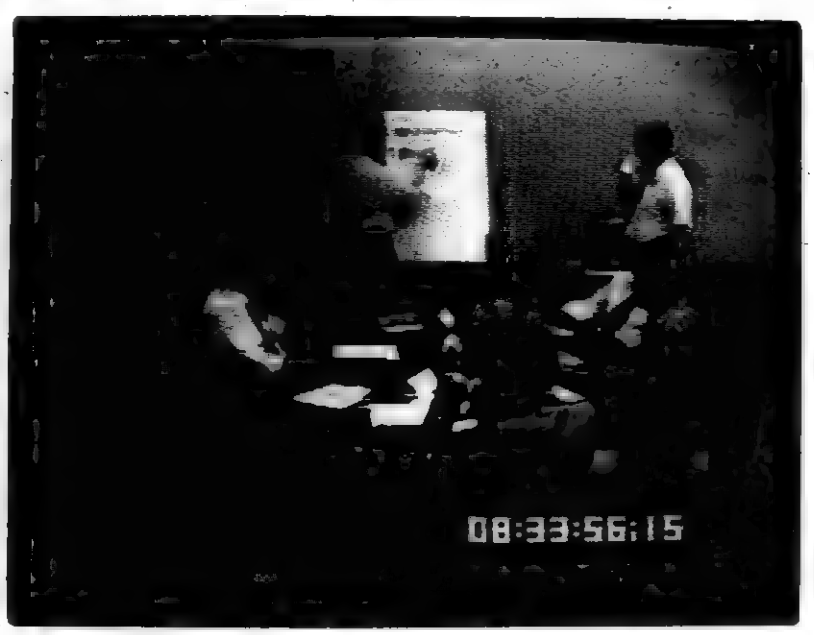
"A graphical interface is clearly important... users love 'em. But the architecture has to be designed to handle it or the performance compromise is unacceptable."



"I'd like to see more discipline from software developers. Commands should be consistent for every application... it would eliminate the cost of constantly retraining."



"My company's needs go way beyond off-the-shelf software. I need serious development tools my existing programming staff can use to develop custom apps quickly and easily."

"Macintosh? No kidding?"

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And they wanted powerful development tools that would let their existing programming staff build applications quickly and easily. Like Macintosh.

In short, they wanted everything that Macintosh offers. But they just didn't realize they could have it today.

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lights-out computing.

Since buying two units — one for back-up — Miller eliminated 80% of the people formerly involved in tape handling and also improved service levels. Miller estimates that the move to ATL has saved $2.5 million in salaries and what would have been DASD purchases. "We haven't added DASD in 18 months," he says.

The Masstor system also helped BU save on $200,000 worth of floor space. Masstor's proprietary cartridge design stores more data than the usual ½-in. cartridge. Miller would have had to purchase several ATLs from Storage Tek and Memorex Telex to store his 16,000 cartridges; with Masstor, he requires just one unit.

Some users are put off by Masstor's use of a proprietary storage format, however, citing its lack of interchangeability with conventional tape cartridge systems and the need to convert existing tapes to the Masstor format.

Automated tape retrieval also appealed to Thomas Pumo, director of technical services at Reader's Digest Association, Inc. in Chappaqua, N.Y. Pumo says that his investment in five Storage Tek units (one in June 1989 and four more last February) has saved him "a couple of hundred thousand dollars" on DASD and allowed him to run his operation with 12 fewer people.

The company replaced 40 IBM 3480 tape transports with the equivalent number of Storage Tek transports. Response times, Pumo says, are less than 30 seconds — down from a couple of minutes.

Reader's Digest is considering optical storage for some specialized applications but has decided against using it as a tape alternative. "We have 100,000 tapes, so we wanted to stay with tape," Pumo says.

Although optical technology is drawing increased attention, even its proponents say it is not yet ready for the large data centers. "Optical can hold the equivalent of 15 to 30 reels of tape on one disk and have random access," but it is still comparatively slow, says Richard Fisher, vice-president and general manager at Rothchild Consultants in San Francisco.

A number of compromises have appeared on the horizon, however. One is flexible optical tape, which is in development at Memorex Telex. This hybrid technology offers access times equivalent to tape yet can store more data. This optical tape, Fisher says, can be put into a standard 3480 tape cartridge and hold 50G to 70G bytes of data and could even be managed in existing tape libraries.

By combining optical with magnetic storage, Epoch Systems in Westboro, Mass., has developed a system that reaches near-line speeds.

The system combines 2G bytes of magnetic disk storage with 30G bytes of optical jukebox storage, says W.W. Souder, director of formation evaluation at Phillips Petroleum Co. in Bartlesville, Okla. The oil firm replaced two magnetic disk servers with a 32G-byte Epoch-1 Infinite Storage Server on an Ethernet local-area network to handle a database of oil well logs. The Epoch handles all data management, moving files between optical and magnetic media when users call for them. "We don't care if it is on magnetic or optical. The system takes care of that," Souder says.

INVESTING IN five Storage Tek units has saved "a couple of hundred thousand dollars" on DASD.

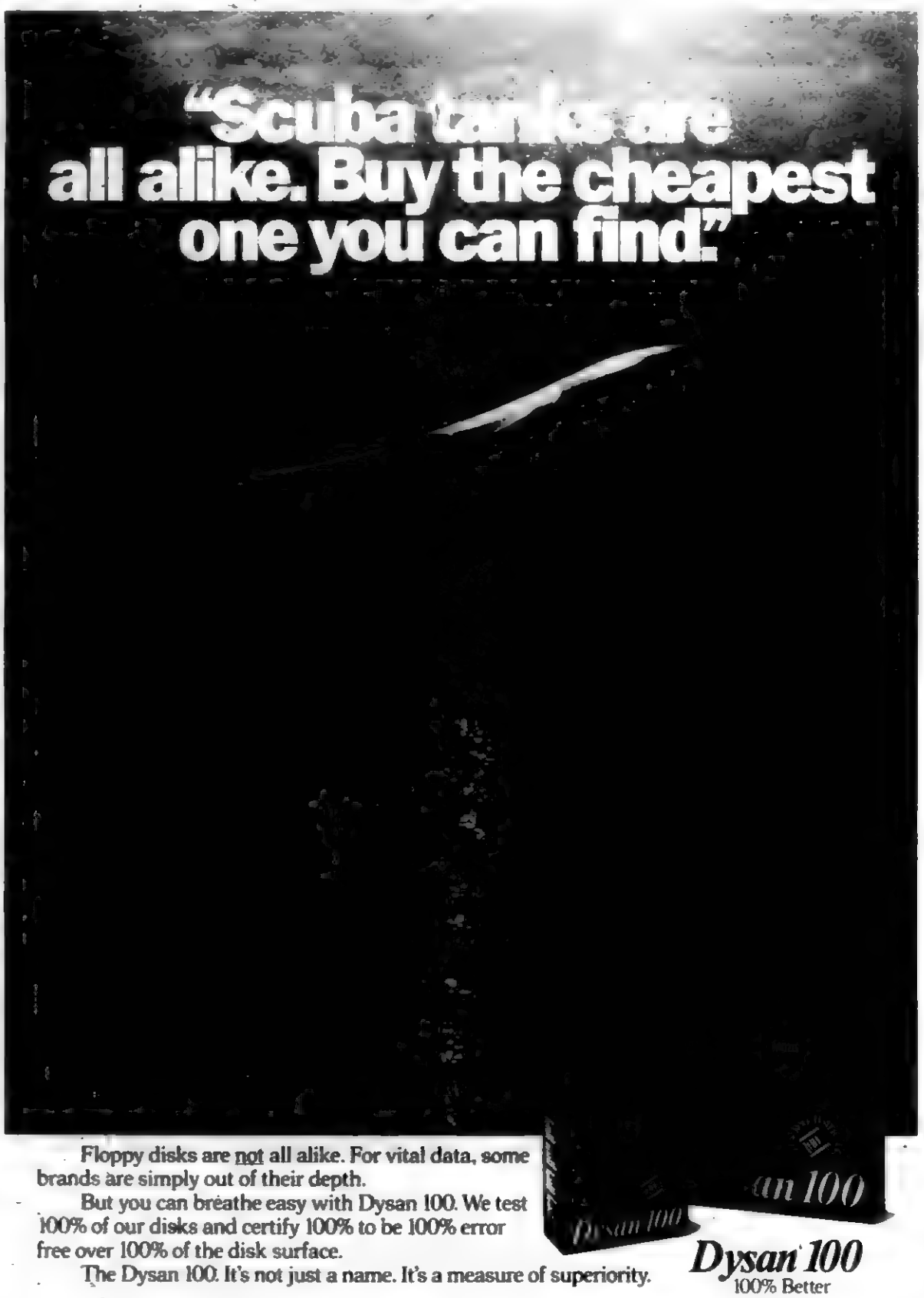
THOMAS PUMO
READER'S DIGEST

Through its robotic design, a write-once optical jukebox system from Filenet Corp. in Costa Mesa, Calif., is able to achieve near-line speeds. Vertical cartridge handling, simultaneous access across multiple drives and the use of brushless servomotors result in 40% systems performance gains, the firm says.

While some vendors are addressing the speed issue of optical technology, Fisher does not expect it to approach the current speed of magnetic media until the middle of this decade.

As a result, most data centers will continue to place optical in specialized applications that can abide by off-line speeds. "We use optical to store reports. It saves us a lot of paper," says Gregg Kirkland, vice-president and cashier at Central Bank, a small bank in Fairview Heights, Ill. "We cost-justified the system based on what we would save in one year's paper reduction," he says.

Whether the goal is to reduce storage costs, speed data retrieval, use less floor space or just find somewhere to stash an ever-increasing abundance of data, people are building more complex storage systems today than ever before. DASD is not about to go away; conversely, it will be used to its fullest potential as companies learn how to best allocate their data. •



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BUYERS' SCORECARD

Users rate Amdahl's DASD best of class

BY MICHAEL L. SULLIVAN-TRAINOR
CW STAFF

Many business gains are achieved by taking advantage of someone else's mistakes. This is especially true in the battles among IBM and the plug-compatible hardware vendors.

Amdahl Corp. excels at carving a niche out of IBM's miscues. Even though it has only 7% of the direct-access storage device (DASD) market compared with IBM's 81% share, the firm's triple-density DASD earned the highest user ratings among the products considered in *Computerworld's* Buyers' Scorecard survey on DASD.

The survey compared ratings from 50 users of each of the triple-density DASD products in the IBM environment. Scores are derived by multiplying the ratings each user group gave its own product by the importance factors all users assigned to the 13 criteria.

Following closely behind Amdahl's 6380-K in achieving high overall ratings was Hitachi Data Systems Corp.'s 7380-K. Both companies ranked significantly ahead of IBM's 3380-K. IBM's 3390, the next-generation follow-on to the 3380, also received strong ratings from users. (See ratings and methodology, next page.)

Despite operating in an IBM-dominated environment, Amdahl scored highest in providing compatible DASD to installed hardware. In addition, the 6380 scored high ratings in cost-per-megabyte of storage and reasonable acquisition and maintenance costs.

"The 6380 gave us a technology improvement — we moved from a non-cache environment to cache — at a substantially lower price than anything else on the market," says Joseph Donnelly, director of data services at Mastercard International, Inc. in St. Louis. "Our analysis showed that [Amdahl's] 6100 controller and the 6380 with cache capability offered superior performance to IBM's 3990 controller."

Hitachi's 7380 edged past Amdahl's 6380 in the criterion most important to users — reliability. Hitachi also inched ahead of Amdahl in overall performance. However, Amdahl topped nine out of the 13 user ratings.

Also scoring higher than the 3380 was Memorex Telex Corp.'s triple-density products. Although the company has only a 1% share of the market, its users rated it above IBM in reliability, cost-effectiveness and ease of use.

The 3380 did not take the highest marks in any category, and its ratings overall were significantly lower than most of its competitors. Users gave the product some of its strongest marks in the areas of compatibility, reliability and service and technical support. Good scores in the last two areas represent something of a triumph of recovery for IBM. In 1988, IBM identified a bearing problem in the 3380's head-disk assembly and has been working with individual users to repair it.

Lowest rated among the DASD systems was Storage Technology Corp.'s 8380-R33 drive. Better known for its automated tape systems, Storage Tek holds 5% of the DASD market. However, the 8380 ranked last or second to last in all categories.

Triple-density direct-access storage devices

Total scores reflect all criteria and their user-assigned importance
Response base: 50 users per product

Product	Three highest ratings	Three lowest ratings
Amdahl Corp.'s 6380-K SCORE 74.8	Compatibility to installed hardware Reliability Ease of operation	Cache effectiveness Acquisition & maintenance costs Floor space needs
Hitachi Data Systems Corp.'s 7380-K SCORE 74	Reliability Overall performance Ease of expansion	Cache cost/megabyte Cache effectiveness Storage cost/megabyte
Memorex Telex Corp.'s 3890-0K4/2K4 67.8	Compatibility to installed hardware Ease of operation Ease of expansion	Cache cost/megabyte Reliability Cache effectiveness
IBM's 3380-K SCORE 66.4	Compatibility to installed hardware Quality of service & technical support Overall performance	Cache cost/megabyte Acquisition & maintenance costs Floor space needs
Storage Technology Corp.'s 8380-R33 SCORE 63.2	Compatibility to installed hardware Ease of expansion Ease of operation	Reliability Floor space needs Environmental controls

KEY RATINGS

Hitachi's 7380 receives the highest ratings in the two criteria of most importance to users: reliability and overall performance. However, Amdahl's 6380 tops the field in compatibility and service/support along with seven of the remaining nine categories.

User importance rating

9.5 Reliability
Memorex 3890 8.8

9.1 Overall performance
IBM 3380
Memorex 3890 8.1

9.1 Compatibility to other installed hardware
IBM 3380
Memorex 3890 8.8

9.1 Quality of service and technical support
Memorex 3890 8.0

8.6 Cost per megabyte of cache
Memorex 3890 8.2

8.5 Reasonable acquisition & maintenance costs
Memorex 3890 8.1

CW Charts: Paul Mock

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   - 22. Dir./Mgr. Tech. Planning, Adm. Svcs., Data Comm. Network Sys. Mgt., Dir./Mgr. PC Resources
   - 23. Dir./Mgr. Sys. Development, Sys. Architecture
   - 31. Mgrs., Supry. of Programming, Software Dev.
   - 32. Programmers, Software Developers
   - 60. Sys. Integrators/VARs/Consulting Mgt.

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   - 51. Sales & Mktg. Management

   OTHER PROFESSIONALS
   - 70. Medical, Legal, Accounting Mgt.
   - 80. Educator, Journalists, Librarians, Students
   - 90. Others _____ (Please specify)

3. **COMPUTER INVOLVEMENT** (Circle all that apply)
   Types of equipment with which you are personally involved either as a user, vendor, or consultant
   - A. Mainframes/Supermins
   - B. Minicomputers/Small Business Computers
   - C. Microcomputers/Desktops
   - D. Communications Systems
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A CLOSER LOOK

Users of IBM's 3380 give it low ratings in terms of cost and floor space requirements. Memorex's 3890 comes in a strong third in most of the ratings. Storage Tek's 8380 receives low ratings overall, scoring its highest mark in ease of operation.

User importance rating:

8.0 Cost per megabyte of cache

8.0 Ease of expansion

8.0 Effectiveness of cache features

7.9 Reasonable floor space requirements

7.8 Ease of operation

7.8 Efficient environmental controls

7.5 Reasonable learning curve

Loyalties

Would you buy the product again?

(Reasons based on most frequently stated responses)

Amdahl 6380

Response base: 49

Likely
The reason: Good service & support

2

Unlikely
The reason: Want to compare with 3390

Number of respondents

Hitachi 7380

Response base: 50

Likely
The reason: Reliability

1

Unlikely
The reason: Features inferior to IBM's

Number of respondents

Memorex 3890

Response base: 50

34

Likely
The reason: Price/performance

16

Unlikely
The reason: Old technology

Number of respondents

IBM 3380

Response base: 50

Likely
The reason: Reliability

9

Unlikely
The reason: Moving to 3390

Number of respondents

Storage Tek 8380

Response base: 48

Likely
The reason: Price

13

Unlikely
The reason: Unreliable

Number of respondents

Drive devotion

IBM's 3390 DASD has overcome delivery problems and last-minute fixes to win allegiance among users of high-end storage devices. Fifty users surveyed by Buyers' Scorecard gave the product very high marks for reliability, performance and ease of use. IBM's technical service and support also remain highly rated in its latest DASD endeavor.

However, the higher capacity and performance IBM is offering with the 3390 also come with a higher price tag. Users rated price/performance payoffs at the bottom of the list of 13 criteria. The cost per megabyte of cache received the lowest ratings.

Despite the perceived imbalance between capability and cost, 43 of the users surveyed said they would be very likely to purchase the product again if they were making the choice today, and the remaining seven said they would be somewhat likely to purchase the product again.

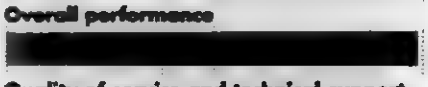
Respondents also provided a laundry list of features that they would like to see added to the 3390. Heading the list was improved cache features at the data-set level, followed by increased density and lower cost.

IBM 3390 RATINGS

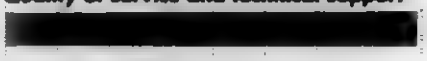
Response base: 50

Reliability

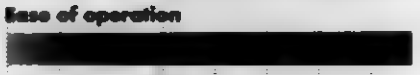
Overall performance



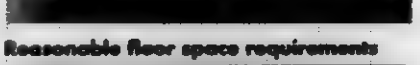
Quality of service and technical support



Ease of operation



Ease of expansion



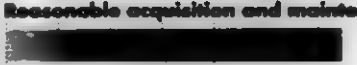
Reasonable floor space requirements

Reasonable learning curve

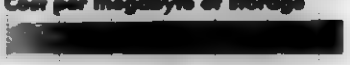
Efficient environmental controls

Effectiveness of cache features

Compatibility to other installed hardware



Reasonable acquisition and maintenance costs



Cost per megabyte of storage

Cost per megabyte of cache

METHODOLOGY

Products rated in *Computerworld*'s DASD Buyers' Scorecard were selected in the following manner: The products had to operate in the IBM mainframe environment and be triple-capacity direct-access storage devices (DASD) comparable to the IBM 3380-K. The IBM 3390 was rated because it represents the next generation of high-end DASD. Because its larger capacity and different performance features preclude direct comparison with the other models currently on the market, user ratings for that product are presented separately.

Ratings for each product were based on responses from 50 randomly selected users culled from lists provided by independent sources.

The market share for the vendors included in the survey is as follows: IBM's 3380 — 81%; Amdahl Corp.'s 6380 — 7%; Hitachi Data Systems Corp.'s 7380 — 6%; Storage Technology Corp.'s 8380 — 5%; and Memorex Telex Corp.'s 3890 — 1%.

According to the survey, 38% of the 300 sites use IBM 3090s, 19% use Amdahl mainframes, 18% use IBM 4381s, and 10% use Hitachi mainframes.

Of the 300 respondents, 92% have been using storage products for five years or more. Of those polled, 56% are operations managers, 37% are IS managers, and 7% are DASD managers.

Of the respondents, 60% use caching features to increase performance. The sites have an average of six DASDs attached to each controller.

The survey was conducted via telephone interviews by First Market Research in Austin, Texas. Result tabulation was performed by IDG Research Services in Framingham, Mass.

The total scores, which are weighted according to the criteria that all respondents find most important, were computed by multiplying the mean scores all users assigned to the importance of each criterion by the mean scores each user group gave to its own product.

For example, the criterion — reliability — received a mean importance rating of 9.5 on a scale of one to 10. Amdahl's 6380 users gave the product a 9.4 for performance in this area. To find a final score, these two factors were multiplied for a score of 89.3. This number was then added to the other totals of criterion importance ratings and performance ratings. This sum was then divided by the number of ratings for a total score of all 13 criteria.

ACKNOWLEDGMENTS

Computerworld would like to acknowledge the assistance provided by the following individuals and organizations in the preparation of this month's Buyers' Scorecard: Bob Abraham, Freeman Associates, Inc.; Crawford DelPrete, International Data Corp.; James Porter, Disk Trends; Computer Intelligence; and Installed Technology International.

Why SMS spells jumble

BY BARBARA BOCHENSKI

Like a partly finished puzzle, IBM's evolving system managed storage (SMS) is missing a few pieces. This means only good things to independent software developers, which are promoting existing products — and creating new ones — to fill in the blanks.

A pieced-together automated storage management system may not be so ideal for users, but it does the job for people who want such a system now.

SMS automatically allocates data sets to various storage media in accordance with service requirements established by the storage administrator. Its long-range goal is to completely automate storage management.

"IBM has admitted it can't do it all," says Nick Allen, a storage management analyst at Gartner Group, Inc. IBM has invited added value, he says, and has received it from the likes of Sterling Software, Inc., Legent Corp., Innovation Data Processing and Computer Associates International, Inc.

These products attempt to address areas that IBM has not; for instance, the VM operating system.

"If DFSMS/MVS was Project Jupiter, SMS for VM is Black Hole," Allen says, referring to IBM's development code name for one portion of SMS.

IBM does remarket two VM utilities from Systems Center, Inc. in Reston, Va. VM/Backup is an automatic backup and restore system, and VM/Tape is a tape drive and volume manager. A permanent license for each product is available from Systems Center starting at $4,250.

Certain data types have also been left out of the SMS game plan, such as ISAM, OSAM, nonstandard file labels and unmovable data sets. "IBM only handles about 70% of our data," says John Brightly, technical services manager at American Tobacco in Chester, Va.

Sterling Software fills this gap with Data Management System/OS, a space management facility.

While some people lament the lack of support for active data compression, others find it causes performance problems. Nevertheless, both Innovation Data Processing in Little Falls, N.J., and Sterling offer data compression products. Innovation Access Method from Innovation Data Processing is $10,000 for an annual lease and $30,000 for a perpetual license. Sterling's Shrink/MVS costs $21,000, and its Shrink/DB2 sells for $25,000.

Storage administrators also complain that there is no way to make sure service requirements are met. They can allocate data sets to certain storage media and establish parameters such as response time, but they have no way to enforce them.

While no product can yet fulfill this need, both Sterling and Legent are helping storage administrators at least gauge the performance of preset service levels through a user interface.

Sterling Software's View is a personal computer-based user interface that lets the storage administrator see at a glance the status of the storage system. Through color-coding of screens, administrators can decide quickly whether to take action.

View is sold with Sterling's Automatic Initiation Manager (AIM), a subsystem for Sterling's overall storage management product, for $24,000.

Legent's automation storage product DASDMON identifies poor performance in on-line and batch reports. The Storage Performance Expert, a main component of DASDMON, then steps in to recommend tuning solutions and utility statements to help implement them. The product sells for $10,000 to $30,000.

Probably the biggest complaint users

Continued on page 72

Bochenski, a 30-year veteran of the IS field, is a free-lance writer and advanced computing consultant in Bellevue, Wash.

Controllers go to center stage after years behind the scenes

BY KENNETH HALLAM

With their moving and spinning parts, disk drives draw a lot of attention as developers adjust actuator speeds, head-flying heights and rotation frequencies to decrease the time it takes these mechanical creatures to deliver data.

Disk-drive controllers — which are not mechanical but are based on semiconductor technology — have not traditionally turned heads. Their electronics are an assortment of very familiar commercial parts, including microprocessors, dynamic random-access memory, shift registers and some custom interface logic. Like an efficient waiter, these devices take orders from the customer, translate them to the drive and then deliver the requested data.

Innovations are stifled in the IBM world by vendors' fears of being labeled "noncompatible." In Digital Equipment Corp.'s domain, the company keeps its technology private by regarding its systems as closed and the interface connections for controllers, proprietary.

Controllers continue, however, to build steadily on existing strengths and acquire new capabilities. Their intelligence has steadily increased from a one-channel, eight-drive capability in the 1960s to handling up to eight channels and 64 different disk drives today.

A more far-reaching innovation on controllers is cache memory. Cache was first offered in the 1970s by independent developers, but it was never a large commercial success. Now that IBM is shipping the 3990 controller with cache memory, all the plug-compatible manufacturers offer it as well.

Controller cache memory holds either data that the controller predicts will be requested in the near future or data from a previous request on the chance that it will soon be requested again.

Other capabilities of controller cache memory include nonvolatile memory, which helps avoid data loss in the case of a power failure; fast-write, which writes channel requests first to cache and later to the drive, eliminating the time spent waiting for the disk drive to locate the correct sector; and size options, ranging from 2M to 8M bytes of capacity.

Should something go wrong with the system, expert system technology has been incorporated into controllers to simplify maintenance. First seen in 1988, these systems look at a statistical record of direct-access storage device activity and predict items that will most likely need the attention of a service engineer.

Amdahl Corp., Storage Technology Corp. and Hitachi Data Systems Corp. have all built this capability into their most recent controllers.

Longer cabling

Another problem will be solved when fiber optics replace the current cabling technology connecting the controller to the channel. Within two years, fiber optics will extend the 400-foot maximum distance that controllers can be placed from the CPU to at least one kilometer.

Another advantage of fiber-optic cabling is faster data transfer rates. The 3M to 4.5M byte/sec. limits seen today will be replaced by a 20M to 100M byte/sec. bandwidth on the fiber-optic channel. This increased bandwidth will allow controllers to operate more drives at a faster data rate than ever before.

While there are some fiber-optic offerings out today from Hitachi and IBM, these simply emulate the CPU channel, forcing timing constraints that limit the number of feet the fiber can be run. Many hardware and microcode changes must be made to controllers and CPUs before fiber-optic channels will be possible.

Five years from now, controllers will eventually take over data management capabilities from the I/O software (see story below). Outside of the IBM world, some controllers already participate in some aspects of data management. For instance, Epoch Systems in Nashua, N.H., offers a storage subsystem for Unix users that looks like a network node. The location of the data depends on the frequency of use and the priority assigned to it by the operating system. As data ages and is called for less often, it may move from a fast Winchester drive to an optical disc, then to a tape drive. All of this movement or migration is controlled by the Epoch subsystem rather than by Unix. ●

Hallam is a partner at ENDL Associates, a market research firm in San Juan Capistrano, Calif.

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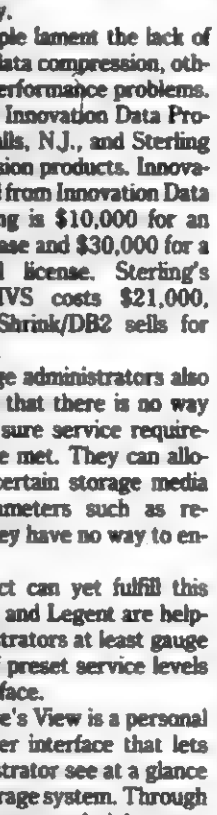


The understudy

Controllers are poised for a major promotion that will, within five years or so, give them primary responsibility for data flow management. Right now, that job belongs to I/O software, which is clearly struggling under the load of growing on-line databases and the task of locating an abundance of data by head, cylinder and sector address.

This change will result from a gradual move away from the Count-Key-Data format to the more efficient Fixed-Block-Architecture. With the latter, the systems software will no longer locate data according to a specific address but rather by logical block address. Specific track capacities, number of tracks per surface and other features of drive geometry will be known by the storage controller.

Eventually, the storage controller will become more of a data manager than a traffic cop. It will select the location for the data to be placed and even move it later, if the data set grows too large for that location.

KENNETH HALLAM

PRODUCT SPOTLIGHT

Solid-state disks/Disk emulators

VENDOR	PRODUCT NAME	INTERNAL OR EXTERNAL DEVICE	HARDWARE COMPATIBILITY	MINIMUM/MAXIMUM FORMATTED CAPACITY (BYTES)	AVERAGE ACCESS TIME (MSEC)	MAXIMUM DATA TRANSFER RATE (BYTE/SEC.)	TRANSACTIONS PER SECOND	DISK DRIVE EMULATION	INTERFACES SUPPORTED	MAXIMUM PROCESSORS THAT CAN ACCESS DEVICE AT ONE TIME	DATA BACKUP CAPABILITIES	VOLTAGE REQUIREMENTS	DIMENSIONS (FEET)	WEIGHT (POUNDS)	PRICE PER MEGABYTE	PRICE RANGE MINIMUM/MAXIMUM
Amdahl Corp. (408) 746-6000	6110 High Performance Storage	External	All Amdahl, IBM 370 architecture	64M/1G	0.2	4.5M	Workload-, model- and channel-dependent	IBM 3380E, 3380J, 3380K	IBM Channel	16	Battery, Winchester disk	208/415 VAC	68.5 x 68.8 x 32 (maximum), 68.5 x 64.8 x 32 (maximum)	1,000-1,355	Contact local Amdahl representative	Contact local Amdahl representative
Amperif Corp. (818) 998-7606	9200-30	External	Unisys-Sperry 1100/2200	36M/2.3G	0.002	9M	Application-dependent	All block mux, Sperry 8470, Word Channel	Sperry Word Channel, block mux	8	Battery, extended battery	208 VAC	60 x 24 x 40 (maximum), 60 x 122 x 40 (maximum)	850-4,250	$1,000	$132,000 (36M) - $2 million (2.3G)
	8200-30	External	Unisys-Burroughs BX900, A and V series	36M/2.3G	0.002	9M	Application-dependent	Unisys-Burroughs 659, 9494, M9710	Burroughs DLP	8	Battery, extended battery	208 VAC	60 x 24 x 40 (maximum), 60 x 122 x 40 (maximum)	850-4,250	$1,000	$132,000 (36M) - $2 million (2.3G)
Ansamatic, Inc. (408) 972-0600	Wafer Stack	External	Any CPU with a SCSI interface	36M/212M	1	4.6M, 2M	700	SCSI drives	SCSI	1	Battery	120/240 VAC	8.5 x 5 x 15	30 (160M)	$230-$500	$7,000 (40M) - $30,000 (240M)
Andromeda Systems, Inc. (818) 700-7600	DC-64 Shadow Ram	Internal	DEC Microvax, Micro PDP-11, other Q-Bus CPUs	16M/256M	2	2M	500	DEC DU device	Q-Bus	8	Battery, Winchester disk, data is automatically shadowed to Winchester disk	5 volts DC	8 x 5 x 1	1.2	$250	$6,195 (16M) - $81,995 (256M)
Apo Technology, Inc. (714) 660-4200	Sperm Disk	Both	DEC VAX, Decstation, IBM RS/6000, Sun 3 and 4	8M/512M	0.05 (maximum)	8M	30,000	SCSI drives	Unibus, Q-Bus, SCSI	7	Battery, extended battery, streaming tape, Winchester disk	5 volts DC (internal), 110/220 VAC (external)	1.69-4.88 x 5.75 x 8.50 (internal), 5.5 x 9.4 x 13.6 (external)	25-55	$300-$500	$4,995 (8M) - $44,995 (256M)
Cray Research, Inc. (612) 333-5889	SSD	Both	Cray X-MP, Cray Y-MP	1G/16G	0.014	2G	71,428	NP	Cray HISP	8	Streaming tape	208 VAC	NP	3,220	NA	$600,000 (1G) - $5 million (16G)
Datarem Corp. (800) 833-0771, (800) 750-0071	Wide Word System 2000	External	DEC VAX/VMS, Convex C1/C2, all Sun	256/640M	0.014	20MB	300-350	No exact emulation	Unibus, Q-Bus, VME	8	Battery	120/240 VAC	16.75 x 10 x 24	100-150	$200 (minimum configuration)	$20,750 (256) - $160,000 (640)
DDC Pertec (818) 882-0030	SSM-300	External	Data General Nova, DEC PDP-11, Fonboro, L & N	8M/256M	2	16M	System-dependent	DDC, General Instruments, PMI, Bryant, Diablo, CDC, Pertec	Unibus, SMD, Diablo, DDC	1	Battery, streaming tape, Winchester disk	110/120 VAC, 220/240 VAC	7 x 17.75 x 20.5	40-55	$1,750 (8M), $489 (256M)	$14,000 (8M) - $125,200 (256M)
Digital Equipment Corp. (800) 641-3300	RSE20 Solid-state disk	External	VAX 9000, 6000, Vaxclusters	128M/240M (within single cabinet)	1.3	2.5M	Application-dependent	NA	Q-Bus, BI Bus, XMI Bus, (interfaces through HSC, KDM, KDB, KDA controllers)	Multiple	Battery, magnetic media	120/208 or 220/240 VAC	68.5 x 31.3 x 30	525 (240M)	NA	$200,000 (128M) - $300,000 (240M)
ESIC Corp. (800) 232-3622, (800) 435-1000	Orion	External	Amdahl, Hitachi, IBM 370 architecture	16M/512M	0.1	4.5M	600 per storage director	IBM 3370, 3380 and compatibles	IBM Channel	4	Battery, Winchester disk	110/220 VAC	31.4 x 15.5 x 33.31	275	$1,400	$27,400 (16M, one storage director) - $558,000 (512M, two storage directors)
Hitachi America Ltd. (800) 283-4000 Ext. 877	5V 507C series, semiconductor storage device	Both	Any CPU with a SCSI interface	16M/20M (half-height), 16M/80M (full-height)	0.35	4M	NP	Full-height 5¼-in., 16M-80M SCSI drives	SCSI	1	Battery, Winchester disk	5 volts DC	1.63 x 5.75 x 8.0 (half-height), 3.26 x 5.75 x 8 (full-height)	2.1 (half-height), 2.4 (full-height)	$300 (16M), $3300 (80M)	NP
Imperial Technology, Inc. (800) 451-0866, (213) 536-0010	Megaram-3380	External	IBM 370 architecture, 3030, 4300, 3080, 3090 series	32M/2G	0.3	4.5M	Application-dependent	IBM 3380, PCM	IBM Channel	16	Battery, extended battery, streaming tape, Winchester disk	208/230 VAC	71 x 22 x 32 (maximum) - 284 x 86 x 120 (maximum)	500	$500	$25,000 (32M) - $800,000 (2G)
	Megaram-SCSI	External	Any CPU with a SCSI interface	16M/288M	0.1	5M	500	All 5¼-in. drives	SCSI	4	Battery, extended battery, Winchester disk	5 volts DC	3.25 x 5.75 x 8.2	7	$300	$3,500 (16M) - $60,000 (288M)
	Megaram-VX	External	DEC VAX, Microvax, PDP series	8M/1G	1	3.5M	750	DEC RA series	Unibus, Q-Bus	4	Battery, extended battery, streaming tape, Winchester disk	110/220 VAC	5.25 x 19 x 20	50	$500	$10,000 (8M) - $400,000 (1G)
	Megaram-SDI	External	DEC VAX, Vaxcluster	8M/1G	1	3.5M	750	DEC RA series	SDI	2	Battery, extended battery, streaming tape, Winchester disk	110/220 VAC	5.25 x 19 x 20	50	$500	$10,000 (8M) - $400,000 (1G)
	Megacard-MP	Internal	DEC VAX, Microvax, PDP series	8M/1G	1	3.3M	750	DEC RA series	Unibus, Q-Bus	4	Battery, extended battery, Winchester disk	5 volts DC	DEC standard quad-sized boards	2	$500	$7,500 (8M) - $350,000 (1G)
	Megaram-80	External	HP 1000, 3000	8M/512M	1	1M	200	All HP 7900 series	HPIB	6	Battery, extended battery, streaming tape, Winchester disk	110/220 VAC	7 x 19 x 24	80	$500	$15,000 (8M) - $250,000 (512M)
Shamrock, Inc. (714) 777-8000	SoftFile	External	Concurrent Computer Corp. 3200 series	32M/256M	0.005	8M	System-dependent	Controller supplied	HP	2	Battery	110/220 VAC	7 x 19 x 20	35-70	$400	Contact vendor
	VME SoftFile	External	Data General Aviion, Sun 3 and 4, Motorola 68000 series	32M/256M	.005	16M	System-dependent	NA	VMEbus	2	Battery	110/220 VAC	7 x 19 x 20	65-90	$800	Contact vendor

The companies included in this chart responded to a recent survey conducted by *Computerworld*. When a vendor is unable to provide specific information about its product, the abbreviation NP (not provided) is used. When a question does not apply to a vendor's product, the abbreviation NA (not applicable) is used. Further product information is available from the vendors.

VENDOR	PRODUCT NAME	INTERNAL OR EXTERNAL DEVICE	HARDWARE COMPATIBILITY	MINIMUM/MAXIMUM FORMATTED CAPACITY (BYTES)	AVERAGE ACCESS TIME (MSEC)	MAXIMUM DATA TRANSFER RATE (BYTE/SEC.)	TRANSACTIONS PER SECOND	DISK DRIVE EMULATION	INTERFACES SUPPORTED	MAXIMUM PROCESSORS THAT CAN ACCESS DEVICE AT ONE TIME	DATA BACKUP CAPABILITIES	VOLTAGE REQUIREMENTS	DIMENSIONS (FEET)	WEIGHT (POUNDS)	PRICE PER MEGABYTE	PRICE RANGE MINIMUM/MAXIMUM
[illegible]	[illegible]	[illegible]	All Amdahl, Hitachi, ASEC, IBM 4300, 3090 series	[illegible]	0.1	10M	2,000	IBM 3380	IBM Channel	16	Winchester disk	[illegible]	51.5 x 42.5 x 31.5 (mid-mount), 51.2 x 172.4 x 31.5 (enclosure)	672-3,556	$1,500	$64,788 (16M) - $1,048,596 (8G)
Memory Sciences Corp. (708) 361-6745	Pentor	External	DEC VAX, Microvax, IBM 4381, 3090, 3080 series, VMEbus-based	4M/10G	1	5.5M	2,000	All DEC, IBM 3380, 3390 series	Unibus, Q-Bus, SMD, IBM Channel	8	Battery, extended battery, Winchester disk	110 VAC	60 x 24 x 30 (1G)	42-162 (1G)	$550	$17,000 (4M) - $600,000 (1G)
[illegible]	[illegible] disk	External	Any CPU with SCSI interface	[illegible]	0.1	[illegible]	Determined by controller	Any SCSI drive within 1024-cylinder capacity	SCSI, SCSI-2	7	Battery, automatic backup/restore	5 volts DC	1.62 x 5.75 x 8 (half-height), 3.25 x 5.75 x 8 (full-height)	5	$300 (16M), $160 (320M)	$4,320 (16M) - $42,100 (432M)
Sun Plus Technology, Inc. (408) 748-7717	RDC-16 RAM Disk, RDE-32 RAM Disk	Internal	All Digital Q-Bus, and Unibus CPUs	1M/ 80M, (Q-Bus), 128M (Unibus)	4.3	1M	System-dependent	MSCP	Unibus, Q-Bus	1	Battery	5 volts DC	8.75 x 10.38 x .25	2	$350	$6,000 (16M) - $28,000 (80M)
[illegible]	[illegible] disk subsystem	External	IBM 3090, 4300, 4381 series, PCM and compatible	[illegible]	0.1	4.5M	2,000-3,000	IBM 3380	IBM Channel	8	Battery, Winchester disk	208 VAC	47.9 x 31.5 x 28.4	880	$1,300-$1,600	$162,000 (64M) - $1,200,000 (1.1G)
System Industries (408) 433-1313	Megaray	External	DEC Vaxcluster, Unibus and Q-Bus CPUs	28.9M/ 462.4M	3.25	3M	300	DEC RA80 series	Unibus, Q-Bus, SDI, CI Bus, BI bus	4, 16	Battery, extended battery, Winchester disk	110/220 VAC	5.25 x 19 x 20	50	$1,000 (minimum configuration), $615 (maximum)	$31,050 (28.9M) - $313,950 (462.4M)
[illegible]	[illegible]	External	DEC VAX, Unibus and Q-Bus CPUs, Bus 3 and 4	[illegible]	[illegible]	[illegible]	System-dependent	DA	Unibus, Q-Bus, VME, S-Bus	64	Battery	110/220 VAC	17 x 24 x 32	600	$800	$20,800 (64M) - $4 million (8G)
Vermont Research Corp. (800) 225-0431, (802) 886-2284	Premax	Both	DEC Microvax, VAX 8000, 8600, Encore 32 series, Concurrent Series 3200	2M/3G	0.5	10M	Determined by controller	Proprietary firmware allows emulation of any drive	Unibus, Q-Bus, HPIB, SMD, SCSI, ESMD, Diablo	2	Battery, extended battery, streaming tape, Winchester disk	115 VAC	8.5 x 16.8 x 22	55	$250	$13,000 (8M) - $32,000 (128M)
	Threadlite	Both	DEC Microvax, Motorola 68000 series	8M/320M	0.5	5M	Application-dependent	All 3.½-in. and 5¼-in. drives	SCSI	2	Battery, extended battery	5 volts DC	1.62 x 5.75 x 8 (half-height), 3.24 x 5.75 x 8 (full-height)	7.5	$150	$4,160 (8M) - $47,500 (320M)
	Sierra Series	Both	DEC PDP series, MODCOMP Classic, Fonhavo Fox series	5M/80M	0.5	1.2M	200	All Diablo, CDC 9427 Hawk, CDC 9742, Wang	Unibus, Diablo	1	Battery, extended battery, streaming tape, Winchester disk	115 VAC	8.5 x 16.8 x 22	50	NA	$15,000 (5M) - $21,000 (80M); One to four drives can be emulated in single unit
[illegible]	[illegible]	Both	DEC VAX, Microvax, Motorola 68000, Sun Sparcstation	[illegible]	4.5	8M	System-dependent	SCSI drives	SCSI	7	Battery, extended battery	5 volts DC	3.24 x 5.75 x 8	7.5 (320M)	$225	$2,500 (80M) - $60,975 (320M)
Z-Stor Corp. (949) 261-0020	Z-Stor UB2 mass storage subsystem	External	DEC VAX, Prime 50, Wang VS series	64M/4G	0.864-1.59, 1.22 (average)	3.125M	1,100	All SMD devices	Unibus, Q-Bus, SMD, SCSI	2	Battery, extended battery, Winchester disk, power conditioning (all standard)	110 VAC	34 x 22.75 x 30	300	$500	$64,000 (64M) - $2 million (4G)
[illegible]	[illegible]	External	Unisys 1100/2000, A and V series	300-[illegible] 1.2G-4G	1-2	[illegible] 5.33M	1,000	8470, 8480, 8481, HSD10, HSD40-30, 880	Block store, Word-Channel	4	Battery	115/240 VAC	41 x 23 x 38	900	$900-$1,000	$90,000 (32M) - $2,100,000 (4.1G)

SMS

FROM PAGE 70

have with SMS is the difficulty of preparing for it.

Before implementing the strategy, organizations need to analyze their use of data sets and then use various tools — such as Automatic Class Selection (ACS) routines in combination with data set names — to communicate that information to SMS.

Sterling Software's SMS/Migrator ($12,000) helps users set up systems by generating ACS routines.

Sterling also offers an umbrella product that directly competes with SMS, its Storage Automation Management System. "We can help people get started with automated storage management techniques," says Charles Keiper, senior technical consultant at the firm.

"Then, if they want to go to IBM, they can," he adds.

For $75,000, users get Sterling's Volume Allocation Manager, Data Management System, AIM, a PC-based user interface and a data compression tool.

Other vendors compete as well. Of the five major components of SMS, only one — Data Facility Product (DFP) — is an integral part of the MVS operating system. The others — DFHSM, DFDSS, DFSORT and RACF — are replaceable.

For years, people have replaced RACF with CA's ACF2. A variety of sort programs from third parties can substitute for DFSORT.

A number of alternatives are available for DFHSM and DFDSS. For example, Automatic Backup and Recovery from Innovation Data Processing can be used with DFP instead of DFHSM, and the company's Fast Dump Restore can replace DFDSS. •

ASK THE VENDOR

We are testing an SMS environment but are concerned about remote operation during disaster recovery, since SMS data sets must be restored to SMS volumes. Does Innovation's FDR/ABR DASD management software support non-SMS sites or sites that don't have enough SMS volumes to accommodate our needs?

Don Kinney
Second Vice-President
Travelers Insurance

INNOVATION DATA PROCESSING: FDR/ABR supports recovery to non-SMS environments with volume and data set backups taken in an SMS environment and vice versa. Within SMS, volumes and data sets can be restored with SMS constructs that are in effect at the time of restore. Optionally, at the time of a restore, the SMS-class information that was in effect when the backups were taken can be presented to the system's Automatic Class Selection (ACS) routines. Additionally, FDR/ABR will allow authorized users to bypass the system's ACS routines and, in appropriate recovery situations, restores can bypass the SMS subsystem itself and be directed to specific SMS or non-SMS volumes.

We use Legent's DASDMON 2.0 to provide information on DASD performance and assist with improving I/O response times. Will it work with our new IBM 3990 cache controllers?

John Melville
Manager of Systems Management
Maryland Casualty
Baltimore, Md.

LEGENT CORP.: DASDMON's measurement method can report on cache controller performance, regardless of vendor. Each I/O is measured to determine the type of request and whether the request was served from cache or DASD. DASDMON displays read-write percentages and cache hit percentages down to the data set and job level. Fast writes from the IBM 3990 controller are measured and reported.

Paths to information power

The sharpest companies know how to wield information for real advantage. How is your organization doing?

BY JACK W. SIMPSON

The global marketplace is changing — and not just because of Europe 1992. During the past few months, we've seen dramatic examples of how quickly things can change. By the time you read the daily newspaper, the political winds can shift, leaders can fall, and new governments can be installed.

By now, most information systems managers know that staying competitive in the '90s will depend on keeping up with this new change of pace: Information travels faster; opportunities come and go.

Yet, a poll taken last year by Louis Harris & Associates of New York reported that two-thirds of chief executive officers said that their companies' computer and communications resources were not properly integrated into their business operations.

Why not? Why would a company give up the advantage of real-time decision-making by operating without a sophisticated infrastructure for integrating information? Perhaps it's hard to see the big picture as it gets lost in bits and bytes and budgets.

Smart managers — those who recognize the importance of their company's information systems — will see that the answer lies in merging a company's internal data with important external information.

Merging internal and external data and the design of an information infrastructure takes a master plan. Typically, companies go through four phases in building an information infrastructure: introduction, growth, integration and power. To be successful, companies need to quickly get to the power stage — the stage at which a company sees the maximum benefit from its technology investment.

At this stage, companies also gain a competitive advantage by using internal and external information to forge decision-making links — both with its management team and with its customers, suppliers and others important to it.

In the introduction stage, a company is most likely to invest in IS machines that automate payroll, inventory and word processing. This is where computing began. Goals in this stage, such as reducing paper and increasing clerical productivity, are easily realized. However, it's hard to see the return on investment. For example, some thought that word processing would result in fewer secretaries, but most of us would agree that we've kept the secretaries and just added more computers.

Growth stage

The growth stage is a step up, but computing and information needs remain fairly simple. At this stage, the company takes on new capabilities. The art department, for instance, may produce graphics and typesetting. The marketing department may coordinate with the sales force to manage a direct mail list. These departmental applications and databases, as well as electronic mail, filing, scheduling, voice messages and portable personal computers help flatten a company's organizational structure and make it faster and more efficient.

A risk in the growth stage is that upfront costs can sometimes outweigh the near-term benefits and expectations. If promises are made and not delivered, a credibility gap occurs and the firm may cut spending before technology has a fair chance to improve the bottom line.

At this level, the manager or IS executive is left walking a tightrope. He has to make sure the company buys what it needs for today while still establishing the infrastructure for tomorrow. He needs to relate his activities to the bottom line and deliver on promises to build credibility.

Many companies today are in

Simpson is president of Mead Data Central, a Dayton, Ohio, information provider.

- **IS can guide process**
- **Well-planned infrastructure is key**
- **Blend internal and external information**

the integration stage. The driving force at this point is getting mission-critical information — the information people need to do their jobs — to each sales representative, market planner, product developer, strategist, manager and professional.

In this integration effort, the use of external information has broadened from one department to many. The critical management issue here is maintaining the completeness and the integrity of data from all departments as it's shuttled around on a real-time basis.

At this stage of integrating the internal and external information, the company will see a solid return on its investment in technology and data management. The efficient use of internal and external information will help a salesperson clinch a deal because of something he learned that morning. Marketing will act faster on segments previously undetected, or perhaps ignored, by the competition. Manufacturing can hear about problems when they happen and act while the trail is hot, or be linked to suppliers to ensure just-in-time inventory control. In addition, the sales force can be linked to customers for efficient ordering and problem-solving.

Power stage

From the integration stage, the successful merger of external and internal information will lead the firm into the power stage, which demands full-scale capture and application of external information.

The power stage delivers the broadest possible range of mission-critical information to everyone in the organization as well as to everyone important to the firm, such as customers and suppliers. Finally, in the power stage, the investment made in an IS infrastructure and the full utilization of external information can give a company the ability to react in real time.

Instead of relying on copious files of newspaper clippings, the evening news, a researcher in a library or a Freedom of Information request in Washington, D.C., a company can have the pertinent data relating to mission-critical information electronically in seconds.

Marketing managers, for example, use on-line information services for access to trade journals, newspaper articles, surveys and census figures to track trends and demographics, to stay aware of the latest issues and to find new business opportunities. Sales representatives use access to news, biography files, Standard & Poor's Register of Corporations and Securities and Exchange Commission documents to create a profile before they call a prospective client.

Information explosion

Today, research indicates that at least 80% of U.S. corporations have their information systems somewhere in the growth or integration stages. Moreover, nearly 20% of U.S. firms have fully integrated outside information services into their daily business — the power stage.

How to get from one stage to another isn't obvious or easy. It takes a chief information officer with creativity and vision and a CEO who wants the benefits of information technology and who will provide an environment for change.

In the early stages, the CIO no doubt will be walking a tightrope: Making sure the company buys the technology it needs for today, while establishing the infrastructure and architecture for tomorrow.

The best way to achieve that credibility is to have a solid plan in place, one that integrates technology into the day-to-day work flow of key decision makers and is connected to the long-term business strategy of the organization, i.e., using information to create a competitive advantage.

The CIO must chart the course and be prepared to navigate the firm through the choppy seas that lie ahead. Competition in the '90s will be fierce, stirred by the increasing speed and breadth of available information. It's up to the CIO to make sure his firm has all the data it needs to seize emerging opportunities. ●

The info is better, but they miss the sound of ticker tape

BY JOSEPH MAGLITTA

It is just after 7 a.m. on Aug. 2, and the sun has barely risen over the flatlands of north-central Oklahoma. Bill Newberry pads into the near-empty 16th-floor headquarters of Phillips Petroleum Co. He sits down at a personal computer and presses a few keys. Up pops a screen filled with the latest news of the Iraqi invasion of Kuwait that began only hours before.

Halfway across the nation, Martha Moore is busily preparing an electronic "morning newspaper" for employees at a Digital Equipment Corp. engineering facility in suburban Boxboro, Mass. In less than one minute, carefully selected items are zipped across a company network to more than 100 users.

As U.S. organizations become more adept at delivering information to employees, tastes in information have begun to change. Information consumers are getting pickier.

"Originally, people were so thrilled to get information. We'd give them an info-dump, and they'd happily wade through it," says Moore, who is manager of information systems at one of DEC's 18 official corporate libraries. But, she says, it has become clear that "as people get increasingly information savvy, they don't want to wade through all that stuff."

A novel approach

The notion of "information overload" is hardly news to any busy professional whose desk is stacked high with newsletters, magazines, newspapers, reports and other items.

What is novel, however, is how organizations are tackling the problem. A small number of major corporations — including Lotus Development Corp., Prime Computer, Inc. and NEC Technologies, Inc. — have begun to employ various information-sorting systems that use sophisticated artificial intelligence, filtering, "knowledge agents" and FM transmission to help users make sense of the information blizzard.

While the technological approaches vary, the purpose is the same: Screen out all unwanted information and mine only what's usable.

Phillips Petroleum and DEC are good examples of how companies are using technology to satisfy finicky, information-hungry users.

Throughout the day on Aug. 2, and for days afterward, one of the hottest spots outside the Persian Gulf was a PC located in the Phillips corporate affairs department in rural Bartlesville, Okla.

The PC is a dedicated terminal for News Edge, an information screening service sold by Desktop Data, Inc. in Waltham, Mass. Feeds from major newswires are beamed to a rooftop satellite dish, which feeds into a special PC. Special software looks for predetermined keywords and places desired items in an "alert" database.

During the invasion, Phillips public relations staff "used News Edge and Cable News Network all day to monitor the Gulf," says Newberry, a communications systems analyst.

Even on normal days, Newberry says, staffers check the system approximately every 30 minutes to catch alerts on oil spills, stock and oil prices, new legislation and other hot topics affecting company operations.

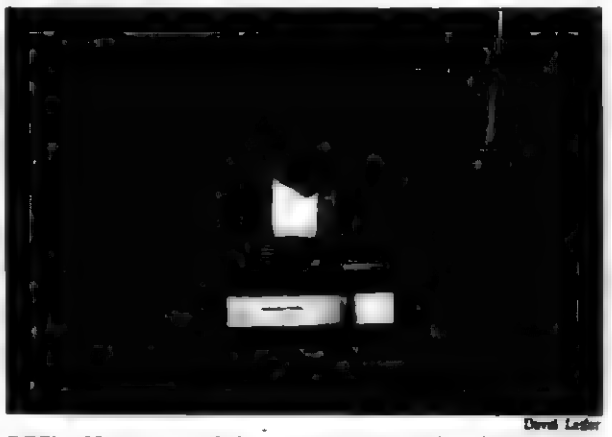
Installed last May, News Edge replaced a single Dow Jones News/Retrieval service wire, known as a "broad tape." Now, instead of paper tapes spilling onto the floor, a single PC gives the latest information from Dow Jones, the PR Newswire, Comtex Scientific Corp., United Press International, Knight-Ridder, Inc. and Reuters.

It costs about $500 to $600 per month to run the system, according to Newberry, who says it's worth every cent. While the cost is expensive for one terminal, it's a bargain as more are connected, he says.

The biggest and most obvious benefit is that users from three departments get more and better news faster.

The Gulf conflict wasn't the first time that the system had paid for itself, he adds. During the system evaluation, Phillips monitored News Edge to learn the location and time of a federal press meeting called in the aftermath of an October 1989 explosion of a Phillips Petroleum chemical complex that killed 19 people.

About the only drawback, Newberry says, is the Oklahoma weather. "Thunderstorms mess up the satellite reception and cause small glitches that make the system beep. But the data comes in pretty readable; there's no garbage."



David Leiter

DEC's Moore *needed a way to streamline information gathering and dissemination*

But Newberry wasn't prepared for another surprise: Information vendors demanding big rate hikes. "We have experienced wolves at our door wanting to increase prices," he says. For example, Reuters wanted to raise the per-terminal price from $25 to $625 per month, but after negotiations, agreed to keep the original rate, Newberry says.

Hit with users

Does the system get used? "If [users] are looking for anything, they usually come here first," Newberry says. In fact, he says that News Edge has been such a hit that Phillips is considering adding it to the company's executive information system as well as making it available, via network, to 250 other users. "The one thing users miss is the noise from the broad tape [ticker tape]."

At DEC, Martha Moore had a simple reason for wanting a customized information service. "I just wanted to get information out to people without killing myself," she explains.

As the main information provider for some 1,200 DEC employees, Moore often found herself spending up to eight hours a day gathering and abstracting information for internal distribution. "It was crazy," she recalls.

During a search for possible solutions, she found First, a news gathering and disseminating tool developed by Individual, Inc. in Cambridge, Mass. Based on AI technology developed by Cornell University, First is sold based on the number of stories desired and a flat rate for distribution rights. The company says that daily service for 200 managers costs about $50 per person per year.

A trial system was installed in November 1989, and Moore was quickly sold. "The newswires are good, but it's awful hard to get information out of there without getting a lot of garbage. Now, I get exactly what I need and nothing more," she says.

First evaluates the relevance of information presented to it, then locates, filters, refines and transmits customized news via MCI Mail or other channels. Information is stripped down to the barest essentials: Readers receive only four to six carefully selected articles per day from six major newswires. Users get only the information that interests them.

"News comes right off the newswires at 3 a.m. When I come to work at 8 a.m., we look at the news and throw it out to a distribution list of about 100 people. It literally takes a minute."

Moore says First is cheaper to use on a regular basis than Dialog, Lockheed Corp.'s popular on-line product, which is still used to search for technical journal articles.

NATIONAL
BRIEFS

Empire of the Sun

AT&T is about to up its stake in workstation maker **Sun Microsystems, Inc.** in a deal that will net Sun an estimated $192 million, the companies announced recently. Under an outstanding agreement, Sun has the right to issue new shares in an amount up to 15% of its outstanding stock and sell them to AT&T. If the deal closes, the communications giant will emerge as 14.7% owner of Sun, based on shares acquired from Sun itself.

■

Everybody's all-American

A year ago, **MRS Technology, Inc.**'s flagship product line — a panel printer specifically geared to the manufacture of color active-matrix LCDs — was a big deal in Japan, but, according to MRS President Griffith Resor, the firm could barely scrape a deal on home turf. With increasing attention focused on the flat-screen technology enabled by MRS, however, that could change. Witness the recent $1.5 million deal that will land the firm's products in a bastion of U.S. technology: **IBM's Thomas J. Watson Research Laboratory.**

More briefs on page 81

Laptops beget laptops — and fast

Toshiba uses its own products to speed production in an age of short shelf life

BY LORI VALIGRA
IDG NEWS SERVICE

Trendy laptop computers are fast gaining market popularity, but the almost equally speedy end to their shelf life presents a big challenge to their makers: how to design, manufacture and get a product out the door so it will not be stillborn.

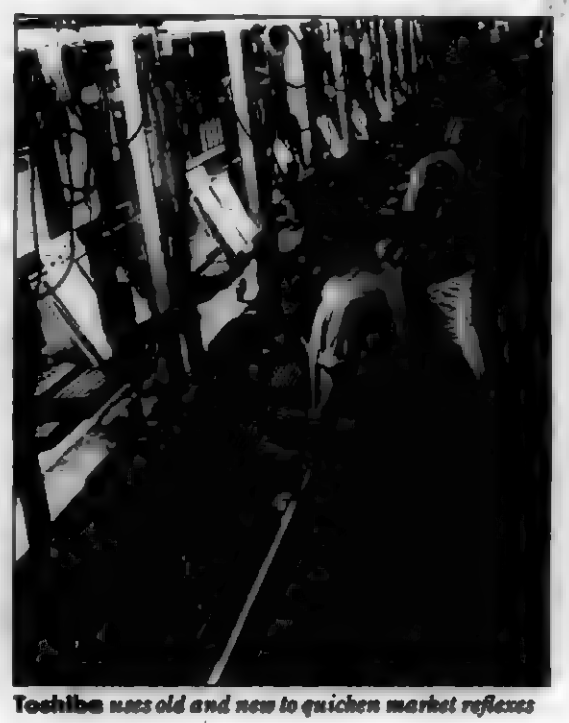
"If a product isn't developed and put on the market quickly, competitors will release their own versions, and the life span of the product still under development shortens drastically," said Masao Suga, who heads the personal computer research and development department at Toshiba Corp. in Tokyo. "Often it's the case with some products that the effective life span is already over by the time it goes to the marketplace."

Japanese companies such as Toshiba have created their own dilemma as they strive to stuff more technology into ever smaller packages. Luckily, they have a strategic advantage: their particularly sophisticated manufacturing ability.

For Suga, who is employed at Toshiba's Ome design and manufacturing works west of Tokyo, factory automation and product development go hand-in-hand: Ome uses Toshiba J3100 laptops for design, development and assembly of its own new products.

For example, it uses the laptops in the design stage to determine how easily the product can be manufactured. The J3100 laptops are linked using two local-area networks: Novell, Inc.'s Netware and Toshiba's proprietary 10M bit/sec. Ethernet-compatible network. Thanks to this setup, it now takes only a few minutes for an assembly line of 12 workers at Ome to slap together a notebook-size Dynabook.

The decision to automate the Ome plant was an easy one, based on a new business focus for Toshiba. Automated lines in the 22-year-old, 75,000-square-meter plant, which turns out a wide range of data processing products, were first installed in 1984. This was in preparation for a move Toshiba hoped would be a big business: its 1985 entry into the laptop market. The company now makes around 1 million laptops per year at Ome.



Toshiba *uses old and new to quicken market reflexes*

"We decided to automate in 1984-1985 because we wanted to introduce laptops and have advanced equipment for producing them," Suga said. Robots used initially proved too inflexible to accommodate the short product life cycles, which range from six months for Japanese word processors to about three years for laptops.

Toshiba laptops currently on the market serve as the basis for new versions, with 70% of the design work from current models replicated in the new. The 30% novel design includes integrating the latest technologies, such as more compact floppy disk drives. This ratio also holds for laptop components.

"By using laptops and central databases, not only can the 30% of the original design be carried out, but any previously performed relevant material can be easily found and accessed," Suga noted. This economy, he said, assures that the latest design continues to follow any design methods or standards that have been set.

"The use of laptop computers is the key to Toshiba's efficient design," Suga said. Affecting a quick design turnaround keeps Toshiba from falling into a trap he termed the "desperate development cycle" in order to remain competitive.

Continued on page 81

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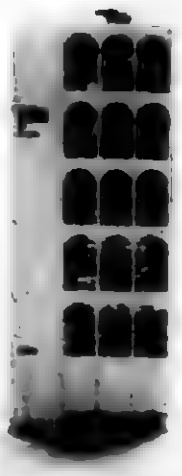

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COMMENTARY

Rosemary Hamilton

The CASE for AD/Cycle

Only IBM can go from being on the outside to being at the very center of a market in a matter of months. Take a look at the computer-aided software engineering (CASE) market these days.

Users seem to be taking IBM's entry into the CASE market in stride. Information systems managers contacted recently said several factors go into making a CASE product selection, but where a company stands in relation to IBM does not top the list.

Nonetheless, it is nearly impossible to find a company that does not in some way position itself around IBM and its CASE offering, AD/Cycle.

Just one year ago, the CASE industry consisted of dozens of companies offering different products and approaches for software engineering. Their greatest problem, perhaps, was to gain more of an identity with corporate buyers.

Now that IBM's AD/Cycle is in the picture, there are no identity problems. While some vendors such as Index Technology have aligned themselves with more than one CASE partner, the view of the majority is clear: Companies cannot help but position themselves in some way with AD/Cycle.

Many users claim to focus more on a CASE vendor's products and how they fit into the user's plans than on that vendor's business partnerships.

However, the vendors seem intent on selling those advantages to users anyway.

This game began in September 1989 when IBM introduced AD/Cycle. In a sense, it ushered in a class system for the CASE market.

With AD/Cycle, IBM set up an inner circle of three business partners and a second tier of a few dozen, less-connected companies. Beyond that — well, each company was on its own.

The inner circle includes Index Technology, Bachman Information Systems and Knowledgeware. Recently, IBM added a fourth partner, Synon, but the circle remains a tight, elite group. The second tier consists of most other players in the CASE market, some of whom offer products that directly compete with AD/Cycle.

Perhaps the most important advantage of inner circle life — even beyond having IBM as a stakeholder and co-marketer — is the right to sit on the committees that are crafting AD/Cycle.

THIS GAME BEGAN in September 1989 when IBM introduced AD/Cycle. In a sense, it ushered in a class system for the CASE market.

For example, a major piece of AD/Cycle is the Repository Manager information model. In essence, it is the key to AD/Cycle in that it consists of the rules and guidelines that will govern this eventually integrated application development environment.

Inner-circle members work with IBM at establishing those rules and guidelines. It is their combined efforts that produced the first bare bones information model, which was released in June.

"We have the inside track and, I would venture to say, a much deeper level of understanding of the technology than the others will have," said Arnold Kraft, president and chief executive officer of Bachman.

Inner-circle companies claim that, unlike the second-tier members, they have a say in what AD/Cycle will be.

While the second-tier companies have to wait for IBM to release AD/Cycle specifications to modify their products to be compliant with it, the inner circle is right there creating it.

This has two rewards: Their products will be a more integral part of AD/Cycle, and they will be able to deliver AD/Cycle-compliant products more quickly than the second tier.

The second tier claims that the key is to tie into the IBM Repository, period. Since IBM will make specifications public, then all CASE providers, regardless of their relationship with IBM, will eventually provide AD/Cycle-compatible products.

While they acknowledge that the inner circle will have a six-month to one-year lead time on them, they also suggest this: A six-month to one-year lead time isn't critical when it comes to CASE because many customers plan to implement tools slowly over the next few years.

Furthermore, they assert that if a user desperately needs a full-blown CASE environment today, they can provide it now and then migrate users to the Repository Manager later. An inner circle company cannot do that.

In the end, though, the advantages that the companies promote are unlikely to sway the users.

"Those [users] who are essentially Blue and who want to implement AD/Cycle and are prepared to take the time necessary to let AD/Cycle evolve will clearly tend to favor the inner four," said Vaughan Merlyn, chairman of CASE Research.

"The shops that are interested in more short-term results who will value solutions that are here and proven today will value those [IBM] relationships much less," he said.

Hamilton is *Computerworld's* senior editor, systems and software.

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Daisy chained to sunken fortune

Landed in bankruptcy court, Daisy now requesting time to reorganize

ANALYSIS

BY J. A. SAVAGE
CW STAFF

SUNNYVALE, Calif. — Daisy Systems Corp., now in the hands of the bankruptcy court [CW, Aug. 6], is in danger of adding another epitaph to the expanding technology company graveyard.

Singled out as a beacon of entrepreneurship by President Reagan in 1983 when it increased its revenue from $7 million to $25 million in one year, Daisy began falling to earth in the mid-1980s.

The crash came when the company, already weakened by its inability to adapt to open systems rapidly enough, plunged into the costly, hostile acquisition of a company that, once won, proved costly and hostile to assimilate, analysts said.

Daisy began making the Logicon series — workstations with proprietary graphics chips and a proprietary operating system — in 1981. The company aimed its systems at the computer-aided engineering market, specifically in the area of chip design.

An attempt at expansion in the mid-'80s brought the first hint of trouble to the then-high-flying firm.

"They tried to port software over to Digital Equipment Corp.'s platform," said analyst Robert Herwick at Hambrecht & Quist, Inc. in San Francisco. Once there, he said, Daisy "discovered a total lack of discipline and documentation, which led to unportable software."

In 1986, Daisy laid off 10% of its 1,000-person work force. At the same time, eight investor suits were brought against the company, charging it with misrepresenting its financial condition from the time it went public in 1984.

Despite its problems, in 1988 Daisy set out to acquire Cadnetix Corp., a Colorado maker of turnkey systems for printed-circuit board layouts.

When Cadnetix refused Daisy's offer, Daisy bought it in a hostile takeover and eventually moved its entire operations to Colorado under the name of Dazix. The Daisy name, and the holding company that bears it, remained in California.

The costly and psychologically formidable task of integrating Cadnetix into the Daisy fold and Daisy into the Cadnetix home base had to be undertaken by people who were unhappy about where they were, unhappy about what they were doing or both, Herwick said. At that time, Daisy had targeted Sun Microsystems, Inc. as its platform and was the first licensee of Sun's operating system. It marketed the system under the name Advansys series.

The pace of gloomy activity picked up late last year, after Daisy announced a $140 million annual loss. Its chairman and chief executive officer, Norman Friedmann, resigned in December 1989.

He was replaced by Gary Sbona, the founder of Regent Pacific Management Corp., "to assist the company with regard to its current financial problems," according to a statement made at the time.

Sbona did not return *Computerworld*'s calls, but a statement issued by the company said that he would continue as CEO.

Just prior to Friedmann's leaving in December, the company refused to pay the most current interest payment and other fees to its senior lender, Heller Financial, Inc. Daisy is currently in default under terms of its loan agreement.

In March, the company laid off more than 100 people. By May, Daisy's creditors had run out of patience. A group of them hauled the struggling firm into federal bankruptcy court.

In court documents, four creditors other than Heller are listed as having a total of $11.5 million in bonds. Herwick estimated that Heller is holding another $37 million. An attorney for Heller said the company would not discuss Daisy and would not confirm the number. Other creditors have been named, but without specific denominations of the debt.

As an alternative to the involuntary bankruptcy, Daisy petitioned the court two weeks ago to give it a chance to reorganize under Chapter 11 of the Bankruptcy Code. The firm said that the reorganization it hopes to try would necessitate a "substantial reduction" in its work force.

In its reorganization plans, Daisy said that it will establish an independent international group with software and technology licensed to the group and royalties paid back to the U.S. companies. According to a statement, it will also seek a buyer for Dazix, "hopefully as a whole, but if not, in parts."

Herwick did not blame Daisy's new management for its troubles. "It was too little, too late. It would've taken a miracle," he said.

THE COSTLY AND psychologically formidable task of integrating Cadnetix into the Daisy fold and Daisy into the Cadnetix home base had to be undertaken by people who were unhappy about where they were, unhappy about what they were doing or both.

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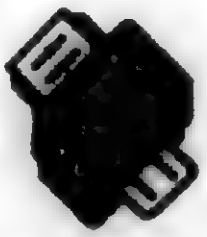

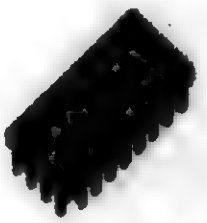

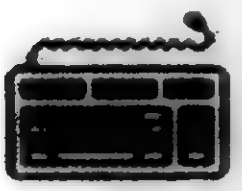

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Businessland dives deeper into red

BY RICHARD PASTORE
CW STAFF

SAN JOSE, Calif. — Businessland, Inc.'s financial frying pan got a lot hotter last week when the computer reseller announced quarterly and fiscal-year losses exceeding $21 million. The firm also reported that, because of accounting errors, it underrepresented its losses in the previous two quarters and is now in violation of certain creditor terms.

The company posted a fourth-quarter loss of $21.5 million on revenue of $339 million, compared with income of $7 million and revenue of $322.6 million in last year's comparable quarter.

Businessland closed out its 1990 fiscal year with a net loss of $23 million and sales of $1.4 billion. The loss included a $6 million restructuring charge related to store closings and layoffs late last year. This is Businessland's first fiscal-year loss since 1986.

The company blamed the negative figures on lower operating margins, increased spare parts inventory and operating losses from its international business and Computercraft consumer retail outlets.

Businessland began to trickle red ink in the fourth calendar quarter of 1989, when it reported a $1.2 million loss and announced a layoff of 5% to 7% of employees. In reality, the situation was even grimmer than it appeared. Recent adjustments for accounting errors almost doubled the previously reported $1.2 million loss.

The losses place Businessland in violation of terms with creditors who hold $50 million in senior notes. The company said it is currently in contact with its lenders concerning the violation.

The reseller announced a recovery strategy in January that included aggressive overseas expansion. It also vowed to roll back discount points to fight the downward pressure on profit margins and increase its offerings and pricing for support and services.

Resellers such as Businessland were responsible for more than 60% of all personal computers sold in the U.S. last year, according to International Data Corp. in Framingham, Mass.

INTERNATIONAL BRIEFS

Not just for PCs

In line with a national effort to establish Taiwan as a force to be reckoned with at the higher end of the computer industry, Taipei-based **Fora International** has acquired **Micro Marketing International, Inc.**, a Pennsylvania-based direct-marketing firm, to expand its sales channel in the U.S. The deal, valued at approximately $10 million, is Fora's second such in two years; last year's catch was **Dyna Micro, Inc.**, a distributor with offices in Los Angeles and Houston.

■

New kid on the bloc

A German/Hungarian joint venture launched last year got high marks from its German partner earlier this month. Munich-based **Montana Computer Consulting** noted satisfaction with the first fruits of **Montana Szamitastechnikai Tanacsado es Szolgaltato Kft.**, a software development firm formed by Montana Computer and a consortium of Hungarian private investors. In addition to contributing 50% of the startup funding, Montana Computer is shipping PCs, printers and optical character recognition equipment to technology-hungry Hungary. Plans for the joint venture firm include a move into the Japanese market.

In 1863,
S. Langhorne
Clemens
decided to change
his name.

Toshiba

FROM PAGE 75

The computers are put to work as part of the so-called Variety Reduction Program popular among manufacturers in Japan. The program's popularity stems from its track record: While it took Toshiba three years to develop the T3100 and J3100 laptops from scratch, it took only nine months to design the Dynabook.

In the U.S. and other countries, technology on the factory lines traditionally has been greeted with fear and confusion by workers. Not so in Japan: The Japanese government's industrial drive, along with rapid adoption of factory automation systems at major companies such as auto makers, has made automation a household word. Toshiba has 2,000 full-time employees at Ome, 70% of whom are engineers. Each engineer has an average of 1.5 Toshiba J3100 laptops to use. "So there were no 'people problems' in introducing the technology," Suga said.

The factory is about 70% to 80% automated, he said. Visitors to the company often comment about the number of people still present on the manufacturing lines, but Suga said that with the fast-paced product life cycles, humans are needed. "There are problems with automated systems. They can't catch up with new technology, so humans are acting as universal super robots," he added.

Along with using the networked laptops for product development, assembly, employee training and administrative work, Toshiba ties the LANs into a network that links the firm's head office with other Toshiba outposts and departments, as well as with parts and equipment suppliers.

For example, using the laptops, Toshiba can communicate with suppliers to order hard-to-get advanced technology parts such as dense memories and gate arrays. "It's hard to get parts for our products. We must order them three months in advance," Suga said. This is part of the well-known "kanban," or just-in-time system, used in Japan to keep production and inventories in line with customer demand.

Toshiba plans to link its factories into the $33 million global digital network it is setting up throughout its 220 locations in 36 nations. The network, scheduled to be cut over in December 1991, will support high-speed Group III and IV facsimile transmissions, store-and-forward switching systems, electronic mailboxes on personal computers and engineering workstations and data communications.

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NATIONAL

BRIEFS

Diehard

Wall Street, gone awry in reaction to escalating uncertainty in the Mideast, is proving a particularly hostile environment for technology stocks. None of that, however, seems to be getting to **Micrografx, Inc.** Last week, the application software vendor announced that it would be numbered among the firms included in the newly expanded NASDAQ National Marketing System. The move will increase the access of stockbrokers and market makers to up-to-the-second stock information.

■

Romancing the stone

San Diego-based **Emerald Systems Corp.**'s acquisition of Longmont, Colo.-based **Digital Storage Systems, Inc.** for an undisclosed amount of cash and stock gives Emerald pioneer status as a network backup and restore supplier entering the real-time, continuous backup market. The purchase of Digital Storage Systems, an early developer of continuous backup software, comes one month after 6-year-old Emerald secured $6.5 million in a third round of venture capital financing.

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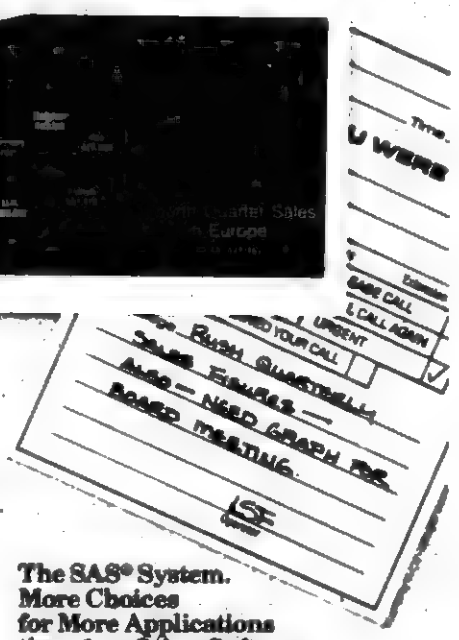

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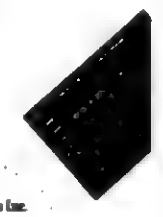

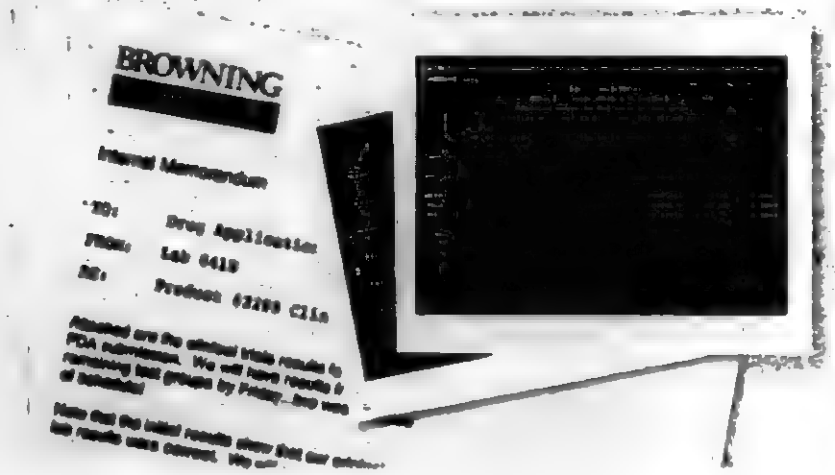

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CW0813

Creating your own promotion

With enough initiative, you can write yourself a new job description

BY JILL VITIELLO
SPECIAL TO CW

At many firms, downsizing and belt-tightening have knocked some rungs out of the traditional corporate ladder. As a result, ambitious information systems professionals need to find new ways to get ahead.

One route they can take is to create a promotion for themselves by writing a new job description. However, they had better go about it the right way.

Sometimes writing your own job description is the only way to get a promotion, says Marilyn Moats Kennedy, author of six books on career planning and managing partner at Career Strategies, a consulting firm in Wilmette, Ill.

The experience of one telecommunications analyst illustrates the process. A leading consumer products firm hired him two years ago to troubleshoot telecommunications problems for users. Because he was interested in local-area networks and personal computers, he volunteered to work in those areas, too.

Among other initiatives, the analyst recommended and implemented the replacement of LAN control units with PCs, which are faster and can handle six times as many users. The move is expected to save the company about $40,000 over three years.

The analyst earned recognition and respect from his boss by going beyond the requirements of his job. At his annual review, his boss suggested that he deserved a promotion but indicated that there was no appropriate job slot.

That's when the two decided to rewrite the analyst's job description to upgrade his position. Working from the current job description, they created an entirely new one that added responsibilities such as standardizing procedures, controlling expenses and managing projects.

"We knew the company was hot on innovation and expense control," the analyst says. "My boss and I created a job that highlighted those skills in order to get it approved."

The plan worked. The analyst and his boss won the approval of the director of information services, who handled negotiations with the human resources department. The telecommunications analyst was named senior network analyst and got a raise commensurate with his new job grade.

Creating a new job description has its risks, but handled carefully, they can be well worth the rewards of a new position and a fatter paycheck. Here are three guiding principles:

1) Make sure your timing is right. For the approach to work, you must show that your initial duties have evolved into different, more demanding responsibilities, says Janice Gaccione, managing partner at MacLean Associates, a compensation consulting firm in New Hope, Pa.

In most companies, a job grade is associated with a salary range. If you're doing great work but handling the same responsibilities you were hired to take on, you should aim for a raise within your present salary range. Usually, a promotion is appropriate only when your responsibilities have grown enough to bump you up to a higher job grade.

A PC administrator who has been servicing three departments and is asked to handle two more is still doing the same job, although there is more work. A PC administrator who is asked to supervise all the PC administrators at the firm is stepping into a new role — managing others.

Make sure you offer proof in your new job description that you are actually doing the work typical of a higher position. It may help to study descriptions of jobs one and two grades above you or to read surveys of jobs and salaries in trade publications.

2) Don't do an end run. Enlist the support of your boss. Without it, you don't stand a chance. "If you go to your boss' boss, you create problems," Gaccione says. Your manager is responsible for determining your position's worth; it's unlikely that a manager at a higher level would differ with his judgment.

> SOMETIMES WRITING YOUR own job description is the only way to get a promotion.
>
> MARILYN MOATS KENNEDY
> CAREER STRATEGIES

Don't go to the human resources department without your manager's approval. "You might as well start looking for a new job," Kennedy says. Human resources departments don't work with individuals for their own benefit. They have guidelines to maintain and will allow changes in job descriptions only with the manager's permission.

3) Target company needs. The analyst saw the need for a LAN expert on staff and set out to become the local LAN guru. His effort showed foresight as well as initiative.

It is particularly important to identify the characteristics your company values. Typical factors include education, experience, skill level, problem-solving ability, complexity and variety of duties, customer contact and leadership. If your company prizes the ability to win customers, for example, emphasize any increase in customer contact associated with the new job.

"Your job description should emphasize what you are being paid to achieve rather than present a list of tasks," Gaccione says. Like the analyst, demonstrate how your work benefits the company by helping customers, saving money or generating profits.

A final word of caution: Don't discuss the change as if it were a well-deserved promotion. The days of the paternal corporation have passed. "There are no entitlements in today's business environment," Kennedy says.

It isn't impossible to get a promotion in a corporation that has gone from pyramid to pancake. It just takes more planning and creativity than ever before.

Vitiello is a speech writer and freelance journalist based in East Brunswick, N.J.

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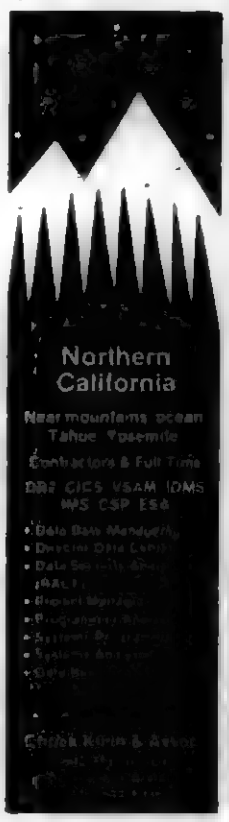

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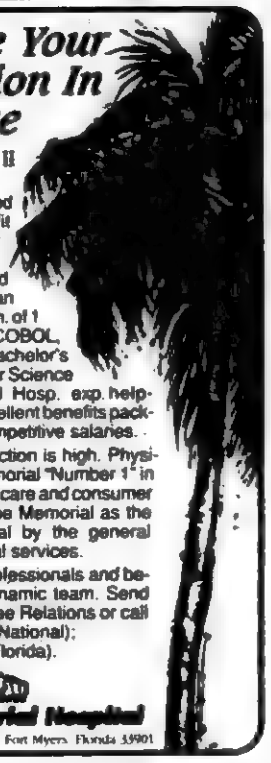

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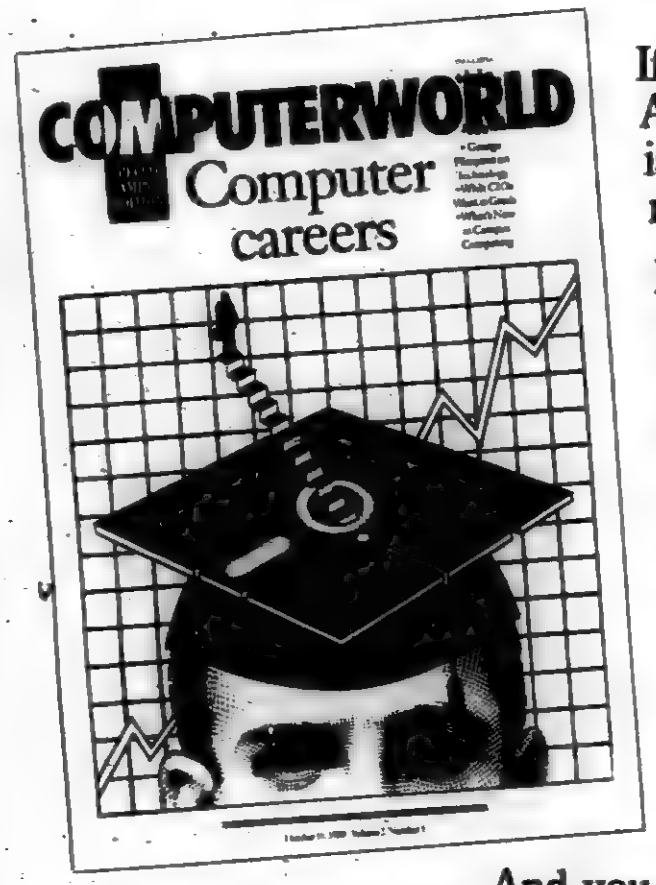

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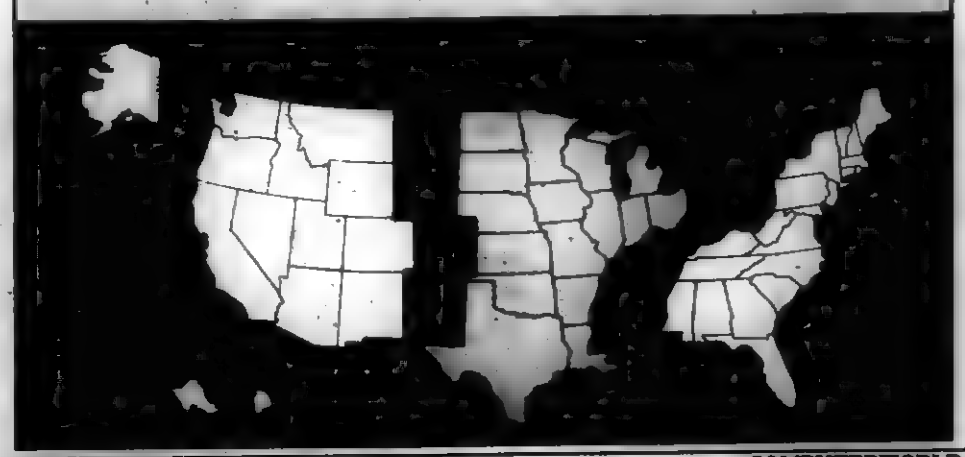

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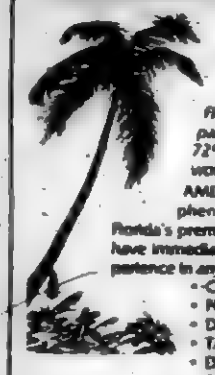

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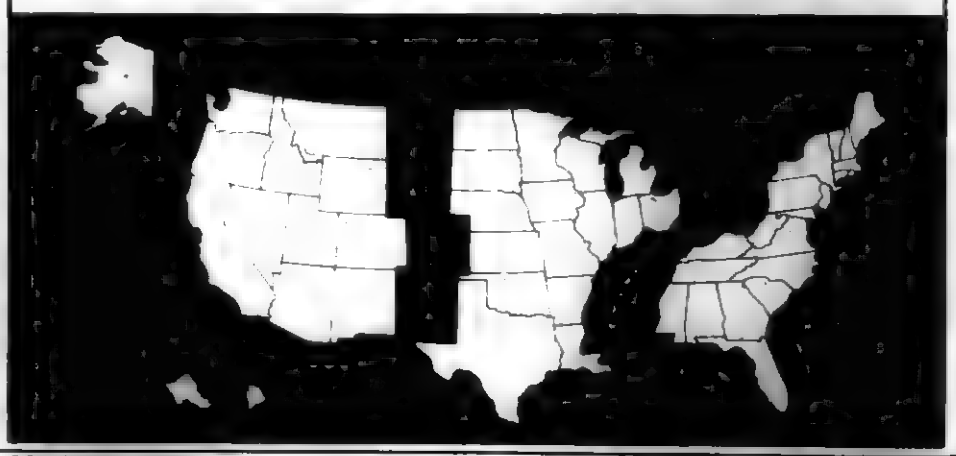

Dealers grapple with new PCs

Sophistication of hardware and software puts a premium on service

The increasing power and sophistication of personal computers and the critical nature of the applications the machines can support are changing the way vendors and dealers sell PCs.

The Systempro from Compaq Computer Corp. illustrates the growing complexity of the machines. Often used as a network server, the Systempro can run two processors and two operating systems. The high-end model sells for as at a list price of as much as $29,999. "It really challenges the definition of the personal computer," says Dan Ness Jr., a microcomputer industry analyst at Computer Intelligence, a market research firm in La Jolla, Calif.

The Systempro stands at one end of a polarized PC market. While the high-end machines take on the character of a minicomputer or workstation, the low-end models are treated more like a commodity.

As rock-bottom prices and sophisticated service become more critical, dealers must move in one direction, says Susan Yamada, an analyst at Merrin Information Services, Inc. in Palo Alto, Calif. They must either be "box pushers" marketing on the basis of price or "boutiques" offering more specialized support than in the past. "In the long run, anyone in the middle is not going to be around," Yamada says.

Businessland, Inc. is trying to adjust to the market. It has positioned its Computer Craft division to sell low-end PCs and its Advanced Products division to market high-end systems. "Businessland is trying not to focus on price and stress value-added sales," Yamada says. Last week, the company posted a $23.1 million loss for its fiscal year and its stock dropped 58%.

Computer Intelligence examined the sources of revenue for different types of resellers to gauge their ability to support complex PC systems (see chart).

Buyers interested in a long-term relationship with a reseller should identify the ones that emphasize continuing support and avoid "fire sales," Ness says.

Vendors, meanwhile, are trying to help dealers sell the more complex PCs. Compaq has opened four demonstration centers to which dealers can bring customers. The firm is also helping chain stores that sell its computers recruit local-area network consultants and other specialists as franchisees.

"It's a different sell," says Mike Berman, a Compaq spokesman. "There's a longer evaluation process. Depending on what the dealer's business is, it will have to make some adjustments."

IBM and Apple Computer, Inc. are helping dealers cater to customers in niche markets. They offer cooperative marketing funds and training to encourage dealers to sell specialized software and services to customers in specific industries.

Ness suggests looking beneath the surface of such arrangements to examine the dealer's willingness and ability to support a particular application. Get references from other customers, he says.

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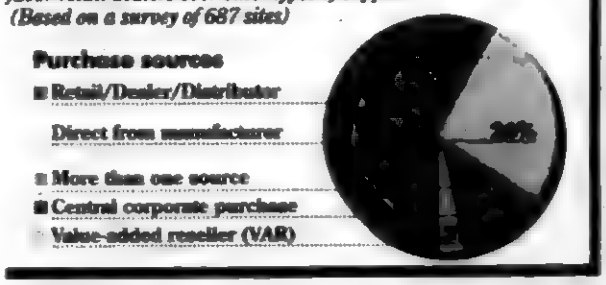
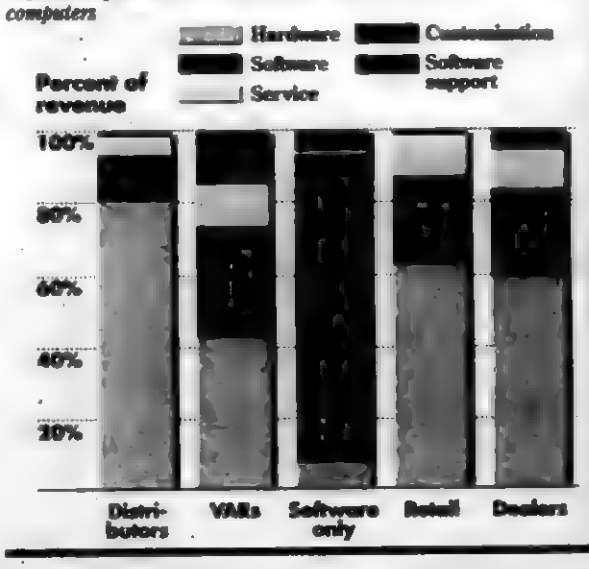
The channel

Personal computer users with more than 500 employees heavily favor retail dealers over other types of suppliers (Based on a survey of 687 sites)



What they do

Value-added resellers are more accustomed than other suppliers to providing services called for by more complex personal computers



Source: Computer Intelligence — CW Chart: Paul Mock

The BoCoEx index on used computers

Closing prices report for the week ending August 3, 1990

	Closing price	Recent high	Recent low
IBM PC Model 176	$400	$660	$250
XT Model 086	$500	$700	$350
XT Model 089	$650	$825	475
AT Model 099	$1,050	$1,375	$475
AT Model 239	$1,125	$1,325	$700
AT Model 339	$1,375	$1,400	$900
PS/2 Model 50Z	$1,650	$2,000	$1550
PS/2 Model 60	$2,500	$2,600	$2,400
Compaq Portable II	$975	$1,150	$875
Portable III	$2175	$2,500	$1,900
Portable 286	$1,400	$1,675	$1,300
Plus	$875	$750	$650
Deskpro	$825	$900	$800
Deskpro 286	$1,400	$1,625	$1,300
Deskpro 386/20	$2,800	$3,100	$2,700
Apple Macintosh 512	$375	$775	$275
512E	$450	$450	$350
Plus	$1,200	$1,275	$1,000
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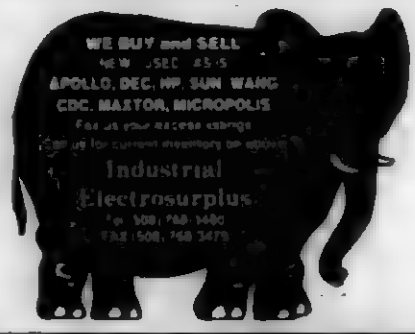

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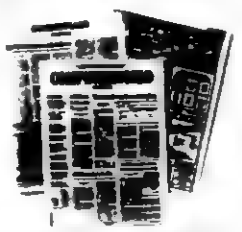

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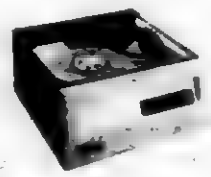

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Teaching presentation skills

Training must show that it is how the message is conveyed that counts

BY JESSICA KEYES
SPECIAL TO CW

There are an estimated 11 million meetings held across the country every day, according to Edward Scannell, past president of the American Society for Training and Development. As a result, the chances are that someday an unsuspecting member of your staff will be asked to make a presentation.

Inside an information systems organization, these presentations can be quick and informal affairs, replete with jargon and chalkboard scribbling. However, as IS professionals move out into business units or fight harder for scarce budget dollars, training organizations must equip them with good presentation skills.

Research findings underline the challenge. People listening to a speaker judge the talk on three attributes: content, the speaker's appearance and his delivery. Content isn't the most important factor. The weighting is more like 8% for content, 42% for appearance and 50% for the way the speaker conveys his message — his enthusiasm, for instance. It's not what he says as much as how he says it.

A lot of people develop severe stage fright when confronted with an audience. Sending them to a class cures the jitters most of the time. People who overcome the problem learn exactly what causes the nervousness, along with some physical and mental techniques to combat it. They include the following:

Know your audience. This consideration may be the most important. A surprising number of IS people make the mistake of delivering the same presentation to senior managers that they would put on for their peers. Presentations must be tailored to the audience. Think of the way IS people design executive information systems: They are quick and easy to use, reflecting the technical abilities of senior managers and the constraints on their time.

Peg the presentation to the time of day. Success can depend on when a presentation is given. The best time is early in the morning, as long as the presenter is energetic and the presentation is full of momentum. Right before lunch is the easiest time to give a presentation; people may be ready for lunch, but they tend to be most alert then. Presentations after lunch suffer from sleepy, overstuffed audiences. A presenter who speaks at 4 p.m. must be mesmerizing.

Warm up the audience. Giving a presentation involves more than speaking in front of a group of people. It calls for working the audience, too. Right before his talk, the presenter should meet and greet as many people as possible. The members of the audience will be more comfortable, and the speaker will avoid standing awkwardly while they gather.

Organize the talk. A presentation has an introduction, a body and a conclusion. While this point may seem obvious, it's an important one to emphasize because presenters often fail to order their thoughts coherently.

The conclusion is the easiest part. It sums up the idea the speaker wants the audience to buy into. The introduction and the body are more difficult. Experienced speakers learn to make power openers: They use the first few moments, when they have everyone's attention, to dramatize their point, often with anecdotes, examples, evidence or statistics. It takes practice to get good at it.

It also takes practice to organize facts logically into the body of a presentation. It's important to get them all in, put them in a logical order and anticipate questions that may arise.

Use body language. As the research suggests, appearance, style and manner of speaking are crucial. Specific considerations include the need to dress appropriately, project your voice, use effective phrasing, employ humor, make eye contact, maintain good posture and emphasize points with facial expressions, gestures and body movements.

Control the environment. There are too many presentations to senior managers where 10 people squeeze into a cubicle for an on-line demonstration. One problem is that no one quite sees the action on the tiny screen. Another one is that the system can go down, sinking the presentation with it. Even if that doesn't happen, most presenters are nervous enough without worrying about the vagaries of a demonstration system. If it's feasible, I demonstrate a system using 35mm slides of screens or a computer slide show.

Presentation devices also help when staff members need to convey facts and figures while demonstrating a system. Additional devices to consider include overhead projectors, computer graphics, multimedia programs and video camcorders.

There's another reason IS organizations should teach staff members these techniques: It's often said people retain only 10% of a verbal presentation after 10 days while they remember 65% of a demonstration.

It takes a savvy IS manager to understand the value of teaching staff members the tricks of the presentation trade. The manager should also keep in mind that while these skills can be taught, it takes coaching and practice for staff members to learn them.

Keyes is president of New Art, Inc., a management and computer consulting firm in New York.

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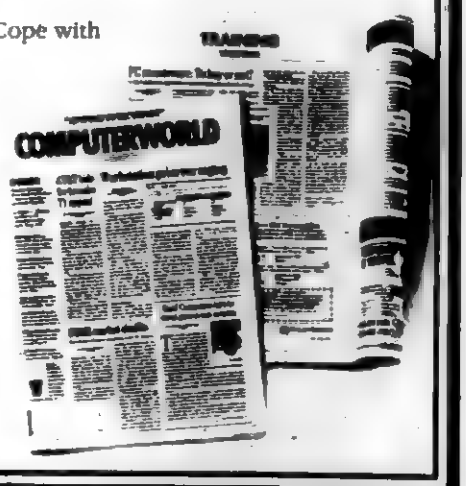

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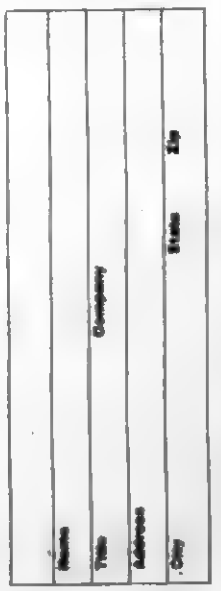

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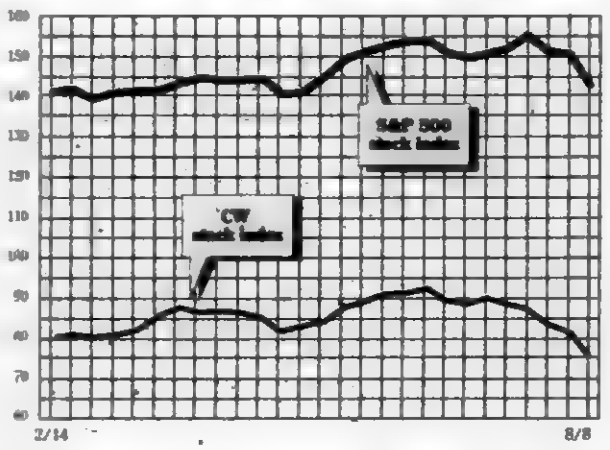

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Peripherals & Subsystems	89.9	85.0
Leasing Companies	71.8	62.2
Composite Index	82.3	75.9
S&P 500 Index	150.2	143

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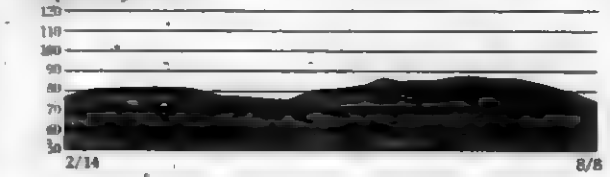

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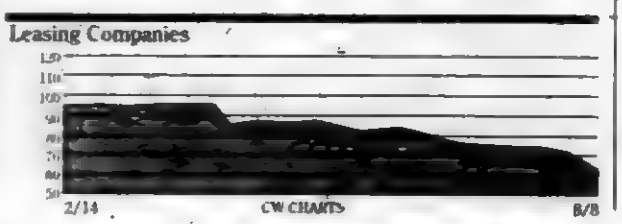

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EXCH		52-WEEK RANGE		PRICE CLOSE AUGUST 8, 1990	WEEK NET CHNGE	WEEK PCT CHNGE
Communications and Network Services						
N	AMERICAN INFO TECHS CORP	68	55	60.125	-1.5	-2.4
Q	ANDREW CORP	26	17	17	-2.3	-11.7
Q	ARTEL COMM CORP	10	3	3.5	-0.5	-12.5
N	AT&T	47	34	35	-1.8	-4.8
Q	AVANTEK INC	7	2	2.875	0.0	0.0
N	AYDIN CORP	21	13	13.25	0.0	0.0
N	BELL ATLANTIC CORP	57	43	46.5	-3.4	-6.8
N	BELLSOUTH CORP	59	49	53.875	-1.1	-2.0
Q	COMPRESSION LABS INC	16	7	13.25	-1.3	-8.6
Q	CONTEL CORP	37	23	31.875	-1.8	-5.2
Q	DATA SWITCH CORP	4	2	3.5	-0.3	-8.7
Q	DIGITAL COMM ASSOC	27	17	21	-1.5	-6.7
Q	DYNATECH CORP	21	15	18.25	0.1	0.7
Q	FIBRONICS INTNL INC	13	5	9.875	-0.9	-8.1
Q	GANDALF TECHNOLOGIES	7	2	3	0.0	0.0
N	GENERAL DATACOMM INDS	7	3	3.375	-0.3	-8.9
N	GTE CORP	38	27	27.5	-1.8	-6.0
Q	INFOTRON SYS CORP	11	3	3	-0.3	-7.7
N	ITT CORP	65	51	54.75	-3.3	-5.6
N	M A COM INC	8	3	4.75	-0.4	-7.3
Q	MCI COMMUNICATIONS CORP	49	31	34.875	-2.1	-5.7
N	NETWORK EQUIP TECH INC	34	6	6.5	-0.5	-7.1
Q	NETWORK SYS CORP	15	7	10.125	-0.8	-6.9
N	NORTHERN TELECOM LTD	30	20	26.25	-0.8	-2.8
Q	NOVELL INC	59	24	45.875	-3.1	-6.4
N	NYNEX CORP	92	73	75.375	-1.3	-1.6
N	PACIFIC TELESIS GROUP	52	40	41.25	-1.6	-3.8
A	PENRIL CORP	9	5	7.125	-0.5	-6.6
N	SCIENTIFIC ATLANTA INC	29	19	22	-3.6	-14.1
N	SOUTHWESTERN BELL CORP	65	51	52.75	-2.0	-3.7
Q	3 COM CORP	19	10	13.75	-2.1	-13.4
N	U S WEST INC	41	33	36.125	-1.4	-3.7
Computer Systems						
Q	ALLIANT COMPUTER SYS	9	3	3.875	-0.4	-8.8
Q	ALPHA MICROSYSTEMS	8	2	2.25	-0.2	-8.5
Q	ALTOS COMPUTER SYS	8	5	8.125	-0.1	-1.5
A	AMDAHL CORP	19	11	13.375	-1.9	-12.3
Q	APPLE COMPUTER INC	50	32	40.125	-2.3	-5.3
Q	AST RESH INC	26	7	20	-1.1	-5.3
N	BOLT BERANEK & NEWMAN	9	4	4.25	0.0	0.0
N	COMPAQ COMPUTER CORP	68	37	54.375	-0.4	-0.7
N	COMMODORE INTNL	12	6	6.375	-0.5	-7.3
N	CONTROL DATA CORP	22	13	13.875	-1.8	-11.2
N	CRAY RESH INC	51	31	38.5	-5.0	-11.5
N	DATA GEN CORP	17	6	6.126	-1.4	-18.3
N	DATAPOINT CORP	6	1	1.5	-0.1	-7.7
Q	DELL COMPUTER CORP	14	5	10.625	-1.4	-11.5
N	DIGITAL EQUIP CORP	103	67	68.25	-5.1	-6.9
N	FLOATING POINT SYS INC	4	0	2.25	-0.1	-5.3
N	HARRIS CORP	40	26	27	-3.4	-11.1
N	HEWLETT PACKARD CO	57	38	38.5	-3.9	-9.1
N	HONEYWELL INC	112	73	98.375	-3.4	-3.3
N	IBM	123	99	103.125	-8.5	-7.6
Q	INFORMATION INTL INC	18	12	12.125	-0.5	-4.0
Q	IPL SYS INC	14	5	10.25	-1.3	-10.9
N	MAI BASIC FOUR INC	6	2	1.875	-0.1	-6.3
N	MATSUSHITA ELEC INDL LTD	180	123	124.25	-12.3	-9.0
Q	MENTOR GRAPHICS CORP	26	14	15.25	-0.5	-3.2
N	NBI INC	2	0	0.25	0.0	-11.0
N	NCR CORP	72	55	66.25	-4.0	-5.8
Q	PYRAMID TECHNOLOGY	36	12	19.75	-3.3	-14.1
Q	SEQUENT COMP SYS INC	34	14	26.5	0.0	0.0
Q	SUN MICROSYSTEMS INC	37	13	30.25	-1.3	-4.0
Q	SYMBOLICS INC	2	0	0.5	0.1	33.3
N	TANDEM COMPUTERS INC	30	17	17.625	-1.3	-6.6
N	TANDY CORP	49	30	33.5	-3.9	-10.4
N	ULTIMATE CORP	11	5	6.375	0.4	6.3
N	UNISYS CORP	23	9	10	-1.1	-10.1
A	WANG LABS INC	7	3	3.75	-0.3	-6.3
Software & DP Services						
Q	AMERICAN MGMT SYS INC	20	11	14.75	-2.8	-15.7
Q	AMERICAN SOFTWARE INC	18	8	10.125	-4.0	-28.3
N	ANACOMP INC	7	2	2.625	-0.4	-12.5
Q	ANALYSTS INTL CORP	24	14	17.5	-2.0	-10.3
Q	ASHTON TATE	15	8	9	-1.4	-13.3
Q	ASK COMPUTER SYS INC	13	7	8.875	-0.8	-7.8
N	AUTO DATA PROCESSING	60	40	50.125	-2.6	-5.0
Q	AUTODESK INC	60	33	49	-4.3	-8.0
Q	BMC SOFTWARE INC	30	14	23.25	-2.3	-8.8
N	BUSINESSLAND INC	14	2	3.75	-3.1	-45.5
Q	COGNOS INC	10	4	8.75	-0.9	-9.1
N	COMPUTER ASSOC INTL INC	20	7	7.625	-0.8	-9.0
Q	COMPUTER HORIZONS CORP	17	7	13.25	-2.8	-17.2
N	COMPUTER SCIENCES CORP	59	40	41.625	-1.5	-3.5
N	COMPUTER TASK GROUP INC	13	9	9.5	-1.0	-9.5
Q	COMSHARE INC	25	16	20.25	-0.8	-3.6
Q	CORPORATE SOFTWARE	16	8	13.25	-1.3	-8.6
N	GENERAL MTRS (CLS E)	38	24	30.625	-2.6	-7.9
Q	GOAL SYSTEMS INTL	19	10	13.75	-1.1	-7.6
Q	HOGAN SYS INC	7	2	3.5	0.3	7.7
Q	INFORMIX CORP	18	8	8.25	-2.1	-20.5
Q	INTELLICORP INC	8	4	4.25	-0.6	-12.8
Q	LEGENT CORP	32	19	21.25	-2.3	-9.6
Q	LOTUS DEV CORP	39	20	20.75	-2.3	-9.8
Q	MICROSOFT CORP	81	38	63.5	-3.3	-4.9
Q	NATIONAL DATA CORP	35	11	12.5	-0.4	-2.9
N	ON LINE SOFTWARE INTL INC	11	6	6.625	-0.4	-5.4
Q	ORACLE SYS CORP	188	15	16	-1.1	-6.8
N	RANSOPHIC SYS INC	19	10	11.25	-1.4	-10.9
Q	PHOENIX TECHNOLOGIES INC	6	2	2.875	-0.4	-11.5
N	POLICY MGMT SYS CORP	43	30	43.375	0.0	0.0
Q	PROGRAMMING & SYS INC	25	16	16.5	-1.8	-9.8
Q	RELATIONAL TECH INC	10	4	4.5	-0.4	-7.7
N	REYNOLDS & REYNOLDS CO	27	17	17.25	-2.4	-12.1
Q	SAGE SOFTWARE INC	18	7	11	-2.0	-15.4
Q	SEI CORP	22	15	19	-1.3	-6.2
Q	SHARED MED SYS CORP	17	12	13.125	-1.3	-8.7
Q	SOFTWARE PUBG CORP	28	14	23.5	-2.8	-10.5
N	STERLING SOFTWARE INC	11	7	8.625	-0.9	-9.2
Q	SUNGARD DATA SYS INC	28	17	21.25	-1.3	-5.6
N	SYSTEM CENTER INC	25	13	13.25	-2.4	-15.2
N	SYS. SOFT INC	29	16	22.375	-0.9	-3.8
Q	WORDSTAR	2	1	0.75	-0.2	-22.6
Semiconductors						
N	ADV MICRO DEVICES INC	11	5	5.625	-1.3	-18.2
N	ANALOG DEVICES INC	11	6	6.625	-0.3	-3.6
Q	ANALOGIC CORP	11	8	9.25	-0.1	-1.3
Q	CHIPS & TECHNOLOGIES INC	26	15	15.75	-0.5	-3.1
N	INTEL CORP	52	28	37.125	-5.4	-12.8
Q	MICRON TECHNOLOGY INC	16	7	9.375	-1.8	-15.7
N	MOTOROLA INC	88	53	76	-4.4	-5.4
N	NATL SEMICONDUCTOR	9	5	5.375	-0.3	-4.4
N	TEXAS INSTRS INC	44	28	29	-2.6	-8.3
A	WESTERN DIGITAL CORP	15	6	9.875	-2.3	-18.8
Peripherals						
Q	ALLOY COMP	2	0	0.438	-0.2	-29.9
N	AM INTL INC	6	2	2	0.0	0.0
Q	AUTO TROL TECH CORP	5	2	2.75	-0.8	-15.4
Q	BANCTEC INC	24	13	18.25	-1.0	-5.2
A	COGNITRONICS CORP	8	3	5.375	-0.9	-14.0
Q	CONNER PERIPHERALS	31	11	23.5	-3.6	-13.4
A	DATARAM CORP	22	8	15.875	-3.1	-16.4
N	EASTMAN KODAK CO	52	36	41.125	-1.3	-2.9
N	E M C CORP MASS	7	3	5.5	-0.1	-2.2
Q	EMULEX CORP	9	4	6.5	-0.6	-8.8
Q	EVANS & SUTHERLAND	35	18	25.75	-0.5	-1.9
Q	ICOT CORP	2	1	1.313	-0.3	-16.0
Q	INTERLEAF INC	8	5	5.125	-1.3	-19.8
Q	IOMEGA CORP	8	3	4.625	-0.4	-7.5
Q	MASSTOR SYS CORP	4	1	1.125	-0.1	-5.3
Q	MAXTOR CORP	17	7	9.625	-1.1	-10.5
Q	MICROPOLIS CORP	10	3	7	-1.4	-16.4
N	MINNESOTA MNG & MFG CO	91	68	84	-7.0	-7.7
Q	PERSONAL COMP PRODUCTS INC	5	4	3.969	0.0	0.0
Q	PRINTRONIX INC	15	8	11.125	-0.3	-2.2
N	QMS INC	21	9	16	-1.5	-8.6
Q	QUANTUM CORP	28	9	18.75	-3.0	-13.8
N	RECOGNITION EQUIP INC	9	4	5	-0.3	-4.8
Q	REXON INC	10	5	6	-0.8	-11.1
Q	SEAGATE TECHNOLOGY	20	11	11	-1.6	-12.9
N	STORAGE TECH CORP	35	9	21.5	-4.4	-16.9
Q	TANDON CORP	4	1	2.313	-0.3	-9.8
N	TEKTRONIX INC	23	12	14	-2.0	-12.5
Q	TELEVIDEO SYS INC	1	0	0.344	0.0	0.0
N	XEROX CORP	69	43	44.625	-2.4	-5.1
Leasing Companies						
N	CAPITAL ASSOC INTNL INC	7	2	1.75	-0.4	-17.6
N	COMDISCO INC	24	17	18	-1.4	-7.1
Q	LDI CORPORATION	18	13	13	-1.5	-10.3
Q	PHOENIX AMERN INC	5	3	3	-0.6	-17.2
Q	SELECTERM INC	9	3	3.25	-1.3	-27.8

EXCH: N—NEW YORK; A—AMERICAN; Q—NATIONAL

Fitness test

Wall St. gymnastics left some firms high, others exhausted

Up, down. Up, down. Last week's calisthenics were tough on technology stocks as investors exercised the right to change their minds — first slamming prices down, then pumping them back up again by Thursday's close. Novell, Inc. lost a chunk but then finished strong, jumping 3½ points by Thursday to 48¼. Microsoft Corp. managed to overcome a price slip, eventually gaining 1⅜ points to reach 65⅛.

Other companies could not hack the rigorous workout and lost big for the week. Hewlett-Packard Co. hit a new low on Monday — along with several other stocks — and then continued the downturn, sliding 3½ points to close the week at 37. Computer Associates International, Inc. sagged to 7⅝, down ⅛ of a point. Lotus Development Corp. announced staff cutbacks and then dropped to a new low. At week's end, its shares were down ⅝ of a point to 21¼.

The bigger they were, the harder they fell. IBM dropped 4⅞ points for the week to 103¼, and Digital Equipment Corp. sank 3¼ points to 68⅝. Texas Instruments, Inc. stumbled 2 points to 28⅜.

Several firms, although battered by traders' whims, ended up right back where they started. Among those unchanged for the week were Intel Corp. at 39¼, National Semiconductor, Inc. at 5⅛, Compaq Computer Corp. at 54½ and NEC Technologies, Inc. at 57.

Telecommunications issues mired it up, with MCI Communications Corp. declining ¼ of a point to 35½ and AT&T losing ⅜ of a point to hit 35⅛. United Telecom, Inc., however, inched up ⅛ of a point to 25⅜.

KIM S. NASH

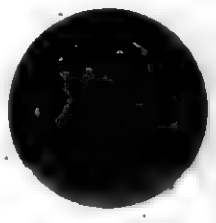
Saudi

FROM PAGE 1

Sysorex International, Inc. has 15 U.S. employees — some of whom have families with them — located in Riyadh to develop a computer system for the Saudi Arabian Department of Customs. Peter Gioe, director of administration and personnel at the firm's Mountain View, Calif., headquarters, said, "They're somewhat anxious, as you might expect. But they are reassured that as soon as the situation warrants, they are in a position to leave."

AT&T has several hundred American employees in Saudi Arabia who are staying for the moment, a spokesman said. However, the company also has "a couple of dozen" employees in Kuwait working on a telecommunications modernization project, and the spokesman said AT&T is working with the State Department to get them out. AT&T has learned through intermediaries that the employees are safe, he said.

"The people on or near the border are very concerned, of course, but many Americans in Saudi Arabia do not seem unduly concerned," Leslie said.



Business in Saudi Arabia is far from slow. It is the largest consumer nation on the Persian Gulf, according to trade figures for the Computer and Business Equipment Manufacturers Association (CBEMA). Year-to-date figures through May 1990 show sales from the Middle East at $161.5 million, with $24.6 million coming from Saudi Arabia and $12.2 million from Kuwait. Saudi Arabia is also the second-largest Middle Eastern market for telecommunications equipment, according to CBEMA.

However, while the deployment of U.S. troops to Saudi Arabia may insulate that nation from invasion or enable it to repel an assault, the Iraqi effort to annex Kuwait has halted business there. Businesses formerly based in Kuwait are looking for a new place to set up shop, and computer vendors in the U.S. that sell equipment through distributors have been forced to move on.

"We have lost some business there, but we didn't put all our eggs in one basket. We'll just have to move on," said Michael Burke, director of sales for the Middle East at Sprint International.

"We're not going [to the Middle East] again. We won't do business over there," said Ross Perot, chairman of Perot Systems Corp. In 1979, Perot executed a daring rescue in which he freed two U.S. employees of Electronic Data Systems Corp., which he headed, from an Iranian prison.

Perot said his advice to U.S. companies with Middle East operations is to pull their people out as soon as possible. "If you have a problem over there or anywhere in the world, you'll get no help from anyone in the U.S. government," he said.

Few computer companies do direct business in the Middle East, preferring to work through local third-party distributors.

"WE'RE NOT going [to the Middle East] again. We won't do business over there."

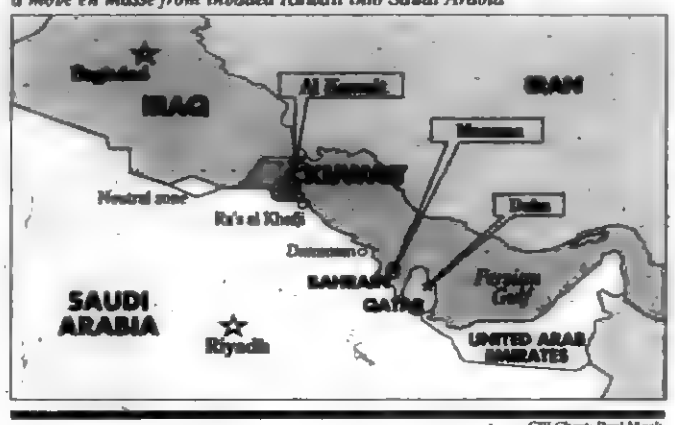
ROSS PEROT
PEROT SYSTEMS CORP.

Until recently, Kuwait was the headquarters for many of those distributors. The country was favored for setting up headquarters, because entering and leaving Kuwait was relatively easy, said Burke, who oversees the Sprint business conducted through distributors.

National Correspondent Mitch Betts contributed to this report.

Mounting tension

With growing turmoil after Iraq's recent actions, computer merchants faced a move en masse from invaded Kuwait into Saudi Arabia



CW Chart: Paul Mock

Oil trackers quicken pace

BY MITCH BETTS
CW STAFF

The Middle East crisis has meant very hectic times at Computer Petroleum Corp., a St. Paul, Minn.-based firm with an electronic database that tracks wholesale and retail petroleum prices. "We're running full out," said Gary Thomas, director of operations.

The company, which surveys the oil industry to create its pricing database, allows subscribers to dial into an NCR Corp. 9800 mainframe computer and download the price surveys.

Thomas said the number of subscriber log-ons has increased 30% to 35% since the crisis began. The number of data transfers is up 28%, he said.

One customer, the American Automobile Association (AAA), relies on the company for the "AAA Fuel Gauge Report," which was used by the news media and concerned politicians to track the daily price hikes at local gasoline stations. For example, it showed that self-serve, regular unleaded gasoline cost an average of $1.237 per gallon on Aug. 8, which was 16.2 cents higher than the price just before Iraq's invasion of Kuwait.

Most subscribers are companies in the petroleum industry that use the database in the morning to guide them in making pricing decisions for the day, Thomas said.

Kuwaiti businessman flees turmoil

BY MAURA J. HARRINGTON
CW STAFF

Two weeks ago, Abdulmohsen Al-Babtain was a busy man as president of Gulfnet Kuwait, an international distribution company with headquarters in Kuwait. Today, after fleeing Kuwait, which was invaded by Iraq on Aug. 2, Al-Babtain is happy just to be alive.

"It all happened early in the morning. We woke up to the sound of artillery and machine guns at four or five in the morning," explained Al-Babtain, a Kuwaiti national who managed to escape his homeland by car shortly before Iraqi President Saddam Hussein ordered all Kuwaiti borders to be tightly sealed.

"At first people didn't take [the invasion] seriously because [Kuwait] had helped Iraq for all those years," Al-Babtain said, referring to reports that Kuwait had given millions of dollars in aid to Iraq after the war between Iran and Iraq.

"It was the shock effect at first. People just went to work around everything. But then it got serious. If you went on the roof you could see the heavy bombing and the tanks," Al-Babtain said.

"I lost track of time, but on the fourth day we escaped by car . . . . I took my grandmother, and my family — my wife and kids — was already in London, but my brothers and sisters, they are still in Kuwait," Al-Babtain continued.

"I HAVE HEARD the Iraqis have stopped everything. Our business there is lost."

ABDULMOHSEN
AL-BABTAIN
GULFNET KUWAIT

Al-Babtain, whose company distributes Sprint International's telecommunications products in the Middle East, said he had managed to contact his family by cellular radio from the town of Khafji on the Kuwait-Saudi border. He made the contact shortly before the Iraqi army overtook the town, he said.

Al-Babtain said all business in Kuwait has been halted.

"I have heard the Iraqis have stopped everything. Our business there is lost," he said.

Persian Gulf customers

Kuwait was one of many Persian Gulf countries purchasing computer equipment from Al-Babtain's and other distribution companies in the Middle East.

According to Al-Babtain and other distributors, computers are infiltrated throughout all levels of business in Persian Gulf countries, including Kuwait, the United Arab Emirates, Oman, People's Democratic Republic of Yemen, Saudi Arabia, Iraq, Jordan and Bahrain.

"We have global support to go ahead with our [business] plans in other [Persian Gulf] countries, and we will do that. We were involved in this business in Kuwait since 1977. That's gone, unfortunately, and will take a long time to build back up," Al-Babtain said. "But for the long term, we will continue to establish joint ventures, continue with research and development and build up a maintenance company for the whole Persian Gulf."

DEC opts for Objectivity's object-oriented database

BY JEAN S. BOZMAN
CW STAFF

MENLO PARK, Calif. — After studying a cluster of object-oriented database companies on both the East and West Coasts, Digital Equipment Corp. picked Objectivity, Inc., a 2½-year-old firm, to give DEC users their first window on the technology.

The relationship between DEC and the 30-person start-up firm, which began selling its product in April, is still being defined. It is not an exclusive relationship, since Objectivity is also being ported to Sun Microsystems, Inc., Hewlett-Packard Co. and Sony Microsystems, Inc. platforms.

"We run today on Sun-3s and Sun-4s," Objectivity President Bob Field said. "We're also porting it to 386-based PCs, Decstation 3100s, Vaxstations and Sony workstations."

Vital to Objectivity's architecture is an ability to "translate" the data automatically. "We store the data in the format in which it was last used," Field explained. "If you store the data on a Sun-4 and the Decstation wants to read it, the database software translates it and deals with the bit-ordering and floating-point information."

DEC engineers are working on an interface between Objectivity/DB and DEC's own RDB relational database, said Lydia Bennett, product manager for object-based systems at DEC. However, final DEC product and pricing information is several months away.

The joint development and marketing partnership is a first for the industry, said Les Hellenack, director of new software technologies at International Data Corp. in Framingham, Mass. "Objectivity pulled a coup by being the first object-oriented database selected to become part of a systems vendor's product line," he said.

NEWS SHORTS

Soderblom token-ring claim tossed

Last week, the U.S. Patent Office disallowed Olof Soderblom's most recent attempt to maintain his patent claim on the technological basis of the IEEE 802.5 token-ring standard. The office had already ruled that Soderblom's original 1968 patent did not apply to the specific closed-loop token-ring technology used in 802.5. Soderblom then entered 34 arguments against this decision, but the patent office disallowed those points that directly related to his 802.5 claims.

Microsoft prepares OS/2 gap filler

Microsoft Corp. will ship a modified version of OS/2 Release 1.2 to OEMs next month, with more than 30 hardware vendors, including IBM, slated to receive it. Microsoft plans to release it within the next 90 days. In addition to supporting OS/2 LAN Manager 2.0, which Microsoft said will ship next week, the upgraded OS/2 Release 1.21 will provide users with "significant" advances in printer functionality, according to Pat Bellamah, Microsoft's OS/2 product manager.

Autodesk pirates paying up

Autodesk, Inc. said last week that its antipiracy campaign is starting to pay off. More than $2 million has been collected in 18 months from software users who have been nabbed making illegal copies of Autodesk software, the company said.

IBM mixes, matches net groups

IBM has quietly initiated the separate consolidations of its local-area network and network management groups as part of a strategy to focus and expand these strategic areas, a company spokeswoman said last week. Network management products at IBM were formerly divided into products, systems management and alliances groups, whose directors reported to IBM's director of communications programming, Van Hettinger. The reorganization puts all of these groups under William Warner, former director of the Application System/400 programming laboratory in Rochester, Minn. LAN products, which were formerly scattered among such IBM groups as the Entry Systems Division, are now under Donald Haile, former director of IBM's software systems for enterprise systems.

Korea phone network goes digital

South Korea is planning to install 2.68 million telephone lines nationwide next year, some 62% of which will employ the country's own TDX digital switching system, according to a Korea Telecommunications Authority (KTA) announcement. When the installation is completed by the end of next year, KTA said there will be 36 telephone lines for every 100 inhabitants. KTA said it will stop supplying its conventional analog exchange system next year.

AT&T snags more Sabre business

AT&T has won a multimillion-dollar overseas slice of the Sabre pie for the next five years. Networked AT&T 6386/SX and 6386/25 Workgroup Systems will be the hardware of choice for the Sabre Travel Information Network's agencies and administrative offices in Europe, Canada, the Caribbean and the Pacific Rim, the companies said. Sabre's Travel Information Network is the marketing arm of the Sabre computerized reservation system. AT&T last year was awarded Sabre's U.S. domestic computer contract, valued at $100 million.

China to focus on smaller systems

China will suspend mainframe development projects and concentrate its domestic computer efforts on producing open system minicomputers and superminis, according to a government official. China is also seeking cooperative agreements with foreign workstation vendors. The official said China can now manufacture workstations based on Hewlett-Packard Co.'s Precision Architecture.

Graphics workstation market upbeat

BY ELLIS BOOKER
CW STAFF

DALLAS — Whether or not the graphics capabilities shown at Siggraph are destined for the average television — let alone the average computer — the market for technical workstations able to manipulate high-resolution, three-dimensional graphics and images will keep workstation vendors humming.

To that end, Sun Microsystems, Inc. in Mountain View, Calif., unveiled two high-end "visualization" workstations in Dallas last week.

The two models of the Sparcstation VX — priced at $55,900 and $86,900, respectively — make use of Intel Corp.'s 64-bit I860, a chip that has become a darling among workstation vendors for use in their graphics subsystems since its introduction by Intel last February.

Sun also introduced a multiprocessor MVX board option for the new VX workstation that can boost its 40 million instructions per second (MIPS) and 60 million floating-point operations per second (MFLOPS) peak performance to 160 MIPS and 240 peak MFLOPS.

The new hardware will use Sunvision, a $3,000 software package for image processing and photo-realistic rendering on the Sparcstation, and XGL, a two-dimensional and 3-D graphics software library, both of which Sun introduced in March.

Some other announcements made by the 245 Siggraph exhibitors included the following:

- Texas Instruments, Inc. said it has developed a working prototype of a laser-based display system that presents real 3-D images that can be seen from any angle with a 750- by 750-pixel resolution. TI said it was seeking parties interested in developing applications for its Omniview display system.
- Digital Equipment Corp. introduced DEC AVS, a data visualization software tool for its Decstation family of Unix workstations. It is DEC's implementation of Stardent Computer, Inc.'s Application Visualization System software under a licensing agreement. DEC also said it would work with Rasterops Corp. on full-motion television and video for its workstations and with Brooktree Corp. on true-color windowing systems.
- Edsun Laboratories, Inc. in Waltham, Mass., showed a pin-compatible replacement chip for the display subsystems of IBM Video Graphics Array (VGA)-compatible boards that enables them to show photo-realistic still images on ordinary monitors. The very large-scale integration chip, which replaces the standard random-access memory/digital-to-analog converter on a VGA board, mixes two colors per pixel, allowing the standard personal computer to move up from 256 colors to 790,000 colors. The chip also helps smooth the rough edges — or "jagging" associated with VGA displays.

The chip, which is being co-developed and manufactured by Norwood, Mass.-based Analog Devices, Inc., will be in production in September, and display drivers have already been developed for a few popular PC applications, according to Edsun officials, who said a driver for Microsoft Corp.'s Windows Version 3.0 is scheduled to ship in November.

REPORTER'S NOTEBOOK

Siggraph when it sizzles

DALLAS — A gigantic metal cockroach ominously prowls the streets of a full-color, photo-realistic world. Aside from being very un-Disneylike, this cartoon is special because it was created on a computer.

Welcome to Siggraph '90. The computer industry graphics show last week delivered, as expected, its usual dose of breathtaking 3-D computer simulations, much to the delight of the 25,000 attendees in Dallas.

From "visualization," in which huge amounts of complex scientific data are portrayed graphically, to "virtual reality," in which the user dons a helmet and gloves to enter and interact with computer-generated worlds, graphics technology has placed an array of tantalizing tools in the hands of software and applications developers.

What these superb animations will mean for traditional business computing is harder to see, but even here trends are coming into focus. Take, for example, a graphical representation of air pollution data, shown at one of the 28 day-long seminars at the conference. In the demo, a topological map of Los Angeles was superimposed over a satellite photograph; over this contoured surface, colored globes representing tons of pollution and arrows representing air flow colorfully danced — a vivid, shocking portrayal of the sorry state of LA's smog problem.

Hypermedia is a young science, Walter Bender, principal research scientist at MIT's Media Lab, said earlier in the day. "Books and writing have had centuries to evolve . . . hypermedia has only had a decade," he said.

High-definition television is not the issue, Bender continued. He said consumers simply are not complaining about the image quality of their TV sets.

"The complaints are over content," Bender said, adding that computers, software and direct distribution of programming can and will make TV sets and the information they carry more adaptable to the needs of the viewer.

ELLIS BOOKER

Low-cost Sparc systems to integrate DOS

BY J. A. SAVAGE
CW STAFF

Promising availability in the next few months, Taiwan-based Tatung Co. has a product that integrates personal computers based on DOS and complex instruction set computing as well as workstations based on Unix and reduced instruction set computing.

Tatung, a high-volume PC clone maker, licensed Sun Microsystems, Inc.'s Scalable Processor Architecture (Sparc) in June 1989. It is the first foreign company to import Sparc-based workstations. Several other foreign corporations have licensed Sparc but have yet to market workstations. Japan-based Toshiba Corp. imports laptops based on Sparc.

Tatung will use a U.S. corporation — Mars Microsystems in Mars, Pa. — as the distributor.

The basic workstation, called Mariner 41, will be based on Sparc, with a base price of $5,995 — about $1,000 more than a Sun diskless workstation. A DOS add-on, which uses an Intel Corp. 80386 processor that fits on the Sparc motherboard, will be optional, according to a spokeswoman.

Tatung is the first of an expected flood of Sparc-based foreign clones. "Sun will have to live with the results," said Bruce Jenkins, an analyst at Daratech, Inc., a Cambridge, Mass.-based market research firm. "On the positive side, Sparc as a standard is promulgated far and wide. On the negative side, it intrudes on the company's market share."

AS/400 may break free of SNA

BY ELISABETH HORWITT
CW STAFF

NEW YORK — IBM is expected to further extend the Application System/400's ability to communicate outside the Systems Network Architecture environment next week.

Announcement of the extensions, which will probably share the limelight with news of IBM's low-end additions to the AS/400 family [CW, Aug. 6] will encompass major local-area network protocols such as Ethernet and Transmission Control Protocol/Internet Protocol (TCP/IP), as well as the Integrated Services Digital Network (ISDN) telecommunications standard.

Features expected for the AS/400 include the following:

- Support of 802.3 Ethernet on the AS/400's internal adapter. This will provide less costly and more efficient Ethernet connections than the current support, which requires an outside box.
- An adapter with a total throughput of 16M bit/sec., which would connect up to four Token-Rings to the AS/400. The current Token-Ring adapter for the AS/400 supports only 4M bit/sec. speeds.
- Faxsupport 400, a software product that would turn an AS/400 into a facsimile server for personal computers using IBM's PC Support program.
- Support of Telnet, the terminal-to-host application for TCP/IP.
- Software to provide links between the AS/400 and IBM's RISC System/6000.

Both the faster Token-Ring connection and the fax server software could find a home at Kendall Co., according to Steve McManama, director of computing services at the Boston-based health care company.

AS/400 link

Kendall is in the process of linking its extensive AS/400 installation over Token-Rings running on unshielded twisted pair wire and is looking for a way to boost transmission, McManama said. Kendall is also working with Electronic Data Systems Corp. to attach a fax machine to the AS/400. He would welcome software to allow PCs to send faxes through the host, he added.

Kendall is less interested in TCP/IP than in Open Systems Interconnect (OSI) as a way to link its AS/400s to a Digital Equipment Corp. VAX 8500, McManama said. IBM has made a statement of direction that it will implement OSI on the OS/400 operating system but is unlikely to announce such a product next week, sources said.

Several expected introductions will expand the AS/400's ability to act as the focal point for meshing voice and data networking applications over ISDN.

Teleos Communications, Inc. has developed an ISDN board for IBM that allows the AS/400 to communicate over a 1.5M bit/sec. ISDN Primary Rate Interface, a Teleos spokeswoman said. In addition, Teleos is expected to introduce an ISDN server platform that will coordinate communications between the host and lower speed ISDN lines out to individual devices, either locally or remotely.

The server is also expected to play a part in IBM's expected announcement of ISDN-based links for Callpath 400, its host-to-private branch exchange interface for the AS/400.

IBM would not comment on whether the above networking announcements were in the works.

A key networking product that probably will not be ready in time for next week's introduction is a programmable protocol converter that will allow users to link virtually any type of proprietary device to the AS/400, according to David Andrews, president of the Cheshire, Conn. consulting company ADM, Inc.

A prototype of the product, which IBM has demonstrated to some of its business partners, incorporates a Personal System/2 motherboard and "selected PS/2 chips and components in a small physical package," according to Andrews.

Communications feast

IBM's AS/400 connectivity announcements will act as an appetizer to a much larger banquet of communications-related introductions slated for early next month, several sources said.

An expected new version of IBM's Netview network management system will include at least two long-awaited enhancements: an internally developed graphics-based user interface and support of IBM's peer-to-peer LU6.2 protocol, according to Richard Boyle, a program director at Stamford, Conn., research firm Gartner Group, Inc.

Based on IBM's Presentation Manager, the graphics-based interface will supersede the Netcenter Netview workstation, which IBM purchased from US West approximately one year ago. However, the initial release will only contain pieces of the final IBM product, one source said.

Native support of LU6.2 on Netview will open the way at last for effective two-way communications between network management hosts and non-IBM networking systems, according to Joseph Mohen, president of Seacliff, N.Y., consulting company Teleprocessing Connection.

Currently, non-IBM devices must access Netview hosts via Netview/PC, a PC-based interface that has been roundly criticized by vendors as being awkward and limited. LU6.2 will also provide more effective communication between multiple Netview hosts and between Netview and other vendors' systems that control different network domains, Mohen said.

Also in September, IBM will release a list of approximately 40 LAN and LAN-diagnostic vendors that "are lining up behind IBM for integrated network management," Boyle said. "Not too many major companies will be missing."

ELISABETH HORWITT

Unix

FROM PAGE 1

Brothers is currently using a large number of Unix-based Sun and Pyramid Technology Corp. workstations.

While Unix celebrated its 20th anniversary last year, the operating system has only been available commercially since 1983 — coincidentally, at the height of the glory years for the Massachusetts mini makers. Those companies did not start to invest serious time and substantial money into multiplatform interoperability until the middle to latter part of the decade, well after the Unix movement had begun to gather steam.

DG was one of the earliest on the Unix bandwagon. It is currently betting the future on its reduced instruction set computing-based Aviion series, introduced in February 1989, and the company has reportedly signed more than 200 Aviion resellers to date.

"I think they are pivoting successfully from old to new world computing with their Aviion line," Colony said, "but they have to make money to keep customers, and the Aviion hasn't made enough to keep them in business." The company is currently depending on its proprietary MV line as its primary source of revenue.

Building now with old

DG has also been able to leverage its installed MV base to increase Aviion sales — at least in part. According to Rob Morrow, an Aviion user and planning manager at Boise Cascade in DeRidder, La., his company's decision to purchase the Aviion systems was based on the fact that all existing software applications were built on DG's AOS/VSII platform, so "it just made sense to go with the Aviions — it allowed us to go with the same structure and framework."

George Weiss, an analyst at Gartner Group, Inc. in Stamford, Conn., said he feels that DG's Distributed Application Architecture is the most comprehensive of the second-tier companies' next-generation road maps but cautioned that the vendor must rapidly establish itself as a strong presence in vertical markets.

Wang, with revenue dropping 10% each year and no clear technology direction, might be in for a somewhat rougher ride. The company seems more preoccupied with finding the next dollar to keep it afloat than with pursuing new product development, Colony said.

However, users are keeping a stiff upper lip. Clem Kichuck, president of Market Corp. Systems in Westport, Conn., has been using Wang equipment for 10 years and is enthusiastic about Wang's progress in the Unix arena. Although a Unix version of Pace, Wang's database system, is not due out for another 12 months, Kichuck remained undaunted.

"Pace is, in my estimation, the finest database in the world," Kichuck said. "The only problem has been that it was a strictly proprietary system."

Larger niche market?

According to Weiss, Wang needs a larger niche market. "Their Unix ports for Pace systems are starting out late, and they have no high-end Unix strategy to speak of," he said. Weiss added that he is more optimistic regarding Prime's situation, where he sees Prime as being in a reasonably good position to move its 50 series users to EXL, Prime's Unix port. Prime will also be porting its Information database to Unix later this month.

The five-year forecast for the former minicomputer kings does not look all that bad. Analysts favored DG as a survivor, providing the company can continue to trim fat and learn to operate in the low-margin marketplace.

THE FIVE-YEAR forecast for the former minicomputer kings does not look all that bad.

Industry experts generally predicted that Wang is likely to fail under new ownership within the next 12 to 18 months. They also speculated that Prime would evolve into two separate companies — Computervision playing the computer-aided design and manufacturing market and the other half devoted to departmental systems.

"It's easy to criticize in hindsight," Kernochan said. "These companies just couldn't react fast enough to the shifts in the marketplace. In the next couple of years, we're going to see cost cutting and more cost cutting, and over the long term, if they can succeed in the Unix world, they have a good chance for survival."

Second-class postage paid at Framingham, Mass., and additional mailing offices.
Computerworld (ISSN 0010-4841) is published weekly, with a single combined issue for the last week in December and the first week in January by CW Publishing/Inc., 375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171.
Copyright 1988 by CW Publishing/Inc. All rights reserved.
Computerworld can be purchased on 35 mm microfilm through University Microfilm Int. Periodical Entry Dept., 300 Zeeb Road, Ann Arbor, Mich. 48106. *Computerworld* is indexed: back issues, if available, may be purchased at $2.00 per issue, plus postage. Call (800) 669-1002.
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Subscription rates: $2.00 a copy; U.S. — $48 a year; Canada — $110 a year; Central & So. America — $130 (surface), $250.00 (airmail) a year; Europe — $195 a year; all other countries — $295 a year. Four weeks notice is required for change of address. Allow six weeks for new subscription service to begin. Subscriptions call toll free (800) 669-1002.

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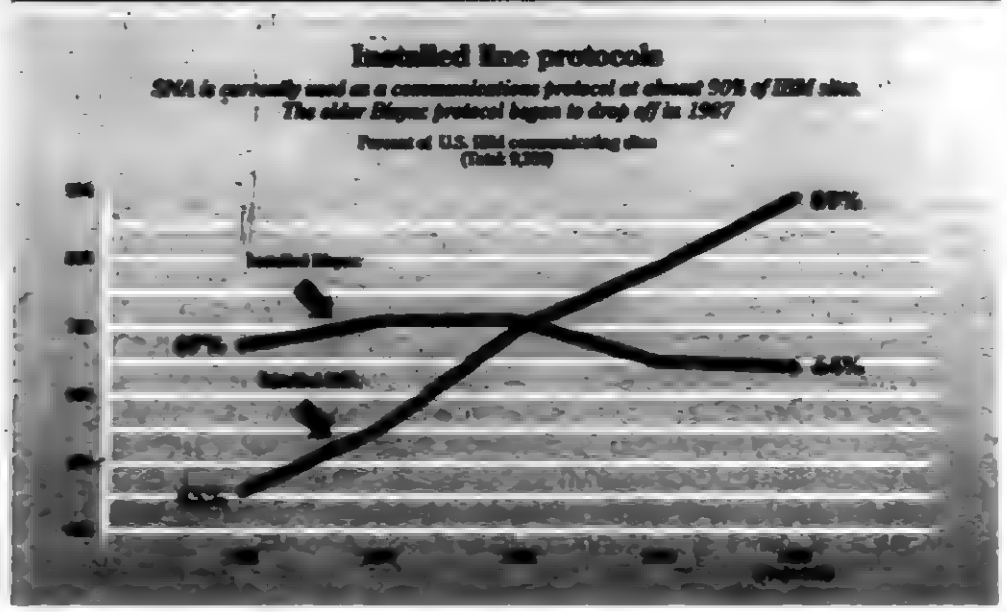
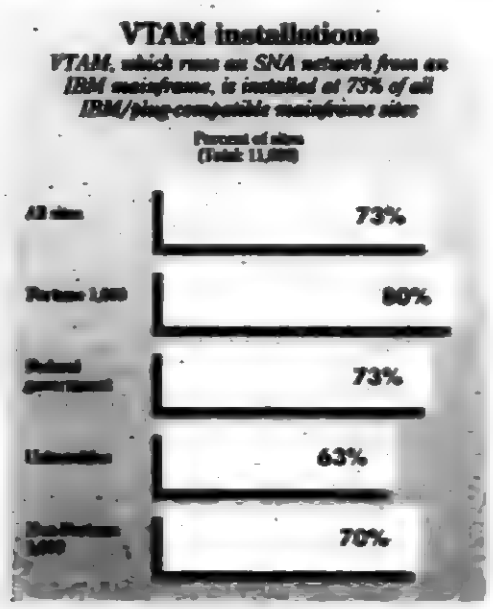
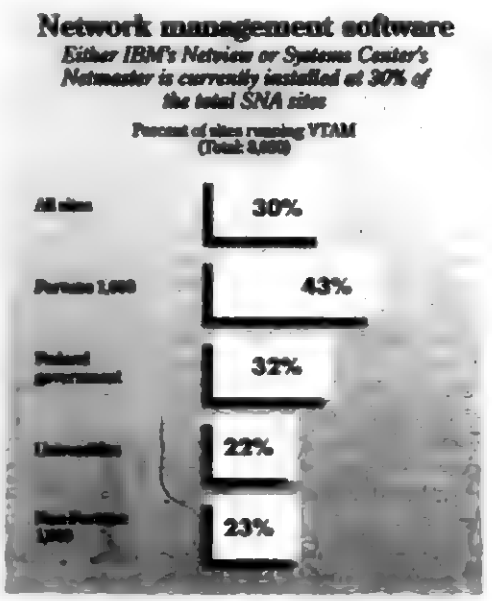
TRENDS

SNA

IBM's major hurdle was to get sites using older bisynchronous protocols to make the SNA upgrade investment. It's been well over a decade, but SNA is now right where IBM wants it to be — maybe.







Source: Computer Intelligence, La Jolla, Calif.

CW Chart: Tom Monahan

NEXT WEEK

Manager's Journal follows this week's special supplement on information systems in Japan with a profile on **Haruo Nabeshima**, general manager of IS at construction giant Taisei Corp. Like many Japanese IS managers, Nabeshima has spent his career rotating through several functions at Taisei and has worked in IS for only three years.

Kato Kerry/Gamma Liaison

The triumph of perestroika is closely tied to computing, but Soviet computing ambitions currently far outweigh its abilities. New technology brings with it some weighty questions about such issues as information planning, as well as security and societal impact. Get a firsthand computing tour of the Soviet Union in In Depth.

INSIDE LINES

Painting the town

Next, Inc. is reportedly preparing for the debut of its color monitor system on Sept. 18 in San Francisco. The new offering will provide photo-realistic color and a graphics accelerator. Meanwhile, Businessland is hoping to clear some of the older monochrome models off the shelves in anticipation of the upcoming announcement and has chopped the list price of the systems 20% to $8,000.

LAN Man plan elan

Mike Murray at Microsoft confirmed that the long-awaited LAN Manager 2.0 is shrink-wrapped, in the box and will be on its way to distributors this week. "The product is obviously a little later than we had thought," he noted. Final code was shipped to OEMs several weeks ago. "They are all working with it," he said, noting that different OEMs add different levels of value to the product.

Headed for Vancouver?

Bill Gates, Microsoft's grand pooh-bah, recently bought a Porsche 959 and had it shipped to the States. Of course, he can't legally drive the much sought-after symbol of status and speed here, because it's too fast for U.S. roads and its emissions don't pass this nation's muster.

Relief from number-crunching

Why should PC users have all the fun? Tiger Media, a publisher of computer games on CD-ROM, is planning to release a role-playing game for Sun 's Sparcstations and compatibles. "Airwave Adventure: The Case of the Cautious Condor" will retail for $75 and will soon be available directly from the firm.

With friends like these...

The success of Intel's I860 graphics chip was apparent at the Siggraph '90 show in Dallas last week, turning up in boxes from about 20 vendors — including HP, Alliant, DEC and Sun. But Intel wants a piece of this game, too. The chip maker was demonstrating its own workstation using the chip in its booth. According to knowledgeable sources, a 40-MHz version of the I860 Image Workstation, marketed as a software development platform, will be available later this year.

Recalculating the spreadsheet

A source close to Lotus claims that some "really scared" Lotus employees are anticipating another wave of layoffs. "Managers' bonuses this year will depend in part on how well they cut costs," the source added. Lotus spokesman Richard Eckel declined to confirm or deny that report. However, he did concede that recent steps toward decentralization will mean "greater accountability, as well as greater flexibility, for those people managing decentralized business units."

Hall of fame?

Last week, when we received a collect call from Craig Neidorf, co-editor of "Phrack," a newsletter for hackers, we were certain that the 20-year-old college student was about to drop a major scoop into our laps. Neidorf was recently cleared of charges stemming from a plot to steal a text file detailing the workings of Bellsouth's emergency 911 telephone system. Neidorf and his attorney are planning to file a civil lawsuit against Bellsouth as a result of the case. Naturally, we though he was going to fill us in on the latest in this hack-fights-back story. But no, Neidorf wanted clips for his scrapbook — and oh, he wanted the originals, the one with the color photos and not copies, please.

Limpest promotional trick of the year: Nice try by Tandem media planners who invited the press to a no-news confab aboard a cruise through New York harbor next month. But the press hounds who pulled the napkin out of the champagne glass delivered at the close of deadline last week aren't likely to be in such a friendly mood after seeing a shower of gold confetti sprinkle their rugs. Surely Tandem has better things to do with its money. Direct your suggestions to News Editor Pete Bartolik at (800) 343-6474, fax them to (508) 875-8931 or address them to COMPUTERWORLD *via MCI Mail.*

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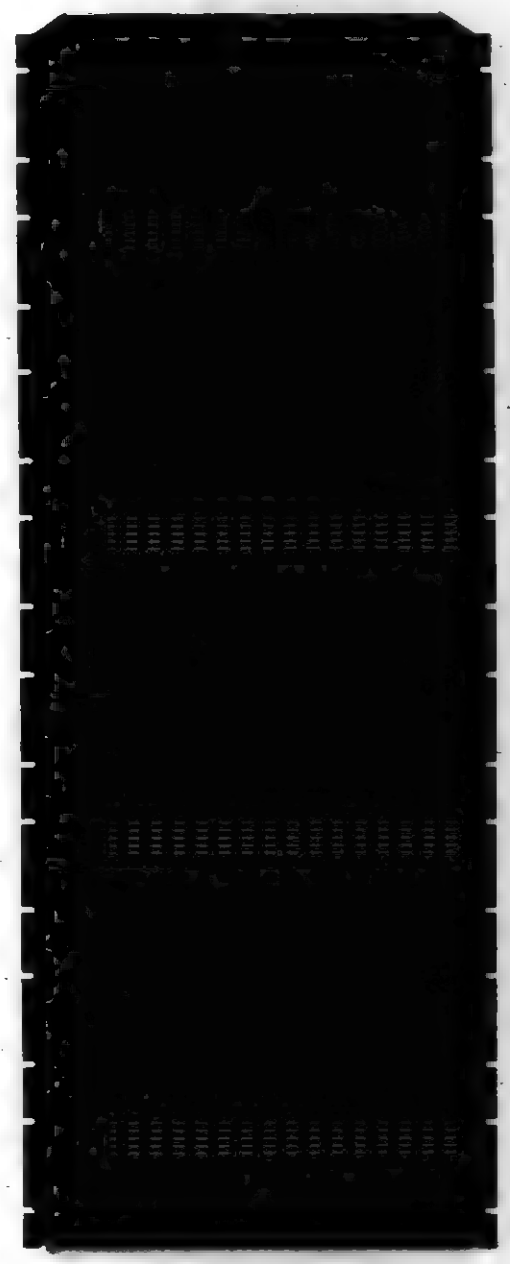

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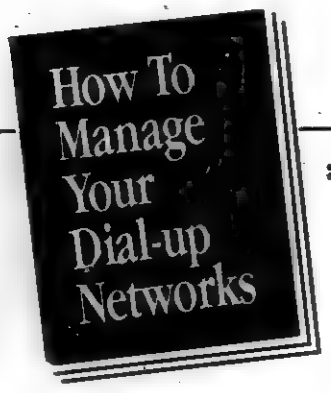

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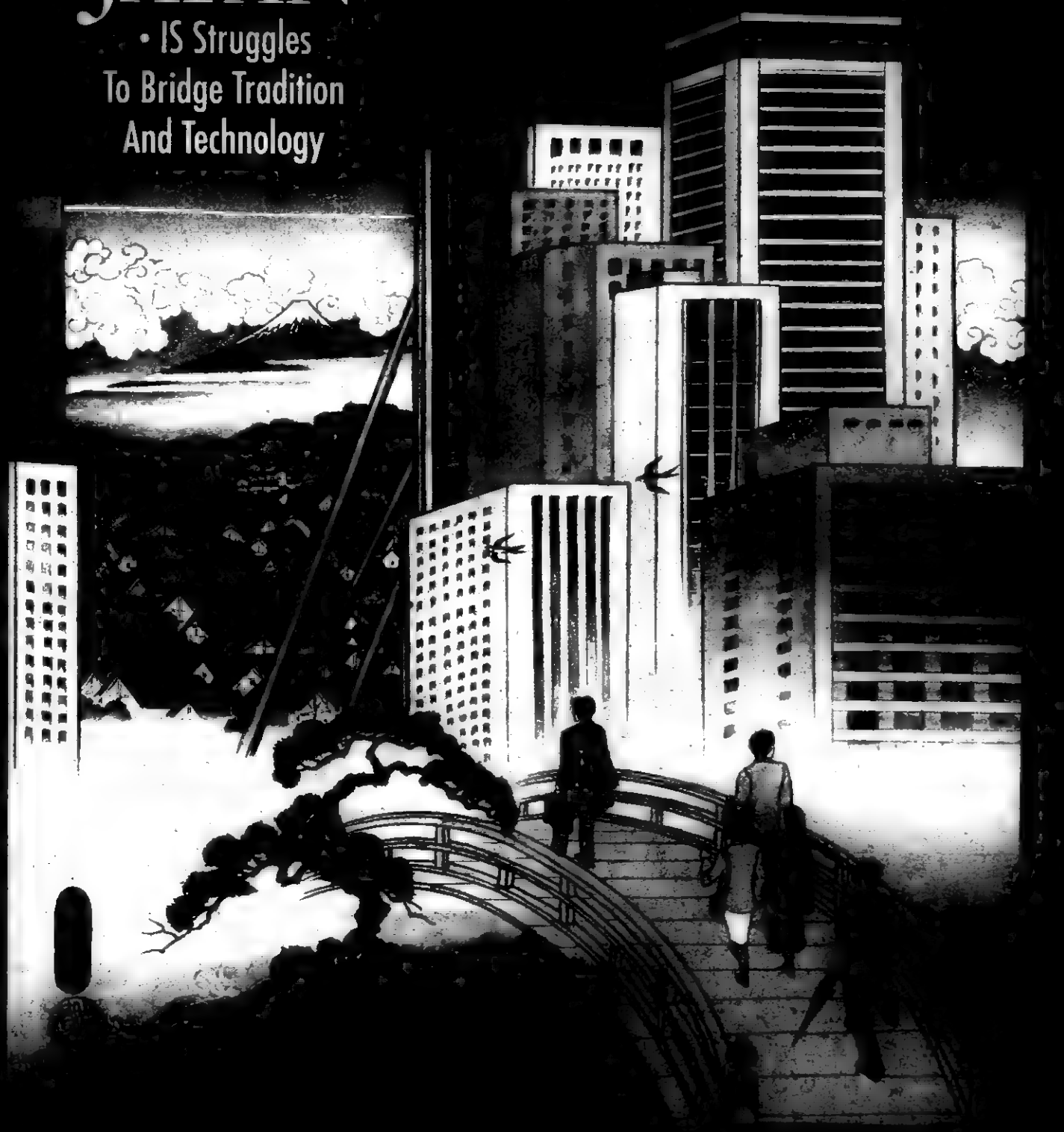

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Exploding Myths

Japan, the obsession. The looming black shadow of the Soviet Union is dissipating, almost gone. Japan has become the intimidator, the predator. Japanmania is in full swing.

The average U.S. citizen now dubs Japan Public Enemy No. 1, and to some Japanese, the enemy is us. Thirty percent of Japanese people under 20 say that if a war broke out tomorrow, that war would be with the U.S.

The media blitz leaves an almost surreal image of Japan. How does this tiny nation weave its magic? How has it propelled this economic juggernaut? What is fact and what is myth?

Fact: Japan has a higher per-capita gross national product than the U.S. and a staggering trade balance advantage (+$64.3 billion, compared with -$50 billion for the U.S.). The Japanese are better savers, better investors and a major force in the global economic picture.

Virtually every aspect of Japanese might has been scrutinized and documented in the business press, except for a hard look at the country's information systems environment. Japan has earned renown for its automated factories and manufacturing prowess. But what about the use of technology for strategic advantage in the rest of the business world? How does Japan stack up in its implementation of IS?

Computerworld decided to explore this heretofore unknown sector from within Japan. To prepare this issue, we sent four editors to Tokyo to survey the IS community and meet with Japan's IS movers and shakers. Executive Editor Paul Gillin, Features Editor Joanne Kelleher and Senior Editors Clinton Wilder and Amiel Kornel spent a total of four weeks in Japan meeting with IS leaders in major corporations.

What they found poked holes in many of the stereotypes Americans hold about Japan and the Japanese. Although much has been written and said about how the Japanese capacity for vagueness can leave visitors scratching their heads in confusion), the IS people were forthright and enthusiastic. Interviews yielded insight into everything from Japan's desktop woes to the implementation of advanced technology, from the crushing shortage of programmers to the growing independence of users from their computer vendors.

The perception of an American lead in IS has merit — but only to the extent that inherent cultural issues have slowed the Japanese down. It is clear that strategic information systems have become a mandate for every major corporation. IS is now a target, and the Japanese hit their targets with stunning accuracy. The gap is shrinking.

More importantly, IS serves as a platform for cooperation and learning. The Japanese greatly admire what IS pros have accomplished in the U.S. and have an endless thirst for ideas and knowledge from the U.S. community. It was a spirit of sharing, not confrontation, that greeted our Tokyo team. Perhaps in a time of escalating tension, that is an essential quality to engage.

Glenn Rifkin
Editor

ACKNOWLEDGEMENTS

We would like to thank the following people for providing invaluable assistance in preparing this special issue of *Computerworld*:

- Bill Totten and Kazumi Nei, K.K. Ashisuto Co., Japan
- James Povec, IDG Japan
- Shuko Goto, CW Japan
- Jack Plimpton, Japan Entry, Boxford, Mass.
- IDC Pacific, Tokyo
- Takeshi Tamori, Intec, Inc.
- Charles Lecht, Tokyo
- Nolan, Norton & Co./Peat Marwick Consulting Co.
- Lotus Development Corp.

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Marui department stores turn information into gold. Page 15.

With the IS labor shortage reaching crisis proportions, Japanese managers are breaking old staffing taboos. Page 23.

Sony's IS chief in Japan seeks information sharing. Page 10.

The Information Age, Japan Style

情報

jōhō: *information*

BY PAUL GILLIN

Westerners who do business in Japan inevitably come to the same conclusion: Things are not as they seem. The information systems area is no exception.

On the surface, IS professionals in Japan deal with pretty much the same realities and concerns as their U.S. counterparts. Cobol is the programming language of choice, the chief information officer concept is emerging, application backlogs are a problem, good people are hard to find, everyone wants to use IS for competitive advantage, but few succeed in doing so.

The cultural and business realities surrounding IS, however, could not be more different. "This is the sixth culture I've worked in, and Japan is, by far, more alien than any place I have ever lived," says Charles Cronheim, director of IS at Mobil Sekiyu Kabushiki Kaisha. "Not bad, just different."

A business climate in which lifetime employment is an entitlement fosters a degree of company loyalty unknown in the U.S. But such security can also encourage sloth. Meetings often drag on as everyone tries to agree on a course of action; however, the unanimity that emerges from these sessions is remarkable.

The kind of rearguard user action that brought personal computers covertly into U.S. offices during the early 1980s has not happened in a culture where channels of authority are acknowledged and respected. Japanese users and vendors may spend two or more years negotiating a single contract, but the resulting ties are long-lasting. "Once you start work, the relationship is open-ended," says Mark K. Shull, manager of business development at EDS Japan Ltd.

How much IS has contributed to the Japanese economic miracle is debatable. Experts generally agree that IS is still emerging from a support role and is three to five years behind its U.S. counterpart. Even at this stage, however, IS plays a key part in contributing to the efficiency for which the Japanese are so renowned. "Japan looks at strategic information systems as a way to make the business run faster and more efficiently," says Kevin K. Jones, principal at McKinsey & Co. in Tokyo.

In terms of a direct comparison between the U.S. and Japan, the U.S. is clearly further up the information systems learning curve. Indeed, Japanese IS professionals watch the U.S. intensely. For example, interest in

strategic IS is just beginning to crest in Japan, though it has already waned somewhat in the U.S. The concept of CIO is stirring great curiosity, though few Japanese CIOs exist. "We have 'Japanized' the CIO," says Bundou Yamada, president of Fujitsu Research Institute. "He's one of the consensus makers."

Some basic concerns are almost identical between the two cultures. Japanese IS executives are concerned with cost-cutting, the stereotypes of long-term investment notwithstanding. They complain about long backlogs and poor productivity. Many criticize top executives for not being more attuned to the potential of technology.

However, the Japanese approach to the same ideas and problems is often very different. The concept of strategic information systems (SIS) is unlikely to be the flash in the pan that it was in the U.S. (see story page 7). "Japanese, by their very nature, view information as a highly precious asset," says Steve Stiling, president of the communications and integration services division of Computer Sciences Corp. Furthermore, consensus thinking creates an environment in which strategic systems projects, once begun, are more likely to be finished.

Those projects often have very different goals from strategic projects in the U.S. The Japanese pride themselves on honing processes to their highest possible efficiency, a characteristic that has made them the world's most effective manufacturers. Americans, in contrast, tend to use IS to change the rules, applying it to the job of finding new ways to do business. "If you give me a choice, I'll take an American to do planning and analysis and a Japanese to do implementation," says Gabriel Rozman, information technology director at Ernst & Young International.

Some of the most notable strategic information successes in Japan have been of the fine-tuning nature. 7-Eleven Japan Ltd. developed a just-in-time delivery system for its stores that is so intricate that inventories are replenished three or four times per day. That is a big cost-saver in Tokyo, where sky-high land prices make inventory an expensive luxury.

Yamato Transport Co. Ltd. is using information generated as a by-product of its industry-leading overnight delivery business to expand into new services such as book clubs and refrigerated goods handling. "By just expanding our existing information system, we were able to add new lines of business," says Takashi Sekita, director of the applications improvement department at Yamato.

There is a new sense of urgency to Japan's quest. Low-cost competition from other Pacific Rim nations and a strengthening yen are forcing Japanese industry to invest further in streamlining production. The booming service sector is sucking up increasing numbers of college graduates into its well-paid ranks, heightening an already critical labor shortage in production industries. The Japanese hope the strides they have already made on the factory floor will enable them to get more out of computer-integrated manufacturing (CIM) than Americans have thus far.

Japan is also confronting the need to offset its high wage scales by transforming its economy to a service orientation. The percentage of workers in manufacturing jobs is expected to drop from 55% in 1970 to 40% by the year 2000, while employment in services will increase from 25% to 40% of the economy, Fujitsu's Yamada says.

As a result, service providers such as banks and securities firms are aggressively competing with one another to offer new services. The Sumitomo Bank Ltd. brings in more than $10 million per year selling software originally developed for its internal use. "IS is going to be the key to the success of the banking business," says Genichiro Ogawa, assistant general manager at the operations administration department of Sumitomo Bank.

Japanese companies have some distinct advantages in developing effective IS. The country has a highly advanced telecommunications system, having built full Integrated Services Digital Network capability from scratch within the last five years. Taisho Pharmaceutical Co. Ltd. has harnessed a nationwide network of 3,500 point-of-sale systems to collect statistics on sales of its products and is now tying that into a CIM system that will change production lines dynamically as new supplies are needed.

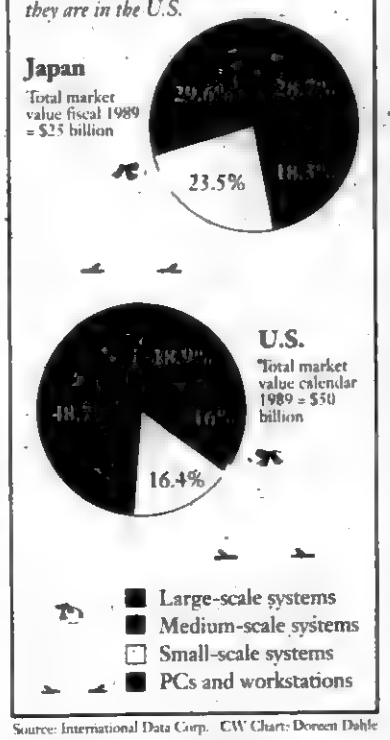
In contrast to the U.S.' nightmarish educational problems, Japan has a well-trained, highly motivated and increasingly innovative work force. Though the curriculum still stresses rote memorization, the image of Japan's educational system as an uncreative "robot factory" is far overblown. There were more Japanese companies than U.S. companies among the top 10 recipients of U.S. patents last year.

Personnel shortages are a problem, but an institutionalized rotation system that moves employees where needed helps prevent critical projects from stalling. It also turns out well-founded managers. "In the West, we tend to create specialists. In Japan, we tend to develop generalists," says Sam Hisamune, general manager of business operations at EDS Japan.

Friction between users and IS that is so entrenched in U.S. corporations is less of a factor in Japan. "When I worked in the U.S., users looked at IS as [only] giving them technical solutions," says Susumu Takahashi, deputy senior general manager at Sony Corp.'s IS group. "In Japan, almost all

Thinking big

Mainframe computers are more prevalent in Japanese companies than they are in the U.S.



Source: International Data Corp. CW Chart: Doreen Dahle

key users know what the IS activities are." That understanding spills over into a more casual attitude toward project management. "The Japanese tend to go into a billion-dollar project with just a couple of sheets of paper" for an outline, Rozman says. "They have great trust in their ability to work together."

But the island mentality and Japanese corporate culture present their special problems as well. Software application backlogs in many companies exceed five years and are not shrinking. Japanese users and vendors alike are slaves to the "not invented here" syndrome. The result is a proliferation of proprietary architectures and a tendency to develop even the most routine of applications from scratch rather than buying elsewhere. EDS Japan estimates that 80% of Japanese software is still developed in-house.

That mindset has slowed the move to standards and burdened users with a mountain of custom software to maintain. "The whole Japanese [computer] industry is still proprietary," says Rob Morel, director of OSF Pacific, the Japanese office of the Open Software Foundation.

The country also faces a shortage of nearly one million programmers by the year 2000 (see chart, page 24). The Ministry of International Trade and Industry (MITI) has undertaken an effort to cope with that problem by launching a $200 million project to build a standard computer-aided software engineering system.

End-user computing lags far behind the U.S., in part because language problems are only now being overcome by sophisticated software. Many Japanese users still rely on U.S. vendors for systems and PC software, and translation to Japanese is ponderous. Novell, Inc. did not open a Tokyo sales office until this year, and it took four years for Lotus Development Corp. 1-2-3 to make it across the Pacific.

However, the Japanese have shown a willingness to be patient and learn. Having entered the IS age later than their counterparts in the West, they have made fewer mistakes. Japanese IS managers openly admire the achievements of U.S. strategic information practitioners. But they believe they can do better. □

GILLIN IS COMPUTERWORLD'S EXECUTIVE EDITOR.

THE EPITOME OF EFFICIENCY

ASK A JAPANESE IS manager to name the prototypical example of a Japanese strategic information system and chances are he will mention Kao Corp.

Few Japanese firms have changed their business more fundamentally or come to dominate their market more completely through the use of IS than Kao, a $4 billion maker of personal care products, cleaning supplies and specialty chemicals.

As the company is quick to point out, however, business changes have been the key to its success, technology merely the enabler. "People say our system is strategic, but it's not just our computers," says Takahisa Yano, senior manager in Kao's systems development department. "It's the modernization of our distribution system and the human network we have built around it."

Kao shook up its industry 23 years ago by completely changing traditional distribution channels. Out went a distributor middleman who stood between manufacturer and retailer. In came a network of 129 Kao Sales Companies, or *hansha* — dedicated manufacturer representatives who dealt directly with retailers. "In this competition, winning and losing depend on getting your products displayed on the shelves," Yano says.

Kao researchers *test the effects of fats and oils on food products*

The *hansha* were equipped with office computers and linked over a value-added network directly to Kao headquarters. "This gave us accurate figures on the total inventory of Kao products all over Japan," Yano says.

In 1976, Kao set out to build a just-in-time distribution network to replace the inventory-laden warehouse process. The company bought out all inventory from its *hansha* and transferred it to headquarters.

The inventory repurchase cost Kao about a month of sales, but the rationale was strategic. Kao was better able to launch products because it did not have to face *hansha* resistance to stocking inventories of untested new wares. Total inventories were ultimately cut by nearly 30%.

Data was put to work in new ways. The firm folded point-of-sale information into a market analysis system, and a telephone service system was created to field customer questions and complaints, feeding that information back to the research and development labs.

In 1980, Kao became one of the first manufacturers to tie in electronically to major retail chains. Retail chains could submit orders in batch which Kao would process and ship out separately to the appropriate *hansha*. Kao now serves more than 900 retail chains this way, some encompassing more than 200 stores.

In 1982, Kao halved its delivery time from 48 to 24 hours by equipping *hansha* sales personnel with portable terminals and modernizing its factories. The sales representatives now transmit orders directly from customer sites. Warehouses were consolidated — only two now serve the Tokyo area, compared with 15 previously. Kao, which spent roughly $55 million on IS last year, is now able to process orders as small as a single bottle of shampoo and ship them out within 24 hours. But therein lies a problem as well. The flexibility retailers have realized from just-in-time distribution has caused them "to minimize their own inventory and have the [manufacturers] carry it instead," Yano says. In short, Kao is so good at satisfying small orders that it now gets too many of them. To compensate, the company now offers retailers bigger discounts to order in larger quantities. The message: "The system works. Don't abuse it."

— Paul Gillin

Strategic AMBITIONS

BY CLINTON WILDER

It is almost impossible to spend more than five minutes inside a Japanese company of any size without hearing the letters SIS. Pronounced separately and almost always intoned fervently, they stand for strategic information systems — a concept that has virtually become a corporate obsession.

"As usual, the Japanese are learning from the successes and failures of the U.S.," says Charles Wiseman, a consultant and Columbia University Graduate School of Business professor whose 1988 book, *Strategic Information Systems*, has sold more than seven times as many copies in Japan than in the U.S. "I speak to waves of Japanese study tours that are trying to get their hands around it and understand what distinguishes the successful implementers of SIS."

To be sure, there are already Japanese SIS examples that have become legendary in Japan's IS circles. The most famous are Yamato Transport Co. Ltd., whose package tracking systems propelled it to No. 1 in overnight delivery services, much like Federal Express Corp. in the U.S., and Kao Corp., which used an electronic distribution system to revolutionize the consumer health-care products industry in Japan (see story page 6).

A less well-known but similarly impressive example is a company named Toyo Sassi, which vaulted from No. 3 to No. 1 in the aluminum building frame market by providing on-line ordering terminals to its retailers, which shortened product delivery from two or three weeks to one day.

In general, however, Japanese IS managers understand that those kinds of preemptive competitive strikes with information technology are extremely rare. Coming to the SIS process later than the U.S., the Japanese are tending to define strategic systems more realistically than their American counterparts did at first. In fact, their definition is very close to the pragmatic version now extant in the U.S. In Japanese terms, SIS is more akin to re-engineering business processes or distribution relationships than designing one particular system or using information to break into a new market.

Companies' willingness to cooperate on technological initiatives could serve as a springboard for SIS

A Japan Institute of Office Automation survey of 239 Japanese companies earlier this year bears this out. Less than 5% of the respondents listed "start new business by utilizing existing database" as an SIS-related activity in their firms. Accelerating the process of gathering and delivering distributed information within the company was the No. 1 SIS-related process, cited by 49% of the companies (see chart page 9).

Those priorities are particularly reflective of the challenges currently facing manufacturing. Japan may have pioneered shop-floor automation and just-in-time inventory, but deriving the right information from customers and suppliers and using it strategically is still an elusive goal for many manufacturers.

Kaku Kurita/Gamma Liaison

Kikkoman's Saito *says even fierce rivals recognize the benefits of agreeing on standards*

VOLUME TRADING

THE FIRST SOUND a visitor makes as he steps from the elevator on the fourth floor of Sanyo Securities is usually a gasp.

Sanyo Securities, though little known outside the Japanese market, boasts the world's largest trading room. In fact, Sanyo claims that the airline hangar-size structure, situated about 20 minutes from downtown Tokyo, is the largest continuous open work space in the world.

Just as striking as its 40,000-sq-ft expanse is the amount of information on display within the trading center. Four giant flat-panel displays flash tables and graphs at one end of the room. Exchange figures flicker across tote boards on two side walls. And each of the 750 trader posts on the floor faces three video screens and one dedicated computer terminal.

Sanyo Securities views technology as its edge against top players. "We cannot win by competing on the same basis as the big four" Japanese securities firms, says Shojiro Ono, general manager of the systems planning department. "We are using our computers as a competitive weapon."

Two major new thrusts are Sanyo Investment Research New Information System (Simis), an integrated sales support system, and Personal Computer Analysis System for Your Portfolio (Pasport), a home computer-based customer investment support and order system.

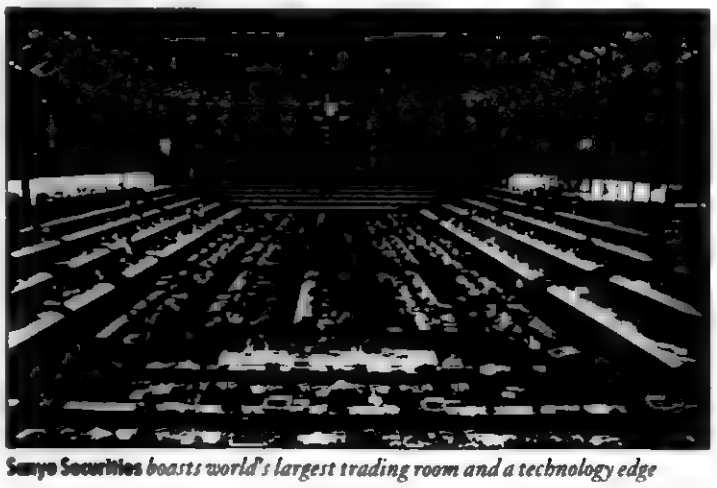
Simis is a PC-based system with a built-in link to one of Sanyo's three IBM Model 3090 mainframes. Salespeople can use it to make timely and well-grounded recommendations to customers, using current quotes, a built-in real-time news ticker and the latest reports from Sanyo's stock analysts. Sales representatives can pull up historical information on individual stocks, look at detailed price information for the last several days and graphically display stock performance over time. Recommended buy and sell points from Sanyo analysts are built into the displays, giving sales representatives the benefit of expert advice in one neat package.

Similar information is also available to individual clients through Pasport, a home portfolio analysis and ordering system that runs on more than 70 brands of PCs as well as on Japan's ubiquitous Nintendo systems.

Investors with more than 3 million yen (about $20,000) in a Sanyo Securities account can call a local number from their PC and tap into investment information on Sanyo mainframes.

Among other services, they can get real-time quotes, news wire information and stock data for graphical display on the PC; electronic mail to their sales representatives; and access to a Sanyo bulletin board of information about the market. These users can also buy and sell stocks and bonds electronically.

— Paul Gillin



Sanyo Securities *boasts world's largest trading room and a technology edge*

SIS "is giving them some trouble," Wiseman says. "It's not like a particular manufacturing technology, where they can come and observe the U.S. and make incremental adjustments."

The best Japanese examples of SIS are in airlines and the distribution and transportation industries, says Akira Kawai, general manager of the MIS division at NEC Corp. "SIS in manufacturing is not very clear," Kawai says.

Even NEC, Japan's leader in personal computer market share, is not immune to this problem. The company would like to do better in retail sales of PCs, word processors and facsimile machines, and about three years ago put in place what Kawai calls "the basic foundation of SIS" — providing its distributors (known as dealers) with on-line ordering terminals or access to NEC via a public network for those that already have a PC.

A number of the components necessary to make this systems approach truly strategic are still missing, however. "We need to tell them when we can deliver orders and give information about new products," Kawai says. "We want to get information about inventory and better customer data. Right now, the system doesn't provide this."

Do Japanese firms lag behind U.S. businesses in using information strategically? Yes, Wiseman and other observers say. But within many Japanese industries, the tradition of long-standing business relationships and the willingness of competitors to cooperate on technology initiatives creates an infrastructure in which SIS is likely to thrive.

"Unlike Americans, who are not inclined to cooperate with each other, in Japan cooperation is cultural, legal and encouraged," Wiseman says. "We might see the emergence of a number of systems that require cooperation, like EDI."

Japan's Association of Food Manufacturers, which includes both wholesalers and retailers, has held standardization meetings for five years to develop uniform product coding standards. Such consortia are common throughout Japanese industry, and many bring IS managers together in meetings sometimes sponsored by computer vendors.

"We may be competitors in business," says Shohei Saito, general manager of the IS department at Kikkoman Corp., the world's largest soy sauce producer and a $950 million company. "But as far as the information infrastructure is concerned,

we feel we should cooperate."

In the pharmaceutical industry, a consortium of pharmacies developed the Pharma network to link pharmacies to their suppliers. The system is comparable to those developed by U.S. drug distributors McKesson Corp. and Bergen Brunswig, Inc., but in Japan it was a collaborative effort.

"That's the kind of thing that's different," Wiseman says. "The group was already there and had a tradition of cooperating before the system was designed."

The Japanese definition of SIS encompasses not only improving customer/supplier relationships but also empowering internal managers with better decision support data.

Many companies are trying to rationalize various databases. Kikkoman is moving from several different Fujitsu Ltd.-based databases for customer and competitor information to an integrated decision support system based on IBM's DB2.

Managers at Tokyo department store chain Marui Co. Ltd. can access on-line, companywide customer, credit, merchandising and administration information on Marui's Total Operation System. Marui department managers "get to handle information that would otherwise go only to top management," says Motokazu Orihata, president of Peat Marwick Consulting Co. Ltd. in Japan. "Each manager can scan the database to see what's going on in other stores, just like the president. SIS can revitalize corporate culture."

Can SIS also help Japanese companies compete globally? The concept of information as a competitive differentiator is fairly new in Japan, but it is being studied intensely — just as the playing fields of manufacturing efficiency and product quality were studied in the past. At an ever-increasing rate, Japanese companies are seeking ways to compete on the new global playing field of SIS in the next 10 years and beyond. □

WILDER IS COMPUTERWORLD'S SENIOR EDITOR, MANAGEMENT.

SIS = Business improvement

Systems that empower through distribution of better information are considered strategic in Japan

Percent of respondents; base: 239; multiple responses allowed

か What does your company actually do as a part of SIS activities?		Fiscal year 1989	Fiscal year 1988
1	Speed up gathering/processing/ delivering distributed information	49%	36.3%
2	Build database of in-house information and enable it to be accessed from anywhere within the company	30%	24.4%
3	Increase added value by linking departmental information	28.9%	23.3%
4	Link the company's information systems with customers' or other companies' systems	27.2%	26.7%
5	Support decision-making by strengthening the system to inform the status of resources to managers	24.3%	14.1%

Source: Japan Institute of Office Automation

CW Chart: Doreen Dahle

AERIAL MANEUVERS

SOMETIMES THE BEST OFFENSE is a good defense.

Such is the case with Japan Air Lines (JAL), a Japanese institution that is using travel agent automation to keep itself on top of the airline heap.

Four years ago, JAL faced a competitive problem from United Airlines, which was moving its computer reservation system into the Japanese market. "We saw it as a strategic threat," says Eiichi Matsubara, manager of planning in the information management and systems division.

Exploiting what it perceived as the greatest weakness of the United System, which was that it operated in English, JAL set out to build a full-scale personal computer-based travel agent automation system tailored to both the language and the requirements of Japanese users. In pursuit of this goal, the IS and support departments jointly interviewed more than 100 travel agents about their preferences. The results were rolled up into a design for a workstation front end with an on-line link to JAL's cluster of IBM and Hitachi Ltd. mainframes.

JAL contracted with Mitsubishi Electric Co. to build the front end, while JAL's two data processing subsidiaries — JAL Data and JAL Creative Systems — developed the mainframe portion in conjunction with IBM Japan.

Two years later, JAL rolled out Axxess, a packaged computer system designed to run on a 32-bit Mitsubishi Corp. PC. Axxess gives the travel agent up to four windows on a screen in which various local- and on-line information can be displayed. For example, an agent can view reservation records on one screen and shopping information about a destination in another.

In addition to full on-line reservation facilities using a public 64K bit/sec. packet-switched network, Axxess links to a travel information database on an IBM 3090 at JAL's data center. Agents can tap into a database of travel information on hotels, shopping, recreation and the like using a simple keyword search.

JAL mainframes also have gateways to a hotel reservation network, and the carrier is working on transparent links to other major airlines' reservation systems. A fare calculation system processes up to 32 itinerary points, letting the agent optimize a traveler's connections for the lowest cost and shortest wait. The Axxess system also has local features for travel agency automation like a PC database and pop-up notepads and calendars.

As a defensive strategy, Axxess has done its job. JAL counts 3,400 agents with PC-based Axxess systems among the 15,000 on-line terminals that are connected to its massive network. That number represents a considerable lead on United's reservation system in the Japanese travel market.

— Paul Gillin

CASE STUDIES

·S·O

The Japan View

BY CLINTON WILDER

Outside of the automobile industry, Sony Corp. and its outspoken chairman, Akio Morita, are probably the most famous symbols of the Japanese competitive threat to U.S. companies. It's a long legacy: *Time* magazine ran a cover story on Sony and Morita titled "How to Cope with Japan's Business Invasion" in 1971.

But in Japan, Sony is considered very Westernized. It is the only Japanese company with foreign-born executives (one American and one West German on its executive committee.

A visit to the management and operations systems group at headquarters in southern Tokyo's Shinagawa district confirms the Western influence. Unlike the typical Japanese office, in which workers are cramped together in an assembly line of desks, the 44-year-old firm's carpeted quarters features individual cubicles, a light gray decor and ergonomic chairs.

The global feeling is more than superficial. Sony employs 800 information systems professionals in its overseas business units, which is nearly as many as its 1,000 IS employees in Japan. Furthermore, the head of the 150-member corporate IS group, deputy senior general manager Susumu Takahashi, has done two tours of duty at Sony Corp. of America headquarters in Park Ridge, N.J. His associate, Michio Yoshino, general manager of the planning and control division in the management and operations systems group, has also done an IS rotation in the U.S.

Takahashi's main goals for IS also have a remarkably familiar ring in the U.S. — make manufacturing more flexible and responsive, create a global network infrastructure and shorten product lead times. In other words, Sony is seeking to chop away bureaucracy with better use of *joho* (information). "The bigger the company grows, the more there are barriers to information-sharing," Takahashi says.

Information systems at Sony Corp. endeavor to combine the best of Eastern and Western worlds

The traditional Japanese management paradigm emphasizes ideas percolating up through the hierarchy by consensus, but Sony believes top-down planning and coordination are also critical for the successful use of IS. Three years ago, Deputy President Ken Iwaki set up several task forces and committees, made up of both systems and business managers, to hammer out Sony's information strategy.

Takahashi credits Iwaki's leadership in functioning as the Japanese-style chief information officer (see story page 13) with better coordination between IS and users throughout the organization.

The core of Sony's IS strategy is a planned global network that will integrate locations and functions throughout the company. The network would allow users in the major product operations in New Jersey, Japan and Cologne, West Germany, to share data on sales, production, product design, quality, repair history, accounting, purchasing and management procedures.

Currently, Sony executives in the three countries hold directors' meetings with teleconferencing technology.

With 90,000 employees worldwide working in decentralized, product-oriented business units, Takahashi's goal of sharing and consistency among those units is daunting indeed. Re-engineering old applications is the biggest challenge. He says he is less than impressed with the capabilities of current computer-aided software engineering (CASE) offerings.

Sony doesn't have one particular system that it points to as a

Kaku Kurita/Gamma Liaison

Sony's Takahashi *seeks integration*

N · Y ·

The U.S. View

BY GLENN RIFKIN

Bob Trenchard, the 49-year-old senior vice-president of MIS, joined Sony Corp. of America 4½ years ago, just as Japan-bashing was becoming a national pastime. Trenchard's reaction was to become a staunch supporter of the Japanese way of doing business, specifically Sony's.

Making Trenchard's situation more comfortable is the autonomy he has in running Sony's entire U.S. information systems operations, along with the fact that Sony, under Chairman Akio Morita, is intent on being an international company. Morita himself spent a year in the U.S. in 1960 helping to start Sony Corp. of America. Today, Sony employs 9,000 Americans across the U.S.

For the first time, Sony is moving significant portions of research and development, manufacturing and engineering out of Japan and into the U.S. and Europe, which presents major challenges as well as opportunities for IS.

Sony's Deputy President Ken Iwaki, the firm's chief information officer, is looking to Trenchard's group to bring its knowledge and experience in such areas as computer-aided software engineering (CASE), executive information systems (EIS) and artificial intelligence to aid this globalization effort.

Departmental autonomy and an anticipatory corporate culture help ease growth strains at Sony's U.S.-based operations

Cultural pluses

Though complaints are common about the difficulties Japanese subsidiaries have in the U.S. in dealing with cultural and language differences, Trenchard says he believes the values of Japanese business help rather than hinder his efforts. "Most American companies are shortsighted, not willing to tough it out," Trenchard says. "I'm expected to make a profit [here], but I don't live in fear month to month."

Trenchard finds benefit in Japanese-style decision-making. "Americans are big into planning, and if they don't have resources, they go out and find a way to get them. The Japanese will scale back, reshape things and go step by step. It can be slow and frustrating, but it's a better way. When we do get consensus, we can really move fast."

Andy Freeberg

Sony's Trenchard *likes Japanese methods*

Three years ago, with Iwaki setting the agenda, the company agreed that it had to decrease its response time to market and deliver products faster. IS, Iwaki insists, has to be the vehicle for that around the world. "He is a brilliant strategist, a businessman, not a technologist," Trenchard says of Iwaki. "He wants to move the whole corporation into a just-in-time way of doing things."

At the same time, Sony Corp. of America found itself in transition, moving from a sales and marketing operation to a "full company," heavily involved in research and development, manufacturing and engineering.

To this end, major changes needed to be implemented in the U.S. IS operations, and Trenchard was brought in to spearhead the effort. An early priority, he says, was to get IS to come down from its technical ivory tower and get out into the business world of the end users.

Sony has instituted a "distributed, not decentralized" approach to IS. Using CASE (Texas Instruments, Inc.'s IEF product), Trenchard is pushing applications development out to the various business units, which are different and have different focuses. For example, the industrial products sector has different concerns from the consumer products group and requires specific applications that are better developed in that business unit.

Today, Trenchard is overseeing the consolidation of five data centers across the U.S. into one cross-country data center based simultaneously in Park Ridge, N.J., (corporate headquarters) and San Diego.

He is also replacing major portions of Sony's sales order entry and inven-

SONY: JAPAN VIEW

Continued from page 10

strategic information system. It measures its IS effectiveness by how well the technology supports the corporate goal of streamlining production and sales.

Computer-integrated manufacturing strategy at Sony is made up of more than internal production. It also involves improving the information flow to and from captive manufacturing subcontractors and component suppliers, which number more than 170 in Sony's case.

"The goal is to speed up our business," Takahashi says. "That's strategic."

Takahashi says the IS/user relationship is better than what he saw during his two stints at Sony Corporation of America. "In the U.S., users wait to get involved until you get closer to the installment of the system," he says. "As a result, it takes a lot of time. Here, you work together with the users from the start. The user knows the risks and tries to go forward with you."

He also says U.S. users tended to blame IS for not understanding their jobs. "In Japan, we understand each other's headaches," he says. "Almost all the key users know what the IS activities are."

An example of that type of cooperation is an office automation project called Project of Advanced Workstyle, which is attempting to design more user-friendly interfaces as well as data-sharing and office applications for Sony employees using Sony's Unix-based News workstations. The project's general manager is Mitsuru Inaba — formerly a designer of Sony consumer products such as the Handycam video camera. "Inaba really considers the human factors," Takahashi says.

Sony's commitment to information technology investment is impressive: The worldwide IS budget is about $245 million. IS spending is increasing at a staggering 20% per year in Japan. The firm won't disclose its actual IS budget, but Takahashi says spending will continue to increase.

Measuring the return on investment is as dicey for Sony as it is for IS managers in the U.S. "We do [return on investment] for all projects, but the quality of that ROI measurement is a problem," Yoshino says. "After the installation, we try to judge whether we attained the benefits or not." □

Mirror, mirror

Though Sony Corp. of America has autonomy in its IS endeavors, it follows the lead of Ken Iwaki, Sony's CIO in Japan, who seeks to make Sony a truly global entity

Sony Corporation
Tokyo, Japan

- Top IS executive: Susumu Takahashi, senior general manager
- 1,000 IS employees
- 2 data centers
- Faces shortage of software engineers and applications development backlog
- Exploring CASE tools with guidance from U.S. operation
- Annual IS budget: $245 million worldwide*

Sony Corporation of America
Park Ridge, N.J.

- Top IS executive: Bob Trenchard, senior vice-president, MIS
- 400 IS employees
- 5 data centers being consolidated to 1
- Enjoys surplus of software development talent
- Three years into major CASE project
- Annual IS budget: $40 million

*Figure for Japan alone was not available

CW Chart: Doreen Dahle

SONY: U.S. VIEW

Continued from previous page

tory systems — projects requiring 100 to 120 man-years for each segment. Changes in the U.S., Trenchard says, will have ramifications for all of Sony's international IS operations. Sony is committed to the Computer Integrated Enterprise, a concept similar to computer-integrated manufacturing. To achieve this, IS must work closely with its global counterparts.

Trenchard's mission — getting the 400 IS employees to work closely with Sony's end users — is paying off. Turnover in IS is down from 45% four years ago to close to zero, and the IS budget is increasing, he says. This year, the budget rose 59% to more than $40 million. "The most satisfying part of this is that the budget increase for MIS was fought for by the business units, not by us," Trenchard says.

The bulk of IS spending at Sony is being invested in systems development for the 68 business units scattered around the U.S. In addition, a chunk of capital is going toward a new IBM 3090 200S for the San Diego facility. Currently, San Diego has a 3081, while Park Ridge houses a 3090 50J. The mainframes process much of the financial, manufacturing and sales data. Sony has a few midrange IBM Application System/400s and System/36s with Digital Equipment Corp. VAXs in engineering.

IS supports more than 3,000 desktop systems around the country and has standardized on four offerings: IBM Personal System/2s, Apple Computer, Inc. Macintoshes, DEC Vaxstations and a Japanese workstation made by Sony.

Trenchard points out that he has an advantage over his Sony counterparts in Japan because critical software development — CASE and AI — is happening here at a more rapid pace than in Japan. A joint committee to spearhead CASE development in Japan recently got under way. In fact, a lack of software engineers in Japan is at the root of Sony's decision to move some of its key functions, such as research and development, to the U.S. and Europe. With chip technology increasingly playing a key role in Sony's vast electronics product line of camcorders, televisions, VCRs and stereos, speed to market has become the No. 1 priority for IS.

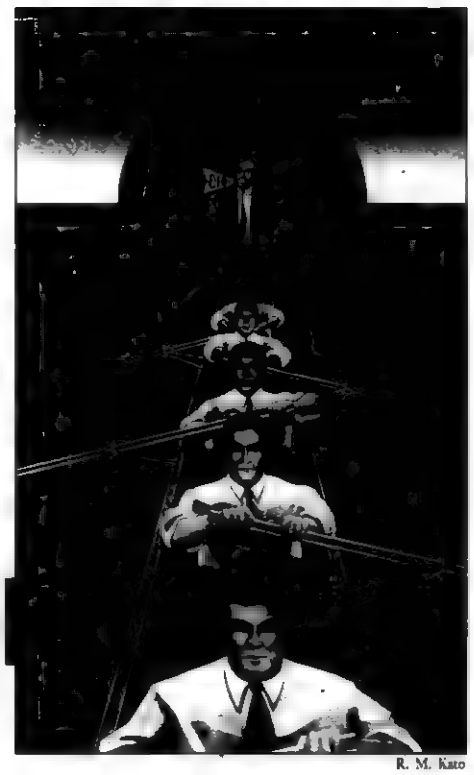
"We used to bring out a product from start to finish in two years," Trenchard says. "Now it is six months and sometimes faster. It's an absolute necessity that we have the most flexible, most responsive systems operation in our industry."

In that regard, the U.S. operations share goals and certain projects with Sony IS in Japan. An example is an EIS designed to allow Sony executives to do decision support, play "what-if" games and stay one step ahead of critical industry trends. The Corporate Business Information Project, as it is known, is a joint project being done with Sony Japan. Several key IS people from both countries will rotate between Japan and the U.S. to work on the system, which is based on technology from Comshare, Inc. in Japan and Pilot Executive Software in the U.S.

In turning around the U.S. operation, Trenchard wants "the most cost-effective IS operation in the industry." His enthusiasm for Sony and working with the Japanese comes through in every aspect of his conversation. "I'm a better person for working here," Trenchard says. □

RIFKIN IS A COMPUTERWORLD FEATURES EDITOR.

Old Ways, NEW INFLUE



R. M. Kato

CIOs fulfill a unique role in Japanese firms' corporate structure

BY CLINTON WILDER

One of the most popular American songs in the *karaoke* bars, where Tokyo salarymen go to pass around a microphone and sing into the wee hours, is Frank Sinatra's "My Way." Without question, there is A Japanese Way to conduct business, and the information systems organizations of Japanese corporations are no exception.

Within IS, one finds the same Japanese management concepts that have become legendary: emphasis on consensus, group decision-making and lifetime employment, with rotation through several different functional areas.

Although IS is raising its profile as a strategic component of the Japanese corporation, it is evolving within the existing structure rather than challenging it.

The Japanese concept of a chief information officer exemplifies this. An increasing number of Japanese corporations use the term CIO, says Motokazu Orihata, president of Peat Marwick Consulting Co. Ltd. in Japan. However, Japanese firms have molded the CIO concept to fit their indigenous corporate culture.

To an American, a CIO is a company's highest ranking IS executive. A loose definition of the Japanese CIO would be a senior non-IS executive who acts as the high-level sponsor and supporter of information technology within the company.

Where a CIO is present, he usually exists in practice but not in title. IS staffers can point you to the person who functions in that capacity within their organization, but the title after that person's name is most likely to be something similar to "director."

One reason that the title is seldom actually conferred is the sense that it might imply ownership or control over information, which is viewed as a shared business resource. "If information is grasped by just one person, others may get nervous," says Masayasu Masuda, general manager of the office automation planning & coordination department at Mitsubishi Corp.

For the most part, the person called CIO is not the chairman or chief executive officer of the company but rather an executive several levels below the top job who is perceived as a rising power. A recent survey by *Nikkei Computer*, a Japanese IS publication, found that in 43% of the companies that say they have an executive functioning as a CIO, that official is an executive

managing director, three levels down from the president. One-quarter said a director — roughly equivalent to a U.S. division head — functions as CIO. Only 3% — four companies out of 126 — accorded that duty to their president.

In a business culture where relationship-building is the foundation for every action, the CIO is viewed as the executive who can bring together various functions to promote the IS cause.

The idea of a nontechnical sponsor for IS is actually just an extension of normal practice within IS departments, because the Japanese way of organizing and managing IS is also built on the fundamental principle of employee rotation.

Although career IS managers do exist, they are in the minority. An IS manager is much more likely to have served terms in materials controls, accounting, finance, purchasing, engineering or even the legal department — all within the same company.

Mitsubishi Corp.'s Masuda, for example, is a chemical engineer by training and spent 30 years in engineering and sales before moving to IS in 1988 (see story below).

Bank of Tokyo analyst Keita Abe, who studied law in college, says that having a non-IS background actually makes it more likely that he will do a stint there than someone who studied computer science. "The fact that [a colleague] has a computer background may not mean he will be transferred to the computer department, yet I, with my law background, may be transferred there," Abe says. "Everyone is treated equally regardless of their background."

The way to go

In many ways, this organizational approach is ideal for promoting the effective use of IS. Barriers to business understanding are small, because employees are likely to have worked in several different areas. That creates a critical mass of collective thinking that is greater than the sum of the parts, says Peat Marwick's Orihata. "Different functions can communicate, which not only links the functions but generates new ideas," he says.

The rotation system is, however, heavily dependent on the fact that a lot of technical expertise and programming talent has traditionally been supplied by vendors. There is some question about whether extensive rotation will continue to be feasible now that vendors are cutting back on that kind of customer service and users are demanding more sophisticated systems (see story page 23).

Another development that may create more of a need for IS specialization is the increased trend toward setting up the IS function as a separate business, which often sells processing services to other firms within its *keiretsu*, or family of companies.

Tokyo-based Dentsu, Inc., which has revenue of about $9 billion and is the world's largest advertising agency, was an early adopter of this strategy. It spun off IS back in the 1970s in a joint venture with General Electric Co. The two firms formed Information Services International-Dentsu Ltd. (ISID), of which Dentsu owns 66.6% and GE 33.3%. Recently, labor shortages, combined with vendor cutbacks and the hunger for more and better applications, have prompted many more companies to start thinking about IS as a profit-making activity.

Typically, the spin-off operations handle the more routine aspects of IS, such as processing and programming. More critical functions, such as applications design, end-user support and technology research and development, remain in-house. □

BUILDING A TEAM SPIRIT

MASAYASU MASUDA, the amiable general manager of Mitsubishi Corp.'s office automation planning and coordination department, enjoys pointing out two pieces of Americana in his office to U.S. visitors. On one wall is a poster from the Kentucky Derby, which he has attended, and above his desk is a photo of New York Yankee great Mickey Mantle.

Despite these souvenirs and his nearly flawless English, Masuda runs a typical Japanese IS organization. It is one that relies on the frequent rotation of managers, seeks to improve its relationship with users, faces the need to make computing a less threatening prospect for senior executives and grapples with the challenge of using IS strategically in a highly varied business.

Mitsubishi Corp. is separate from the giant electronics, auto, chemical and banking firms that share its name. Its business is joint ventures and partnerships in dozens of different industries such as import/export, natural gas, retailing, metals and food. Relationship-building is the foundation of all Japanese business, but it's the very lifeblood of Mitsubishi.

Kaku Kurita/Gamma Liaison

Mitsubishi's Masuda *brings a user perspective to IS*

"Eighty-five percent of the know-how we have cannot be put into a computer right away," Masuda says. That doesn't mean that Mitsubishi backs off from IS — quite the contrary. Its IS budget is growing at 12% per year, and 40% of those yen go to departmental systems and applications. The firm plans to have a total of 3,800 workstations (terminals and personal computers) by 1991, more than triple the 1,200 it had in 1987.

"In the past two years, we have pressed the company to think more about IS, and the IS mind-set is prevailing pretty quickly," Masuda says.

A chemical engineer by training and a 30-year Mitsubishi veteran, Masuda took over his current job — his first ever in IS — in 1988. He tries to bring a user perspective to Mitsubishi's IS organization, but it sometimes can be frustrating.

"IS wants everything to be 100% complete technically," he says. "Users don't care about all the minor things. We just want [the applications] faster. IS people all say they understand, but I have to continue to talk. And then if I don't see them for a couple of days, I have to start all over again."

— Clinton Wilder

CASE STUDY

Cashing In On CREDIT

Japanese shoppers don't leave home without Marui's little red card

BY AMIEL KORNEL

Judging by the overflowing crowds in the Tokyo retail districts of Shinjuku and Ikebukuro, the once-frugal Japanese have embraced spending with a passion. And computers are helping them disburse their yen with greater ease.

At Marui Co., Japan's tenth-largest and most profitable department store chain, information systems have played a key role in capturing customer loyalty and disposable income.

More than 10 million Japanese, almost exclusively young people, carry Marui's red credit card. That number represents 30% of all the department store credit cards issued in Japan.

Credit-card purchasing is still the exception rather than the rule among the savings-minded, cash-and-carry Japanese public, but Marui clearly knows how to stimulate demand and handle the processing of credit transactions.

Sixty percent of purchases at Marui stores are made using its credit card. At other Japanese department stores, the percentage of credit sales is closer to 20%.

Kaku Kurita/Gamma Liaison

M&C's Furubayashi *says Japan's new cost-consciousness is helping to boost the firm's sales*

The basis for the company's success with credit business, Marui claims, is the early lead it established in information systems.

In 1977, the company installed an on-line system that linked all of its stores and coordinated customer services, merchandising, sales and administration.

That system allowed Marui to collect a huge amount of data on customer demographics, purchase patterns and payment histories, which served as the basis for a number of applications, such as credit evaluation.

Then, in 1984, the company decided that its applications and processing management infrastructure could also be marketed, so it spun off its IS operation as a separate money-making affiliate, M&C Systems Co.

In 1989, M&C produced revenue of $65 million through the development and licensing of applications as well as by operating a service bureau for other Japanese retail organizations.

Right now, 38% of M&C's revenue is derived from licensing fees for the company's L-Pack system, which handles credit-card issuance, sales transactions, billing, collection and sales promotion. The rest comes from in-house services provided to Marui.

The system permits issuance of a credit card within five minutes of the time a customer files an application. It also re-evaluates customers' credit worthiness and spending limits, which are based on payment history, each time a sale is made.

Thirty-six retailers currently use the software, paying $26,000 per month for the license in addition to a one-time fee for installation and training that can range from $323,000 to $646,000.

Despite the traditional Japanese preference for customization, M&C has insisted on marketing its software as a package.

While this approach initially made sales difficult, a new willingness in Japan to use packaged software in order to keep costs down is helping to boost sales, says Hiroshi Furubayashi, general manager of marketing at M&C.

In fact, 15 of the current users of L-pack signed up during the past two years. □

KORNEL IS A COMPUTERWORLD SENIOR EDITOR, FEATURES.

"If they can send a man to the moon, why can't they make my computers talk to each other?"

IBM Has Developed An Answer To The Looming Question Of Multivendor Networking.

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Masaaki Ogai

Desktop DEPRIVATION

Cost, culture and language barriers stymie Japanese PC use

BY PAUL GILLIN

Americans often complain about how hard it is to select a personal computer, but our purchasing dilemmas are nothing compared with what a Japanese buyer faces.

Imagine this: You want to buy a PC. You look at the options: IBM, Compaq, AST Research, Tandy, Dell Computer.

Careful. Each one is somewhat incompatible with the others, and chances are they won't run the same software.

You also want to choose a word processing package, but the only options available require you to type the words phonetically in French and then choose from a menu of English equivalents. They're slow and cost about $700.

Oh, yes — price. That Intel Corp. 80386-based PC you buy with the IBM Video Graphics Array (VGA) monitor and a couple of software packages is going to run you about $10,000. And you'd better budget for an end table because there is no way a PC will fit on your cramped desk.

Sound terrible? Well, that's a watered-down translation of the difficulties the average Japanese office worker faces when buying a PC. The PC market is studded with multiple incompatible standards, at least 10 of which carry some clout. The Japanese language is about as unsuitable to a keyboard as a language can be, and cramped office space leaves little room for a bulky computer footprint.

As a result, PC growth has been far slower than in the U.S. Only 2% of Japan's population uses PCs, compared with 10% of the U.S. population, according to Japan Entry, a Boxford, Mass.-based consulting firm.

"We're at the stage the U.S. was five to seven years ago," says Roger Boisvert, president of the Tokyo PC Club.

Things are slowly turning around as better software from both sides of the Pacific hits the market. Sales of packaged PC software jumped 44% in 1989, according to the Japan Personal Computer Software Association.

But why has such a technologically advanced country lagged so far behind in desktop computer use? There are several reasons:

• **Language.** Only in the last three years or so has software

that can produce the complex Japanese Kanji characters come into widespread use. Even the best Japanese language word processors are ponderously slow compared with those in the U.S. For example, Just Systems' Ichitaro, the leading Japanese word processing software, requires users to enter words phonetically in English or in Katakana, a 56-character Japanese phonetic alphabet. A front-end processor interprets the phonetic input and translates it into displayed text.

The process takes about twice as long as English language word processing, and the front-end processor's phonetic dictionary adds about 150K bytes of memory overhead. It also requires the user to be fluent in at least two written languages.

● **Office space.** Sky-high rents in Tokyo and Osaka force office workers into close quarters and make computer space all the more precious. With desks about a third smaller than their American equivalents, it's no accident that laptop PCs dominate the market.

At Nissan Motor Co. Ltd., for example, desks are packed together in a partitionless room with Toshiba Ltd. J3100 laptops on swivel platforms, allowing two workers to share one laptop machine. The same scene is repeated in offices all over Tokyo.

● **Culture.** Some users say the data orientation so common to American businesses just does not exist in Japan. "Rather than emphasizing the use of data, Japanese managers tend to emphasize intuition and experiences as a decision-making method," said Hajime Morita, general manager of the Japan Personal Computer Software Association.

"There's a fundamental difference in working style," says Jim Adams, a PC manager at a major Tokyo financial institution. "Each year, we get a crew of freshmen out of school, and few have touched a computer. That's only beginning to change now."

● **Incompatible standards.** NEC Technologies, Inc. has the largest PC installed base in Japan with 51% of the market, according to Japan Entry. However, IBM, Toshiba, Fujitsu Ltd., Hitachi Ltd. and Mitsubishi also have significant influence. All support MS-DOS, but each vendor's implementation is somewhat different. As a result, software developers have to invest significant time and money to customize packages to different architectures.

"This creates a vicious circle in which development doesn't happen because the hardware standards aren't there, and hardware [standards] don't settle because development doesn't happen," Boisvert says.

It's like the U.S. PC market of the early

Revving Up Business With PCs

THEY SAY No. 2 tries harder. For Nissan Motor Co. Ltd., Japan's second largest auto maker, that means an unusually heavy investment in desktop systems.

In a country where business PC use is a fraction of that found in the U.S., Nissan is in the final stages of a five-year plan to link nearly everyone in the corporate headquarters office on PCs connected to Novell, Inc. Netware local-area networks. "Our theme is that more active information flow creates a more active business," says Fumiaki Yamada of the Office Automation Promotion Section of Nissan's information systems department.

For Nissan, an active information flow means reducing the employee-to-PC ratio from 9:1 to 4:1 by 1992. The number of PCs in Nissan's Tokyo headquarters has climbed from 138 in 1986 to 1,700 last year and is expected to reach 2,210 in 1990. More importantly, nearly one-third of those systems are networked, and Nissan aims to have 86% of the systems linked on LANs by 1992. In contrast, researchers estimate that only 5% to 10% of the PCs in Japanese businesses are networked today.

Office workers can use a variety of standard business software from the network servers. LAN users have access to Japanese and English word processors, 1-2-3 or Microsoft Corp. Excel spreadsheets, Ashton-Tate Corp.'s Dbase and Digital Equipment Corp.'s All-In-1 electronic mail. Nissan's OA Promotion Section is also developing some ambitious custom applications. One is a text database for the international department that stores all documents created in that department. Another is a decision support system for Nissan managers that now encompasses nearly 6,000 pre-prepared screens of analytical information. Nissan's architecture envisions Netware LANs for departmental PCs with a Fiber Distributed Data Interface backbone that will be installed during the summer in the headquarters building. Support tools like these are not cheap in a country where a laptop PC costs more than $5,000 and a copy of Lotus Development Corp.'s 1-2-3 fetches $650.

However, Nissan does not apply standard cost-benefit criteria to a strategy it believes is essential for changing the corporate structure. "Through massive interaction with PCs, we believe employees are going to change the nature of their jobs," says Hiroshi Kitaguchi at the OA Promotion Section. — Paul Gillin

Kuku Kurita/Gamma Liaison

Nissan's Kitaguchi *promotes active employee interaction with PCs*

'80s, when vendors vied with one another to create MS-DOS-based standards. Unlike the U.S., though, the Japanese market is unlikely to rally around a leader anytime soon. Many retailers are loyal to certain vendors and will not, for example, let desktop systems from NEC and IBM share shelf space.

In fact, hardware vendors offer incentives to software makers to limit themselves to certain platforms.

"Every year, I get offered more *not* to port [my software] to new hardware," Ito says.

● **Limited software.** The combination of a small market and multiple standards has meant slow going for the domestic software industry. Top-selling Ichitaro, for example, has only 300,000 installations, according to *Nikkei PC*, an industry magazine.

In contrast, Lotus Development Corp.'s 1-2-3 has sold more than 10 times that many copies in the U.S. "It is very costly to develop for [the Japanese] market, and the potential sales are small," Morita says.

● **Costs.** Computers, as with most other things, are expensive in Japan. An Apple Computer, Inc. Macintosh IICI sells for roughly $9,200 in a Tokyo Computerland, while an identically configured machine at a Boston Computerland retails for $5,700. Wordperfect Corp.'s Wordperfect, which costs $270 at the local Egghead Discount Software in the U.S., sports a $650 price tag at a Tokyo computer retailer. These factors have added up to make the PC a slow bloomer, but the future looks brighter. With the language barrier largely overcome and more powerful machines reaching the market, some firms are making large-scale commitments to PCs.

Companies such as the Bank of Tokyo and Japan Air Lines have harnessed desktop technology for strategic advantage. Nissan has targeted a ratio of three users for every two PCs by 1992, and The Sumitomo Bank Ltd. has already outfitted half of its workers with desktop systems.

As the value of personal computing becomes more apparent, a different characteristic of Japanese business may take hold. "People buy whatever they need here," Boisvert says. "Short-term costs are not much of an issue." □

Slow bloom

PCs are starting to move into Japanese offices, but dedicated word processors are still in vogue

	U.S.	Japan
Population	250M	120M
PCs	25M	2.7M
Word processors	12M	9M
Engineering workstations	179K	69K

Source: Japan Entr... C.W. Chart: Doreen Dable

Customized Template Maps Out Investment Decisions

WHO SAYS JAPAN'S corporate culture suppresses individual initiative?

Not Mario Tachibana. By combining his knowledge of finance with spreadsheet virtuosity, Tachibana has created a new source of revenue for the Bank of Tokyo.

In Japan, where PCs are still fighting for space on the desktop, a single application of the technology can still make a difference. Tachibana, who is assistant manager in the bank's corporate advisory division, came up with an idea to automate a big part of his department's work, which involves playing out investment scenarios for commercial clients. The advisory division analyzes the financial structure of client companies and helps them decide where to put their money.

Until recently, most modeling was done with paper spreadsheets, desktop calculators and intuition. With the automated Management Planning System (MAPS) developed by Tachibana, the medium has become a Lotus Development Corp. 1-2-3 Release 2J worksheet.

A MAPS team now develops customized 1-2-3 templates for customers showing the impact of various investment decisions on areas such as profitability, cash flow, tax liability and depreciation. "MAPS is tailor-made to each customer," Tachibana says. "As the project progresses, we can modify the model to meet their changing needs."

The models are massive, requiring an Intel Corp. 80386-based desktop computer, 8M bytes of memory and a 100M-byte hard disk — about a $20,000 investment in Japan.

The payback is considerable, however. MAPS has added about 200 customers to the corporate advisory service in less than four years. The project that started as an individual's brainstorm now employs eight people within the corporate advisory division, and the MAPS spreadsheets and graphics have become a staple of corporate advisory division presentations to prospective clients.

Bank of Tokyo's *Tachibana automates investment scenarios for clients*

Bank of Tokyo's IS department has played a minimal role in the MAPS project, but that's not unusual, Tachibana says. User departments often work informally on technology applications, sometimes in collaboration. For example, the corporate advisory division is now working with the corporate finance department to develop a program that lets bank officers analyze customers for creditworthiness.

Despite the success of MAPS and his computer science background, Tachibana says he doesn't see his future in computing. "As a banker, I must be good at banking," he says. "I would like to work in specific fields using computers. But I am a banker first."

However, PC fever is apparently catching. Last year, the bank distributed PCs to all 154 "freshmen" — first-year employees — in hopes that they will bring the technology to bear throughout their careers. — Paul Gillin

Customers Force A Market *Free-for-all*

BY AMIEL KORNEL

Traditional loyalties are challenged by economic realities

Single computer suppliers have been the rule in Japan ever since IBM painted the country blue with its mainframe computers in the late 1950s. At that time, and for the next 10 years, IBM systems so dominated the market that data processing managers were known as *IBM gakari*, or "the person in charge of IBM."

"Thirty years ago, even Hitachi was a big IBM user," says Yasuhiko Tani, executive managing director of Hitachi Ltd.'s computer, telecommunications and office systems group.

Although IBM's dominance began to fade in the mid-1960s with the rise of Japanese mainframe vendors such as Hitachi, Fujitsu Ltd. and NEC Corp., the tradition of corporate commitment to a single vendor persisted. There are clear signs, however, that this chapter is coming to an end.

The harsh economic realities of global competition are pushing the Japanese into new and more adversarial relationships with their computer suppliers. The need to keep costs down while improving the quality of products and services is forcing companies to re-evaluate their procurement strategies and spread buying among several vendors.

"The traditional customer loyalty to one vendor is changing," says Takuo Kikukawa, deputy general manager in charge of domestic marketing at Fujitsu. "We think a multivendor era is dawning in Japan."

Loyalty, exclusivity prized

Why did single-vendor relationships remain entrenched for so long? Much of the answer can be found in centuries-old Japanese attitudes about dealing with suppliers. Historically, the Japanese have preferred commercial relationships based on loyalty and exclusivity.

For buyers, this has often meant forgoing the price advantages and, sometimes, the improved product quality that competitive markets create. "Unless products are far superior or much cheaper, they wouldn't switch vendors," says Keiichi Maesato, a consultant in the Tokyo office of market research firm International Data Corp.

In return for their unswerving loyalty, customers

Joel Nakamura

asked for and received exceptional levels of support, including custom-made products and extensive low-cost service and support.

"Japanese people really appreciate a long-lasting relationship and demand a lot more hand-holding," Maesato says.

Joichi Ito, president of software distributor MDG Japan, Inc. complains that the level of demand for support can sometimes be exasperating. "When my beeper goes off," he says, "I have to run to a phone and call the customer right then."

The pricing structure employed by Japanese vendors reflects the premium users place on inexpensive but wide-ranging services. "Vendors keep a close relationship with companies by keeping hardware prices high and software and services costs low," says Mochio Umeda, a consultant at Arthur D. Little (Japan), Inc.

For many Japanese information systems buyers, intense loyalty has been a pragmatic necessity as well as a cultural preference. The influence of powerful industrial groups that pressure companies to buy from favored vendors and the hammerlock of proprietary standards have kept IS users firmly in the grip of suppliers.

Large Japanese companies belong to loosely tied industrial groups centered around a major bank. Called *keiretsu*, these groups have traditionally wielded much economic clout. For example, NEC, formerly called Sumitomo Electric Co., is part of the Sumitomo *keiretsu*.

In the past, members of the group — The Sumitomo Bank, Sumitomo Life Insurance Co. and others — favored *keiretsu* partners in their business dealings. Although prices are sometimes higher than those demanded for similar goods and services that are provided by alternative suppliers, pressure that is exerted by other members generally keeps potential renegades in line.

A plethora of proprietary protocols and architectures has also reinforced the bond between IS users and their suppliers. "If standards became more available, I would have more courage to change vendors," confides Hideo Watanabe, IS director at chemical manufacturer Mitsubishi Kasei.

While Japanese vendors such as Hitachi and Fujitsu are known in the West as makers of systems compatible with IBM equipment, in their home market they have tweaked things just enough to lock users into proprietary architectures. "Open systems are not of interest to [vendors]," says Rob Morel, director of the Open Software Foundation's Tokyo office.

"It's important for a manufacturer to have its own operating system that is not completely plug compatible," Fujitsu's Kikukawa says, "and to offer features not offered by IBM."

Custom-made in Japan

What's more, standards can be hard to preserve in a country where customization is in high demand, he adds. "Sometimes we have to change or enhance our operating system to meet customer requests."

The Japanese demand for customization has also meant that hardware vendors are often called on to develop specific applications software for users. This practice further erodes users' independence.

"We often work with the vendor to develop systems," Watanabe says. "If the relationship is too adversarial, we can't do that." Mitsubishi Kasei, which began using IBM equipment in 1952, turned to Fujitsu computers 20 years ago, becoming one of the mainframe maker's first customers, Watanabe says. Until recently, he headed Japan's Fujitsu users group.

Winds of change

Some companies have already begun bucking tradition, however, spreading their purchasing across more suppliers. As a result, Japan's computer behemoths are being drawn into competitive bidding by buyers trying to drive down prices.

"Customers are becoming tougher in price negotiations," acknowledges Soji Endo, manager of overseas operations for Hitachi's computer business.

One of the new breed of tougher customers is The Sumitomo Bank, which IS chief Yoshiyuki Fujii says has turned to multivendor procurement as a way of keeping a cap on its $200 million to $300 million annual IS budget. The bank's 12 mainframes come from NCR Corp., IBM, Digital Equipment Corp., Unisys Corp. and NEC. "One of the reasons we use five vendors is to minimize our cost for investment in new machines by letting them compete," Fujii says.

The growing push for competitive bidding has already resulted in lower prices. IDC's Maesato says that IBM has been discounting heavily for the past two to three years.

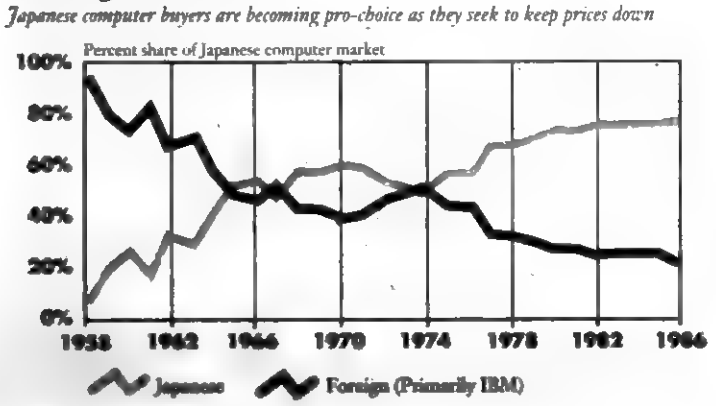
Moreover, IBM, Fujitsu and Hitachi changed software pricing policies during the past year, lowering costs for small- to medium-size users. "Manufacturers pay for customer loyalty by giving in on prices," a Fujitsu spokesman says.

The need for more cost-effective systems is also clearly weakening the influence of the *keiretsu*, says Akira Morita, consultant at Arthur D. Little. While for expensive mainframes, companies still might bow to the group's pressure, he says that for departmental and networked personal computers "they go outside."

The shackles of proprietary protocols are also loosening. The international open standards movement that is gaining momentum in Europe and the U.S. is reaching Japan's shores, according to observers. Japanese users involved in international business are starting to pressure their domestic vendors to provide Open Systems Interconnect capabilities and standard Unix operating systems. □

Bucking tradition

Japanese computer buyers are becoming pro-choice as they seek to keep prices down



Source: *IDC Komputa Soto Kompanipu, Fujitsu no Gaikyo*

CW Chart: Doreen Dable

The Labor Crisis BUILDS

BY JOANNE KELLEHER

In information systems managers in Japan don't need an abacus to figure out that there is something seriously wrong with the numbers they are trying to reconcile. When they add escalating user demands and top-level pressure for strategic information systems to applications backlogs that already range from one to five years, they get a sum far bigger than current systems engineering and programming staffs can handle.

"If I were to choose the one biggest problem we have right now, it would be lack of personnel," says Kenichi Hayashi, manager of business systems in one of Mitsubishi Corp.'s two IS departments.

That's a problem that is increasingly difficult to solve in a country already suffering from a full-fledged labor drought. Japan's Ministry of International Trade and Industry (MITI) estimates that there are currently 251,000 fewer programmers and software engineers than needed, and it is projecting the deficit will swell to 965,000 by the year 2000.

However, the numbers really only tell part of the story. What they don't disclose is worse.

To begin with, there are the wage demands that go along with scarcity. Daniel Maher, a senior managing partner at consulting firm Chuo Coopers & Lybrand in Tokyo, says new hires are expecting and getting anywhere from $8,000 to $16,000 more than existing staff, and wages are rising, on average, about 10% to 20% per year.

An additional complication is that IS departments in Japan have long been extremely dependent on software development assistance from hardware vendors, and now, at a time of maximum work load, that support is being withdrawn.

Until recently, it was common practice for computer vendors to stage-manage and underwrite major portions of the systems development efforts of large customers.

Jiro Matsuki

"They would send systems engineers — in some cases, hundreds of them — to work for major customers in systems development," says Yuji Ogino, managing director at International Data Corp. Japan Ltd. "Also, if they charged anything at all for this service, they usually only asked for a nominal amount."

This practice is usually referred to as "good luck business." But the good luck has now run out for the majority of customers. Vendors are also struggling with labor shortages and escalating wages. The *Nihon Keizai Shimbun (Japan Economic Journal)* recently reported, for example, that NCR Japan came up 25% short of its recruiting target for science specialists last year.

That kind of hiring problem, in combination with growing pressures on hardware pricing, is causing many vendors to conclude that they can no longer afford to subsidize the applications development efforts of their customers.

The biggest accounts are, in many cases, being

offered the option of participating in joint development partnerships with vendors, in which both sides contribute funds and personnel. Less favored customers, however, are left to fend more or less for themselves.

Get with the program

Many companies are turning to contract programming firms to execute their application specifications. For example, CSK Corp., which is Japan's leading systems software development house, has already decided that its current base of 6,200 employees will not be sufficient to keep up with rising demand.

According to *Business Tokyo* magazine, the company has spent $107 million over the past two years on the creation of a training center.

Programming in Japan is viewed "as a mechanical activity, not a creative art," says Gabriel Rozman, information technology director at Ernst & Young International.

For that reason, IS managers are generally less worried about programmer shortages than they are about scarcity of systems engineers capable of planning and developing sophisticated information and communications systems.

"It isn't so easy when it comes to systems engineers," explains Tsutomu Ohta, general manager of the IS department at Nissan Motor Co., which is currently employing six outside firms — in addition to the IBM service department — to assist with not only the design, but also the engineering of large-scale systems.

This is not an approach that the company is particularly happy with, Ohta says. "It's very expensive, and these firms lack knowledge of the industry," he adds.

However, Ohta says, he doesn't have much choice at the moment.

It isn't only the expense or the lack of specialized knowledge that makes dealing with outside contractors, such as consulting firms and systems integrators, a difficult step for Japanese companies, according to Maher.

"Systems engineering is considered a key business issue," Maher explains, "and in Asia in general, it has long been seen as a sign of failure for a company to have to hire outsiders to deal with its business issues."

Traditions of all kinds are beginning to give way, however, as Japanese companies struggle to reconcile the pressing need for ambitious information systems with the growing deficits in systems design and development personnel.

Cradle-to-grave employment, the entrenched seniority system, exclusive relationships between corporations and top universities, taboos on taking core business issues outside the corporate family, the automatic relegation of women to menial labor — all of these long-standing totems are beginning to erode in the face of intractable personnel shortages.

> *"Systems engineering is considered a key business issue, and in Asia in general, it has long been seen as a sign of failure for a company to have to hire outsiders to deal with its business issues."*
>
> **Daniel Maher**
> **Chase Coopers & Lybrand**

Mitsubishi, as an example, broke with tradition this year and started recruiting midcareer systems professionals. The company took this step only after trying a number of other tactics to cope with a rising tide of systems development and support requests, including reorganizing its IS department to facilitate the transfer of systems development to individual business areas.

For a company like Mitsubishi, the decision to hire IS personnel trained in other places represents a big step into the unknown. Hiring fresh out of colleges and universities has long been a near sacrosanct corporate policy in Japan.

This practice, along with cradle-to-grave employment, has been the cornerstone of Japan's famously cohesive corporate cultures. By plucking new employees fresh from the classroom, companies were able to inculcate them with the company's particular values and philosophies and create maximum personal identification with the company's goals.

Harmony vs. experience

Bringing older, experienced workers trained by other companies into such a carefully balanced environment means running the risk of introducing foreign ideas and disharmony.

Among other things, the hiring of outsiders upsets the seniority system, raising the specter of Western-style competition and back-biting.

Clearly, however, many companies feel that the current situation warrants taking those risks. According to the *Nihon Keizai Shimbun*, financial services companies are moving aggressively in this direction, and three of Japan's leading city banks have already hired a total of 150 midcareer workers.

Equally revolutionary is the fact that many large companies are starting to recruit outside their collegiate networks, extending offers to graduates not only of second- and third-tier private universities but even low-prestige technical schools run by the prefectures.

According to Maher, corporations are lining up to solicit these non-pedigreed students. "The technical schools are getting swamped," he says. "Each male graduate now has at least three offers to consider."

Women, so far, have not benefited greatly from the new liberalism in hiring policies. IS departments, and Japanese companies as a whole, are still largely male preserves.

Women tiptoe through the scene carrying tea for visitors or hauling briefcases and heavy equipment, but these omnipresent "office ladies" are regarded as decoration, not professionals in training.

Women already outnumber men on college campuses, however. And by the time that the estimated 90,000 of them are ready to graduate in March 1991, some employment experts say they believe that companies will be ready to break that last taboo. □

KELLEHER IS A COMPUTERWORLD FEATURES EDITOR.

Doing without

The gap between the demand for and supply of IS professionals is expected to widen rapidly throughout the decade

	1990*	1995*	2000*
Software engineers	107	240	422
Programmers	144	272	544
Total	251	512	966

*Personnel gap (in thousands) *Estimated

Source: MITI CW Chart: Doreen Dahle

CASE STUDY

Mixing HIGH TECH and HIGH RISES

BY PAUL GILLIN

Japan's sizzling economy and the global demand for massive construction projects has transformed the country's construction industry from a bricks-and-mortar environment into a high-tech hotbed. Taisei Corp., Japan's third largest construction firm, has been at the forefront of that trend.

Success in the Japanese construction industry depends on controlling costs while navigating a maze of government restrictions. Taisei claims to be the leader in applying computer technology to design and planning.

Taisei, with $10 billion in revenue, is applying computer modeling to the staggeringly complex task of building giant structures such as power plants, bridges and the No. 1 Tokyo municipal government building, which will be Japan's tallest skyscraper when it is completed in April 1991.

The company's love affair with technology dates back to 1958, when Taisei formed a technology research subsidiary. The commitment was reinforced in 1961, when it became the first Japanese construction firm to install a mainframe computer.

Today, Taisei employs more than 12,500 people in 17 countries. That work force is armed with more than 3,200 personal computers, workstations and terminals, which translates into an employee-to-PC ratio of 4:1.

Taisei's intent, however, is to halve that ratio by the year 2000, an unusually aggressive goal in the fieldwork-intensive construction industry. More than one-third of the 125 employees in the information systems department work on civil engineering or computer-aided design (CAD) applications, most in lockstep with user departments.

Haruo Nabeshima, Taisei's affable IS director, says technology has been part and parcel of the firm's culture for the 30 years he has been there. "My personal goal is to realize construction without people

Kaku Kurita/Gamma Liaison

As director of IS at construction company Taisei, Haruo Nabeshima's personal goal is to achieve construction without people and a production environment without paper

and a completely paperless production environment," he says.

Though paper is still very much in evidence in the company's offices in the thriving Shinjuku business district, Taisei has made some major strides toward taking the labor out of project design and estimation. The company employs 17 discrete software systems in its planning and bidding process, and it has just completed a four-year effort to integrate those systems into a master design tool. Among the tools Taisei engineers have are the following:

- A laptop computer-based system for roughing out plans and proposals at the client's site. The company added graphics to Lotus Development Corp.'s 1-2-3/J Japanese language spreadsheet to allow engineers, for example, to simulate a building's exterior view from within a spreadsheet.
- A schematic design and proposal system that enables an engineer to model height and shadow restrictions, simulate a building's volume and generate cost estimates while still in the proposal stage.
- Three- and four-dimensional landscape simulations that show a proposed building and its surroundings. The images can be combined into an animated sequence to simulate, for example, a walk around the building's grounds.
- Construction analysis systems that create solid models or wire-mesh diagrams showing things such as the stress points of a design, the effects of air flow over a domed structure and a building's earthquake tolerance.
- Systems for modeling concrete structural frames and internal utility systems such as air conditioning. From the models, engineers can generate complete construction plans and parts lists.

Taisei's crowning CAD achievement is a system that connects its various design packages to create a central database for an entire construction project. Loran-T, the four-year, $8 million project, has functions for modeling the physical properties of a building, simulating the schematic design, laying in utility equipment and performing structural analysis. Loran-T is integrated with a graphical three-dimensional database that can show how designs will appear when they become a finished structure.

Taisei software *creates 3-D models of building superstructures*

The key is the central database of project specifications. Discrete modules such as cost accounting and project planning can tap into the project data to generate detailed estimates of project costs before a shovelful of earth is turned. Loran-T runs on a Digital Equipment Corp. Vaxstation 3100 with an IBM 3090 interface.

"This is a totally integrated CAD system with the building model at the nucleus," says Naonobu Fujita, general manager of the research and information department in Taisei's design and proposal division. "We are actually creating a mock-up model of the building, which becomes more accurate as we go along."

A demonstration of a building model shows Loran-T generating a 3-D solids model of a building superstructure from a set of specifications. Engineers can enter specifications for something such as an air-conditioning system and Loran-T will generate the parts requirements, create a cross-section diagram of the building showing the location of the air-conditioning ducts and then generate a full-color simulation of the building's interior showing the ducts overhead. Users can "walk through" the building for a simulated visual inspection.

Backing up Taisei's high-tech infrastructure is a backbone network that provides high-speed communications between its Tokyo headquarters and 12 branch offices throughout Japan. The in-house network features Ethernet communications on each of the 26 floors that Taisei occupies, along with dual 50M bit/sec. hyperchannels that automatically back each other up. The network supports voice, data and full-motion video.

More than 1,500 miles of leased-line communications link offices throughout Japan at speeds from 384K to 3M bit/sec. A critical tributary covers the geographic triangle formed by the firm's Tokyo and Osaka offices and its Totsuka research center. That lifeline network uses a combination of 3M and 1.5M bit/sec. lines to provide speed and redundancy. The whole network is monitored by a network management system that Taisei, like many Japanese companies, developed itself.

The next step, says Yasuhiro Takahashi, senior systems engineer in IS, is to expand its communications network to an estimated 3,000 construction sites worldwide by tying them to the corporate network via a value-added network. There is still plenty to be done. While 90% of Taisei's workstations in the head office and branch locations are networked, only about 20% of the 1,200 field devices in the field are connected. □

GO TEAM!

TAISEI'S DEVELOPMENT APPROACH typifies the team orientation that Japanese companies take for granted and many U.S. organizations envy.

The information systems department was only one of four players on the project to build Loran-T, a start-to-finish integrated CAD system. Employees from the architectural design, structural design and utility equipment user organizations were on the development team.

Development was then split into five task-force committees responsible for different segments of the final product: three-dimensional building model database; system environment; estimation system; drafting CAD system; and engineering document system.

Each development team included representatives from both user and IS departments. Design proceeded in parallel, with coding farmed out to a contract software house.

Involving users in system design seems natural for Haruo Nabeshima, Taisei's general manager of IS. A civil engineer by training, Nabeshima came into the IS position three years ago with no technical background or computer training.

— Paul Gillin

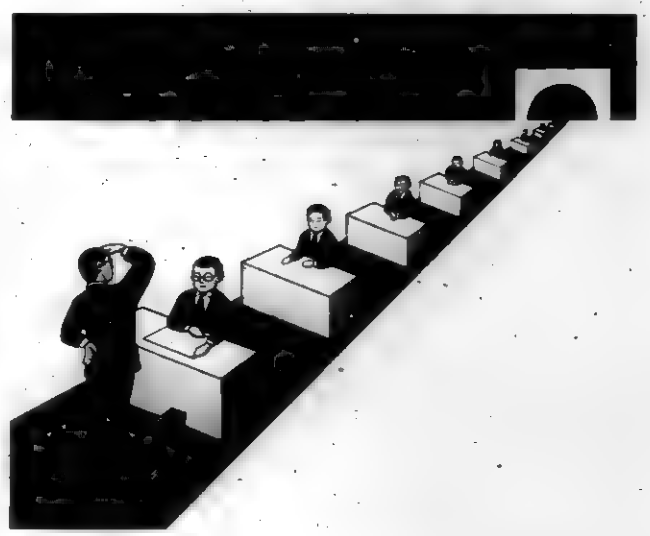
The Consensus Is: Group Process SLOWS *Decisions*

BY AMIEL KORNEL

Are the demands of fast-paced technological change on a collision course with traditional methods of decision-making in Japan? Some people think so, pointing to the fact that project planning and budget definition can be a slow and painful process in a country where risk-taking and personal initiative are largely frowned upon and consensus is all-important.

"The planning process takes so long that by the time it is done, many issues aren't relevant any more," says Gabriel Rozman, information technology director at Ernst & Young International.

What is also likely to be lost in the long process of consensus-building and compromise is focus, says Yoichiro Sakuma, a consultant at Arthur D. Little, Inc. Because achieving consensus requires reconciling contradictory views among managers and even low-level staff, objectives can become blurred.



Tomio Nitto/Reactor

Both Sakuma and Rozman blame the traditional Japanese approach to project planning for a large part of the massive systems development backlogs that most Japanese companies have accumulated. Breaking a project into manageable chunks and weighing the relative importance of project objectives is "against the Japanese culture," asserts Rozman, who has spent 5½ years doing consulting work in Japan. "Dividing an application into modules and assigning priorities," he says, "is [considered] insulting because you're telling one person his application is more valuable than another's."

But what Sakuma and others see as counterproductive, Charles Cronheim sees as "quiet and gradual" and, ultimately, more sensible. Cronheim, director of information systems at Mobil Sekiyu Kabushiki Kaisha, says that in Japan, where he has worked for the last four years, "ideas are shared with a few peers and spread laterally. By the time they get to me, they've been sold." That is in contrast to the American decision-making process, in which "99% of the ideas never go anywhere, not because they're not good, but because no one buys in," he says.

Still, for U.S. companies trying to do business in Japan, the decision-making process can seem agonizingly sluggish. "There is a long period of building trust, getting to know the company . . . It can take as long as two years to get a complete agreement," says Mark K. Shull, manager of business development at

EDS Japan Ltd. Once the agreement has been made, however, "the Japanese personal commitment is as strong as a legal document," Rozman adds.

The archetypal decision-making process — budgeting — exemplifies the Japanese method of planning. With the payback from their IS investments difficult to quantify, Japanese companies prefer to set strict limits on spending. "Most companies compute their IS budget as a percentage of the next year's expected revenue," says Yutaka Kato, a professor at Kobe University's School of Business Administration. As a result, IS managers don't know how much they'll have to spend from year to year, which makes planning difficult. Multiyear projects can suddenly lose their funding because of unexpected downswings in business.

In some companies, however, long-range planning provides IS with a buffer against year-to-year fluctuations. The Sumitomo Bank Ltd., the world's second largest bank, sets spending according to five- to 10-year plans, says Yoshiyuki Fujii, assistant general manager of operations administration.

Other companies are attempting to make planning more responsive to IS requirements by bringing the two functions together, often under a top executive. Last year, for example, Fuji Photo Film Co. established a corporate planning section dealing with corporate business, logistics and information. "That kind of arrangement is becoming more common in Japan," says Hiroaki Osuga, manager of Fuji's systems planning and data processing department.

In some organizations, traditional consensus methods are being preserved, but the decision-making group is changing to fit the times. Taisei Construction Co., for example, works on what it calls an "open team" system in which any group can create a development team with IS. As a result, a group can develop an application more quickly while keeping focus on the initial goal. Says Naonobu Fujita, general manager of research: "We create task forces to minimize the time we have to spend making decisions." □

Investing *In* *R&D* PROWESS

BY AMIEL KORNEL

Often accused of imitating U.S. technology, Japan has clearly set its sights on achieving innovative preeminence.

Signs of this resolve are everywhere. Consider the following:

- Two-thirds of Japanese managers surveyed last year by Japan's Science and Technology Agency cited strengthened research and development as their primary goal.
- Japanese capital investment in manufacturing plants, equipment and research has risen 150% during the past five years to an estimated $600 billion in 1990.
- Nearly a quarter of Japan's capital investment last year went into new products and research, up from 14% in 1980.

All of this research and monetary muscle is finding its way into many information systems-related areas.

Improving the interface between man and machine is arguably the most pressing area of Japanese research. The Kanji character set's roughly 7,000 ideographs make typing a nightmare, and although the simplified Katakana character set has at least made personal computer use a possibility, typing is still slow.

As a result, voice recognition and touch-panel technologies are high priorities. Nippon Telegraph and Telephone Corp. (NTT) is working on a voice recognition system that it reportedly hopes to have on the market in about a year's time. Sony Corp. and Canon Ltd. have

Armed with innovative new technologies, Japanese industry seeks to hone its competitive abilities

R.M. Kato

begun to offer notebook-size PCs that use touch-sensitive screens and pens that allow handwritten entry of text and data.

At the chip level, researchers are seeking new levels of component density. In an NTT project, researchers are developing X-ray lithographic techniques for making advanced, more densely packed chips. Backed by 13 of Japan's biggest electronics and semiconductor manufacturers, the project, to be completed in the year 2000, has gained financing of $100 million.

Companies are also looking at increasing the speed of circuit elements. At Hitachi Ltd., research targeting gallium arsenide, superconductors and optoelectronics is expected to lead to nonsilicon elements offering improved performance. Hitachi spent $2.8 billion — 5.8% of sales — on R&D last year, the company says.

Making components smaller does not ensure long-term technological advances, however. The next step, according to Michiyuki Uenohara, who recently retired from the post of senior vice-president in charge of R&D at NEC Corp., is to look for "completely new architectures [that], without increasing density of integration, allow an improvement in throughput."

Tip of the iceberg

This search will be one of many R&D projects on which NEC reportedly plans to spend a total of roughly $1.7 billion in 1990.

Artificial intelligence is also a major focus. Just one example is a neural network project initiated by Hitachi last year. In an early test application, researchers have been able to design a securities system that selects ideal combinations of stock investments in a fraction of the time previously required, according to the company.

Most communications-related R&D in Japan is carried out in the laboratories of NTT, which spends more money than any other company in the world on investments in new equipment and research. NTT is betting on new Integrated Services Digital Network (ISDN) capabilities to be available countrywide by the end of this year.

Kohji Ohboshi, senior vice-president in charge of corporate strategy planning, said the company projects 35,000 ISDN subscribers by the end of 1991 and 750,000 by 1995.

Although vendors are hot on the R&D trail, there is little domestic demand for breakthrough IS products. Japanese IS users seem content to remain well behind technology's leading edge.

As a result, Japanese vendors count on the readiness of foreign users to embrace new technology to drive their research efforts. In fact, new products and technologies are often tested in the U.S. before being used back home.

"We usually introduce new technology into the American market first," Uenohara says. "Japanese users ... prefer waiting until someone else tries it."

One exception is expert systems development, which many companies are pursuing aggressively.

The Bank of Tokyo Ltd. is working with Xerox Corp. to develop an expert system application for Unix workstations that will evaluate leasing proposals, according to Mario Tachibana, assistant manager in the bank's corporate advisory division.

Chemicals maker Mitsubishi Kasei is building an application that would allow researchers to simulate stages of organic synthesis.

Also, at The Sumitomo Bank Ltd., expert systems are already performing such jobs as market forecasting and tax consulting, according to Kunihiro Ohbayashi, general manager of the systems development department. Another 10 such systems are under development for applications such as business promotion support and customer credit analysis. □

A Day in the Life

BY LORI VALIGRA

Around 7:00 a.m. each morning, as the sun rises in Tokyo, Yoshiyuki Fujii and about 10 million other Japanese "salarymen" board crammed trains for work. By the time they return home, the moon will be high in the sky.

The image of the blue-suited workaholic is alive and well in today's Japan. For Fujii, waking at 7 a.m. and returning home at 11 p.m. is a normal day's work. But it's a day that brings him enjoyment and reward.

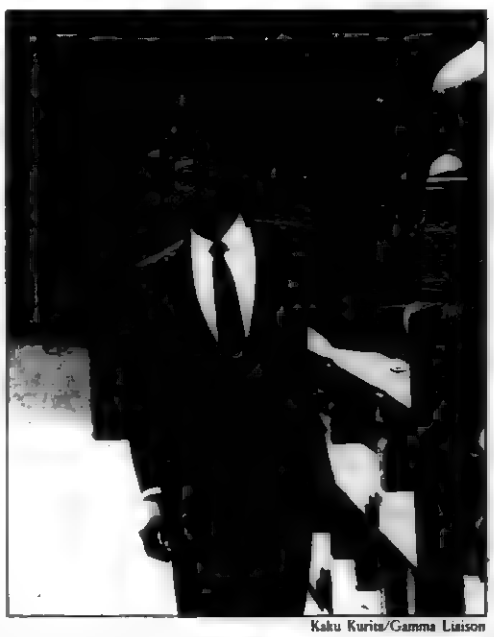
As assistant general manager for the operations administration department (OAD) of The Sumitomo Bank Ltd. based in Tokyo, Fujii is responsible for general planning of the infrastructure for the bank's global computer system and network, computer facilities management, budget control as well as coordinating his staff of eight. His department manages hardware and software for the bank.

The 38-year-old Fujii is no stranger to hard work; his bank, based in the merchant port of Osaka, is known for driving its employees hard.

"Sumitomo people are very dedicated to their work. They act as if they are bank directors or managers," says Fujii, who holds an economics degree from the prestigious Tokyo University.

As one of the most aggressive Japanese banks, renowned for its bottom-line focus, Sumitomo stands in sharp contrast to the more gentlemanly Tokyo banking circle, which generally is slower to react to new banking opportunities. So do its profits: It has the highest earnings among the 13 Japanese city banks and the third largest fund volume. Japanese banks have traditionally held lots of assets but were shy of profits compared with banks in other parts of the world.

Analysts here compare Sumitomo's corporate culture with that of Citibank NA. The bank is positioning itself to become an international player, a trait that shows in its employees: Rather than eating the traditional Japanese breakfast of fish, Fujii opts for toast, coffee and some fruit or yogurt. He spends about 30 minutes with his two young sons before boarding the crowded train in northwestern Tokyo for the 45-minute commute into the city's business hub in Marunouchi. That is shorter than the average commute of more than one hour that most Tokyoites face, but he still has enough time to scan the morning paper before arriving at the office around 8:15 a.m.



Kaku Kurita/Gamma Liaison

Yoshiyuki Fujii's *day, like that of many Japanese 'salarymen,' often extends late into the night*

Like most Japanese offices, Sumitomo has an open floor arrangement in which each manager sits at the head of a long row of desks so that all employees can easily see each other. In his office on the ninth floor of the bank's Tokyo headquarters, Fujii starts his day by checking his schedule book to see if he must make any telephone calls.

Although he meets individually with his staff every week, the group holds a 20-minute meeting each morning to review general announcements and work schedules. Following that is another hour-long meeting at which section chiefs, including Fujii, give updates on their current activities and discuss any problems and future plans. Some days there are deputy managers or general managers (a

# of an IS Manager

level above Fujii) at the meetings to discuss general banking policy. Fujii spends about two-thirds of each day in meetings. Most of the time, the various meetings focus on the global information network that OAD administers. Recently, discussions have centered on OAD's semi-annual budget.

"Basically, we are always working on a different part of the budget. The key is to try to see what the other banks are doing through published information and opinions. We look at how they operate their systems and develop software and their philosophy of utilizing information systems or promoting business. This helps us determine our domestic and international budget," Fujii explains.

Another focus of recent meetings has been the availability of automatic teller machines (ATMs) on Sundays, which will happen next spring. Currently, ATMs are operational from Monday through Saturday, although they close by 7 p.m. on weekdays. "We must prepare for the Sunday openings and set up our facilities and maintenance teams for ATM planning. Our customers are not very tolerant [of failures], unlike their American or European counterparts," Fujii says.

Beyond the usual

While most meetings are routine, there are also problem-solving sessions, some prompted by headline-grabbing disasters at other banks. Events at Mitsubishi Bank have provoked a number of such meetings in recent years.

Following an underground fire near Mitsubishi's computer center in Tokyo in the mid-1980s, Mitsubishi's ATMs were knocked out for a day. This was the first large network disaster, starting a rush in Japan to build backup computer centers. Sumitomo decided to build a $20-30 million dollar backup computer center in Kawasaki, just outside Tokyo.

. . . . . .

"Salarymen are not just workaholics. They enjoy a personal life, too. They are hard-working and hard-playing."

Yoshiyuki Fujii

. . . . . .

Mitsubishi had another mishap this spring, when it reportedly shut off voltage to its ATMs while conducting routine maintenance on the power facility one Saturday, which caused the system to crash. "That caused a series of meetings at Sumitomo to look at our operations," Fujii says.

Following the morning meetings and an hour's lunch break in the company cafeteria, Fujii may attend another meeting, sift through a foot-high stack of IS documentation and banking and IS magazines that arrive daily at his desk, or make overseas telephone calls to technical people in OAD departments in London and New York. The purpose of these calls is to coordinate the worldwide network and to make sure there are no problems.

In addition to his work, Fujii periodically gives lectures to engineering students at local universities. Several times a week, after finally wrapping up his office work at 8 p.m. or 9 p.m., he and his staff, colleagues from other companies, bosses or college friends go to the nearby Palace Hotel or a beer hall to unwind over drinks for about an hour. Though Fujii stresses that these famous salaryman drinking bouts are not necessary once employees enter the management ranks, they are critical for younger employees establishing contacts and building group morale.

Because Fujii usually gets home around 11 p.m. or midnight five days a week and sometimes takes work home, he only sees his two boys briefly in the morning, when he checks on them in bed each night, and on the weekends, when he plays catch or goes on bicycle rides with them.

Even Sumitomo's president is stressing the importance of leisure activities and the company intercom blurts out exercise routines for five minutes every afternoon. Still, Fujii and other Japanese salarymen regularly put in long hours and enjoy them.

"But salarymen are not just workaholics," Fujii says, who plays "go" (a Japanese board game), "shogi" (Japanese chess), golf or reads when he has spare time. "They enjoy a personal life, too. They are hard-working and hard-playing." □

VALIGRA IS THE TOKYO BUREAU CHIEF FOR THE IDG NEWS SERVICE.

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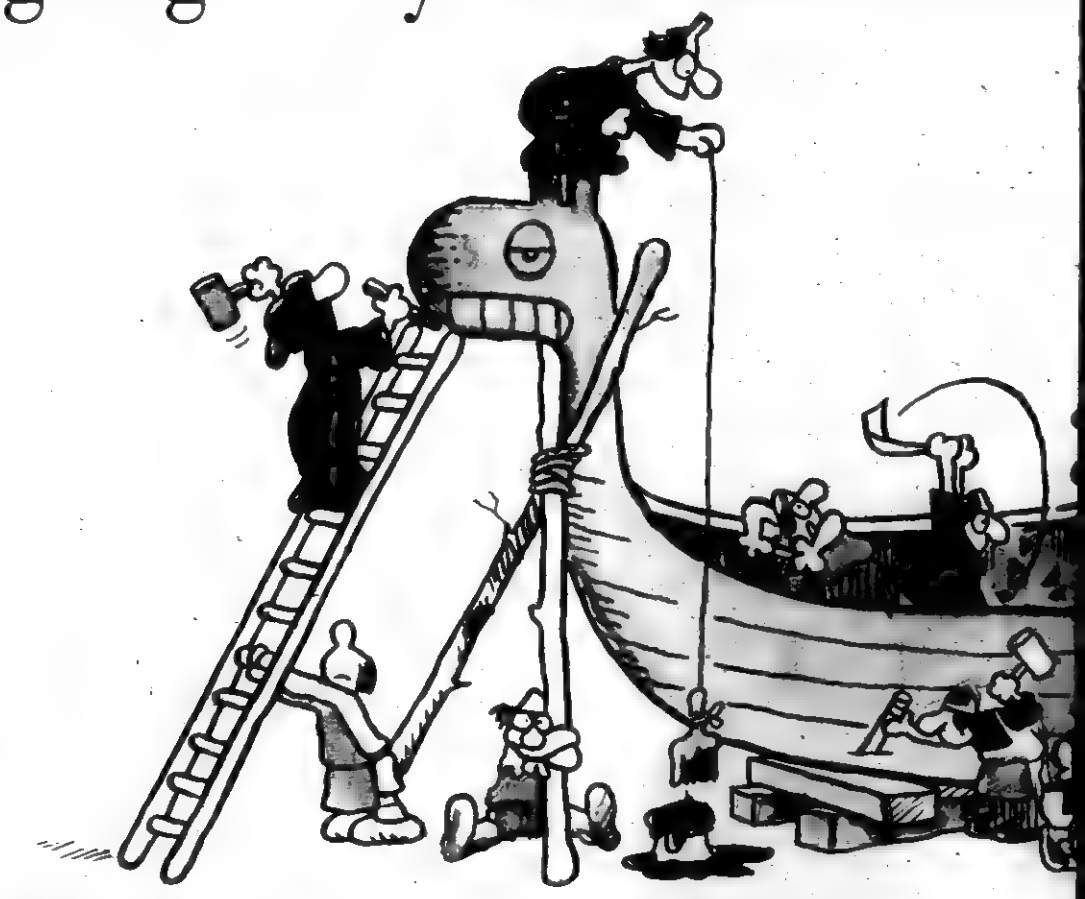

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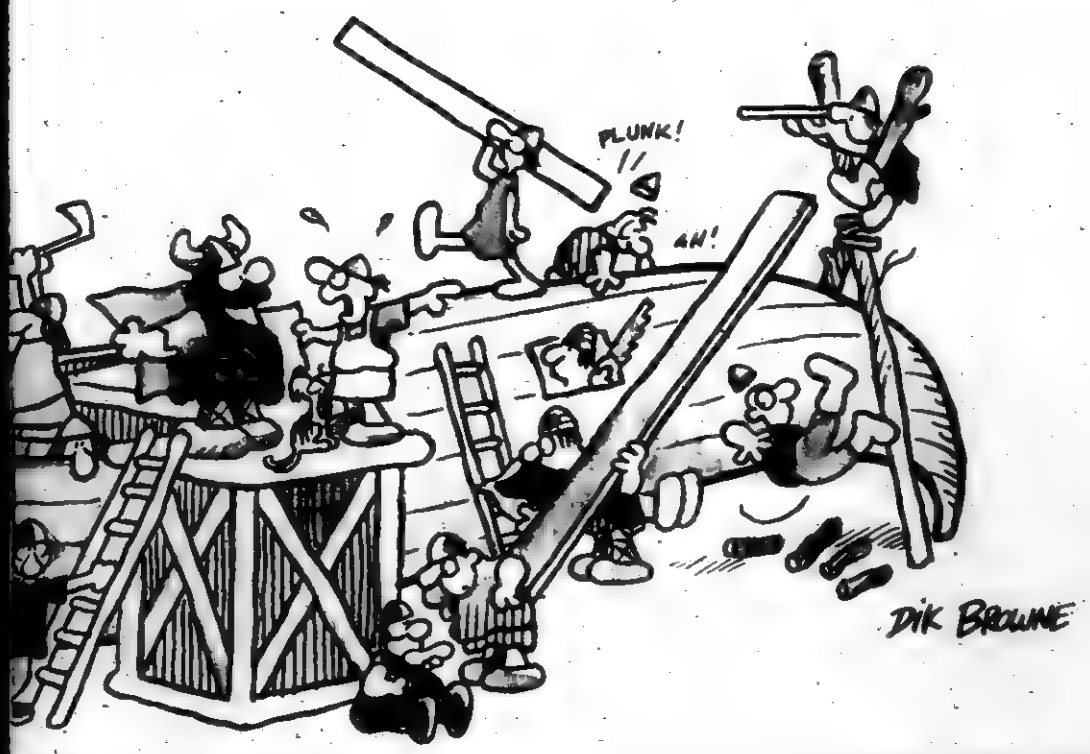

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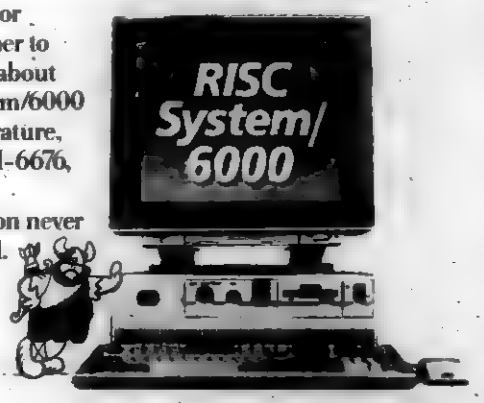

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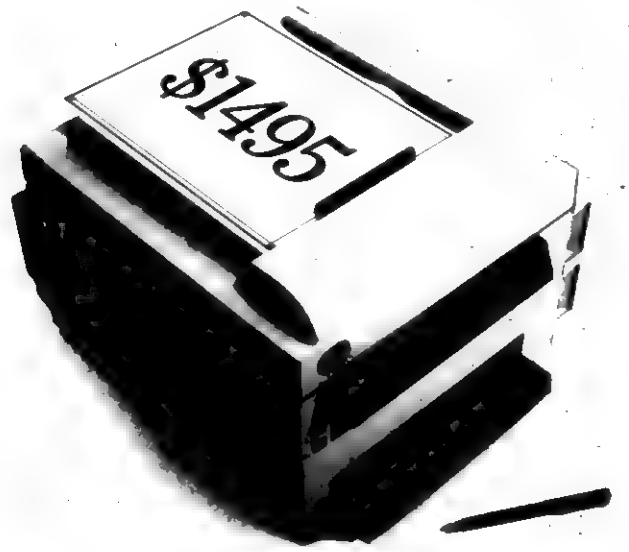

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VOL 24
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THE NEWSWEEKLY OF INFORMATION SYSTEMS MANAGEMENT
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COMPUTERWORLD

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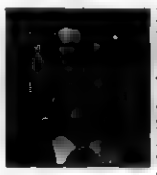
In Depth — A first-hand look at computing in the Soviet Union. Page 73.

Executive Report — How IS can soften the impact of changes in the work force. Page 63.



Profile: He's not the typical IS professional. Most of Haruo Nabeshima's 30-year career at Japan's Taisei Corp. was spent learning the construction business from the foundation up. Page 57.

Prime rebirth: Nearing the one-year anniversary of its acquisition by a private investment firm, the minicomputer vendor is boasting increased revenue and operating profits. Page 4.

The 'Houston 30' may ally with Corporation for Open Systems as the group of heavyweight IS managers forges efforts to breach open systems barriers. Page 6.

DEC and IBM on outside looking in as Ford group standardizes on HP's Unix minis, and GE Aerospace counts on Sun for future systems replacements. Page 8.

Release 3.1 of 1-2-3 is slated to ship within the next week or two, and beta testers say it does the job. Page 16.

IBM to pull 3090 into Summit camp

BY ROSEMARY HAMILTON
CW STAFF

IBM will usher in its next-generation mainframe and revamp its existing System/370 line with a product blitz scheduled for the first week of September, according to recently briefed customers.

The announcement, considered to be IBM's biggest mainframe introduction in years, will include the long-expected 3090 follow-on, commonly referred to as Summit.

But it appears that IBM will attempt to unite the new generation with the existing 3090 J line, which was not the case when previous mainframe generations were released.

IBM customers contacted last week said they expect that IBM will introduce an initial Summit system that will have new features, such as fiber-optic channels, and environmentals, including new power supplies.

However, the system will contain the engine of an enhanced 3090 J that has been termed the "J-Prime" by many. Then, in 1991, IBM will provide the raw performance upgrade — considered the true Summit — with a uniprocessor in the range of 40 million to 50 million instructions per second.

The pre-Summit systems scheduled to be introduced in two weeks will have a different appearance and will arrive with a smaller footprint and reduced power demand, but their innards will be the 3090 J architecture, said Terry Lowder, vice-president of technical research at Banc One Corp. in Columbus, Ohio. The bank is basing its information systems architecture on Summit and has been briefed by IBM on what to expect.

Dave Moore, a senior vice-president at Mellon Bank, said he expects IBM to offer an upgrade package that, when added

Continued on page 100

March to the Summit

IBM's dramatic high-end revamp is expected to include the following:

- Initial Summit versions based on an enhanced 3090 J processor with fiber-optic channels, a smaller footprint and reduced power consumption.
- Upgrades to 3090 J processors to provide Summit features to current mainframes.
- New releases of DB2 and MVS/ESA.
- 4391 processor boosting 4300 line top end to 20 MIPS.

See additional stories, page 100.

Enticement

AS/400 to offer SSP-to-OS/400 migration. Page 101.

PC resellers flounder in discount sea

BY RICHARD PASTORE
CW STAFF

Personal computer dealers are trapped in a real-life version of *The Poseidon Adventure*. Despite recent restructuring and repositioning, many resellers have been unable to find their way back to the surface. Their unrelenting downward spiral of profit margins has some users worried and ready to jump ship.

One of the country's largest resellers, Businessland, Inc., reported a $21.5 million loss last quarter [CW, Aug. 13]. Other chains have suffered as well: Computer Factory, Inc. lost $7.3 million in the second calendar quarter (see chart, page 6).

"We are concerned about the health of Businessland, and we are looking at alternatives," said Wendell Harris, information

Continued on page 6

Escape from Manhattan

New York firms flee financial district blackout

BY JOHANNA AMBROSIO
CW STAFF

NEW YORK — The fears of many information systems managers were realized last week when a blackout in lower Manhattan cut the power to 200 data centers. At week's end, 20 of the nation's largest corporations were still using temporary computer centers.

Observers are calling the blackout one of the worst regional computer-related disasters in at least a decade. "It's very, very serious," said Jeff Marinstein, executive vice-president at Contingency Planning Research, Inc., a consulting firm in Jericho, N.Y.

Richard B. Zane, president of Comdisco Disaster Recovery Services, agreed. "More companies have declared disasters than did as a result of the San Francisco earthquake or the Hinsdale [Illinois] fire," Zane said.

And it is not over yet. Although Consolidated Edison, New York's electrical utility, promised to restore power by today, IS managers may be stuck in their alternative sites throughout this week as well. "Even companies whose power has been restored can't necessarily return to their data centers," Marinstein said. "They might be running on reduced power, with inadequate electricity for the computers and air-conditioning systems."

Financial services firms were hit the hardest, with at least 12 of the 20 displaced data centers coming from that sector. Citibank, Manufacturers Hanover Corp. and Credit Lyonnais

Continued on page 4

Database fight pits safety vs. expense

BY MITCH BETTS
CW STAFF

Chicago fire officials say that on the Dan Ryan Expressway, a truck containing hazardous materials goes by every 22 seconds. In fact, much of the 4 billion tons of hazardous chemicals and radioactive waste shipped in the U.S. each year is transported by trucks over the nation's highways.

And sometimes the trucks crash.

This past January, for example, a truck carrying low-level radioactive chemicals on Interstate 85 near Salisbury, N.C., collided with a car and exploded into flames. Emergency personnel were not sure how to respond to the accident because the truck's manifest was burned in the fire, and it took almost five hours to determine the exact nature of the cargo.

U.S. firefighters, who risk their lives every time they approach a similar accident scene, are urging Congress to implement a nationwide computer system that would provide them with details on every one of the estimated 500,000 daily shipments of hazardous materials.

"It's like mini-Bhopals on the highway every day. It's a disaster waiting to happen," said George Burke, spokesman for the International Association of Fire Fighters in Washington, D.C., drawing an analogy to the deaths of more than 2,500 people in a Bhopal, India, chemical leak in 1984. The union stepped up its lobbying campaign after a November 1988 incident in Kansas City, Mo., in which an unmarked trailer filled with volatile chemicals exploded, killing six firefighters.

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101 IBM dresses up the upgrade ramp, hoping to lure more System/36 users into AS/400 waters with **AS/Entry**.

Quotable

"It's as if IBM is saying, 'Here's your sports car. We'll give you a new engine later on.'"

FRANK GENS
TECHNOLOGY INVESTMENT

On IBM's new mainframe plans. See story page 1.

SYSTEMS & SOFTWARE

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Burn their ATM cards! Check out those valuable execs populating your company, then ponder this: One in three of them would walk out the door forever and start his own competing firm if he had the funding. That comes from a recent survey of Fortune 1,000 executives by Accountemps. What's the HR department to do? "Tap this entrepreneurial energy and retain valuable executives by giving them a stake in both individual and company performance . . . to capture the appeal of self-employment without the inherent risks," the report says. Or give them something they wouldn't otherwise have, like Lakers tickets.

Spicing up customer service is Taco Bell's goal as it moves forward with new PC plans. Page 37.

Behind the Soviet love/hate relationship with computers. Page 73.

EXECUTIVE BRIEFING

■ **Summit will arrive in September,** leading IBM's biggest new product blitz in years. The initial climb to Summit will not be terribly steep for current 3090 J users, as the first of the new mainframes will basically be a large 3090 engine with additional features such as fiber-optic channels. Summit's pricing scheme will reveal IBM's strategy for the life of the 3090 line. In the meantime, IBM sales reps are dangling heavy discounts to lock in Summit sales and stave off Amdahl and Hitachi Data Systems. **Pages 1, 100.**

■ **Large divisions at Ford and General Electric will embrace Unix-based systems** and phase out proprietary IBM mainframes and DEC VAXs. Ford's $9 billion automotive components group will standardize its manufacturing control on Hewlett-Packard's Unix-based minicomputers. Separately, GE's aerospace division is moving to a client/server architecture based on Sun workstations and servers. The so-called Houston 30, a federation of users (including Ford and GE) pressing for open systems, is considering an affiliation with the vendor-dominated Corporation for Open Systems. **Stories, pages 8, 6.**

■ **"Worse than the San Francisco earthquake"** was the effect of lower Manhattan's week-long power outage on New York-based IS operations. Some 200 data centers went down last Monday, and some were still without power as of last Friday. The financial services industry was hardest hit, with brokerage transactions and electronic funds transfers halted or delayed. **Page 1.**

■ **Outsourcing while also downsizing** may be a new trend. ABB-Combustion Engineering Nuclear Power was the latest firm to announce such a strategy, farming out CDC Cyber-based operations for its engineering applications for two years while it recasts them for HP Apollo workstations. **Page 10.**

■ **Global networks are being used as a strategic technology** only at the most leading-edge firms, such as American Express, according to a Nolan Norton study. At most companies, the installation of such networks is justified on a cost basis. **Page 45.**

■ **A nationwide database of hazardous chemicals** being transported by truck is being urged by firefighters, who often lack information about the nature of chemical fires they must extinguish after trucking disasters. But the chemical and trucking industries oppose such a database. **Pages 1, 99.**

■ **Soviet computing plans are ambitious** but are likely to be slowed by a lack of equipment, a brain drain of technical personnel, uncooperative managers and primitive security know-how. Meanwhile, an ASM board member just back from Moscow found a shocking lack of IS infrastructure but a strong willingness to learn from U.S. successes — and failures. **Pages 73, 57.**

■ **On-site this week:** Few organizations have been as transformed by the falling of the Iron Curtain as Radio Free Europe. Formerly the information lifeline of the Eastern Bloc, the network is now competing on reopened airwaves with the likes of the BBC and Voice of America — with IS as an enabler of the change. Radio Free Europe uses two DEC VAX 8550s and a custom relational database management system to run a fully computerized news gathering and editing operation. **Page 31.** Taco Bell is looking to PCs to spice up profits and customer service. The Irvine, Calif., fast-food chain is installing 1,750 Hewlett-Packard Vectras for sales tracking and forecasting, staff scheduling and other Unix-based applications in its company-owned restaurants nationwide. **Page 37.**

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Prime merits customers' faith

BY SALLY CUSACK
CW STAFF

BEDFORD, Mass. — Closing in on the one-year anniversary of its acquisition by private-investment firm J. H. Whitney & Co., Prime Computer, Inc. last week reported a 5.7% increase in revenue for its second-quarter earnings — an announcement that reaffirmed the faith of a loyal customer base and slightly surprised industry analysts.

"The bare fact that they were able to get any increase at all is striking, particularly since their sales force has been reduced," said Wayne Kernochan, a senior analyst at The Yankee Group, a Boston-based research firm.

Cathy Van Orman, president of the National Prime Users Group, said the Prime user base is upbeat about the second-quarter results and expressed confidence in Prime's president and chief operating officer, John J. Shields. "He is a dynamic individual, and we've always felt that if anyone can dig Prime out, he's the man."

"Customers were buying a year ago at very small amounts," Shields said last week. "What we see today are large contracts from world-class companies and customers that are confident with both our products and our long-term financial viability."

Prime President and COO
Shields 'dug Prime out'

Shields, formerly senior vice-president and heir-apparent to President Kenneth H. Olsen at Digital Equipment Corp., joined Prime in January as part of a new executive lineup appointed by J. H. Whitney. At that time, James F. McDonald, former Gould, Inc. chairman and president and now Prime vice-chairman and chief executive officer, also joined the Prime turnaround team.

Prime's revenue for second-quarter 1990 was posted at $403.5 million, up from $381.9 million for second-quarter 1989. Percentage of operating income revenue was reported at 12.4%, up from 2.6% during the corresponding period last year.

Prime was also able to service its debt obligations on a bridge loan with Shearson, Lehman Hutton, Inc. Under the revisions, Shearson has reset the rating to give Prime long-term financing at a reduced interest rate. "This is a clear expression of our vote of confidence in Prime's long-term potential," a Shearson spokesman said.

Shearson will receive 7.5% of the common equity in Prime's parent company, Delaware-based DR Holdings, Inc., and an additional 1% of common equity per quarter that the present loan is outstanding, subject to a maximum of 25%.

One year ago, at the time of the acquisition, the user base was unsure and very cautious, Van Orman recalled. Now, she cites Prime's recent government contract with Electronic Data Systems Corp. and apparent commitment to open systems and Unix as reasons for renewed hope between both Prime 50 series and Computervision platform users.

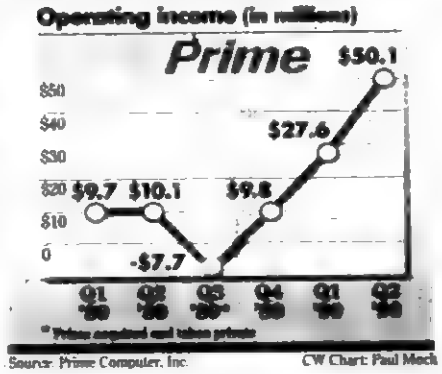
Dana Long, manager of advanced engineering at The Toro Co. in Minneapolis, indicated that his firm has always had a fair amount of confidence in Prime. "We knew that they were going to be a major long-term player in the computer-aided design field. They have good software and good people — the second-quarter news doesn't really surprise me."

Toro has been using Computervision workstations for eight years and has installed 17 of the firm's Sun Microsystems, Inc.'s Scalable Processor Architecture-based workstations since January.

According to Shields, Prime is making substantial investments in research and development to keep 50 series customers happy and provide them with an upgrade path to the open systems environment if "that is where they choose to go." Shields also indicated that Prime will soon be introducing a line of reduced instruction set computing-based Unix processors.

Signs of life

Prime executives point to increasing operating profits – which do not reflect payments on the buyout debt – as a sign of improving health



Source: Prime Computer, Inc. CW Chart: Paul Mock

Blackout

FROM PAGE 1

were among those who sought refuge in hot sites operated by Comdisco Disaster Recovery, IBM and Sungard Recovery Service, Inc. The Federal Reserve Bank shut down the mainframes in its headquarters on Thursday morning and shifted its computer operations to another Fed-owned location.

The blackout began Monday at 1:13 p.m. when fire broke out in an electrical substation near Manhattan's South Street Seaport. As 70 square blocks of lower Manhattan were darkened, some 180 data centers went down. Trading at the American Stock Exchange, the Commodity Exchange and other exchanges was also halted.

Most of the affected firms came back on-line when power in about half of the affected areas was restored at 6 p.m. on Monday. However, 60 data centers were still without power on Friday, Marinstein said.

The blackout's long-term effects will vary, observers said. For businesses that had power restored within hours, minimal disruption and no data loss was experienced. However, organizations that had no electricity for much of the week may face serious consequences.

Added to the expense of running at a hot site are such items as overtime for the systems people. However, the snags in some banks' funds-transfer systems could be far more damaging. Citibank alone is responsible for moving more than $50 billion per day. For every transaction that gets delayed because of computer glitches, interest is lost and fines levied.

John F. Lee, president of the New York Clearing House Association, said about five large banks were still having problems with their computers because of the blackout. However, his group and others have been working with the banks to help them settle their accounts and avoid large fines.

Lee was worried that the funds-transfer system in those five banks might break down altogether. "They're running by diesel generators," Lee said, "and my biggest fear is that the generators will give out."

His fears were partially realized on Wednesday, when Citibank reportedly moved its computer operations off-site because of failed generators.

The Federal Reserve Bank did the same early Thursday morning after the cooling systems in two of its three generators went down. According to a Fed spokesman, the bank shifted its Fedwire funds-transfer system to mainframes in its Pearl River, N.Y., site. "The critical things went over to Pearl River, and everything is functioning smoothly," the spokesman said.

However, because of the sheer volume of transactions handled by the Fed's New York computers — $900 million on an average day — some banks reported delays in funds transfers Thursday.

On Tuesday, Credit Lyonnais shifted its computer operations to a hot-site facility in North Bergen, N.J., run by Comdisco Disaster Recovery. For the rest of the week, more than 90 of the bank's data processing staff members and traders used Digital Equipment Corp. computers.

Zane said that of the 12 organizations using his company's facilities, only two had returned to their own shops by Thursday.

Banks were not the only ones hit. American International Group, an insurance company, also sweated through the week. The firm's major computer-related problem was "scrambling to find alternative data entry sites for claims processing," said Larry English, president of AIG Data Centers, Inc. The company's main computer center is in New Jersey and so was not affected.

CORRECTIONS

A recent article misstated the revenue growth for IBM's Application System/400 business in 1989 [CW, Aug. 6]. That growth was 19% over the previous year. The new business segment of AS/400 sales, however, grew by 27% in the U.S. during the first half of 1990. IBM officials also said they had not confirmed that six new AS/400 models would be announced Aug. 21.

A photo accompanying the article in the Aug. 6 PCs & Workstations section about New York Life Insurance Co. was mislabeled. The caption should have identified Shirley Singleton, a project manager at Logica Data Architects, Inc. in Waltham, Mass.

The credit on the illustration that appeared on page 13 of the Aug. 13 Japan supplement should read Kaz Aizawa rather than R. M. Kato.

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NEWS SHORTS

Windows open on Grid

Grid Systems Corp.'s latest laptop computer bends over backward to accommodate Microsoft Corp.'s Windows 3.0. The 12-pound box is powered by an Intel Corp. 20-MHz 80386SX chip, ships with 2M bytes of memory (expandable to 8M bytes) and features an IBM Video Graphics Array backlit display. The Gridcase 1550SX supports the point-and-click capability of Windows with a keyboard-based Isopoint bar, which allows for mouse-like positioning. Grid has also bundled Windows 3.0 on the 60M-byte hard disk. The $6,295 base machine includes an internal floppy disk drive and rechargeable three-hour battery.

Timeplex upbeat

Following dismal second-quarter earnings reports from arch-rivals Newbridge Networks, Inc. and Network Equipment Technologies, Inc., T1 switch vendor Timeplex, Inc. announced that its revenue has grown between 20% and 25% for the first half of 1990, compared with the same period last year. One major factor behind this growth, according to Timeplex President Dewaine Osman, is that the Woodcliff Lake, N.J., vendor began shipping several long-delayed strategic products. In addition, parent company Unisys Corp.'s sales force is finally starting to move some Timeplex products off the shelves, Osman said.

Energy firm outsources with EDS

Electronic Data Systems Corp. (EDS) has landed its sixth major energy-sector contract by signing a 10-year deal for information technology services and development with The Permian Corp./Permian Partners, L.P. The agreement calls for EDS to manage information technology for the $2.5 billion independent energy company's oil and gas distribution operations. Houston-based Permian serves 31,000 leases with 500 trucks and 4,500 miles of pipelines. It has operations in 16 states.

Epoch looks to the Macintosh

Epoch System, Inc. took a bite of a new market last week with the announcement that Apple Computer, Inc. Macintoshes can now access Epoch-1 Infinite Storage servers for on-line storage and backup. Epoch's joint marketing agreement with Cayman Systems in Cambridge, Mass., will enable Macintosh users to connect to Epoch's Network File System protocol through Cayman's Gatorbox gateway and Gatorshare networking software. The Cayman products are priced from $1,995 for Gatorshare and from $2,795 for Gatorbox. Epoch servers start at $82,900.

Memorex Telex adds flat screen

Memorex Telex N.V. brought flat-screen technology into the world of the IBM midrange last week with the introduction of a 14-in. monochrome display station for IBM System/36, System/38 and Application System/400 minicomputers. Prices for the 1476 A2/G2 Display Station start at $995.

HDTV grant to Zenith

Zenith Electronics Corp. welcomed its first government grant for its high-definition display technology last week. The award, from the Defense Advanced Research Projects Agency, will go toward development of new, less costly manufacturing methods for Zenith's flat tension mask high-resolution monitors. Zenith said it expects the award will be in excess of $1 million.

Informix adds on-line support

Informix Software, Inc. is joining the ranks of vendors that are automating their customer-support centers with electronic bulletin boards and access to on-line databases. The firm is launching a new worldwide service, called Informixlink, that will be available to value-added resellers this year and end users in 1991. Informix competitor Ingres Corp. recently unveiled a similar dial-up service called Ingres/Advisor.

More news briefs on page 99

Houston 30 seeks affiliation with COS

BY MITCH BETTS
CW STAFF

The so-called Houston 30, a group of information systems managers devoted to breaking down the barriers to open systems, has held "positive" negotiations about affiliation with the Corporation for Open Systems (COS), a Reston, Va.-based consortium.

Charles J. Gardner, director of information technology infrastructure at Eastman Kodak Co. in Rochester, N.Y., said the users group will decide whether to go ahead with the COS alliance at its mid-September meeting.

The Houston 30 — named for the location and number of users at a previous meeting — includes such heavyweights as General Electric Co., General Motors Corp. and Du Pont Co.

The group hopes to give the user community a vehicle for articulating a common set of systems requirements and prodding vendors to implement those recommendations [CW, June 25].

Gardner said the negotiations with COS "are well along, and both sides remain positive about what's happening."

In May, the Houston 30 said it was not sold on COS affiliation because the COS mission is focused primarily on networking. But Gardner said COS is willing to expand its charter to include the Houston 30's concerns.

Also on the agenda of the user-only meeting is a draft document outlining nine barriers to open systems, which are defined as computing systems that are based on international and de facto standards rather than proprietary designs. The barriers listed include the following:

- The business culture among users, developers and managers is resisting change. For users, the costs sunk into installed systems and applications make it difficult to justify the move to open systems.
- There is no critical mass of open systems products "to satisfy user needs and to entice vendors to develop open systems platforms."
- IS managers have not been able to articulate a direct link between open systems and the accomplishment of business goals.
- Compared with Europe and Japan, the U.S. government lacks a "national vision" supporting the development of open systems.

In addition, many users are wary of the notion that the basic components of information systems are common to all industries. They believe their requirements are unique and fear they will lose a competitive advantage by going with standardized systems, said Bud Huber, the Houston 30 spokesman and manager of advanced networks integration at Hughes Aircraft Co. in Long Beach, Calif.

However, Huber argued that IS managers should compete by adding value to their businesses' goods and services, rather than competing with proprietary technology.

Resellers

FROM PAGE 1

systems manager at Scott Paper Co. in Everett, Wash. "We'd like to have a vendor we can depend upon and one that is successful enough to provide us with services other than just delivering boxes."

Other users are also becoming uneasy. "I'd be very worried about their health and ability to continue support," said James LaCivita, systems manager at Child World, Inc. in Avon, Mass.

Though it is not imminent, a reseller shakeout is "very possible," said Paul Zagaeski, an analyst at The Yankee Group in Boston.

The root causes of the dealers' woes remain overdistribution and rampant discounting, observers said. "There are simply too many stores out there," said Charles Wolf, an analyst at First Boston Corp. in New York.

Early in the year, resellers such as Businessland and Computerland Corp. vowed to curb discounting and raise margins by as much as 5%. However, that strategy has failed so far, analysts agreed.

"It's not a very good strategy, because Businessland has spent years conditioning its customers to expect low prices," said Seymour Merrin, president of Merrin Information Services in Palo Alto, Calif.

Customers report little change in dealers' penchant for discounting. "They've been pretty willing to give us a good discount," said William Tiganelli, assistant vice-president at the Federal Reserve Bank in Baltimore.

Because of the highly competitive market, many dealers would lose sales if they told customers they could not afford to offer discounts. "If that's a statement a dealer makes to me, then I start shopping around," said Tim Thompson, a microcomputer analyst at St. Mary's Medical Center in Evansville, Ind.

A second strategy — that of charging separately and charging more for service and support — also seems to be failing. To make money from service, dealers must provide very high levels of support, Merrin said.

"Show me a dealer who can really provide that service, and I might be willing to pay," Thompson said. Thompson, a former Computerland store manager, said the frequent staff turnover makes it difficult for the stores to provide good, consistent service.

"It's one thing to say we charge a little more, but we're worth it," Thompson said. "But you generally find that they're not worth it."

Dealers also may have underestimated customers' abilities to handle their own support. The resellers had hoped that customers would pay them handsomely to support the new high-end, more complicated server rollouts. "But that isn't happening to the degree they expected," Zagaeski said. "Users are buying the machines, but they're doing a lot more of the work themselves."

Some observers are now saying that dealers should cede service to large systems integrators such as Electronic Data Systems Corp., concentrating instead on reducing overhead and restructuring the retail operation to emulate the fast-growing "superstore."

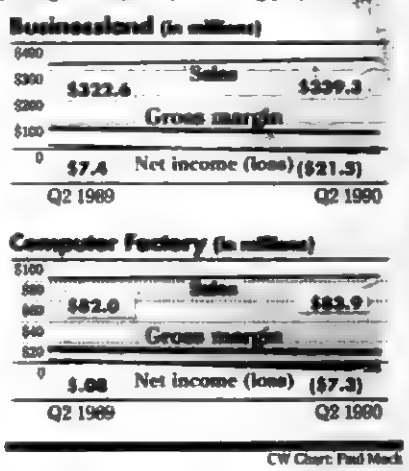
The Computer Factory announced recently that it would do just that. The chain is consolidating its less-profitable stores into larger supercenters during the next nine months.

For its part, with survival on the line, Businessland is focusing on the basics. "Our priority is to ensure that the fundamentals of the business are sound and that we recover our balance and strength in fiscal year 1991," Chief Executive Officer David Norman said.

In the meantime, dealers had better hope they can find their own Gene Hackman to keep the reseller *Poseidon* afloat.

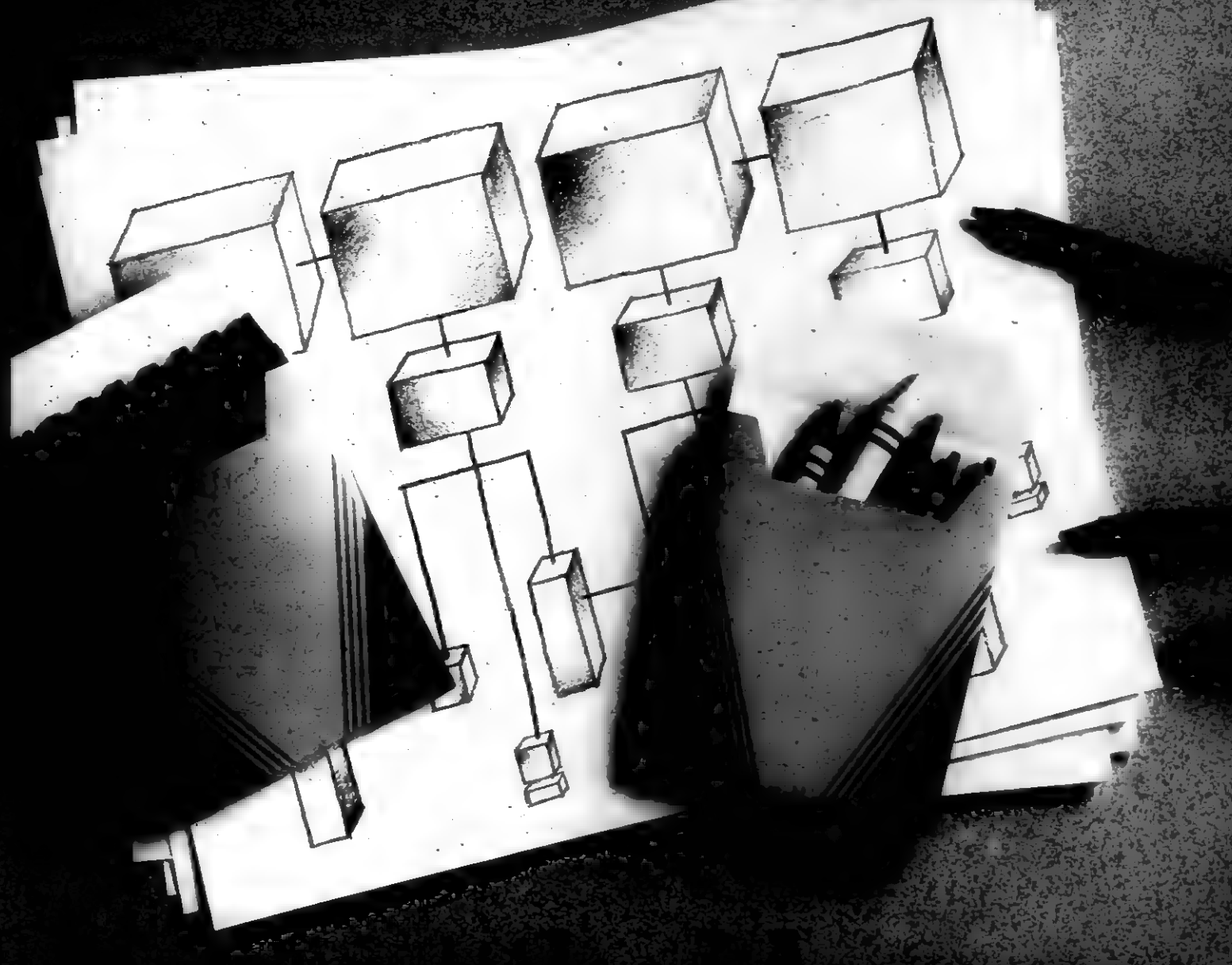
Living on the margin

With revenue relatively flat, PC dealers are feeling the impact of shrinking profit margins



CW Chart: Paul Mock

Management in the real world.



Ford, GE divisions opt for Unix

Show IBM and DEC the door while ushering in HP and Sun systems

BY J. A. SAVAGE
CW STAFF

Two of the largest U.S. corporations are phasing out proprietary computers from IBM and Digital Equipment Corp. in favor of exclusive purchasing agreements with vendors that offer hardware based on open standards.

Ford Motor Co.'s automotive components group will standardize its manufacturing control on Hewlett-Packard Co.'s Unix-based minicomputers. At the same time, General Electric Co.'s Aerospace division is slated to move to a client/server architecture that is based on Sun Microsystems, Inc.'s Unix-based workstations and servers, Sun announced last week.

"Users are seizing control," said Michael Goulde, an analyst at the "Open Systems Advisor," based in New York.

Surprisingly, these two exclusive deals run counter to methods undertaken by most users moving to open systems. "More are trying to get flexibility by shopping around for vendors," Goulde said.

Ford and GE, while announcing the agreements at the same time, have negotiated very different deals. Ford's deal is by far the most comprehensive. GE Aerospace, on the other hand, simply got a bargain from Sun.

HP and Ford will set up a separate, cooperative organization to develop and review the most productive methods for Ford's factory automation.

HP said it hopes that the cooperation will eventually result in products that can be sold to other companies in the automotive industry.

The idea originated in the manufacturing planning and information systems group, said Chuck Feltner, the group's director, but was incubated in the business planning office with IS participation.

The component group, one of three major divisions of Ford that brings in between $8 billion and $10 billion per year, discussed the plan to standardize its manufacturing on one vendor's hardware with IBM, DEC and HP.

"We went with whomever we felt could help us the most to find what they could bring to the party to help us develop a competitive advantage through more effective use of computers," Feltner said.

The decision was not a result of a bid process, he said: "We did not go out to select a vendor."

Standardizing on HP computers was a product of the cooperation agreement, and no special hardware discounts were involved, according to Feltner. Ford's component group will keep its other vendors' machines until they wear out, at which time they will be replaced by HP equipment.

In the meantime, Ford and HP will establish what they are calling a computer-integrated manufacturing alliance, which includes a staging center with the most up-to-date HP systems simulating manufacturing processes, training support and the development of a technology plan for Ford.

GE's agreement with Sun is more straightforward. GE Aerospace, an organization with revenue of approximately $5 billion, decided to go with a single hardware platform and put it out for bid, according to Charlie Wise, GE's manager for the Aerospace Support for Systems, Integration, Software and Test program.

"That's not to say we won't buy from other Unix vendors in the long term," Wise said. "Since the defense business is downsizing, all aerospace businesses need to increase productivity," he added. "We have a very large investment in other computers, but our strategy is to go to a client/server type of system."

As the company's IBM mainframes and DEC VAXs become obsolete, they will be replaced with Sun hardware, according to Wise.

In conjunction with the Sun pact, GE Aerospace also awarded Cadre Technologies, Inc. a $10 million contract under which Cadre will supply the firm with its workstation-based Teamwork line of computer-aided software engineering (CASE) packages. Cadre officials claimed that the contract is the largest single-order CASE purchase to date.

IBM turns patent screws on Sun

BY J. A. SAVAGE
CW STAFF

In order to avoid any future patent infringement case from massive IBM, Sun Microsystems, Inc. announced last week that it will license all of IBM's patents and that IBM will have a reciprocal right to Sun's patents.

Analysts said they suspected that IBM was using its patents on reduced instruction set computing (RISC) technology to propel the agreement, in which all the royalties are expected to flow from Sun to IBM. "Although the final agreement doesn't have anything to do with RISC, it was probably used as an icebreaker," said Mark Stahlman, an analyst at Alex Brown & Sons, Inc. in New York.

An IBM spokesman acknowledged that the company had nudged Sun with a letter a few months ago, but he would not divulge the contents of the letter.

"In 1988, IBM decided to become more aggressive in trying to generate more revenue from its patent portfolio," Stahlman said. As a result, several agreements were made, including Sun's and a similar one announced earlier by Compaq Computer Corp.

IBM also has an agreement with at least one other RISC computer company, Hewlett-Packard Co., although that cross-licensing agreement predates 1988, according to IBM.

While acknowledging that the royalty payments would flow in only one direction, Michael Morris, Sun's general counsel, tried to paint a rosy picture of the agreement. "IBM spends billions on research and gets 600 patents a year. I think maybe down the road it could be advantageous to us." Morris would not say how much the agreement was worth.

A third company that makes RISC processors, Mips Computer Systems, Inc., would not comment on licensing. A spokeswoman refused to even say whether a licensing deal with IBM did or did not exist. Silicon Graphics, Inc., which makes workstations based on the Mips processor, has no separate agreement with IBM. Silicon Graphics said that any such licensing would be up to its supplier, Mips.

RISC factor

Speculation that IBM is demanding RISC patent royalties may affect a rapidly growing industry

	Units shipped	Value of shipments
1989	117,000	$2.13B
1990*	296,000	$4.89B
1991*	493,000	$7.45B
1992*	778,000	$10.80B
1993*	1,253,000	$16.07B

*Projected

Source: Workgroup Technologies

HP answers lobbying with updated HP 1000

Responding to strong lobbying by users of Hewlett-Packard Co.'s 24-year-old line of real-time computers, HP plans to announce today that the line will get a kick into the next century with a new processor.

Users did not demand a new CPU, but they were concerned about HP making a long-term commitment to the HP 1000 series.

HP 1000 computers, used most often in factory automation and process control, have had several model changes since the mid-1960s, but the basic proprietary instruction set remains the same.

Bruce Campbell, HP's general manager of data systems operations, said that the new Model A990 will require only a board swap to reach twice the power available in its current high-end model, which was introduced in 1983 — going from 3.5 million instructions per second (MIPS) to 7 MIPS.

The HP 1000 will still remain outside HP's strategy for the 1990s, known as New Wave Computing. The New Wave umbrella includes software packages to connect dissimilar computers. Promising availability by the first quarter of 1991, HP said it will continue manufacturing the system until at least the year 2000 and will support it until the year 2010.

J.A. SAVAGE

Xerox hopes for brighter future on Sun platforms

BY J. A. SAVAGE
CW STAFF

Xerox Corp., pioneer of the user-friendly graphics interface, is looking to Sun Microsystems, Inc. to make its often-emulated software more profitable for the company. Analysts said they expect an announcement in the next few weeks of a Xerox system on a range of Sun's hardware platforms with Xerox's commercial document processing software.

Xerox's current proprietary hardware and software system, the 6085 Professional Computer, suffers in sales, analysts said. Xerox would not divulge the number of units shipped.

No growth path

One reason why Xerox's computer sales have suffered, analysts and users agreed, is that the 6085 has no growth path, and no outside applications will run on it.

"The 6085 is restrictive because you can't put any other software on it," said Maria Goldin, director of computer services at Damon & Morey, a Buffalo, N.Y., law firm that uses the Xerox system.

Although she said she is generally happy with the proprietary hardware and software on the 6085 and claimed it is much easier for the firm's secretaries to use than Wordperfect Corp.'s Wordperfect — the standard word processing package used in law firms — she said attorneys could benefit from adding other applications, such as database management. She cannot add those on Xerox's proprietary system.

"It's a good thing they're doing something about opening up platforms," Goldin said. Still, she added that there is a second reason why sales of the 6085 have suffered. "[Xerox] still has the photocopier mentality. They don't advertise. They keep their systems a little-known secret."

Porting Viewpoint

The new Xerox system includes porting the company's Viewpoint and Network Services applications, used in the 6085, to Sun's operating system — a version of Unix.

These applications include Xerox's graphical user interface — the predecessor of other user-friendly interfaces, such as those found on Apple Computer, Inc.'s Macintosh.

It will be based on a range of Sun hardware, including the recently introduced Sparcstation IPC, a color workstation.

Putting an office twist on a Sun platform, which is used largely in engineering environments, might give Xerox a bit of an edge in a workstation market crowded with vendors — but industry watchers said that it is still a long shot.

"In 1980, Xerox was unique, but today there's a lot of products that look like them," said Amy Wohl, an analyst at Wohl & Associates in Bala Cynwyd, Pa.

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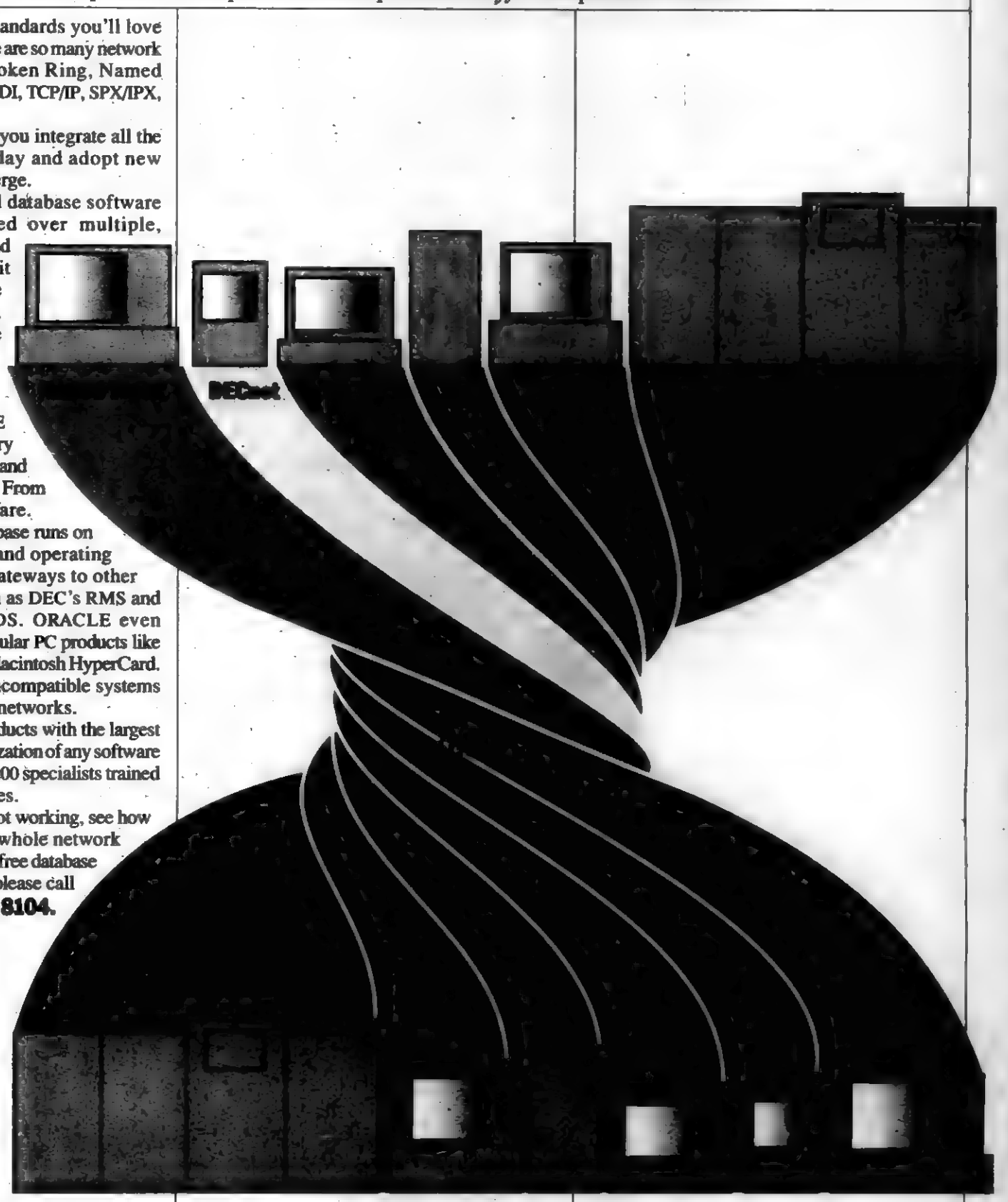

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An ounce of outsourcing and a dash of downsizing

BY CLINTON WILDER
CW STAFF

WINDSOR, Conn. — Outsource or downsize? A leading nuclear power equipment and services company is betting that the right reaction is a combination of both.

ABB-Combustion Engineering Nuclear Power announced last week that it will outsource its Control Data Corp. Cyber-based processing for the next two years while it rewrites most of its engineering applications for a network of Hewlett-Packard Co. Apollo division workstations and servers. The outsourcing vendor is Power Computing Co., which provides processing services to many utilities operating nuclear power plants.

ABB-Combustion Engineering, a unit of Swiss industrial equipment giant Asea Brown Boveri, Inc., is one of a growing number of firms that views outsourcing as an interim step while migrating applications to new hardware platforms. Dial Corp., for example, is outsourcing IBM mainframe processing to Andersen Consulting during a five-year migration to Digital Equipment Corp. VAXs [CW, Jan. 29].

Interim outsourcing "is a mechanism by which you can effect that transition with less pain and effort," said Steve Sunderland, ABB-Combustion Engineering's director of nuclear information services. "It allows the company to focus on the main mission."

Sunderland's staff will retrain approximately 500 applications developers and end users to work in the Apollo environment. Ten Cyber operations employees will either leave the company or transfer to IBM mainframe-based operations in the same data center here, a company spokesman said.

Sunderland said that unspecified cost savings are expected "in the long run" by migrating to smaller platforms. "We wanted to provide more modern, cost-effective tools to our engineering community as well as our customers," he said.

Cyber-based applications that will be rewritten include nuclear, mechanical and fluid engineering, hydraulics and thermal analysis. The outsourcing of Cyber processing to Power Computing's Cyber 990 in Dallas began four weeks ago and was expected to be completed this past weekend, Sunderland said.

"It has been carried out in a very rapid manner, which is critical because of the cyclic nature of work load in this industry," he said. "We had to assure nuclear power station operators that they would be fully supported during the transition."

The outsourcing contract is a two-year pact with extension options. Power Computing may retain some Cyber applications after the downsizing is completed, a Power Computing spokeswoman said.

ABB-Combustion Engineering, which employs about 1,000 people, is a division of Stamford, Conn.-based Combustion Engineering, Inc. The parent company was acquired in January by ABB, the world's largest industrial equipment maker, with sales of $26 billion. Sunderland said the downsizing/outsourcing plans were hatched before the acquisition.

ABB-Combustion Engineering will continue to run its commercial corporate applications in-house on its IBM mainframes. Since the ABB acquisition, the information systems department is attempting to expand its services to ABB's North American operations, a spokesman said.

The outsourcing contract is Power Computing's second for Cyber processing. The first, with Charlotte, N.C.-based Duke Power, is not related to a downsizing plan.

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Mideast recruiters shrug off danger

When Saddam Hussein talks, not all Americans listen.

Despite the potential danger facing Americans in Saudi Arabia because of the possibility that Hussein will invade his Arabic neighbor, some American computer professionals are going through with plans to move and work there this fall.

John Leslie Sr., president of Houston-based Leslie Corp., an employee placement organization for U.S. companies doing business outside the U.S., said his company is still planning to send three computer professionals to Saudi Arabia this fall.

"One person backed out, but the others are still planning to go," Leslie said, adding that one of the three is scheduled to leave this week, while the other two will probably leave early next month.

"It's still business as usual for all the companies that we deal with in Saudi Arabia," Leslie said. "My guess is that many people in Saudi Arabia don't know how serious the situation is there."

Leslie Corp. places approximately 100 Americans in companies in Saudi Arabia and the Middle East each year, but Leslie said he is unaware of the status of Americans sent there by his company in the past, because he only claims responsibility for the Americans until they hit foreign soil. However, to the best of his knowledge, Leslie said, they are all safe.

MAURA J. HARRINGTON

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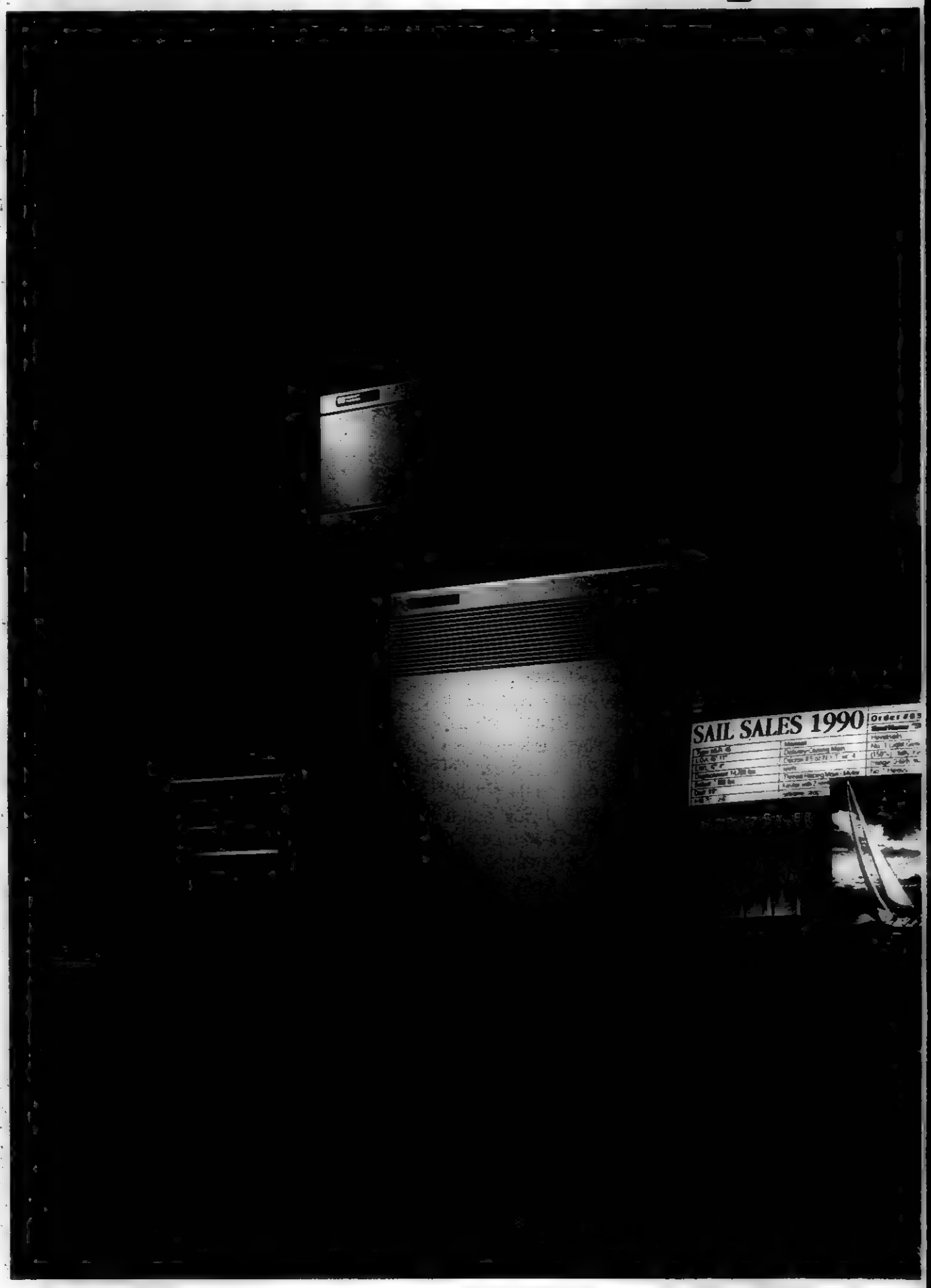

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Line-by-line ISDN debuts in Illinois

BY ELLIS BOOKER
CW STAFF

CHICAGO — Businesses here have been able to buy an Integrated Services Digital Network (ISDN) line for more than two years, but only as part of a multiline Centrex contract.

That changed earlier this month, with the approval of Illinois Bell's non-Centrex ISDN tariff by the Illinois Commerce Commission.

Illinois Bell hopes that its service, the first "line-by-line" ISDN in the nation, which permits a customer to buy as few as one ISDN line, will broaden the market for the all-digital networking technology.

To date, Illinois Bell has signed up more than 40 ISDN Centrex customers and deployed 26,000 ISDN Basic Rate Interface (BRI) lines. Currently, 30 of the phone company's 200 switching centers are equipped to handle ISDN.

A BRI line is composed of two 64K bit/sec. B channels for carrying data or voice and one 16K bit/sec. D channel used for packetised network signaling data. In some implementations, a portion of the D channel is available for user data.

Analysts said the latest Illinois Bell service will not have much appeal for large customers.

"I don't see users who already subscribe to Centrex [ISDN] as being strong candidates for this offering," said Victor Krueger, vice-president of the telecommunications industry service at Dataquest, Inc. Centrex arrangements, he said, are "almost by definition" restricted

to people who need several lines, but a single-line tariff "opens it to people who want to experiment — to smaller users and personal computer users."

Meanwhile, ubiquitous deployment of ISDN rests on solving some technical matters, Krueger added. While connecting ISDN systems across different digital central office switches and connecting local ISDN networks across long-distance carriers have been demonstrated, these arrangements are atypical.

However, Ron Czaplewski, Illinois Bell's director of ISDN/Packet Business Services, said his firm is working with a variety of interexchange carriers to support long-distance ISDN connections. "Basically, we've got packet switching within the Chicago [local access and transport area] and are in processes of establishing ISDN-supported packet calls with interexchange carriers," he said.

Illinois Bell has unbundled its line-by-line ISDN service, offering a variety of voice and data configurations. One configuration permits packet-switched data over a B channel, which can then be attached to multiple incoming D channels. This arrangement could provide host access to telecommuting workers.

The cost of one BRI line, not including usage charges, is $22.66 per month, with a one-time installation charge of $94.50. Two regular business Touch-Tone lines would cost $18.78 per month with a one-time $148.50 installation fee; a videoconferencing configuration would cost $35.66 per month, plus installation fee.

Microsoft expands SQL Server's sales strategy

BY JIM NASH
and PATRICIA KEEFE
CW STAFF

In an effort to broaden the availability of the newly enhanced SQL Server Version 1.1, Microsoft Corp. announced last week that it will supplement its OEM distribution strategy with sales through distributors, resellers and third-party developers of database front ends.

Previously, SQL Server was available only through Ashton-Tate Corp., which at one point had exclusive retail distribution rights, and hardware OEMs, such as NCR Corp.

Microsoft is the first supplier of a database engine to team up with front-end developers. "Never has a database company sold a database component to another company to sell as part of their solution," said Dwayne Walker, Microsoft's senior product manager of SQL Server. "It lets the front-end developers sell a complete package without having to invest in building an engine."

It offers users one-stop shopping and lessens an already long to-market time frame. Developers such as Borland International, Datacase International, Inc. and Revelation Technologies, Inc. were expected to ship front ends one year ago.

The following developers of database front ends will resell SQL Server Version 1.1.: Sybase, Inc.; Ashton-Tate Corp.; Blythe Software, Inc., Datacase and Revelation (see story page 37). There are 25 front ends to SQL Server currently shipping, according to Walker.

The just released Version 1.1 enhancements include a Basic language interface, support for Microsoft's Windows 3.0 and 30 days of free support. SQL Server will cost $995 for five users and $995 for each additional unit of 10 users.

Clothing manufacturer W. L. Gore is a beta-test site for Datacase's SQL front end, which is slated to ship next month. According to Rajul Asthana, an associate at Gore, the interface fronts for SQL Server Version 1.0 were purchased through Sybase.

Asthana uses SQL Server to integrate Gore's local-area networks, Unisys Corp.'s A-10 mainframe and Digital Equipment Corp. VAXs. Novell, Inc.'s Netware 286 uses Named Pipes to link the LAN to the database server. Comparing SQL with its competitors, Asthana said Microsoft's semantic integrity, its ability to store common business rules on the database, puts it ahead of competitors such as Oracle Systems Corp.

Industry, IS execs share blame in government integration foul-ups

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — Senior information systems managers in the federal government are increasingly seeing the importance of grand designs while shying away from trouble-prone megaprojects to implement those designs. At the same time, the IS executives blame the computer industry for many of the problems that have marked the government's ill-starred systems integration projects.

Those are among the conclusions from a survey of 20 IS managers conducted by the Federal Information Systems Integration (ISI) Committee of Adapso, the computer software and services industry association.

IS officials at 15 civilian and military agencies said huge systems development projects have fallen out of favor because they so often lead to huge cost and schedule overruns. Now, those failures and smaller budgets have forced a focus on incremental approaches in which manageable system pieces are brought up one at a time.

Nevertheless, the officials stand by the concept of developing comprehensive, strategic systems plans that support an agency's mission while expressing its technology vision.

"No one sees an alternative to grand designs and systems integration, but both areas have been much maligned," said Robert Steele, chairman of Adapso's Federal ISI Committee.

Adapso said most of the government officials participating in the on-site interviews expressed "great concern" about the quality of people provided by the industry on systems integration jobs. They complained about poorly trained people, "bait-and-switch" tactics and high turnover in vendors' project personnel. In particular, they noted the shortage of people able to lead systems integration projects. "The biggest issue for the future is training for project managers," one IS official said.

Some officials said the cumbersome procurement process and its attendant integrity laws have hurt government-industry dialogue. "Government officials are eager to talk to industry, but Congress has thrown a pall over communications," Steele said.

"Government officials feel industry needs to be more honest with them," Steele added. "They see industry becoming an extension of the government, telling them things they want to hear."

Steele said Adapso would try to use the results of the study to forge closer government-industry ties.

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Lotus 1-2-3 Release 3.1 wins early user praise

BY PATRICIA KEEFE
CW STAFF

CAMBRIDGE, Mass. — Release 3.1, the semi-Windows-literate and significantly enhanced version of 1-2-3, is slated to ship within the next week or two, Lotus Development Corp. confirmed last week. Early returns from beta testers and developers gave the successor to the weakly received Release 3.0 an enthusiastic thumbs-up.

Still unclear, however, is how and when Lotus will migrate the enhancements in 3.1 to the rest of its multiplatform family, which is built around a 3.0 core.

"We don't really have a lot to say about it [at this time]," said a Lotus spokeswoman, who conceded that 3.1's imminent release does beg the question of Lotus' migration plans. Lotus plans to retire Release 3.0 once 3.1 ships.

Several beta-test users, however, happily answered questions last week about the revamped spreadsheet, which was first announced in May along with a cursory description.

Release 3.1 is being praised primarily because of the following enhancements:

- The addition of Impress desktop publishing capabilities, which reportedly surpass those found in the Allways technology available with the Release 2.01 and 2.2 generation of 1-2-3;
- A virtual memory management system that frees up space by swapping data off and on disks.
- Improved Datalens access, achieved by moving the memory-intensive search-and-retrieve activity off the client and onto the server.

At Starkist Seafoods in Long Beach, Calif., Benjamin Goldfarb, manager of personal computing services, plans to upgrade the 75 or so users of Release 3.0 to 3.1. "That's a slam dunk," he said, praising 3.1's what-you-see-is-what-you-get capabilities.

"In 2.2, you had to flip-flop between two different screens — one for graphics or formatting, and the other to enter data into a spreadsheet," said James D. Brown, an accounting consultant at Amoco Corp. in Chicago. But not anymore: "It's a major improvement," he said.

Other pluses, according to Goldfarb, are the integrated mouse support and a "mini" word processor: "It gives you the ability to truly integrate text and graphics. You could do it under 3.0, but it was a bit hokey."

Although the product will look 100% different to the user, the revamped package not only preserves keystroke memory but will offer a "high degree of compatibility" with 1-2-3/G, product manager Paul McNulty said.

In a nutshell, Release 3.1 will allow users to run the character-based spreadsheet in a window and copy data to Microsoft Corp.'s Windows' Clipboard. It is the first DOS application to support Microsoft's DPMI extended memory standard, and it is launchable from an icon.

While compatible with all three modes of Windows Version 3.0, 1-2-3 Release 3.1 will not support key Windows 3.0 features, such as Dynamic Data Exchange and a graphical user interface. Users will have to wait for 1-2-3/Windows.

This latest version of 1-2-3 is also significant from a Lotus strategic point of view.

Lotus admittedly miscalculated user interest in Windows, while overestimating demand for OS/2. Release 3.1 gives Lotus a foot in the Windows door by at least letting users access 1-2-3 from an icon. It should also buy Lotus some breathing space until 1-2-3/Windows is ready to ship.

It is already too late at Lithonia Lighting in Atlanta. Informations Systems Vice-President Jeffrey Kernan has already begun the switch to Microsoft's graphically oriented Excel spreadsheet. "Lotus missed the boat with a memory-intensive Release 3.0," he said.

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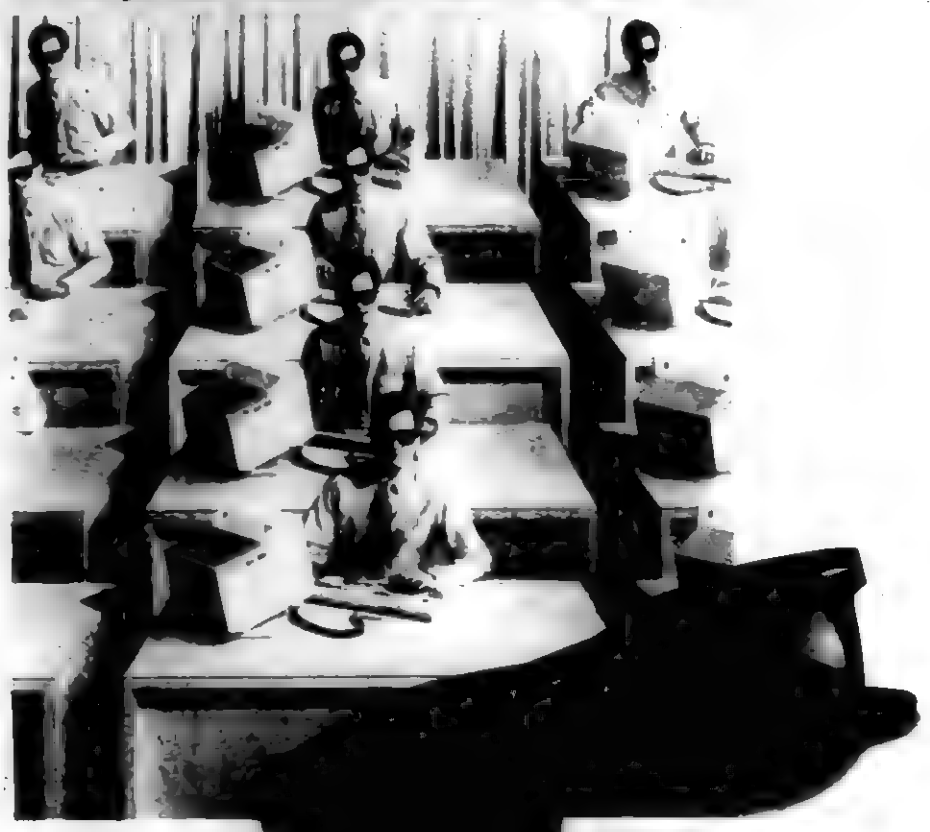

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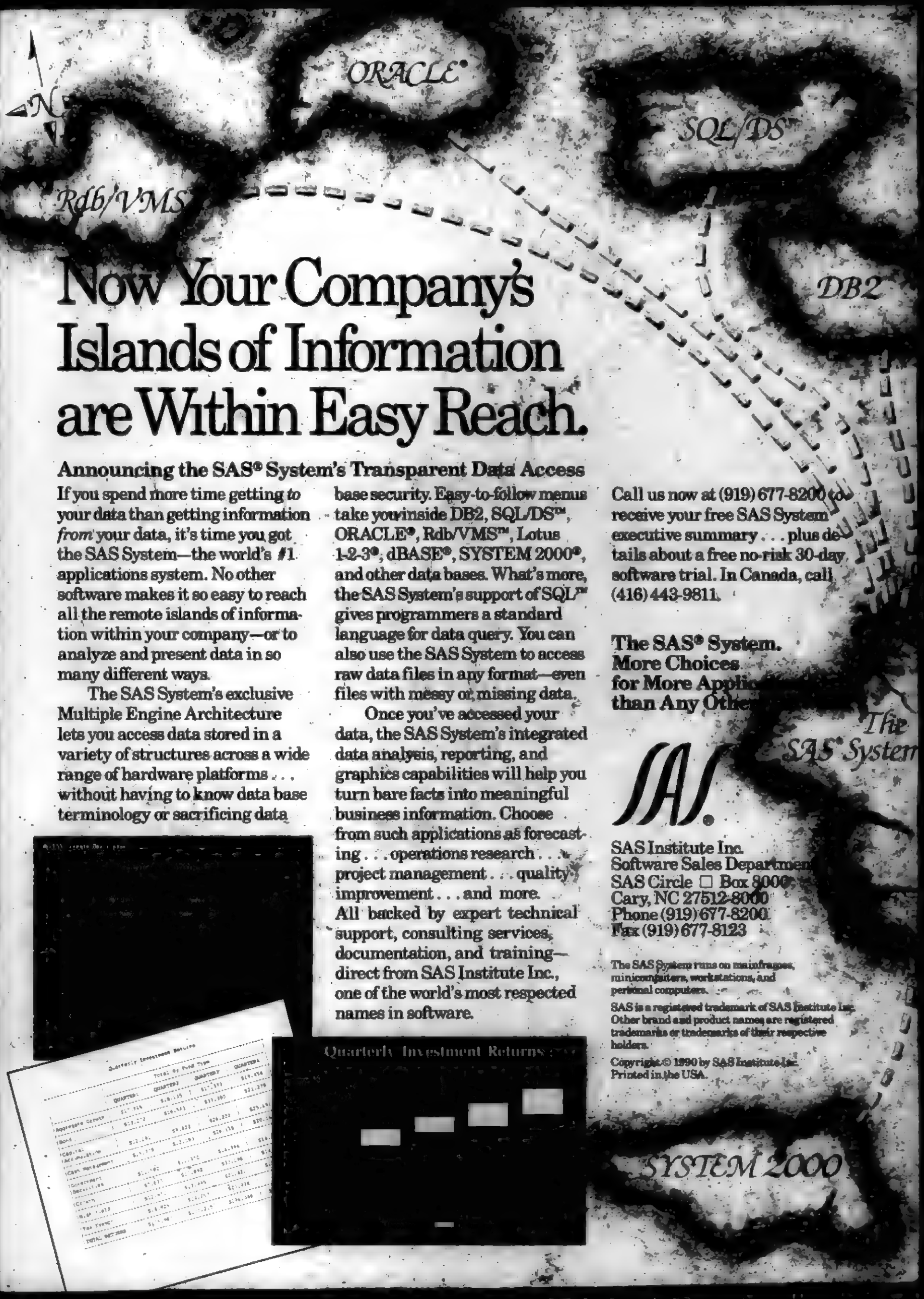

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ADVANCED TECHNOLOGY

TECH TALK

Instead of nukes, viruses

■ The Department of Defense (DOD) wants to finance a study on "commando viruses," designed to infiltrate an enemy's computer via radio transmission or telephone lines. The DOD has received 19 proposals from software companies out to get a contract that is valued at $50,000 in the first phase and that eventually could be worth millions of dollars. Some experts think that a military-grade virus would amount to much more than Tempest in a teapot. The U.S. is much more reliant on computers than Iraq, for example, and thus more vulnerable if a commando virus were to backfire.

Seeing the light

■ Researchers at IBM's Almaden Research Center in San Jose, Calif., have announced the development of a compact laser that could potentially pack four times more data onto optical discs than is now possible. The laser emits blue light, which has a shorter wavelength than infrared and thus can be focused more precisely. The result is that more data can be encoded on an optical disc. Up to now, it has been difficult to make a reliable and efficient blue laser. The scientists were able to convert the infrared light from the colors of a conventional laser into blue by passing the light through a potassium niobate crystal.

A lively animation market

■ Computer animation will grow faster than a video arcade machine can swallow quarters, according to market researchers at Frost & Sullivan, Inc. The market seers predict that sales of computer animation hardware and software will amount to $50 billion worldwide by 1994. Network monitoring systems for telecommunications, plant processing monitoring systems and multimedia home computing, including videotex services, will be the driving forces behind the growth, the firm said in a recent study.

The real face of mankind's past

Computer scans reveal that Australopithecus africanus isn't quite the missing link

BY KIM S. NASH
CW STAFF

Tapping keyboards and scrutinizing the blips and lines on a computer screen seem worlds away from the traditional hot and dusty anthropology dig. But Washington University Medical School scientists Glenn Conroy and Michael Vannier have made some big discoveries about human origins while working in the clean quiet of the Mallinckrodt Institute of Radiology in St. Louis. They have found, for example, that your mother had a relatively small brain, big nasal passages and chunky, primitive-looking teeth.

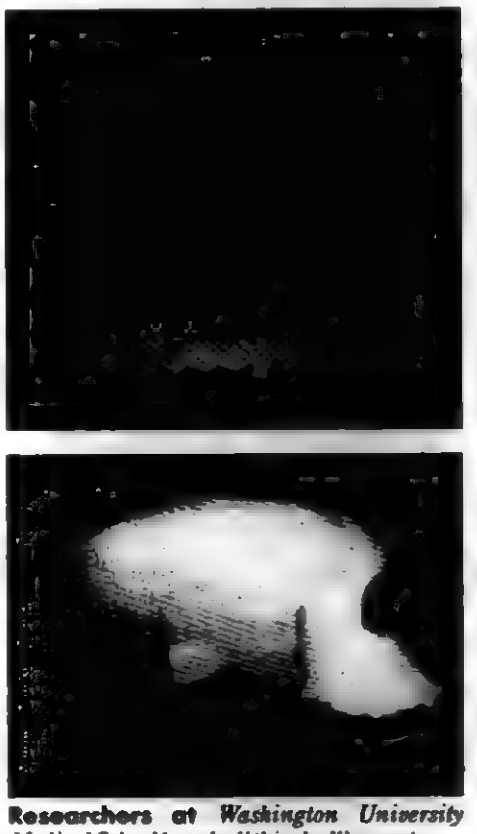
Don't take it personally, though. It is not your mother, exactly, whom they describe but rather *Australopithecus africanus*, a two- to three-million-year old human-like species thought to be the predecessor — mother, if you will — to all of us in the modern *Homo* line.

Using homemade software, an Ethernet network of Digital Equipment Corp. Microvaxes and scanning equipment from Siemens Information Systems, Inc., Vannier and Conroy did something no one had done before: They peered inside the rock-filled fossil skull of the Taung baby, an *A. africanus* specimen named for the region in South Africa where it was found.

Since 1924, scientists have studied the Taung child skull remains but have previously been unable to examine its underside because it is packed with ancient stone and sediment. The inner surface of a skull can hold many important clues to human evolution, such as brain shape and size and blood flow paths. Conventional X-rays cannot penetrate thickly mineralized fossils, according to Vannier, so the only way anthropologists could possibly have surveyed the innards of Taung would have been to crack the one-of-a-kind find like a coconut.

By electronically sandwiching more than 40 computerized tomography pictures into a single three-dimensional image, they modeled the full head, inside and out. Tomography is a medical procedure in which doctors typically investigate the inside of a solid object, such as an arm or leg, by sweeping an X-ray over an electronically predetermined cross-section of it, yielding a two-dimensional likeness. Conroy and Vannier did the same thing on the fossilized skull, but worked their way across the entire object with a series of views.

Once these images were on-line, they could be electronically dissected, sliced into cross-sections for detailed study or manipulated in ways otherwise impossible without damaging the specimen, Conroy explained.



Researchers at *Washington University Medical School 'cracked' this skull's secrets*

That is no easy feat. The densest material that scanners normally can penetrate is living human bone, which has less than half the density of some fossils, said Vannier, a professor of radiology. The initial series of tomography scans was fuzzy and unusable, leading the scientists to experiment with immersing the skull in a tub of water inside the scanner. With a little fine-tuning, this technique gave the doctors a sharp new view of our past, leading them to contradict some long-held and weighty theories of human evolution based on speculations.

"We saw thin bones and patterns of dental growth that no one had ever seen before, and they were distinctly more primitive than some people thought previously," Vannier said. The tomography pictures have convinced many theorists of human evolution to revise their earlier opinions that *A. africanus* was more human-like than apelike. For some scientists, this work cements the theory that the *Homo* line emerged later in time from a transitional creature that resembled both humans and more primitive beings — and not from an earlier being more like us, as was once thought.

Stone Age, Information Age

While anthropologists now turn to modern technology to get a glimpse of our past, many scientists do not know where to look for software tailored to this kind of research. Indeed, breakthrough findings like those of Washington University Medical School scientists Glenn Conroy and Michael Vannier are rare, in part because of a lack of commercial software, said Bill Wilson, academic computing specialist at Northern Arizona University in Flagstaff. "Virtually no applications exist for our discipline. Even though that's probably changing, we still haven't come far," he said.

In fact, Conroy and Vannier used a combination of in-house scanning software, originally developed for use during surgery, and imaging products from the National Institute of Health. Even now, six years after Conroy and Vannier's first experiments, there remains a serious lack of anthropology-specific applications.

To answer demand from human origins researchers for information on software, David Givens, editor of "Anthropology Newsletter," started "Soft.Where," a column designed to "highlight some of the more exotic stuff." Products are available, he said, but they are mainly on the unpublicized private circuit.

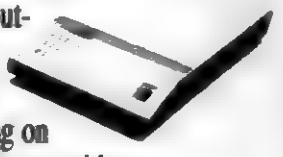
John Omohundro wants to change that with Mystery Fossil, a program he wrote using Apple Computer, Inc.'s Hypercard on a Macintosh. The anthropology professor at the State University of New York at Potsdam uses Mystery Fossil as a teaching aid to make introductory students "feel like they're really doing anthropology," Omohundro said. Mystery Fossil challenges students to identify three digitized photographs of unnamed fragments of prehistory by querying the program's database containing information on eight other well-known fossils and then comparing and contrasting their findings.

KIM S. NASH

NEC modems keep information moving as if your life depends on it.

In a 911 emergency, to risk a communications breakdown is to risk a life. So if you don't want to take any chances, make sure your modem can handle the pressure in a crisis.

In Florida, NEC's I Series Intelligent Chassis System is now helping coordinate the life-saving efforts of Lake County's 911 services. The county chose the system after tests found NEC's I-Chassis modems outperformed others. And they've proved their round-the-clock reliability by being on the job there for more than a year without a single failure.



Since NEC modems are designed to rapidly and accurately transmit huge volumes of data, Lake County's 911 operators can now quickly pinpoint accident locations, provide traffic instructions, find patient medical records, and dispatch back-ups when needed. And because NEC's Dual Modem Card links 911's control center to NEC Dial-up Modems in remote locations, Lake County feels it has found the best data networking solution attainable.

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EDITORIAL

Glass houses

Every compulsion is put upon writers to become safe, polite, obedient and sterile.

Sinclair Lewis

Recently, articles have appeared in some big daily newspapers and in magazines calling into question the "mission" of those publications lumped under the broad and increasingly anachronistic category of "computer trade press."

By focusing on specific publications, the articles have raised doubts about the veracity of the reporting that has appeared from time to time in the computer press. Is it really objective? To what extent is it influenced by advertisers (almost assuming that there is some measure of influence)? Are product reports and reviews serving the reader or the publisher?

The issues raised in some of these articles do contain some compelling evidence to justify the questions. One piece in *The Washington Post* cited a review of a landmark product in a leading personal computer magazine. The reviewer, according to the article, was also a paid consultant for the vendor of the product. The review was glowing.

Another article, this one in *The New York Times*, singled out a Macintosh magazine for its objective reporting on a key vendor — namely, Apple. It was almost as though objective reporting in the "trades" was something out of the ordinary and thus worthy of special mention. The author even went so far as to attribute the magazine's recent successes to its editorial integrity and objectivity. Gee, are there other ways of succeeding we don't know about?

There is no question that objectivity can take a back seat to editorial pandering at certain publications. They're easy to identify because they usually go out of business before too long. Readers don't read them, they do poorly on readership studies, and advertisers refuse to spend money on them.

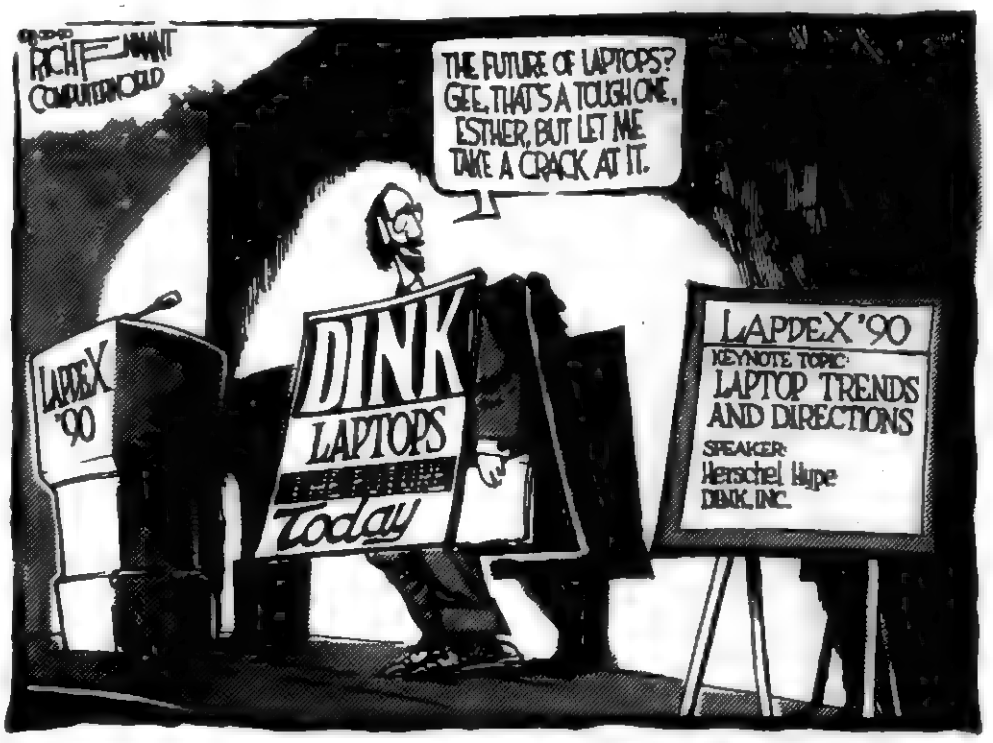
However, there is something a tad smug about reacting to objectivity in "trade" publications as though it were an anomaly. Moreover, it smacks of hypocrisy.

For one thing, there are countless stories that appear in the daily and business press that are gleaned directly from articles in the computer press. Objectivity doesn't seem to be a problem there.

For another, the daily and business press has been hiring very aggressively of late from the so-called trades, particularly to bolster coverage of information systems and the computer industry. No problem there, either.

So why, then, does "trade press" veracity and objectivity become an issue at all? Isn't it equally an issue for all serious business publications?

Apparently, there are many people who see the twin matters of ethics and responsibility as needing more attention in certain quarters than in others (such as their own). For these people, we suggest that what's good for the goose is good for the goose.



LETTERS TO THE EDITOR

No vision

Your article "Blind IS managers defy career odds" [CW, July 9] is quite uplifting. The statistics you mention verify what I have seen: Blind information processors tend to enter the workplace at the bottom rungs of IS and stay there.

Although great advances have been made in the areas of screen readers, optical scanners and voice synthesizers, a dearth of software exists for blind persons. Software vendors, for example, persist in offering products that only serve the sighted public. Graphical user interfaces, which feature pop-up windows and mouse support, offer impossible hurdles for the blind. Why not offer both graphical and pure-text versions?

It's ironic that mainframe and minicomputer applications tend to be the easiest for the blind to use because of the "blandness" of their interfaces. The PC environment has the potential power to liberate more handicapped people. However, without the commitment of software vendors, no amount of "high motivation [to] overcome the physical obstacles" of blindness will resolve this situation.

Congratulations to Jim Fleming, Michael J. Mady and McKinley Young for beating a system that is rife with discrimination.

Gerald J. Jurrens
Kingston, N.J.

No meddling

I share Mitch Betts' concern for the future of the U.S. electronics industry [CW, June 25], but not his eagerness to surrender that future to federal bureaucrats.

The HDTV controversy that he highlighted illustrates why government should not be entrusted with technology policy. Each of the several HDTV proposals calls for incremental enhancement of antiquated analog technology — technology that predates solid-state circuits. In fact, television is one of the last refuges of vacuum-tube technology. Digital flat-panel display screens are already displacing CRTs in personal computers and workstations. Moreover, "digital" has become the technology of choice for transmitting, processing, storing and presenting recorded sound, structured data, graphics, text and plain old voice communications. With the arrival of digital video-interactive technologies, all-digital broadcast TV is possible today. Thus, HDTV is already obsolete.

If the U.S. needs a coherent policy for the electronics industry, it needs one that is fashioned and controlled by that industry — one that electronics firms will bet their futures on, and with their own money. A government policy targeting the electronics industry would surely be far worse than none at all. Let us hope that a civilian counterpart of the spendthrift DARPA never gets a chance to waste a nickel.

Dave Nelson
Garmisch-Partenkirchen, West Germany

No accident

You have a chart in a recent issue [CW, Aug. 6] that purports to show how computer-related fraud and abuse is discovered. While the chart attributes 32% of discovery to "accidents," it is silent on the role of external controls — those relying upon relations with customers, vendors, and fiduciaries. These controls include the routine exchange and reconciliation of statements and confirmation.

In fact, if internal controls do not prevent the abuse, it is most likely to be discovered by the operation of these external controls. Much of the discovery that is attributed to "accident" is actually the operation of these controls. The operation of these controls is so subtle and automatic that these controls are often beneath our level of notice. Nonetheless, management has a right to rely on them. They are very independent and reliable. Their one disadvantage is that they operate late and publicly.

William Hugh Murray
Executive Consultant, Information Systems Security
New Canaan, Conn.

No chance

Three cheers to Marty Gruhn on her article, "Why high-tech companies fail from their own success" [CW, July 16]. I found this to be a great dose of reality compared with some of the "pie in the sky" attitudes held by some of today's high-tech firms.

Gruhn leaves us with an interesting thought: What would happen if marketers had to go out and hit the pavement and actually speak with their customers? What a scary thought!

Peter Giroux
Howie & Associates, Inc.
Roswell, Ga.

Computerworld *welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor In Chief,* Computerworld, *P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701. Fax number: (508) 875-8931; MCI Mail:* COMPUTERWORLD.

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Business computing gets stuck

DAVID LIDDLE

The computer industry is built on the vision of transforming the way we in which we work. It has long been an article of faith that computers are destined to banish the tedium and inefficiency of business routine in favor of a newly dynamic, interconnected workplace.

That vision contains a kernel of reality, and the basic technologies for its fulfillment exist today. But after years of one blockbuster technology advance after another, a huge gap remains between the vision and today's reality.

Wait a minute. What about scientific and research computing, where ever-faster computers and workstations are fueling breakthroughs in other fields? And don't large-scale computers enable big enterprises to crunch numbers and process minute details in staggering volume? True enough. But in the corporate office — the place for both the greatest potential and greatest need for technology solutions — computer-generated information is as likely to be a burden as an asset. The vision of a workplace transformed and enriched by a computer on every professional's desktop is still a pipe dream.

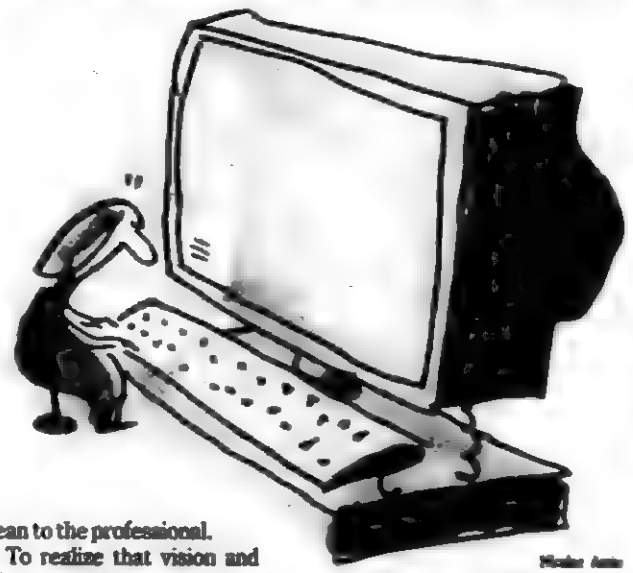
There is a snowballing perception in the business world today that the tangible benefits and value promised by office automation have not been delivered. A recent study in *Fortune* magazine concluded that the bottom-line payback from office automation is essentially zero. Corporations spend thousands of dollars per machine annually on computer purchases, maintenance, support and training. But what value are they buying?

My colleagues and I have a running joke about the big four computer applications: spreadsheets, word processing, spreadsheets and word processing. Not a knee-slapper, but nonetheless wry recognition that business computing remains stuck at a far-too-basic level. On average, a Fortune 500 employee equipped with a personal computer uses only one or two software products regularly. And those computer users represent only about 20% of all the office workers in those companies.

A brief walk through the offices of nearly any big company will confirm that 80% of business professionals are still working without a significant computer resource at hand.

Where is the demand for computers to serve this 80%? Not there. To justify new computer investments, people need new and different kinds of software.

Spreadsheets and word processors were catalysts in the widespread acceptance of PCs. But, conceptually, they are backward-looking — they simply computerize single, traditionally manual office tasks. Their limited capabilities cannot fulfill our vision of what computers can mean to the professional.



To realize that vision and rejuvenate the computer software industry in the process, developers and marketers must rethink their assumptions and work to create products of real value to the business world. They must focus on that unautomated 80% of office workers who need more flexible computer solutions.

The first essential is to extend the base of usable data — encompassing text, numbers, graphics and images. People must have easy access to a widespread world of information and must be able to organize and analyze it easily.

To transform that world of data into useful information, people need more broadly functional suites of software tools that can handle the varying demands of different individuals. These tools must be built on consistent conceptual models, allowing them to shift seamlessly from one program to another and use different programs in the same natural, intuitive manner.

Each new program today typically imposes a separate learning curve. It's no wonder so many people just use one or two applications; they want to succeed at their jobs, not become computer experts.

A telephone company study done more than 60 years ago, projected a need for 100 million telephone operators by 1950. This absurd scenario motivated it to rethink telephone systems from top to bottom. Now, as we use the telephone every day, we intuitively perform 95% of the tasks operators used to do.

Every company regularly confronts situations that are critically important one week and all but forgotten the next. In the Fortune 500 alone, we might project the need for 5 million new programmers to handle these ad hoc programming jobs. But the practical solution is to give those business users who understand their business issues the computer tools to apply to their problems.

We simply need a new approach to doing business. As a start, vendors might try talking and listening attentively to their customers, rather than to one another, the press and perhaps their retailers. Real customer communication is the first and most essential step toward developing effective computing solutions. And technology companies must more actively support business customers — and that means going beyond the 800 hot line that comes complete with a busy signal.

To attract and satisfy corporate customers, we in the industry must apply our technologies and our imaginations to create a new generation of business computing tools. We must take risks in product development, and if necessary, charge higher prices to support those risks. We must abandon today's too-common "break the shrinkwrap and you own it" mentality, emphasize communication and customer support and deliver solid value and satisfaction.

Liddle is president and chief executive officer of Metaphor Computer Systems, Inc.

Without a data model, everything falls down

EFREM MALLACH

Steve got a recipe for disaster last month, disguised as a proposal for a new cost accounting system. The proposal came from one of the biggest management advisory firms in the world. It was most impressive, with engraved letterhead paper and custom-printed divider tabs. It also weighed two pounds. It included resumes of five partners and three experts who have each published at least one book in the field. The conceptual design phase alone was estimated at nearly $750,000. The proposal probably cost more to write and produce than most of us earn in three months.

This proposal was put together by cost accounting experts. They put everything they knew about cost accounting into it. It lacked just one thing: input from a person who was once stuck with maintaining a complex system that was not based on a coherent data model. Without that input, and especially without the data model, it was a blueprint for a house of cards that could tumble down at any moment.

Why is a sound data model so important? Because programs come and go. Requirements change. Businesses evolve. Technology makes new functions possible. But what stays around for decades, what information systems managers most dread to change, is the database. As Daniel Appleton at the University of Indiana has pointed out, the usefulness of applications peaks and declines long before that of the data they hold.

The distinction between data modeling and database design is crucial. Data modeling has to do with business, not with computers. It deals with entities that exist in a business, with relationships among these entities and with attributes that define the entities. Databases may come in various forms. The data model is the same.

One of the tasks set in Steve's project proposal is "integration strategy." This task includes, among other things, surveying the capabilities of existing packages.

How to check them?

On what basis are packages to be evaluated? The proposal waxes lyrical about what the system is supposed to do. Yet there is not a word about the data it will use while doing it. If anyone is ever going to worry about the underlying data model, it's not until much later in the technical design phase of the project. That's far, far too late. One cannot assume that any functionally adequate package is based on a suitable data model.

The likely outcome of this situation is clear. A package will be chosen — and modified or extended as needed — to meet the stated functional requirements. As soon as something that wasn't in the stated requirements comes up — something that the cost-accounting experts didn't know about — disaster will strike. The applications will have a roadblock precisely where new traffic must flow. The database will turn out to have put two concepts into one data structure, or one concept into two data structures. The cost of fixing matters, so small at the conceptual design stage, will then be astronomical.

This happens all the time when systems are designed by functional experts, be they cost accountants, industrial engineers or market planners. Such people focus on the applications. After all, they reason, it's the applications that do the work. The data will be whatever the application needs. It just goes along for the ride.

This line of reasoning led a Western Massachusetts manufacturing company into Chapter 11 in early 1988. It picked a manufacturing resource planning (MRP) package by following the well-intentioned advice of its hardware vendor's MRP experts. Everyone looked at the functional capabilities of the package, but nobody ever bothered to look at its underlying data model.

The data model turned out to be totally unable to cope with a few features of the firm's production process. By the time the real issue was discovered — delayed first by a hardware upgrade that was supposed to fix things, then by frantic efforts to apply software Band-Aids — it was too late. The customers had gone elsewhere. All the manufacturing firm could do was sue the hardware vendor.

The best way out of this fix is not to get into it. Any application of importance *must* be based on a sound data model. The foundation that rests on the data model is the database itself. The visible applications cannot possibly stand unless the other two are firmly in place.

I've sent Steve a letter urging him to develop a good data model for his cost accounting system proposal. If he doesn't, his recipe for disaster will turn into a most unpleasant meal.

Mallach is a faculty member at the University of Lowell in Lowell, Mass., and a consultant to users and vendors.

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COMMENTARY

Jean S. Bozman

They're still saying OOPs

The world of object-oriented programming and the world of procedural code, including the Cobol and C languages, have an uneasy coexistence. Few products attempt to bridge the gap between the two worlds — with the possible exception of the hybrid C++ programming language.

However, leading-edge users and analysts now tell us that these two distinctly different technologies should be stitched together through industry-standard interfaces.

Why won't those bleeding-edge people leave us alone? The staid procedural code of Cobol is familiar, and it certainly has staying power; most information systems organizations have used it for a quarter of a century or more. But object-oriented programming (OOP) presents many advantages, including quick development, reusable code and reduced maintenance.

Moreover, object-oriented databases offer users a new IS dimension — the ability to store drawings, images and sounds as "objects" rather than as long strings of 1s and 0s. That would aid immensely in computer-aided design and manufacturing, computer-integrated manufacturing, petrochemical and even military applications. According to some industry analysts, the benefits are so compelling that OOP systems will overtake procedural systems by the year 2000.

Continued on page 34

FEATURE: OLDER MACHINES

One person's obsolete is another's classic

BY JUDITH FINN
SPECIAL TO CW

Unswayed by the lure of state-of-the-art technology, many users still have high praise for machines that others have termed obsolete. Digital Equipment Corp. Decsystem-10s, 20s and early-model PDP-11s, as well as IBM System/36 minicomputers, continue to satisfy the front-line needs of a variety of users, despite vendor urgings to upgrade.

"These [machines] are like a 1960 Ford," says Michael Erbschloe, executive editor at Computer Economics, a publishing company based in Carlsbad, Calif. "If you can get the parts, they can last forever." Erbschloe says these [older] systems continue to run and do a good job because "they were built well, with tested technology and minimal parts."

Michael Klein

Some users cite low cost, continued support and software loyalty as reasons they have stayed so long with what they have in place. Others note that they are tied into ongoing leases.

For Art McClinton, lead scientist at Mitre Corp.'s research laboratory in McLean, Va., the costs simply do not justify a complete conversion from the PDP-11 Model 70, which the organization currently uses to run communications packages. While the systems engineering firm's lab has upgraded its several other PDPs to VAXs, "redoing [this system] on the VAX is just more money than I would save," he says. Two years ago, Mitre estimated that it would cost "a couple of hundred thousand dollars" to convert its system, according to McClinton.

The simple fact is that upgrading can be painful from an economic standpoint. Martin Rabenovets, president of System/36 software development firm Computer Systems Consultants, Inc. (CSCI) in Landover, Md., says he cautions his clients to examine their needs carefully before making a decision about whether to migrate to new architectures.

If the current system is getting the job done, Rabenovets claims, it would be foolish to get new equipment simply because it's new. "We know what the System/36 can do. Does the added functionality [of the Application System/400, the System/36 follow-on] justify the added cost?"

"You have to consider the incremental cost of an upgrade," cautions Terry Shannon, director of DEC Advisory Services at International Data Corp. (IDC) in Framingham, Mass. He notes that users sometimes overlook hidden

Continued on page 32

A 4M-bit DRAM come true

BY MARYFRAN JOHNSON
CW STAFF

MILPITAS, Calif. — System Industries, a supplier of data storage subsystems for Digital Equipment Corp. computers, last week introduced a 128M-byte storage module that quadruples the capacity of its Megaram family of solid-state disks.

Using new 4M-bit dynamic random-access memory technology, System Industries increased the storage capacity of a single quad-size board from 32M bytes to 128M bytes, for a maximum of 2G bytes per system. The firm also dropped the price of its 128M-byte Megaram-SDI drive by 26% to $73,900.

At $577 per megabyte, the System Industries module is comparable to DEC's ESE20 solid-state disk, which holds 120M bytes per drive for $110,000, or $916 per megabyte. The DEC drive uses 1M-bit DRAM chips rather than the 4M-bit chips.

Over 100% improvement

One System Industries customer — Lashco, Inc., a stock-trading service company based in Chicago — reported a 150% improvement in throughput for its on-line transaction processing application after adding a Megaram-SDI disk to its DEC VAX 8550.

"[System Industries] is using more recent technology in the same board design by putting a chip with four times the capacity into the same configuration," said Mike Casey, a storage analyst at Gartner Group/Infocorp in Santa Clara, Calif.

"From an end user's point of view, anything less expensive is good," he added.

Casey noted that in the solid-state disk market, the difference between $914 and $577 per megabyte may be "a relatively small advantage, because this stuff is so expensive that people don't wants gobs and gobs of it."

Outside of the IBM market, there are still few signs that 4M-bit chips are readily available in large quantities, said Robert Abraham, vice-president of Freeman Associates, Inc., a market research company in Santa Barbara, Calif.

"There is a bit of sex appeal to having the 4M-bit DRAM chip, and on [System Industries'] part, that's very good positioning for future market acceptance," Abraham said. "Something I suppose any potential customers should be concerned about, however, is what is the source of the chip? What do these guys know that no one else knows?"

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Radio Free Europe updates IS image

Ex-Cold Warriors overhaul systems for success as modern broadcasters

ON SITE

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — For more than 35 years, the mission at Radio Free Europe and Radio Liberty, Inc. was to dodge jamming signals from Communist governments and broadcast news reports about local politics and culture to people behind the Iron Curtain.

Now, the Iron Curtain is gone, the jammers are turned off and Radio Free Europe/Radio Liberty is being transformed — with the help of the information systems department — from an instrument of the Cold War into a modern, competitive broadcasting company.

For example, the three-year modernization project has created a fully computerized news gathering and editing operation, called Newswire 2000 — running on Digital Equipment Corp. VAXs and a customized database management system — that replaces the old-fashioned system of dictation and hard copy.

"We were not as competitive as we should have been with other major international broadcasters, such as Voice of America, British Broadcasting Corp. and Deutsche Welle," explained Robert Short, director of IS. "Whereas they could put out a newscast from hour to hour, it used to take us as long as four hours from the time we brought the news in, processed it . . . and sent it out to the broadcast departments to then translate into their own languages."

Instead of two live newscasts in an eight-hour shift, Radio Free Europe/Radio Liberty now produces hourly newscasts in 17 languages. Correspondents use desktop or laptop computers to file reports, which, along with wire service feeds, wind up at the broadcaster's main data center, located in Munich, West Germany.

Newswire 2000 operates on a pair of DEC VAX 8550 systems, running custom-developed relational database management software from Nexus GmbH in Dachau, West Germany.

The IS modernization plan also included the company's administrative operations. "In fact, that was foremost in the eyes of executive management because they needed to get a handle on corporate assets and personnel matters," Short said.

The IS department began with an overhaul of the personnel system and then added modules covering employee benefits, payroll and other administrative functions. "The personnel management system formed the nucleus of our relational database system. From there, we feed information to all of the other systems that require it," said Allan Capon, IS director for U.S. operations.

For example, the personnel system is linked to a housing management system because the company leases about 550 housing units for employees in Munich in order to cope with a severe housing shortage there. Consequently, personnel records also include details on the size of the employee's family so that it can be matched to appropriate housing.

Developing the personnel system "turned out to be a lengthy exercise [of about 18 months], because we discovered we weren't just a normal company dealing with normal personnel issues," Capon said.

Radio Free Europe/Radio Liberty, secretly funded by the Central Intelligence Agency until 1971, is now a congressionally funded private corporation with a $190 million budget. It is headquartered in Munich, with major offices in Washington, D.C., and New York.

The company also makes heavy use of bar codes. The inventory management system uses bar codes to track every significant piece of office equipment or furniture, while employees have bar-coded badges that allow them to check out music albums and books.

Most of the administrative database uses Adabas software from Software AG of North America, Inc. and runs on a VAX 8550 at the Munich data center. The exceptions are the accounting and inventory modules, which are packages from Ross Systems, Inc. and run on a VAX 8350 cluster in Washington, where the company's chief financial officer is located.

The result of the modernization program is that the company has gone from manual procedures and batch processing on DEC PDP-11s to a VAX-based information system — with 1,250 users — that is "on-line, relational, cross-functional and distributed," Short said.

Furthermore, the upgrade was accomplished ahead of schedule and under budget. Short said the project met its goals three years into a five-year plan and used $5 million of the $8 million budget.

"Whereas other government agencies have no problem getting funding and waste it, we do a lot more with the little budget we've got," Short said.

However, even with a modern information system, it is not clear how long the company will survive in its present form. Already there is talk in Washington that perhaps Radio Free Europe is obsolete and should be folded into Voice of America or disbanded.

Trying to adapt to the post-Cold War climate, the company is exploring new revenue-generating business opportunities. For instance, the stations could turn their massive collection of demographic and research data on Eastern Europe and the Soviet Union into an on-line database that would be valuable to businesses entering those markets.

DG boosts Eclipse line with low-end 3-MIPS box

BY SALLY CUSACK
CW STAFF

WESTBORO, Mass. — Data General Corp. extended its Eclipse line of MV computers last week with the introduction of a desktop machine that runs at 3 million instructions per second and is aimed at commercial, scientific and technical time-shared and client/server applications.

Designated the MV/3500 DC, the system supports as many as 40 users and is positioned in the middle of the lower portion of the Eclipse series. The system is based on a single-chip, custom, very large-scale integration CMOS microprocessor, designed by DG and manufactured by Hitachi Ltd. in Japan. The single-board architecture can be expanded to 16M bytes of memory in 4M-byte increments and can reportedly accommodate as many as four optional communications boards.

Scheduled for shipment in early September, a base model will be priced from $25,500, including 4M bytes of main memory and 179M bytes of Winchester storage. The MV/3500 DC supports AOS/VS II, AOS/VS and DG/RDOS and plugs into standard electrical outlets.

In a separate announcement last week, DG unveiled a GNU C++ compiler for its Aviion line of reduced instruction set computing-based servers and workstations. The compiler is based on AT&T C++ 2.0 and was designed to provide software developers with a high-level language programming tool.

GNU C++ is now available, and a software package comprised of GNU C++, a GDB debugger and AT&T C++ 2.0 libraries is priced at $1,595.

Cortex eases documentation

BY ROSEMARY HAMILTON
CW STAFF

Cortex Corp. extended its computer-aided software engineering (CASE) tool set to automatically generate end-user documentation.

The Cortex Documentor will be offered as an integrated component of Corvision, a family of tools that runs on the Digital Equipment Corp. VAX system.

Previously, there was no formal way to generate documentation for users, said David Holroyd, Cortex's president. The software is integrated with Corvision's repository, allowing it to share data and information with the other tools. So, when an application is modified, the updates will automatically be provided to the Documentor, which will then release new documentation for users.

Cortex plans to eventually tie its product to the DEC repository, CDD+. This will give customers the option of using either the Cortex or DEC repository as their core information storage component, Holroyd said.

The company has a longer term goal of providing a link to the IBM CASE environment, AD/Cycle, for customers with DEC and IBM equipment.

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Classic

FROM PAGE 29

costs such as software licensing fees that can be more costly for newer, more powerful machines.

Both IBM and DEC currently support their old System/36, PDP-11 and Decsystem machines. Users state that they appreciate the quality of the support and note that repair personnel who service the older machines are experienced.

"The field service engineers were trained in PDPs," McClinton says. "They were good and stayed with DEC." The result, he says, is that highly skilled technicians repair and maintain PDP-11s.

> "WE'RE NOT investing in enhancing the System/36 in capacity or growth. . . . [The System/36] is dead-ended."
>
> FRED WILE
> IBM

The South Street Seaport Museum in New York uses a System/36 to run its accounting packages. Controller Peter Reilly says the system is highly reliable and that "the software and hardware support has been there; there's no problem with any of that."

Software loyalty also plays a role in the decision not to upgrade. Users are often hesitant to start over, despite vendor assurances that their programs can be transferred with a minimum of bother. Leslie Maltz, director of computing and communication resources at Stevens Institute of Technology in Hoboken, N.J., says that's the reason the school waited until last year to retire its last Decsystem-20.

"We had such an investment in software," says Maltz, who is also the chair of the product directions committee at the Digital Equipment Computer Users Society (DECUS), the DEC user group. "It was really hard to make a major transition like that and really hard to find something that was comparable."

The South Street Seaport Museum's accounting software needs drove its decision to purchase the System/36 originally. "We were looking for software to meet our needs, and we found that what we liked best ran only on the System/36," Reilly says. Although the CSCI software it uses is now available on the AS/400, the museum will continue to use its System/36 until the lease expires in February 1992.

IBM's message for organizations such as Reilly's is clear. For one, IBM is developing no new software for the older System/36 line. "We're not investing in enhancing the System/36 in capacity or growth," says Fred Wile, IBM's director of marketing for AS/400 in the U.S. "It won't change at all. For a company that's growing, [the System/36] is dead-ended."

IBM is focusing its low-end attention on the System/36 successors: the AS/Entry and AS/400 families. Despite its greater functionality, the 2-year-old AS/400 has not yet won over most of the System/36 users. According to Computer Intelligence, a market research firm in La Jolla, Calif., there were 95,100 System/36s installed in the U.S. as of January 1990, compared with 26,100 AS/400s.

However, IBM is doing what it can to woo System/36 users to the AS/400. The firm revamped the System/36, introducing it last fall as the AS/Entry.

Furthermore, IBM manager of AS/400 marketing Art Abbey notes that nearly all software programs currently running on System/36s can be externally defined to run on the AS/400 while maintaining System/36 mode. However, while this makes the initial migration easier, it does not allow the user immediate access to AS/400 capabilities.

Unlike the System/36, DEC's 20-year-old PDP-11 line has the sanction of both user and vendor. As of December 1989, there were 177,000 machines installed worldwide, according to Sandy Gant, analyst at research firm Gartner Group/Infocorp in Santa Clara, Calif.

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It's the most effective solution for managing both tape and DASD resources.

PDPs "just don't die," Erbschloe says. "I've seen them in garages and warehouses, in the same spot, running and doing the same thing for 10 to 16 years."

DEC has been keeping the PDP alive with its May announcements of two PDP-11 computer systems that promise a 40% performance increase over previous high-end systems.

PDP-11 users remain cautiously enthusiastic. "The PDP-11 is a workable solution. It is currently running, we don't need to replace it, and DEC is willing to provide the maintenance at a reasonable cost," McClinton says.

During the 13 years the Mitre lab has had its PDP-11, the computer's role has changed, moving away from an aeronautics research function. The PPD-11 is currently being used to run communications packages complementing other systems that cannot be converted, Mitre technical staff member E. G. Livaditis says. "It serves a communications gateway function to another world," he says. "We acquire data on it from external sources via Decnet and import it into the VAX world."

Fermi National Accelerator Laboratory in Batavia, Ill., plans to hold onto three of its PDP-11s while most of the other 33 PDPs currently in operation are upgraded to VAXs. "We expect that after a while all [our] modern programs will run only on the VAX," says Peter Lucas, head of Accelerator controls, "but we have no plans to take [the PDPs] out. People are comfortable with them, and until the VAX is really solid, we'll just leave them."

As of January 1990, however, there were only 140 Decsystem 10s and 280 Decsystem 20s in the U.S., according to Computer Intelligence. This is largely because of DEC itself, which discontinued the machines in 1983. If DEC hadn't done so, the First Church of Christ Scientist in Boston says it would not have ceased using its Decsystem 10, says Gene Madden, manager of information systems.

The church has been upgrading to VAXs during the last several years, but those machines haven't been able to compensate for the familiarity of the Decsystem. "We have had a lot of experience on the Decsystem 10 and could do things on it that we haven't figured out on the VAX," Madden says.

"You can't build up 17 years of experience in three or four years," he adds.

> PDPS "JUST don't die. I've seen them in garages and warehouses, in the same spot, running and doing the same thing for 10 to 16 years."
>
> MICHAEL ERBSCHLOE
> COMPUTER ECONOMICS

Maltz agrees. The Decsystem Tops 10 operating system "was ideal for us," she says. It was run on both the Decsystem 10 and 20 "because of its richness and robustness. It had most of the functionality that was needed in our kind of environment," Maltz explains. She notes that it could support a large number of users, run a mix of computer-intensive and I/O-intensive jobs and had an early time-sharing device.

"The Decsystem was a classic," Madden says. "It produced an on-line computing environment for users that was very flexible and put a lot of power in the individual users hands that I've seen on other systems only recently."

For users who do decide to stick with their current equipment, Shannon cautions that maintenance costs can be significant and the power requirements substantial. But these considerations are sometimes outweighed by the immediate as well as long-term costs of an upgrade or replacement and the potential problems inherent in migrating software and specific applications. A significant number of users agree and continue to follow the old adage, "If it ain't broke, don't fix it."

Finn is a Boston-based free-lance writer and editor.

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Bozman

FROM PAGE 29

Unfortunately, in today's world, each of the dozens of OOP vendors, most of them small start-ups, has designed a unique environment. This includes competing object-oriented database vendors such as Servio Corp., Versant Corp., Ontologic, Inc. and Objectivity, Inc.

Someone, somewhere has got to come up with a set of standard interfaces to link object-oriented technology with the everyday procedural code most people use.

One group that thinks it can bridge the gap is the 1-year-old Object Management Group (OMG). OMG is a nonprofit vendor group with a Star Trek-like mission: to boldly forge interfaces where none has gone before. So far, OMG Marketing Vice-President John Slitz said, there are 80 members in the OMG group — enough to make for a lively discussion. Many of these competing vendors gained earlier experience in standards-making cooperation through participation in the Open Software Foundation.

However, the 80 members, including IBM, DEC, Hewlett-Packard and many OOP vendors, are not going to sit around wrangling and arm wrestling all day long. "OMG is a technical and promotional vehicle," Slitz said. "The idea is to get the industry to accept a new paradigm, which is object-oriented technology. But since nothing in technology ever goes away, this paradigm is going to have to overlap that of procedural code."

How will the transition be managed? How will the interfaces be created? Slitz said that OMG's intent is not to make standards. That task will be left to the computer industry's traditional standards-making bodies — American National Standards Institute and the International Standards Organization.

OMG members will simply propose the interfaces and map out a consistent OOP "framework" for the industry. "We believe we've struck the proper balance between cooperation and competition," Slitz said. "We're looking at very detailed interface specifications that would allow the overall [OMG] framework to be cobbled together."

For this privilege, OMG members pay $5,000 in annual dues, with dues increasing to $50,000 if the member firm has more than $500 million in annual revenue.

The task of bridging the OOP and procedural worlds may be difficult, but it is vital. Unless a set of interfaces is developed, each object-oriented product will have to be custom fit to each standard vendor offering.

That is why DEC is custom-designing an interface for its own RDB relational database and an object-oriented database made by Objectivity, Inc. in Menlo Park, Calif. [CW, Aug. 13]. DEC is also developing new "class libraries" to supplement Objectivity's class of CAD/CAM "objects."

However, neither giant DEC nor little Objectivity has any desire to reinvent the wheel. Both are OMG members.

> "THE IDEA IS to get the industry to accept a new paradigm, which is object-oriented technology."
>
> JOHN SLITZ
> OBJECT MANAGEMENT GROUP

Bozman is Computerworld's West Coast bureau chief.

Addition of SQL to Express targets database systems

BY MAURA J. HARRINGTON
CW STAFF

Information Resources, Inc. recently upgraded its fourth-generation language Express package by embedding SQL in the product. This feature allows users to send large queries to IBM's DB2, SQL/DS and Digital Equipment Corp.'s RDB relational database systems.

Express with SQL was designed to distribute application logic, Information Resources President Jeffrey Stamen said. SQL under Express adds logic to a query by having key words built into the query to save steps, Stamen said. "So now it's not necessary to know what communications protocol you're using."

"I think there is a lot of interest in the SQL feature," said Steven Rubinow, director of decision support systems for the information systems department at Quaker Oats Co. Rubinow said that while having SQL embedded into Express is an important feature, he would also have liked to see an Express version of Microsoft Corp.'s Windows Version 3.0 in this upgrade.

Other enhancements made in Version 3.0 were personal computer-to-mainframe communications capabilities through the Express Communications Architecture (ECA) and enhanced graphics capabilities, the firm said. ECA will communicate between platforms only if both are running Information Resources' Express, a spokesman said.

Express costs between $50,000 to $175,000, depending on configuration.

NEW PRODUCTS — SOFTWARE

Utilities

Data Summary, Inc. has announced a data reformatting utility designed for IBM Application System/400s.

The Intelligent Data Conversion System (IDCS) enables users to move existing data into AS/400 applications. It consists of a data conversion program generator, an entry screen for matching I/O fields and a proprietary data dictionary of I/O fields that can be manually or automatically loaded. The IDCS runs as a native application on AS/400 systems. It requires a data entry terminal and disk space for unconverted and converted data.

The price is $1,800 for all AS/400 models.

Data Summary
2535 S. Clinton
Berwyn, Ill. 60402
(708) 795-060

Release 3.0 of Tapeview, a tape display system developed by Deere and Co., has been announced by Main Frame Software Products Corp.

The product can display any message in the VSE/SP environment — a platform not supported by previous releases. Other features include the ability to initiate functions, such as beginning a certain job at a specific time, and the ability to provide an automatic response to system messages.

The system also enables users to get hard-copy printouts of a current month's requests by pressing a single key.

Pricing for a software license for Release 3.0 starts at $8,500.

Main Frame Software Products
135 Glen Road
Wellesley, Mass. 02181
(617) 239-0288

Applications packages

Andersen Consulting has added a Promotions and Deals software module to its DCS/Logistics on-line, IBM mainframe-based computer system.

The tool helps distributors manage on-line promotional programs such as setup procedures, order and invoice pricing, payments and planning and analysis routines.

The DCS/Logistics Promotions and Deals module costs between $50,000 and $125,000, depending on CPU size and type of model.

Andersen Consulting
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System Software Associates, Inc. has announced Version 2.1 of its Business Planning and Control System line of application software products designed for the IBM Application System/400 environment.

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COMMENTARY

Patricia Keefe

While the cat's away

The great escape. Lotus Chief Executive Officer Jim Manzi took off on sabbatical a couple of weeks ago, possibly headed for Spain. Does bad news stalk his vacation plans? Lotus stock dropped 26% in value during the two days after the company startled Wall Street by lowering expectations for the third quarter. Meanwhile, for the second year in a row, the League for Programming Freedom chose to vent its frustration over intellectual property rights issues outside of Lotus' headquarters.

Also, although Lotus Senior Vice-President Frank King denies it and a spokesman says the product is on schedule, reports persist that Lotus is having a tougher time than expected porting 1-2-3 to Windows. The latest reorganization reportedly has resulted in the scrapping of two separate Windows development projects, but it is expected to produce a greater overall focus on solving that problem.

The last time Manzi tried to take a vacation, his planned merger with Novell came tumbling down around his ears.

Don't leave home without it. Yet another reason to buy

Continued on page 42

CD-ROM's Unix promise unmet

Goal of one standard package for many Unix platforms remains elusive

ANALYSIS

BY JAMES DALY
CW STAFF

On paper, it looks like a match made in heaven. Feed the hungry computational needs of increasingly sophisticated Unix-based workstation applications with the high-capacity storage capabilities offered by compact disk/read-only memory (CD-ROM) technology, and it's smooth technological sailing, right?

In theory, yes. However, that matchup now seems stalled on the commercial software front, tripped up by a series of non-interoperable software drivers that prevent applications developers from writing a single CD-ROM package that can work across a variety of Unix platforms.

"It's a real hornet's nest, and users are caught in the middle," said Linda Helgerson, editor of the "CD-ROM End User" newsletter in Falls Church, Va.

Analysts said that because each vendor's machine uses a proprietary software driver, applications developers who wish to publish commercial Unix software on CD-ROM must tailor their software to each vendor's product and get a proprietary driver's license to have the disk work on that particular CD-ROM drive.

A software publisher, for instance, would have to write separate applications for Hewlett-Packard Co., IBM and Sun Microsystems, Inc. workstations.

"If you're a developer going after the whole Unix marketplace, you don't want to have to write to several different platforms, because it erodes your profit margin horribly," said Bob Katzive, vice-president at Disk/Trend, Inc., a market research firm in Mountain View, Calif.

Analysts said this lack of a uniform driver is slowing down the assimilation of what could be a technological boon to the workstation world. CD-ROM is an optical form of storage often used for high-end backup discs. The technology offers the ability to store 600M bytes of information on a 4-ounce disc — the equivalent of more than a dozen hard disks.

Such expansive storage abilities make it a natural for graphics-intensive Unix applications that quickly stretch the storage limitations of magnetic media.

So far, workstation manufacturers have embraced the technology enthusiastically. HP has offered CD-ROM drives and packages for several years, while Sun recently announced that it will include its CD-ROM drive as a standard feature on many of its Sparcservers and Sparcstations and vowed to move all of its software onto CD-ROM by next year. IBM has also included a CD-ROM drive as standard equipment on a version of its RISC System/6000 workstation, and Silicon Graphics, Inc. is reportedly readying a similar announcement.

Two years ago, the International Standards Organization (ISO) released ISO 9660, a CD-ROM volume and file format specification for the DOS operating system that standardized the placement of files and data on CD-ROM. However, while the so-called "High Sierra Standard" — named after a resort in the eastern mountains of California where the particulars were finally hammered out — is adequate for the similar stylings of DOS machines, "it is far too restrictive for Unix," said Andy MacRae, segment manager for third-party storage devices at Sun.

Unix-based systems vendors have used ISO 9660 by default, but they are not happy about the jury-rigged solution.

"There's a significant trade-off involved," said Sabrina Lin, a member of the applications support division at HP. "ISO 9660 gives you a degree of interoperability, but at the expense of sub-optimal performance for Unix systems."

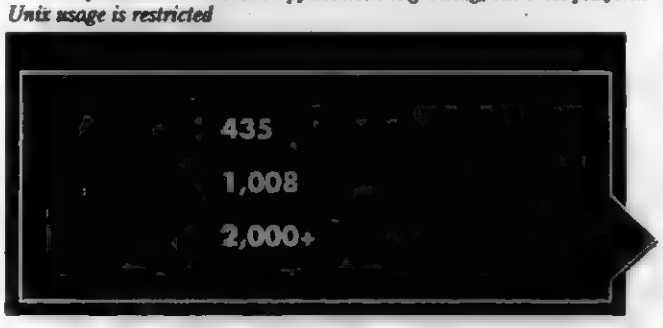
Meanwhile, several ad hoc committees have met to try to hammer out a CD-ROM driver standard optimized for the Unix environment, but not one has been successful yet. Analysts said the standardization issue must be nailed down before CD-ROM for commercial Unix can take off. "A significant opportunity is being lost here because publishers are unwilling to devote a lot of time writing several versions of their software for the [Unix-based CD-ROM] format," Katzive said.

Vendors have tried to lure applications developers and seed the market by offering internally produced applications. However, reaction to this enticement has been mixed.

"Users are just not going for them in earnest because they can only get internal programs that come from the company store," Helgerson said. "And users are beginning to tire of the vendors playing games."

Within limits

The list of available CD-ROM applications is growing, but cross-platform Unix usage is restricted



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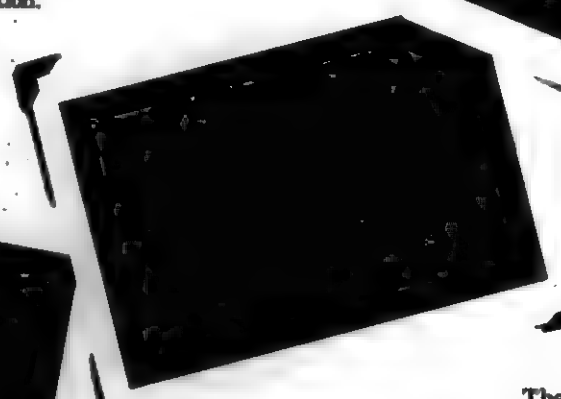

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Coprocessors Supported	16-MHz 387SX	16-MHz 387SX	
Expansion Slots Available Type	3 (2) 8-/16-bit ISA (1) high-speed memory	5 (4) 8-/16-bit ISA (1) high-speed memory	
Standard Memory Maximum Memory	1 MB 16 MB	2 MB 13 MB	
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5¼-inch Diskette Drives	1.2-MB optional	1.2-MB optional 360-Kbyte optional	
Standard Fixed Disk Drives	40-MB	84-MB 40-MB	
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Maximum Storage Capacity	120 MB	1.2 GB	
Tape Drives (Optional)	N/A	150-/250-MB, 80-/120-MB, or 60-MB	
Operating Systems MS-DOS and MS OS/2 are available from Compaq	MS-DOS, MS OS/2, Novell NetWare, Microsoft LAN Manager, Banyan VINES, SCO UNIX/386	MS-DOS, MS OS/2, Novell NetWare, Microsoft LAN Manager, Banyan VINES, SCO UNIX/386	
Display (Optional)	Video Graphics Color Video Graphics Monochrome	Advanced Graphics Color Video Graphics Color Video Graphics Monochrome	
Video Controllers	Video Graphics (standard) 640 × 480 graphics 720 × 400 text 132-column text support	Video Graphics (standard) 640 × 480 graphics 720 × 400 text Advanced Graphics 1024 (optional) 1024 × 768 graphics 720 × 400 text	
Keyboard	Enhanced Keyboard	Enhanced Keyboard	
Dimensions	15.0"W × 14.9"D × 3.9"H (38.1cmW × 37.8cmD × 9.9cmH)	15.8"W × 14.8"D × 5.9"H (40.1cmW × 37.5cmD × 14.9cmH)	
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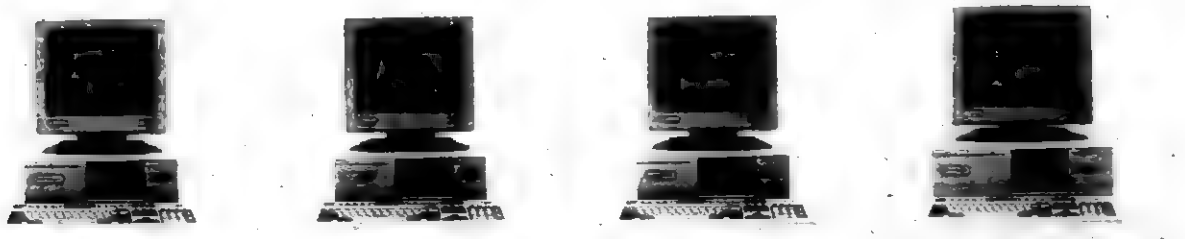

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1.2-MB optional 360-Kbyte optional	1.2-MB optional 360-Kbyte optional	1.2-MB optional 360-Kbyte optional	1.2-MB optional 360-Kbyte optional
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MS-DOS, MS OS/2, Novell NetWare, Microsoft LAN Manager, Banyan VINES, SCO UNIX/386	MS-DOS, MS OS/2, Novell NetWare, Microsoft LAN Manager, Banyan VINES, SCO UNIX/386	MS-DOS, MS OS/2, Novell NetWare, Microsoft LAN Manager, Banyan VINES, SCO UNIX/386	MS-DOS, MS OS/2, Novell NetWare, Microsoft LAN Manager, Banyan VINES, SCO UNIX/386
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Video Graphics (standard) 640 × 480 graphics 720 × 400 text 132-column text support Advanced Graphics 1024 (optional) 1024 × 768 graphics 720 × 400 text	Video Graphics (standard) 640 × 480 graphics 720 × 400 text Advanced Graphics 1024 (optional) 1024 × 768 graphics 720 × 400 text	Video Graphics (standard) 640 × 480 graphics 720 × 400 text Advanced Graphics 1024 (optional) 1024 × 768 graphics 720 × 400 text	Video Graphics (standard) 640 × 480 graphics 720 × 400 text 132-column text support Advanced Graphics 1024 (optional) 1024 × 768 graphics 720 × 400 text
Enhanced Keyboard	Enhanced Keyboard	Enhanced Keyboard	Enhanced Keyboard
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Mainstream Productivity	Word Processing Spreadsheets Database Stand-alone or Networked PCs	Moderate Performance Specific Network Features Minimum Expansion	COMPAQ DESKPRO 386s/20 COMPAQ DESKPRO 386s COMPAQ DESKPRO 386N

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Taco Bell sends out for HP PCs

Fast-food chain automates to free managers to work with people

ON SITE

BY RICHARD PASTORE
CW STAFF

IRVINE, Calif. — Most fast-food aficionados have had the displeasure of dealing with the often surly adolescents who man the counters. The managers of these burger flippers are often nowhere to be seen. But Taco Bell Corp. is hoping a new restaurant-based personal computer system will help distinguish its customer service by freeing its managers for more interaction with the burrito-buying public.

"The customers are the important people in this business," said Ken Harris, vice-president of MIS at Taco Bell. "We want to automate the administration portion of the manager's job as much as possible so he or she can impact the business by working directly with the customers."

Taco Bell has sunk $8.2 million into the hardware purchase alone: The restaurant chain will take delivery of 1,750 Hewlett-Packard Co. Vectra PCs during the next 18 months. HP will install and service the Intel Corp. 80386SX-based boxes in each company-owned restaurant's back office.

Restaurant managers will use homegrown Unix-based software to track and predict sales, schedule staffing, manage inventory levels and track speed of service.

For example, the system could use historical sales data to predict how much food the restaurant will sell next Wednesday and suggest how much inventory to order.

The manager, noting that a major league baseball game will take place nearby that night, could enter an expected 10% sales increase into the program. The system, in turn, would then suggest how many extra workers should be scheduled that night to cover the increased crowds.

Previously, the manager made all of these determinations manually; Taco Bell had no restaurant automation other than a point-of-sale (POS) system, Harris said. Overall, the PCs should save the manager 20 to 25 hours of paperwork per week, he estimated.

The system should also save the $1.4 billion chain a few bucks as well. "The effective use of these systems is expected to improve our food costs by 1% of sales," said Merlin Piltz, vice-president of operations.

The savings will come partly from improvements in inventory management. With better sales predictions, inventory is less likely to wind up spoiling in restaurant storage bins.

The company also expects the system to boost sales volume. Improvements in staffing levels and greater personal attention from the manager is expected to move customers through the line faster and allow for increased sales volumes at key rush times, Harris said.

Taco Bell's corporate executives will also benefit from the system by improving the timeliness and scope of their restaurant data reports.

On a nightly basis, the PCs will download transaction data from the POS systems. In turn, an IBM RISC System/6000 workstation at headquarters will poll all the PCs nightly via dial-up asynchronous lines and upload the data to an IBM 3081 mainframe. Company executives can then use mainframe-generated reports to see how well burritos are selling in Boise and whether restaurant No. 1,342 has improved its cost control, for example.

Taco Bell *uses personal computers to beef up customer service*

Taco Bell, along with its sister Pepsico, Inc. subsidiaries Kentucky Fried Chicken Corp. and Pizza Hut, Inc., recently signed a $1 million deal with Corporate Microsystems, Inc. to provide the communications software to link the restaurant PCs with the headquarters hardware (CW, July 30).

Solid reputation

HP won the PC bid based on the reliability of both its hardware and the company itself, as well as price, Harris said.

"We're not looking at this thing as a one-year investment," he noted. "HP has a quality computer, and they're a quality organization."

Though the technology for such a system has been available for some time, hardware prices precluded earlier implementation.

Because the fast-food business operates on low margins, "there has been a reluctance in this industry to making big investments in hardware," Harris explained. "But now I think you can get some rather dramatic impacts at a reasonable cost."

Future enhancements to the system will include real-time sales tracking and electronic data interchange (EDI).

Already in limited test use, EDI-equipped restaurants are ordering inventory from suppliers and receiving order confirmations electronically.

Front-end applications released for SQL Server

BY PATRICIA KEEFE
CW STAFF

At long last, front-end applications for SQL server engines are starting to emerge from their 1- to 2-year-old cocoons. At least four vendors — Borland International, Dataease International, Software Products, Inc. and Revelation Technologies — are planning to ship front ends, starting next month.

The timing couldn't be better, both for frustrated users and for Microsoft Corp., which recently launched a renewed distribution effort for the SQL Server it co-developed with Sybase Corp.

Many of the early OS/2 beta testers were really standing in line to use SQL Server, in some cases as part of an effort to downsize mission-critical applications. However, access to SQL Server was stymied on two fronts: A distribution strategy centered around Ashton-Tate never came to fruition, and cocksure developers soon discovered that building an SQL front end was a bit more complicated than they had anticipated. Subsequently, initial delivery targets were thrown off course by more than a year.

The change in schedule boomeranged throughout the user community. About a year ago, Chevron Canada had to scrap plans to base a significant portion of its new order entry system on Borland's Paradox SQL Link, which was supposed to ship last summer. It then turned to Dataease, with the same results. "We were pretty frustrated," said Bill Soper, a project manager for the Chevron Automation Sales Team. "By the end of 1989, we had to make a decision."

Soper rejected developing his own front end in C because the development staff is Cobol-based, nor did he want to develop on a minicomputer platform. The project was saved by Sybase's decision to port its A Programmers Tool (APT) to a version of Unix running on Intel Corp.'s 80386 chip.

Soper, who also heads up the Vancouver SQL Server Users' Group, said he believes many people have held off attempts to downsize mission-critical applications because of the lack of front ends. He predicted that during the next month or so, as many of these users begin to examine this quarter of front ends, many of these downsizing projects will be activated. Chevron is among those that will consider the new front ends.

Other issues key to the three or four largest corporations participating in the users group, according to Soper, concern back-up and administrative concerns.

But SQL Server, which has found itself mired in minuscule sales cushioned by endless mar-

Continued on page 42

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Big-name database vendors hit Macworld

BY RICHARD PASTORE
CW STAFF

BOSTON — Macworld Expo attendees were treated to more than the usual slew of desktop publishing product debuts earlier this month. Several business productivity and networking rollouts graced the booths here, including software from the big names in databases.

Oracle Systems Corp. announced Oracle Server for Apple Computer, Inc.'s Macintosh. The SQL server allows Macintosh users to access data residing on minicomputers, mainframes and OS/2 client/server systems, the company said.

With the included Hypercard-based Query Tool, users can generate their database queries graphically by pointing to and clicking on database columns and tables. Other Hypercard tools let users generate Hypercard forms without programming and allow administrators to add users, create tables and establish host connectivity.

The software supports Apple's Localtalk, Ethertalk and Tokentalk. It requires a Macintosh II (preferably a Macintosh IIFX) with a minimum of 8M bytes of system memory and 10M bytes of hard-disk capacity. The software will ship in the first quarter of next year, according to the company, which has not revealed pricing.

Ashton-Tate Corp. introduced Dbase IV Runtime Plus for the Macintosh, based on the newly released Dbase IV Version 1.1. The utility is said to allow Macintosh users to run most Dbase IV and Dbase III Plus DOS-based applications without modification.

With Runtime Plus, users can utilize the Dbase IV language and Dot Prompt to manipulate and browse through data and create or modify applications on the Macintosh. They can then port these applications to DOS-based personal computers unchanged. Also, networked users can have shared access to applications and data on PCs and Macintoshes that adhere to Apple's Appleshare File Protocol. Ashton-Tate did not release pricing or an availability date.

Continuing in the database arena, **Occam Research Corp.** in Watertown, Mass., unveiled Muse, an English-driven data analysis program. Users can type simple English commands to reference, manipulate, reformat, calculate and visualize large data sets. Muse will run on a Macintosh SE or higher with 2M bytes of memory, a hard disk and System 6.0.5 or higher. General distribution of the $695 product is expected in the first quarter of 1991.

Networked Macintosh users can simultaneously view and edit the same graphics-and-text documents using Aspects real-time document conferencing software from **Group Technologies, Inc.** Two to 16 users at a time can access files created with other Macintosh utilities and, via 2,400 bit/sec. connections, make changes that appear virtually instantaneously, the Arlington, Va.-based firm claimed. The program includes a word processor and painting and drawing tools for use in editing. Due out next month, Aspects will cost $299.

A number of new scanners also popped up at the show. Los Gatos, Calif.-based **Caer Corp.**'s Typist handheld scanner lets users scan text into a Macintosh file at the rate of 500 words per minute. The information can be scanned directly into whatever application the user is running on the Macintosh, including spreadsheets and databases. Scheduled to ship next month, the $695 device requires a Macintosh SE or higher, a minimum of 4M bytes of memory and a hard disk. A DOS machine version is also available.

Another of the increasingly common budget-priced laser printers debuted at the show, this one from **NEC Technologies, Inc.** in Boxboro, Mass. NEC's six page/min. Silentwriter2 Model 90 sells for $2,495 and is fully compatible with Adobe Systems, Inc.'s Postscript format.

USE YOUR SNA BACKBONE TO LINK TCP/IP LANS.

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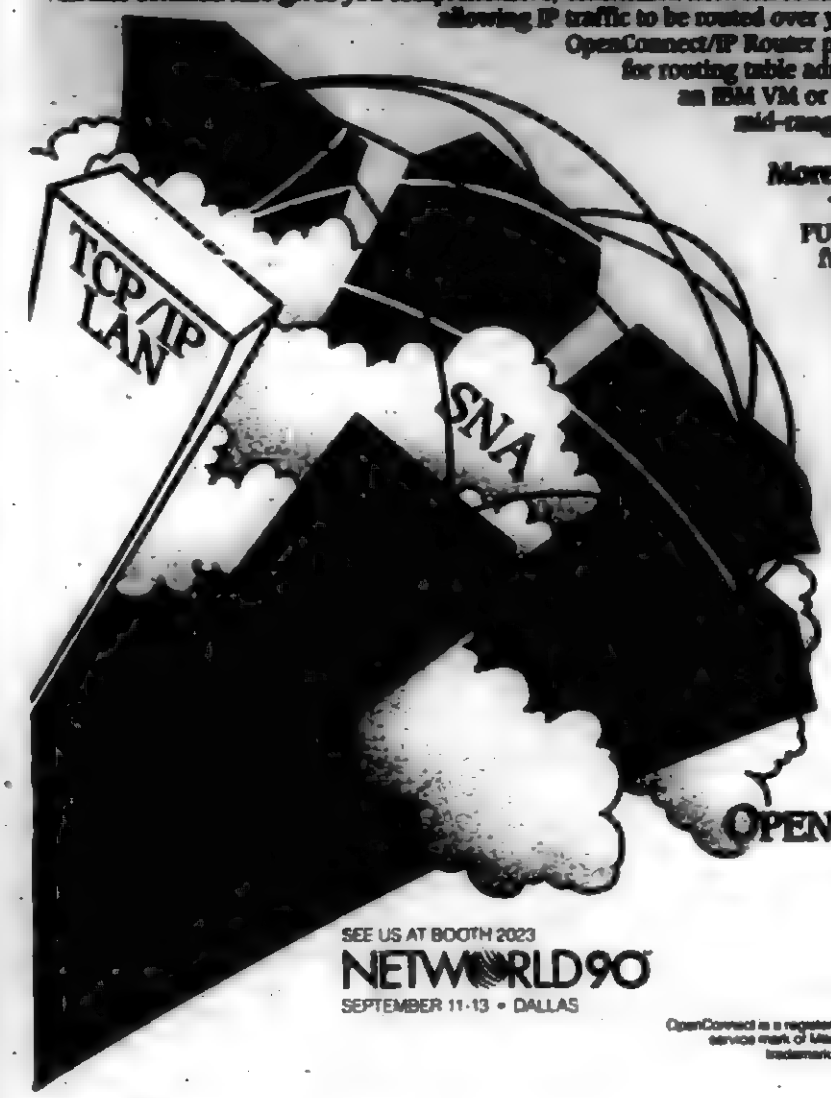
The OpenConnect/IP Router allows you to route and transfer data packets from one TCP/IP network, over your SNA backbone, to another TCP/IP environment. Data packets are "enveloped" and transferred transparently to another computing environment around the corner or around the world. This eliminates the need for additional circuits, wiring, extra routers and the high cost associated with each. The OpenConnect/IP Router solution also gives you comprehensive, centralized network routing control of remote LANs by allowing IP traffic to be routed over your proven SNA topology. The OpenConnect/IP Router package includes a Control Program for routing table administration, which can reside on an IBM VM or MVS mainframe or AS/400® mid-range system.



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The OpenConnect/IP Router supports PU 2.0 and PU 2.1 definitions and is fully compatible with the OpenConnect line of servers. The OpenConnect/IP Router supports NetView® and provides full connectivity to IBM's TCP/IP.

The OpenConnect/IP Router package protects your current network investment, provides for centralized network routing control, and allows for maximum network utilization by providing access to all devices on the various networks. For more information, please contact Mitek OpenConnect Systems today.

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NEW DEALS

Compuadd wins federal contracts

Compuadd Corp.'s Government Services division has won three major procurement contracts for personal computers and related products. The states of **Louisiana** and **North Carolina** have authorized Compuadd to fill orders from state agencies, local governments and state-supported educational institutions. The 37-member **Inter-University Council of Ohio** has also authorized Compuadd to serve as a supplier of PC equipment.

The **General Services Administration** (GSA) has awarded its 1990 GSA schedule for the period of June 29, 1990, through March 31, 1991, to **Compaq Computer Corp.**

Silicon Graphics, Inc. has supplied the **National Research Council of Canada** (NRC) with $1.7 million worth of its Iris 3-D workstations and project supercomputers. The systems will be installed in six institutes within the council and will be networked via Ethernet for use in advanced scientific research.

Introducing the laser printer to buy if price is the first thing you look at,

or the last.

	The New IBM LaserPrinter E	HP LaserJet IIP
Speed	✓ up to 5 ppm	up to 4 ppm
Speed upgrade option	✓ up to 10 ppm	No
Adobe PostScript option	Yes	Yes
Printer emulation	✓ IBM, HP PCL	HP PCL
Std. plotter emulation	✓ Yes	No
Font card slots	✓ 2	1
Std. input paper tray capacity	✓ 200	50
Std. output paper tray capacity	✓ 100	50
Opt. sec. input paper tray capacity	✓ 500	250
Opt. envelope tray capacity	✓ 75	20
List price*	✓ $1495	$1495

*Dealer prices will vary.

Any way you look at it, the new IBM LaserPrinter E gives you more for your money than any other laser printer in its price range.

For the same price as the HP LaserJet IIP, the IBM LaserPrinter E gives you all the advantages of laser quality output 25% faster, with four times the paper capacity, twice the number of font slots and double the monthly usage volume.

Plus the IBM LaserPrinter E is unique in its price range because it lets you customize your printer's speed and features to meet your exact needs, at any given moment.

All of which makes the IBM LaserPrinter E the only affordable laser printer that lets you buy now and grow later.

For example, if you decide you want faster printing, only the LaserPrinter E lets you double its speed.

Or if your software requires the Adobe PostScript® language, the LaserPrinter E can also give you that creative flexibility for less money.

Or if you decide you could use automatic collating of letterhead, second sheets and envelopes, the LaserPrinter E lets you add that, too.

Yet no matter how many features you add, the LaserPrinter E's unique stackable design takes up practically no more deskspace.

So whether your first requirement is price, performance or flexibility, the new IBM LaserPrinter E should be at the top of your shopping list. See it today by calling 1 800 IBM-2468, ext. 982, for the name of your nearest IBM Authorized Dealer.

The new IBM LaserPrinter E. Suddenly, nothing else measures up.

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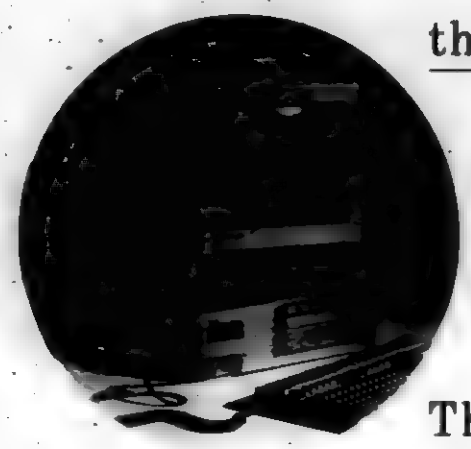
Introducing the NEC PowerMate® SX/20. If you want a system that will make a noticeable impact on your company's productivity, it's worth a look, for a lot of reasons.



The most important one being, it's from NEC.

Which means that not only does the PowerMate SX/20 give you advanced technology, excellent performance and uncompromised quality, it also offers you the security that your system will be fully supported in the years ahead by people who will be there when you need them.

Fact is, NEC Corporation is a 24-billion-dollar company. As well as the world's third largest manufacturer of personal computer systems.

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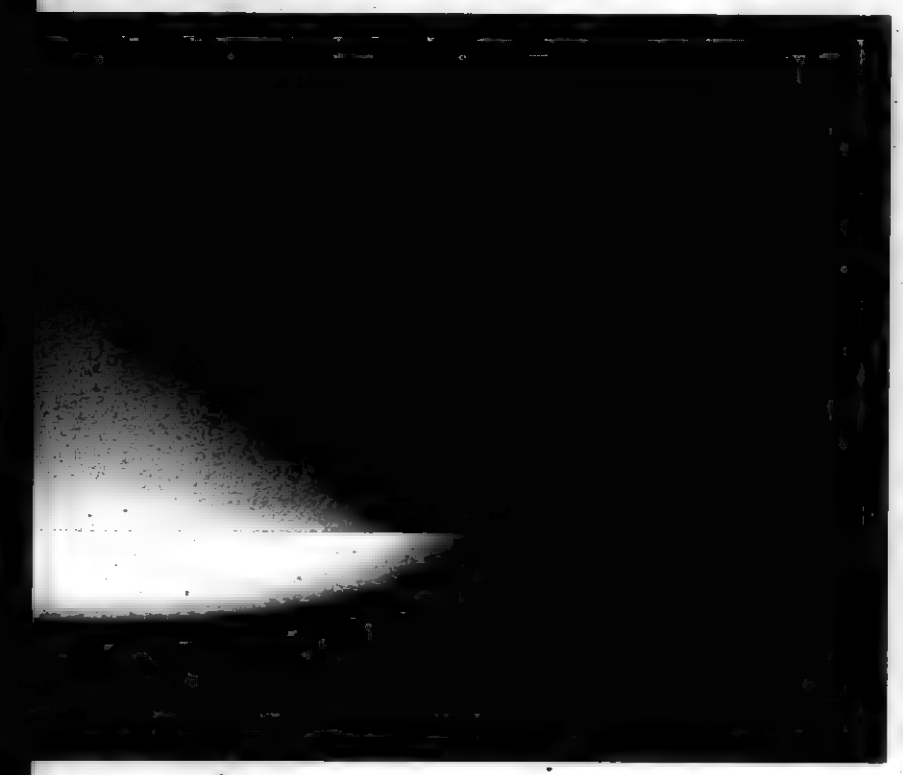

All of which helps to make a great system an even greater value.

Built around the 20MHz Intel® 386™SX microprocessor operating at zero wait states, the PowerMate SX/20 offers 2MB of standard RAM, which is readily expandable to 16MB. It also gives you the storage bays and expansion slots you need to make your system grow as your needs do.

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For additional information, call 1-800-NEC-INFO.

The PowerMate SX/20. Choosing it will gain you a certain amount of attention. All of it good.

NEC

Keefe

CONTINUED FROM PAGE 35

travel insurance: In case you haven't been watching lately, Lotus stock hit a new 52-week low last Wednesday, bottoming out at 19¼ points, just ¼ of a tick under the previous low of 19½. Wall Street analysts say the stock's steady descent is related to expectations for the next two quarters and the Street's severe case of jangled nerves. Many industry observers predict that delivery of Lotus 1-2-3 Version 3.1, which is expected within a few weeks, will perk the stock up a bit, although a big recovery will probably hold off until 1-2-3 for Windows ships in 1991.

Easy to be hard. Charlotte Walker, an analyst at Labe Simpson & Co., is unfazed by the recent layoffs at Lotus [CW, Aug. 13]. "It's easy to bash Lotus," she said, noting that the company has a poor record of communicating with Wall Street, a "spotty" financial record and an "arrogant" CEO — Jim Manzi — who "attracts a lot of negative press."

A mountain out of a molehill? One Wall Street pundit says he isn't surprised some Lotus employees reportedly are expecting more layoffs, although a Lotus source says it won't happen. Describing Lotus as a bunch of little fiefdoms, the analyst said: "Every time I walk into Lotus, I can't figure out what a lot of these people are doing, and I don't usually have that problem." The Lotus source attributed the job consolidation of two weeks ago to that very issue.

Lotus recently overhauled some of its divisions, eliminating some of those fiefdoms. Another source close to the developer, meanwhile, reports that "the numbers being thrown around inside" the company indicate that Lotus wants to squeeze $10 million or more in costs out of the next two quarters in an effort to calm Wall Street jitters.

Another Windows 3.0-related fix. Networked users of EMS emulators from Quarterdeck (QEMM) and Qualitas (386 to the Max) who try to run those packages under Windows Version 3.0's 386 enhanced mode along with DOS packages can not load their network redirectors and drivers into high memory. This caused a shrinkage of available memory for DOS applications because Windows 3.0 lacks support for importing a variety of drivers and loading them into high memory.

Quarterdeck did come up with a fix, but concern that it would not work with future Windows upgrades led Microsoft to provide the VXD virtual device driver, which allows users to load network code into high memory. It is available through Quarterdeck and Qualitas.

Only Austin knows for sure. "IBM will be goddamned if it doesn't ship OS/2 2.0 by the first of the year," says a user who talked with IBM recently. "Unofficially, that's their goal." IBM is said to be hopping mad over what appears to be Microsoft's leisurely approach to finishing Version 2.0. Last week, Microsoft vice-president Steve Ballmer conceded that Microsoft has given inconsistent answers about a delivery date for 2.0. He said the program is 95% complete and will ship sometime in 1991. He attributes most of the waiting time to a "fit and finish" goal that will require a thorough (and most likely lengthy) beta-test process. Responding to developers who don't expect 2.0 to ship before the third quarter of 1991,, Ballmer admitted it was possible but seemed to be saying it will ship earlier. IBM, meanwhile, tends to ship its versions of OS/2 long before Microsoft OEMs do, so anything is possible.

Keefe is Computerworld's senior editor, PCs and workstations.

CD-ROM

CONTINUED FROM PAGE 37

keting promises, is about to get a jolt.

A number of second-tier players, including MDBS' Object 1 and Intelligent Environment's Application Manager — have been out in the market for a while, according to Richard Finkelstein, a database consultant and owner of Performance Computing, Inc. in Chicago.

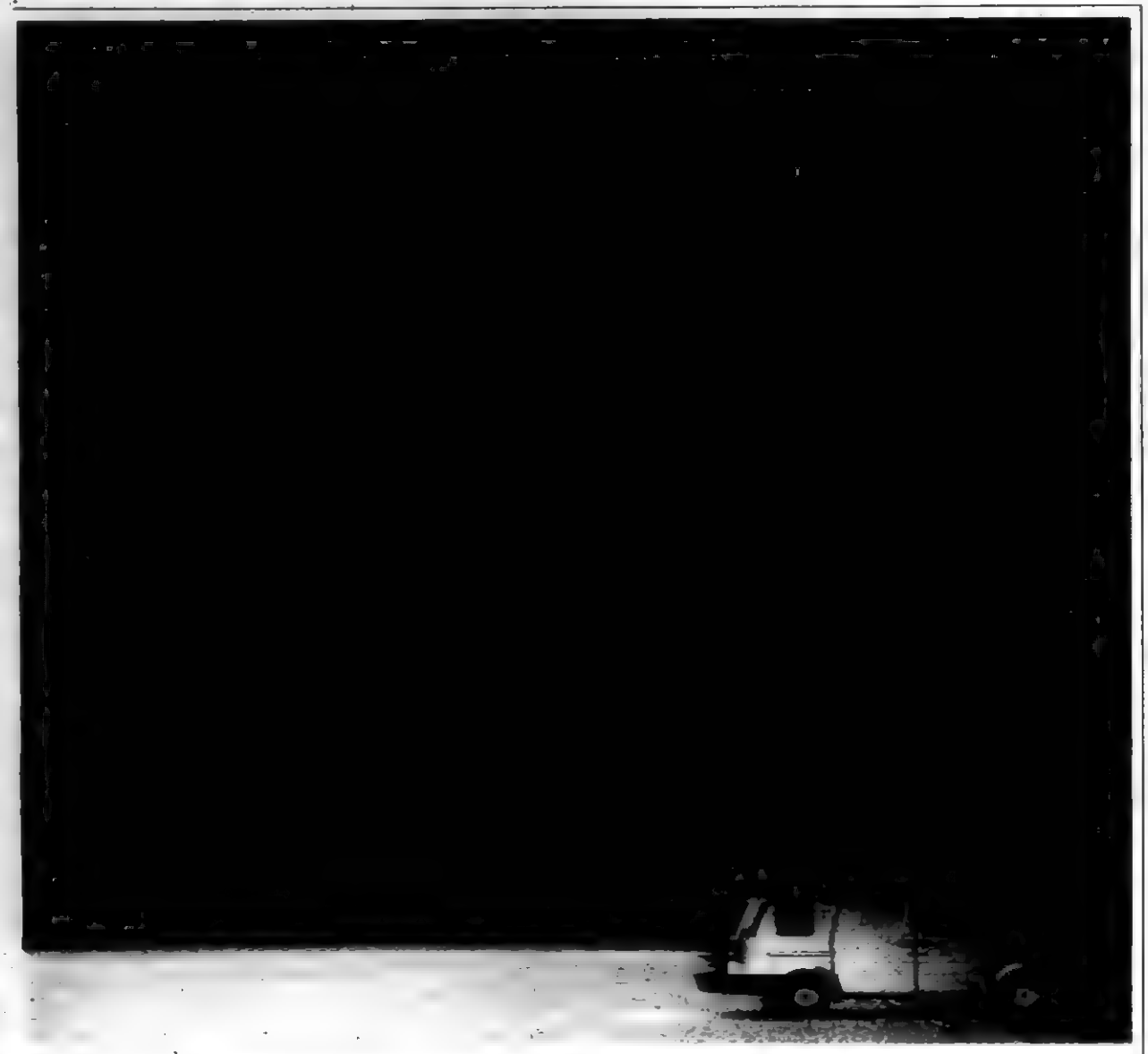
In the last two weeks, Software Products, Inc. (SPI), Dataease and Borland announced plans to ship front-end to SQL Server in September.

Finkelstein said developers had two choices: they could translate their existing applications into SQL and preserve their current user base, or they could embed SQL statements in their program. In the latter case, SQL is embedded in new programs, which means that the old programs have to be rewritten.

Borland plans to unveil a new SQL Link on Sept. 5. Invites stamped "Vroom (SQL) Turbo Drive" went out last week. Vroom and Turbo Drive are actual names of proprietary Borland technology. Chevron has looked at Advanced Revelation.

David Cearley, a software analyst at Gartner Group, Inc. who is beta testing all of these products, reports said that all are looking good. His favorite, however, is the lesser known Revelation's Advanced Revelation: "It might be the best one, but it's the lesser known one."

Separate from the issue of available front ends, Microsoft has to provide a distribution and support infrastructure. SQL Server is included in the massive LAN Manager retail effort.



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NEW PRODUCTS

Systems

Compuadd Corp. has announced a personal computer based on Intel Corp.'s 80386SX microprocessor.

The Compuadd 320S features built-in parallel, serial and game ports; five expansion slots; one 5¼- and two 3½-in. half-height drive bays; and a motherboard with a built-in hard drive interface.

Pricing for complete configurations starts at $1,859. The product is being bundled with Compuadd's licensed versions of Microsoft Corp.'s Windows Version 3.0 and MS-DOS Version 4.01 at no additional charge.

Compuadd
12303 Technology Blvd.
Austin, Texas 78727
(512) 250-1489

Texas Instruments, Inc.'s Peripheral Products Division has announced an Intel Corp. 80C286-based notebook-size personal computer.

The Travelmate 2000 measures slightly less than 1½-in. high with an 8½-in. by 11-in. footprint. It features 1M byte of random-access memory, which can be expanded to 3M bytes; a triple supertwist black-on-white IBM Video Graphics Array-compatible display; and an internal 20M-byte hard disk drive.

The product is priced at $3,999.

TI
P.O. Box 202230
ITG-040
Austin, Texas 78720
(800) 527-3500

Sunriver Corp. has added a high-end workstation to its Cadsystem product family.

The Lightstation provides Autodesk, Inc. Autocad users with automated engineering functionality and features multitasking 32-bit graphics processing and 1,024- by 768-pixel resolution for high-speed computer-aided design computations, according to the company. The product is available with optional 16- and 19-in. monitors.

The Lightstation costs $3,499.

Sunriver
11500 Metric Blvd.
Austin, Texas 78758
(512) 835-8001

Software applications packages

Samna Corp. has announced an update of its Ami Professional word processor that is compatible with Microsoft Corp.'s Windows Version 3.0.

Version 1.2 of Ami Professional allows users to employ Windows features such as three-dimensional push buttons, proportional system fonts and a broader color palette. Other features include the ability to integrate graphics and text and built-in drawing and charting capabilities.

The product is being offered to first-time buyers for $495. Registered users of Ami Professional may upgrade to Version 1.2 for a $10 shipping and handling fee.

Samna
5600 Glenridge Drive
Atlanta, Ga. 30342
(404) 851-0007

Software utilities

Diagsoft, Inc. has introduced a benchmarking program designed to allow manufacturers and end users to evaluate IBM Personal Computers and compatibles.

Power Meter Version 1.7 enables users to measure, monitor, sort and compare performance characteristics of various types of PCs.

Six special system tests simulate PC applications for spreadsheets, word processing, computer-aided design and engineering, program development, database operations and a general simulation of a PC's overall performance.

Power Meter Version 1.7 is priced at approximately $100.

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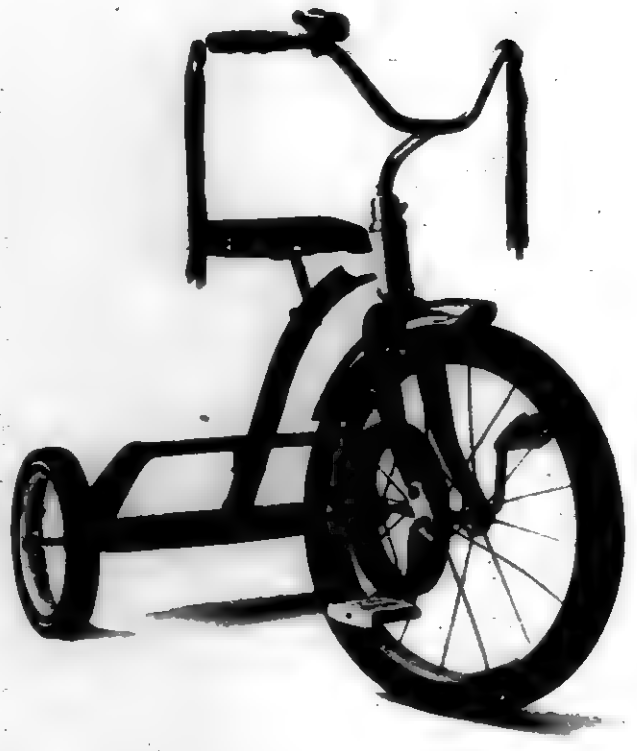
At some point, growing up means giving up something you once loved.



At first, you loved your network operating system. It made life easier for you.

But now your networks and needs are growing. And you need to tie everything together into a single, integrated network.

Unfortunately, your current network operating system can't handle it.

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Consider VINES. It lets you easily turn your isolated PC clusters into a corporate-wide PC network with unlimited future capacity.

VINES' strong standards support helps to protect your current investment in server hardware, communications equipment and applications.

And right now, you won't lose your networking software investment, either. Trade in your present software and we'll give you cash credit toward the purchase of any VINES product.

For example, get a credit of up to $3,500 for your copy of NetWare.®

Additional discounts apply to larger networks.

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Call us at 800-828-2404 (in MA 508-898-2828) for more details on our trade-in program.

Isn't it time you found something to love that you'll never outgrow?

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Banyan Systems Incorporated, 120 Flanders Road, Westboro, MA 01581 NetWare is a registered trademark of Novell, Inc.

COMMENTARY

David Freeland

Keeping up with Netview

The more you get, the more you want. It seems users of data processing systems have always been that way, and users of automated network management products are no exception. One day you get a response to your wish for more timely network information through IBM's Netview, and then you realise you have so much information that you need more software to manage the Netview information.

As a case in point, a recent survey conducted by a network management software vendor claims that only 15% to 20% of Netview messages get logged for corrective action — even after filtering.

A network manager at a New York investment banking firm said, "We are currently investigating filtering and thresholding of alarms over a heterogeneous environment. There is a critical need for alarm correlation to reduce the flood of messages."

Fortunately, vendors are already beginning to address this need with software that further refines Netview output and integrates it with other areas of network management. For example, products from IBM and other vendors present Netview information on graphical displays. (IBM's current product

Continued on page 51

Microsoft's last LAN stand

Updated LAN Manager is late contender; users skeptical

ANALYSIS

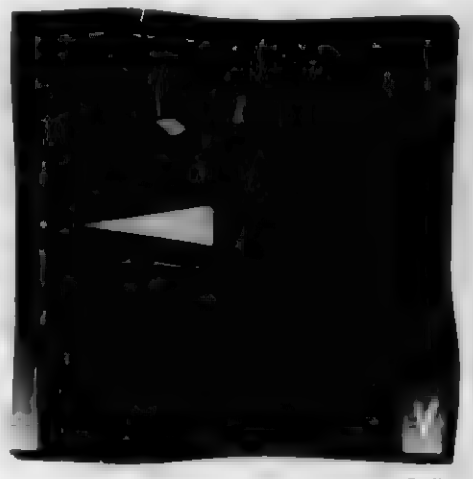
BY JIM NASH
CW STAFF

Borrowing a tactic used with some success by the Chinese during the Korean War, Microsoft Corp. has announced its intention to throw people at its most notable failure — local-area networking.

In announcing Microsoft's decision last month to directly market its networking product, LAN Manager, company executives punctuated their speeches with hawkish bluster about storming beaches and conquering markets.

Rhetoric aside, however, industry observers agreed that Microsoft has shown up late for the LAN contest. Many said it would be next to impossible for Microsoft to usurp the No. 1 spot of Provo, Utah-based Novell, Inc., which is widely acknowledged to hold about 65% of the personal computer-based LAN market. Estimates of LAN Manager's presence hover at about 10%, including its OEM sales.

"I think [Microsoft's announcement] will fill up a lot of media pages," said Karen Soskin, a telecommunications specialist at Miles, Inc. in Elkhart, Ind., "but unless they find a fundamental way to improve upon what is out there and can communicate it clearly and cleanly, they don't have a chance."



Ray Wells

So far, Redmond, Wash.-based Microsoft has said it will commit 500 new employees to the existing LAN Manager development and marketing teams. Executives have refused

Continued on page 49

Globalization: Key to corporate competition

BY ELISABETH HORWITT
CW STAFF

LEXINGTON, Mass. — The use of global networking to gain competitive advantage is just taking off among the more savvy international firms, according to a recently completed study by KPMG Peat Marwick. However, most of the 50 firms profiled in the study use their international networks to support basic operations and justify the high-speed backbones on the basis of cost, said William Synnott, a director at Peat Marwick subsidiary Nolan Norton & Co.

The one-year study "focused on how networks are used in support of corporate globalization," as well as emerging trends within "the regulatory, political and market structure in which global networks operate," Synnott said.

Nolan Norton's William Synnott

A number of companies interviewed by Nolan Norton had indeed found inventive ways to use their global networks to outmaneuver their rivals. One set of strategic applications ran on delivery networks, which are used to bring the company closer to the customer, supplier or other business partner. Such applications include electronic data interchange, automated teller machine networks and airline reservation systems.

Firms that wrung the most advantage from delivery networks used them for much more than simple provision of customer services. For example, American Express Travel Related Services has made digitized images, rather than copies, of customers' statements so that they can be electronically transmitted not only to the customer, but also to different parts of the credit card firm.

The data is then used in strategic applications such as "micro marketing on the basis of consumers' buying habits," Synnott said.

Even more strategic potential is to be found in the information type of network, which is "used to leverage total staff and resources, bringing a totality of ideas, skills and experiences together," Synnott said. This is important in a firm where such resources are scattered around the world, he added.

At Digital Equipment Corp., for example, an engineer "puts a problem on the network of 50,000 terminals and VAXs around the world, goes to bed and the next morning finds half a dozen solutions," Synnott said.

International clothing retailer Benetton uses its network to collect daily sales data from its outlets so that it can "track what's hot and what's not moving" for planning purposes, Synnott said.

In contrast to the above leading-edge companies, however,

Continued on page 48

New Version!

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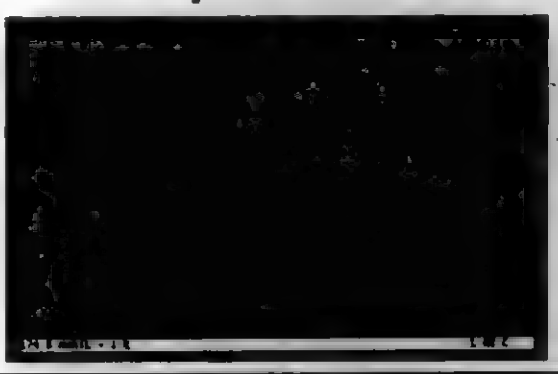
- *user interface*
- *utilities*
- *network support*



SPF/PC includes many PC-productivity features to save time and keystrokes, such as direct access to BROWSE and EDIT directory lists from the DOS prompt.

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Netvisualyzer: Seeing in real time is believing

BY JOANIE M. WEXLER
CW STAFF

CAMBRIDGE, Mass. — Silicon Graphics, Inc. has leveraged its computing and graphics technology into a system that lets companies see graphically what is happening on their local-area networks in real time.

The company's Netvisualyzer, announced early this month, is reportedly a step up from the current generation of protocol analyzers, with the potential to develop into a full-blown enterprisewide system for centrally managing heterogeneous networks.

The offering consists of data station and display station software, both of which run on Silicon Graphics workstations and servers. The vendor said the products compete with currently available protocol analyzers such as Network General, Inc.'s Sniffer Network Analyzer and Novell, Inc.'s Lanalyzer.

Current generation protocol analyzers must be plugged into the network segment they are monitoring. Many also provide bit-stream — rather than English text — decodes, so users have to be technically savvy to interpret the data. Novell, however, released a version of its Lanalyzer late last month that steps users through the testing process and uses English text to describe protocols [CW, July 30].

Where Novell added text, however, Silicon Graphics has added three-dimensional color visuals to network analyzers.

"The easier the user interface is, the better," said Jim McCabe, a project leader for network development at NASA-Ames Research Center, a Netvisualyzer beta-test site.

"Using the graphics," he said, "a network manager can get a lot of information and then call in the hard-core network gurus who can do the interpreting of the text." McCabe has been monitoring 14 Ethernet and Synoptics, Inc. Lattisnet networks with the products.

He added that "as a first stab at a platform for the ultimate network manager, it's very good, but it isn't complete yet." He cited the product's current inability to poll Simple Network Management Protocol management information bases as one area that could be enhanced.

While Netvisualyzer will reportedly monitor networks running different operating systems, the product currently only runs on Silicon Graphics computers running Irix, the vendor's version of Unix.

A minimum system configuration for the Netvisualyzer Data Station is $12,490, and a minimum configuration for the Display Station is $28,590.

Monitors run HP's own Unix

BY J. A. SAVAGE
and ELISABETH HORWITT
CW STAFF

PALO ALTO, Calif. — Hewlett-Packard Co. has announced a performance monitoring system for Unix — but only for its own HP/UX flavor of the operating system standard. The company has promised, however, to eventually offer versions that run on all Unix platforms.

HP also announced a service under which it will manage customers' multivendor local-area network operations. The company's Unix performance monitor, HP Glanceplus/UX, runs on the HP 9000 series with the HP-UX operating system Version 7 or later.

HP is attempting to answer the call of capacity managers struggling to accurately predict when CPUs are near capacity on Unix systems. As hardware based on open standards creeps into the data center, capacity managers have either had to write their own capacity management software or guess when CPUs are near capacity. In contrast, mainframes have a bounty of capacity management tools.

Managers said that accurate procurement of Unix systems has been hindered by a lack of monitoring software. Michael Covert, senior computer system specialist at Chemical Abstract Service in Columbus, Ohio, complained bitterly about it at last December's International Conference on Management and Performance Evaluation of Computer Systems in Reno, Nev. Covert has a homegrown program that sends data from his Digital Equipment Corp. VAXs running Ultrix out to a mainframe, where it is compiled into reports.

HP is the second vendor to offer monitoring tools that run only on the company's own version of Unix. In May, Sun Microsystems, Inc. announced its Sparcserver Manager, which runs only on Sun's servers. At the time, Sun Chief Executive Officer Scott McNealy said his company would not unbundle the software to be used on open systems. Instead, he said, it would be a "value added" to Sun's line.

HP IS THE second vendor to offer monitoring tools that run only on the company's own version of Unix.

Despite McNealy's promise, Sun will attempt to unbundle when it solidifies its operating system on AT&T Unix System V, said Dave Taber, server software manager. It is now changing from Sun O/S to System V. "You'd be crazy not to [unbundle]," he said. "You'll have a dead product in however many months if you don't."

HP, meanwhile, has submitted to the Open Software Foundation and Unix International the changes it made to the HP/UX kernel to allow the monitoring software to run, according to Susan Cook, product marketing manager at HP's Worldwide Customer Support Operations. If accepted, she said, the software will become available on the open market.

HP's new product includes an on-line mode for active monitoring. It also has screens for observing global levels for CPUs, disks and memory, as well as individual processes and individual users on a network. "It might tell you to change configurations or add a server," Cook said.

The vendor's new HP LAN Operations program will manage customers' LAN setups for up to 24 hours a day under a special service contract, the firm said. In addition to network problem resolution and monitoring, the program offers network planning and design consultation, implementation and training services.

HP will provide monthly LAN status and performance reports, as well as a 24-hour-a-day help line for technical assistance. Under one program option, an HP network administrator will work full-time at a customer site.

The service is capable of managing multivendor LANs based on Ethernet or IEEE 802.3 standards and on Transmission Control Protocol/Internet Protocol, HP said. The program uses HP Openview network management capabilities and test-measurement equipment such as HP Lanprobe, as well as internal support tools.

FDDI alternatives dragging

BY JOANIE M. WEXLER
CW STAFF

BOSTON — Efforts to create lower-cost alternatives to the 100M bit/sec. Fiber Distributed Data Interface (FDDI) network standard got off to a sluggish start at two back-to-back ad hoc committee meetings this month.

The meetings, which addressed the feasibility of running data at such high speeds over twisted-pair wiring as well as less expensive fiber alternatives, attracted about 150 vendors. New technology presentations were made by Chipcom Corp. and Digital Equipment Corp. for running 100M bit/sec. over alternative media.

Ilan Carmi, engineering director at Chipcom, headed the twisted-pair ad hoc discussion and said it would be very optimistic to hope for an FDDI alternative media proposal to reach the ballot stage within a year.

Bill Cronin, principal engineer at DEC's local-area network engineering group, will head a group that will prepare a project proposal for the American National Standards Institute FDDI standards committee at its mid-October meeting. The committee will review the proposal to determine if it merits forming a working group to create new FDDI standards for using alternative media.

"Two big issues were left," said Bruce McClure, chairman of Synernetics, Inc. in North Billerica, Mass. "Do you create new standards for both shielded and unshielded twisted-pair or just shielded? And if you do unshielded, which unshielded do you do?"

McClure, who headed the meeting on fiber alternatives, said he thinks it is important to keep the number of different standards to a minimum and make them all compatible in order to aggregate FDDI volume rather than splinter it.

"Lack of volume is why the components are so expensive," McClure said. He added that a twisted-pair option would bring cost pressure to fiber vendors. "When there's not much volume, a vendor doesn't have a big incentive to lower costs," he added.

Globalization

FROM PAGE 45

"the principal driver behind the global network was not competitive advantage but cost-efficiency" at the majority of firms surveyed, Synnott said.

At many companies, different business groups had been implementing international connections on an as-needed basis.

Such companies often "didn't know how much they had been spending," Synnott said. "When they added up the figures, they were shocked and decided to find a way to consolidate the networks, so the global network backbone was born."

Such companies, which made up significant portions of both the study group and clients of Peat Marwick's report, were still struggling with "how to sort out the complicated regulatory and approval process in each country they did business in," Synnott said.

Harried by the intricacies of international networking diplomacy and frustrated by the lack of consistent network quality and support overseas, many firms would gladly outsource the management and operation of their global networks.

Indeed, some have, Synnott said; Benetton's network, for example, is provided by General Electric Information Services.

Right now, many companies are "skeptical that carriers can provide" everything they need in a global network and are using private facilities whenever possible, Synnott said.

However, this attitude is because of change as the global networking market continues to open up to competition and public carriers bring out enhanced services such as Integrated Services Digital Network and virtual private networks, he added.

"Users are not interested in being their own telephone companies," Synnott said. "Running global private networks is a complicated business," and the shortage of good technical people is even more acute overseas than it is domestically.

Meanwhile, an increasing number of companies are creating a new job title: global network manager. In contrast to the telecommunications manager, who is responsible for day-to-day corporate network operations, the global network manager is responsible for formulating a global networking strategy and architecture, Synnott said.

With a typical staff of five to 10 people, the global manager "generally does not report to the telecommunications manager, but to the manager's boss — the CIO if you will — or outside of the information technology organization completely, to strategic planning," Synnott said.

The 1,100-page, one-year study included interviews with more than 30 overseas and domestic carriers as well as 50 global corporations, Synnott said.

Clients for whom the study was commissioned include vendors such as AT&T, IBM, Singapore Telecom and MCI Communications Corp., as well as businesses such as American Standard, Brown & Root, Daimler Benz, Shell International and Lloyds of London.

Microsoft

CONTINUED FROM PAGE 45

to say how much will be spent on raising the product's profile, but analysts have estimated that Microsoft may sink as much as $70 million into LAN Manager this year alone. Much of the time and money will go toward direct marketing of LAN Manager and building a chain of 600 domestic value-added resellers for the product.

"Novell did an important thing in the 1980s by building up its second channel distribution," said Steve Ballmer, senior vice-president of systems software at Microsoft. "There are people who are in business to sell Netware. Someone told me recently that there are now more Netware resellers than 7-Eleven stores."

One way that Microsoft will seek to differentiate its reseller strategy from Novell's is by signing up only those resellers who are willing to go through its training, support and customer satisfaction programs, Ballmer said. This last program involves Microsoft calling up customers for feedback on a given reseller's performance, he added: "If there is a problem, we call the dealer."

Systems manager Wendell Harris at Scott Paper Co. in Everett, Wash., recommended that Microsoft put its resources behind making existing products compatible with other network elements. Harris said Scott Paper has had difficulty getting products such as Microsoft Windows Version 3.0 to work well with IBM and Digital Equipment Corp. networks.

Analyst Frank Dzubeck, president of Communications Network Architects, Inc. in Washington, D.C., said that the computer industry is rife with success stories built on massive infusions of bodies and money. He said that Microsoft will carve a significant market share for LAN Manager during the next year or two. Dzubeck added that he thinks Microsoft will claim 20% of the LAN market by early 1992.

For Soskin, the tempo of the race is less important than the timing of it. Microsoft joined a contest that is not only already in progress but is also evolving into a new kind of competition, she said.

"The center of gravity in networking is moving away from network operating systems. There's more [interconnecting LANs over wide-area networks] going on out here," she said.

Frank Michnoff, an analyst at Meta Group, Inc., said Microsoft may surprise its critics. "You don't want to underestimate Microsoft. They have unbelievable marketing clout," he said. He also said that the 40% annual growth in the LAN market leaves no doubt that LAN Manager will grow with the market.

"It's hard to bet against Microsoft," First Boston Corp. PC analyst Charlie Wolf agreed. "It is so well disciplined and has enormous momentum." He pointed out the company's willingness to stick with Windows for five years before it delivered a successful version.

However, this might be the one time when Microsoft's clout, resources and momentum prove impotent, Michnoff said. "They are up against users who don't always buy into the big guys anymore for their solutions."

Information systems professionals are demanding network operating systems that bundle distributed naming services, integration with IBM systems, electronic mail and comprehensive service and support, observers noted.

"What they need to do is license [Novell's] Netware source code and sell Netware," said Richard Retin, a senior technical analyst at Wells Fargo Bank NA in San Francisco.

Discussing Microsoft's chances of overshadowing Novell by mid-decade, Retin said: "It's totally ridiculous. There's too much loyalty among [Novell's] customers and resellers. Even Microsoft can't dislodge them."

Michnoff agreed that LAN Manager faces rough going in the short term. And it may be only the short term that Microsoft has. He and several other observers said enterprisewide standardization on one LAN operating system is occurring and should crest during the next three or four years.

Michnoff predicted that it will be 1995 before LAN Manager can dominate the market.

Given its resources and possible tie-ins with OS/2 and other products, Wolf said, Microsoft "should reasonably capture 15% to 20% [of the LAN market] within three years," including OEM sales.

SCOTT PAPER HAS had difficulty getting products such as Microsoft Windows Version 3.0 to work well with IBM and Digital Equipment Corp. networks.

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Goal Systems

Freeland

CONTINUED FROM PAGE 45

was purchased from US West, but the long-awaited, internally developed graphical interface is expected in September.) BGS Systems' Bestnet feeds data collected by Netview into network performance tuning and optimization software packages.

Peregrine Systems' NAPA product will automatically capture and filter Netview alerts to generate help desk trouble tickets.

Boole & Babbage has applied expert system techniques to allow comparatively nontechnical analysts to use trouble-correction techniques that normally would be employed by more experienced analysts.

Unfortunately, it is not only inexperienced network managers who may need extra software help in interpreting Netview data.

Netview itself does little to relate individual alerts to the broader context of the entire network system. For example, Netview alerts might indicate that 15 network components are down but not that a controller is down at location X and that 14 devices dependent on the controller have dropped out because of it.

Netview does not match a nonfunctioning device with the vendor or technician responsible for its maintenance or its past performance history, nor does it provide a way to measure the cost of the outage in real business terms, such as in number of sessions terminated.

Many network managers are beginning to address these problems. Using Netview programming tools and third-party software, they are grouping Netview alerts together based on network components, and they are programming the system to eliminate alerts from consideration as soon as automatic recovery techniques solve the problem.

Software products slated for introduction by the end of the year promise to greatly lighten the task of integrating and managing Netview information.

For instance, one planned product uses a network topology database to categorize Netview alerts, pinpoint the likely cause of the problem and identify dependent components that crashed along with the primary device.

Another product will use a serial number to identify individual devices to both Netview and data center management applications. Besides making it easier to locate devices physically, the feature will facilitate management of network inventory and maintenance, change records and help desk problems.

UNFORTUNATELY, it is not only inexperienced network managers who may need extra software help in interpreting Netview data.

Other trends to be reflected in upcoming software announcements include improved graphical displays, simpler software interfaces with Netview and an increased emphasis on relating network events in more meaningful terms, such as number of users or resources not able to use network components.

Netview has long had a large capacity to collect and spew out network management information. As applications slowly add the interpretative power to match this capacity, it is certain that Netview's output will be put to better and better use.

Indeed, the seesaw is due to tip the other way, as increasingly sophisticated analysis software — and users — demand even more exhaustive network information from Netview. This will probably occur fairly quickly.

Freeland is a principal at Spectrum Automation, a San Diego-based network management consulting firm.

BIT BLAST

Bytex teams up with Codex

Matrix switchmaker Bytex Corp. said it has entered into a value-added reseller agreement with Codex Corp., which will reportedly offer the Bytex product to enhance its range of integrated systems.

Bytex also said recently it intends to expand into the local-area networking business, and its first step in that direction has been to acquire Vance Systems Corp., maker of the ATS LAN 1000 protocol analyser. LANs are competing with the saturated matrix switch market, because LANs only require one port connection to the switch instead of separate, multiple-port connections for each computer.

Olicom USA said it retested its 4/16M bit/sec. token-ring network adapter cards after Madge Networks Ltd. announced that a faulty Texas Instruments, Inc. chip caused Madge to recall 2,000 boards. Olicom said its boards, which also use the TI Falcon chip, work fine and are running in networks as large as 120 nodes.

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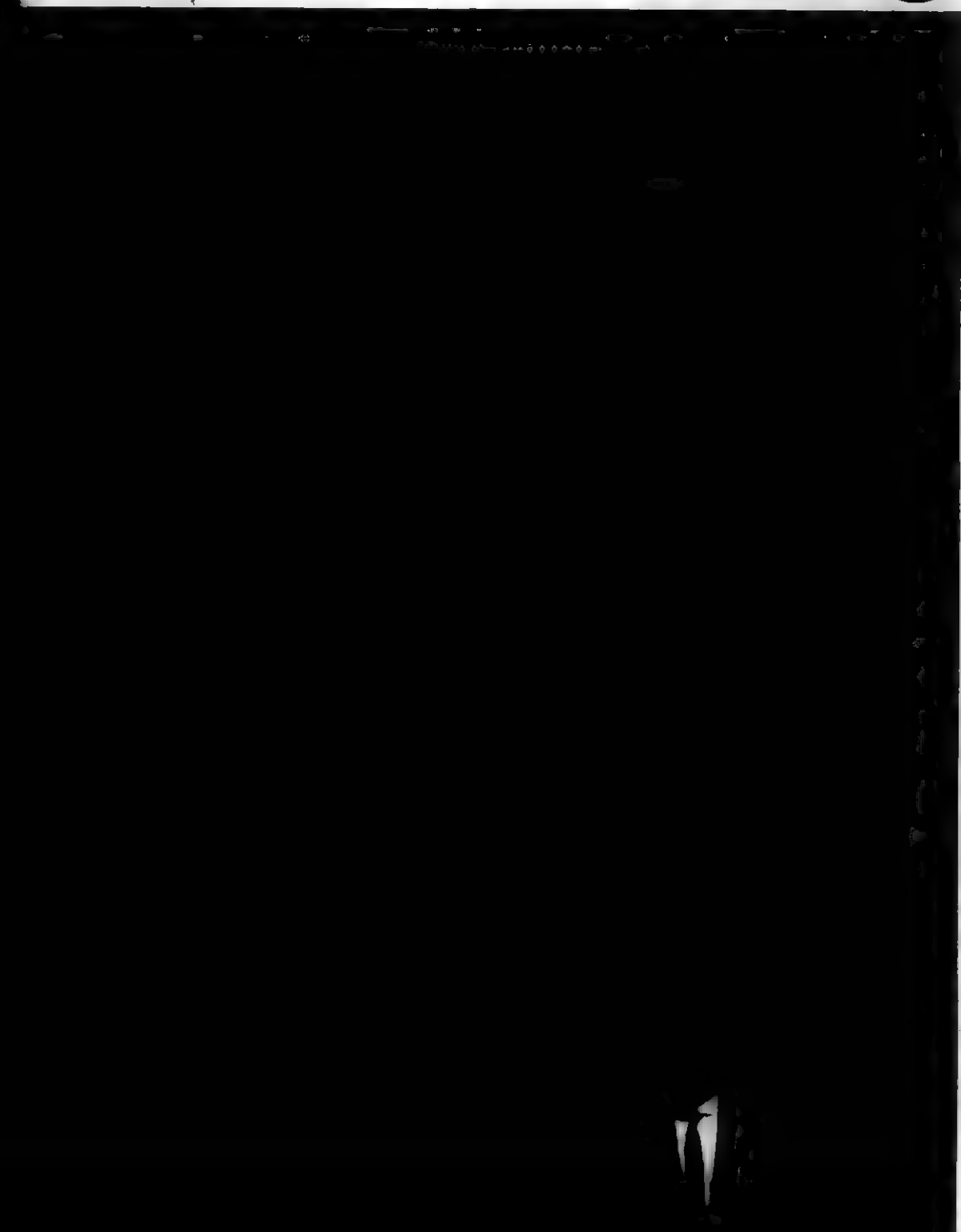

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NEW PRODUCTS

Links

T4 Systems, Inc. has released T4 Multilink, a multiport unit that lets users transmit documents and application screens from a mainframe to a Group III facsimile machine.

The product uses simple printer emulation to provide user compatibility with IBM, Digital Equipment Corp., Hewlett-Packard Co. and Unisys Corp. systems without extensive software modifications.

Pricing for a single-port T4 Link unit begins at $12,395. T4 Multilink is available in four models ranging from $29,995 to $44,995, depending on number of ports.

T4 Systems
8901 Kanis Road
Little Rock, Ark. 72205
(501) 227-6637

Hewlett-Packard Co. has announced four interfaces that provide testing access to the Integrated Services Digital Network (ISDN) at the Basic and Primary Rate Interface levels.

The four products include the HP 18281A ($2,000), an ISDN Basic Rate monitor and simulation interface, and three Primary Rate Interfaces: the HP 18282A 1.544M bit/sec. interface ($2,500); the HP 18283A 2.048M bit/sec. interface with three pin connectors ($2,500); and the HP 18284A 2.048M bit/sec. interface ($2,500).

The products were designed to enhance the HP 4952A wide-area network protocol analyzer, which sells for $8,540.

HP
3000 Hanover St.
Palo Alto, Calif. 94304
(800) 752-0900

Hughes LAN Systems, Inc. has announced its Linc/Term HUB series of integrated terminal server modules that feature asynchronous terminal connectivity directly into the chassis of a third-party smart-wiring hub.

The series includes Linc/Term 3208, TSRV-8 and 5208. Each module supports up to eight RS-232 devices and the industry-standard Simple Network Monitoring Protocol.

List price is $1,395 for each module.

Hughes LAN Systems
1225 Charleston Road
Mountain View, Calif. 94043
(415) 966-7300

Customer-premises equipment

OST, Inc. has introduced a board-level Integrated Services Digital Network (ISDN) terminal adapter designed for use with IBM Personal Computer XTs, ATs or compatibles.

The OST PC SNET card provides ISDN Basic Rate access for PC users and features five types of communications applications supported by its S or Basic Rate Interface: X.25, Open Systems Interconnect, transparent, asynchronous and local-area network.

A single card yields an aggregate throughput of 144K bit/sec., the vendor said. PC SNET is priced at $1,695.

OST
14225 Sullyfield Circle
Chantilly, Va. 22021
(703) 817-0400

Gateways, bridges, routers

Multi-Tech Systems, Inc. has announced an asynchronous communications gateway for IBM Netbios-compatible local-area networks.

The Multi-Com-Async Gateway comprises a multiport serial adapter card, redirector cards or redirector-equipped network interface cards and software. It provides users with modem sharing for dial-in or dial-out operations and supports four 2,400 bit/sec. modems using Microcom Networking Protocol Class 5 data compression.

The product costs $1,075 plus the price of four network interface cards.

Multi-Tech Systems
2205 Woodale Drive
Mounds View, Minn. 55112
(612) 785-3500

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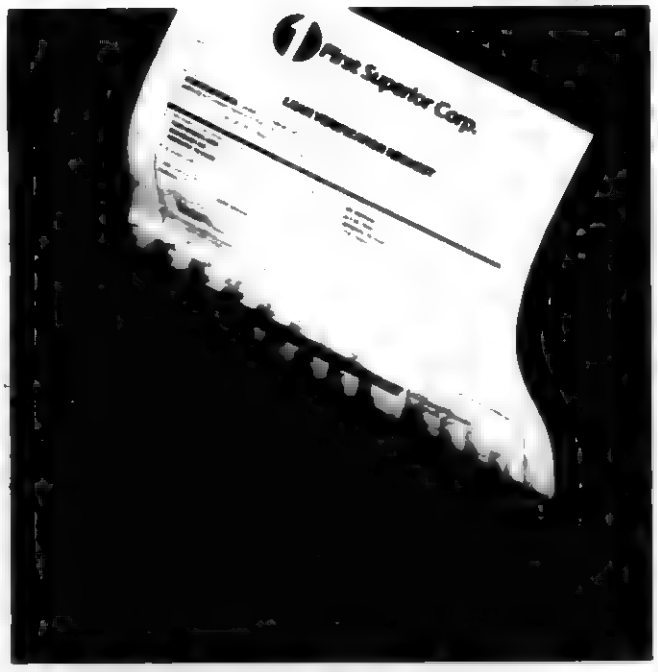

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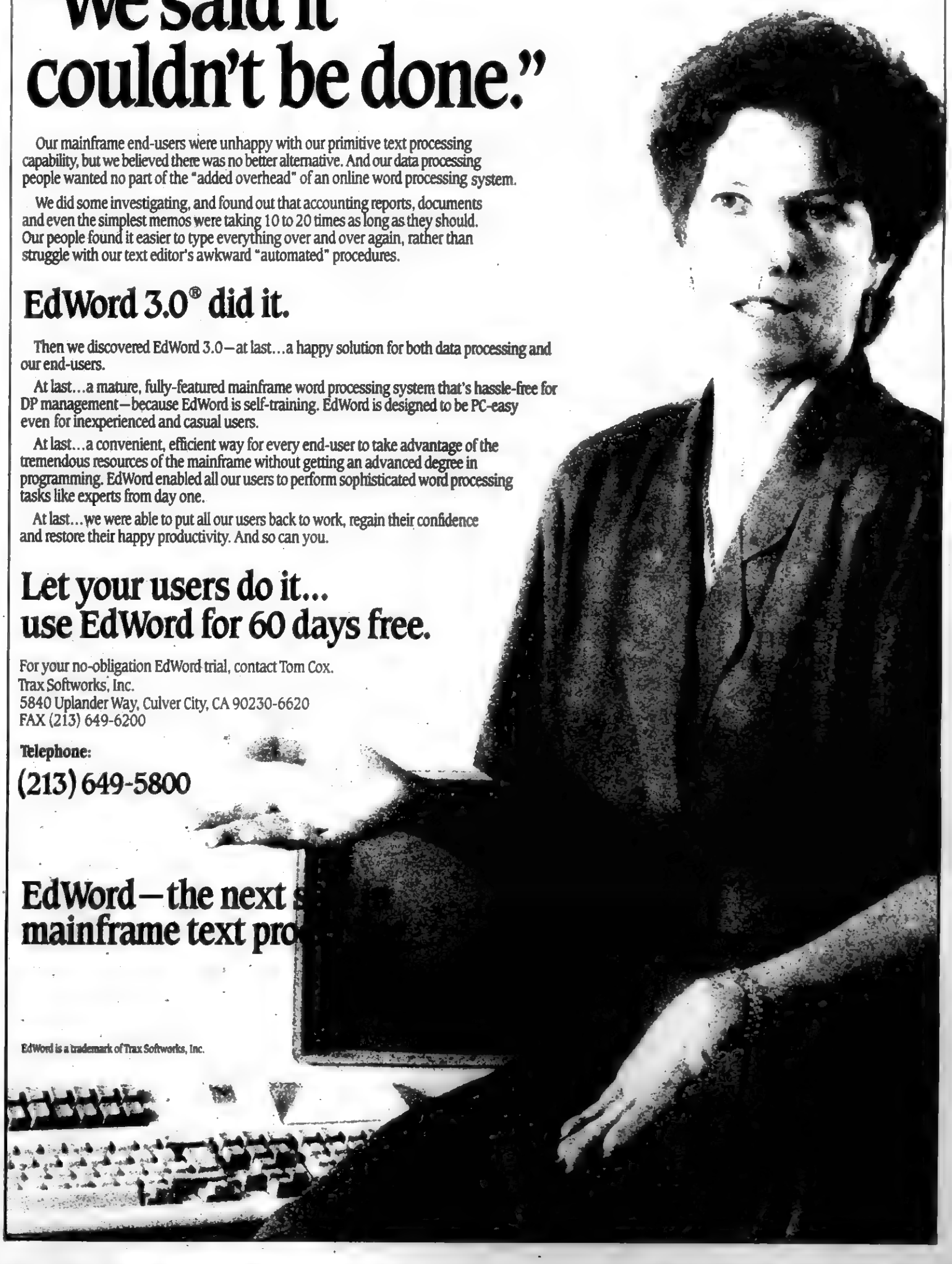

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MANAGER'S JOURNAL

EXECUTIVE TRACK

Richard A. Bolandz has joined **PHH Corp.** in Hunt Valley, Md., as vice-president, information technology and strategy — a newly created position. He reports to Eugene A. Arbaugh, senior vice-president of marketing.

Bolandz, 34, was formerly director of the technology-enabled business transformation practice at the Index Group, Inc. consultancy in Cambridge, Mass. Before that, he held senior positions at consulting firms MLI Ltd. and Booz, Allen & Hamilton, Inc.

Bolandz holds an undergraduate degree from Boston College and a master's degree in foreign service from Georgetown University. He also attended the American University MBA program.

Shirley E. Valentine has been named vice-president of information systems at **Kraft USA**, an operating unit of Kraft General Foods in Glenview, Ill. She reports to Robert V. Richards, vice-president of information services at Kraft General Foods.

Valentine, 36, was most recently director, corporate systems, at Kraft General Foods for one year. She joined the firm in 1988 as director, business systems. Before joining Kraft, she was senior manager in the consulting division at Arthur Andersen & Co. for 10 years.

Valentine holds a bachelor's degree in industrial management from Purdue University and an MBA in finance from Indiana University.

Harley H. Dietrich Jr. has been named senior account executive at **Compusource**, a vendor of IS services in Cary, N.C.

Dietrich has 15 years of experience in IS and was senior systems programmer at the former National Steel Corp., now National Intergroup, Inc., in Pittsburgh. When National Steel spun off its IS as services vendor Genix Corp. in 1984, Dietrich became account manager and later marketing manager for Genix.

He attended Robert Morris College in Pittsburgh.

Building IS from the ground up

Taisei's Nabeshima knew the construction business inside out before he took control of IS

BY PAUL GILLIN
CW STAFF

Haruo Nabeshima looks out the window of the employee lounge on the 52nd story of Taisei Corp.'s downtown Tokyo skyscraper and sees a chance to make a difference.

"I'm not the kind of person to work in a lab," says the 52-year-old general manager of information systems at the Japanese construction giant. "If I can be part of building beautiful structures all over Japan, that is how I can contribute to my country."

It's not the kind of talk that is normally associated with information systems, but Nabeshima is not the typical IS professional. In fact, he has spent only three years of his 30-year career at Taisei in that function. The rest he has spent learning the construction business from the foundation up.

His jobs at Taisei have led him across Asia, the Middle East and North America. He has survived a battle with hepatitis, nearly been thrown in a Saudi Arabian jail, hosted sushi parties in Montreal and attended the World Series in Pittsburgh.

Now, as head of the 125-person IS department at Taisei, Japan's third largest construction firm, he manages the delicate task of integrating information technology into one of the most labor-intensive industries in the world.

Nabeshima's career has had him hopping from job to job and country to country for Taisei, working in virtually every aspect of construction project management. The constant transfers may seem strange to Americans, who are used to working their way up through the ranks of their discipline, but they are common by Japanese standards. "If a man stays in the same department a long time, his productivity eventually goes flat," Nabeshima says. "If he is transferred around the organization, his productivity falls briefly but then goes sharply up."

Continued on page 61

PROFILE: Haruo Nabeshima

Kaku Kurita/Gamma Liaison

Position: *General manager of information systems, Taisei Corp.*
Mission: *Integrating information technology into Japan's third-largest construction firm.*

Soviets poised to learn from our mistakes

BY ALAN J. RYAN
CW STAFF

A state-run organization with 60,000 employees, 350 plants and no technology to manage any of it was one of the incredible findings of Al Mingione on his recent trip to the Soviet Union.

Mingione, a member of the Association for Systems Management's (ASM) international board of directors, spent some time in the USSR last month and found the Soviets to be well-educated on technology trends, computer science and math.

However, he said, "There is a scarcity of computers, and the computers they do have they use for model building and expert systems."

Mingione added that the Soviets have few commercial applications and are lacking in critical business systems analysis skills.

Mingione, who is also director of information resource management services at DPCS of Northern California in San Jose, Calif., was on a fact-finding mission to determine avenues for potential U.S./Soviet alliances in the field of information resource management. The visit was sponsored by the Cleveland-based ASM and San Jose State University.

Beyond seeking business applications for uses such as scheduling, inventory, maintenance management and capacity planning, Mingione said, he discovered that the Soviets he had met were very interested in learning how to use information systems to help manage their own businesses.

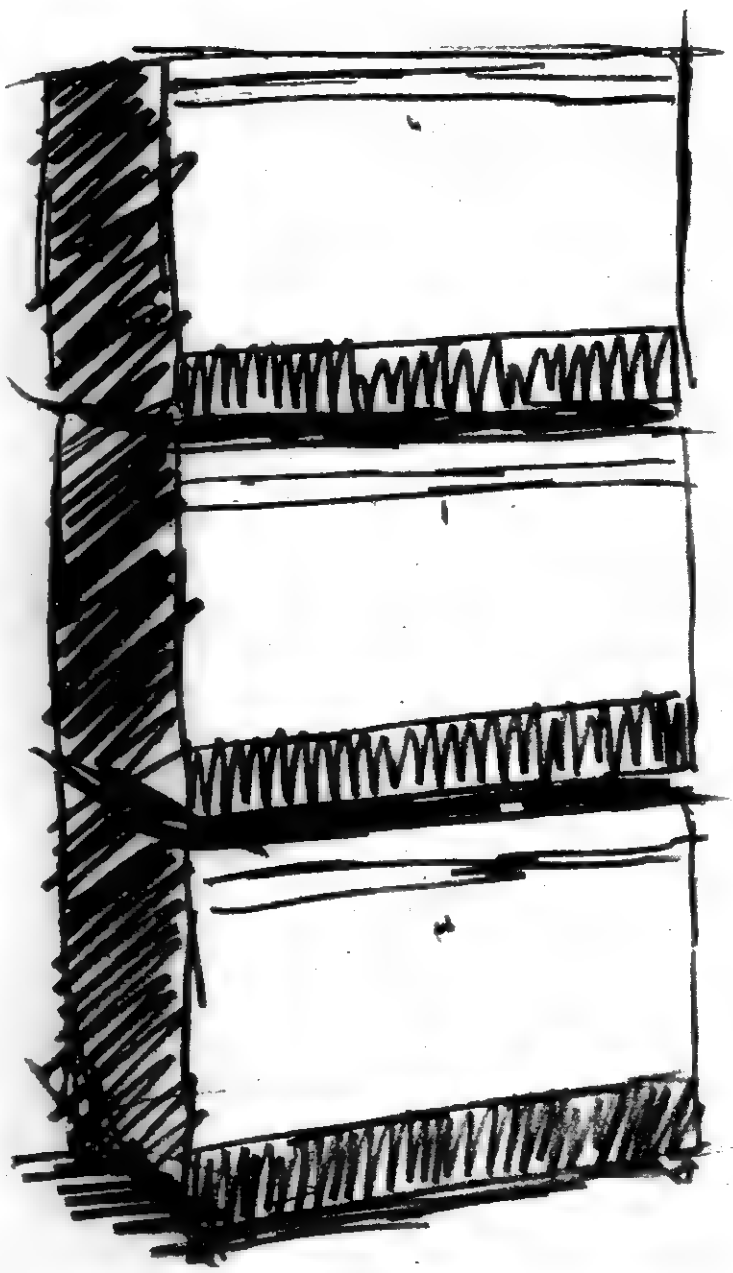
Other goals the Soviets have include finding ways to convert the country's military technology to civilian applications and training the Soviet professional who will manage the acquisition and use of technology.

Some ideas for forging U.S./Soviet alliances include forming an ASM chapter in Moscow for information exchange that would include a mentoring program and developing a program in which Soviet professionals would be subcontracted for upgrading or enhancing American business systems.

In some ways, the Soviets are at an advantage by being behind in the use of technology, Mingione said, because they can learn from the lessons of the U.S. in its applications of computer technology.

"They have problems and lots of work ahead of them, but the good news is they can start with a clean slate," he said.

"[The U.S. was] learning as we were going along, but they can benefit from our mistakes."



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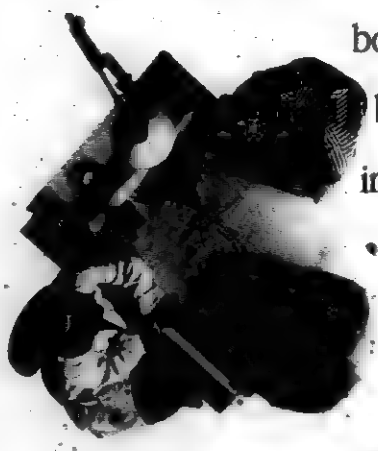

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COMMENTARY

Gary H. Anthes

Lessons learned in a time of war

The enemy rockets always came at night, but they were not well-aimed and rarely did much damage. After a buddy was bitten by a poisonous snake as he took cover in a bunker during a red alert, I decided to stay in bed whenever the rockets came.

But just before dawn on Feb. 24, 1970, the Viet Cong got lucky, and I learned about disaster recovery.

A rocket launched from somewhere in the Vietnamese jungle hit the U.S. Navy supply depot near Da Nang, somehow landing on a stack of 6,000 antitank mines. The exploding mines sent shock waves across the depot, flattening the data processing center where I worked. Secondary explosions continued for 13 hours.

When I heard the mammoth explosion at my camp several miles away, I immediately thought of the gray case holding the five tapes that were updated each day and taken off-site in case computer processing ever had to be moved to the Navy's emergency facility in the Philippines.

But the case holding the backup data files wasn't in its familiar spot by my bed; I had forgotten to take it with me the previous evening. With visions of court-martials dancing in my head, I drove to the supply depot to help in the cleanup and recovery effort.

Although the building that housed the computer center had collapsed, the IBM 1401 computer and its coterie of electromechanical punch-card machines seemed more or less intact, though covered with tons of debris. The case holding the magnetic tapes was where I had left it, apparently unharmed.

Two civilian IBM engineers soon arrived on the scene, and if they slept at all during the next few days, it wasn't apparent. The computer was wheeled to an intact warehouse nearby, where Navy Seabees worked around the clock to install a raised floor and air-conditioning. Thanks to these heroic efforts and to IBM's industrial-strength vacuum cleaners, the equipment was cleaned up and working again within a week.

WHEN I heard the mammoth explosion at my camp several miles away, I immediately thought of the gray case holding the five tapes that were updated each day.

The IBM 1401 — a predecessor to the System 360 — had all the power and memory of today's arcade games. But it ran three shifts a day, seven days a week, keeping track of an inventory of 105,000 items supporting requisitions worth $32 million per month.

Although the computer and its inventory control applications were critical to the Navy's mission of supplying combat troops, disaster recovery was executed so quickly that Navy brass elected not to send me to the Philippines with the backup tapes. Thus, I escaped a court martial and never learned whether the explosions had jiggled the tapes' bits into alphabet soup.

There are some lessons in all of this for today's data center manager, none of them having to do with Viet Cong rockets, antitank mines or poisonous snakes. First, expect the unexpected. Second, have a gold-plated service contract backed up by dedicated, competent people. Finally, if you're the one entrusted with the case of backup tapes — don't leave work without it.

Anthes, *Computerworld's* Washington, D.C., correspondent, is a former U.S. Navy Lt. j.g. and was assistant director of data processing at the Navy Supply Depot in Vietnam.

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Nabeshima

CONTINUED FROM PAGE 57

Nabeshima has worked on the user side of technology for most of his career since joining Taisei shortly after graduating from the architecture program of prestigious Tokyo University in 1961.

Like many Japanese, he chose an employer expecting to spend his career there. At Taisei, that has meant a lot of time on the road. "In Japanese companies, it is more of an honor to work on-site than in the office," says Carla-Jean Ebenstein of the planning and research department at Taisei's international division. "That is the way you learn the inner workings of the business."

Nabeshima's international odyssey began in 1968, when he signed on to a 2½-year project in Saudi Arabia. Arriving with no knowledge of the local language or customs, he worked his way up from building concrete forms to managing staffing for the entire project. The work was hot, strenuous and even dangerous. Nabeshima recalls once being dragged before a Saudi Arabian judge and threatened with prison for firing a local worker.

> "BEFORE I JOINED the department, I saw the computer as Buddha and the IS people as high priests."
>
> HARUO NABESHIMA
> TAISEI

In the early 1970s, he spent a year in Pittsburgh and Alabama, where he first came into contact with computers. "I thought, 'We must have these,' " he says.

He returned to the Middle East in 1972 to pursue projects in Kuwait, Qatar, Iraq and the United Arab Emirates, but he spent most of the next seven years in Saudi Arabia. He ultimately rose to be Taisei's director of Saudi Arabian operations, and in 1985, he was named manager of the project sections for the entire Middle East and Africa.

During the years in the Middle East, his constant companion was a computerized system for project cost accounting. The system was deployed on every project Nabeshima managed. Apparently, it caught the eye of corporate headquarters, because Nabeshima was brought back to Tokyo in 1987 as director of corporate IS. In typical Japanese corporate style, the transfer into IS was not a matter of personal choice. "The company decided it for me," he says.

Nabeshima says his limited computing knowledge has not prevented him from making his mark on Taisei's IS operations. "Before I joined the department, I saw the computer as Buddha and the IS people as high priests," he says. "But I think the philosophy should be service to the customers."

In line with that, he removed the locks from IS department doors and convened needs assessment sessions with users. He cut charges for mainframe time by 80%, tripled CPU power by upgrading to an IBM 3090-300S mainframe and went to 24-hour computer access.

His justification was that "if we provided better services, computer usage would go up," he says. "And it did, very dramatically." Mainframe use doubled almost immediately from 60 to 120 hours per month and rose to a peak of 400 hours this past April.

Faith in technology has made Taisei a showcase of computer innovation. Its employees go to work armed with information tools for everything from estimating project costs to creating solid-model building designs that the users can "walk through" as if they were inside the building. Taisei has just completed a four-year project to develop an integrated computer-aided design and analysis system that stores and models virtually all information about a project from conception to completion [CW Special Report, Aug. 13]. The company is now working on expanding its already extensive communications network to link computers at the hundreds of project sites around the world.

As a manager, Nabeshima emphasizes personal discipline and a willingness to take risks. "He's very disciplined, but he doesn't expect anything of others he wouldn't expect of himself," Ebenstein says. Nabeshima rises at 5 a.m. every morning and exercises for nearly an hour. He times the one-hour train ride from his Kawasaki City home to get him into the office by 8 a.m., an hour early by Japanese standards. "I do this so I can be alert and cheerful when I see my employees at 9," he says.

Although his English is superb, he continues to take night classes in the language. He manages to play golf about 50 times per year, which is no small accomplishment in a country where golfers can line up for hours to pay $250 for 18 holes.

Nabeshima is especially proud of his relations with his employees. "My policies are to treat workers very fairly, but I still believe in being a strong boss," he says. An evaluation system he initiated for IS department employees recognizes accomplishments but doesn't penalize failures. "People should be rewarded for taking risks and being aggressive," he says.

Throughout it all, Nabeshima displays a constant smile and sunny disposition. He is fond of telling visitors that his bout with hepatitis taught him that he should live each day to the fullest. "I believe I have 4,500 days left on this earth," he says. "There is no excuse for wasting time."

To find out how easy it is to convert DCA's new IRMA from standard to MCA bus, flip the page.

CALENDAR

Traditional glass house architectures will be altered as the decade of the '90s evolves because of improving price/performance of communications and applications-specific systems. The changes will require new strategies for management of both.

Addressing those issues will be Meta Group, Inc.'s "The Expanding Glass House of the '90s" conference to be held Sept. 24-26 in Toronto.

For more information, contact Meta Group in Westport, Conn., (203) 226-6382.

SEPT. 16-22

American Bankers Association's 1990 National Bank Card Conference. New York, Sept. 16-19 — Contact: ABA, Washington, D.C. (202) 663-5000.

Management Systems Council Fall Conference. Hilton Head, S.C., Sept. 16-19 — Contact: Joanne Rang, Management Systems Council, Alexandria, Va. (703) 836-1721.

Midwest DB-DC Users Group Conference. Grand Rapids, Mich., Sept. 16-19 — Contact: Fox-King and Associates, Troy, Mich. (616) 774-2000.

Telecon '90 — The Evolving Telecommunications Environment. Montreal, Sept. 16-20 — Contact: Kimberly Mungham, Canadian Business Telecommunications Alliance, Toronto, Ont., Canada (416) 865-9993.

Federal Computer Conference. Washington, D.C., Sept. 17-19 — Contact: Stephen O'Keefe, National Council for Education on Information Strategies, Silver Spring, Md., (301) 587-9344.

Financial Document Security, Check Fraud and the New Image Technology for Check Design and Check Processing. Jackson Hole/Yellowstone National Park, Wyo., Sept. 17-19 — Contact: MICR Institute, Atco, N.J. (609) 435-0090.

Graphics & Multimedia Conference and Exposition. Long Beach, Calif., Sept. 17-19 — Contact: Exposition Management, Waltham, Mass. (617) 290-0400.

Internationalization of Telecommunication: Making Today's Choices in Light of Tomorrow's Changes. Minneapolis, Sept. 18-19 — Contact: Randy Young, Minnesota State Planning Agency, St. Paul, Minn. (612) 296-8264.

The Telco-Cable 8 Conference. Washington, D.C., Sept. 18-19 — Contact: Telecommunications Reports, Washington, D.C. (202) 347-2970.

Electronic Publishing '90 Conference. Gaithersburg, Md., Sept. 18-20 — Contact: National Institute of Standards and Technology, Gaithersburg, Md. (301) 977-6711.

Working with Personal Computer Local-Area Networks Seminar. Milwaukee, Sept. 19-21 — Contact: John Snedeker, Center for Continuing Engineering Education, University of Wisconsin-Milwaukee, Milwaukee, Wis. (414) 227-3120.

Future Winning Positions. Santa Clara, Calif., Sept. 20 — Contact: Dataquest Conference Department, San Jose, Calif. (408) 437-8245.

The Secrets of VMS File I/O Seminar. Amherst, N.Y., Sept. 22 — Contact: U.S. DECUS, Marlboro, Mass. (508) 480-3446.

SEPT. 23-29

Graph Expo '90. New York, Sept. 23-26 — Contact: Graph Expo, Waldorf, Md. (703) 264-7200.

Networking/Unix '90. Atlanta, Sept. 24-25 — Contact: Sue Fredricks, Inforum, Atlanta, Ga. (404) 220-2711.

Third-Party Computer Maintenance. San Francisco, Sept. 24-25 — Contact: Frost and Sullivan, New York, N.Y. (212) 233-1080.

Manufacturing Productivity Conference. Anaheim, Calif., Sept. 24-27 — Contact: Lisa Machnaki, Society of Manufacturing Engineers, Dearborn, Mich. (313) 271-1500.

PC Expo. Chicago, Sept. 25-27 — Contact: H.A. Bruno, Inc., Englewood Cliffs, N.J. (201) 568-8542.

C++ at Work '90 International Conference. Secaucus, N.J., Sept. 25-28 — Contact: Richard Friedman, SIGS Publications, Conference Division, New York, N.Y. (212) 274-0640.

Internetworking for the '90s. Washington, D.C., Sept. 25-28 — Contact: U.S. Professional Development Institute, Silver Spring, Md. (301) 445-4400.

Engineering Documentation Management Systems User Forum '90 Conference. Cincinati, Sept. 26-28 — Contact: Kalthoff Group, Cincinnati, Ohio (800) 242-6822.

Managing the Global Forces of Change: Strategies for Corporate Success in the '90s. Fort Collins, Colo., Sept. 27 — Contact: National Technology University, Fort Collins, Colo. (303) 484-0565.

Portable Computing and Communications Exposition and Conference. New York, Sept. 27 — Contact: Michael Sullivan, IDG Conference Management Group, Framingham, Mass. (800) 225-4698.

Operations Manager Conference. Laconia, N.H., Sept. 27-28 — Contact: Jerry Lemelin, Portsmouth, N.H. (207) 439-2491.

SEPT. 30 - OCT. 6

Benefiting from Systems Integration. New York, Sept. 30-Oct. 2 — Contact: Abbey Chakalis, CMP Conference Group, Manhasset, N.Y. (516) 562-5717.

APSM Annual World Conference. Chicago, Sept. 30-Oct. 3 — Contact: APSM International, Ft. Meyers, Fla. (800) 333-9786.

Association of Banyan Users International Conference and Exposition. Orlando, Fla., Sept. 30-Oct. 3 — Contact: Daniel & O'Keefe Associates, Sudbury, Mass. (508) 443-3330.

Information Industry Association's Annual Convention & Exhibition. Boston, Sept. 30-Oct. 3 — Contact: IIA, Washington, D.C. (202) 639-8262.

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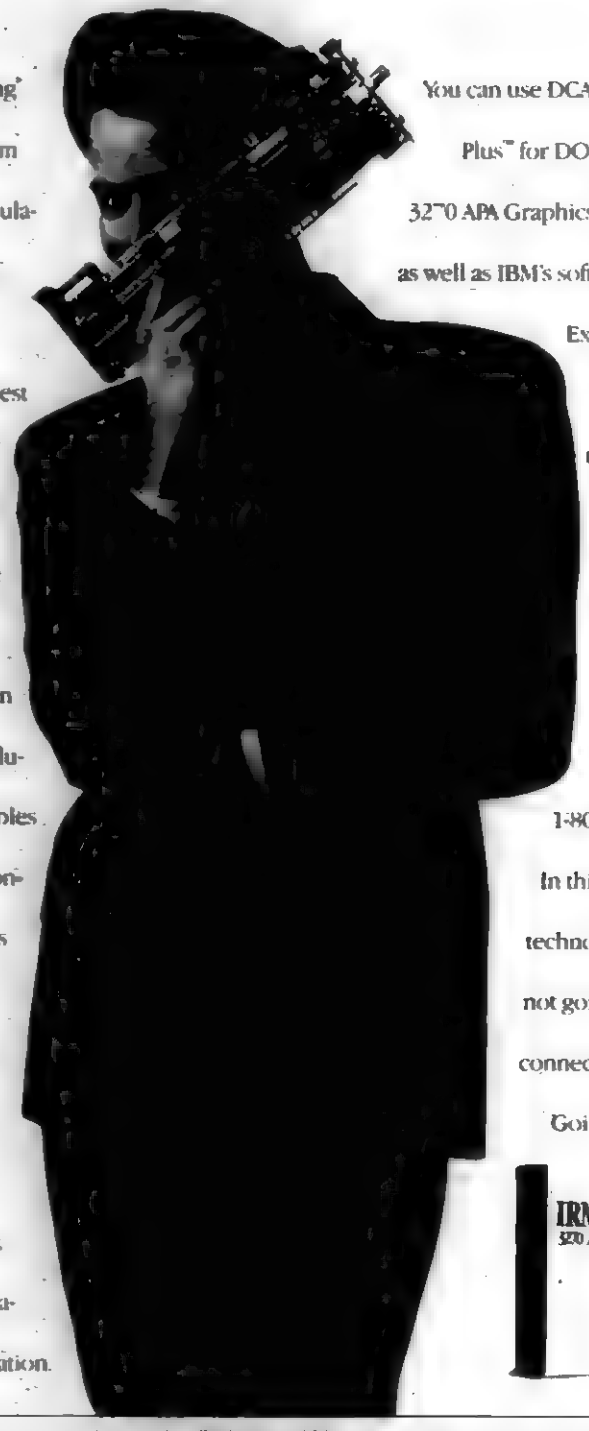

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Remember that old saying about the best defense?

BY SHERYL KAY

Three years ago, skilled workers were plentiful in Pittsburgh, and companies such as Mellon Bank could take their pick among strong candidates, even when hiring for low-level jobs. Things are different today. Now, says Tim Vigrass, manager of financial systems development, qualified workers are in shorter supply. To fill lower paying positions, "We have to be willing to accept less skilled people and find ways of bringing them up to speed," he explains.

For a newspaper, literacy is always a credibility and marketing issue, but it was never a personnel issue for the *Los Angeles Times* until the publication began to automate production and printing processes. Automation increased the reading and writing component of jobs that had, until then, primarily involved manual crafts. By 1988, the mismatch between existing and required skills had become so pronounced that the company had to do something to close the gap.

All around the country, employers are either beginning to struggle with, or at least starting to glimpse, work-force changes that have major implications for continued productivity. In an increasing number of instances, companies are looking to information systems to help them cope with these new realities.

"Whether they know it or not, U.S. corporations are facing a changing work force," says Diane Bengston, assistant director of human resources for data processing at Travelers Insurance Co. in Hartford, Conn. "Technology must play a key role in addressing the challenges those changes bring."

James Ware, vice-president of education and organizational effectiveness at Index Group, Inc. in Cambridge, Mass., agrees. "Technology and human resources are the two strategic resources that will separate one company from its competitors during the next 10 years," he says.

Alan Levenson

Nedor *runs an on-site literacy program at the* Los Angeles Times *to combat skill-gap problems*

Although labor issues, until recently, have received scant attention from IS departments, Ware predicts a sharp uptick in the number of systems created specifically in response to shifts in employee population. "Five years from now, 15% to 20% of application systems may have work-force changes as the driving force behind them."

These systems won't fall into a single, easily classified category, because what's happening to the labor force isn't simple.

Demographic changes certainly play a large and important part. For example, the population as a whole is aging, and that fact has several ramifications. The most obvious is that there are, or soon will be, fewer workers available for entry-level positions of any kind. A less obvious, but equally important, effect is the consequent need for employers to seek workers from a broader spectrum of the population and to work harder to retain experienced employees whose needs and priorities may be changing as they grow older.

A broad spectrum of value changes are also taking place among younger workers, and if employers want to hold on to the high-potential workers they do manage to hire, they will have to address these new values. Chances are that employers will make that effort, because a widespread decline in academic preparedness is looming at a time when many companies are introducing equipment that demands more skills from workers than ever before.

All of these trends, both individually and in combination, will affect the way companies conduct business. In turn, a firm's ability to address these work-force variations will have an impact on how competitive it can be, according to Kathryn J. Hayley, senior manager at Deloitte & Touche in Chicago.

"Companies will have to look increasingly to their technical departments to help fill in the gaps, in several ways, between what their current labor force can do and what future labor forces will be available to them," Hayley says.

One basic way that technology can be used to ameliorate the effects of work-force change is to isolate, before the fact, just where those gaps are likely to materialize.

Using technology to predict future hiring requirements has a long tradition at Ohio Bell Telephone Co. in Cleveland. It is a practice that the Bell operating company inherited from its now-estranged parent. Long before anyone had even thought of

INSIDE

Stretching management resources
Page 70

"Workforce 2000" here already
Page 69

Kay is a business consultant and freelance writer specializing in emerging technologies and human resources.

Best defense

CONTINUED FROM PAGE 63

divestiture, AT&T was using a mainframe software system called Interactive Flow Simulator to forecast the kinds and quantities of employees likely to be needed months and years hence.

After divestiture, Ohio Bell decided to continue the practice on its own and eventually settled on a personal computer-based approach using Lotus Development Corp.'s 1-2-3 spreadsheet, says Lynn McClary, manager for human resource planning. Although the company switched last year to a commercial human resource forecasting package called NAI Forecasting from Nardoni Associates, Inc., McClary is emphatic in her belief that most organizations can and should start with something small and homegrown. The only reason to consider a commercial package, she says, "is if people begin asking questions you can't answer."

Dynamic demographics

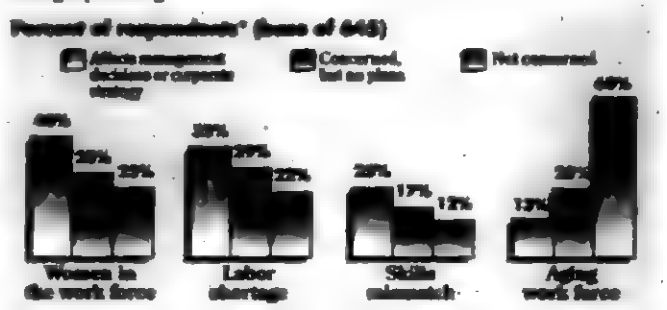
One of McClary's concerns is that a company may be shying away from performing what she sees as an increasingly crucial activity because of the mistaken perception that it entails a large investment. "I think this kind of system is becoming much more critical," she says. "The demographics of the workplace are changing, particularly in terms of aging and retirement. It is becoming more difficult to find qualified people. And because, with new technologies, people are required to know more, the amount of time that it takes to train them is increasing." A forecasting system can't find or train employees for you, McClary says, but it can give you a very valuable jump on "making sure you have the right people in place at the right time."

Sovran Financial Corp. in Norfolk, Va., does not have an information system dedicated to human resource forecasting. It does, however, assign task forces to investigate issues relating to employment needs and hiring practices. One such task force recently investigated work and family life issues for the 1990s and how the firm can help employees strike a balance between the two areas. "At these times, we will frequently go to the systems department and request the reports that we need in order to evaluate the statistics and make manpower projections," says Dorothy Williams, vice-president of human resources information systems.

Ohio Bell and Sovran are ahead of most firms in terms of their awareness of the need to collect information on hiring requirements and workplace issues. In fact, few companies have begun to think at all about how IS can be put into action on work-force issues.

Translating thought into action

Most companies recognize emerging workforce issues, and some have started to incorporate them into their management decision-making or strategic planning



*Percentages do not total 100% because a portion of respondents did not answer certain questions

Source: Towers Perrin and Hudson Institute, Inc. CW Chart: Michael Siggins

Ware says this is probably attributable to executive shortsightedness. "They are too removed, and they don't realize how dependent their company is on skilled labor," he explains.

These priorities are communicated in turn to the company's IS organization, according to Dick Frantzreb, publisher at Advanced Personnel Systems, a developer and distributor of directories of human resources software in Roseville, Calif. "Systems that revolve around training, compensation or recruiting have traditionally been lower on the IS priority list than, say, marketing, company operations or finance," Frantzreb says.

Age Wave's Dychtwald *advocates hiring retirees*

As firms become more acutely aware of demographic changes and begin to experience difficulty hiring skilled workers, IS and human resources staff will share a common interest mandated by top management. "They will start thinking in the same frame of reference, and, in the future, they will have the opportunity to work much closer together," Frantzreb says.

Hayley agrees that most companies will eventually come around to the idea of applying IS aggressively to human resources issues. However, she adds, the companies that have the foresight to get started early will fare the best. "The labor changes are going to come at us like a wall," she says, "and a lot of people are going to be caught unaware."

One area in which Sovran, in particular, is well ahead of the pack is in the use of retirees to supplement its work force.

According to Ken Dychtwald, chairman of Age Wave, Inc. in Emeryville, Calif., retirees not only constitute a large and growing sector of the population but also represent a largely untapped reservoir of talent. There are, he says, 32 million retired persons in the U.S. today, and 40% of them would rather be working.

At Sovran, this phenomenon became apparent several years ago. "We were looking at ways to supplement our work force," Williams says, "and we recognized our retirees were already trained workers — we were losing a wealth of information each time a person retired."

In response to the situation, Sovran set up a separate corporation named On-Call, Inc. to serve as an in-house temporary agency partly staffed by retirees. Then it became necessary to address the issue of benefits for these retirees who had now turned into employees.

Because the company had already implemented a flexible benefits software package from Tesseract Corp., the task was easy. "We set up eligibility codes based on tables that indicate which type of employees are qualified to participate in each given benefit," Williams notes. Retirees were assigned the code letter R so that, when queried, the software would generate screens showing benefits available to retirees.

Dychtwald points to illiteracy as another major factor influencing the work force and hence the hiring practices of corporate America. "Thirty percent or more of those in high school will not graduate this year," he predicts.

Even for those who do graduate high school, further education may not be an option, adds Linda Cunningham, a partner at the consulting firm Heller Hunt and Cunningham in Brookline, Mass. "College costs are rising dramatically," she notes, "which will affect everyone, particularly minorities, who now make up a greater percentage of the population and will begin to enter the work force in greater numbers than ever before."

Into the skills breach

As a result of these trends, Cunningham says, companies will take a much more active role in education. In many instances, firms have begun providing remedial education programs that are heavily dependent on computers and educational software.

The *Los Angeles Times* is already committed to such an effort. To combat its skill-gap problem, the paper decided in 1988 to open an on-site educational facility equipped with IBM's Principles of the Alphabetic Literacy System (PALS). According to Barbara Neder, administrator of the laboratory, this interactive laser video, composed of PCs, the laser and IBM's Infowindow Monitor, has been invaluable in assisting employees involved in production and printing jobs boost their spelling, writing and reading skills.

"We have people with 20 years of experience here who, in the past, did everything manually," Neder says. "These jobs were crafts where most of the people didn't even need a high school diploma. But that has changed dramatically." Press operators have now become computer operators, she explains. They have to be able to read what is on the computer screen as well as tell the computer what to do regarding press settings. They also have to write troubleshooting reports and other memos.

Although the lab was costly to install and to continue to upgrade, Neder says, "It would cost us much more to let those people go who were having problems and to go through hundreds of other applicants who may or may not be qualified." It is much more economical to train a company's current employees, she says, and "These employees, who have gone through PALS, now have a new-found respect for the company."

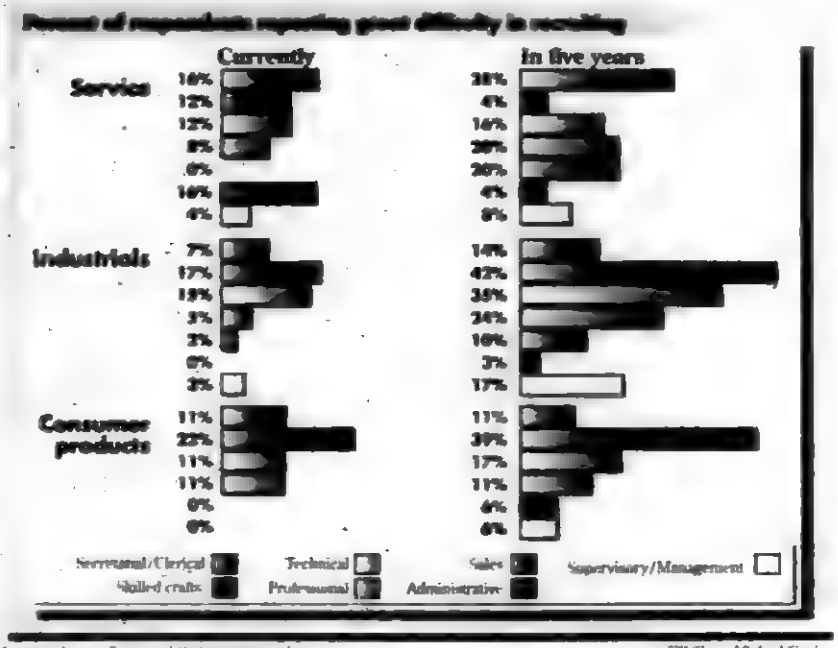
Even though PALS was relatively easy to install, Neder notes that the IS department was not involved initially with the system's procurement. She says that it would have been much easier had the group been involved.

"They unfortunately didn't have the resources at the time, so I became an expert in DASD [direct-access storage devices], communications, memory, etc.," she says. Now, however, because of the tremendous success of the program (10 times more employees use the system now than in early 1988), the lab has its own in-house IS support team on-call for problems or to consult on possible upgrades.

Roughly 300 employees have already gone through the program, but the job is a continuing one, Neder says, because the

In for a dry spell

Of these selected industry sectors, industrials may be hardest hit by labor shortages, according to a survey of human resources executives at the firms



Source: Towers Perrin and Hudson Institute, Inc. CW Chart: Michael Siggins

paper continues to hire people with literacy problems for lower paying positions. Although its educational program does provide a community service, the motivation for hiring educationally disadvantaged isn't particularly altruistic, she says. "We have no choice. That is who is available for these types of jobs."

At Mellon Bank, one tool that is helping to ease the training burden associated with hiring less-skilled workers is a mainframe reference tool called Preference from Goal Systems International, Inc. Preference provides on-line applications assistance to users by linking various application systems to on-line text references written by Mellon. Currently, employees use Preference only for a reference manual. Next year, however, the bank plans to make fuller use of the product's Help feature, which provides single-keystroke access to text explanations of problems that may be encountered by data entry personnel working on various stages of applications.

Diversity in the makeup of the work force is another issue to be faced. We are already starting to see a shift from the traditional white male work force of the past, to a labor pool including more minorities and women, and that trend will accelerate

Travelers' Bacon *says increase of women employees led to telecommuting*

during the next few years, according to Cunningham. "The clone factor in hiring" has perpetuated male dominance in the workplace, she says. Company founders are usually male, white and well educated, and they have tended to hire people like themselves. But now they can't do that as easily, because young applicants fitting that profile are becoming scarcer.

At Travelers, the shift that brought about a technology-enabled change in procedure was related to the rising proportion of women in the work force and the criticality of retaining valued female employees, says Larry Bacon, vice-president of data processing. "Keeping outstanding people is vital to us," he adds.

From 1985 to 1990, the number of professional women hired at Travelers increased by 83.2%, according to a company spokeswoman. Furthermore, a number of female employees who had been with the firm for 10 years decided during that time frame to have children and expressed a strong desire to stay at home with them. Faced with the prospect of losing these employees and other recently hired women as they reached the same crossroads, Travelers decided that telecommuting was its best option.

Started in 1987 as a pilot program for women only in data processing, telecommuting is now also offered to employees in the national claims processing group, research personnel in human resources and personnel in insurance operations. "We started with 10 participants," says Bengston, a telecommuter herself, "and now we have close to 100 employees involved either part-time or full-time."

The system itself consists of IBM MVS host mainframes linked with IBM Personal Computer ATs through Systems Network Architecture-based communications. According to Bengston, the system was easy to implement because the technology was already in place for linking field offices to Travelers' headquarters. "We just hooked up a dedicated packet-access line right into my home, and now I can enter any system from home that I could have from work," she says.

There has also been a financial advantage to the company, Bengston says, in that the $4,000 or so that it costs to equip its telecommuters with home workstations is more than offset by savings on office space.

Serve-yourself benefits

Accommodating the needs and values of an increasingly diverse employee population is also pushing companies inexorably in the direction of more flexible benefit plans and benefit systems.

"Systems that traditionally supported human resources were geared to a more definite, set group of people," notes Judy Dunnington, manager of implementation services at Hunter Group, Inc., a Baltimore consulting firm. Now, companies must take a broader view to attract and keep the best talent and offer flexible or "cafeteria-style" benefits. In such a scenario, the employee, based on certain requirements, is able to select benefits best suited to his situation.

Flexibility is not a word that applies only to benefits systems, however. It will have to be the prevailing feature in all systems efforts relating to employees during the next few years, Dunnington says. Labor force variations are very fluid, and because the changes are ongoing, IS will be stepping into very nebulous territory.

"The user will say, 'I know what I need today, but I'm not sure what I'll need tomorrow, and I'll need all of it by yesterday,'" Dunnington quips. •

Datacomm Commentary

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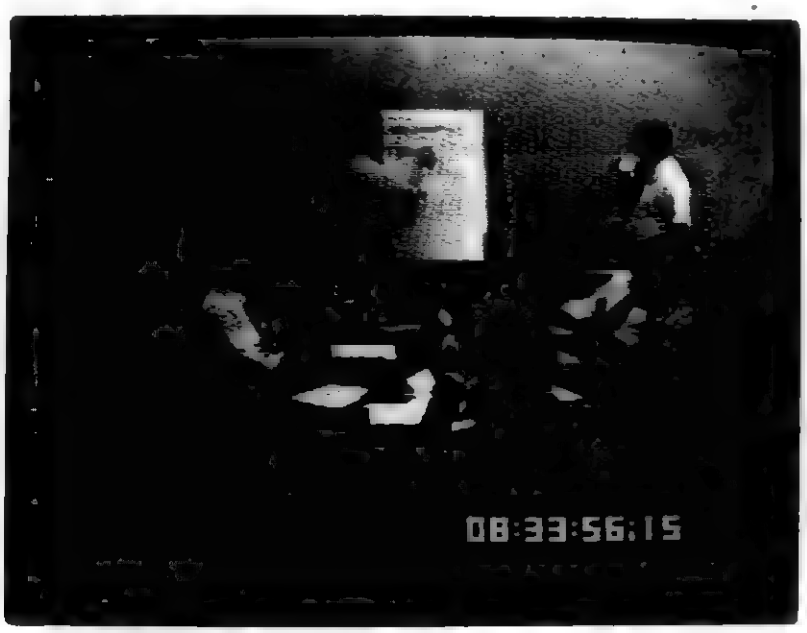

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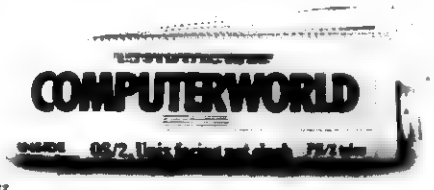


The Newsweekly of Information Systems Management

INTERVIEW

Shifting currents in the labor pool

Towers Perrin's Kanin-Lovers outlines ways that firms can take advantage of technology to address work-force changes

The future may have arrived somewhat ahead of schedule, at least in terms of work-force trends. A recent survey of 645 companies conducted by management consulting firm Towers Perrin in conjunction with the Hudson Institute, Inc. reveals that many U.S. corporations are already feeling the sting of demographic and value shifts in the U.S. labor pool that were originally predicted as long-term trends by the institute's 1987 report, "Workforce 2000." Jill Kanin-Lovers, vice-president at Towers Perrin and chair of the firm's internal task force on "Workforce 2000," recently spoke with Computerworld *researcher Kim Nash about how some of the companies surveyed are responding to this situation (see charts page 64) and about how technology may be able to help all companies address these concerns.*

What are the major work-force changes that companies are currently encountering?

We've identified six categories. The first is labor shortage, which some parts of the country are feeling more than others.

The second is cultural diversity. The increasing number of minorities and immigrants in the workplace challenges old management styles. Managers now have to learn to supervise and motivate people who have different value systems.

A third category is the increase of women in the work force. While issues concerning work vs. family are not strictly "women's" issues, women tend to be more vocal about them.

Another shift we found is in worker values. Today's educated employees want more independence and flexibility. They are not always as interested in compensation as in quality of life.

The aging of the work force is also an issue. Surprisingly, this is one area companies are not as concerned about. It seems to me that if you have a shortage of skilled workers, one resource you could tap would be the people whom you would have normally encouraged to retire.

Are companies doing that yet?

Not yet. Some companies, though, are experimenting with retiree job banks, from which they can bring retirees back for special assignments.

And there is one more category?

Yes. Skills mismatch or skills shortage. This is another problem that's being felt differently in different industries and parts of the country. Nevertheless, the majority of companies that responded to our survey said they have a tremendous need for more technical employees and that it will get worse over the next five years.

How are companies dealing with the growing demand for technical workers?

Some are taking the traditional approach of raising entry-level salaries. That may work for a while, but they are going to have to think through a broader strategy for the long term.

Some organizations form partnerships with educational institutions so that they can position themselves as preferred employers and help to structure the curricula. Others are looking at ways to restructure work so that a skilled worker can focus on the more technical part of a job and assign the mundane tasks to someone else.

Some companies also now offer more job-scheduling flexibility, including work-at-home arrangements and compressed work weeks.

How many companies would you say are actually doing these sorts of things?

We were surprised to find that a significant number of organizations are doing what we would view as very innovative things. Quite a few are looking at more flexible job structures. An increasing number are partnering with educational institutions at both high shool and college levels.

We also found a group of companies that have implemented what I call Mommy Work Week programs, which are plans designed to lure housewives to work by offering flexible, school-hour work schedules.

Do you see any ways that computers and information systems can be used by companies to help them adjust to work-force changes?

It's technology that's changing the work world in the first place, and it's technology that will increase worker efficiency.

The introduction of technology for tasks that can more efficiently be done with a computer is going to be a really important part of job redesign and staying competitive.

If you can't get the labor, and if you're going to have to make better use of the workers you already have, you've got to get the job done as efficiently as you can.

Kanin-Lovers *notes that educated employees want more independence and flexibility*

Can you think of any instances in which this is already happening?

I know of a fast-food chain that uses pictures instead of words on their point-of-sale terminals. They have pictures of hamburgers and the like, so the cashier doesn't have to know how to read. This is an example of designing a technological support system to make a less-skilled work force more productive.

How much do changing employee values play into the job redesign you mentioned earlier?

Right now, we have three different value systems in the workplace. One is a group that we call the Radio Babies, who are currently our senior managers. These are older workers who have a very strong work ethic, tend to have more loyalty to the corporation and are used to more hierarchical styles of management.

The second group, TV Babies, is not as comfortable with that commanding, controlling management style. They had more choices when they were growing up and are now looking for more teamwork at work.

The last group is called the Computer Babies. These are people who are used to — and demand — a lot more variety, flexibility and choices. They are not necessarily looking for the challenge of climbing up the corporate ladder as much as they are looking for the challenging project.

Your report mentions that about 50% of the companies surveyed have increased their use of technology and automation. How does this increase relate to changing labor demographics?

In the past, companies were assured of plenty of labor. They could get people who had the right skills and didn't have to worry about each individual as a special asset. When you see the skills shortages happening now, you have to think of different ways to get the work done.

If the best way to make use of employees is to invest in more appropriate technological support or to automate some tasks, that's what managers will do.

Do you expect, then, that increasing technology and automation will be a major trend as the work-force changes become more pronounced?

If companies are going to stay competitive, they have no choice. They've got to look for ways to do the work better with less labor and for ways to take advantage of the limited labor supply that is available.

EXECUTIVE REPORT

Flat management requires juggling

BY SUZANNE WEIXEL

Not all work-force changes fall into the act of God category. Some are the result of corporate decisions. Perhaps the most prevalent current example is the trend toward flattened organizational structures, which require fewer managers to spread themselves across more territory and more employees.

In many cases, the remaining managers are being asked to make almost superhuman stretches. At Federal-Mogul Corp., for instance, a decision to eliminate several management layers meant that Bob Muylaert, information services account executive for sales and marketing at the vehicle parts supplier in Southfield, Mich., saw his direct reports increase from two to 17 in one month.

With the proper use of management techniques and technology, however, Muylaert says that having more than eight times the number of direct reports does not mean having eight times the work load.

At Federal-Mogul, the flattening meant shifting from a hierarchical, function-oriented way of doing business to a more involved, integrated cross-functional approach. For Muylaert, this translated into developing a wider span of knowledge and learning how to communicate more effectively. "You have to be a powerful communicator to survive in this situation," he says.

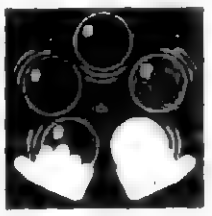
Marriott's L'Esperance *uses technology such as E-mail to keep employees informed*

In addition to personal skills, Muylaert says he has come to depend on electronic mail and voice mail to boost his communications range and is investigating project management software to help him juggle his various activities.

Making flatter even better

At Marriott Corp., Charles L'Esperance, senior vice-president of hotel information systems, can rattle off an even longer list of significant technologies used to keep senior management in contact with the frontline customer service staff now that the layers of intermediate management are gone. Along with E-mail and voice mail, portable laptop computers and project tracking groupware have also become staples of the management process since the organization decided that flatter was better.

"Whenever there is a senior management meeting, we broadcast the major points to all the associates [employees], via voice mail," L'Esperance says. "Even when I'm traveling, I have a laptop for accessing E-mail and a telephone for linking to voice mail."



Marriott also recently installed a videoconferencing system. It serves mainly as a training tool, but senior managers also use it for employee communications when they want to make announcements.

On the flipside, however, to keep management informed about what the staff is doing, each Marriott hotel submits a weekly sales report that includes key statistics. Departments use E-mail or voice mail to submit daily reports. In addition, managers and employees use personal computer tools such as Lotus Development Corp.'s Agenda for keeping lists of things to do and organizing meetings.

Before the advent of such communications systems, conventional wisdom limited to five the number of staff members that one person could manage directly, says Kay Redditt, president of Cognitech Services, Inc., a consulting firm based in Easton, Conn. "Basically, the systems enable a manager to reduce the amount of time he or she devotes to each individual report," she explains.

Such systems can also help to change both the nature and the ownership of work, which, says Daryl Conner, an Atlanta management consultant, is essential for successful restructuring. "Surgically removing layers of management and redistributing the same work and the same work habits to different employees is not going to cure anything," he adds.

Perhaps the hardest habit for the remaining managers to break is that of

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trying to supervise the details of work processes, says Madeline Weiss, president of Weiss Associates, Inc., a consulting firm based in Bethesda, Md. Instead of concentrating on exactly how each job is done, managers have to learn to manage with a focus on results such as quality improvement.

In order for that shift of responsibility to occur, Weiss explains, frontline employees must be given enough information to make decisions that are in line with corporate strategy.

An ideal information management system for use in a flattened organization is a combination of electronic messaging, automated project management, document management, a meeting and resource scheduler and a database, according to Michael Howard, president of Infonetics Research Institute, Inc. Howard calls this approach work-flow management, because it not only organizes different applications for many users but also ties different applications together and manages different processes.

> "WE SHARE RESPONSIBILITY, and we share success. It's a win-win situation."
>
> HARVEY SHREDNICK
> CORNING

Marriott uses a package called Coordinator, a PC-based E-mail and project tracking system from Action Technologies, Inc. The program handles correspondence among project teams and performs commitment tracking, which entails monitoring project requirements such as staff, hours and other resources.

Access to this type of data is valuable, for example, when working on opening a new hotel. If 12 people are working on the project, L'Esperance explains, a 13th person can come in, access Coordinator and receive all correspondence and data relating to that opening in chronological order. "The good news is that everyone knows what he's talking about instead of just taking a message and passing the buck," he adds.

Post It

Making performance data available is a technique also used by Corning, Inc. in Corning, N.Y., which within the last two years has dropped the number of management layers in its computer operations department from five to three.

Corning wrote a software program in-house to monitor the performance of the operating staff, and the results are made available to all employees, says Harvey Shrednick, vice-president of information services. Figures for costs, tape errors, system availability and operator errors are posted on a bulletin board outside the computer room each month.

According to Shrednick, in the two years since cutting down management layers, operator errors have dropped significantly — falling to zero during April, May and June of this year. "We share responsibility, and we share success. It's a win-win situation," he says.

Federal-Mogul's Muylaert believes in the power of communication for flattened organizations

Muylaert found that giving his staff access to all the data he uses, including capital plans and profit plans, helps keep them motivated and informed. Staff members help compile the data by contributing their own knowledge, on-line via E-mail or in hard copy. The final data is loaded into a spreadsheet, printed out and distributed in a "briefing book" that is used throughout the year to keep track of expenditures and the like.

Employees are privy to everything except personal salary data, and they have adopted a team approach to solving problems and brainstorming for ideas. As a result, Muylaert says, they have grown tremendously. "They take more risks, they are more comfortable making decisions and can make decisions faster." •

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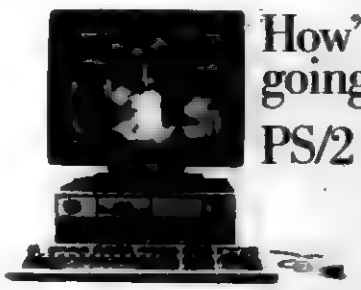

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Lack in the USSR

A firsthand account of how ambitious Soviet computerization plans face shortages of computers, security know-how and savvy managers

BY SANFORD SHERIZEN

Editor's note: Earlier this year, 47 U.S. computer and quality experts toured the Soviet Union as part of a "Citizen Ambassador Program" organized by People to People, a Spokane, Wash., group that unites specialists with their counterparts from other countries. Among them was Sanford Sherizen, a noted security consultant who was sponsored by the College of Criminal Justice at Northeastern University. The following is his report:

Imagine a bank that has 200 million customers with 80,000 branches in 15 republics across the nation. Then consider that you are in charge of replacing traditional savings account passbooks with debit cards. Finally, think about the security that would be required throughout every phase of the changeover.

This type of challenge was on my mind when I landed in Moscow at the start of a professional trip through the USSR in May. I was prepared for an enormously complicated land in the midst of rapid change. Little did I know how unprepared I was for what I saw.

I had applied for this trip in order to find out how the USSR was making certain decisions at this historically important time. As a criminologist and information security consultant, I wanted to examine how the Soviets are making some very critical and intriguing decisions regarding the following computer-related issues:

- How is the USSR going to balance increased information flows essential to *perestroika* with its traditional restrictions over information?
- How are the Soviets going to achieve widespread computerization while deciding on what to do with such inevitable by-products as hacking, free information flow, changing work patterns, challenges to traditional management controls, etc.?
- What are the ways in which security is shifting from KGB-type state security to other forms of private information security?

Raising good questions was easy. Getting answers proved much harder.

A computer tour of the USSR

In Moscow, Leningrad and Minsk, at universities, banks, computer organizations and with entrepreneurs, our Soviet hosts were very friendly, treating us as honored guests who were interested in sharing information. Many of the Soviets were technically savvy and very interested in obtaining computers for their organizations.

We met some technically sophisticated people who were aware of the latest computer issues in the U.S. They often knew quite a bit about U.S. computer systems and were able to discuss specialized application features. One even pulled out the latest copy of the software magazine *Dr. Dobb's Journal* from his briefcase to make a technical point.

However, the majority of these Soviets work with very old systems that are being used extensively to support major organizations. Many share large work loads on the few available computers with a number of other people. Where we saw personal computers (including equipment from the U.S., Asia and Europe as well as Soviet-made machines), too few of them are available to meet the needs of the organization. Of course, we did not go to military or specialized facilities where some of the more advanced computers are used.

Reminders of inadequate computerization are everywhere. Many stores and offices are still using an abacus, or at best, a calculator. Point-of-sale terminals, spreadsheets and cash management systems are still a long way off. By one Soviet estimate, U.S. machines this year will make roughly 50 billion more computer calculations per day than Soviet machines.

The lack of modern computers is not surprising; computerization in the USSR has a history of political restrictions. During the 1940s and 1950s, Soviet leader Joseph Stalin forbade the study of cybernetics, electronics and computer technology, because they were considered "bourgeois" sciences. The result was that computer activities were almost nil, except for some military applications.

Yet *perestroika* may require computers in order to succeed. Information technology in the period from 1986 to 1990 was to be the key to Soviet leader Mikhail Gorbachev's plan for renewing and restructuring the country's economy. In his address to the 27th

Russell G. Jones

Sherizen is president of Data Security Systems, Inc. in Natick, Mass., and a criminologist and expert on computer crime prevention.

- **Broad cultural change needed**
- **For many, calculators are high-tech**
- **'There is a time when one must start'**

Party Congress, Gorbachev detailed the following elements of his plan: Double the telephone system by the early 1990s, complete a national computer network, introduce computers and databases at all levels of the national economy, train a new generation of Soviet citizens as computer-literates and reorganize the USSR Academy of Sciences to correct the nation's computer backwardness.

My suspicion is that few, if any, of these goals will be accomplished soon. Even basic support services necessary for computers, such as safe and reliable electricity, are lacking.

Ekonomicheskaya Gazeta

What do we need new technology for when the old technology is still working?

Reprinted by permission.

Nikolai Gorshkov, the first head of the State Committee on Computer Technology, said in a 1986 interview with *Pravda* that energetic steps were needed to bring order to the burgeoning Soviet computer industry. Gorshkov said the majority of computer programs drafted in the past decade had not been up to the standards needed for mass use, and lack of coordination hampered efficiency. He added that government inspection of computer quality would be set up under his committee.

Unfortunately, few Soviets indicate an awareness of what computerization has *not* accomplished in the West. Very little consideration appears to have been given to such issues as employment changes, computer crimes, shifts in the nature of property, legal definitions of computer technology and an organizational infrastructure to support computerization.

The current Soviet image seems to be that computerization will quickly make the Soviet system more rational and effective. One official, in describing how he was trying to restructure his bank to fit with *perestroika*, said that the U.S. had developed some 80 to 90 years ago what he was trying to do now: "Today, we are trying to invent a bicycle when we really need a space vehicle. There is a time when one must start. So we begin."

Roadblocks

Besides a lack of computer products and an infant industry, other problems are also slowing the growth of computing in the Soviet Union.

Managerial resistance. Notable obstacles are the many "potential enemies" of computerization — people who have a stake in resisting free information flow. Their large ranks include managers who have survived in their positions by learning how to manage shrinkage so that they can trade with other managers for needed goods. These managers understand that objective computers can cause them problems.

Similarly, government and party officials understand that computers can end their monopoly on information distribution and cause them serious headaches by objectively counting units. The skills that have allowed these managers and officials to hold on to their offices will be used as necessary to combat computerization.

However, the ability to manipulate computers may be an incentive for these individuals to support computers. Once these potential enemies find out about computer manipulations to change objective audits of their work, they may become the best friends of computerization.

Poor communication. Another obstacle to computerization is the lack of communication among organizations. The centralization of economic planning, the problems in telecommunications and the hierarchical division of labor make it difficult for managers to support computers. This in turn will undercut the control that managers have over their own jobs as well as their employees.

This lack of coordination among organizations and even departments within one organization has also caused problems in the manufacturing of computer equipment and software. Imagine how difficult it would be to develop a computer system without being able to be informed about the full scope of the organization and the nature of the information that is to be processed.

Widespread emigration. Compared with just a few years ago, many more programmers and other computer experts are now talking about wishing to emigrate. A Soviet who recently came to the U.S. told me that many of his technical friends have given up on the USSR and want to leave. Indeed, a significant portion of the Soviet Jewish emigrants are computer experts who are fleeing from open anti-Semitism both in the workplace and on the street. Some non-Jewish Soviets are seeking joint ventures that will allow them to "visit" the West. The loss of some very talented people will restrict the ability of Soviet society to advance with computerization.

It is clear in the Soviet Union today that, while there is an absolute need for computerization to make the market economy function, computerization will not work within an abacus-based society without major changes. Without carefully considered legal and industrial supports, computers will become expensive paperweights. Whether the less tangible supports that lay the foundation for computers, such as copyright protections, privacy and even basic communications connections, will be achieved is still an open question. ●

Talk with Soviet users

Network connections to and from the USSR are few but growing all the time. Some of the choices include a bulletin board that provides electronic mail and teleconferencing with Soviet computer users called the San Francisco/Moscow Teleport located at 3278 Sacramento St., San Francisco, Calif. 94115 (415) 931-8500. Another connection is through Peacenet via Jeff Sears, (415) 923-0900.

A Russian text processing mailing list, called Rustex-L, is also available. It is administered by Dimitri Vulis, Department of Mathematics, City University of New York Graduate Center, who can be contacted at DLV%CUNYVMS-1.BITNET@cunyvm.cuny.edu.

An excellent overview of Soviet technological growth is provided in a book entitled *Chip in the Curtain: Computer Technology in the Soviet Union* by David A. Wellman, Washington, D.C., National Defense University Press, 1989. (202) 475-0948.

Bozhe Moy! Hackers and viruses already plague Soviets

There have already been computer crimes and virus attacks in the USSR. Over the last several years, the number of incidents has appeared to increase along with other forms of crime.

One of the earliest cases of a computer virus in the USSR occurred in 1988 when an unidentified programmer at the Gorky Automobile Works on the Volga River was charged with deliberately using a virus to shut down an assembly line in a dispute over work conditions. The man was convicted under Article 206, the so-called hooliganism law, which provides for a jail term of up to six years for "violating public order in a coarse manner and expressing a clear disrespect toward society."

The comments about viruses heard at a number of meetings are worth reporting: "We are ready to meet the problem." (Moscow State University); "Viruses come from international exchanges but some day soon come from here." (National Academy of Economics); "The USSR recently joined Interpol. A requirement of that organization is that member states' police departments must ensure data security. The result has been that the police management has now become sensitized to that issue." (National Academy of Economics); "On the physical side [of security], we close what needs to be closed. Some say that only a sentry will be sufficient." (A Soviet bank security official); "How have we responded to viruses? Up until now we suffer." (Institute for Informatics Problems in the Information Sciences Department of the Academy of Sciences of the USSR).

According to various Westerners, pirated software is all over the USSR, and the Soviets often get hit with viruses when they buy these "forbidden fruits" via the Hong Kong or Swiss connections. A number of the 70 known Bulgarian viruses also appear to be prevalent, along with two Soviet strains: Victor and a variant of the Vienna virus.

According to Aryeh Goretsky at McAffee Associates, a computer security firm, other viruses that have been confirmed by Soviet and Eastern European antiviral programmers include the following: Yankee Doodle, Vacsina, Microsoft88 (534), Sunday, Amstrad or Pixel, Disk Killer 170X, Stoned, Ping Pong, Vienna, Jerusalem, Friday the 13th COM, Pakistani Brain, Disk Killer and W-13.

Programs available to combat viruses are Aidstest by Lozynky and Anti-Kot and Anti-Kor by Kotik. Some Western antivirus programs and some homegrown versions were also found at various Soviet sites.

It is noteworthy that viruses are increasing, even though a form of data security exists in the Soviet Union. This security is of the most basic type: It is largely composed of guards and locked doors restricting access to computer rooms.

Other simple measures are used, such as limiting links between computers and systems and access controls to files. These measures are far from adequate, however, given the pressure to acquire and distribute microcomputers and to establish networks.

What makes the situation worse is the lack of trained data security personnel, data security standards and tools, data security supports and, in some instances (but not in others), lack of knowledge of security techniques beyond basic approaches.

Sadly, it appears certain that there will be an onslaught of computer crimes and virus attacks in the near future. If (and when) *perestroika* can lead to computer linkages of even a minimal sort, the types of crime and abuse problems that have become part of life in the West will be found in the USSR.

A mixture of homegrown hackers, outsiders and even some business managers will create what could be a very fearful situation for the Soviet authorities. How they will respond to this challenge is, to a large degree, based on what authority will be functioning in the near future.

Decisions about what information to protect and how to do it are not being developed in the USSR today. Unfortunately, it appears that these decisions will be put off there as they were in the U.S. for too long.

Soviet computerists, both in state enterprises and the fledgling private sector, can learn about information security from U.S. experiences. The main issue is to try to be like us while avoiding the many problems (including security problems) that we developed in association with computerization.

SANFORD SHERIZEN

NATIONAL
BRIEFS

Peach and Apple pie?

Norcross, Ga.-based **Peachtree Software, Inc.**, a privately held purveyor of accounting software to the IBM Personal Computer and compatible market, bought itself a big slice of a new market with its recent acquisition of **Layered, Inc.**, a leading developer of accounting products for the Apple Computer, Inc. Macintosh. The deal, terms of which were not disclosed, will land Layered's Boston-based operations in Norcross as a Peachtree division headed by current Layered President Bill Savoy.

■

One more reason

Aiming at complementing the strength of its current wide-area network applications, Columbus, Ohio-based **Compuserve, Inc.** has acquired **Microsolutions, Inc.**, a local-area network products reseller based in Dallas. In what is becoming the traditional takeover style for Compuserve and parent **H&R Block, Inc.**, Microsolutions' 85 employees will all be retained, and the company will continue to be headed by President Mark Cuban and Chief Executive Officer Martin Woodall. Financial terms were not disclosed.

More briefs on page 75

Easing the pain when jobs are lost

When cuts must be made, some firms are giving employees more than just a pink slip

BY SALLY CUSACK
CW STAFF

Layoffs, mergers and attrition — these words strike fear in the hearts of many, from the lowly chambers of clerical administration to the lofty corridors of the corporate elite. In these times, no one is sacred.

During the recent spate of computer industry restructurings and upheavals, what — if anything — are the major players doing to ease the painful transition process for their employees?

In many cases, companies are reaching outside their organization for help, usually in the form of an outplacement service firm. When The Dun & Bradstreet Co. purchased Management Science America, Inc. last year, aggressive restructuring plans merged MSA's Atlanta-based operations with D&B's Natick, Mass.-based McCormack and Dodge group to create a new entity — Dun and Bradstreet Software. The move forced a 380-person reduction in the combined work force, and D&B sought outside help in the form of Drake Beam Morin, Inc., an international outplacement services organization in New York.

"We chose Drake Beam Morin primarily because of their international scope," said Ron McKenzie, director of human resources at D&B Software. "Though most of our work force reduction was concentrated in the Atlanta and Boston areas, it affected staff worldwide. We needed a company that had branch offices almost everywhere and that could help our employees relocate within their own area whenever possible."

Drake Beam provided D&B Software with two different programs: one offering individualized counseling services for senior management personnel and the other providing seminars for the general staff, designed to explain the transition process and explore alternate career paths. At the upper-management level, Drake Beam also provided counseling services to employees' spouses and offered a program by which a relocated executive, if not happy with his or her new position within six months, could return to the counselor for alternative placement.

The outplacement market at a glance

Frequent, and often massive, work-force reductions in other industries are making the once-miniscule outplacement sector into a boomtown

- Outplacement services market currently valued at approximately $460 million more than twice the size of the estimated market a year ago
- Some 225 firms currently make up the market, compared with approximately 100 in 1984 and an estimated 40 in 1980
- The standard fee charged by reputable outplacement firms is 15% of a departing employee's salary; for group outplacement services, a firm will negotiate rates with the customer company, tailored to the circumstances prevailing and the services provided

CW Chart: Paul Mock

Deep cuts

Prior to its purchase by Computer Associates International, Inc., Westwood, Mass.-based Cullinet Software, Inc. went through several waves of work force reductions in a futile attempt to turn company finances around. During the downsizing maneuvers, Cullinet contracted with Hurst Associates in Boston for assistance.

In addition to providing employee counseling, outplacement seminars, a career resource center and vocational testing, Hurst instructed managers on appropriate ways to conduct termination interviews — by focusing on the concerns of the departing employee in a professional and humane manner.

"Many managers inadvertently take a quick, clumsy, let's-get-it-over-with approach," said George J. Stiles, president of the Career Re-Directions division at Hurst. "They have to remember that the employee is in a tremendous state of shock, and they need to know what the next step is, and that includes providing information on income, severance and outplacement assistance."

Some companies have met with success by creating employee services organizations in-house. When Apple Computer, Inc. laid off approximately 400 employees in January, the vendor set up a transition center near its Cupertino, Calif., headquarters.

"The bottom half of the building was devoted to 60 or so offices with telephones, personal computers and support equipment for resume writing," said Ylonda Davis, an Apple spokeswoman. "We also had a job-posting room, and we created a data-

Continued on page 77

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EXECUTIVE CORNER

Goldberg takes Image Business Systems helm

Former Adapso Chairman Jay N. Goldberg is the new president and chief executive officer of New York-based software vendor **Image Business Systems Corp.** A 29-year industry veteran who started his career with IBM and spent nearly two decades at the head of a professional services firm he founded, Goldberg most recently served as chairman and CEO of Money Management Systems. Image Business Systems is privately owned by its employees and a group of investors, including IBM.

Eastman Kodak Co. appointed **Dennis M. Peck** CEO of its Santa Monica, Calif.-based subsidiary, **Interactive Systems Corp.**, purveyor of Unix-based products and services to OEMs and resellers. Peck, who has spent the past two years as an independent marketing and management consultant, is former chairman and CEO of workstation vendor Saber Technology Corp.

Former **Xerox Corp.** executive **Arthur Lipton** has signed on as the head of **Wyse Technology**'s flagship terminal business, replacing acting head Paul McIntire. As senior vice-president and general manager, Lipton — a 19-year Xerox veteran who spent the past decade in operating group executive positions — will report to Wyse President Daniel Wu.

Hewlett-Packard Co. has named **Jacques A. Clay** as general manager of HP's Personal Computer Group, replacing Robert L. Puette, who is now president of Apple Computer, Inc.'s Apple USA. Clay previously was general manager of the company's Grenoble, France, Personal Computer Division. HP also said it will relocate the Personal Computer Group's headquarters to Grenoble.

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Global digital network on tap

BY KEITH NEWMAN
IDG NEWS SERVICE

AUCKLAND, New Zealand — A self-managing, self-healing, intelligent digital network is being developed to meet the growing demands of global businesses.

AT&T, in association with other major telecommunications companies, is spearheading the system and has invested more than $8.85 billion during the past three years to accelerate digitization of the network. All of the traffic on its domestic switched network will be digital this year.

This worldwide intelligent network incorporates electronic switching systems that permit the network to heal itself. Half the technical professionals at AT&T Bell Laboratories are developing software to ensure it will meet quality, speed, diversity and reliability demands, according to the company.

The demand for software-defined networks is an example of user appetite for more control, said AT&T New Zealand communications managing director Don Congdon, and AT&T is already branching out from its dedicated multinational networks to integrated virtual networks to meet this need.

He cited General Electric Co.'s worldwide private network as offering a glimpse of future: "That network will carry voice, images and video to link 1,400 offices in 25 countries on six continents."

Global corporations want a consistent set of interfaces so that their employees do not have to learn a new system every time they move from country to country as well as in order to offer a consistent, high-level service at competitive prices without dealing with multiple telephone companies, Congdon said.

"Advanced communications technology has made it possible for any company to market products and services anywhere. As private networks have become more complex, net management functions have become a costly nightmare for many users," he said.

According to Congdon, different carriers are at different stages of development. "Telecom New Zealand has been at the forefront of these trends and in many ways has become the model for others to follow," he said.

Telecom New Zealand's move from a Postal Telephone and Telegraph authority to a private corporation is being looked at with "keen interest" in Australia, Singapore, South Korea and other places outside the Pacific, Congdon said. "Major telephone companies of the Pacific recognize they must work cooperatively to overcome standards issues, diverse interests and difficulties in coordination."

The Integrated Services Digital Network (ISDN), for example, has gone from an exotic concept to a reality and will be available from 343 U.S. locations on the AT&T network by the end of the year.

"Earlier this year, Japan's KDD and NTT linked with AT&T to connect New York, Tokyo and [Osaka, Japan] in the first demonstration of commercially available international ISDN applications. The U.S. also has links with the UK and France," Congdon said.

Jobs

CONTINUED FROM PAGE 75

base of available positions based on calls we received from outside companies." Davis said she handled between 30 and 40 inquiries from interested hardware and software companies within three days of Apple's announcement.

Control Data Corp. also marches to the beat of the "do-it-yourself" drum. In recent years, the Minneapolis-based corporation has sold off several of its major divisions, resulting in a sizable work force reduction: The company went from 33,500 employees in 1988 to 18,000 employees by the end of 1989.

For those facing involuntary layoffs, CDC provided a host of in-house transition services. These were available to all displaced, full-time employees at all levels and included a three-day job search seminar, one-on-one assistance from a job coach, retraining or skills upgrading information and employment opportunity data from more than 1,000 firms. According to CDC, 80% of the individuals affected in the Twin Cities area who participated in the program found new jobs.

Eighty percent seems to be the going rate. George Stiles reported that 80% of Cullinet's employees found positions within 60 days of the layoff. But what of the remaining 20%? "Nothing's perfect in these situations. You try to do the best you can," McKenzie said.

A company's best is not always enough. "Other than attending a one-day seminar provided by Drake Beam, I was very much on my own," said a former McCormack & Dodge employee who requested anonymity. "The company was caught off-guard, and D&B's own personal company support was lacking. The support was not in place when the merger took place [see story below], and there was very little intercompany communication with reference to job availability, etc., after that." Nevertheless, many company representatives said, as work force reduction becomes a fact of life in the business community, outplacement services with all their imperfections are a quantum improvement over the alternative. "The question we asked ourselves when putting these programs together was, what would I do in this instance?" McKenzie said. "We try to take the human approach."

> "MANY MANAGERS inadvertently take a quick, clumsy, let's-get-it-over-with approach. They have to remember that the employee is in a tremendous state of shock, and they need to know what the next step is."
>
> GEORGE J. STILES
> HURST ASSOCIATES

Soften the blow

When a work force reduction appears inevitable, is there anything a company can do in advance to mitigate the damage to employees — both outgoing and remaining — and customers, who all too often feel the fallout of any severe corporate disruption?

Plenty, according to George Stiles, president of the Career Re-Directions division at Boston-based Hurst Associates.

- Get top management involved with the outplacement consultants early in the game.
- Before the event, train all managers and supervisors in "the most dignified, compassionate, professional way to handle this difficult event." In a two- to three-hour workshop, he said, managers and supervisors can be clued in to the possible impact of the work force reduction on various segments of the corporate population and schooled in the most appropriate and helpful responses to situations that might arise.
- Train managers and supervisors on the nature and scope of all outplacement services that will be available to affected employees. Stiles advises doing this as close to the actual announcement as possible, to minimize the time in which rumors — hence, anxiety — are likely to spread.
- On the day of the announcement, have outplacement consultants on the premises. "If affected employees get packets instead of people, the better chance is that they won't avail themselves of all of the services that have been put in place for them," Stiles said. In addition, he said, "they won't get to ventilate their feelings." The opportunity to do the latter, he added, is among the most valuable services provided.

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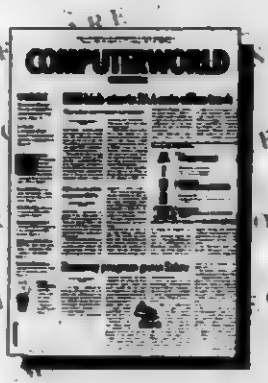

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Bull HN expands while parent firm plans cutbacks

BY SALLY CUSACK
CW STAFF

BILLERICA, Mass. — Dubbing the action a "further demonstration of its commitment to the United States market," Bull HN Information Systems, Inc. reached a preliminary agreement earlier this month to purchase Honeywell Federal Systems, Inc. (HFSI) from Honeywell, Inc.

Bull HN also confirmed last week that its French corporate parent, Groupe Bull, plans to reduce its work force by as many as 3,000 employees worldwide in the coming year.

David Dotlich, executive vice-president of corporate relations, said the majority of layoffs will occur in Europe. While the firm currently has no plans to reduce its stateside staff, Dotlich did not rule out that possibility as the company continues to downsize throughout the year.

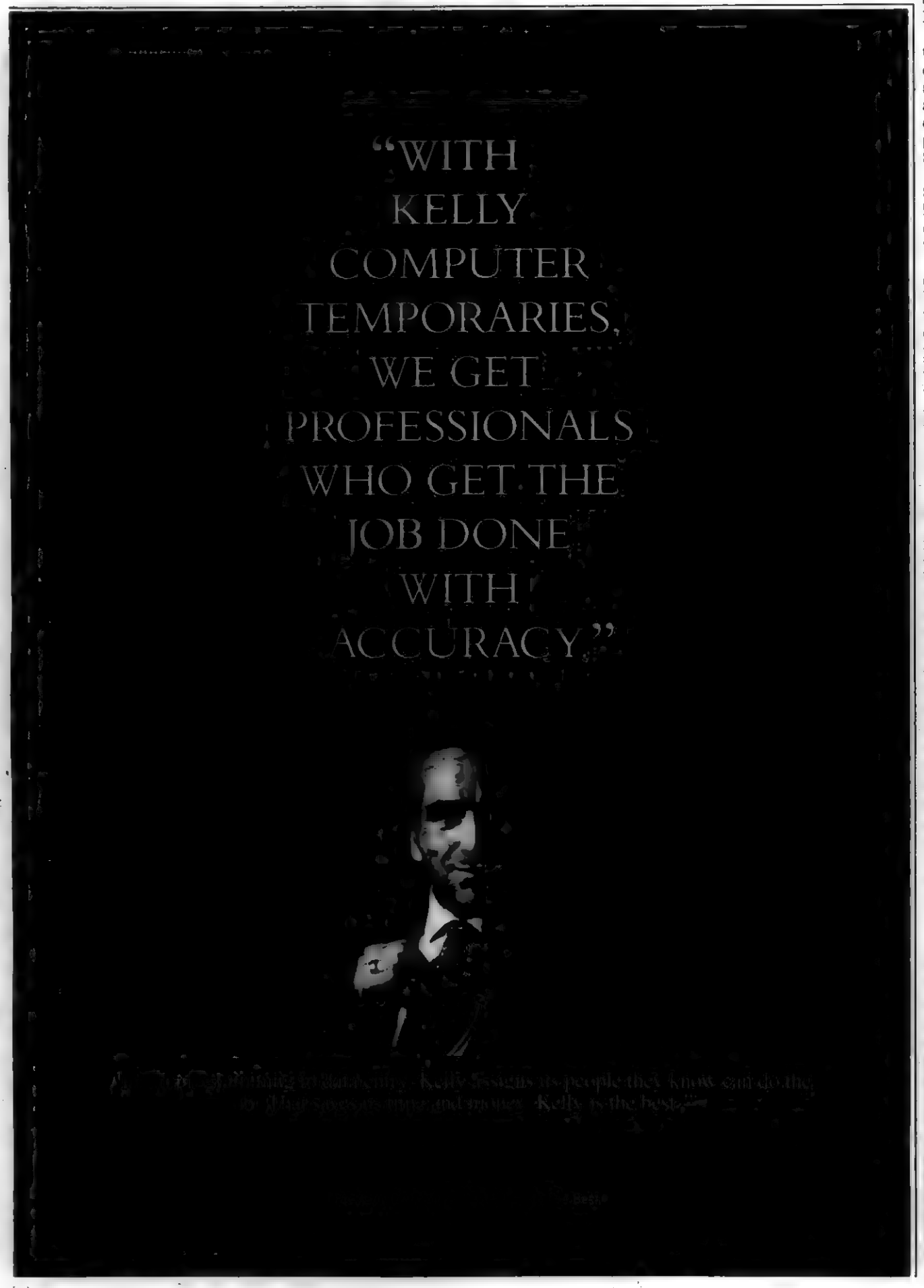
Terms of the agreement with Honeywell were not disclosed, but a knowledgeable industry source pegged the purchase at just under $100 million. The pact is subject to final negotiation of definitive agreements and other approvals. Upon closing, McLean, Va.-based HFSI will be operated as a wholly owned subsidiary of Bull HN.

Marina Young, president of IDC Washington, Inc., said the acquisition gives Bull HN a toehold on the huge federal market for Unix-based systems and systems integration services and will likely lead it into the commercial arena as well. She also said Honeywell's expertise in secure hardware is needed in Bull HN's European markets.

HFSI currently provides systems integration, marketing, computer products and technical services to the U.S. government and prime contractors. The unit employs approximately 1,600 people and posted 1989 sales of $274 million.

Bull HN reported revenue of $2.1 billion in 1989. The firm has more than 17,000 employees, with 8,100 of them based in the U.S.

Bull HN said that with Honeywell, it is seeking all necessary U.S. government approvals for the transaction. HFSI will be operated under the terms of a proxy arrangement because of Bull HN's foreign ownership.



NATIONAL
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How big is it?

Anyone looking to pin a dollar value on the French computer hardware market had better prepare for frustration. Even experts differ — by billions. **International Data Corp. Europe** (IDC) estimated that French computer users will spend $17.4 billion on hardware and software this year. **The Diebold Group, Inc.**, however, pegged the figure at $22 billion. **IBM France**'s estimate was $26 billion. By how much is the market growing? According to IBM France, 14.6% annually between 1989 and 1993; according to IDC, by 12%.

■

The new Warsaw pact

Under an agreement signed earlier this month, **Poland** will be free to import U.S. high-technology products denied to its former Communist rulers. The way was paved by the June decision of the **Coordinating Committee for Multilateral Export Controls** to scrap the limits on U.S. exports to Poland, Czechoslovakia and Hungary, provided the countries agreed to allow on-site checks and not put Western equipment to military use.

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A boost for advanced tech R&D

Commerce Dept. program will support industry-led projects

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — The Advanced Technology Program, launched last month by the U.S. Department of Commerce, may be the closest the Bush administration ever gets to an "industrial policy."

Mandated by Congress in the Omnibus Trade and Competitiveness Act of 1988, the program will provide financial aid to industry-led research and development projects. The start-up budget is $10 million, but Congress envisions a budget that would leap to $100 million in fiscal 1991.

Undersecretary White

In essence, the Advanced Technology Program allows U.S. businesses and joint ventures to compete for government grants for R&D projects. Industry proposals, due Sept. 24 for the current round, will be judged on whether they have technical merit and the potential to boost U.S. productivity and economic growth.

Adhering to administration policy, the program rules stressed that grants will be limited to R&D on "pre-competitive generic technologies," which are technologies (such as high-temperature superconductors) that are in an early stage of development and could be used for a broad range of products or processes.

The agency said the grants will help industry overcome "technical choke points" — that is, technical barriers currently holding up progress in high-risk technology fields. The program will help industry "through the laboratory prototype stage," but it will leave the development of commercial products to the private sector.

"This administration believes the federal government should avoid 'picking winners and losers' but instead should foster an industry-led strategy for competitiveness," the Commerce Department said.

The Advanced Technology Program — which has vigorous support among Democrats and Republicans in Congress — is the first high-profile program from the Commerce Department's new unit in charge of technology policy, the Technology Administration.

Judging from the program rules, the Technology Administration has the job of carefully steering a course between the administration's opposition to government subsidies for commercial technology and Congress' desire for a more activist technology policy.

Steering the Technology Administration is Robert M. White, a computer industry technologist who was nominated by President Bush to serve as the first undersecretary for technology. He was confirmed by the U.S. Senate in April.

White had been vice-president of Microelectronics and Computer Technology Corp., an industry consortium in Austin, Texas, where he directed the advanced computing technology program. Previously, he was chief technical officer at Control Data Corp. and principal scientist at Xerox Corp.'s Palo Alto Research Center.

White and congressional supporters say they hope the Advanced Technology Program grows to become the civilian equivalent of the Defense Advanced Research Projects Agency. The actual budget for the program will be determined by the ongoing negotiations to reduce the federal budget deficit and the resulting appropriations bills for fiscal 1991.

Rules of the game

The Commerce Department's new Advanced Technology Program provides grants for R&D projects on fledgling technologies with broad applications. The agency's Technology Administration recently issued the following rules for the program:

- Grants to individual firms are limited to $2 million over three years.
- Grants to joint ventures are limited either to cases where federal aid is needed to form a consortium quickly or in which an existing consortium plans to pursue a new area of R&D. The dollar amount is limited only by the budget, but the federal aid must be less than 50% of the venture's budget.
- No direct funding will be provided to universities or government organizations; they may, however, participate as members of a joint venture.

The scope of technologies covered by the program, administered by the National Institute of Standards and Technology (NIST) in Gaithersburg, Md., appears unlimited. The department had planned to restrict the program to technology areas in which the NIST has expertise, but that provision was dropped in the final rules. Application kits are available by calling (301) 975-5187.

MITCH BETTS

Eastern Bloc trade must clear financing hurdles

Despite liberalized export controls, Western firms see difficulties ahead in gaining market share

BY LOTHAR GRIES
and LINDA LEWIS
IDG NEWS SERVICE

PARIS — Not since the end of World War II has a political event aroused as much hope, even euphoria, in economic circles as did last winter's collapse of Communist regimes in Eastern Europe.

Today, the euphoria has given way to a lull and even a certain apprehension. Some analysts are pessimistic; for instance, the French Observatory for Economic Circumstances (OFCE), believes that French companies will continue to have difficulty acquiring Eastern European market share.

Most players are now aware that returns on investments will take much longer than expected, given the difficulty of financing contracts in these countries and the often strict export controls to the East enforced by the Coordinating Committee for Multilateral Export Controls (Cocom). About 50% of the 81,000 export authorizations given to U.S. firms last year were reportedly superfluous.

Cocom controls were particularly strict in the computer sector, where it is forbidden to export computers with processing power greater than that of an Intel Corp. 80286-based personal computer.

However, at a Cocom meeting held here in June, attendees agreed to end all export controls on personal computers up to a so-called processing data rate (PDR) of 275 bit/sec., the equivalent of an 80386-based PC. It will be up to Cocom members to decide whether to license systems with a PDR of 450. Cocom is expected to consider licensing sales of computers with a PDR of up to 1,000, which would cover more powerful minicomputers and some mainframes.

The Soviet PC installed base is estimated at between 500,000 and 1 million units, compared with about 40 million in the U.S. The situation is reportedly not much better in Moscow's former satellite countries.

Evidence of this liberalization of export curbs is already apparent: U.S. authorities have given Control Data Corp. the go-ahead to deliver six large Cyber 962 systems, worth about $32 million, to the Soviet Union. These systems are to be used for nuclear plant security — at Chernobyl, for example.

According to IBM's West German subsidiary, the computer market in East Germany is expected to explode in the next 10 years and be worth about $21 billion by 2000, compared with $1.8 billion last year. Czechoslovakia, Hungary and Poland are seeking preferential treatment from Cocom.

However, most European and U.S. computer suppliers did not wait for either the June Cocom meeting or the fall of Communism to move into Eastern Europe.

In 1987, the U.S., Japan, UK, France, Italy and West Germany exported high-tech products worth about $1.12 billion to those countries. A third of this amount, or $374 million, came from computer systems sales; 50% of that figure was generated by West German firms.

Soviets stirring

In the Soviet Union, foreign companies are also seeing the stirring of near-dormant operations. IBM's Moscow office, for instance, has been open since the mid-1970s but has generated very little business to date.

However, IBM Senior Executive Michael Armstrong's April visit to Soviet Prime Minister Nicolai Ryjkov in Moscow proved fruitful. IBM recently announced an agreement with the Soviet Ministry of Education to deliver 13,000 PCs.

Reportedly worth between $10 million and $20 million, this contract is only a drop in the bucket compared with the contract signed by West Germany's Siemens AG and the Soviet Union a year ago. Under that pact, Siemens will supply the USSR with 300,000 PCs valued at $880 million. Although Cocom has cleared the deal, it has been delayed by a lack of appropriate financing even a year after the agreement was signed.

Nor is the Soviet Union restricting itself to the big, established firms. Earlier this month, Atlanta-based Craftsman Electronics, Inc., a 1-year-old company that buys computer manufacturers' excess inventory and sells it at a discount, signed on to supply the Soviet Union with 30,000 personal computers — mostly IBM Personal Computer ATs — and related equipment to be used in the Soviet educational system. The Soviet Union will pay Craftsman the $51 million contract price in U.S. dollars through a loan from a European bank, according to Craftsman.

A significant difficulty of doing business with former Communist countries involves the financing of contracts. Now that Cocom has relaxed export controls, the lack of financial resources, especially in convertible currencies, is the major barrier for business with the East Bloc. East Germany, which has had a convertible currency in the Deutschmark since July 1, is the only exception.

IBM, on the other hand, said that its PC deliveries will be paid for in dollars. To alleviate hard currency problems, other vendors, such as France's Groupe Bull and Digital Equipment Corp., prefer to set up joint ventures with local firms. Bull has created the joint venture Hungarian French Computer Co. with Hungary's Videoton.

Long-term profit

Focusing on marketing and assembling computer systems, this new company is expected to cost several hundred million francs in investments and be profitable in the long term. Nonetheless, Bull hopes to multiply its turnover in Eastern Europe during the next three years.

According to the firm, revenue is expected to total $150 million in 1993, compared with about $15 million in 1989.

DEC, the first major U.S. manufacturer to venture so openly into Eastern European markets, has also created a joint company with a Hungarian enterprise. More modest than Bull's project, DEC's investment totals about $2 million.

Texas Instruments, Inc. has also decided to set up an office in Budapest, from which it will "evaluate marketing opportunities in the Hungarian, Polish and Czechoslovakian markets," according to the firm.

The No. 1 life cycle method

Demand is solid for specialists in information engineering development

BY SHERYL KAY
SPECIAL TO CW

As computer-aided software engineering catches on, proficiency in the development methods that CASE tools support should serve information systems professionals well. One of the most popular methods is information engineering.

The number of people practicing information engineering has more than doubled in the past two years, according to several recruiters. Among consulting and software companies specializing in the field, the growth has been more rapid.

A study issued last month by Case Research Corp. in Bellevue, Wash., finds information engineering to be the most popular of the third-party life cycle methods in use.

Of 186 organizations surveyed, 12% use information engineering, compared with 9% for the second most popular commercial choice, Andersen Consulting's Method/1.

The study suggests that demand for people who know information engineering will continue. Among the companies that have adopted information engineering, all plan to increase their use of it.

Given the demand for their services, information engineering specialists are earning more than generic systems analysts. Nationwide, specialists with three to five years of experience bring in $30,000 to $50,000 per year, according to James B. Ray, director of MIS at the Jack Eckerd Corp., a drugstore chain in Clearwater, Fla. Systems professionals with more than 10 years of IS experience and several years in information engineering can earn $60,000 per year or more, Ray says.

In general, senior systems analysts with an average of 10 years of IS experience earn about $45,000 per year, according to *Computerworld*'s latest salary survey.

Ray has found information engineers in short supply. "The ones that are really good are having successful careers where they are and have no reason to make a change," he says. The few that he has been able to hire felt their employers weren't moving quickly enough to embrace the method.

Ask 10 IS professionals what information engineering is and you're likely to get 10 different answers. Many of the practitioners don't know where it came from.

The method was popularized by software gurus James Martin, the founder of Knowledgeware, Inc. in Atlanta, and Clive Finkelstein; the two first wrote about it in 1981, says Sam Holcman, president of Southfield, Mich.-based Computer and Engineering Consulting Ltd.

Information engineering is a data-oriented method — it emphasizes the organization of data more than traditional approaches to systems development, which tend to revolve around the business process or application in question. It applies to all phases of the development life cycle, Holcman says.

Information engineering, which relies on graphical modeling and planning tools, calls for a single database to handle a certain type of data.

Applications such as a payroll or employee tracking system pull data from this central source. Systems built more conventionally usually include their own data stores even if they get some information from a central source.

This approach can reduce the amount of redundant data, cutting the costs of storage and updating, and can make it easier to introduce a new application or revise an existing one, says Les Hazelrigg, a project manager at Jack Eckerd.

While the concepts behind information engineering date back to the 1960s, implementation of the theory is a more recent phenomenon. In fact, many IS managers still resist the practice.

> "YOU CAN'T BE a cowboy out there on the range all alone."
>
> SAM HOLCMAN
> COMPUTER AND ENGINEERING CONSULTING

"Some people don't want to accept the changes the information engineer will implement," says Ron Kuznicki, manager of the automated systems environment at United Services Automobile Association in San Antonio. Such people say they have been developing systems without problems, so why adopt a new method, Kuznicki says.

Companies in a variety of industries employ information engineering. They tend to be big organizations that need the consolidation of data the method offers and can afford the expense it involves, Ray says.

The principles of information engineering are not complex or difficult to learn, Kuznicki says. IS professionals often learn these principles through in-house courses or public seminars put on by training vendors.

Prospective information engineers should have a strong mainframe background and experience in on-line systems, databases and data modeling.

They should also be excellent communicators who can extract information from people at all levels of management. "You can't be a cowboy out there on the range all alone," Holcman says.

Information engineers lead Joint Application Design sessions, which bring together users and IS people to review a system's functions, procedures, reports and screens. To lead such meetings, they need superior interpersonal skills.

Demand for specialists in information engineering and similar development methods should continue to grow with both the use of CASE and closer interaction between developers and end users, experts say. "Programming as we traditionally recognize it will disappear, and the IS professional will become more immersed in analysis," Ray says.

Kay is a business consultant and freelance writer specializing in emerging technologies and human resources.

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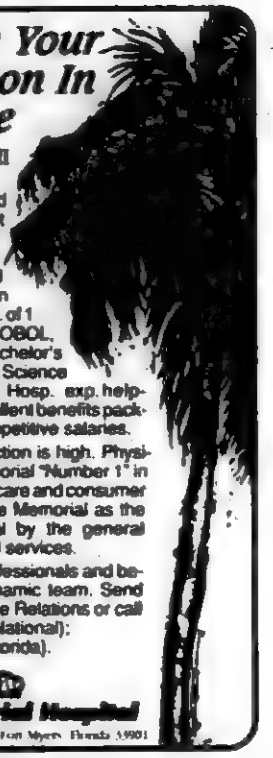

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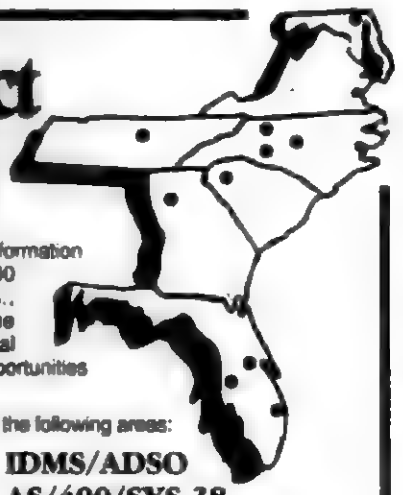

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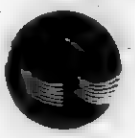

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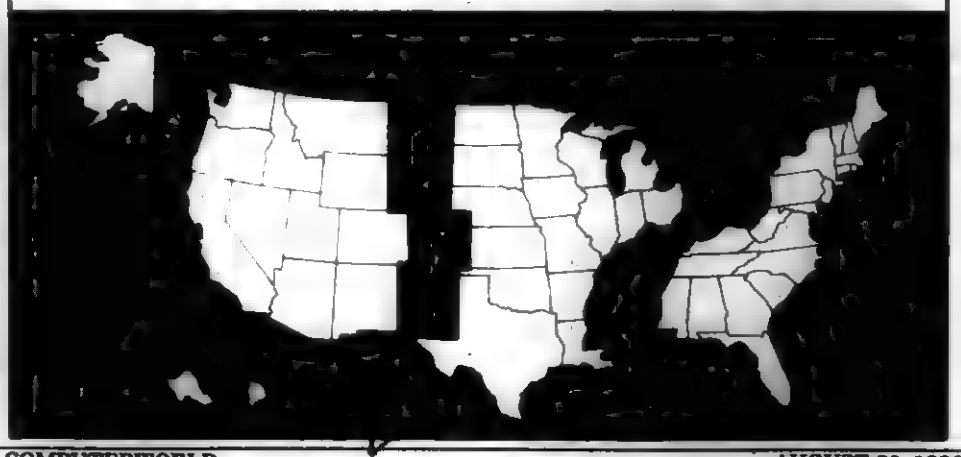

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Issue Date: October 31, 1990
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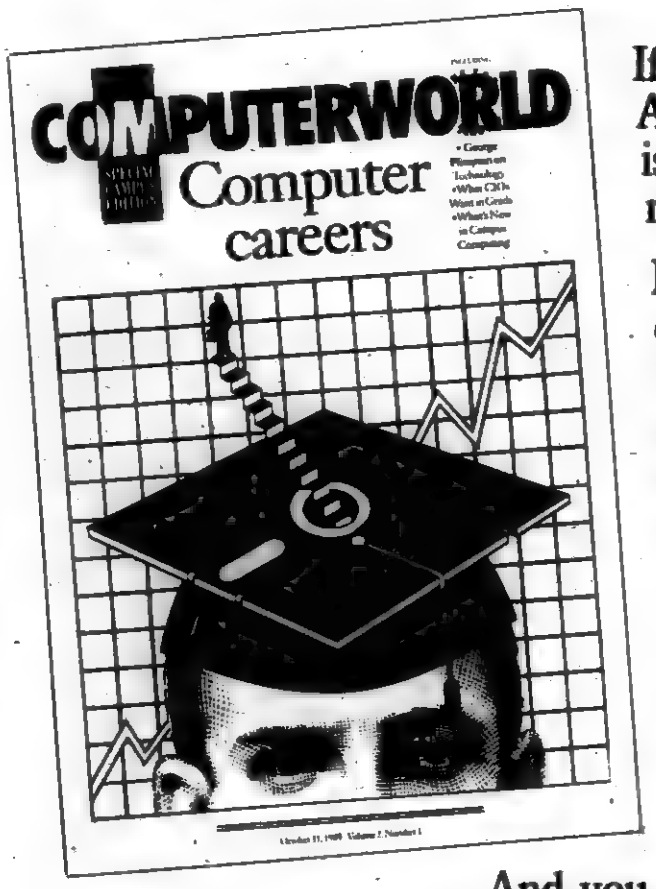

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Planned Editorial Features:

(subject to revision)

- MIS salary and job satisfaction survey
- Where are the best jobs?/What positions are hot?
- Experiences of recent MIS graduates in their first jobs and what helped them in school
- The MIS career ladder
- Profiles of acclaimed top level MIS executives
- The strategic advantage of computers and how they play a key role in running a company

MARKETPLACE

Pulling procurement together

A central staff to acquire products and services can mean big savings

BY JAMES R. TAYLOR
SPECIAL TO CW

Today, companies are finding that they must invest heavily in information technology. Their success depends on it. But the costs of the hardware, software and services that they need are bounding upward.

The challenge is complicated by a bewildering proliferation of vendors and products in the face of the requirement for a corporate architecture that is compatible, connectable and integrated.

Given this scenario, corporations can generate substantial benefits through a technology procurement organization located strategically at a single site close to executive management.

Members of this central procurement staff need specialized know-how in finance, technology and project management. They need to understand a wide range of information technologies, as well as subjects such as contract negotiations and financial analysis. They must also understand their corporation's financial "capacity" — its ability to plan and absorb costs over the useful life of technology assets.

Working with corporate management, these specialists can create and implement corporatewide procurement policies and procedures that are aligned with the firm's technical architecture and financial strategies.

Let's briefly examine a centralized procurement for data processing equipment. Hardware procurement encompasses the full life cycle of the asset, starting with a definition of needs and then continuing through product selection, acquisition, financing, installation and replacement. The process starts when a manager from one site identifies the need for upgraded or replacement equipment. He conveys the need to the central procurement staff, which can align it with the corporation's technology architecture, capacity planning and financial policy.

The central staff reviews its inventory of installed equipment, which includes locations and financial obligations. It can review the terms and conditions of existing leases, license agreements, volume purchase agreements (VPA) and master lease agreements. The staff can then submit requests for proposals to vendors, negotiate contracts and, ultimately, execute the agreements. It ensures that agreements will benefit the entire corporation.

The equipment that the staff supplies may be acquired within the corporation or from the open market. Equipment no longer required or coming off lease at another site might meet the requirements.

If so, the procurement staff may need to negotiate lease renewals or extensions or acquire replacement equipment for the site supplying the gear. Site managers establish the timing of the removal and installation; a procurement specialist ensures that the corporation meets contract terms and financial obligations.

The procurement team might make an outside acquisition through an existing corporatewide VPA, or it may negotiate a new one. In general, a centralized staff with corporatewide perspective is more likely than people at a single site to recognize opportunities for savings and act on them. By transferring equipment from one site to another, for example, one location might avoid penalties for early termination of a lease, and the other one might get preferred terms by renegotiating and extending the existing lease.

The central staff determines whether equipment will be purchased or leased using a standard analysis developed and approved by corporate management. It also negotiates leases, since the financial benefits affect all sites.

The volumes involved can bring down lease rates significantly. The staff can keep track of corporatewide activities and spread knowledge around to help drive down everyone's costs.

A central procurement staff can generate similar savings and benefits in the areas of software licenses and service agreements through techniques tuned to the nuances of these products and services. For a central procurement staff to be effective, management must clearly define and communicate its roles and responsibilities — spanning technical, financial and contract issues. Open and obvious support by senior management is crucial to help establish credibility across the organization.

Centralizing procurement can bring together a critical mass of expertise that may already exist piecemeal at scattered sites. This expertise may be in finance, technical or legal departments whose members have spent part of their time on aspects of technical procurement.

The centralized positions can be filled by selecting the best technical, financial and legal people. Centralizing the function does not necessarily mean increasing staff levels. On the contrary, it might result in a decrease in overall staff by concentrating the expertise in one location where everyone can share it.

Centralized procurement can generate savings through rock-bottom prices and aggressive lease rates. These savings can be measured in hard-cost avoidances on the basis of dollars per million instructions per second or byte of storage. The negotiating experience the staff acquires will lead to agreements and contracts that benefit the entire corporation, minimize legal risk and enforce management's financial strategies and architectural standards.

Taylor is an associate with the Center for the Study of Data Processing at Washington University in St. Louis.

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AT Model 099	$1,050	$1,375	$475
AT Model 239	$1,125	$1,325	$700
AT Model 339	$1,375	$1,400	$900
PS/2 Model 502	$1,850	$2,000	$1550
PS/2 Model 60	$2,500	$2,600	$2,400
Compaq Portable II	$975	$1,150	$875
Portable III	$2175	$2,500	$1,900
Portable 286	$1,400	$1,675	$1,300
Plus	$675	$750	$650
Deskpro	$825	$900	$800
Deskpro 286	$1,400	$1,625	$1,300
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Apple Macintosh 512	$375	$775	$375
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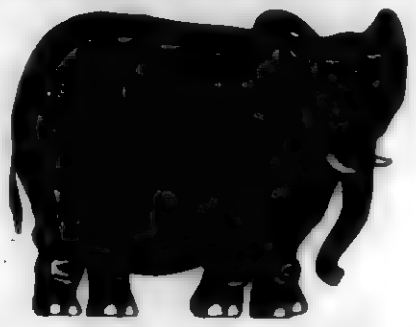

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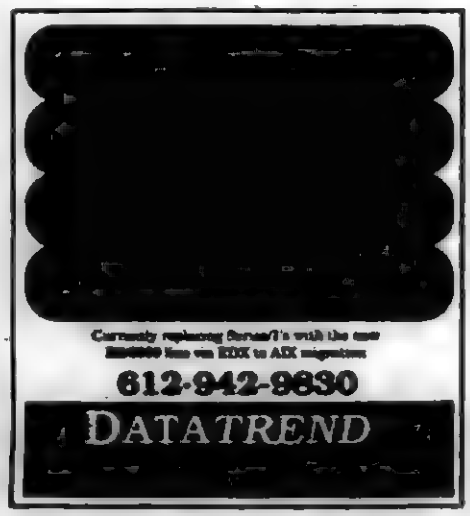

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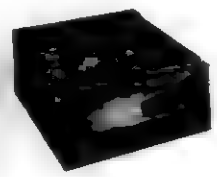

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The fine art of selling training

IS upheavals mean educators need to steal a page from marketers' book

BY STEWART L. STOKES JR.
SPECIAL TO CW

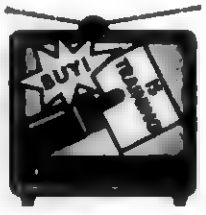
The internal marketplace for information systems training and education is undergoing fundamental changes that pose a serious challenge for training managers.

Training organizations must do more with less; they must deliver more relevant and timely education using fewer resources. Many of the organizations face a shrinking customer base as their enterprise downsizes. In addition, more and more IS professionals are dispersed among business units.

The challenge for IS training groups is to get more out of limited resources and to market their services in an innovative and disciplined way; they must direct the resources at the areas that promise the greatest payoff.

The organizations need to promote training and education as valuable resources for their customers through an internal marketing program. The goal should be to eliminate the perception of IS education as an activity that is nice to have but time-consuming and costly. Instead, the training should be presented as a resource that is timely, cost-effective and necessary.

To accomplish this goal, many organizations must give up their traditional production orientation, which focuses on the number of people who go through programs and courses. What they need is a marketing orientation that zeroes in on important target markets and on the timely, relevant and cost-effective training these markets need.



Figures such as the number of people trained in CICS may provide interesting statistics for the training department's annual report; however, they reinforce the notion that courses are a commodity and that it is best to bring in the cheapest provider. They also reinforce the impression that people who provide training are basically clerks, so their jobs can't be worth much money.

Adopting a marketing orientation involves the following three thrusts:

1. Conduct a "SWOT" analysis of training — an examination of its strengths, weaknesses, opportunities and threats.
2. Segment markets and identify target markets.
3. Develop a marketing mix to reach target markets.

The SWOT analysis should identify the training organization's distinctive competencies. Training managers should conduct a SWOT analysis of their organization and ask their key customers to do the same. They should pay attention to their customers' opinions, for it is these views that will have the greatest impact on the organization's long-term success.

The SWOT analysis leads to market segmentation and target marketing. A market segment is a distinct group of customers identified by variables such as location, function, technologies employed or volume of training services consumed.

Target markets are subsets of these segments. They tend to be more specific and focused. They should also be important to the enterprise. They may be high-priority departments, task forces, work groups or people who will be working together more closely or taking on new responsibilities. Target markets can be individuals as well as groups.

There are a few key questions for IS trainers and senior IS managers to ask as they segment and target markets for training services, including the following:

- Where can IS trainers add the most value to their customers' businesses?
- How can IS training make the greatest contribution?
- In what ways can the IS training organization build partnerships with its customers?

The marketing mix is the combination of resources used to influence target markets. A marketing mix might include literature developed for the target market, group or individual presentations, champions outside the training department who promote programs, advertising for specific programs and training events.

One training manager is reaching target markets through IS training fairs, which leverage her time and energy. She works in a decentralized firm; her customers are scattered geographically and among business units.

This manager also relies on individuals with whom she has built a training support network to help her communicate with target markets. Using her network and her knowledge of the business units, she identifies target market needs, and the themes of her training fairs reflect these needs.

Internal customers turned out en masse for one recent fair because they had been involved in the planning; thus, their interests were represented. Training vendors did the same because they knew they would face a well-targeted audience. The event earned the manager accolades from her IS management.

Coping with the challenges of a changing marketplace requires innovation in all realms of the IS world. Adopting a marketing orientation and positioning services as a valuable resource will help ensure the well-being of IS training organizations.

Stokes is a senior vice-president of QED Information Sciences, Inc. in Wellesley, Mass.

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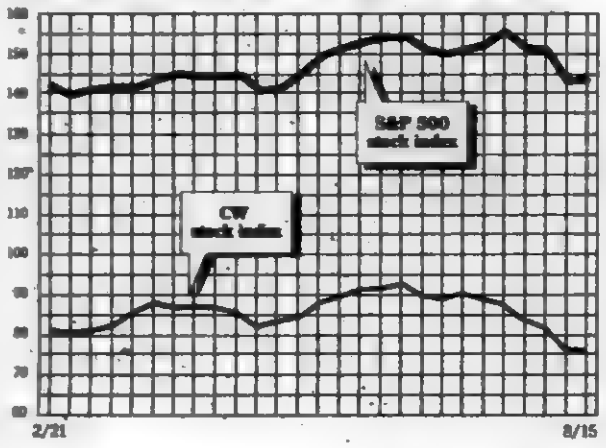

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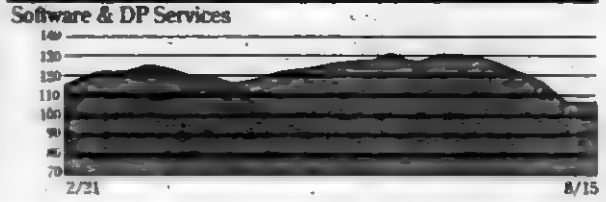

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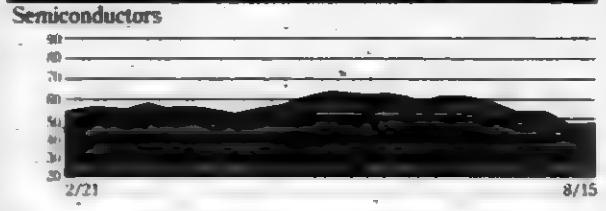

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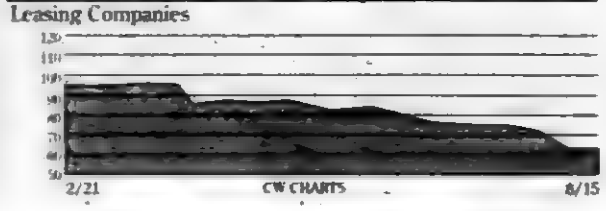

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Communications and Network Services

N	AMERICAN INFO TECHS CORP	68	55	59.875	-0.3	-0.4
Q	ANDREW CORP	28	16	16.5	-0.5	-2.9
Q	ARTEL COMM CORP	10	3	3.5	0.0	0.0
N	AT&T	47	34	35.25	0.3	0.7
Q	AVANTEK INC	7	2	2.75	-0.1	-4.3
N	AYDIN CORP	21	13	12.875	-0.4	-2.8
N	BELL ATLANTIC CORP	57	43	46.5	0.0	0.0
N	BELLSOUTH CORP	59	49	53.75	-0.1	-0.2
Q	COMPRESSION LABS INC	16	7	13.375	0.1	0.9
Q	CONTEL CORP	37	23	31.875	0.0	0.0
Q	DATA SWITCH CORP	4	2	3.938	0.4	12.5
Q	DIGITAL COMM ASSOC	27	17	19.625	-1.4	-6.5
Q	DYNATECH CORP	21	15	17.5	-0.8	-4.1
Q	FIBRONICS INTNL INC	13	5	9.25	-0.6	-6.3
Q	GANDALF TECHNOLOGIES	6	2	3	0.0	0.0
N	GENERAL DATACOMM INDS	7	3	3.125	-0.3	-7.4
N	GTE CORP	36	28	27.625	0.1	0.5
Q	INFOTRON SYS CORP	11	3	3.25	0.3	8.3
N	ITT CORP	65	51	55.75	1.0	1.8
N	M/A COM INC	7	3	4.625	-0.1	-2.6
Q	MCI COMMUNICATIONS CORP	49	31	36.5	1.6	4.7
N	NETWORK EQUIP TECH INC	34	6	7.25	0.8	11.5
Q	NETWORK SYS CORP	15	7	10.375	0.3	2.5
N	NORTHERN TELECOM LTD	30	20	26.375	0.1	0.5
Q	NOVELL INC	59	24	49	3.1	6.8
N	NYNEX CORP	92	73	76	0.6	0.8
N	PACIFIC TELESIS GROUP	52	40	42	0.8	1.8
A	PENRIL CORP	9	5	7.375	0.3	3.5
N	SCIENTIFIC ATLANTA INC	29	19	23	1.0	4.5
N	SOUTHWESTERN BELL CORP	65	51	52.75	0.0	0.0
Q	3 COM CORP	19	10	14.5	0.8	5.5
N	U S WEST INC	41	33	36.125	0.0	0.0

Computer Systems

Q	ALLIANT COMPUTER SYS	9	3	3.063	-0.8	-21.0
Q	ALPHA MICROSYSTEMS	7	2	2.125	-0.1	-5.6
Q	ALTOS COMPUTER SYS	8	5	8.125	0.0	0.0
A	AMDAHL CORP	19	11	12.125	-1.3	-9.3
Q	APPLE COMPUTER INC	50	32	39.25	-0.9	-2.2
Q	AST RESH INC	26	7	21	1.0	5.0
N	BOLT BERANEK & NEWMAN	9	4	5	0.8	17.6
N	COMPAQ COMPUTER CORP	68	37	53.375	-1.0	-1.8
N	COMMODORE INTNL	12	6	6.375	0.0	0.0
N	CONTROL DATA CORP	22	13	13.125	-0.8	-5.4
N	CRAY RESH INC	51	31	38	-2.5	-6.5
N	DATA GEN CORP	18	5	5.375	-0.8	-12.2
N	DATAPOINT CORP	6	1	1	-0.5	-33.3
Q	DELL COMPUTER CORP	14	5	12.375	1.8	16.5
N	DIGITAL EQUIP CORP	109	67	89.875	0.8	0.9
N	FLOATING POINT SYS INC	4	0	1.75	-0.5	-22.2
N	HARRIS CORP	40	28	27.25	0.3	0.9
N	HEWLETT PACKARD CO	53	36	37.75	-0.8	-1.9
N	HONEYWELL INC	112	73	99.5	1.1	1.1
N	IBM	123	93	106	1.9	1.8
Q	INFORMATION INTL INC	16	12	11.875	-0.3	-2.1
Q	IPL SYS INC	14	5	10	-0.3	-2.4
N	MAI BASIC FOUR INC	6	2	1.875	0.0	0.0
N	MATSUSHITA ELEC INDL LTD	178	118	127	2.8	2.2
Q	MENTOR GRAPHICS CORP	26	14	14.5	-0.8	-4.9
N	NBI INC	2	0	0.234	0.0	-6.4
N	NCR CORP	72	55	65	-0.3	-0.4
Q	PYRAMID TECHNOLOGY	36	13	21.5	1.8	8.9
Q	SEQUENT COMP SYS INC	34	14	25	-1.5	-5.7
Q	SUN MICROSYSTEM INC	37	13	28.25	-2.0	-6.6
Q	SYMBOLICS INC	2	0	0.375	-0.1	-25.0
N	TANDEM COMPUTERS INC	30	17	17.375	-0.3	-1.4
N	TANDY CORP	48	30	31.875	-1.6	-4.9
N	ULTIMATE CORP	11	5	6.625	0.3	3.9
N	UNISYS CORP	22	9	9.75	-0.3	-2.5
A	WANG LABS INC	7	3	3.375	-0.4	-10.0

Software & DP Services

Q	AMERICAN MGMT SYS INC	20	11	16.375	1.6	11.0
Q	AMERICAN SOFTWARE INC	18	8	9.25	-0.9	-8.6
N	ANACOMP INC	6	2	2.5	-0.1	-4.8
Q	ANALYSTS INTL CORP	24	14	17	-0.5	-2.9
Q	ASHTON TATE	15	8	8.625	-0.4	-4.2
Q	ASK COMPUTER SYS INC	12	7	9.25	0.4	4.2
N	AUTO DATA PROCESSING	60	40	51.875	1.8	3.5
Q	AUTODESK INC	60	33	48.75	-0.3	-0.5
Q	BMC SOFTWARE INC	30	14	24.75	1.5	6.5
N	BUSINESSLAND INC	14	2	3.5	-0.3	-8.7
Q	COGNOS INC	10	4	8.375	-0.4	-4.3
N	COMPUTER ASSOC INTL INC	18	7	7.25	-0.4	-4.9
Q	COMPUTER HORIZONS CORP	17	7	14	0.8	5.7
N	COMPUTER SCIENCES CORP	59	40	41.625	0.0	0.0
N	COMPUTER TASK GROUP INC	13	9	9.75	0.3	2.6
Q	COMSHARE INC	25	16	21	0.8	3.7
Q	CORPORATE SOFTWARE	16	8	12.5	-0.8	-5.7
N	GENERAL MTRS (CLS E)	38	24	32.625	2.0	6.5
Q	GOAL SYSTEMS INTL	18	10	12.5	-1.3	-9.1
Q	HOGAN SYS INC	7	2	3.25	-0.3	-7.1
Q	INFORMIX CORP	16	8	8.25	0.0	0.0
Q	INTELLICORP INC	8	4	4.25	0.0	0.0
Q	LEGENT CORP	32	19	22	0.8	3.5
Q	LOTUS DEV CORP	39	19	19.25	-1.5	-7.2
Q	MICROSOFT CORP	61	28	64.25	0.8	1.2
Q	NATIONAL DATA CORP	35	11	11.75	-0.8	-6.0
N	ON LINE SOFTWARE INTL INC	11	6	7	0.4	5.7
Q	ORACLE SYS CORP	188	15	15.625	-0.4	-2.3
N	RANSOPHIC SYS INC	19	10	10.375	-0.9	-7.8
Q	PHOENIX TECHNOLOGIES INC	6	2	2.875	0.0	0.0
N	POLICY MGMT SYS CORP	43	30	43.375	0.0	0.0
Q	PROGRAMMING & SYS INC	25	15	15.5	-1.0	-6.1
Q	RELATIONAL TECH INC	10	4	4.875	0.4	8.3
N	REYNOLDS & REYNOLDS CO	27	17	16.625	-0.6	-3.6
Q	SAGE SOFTWARE INC	16	7	12	1.0	9.1
Q	SEI CORP	22	15	19.75	0.8	3.9
Q	SHARED MED SYS CORP	17	12	14	0.9	6.7
Q	SOFTWARE PUBG CORP	28	14	23.125	-0.4	-1.6
N	STERLING SOFTWARE INC	11	7	8.875	0.3	2.9
Q	SUNGARD DATA SYS INC	28	18	21	-0.3	-1.2
N	SYSTEM CENTER INC	25	13	12.75	-0.5	-3.8
N	SYS. SOFT INC	29	16	24.75	2.4	10.6
Q	WORDSTAR	2	1	0.875	0.1	16.7

Semiconductors

N	ADV MICRO DEVICES INC	11	5	6	0.4	6.7
N	ANALOG DEVICES INC	11	6	6.875	0.3	3.8
Q	ANALOGIC CORP	11	8	9.125	-0.1	-1.4
Q	CHIPS & TECHNOLOGIES INC	28	14	14.25	-1.5	-9.5
Q	INTEL CORP	52	28	37	-0.1	-0.3
Q	MICRON TECHNOLOGY INC	16	7	9.125	-0.3	-2.7
N	MOTOROLA INC	88	53	74.75	-1.3	-1.6
N	NATL SEMICONDUCTOR	9	5	5.125	-0.3	-4.7
N	TEXAS INSTRS INC	44	28	29.5	0.5	1.7
A	WESTERN DIGITAL CORP	15	6	11	1.1	11.4

Peripherals

Q	ALLOY COMP	2	0	0.5	0.1	14.2
N	AM INTL INC	6	2	1.875	-0.1	-6.3
Q	AUTO TROL TECH CORP	5	2	2.75	0.0	0.0
Q	BANCTEC INC	24	13	18.75	0.5	2.7
A	COGNITRONICS CORP	8	3	5.5	0.1	2.3
Q	CONNER PERIPHERALS	31	11	24.625	1.1	4.8
A	DATARAM CORP	22	8	13	-2.9	-18.1
N	EASTMAN KODAK CO	51	36	42.625	1.5	3.6
N	E M C CORP MASS	7	3	5.625	0.1	2.3
Q	EMULEX CORP	9	4	8	-0.5	-7.7
Q	EVANS & SUTHERLAND	35	10	28.25	0.5	1.9
Q	ICOT CORP	2	1	1.313	0.0	0.0
Q	INTERLEAF INC	8	5	5.125	0.0	0.0
Q	IOMEGA CORP	6	3	4.8	-0.1	-2.7
Q	MASSTOR SYS CORP	4	1	1	-0.1	-11.1
Q	MAXTOR CORP	17	7	9.75	0.1	1.3
Q	MICROPOLIS CORP	10	3	8.5	-0.5	-7.1
N	MINNESOTA MNG & MFG CO	91	68	84.875	0.9	1.0
Q	PERSONAL COMP PRODUCTS INC	5	4	3.875	-0.1	-2.4
Q	PRINTRONIX INC	15	9	11.125	0.0	0.0
N	QMS INC	21	9	15.5	-0.5	-3.1
Q	QUANTUM CORP	28	9	19.125	0.4	2.0
N	RECOGNITION EQUIP INC	9	4	5.25	0.3	5.0
N	REXON INC	10	5	5.75	-0.3	-4.2
Q	SEAGATE TECHNOLOGY	20	10	10.75	-0.3	-2.3
N	STORAGE TECH CORP	35	9	21.625	0.1	0.6
Q	TANDON CORP	4	1	2.375	0.1	2.7
N	TEKTRONIX INC	22	12	13	-1.0	-7.1
Q	TELEVIDEO SYS INC	1	0	0.281	-0.1	-18.3
N	XEROX CORP	69	45	44.25	-0.4	-0.8

Leasing Companies

N	CAPITAL ASSOC INTNL INC	7	2	1.688	-0.1	-3.6
N	COMDISCO INC	34	17	17.75	-0.3	-1.4
Q	LDI CORPORATION	18	13	13.25	0.3	1.9
Q	PHOENIX AMERN INC	5	3	3.063	0.1	2.1
Q	SELECTERM INC	9	3	3.25	0.0	0.0

EXCH: N—NEW YORK; A—AMERICAN; Q—NATIONAL

Shell shock

Wars and rumors of recession send stock prices diving

Shock waves from the Persian Gulf broadsided the stock market last Thursday, and technology stocks were as hard hit as any. While the Dow Jones industrial average plunged more than 66 points on fears of conflagration in the Middle East and recession at home, computer firms either saw early-week gains turn to dust or lackluster performances turn downright abysmal.

Hewlett-Packard Co. made matters worse by announcing a 5% quarterly earnings drop on Thursday, sending its stock to a new 52-week low of 35⅞, down 1⅞ points for the four days. Digital Equipment Corp. lost two points to 67¾, barely above its low for the year. Others with new lows at Thursday's bell were Data General Corp. at 5¼ and Stratus Computer, Inc. at 18¼.

Sun Microsystems, Inc. investors were not enamored with the Sun-IBM licensing pact (see story page 8). Sun's stock fell ¾ of a point Wednesday after the announcement and closed Thursday at 27½, down 3½ points for the week. IBM gained ⅝ of a point on the news Wednesday, helping it to finish the week up 1¼ points to 103¾, despite Thursday's drop of 1¼ points.

Bad news found its way to Compaq Computer Corp., down 2⅜ points to 51½, and Intel Corp., down 2¼ points to 36. Apple Computer, Inc. fared better, losing just ¼ of a point to close at 38½.

Software took it on the chin, too. Lotus Development Corp. fell 3¼ points to 17, Microsoft Corp. lost 2¼ points to 61¾, and Computer Associates International, Inc. was down ⅝ of a point to tie its 52-week low of 7.

CLINTON WILDER

NEWS SHORTS

HP revenue up, profit down

Reflecting an unanticipated increase in tax rates and minor pressure on its profit margins, Hewlett-Packard Co.'s third-quarter revenue was up 8%, but net earnings decreased by 5%. HP expected to be taxed at a rate of 23%, but the quarter's taxes were 30%, a spokeswoman said. That made an $18 million difference between this quarter and last, on revenue of $2.48 billion. The profit margin decreased from 8% to 7.9%, according to the company. Additionally, HP noted that its work force was cut by 1,000 during the quarter, totalling 3,000 fewer staff members in the last three quarters.

Furniture maker designs EDI plan

Haworth, Inc., one of the country's leading office-furniture makers, will sit down at the electronic data interchange table next month. The $500 million firm, based in Holland, Mich., plans to spend $300,000 to $400,000 on what it calls its electronic order-processing system and expects that 80% of its orders will be processed on-line by the middle of 1991. To encourage its 300-plus dealer network, Haworth will defer about $1,500 in hardware, software and transmission costs for dealers who sign up for the program by Oct. 1.

Unix International maps strategy

During the next few months, Unix International will be releasing its plans for tackling distributed computing, network management and the Open Systems Interconnect model. "Our charter has broadened beyond the operating system," said Peter Cunningham, president and chief executive officer. He also said the organization has gotten "fantastic response" to its offer to help software vendors port their applications over to Unix. The goal is to double the current number of Unix applications to 30,000 by 1993. About 50 vendors have already begun porting their applications, and another 800 are interested in doing so, Cunningham said.

Intex prepares 1-2-3 add-in

When Lotus Development Corp. ships 1-2-3 Release 3.1 in a couple of weeks (see story, page 16), add-in developer Intex Solutions, Inc. will be ready with compatible versions of eight add-in products: Forecast, Inventory Analyst, Rescue Plus, Trans for 1-2-3, Financial Toolkit, Intex Bond Calculations, Intex Mortgage-backed Calculation and Intex Option Price Calculations. Also slated for upgrades are 1-2-3 Release 3.0-compatible products @FunctionsIII and Guardian. Release 3.1 versions are slated to ship by year's end.

Lotus plans CPA programs

Lotus will co-sponsor a continuing professional education course for certified public accountants through state CPA agencies. "Lotus Update for CPAs" will be offered at more than 30 locations nationwide. The course addresses the application of software to common accounting problems and uses 1-2-3 Releases 2.2 and 3.1 as a platform for the curriculum. Attendees will learn how to integrate 1-2-3 with other packages. Co-sponsors include the state agencies and several high-technology companies. Participants will be awarded credits toward the annual continuing education requirements of the state CPA societies.

Fujitsu broadens ISDN support

Fujitsu Network Switching of America, Inc. has become one of the first vendors to offer terminal adapters that connect to Integrated Services Digital Network (ISDN) services based on either AT&T's or Northern Telecom, Inc.'s central office ISDN switch. Fujitsu has added support of Northern Telecom's DMS 100 to its two existing ISDN adapters, which enable user devices to communicate over an ISDN Basic Rate Interface. Users can configure the adapters to connect with either a Northern Telecom or AT&T switch by changing a feature cartridge, Fujitsu said.

NY State Police round up hackers

BY MICHAEL ALEXANDER
CW STAFF

The New York State Police rounded up 13 alleged computer hackers last week — including a 14-year-old boy who is accused of breaking into a U.S. Air Force computer at the Pentagon — and charged them with computer tampering and computer trespassing.

The hackers are suspected of altering some files and deleting others in a mainframe computer at City University in Bellevue, Wash., according to Donald Delaney, senior investigator and supervisor of the major case squad at the state police barracks in East Farmingdale, N.Y.

The hackers allegedly used an 800 number to break into the computer, making it easy to identify them, Delaney said. More than 40 hackers reportedly broke into the system, but only those who allegedly spent "an extended period of time," in the computer were arrested.

Eight of those arrested were juveniles, Delaney said. Police plan to arrest three more hackers this week and "probably more" later, he said.

Police seized computers, modems and other gear used in the break-ins from the homes of the 13 hackers.

Pentagon break-in

One of the hackers, a 14-year-old boy who used the handle Zod, is also accused of breaking into a Unix-based superminicomputer at the Pentagon.

He is alleged to be a member of a hacker group called MOD, an acronym for Masters of Disasters and Mothers on Drugs, among other appellations.

"The information gleaned from the computer is of unclassified, administrative nature," said Major Steve Headley of the Air Force investigations office at Bollings Air Force Base in Washington, D.C. "However, the office of special investigations of the Air Force is concerned primarily that the act was criminal of itself and . . . while it was innocuous, unclassified stuff, in aggregate, over a long period of time, it could have meaning or be perhaps sensitive." How and why the break-in occurred remains to be determined, Headley said.

The arrests came after a two-month investigation by a number of agencies, including the New York State Police, the Air Force Office of Special Investigations and the U.S. Secret Service.

Database

FROM PAGE 1

However, the legislation has been stalled by opposition from the chemical and trucking industries, as well as skepticism among legislators about whether a costly new computer system is needed. The firefighters have simply not made a compelling enough case for the system, according to Jeff Yohn, executive editor of "Hazardous Materials Transportation," a newsletter based in Arlington, Va.

Firefighters and other emergency personnel argued that, when faced with a hazardous chemical emergency, what they need most is fast, reliable information about the chemicals.

Unfortunately, the truck's paper manifest may be burned or inaccessible at the accident scene, and the government-mandated placard — those diamond-shaped warning signs — may be missing or obscured. Moreover, government studies have found that the placards are missing or incorrect between 25% and 50% of the time.

The computer system that the firefighters have in mind would provide emergency personnel with dial-up access to a mainframe database of electronic manifests, providing details about the contents of every hazardous material shipment. The information could be downloaded either by the local dispatcher or by on-site personnel with a computer or facsimile machine.

All generators of hazardous materials would be required to file an electronic manifest and pay a fee of approximately $10 to $12 to support the system.

Supporters have not produced an estimate for the cost of the system, but they noted that the only cost to the U.S. government would be the competitive contract to build the system. The cost to the chemical industry, if the filing fee is $12 per manifest, would be an estimated $2.1 billion per year.

The proposal is embodied in a bill sponsored by Rep. Douglas Applegate (D-Ohio) as well as 200 co-sponsors. John F. Mulholland, an entrepreneur who has been pushing for the system for five years, claimed that his company, Source Data Network, Inc. in Rockville, Md., already has an IBM mainframe data center ready to provide the service.

Actually, Coogress did require a central information center in the Hazardous Materials Transportation Act of 1974, but the U.S. Department of Transportation decided to piggyback on a system called the Chemical Transportation Emergency Center (Chemtrec), which is run by the Chemical Manufacturers Association in Washington, D.C. (see story below).

Chemtrec's emergency hot line provides details on 570,000 chemical products and can put authorities in touch with various industry experts, but firefighters complain that it is virtually useless in cases in which the emergency responders do not know what chemical is in the truck. The fact that the Chemtrec system has worked well in many accidents is one reason that the Applegate bill has stalled. "If there was a real pressing need or Chemtrec wasn't working, [the Applegate bill] might have a better chance of passing," Yohn said.

At the moment, it appears that both the House of Representatives and the Senate will pass legislation authorizing a study of the issue, but not the Applegate bill, Yohn said.

The chemical manufacturers and the American Trucking Association have fiercely opposed the Applegate bill, claiming that it is too costly and unnecessary and that the system might be faulty because of data-entry errors or downtime. Supporters disagreed on all counts.

Hazardous details

The chemical industry's emergency information center has upgraded its computer systems to include a Filenet Corp. optical disc storage-and-retrieval system, which handles 570,000 data sheets on chemical products, according to Henry J. Sener, the center's director.

When emergency personnel call the telephone hot line at Chemtrec in Washington, D.C., staffers retrieve an image of the proper data sheet and can send a copy via Filenet's Fascimile Server to an on-site fax machine.

In addition to the imaging system, Chemtrec has a Novell, Inc. local-area network with six IBM Personal System/2 Model 70 microcomputers; this system is used as a database of industry experts and report-generated incidents, according to Sener.

MITCH BETTS

Summit key: Smooth migration

BY ROSEMARY HAMILTON and MARYFRAN JOHNSON
CW STAFF

With the expected unveiling of its Summit line next month, IBM will position its large-system strategy for the next several years in one giant sweep, observers said.

"There'll be about 130 products. . . . This is probably the largest large-system announcement of the decade," said Jim Cassell, an analyst at Gartner Group, Inc., which has pegged the date of the announcement for Sept. 5. "They will replace the 370 product line from 3 [millions of instructions per second] to 200 MIPS in one day."

The announcement will include the long-expected 3090 follow-on, commonly referred to as Summit. The system is expected to feature some initial capabilities of the future large-system concept that IBM sketched out last month [CW, July 3]. To that end, users and analysts said they expect some initial clustering and specialized processor capabilities to be unveiled.

IBM is expected to offer some capabilities, such as fiber-optic channels, as features on the new system and enhancements to the existing 3090 J line. In addition, the company is expected to provide an upgrade package to 3090 J users that would allow them to move more easily to the new generation with their existing equipment.

"What IBM will do is add more [thermal conduction modules] to the processor, and the channel technology will change to fiber-optic," said Terry Lowder, vice-president of technical research at Columbus, Ohio-based Banc One Corp., which has been briefed on what to expect.

The move to fiber-optic cabling from copper wire will double the throughput from the current 4.5M byte/sec. to at least 10M byte/sec., he noted.

"All this is setting the stage for sysplex processors — allowing computers to talk directly, to be attached at the memory level," Lowder explained.

The sysplex feature, which is soon to be announced but will be limited in its implementation at first, according to analysts, is designed to allow multiple machine partitions to act as a single-system image. An early use of sysplex would be to boost the performance of IBM's DB2 relational database management system.

Easy migration

Software migration to the Summit machines should only be a problem for shops that have not moved to MVS/ESA, said Doug Underhill, assistant vice-president of technical services at CSX Techology Corp. in Jacksonville, Fla., which has four 3090 Model 600Js, one Model 600S and two Model 600Es.

"I would expect that users with MVS/XA would continue to run, but they can't take advantage of the new hardware facilities," Underhill said. "Our experience has been that if you keep the software and hardware at the same level, the compatibility is quite good."

"I believe they will make the upgrade to the J transparent, though you'll pay for what you get, of course. But we're not expecting any major problem in making that transition to Summit," said William Anderson, chief information officer at Prudential-Bache Securities, Inc. in New York.

While the IBM 3090 J-Prime may be evolutionary rather than revolutionary, its appearance aids long-range planning for some information systems managers.

"In terms of asset management, getting something that would evolve would be a good idea. Acquiring short-term capacity is never cheap," said Neal Franking, director of information services at Intel Corp. in Folsom, Calif.

Senior West Coast editor Jean S. Bozman contributed to this report.

3090

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to existing 3090 J systems, will create an initial Summit system.

"That's taking the J-level machine, adding some parts to it, and it'll become phase one of Summit," Moore said. "It has the same serial number [as the existing J]. That will be delivered early. Then late next year will be the real Summit."

In all, IBM wants a gradual transition in its product line to avoid disturbing the market too dramatically. "IBM is making a 20% to 30% performance jump from the 3090 J to Summit. That's only about one year's worth of improvement, in comparison to earlier product transitions," said Frank Gens, vice-president of Technology Investment Strategies, Inc. in Framingham, Mass. "That's because IBM believes that a two-time jump in performance would be too big a [financial] bite for many customers to swallow."

Summit's overall pricing scheme will likewise send a signal to IBM's mainframe customers about the future of the 3090 line, other users noted. A Summit machine with a premium price will tell users that the 3090 has some robust years of life ahead of it, while a more aggressive price will indicate the 3090's demise.

Lowder said he expects the price per MIPS to eventually hit $75,000, rather than the $100,000 to $120,000 per MIPS that many industry analysts are predicting.

While other users said they expect an initial cost factor of $100,000 per MIPS and a drop next year to about $90,000 per MIPS, William Anderson, chief information officer at Prudential-Bache Securities, Inc. in New York, noted that IBM "has to get aggressive to stimulate the move" of users up the mainframe line. Prices per MIPS falling down to $75,000 would be a sure sign of that kind of aggression, he added.

An IBM spokesman would not comment on the expected announcement but provided a copy of a speech presented by Bernard Puckett last week at the IBM Share user group meeting in New Orleans. Puckett is president of IBM's Data Systems division, and his speech shed more light on the company's plan for the J models.

Puckett said that IBM has "designed the J series so it is IBM's strategic platform, with a very useful life now and in the future."

"From this J platform," he added, "customers will be able to take advantage of the performance and function of future processor families, either through upgrades or by adding features to the 3090 J."

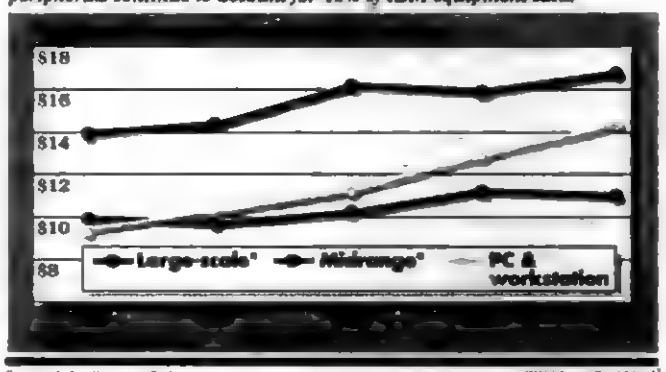
"We are happy the solution is going to protect our investment in IBM," said Anderson, who was briefed on the Summit announcement and said he liked what he heard. His data center has several 3090 Model 600s.

Not everyone is that enthusiastic about the initial Summit rollout. "Since we're not going to upgrade in the next 12 months, it wouldn't be an attractive package to us," said an IS manager at a Chicago-area IBM 3090 shop. "It seems that IBM wants to log some more money in the fourth quarter, but I'm not sure that buying a J-Prime now would be good for us." The user was briefed on the J-Prime announcement by an IBM sales representative in early August.

Senior Writer Maryfran Johnson and Senior West Coast Editor Jean S. Bozman contributed to this report.

The driving engine

While revenue from PCs and workstations is growing, mainframes and peripherals continue to account for 40% of IBM equipment sales



Source: Labe, Simpson & Co. CW Chart: Paul Mack

On the horizon

The following are other highlights IBM customers and analysts said they expect to see unveiled in early September:

- A new release of DB2 — possibly skipping the anticipated Version 2.3 and moving right to Version 3.1 — will feature more functions for distributed database management.
- A new version of the MVS operating system, called MVS/SP Version 4. This is reportedly an enhanced version of MVS/ESA that will support all the new features provided on Summit machines, including support for communications between multiple PR/SM partitions of main memory.
- The initial pieces of IBM's system management architecture, which has no official name yet but may acquire one by announcement time, will be introduced with features such as security enhancements, change management, version control, automated system operation and additional storage management tools.
- The IBM 4391, a follow-on to the IBM 4381 that will reportedly run at more than 20 MIPS — a dramatic boost from the 4381's 8 MIPS.
- New fiber-optic cabling will allow disk-drives to be placed up to 9km away from the central IBM 3090 complex. The serial fiber-optic channels do away with the electrical resistance in the old copper-wired channels that had limited CPU separations to 500 feet or less.

'Let's make a deal' pitch may bridge IBM generation gap

BY JEAN S. BOZMAN
CW STAFF

IBM salespeople have been wheeling and dealing in recent months in an effort to stem the placement of IBM plug-compatible mainframes made by Amdahl Corp. and Hitachi Data Systems Corp.

Analysts said IBM's dual-fold motivation is to ensure that the data center remains in the IBM fold at a time when there are few features differentiating vendors and to tie a hefty discount to a user's commitment to eventually upgrade to Summit.

"There have been occasions when IBM's discounting has gone to 45% or 55%," said Frank Gens, vice-president of Technology Investment Strategies, Inc., in Framingham, Mass. "That's why IBM is dying to get into the next [mainframe] product."

The deals will continue, it seems, because IBM is indicating that the first Summit machines are "place-holders" for more powerful models due out in 1991. Many customers reported that they have been offered before-Summit price reductions — after signing nondisclosure papers, of course. One customer said an IBM representative offered a "market-basket" combination of IBM 3090 J-Prime features and reduced prices on IBM 3490 tape drives.

The no-holds-barred atmosphere has proved exhilarating for many. "Instead of jumping up and down over Summit, customers are jumping up and down over the deals they can get from IBM," said Mike Egan, a senior analyst at Meta Group, Inc. in Westport, Conn. "We've heard about discounts as high as 50%, as well as up-front discounts on the J-Prime machines."

IBM offers System/36 users new tune

BY MARYFRAN JOHNSON
CW STAFF

NEW YORK — IBM is going fishing tomorrow, and its juiciest piece of bait is AS/Entry — the first field-upgradable system designed to lure reluctant System/36 users into the midrange waters of the Application System/400.

With an internal code name of "Yukon" — an unintentional pun on the frosty reception System/36 users have given previous low-end AS/400s — the new model is actually an enhanced System/36 that runs the SSP operating system but can be bumped up to the AS/400's operating system with a board swap. The new entry model replaces the current AS/Entry, which is an enhanced System/36 Model 5363 with no upgrade capabilities.

In introducing the AS/Entry 9402 Y10 and two new low-end AS/400s, IBM is dropping the price of admission to its premier midrange line to well under $20,000.

The exact prices were still a deep secret last week, however — even among the software developers and customers already using the new machines.

"Users are really excited about the lower price point and about the field-convertible system," said Rodger Peck, president of Common, a 4,500-member user group for the IBM midrange. The new models will be accompanied by lower-tier prices for AS/400 software — another boon for users, he said.

Of more general appeal to the AS/400 base, now estimated at 85,000 systems worldwide, are enhancements in networking and communications software, a new version of the OS/400 operating system that allows disk mirroring and performance and memory "kickers" for the high-end Model 70. New versions of Cobol, Fortran and C programming languages will also be unveiled, several sources said.

"There is a tremendous amount of new features [in this release of the operating system] that are very impressive, just in the sheer volume of new things," said Rich Hollahan, network manager at Atlanta-based Georgia-Pacific Corp., which runs a network of 55 AS/400s. "I would have liked to have started today with Release 3.0 rather than 1.2."

Yet Hollahan scoffed at the notion that IBM is calling AS/Entry an "upgradable" system when a user must change operating systems. "At some point, you've got to cross over, and that's where you run into problems," he said. "If you're running [System/36] code and the [System/36] operating system, you have to convert that."

Industry analysts said that tomorrow's announcement is the most aggressive assault the computer giant has made on its recalcitrant base of roughly 250,000 System/36 users, many of which are small businesses that refused to swim upstream to the AS/400.

Allright Corp. in Houston is one example. Don Whalen, data processing manager at the parking lot and garage management firm, has been relying on a System/36 as the company's main processor since 1985.

"We are pretty interested in this announcement. We're going to have to do something soon because I'm running out of capacity," he said last week. His two-person department runs all in-house applications, which handle financials, payroll and billing for 2,000 Allright lots and garages in 80 cities.

The two choices Whalen is weighing now are keeping his workhorse System/36 and offloading just a few applications to a new low-end AS/400 "or biting the bullet now" by moving into a midlevel model such as an AS/400 Model B45.

For System/36 users thinking of migrating to the AS/400, a particularly alluring piece of the new OS/400 is supposed to be "Operational Assistant," a System/36 lookalike shell that reportedly disguises the complexities of the AS/400's operating system.

"That is a very important feature, because a [System/36] user can practically operate his system in his sleep," Peck said. "The slightly different commands on the AS/400 make that sense of command disappear."

"Anything making this a friendlier operation is welcome" for both AS/400 and System/36 users, said Dennis Klinger, vice-president of MIS at Ryder Truck Rental Co. in Miami.

"IBM clearly has a strategy to bring in that [System/36] market, and while I'd like to see some bigger AS/400s, I think the low-end systems will help us expand into areas that have been tough to get at," Klinger said. "What I really care about is, does it make business sense?"

Low-end focus

IBM is expected to announce three low-end AS/400 systems Tuesday at an entry price below $20,000

System	Memory	Disk storage	Operating system	Maximum workstation attachment
AS/Entry 9402 Model Y10	1M-2M bytes	160M to 640M bytes	SSP	28
AS/400 9402 Model C04	8M-16M bytes	640M to 960M bytes	OS/400	14
AS/400 9402 Model C06	8M-16M bytes	640M to 1,280M bytes	OS/400	58

CW Chart: Paul Mach

Midrange CASE rookie takes the field

BY MICHAEL FITZGERALD
CW STAFF

MINNEAPOLIS — A new player entered the market for midrange computer-aided software engineering (CASE) tools last week with the release of Unix-based CASE tools for a broad array of IBM systems, as well as Unisys Corp. mainframes.

Lawson Associates, Inc., a vendor of financial software for midrange and large IBM systems and Unisys mainframes, said its Universe/CASE tool is designed to automatically generate RPG III code for IBM's System/38 and Application System/400 series systems. The product, informally dubbed Android, will also generate Cobol code for the IBM 4300 and 3090 mainframe series and for Unisys A series mainframes, the company said.

Vaughan Merlyn, an analyst at CASE Research Corp. in Bellevue, Wash., raised an eyebrow at the breadth of the product's code-generating abilities.

"No one else is doing that," Merlyn said, referring to the range of systems included in the CASE product's scope.

Lawson has developed software that will import definitions from AS/400 DDS files, Unisys DMS2 files and IBM mainframe VSAM and DB2 files into its dictionary. The company also introduced a complementary Universe/Report Writer, dubbed Microid.

The menu-driven Universe products are intended for use in so-called middle CASE (data modeling and program report definitions) and lower CASE (code generation, documentation and database specification) applications.

Beta-test users agreed with Lawson's estimates that Android will generate between 25% and 95% of the code required for specific programs. The product generates 95% of the code needed for inquiry or on-line maintenance programs, with one user reporting nearly 100% code generation. It reaches between 90% and 95% generation on report-type programs.

For batch programs, though, the code-generation capabilities are said to be much lower. Lawson said it expects to have a program module to correct its batch deficiencies by the end of the first quarter of 1991.

A standing-room-only crowd came to see a beta-test user presentation on the products, which did not surprise analysts, who said the market for midrange CASE tools is underserved.

"People in the midrange world are very eager to get on the CASE bandwagon," commented Robert V. Binder, a principal at Chicago-based firm Robert Binder Systems Consulting, Inc.

Beta-test user David Denes, director of MIS at Davey Tree Experts Co. in Kent, Ohio, said he obtained the Lawson product in November 1989 and is already using Android for mission-critical applications.

For instance, the company, which earns about half of its revenue from public utilities, needs to develop time reports and payroll and billing routines that meet the requirements of each of its 50 to 60 utility customers. Using traditional methods, Denes' staff completed four utilities in 18 months. With Android, the first utility was finished in two months, and Denes said he expects to see development time go below one month in the future.

Other midrange CASE vendors include Synon, Inc.; System Software Associates, Inc. in Chicago; and Summit Technologies, Inc. in Westmont, Ill.

IBM's Repository blueprint details fuzzy around edges

IBM will release a customer document within the next few weeks that explains its information model, the blueprint to its strategic Repository Manager. However, it has yet to decide just how public the actual model specifications will be.

According to a company spokesman, IBM is currently reviewing its options on delivering the specifications to the model, which is not only a key piece of Repository Manager, but also the framework of IBM's overall application development strategy, AD/Cycle.

Currently, specifications are available only when a customer licenses Repository Manager, which costs about $4,500 per month on a high-end 3090.

Industry observers contacted last week said IBM is caught between a desire to promote AD/Cycle as the industry standard and to maintain some control over the information model.

"To me, open means published, and the specifications should be available," said Ali Hazzah, president of Safe Harbor, Inc., a consulting firm in Pelham, N.Y., that focuses on data modeling.

"The intent is to have an open architecture, so we are looking at the best possible ways to do that," the IBM spokesman said.

ROSEMARY HAMILTON

Second-class postage paid at Framingham, Mass., and additional mailing offices.
Computerworld (ISSN 0010-4841) is published weekly, with a single combined issue for the last week in December and the first week in January by CW Publishing/Inc., 375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171.
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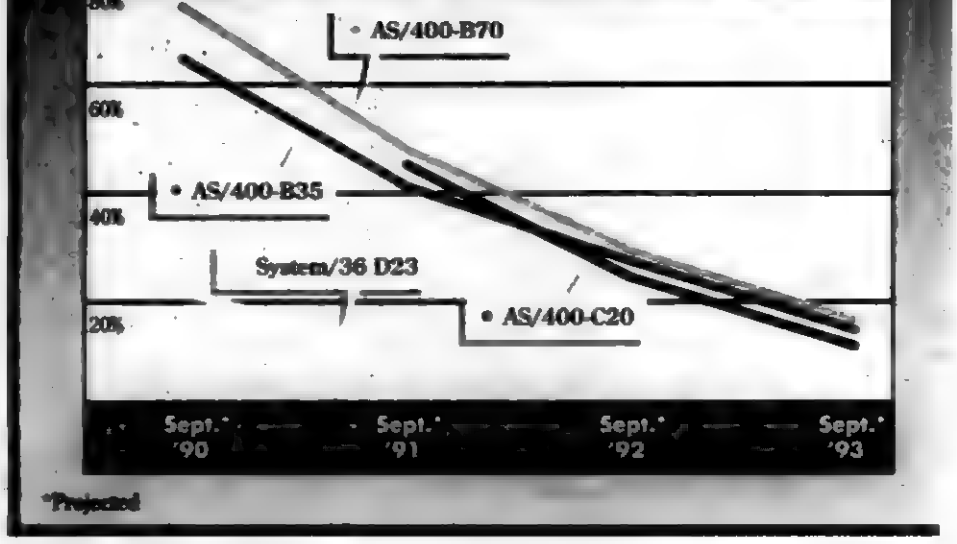
TRENDS

Estimated residual values of selected IBM processors as reported by Computer Economics

Model	List price	Residual value: Current used price	Sept. '91	Sept. '92	Sept. '93
AS/400-C20	$63.3		$15.2	$8.0	$4.0
AS/400-B35	$88.7	$16.7	$11.7	$7.7	$3.9
AS/400-B60	$144.4	$110.0	$71.2	$39.1	$19.9
AS/400-B70	$319.3	$240.0	$152.0	$82.6	$50.8



Source: Computer Economics, Inc., Carlsbad, Calif.

CW Chart: Paul Mock

INSIDE LINES

And let's not forget the 9370

There seems to be an internal contest going on at IBM as to which of several low-to-midrange lines gets to be the "ultimate distributed processor." The RISC System/6000 and Application System/400 divisions seem to be racing to make their systems more "open" to the non-IBM world; upcoming introductions will make the AS/400 more viable in RS/6000's world of manufacturing, research and development and Ethernet. Now we hear that IBM plans to reintroduce the 9371 as the "ultimate distributed processor" next month, believing it didn't do the system justice the first time around. We also hear that at least one customer, Sears, got its 9371s at the bargain price of $20,000 apiece, hardware and software included.

Tear off the first sheet

It's official: Airis Computer, the saucy start-up notebook computer maker, will not ship its low-cost, high-powered notebook computer at the end of this month. A weary-sounding Jeff Maziarek, Airis' co-founder, said that the machine will hit the streets in late September or early October, two months later than the company's stated 10-month deadline.

In need of family counseling?

The word on Compuserve is that IBM will ship OS/2 1.3, which got its first glimpse of the world at a spring trade show, in October. IBM had a few heated words to say about Microsoft's soft-pedaling of OS/2 1.3, the 2M-byte version of OS/2 Standard Edition they jointly developed, admitted Steve Ballmer, Microsoft's software vice-president. If you'll recall, after IBM lived up to its November promise by proudly unveiling a sleek OS/2, Microsoft promptly took the wind out of Big Blue's sails by questioning the need for it, and suggesting its next release of OS/2 would be 2.0. "If you come up with a 350K savings in OS/2, do you have a legitimate, credible 2M-byte system? You can make the call," Ballmer said, implying that Microsoft already has. Pressed to comment on the apparent lack of unity, a candid Ballmer said, "We used to go to great pains to hide [disagreements]. But I have to admit that we have not done this for the last three to four months."

That's a big 10-4

The first big name to go sans wires in networking will be NCR in Dayton, Ohio. NCR will announce its spread-spectrum radio-linked local-area network a week from today. The field thus far has been dominated by start-ups and niche players.

SNAppier network plans

IBM apparently has finally recognized the burgeoning demand for a nice, intelligent box that lets LAN users talk both to Systems Network Architecture (SNA) systems and to other LANs via popular protocols such as Transmission Control Protocol/Internet Protocol (TCP/IP) and Open Systems Interconnect. The vendor is expected next month to endow its 3174 with the SNA peer protocol PU2.1 so that LANs attached to a 3174 can talk to each other directly, without the usual awkward side trip through the nearest host or front end. IBM also is rumored to be readying a hybrid that combines the 3174's SNA support with the 3172 controller's support of popular networking protocols.

High-flying flatfoots

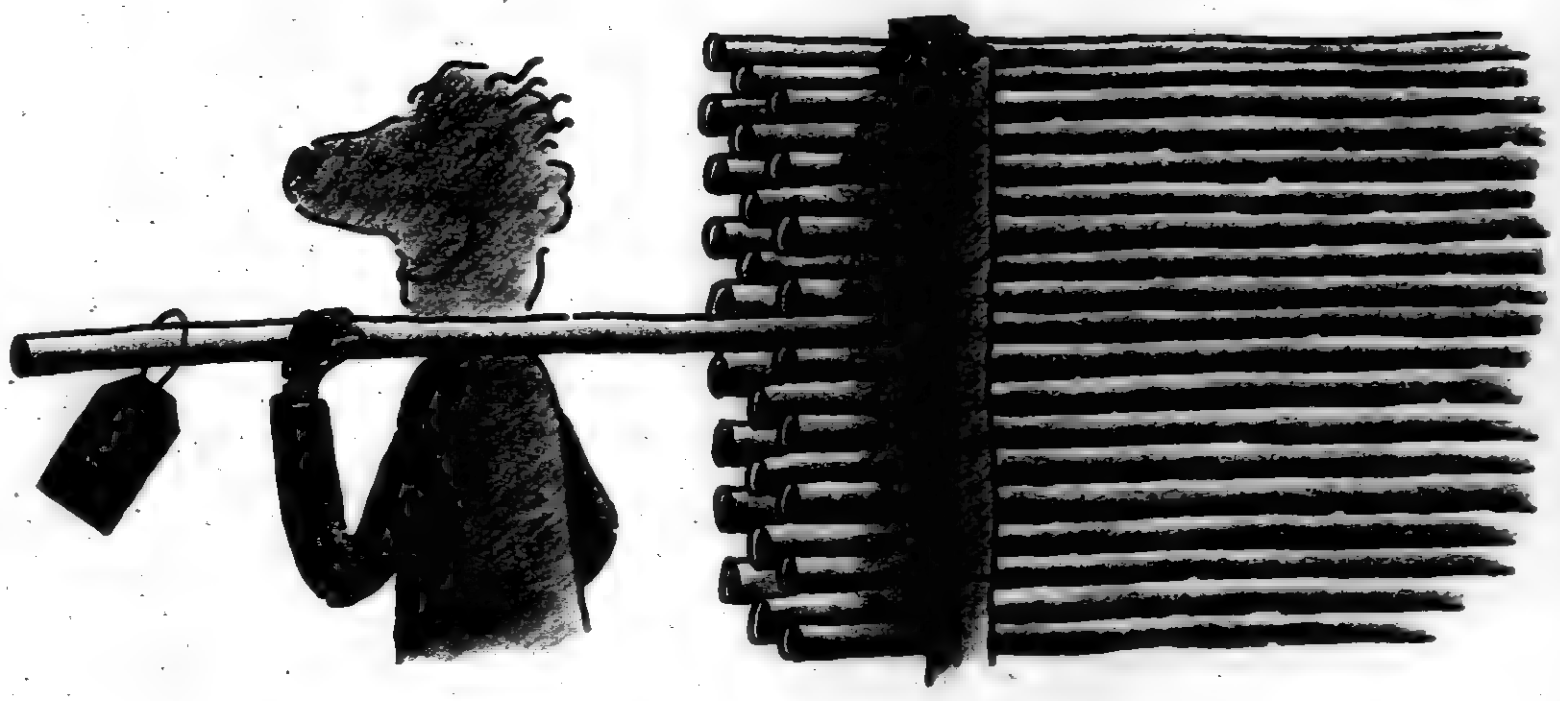
When a young computer hacker broke into an unclassified computer at the Pentagon last November, the U.S. Air Force was quick to draw a bead on him. The Air Force's Office of Special Investigations (OSI) is the only federal agency with a full-time staff of computer crime investigators, according to the OSI. There are 14 Air Force computer crime cops stationed at air bases around the world. The group was instrumental in tracking down the Hannover hacker, profiled in *The Cuckoo's Egg* by Clifford Stoll.

So, is Summit a revolutionary leap forward in the computer age, or a wimpy effort by IBM to move forward while dragging along the burden of its mainframe success? You'll be making the call, and we're here to hear it. Drop your opinions on News Editor Pete Bartolik by contacting COMPUTERWORLD *on MCI Mail, faxing your views to 508-875-8931 or calling toll-free 800-343-6474.*

NEXT WEEK

In many companies, the person who sets the standards for personal computers and local-area networks purchases is the one who yells the loudest. Not so at Martin Marietta Corp., where 35-year-old **Alan Soucy** developed and maintains a rigorous, objective standards-setting process. Read the inside story in Manager's Journal.

"Let the customer do it." Increasingly, that's the attitude taken by many organizations that use technology to enhance profit margins and customer service. Next-generation automated teller machines, grocery self-checkout and self-serve photo kiosks are but a few of the innovations now in use. Check out the whole story in In Depth.



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THE NEWSWEEKLY OF INFORMATION SYSTEMS MANAGEMENT
August 27, 1990 · Vol. XXIV · No. 35 · 116 Pages · $2/Copy · $48/Year

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Automated problem detection is promised with new IBM software service product. Page 104.

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Computer Associates product blitz pumps up systems software suite for IBM mainframes and DEC's VAX. Page 103.

Compaq, despite ravenous competition and a desolate domestic market, has hardly missed a beat as it approaches the close of its first decade. Page 81.

Feds, users diverge on state of OSI

BY ELISABETH HORWITT
CW STAFF

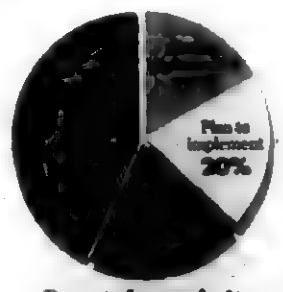
WASHINGTON, D.C. — Phase 1 of the Government Open Systems Interconnect Profile went into effect on schedule this month, signifying a U.S. government vote of confidence that there are indeed sufficient commercial OSI products available to serve users' needs. However, some users, both inside and outside the government sector, apparently do not entirely share the government's view.

"We are telling federal agencies that while GOSIP will not satisfy all their data processing and communications needs right away, they must procure services and products from vendors that conform to OSI standards rather than implementations that provide the same services but lock you into that vendor," said Jerry Mulvenna, a manager at the National Institute of Standards and Technology who helped develop GOSIP. "We definitely believe that there are enough products for GOSIP 1"

Continued on page 8

Opening up

Open Systems Interconnect is on the minds of many, with more than one-third of surveyed IS organizations already implementing or planning to implement the protocols



Percent of respondents (Base: 200)

Source: Business Research Group
CW Chart: Paul Mock

IBM to unify systems tools

BY ELISABETH HORWITT
CW STAFF

WHITE PLAINS, N.Y. — As part of the product wave it is expected to unleash early next month, IBM will blacken in some of the lines of the systems administration framework that it has been talking up to key user and vendor groups for more than a year now.

The scheme promises to allow users to correlate and coordinate such administrative functions as security, updates and reconfiguration, troubleshooting, asset management and capacity planning across all aspects of an enterprisewide computer installation, including networks, databases, applications, hosts and storage systems, according to sources.

Called Systemsview, the initial offering will define a consistent data model and user workstation interface structure for administering the full range of information systems "disciplines," said Don Haile, IBM's enterprise systems director of software systems.

The six disciplines defined by IBM as "areas that customers need to focus on as they manage their systems" are problem, change, configuration, performance, operations and business management, Haile said.

The framework will reportedly extend across existing IBM systems administration tools as well as IBM's network management platform, Netview. Among the more solid of IBM's Systemsview announcements next month, according to sources, will be the following:

- Products that assist in software distribution, including a delivery manager that will enable the host system to remotely control personal computers and automatically download software.
- A data structure, based on SQL, that will be used to collect

Continued on page 104

Update will extend DB2's distributed capabilities

BY JOHANNA AMBROSIO
CW STAFF

ARMONK, N.Y. — IBM's Summit mainframe announcement next week will also feature a new version of DB2 that incorporates features for distributed database management among different machine classes, sources said.

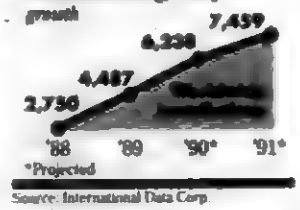
Users of DB2 Version 2.3 will be able to read and update an IBM SQL/DS database from within a DB2 application, the sources said. In comparison, the current release of DB2 has the ability to read and update only another DB2 database.

IBM has said it will roll out the ability for DB2 to communicate with all of its other strategic database managers over time. In the meantime, said Shaku Atre, partner at the consulting firm Atre/Computer Assistance in Rye, N.Y., IBM will announce

Continued on page 104

Still climbing

DB2 installations are projected to continue strong, steady growth



*Projected

Source: International Data Corp.

Opening up

IBM to license OS/400 internal interface code. Page 8.

'Lite' version of OS/2 due next month

IBM's intentions get software developers busy but leave users skeptical

BY PATRICIA KEEFE
CW STAFF

A determined IBM is gearing up to introduce a 2M-byte version of OS/2 Standard Edition, priced under $200, late next month, according to several sources close to the company.

Some key developers, including Lotus Development Corp., Micrografx, Inc. and Borland International, have already confirmed their support for what has alternately been dubbed OS/2 Lite or OS/2 1.3. At the same time, a less-than-enthusiastic Microsoft Corp. is calling for caution.

IBM may have its work cut out for it, as several users contacted last week were highly skeptical about the usefulness of or need for a less memory-intensive OS/2.

Price Waterhouse plans to move its Lotus Notes servers to OS/2 Lite, mostly for performance and memory reasons. However, Price Waterhouse information systems director Sheldon Laube said he "is not swayed in the slightest" when it comes to the desktop.

"As far as OS/2 1.21 vs. OS/2 Lite is concerned, corporate buyers have already determined that [Microsoft] Windows 3.0 meets more of their needs because it can take advantage of the [Intel Corp. 80386] and 16-bit OS/2 cannot," said Brian Livingston, a network consultant and member of the board of the New York-based Microcomputer Managers' Association.

Arthur Block, a vice-president at Manufacturers Hanover Corp. in New York, dismissed OS/2 Lite as a "silly diversification of resources" that could be better spent on developing OS/2 Version 2.0.

If a resistant Microsoft does not offer OS/2 Lite, analysts and developers are predicting the first public break over OS/2 between the two industry giants.

"It doesn't matter whether Microsoft offers it; IBM is a credible enough company so that its stamp of approval on a

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NEIL KING
SCOTT PAPER

On Hewlett-Packard's New Wave Computing strategy. See story page 105.

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From *Made in America* by the MIT Commission on Industrial Productivity: "Though the U.S. computer industry remains strong, the outlook will not be as bright without strong initiatives . . . Innovative U.S. start-up firms frequently sell their technology to Asian competitors and provide market knowledge and even direct assistance . . . American universities conduct nonsecret R&D and are educating a growing cadre of Asian engineers . . . We do not advocate that universities and laboratories shut the door on basic research, but greater protection of American advances as they get closer to products may be in order."

New vistas on the future of technology and the history of the world are possible for museum visitors through the use of computers. Page 18.

Leave the driving to job schedulers, console automation software and problem management tools. Page 59.

EXECUTIVE BRIEFING

■ **The immediate focus may be on new mainframes, but a complex systems administration strategy** could have long-range effects for the IS community when IBM makes its multifaceted product announcement next week. A product known as Systemsview is the first step in IBM's plan to provide IS managers with a common framework for administrative functions such as coordination of security, software updates, configuration changes, troubleshooting, asset management and capacity planning for multiple computing platforms. Another announcement expected in the Sept. 5 avalanche is a new version of the DB2 database management system, reportedly the first product to implement IBM's Distributed Relational Data Architecture. **Page 1.**

■ **There's a lot of merger activity associated with data center automation** these days. Consolidations are pushing many organizations further into automation as they attempt to push the bulk of the work load through fewer, larger data centers. Also, there's a rising interest in interfaces between automation tools, as data center managers begin to seek efficiencies beyond those obtainable with scattered pockets of automation. **Page 59.**

■ **Now that you know IBM's plans to announce its Summit** strategy next month but still don't have details such as price and performance, what do you do? According to some IS managers in major companies, the best thing to do is wait and see. **Page 25.**

■ **Managers shouldering IS arms** upon leaving the military can find themselves highly marketable in the civilian world. Senior officers in particular have a lot to gain because of the scope of the projects and systems they've managed. **Page 88.**

■ **In this age of specialization,** the specialists are becoming even more specialized. One of the latest moves in certification is the testing of information knowledge engineers, sponsored by the International Association of Knowledge Engineers. **Page 49.**

■ **The reaction from large IS shops to IBM's AS/400 announcements last week** could be summed up with a pretty unenthusiastic "that's nice." What did perk up a few ears was IBM's decision to give users and third-party developers more access to the internal OS/400 codes that have previously been kept secret. **Page 8.**

■ **The subtle hum of a VDT can be more of a problem** than most men realize. According to two researchers at the University of Evansville, Ind., the 16-KHz tone is especially irritating to women, and women who are exposed to the tone are more prone to headaches, stress-related complaints and work errors. **Page 10.**

■ **On-site this week.** Back to school means using image processing to manage 70,000 student loan applications at PNC Financial Corp. **Page 27.** Time savings is one of the key benefits seen in Cumberland Farms' plan to install a PC-based store management system in its 1,150 convenience stores. **Page 33.** Providing a network to satisfy the needs of more than 5,000 users — including those who want to be on the leading edge and those who couldn't care less — was one of the challenges facing U.S. Senate IS personnel when they began tying together a nationwide, multiplatform maze of systems. **Page 43.** It took a top-down directive, but administrative staff members at the University of California at San Diego are finally getting the same type of network access that has long been enjoyed by their counterparts on the research side of the campus. **Page 44.**

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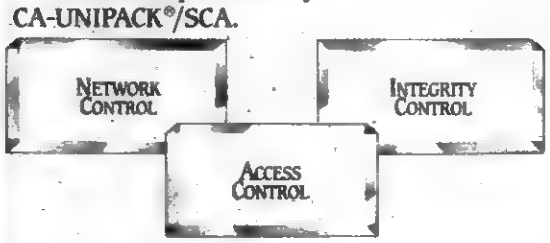

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Apple lawsuit moves at snail's pace

BY JAMES DALY
CW STAFF

SAN FRANCISCO — Despite hopes that the lengthy copyright suit between Apple Computer, Inc. and defendants Microsoft Corp. and Hewlett-Packard Co. could be resolved at a hearing late last week, the glacial pace of the procedures continued. A judge new to the case declared a further continuance to consider motions and become more familiar with the particulars of the suit.

After nearly three hours of testimony from lawyers, U.S. District Judge Vaughn R. Walker scooped up his papers and announced that he "was not prepared to announce a decision" but would review the submitted motions before arranging another hearing. No date was set for the next meeting.

Judge Walker, however, touched upon a potential Achilles' heel in Apple's claims last week when he noted that the crux of the case may eventually hinge on the wording of the original contract. The Apple contract apparently "failed to limit the use of the licensed features," he said.

Jack Brown, a Phoenix-based lawyer heading up Apple's legal team, conceded that the contract "certainly wasn't done with the greatest artistry" but added that it had "never been Apple's intention to give away the whole interface."

Lawyers from Microsoft and HP also argued that the recent copyright decision involving Lotus Development Corp. and Paperback Software International, Inc. should have no bearing on their case because of the original license Apple inked with Microsoft. Lotus recently scored an important victory when a federal judge ruled that Paperback Software's clone of Lotus' popular 1-2-3 spreadsheet copied the "look and feel" of the original Lotus application [CW, July 2].

Sparkling Windows

Windows installations are expected to almost double this year

Source: International Data Corp. CW Chart: Paul Mock

Both sides argued strenuously to narrow the focus of the protracted suit, which has gone through three judges and has lasted 2½ years. In late March, Judge William W. Schwarzer handed the case over to Walker after Schwarzer accepted a position as head of the Federal Judicial Center in Washington, D.C.

Attorneys said that the case should proceed more quickly when Walker is up to speed on the specifics.

"It should go much faster now," said Neil Borstyn, an attorney for HP. "We've clarified the issues that need to be decided." Those issues, Borstyn said, include the scope of Apple's original license and the copyright protection it offered.

Over the line

Although Microsoft was licensed to duplicate the look and feel of Apple's Macintosh screen appearance when it created Windows Version 1.0, Apple contends that Version 2.03 and HP's New Wave, which is based on the updated Microsoft program, overstepped the boundaries of the 1985 agreement when they copied the "audiovisual expression" of the Macintosh too closely.

The case has essentially been at a standstill since July 1989, when Schwarzer dramatically scaled down the scope of the case, ruling that all but 10 of the 189 features that Apple claimed both programs unlawfully duplicated would be subject to further consideration [CW, July 31, 1989].

DG resigns itself to more staff cutbacks

BY NELL MARGOLIS
CW STAFF

WESTBORO, Mass. — Still in search of the profits that continue to elude its grasp, Data General Corp. announced last week that it will eliminate some 2,000 employees from its worldwide work force over the next several weeks.

The move marks the sixth consecutive large-scale fourth-quarter layoff for DG, which is now down 45% from its peak employment, said William J. Milton Jr., an analyst at Brown Brothers, Harriman & Co. "Obviously," Milton added, "the company can't go on like this or there won't be anyone left."

"We now have the organization in place and the appropriate mix of employee resources to compete successfully in today's information technology marketplace," said DG's Chief Executive Officer Ronald Skates in a prepared statement.

"They do have a strong balance sheet," Milton noted. In addition, he said, "through all of these losses and layoffs, remarkably, revenue has remained basically flat." Since it has stayed flat in the $1.2 billion to $1.3 billion range, he added, the firm's immediate survival is not at stake.

The same cannot be said of its growth prospects. That sales have not nosedived, Milton said, is a testimony to DG's particularly loyal user base.

Unfortunately, as several analysts have noted in recent months, the loyal customers in question are chiefly patrons of DG's proprietary minicomputer offerings. The reduced instruction set computing-based Aviion workstation line, on which the firm is betting its future, has been well-received by both market analysts and early users but is not yet contributing a major share to the bottom line.

"Aviion is their one hope, and it isn't a strong one. The workstation market is already a very crowded one, and DG has neither critical mass nor credibility," Milton said.

The proliferation of similar observations, coupled with stock now trading at about 50% of its book value, has fueled speculation that a takeover of DG is in the offing. A DG spokesman, however, denied that any such deal is being entertained and said DG is not for sale.

News of the latest DG workforce reduction raised few eyebrows on Wall Street, not so much because word of it had leaked out earlier in the week but because a major trim of the employee roster has become something of a predictable summertime event for the company.

CA, Goal settle out of court

BY JOHANNA AMBROSIO
CW STAFF

COLUMBUS, Ohio — Computer Associates International, Inc. and Goal Systems International, Inc. last week announced they had settled the lawsuit filed by CA against Goal.

The terms of the out-of-court settlement were not made public, but in Goal's second-quarter financial statement, also released last week, the company said that it will issue a series of fixed payments to CA. The second-quarter payment amounted to $530,000.

Goal said that it has six months to remove all infringing code from its products. During that time, Goal said, it will be allowed to continue to service and support its customer base. At the end of six months, CA will verify the deletion of infringing code.

Suit with infringe

The lawsuit, which was filed June 25, alleged that Goal's Runtrac and Jobtrac products infringe on CA copyrights [CW, July 2]. The company purchased these products from an independent developer, J. William Bennett, whom Goal has since released [CW, July 16].

The settlement applies only to the lawsuit filed against Goal, the company said, and has no bearing on any legal proceedings against Bennett and his company. Bennett could not be reached for comment.

CA Chairman Charles B. Wang said in a prepared statement, "Goal responded professionally to the entire situation. They recognized they had a problem, even though, by and large, it was not of their own making."

David C. Wetmore, Goal's president and chief executive officer, announced, "I, too, am happy we were able to settle this matter quickly with CA. CA was especially sensitive to the needs of our customers, and the terms of the settlement reflect their appreciation of these concerns."

CORRECTIONS

American Management Systems in Arlington, Va., is an independent entity and was not acquired by Philadelphia-based Bell Atlantic Corp. [CW, Aug. 6]. Bell Atlantic Systems Integration Co. is a joint venture of the two companies. Also, a sentence attributed to Al Smith, executive vice-president of the Bell Atlantic unit, regarding his company's marketplace, incorrectly referred to Ameritech and should have read: "The move was necessary because Bell Atlastic was trying to capture the broader needs of its customers."

Unisys Corp.'s Ally software for Sun Microsystems, Inc. workstations [CW, July 30] will be priced at $1,000 for each workstation supported.

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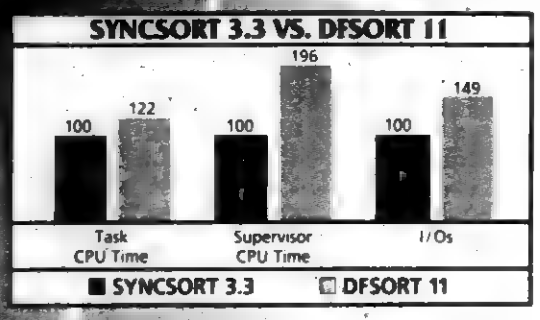

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NEWS SHORTS

NSA denies killing security center

The National Security Agency (NSA) last week denied a published account that said the agency is dismantling its National Computer Security Center, a semipublic unit of the supersecret agency that was established by the U.S. Department of Defense in 1982 to evaluate and certify the security, or levels of trust, of computer systems. A spokeswoman for NSA said the center is being restructured to align its activities more closely with NSA's communications security work. The move was prompted by the blurring of distinction between telecommunications and computer systems, she said. Patrick Gallagher will remain director of the center, and the center will continue to meet its commitments to industry for product evaluation and certification, the spokeswoman said.

Systems Center moves on AS/400

Systems Center, Inc. in Reston, Va., announced last week the acquisition of automated management software for IBM's Application System/400 midrange line. In a transaction the companies said was worth $2.4 million, Systems Center purchased the AS/400 software and related assets from Informed Management Environment, Inc. in Houston. Systems Center, formerly VM Software, Inc., is a relational database vendor that offers more than 50 products, mostly geared to the IBM mainframe environment.

Intel repurchases shares

Intel Corp.'s board of directors last week announced for the second time its authorization to repurchase 20 million shares of its stock in open market or negotiated transactions. Chairman Gordon Moore said the company's financial position and investment alternatives, as well as the market's retreat, recently contributed to the board's decision. He added that going through with this buy-back program would not interfere with Intel's ability to continue its capital and research and development programs. For the quarter ended June 30, Intel had 204 million shares of common stock and equivalents outstanding, the company said. Intel's previous and only other buy-back was in 1987, when it repurchased 13.35 million of its shares from IBM at $27 per share, the company said.

Lotus has a new Agenda

Lotus Development Corp. last week announced that it has begun to ship Agenda 2.0, described as a significantly enhanced version of its personal information manager. Priced at $395, Agenda 2.0 features improved ease of use coupled with four business starter applications: Activities Planner, Account Manager, People Manager and Information Sifter. Lotus is guaranteeing that if users do not become productive within 30 minutes, they can return the package to Lotus within 30 days for a full refund.

Magellan tool kit ships

Lotus also unveiled the Magellan Viewer tool kit for Magellan 2.0, a utility and DOS shell for personal computers. The tool kit will enable developers to create new "viewers," which display the contents of common file formats. It includes sample code for two viewers, as well as assistance in how to design, test and debug a viewer. New viewers will be included in the Lotus Products Enhancement Guide. Developers will also receive discounts on software, the annual developers conference and a quarterly newsletter subscription. The tool kit costs $150 and has a limited 90-day warranty, telephone support and a customer assurance plan.

Never mind!

Citizens & Southern Corp., an Atlanta-based regional bank, apologized last week to 10,000 customers in Georgia, Florida and South Carolina who were mistakenly sent notices that they were in default on their home mortgages. Because of a combination of human and computer processing errors, the default notices were sent instead of the proper late-payment notices, according to bank spokesman Scott Scredon.

Wang wins $841M contract

BY SALLY CUSACK
CW STAFF

LOWELL, Mass. — The U.S. Department of State has awarded Wang Laboratories, Inc. a contract that is potentially worth up to $841.3 million to supply computer systems and services to government agencies on a worldwide basis.

Under terms of the indefinite delivery/indefinite quantity contract, Wang will supply, install and support midrange systems, personal computers, workstations, software, communications and related peripherals, as well as technical support and training.

The contract covers the next five years, with various extension options for a total of 11 years. Both commercial and secure products are included in the contract, the vendor said.

"Hopefully, this means there will now be resources and revenue coming in so Wang can increase its [research and development] to support the existing product line," said Douglas S. Eschner, data processing manager at CBC Environmental Corp. in Oak Creek, Wis. The laboratory, which uses a Wang VS 100 and some VS 80s, was evaluating other technologies approximately one year ago, Eschner said, but held off alternative purchases because Wang has offered improved products and price reductions during the past year. He added that no final evaluation has been reached, however.

Whither the bottom line?

While the contract gives the Wang name some much-needed visibility, the question remaining is just how much of a contribution this will actually make to the company's bottom line, said Chris Christiansen, director at Meta Group, Inc., a Redding, Conn.-based research and consulting firm.

"With an indefinite contract, there are no specific quantities or dates," Christiansen noted. "It's a nice steppingstone in terms of returning Wang to a stable position in the eyes of its customer base, but the company still has a long way to go."

Among the applications software included in the contract are word processing, image processing, electronic mail and messaging, database management and graphics capabilities.

The computer systems to be supplied will support the office automation and distributed information processing needs of the Department of State, the U.S. Agency for International Development, the U.S. Information Agency, the Foreign Agricultural Service of the U.S. Dept. of Agriculture and the Foreign Commercial Service of the U.S. Dept. of Commerce.

OS/2

FROM PAGE 1

product is all we need to know," Borland President Philippe Kahn said. "Corporate users should seriously consider it."

However, Micrografx President George Greyson said the bottom line for users is still going to be applications. "OS/2 is still limited by the number of applications," agreed Norman Thurow, director of IS development for the data systems division of General Dynamics Corp.

Many users said they suspect IBM has produced the 2M-byte version of OS/2 because it told buyers of its Personal System/2 Model 50, 55SX and 60 systems that OS/2 would run on an Intel 80286-based box. In fact, IBM is targeting the massive installed base of 286-based computers, said one source, quoting officials at IBM's Austin facility.

"IBM's intent here is to make OS/2 more accessible to the majority of the installed base," said John Dunkle, an analyst at Workgroup Technologies in Hampton, N.H.

Others perceive a more sinister motivation. "IBM is just doing this to try and knock some of the wind out of Windows 3.0's sales," said Steve Hess, an analyst at Creative Strategies Research International.

"OS/2 has become a pawn in the increasingly tense IBM/Microsoft relationship. IBM is betting heavily on OS/2, but Microsoft is intent on wringing every last cent out of the corporate Windows market," said Bill Bluestein, an analyst at Forrester Research, Inc. Right now, Windows 3.0 provides better desktop functionality and ease of use, at least until OS/2 2.0 comes out, users agreed.

However, Livingston said, "I think it would be futile to expect to run OS/2 or Windows 3.0 on a 286 machine, especially when 386-based machines cost just a bit more."

Developers who would be the source of missing OS/2 applications were decidedly more upbeat.

"We like it because the performance is better, it has more drivers, and IBM has reduced memory requirements by between 1M and 2M bytes," a Lotus spokeswoman said.

> "IBM IS JUST doing this to try and knock some of the wind out of Windows 3.0's sales."
>
> STEVE HESS
> CREATIVE STRATEGIES

Even Microsoft agreed that OS/2 Lite, which is based on the recently released OS/2 1.21, provides better performance, file management and printing features, consumes less memory and offers improved application loading.

Steve Ballmer, Microsoft senior vice-president of system software, conceded that OS/2 Lite is "definitely better than 1.21 in certain ways."

Microsoft, nevertheless, has indicated it will not offer OS/2 Lite unless requested to do so by OEM customers, who just started shipping OS/2 1.21. Ballmer reiterated last week that his customers are waiting for the 32-bit OS/2 2.0.

Ballmer outlined two issues Microsoft has with OS/2 Lite: the timing of its release and the level of functionality under 2M bytes of memory. "We're gonna make [OS/2 Lite] available, but we just did a release. How often can I turn OEMs on releases and expect them to be interested?"

Noting that OEMs waited seven months for OS/2 1.21, Ballmer suggested that "the last thing they'll want to do is wait for another promise for another new release further out into the future."

Running OS/2 in 2M bytes, Ballmer suggested, may only be possible by not installing a series of features including the DOS box, the printer spooler and the network and high-performance file system. "It could be that you can't install as many features as [under OS/2 1.21]."

Privately, many developers view the OS/2 schism as an indication that the long-standing IBM/Microsoft marriage is landing in divorce court, something both companies denied.

"We are trying to work some [disagreements] out. While anything is possible, it is not our objective to go our separate ways with OS/2," Ballmer said.

An IBM spokeswoman denied that any friction exists, adding that IBM is only following through on a Comdex/Fall '89 commitment to try to reduce OS/2's memory requirements below 3M bytes.

Desktop Unix leaders seek PC compatibility

AT&T, Intel and The Santa Cruz Operation join forces in attempt to forge specification

BY JEAN S. BOZMAN
CW STAFF

SANTA CRUZ, Calif. — AT&T, Intel Corp. and The Santa Cruz Operation (SCO) — the dominant players in the desktop Unix market — stood shoulder-to-shoulder in the California sunshine last week as they took a shot at forging a standard for Unix on Intel 80386-based machines. It is a shot they hope will echo 'round the world, since most parties to the Unix-standards battles of the 1980s have already agreed to go along, industry analysts said.

The move to define a single binary compatibility specification for AT&T Unix System V on Intel 386-based machines, announced at last week's SCO developers conference, is intended to promote shrink-wrapped Unix applications for a wide variety of Intel 386- and I486-based machines. However, analysts stressed that computers running other variants of Unix would still be able to interoperate with the Unix System V/386 machines and that many Unix applications would remain portable across multiple hardware platforms with few, if any, programming changes.

> "WE'LL STILL FIGHT and scream about whose SCSI driver is the best, but we're agreeing on the way the interfaces touch the applications."
>
> DOUG MICHELS
> THE SANTA CRUZ OPERATION

Still, the SCO approach has its advantages. "You'd rather not have 20 versions of Wordperfect for Unix desktop machines," explained Judith Hurwitz, vice-president of Patricia Seybold's Office Computing Group in Boston. "Why have one version for HP's 386 machines and another one for IBM's machines? If you only need one packaging and one product on the shelf that works on the Intel 386 chip, that's economy of scale."

SCO is a privately held business that sells the Unix System V/386 and Xenix operating systems, along with the Open Desktop interface, to value-added resellers. Industry analysts said they believe SCO's 300,000-plus licenses account for 80% of the desktop Unix market — supporting perhaps as many as 1½ million end users. The firm, of which Microsoft Corp. owns a 20% share, estimated its 1990 revenue at $100 million.

The AT&T/Intel/SCO pact was endorsed by the Unix International standards group, which supports AT&T's Unix System V operating system, and by its counterpart, the Open Software Foundation (OSF), which is developing a separate Unix standard, OSF/1. 88open Consortium, a standards group made up of vendors using Motorola, Inc.'s reduced instruction set computing processor, also pledged support, saying it would allow applications to be ported from Unix System V/386 systems to 88000-based systems with a simple recompile.

AT&T, Intel and SCO made their first pledge to unify AT&T Unix System V applications in 1988. However, initial efforts failed as computer manufacturers made custom extensions to the basic Unix System V/386 operating system. "We didn't have a process in place to ensure that things didn't go astray," explained Larry Dooling, president of AT&T's Unix Software Laboratory. "The engineers [at different firms] weren't communicating."

Starting next month, AT&T, Intel and SCO will hold periodic meetings to define an industry standard for Unix System V/386 desktop applications. The meetings, which may be held monthly, will be open to any vendors that wish to attend, SCO Vice-President Doug Michels said. "We'll still fight and scream about whose SCSI driver is the best," Michels said, "but we're agreeing on the way the interfaces touch the applications. We're agreeing on the way to a paint a pixel on the screen."

Intel's competitors, Motorola and makers of Sun Microsystems, Inc.'s Scalable Processor Architecture chips, have yet to be brought into the discussion, however. Without the Intel competitors, a comprehensive Unix standard for desktop applications would not be truly complete, industry analysts said. Michels and others said there would be an attempt to involve the competing firms in the evolving software standard discussion.

One other voice was not heard from: Microsoft, which sells the competing OS/2 multitasking operating system. "We don't see any significant impact [on OS/2] from this announcement," Microsoft spokesman Marty Taucher said. "We think Unix and OS/2 are designed to do fundamentally different things." The message Microsoft wants to deliver is that SCO has been a leader in bringing shrink-wrapped Unix to the market."

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IBM spreads AS/400 goodies

But low-end systems and OS/400 hardly have users in a frenzy

BY MARYFRAN JOHNSON
CW STAFF

NEW YORK — For big clients such as Campbell Soup Co. or Georgia-Pacific Corp., IBM's Application System/400 announcements last week were welcome but hardly earthshaking.

And no one at Tiffany & Co. or Mrs. Fields Cookies got in a lather about additional low-end systems or the new release of the OS/400 operating system.

"The AS/400 announcements were nice but anticipated," said Harry Wallaesa, corporate vice-president of MIS at Campbell Soup in Camden, N.J. "IBM's development path is pretty clear, and for large customers, they do a good job of positioning for that environment."

"The AS/400 really needs to become all things to all people," added Paul Quinn, president of Fields Software Group, the systems development subsidiary of Mrs. Fields Cookies. "I'm encouraged by the fact that IBM is opening the system up so users can control more of what's going on."

Quinn was referring to the "open access" feature in OS/400 Release 3.0, which allows customers and third-party vendors to gain access to internal interface codes that IBM formerly kept clamped shut.

The clarity of the AS/400's future and the "something-for-everyone" nature of the latest announcement seemed to spread comfort and a degree of relief.

"What we're seeing with the AS/400 line is more maturity in the enhancements. The box is out of the toddler stage," said Carolyn Griffin, an analyst at International Data Corp. in Framingham, Mass.

For small businesses and System/36 users, the best news was a trio of low-end systems — priced at $12,195, $18,250 and $23,850 — the cheapest one being a System/36 (called AS/Entry) that can be field-upgraded to an AS/400. The new release of OS/400 should also be inviting, with ease-of-use features that mask the complexities of the operating system.

Large customers were mollified with new disk mirroring capabilities, doubled memory capacity on the high-end models, new disk and tape media, plus a fire-sale feature: 15% discounts on older disk storage devices.

"Those deep discounts on the [direct-access storage devices] are real good news," said Scott Russell, a senior technical analyst at Georgia-Pacific in Atlanta. The dramatic reduction in floor space required by the new 9336 drive is "a big improvement" for large shops, he added.

Even industry analysts got some "futures" to pontificate on with IBM's promise of more powerful high-end systems in early 1991, including multiprocessing capabilities to take the AS/400 up to the bottom rungs of 3090 mainframe power.

"We haven't seen the wall yet in either direction — going lower or higher," said Robert LaBant, vice-president of Application Business Systems, the IBM division responsible for the AS/400.

At Tiffany's data center in Parsippany, N.J., the new operating system and high-end memory expansion capability mean that a planned upgrade of an AS/400 Model B60 can wait. "We're taking the new release of the operating system early, although we're not normally a pioneer," said Eric Corbman, director of technical support and planning. "We've been pleased with IBM's direction, though we sometimes get frustrated with whether they're moving fast enough on the high end."

Although famous for its jewelry stores, Tiffany has moved into multiple-channel retailing through direct mail, 800 numbers, corporate business, wholesaling and international distribution. All of the business — except for the personal computer local-area network-based international stores — runs on two AS/400s, the Model 60 and Model 70.

Several customers and analysts took note of the open-arms welcome IBM is extending to third-party software vendors.

"IBM has finally acknowledged the fact that other people out there can do some things better," said Gibbs Vandercook, senior manager of the advanced technology group at Ernst & Young in Chicago.

As part of the announcement, 10 software companies unveiled their IBM Systems Application Architecture-compliant cooperative processing applications for the AS/400. Included among the business partners were Andersen Consulting, Computer Associates International, Inc., Marcam Corp., J. D. Edwards & Co., Software 2000 and Information Builders, Inc.

Storage options

IBM's AS/400 revamp includes new tape and disk storage devices

Device	Media	Storage capacity	Price
9336 Model 30	5¼-in. disk	942M bytes	$26,000
9336 Model 20	5¼-in. disk	1.7G bytes	$39,000
9348 Model 2	½-in. streaming tape	1.6K-6.25K bit/in.	$22,600

Source: IBM — CW Chart: Doreen Dable

Midrange treats

While much attention was focused last week on the low-end hardware filling out IBM's AS/400 line, there were other notable highlights in the announcement:

- The new 9336 disk unit reportedly increases the high-end storage capacity that an AS/400 can support from 38.4G bytes to 54.8G bytes. These new drives offer a 38% faster average seek time than the 9332 and 9335 disk drives, and the 9336 can pack up to 20G bytes of storage into a single 6-ft-high AS/400 rack.
- For high-end customers, a new 32M-byte memory card based on IBM's 4M-bit dynamic random-access memory chip can double main memory on the Model B70 to 192M bytes.
- Disk storage mirroring capabilities in OS/400 Release 3.0, the new release of the operating system, allow the system to keep an exact copy of information on a second disk. If a mirrored disk fails, the system keeps running.
- Operational Assistant, another new capability in OS/400, makes the AS/400 easier to use for new or nontechnical customers through streamlined menu screens and Help text. It is mainly intended to encourage migration from System/36s to the AS/400 platform.
- An "open access" feature in OS/400 allows selected third-party software vendors and systems programmers at customer sites to tinker with certain machine interface instructions. This enables customization of the AS/400 for particular applications and increases interoperability with other vendors' computers.
- New networking features — mostly geared toward client/server environments — include an integrated Ethernet LAN attachment, an AIX AS/400 connection program for RISC System/6000 workstations, a 16M/4M-bit Token-Ring LAN adapter and Transmission Control Protocol/Internet Protocol Telnet support.
- SQL enhancements, new languages such as Fortran/400, RM/Cobol-85 and Procedures Language 400/Rexx, plus Application Program Driver, which is a precoded menu utility.

OSI

FROM PAGE 1

to make such implementations feasible, he added.

The government's release of GOSIP is accelerating user implementations of the standard in both the public and private sectors, according to a recent report from Newton, Mass., consulting firm Business Research Group (see chart page 1).

However, some government users apparently feel they can comply with the spirit of GOSIP without actually rushing to convert all their current systems to OSI.

The National Aeronautics and Space Administration's Lewis Research Center in Cleveland, for example, does not have direct plans for OSI, even though "we know we have to get into it," according to network analyst Daniel Cica. "I think we can still buy [Transmission Control Protocol/Internet Protocol] as long as the vendor also provides OSI compliance" on the same product, he added. The center has begun talking to OSI software vendors and plans to migrate its Digital Equipment Corp. systems to OSI-compliant Decnet Phase V, Cica said.

In the private sector, the promise of multivendor electronic mail connections via CCITT's X.400 is a major driving force behind OSI, Business Research said. However, many private sector companies also have a reluctance to pay the upfront costs of full OSI conversion, according to open systems consultant Jere Thomas. "The next-quarter profit and what's going to be here tomorrow is driving the ship," he said.

Thomas, who helped found the Houston 30 consortium to provide user input on standards development, said that corporate management needs to look beyond short-term returns and say, "Yes, migration to OSI will cost us next year, but in five years we'll get the gravy."

> "THE NEXT-quarter profit and what's going to be here tomorrow is driving the ship."
>
> JERE THOMAS
> CONSULTANT

To hear users tell it, however, the main reason for their reluctance to convert to OSI is the lack of functionality in current products based on the standard. Nor does implementing X.400 necessarily mean a rapid move to the rest of the OSI stack.

Du Pont Co., for example, announced one year ago that it would use MCI Communications Corp.'s X.400 electronic mail services as a method of exchanging messages and business documents with its trading partners worldwide. Recently, the vendor implemented a Hewlett-Packard Co. gateway so that its own three internal E-mail systems — none of which are X.400-based — can talk over MCI's X.400 network.

Du Pont "would like to migrate to X.400 internally once it matures and once our vendors provide high-performance software" based on the standard, said Gordon Preston, the company's product manager for corporate E-mail management. Areas in which proprietary E-mail systems currently outperform X.400 include directory functions and special features such as automatically returning a message to sender when the recipient cannot be found, Preston added.

Du Pont is also "committed to implementing" the rest of the OSI standard "as soon as it's available," Preston said. "Our expectation is that it will be 1995 before the OSI protocols are completely available."

Hughes Aircraft Co. is another company whose commitment to full OSI migration has had to wait for the standard to mature, according to Jeff Littrell, manager of local-area network E-mail. "Right now, I think OSI products are in a good stage for allowing users to get their feet wet but not for replacing our existing infrastructure." Major gaps in current OSI products center around the X.500 directory and network management, he said.

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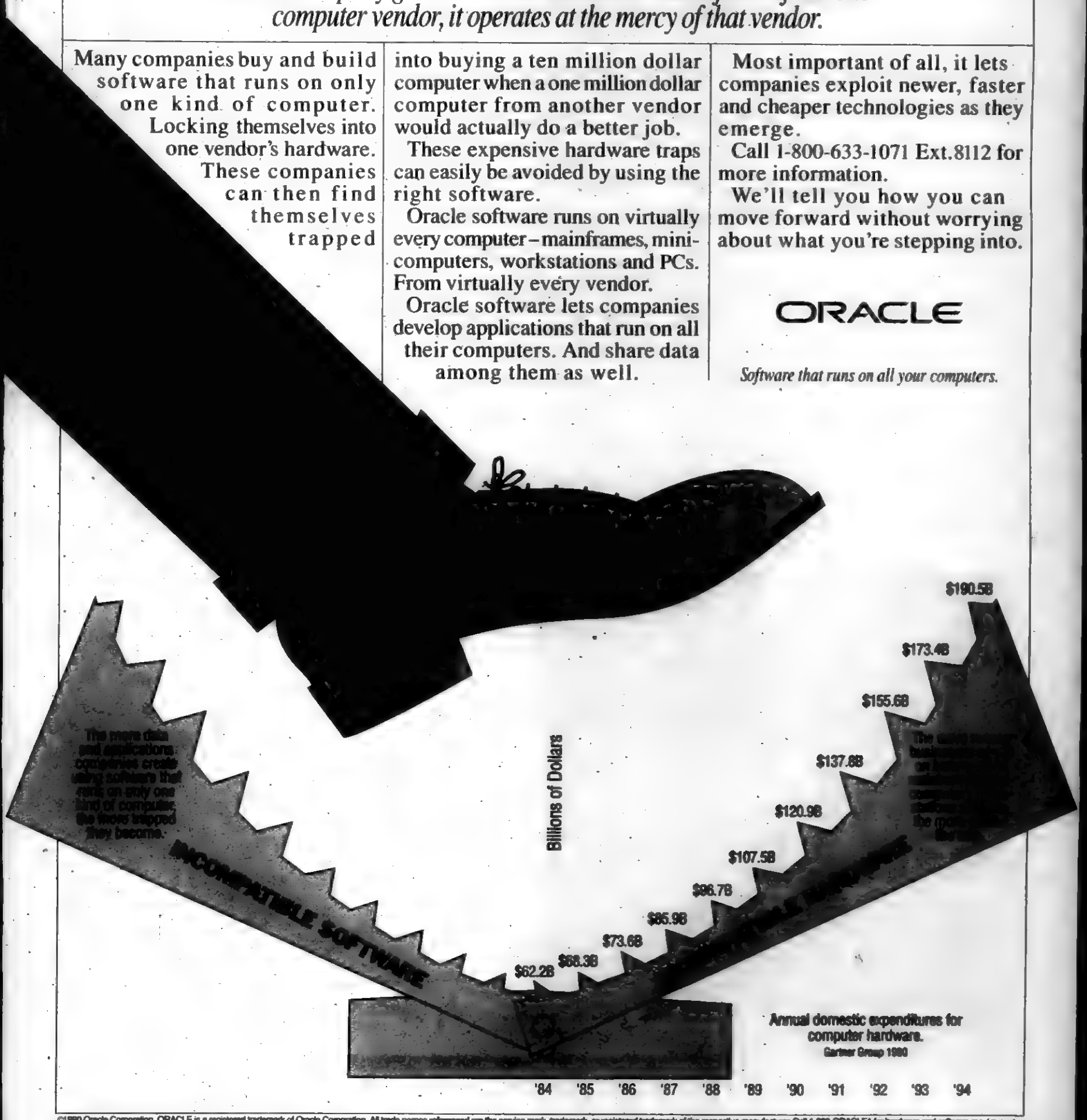

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VDT tones may cut productivity, study says

BY ELLIS BOOKER
CW STAFF

EVANSVILLE, Ind. — The hum of hard-working office staffers is not the only noise in corporate America. Listen carefully to the computers these workers use, and you will detect a high-pitched squeal.

That barely audible signal — a 16-KHz pure tone emanating from some VDTs — can be especially irritating to women, according to two researchers.

Douglas Covert and Caroline Dow, both assistant professors of communication at the University of Evansville, said that women exposed to the noise made more errors and were more prone to headaches and other stress-related complaints than women who were not exposed to the sound.

The findings were reported earlier this month in Minneapolis at the national convention of the Association for Education in Journalism and Mass Communications, an academic association based at the University of South Carolina in Columbia.

The study detailed two experiments conducted by Dow and Covert and suggested that female workers can be affected by the sound even when they do not consciously hear it.

"Women in our [journalism] classrooms were having difficulty two years ago when we transferred from typewriters to computers," Covert said. What had been a pleasant classroom became a tense one. The women were complaining of headaches, fatigue and irritability, he said.

Some of the women students actually complained about the noise, which Dow could hear but Covert could not.

Covert and Dow conducted a literature search on women, noise and computers in the workplace but found little background on the psychological impact of VDT noise. "We did find references to the greater sensitivity of women to sound," Covert said. Women can hear tones that are 1- to 3-KHz higher than those men can detect, and in general, women hear noise at roughly half the loudness of men.

THE STUDY found that the group exposed to the sound had an 8% productivity loss compared with the control group.

The first of the two studies, conducted in April 1989, exposed a classroom of women students to the tone raised to the level of normal conversation. The researchers then compared the group's performance without the noise, which was produced by an electronic tone generator. The students, who were performing clerical tasks during the test, made twice as many mistakes, the researchers found.

In March, the researchers conducted a second test involving 100 female students. The women took a simulation of the Graduate Record Exam. Half were exposed to the tone during the test; half were not.

The study found that the group exposed to the sound had an 8% productivity loss compared with the control group.

Bruce Dickerson, executive director of the not-for-profit Center for Office Technology in New York, which reviews ergonomic studies on VDTs, said he was unaware of similar studies on the effect of VDT noise and stress.

"They have to report on their methodology, conclusions, data and recommendations," Dickerson said. Other scientists will have to review the research and replicate the experiments before Dow and Covert's work can be evaluated properly, he added.

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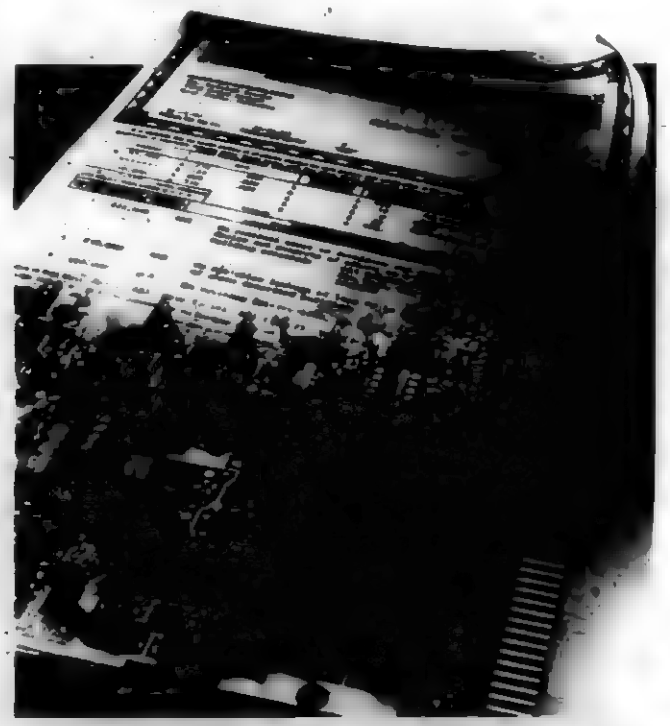

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EDS speeds Chicago parking ticket collection

BY ELLIS BOOKER
CW STAFF

CHICAGO — This city's backlogged parking ticket collection system, described by its own administrators as the worst in the nation, is being towed into the next century.

Electronic Data Systems Corp. (EDS), which began handling the data processing side of the ticket operation in late July as part of a five-year, $40 million contract, is also revamping the troubled computerized system, adding such state-of-the-art components as radio-frequency data terminals for crews in the city's "Denver boot" patrol trucks and equipping enforcement personnel with handheld computers and portable printers.

However, the new system's most unique element will be an imaging subsystem that will permit on-line access to the 12,000 to 15,000 parking violations the city issues each day.

"Chicago's [parking system] is about the worst of any big city," city parking administrator Inge Fryklund said. She added that she has high hopes for the imaging portion of the system — the first of its kind in the country.

Chicago had plenty of incentive to try to leapfrog other cities. Its parking system reportedly has a backlog of hundreds of thousands of overdue tickets; $50 million worth of fines go uncollected each year.

The total cost of the old system, including the keypunch and trafficking personnel, was $13 million. "We'll be paying $8 million annually to EDS instead of $13 million," Fryklund said.

Chicago residents may also appreciate the swift justice the new system promises. Instead of the whopping six-month lag time between when a ticket is issued and when it is keypunched into the computer system, the EDS contract stipulates that tickets must be entered into the image database within three days.

To make that possible and to automate other functions of the new system, Chicago will shift to a new parking ticket form containing machine-readable codes next month. The codes will enable the new system to generate detailed management reports showing city officials where tickets are being written, where parking meters are breaking down and which hydrants are attracting the most cars.

Until now, ticket information has been entered (or sometimes not entered) on 1957-vintage keypunch terminals — part of an old punch card system that was later converted to a batch tape system.

The image database, which will also contain correspondence from citizens, will be accessed from 14 Sun Microsystems, Inc. workstations at City Hall, the existing traffic court building and three remote locations around Chicago.

EDS replaces Computil Corp., a Clifton, N.J.-based service bureau that provided information systems services for the old system.

"The employees who were in data processing are being recycled into information processing clerks for the [ticket] hearing centers," said Michael McGowan, deputy director of revenue in charge of planning for the city of Chicago. McGowan said that no IS layoffs were caused by the outsourcing deal with EDS. "As a matter of fact, we're asking for a few more people," he said.

Next year, Chicago expects to issue about 4.5 million parking violations.

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Power returns to lower Manhattan

BY JOHANNA AMBROSIO
CW STAFF

NEW YORK — The lights are back on and most businesses have returned to their data centers after the week-long blackout that hit lower Manhattan on Aug. 13.

"The worst is over," said Richard Zane, president of Comdisco Disaster Recovery Services in Rosemont, Ill. "Only one of our customers is staying until the end of the month, and we have no more active alerts."

A spokesman for Consolidated Edison, New York's electrical utility, said, "Everyone is back on Con Ed power. No one's on restrictions, and no one is on generators."

Full power was restored last Monday, but it took a few days for everyone to get back into their data centers. About half of the 20 companies that went to hot sites were in them for seven days or more.

Direct losses and associated costs from the blackout may run into the millions of dollars, observers said. "It's going to take a while before the bottom line is clear," said Robert Campbell, president of Advanced Information Management in Woodbridge, Va. "But so far, it's looking like at least $100 million."

He, as well as several others, suggested that legal action against Consolidated Edison may be one remedy being considered by the firms with the hardest hit data centers. Two firms have already filed lawsuits against Consolidated Edison because of the power outage, but neither lawsuit was specifically computer-related.

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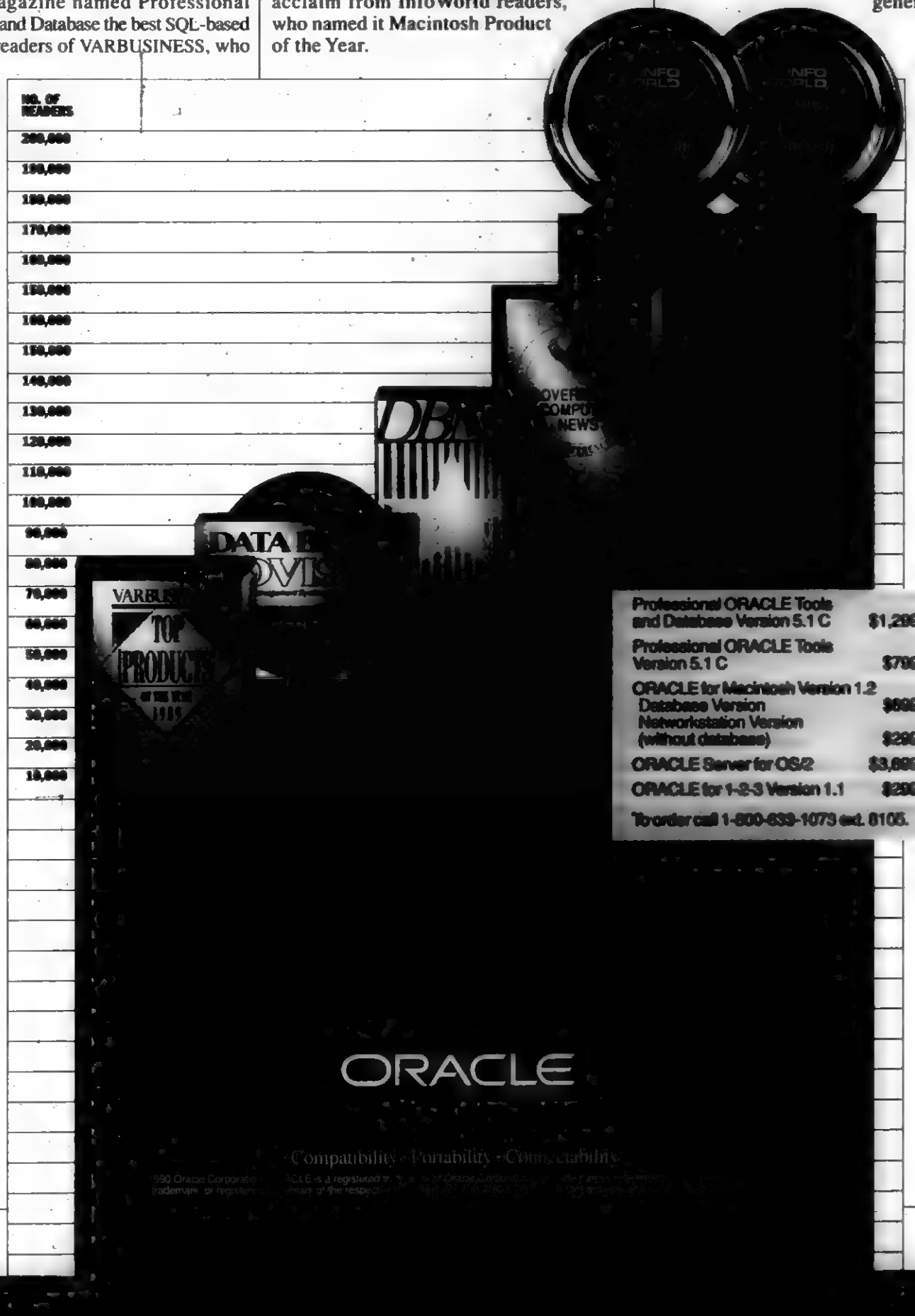

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It's all Cyber systems go for Soviets

With export license in hand, CDC and USSR officials ready for mainframe sale, safeguards

BY ELLIS BOOKER
CW STAFF

MINNEAPOLIS — Control Data Corp. received a green light from the U.S. Department of Commerce last week to export six mainframe computers to the Soviet Union.

The Cyber 960 mainframes, which will be used to analyze safety factors in Soviet civilian power plants, are the most powerful computer systems ever sold to the Soviets.

CDC has been awaiting an export license for the machines since last November. The Soviets will pay $32 million in hard currency for the systems, according to the company, which will deliver three systems this year and three in 1991.

Soviet interest in the sale was underscored in June, when Soviet President Mikhail S. Gorbachev stopped at CDC's headquarters here for a brief demonstration of the Cyber 960. CDC was the only U.S. company visited by the Soviet leader during his U.S. tour.

In June, the Coordinating Committee on Multilateral Export Controls (Cocom), the international trade watchdog organization, liberalized its rules for computer sales to the Soviet and Eastern Bloc nations (CW, June 11).

Under the revised rules, Cocom has 20 days to file an objection once it receives an application for a high-end computer sale to the Soviet Union or East Bloc nation.

This month, the U.S. and Soviet Union agreed on usage safeguards for the mainframes, which have a performance rating of 435 and fall into the second of three performance tiers established by the new Cocom rule. Last Monday, when the 20-day waiting period ended without a Cocom objection, the Commerce Department approved CDC's export license.

The Cybers will be controlled under an agreement reached in June between the U.S. and Soviet governments over the use of the CDC computers. The accord specifies various safeguards, including on-site visits during which usage logs of the mainframes will be checked, and other safeguards built into the computers themselves.

A CDC spokesman said the firm hopes to see increased computer business with the Soviets. The day Gorbachev visited CDC's headquarters in June, the firm signed a technology sharing agreement with the USSR's Academy of Sciences under which the two will explore computer applications in five areas: nuclear safety, petroleum exploration, electric power generation and transmission control, software development and workstations.

Prime adds RISC systems and Unix version of DBMS

BY SALLY CUSACK
CW STAFF

NATICK, Mass. — Prime Computer, Inc. moved to fulfill promises to its customers for more Unix-based products when it showered the market last week with a mixture of new processors and a Unix version of its Information database management system.

With the unveiling of Prime Information Plus, the long-awaited Unix version of its DBMS for transaction processing, the firm launched its EXL 7000 series of reduced instruction set computing (RISC) processors. The software has been optimized to run on the new Prime platforms.

Aimed at commercial Unix users with heavy transaction processing requirements, the new binary-compatible processors are available in four configurations — the EXL 7330, 7340, 7360 and 7680 — with performances ranging from 25 million instructions per second (MIPS) to as much as 68 MIPS, according to the company.

The new RISC family supplements Prime's existing line of complex instruction set computing Intel Corp. 80386 Unix machines. Prime will continue to market its entire line of EXL products.

Michael O'Rear, a beta-test site user at the University of Southern California in Los Angeles, was especially impressed by the ease of both the hardware and software installation. O'Rear, who is currently running the PI Plus database on an EXL 7340, said that the system was up in a matter of hours. He said he finds it "extremely easy" to port applications over to the RISC platform. USC has been running Information on Prime 50 series machines for almost 10 years.

"We're not planning to drop our 50 series, but this does give us an escape valve if we ever want to move, or are forced to move, to an open systems environment," O'Rear noted.

According to Richard B. Snyder, president of Prime's Computer Products division, the EXL 7000 series will be marketed through both direct channels and value-added resellers in the U.S. The systems are the result of a technology partnership with Mips Computer Systems, Inc. in Sunnyvale, Calif., and will use Mips technology at all levels of integration.

Information is a Pick Systems'-compatible, fourth-generation language software package that has been available to Prime 50 series users since 1978. Prime is positioning its new Unix offerings to take advantage of the 4,000 Pick applications currently in the marketplace.

"Most of the other Unix boxes out there run systems-related software. The EXL 7000 series is more geared toward actual end-user, commercial applications," Snyder said.

Networking functions reportedly include Transmission Control Protocol/Internet Protocol, Network File System and X.25 protocol capabilities.

Available for immediate shipment, the entry-level EXL desk-side server supports as many as 100 users and is priced from $18,000, while the EXL 7680 is capable of supporting up to 500 users and is priced from $150,000.

Two execs opt out of MCI management reorganization

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — MCI Communications Corp. shuffled its management deck last week but lost two of its top cards.

Nathan Kantor, president of MCI Northeast, one of seven regional divisions, resigned to start a telecommunications consulting firm. He is succeeded by Jonathan C. Crane, formerly president of Atlanta-based MCI Southeast. Crane's post is going to Douglas L. Main, previously senior vice-president of finance.

Ronald E. Spears, president of the Chicago-based Midwest division, resigned rather than relocate to a new post at MCI's headquarters here. His job will go to Gregory A. LeVert, formerly vice-president of large accounts.

"I want it to be a high-quality telecommunications consulting and implementation firm, with the emphasis on implementation," Kantor said of his new venture. He said he hoped to help managers who are befuddled by galloping technology, international upheavals and a troubled economy.

Kantor said his firm will assist other firms in developing or improving network strategies. The company will also specialize in international telecommunications, helping U.S. firms establish overseas partnerships, especially in Europe.

He would not discuss the firm's initial financing or staffing.

"I've been thinking about this for some time," Kantor said. "The toughening economy has pushed me a little faster. Some would say it's not a good time to do this, but I'd say now is the best time."

Kantor acknowledged that he would have to be careful to ensure objectivity in advising clients about the use of telecommunications services such as those provided by MCI. "But 99% of the other consultants out there came from AT&T, so maybe I'll bring some balance."

MCI also announced that O. Gene Gabbard will assume the title of executive vice-president and chief financial officer and will head MCI's corporate development department.

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Birmingham	9/27	NEW MEXICO	
		Albuquerque	10/4
ARIZONA			
Phoenix	10/4	NEVADA	
		Las Vegas	9/13
CALIFORNIA			
Sacramento	9/26	NEW YORK	
San Diego	10/18	Tarrytown	9/26
Long Beach	10/26	Buffalo	10/10
Woodland Hills	10/30	Rochester	11/13
San Jose	11/14	Melville	12/4
COLORADO		OHIO	
Colorado Springs	10/18	Cleveland	9/19
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CONNECTICUT			
Danbury	10/23	OKLAHOMA	
		Oklahoma City	9/19
DIST. of COLUMBIA		Tulsa	9/20
Washington, DC	8/9		
Washington, DC	11/6	OREGON	
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FLORIDA			
Jacksonville	9/19	PENNSYLVANIA	
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Fort Lauderdale	10/16	Pittsburgh	9/26
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Atlanta	11/6		
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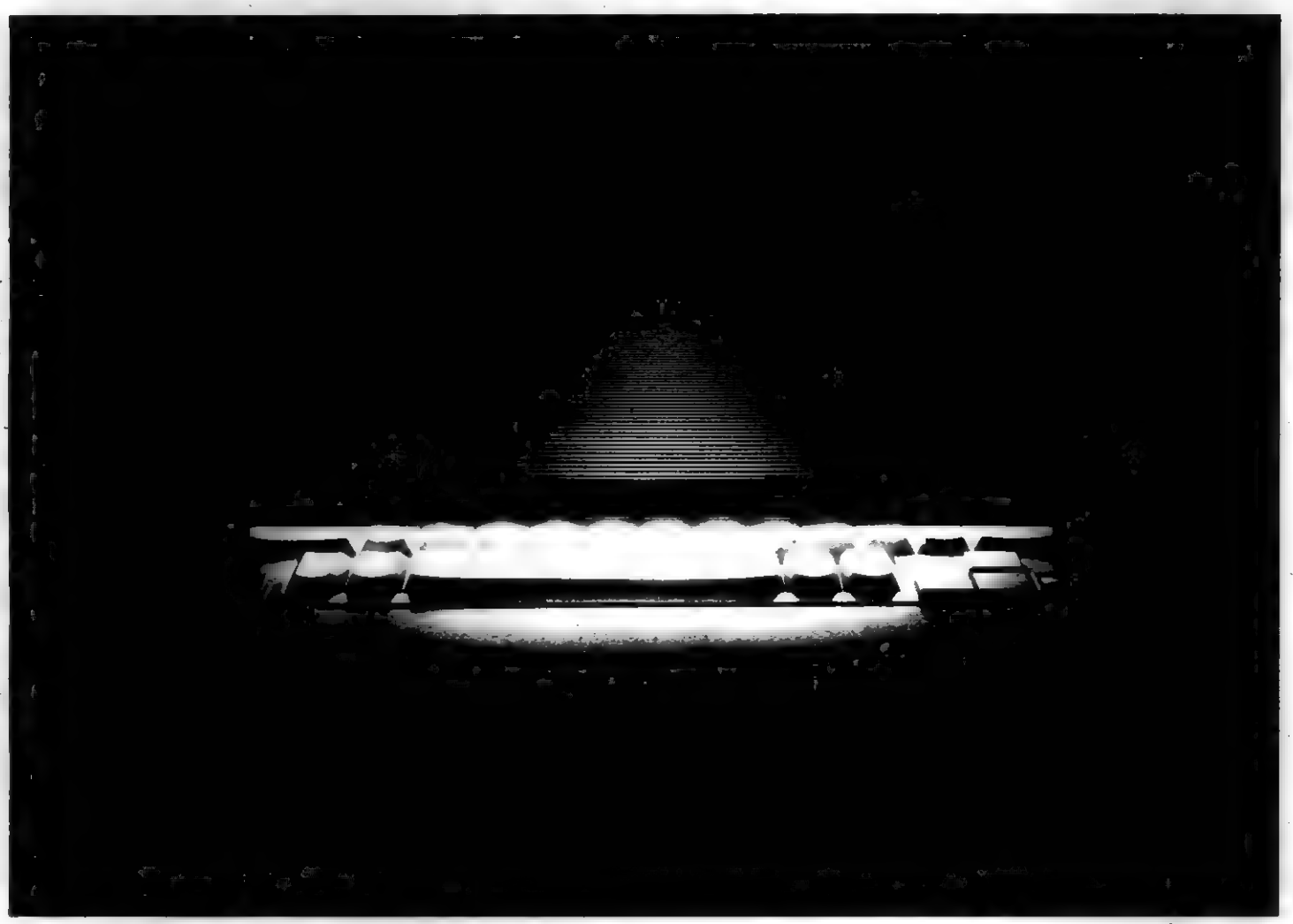

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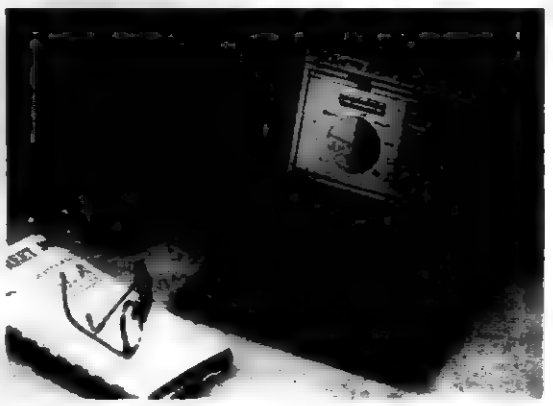

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ADVANCED TECHNOLOGY

The ghost in the museum is a machine

Museums use computer technology behind the scenes to entice, educate and entertain museum visitors

BY ALAN J. RYAN
CW STAFF

Duck!

Technology is the culprit when a visitor to the Smithsonian Institution's National Air & Space Museum gets hit in the head by an airplane. A computer-controlled robot of the type used in aircraft manufacturing plants has been programmed to make paper airplanes and send them out over the crowd of visitors who flock to the museum in Washington, D.C., each day.

However, computer technology has become more than just a zany or intriguing component in our nation's museums; technology has become integral to the new museum culture and is often seen as a necessary tool to attract visitors to the museum and hold their interest after they arrrive.

At the National Air & Space Museum, computers were a long time in coming but are essential now, spokeswoman Joyce Peterson said. "Computers have so entirely taken over the field of aviation that it was imperative we do it."

Historically, science and technology museums have been the first to recognize high technology, said Ann Mintz, special projects director at Philadelphia's Franklin Institute. "The first computer was placed on the floor at the Franklin Institute in 1958."

In today's museums, however, the computers have become a function of the exhibit rather than the exhibit itself, and they are used interactively by museum visitors.

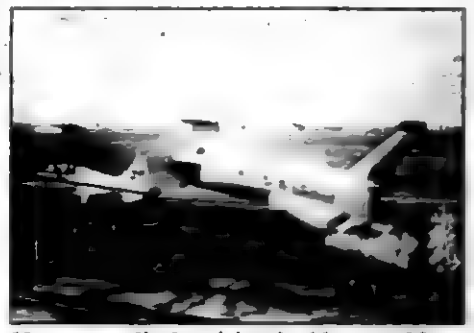
At COSI, Ohio's Center of Science and Industry in Columbus, many exhibits would not be possible without computers, said Heather Weigand, one of the museum's directors.

COSI is using multimedia — the blending of video, sound, graphics and animation — to motivate children to learn more about science and math, Weigand said.

COSI is currently putting the finishing touches on its "Mission to Mars," a $1.8 million, 5,000-sq-ft exhibit that will be on display from Dec. 26 through May 11, 1991, prior to embarking on a two-year national tour.

The exhibit consists of three sections:

- Three thousand square feet of the exhibit is devoted to science exhibits related to Mars. Visitors can retrieve information about the exhibit from 28 Apple Computer, Inc. Macintosh computers, donated by Apple.
- The second segment of the exhibit consists of a Mars habitat simulator, consisting of a network of computers linked to laser video discs. "It will link sound, graphics and animation to simulate a trip to Mars and give visitors a taste of what scientists on the red planet might do as part of their research," Weigand said.
- The third part of the exhibit is a "manned Mars outpost," where the visitors walk onto the simulated planet and take part in creative problem-solving activities.



Museums *display visitor-hooking graphics*

Computers make the entire museum experience more memorable because they can help to explain complex topics in a visual and accessible way, Peterson said.

The Air & Space Museum boasts two levels of computer monitors — one set at the eye level of the user and another positioned four feet above it so other visitors can view the information, too.

"A lot of people have the stereotype that museums are stodgy, stuffy, not very up-to-date places," said Carol Hagglund, museum educator at the Roger Williams Park Museum of Natural History in Providence, R.I. "We're trying to come into the modern world."

At the Roger Williams museum, Hagglund said, a grant from Apple Computer will bring multimedia technology to two dioramas — life-size exhibits of wildlife specimens and landscape with natural-looking surroundings and a painted background. The computers will "show motion and illustrate some of the things that the static nature of the exhibit does not allow visitors to see," Hagglund said.

The animated videos accompanying the exhibits will give visitors a choice of information they want to retrieve. For example, a visitor can view birds flying and horseshoe crabs molting or can find out how some animals gather food.

"It's a new way of looking at one of the oldest exhibit formats in a natural history museum," Hagglund said. "And it is also a way to teach the children." The museum, currently under renovation, will reopen this fall with the new displays in place.

Another system being put in place at the Roger Williams Museum is a two-part environmental issues project that will show the environmental impact of man's action on Narragansett Bay. Through animated sequences, the computer at the museum will show the impact of sewage overflow and treatment, road runoff and other pollutants on the bay, Hagglund said.

The second part of the environmental impact system will be a live monitoring of water conditions in Narragansett Bay. A monitoring station will measure the levels of dissolved oxygen, pH levels, salinity and water temperature. The interpretation of the data will be done on a Macintosh, Hagglund said.

An interface that stands up to Bart Simpson

BY JOHANNA AMBROSIO
CW STAFF

At the Franklin Institute Science Museum in Philadelphia, the user interface is the thing.

Designers of the museum's new museumwide computer system, which went on-line in May, faced a daunting task: how to implement a system that would be used and understood by a diverse range of adults and children to help them learn about and explore the exhibits in a fun and natural way. The computers are also used to answer questions about museum hours, attractions and facilities.

The machines needed to withstand abuse by the museum's 750,000 visitors each year; bubble gum on the screens is not an uncommon occurrence. "Some of the kids are real Bart Simpsons," said Ann Mintz, the museum's director of special projects.

In response to those challenges, the Franklin installed a network of some 28 Unix-based workstations throughout 11 exhibits, each of which has a touch screen, color display and bar-code reader. The workstations are on tilt platforms to make them accessible to people in wheelchairs and to people of different heights. By the end of the year, there will be 42 computers in 20 exhibits. The network ties the workstations to Unisys Corp. hosts running Unisys Mapper.

Upon entering the museum, each visitor receives a card with a bar-code number. To operate the workstation, the visitor runs the card through a reader or simply touches an area on the screen that is of interest. Printout options include information about a specific topic, how to find out more about something and games and projects for children to do at home.

Franklin Institute's *computers are used by 750,000 visitors each year*

At each workstation, information is delivered at adult, child and preschooler levels. Once a level is selected, the screen changes to reflect that level. Children, for example, might want to play a game about aviation, and adults can elect to answer an interactive poll about the environment. People can change levels if, say, an adult wants to tour on a child's level or vice versa.

The interface is similar at each level: Users touch boxes containing the information they want to know or the answers to games and poll questions. At the bottom right of the screen, three icons remain constant: a finger pointing forward to go on, a finger pointing backward to go back one screen and a stop sign. Touching the stop sign returns the user to the main menu most recently accessed.

Extreme care was taken to design all the screens, to figure out the maximum number of words and word placement and to map the display correctly so that when a visitor touches something, the proper information is given.

"We have about 10 seconds to get people's attention. If they're not successful in that time, they just walk away. There can't be a learning curve," Mintz said.

One way the museum can find out how much the computers are used is by analyzing data about who uses which portions of the system and how far they get. "We're not doing a lot of analysis now, but we can when we're ready to," Mintz said.

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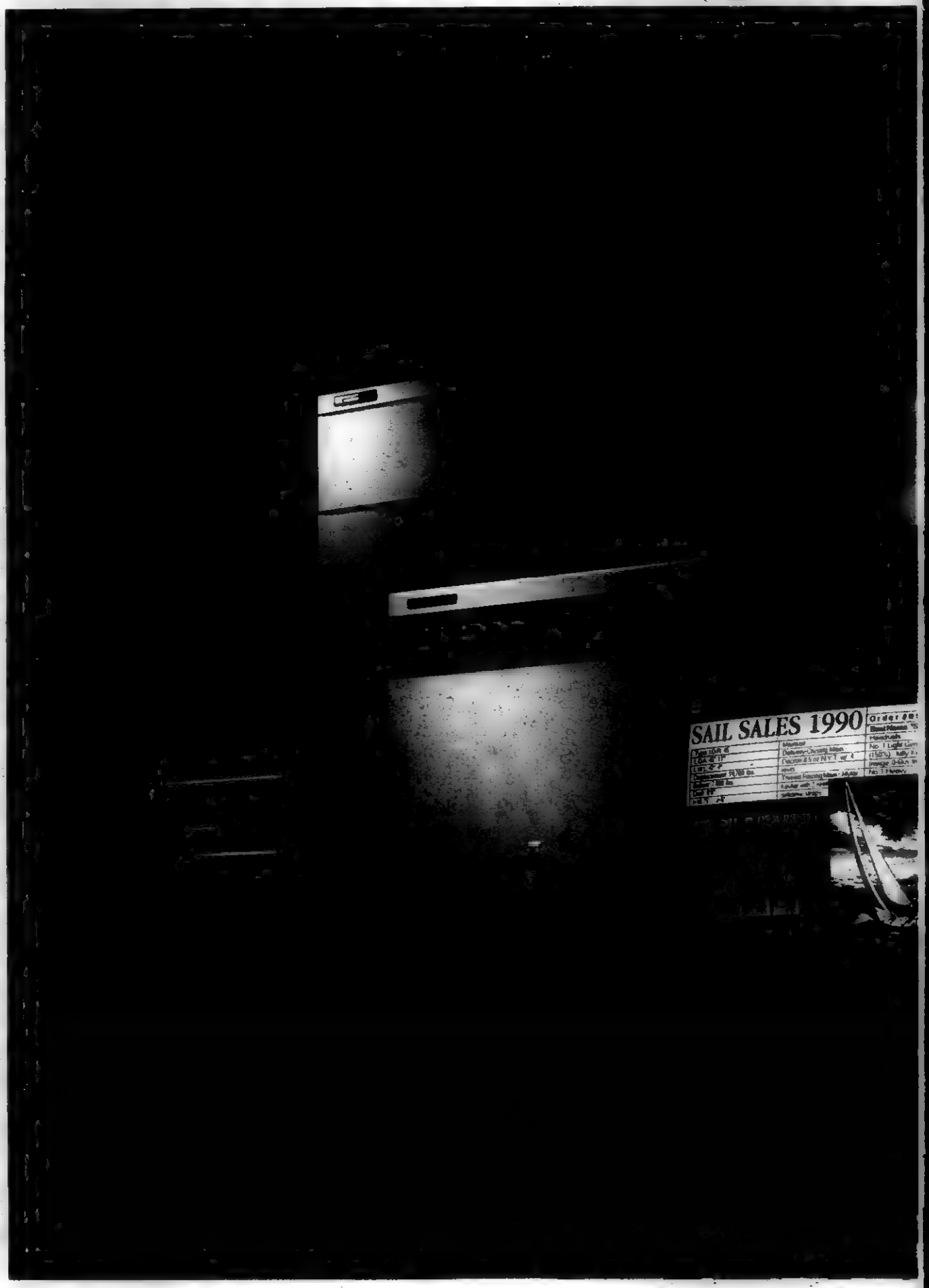

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EDITORIAL

Some things old

IS IT SOMETHING in the water or something in the air?

Lately, we've run a number of stories with a back-to-the-future twist. For example, a lobbying effort by dedicated users of the HP 1000 line (a quarter-century-old line, at that) has goaded Hewlett-Packard into committing over the next 20 years to a processor that has little to do with HP's essential RISC strategy.

We've also reported on the sizable groups of loyalists to such "dinosaurs" as the DEC 10s and 20s and early models of its venerable PDP-11 mini line, as well as IBM's System/36. Then there are the millions of PCs in use based on Intel 8088, 8086 and 80286 processors.

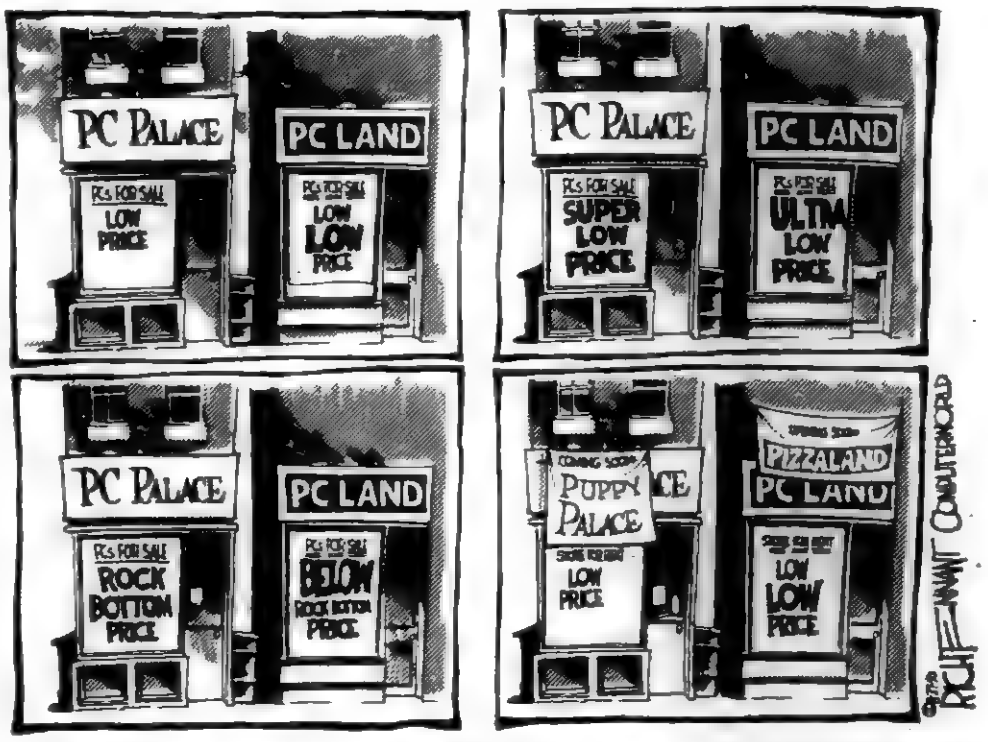
What's wrong with these users? Are they the same Luddites who led the movement for repudiation of advanced technology by rejecting OS/2 as a replacement for MS-DOS? Is it the same group that is clinging so tenaciously to proprietary offerings just because those products are often so much more robust than the plain vanilla "standard" products that are so frequently served up these days? Just because a product gets the job done, is that a good reason not to scrap it and move on to the next generation?

There are plenty of good reasons to explore and exploit advanced technologies, with corporate survival by way of a well-planned IS strategy the foremost one. But there is no small gulf between the pace at which the vendor community is bringing new technology to market — sometimes at the expense of maintaining very solid product lines — and the rate at which customers are willing to absorb that technology.

At a press/analyst meeting a few months back, Lotus CEO Jim Manzi was asked to assess the role of the IS manager in the early 1990s. That role and its influence on the entire IS structure, he said, will increase. But he was hasty to add that he and Lotus weren't exactly happy about that, because IS tends to be relatively slow when it comes to approving purchases of new technology. This sentiment has been echoed by others at Microsoft, Ashton-Tate and so on.

We have to agree on both counts. In the corporate networked environment, a high degree of central orchestration is essential to achieve the levels of integration needed to truly exploit the prodigious technology investments that have been made. And yes, the IS conductors will do very well to proceed with methodical prudence every step of the way.

As for the vendors, just consider what happened within the auto industry. The Detroit car makers grew fat a generation ago on an auto-buying public that liked to trade up every two or three years. Along came the oil crisis of 1974, and buying habits changed. Detroit did not. It eventually relinquished enormous market share to foreign competitors, who came at the market with efficient cars that were built to last. Today, those foreign manufacturers, who fed the market what it wanted years ago, are taking over the leading-edge high end of the market as well. It seems everyone has gotten what they deserved.



LETTERS TO THE EDITOR

Concurrent

Congratulations on your new monthly series [CW, July 23] reviewing products in the application development arena. We're pleased to have had the opportunity to test Nomad in a well-constructed benchmark that accurately reflected "real-world" application requirements.

While we appreciate the attention given to describing specific product functions, we hesitate to leave unchallenged some overall impressions that may be left with the reader. Your reviewers have drawn speculative conclusions with regard to Nomad's suitability for concurrent development of large, complex applications that are not consistent with Nomad users' experience with the product. Many of them use Nomad effectively in multiperson development teams for applications whose complexities far exceed those of the benchmark.

Abby Pinard
Vice-President, Marketing
Must Software International
Norwalk, Conn.

Standards matter

Rep. Richard Gephardt's Viewpoint article [CW, Aug. 6] points out the need for international standards for communications among different computer systems and standards for the security of computer systems and their data.

Just as a matter of clarification, the Department of Defense, in conjunction with both domestic and international industry, has been aggressively and successfully working toward such a goal for years. In the article "Easing paperflow could help slash DOD budget," [CW, Aug. 14] the initiative referred to as Computer-Aided Acquisition and Logistics Support, or CALS, is encouraging standardized international trading practices in the Information Age.

CALS is a strategy designed to effect an evolution from the current paper-intensive process of product development to a highly automated method of operation, thus eliminating the roadblocks caused by incompatible islands of automation. In addition, as a member of the DOD CALS Industry Steering Group, we understood all along that the right information in the wrong hands could prove disastrous; consequently, computer security is an important feature.

Paul N. Pechersky
Vice-President, MIS
ICL, Inc.
Irving, Texas

Needed detail

Regarding your recent column, "IS needs to learn rules to play innovation game" [CW, Aug. 6], Mr. Ogbene's "Viewpoint" was typical of the consulting world we "muzzlers of innovative solutions" face daily.

I note no mention of cost-effectiveness in his proposed smart-card solution ramblings about the evils of information systems departments and their roles in corporate America. Rather, his complaint, more directed at difficulties in securing his "daily bread," is sour grapes about several failed efforts to introduce the wonders of "innovation" to several concerns. My role, and that of IS executives, is to ensure that information technologies are applied to earning our respective employers' profits, not introducing innovation.

In his examples lies a clue to why these miraculous solutions were not adopted posthaste. In the hotel scenario, Mr. Ogbene gives us just enough information to see that the depth of his proposal is indeed typical for the gunslingers of consultant-dom; how were these spreadsheets to be reported centrally? The other example lacks details, but large-scale inventory systems require a level of expertise and detail not evident in this viewpoint.

Marshall J. Huntenburg
AVP Data Center Services
GAB Business Services
Parsippany, N.J.

Fool me once . . .

It's really great to read that Peter Bartolik loves his PCjr with its nifty design features, which he was able to pick up for a close-out $400 [CW, July 2]. Admittedly, he does not think the IBM PS/1 will make it. Good thinking! It was a loser from the time I opened the box, as testified by IBM, which made the machine obsolete six months after I purchased it. To add insult to injury, Computerland, the distributor of my giant paperweight, refused to offer any help. Scotty of Star Trek said it best: "Fool me once, shame on you. Fool me twice, shame on me."

Jerry Amancio
Manager, Data Processing
Carlyle Johnson Machine Co.
Manchester, Conn.

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Slow the push to judgment

MITCHELL KAPOR

The more closely we look at the "problem" of computer hackers, the more we need to be wary of quick judgments and shortsighted solutions.

In a recent case, the press reported that highly confidential material about the operation of the 911 emergency system was removed from Bellsouth Corp.'s computer network as part of a plot to disrupt 911 services. The material was variously described as computer control software, telephone access codes and even a computer virus. These news reports were based on accounts from government prosecutors, Secret Service agents and Bellsouth officials.

Craig Neidorf, the defendant in the case and the publisher of an electronic newsletter, was indicted on felony charges of wire fraud and interstate transportation of stolen property. Neidorf had published a document that someone else had removed, without his knowledge, from a Bellsouth computer.

When the Electronic Frontier Foundation (EFF) was formed last month to protect the First Amendment rights of computer users, some reporters misconstrued its purpose as an attempt to defend malicious computer break-ins. Ignored was EFF's clear position that unauthorized entry into computers is wrong and should be punished. The press also discounted EFF's claims that the government prosecution of computer crime had gone too far in the Neidorf case. We were told instead to wait until the facts came out.

We waited. On the fourth day of the Neidorf trial, the prosecution dropped the case after it became clear that the "highly confidential" Bellsouth document was publicly available. In fact, it could be ordered from Bellsouth for $13.

The EFF was instrumental in this outcome. We located the expert witness who found publicly available information that contained all the material in the disputed document. Without our participation, Neidorf may well have gone to jail for the act of simply publishing information.

Justice was served by the government's decision to drop the case, but it was expensive justice. Neidorf and his family face enormous legal bills for an action that never should have been brought against him. The prosecutors relied on Bellsouth's claims and failed to do independent research, which could have easily shown that Bellsouth's allegations could not be supported. More independent verification must be required before initiating criminal proceedings.

Bob Dalton

In a second case, the EFF assisted Steve Jackson, a game manufacturer in Austin, Texas, who suffered substantial business losses after a Secret Service raid in early March. No charges were ever brought against Jackson or his company. We helped him recover his equipment after it had been seized by the Secret Service. We are also trying to get the warrant unsealed so we could determine the reason for the investigation that forced Jackson to lay off half of his staff.

People who break into computer systems and cause harm should be held accountable for their actions. The punishment should match the seriousness of the act. Just as the law makes a clear distinction between trespass and burglary, we need to make appropriate distinctions among the various forms of computer crime, based on facts such as intent and the degree of actual damage.

In some instances, it may be necessary to create new criminal laws to discourage new types of crime. For example, the EFF supports an amendment to computer crime law that would punish people who engage in reckless acts with computers.

At the same time, network operators must also be held accountable for the management of a network and should put in place adequate security measures to protect both private users and corporate data. Blaming hackers for all forms of computer abuse is a shameful evasion of responsibility. Creating scapegoats will not improve system security.

Computer users need to know that their use of computer networks for information and communications purposes is secure from unwarranted intrusions and interference by anyone, whether a private party or a government agent. This requires not only the proper laws and the intelligent application of those laws, but also the development of a broad public understanding of benefits and responsibilities that come with modern computing and telecommunications technology.

EFF has funded a significant two-year project on computing and civil liberties to be conducted by the Computer Professionals for Social Responsibility. We aim to educate policymakers about the civil liberties issues that may lie hidden in the brambles of telecommunications policy. This process — not midnight raids at gunpoint — will help shape public policy that is sensible, reasoned and well-informed.

Kapor is the chairman of On Technology and the co-founder of the Electronic Frontier Foundation.

American business must seek out the longer view

ROCCO J. MARANO

America has proven its business acumen in many subindustries such as telecommunications equipment, computers and semiconductors. But we suffer from a nagging inability to put all of these together into a coordinated, far-reaching initiative.

The challenge that information-related business and enterprises face today, and the challenges to America's overall technological competitiveness, are largely internal issues. Some of the most difficult potential roadblocks are rooted in long-standing domestic traditions.

Isolationist views, archaic regulations, short-term management mentality, the pursuit of excessive financial gimmickry and a troubled public educational system all threaten America's position as a technological leader by endangering our ability to integrate our resources.

There exists a tremendous opportunity for U.S. businesses to exploit and build on America's technological and industrial strengths. If we make the right choices now, people will have access to new kinds of information and be able to create new knowledge, wealth and entertainment. America's telecommunications infrastructure is key to this vision of the future.

Americans are already taking advantage of many advances and have started to make changes in the way they gain access to and use information. They have bypassed public telephone networks when those networks did not meet their needs. But as they have become accustomed to pieces of the future, they have come to expect the rest of the future to fit together nicely in one vast technical quilt.

However, it does not yet fit together well, and Americans are beginning to ask why not.

In the U.S., we act as if we are an island economy, largely independent from the rest of the world. In more lucid moments, we know that is not true. But our national view of such matters was formed when it was true.

In management, many continue to strive for short-term profit, believing that value to shareholders is equivalent to next quarter's earnings. Short-term "quarterly profit" management concentrates on what a firm has, instead of what it can create. It can add, but it can't dream.

A little of both

I'm certainly not suggesting that we concentrate on dreaming and forget how to add. But look at how many technologies pioneered in the U.S. have been turned into products in other countries and sold back to us as imports. We need to reshape the journey from laboratory to market without diminishing the importance of either.

Ironically, our nation's laws make total cooperation almost impossible. U.S. antitrust laws were written to ensure fair competition in an isolated, independent economy — something that no longer exists. U.S. companies compete in world markets; if they are to compete effectively, they must be able to cooperate upstream from the marketplace.

In telecommunications, a critical arena for fueling the information age, regulation was designed to ensure basic or "plain old telephone service" — service that was reliable, universal, affordable and nothing more.

The world just doesn't look like that anymore. Regulation that assumes it does stands in the way of progress — economic and social, as well as technological. But there are hopeful signs. For one, bills are pending in Congress that would move jurisdiction over the 1982 decree that broke up the Bell System from the court to the Federal Communications Commission. That decision still prevents the regional Bell holding companies from designing, manufacturing or providing information services.

The U.S. government also has no coordinated strategy for technology. Instead, we have an ad hoc, disjointed policy scattered among nine congressional committees, four congressional support agencies, 14 executive branch departments, dozens of executive branch agencies and 51 state regulatory bodies.

In contrast, our chief international competitors have coherent national policies embedded in civilian agencies. Though the Japanese have their own problems in this area, their Ministry of International Trade and Industry plays a major role in targeting the coordination and funding of Japanese efforts in high technology.

It is this national approach that enables some other industrialized nations to take coherent, strategically advantageous positions during multilateral and bilateral negotiations. The U.S. does not have a single telecommunications or information/technology policy; consequently, it has been more difficult for us to achieve a unified national point of view.

We still have time to direct our future and better prepare for the 21st century. There are some things that industry and government must do now to make that happen.

- Industry can expand the frontiers of fundamental technologies through much greater upstream cooperation — and government can amend its antitrust laws to allow it.
- Industry can continue good standards work that has been done — and work toward streamlining the process by which we arrive at a viable international standards position.
- Government can lead the way to a national information technology policy — and revise laws and regulations as needed to support that policy.
- Both government and business can make a greater investment in improving the quality of public education and encouraging more youngsters to take on the scientific challenge.

We can choose to be technological followers, living on mutually incomprehensible islands. I cannot believe we would consciously make that choice. Yet, that is the future being shaped by our individual motives. There is a better choice.

Marano is president and chief executive officer of Bellcore.

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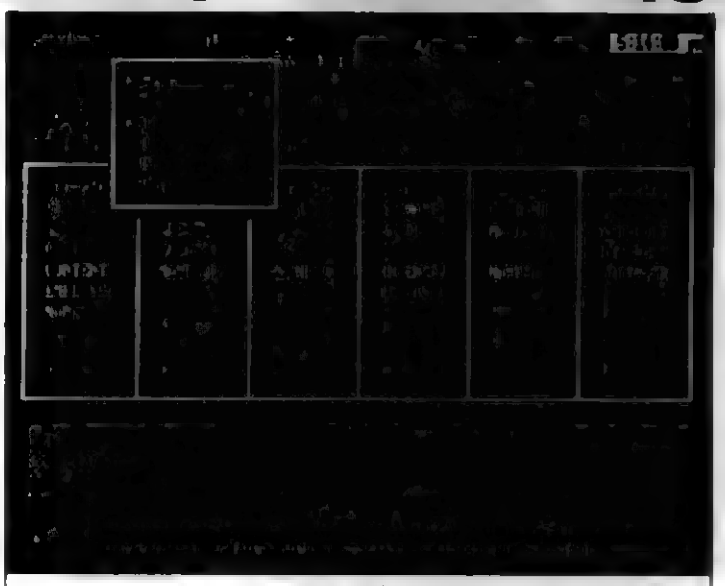

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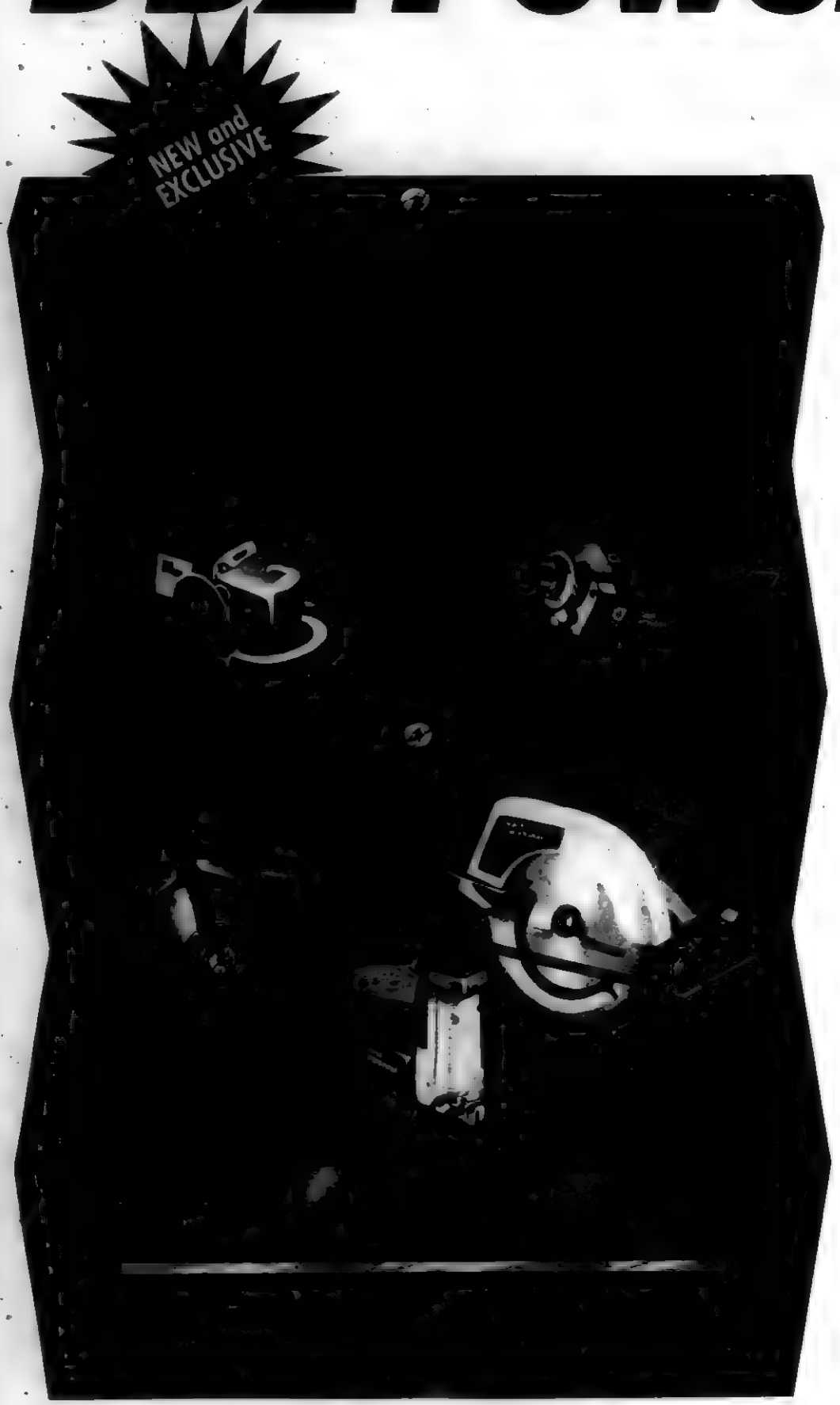

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COMMENTARY

Robert L. Glass

Crisis? What crisis?

I have always been uncomfortable with the notion of "the software crisis," the belief that software is always behind schedule, over budget and unreliable. Part of my reaction was emotional — as a practicing software professional, I was offended that someone would say we were not doing a good job.

Part of it was logical — if there truly is a software crisis, then how can we send vehicles into space? How can we run our banking system with computers? How did we create a multibillion-dollar software industry?

My emotional response boiled over a few months ago when I saw how people were using the data from the U.S. General Accounting Office (GAO). You've probably seen the data — a horrendous percentage of projects were never successfully completed. Speakers and writers began using the GAO data to prove there was a software crisis.

But there was a problem with that data: The projects studied by the GAO were not random choices. They were selected because they were in trouble. In other words, the GAO study concluded that many troubled projects are never completed successfully. That, of course, is self-fullfilling prophecy.

I would like to assert that the software crisis has been

Continued on page 32

Foggy mainframe picture stalls user plans

ANALYSIS

BY ROSEMARY HAMILTON
CW STAFF

It all depends on where you sit.

Throughout the summer, the expected announcement of IBM's next-generation mainframe has been great sport for industry observers as they speculate on what it will be.

But for some information systems managers, the same period of time has been much more of a hassle, with managers having to make capacity plans with a big question mark. While some managers may have been briefed to varying degrees on IBM's product plans, not all have been privy to such briefings.

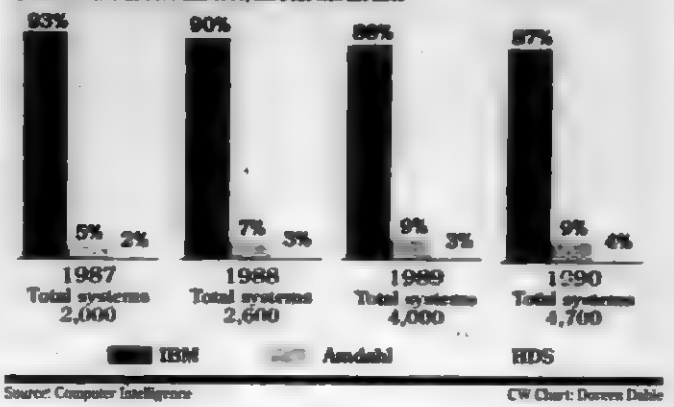
Several IS managers contacted recently said their goal is to position themselves so they do not get hurt. Not only will the announcement put new systems on the market, but it will likely rearrange the pricing structure on current 3090s and used equipment.

So, the primary concern is to avoid adding capacity unless it is absolutely necessary, IS managers said. What IS managers don't want to do is buy a system that will soon be technologically behind or that will suffer a big drop in value in the near future. If it is necessary to upgrade, then the goal of most IS managers is to buy as cheaply as possible — either on the used market or by working a deal with IBM.

"You make sure you have the best deal possible," said Bill Freel, an executive vice-president at Prudential Services Co., the information services arm of Prudential Life Insurance Co. "The better you can do, the less you're impacted by the new price/performance curve."

Big Blue marble

No matter how you cut it, the mainframe world remains IBM's domain



Source: Computer Intelligence

CW Chart: Doreen Dahle

Analysts contacted recently report that while buying activity is typically slow at this time of year, it is taking even more of a dip because of preannouncement jitters.

"We are seeing a lot of hesitation and concern about up-

Continued on page 28

AS/400 utility debut makes few waves

BY MARYFRAN JOHNSON
CW STAFF

When IBM's new Application Program Driver (APD) appeared on the U.S. market a few weeks ago, it drew a few muffled cheers from small software vendors but mainly yawns of disinterest from the big software houses.

"This is one of those situations where the people who needed it already have it," said Jim French, director of technology at System Software Associates, Inc., a major Application System/400 software company in Chicago. "Those who don't have it haven't figured out they need it yet."

"It" is a precoded menu utility — a kind of operational housekeeper — that provides a standardized approach for key support functions common to nearly all applications. Those functions include menu design and control, security measures, single menu display, batch program scheduling, integration of transactions from various applications and save/restore functions.

"What IBM has done here is build in a lot of code for housekeeping features, things the little business partners can't afford to develop in their own applications," said Carson Soule, president of Computer Applications Specialists in Beltsville, Md. "The big application shops have been doing this stuff all along."

Old news in Europe

Available for years in Italy and other European countries, APD is a software shell that perches on the OS/400 operating system "and kind of tweaks it," said Tim Fenlon, president of Chiefs, a small software company in Franklin, Ohio, that specializes in public safety applications.

"We are using APD to assist us in controlling access and password security, so users can't poke around into other menus they are not authorized to see," Fenlon said. "It can also be used to automatically time-schedule backups, which is important to our customers, [who] are police, sheriffs and emergency medical departments."

"This may be one of the best products announced on the AS/400," added Fenlon, whose firm took part in IBM's prerelease program on APD. "With that relational database environment, you can get yourself in trouble if you don't know what you're doing or how the system is run. You can foul up your own applications without intending to."

More technically oriented users can employ the program driver to lash together a number of small applications from different companies, customizing their own menu screens with greater ease and navigating more smoothly between programs with a common interface.

IBM has set its one-time license charge for the utility from $900 to $2,400, but the going rate for menu utility packages from third-party vendors generally tops out at $900, several sources said.

The most likely customers for the program driver will be small software developers, customer sites with large AS/400 networks and their own programming staff and accounts with specific security concerns.

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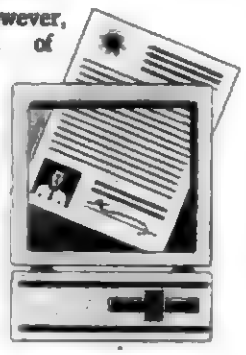
Loan staff saved by imaging lifeboat

Image processing rescues PNC from drowning in a paper flood

ON SITE

BY MARYFRAN JOHNSON
CW STAFF

PITTSBURGH — Summertime used to be crunch time for the student loan department at PNC Financial Corp., with thousands of documents rushing like a swollen river through John Koopman's division.



These days, however, the vice-president of PNC's Education Loan Center is basking in the glow of a successful imaging project that is harnessing that flood of paperwork and shoring up employee productivity.

The education loan center completed installation of a Filenet Corp. optical disc-based image processing system last year, with 15 dedicated Filenet workstations and an optical-disc storage "jukebox" that holds all of the student loan paperwork.

Letters, forms and applications that were once shuffled around manually in thousands of manila folders now reside electronically on-line. Access and retrieval of an estimated 2 million documents takes a few keystrokes rather than a safari to the file room.

"The change in our work environment and the impact on our business has been tremendous," Koopman said. "What the terminal and PCs did to the desk of the traditional office worker, imaging is doing for the clerk. It's radically changing their environment."

PNC is the 14th largest bank holding company in the U.S., with $40 billion in assets and 15 member banks in the Midwest and Northeast. All of the banks forward their student loan applications, notes and related paperwork to PNC for processing — a summertime rush that calls for processing 5,000 applications per week. This year, PNC expects to process 70,000 student loans.

The bank keeps the original note, but all other paperwork can be discarded once it is scanned into the system.

When the bank moved to a new building in March, Koopman was able to save $60,000 in annual rental fees for office space his 50-employee department no longer needed.

Converting the loan center's 150,000 paper files into imaged documents took 10 months, and employee training took an additional month. The resulting 20% improvement in employee productivity — through the elimination of several manual steps in the procedure — was another benefit, he noted.

Yet the most visible and important change, Koopman said, came in customer service.

"When someone calls in about a student loan, from the beginning you feel a little defensive," the banker said. "Everybody's perception is that this process is a pain in the neck, full of bureaucracy. This phone call is just heading down the dark tunnel!"

With document images readily available from each workstation, requests can often be handled while the client is still on the phone.

However, a more productive workplace may have side effects management did not anticipate, he added. Visual signs of progress used to be the shrinking stack of paperwork on the corner of the desk. "How do you give that operator a visual inkling of where they are in their process?" Koopman asked. "What worries me now is the long-term impact of this technology. Will a clerk end up feeling burned out after six months of sitting in a chair all day and looking at a terminal screen? That issue is probably the poorest addressed side of imaging."

Koopman sees imaging impact

His suggestion is for imaging vendors to follow the lead of Apple Computer, Inc.'s Macintosh personal computers and incorporate some colorful, graphical user interfaces into the imaging software to track and display a worker's progress.

As a predominantly IBM shop, PNC maintains all of its student loan accounting, payment history and financial records in a database on a 3090 mainframe, with a host connection to the Filenet system limited to workstation inquiries only.

"The inquiry function just pops up a 3270 window, and it's nice to be able to view on-line accounting data [from the mainframe] at the same time as the database on the Filenet system," said Nancy McDonald, who manages end-user technologies and custom services for the bank's data center. "But that's the only integration we need now."

When PNC went looking for an optical storage system in 1987, Filenet was the only vendor that inspired much confidence, Koopman recalled. "Nobody had all the pieces, really. But the software was where Filenet separated from everybody else."

The game has changed, Koopman and McDonald agreed, with imaging technology offered by IBM, Digital Equipment Corp., Wang Laboratories, Inc. and other vendors.

If the bank moves imaging technology into other divisions, it will probably lean toward imaging products from IBM rather than Filenet, McDonald noted. "While Filenet is certainly performing very well, they are dedicated workstations. You can't run Lotus or Wordperfect there," she explained. "The platform of the bank is heavily committed to IBM, and IBM has committed huge resources to research and development in imaging. Seeing is believing for a lot of it, of course, but you cannot ignore it."

Wang updates Office/Profs Gateway

BY SALLY CUSACK
CW STAFF

LOWELL, Mass. — Wang Laboratories, Inc. has expanded its support of IBM's Systems Application Architecture with a revised version of the Wang Office/Profs Gateway designed specifically to run in an IBM VM/XA SP2 environment.

Release 3.16.60 will continue to support IBM's VM SP5 and VM SP5 HPO operating systems, the company said. Wang Office/Profs Gateway was originally introduced to allow Wang Office users to exchange documents, memos, invitations and data processing files with Profs users. Available now, the latest release costs $4,000 for IBM systems. Wang Office/Profs Gateway for VS platforms ranges from $2,500 to $32,500.

The company also announced that it has certified VS Access/3210 Release 2.1 to run on IBM's ESA/370 operating system, allowing Systems Network Architecture (SNA) 3270 workstations and personal computers to log on to Wang VS systems via an SNA network. Release 2.1 was created to permit migration from MVS to ESA/370 without affecting current user access to a VS system.

VS Access/3270 costs $4,000 for MVS and ESA/370 and $2,500 for VM and VSE. Versions for the Wang VS series cost from $250 to $3,250.

A mainframe feel for Unix

BY ELLIS BOOKER
CW STAFF

ROSEMONT, Ill. — A move to Unix can be scary for dyed-in-the-wool IBM programmers. However, two recently introduced software tools reportedly make the transition a little easier, allowing users to cling to their familiar IBM mainframe program editors even after they have started sitting in front of Unix workstations.

In June, the Workstation Group, a division of Dynasoft Corp., introduced uni-Xedit and uni-Rexx, Unix versions of IBM's popular systems editor (Xedit) and its Systems Application Architecture procedures language (Rexx). The tools provide an IBM user interface but output Unix data structures.

Dynasoft developed the programs at the request of one of its big customers, Amoco Corp.

"Our interest started two years ago when we started to introduce Unix into our shop," said Ronnie Powell, a supervisor in the workstation support center at the Houston-based energy company.

Amoco first looked at Kedit, a personal computer version of Xedit from Mansfield Software Group, Inc. in Storrs, Conn. "We asked them about their development plans, and they said they were going to OS/2," Powell said. Similarly, Mansfield's Rexx product was destined for OS/2, not Unix, Powell was told.

So Amoco discussed the idea with Dynasoft, from which it had already purchased IBM mainframe utilities.

The result was a partnership of sorts: Amoco funded Dynasoft's initial research and development work and for this received a commitment of future support for the two products.

While Dynasoft's uni-Xedit and uni-Rexx mirror the command syntax of the IBM products, this does not extend to their underlying data structures. In other words, the Unix implementations of Rexx and Xedit output ASCII, not EBCDIC, as do IBM systems. Although not naturally compatible, there are ways to reformat and exchange data files between the systems.

Powell said that the savings from the tools, which have been used by Amoco's Unix programmers for about a year, are somewhat intangible. "We wanted to reduce the barrier to getting into this environment," he said. "We didn't figure, 'This will save 20 hours of training.' "

Critics could reasonably question the wisdom of replicating IBM mainframe commands on modern Unix workstations, Powell admitted. But the goal of the project was "to lower the discomfort level," he said, and the project was undertaken with the expectation that the VM programming staff, after growing accustomed to Unix, might find Unix tools preferable to the mimicked IBM ones.

Prices start at $399 for each tool or $699 for both.

Global interface released

BY MAURA J. HARRINGTON
CW STAFF

RALEIGH, N.C. — Global Software, Inc. has introduced Manager's Workstation, a graphical interface designed to enhance personal computer access to IBM Application System/400 computers and IBM mainframes.

Although it is designed primarily for Global's Executive Information System, Manager's Workstation can also be used with other Global software, the company said.

The product features a four-color, menu-driven format, as well as graphics and mouse capabilities. Additional features include the ability to create spreadsheets and comparison charts and to access Global and non-Global products, said Thomas Roberg, Global vice-president. "The whole point of this product is to give the user an easy way to talk to the system."

Julie Skibski, senior systems analyst and programmer at Toledo Hospital in Toledo, Ohio, said that while the computing capabilities and interface to non-Global products sound attractive, the product is a luxury at the present price.

"We have Global's general ledger and accounting packages, and it would be nice to be able to link our products to non-Global products. But we're also looking at costs, and we couldn't justify it," Skibski said.

The price for Manager's Workstation ranges from $5,000 to $10,000 and must be used with at least one other Global application product.

Available now, Manager's Workstation must be used with an MS-DOS or OS/2 operating system, a 1M-byte Intel Corp. 80286-based PC with a 20M-byte hard drive, Enhanced Graphics Adapter or Video Graphics Array color monitor and a mouse, touch screen or host-access board.

PRODUCT REVIEW

Ideal's case for decision support

Computer Associates International, Inc.

This is the third in a monthly series of performance benchmarks that for the next several months will focus on the integration of computer-aided software engineering (CASE) and fourth-generation language (4GL) products. The benchmarks are monitored by an independent team headed by David Whiteside, managing director of Computing Futures Ltd., and his associate, Prof. Eberhard Rudolph, formerly of the University of Auckland, for exclusive publication in Computerworld.

Each product is observed in action over a three-day period during which a vendor team solves the case study project costing system, an application familiar to most information systems professionals. The team's mission is to demonstrate the capability of the major CASE/4GL environments to deliver complete and complex business solutions under "live fire" conditions. In this issue, we look at the development tools CA-Ideal and CA-Datacom from Computer Associates International, Inc.

•

Carried out by CA in the UK, the solution to the benchmark problem was basically complete, but it lacked in some minor areas. However, the CA solutions complied almost totally with IBM's Common User Access entry-level requirements. Thus, we rated the level of completion "very good."

•

CA's test team consisted of three specialists as well as a project leader, who spent almost all of his time identifying possible enhancements. CA put an unusually strong effort into finding a solution to the benchmark problem that would incorporate any change it could anticipate. As a result, the overall effort of 162 hours, including 104 hours of planning, was much higher than what we have observed in previous tests. It also exceeded the 120-hour time frame suggested by several estimating tools.

The development speed was further hindered by the high volume of coding detail required and several failures of the software environment. For these reasons, we rated the speed of development "poor."

•

However, the prodigious effort put into initial development paid off in maintenance. Most of the enhancements we asked for at random were already in place. Only minor modifications were needed, preventing a demonstration of the true maintenance capabilities. Under the circumstances, we rated speed of maintenance "excellent."

•

While the documentation produced was complete, it was not particularly readable. It consisted of program listings, data definitions and layout definitions, identification and resources. No graphical representation was generated. Thus, we graded documentation "fair."

•

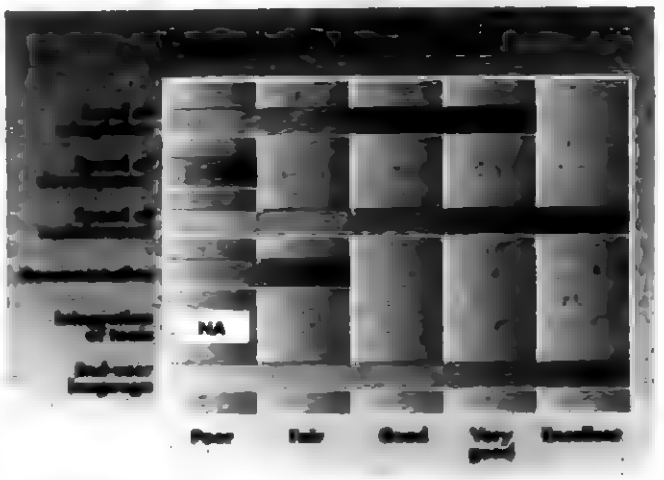
There were no tools to be integrated. Third-party CASE tools could be used up front, but their results have to be imported manually into the CA environment. Therefore, a "not applicable" rating was given to the integration of tools category.

•

The end-user tool CA-Dataquery was impressive. It was very easy to use and handled the inquiry jobs without fail. The personal computer version of this tool was also used successfully to import Ashton-Tate Corp. Dbase files in the interface section. It fully deserved the rating "excellent."

•

In summary, the considerable effort CA put into solving the benchmark problem did not always pay off. However, a workable solution was provided for a mainframe environment. In our case, it was easily maintained and provided guided access for the end user with decision support needs.



Computer Associates tool kit

- CA-Datacom — DBMS including SQL relational support
- CA-Ideal — Fourth-generation language
- CA-Dataquery — End-user decision support tool
- CA-Dataquery PC — PC version of the decision support tool

Development and maintenance report card

Performance in each area is graded from A (excellent) to F (poor).

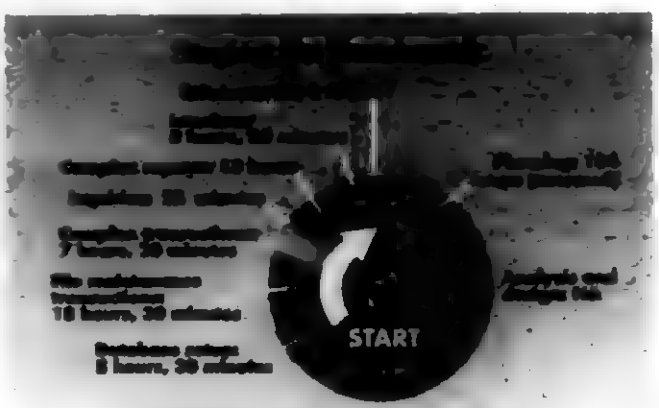
ANALYSIS AND DESIGN: NA
In the absence of an integrated CASE tool, the CA solution was analyzed and designed with a great deal of effort during the planning stage. It took a team of three 13 man-days prior to the start of the benchmark.
Strength: Not applicable.
Weakness: There is no bridge to third-party CASE tools.

DATABASE SETUP: D
This stage took a very long time to set up. A lack of familiarity with SQL coupled with meaningless error messages and a bug in an SQL function were the roots of the delays. An overly complex solution further added to the problem.
Strength: Full SQL support.
Weakness: It is not very helpful to the developer.

FILE MAINTENANCE TRANSACTIONS: D
Again, this was a very cumbersome process in which the programmer had to define the program code at a detailed level. The only help was Ideal and SQL syntax templates, which could be adapted with the source code editor.
Strength: All program components make use of the data dictionary.
Weakness: The programmer is overburdened by detail.

COMPLEX TRANSACTIONS: C
Where much attention usually has to be given to coding details, Ideal was able to tackle the job without much difficulty.
Strength: Use of data integrity provided by the schema.
Weakness: There is still a lot of detail to cope with.

INQUIRIES: A
What a contrast. The end-user tool Dataquery provided the answers with ease. A "guided tour" even directed the casual user to a solution, which is integrated with the data architecture of the whole system.



Total effort: 162 hours, 15 minutes
Elapsed time: 49 hours, 20 minutes
Team size: 3 (4 in planning)

Strength: It provides SQL power to the end user.
Weakness: None identified.

COMPLEX REPORTS: D
Because the complex report had to be coded in Ideal, it took an excessive amount of time and was barely completed by the end of the benchmark.
Strength: The data dictionary assists in the reporting process.
Weakness: It lacks an efficient report-painting facility.

INTERFACE: B
CA-Dataquery PC was used to load the data into the mainframe environment. A modified version of the Ideal timesheet program provided a solution after a data definition error was spotted.
Strength: Dbase III files are uploaded with ease.
Weakness: The error report has shortcomings.

ENHANCEMENT: A
This was an easy cruise because all the data changes were already anticipated and incorporated from the beginning. The necessary layout and logic changes were made without difficulty.
Strength: A well-planned data structure.
Weakness: The system is overly complex.

The solution was developed on an IBM 3081 mainframe under MVS/XA Version 2.2.3 and JES 2, which provided central support services for Northern Europe and provided U.S. gateways supporting between 200 and 300 terminals.

Details of the products are available from Computer Associates World Headquarters, 711 Stewart Ave., Garden City, N.Y. 11530, (516) 227-3300.

***Development World** product briefings are based on a series of full solutions to the case study. They are prepared by leading vendors and published along with in-depth product analyses and consultants' test reports in Development World Libraries. Please see business reply card between pages 60 and 61 or fax (508) 820-0146 for a brochure.*

A Comparison Chart of the Major Cooperative Processing Software Products:

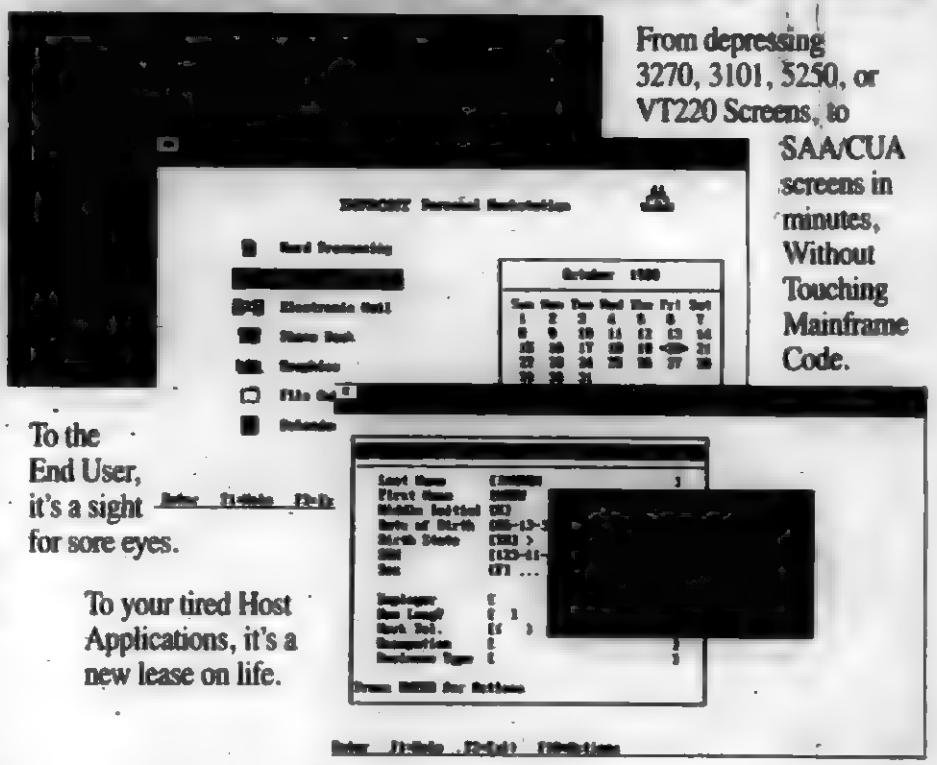
FUNCTIONS:	SUPER-LINK®	Easel™	Mozart™	Arbiter®	IBM's HLLAPI™	IBM'S APPC™
Processing Topologies Supported						
Peer-to-Peer Processing	✓			✓		✓
Existing terminal-based systems	✓	✓	✓		✓	
Mixed Peer-to-Peer and existing systems	✓					
Application integrity/Software Distribution	✓		▬			
SAA/CUA Interface compatibility	✓	✓	▬			
Workstation Environments Supported						
PC/DOS	✓	✓	✓	✓	✓	✓
OS/2	✓	✓	✓	✓	✓	✓
PC/DOS to OS/2 application compatibility	✓		?			
LAN Server for shared applications and data	✓		?			
Multiple transaction servers on a LAN	✓					
Development Environment Comparison						
Object orientation	✓	▬				
Dictionary and documentation	✓					
Panel/Form painter for creation/maintenance	✓	✓	▬			
3270 screen capture: picture and attributes	✓					
CASE/Application Generation	✓	✓				
Intelligent (language-sensitive) editor	✓					
System and user-defined reusable code templates	✓					
Integrated compile/test/debug	✓	✓				
Execution time source debugging	✓	▬				
All development tools for DOS available in DOS	✓		✓			
Objects Supported						
CUA display images	✓	✓				
CUA dialog within display object	✓					
Validation within display object	✓					
Help processing	✓					
Error processing	✓					
Text window interactions	✓	▬				
Business graphics	✓	✓				
3270 definition	✓					
Interactions with 3270	✓					
Interactions with Peer-to-Peer	✓					
"Logon" Scripts	✓					
Application integrity/Software Distribution	✓					
Local Data Access						
Indexed files	✓		✓			
dBase	✓		✓			
Flat Files (random access)	✓					
Flat Files (sequential access)	✓	✓	✓			
Multiple read/write to files on LAN Servers	✓					
High Level Functions Directly Available in the Language						
Field-level context sensitive help	✓		✓			
Optional user learning mode	✓					
Display and selection from:						
Indexed files	✓		✓			
Sequential files	✓	✓	✓			
In-memory lists	✓	✓	✓			
Menu display and selection	✓		✓			
Determining 3270 screen identification	✓		✓			
Read/write to 3270 in a single command	✓					
Read/write to 3270 one field at a time	✓	✓	✓			
Determine dynamic 3270 attribute changes	✓					
Embedded user assistance (pop-up selection lists)	✓					
Data editing/validation:						
Data type/mark checking	✓		✓			
Single range/limit check	✓		✓			
Field/data driven range/limit check	✓					
Date formatting/validation	✓		✓			
Validation against local and LAN files	✓					
Required fields	✓		✓			
"Must Fill" fields	✓					
Zero not valid fields	✓		✓			
Peer to Peer Host Environments Supported						
MVS-CICS	✓			✓		✓
MVS-IDMS/DC	✓					
MVS/TSO	✓					
DOS/VSE-CICS	✓			✓		
VM/CMS	✓			✓		✓
DEC VAX/VMS	✓					
Software Distribution Host Environments Supported						
MVS-CICS	✓		✓			
MVS-IDMS/DC	✓					
MVS/TSO	✓					
DOS/VSE-CICS	✓					
VM/CMS	✓					
DEC VAX/VMS	✓					

Every effort to present an accurate chart has been made, however no guarantee can be made (1/2/90). Super-Link® is a registered trademark of Multi Soft, Inc., Lawrenceville, NJ. Mozart™ is a trademark of Aspen Research. Easel™ is a trademark of Interactive Images, Inc. Arbiter® is a registered trademark of Tangram Systems.

Don't be Suckered, Pushed, or Intimidated into expensive OS/hardware just to get SAA/CUA.

Multi Soft delivers SAA CUA on character based 640K DOS PCs.

Save over $5000 per station, extend the life of your corporate hardware and software assets, and save millions of dollars!



From depressing 3270, 3101, 5250, or VT220 Screens, to SAA/CUA screens in minutes, Without Touching Mainframe Code.

To the End User, it's a sight for sore eyes.

To your tired Host Applications, it's a new lease on life.

Multi Soft's INFRONT/DS™ & EasySAA™ products enable rapid development of intelligent SAA/CUA cooperative processing applications on standard low-cost 640K DOS PCs.

In addition its INFRONT/SDF™ (Software Distribution Facility) maintains the integrity of your software applications, tables and data.

The SUPER-LINK product family represents the leading edge, and by far, the only complete family of cooperative processing products.

And its INFRONT/HPO™ product provides the full peer-to-peer cooperative processing capabilities of IBM's APPC (Advanced Program-to-Program Communications) product for PC/host applications. However, instead of requiring the use of LU6.2 SNA sessions, it works over the LU2-based networks that are already in place. Both standard, LU2-based SNA links, as well as asynchronous communications are supported.

Not even IBM offers that kind of support now. In addition all SUPER-LINK based applications port without change to IBM's OS/2, PM, and LU6.2 strategic platforms.

You can even add ICON Based Menus & Backgrounds on your CGA character based DOS PC *in minutes!*

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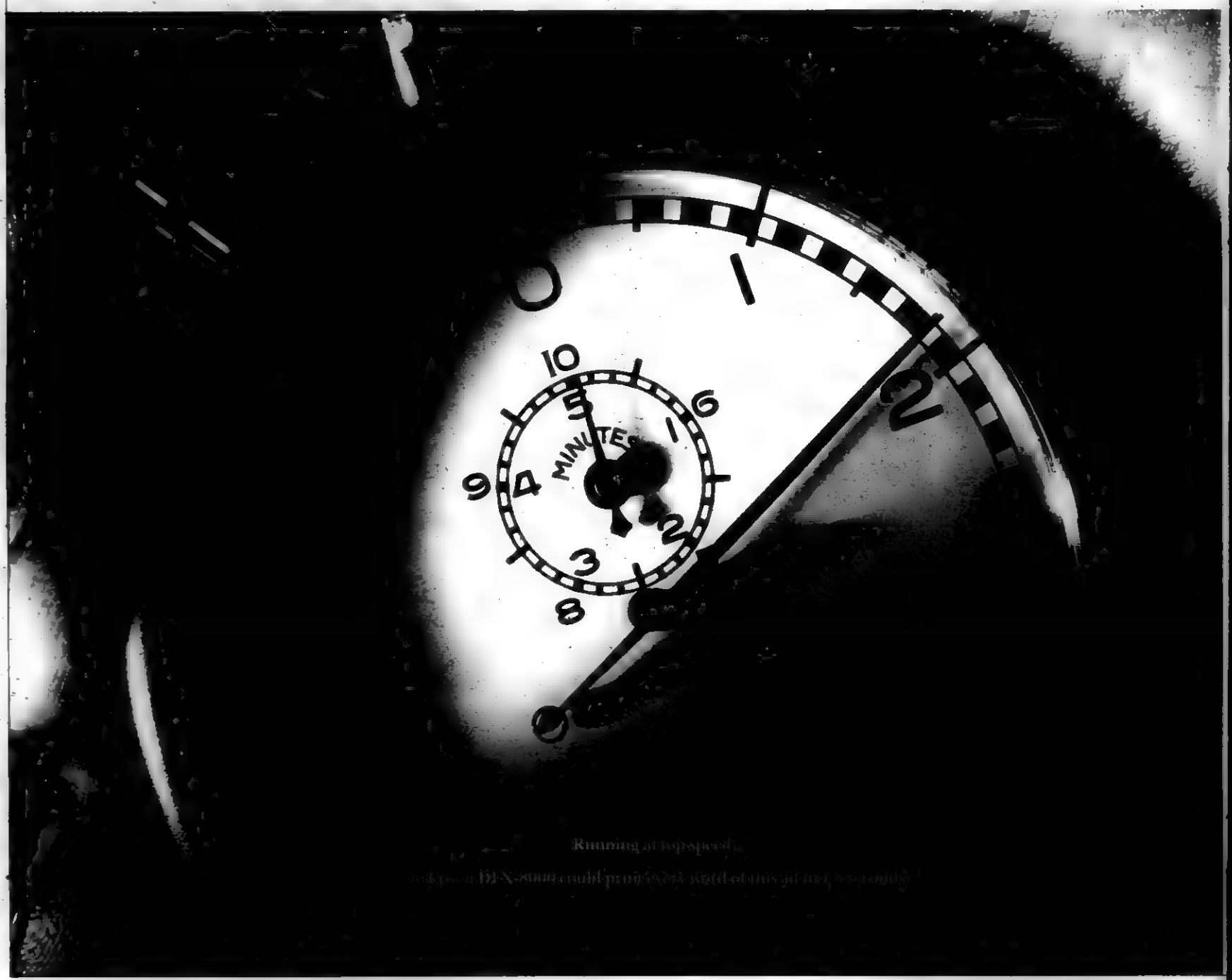

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Calculations based on average reading time of 100seconds per page. SmartPark is a trademark of Epson America, Inc.Epson is a registered trademark of Seiko Epson Corporation. ©1990 Epson America, Inc., 2780 Lomita Blvd., Torrance, CA 90505. (800) 922-8911.

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e Epson DFX-8000
nted 52 more.

There is an elite group of high-volume printer users for whom speed is measured not in hundreds of characters per second, but in thousands. For those of you, the quick minds at Epson® have created the new DFX-8000. It is, quite simply, the fastest printer Epson has ever made.

It is also compelling proof that an inspired piece of engineering need not be accompanied by an inflated price tag.

At 1066 characters per second, Epson's fastest printer ever.

Through a highly innovative two-in-one print head design, the engineers at Epson were able to double the speed of the DFX-8000—at a cost significantly below that of the average line printer.

While few printers can match the sheer speed of the DFX-8000, even fewer can match the ease with which it handles. Productivity-enhancing conveniences include Epson's advanced Smart-Park™ paper handling, dual paper feeds and an optional automatic paper cutter, plus other useful features rarely found on line printers.

As with every Epson, compatibility and reliability are a foregone conclusion. The DFX-8000 will easily connect to your PCs, minis and mainframes, and will run day after day without the least bit of trouble.

The combination of speed, features and reliability offered by the DFX-8000 is enough to accelerate the pulse of the most demanding high-volume printer user.

That is why, when you finish reading, we encourage you to watch it print a few hundred pages, in person.

It will only take a few minutes of your time.

Engineered For The Way You Work.™ EPSON

Glass

FROM PAGE 25

neither proven to exist nor analyzed as to its causes. Why, then, do we have this mentality?

Usually the software crisis is cited as a justification for a research study. Give us funding, the researchers say, and we will automate some technical portion of the software development process, which will in turn solve the crisis. Since we understand far too little about this problem, it is unclear that the solution will be technical.

Let us suppose that there is some validity to the crisis and that many projects are behind schedule and over budget. Can we hypothesize a cause? The simplest explanation I can think of suggests a single source for all three symptoms. We simply do a bad job of estimating how long it will take to build software.

It is obvious that this problem could cause poor schedule and budget performance. But what about unreliability? I would assert that troubled software projects, finding themselves badly behind schedule, skimp on the activity under way when the deadline draws near. What is that activity? Testing. We skimp on testing and release unreliable software, because it's our last hope of catching up.

If I am right, the software crisis is not about how we actually construct software but about how we *think* we construct it. That is, it is not the technology of software construction that is the problem — it is the management of that technology. If it is a management problem, it is unlikely that it will be solved by technical solutions. Putting this another way, all those who are crying "software crisis" to obtain research funds are simply crying wolf.

If we assume that the software crisis is indeed a management problem, what can we do about it? The obvious answer is to find better ways to estimate costs and schedules. At first glance, that throws us back into a technology problem. Can't we find better algorithms for doing estimation?

We have had lots of algorithmic answers to that question for over a decade now. Although some are better than others, and although we are better off using them than not, they have not proven to be either consistent or accurate.

If estimation algorithms are not the answer, what is? My somewhat outrageous answer is what I call "guts management." We need managers who stand up under pressure.

Look at the environment in which we software people do our estimates. Someone conceives of an idea. If the idea looks good, everyone wants the product yesterday. In some cases it is marketing, pushing to have it ready by some window of opportunity. In other cases, it is systems engineering, pushing to have it available when its interfacing technology is ready. The pressures in this kind of environment are enormous.

What do we in software do about that? We make three serious errors:

- We give in to the desired schedule dates rather than holding firm for our own best estimates. In other words, we frequently find ourselves managing according to a schedule we never did believe in.
- We give estimates at the start of the project and then manage to them. We rarely update the estimates to match real activity.
- Worst of all, we live or die by estimates given before the requirements were even defined and, therefore, before we fully understood the problem!

A guts manager is one who stands by his or her guns at the outset, insisting on appropriate approaches to project scheduling, suffering pain at the beginning of a project instead of postponing it until the end.

That is easy to say and less easy to do. But the route to progress is often charted by the amount of pain in the status quo, and there is enormous pain because of the present "software crisis" mentality.

Glass is president of Computing Trends, a software engineering consulting and publishing company based in State College, Pa.

Mainframe

FROM PAGE 25

grades," said Frank Gens, a vice-president at Technology Investment Strategies Corp. in Framingham, Mass. "We are working with accounts who are evaluating capacity requirements, and the prevailing sentiment is we've got to cover our rears as well."

Jim Matsey, IS director at Reynolds Metals Co., said he needs additional capacity by year's end but won't make any decisions until he sees the new mainframes. "I'm in a wait state until the announcement," Matsey said. "I can't take action until I see it. I wouldn't buy any kind of machine right now."

Jim Cassell, a vice-president at Gartner Group, Inc., said customers should be working deals with IBM for the new systems that also include a good price on whatever additional capacity they may need between now and when those systems are available. He targets availability of the new generation for late 1991.

"It's our view that users should make a transition bid," Cassell said. "They should be thinking, 'I really want to position myself for the new technology in late 1991, but I need something in the meantime.' So, they should ask IBM, 'How do I get from here to there at the least cost?' This should be a capacity bid, not a box bid."

Some IS shops seem to have more difficulty working with the big question mark than others. The Boston Industrial Products division of Dana Corp. is running out of horsepower with its 4381 and has its fingers crossed that IBM will deliver the long-awaited follow-on, the so-called 4391, this fall, said Rich Krejsa, manager of systems programming. The 4391 is reportedly part of the big mainframe announcement IBM has scheduled for next month.

If IBM doesn't deliver, "we will seriously have to rethink our mainframe strategy," Krejsa said. "We've been holding up some projects that we know will increase our utilization. I think we can get by until the end of the year."

However, Prudential Services, which has several 3090-class machines, seems to be taking this more in stride. Freel said that even if the company bought another mainframe now that was outdated — either technologically or financially — by the announcement, it could always reshuffle its systems and assign it to a less critical aspect of the business.

"We have enough equipment in place, so we can play the rollover game," Freel said. "If we acquire one today that's impacted [by the announcement], that's not our only one. That could operate for another five or six years at various places in the organization."

NEW PRODUCTS — SOFTWARE

System software

Exide Electronics Corp. has introduced Onlinet, an interface software package that enables users to continuously monitor power quality and uninterruptible power supply status from a workstation.

When a power failure is detected, the software broadcasts a warning message and initiates an automatic, user-defined shutdown procedure for attended or unattended operations, the vendor said.

The software is compatible with The Santa Cruz Operation's Xenix operating system and runs on all models of the Powerware Personal series. The list price is $149.

Exide Electronics
3201 Spring Forest Road
Raleigh, N.C. 27604
(919) 872-3020

Utilities

Mackinney Systems has announced a global cross-reference generator that reads Cobol source code.

Cobol Glossary Release 3.8 enables users to read source code from VSE libraries, CA-Librarian, ICCF or or IEBPTPCH files from a partition data set. Features include a report that lists illegal verbs used in CICS command-level programs and the ability to assist users in Cobol II conversions.

The product costs $695 or $295 for an annual lease. A 30-day trial period is also offered.

Mackinney Systems
2740 S. Glenstone
Springfield, Mo. 65804
(417) 882-8012

Information Dimensions, Inc. has announced an image processing module for Digital Equipment Corp. VAX/VMS-based X Window applications of its Basisplus text information management system.

Basisplus/DMXRV combines the content-based text retrieval capabilities of Basisplus with single-screen image and graphics viewing. The product runs on VAX/VMS systems and on all other major hardware platforms.

A first copy license ranges from $5,000 to $179,000 for Basisplus and $500 to $7,500 for Basisplus/DMXRV.

Information Dimensions
655 Metro Place South
Dublin, Ohio 43017
(614) 761-8083

NEW PRODUCTS — HARDWARE

Processors

NCR Corp. has announced an enhanced version of its 2127 Retail System, a point-of-sale and transaction processing system designed for food, drug and general retail companies.

Features of the system include high-density disk drives that double storage capacity from 20M to 40M bytes, a 25% increase in processing speed and automated transaction and management reporting functions.

The system costs between $4,500 and $8,500, depending on configuration.

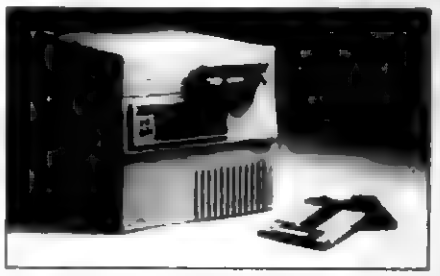
NCR
1334 S. Patterson Blvd.
Dayton, Ohio 45479
(800) 225-5627

Sky Computers, Inc. has introduced an array processor that combines the Intel Corp. I860 and I960 reduced instruction set computing processors in a single board-level array processor.

Sky Warrior II features a processing speed of more than 80 million floating-point operations per second. I/O, memory and diagnostic functions are handled by the I960 microprocessor, enabling the I860 to be used for other computing tasks.

The product supports several operating systems, including AT&T's Unix System V and Sun Microsystems, Inc.'s Sun OS. It is priced at $8,225.

Sky Computers
27 Industrial Ave.
Chelmsford, Mass. 01824
(508) 250-1920



The RF-10J *holds 10G bytes of data*

Data storage

Reflection Systems, Inc. has introduced a 10G-byte optical-disc jukebox that can hold up to 11 Plasmon 940M-byte 5¼-in. write-once optical discs.

The RF-10J jukebox includes a small computer systems interface that enables it to be incorporated into multiuser operating systems or stand-alone personal computers. It features a drive with an average seek time of more than 100 msec and a maximum sustained data transfer rate of 655K bit/sec., the vendor said.

The product is priced at $12,500.

Reflection Systems
P.O. Box 611508
San Jose, Calif. 95161
(408) 432-0943

American International Devices, Inc. has announced the AI/4104DD, an 8M-byte add-in memory board designed for IBM Application System/400 Models B-10 and 20 as well as C-10, 20 and 25.

The board is completely plug-compatible with AS/400 hosts and with any combination of IBM-resident memory. Two AI/4104DD boards can be equipped with two American International or IBM 4M-byte daughterboards to provide the AS/400 Model C-20 with 32M-byte capacity, the vendor said.

The board's price is $8,000.

American International
12540 Beatrice St.
Marina Del Rey, Calif. 90066
(800) 243-4433

How to answer the needs of 386 users with just one line.

It's the COMPAQ line of high-performance 386 desktop personal computers. We designed each one with just the right balance of quality COMPAQ features and Intel 386 power. Giving you the perfect choice for every user, at every level.

Just turn the page for proof. We put extensive information about the entire line on a handy, removable reference chart. From the COMPAQ DESKPRO 386/33L to the COMPAQ DESKPRO 386N you'll find six levels of 386 performance designed to meet the wide range of your desktop computing needs. Each personal computer is built to be compatible with the industry-standard hardware and software you've invested in.

But why did Compaq create such a broad 386 desktop line? Because you told us to.

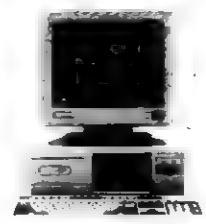
At Compaq, our first rule is to build computers that literally answer our users' very latest needs. So we regularly seek out a variety of PC users like you. We ask questions, probe for input—even criticism.

We then combine all these ideas with our own innovative thinking and the best of the latest PC technology, to create products that deliver not just high performance, but the *right* combination of features for you.

That's how we started this line, when we introduced the industry's first 386-based PC. That's how we consistently break through to new levels of PC performance. And most importantly, that's how we earned our sterling worldwide reputation for delivering the ultimate in power, compatibility and reliability. At every level.

Turn the page and see for yourself. Not only will you see the one 386 line that simply works better. You'll see which PCs in that line simply work better *for you.*

One line that simply works



Key Features and Options	COMPAQ DESKPRO 386N	COMPAQ DESKPRO 386S
Product Class	Low-profile desktop	Small desktop
The User	For the user who needs 386SX performance and requires specific network features	For the general business user considering 286 personal computers
Microprocessor Clock Speed	32-/16-bit 386SX 16-MHz	32-/16-bit 386SX 16-MHz
Coprocessors Supported	16-MHz 387SX	16-MHz 387SX
Expansion Slots Available Type	3 (2) 8-/16-bit ISA (1) high-speed memory	5 (4) 8-/16-bit ISA (1) high-speed memory
Standard Memory Maximum Memory	1 MB 16 MB	2 MB 13 MB
Storage Capabilities 3½-inch Diskette Drive	1.44-MB standard	1.44-MB standard, second optional
5¼-inch Diskette Drives	1.2-MB optional	1.2-MB optional 360-Kbyte optional
Standard Fixed Disk Drives	40-MB	84-MB 40-MB
Optional Fixed Disk Drives *Fixed Disk Expansion Unit only. **Supported in Model 1 only.	120-MB 60-MB 40-MB 20-MB	Fixed Disk Expansion Unit (Model 300) 320-MB** 84-MB 300-MB* 40-MB 110-MB 20-MB
Maximum Storage Capacity	120 MB	1.2 GB
Tape Drives (Optional)	N/A	150-/250-MB, 80-/120-MB, or 60-MB
Operating Systems MS-DOS and MS OS/2 are available from Compaq	MS-DOS, MS OS/2, Novell NetWare, Microsoft LAN Manager, Banyan VINES, SCO UNIX/386	MS-DOS, MS OS/2, Novell NetWare, Microsoft LAN Manager, Banyan VINES, SCO UNIX/386
Display (Optional)	Video Graphics Color Video Graphics Monochrome	Advanced Graphics Color Video Graphics Color Video Graphics Monochrome
Video Controllers	Video Graphics (standard) 640 × 480 graphics 720 × 400 text 132-column text support	Video Graphics (standard) 640 × 480 graphics 720 × 400 text Advanced Graphics 1024 (optional) 1024 × 768 graphics 720 × 400 text
Keyboard	Enhanced Keyboard	Enhanced Keyboard
Dimensions	15.0"W × 14.9"D × 3.9"H (38.1cmW × 37.8cmD × 9.9cmH)	15.8"W × 14.8"D × 5.9"H (40.1cmW × 37.5cmD × 14.9cmH)
Additional Options ‡U.S. and Canada.	2400-Baud Internal Modem‡	2400-Baud Internal Modem‡

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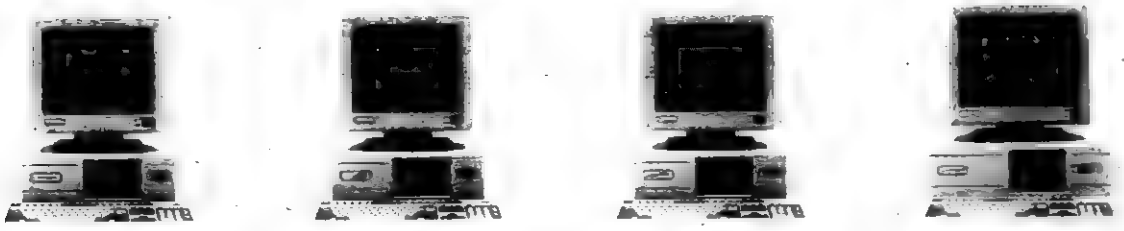
better for all 386 users.



COMPAQ DESKPRO 386s/20	COMPAQ DESKPRO 386/20e	COMPAQ DESKPRO 386/25e	COMPAQ DESKPRO 386/33L
Small desktop	Small desktop	Small desktop	Fully expandable desktop
For the general business user who requires more performance and features in a mainstream 386SX personal computer	For the advanced productivity user who needs the right combination of performance and features	For the experienced user who needs superior capabilities and power	For the performance-sensitive user requiring the ultimate in 386 performance and expandability
32-/16-bit 386SX 20-MHz with 4K Cache	32-bit 386 20-MHz with 32K Cache	32-bit 386 25-MHz with 32K Cache	32-bit 386 33-MHz with 64K Cache
20-MHz 387SX	20-MHz 387 or Weitek 3167	25-MHz 387 or Weitek 3167	33-MHz 387 and 33-MHz Weitek 3167
4 (4) 8-/16-bit ISA	5 (4) 8-/16-bit ISA (1) 32-bit memory	5 (4) 8-/16-bit ISA (1) 32-bit memory	7-8 (7) 8-/16-/32-bit EISA (1) 32-bit memory
2 MB 16 MB	4 MB 16 MB	4 MB 16 MB	4 MB 100 MB
1.44-MB standard, second optional	1.44-MB standard, second optional	1.44-MB standard, second optional	1.44-MB standard, second optional
1.2-MB optional 360-Kbyte optional	1.2-MB optional 360-Kbyte optional	1.2-MB optional 360-Kbyte optional	1.2-MB optional 360-Kbyte optional
120-MB 60-MB	110-MB 40-MB	120-MB 60-MB	650-MB 320-MB 120-MB
Fixed Disk Expansion Unit (Model 650 & 300) 650-MB* 120-MB 300-MB* 60-MB 210-MB 40-MB	Fixed Disk Expansion Unit (Model 300) 320-MB** 84-MB 300-MB* 40-MB 110-MB 20-MB	Fixed Disk Expansion Unit (Model 300) 320-MB** 84-MB 300-MB* 60-MB 120-MB 40-MB 110-MB	Fixed Disk Expansion Unit (Model 650 & 300) 650-MB 210-MB 320-MB 120-MB 300-MB* 420-MB Drive Array Pair 240-MB Drive Array Pair
2.6 GB	1.2 GB	1.2 GB	2.6 GB
150-/250-MB, 80-/120-MB or 60-MB	150-/250-MB, 80-/120-MB or 60-MB	150-/250-MB, 80-/120-MB or 60-MB	320-/525-MB, 150-/250-MB or 80-/120-MB
MS-DOS, MS OS/2, Novell NetWare, Microsoft LAN Manager, Banyan VINES, SCO UNIX/386	MS-DOS, MS OS/2, Novell NetWare, Microsoft LAN Manager, Banyan VINES, SCO UNIX/386	MS-DOS, MS OS/2, Novell NetWare, Microsoft LAN Manager, Banyan VINES, SCO UNIX/386	MS-DOS, MS OS/2, Novell NetWare, Microsoft LAN Manager, Banyan VINES, SCO UNIX/386
Advanced Graphics Color Video Graphics Color Video Graphics Monochrome	Advanced Graphics Color Video Graphics Color Video Graphics Monochrome	Advanced Graphics Color Video Graphics Color Video Graphics Monochrome	Advanced Graphics Color Video Graphics Color Video Graphics Monochrome
Video Graphics (standard) 640 × 480 graphics 720 × 400 text 132-column text support Advanced Graphics 1024 (optional) 1024 × 768 graphics 720 × 400 text	Video Graphics (standard) 640 × 480 graphics 720 × 400 text Advanced Graphics 1024 (optional) 1024 × 768 graphics 720 × 400 text	Video Graphics (standard) 640 × 480 graphics 720 × 400 text Advanced Graphics 1024 (optional) 1024 × 768 graphics 720 × 400 text	Video Graphics (standard) 640 × 480 graphics 720 × 400 text 132-column text support Advanced Graphics 1024 (optional) 1024 × 768 graphics 720 × 400 text
Enhanced Keyboard	Enhanced Keyboard	Enhanced Keyboard	Enhanced Keyboard
15.8"W × 14.8"D × 5.9"H (40.1cmW × 37.5cmD × 14.9cmH)	15.8"W × 14.8"D × 5.9"H (40.1cmW × 37.5cmD × 14.9cmH)	15.8"W × 14.8"D × 5.9"H (40.1cmW × 37.5cmD × 14.9cmH)	19.2"W × 17.7"D × 6.5"H (48.8cmW × 45.0cmD × 16.6cmH)
2400-Baud Internal Modem‡	2400-Baud Internal Modem‡	2400-Baud Internal Modem‡	2400-Baud Internal Modem‡

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USER TYPES	TYPICAL APPLICATIONS	PERFORMANCE/EXPANSION REQUIREMENTS	PRODUCT
Specialized/Power	CAD/CAE Scientific Analysis Software Development Customized LAN File Server	Higher 386 Performance Maximum Desktop Expansion	COMPAQ DESKPRO 386/33L
Advanced Productivity	Financial Analysis Database Presentation Graphics Small LAN File Server	DX (32-bit) Performance Moderate Expansion	COMPAQ DESKPRO 386/25e COMPAQ DESKPRO 386/20e
Mainstream Productivity	Word Processing Spreadsheets Database Stand-alone or Networked PCs	Moderate Performance Specific Network Features Minimum Expansion	COMPAQ DESKPRO 386s/20 COMPAQ DESKPRO 386s COMPAQ DESKPRO 386N

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COMMENTARY

Patricia Keefe

A house divided?

Boomin' Steve Ballmer, Microsoft's senior vice-president of software, roared through these offices two weeks ago (by the time this hits your mailbox), banging the gong on a host of Microsoft product directions and strategies.

The ever-effervescent Ballmer was surprisingly blunt when it came to the one topic of discussion that Microsoft officials would no doubt like to avoid — its bruised partnership with IBM.

(Remember, Ballmer is the man who penned the epitaph for Intel's 80286 chip long before the infamous red-X campaign was launched. Pressured to explain why protected-mode 286 DOS had not been delivered, he blurted out in late 1987 that the 286 "was brain-dead." The 286 has taken a backseat among developers ever since. We had to wait for Windows 3.0 to get protected-mode capabilities with DOS.)

Zooming back to the present, the fact that IBM and Microsoft have their differences is hardly news. The trade press has been chasing this story for years — literally.

What *is* new are admissions such as the ones Ballmer recent-

Continued on page 42

Microsoft ships 2.0 update kit

Tools for third-party development of 32-bit applications included

BY PATRICIA KEEFE
CW STAFF

REDMOND, Wash. — Microsoft Corp. is now shipping an OS/2 2.0 Software Development Kit (SDK) Update for the OS/2 Presentation Manager system Version 2.0.

The update includes the necessary prerelease components for corporate and third-party developers to write 32-bit applications prior to the general release of OS/2 Version 2.0. The OS/2 2.0 SDK includes a 32-bit version of Microsoft's Macro Assembler Version 5.1, 32-bit application programming interfaces, a 32-bit compiler based on Microsoft C Version 5.1, a new linker and other Presentation Manager-related tools.

A network redirector permits access to a network while writing code. Documentation is provided in more than 2,000 pages of hard-copy format as well as through two on-line formats.

As for OS/2 1.2, which has been available for some time from IBM, it appears that later may be better. Microsoft may be bringing up the rear with plans for a September release of OS/2 Version 1.21 to OEMs, but at least it cushioned the delay by providing some added capabilities, most notably vastly improved printer support and LAN Manager 2.0 compatibility.

About 30 hardware OEMs, including IBM, will ship the product within the next 90 days, according to Microsoft.

OEMs, developers and users have screamed long and loud over a dire shortage of printer drivers. Microsoft had hoped that hardware manufacturers would fill that void, but early this year, in a meeting with the press, the firm conceded it would have to solve the problem itself.

Printing improvements reportedly enable faster and higher quality output to printers, ease printer driver installation procedures via a built-in Presentation Manager printer installer application and support a smaller, faster print spooler.

In networked environments, LAN Manager 2.0 requires OS/2 1.21 on the server but supports OS/2 1.1 and OS/2 1.2 clients.

Microsoft's enhancements also add to the capabilities of functions first introduced in Version 1.2. For example, the high-performance file system features improved operating system response and overall performance improvements. Other upgrades include an enhanced Presentation Manager shell, direct manipulation of icons, a new system editor using the interface and a dual-boot capability to MS-DOS or OS/2.

Separately, Microsoft also released Basic Professional Development System Version 7.1, complete with an updated version of its Programmers Workbench and its programmer's editor, as well as Version 3.1 of the Codeview debugger, the Microsoft Source Browser and additional on-line Advisor documentation. These tools were previously only available under Microsoft C Professional Development Version 6.0.

Also, Microsoft's Professional Indexed Sequential Access Method was significantly updated, now supporting OS/2.

Cumberland looks to PCs to compete in crowded field

ON SITE

BY RICHARD PASTORE
CW STAFF

CANTON, Mass. — Having a convenience store on every block may be a boon for folks with late-night Twinkie cravings, but such a glut may not be so convenient for the companies' bottom lines. At least one chain is looking to in-store computers to provide competitive leverage.

"The industry now is very competitive, almost saturated," said John Carroll, vice-president of MIS at Cumberland Farms, Inc. "Any competitive advantage we can get, whether it's with computers or sales and marketing, is worth pursuing."

To cut corporate labor costs and boost reporting efficiency, the $3 billion privately held convenience chain recently rolled out a personal computer sales and ordering system for its 1,150 stores.

Since January, store managers have been using the computers to log in each day's sales, bank deposits and inventory deliveries. They also input figures for gasoline sales from the company-owned Gulf gas station/store combinations and place orders for Cumberland Farms-brand products. The PCs do the rest, adding and correlating the figures, generating printed reports and uploading the data nightly to the mainframe at headquarters.

Cumberland Farms' Carroll

The system, known internally as PC Express, replaced a manual operation that was antiquated and inadequate, according to Carroll.

"There was a general consensus here that the system we had was dismal — it was labor-intensive, inaccurate, messy and two to three weeks in arrears," Carroll said.

Store managers formerly spent between one and three hours per day adding up numbers on cash register tapes, posting totals to a worksheet, copying information into a manager's report, and then cross-

Continued on page 40

Micro Focus COBOL/2 Workbench™ Is a Hit!

We're very proud of COBOL/2 Workbench. And we're very gratified at achieving a weighted score of 9.6 when measured against corporate buyer preferences in a recent PC Week review.

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COBOL/2 Workbench is a "superb interactive environment" and "professionally crafted," according to a recent product review.

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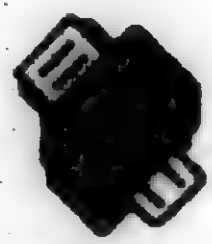
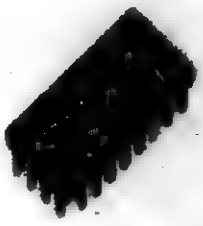
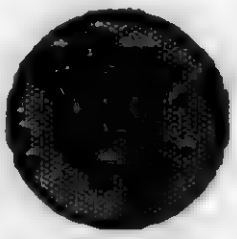
Call Micro Focus today at 1-800-872-6265 and request a reprint of the entire PC Week review.



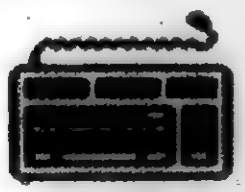
Printers



386 Enhanced



International



Keyboards

Now, all it takes is and you're

It's only fair to warn you that exposure to new Microsoft® Windows™ version 3.0 has been linked to obsessive and habitual usage. Why?

Because with a simple click of the mouse users can connect to the network, even access and manage network resources. All without cumbersome keyboard commands.

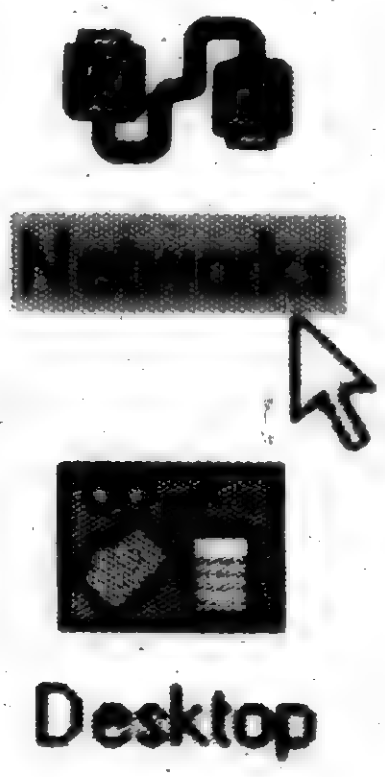
Which means users are now able to share data. Not frustration.

While in the interest of time, the Windows 3.0 graphical user interface was designed to be easy to learn. And use. Neophytes, not to mention troglodytes, will be up and running in no time. With virtually no training.

Now, 286/386™ machines running MS-DOS® will no longer be limited to 640K. So there are no more impediments.

Users can even enjoy a network connection and at the very same time satisfy the cravings of multiple applications.

For more information, call (800) 323-3577, Dept. L21. In Canada, call (416) 673-7638. Outside the U.S. and Canada, call (206) 882-8661. *©1990 Microsoft Corporation. All rights reserved. Microsoft, MS-DOS and the Microsoft logo*



a point and click hooked.

And since Windows 3.0 has a modular setup program, a single copy now memorizes every user configuration on the network. Which means, so to speak, one size fits all.

Furthermore, Windows 3.0 has redefined its relationship with IBM® 3270 emulation programs. Users can now download corporate data and easily share it with Windows applications. Something we have come to call peaceful coexistence.

One last point. Because Windows 3.0 has been optimized for machines with 1-2 megabytes of RAM, it will go a long way towards protecting your hardware investment.

Call (800) 323-3577, Department L21, for a backgrounder that outlines how Microsoft Windows 3.0 could benefit your corporation.

We're certain that you'll agree it's a habit well worth forming.

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	The New IBM LaserPrinter E	HP LaserJet IIP
Speed	✓ up to 5 ppm	up to 4 ppm
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Adobe PostScript option	Yes	Yes
Printer emulation	✓ IBM, HP PCL	HP PCL
Std. plotter emulation	✓ Yes	No
Font card slots	✓ 2	1
Std. input paper tray capacity	✓ 200	50
Std. output paper tray capacity	✓ 100	50
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Opt. envelope tray capacity	✓ 75	20
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*Dealer prices will vary.

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PRODUCT REVIEWS

Two solid I486-based choices

Northgate Computer Systems, Inc.'s Northgate Elegance 486 25I and Swan Technologies' Swan 486/25 are both 25-MHz Intel Corp. I486-based computers. The Northgate is in a floor-standing tower case. The Swan is a desktop system with a typical IBM Personal Computer AT-style case. Both systems have Industry Standard Architecture buses.

The Northgate system board has one 8-bit slot, six 16-bit slots and one 32-bit slot, which accepts 8-bit expansion cards. The serial and parallel ports are built into the system board, leaving six slots open after a video adapter and disk drive interface are installed. A Weitek Corp. math coprocessor socket is included.

Northgate Elegance 486 25I

Price: $5,895

- Performance: Very good to excellent
- Documentation: Excellent
- Setup: Good
- System design: Very good
- Support: Excellent
- Value: Excellent

Northgate 25I comes *in a floor-standing tower case*

The tower case has three external, half-height 5½-in. drive bays and two full-height internal bays. Available peripherals include an enhanced keyboard and a 16-bit IBM Video Graphics Array (VGA)-compatible board. The Elegance 486 25I offers a 200M-byte hard disk with IDE 1:1 controller; 1.2M-byte 5¼-in. and 1.4M-byte 3½-in. floppy disk drives; 4M bytes of 80-nsec random-access memory; and 64K bytes of 25-nsec cache memory, expandable to 256K bytes.

The Swan system's AT-style case features a standard drive bay arrangement — three external 5¼-in. half-height drive bays and two internal half-height (or one full-height) bays. The motherboard has eight 16-bit slots, five of which are open after adding a video adapter, an I/O card and disk drive interface. The unit's 16 single in-line memory module sockets are located next to the power supply and under the drive cables.

A Weitek coprocessor socket is also on the board, located in front of the 16-bit slots. Available peripherals include an enhanced keyboard and a 16-bit VGA board.

The Swan offers a 330M-byte hard disk with a small computer systems interface (SCSI) 1:1 controller; 1.2M-byte 5¼-in. and 1.44M-byte 3½-in. floppy disk drives; 4M bytes of 80-nsec RAM; and 64K bytes of 25-nsec RAM cache, expandable to 256K bytes.

Both systems offer fast hard disk times and excellent software compatibility. The Swan has difficulty running with a token-ring network adapter, however. In its default setting, the token-ring conflicts with the system's SCSI hard disk interface.

Swan's AT-style setup features standard drive bay arrangement

The Elegance 486 has top-notch documentation. The manual that accompanies the Swan system is also well organized.

The Northgate system's setup is read-only memory-based, and the internal parts can be easily installed or removed; however, there are two small switch blocks that are hard to reach.

The Swan's system design is generic. The front panel has turbo and reset switches, and the system's power switch is located at the back right corner of the case. The Swan's CPU speed can be switched from 25 MHz to 8 MHz via the turbo switch, but enabling the turbo switch disables the system's secondary RAM cache.

Northgate and Swan offer one-year warranties with on-site service, a 30-day money-back guarantee and toll-free support lines. Northgate's lines are open 24 hours per day, 365 days per year. Swan's support lines are open 9 a.m. to 9 p.m. EST.

At $5,895, Northgate's Elegance 486 25I is one of the least expensive 486-based systems on the market. Swan is a solid system at $6,799.

Northgate Computer Systems, Inc., P.O. Box 41000, Minneapolis, Minn. 55441, (800) 548-1993. Swan Technologies, 3075 Research Drive, State College, Pa. 16801, (800) 468-9044.

Swan 486/25

Price: $6,799

- Performance: Very good
- Documentation: Very good
- Setup: Good
- System design: Good
- Support: Very good to excellent
- Value: Very good

Wingz' graphics soar above the competition

Informix Software, Inc.'s Wingz is a spreadsheet for users of Microsoft Corp.'s Windows Version 3.0 or Microsoft's and IBM's OS/2 Presentation Manager. It comes with a full set of features, including a robust set of formulas and many customization options. Its output options are also extensive, but graphics is the area in which it is truly outstanding.

Wingz has the standard assortment of spreadsheet functions, and its Hyperscript scripting language lets users define new functions. It supports multiple regression and what-if tables for modeling, includes many financial functions and has a wide range of matrix calculations.

Wingz can read and write Lotus Development Corp.'s 1-2-3 files and can read Microsoft Excel files. It cannot save in XLS format, but it can write Sylk files. It can also import text, but it does not handle variables properly, and there is no data parse command to separate text strings into numbers. Wingz supports Windows' and Presentation Manager's cut-and-paste functions, so data and graphics from other applications can be brought in via the clipboard.

Wingz has adjustable background recalculation. In manual recalculation mode, users can stop a recalculation with a mouse click. When a complex graph is displayed, there can be significant delays between selecting a command and seeing a response.

Informix Wingz/ PC Version 1.1

Price: $499

- Performance: Satisfactory to excellent
- Documentation: Good
- Ease of learning: Very good
- Ease of use: Satisfactory
- Error handling: Satisfactory
- Support: Satisfactory
- Value: Very good

Graphics capabilities are where this product shines. It has a set of icons representing rectangle, circle, line, text and graph drawing tools displayed on the left side of the screen. The objects created with these tools can be moved, sized and shaded, and drawings or graphs can be mixed with spreadsheet data.

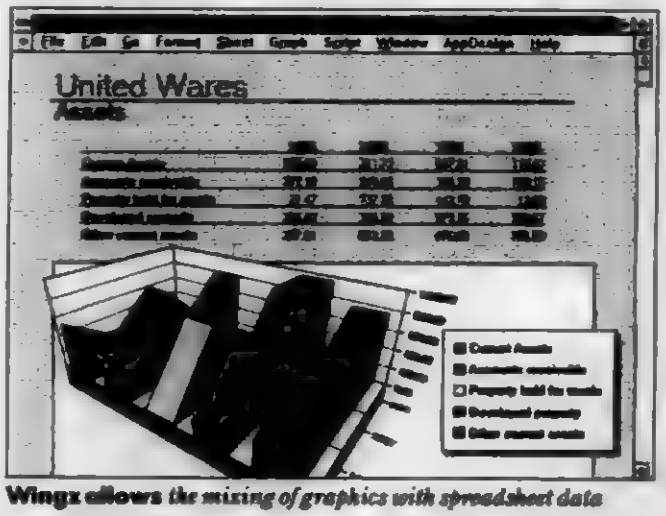
Objects can be cosmetic or functional. One useful object is a button that can be clicked to execute instructions from a script. Scripts can be simple keystrokes played back or complex programs with custom menus, dialog boxes and access to external programs written in C.

Wingz offers an impressive assortment of graph types, including three-dimensional bar, surface and wire-frame charts. Graphs are highly customizable, and just about every part of the image can be changed.

However, there are limitations. For example, creating a graph requires that all data be in a contiguous range. Adding data to an existing chart requires making a copy of an existing range and then redefining it as the additional data series.

Output is handled through the Windows or Presentation Manager drivers and uses those environments' built-in print spoolers. Wingz provides an outstanding selection of color, fill patterns and drop shadows for objects and gives users unprecedented control over the look of the display.

Wingz handles macro chores through Hyperscript. Each worksheet has a "sheet script," and other scripts can be developed that can be executed from any worksheet or attached to specific objects. Hyperscript has no debugging capabilities apart from a syntax check.



Wingz allows *the mixing of graphics with spreadsheet data*

Like most modern spreadsheets, Wingz can use cells or ranges from external worksheets by preceding the cell reference with a file name. But Wingz requires that any supporting worksheets be in memory. The product has no automated consolidation feature.

The documentation consists of a well-written user's guide, reference manual and guide to the Hyperscript language.

Free (but not toll-free) support is available weekdays from 8:30 a.m. to 5 p.m. CDT.

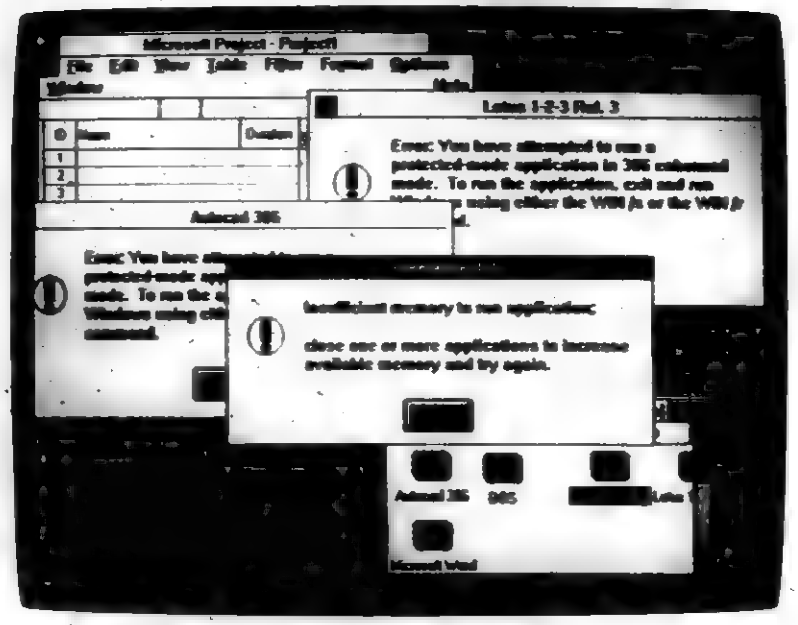
At $499, Wingz may be the top choice for those who develop turnkey spreadsheet-based applications. The program's main fault is its disregard for keyboard users. Many users could overlook its weak file linking and lack of consolidation capabilities in favor of the superb drawing tools and scripting language.

Informix Software, Inc., 16011 College Blvd., Lenexa, Kan. 66219, (913) 599-7100.

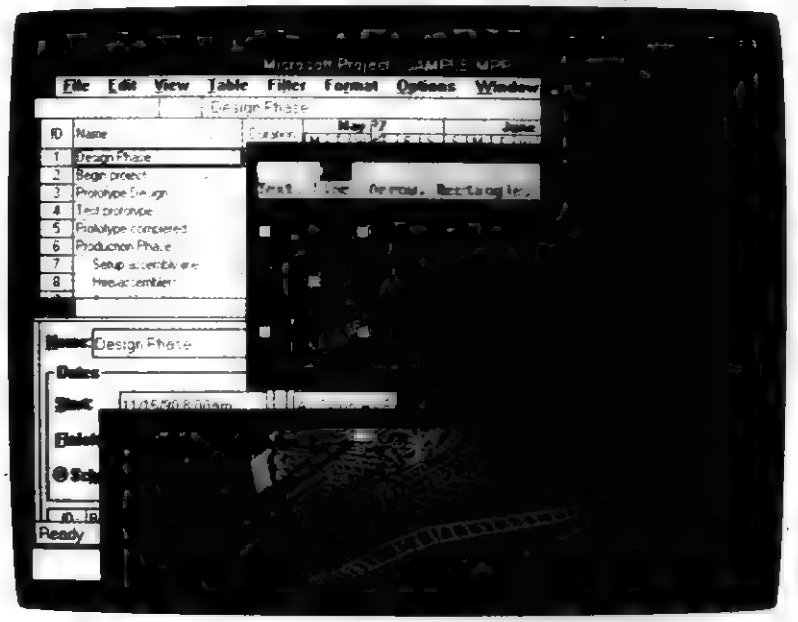
Reviews compiled from information supplied by *Infoworld*.

Is Windows 3.0 the end of DESQview™?

Not if you're still using DOS programs.



Windows 3.0. The multitasking, windowing environment.



DESQview 386 2.3. The multitasking, windowing environment.

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DESQview. The obvious choice.

Quarterdeck

Quarterdeck Office Systems, 150 Pico Boulevard, Santa Monica, CA 90405 (213) 392-9851 Fax: (213) 399-3802

This comparison was made using a system like the one you might run: Both shots show an ALR FlexCache 33/386 running DOS 3.3 with VGA display adaptor, Novell NetWare v3.01 Rev. A, with IPX/SPX v3.01 Rev A, Microsoft Mouse 7.00, and Microsoft SMARTDrive v3.03 disk cache. Buffers were set to 20. For the Windows screen, we ran Microsoft Windows 3 HIMEM.SYS and EMM386.SYS. For the DESQview screen, we ran QEMM 386 v5.1.

Trademarks: Microsoft, Windows, MS-DOS, 80386, i486, ALR, FlexCache, Novell, NetWare. ©1990 Quarterdeck Office Systems

Next-based Frame Maker falls short

PRODUCT REVIEW

Frame Maker 2.0B from Frame Technology Corp. is a what-you-see-is-what-you-get documentation program that combines word processing, graphics integration and layout capabilities. It is being co-marketed with Next, Inc.'s Unix-based Next workstation. In fact, it is the only publishing program available for the Next system.

The Next computer contains a 25-MHz Motorola, Inc. 68030 CPU, a 68882 math coprocessor, a 56001 digital sound processor and 8M bytes of random-access memory, which is expandable to 16M bytes. It also includes a standard 256M-byte erasable optical disc drive; a small computer systems interface connector and two drive bays for optional hard disks; a thin Ethernet connector; and two serial ports. It comes with a 17-in. gray-scale high-resolution monitor with 92 dot/in. resolution. A proprietary Adobe Systems, Inc. Postscript-compatible laser printer with 400 dot/in. resolution that attaches by mounting a card inside the Next is available.

Frame Maker (Next) Version 2.0B
Price: $995
• Performance: Poor to very good
• Documentation: Poor
• Ease of learning: Poor
• Ease of use: Good
• Error handling: Very good
• Support: Satisfactory
• Value: Good

The Next Step graphical user interface is mouse-driven and operates with icons and tear-away menus. It runs on top of the Mach operating system, giving average users an easier interface with which to work but allowing programmers to access Mach for development.

A number of software packages are bundled with the Next, including graphical versions of Webster's dictionary and thesaurus that can be called up from within Frame Maker.

Frame Maker operates using a series of pull-down menus and mouse-accessible features. Its limited word processor support and inability to export text limit users to doing word processing in its internal editor, which has executive word processor editing capabilities, sophisticated spell checking and search-and-replace capability.

The program uses style sheets to aid composition, and a comprehensive set of drawing tools allows users to manipulate graphics quite extensively. Notable limitations are the lack of editing features for bit-mapped images and the lack of support for business graphics or charting.

The program relies on outside products for image editing. In a networked environment, the inability to link source text files with a layout for version control hinders work group publishing. However, Frame Maker does well in its integration of outside graphics as well as with its interactions with other programs in Next's multitasking environment. Hot links can be established with other Next applications, and hypertext connections can be generated between documents.

Frame Maker does not wrap text around graphics. Instead, users must cut and manually resize the text columns affected by a wrap. An exception are frames anchored to a spot in text with the powerful frame-anchoring feature. However, such frames are limited to the width of the column.

Frame Maker offers standard high-end typographic controls. While its quote conversion does not work on imported files, it offers the ability to select multiple line-break characters, such as hyphens, slashes and dashes. It supports type sizes and leading in one-thousandth-point increments from four to 400 points. It does not let users override size and position settings for superscripts, underlines and other similar attributes.

Creating multi-element layouts in Frame Maker is difficult, and although Frame Maker offers basic table-making capabilities through its tab stops, it is not automated or sophisticated.

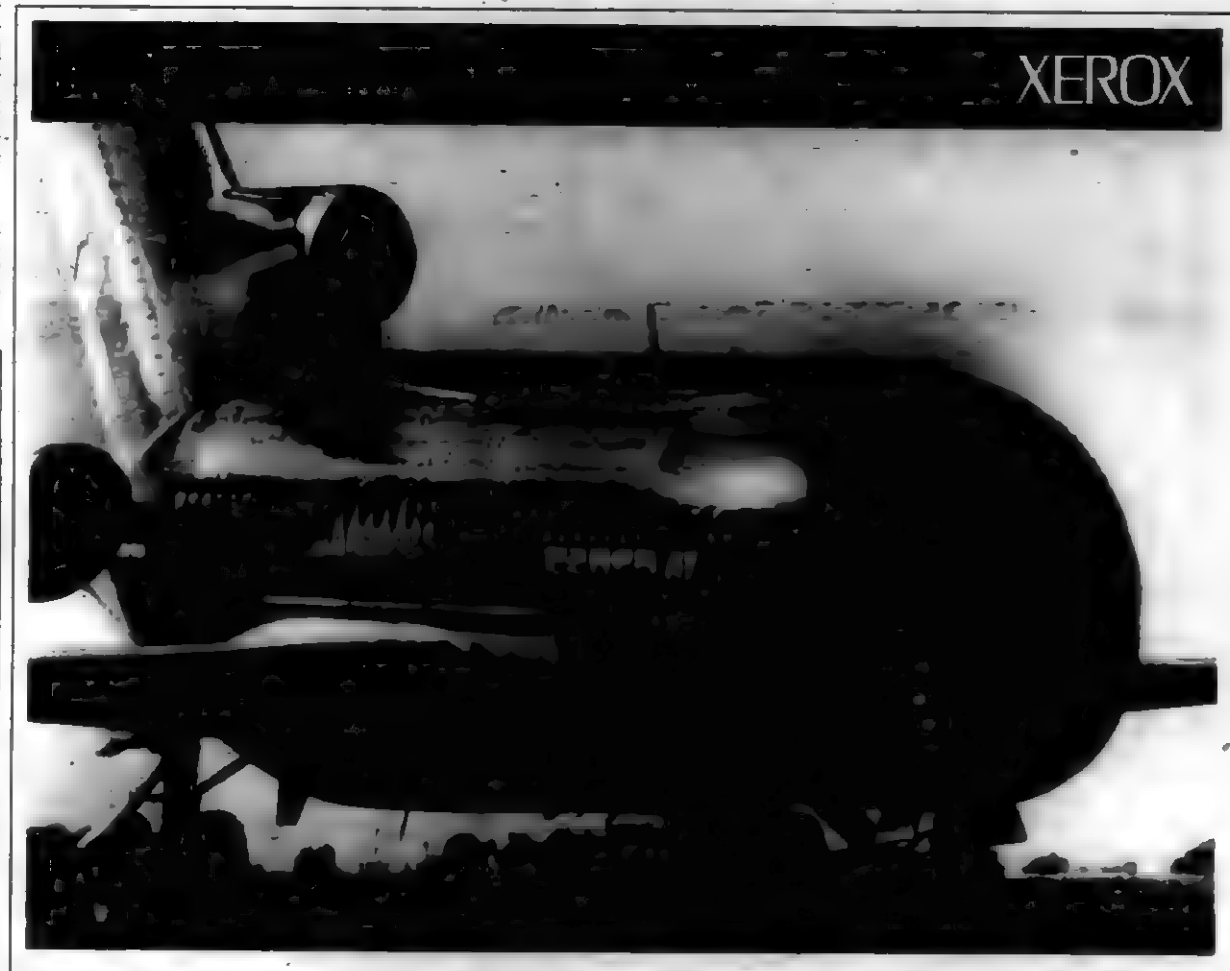
Frame Maker comes with several manuals. Unfortunately, information is hard to find because of awkward organization, a spotty index and omitted details.

Frame Maker is not easy to learn, but once learned, it is easy to use. Despite the impressive Next hardware, the program runs slowly.

Technical support is available to registered Frame Maker users for only 30 days via a toll call. An annual support contract costs $199. There is also bulletin-board and fax support. Support for the Next computer is offered through dealers.

Frame Maker lists for $995. For users who are already in the Unix environment and need to produce documentation — whether paper or hypertext — the Frame Maker/Next combination is a fine deal.

Frame Technology Corp., 1010 Rincon Circle, San Jose, Calif. 95131, (800) 843-7263. Next, Inc., 900 Chesapeake Drive, Redwood City, Calif. 94063, (800) 848-6398.



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CRTs still king of the desktop

New display technologies have failed, so far, to displace the old standby

ANALYSIS

BY MICHAEL FITZGERALD
CW STAFF

Every now and then people start to question the future of the CRT, which seems too ancient a technology to be so essential in modern computers. Those people say the advent of new display technologies such as LCD, gas plasma and electroluminescence make the CRT's days look numbered. Worse, fear of alleged health hazards posed by VDTs seems to be reserving a space for CRTs in the graveyard soon.

Don't bet on it.

While flat-panel displays dominate the portable computing market — which San Jose, Calif., market research firm Dataquest, Inc. estimated will hold approximately 40% of the personal computer market in 1993 — CRTs will continue to dominate the desktop for the foreseeable future. CRT terminals outperform flat-panel technologies significantly in every category other than low-power or limited space environments.

So, while Dataquest predicts that some 10 million flat-panel displays will be sold in 1993, those figures virtually match its estimates for portable sales.

Flat panels are naturals for portables, which require small screens that use little power. CRT terminals must house a vacuum tube and require much more power.

The various flat-panel technologies offer several size-related benefits. They can be made large or small much more easily than CRTs. However, the price difference is staggering. And when a manufacturer makes a larger-than-laptop flat-panel display, costs can skyrocket. Digital Equipment Corp. offers a full-sized electroluminescent monitor for $7,995, whereas a conventional monitor costs approximately $3,300.

Cost, more than anything else, is what holds flat panels back from the commercial marketplace, according to Norman Weizer, a senior consultant at Arthur D. Little, Inc. in Cambridge, Mass.

Weizer said that, other than in portable computers, most flat-panel technologies are used for military rather than commercial applications, and they do not have much to do with the desktop.

Those commercial uses that do exist are in fields such as point-of-sale terminals or instrument control panels. Some banks use flat terminals instead of CRTs at teller stations.

Weizer said he does not see flat panels challenging CRTs in the commercial market for at least three to five years.

Jack Roberts, senior industry analyst at Dataquest, took an even longer view, saying that perhaps in 10 years CRTs will become a less potent force in the market. Then he wryly noted, "I would've said the same thing 10 years ago."

This economist-like ability to completely misforecast comes from technology blinders, Roberts said. "People look at it from a technology standpoint — a CRT is a vacuum tube. That's a first-generation technology."

According to Roberts, it is easy to say that five years from now, a new technology will have developed that is both as good and as cost-effective as CRTs. He also said that there are technologies today that are better than CRTs were five years ago. So why does the CRT still dominate the market?

"I've seen 10 years worth of these projections [predicting the end of the CRT], and they fail to take into account that the CRT moves forward, too," Roberts said. "There have been improvements in the area of performance and costs of CRTs that we didn't anticipate."

However, flat-panel quality is getting much better, and flat-panel displays could begin to pick off some sales from CRTs. Webster Howard, manager of flat-panel display technologies at IBM's T. J. Watson Research Center, sees the portable market as a stepping-stone to the desktop.

"[Portables] are the big area where you can get started against CRTs," Howard said. "It's projected to be a very large market, so it means that there's an opportunity to get established and get costs down."

From there, Howard said he thinks that the high-end workstation market, with its expensive CRTs, is the logical attack point, after which the desktop market may be vulnerable.

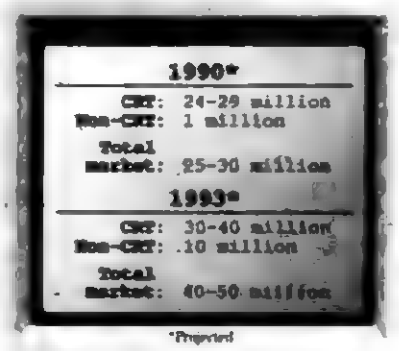
Howard said he expects that nonportable, flat-panel displays will be on some desktops within two years. "There are people who are very sensitive to the size restrictions of the CRT," Howard said. "People in the financial markets who run the trading exchanges, they don't have room or power capacity for any more CRTs. They are eager to get good flat-panel displays, and they'll pay a premium. In Japan, space is at a very high premium. They will be early users of these machines."

Roberts said he doubts either research into high-definition television or health issues will have much impact on CRT use.

CRT makers can provide more effective radiation shields if the market calls for them. In some opinions, power lines, electric blankets, airplane rides and televisions are all at least as dangerous as computer monitors.

Scratching the surface

CRT displays still hold at least a 24-to-1 advantage over non-CRT technologies. But that could change in coming years



Source: Dataquest, Inc. CW Chart: Doreen Dahle

> "PEOPLE LOOK AT it from a technology standpoint — a CRT is a vacuum tube. That's a first-generation technology."
>
> JACK ROBERTS
> DATAQUEST

NEW DEALS

Orkland nabs $13M contract

The U.S. Postal Service has awarded The Orkland Corp. a two-year contract to provide technical service and administrative personnel on-site at the Postal Service's National Address Information Center in Memphis, Tenn. Orkland staffers will support various address technology management systems at the site.

Virginia Polytechnic Institute and State University announced that incoming computer science students will be required to buy **Commodore Business Machines, Inc.'s** Amiga 3000 running AT&T's Unix System V.4. The decision to go with the Amiga ends a three-year standardization effort on **Apple Computer, Inc.'s** Macintosh running AU/X.

J. C. Penney Co. said it will install **NCR Corp.** point-of-sale (POS) workstations in 1,330 stores nationwide, replacing existing terminals. The contract, valued at more than $45 million, includes orders for 16,400 NCR 7052 POS personal computer-based workstation systems and 1,600 NCR 7052D integrated-disk POS workstation systems as well as peripheral equipment.

Cumberland

FROM PAGE 33

referencing the report and worksheet and mailing the paperwork to headquarters.

At headquarters, 50 to 60 people were employed to open the mail, edit the reports and key them into the IBM 3090 mainframe. The total time to process a daily report and generate hard copies was 1½ to two weeks.

If an area supervisor desired a sales report on the eight to 10 stores in his jurisdiction, he had to wait two more weeks for the papers to arrive via an improvised delivery system. "We sent reports out on bakery trucks, milk trucks, any way we could. But by that time, the information was history," Carroll said.

Things have changed. Store managers now spend less than one hour compiling reports. The accuracy of the numbers has increased because the machines do the addition and flag errors.

Now the information reaches the mainframe nightly, boosting its timeliness and usefulness. Without the need to rekey the data, most of the data-entry staff has been eliminated, mainly through attrition. Also, the area supervisor no longer has to wait for the milk truck to show up. He can walk into any one of his stores with a floppy disk and poll the day's information himself.

"The labor cost savings alone funded the entire program," said Carroll, who said he expects a return on investment in 18 to 20 months.

The dipping cost of PCs helped propel the project, Carroll noted. Cumberland Farms tapped NCR Corp. as its primary vendor because of its experience with NCR's cash registers as well as the vendor's very competitive bid and national representation. Cumberland Farms purchased NCR's 3392 PC, a box equivalent to IBM's Personal System/2 Model 30.

> "THE LABOR COST savings alone funded the entire program."
>
> JOHN CARROLL
> CUMBERLAND FARMS

The store PCs are connected via dial-up lines to a local-area network of 20 NCR polling PCs at headquarters. The headquarters boxes, linked by a Novell, Inc. token-ring network, consolidate the data into an IBM PS/2 Model 80, which in turn feeds the information to the mainframe over a 3270 link.

The homegrown software, written with Nantucket Corp.'s Clipper, was completed in two to three months using an outside programming consultant.

The system took only three months to roll out, said Carroll, who attributed the speediness to a relatively unusual team effort. "I consider this one of the best team efforts this company has been through," he said.

Representatives from finance and accounting, human resources, auditing, administrative communications and sales and operations joined the information systems squad in developing, refining and implementing PC Express.

"The main reason [the system] was so successful is because everybody has a little bit of ownership," Carroll said. "We were so successful in doing this that we're trying to get this group involved in future projects."

Carroll is piloting new batch-polling software that would eliminate most of the polling machines at headquarters. He has also set his long-range goal on an integrated point-of-sale system, which would send credit-card grocery and gasoline sales data directly from the cash register to the PC. Because it would be an expensive proposition at $8,000 to $12,000 per site, there is still a lot of work to do to justify the cost, Carroll said.

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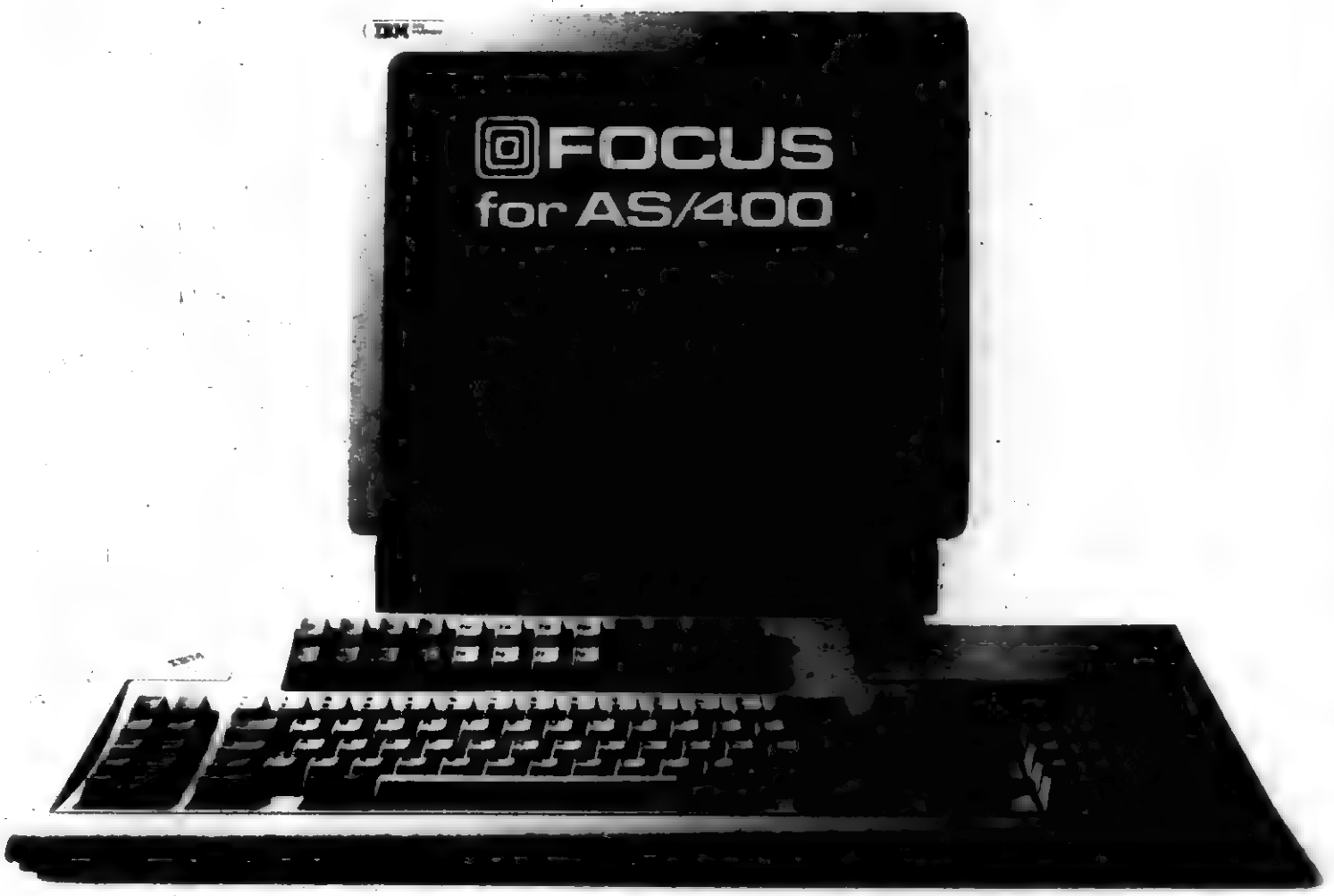

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Keefe

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ly made [CW, Aug. 20], where he not only acknowledged that IBM got a little bent out of shape after Microsoft publicly poured water on its 2M-byte OS/2 plans but further conceded that the two companies have stopped trying to "hide" their differences.

In the words of St. Mark, later paraphrased by Abe Lincoln, "If a house be divided against itself, that house cannot stand." Clearly, divisive cracks exist in the IBM/Microsoft foundation. To explain, Ballmer noted that OS/2 did not sell anywhere near what Microsoft, IBM and many others had predicted.

"When things aren't selling in the volumes expected, things get tough," he said. So both companies tried to figure out what to do. "The good news is that there are a lot of good ideas. Now we're in the process of trying to get those ideas to agree," he carefully explained.

IBM and Microsoft have numerous areas of disagreement, stretching at least as far back as Microsoft Networks (MS-Net), Microsoft's first ill-fated foray into networking software. By the time IBM got through with its version of MS-Net, the two were barely kissing cousins.

In the last two years, the two powerhouses have produced different file servers based on the same core; disagreed, agreed and now are back to disagreeing over the role Windows should play; bickered over and blessed competing font types; and wrestled over the disposition of IBM's Hursley, England-based team of OS/2 programmers. It's probably fair to say that since the November 1989 declaration of unity, the gulf between the two micro giants has widened considerably in a much more public light than ever before.

The end result for users has always been confusion. Are the two versions of whatever the same? When will they be compatible? If they are different, whose should you buy? Is there *any* coherent desktop operating system/environment strategy that you can plan around? Can you bank on any statement of direction that IBM and Microsoft jointly present?

Then there are the "what ifs." What if a piqued IBM went its own way on OS/2? This is not so farfetched. It contemplated doing just that with "PM Lite," which was supposed to be a slimmed-down version of OS/2 Presentation Manager. Microsoft opposed the idea, which had support from some key developers. After a barrage of negative press followed a carefully timed leak, however, that trial balloon lost IBM's stamp of approval.

Also, IBM already delivers new OS/2 releases before Microsoft's OEMs. It also is the sole provider of Extended Edition, which consists of its Communications Manager and Database Manager bundled with vanilla OS/2, and may be the sole provider of a 2M-byte OS/2.

IBM is showing signs of standing its ground on OS/2 1.3 — no matter what Microsoft does. Ballmer did say that if OEMs want it, Microsoft will ship it. But OEMs and resellers probably would prefer not to have another SKU to track, particularly if it doesn't qualify as a Great Leap Forward.

There are also reports that IBM is using OS/2 1.3 to attack Windows 3.0 in sales pitches. If this is true, it's a bad way to atone for missing the Windows boat. If IBM picked up the threads of PM Lite, it would cut off its nose to spite its face.

All this energy would be better spent providing technical innovators with the tools and support they need to migrate over to a single OS/2 standard. Sowing more seeds of confusion by offering opposing agendas to Microsoft's doesn't help users, developers or the industry. This isn't to say that Microsoft's strategy is the way to go. What we need here is a little less bickering, a little more negotiating and a single strategy to bank on.

Keefe is *Computerworld's* senior editor, PCs and workstations.

NEW PRODUCTS

Software applications packages

Dynalink Technologies, Inc. has announced a system clipboard viewer and screen capture program for users of IBM's OS/2 Presentation Manager.

Clip'n Save Version 1.2 serves both as a viewport to any bit-mapped image on a system clipboard and as a screen capture program. Other features include five alternatives for capturing screen images and systemwide hot keys that are said to allow active windows or desktop applications to be captured at any time.

The product is available for $149.

Dynalink
32 Courval
Kirkland, Quebec
Canada H9H 3W6
(514) 630-7663

Coromandel Industries, Inc. has announced a transaction-based data management tool that is compatible with Microsoft Corp.'s Windows Versions 2.11 and 3.0.

C-Trieve/Windows enables developers to build large custom data management applications in C or C++ while using less code. The X-Open standard-based product allows applications to be moved across DOS, Windows, Unix, Xenix, or Sun Microsystems, Inc.'s Sun OS environments without the need to rewrite code.

It runs as a separate application under Windows and costs $395.

Coromandel Industries
7-15 Austin St.
Forest Hills, N.Y. 11375
(718) 793-7963

Cadware, Inc. has announced a personal computer-based software documentation tool and computer-aided software engineering (CASE) learning aid.

Smartcase includes a mouse-driven, point-and-place, icon-based interface. Interactive rule checking and three context-sensitive Help features provide Smartcase users with on-line training for CASE applications.

The product is available in MS-DOS and OS/2 versions, which are priced at $299 and $349, respectively.

Cadware
50 Fitch St.
New Haven, Conn. 06515
(203) 397-2908

Autosight, Inc. has announced a specialized personal computer tool for making Autodesk, Inc. Autocad Data Exchange Format files readable by other computer-aided design systems.

Autosight DXF Handler II can be used to modify text layers, sizes and styles; move text to and from specified layers; create new layers; and facilitate batch processing, according to the vendor.

The product runs on IBM Personal Computer XTs, ATs, Personal System/2s or compatibles and requires 512K bytes of memory and MS-DOS Version 2.0 or higher. It costs $195.

Autosight
P.O. Box 362086
Melbourne, Fla. 32936
(407) 242-5865

Who's the only branch automation company involved with E.I.S.A.?

Systems

Sony Microsystems Co. has introduced the News 3710, an addition to its News workstation family.

Model 3710 is based on Mips Computer Systems, Inc.'s 20-MHz R3000 reduced instruction set computing microprocessor. It can be used for applications such as electronic design automation, computer-aided design and computer-aided software engineering. It features processing power of 17 million instructions per second and includes a 286M- or 640M-byte internal hard disk.

Pricing ranges from $6,800 to $18,200, depending on configuration.

Sony Microsystems
651 River Oaks Pkwy.
San Jose, Calif. 95134
(408) 434-6644

Unisys Corp. has announced that it plans to package Microsoft Corp.'s Windows Version 3.0 with its Unisys Personal Workstation² (PW²) family of network servers and personal computers.

Windows 3.0 enables networked PW² users to share resources, connect and disconnect network disk drives and printers and control local and network printing.

The product is being offered with MS-DOS for all PW² systems. The MS-DOS/Windows 3.0 package costs $195, and an upgrade kit for current users of Windows 2.1 sells for $50.

Unisys
P.O. Box 500
Blue Bell, Pa. 19424
(215) 986-2214

Corvallis Microtechnology, Inc. has introduced the MC-V-NQ, part of its series of handheld personal computers.

The product features 256K bytes of random-access memory, two built-in RS-232 interfaces and an optional internal 1M-byte RAM disk. It was designed for companies that perform data collection applications such as inventory tracking, inspection and warehouse inventory control. It costs $1,450.

Corvallis
413 SW Jefferson Ave.
Corvallis, Ore. 97333
(503) 752-5456

Data storage

Raima Corp. has announced that its Dynamically Linked Library (DLL) version of DB Vista III (DB Vista 3.15) for Microsoft Corp.'s Windows Version 3.0 supports Asymetrix' Toolbook 1.0, a software construction set that enables IBM Personal Computer users to develop applications that address business, education and multimedia markets.

DB Vista III was designed for C language applications development and includes a database engine with a DLL and an SQL query and report writer. Pricing for the product starts at $595.

Raima
3245 146th Place S.E.
Bellevue, Wash. 98007
(206) 747-5570

Candlelight Software, Inc. has announced Windowsmaker, a software package that allows users to develop graphical user interfaces for Microsoft Corp.'s Windows Version 3.0.

The product allows Windows applications to be created in C by pointing and clicking on options and objects. Its code generator produces C source code that includes the Windows user interface and supports links to subroutines and internal functions.

The product lists at $795.

Candlelight Software
2375 E. Tropicana Ave.
Las Vegas, Nev. 89119
(702) 456-6365

Outbound Systems, Inc. has announced that it will begin shipping an external floppy disk drive for its Apple Computer, Inc. Macintosh-compatible laptop computer.

The 3½-in. Apple Superdrive-compatible drive can read and write any 400K-, 800K- or 1.4M-byte Macintosh disk format as well as 720K- and 1.44M-byte DOS disk formats.

The product is priced at $349.

Outbound Systems
4840 Pearl East Circle
Boulder, Colo. 80301
(303) 786-9200

COMMENTARY

Elisabeth Horwitt

Decisions, decisions

The following ditty is presented with apologies to The Lovin' Spoonful:

Did you ever have to make up your mind? To say yes to one communications platform and leave the other behind? There's so many protocols that aren't yet defined. Did you ever have to make up your mind?

Evidently, this tuneful dilemma still hasn't hit home for IBM. The vendor has long been facing its customers with an evermore-confusing array of midrange processor families that overlap in terms of functionality, upgradability and price/performance. Now IBM is further confusing the issue by apparently grooming its RISC System/6000, Enterprise System/9370 and Application System/400 lines as starters in the Great Communications Platform race.

The stakes are high, because users very much want a single platform that will interconnect various types of local-area networks to various types of popular (non-IBM) communications environments. Several members of the bridge-router-gateway contingent are attacking this problem, but they really can only bite off small pieces of

Continued on page 46

Connecting on Capitol Hill

Modernizing systems for the U.S. Senate is a truly political undertaking

ON SITE

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — Information systems managers who see their users as demanding but technologically naive would sympathize with Robert D. Harris, director of IS and technology at the U.S. Senate. Harris has just embarked on the formidable job of overhauling the Senate's nationwide data network — a combination of local-, metropolitan- and wide-area networks that will be used by 5,000 senators, staff members and committee personnel at 550 sites on Capitol Hill and around the country.

By almost any measure, the new network is a big step forward for the Senate. Transmission speeds, security, reliability and flexibility will all be boosted while operating costs should be reduced. But for Harris, the challenge may be more one of managing expectations than technology.

"We've got 100 senators and 26 committees. Some want to be on the bleeding edge of technology," Harris said. "They'll say, 'I saw something at a trade show last week. Why can't we have that?' Others will say, 'I've got a dumb terminal I've been using since 1972, and I don't want to give it up.' "

The Senate just handed the 10-year, $65 million job of installing and running the network to McLean, Va.-based Planning Research Corp. Planning Research will deploy the Senate Data Communications Network, a packet-switched network based on the CCITT X.25 protocol. A 56K bit/sec. backbone linking Senate offices in home states will be based on U.S. Sprint Communications Co.'s public data network service, Sprintnet (formerly Telenet). Users in senators' state offices will tap into Sprintnet via dial-up or dedicated lines at 9.6K bit/sec. — eight times faster than is now possible.

On Capitol Hill, a metropolitan-area network (MAN) will span five buildings and link 110 minicomputers from Data General Corp., Prime Computer, Inc. and Bull HN Information Systems; 39 3Com Corp.-based Ethernet LANs; 2,000 stand-alone personal computers; and 4,000 dumb terminals. Links at 56K bit/sec. will connect the MAN to Sprintnet and to IBM mainframe hosts at the Senate, the House of Representatives and the Library of Congress. All traffic will flow through Digital Communications Associates, Inc. (DCA) packet switches or

Continued on page 44

Study examines in-house integration

BY SALLY CUSACK
CW STAFF

VIENNA, Va. — True multivendor network integration experts are indeed a rare commodity, and many information systems shops across the country are tackling integration jobs with in-house resources and personnel, a recent study reported.

According to a report by Input, a Mountain View, Calif., research firm, both business and technological issues are evolving to increase demand for multivendor connectivity. "Finding a vendor that can deal with management issues while piecing together a comprehensive technology is essential," said Alex Graham, principal consultant at Input.

Results of the survey revealed that many integration projects are done by in-house personnel. Selected from a broad range of companies, almost 80% of the respondents said they had either already completed a network integration project or were currently involved in one, and 97% percent of those surveyed said they would be undertaking such a project within the next five years.

Of those who had already implemented an in-house strategy, most respondents indicated that outside vendors either did not have the technical expertise to advise them competently on network integration or did not know enough about the particular business to add any information of significant value.

Understanding goals

"The real issue for these vendors is to determine just what a particular organization is trying to accomplish by integrating networks," Graham said. "If, for example, the purpose is to tie everyone together, does that mean that everyone has access to all data residing on a network? And just who will decide who gets access to what? These are issues management must resolve."

Users seem to be meeting with reasonable results while going it alone, but it is a time-consuming task. Joe Duran, supervisor of computer operations at the Lower Colorado River Authority in Austin, Texas, said that his company knew at the outset "exactly what the objectives were and just what needed to be accomplished."

The state agency currently has 600 Intel Corp. 80286-based personal computers and three Novell, Inc. local-area networks scattered over eight different locations and is implementing a plan to connect all the LANs to an IBM 3081 mainframe over coaxial and microwave links.

Graham said he feels that integration vendors must be well-versed in voice and data communications, LANs and wide-area networking to meet the demands of today's technological market.

Who was the first bank automation company to produce a computer with 486 chip technology?

Here's a hint: It's not IBM or DEC.

Campus network high achiever

After installing its first LAN, UCSD realizes benefits of data sharing

ON SITE

BY JIM NASH
CW STAFF

Three years ago, a professor at the University of California, San Diego (UCSD) achieving a research breakthrough might have shared her discovery with colleagues via electronic mail.

At the same time, a department head spotting potentially disastrous accounting problems through his spreadsheet program would have had to pop the floppy into his briefcase, board a shuttle and load the disk into another personal computer to show it to his superior.

The 2,000 administrators working on their 1,000-workstation network today at UCSD have put away their campus bus passes. The university has made the connection that data sharing benefits administration as much as academia.

It was newcomer Steve Relyea who "got fed up" with UCSD's "Sneakernet" in 1987. Relyea had moved from the University of California, Irvine the year before to become vice-chancellor for business affairs at UCSD.

"On the administrative side," he explained, "we didn't have much. It was kind of the Dark Ages — a few PCs, but no E-mail, no data communications." Relyea said he was only waiting for the local-area network industry to mature.

Networking advocacy is not the norm at most firms, said Steve McQuarry, UCSD's communications software development engineer. "Most organizations are trying to get the word up to the top. This time the word was coming *down*," he said.

UCSD's Relyea *was fed up with the university's 'Sneakernet'*

That advocacy hit high gear in 1987. Relyea said that the industry finally offered the security, fault tolerance and reliability he felt was needed in order to run PCs at a major university.

It is difficult to imagine a more confusing environment to organize electronically. Scuff an ant hill and watch the activity. That is what UCSD looked like recently as students, teachers, administrators and construction workers swarmed through the labyrinthine campus. It is virtually impossible for anyone short of a San Diego graduate to navigate UCSD easily. Complicating matters is $500 million worth of construction that is turning the 1,800-acre campus inside out.

"One of the toughest things to do is anticipate the building program and how it is going to affect communications," Relyea said.

Why did he pick up such a trouble-prone project? "It was a combination of my being very new," he said, "and my having to deal with the immense geographical dispersal of the campus." For example, UCSD's medical center is 12 miles south of the core, and a new switching station is 20 miles northeast of the campus.

From the outset, Relyea sought to standardize the system. He said he chose a PC LAN over academia's host model to preserve the school's investment in its few administrative microcomputers. He experimented with Banyan Systems, Inc.'s Virtual Networking Software and Novell, Inc.'s network operating systems before choosing Novell Netware.

"It was a really tough choice. I feel we would have made it work either way," Relyea said. "Banyan had better wide-area network tools, but Novell had such a commanding market share and third-party support." Banyan's requirement for its own proprietary servers also helped his decision, he said.

McQuarry said they were just as picky with E-mail. They first tried Novell's package, but the users disliked its clumsiness. CC:Mail, Inc.'s CC:Mail eventually won out, he explained.

The first network was a Netware 286 Version 2.0A in the personnel department in 1988. "They were really champing at the bit," Relyea said. While other departments were dubious about the plan, "personnel was saying, 'Bring it on.' " He said he figured a successful network would evangelize itself in personnel because of the department's integral role in the other departments.

Relyea said linking users in only one department the first time out taught him to continue that pattern. At the time, he had only the money and manpower to tackle one department. But concentrating singly reduced confusion and mistakes, he said.

McQuarry said resistance to networking melted in even the most hardened departments. "Once people saw electronic transfer of files, that's when things started changing." LAN E-mail had a particularly strong effect on users. McQuarry said that E-mail had existed before, but it was a dial-up service to a PC running The Santa Cruz Operation's Xenix. Making E-mail easier to use opened up lines of communication that had never even existed before, he said.

UCSD now supports networks in 53 departments with 67 file servers on an Ungermann-Bass, Inc. broadband backbone that is slowly being switched to fiber optics, McQuarry said. IBM's Personal System/2 Model 70 is the standard workstation; the Model 80 is the standard server.

Bamboo curtain

Sometimes administrators have to go far afield to find the reason for failing networks. Steve Relyea, the architect behind the 1,000-workstation network at UCSD, thought he had tried everything with one faulty remote link.

Relyea could not figure out why the high-speed digital microwave communication link connecting the university's Sorrento Valley telecommunications center with the rest of the campus was having periodic failures. "We tried everything in the book and couldn't find what was causing the problem," he said.

Someone at the site told him that things got worse on windy days. When the crew walked out to the microwave dish, they saw a tall strand of bamboo in front of the device waving in the gusts. "We trimmed [the bamboo shoots], and suddenly, we had 100% performance."

JIM NASH

It's Olivetti.
The company that brought together ISC-Bunker Ramo.

Capitol Hill

FROM PAGE 43

packet assembler/disassemblers (PAD).

Networking software will conform to the Government Open Systems Interconnect (OSI) Profile, a set of OSI specifications mandated this month for federal network procurements.

The network will support mostly office automation applications. Chief among these is the Correspondence Management System, a vendor-managed service that maintains libraries of text used to reply to constituent letters. Dedicated 56K bit/sec. lines will connect Senate users to the vendor's six Digital Equipment Corp. Decsystem-10 computers in Pittsburgh.

The network will also provide access to information services provided by the Senate and will connect to various vendor database services.

The new network will supplant a "very old data [private branch exchange] system in a star configuration" with 25 leased AT&T circuits multiplexing into state offices, said Shaw Zee, the Senate's data communications manager. Users now have to dial in at 1,200 bit/sec., and when a link goes down, it is likely to stay that way for some time. "We have too many vendors and no central responsibility. Today, if you go to one of the minicomputer vendors and say, 'Your port is down,' the vendor will say, 'No, it's in your network.' Also, we have to rely on user cooperation, and they may not want to talk to us," Zee said.

All data traffic will flow through the DCA switches or PADs, sending status information to a network control center on Capitol Hill. A network management system there will allow Senate and Planning Research technicians to pinpoint problems within minutes, without the need for user involvement, Zee said.

In 1988, the Senate paid $1.8 million to provide data service to 150 offices; today, the same service to 390 offices costs $6 million annually. Zee said the Senate hopes the new network will cost no more in two years than it does now, despite an increase in traffic of 15% to 25% per year.

Harris said the Senate is buying the data communications switches and PADs, and it may move to a private network by replacing Sprintnet with its own 1.5M bit/sec. lines. It may also take over network operations from Planning Research, he said. Harris said the decisions would be based primarily on financial considerations once the new network is operational and traffic statistics become available.

In the meantime, increased bandwidth and reliability will make it as easy for users to do business on the West Coast as on Capitol Hill, Harris said.

"WE'VE GOT 100 senators and 26 committees. Some want to be on the bleeding edge of technology."

ROBERT D. HARRIS
U.S. SENATE

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Horwitt

CONTINUED FROM PAGE 43

it. Only IBM can take the whole hog and make it palatable to its own shops in the Fortune 500 sector.

By the whole hog we mean an easily upgradable platform that could act as a combination network file- and disk-server, Netview service point and router/gateway.

It would connect directly to an Ethernet or Token-Ring LAN and then route transmissions across a packet-switched T1 or Integrated Services Digital Network (ISDN) link to other LAN resources or to an IBM host.

The ideal platform would have a low entry price and support IBM's low-end networking, saving OS/2 Extended Edition and AS/400 users from having to route all transmissions via the nearest (or not-so-near) host or front-end processor.

On top of all that, it would support Transmission Control Protocol/Internet Protocol (TCP/IP) and Open Systems Interconnect.

Sound fantastic? IBM doesn't seem to think so. A couple of months back, the vendor furnished a statement of direction which essentially said that all of its Systems Application Architecture lines, as well as the RS/6000, will eventually support both OSI and TCP/IP.

Last week, IBM announced that the AS/400 will support direct Ethernet links, 16M bit/ sec. Token-Ring and TCP/IP terminal-to-host connections.

ONLY IBM can take the whole hog — an easily upgradable platform that could act as a combination network file- and disk-server, Netview service point and router/gateway — and make it palatable to its own shops in the Fortune 500 sector.

Also introduced was a Teleos server that links to the AS/400 over Token-Ring and lets the host act as a coordinator for telemarketing and service agents who take calls over an ISDN link.

This makes the AS/400 a pretty nifty communications box, especially considering that it already has some really special peer-to-peer Systems Network Architecture (SNA) capabilities as well as an internal adapter that makes LAN connections a snap.

Then there is the ES/9370, which IBM is said to be reintroducing this September at the same time it revamps its 370 line. The 9370, as you may remember, was supposed to be a good communicator, with mysterious, not-quite-SNA peer-to-peer clustering capabilities and an internal front-end processor.

The most recent 9370 model — the 9371 — reportedly improves quite a bit on its predecessor with a built-in Intel 80386 processor and IBM Micro Channel Architecture, which allows it to easily link to LANs as a server/gateway supporting the same protocols as a PS/2, as well as 370-type SNA networks.

And let's not forget the RS/6000, which already has strong TCP/IP networking and network management capabilities and is reportedly being linked up to Netview. IBM definitely plans to provide OSI migration capabilities for the box.

The RS/6000 is also being used as the basis for the proprietary 45M bit/sec. T3 switch that IBM developed for the National Science Foundation Network. Can ISDN be far behind?

To make things truly confusing, there is IBM's cluster controller strategy. The 3174 does SNA now and will do low-entry networking shortly; the 3172 does everything else (TCP/IP, MAP and Ethernet, with OSI to come, no doubt). There are rumors that IBM may hybridize the two, creating yet another promising multipurpose LAN gateway.

A group within IBM is said to be fighting to fit the 3174 as an applications processor so it can act as a file server as well.

So, you say (or more likely IBM would say), what's wrong with a lot of choices? Nothing at all, except IBM's flurry of midrange communications introductions leaves out the 370 mainframes and front-end processors.

Fitting those traditional SNA architectures onto a peer-to-peer, multivendor vehicle is a little like trying to balance an elephant on a bicycle. IBM's OSI Communications Subsystem remains an awkward and expensive interim solution at best.

It's true that IBM's midrange systems are becoming quite effective gateways between SNA hosts and popular networking environments.

This seems like a good interim step to take while waiting for IBM to finish putting together its full peer-to-peer SNA and OSI networking strategies.

The question still remains, however: Which of those platforms is IBM grooming to be its Great Communicator? One? Many? All?

Did you ever have to make up your mind?

Horwitt is a *Computerworld* senior editor, networking.

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MANAGER'S JOURNAL

EXECUTIVE TRACK

Steven A. Milston has been promoted to the new position of chief information officer at Minneapolis-based **Health Risk Management, Inc.**, a provider of managed health care services.

Milston will direct the company's information systems research and development and oversee the IS department to support company operations.

Milston was previously director of IS at the firm. His background includes 11 years in finance, five years in manufacturing, 1½ years in consulting and 7½ years in health care.

Before joining Health Risk Management, Milston was a vice-president at First Bank System in Minneapolis. In previous jobs, he was director of a five-year development project for new product support at Control Data Corp. and supervisor of IS operations at the University of Minnesota Hospitals.

.....

John D. Christensen has been named manager of IS at the **South Carolina State Ports Authority** in Charleston, S.C.

His responsibilities include supervising operation of Orion, the Port Authority's electronic manifest filing system.

Christensen was previously manager of MIS at the South Carolina Public Service Authority (Santee Cooper). Before that, he was systems and programming manager at Santee Cooper and senior electronic data processing consultant at The Computer Generation, Inc.

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Who's on the go?

Changing jobs? Promoting an assistant? Your peers want to know who is coming and going, and *Computerworld* wants to help by mentioning any IS job changes in Executive Track. When you have news about staff changes, be sure to drop a note and photo or have your public relations department write to Clinton Wilder, Senior Editor, Management, *Computerworld*, Box 9171, 375 Cochituate Road, Framingham, Mass. 01701-9171.

Daring to alter standard procedures

Martin Marietta's Soucy envisioned a better way to set PC standards, and it worked

BY MITCH BETTS
CW STAFF

In the Army, the guy who complains about the food winds up as the cook. At large defense contractor Martin Marietta Corp., it was a very similar process that put Alan J. Soucy in charge of setting computer product standards for 25,000 end users.

Four years ago, Soucy was in Martin Marietta's Denver aerospace office complaining that some "PC genius" at headquarters was telling him what project management software to use at a time when he was "living and breathing project management software" in the course of his job as chief of project management systems.

Meanwhile, the headquarters staff back East was frustrated because the corporate list of standard products was based mostly on politics, and there was not much compliance with the resulting standards.

Soucy, with typical self-confidence, says he was sure there was a better way to set standards — a way that included getting advice from people doing real work in the field. He was told: "If you think you have a good solution — it doesn't seem to be working the way we're doing it — come on out."

Now the 35-year-old Soucy is manager of computing standards at Martin Marietta, based at the information systems group's headquarters in Chantilly, Va. His sophisticated process for setting standards is getting high marks inside and outside the company.

Soucy's methodology "takes the emotion and biases out. Legitimate business and technical issues get considered, but almost everything else doesn't," says Thomas B. Shafer, vice-president in charge of internal IS at Martin Marietta.

Marcello Paganelli

Martin Marietta's Soucy *is happier about the company's PC standards-setting procedure now that he's in charge of it*

Soucy's Computing Standards Laboratory touts an 11-step methodology for evaluating microcomputer and local-area network products, a process that, not surprisingly, features ample use of field expertise. Standards are no longer based on corporate politics or on the preferences of IBM and Apple Computer, Inc. bigots or on whoever yells the loudest and gets reddest in the face at meetings, Soucy says.

The standards process seems smooth now, but there was considerable resistance to Soucy's overhaul a few years ago, particularly from the IS support managers at the individual Martin Marietta business units.

These local IS managers were apprehensive about Soucy's headquarters operation bypassing them — breaking the proper protocol and talking directly to end users. "The political challenges dwarf any of the technical challenges," Soucy says.

The key to winning converts, Soucy

Continued on page 52

Testing their knowledge of knowledge

Knowledge engineers can become professionally certified by passing the IAKE exam

BY CLINTON WILDER
CW STAFF

The specialists are getting more specialized, and now they're about to become certified, too.

In October, the International Association of Knowledge Engineers (IAKE) will hold the first exam for professional certification in knowledge engineering.

The 2-year-old IAKE, based in Rockville, Md., believes the field has grown significantly enough to warrant a kind of official stamp.

"As the number of knowledge engineers proliferates, employers may be somewhat more skeptical about hiring for specific jobs," said Joseph Coleman, IAKE's director of certification.

"Certification gives the employer some confidence in the applicant over and above the application," he added.

The exam will test technical skills in artificial intelligence, such as know-how in Lisp, Prolog, neural networks and the structures of rule-based and model-based systems.

It will also test applicants in their knowledge of knowledge — cognitive and neuronal science, logic and language theory.

After answering a series of questions, applicants will be asked to construct a simple expert system.

If IAKE membership is any indication, knowledge engineers are indeed proliferating. Membership has jumped from 700 to 1,000 within the past year or so. About 400 members are based outside of the U.S.

Coleman stressed that the certification program is not intended to create an exclusive, haves vs. have-nots situation. "We're not making claims that others can't do this kind of work," he said. "But we wanted some objective or standard for displaying knowledge engineering capabilities."

The exam is scheduled for Oct. 6 in San Francisco. For information, contact IAKE, Suite 302, 11820 Parklawn Drive, Rockville, Md. 20852.

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BOOK REVIEW

Bit stream of consciousness from a human computer

COMPUTER BIT SLICES FROM A LIFE
By Herb Grosch
Underwood-Miller, Box 1707, Novato, Calif. 94948, $24.95

Computers, as a general rule, do not produce graceful prose; the computer named Herb Grosch is no exception.

Grosch began his career at a time when computers were, by definition, human beings — highly trained scientists and mathematicians capable of performing the backbreaking calculations involved in theoretical and applied research. Although most of his working life has been dedicated to the advancement of the machines that made this fraternity obsolete, Grosch still takes pride in having started out as a member of the elite club of flesh-and-blood computers.

This explains why, when he felt it was time to tell the story of a career that placed him at the scenes of many great moments in early computing, Grosch chose to title his memoir the way he did. Less easy to understand is why the editors at Underwood-Miller did not see fit to explain some of the basic rules of the operating environment to their author. They might, for example, have pointed out that it is one thing to compare your autobiography to a "multidimensional database" and quite another to actually write it like an unpacketized bit stream.

That is not to say that Grosch's structural experimentation is entirely without merit. In carrying out his life-as-a-database theme, he hit upon one very useful idea, which was to provide a list of key words and names at the beginning of each chapter. These are arranged in order of appearance, so it is possible to skip over some of the more impenetrable prose dealing with orbital calculation and optical design and get right to the juicy parts.

These, incidentally, are not sections dealing with Grosch's reportedly prodigious sexual exploits. The excitement comes in the passages that let us peek inside the laboratories and executive offices at IBM and General Electric Co., his two major employers, and eavesdrop on the maneuverings that surrounded the birth and infancy of the computer industry.

Grosch was in the center of the action at many of the industry's most important developmental stages. He served two stints at IBM. The first encompassed the founding of the Watson Lab at Cornell University and the building stages of the firm's ground-breaking 701 mainframe; the second gave him a chance to see Thomas J. Watson Jr.'s operation. Between IBM jobs, Grosch carved out a place for himself at GE during the early days of its ill-fated push to become a force in the computer business.

As manager of one of GE's major IBM sites, Grosch participated in the founding of Share, the earliest IBM user group. Share emerged as a result of extreme frustration among IBM users who were unable to pry loose any detailed information about the company's plans for a follow-on to its popular 701 mainframe.

"We organized to put concerted pressure on IBM, and don't let anybody tell you differently," Grosch writes. "When IBM suavely took it over, they swore it was to trade information around and help newcomers. Hogwash! It was to get Tom Watson and Vin Learson and Cuthbert Hurd to come when we whistled."

Author Herb Grosch

That kind of insider information makes the book valuable, despite its flaws. There are revealing glimpses of the management philosophies at the two companies where Grosch spent most of the years covered. Perhaps most fascinating of all, there are passages that bring home both how very far we have come in a relatively brief period and how little some things have really changed.

Consider what it was like trying to design software in a technical void where even producing copies of documentation was a major feat: "Today's youngsters can't really picture how we worked. Not because of the primitive software tools, not because there was no hardware yet to try prototype programs on, not because nobody had invented terminals — but because there were no copy machines."

Yet, as Grosch communicates quite clearly, many of the issues that those of us in the industry think we are confronting for the first time were here before. In 1956, for example, he was fighting a holding action at GE against department managers who wanted to acquire and control their own computers. As he notes, it was "shades of the Eighties."

In his introduction, Grosch writes of aspiring to "Magic Realism — a picture somewhat larger and clearer than life." In many sections, the effect is something closer to a doctoral thesis dictated by a devotee of *Finnegan's Wake*. Still, some of the bits here are worth retrieving and, if you follow the pointers, the search procedure will execute fairly rapidly.

JOANNE KELLEHER

Kelleher is a *Computerworld* features editor.

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Standards

FROM PAGE 49

maintains, has been establishing the credibility of the standards-setting process.

The rigorous product-evaluation process, which takes approximately two to six months, begins by having a technical advisory council set priorities on what technologies to evaluate and identify the field experts in those technologies. Then, and perhaps most importantly, the field experts identify the mandatory and optional features they need to do the job.

The lab staff weeds out all of the products that fail to meet the mandatory requirements and sends the top contenders out to the field offices for a lengthy, hands-on evaluation by the experts.

The users' scoring sheets are tallied up in a matrix that looks like a chart from *Consumer Reports* magazine, and a winner emerges.

Figuring that the lab's structured decision-making process could be applied to other technologies, there is even talk of expanding its scope to include engineering workstations and programming tools.

Shafer considers the program to be highly successful, noting that the standards have a compliance rate of at least 80% and that the process has gradually gained the respect and involvement of all business units at the firm.

A more tangible result is that Soucy's unit has landed Martin Marietta some whopping volume discounts.

Because of the corporate-wide standards, Martin Marietta can negotiate volume discounts that produce savings of $4 million to $10 million each year — several times the lab's budget of $1 million, according to Soucy.

Bottom-line results like that will keep the standards lab in business at a time when defense industry budgets are being slashed. "In a tight budget climate, the kinds of discounts and disciplines we're talking about become even more important," Shafer says.

Martin Marietta's clout with vendors goes beyond discounts. When Soucy makes a suggestion for improving a product, vendors listen.

Zenith Data Systems, for example, followed Soucy's recommendation to install Microsoft Corp.'s Windows 3.0 on the hard disks of its Intel Corp. 80386SX-based microcomputers at the Zenith factory, saving Martin Marietta technicians lots of time when they set up the micros

Behind closed doors

One way that Alan Soucy, manager of computing standards at Martin Marietta, has increased the company's clout with vendors is through membership on customer advisory councils.

The user councils typically provide feedback to the vendors on product strategies and features. Soucy is a member of advisory councils associated with Apple Computer, Inc., Aldus Corp., Novell, Inc. and Zenith Data Systems, for example.

However, Soucy is most proud of his role as founder and vice-president of Managing Apple Computers in Information Systems, an independent organization in Chicago. It has an exclusive membership of IS managers in organizations with at least 100 Macintoshes.

"The roster is Apple's crown jewels . . . and they have big-time clout," Soucy reports.

The group holds a conference every six months featuring closed-door sessions in which Apple discloses its product plans and the IS managers provide Apple with a consolidated list of users' recommendations.

MITCH BETTS

In 1863,
S. Langhorne
Clemens
decided to change
his name.

for thousands of users. Ditto for those thumb screws on the back of the Zenith personal computer.

Soucy emphasizes that there is much more to his operation than coming up with a standard product list. "Even after selecting a standard, most of the work is ahead of you. Some companies fall short because they make this great decision and don't know what to do next."

At the Computing Standards Lab, the follow-up includes getting the word out to executives and thousands of employees through in-house newsletters, planning training courses and technical support, obtaining spare parts for the in-house repair technicians and preparing hot line support. "Otherwise, the standard just dies," Soucy says.

Within Martin Marietta, "we don't have any clout other than our reputation" for credible standards, Soucy says. "Anybody in this company can buy whatever they want at any given time if they have the right justification. There is no standards police that runs around the company handing out fines or putting you in the penalty box," he adds.

Soucy is striving for an approach that is somewhere between standards-by-committee and standards-from-headquarters — or perhaps a blend of the two. "We've got a vision of where we're going to go and why, but it's the people in the field who shape that and fine-tune it based on their field requirements and expertise," he explains.

> "THE POLITICAL challenges dwarf any of the technical challenges."
>
> ALAN J. SOUCY
> MARTIN MARIETTA

In other words, it's a textbook case of participative management.

Soucy sums up his management philosophy this way: "No individual organization within the company has all the answers, but the answers can be arrived at if we get the right people involved."

It worked for him.

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MANAGEMENT BRIEFS

New duties for CIO

Michael R. Zucchini, executive vice-president and chief information officer at **Fleet/Norstar Financial Group, Inc.** in Providence, R.I., was given two new management responsibilities in a recent reorganization.

In addition to managing Fleet/Norstar's data processing and bank operations activities, Zucchini was given the responsibility for AFSA Data Corp., the firm's student loan processing subsidiary based in California.

He was also made responsible for the corporate products and services group, which develops and markets products and services for all Fleet/Norstar subsidiaries.

Wendy P. Shade, manager of customer support at Iron Mountain Records Management Co. in Los Angeles, became president of the **Association of Records Managers and Administrators** (ARMA International) for a one-year term beginning July 1.

ARMA International, based in Prairie Village, Kan., is an association of records and information management professionals with more than 10,600 members in the U.S. and Canada.

John Elliott, former director of information systems for the city of Seattle, has joined Seattle-based **R. W. Beck and Associates** to lead its IS consulting practice in the western U.S.

Before joining the city of Seattle, Elliott managed systems development at the city of Los Angeles Department of Water and Power. His most recent position was as a senior manager at Ernst & Young's consulting division.

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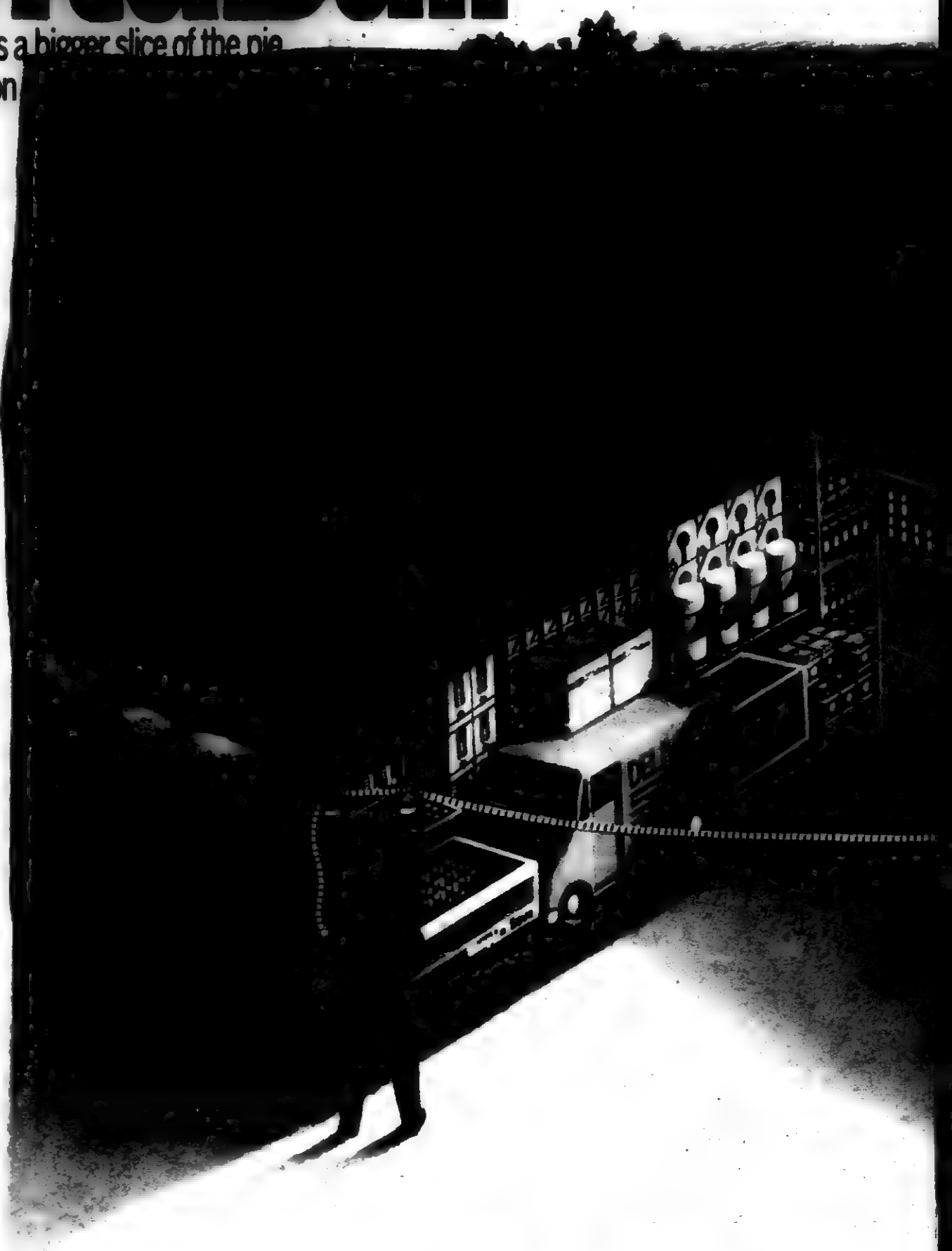

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CALENDAR

The CIO Information Industry Conference, "Information Strategies for the '90s, Thriving on Change," is scheduled for Oct. 28-30 in Palm Springs, Calif.

The conference, sponsored by CIO Magazine and AMR International, will emphasize chief executive officer information imperatives, outsourcing strategies, motivating for innovation, security and privacy trends, imaging systems and more.

For more information, contact Lori Cardarelli, CIO Magazine, Framingham, Mass. (508) 872-8200.

SEPT. 23-29

Networking/Unix '90. Atlanta, Sept. 24-25 — Contact: Sue Fredricks, Interop, Atlanta, Ga. (404) 230-2711.

The Expanding Glass House of the '90s. Toronto, Ont., Sept. 24-26 — Contact: Meta Group, Westport, Conn. (203) 226-6382.

PC Expo. Chicago, Sept. 25-27 — Contact: H.A. Brien, Inc., Englewood Cliffs, N.J. (201) 569-8542.

SAA World Conference & Exposition. Los Angeles, Sept. 25-27 — Contact: Digital Consulting, Andover, Mass. (508) 470-3880.

The Intelligent Corporation Conference. New York, Sept. 26 — Contact: The Ruth Stanat Forum, New York, N.Y. (212) 725-4550.

Managing the Global Forces of Change: Strategies for Corporate Success in the '90s. Fort Collins, Colo., Sept. 27 — Contact: National Technology University, Fort Collins, Colo. (303) 484-0565.

Portable Computing and Communications Exposition and Conference. New York, Sept. 27 — Contact: Michael Sullivan, IDG Conference Management Group, Framingham, Mass. (800) 225-4698.

Operations Manager Conference. Laconia, N.H., Sept. 27-28 — Contact: Jerry Lemelin, Portsmouth, N.H. (207) 438-2491.

SEPT. 30 - OCT. 6

Benefiting from Systems Integration. New York, Sept. 30-Oct. 2 — Contact: Abbey Chakalis, CMP Conference Group, Manhasset, N.Y. (516) 562-5717.

Venture Publishing Seminar. San Jose, Calif., Sept. 30-Oct. 2 — Contact: Bob Moody, VPUG (408) 227-5030.

Development Center Institute Fall Conference. Indianapolis, Sept. 30-Oct. 3 — Contact: Development Center, Indianapolis, Ind. (317) 848-2753.

Information Industry Association's Annual Convention & Exhibition. Boston, Sept. 30-Oct. 3 — Contact: IIA, Washington, D.C. (202) 639-8262.

Control, Audit and Security Conference. Atlanta, Sept. 30-Oct. 4 — Contact: Patsy Day, MIS Training Institute, Framingham, Mass. (508) 879-7999.

TCP/IP Protocol Suite. Burlington, Mass., Oct. 1-2 — Contact: State-of-the-Art Program, Northeastern University, Dedham, Mass. (617) 320-8055.

AS/400 Technical Conference. Hilton Head Island, S.C., Oct. 1-3 — Contact: AS/400 Technical Conference, Warrenville, S.C. (800) 552-9404.

Effective Methods for Information System Quality Assurance. Orlando, Fla., Oct. 1-3 — Contact: Quality Assurance Institute, Orlando, Fla. (407) 363-1111.

Information Industry Scenario Conference. Phoenix, Oct. 1-3 — Contact: Ashley Pearce, Gartner Group, Stamford, Conn. (203) 964-0096.

Information Technology Conference & Exposition. San Diego, Oct. 1-3 — Contact: Data Processing Management Association, Park Ridge, Ill. (708) 825-8124.

National Computer Security Conference. Washington, D.C., Oct. 1-4 — Contact: Tammy Grice, National Institute of Standards and Technology, Baltimore, Md. (301) 975-2775.

Scan Tech '90. Atlanta, Oct. 1-4 — Contact: Aim USA, Pittsburgh, Pa. (412) 963-8588.

CD-ROM Expo. Boston, Oct. 1-5 — Contact: Dorothy Ferrier, IDC, Framingham, Mass. (800) 225-4698.

Object-Oriented Systems Development. Washington, D.C., Oct. 1-5 — Contact: Barnett Data Systems, Rockville, Md. (301) 762-1288.

Unix Solutions Exposition and Conference. Anaheim, Calif., Oct. 3-5 — Contact: The Interface Group, Needham, Mass. (617) 449-6600.

Accessible Computer Technology Exhibit. Washington, D.C., Oct. 4 — Contact: Alan Douglas, ACT 111, Washington, D.C. (703) 557-6158.

OCT. 7-13

Pacific Northwest Software Quality Conference. Portland, Ore., Oct. 7-9 — Contact: Terri Moore, Pacific Agenda, Portland, Ore. (503) 223-8633.

Fox Developer Conference. Toledo, Ohio, Oct. 7-10 — Contact: Fox Software, Perrysburg, Ohio (419) 874-0162.

Indycon Electronic Show & Conference. Indianapolis, Ind., Oct. 8-9 — Contact: Indycon, Carmel, Ind. (317) 571-8462.

Eastern Exposition and Conference. Alexandria, Va., Oct. 8-10 — Contact: The American Public Communications Council of the North American Telecommunications Association, Washington, D.C. (800) 538-6282.

National Communications Forum. Chicago, Oct. 8-10 — Contact: National Communications Forum, Chicago, Ill. (312) 938-3500.

Southeastern Telecommunications Association Conference and Equipment Exposition. Miami Beach, Fla., Oct. 8-10 — Contact: SETA, Columbia, S.C. (803) 731-5640.

American Production and Inventory Control Society International Conference and Exposition. New Orleans, Oct. 8-12 — Contact: APICS, Falls Church, Va. (703) 237-8505.

Interop '90. San Jose, Calif., Oct. 8-12 — Contact: Interop, Inc., Mountain View, Calif. (415) 941-3399 ext. 200.

CASE World Conference and Exposition. Chicago, Oct. 9-11 — Contact: Digital Consulting Group, Andover, Mass. (508) 470-3880.

Northcon/90. Seattle, Oct. 9-11 — Contact: Northcon, Los Angeles, Calif. (213) 641-5117.

Executive Information Systems in Government. Washington, Oct. 9-12 — Contact: Conference Manager, USPDI, Inc., Silver Spring, Md. (301) 445-4490.

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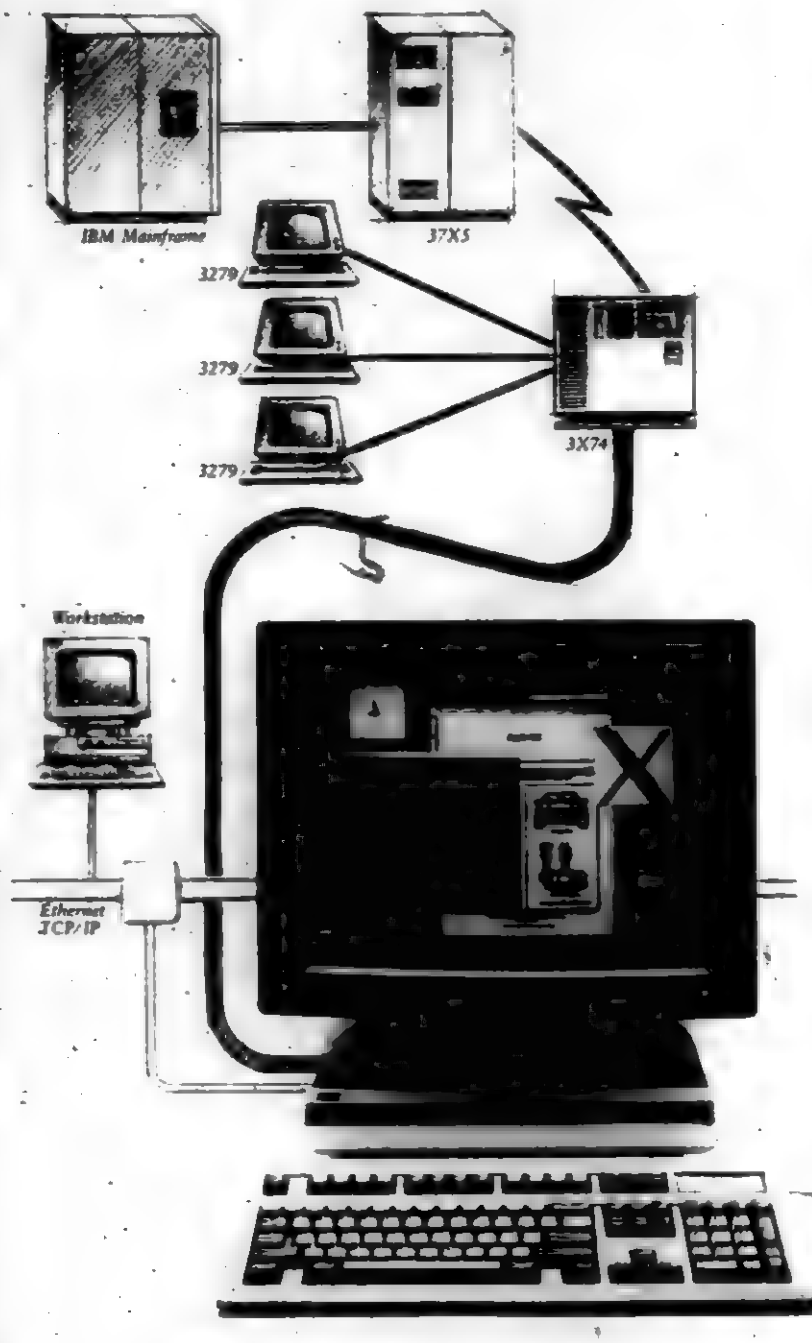

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DATA CENTER AUTOMATION

Consolidation promotes hands-off strategy

BY MICHAEL FEUCHE

When Merrill Lynch & Co. set out to consolidate its seven data centers in the U.S., UK and Canada, it created a two-phase plan. In phase 1, the company would physically relocate all of its diverse operations to two large centers in New York; in phase 2, it would configure automation tools to meet the new needs of the larger centers.

During the physical relocation stage, the brokerage firm discarded half of its 13 mainframes, which processed 536 million instructions per second (MIPS) in three countries, keeping only seven machines to process 734 MIPS.

The new Merrill Lynch data centers process in one day almost four times the number of batch jobs that a "typical" data center runs, according to statistics from Arnold Farber, president of Farber/LaChance. They also process six million on-line transactions per day.

Howard P. Sorgen, first vice-president of operations, systems and telecommunications and the leader of Merrill Lynch's consolidation project, says automation tools were crucial in helping him gain control over the amount of processing taking place in the new data centers. "Consolidation means automation," he says.

That maxim doesn't apply only to Merrill Lynch. When data center operations are consolidated into a single supercenter, work loads inevitably increase as staffs of the same size or smaller are asked to cope with increased processing traffic, including that from "satellite centers" monitored remotely from the supercenter.

Supercenters also typically operate within tight processing schedules, running 24 hours a day, seven days a week with drumhead-tight windows to maximize cost-effectiveness.

Because of these higher efficiency demands, many companies seeking economy of scale through data center consolidation are starting to see automation tools as a virtual necessity.

"Without these tools, I don't know how we could handle our work load and network size, says Robert Drum, executive vice-president at the Fleet/Norstar Financial Group, Inc. The banking institution has consolidated 11 data centers into one, saving $10 million in hardware, software and staff reductions.

The products Drum finds most useful in expediting day-to-day operations are tape management, restart and job scheduling systems. "If I did not have them," he says, "the staff levels I would need to do the same things manually would be quite inflated."

Other automated systems increasingly regarded as crucial to the success of such projects include console automation tools — both to reduce staff and manage remote operations — and job scheduling and balancing tools to keep processing as efficient as possible.

With consolidations on the rise, these tools will only grow in demand. According to Jeff Schulman, a vice-president at Gartner Group, Inc., a research firm in Stamford, Conn., more than 30% of the firm's customers have already centralized their operations. He says he expects that figure to grow to 60% by 1992.

"Consolidation is growing in tandem with automated systems operation," Schulman says. "The two really go hand in hand."

"If you take two small data centers and make them into a larger center trying to produce more work, you're going to need more sophisticated tools," says Len Eckhaus, president of the Association for Computer Operations Management. "This is going to add to the purchase of automation tools."

Console automation systems are on the top of many data center managers' lists when they perform a consolidation. Out of 431 IBM 3090 sites surveyed by software vendor Candle Corp., roughly 45% of those that had purchased or planned to purchase a console automation tool had consolidation as their goal.

David Pardello

The first console automation application in nearly every shop is the reduction of routine IBM MVS operating system messages that flash by operators' console screens.

"If a data center goes from running 200 jobs to 400 jobs per day, these tools become critical," Eckhaus says. "Operators can't respond to all the messages generated from a regular work load; now those work loads are doubling."

At Merrill Lynch, reducing messages "was our first need," says Leonard Peters, assistant vice-president of operations, systems and telecommunications. "We were able to decrease the number of unsolicited messages going into the operator's console by 85% using IBM MPF software."

Console automation tools also create a single point of control to integrate the functions of other automation tools.

"When we [consolidated into]

Continued on page 60

Feuche is a free-lance writer based in New York.

INSIDE

Aiding the Samaritan
Help desk staff get new capabilities from old tools. Page 68.

The Second Step?
How important is it to integrate your automation tools? Page 65.

Product Chart
A comprehensive listing of console automation software. Page 69.

"WITHOUT THESE tools, I don't know how we could handle our work load and network size. The staff levels I would need to do the same things manually would be quite inflated."

ROBERT DRUM
FLEET/NORSTAR

Continued from page 59

two data centers," Sorgen says, "we brought together multiple systems, which required intervention by operators at multiple consoles. Now, there is a single console for an entire data center."

These systems are also needed to control operations remotely. When Manufacturers Hanover Trust Co. consolidated two mainframe installations in 1989, it planned to run one as a satellite center controlled through remote operations at the main data center, according to Howard S. Taylor, assistant vice-president at the firm. The firm already had some automation software, but it needed to purchase a console automation tool to control operations remotely. The resulting staff reductions have saved the company $4.5 million in the past two years, Taylor says.

The company also plans to use its remote capabilities for disaster recovery. "During interruptions of service, remote console operations will permit us to use either one as a contingency site," says Michael Pasiecki, senior vice-president of wholesale computing services at the firm.

At MCI Communications Corp., an OPS/MVS console automation system from Goal Systems International, Inc. will run all three Supernode computer centers now being created in Ohio, California and Oklahoma, says Alan Ditchfield, vice-president of systems engineering at MCI.

The system provides a single point of remote control from a central location in Arlington, Va., for MCI's Omegamon performance monitoring software from Candle and its CA-7 and CA-11 job scheduling and recovery systems from Computer Associates International, Inc.

While most console automation tools are mainframe based, several are also available in personal computer-based versions, such as Automate/PC and CA-Opera/PC. These are designed in particular to perform on-site automated control of largely unattended remote centers.

Right on schedule

A more traditional tool that is seeing new demand from supercenters is job scheduling software, which first appeared in the 1970s. These tools are used in approximately 30% of large mainframe installations, according to Computer Intelligence, with CA's CA-Scheduler holding 78% of the installed base. With the increasing number of jobs that need to be run efficiently in consolidated data centers, these tools are coming into demand.

"We could not function without a scheduler to help us process 5,000 batch jobs a day," says Bill Pollard, senior technical consultant at Baxter Healthcare Corp. in McGaw Park, Ill. The firm completed consolidating its mainframe facilities in 1987.

Job scheduling systems apply logic dynamically in order to determine event- or time-driven schedules to run jobs for optimum throughput and the most efficient use of data center resources.

Schedulers, Pollard notes, have become increasingly sophisticated over the years. For instance, they can support a greater number of jobs and work well with report distribution systems.

Job scheduling systems vary according to the daily number of jobs they support.

The CA-7 scheduler can cost from $35,000 for an IBM 4380 package supporting 30,000 jobs per day to $105,000 for a 3090 version addressing as many as 80,000 jobs per day.

Gaining balance

Another tool that helps supercenters run jobs efficiently is job balancing software. This software scrutinizes computer runs to determine whether the right application is reading the correct information for a particular job.

Balancing systems also perform functions that are otherwise done manually by the production control department. These include verifying control values and totals and performing balancing calculations and comparisons, which are needed in accounting applications.

According to Eckhaus, these systems are just now coming into vogue. Their newfound popularity, he says, can be attributed to the increased emphasis on automation in general and the larger operations needs found in the merging of data centers. "While two smaller data centers could handle balancing manually," he says, "job balancing systems relieve the production control department of that responsibility."

While other vendors are entering the fray, the two major companies offering job balancing products are Beta Software Systems, Inc. in Concord, Calif., and Unitech Systems, Inc.

While chances are small that a firm would have balancing software upon consolidation, many installations have some automation software when they consolidate. The first problem these companies face is which automation tools to keep, which to discard and which to augment.

Existing systems are a mixed blessing to most organizations, especially when the consolidation involves two data centers with firmly established information systems capabilities.

At Fleet/Norstar, Drum says both the Fleet and the Norstar data centers had already gone through eight years of consolidating the facilities of banks previously acquired. "We had a lot of the things we needed and did not have to go out and acquire a lot of software," he says. For instance, both data centers used the CA-7 job scheduling system.

Elsewhere, Drum recalls, "We had to look at each tool and at its capabilities and maintenance costs."

Merrill Lynch was faced with several different suites of automated tools. It standardized on IBM for console automation because it already used Netview to manage the network and automate consoles. Its other IBM systems include Info/Mgt for problem management, Message Processing Facility, OPC/A for job scheduling and the TPNS testing facility.

Existing software may not always work when two data centers merge. In the consolidation of two data centers at the USS Steel division of USX Corp., the unique coding of proprietary software posed problems when it came time to integrate systems. The company is now in the midst of replacing the homegrown tools with commercial ones.

Some problems associated with consolidation currently cannot be solved by automation tools. Tape mounting and printing functions fall into this troublesome category when central operations groups are given the job of running satellite centers.

While robotic tape backup systems can mount tapes without human intervention, they cannot move the tapes off-site, nor can every satellite center afford to store all data on these systems.

However, hardware approaches are emerging that can at least partially clear

Continued on page 64

Distinctive traits

Efficient data centers support greater work loads with fewer people and tend to spend more on technology

Characteristics of		
Approximate MIPS	160	75
Response time for end users during peak hours:	3.5 seconds	4 seconds
Number of users concurrently using on-line systems during peak hours:	2,500	1,500
Number of people on staff:	109*	94*
Percentage dedicated to clerical and administrative management and planning:	22%	20%
Percentage dedicated to direct operations:	30%	40%
Percentage dedicated to operations support:	29%	25%
Percentage dedicated to technical services:	19%	15%
Percentage of people dedicated to manual-intensive tasks:	30%	40%
Salary:	$45,000	$40,000

*Nolan Norton notes that in the efficient data center, it took about half the personnel to support the same amount of work as in the average data center. A personnel profile showed that the efficient data center emphasized reducing manual-intensive activities.

Source: Nolan Norton Institute — CW Chart: Paul Mock

Easy road, hard road

Data center and operations managers say tape mounting is one of the most difficult processes to automate, while another storage management task, tape management, is one of the easiest

Source: Ernst & Young — CW Chart: Paul Mock

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ASK THE VENDOR

We use VSAM I/O Plus for automated VSAM performance tuning. We would like the system to be able to address buffers above the 16M-byte line. Do you have any such enhancements planned?

Larry Tyrell
Senior Technical Analyst
Jefferson-Pilot Life Insurance Co.
Greensboro, N.C.

SOFTWORKS, INC.: Version 4 of VSAM I/O Plus allows the user to set up a 31-bit buffering as the default, thus taking advantage of available space above the 16M-byte line. Without user intervention, VSAM I/O Plus can determine whether the calling program is running in 24-bit mode and will present the record to the program below the buffer line, if required. VSAM I/O Plus will also automatically adjust data and index buffers and increase region size as required for buffers.

Most automated tape management systems require operating system modifications. If we use Epic/VSE for tape and disk management, will we be required to modify our operating system, which is Supervisor?

Rob Cron
Manager of Technical Support
Restaurant Enterprise Group, Inc.
Irvine, Calif.

GOAL SYSTEMS INTERNATIONAL, INC.: Activation of Epic/VSE requires specific modules to be loaded into the Shared Virtual Area. All of these modules will have an entry in the System Directory List, which the operating system uses for the fast loading of frequently used programs. When the Epic/VSE system is activated, the System Directory List entries for certain modules are swapped so that Epic/VSE modules will be given control prior to the corresponding operating system module. Epic/VSE is therefore able to gain control of a request, process it and then pass it to the operating system for processing.

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Access SQL Opens New Windows Of Opportunity For You.

Continued from page 60

staffers from data center floors.

Some firms are looking into electronic vaulting to perform backup duties. Through telecommunications lines, data stored at one site can be transmitted electronically to another.

One problem with this method is its high cost. A typical configuration can range from $500 to $750,000.

Manufacturers Hanover is considering installing an electronic vaulting system as part of its next consolidation phase in early 1991 when it will move one of its New York centers to Delaware.

"WHEN WE [consolidated into] two data centers, we brought together multiple systems, which required operators at multiple consoles. Now, there is a single console for an entire data center."

HOWARD P. SORGEN
MERRILL LYNCH

Taylor says the cost will be more than made up for by reductions in the cost of human operations and human errors.

In general, the larger data center formed by consolidation has an easier time cost-justifying the purchase of automation tools. "Expense is much more justifiable in a large shop," Eckhaus says. "Most automation tools are really geared toward the larger data center."

In the face of outsourcing and budget cuts, all data centers need to focus on maximizing cost-effectiveness. When consolidation is the first step, automation is often an effective follow-through. •

INTERVIEW

Are you ready for your tools to talk?

Peat Marwick's Mark Levin says tool integration is the way to get full functionality from your automation purchases and can also become your ticket to lights-out operations

Buying an automation tool is just the first step. The next is to integrate, says Mark Levin, head of KPMG Peat Marwick Main & Co.'s Data Center Transformation practice in Lexington, Mass.

You can reduce manual intervention by automating individual functions but to get full use of these tools and especially to achieve unattended operations, Levin says, you need interfaces.

In a recent conversation with New Jersey-based free-lance writer Barbara Francett, Levin spoke about the benefits of integrating your automation tools but emphasized that not everyone is ready for it.

Q: What exactly do you mean by "full integration?"
A: You can reduce staff by automating individual functions with robotic tape mounting, electronic output distribution, console automation and other control software, but there is still a time inefficiency. You still need manual intervention to communicate among the various functions.

To restart a job, for example, you'd need to set up the JCL [job control language] files, document the problems, and call a maintenance programmer. That could take more than 20 minutes.

If you had interfaces built in, the communications would be performed electronically. You would need only one person to monitor the console for anomalies, and you would reduce wait time.

Q: It sounds like full integration is synonomous with lights-out operations.
A: Without full integration, you won't get to lights-out operations.

Q: So integration is not for everyone?
A: Most data centers are just at the point of automating individual functions and are about two years away from getting products to communicate with one another.

There's a good reason for this: If I install an output distribution product, I could reduce the printing pool from 10 staff members to seven. If I put major reports on-line for viewing, I could reduce that by another three or four people. By installing an interface between output distribution and console management, I'll eliminate maybe half a person.

Most data center managers will go for the larger payback first.

Q: With that kind of staff reduction, integration may not be worth the trouble to some data centers.
A: You may not be seeing the same payback in terms of staff reduction, but you're making operations more efficient. If a data center manager can deliver reports 100% on time rather than 95% on time, he's going to do it.

Q: So who is ready to start integrating?
A: Highly automated data center environments are ready to maximize their investment in the software and hardware, which is the real reason to integrate tools. They're ready to start thinking lights-out, whether it's just on holidays, weekends or the third shift.

Q: How many companies that you know of have reached full integration?
A: I haven't seen anybody do it yet.

Q: What areas of data center operations are companies most interested in interfacing?
A: The most frequent request is for an interface between problem/change management and software configuration management to maintain overall control over changes made to software configurations.

The second most requested interface is between automated scheduling/restart and automated output distribution. The restart package would delete reports that have been previously archived by the job being restarted.

The third most popular is between console management and problem/change management, to report all production failures and automatically open the problem record.

The fourth is between automated output distribution and data center reporting, for chargeback purposes and to track project results.

Q: What do you consider the absolute minimum level of integration necessary?
A: I'd strongly recommend integrating the automated scheduling and restart/rerun functions. The amount of work required to restart a job in an MVS environment is excessive. Most vendors provide an interface between these functions.

Q: Where is the state of vendor-to-vendor integration?
A: I haven't seen too much of it. Legent has a standard interface between its Endevor software configuration management product and Infoman, IBM's problem/change management product. Candle's Omegamon performance monitor can interface with MVS/OPS and Legent's Automate — both of which are console managers.

Basically, all automation software has the potential for interfaces to other vendors' products through "user exits." These exits are tailorable based on user needs. It's a matter of exploiting them.

Q: And how difficult is it to exploit them?
A: Some interfaces are easier to establish than others. Some vendors are providing the routines to build interfaces, such as a standard code for the interface from console management to problem/change management.

Q: How sophisticated are the vendor-to-vendor interfaces offered?
A: It varies. Sophistication is determined by how much functionality is manual and how much is automated.

Between a restart/rerun package and an output distribution product, for instance, a basic interface will identify redundant jobs and tell the output distribution package to delete those reports. A sophisticated interface would go out and handle the purging.

Q: Some vendors are offering fully integrated packages that offer integration within a line of automated data center products. To what degree do they offer full automation?
A: Computer Associates is tops in MVS-based products. Goal Systems has been working on interfaces among its products. Its scheduler, Jobtrac, interfaces to the restart/rerun product Runtrac. They are working on interfaces between Runtrac and the SAR/Express Delivery output distribution package and between Jobtrac and the MVS/OPS console manager.

Legent's Endevor software configuration product — another strong product — interfaces to its MICS data center reporting package. There's also a standard interface between MICS and the Bundl output distribution product.

Candle has done a good job of integrating its Omegamon performance monitor with the AF/Operator console manager.

Tone Software's console management, scheduling and output products — Control-M, Control-O and Control-R — are also all highly integrated.

Q: What is the downside to full integration of automated functions?
A: The more you integrate, the more communication you need between functions. For example, if I change a program and it affects the contents of a report, then my balancing might not balance and the report could be distributed to the wrong people. Without automated change management, you're dead in the water. •

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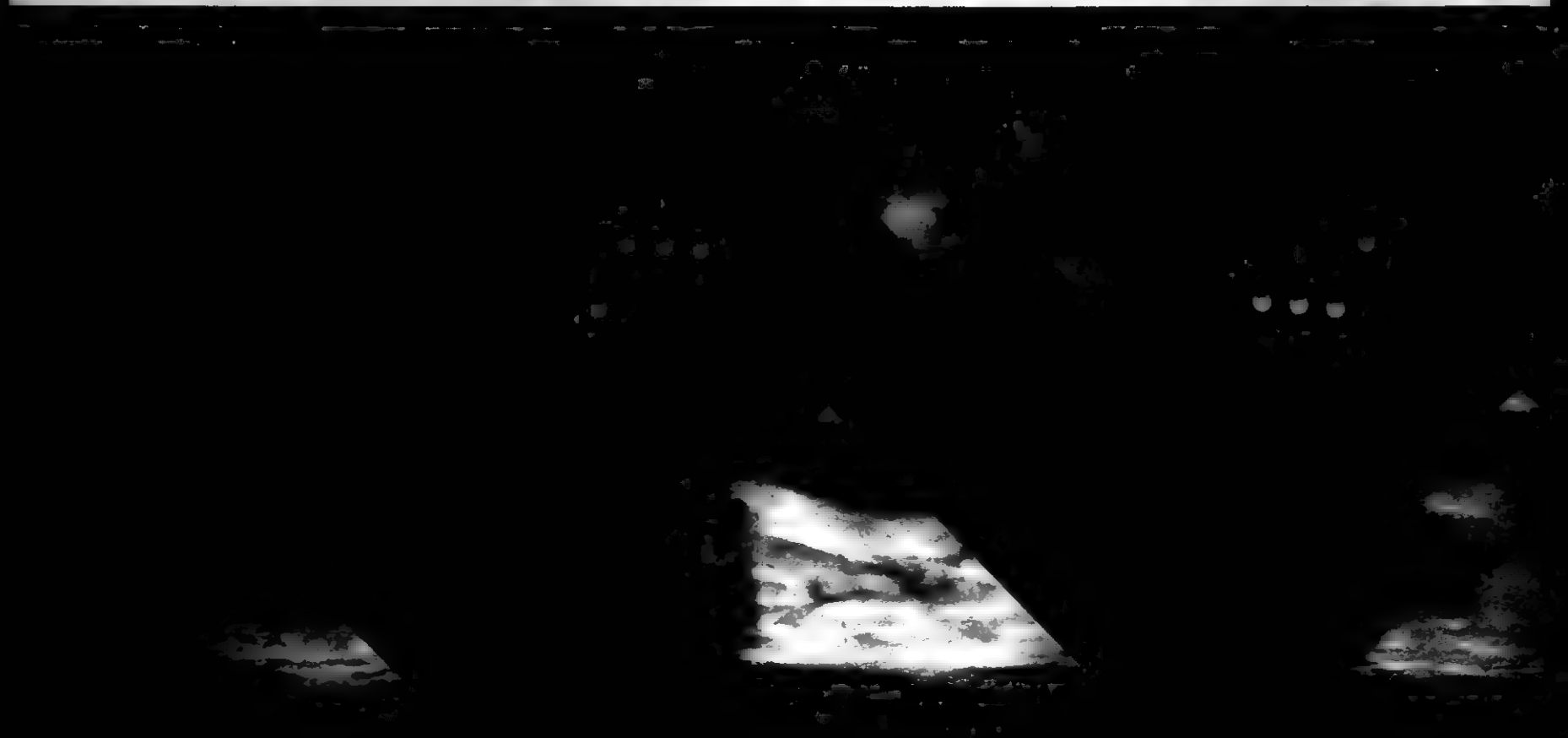

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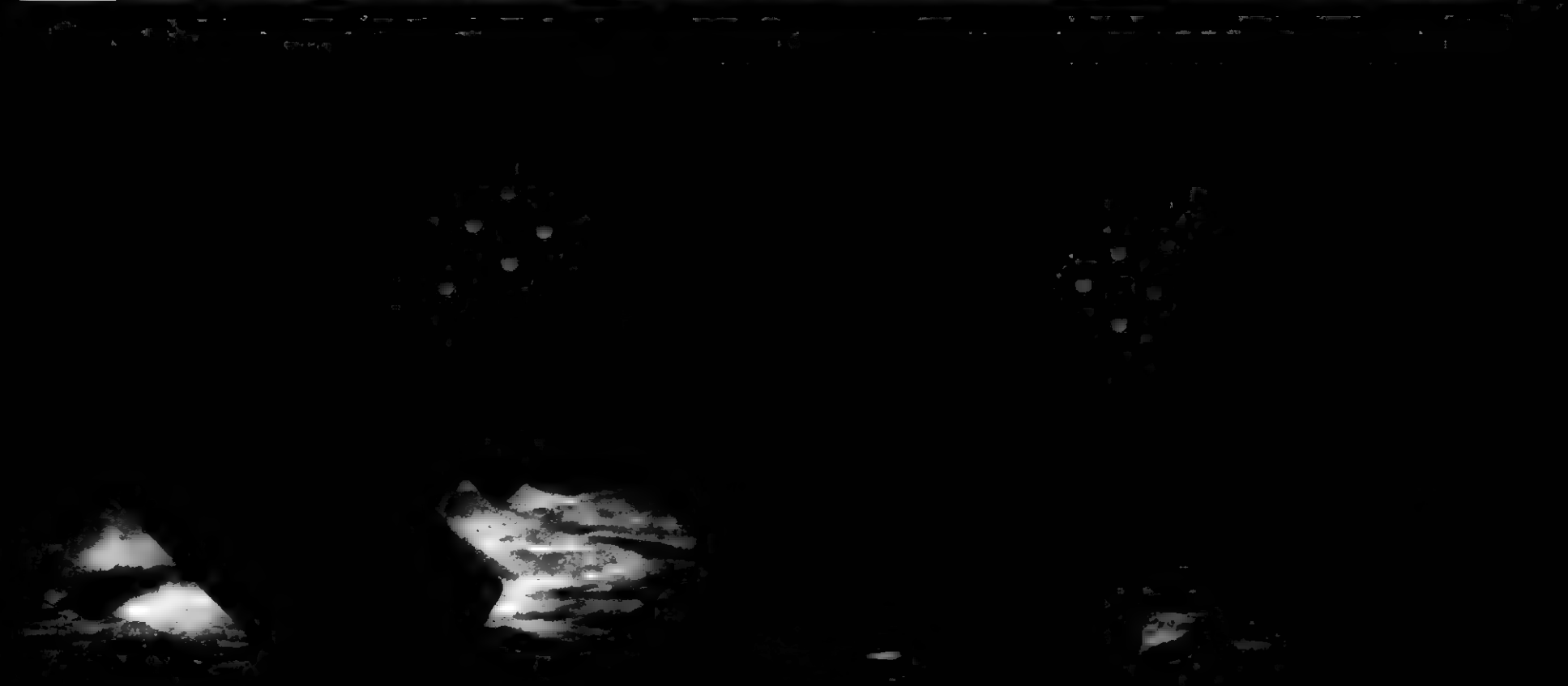

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What's missing from lights-out?

Tools have made strides, but expert systems, novel approaches still lacking

BY GARY ROBINS

When Ron Rubin started as data center manager at Credit Agricole's U.S. operations in Chicago, there were two computers and two people on staff: One day and one night operator kept watch over an IBM System/34 and a Digital Equipment Corp. VAX 11/785.

A year and a half, two VAX 6000s, a few Microvaxes and 90 MIPS later, the data center still

Credit Agricole's Rubin says *lights-out means management by exception*

requires only two operators during the week and runs unattended on weekends.

How much closer to lights-out can you get? In Rubin's estimation: not much.

Rubin has implemented automation tools from DEC, including a console automation system, a systems integrity monitor and VAX performance monitoring software. He says he is about 75% of the way to unattended operations and is moving quickly toward 95%. He is doubtful, however, about the prospect for total lights-out operation.

"I don't think it is possible to get a 100% lights-out environment," he says. "We are still dealing with mechanical equipment, with unpredictable software. You will always have an environment subject to some sort of malfunction that will call for human intervention."

Most data center managers agree that automation tools have made great strides in the past five years, allowing some large shops to run unattended during a night shift or a weekend. Whether they start phasing out operators to any large degree, however, depends on how much further the tools advance and whether lights-out is really where data center managers want to be.

One of the areas in which Rubin would like to see a higher degree of automation is performance management. Current tools generate recommendations for solutions but depend on an operator to implement them. The ideal system, he says, would detect and then correct system problems on the fly.

While many people say console automation is a step toward lights-out operation, these tools need expert systems before they can fill in completely for a human operator, according to Joe Novoshielski, data center manager at SMS, Inc., which provides information processing services to the hospital industry. More than six million messages per week have been eliminated from the master consoles at the Malvern, Pa.-based firm via Legent Corp.'s Automation/MVS and IBM's Message Processing Facility, and many are responded to automatically.

However, expert systems will need to take the place of hard-coding to generate an appropriate response for more complex messages, Novoshielski says.

In some situations, such as tape backup, print distribution and maintenance, operators may never be phased out.

At least one operator is required in most organizations to mount and dismount tapes. For some large shops, robotics eliminates some of this manual procedure with automated tape libraries. At SMS, half of its 10,000 daily tape mounts are automated on six robotic tape silos made by Storage Technology, Inc. The firm hopes to automate 100% of its tape backup by 1991.

Smaller operations such as Credit Agricole would not be able to cost-justify the expense of putting all backup tapes on automated tape silos. Electronic vaulting is out of the question as well because of the expense.

Rubin hopes someday to use 8- or 4mm technology with automated tape cartridge feeders for a minimum amount of human intervention, but until there are improvements in cost, speed and capacity on these technologies, tape backup is a stumbling block.

Distributing reports can also stand in the way of 100% automation. At Manufacturers Hanover Corp. in New York, the printing buck is pushed out to the end user. Frank Noto, an assistant vice-president of automated systems development, hopes to eventually move all staff off the machine-room floor.

"If you define lights-out as just involving the processing of data in the CPU and DASD, it is possible to seal off the machine-room floor," he says. "If I/O functions like tape and print are included in the definition, it is more difficult to eliminate human intervention."

People's Bank in Bridgeport, Conn., has found a way around manual print distribution with IBM's Report Management Distribution System, which delivers reports electronically. The system has reduced printed output by 50%, Vice-President of Corporate Automated Systems Tom Scali says.

Maintenance is another area that still requires human intervention. While environmental monitors can detect hazardous conditions such as excessive temperature, low electrical supply or low water pressure, they cannot yet fix them.

A few environmental firms currently market environmental monitors, but systems intended for data center use are just now appearing on the market. These are usually used in conjunction with an alerting system that calls in technicians or management to fix a problem such as failed air-conditioning.

"The monitor has to be connected to [expert systems] and needs to be able to notify management or emergency services once it senses that the air-conditioning has failed, or there is a fire or leak," Noto says.

At Credit Agricole, Rubin is looking at two products — an environmental monitor and an alerting system from DEC.

Some people argue that because current tools are based on human procedures, they are inefficient for unattended operations.

While current products automate manual functions, says Ed White, manager of software support at R. J. Reynolds Tobacco Co. in Winston-Salem, N.C.,

Manufacturers Hanover's Noto *hopes to eliminate staff from the machine room*

they should concentrate on developing new procedures.

"I don't necessarily want to do the same things we have been doing manually," White says. "I want to find out what the technology opens up for me that I have not been able to do before."

A data center with no human intervention may not always be what managers are looking for, however. "For me, lights-out means management by exception," Rubin says. "Let the tools detect the errors, let the interfaces alert me to the errors, and that is when I want to get involved." ●

Robins is a free-lance writer based in Northfield, Minn.

Help desk systems emphasize prevention

BY DAVID KUCHES

Automation and help desks have not always gone hand in hand. Problem-logging software and call-routing systems have been around since the early 1980s, but only recently have they garnered much interest. About 25% to 30% of large information systems organizations use call-routing systems, and while 50% of large IS groups have invested in problem-logging software, it often falls into disuse.

New capabilities on these systems are starting to turn people's heads. Today's systems can alert the help desk to problems before they affect users, solve common problems without human intervention and train new help desk staff by using expert systems.

Early versions of problem-logging software were mainframe based and allowed help desk staff members to log problems in standardized, record form in a centralized database.

On newer versions, built-in interfaces to work-load and network management software offer automated problem-logging capabilities. When these tools detect problems on the system or network, they automatically log them in the help desk's central repository, alerting the help desk before users experience major problems.

Major vendors of mainframe-based problem management software include IBM, whose Info/Mgt tool holds 50% of the installed base; Computer Associates International, Inc.; Peregrine Systems, Inc. and Infolink Software, Inc. Prices range from $30,000 to more than $100,000.

On midrange systems, Answer Computer, Inc.'s Apriori incorporates an experience-based learning engine that keeps track of common problems. The system can then present these to the help desk staff during the problem determination process.

Apriori runs in the Sun Microsystems, Inc. Unix environment and costs $5,000 per user.

Many firms are considering personal computer-based local-area network versions, which have started to appear in the last year. While at least six vendors offer such tools, Bendata Management Systems, Inc.'s Help Desk Expert Automation Tool (HEAT) and IBM's Problem Management Productivity Services (PMPS) are two that incorporate expert system capabilities to train new help desk members in the problem determination process. The expert system is also used to help veteran staff members work through more complex problems.

The PC LAN-based products that don't use expert systems range in price from $1,500 for a single-user license to $5,000 for a LAN. A HEAT license is approximately $7,500 for one workstation networked version, and PMPS initial license fees are $4,000 to $7,000, with a monthly rental fee of $400 per terminal.

Capture and report

It is an improved reporting mechanism that has people thinking twice about telephone support systems. These systems follow a preset sequence to route calls or distribute them to help desk personnel based on who has had the least amount of call activity in any given period of time.

More recent systems capture such data as the average number of rings before the call is answered, average time per call and number of abandoned calls. This data can be downloaded to a floppy disk for managers to use to assess the quality of support being provided.

Pricing on a system with automated sequencing, such as Aspect Telecommunications' Aspect Call Center, is about $5,000. For a system from Rolm Systems or AT&T that captures data for reports and performs automated distribution, prices can range to $100,000.

An up-and-coming subset of telephone support systems is voice response units. Since the mid-1980s, these systems have routed callers to appropriate help desk personnel by prompting the caller to select numbers on the telephone key pad.

More recent devices answer user questions or solve the problem themselves. If the caller wants to reactivate his terminal, he enters his terminal identification number, and the system reactivates the terminal through telecommunications lines into the control unit.

If the caller is curious about the status of his work record, the system can allow him to access the help desk database. A four-line coaxial-connected Infobot unit is priced at $20,000. On the lower end, Intervoice offers Robotoperator for $100 to $140 per month with a monthly maintenance fee of $200. ●

Kuches is president of Systems Management Engineering, Inc., a firm that specializes in the automation of help desk functions.

Console automation software

VENDOR	PRODUCT	HARDWARE ENVIRONMENT	OPERATING SYSTEMS SUPPORTED	MESSAGE HANDLING FUNCTIONS	ERROR NOTIFICATION ALARMS	AUTOMATIC COMMANDS ISSUED BY SYSTEM	EXPERT SYSTEM OR AI RESPONSES	INBOARD OR OUTBOARD SYSTEM[1]	INDICATORS RECOGNIZED AND ACTED ON	ALLOWS REMOTE IPL[2]	MENU- OR COMMAND-DRIVEN	OTHER AUTOMATION TOOLS INTEGRATED WITH	TRAINING INCLUDED IN PRICE	PRICE RANGE
A.Y.D.E. Software Solutions, Inc. (404) 786-1886	RASP	IBM MVS machines and compatibles	MVS, any release	AP	Dial out to on-call operator, flashing on-screen message	Any operating system commands, such as system or database shutdown, dump equipment	Checks dependencies before issuing systems, if-then logic	Inboard	AP, plus time of day, date, status variables	Yes	Either	IBM Netview, Landmark T-MON, CA-7 and CA-Scheduler	Yes, through Dec. 1990	$15,000 - $60,000
Altai Software (800) 227-7774 (817) 640-8911	Zach, Zach-PC	IBM machines running operating systems listed at right	MVS, VSE, VM, DOS	Delete, highlight, hold reroute, suppress, scroll, color display, revise	Dial out to on-call operator, message sent to system user	Any operating system commands, such as restart job, VTAM commands, limit access	If-Then logic for making conditional decisions, intercepts commands from users	DOS version is outboard; others inboard	Message number, job name, machine ID, wild-card characteristics, frequency of occurrence	Yes	Menu	Altai's Zeke, any program with a callable subroutine	Yes	$7,500 - $21,000
Candle Corp. (213) 307-1400	AF/Operator	IBM 370 and compatibles	MVS, MVS/XA, MVS/ESA	All	Dial out to on-call operator, audio (voice) notification, flashing on-screen message, beeper paging	Restart job, reboot system, limit access, change management, problem logging, problem escalation,	User-defined, including operating system and panel driven library commands, interface to expert system software, if-then logic	Either	All, plus Omegamon and other VTAM applications	Yes	Either	Any VTAM application	Yes	$18,000 - $90,000
Carollon Systems (416) 637-0460	Galcon	HP 3000 and 9000, DEC VAX MPE/V, MPE/XL, HP-UX, Ultrix, VMS	Automatic response, rerouting, suppression, logging	Audio (voice) notification, bell or buzzer, flashing on-screen message	User-defined	Calling any exterior program, restart machines and down lines, other user-defined commands	Logical modeling, programming language for user-defined responses	Inboard	Message number, job name, machine ID, wild-card characteristics, frequency of occurrence	Yes, on HP 3000	Command	Any external program that can send messages to a message file	No	$50,000+
Computer Associates International, Inc. (516) 227-3300	CA-Opera, CA-Opera/PC	Compaq 286E, Compaq laptop, machines running MVS, VM, VSE,	MVS, VM, VSE	Highlight, hold, reroute, suppress, log	Dial-out to on-call operator	Operating system and user-defined commands	System shutdown, IML or IPL, other user-defined commands specific to event or time, rules-based	Opera/PC is outboard; Opera is inboard	All, plus message text, job class and type	Yes	Menu	CA's Scheduler, Dispatch, Netman, CA-7, CA-1, APCDDS, Look, IBM Netview	No	$22,000 - $51,700
Cybermation, Inc. (416) 479-4611	MVS Co-Pilot	Any MVS machines	MVS, MVS/XA, MVS/ESA	Delete, highlight, hold, reroute, suppress, review, log, color display	Flashing on-screen message	Any operating system and ESP job scheduling commands	Expert system shell for user-defined functions	Inboard	Message number, job name, accounting code, wild-card characteristics, frequency of occurrence	No	Either	Cybermation operations software products	Yes	$18,000 - $25,000
Digital Equipment Corp. (508) 467-4112	Vanchester Console System (VCS)	Any machine supporting RS232 line and ASCII text	Independent of operating system	Highlight, scroll, review, log, color display, consolidate messages from multiple consoles	Audio (voice) notification, flashing on-screen message, color change on icon map of computing resources, electronic mail, other user-defined notifications	Any that would otherwise be issued manually, including operating system commands	Any user-defined commands via programming scripts	Outboard	Matching of arbitrary error message strings	Yes	Either	DEC's DECshut, DCM - Data Center Monitor, REMS - Remote Environmental Monitoring System, exec WorkStation, DEC-scheduler	No	$4,300 for 4-node license
EDP Systems, Inc. (904) 575-0179	A S Exec	Unisys A series machines	MCP versions 3.7 to 3.9	Delete, highlight, hold, reroute, suppress, review, log	Bell or buzzer, flashing on-screen message, put job in waiting queue	Job restart, file removal, network and operating system commands	User-defined valid A Series responses via macro language	Inboard	Job name, accounting codes, wild-card characteristics, frequency of occurrence, token matches	No	Menu	EDP's A S Exec/Job, Print, and File, Unisys Work Flow Language	Yes	$5,000 - $15,000
	LION/Job Flow	Unisys V series machines	All Unisys V series operating systems	Automatic response, suppression, reviewing, logging	Recurring prompts on-screen	Any operating systems commands	User-defined via if-then logic	Inboard	Message number, job name, accounting codes, machine ID	No	Both	EST's Buyn, Computer Systems International's Help	Yes	$17,000 - $32,000; includes console automation, job scheduling and tape management modules
Empact Software (404) 493-0883	WYO-Manager	Any MVS machines	MVS/SP, MVS/XA, MVS/ESA	Delete, highlight, hold, reroute, suppress, color display, counters, SMF records	Flashing on-screen message, TSO notify message	Any operator commands via internal programming language	User-defined via if-then logic	Inboard	All, plus time of day	No	Command	Responds to any message that appears on MVS console from any software package	No	$4,500 - $12,500
Goal Systems International, Inc. (800) 338-9000	OPS/MVS	IBM mainframes and compatibles	MVS/XA version 2.2 and higher	All, plus re-wording	All, plus beeper paging	Any operating system command, including restart job, limit access, all TSO, MVS, JES, CICS and IMS commands	User-defined via expert systems interface module	Either	All	Yes	Menu	Any products with VTAM interfaces, IBM Netview	No	$9,500 - $54,500
	FAQS/ASO for VM	IBM 3270, 3390 and compatibles	VM/SP, VM/XA	All	Bell or buzzer, flashing on-screen message	Any operator commands based on user-defined criteria	Message-triggered execs and user-defined via if-then logic	Inboard	Message number, text or origin, wild-card characteristics	No	Command	Goal Systems' Alert/VM, IBM RACF	No	$7,500 - $14,000

[1]Inboard means that the product runs under the operating system of the mainframe. Outboard means that the product runs independently of the mainframe.
[2]IPL — Initial Program Loading.
[3]When "All" is given as a response in the Message Handling Functions column, the following features are included: deleting, highlighting, holding, rerouting, suppression, scrolling, reviewing, logging and color displaying.
[4]When "All" is given as a response in the Indicators Recognized and Acted On column, the following features are included: message number, job name, accounting codes, machine ID, wild-card characteristics and frequency of occurrence.
[5]When "All" is given as a response in the Error Notification Alarms column, the following features are included: dial-out to on-call operator, audio (voice) notification, bell or buzzer and flashing on-screen message.

All products can operate as a remote console for a second site, except those from Empact Software, Mobius, Systems Center, Votek Systems and FAQS/AS for VM from Goal Systems.

The following vendors offer a PC interface for automatic IPL: A.Y.D.E. Software Solutions, Altai Software, Candle, DEC, Goal Systems (except on its FAQS/AS for VM), Legent, Operations Control Systems and Votek Systems.

The companies included in this chart responded to a recent survey conducted by *Computerworld*. When a vendor is unable to provide specific information about its product, the abbreviation NP (not provided) is used. When a question does not apply to a vendor's product, the abbreviation NA (not applicable) is used. Further product information is available from the vendors.

VENDOR	PRODUCT	HARDWARE ENVIRONMENT	OPERATING SYSTEMS SUPPORTED	MESSAGE HANDLING FUNCTIONS	ERROR NOTIFICATION ALARMS	AUTOMATIC COMMANDS ISSUED BY SYSTEM	EXPERT SYSTEM OR AI RESPONSES	INBOARD OR OUTBOARD SYSTEM?	INDICATORS RECOGNIZED AND ACTED ON	ALLOWS REMOTE IPL?	MENU- OR COMMAND-DRIVEN	OTHER AUTOMATION TOOLS INTEGRATED WITH	TRAINING INCLUDED IN PRICE	PRICE RANGE
Goal Systems International, Inc. (800) 833-GOAL	FAQS/ASO for VSE	IBM 3270 and compatibles	VSE/SP, version 2.1 and higher	Alt, plus message text changes, masking, time stamping	Flashing on-screen message	Any DOS attention routine, DOS Power or VTAM commands, REXX Execs	Operating system commands via System Function package for VSE, restart VTAM from other CICS shutdown, REXX Execs for VSE	Inboard	Message number, job name, machine ID, wild-card characteristics, frequency of occurence, time ranges, partition ID, phase number	No	Either	Goal Systems' FAQS, FAQS/PCS, FLEE, FAVER, Explore/VSE, Alert/VSE, Extend/VSE, VSAMaid and Mastercat	No	$7,500 - $11,000
ISA Solutions (800) 462-8301 (760) 477-3535	ISA/Systemster	DEC VAX	VAX/VMS version 4.7 and higher	Automatic response, rerouting, logging	Flashing on-screen message, mails user	DCL-like programming script language	Signals alarm, mails user, other user-defined responses via if-then logic	Inboard	Job name, user-defined variables such as disk space allocation, I/O operating rates, system parameters	No	Command	ISA's OperMaster, NetMaster and TaskMaster	No	$1,295 - $12,000
Legent Corp. (613) 560-3460	Auto-Mate/zAdvisor	Any machines that support IBM 3270 consoles, IBM PC AT, PS/2 and compatibles	MVS, any release; VM/SP 4.0 and higher, VM, SP HPO 4.0 and higher, VM/XA 2.0 and higher	Alt, plus rerouting message text	Alt, plus color-coding messages, passing messages to large-screen display monitors	Restart job, reboot system, limit access	Commands issued through expert system rules-based language, supports IBM Expert System Environment	Auto Mate/MVS and VM are inboard; Auto Mate/XC is outboard	Alt, plus programmer name, job number, other variables created with applications programming interface	Yes	Auto Mate/MVS and VM use menus or commands; Auto Mate/XC uses menus	Any VTAM applications	Yes	$2,000 - $8,000 for Auto Mate/XC; $6,000 - $18,000 for Auto Mate/VM; $10,000 - $30,000 for Auto Mate/MVS
Maxima Corp. (800) 848-8830	Console/Master	IBM 370, 4381, 3080, 3090	MVS/SP, MVS/XA, MVS/ESA	Delete, highlight, hold, reroute, suppress, reformat	On-screen user message	Operating system commands, some VTAM commands	Reactivates VTAM nodes, brings system up or down, brings CICS, IMS up or down, communicates with scheduling system	Inboard	Message number, job name, machine ID, wild-card characteristics	No	Menu	Any scheduling or network systems that support console notification	Yes	$5,500 - $95,000
Mobius Management Systems, Inc. (914) 323-7980	Info-to-Operate	IBM MVS machines and compatibles	MVS/SP, MVS/XA, MVS/ESA	Review, log, color display, measure operator response time to WTOR, UREC, tape mount messages	Flashing on-screen message, highlights responses to messages that exceed user-defined thresholds	None, monitors console messages, does not respond	Internal sampling logic	Inboard	Job name, frequency of occurrence	No	Menu	Any MVS-compatible products	No	$10,000 - $30,000
Morse Software Development, Inc. (206) 455-1838	Q7 Monitor	DEC VAX	VMS	Delete, hold, suppress, scroll, review, color display	Flashing on-screen message, VMS mail	None, monitors console messages, does not respond	None	Inboard	Message number, job name, wild-card characteristics	NA	Menu	VMS operator	No	$1,497 - $10,500
Operations Control Systems (413) 568-4128	Watch-It	Runs on IBM PC and compatibles; interfaces with machines running operating systems listed at right	MVS, VM, VMS, MPE, Unix	Alt, plus command scripts, message analysis	All	Any operating system commands via user-defined scripts	User-defined through logical modeling	Outboard	All	Yes	Menu and icon-based interface	Operations Control Systems' Libraries, Tape, Space Control, Chargeback and Private	No	$10,000+
Pinnit Systems, Inc. (408) 737-1555	The Daily Pinnit	Unisys 1100, 2200	Exec 8	Log	Error log, flashing on-screen message	Start job, job status	Retries job, delays response, manages unscheduled jobs, schedule calendar for 2 years in advance	Inboard	Job name, frequency of occurence	No	Either	Formula Consultants' Star-100 Tape Management System, Votsit's T16-100	Yes	$28,000 - $31,000
Sourcesub Systems, Inc. (800) 537-5270 (310) 000-0000	DOCS/VSE Console Automation Software	Any VSE mainframe, IBM 3270 and compatible terminals	DOS/VSE, VSE/SP, MVT/VSE, VM/SP, VM/HPO, VM/XA	Highlight, suppress, scroll, review, log, color, performance and status displays	Bell or buzzer, flashing on-screen message	Restart job	None	Inboard	Message number	Yes	Command	Allen's Zobo and Zack	Yes	$8,000
Software Engineering of America (516) 328-7000	MEGO	IBM mainframes and compatibles	MVS, MVS/XA, MVS/ESA	Automatic response, deleting, rerouting, logging, color displaying	Dial out to on-call operator, flashing on-screen message, beeper paging, escalation procedures	Any operating system commands	User-defined via if-then logic	Outboard	Message number, job name, machine ID, wild-card characteristics, user-defined variables	Yes	Menu	Any products sending messages through an MVS machine	No	$14,700 - $24,500
	OEDS/MVS	IBM mainframes and compatibles	MVS, MVS/XA, MVS/ESA	Alt, plus time-intensification of message	Bell or buzzer, flashing on-screen message, color-coded alarms, notification of TSO users	Reboot and reload system, modify, restrict access, operating system commands, Trigger relays, TSO CLists and REXX execs, rules-based decision making	TSO CLists, REXX, status variables, user-defined responses	Inboard	Alt, plus descriptor and routing codes based on time, date or event, address space initiation	No	Both	Any products sending messages through an MVS machine	No	$14,700 - $24,500
Sterrett Software Systems, Inc. (513) 943-9000	Auto-Answer	Any VSE- or VM-compatible machines	VSE, VM	Alt	Bell or buzzer	Any operating system commands	User-defined via if-then logic	Inboard	Message number, wild-card characteristics	No	Menu	Any compatible with VSE or VM operating systems	No	$4,500
System Center, Inc. (703) 264-8000	SysMaster, module of NetMaster	IBM 370 and compatibles	MVS, VM	Alt	Flashing on-screen message messages to multiple consoles	Operating system, subsystem (IMS, CICS), VTAM, REXX and user-defined commands	Expert system 1 foundation module	Inboard	Alt	No	Either	Any VTAM application tool that can send messages to console	No	$10,000 - $20,000
Systematics, Inc. (617) 860-0300	Sentry	DEC VAX, any ANSI terminal	VMS	Alt	Alt, plus e-mail and electronic pager	Restart job, kill job, reboot system, other user-defined commands	Notification by exception, user-defined responses using conditional logic	Either	Message number, job name, machine ID, wild-card characteristics, frequency of occurrence, device or type, user status, time of day	Yes	Either	Systematics' Network Security and System Performance Monitors	No	$860 - $200,000
Vanek Systems Ltd. (416) 868-7977	The Intelligent Console (TIC)	Runs on Compaq 286- or 386-based machines; interfaces with machines running operating systems listed at right	MVS, VM, Guardian, MCP, 1100 O/S, Prisma, GCOS, MPE, HP-UX, VMS, AOS, VS	Alt	Alt	Any operating system commands	User-defined via parsing, if-then logic and knowledge base	Outboard	Alt, plus any user-defined syntax	Yes	Menu	Any tool that runs on 3270 machines	Yes	$70,000 - $100,000

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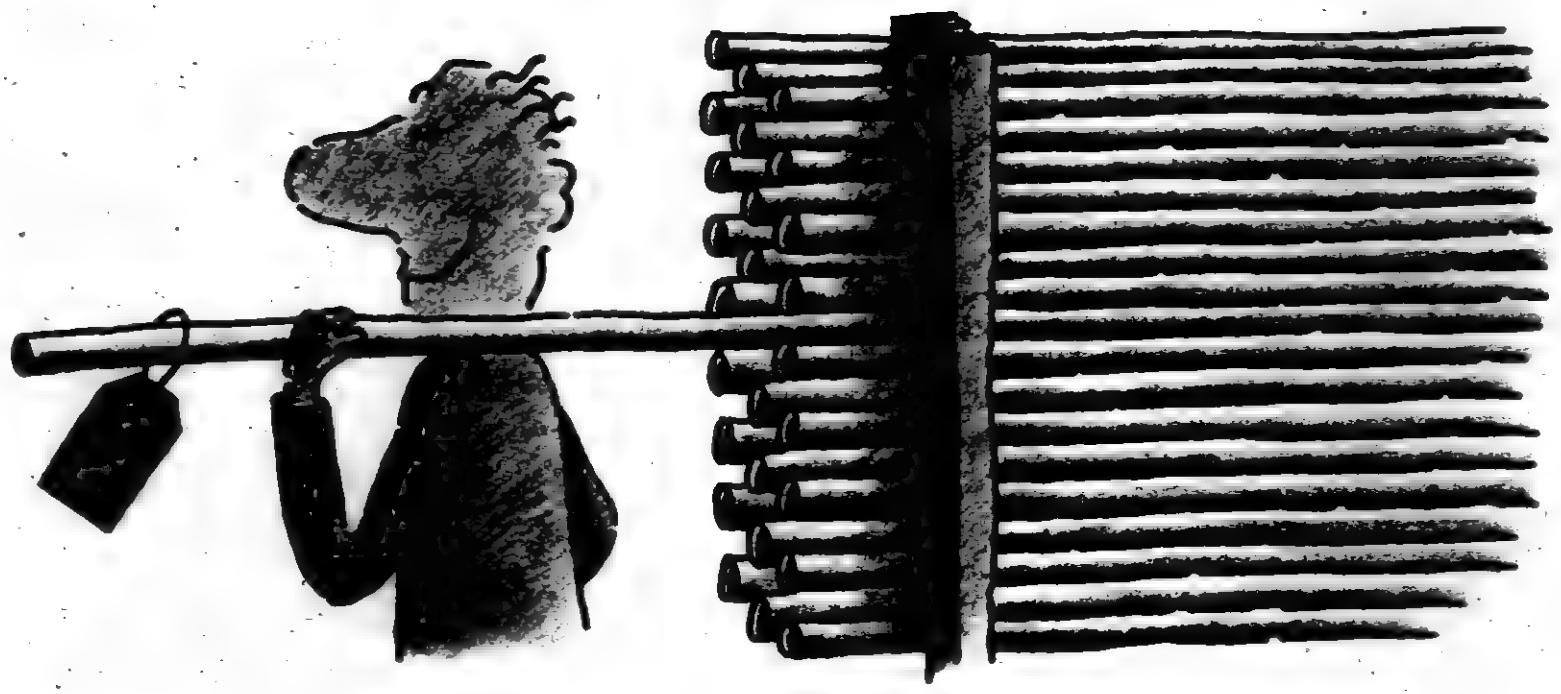

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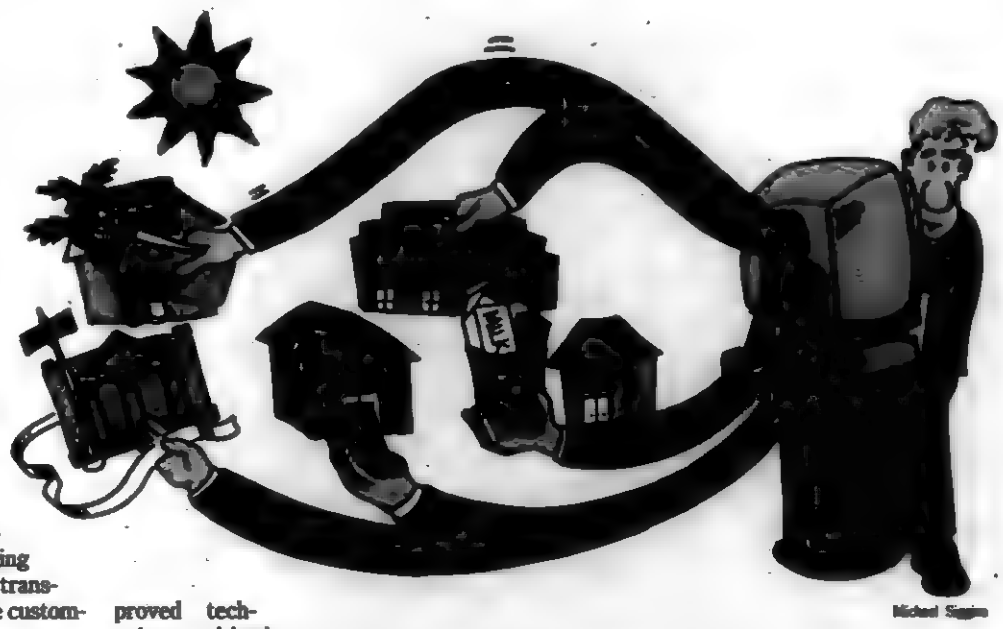
Let the customer do it

From grocery robots to photo kiosks, computerized self-service is in

BY JERRY KANTER, STEPHEN SCHIFFMAN AND J. FAYE HORN



Michael Siggins

Remember the scene in *The Adventures of Tom Sawyer* in which Tom gets his friends to do his whitewashing chore by convincing them that it's a privilege? Today, companies are exercising that same approach by using technology to get customers to do their work for them.

Maturing technologies, such as personal computers, networking and electronic data interchange, hold the promise of improving customer service while managing the growing labor cost of customer transactions. The new approach? Let the customer do it.

Examples of do-it-yourself point-of-sale (POS) technology are becoming more common each day: In addition to using the ubiquitous automated teller machine (ATM), travelers can now do self-ticketing of airline flights and use self-actuated kiosks to buy insurance policies and mortgage options. You can also design your own deck or price a new car, all by keying in your requirements.

In certain areas, fully automatic gas stations enable you to pump your own gas and pay by credit card — without a human attendant. Citicorp has developed a telephone with a built-in screen to facilitate banking at home. Home buying services such as Compuserve, Inc.'s Compuserve, which has been in business for years, are being joined by new competitors.

Yet the idea of letting the customer do transaction processing is not new. Users have been dialing telephone calls without operator assistance since the 1920s.

Today, two major factors are driving the rapid growth of self-service systems: improved technology and business pressures. Until recently, transaction processing was handled exclusively by large mainframe systems. The advent of minicomputers and PCs, along with better, more reliable networks, has changed all that. Tied to bar-code scanning and other POS devices, these electronic links have been extended from the retail store directly to customers.

The bottom line is that today's technology allows the capture of transactions at the point of sale, integrating them electronically with a company's billing and order-replenishment systems.

And organizations everywhere are under great pressure to make technology investments pay off.

Not just an option

Letting the customer do it may be more than just an option. Research company American Demographics points out that a fast-growing elderly population, declining numbers of young adults and a record low population growth rate will put the nation in a demographic vise in the 1990s. Nationally, the 20 to 29 age group is projected by the U.S. Census Bureau to drop 12.5% during the next decade. With the continued growth of a service-oriented economy, there may not be enough people to satisfy the demand for retail clerks and service attendants.

These demographic shifts are forcing retailers, financial service providers and other firms that deal directly with consumers to take a hard look at customer self-service systems. The approach could become a key determinant of survival for some industries.

Beyond survival, many businesses implement self-service systems for other reasons. Cost leadership, product differentiation, bigger market share or strategic advantage are among the possibilities.

For example, an ATM can help a bank reduce its labor expenses and thus provide a cost leadership position in the industry. As a technology, ATMs can help distinguish a bank's services from its competitors. Sears, Roebuck and Co., for instance, may support Prodigy Services Co.'s Prodigy to exploit a market niche not currently addressed through catalog or showroom sales channels.

Self-service systems can also help customers with various stages of the buying cycle. Weyerhauser Co.'s design-a-deck system, for example, helps the customer establish requirements. Prodigy allows the customer to select, order, pay for and acquire a product. ATMs let customers acquire cash and monitor their accounts. Avis, Inc.'s ATM-like machines allow customers to

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- **Technology eliminates middlemen**
- **Bigger profits, smaller work force**
- **Latter-day Tom Sawyers**

expedite car-rental returns. The biggest payoffs come from applications that support many buying steps.

However, it is clear today that competitive advantage gained through information technology is not necessarily sustainable. Even small banks eventually responded to the ATM challenge and joined regional and national bankcard networks. This in turn forced leading banks to evolve their ATM services in order to stay ahead of the competition. Baybanks, Inc., for instance, has introduced a service that allows the customer to keep an eye on which of their checks have cleared most recently.

Looking at three technologies — ATMs, automatic checkout machines and the Prodigy home buying service — provides a good insight into the current state of the do-it-yourself movement.

ATMs: More for the money

In the 20 years since their introduction, money machines, or ATMs, have become an accepted method of convenient access to cash. Financial institutions originally intended ATMs to provide customers with convenient banking services at lower costs than tellers' salaries. By 1988, approximately 65,000 ATMs were in use in the U.S., handling nearly half a *trillion* transactions. Nearly half of all cash withdrawals are made from ATMs. In fact, ATMs are so common today that for most of the U.S., automated banking is no longer a differentiator between financial institutions. ATMs have become a commodity service as common as telephone booths.

CUSTOMERS WILL have their own "individual bank" custom-designed to meet their personal banking, investment and transactional needs.

As a result, banks are looking at two major strategies to increase ATM profitability. One is to join nationwide network systems, such as Cirrus, that permit users to access cash outside of the bank's regional area. The other is to increase the range of services and their attractiveness to ATM users and generate revenue from new fees.

The new challenge for bankers is twofold: Offer profitable services and convince customers that automation is the most effective way to conduct their financial affairs. Some innovative options are within one or two years of implementation. These will require rethinking the role of automation in financial institutions, and in some cases, the nature of the banking business itself. Institutions will probably rely heavily on frequent use bonuses and other use incentives.

Dale L. Reistad, president of the Electronic Funds Transfer Association, predicts that ATM cards will evolve eventually into "supersmart cards" with key pads, readouts and a small battery. These cards will be used not only for personal banking but also for stock transactions, worldwide special-interest electronic mail systems and accessing a variety of databases.

Reistad suggests that the end result in the U.S. will be that customers will have their own "individual bank" custom-designed to meet their personal banking, investment and transactional needs.

Checkrobots: New wave market

A different twist on customer self-service systems has less to do with dollars than with doughnuts. The Automated Checkout Machine (ACM) System, a product of Florida-based Checkrobot, Inc., enables shoppers to check out their own merchandise before paying a centrally located cashier. It incorporates a security system to ensure that each item departing the store has been scanned and paid for. Laser scanning, local-area networks and database management systems are combined to produce a user interface with the store's central computer.

Checkrobot claims that ACM System offers the perception of improved customer service because the automated checkout machine is easy to use, decreases shopping time and increases customers' control over their shopping environment. It also says the system provides a high return on investment, primarily because of decreased labor costs. While the current target market is supermarkets, the company plans to expand to retail organizations in general.

ACM System consists of automated checkout machine stations, a central computer linked to the stations and a POS computer. The automated stations are made up of five parts: a laser scanner, which reads bar-code labels; a color video touch screen, which displays a complete description of the items being purchased, along with their prices and a running subtotal; a produce key pad and produce video screen for handling produce and other variable-weight bulk items; a proprietary and patented merchandise security system; and a conveyer belt that moves through the merchandise security system to the bagging area.

Checkrobot developed ACM System as a response to the evolving retail market and shrinking labor pool. The company claims that automated checkout machines can not only cut down on staffing

needs but also lower costs and increase profitability. Checkrobot estimates that one cashier is needed for every three to four automated checkouts, plus one optional bagger (usually working for a lower wage than checkout operators) for every one to two checkouts.

Beyond cost savings, the system also offers the promise of a competitive advantage. Increasingly, customer service in supermarkets is becoming a big differentiator in a competitive industry. By far the most important factor is efficient, speedy checkout.

Customers seem to think that automated checkout machines work. Independent research found that more than half of the users surveyed said that the systems were "much faster" than conventional checkouts; two-thirds preferred the automated checkout machine to a conventional checkout, perceived self-scanning as an additional service offered by the store, thought overall service was better than in stores without automated checkout and thought their overall checkout time was shorter than prior to the installation of the machines. In addition, five-sixths of the respondents labeled the automated checkout machines as easy to use.

Why does this high-tech system cause a perceived improvement in a low-tech area such as customer service? In general, it is because customers judge service quality perceptually, not quantitatively. There are four possible reasons for this perception.

First, autoscanning responds to shoppers' No. 1 complaint: waiting in line. Automatic checkout machine-equipped lines are always open, regardless of the number of checkout operators working at the time. (The actual time spent scanning is longer, however.) Customers do not operate the scanning system as fast as trained employees. But the longer real time does not affect their perception of faster checkout.

Second, customers perceive autoscanning as more accurate than staff-operated scanning systems. As they scan, the customer can see the item listed with its price on the video screen and then verify its accuracy.

Third, customer research indicates that automatic checkout machines are readily accepted across demographic

Self-serve success

What makes some self-service systems become part of everyday life quickly, while others never seem more than expensive, awkward monstrosities?

- **A perception of benefit.** Customers are willing to operate a transaction processing system if they perceive a benefit greater than the effort of doing it themselves. Prodigy may not shorten delivery time, but customers may still view it as a sales aid. If transaction processing does not appeal to some buyers' purchase criteria in a meaningful way, it may well fail to gain acceptance.
- **Rapid response and a good interface.** High bandwidth is key here. Transaction speeds — and thus satisfaction — are affected by communications between the customer's input device and the rest of the transactional system.

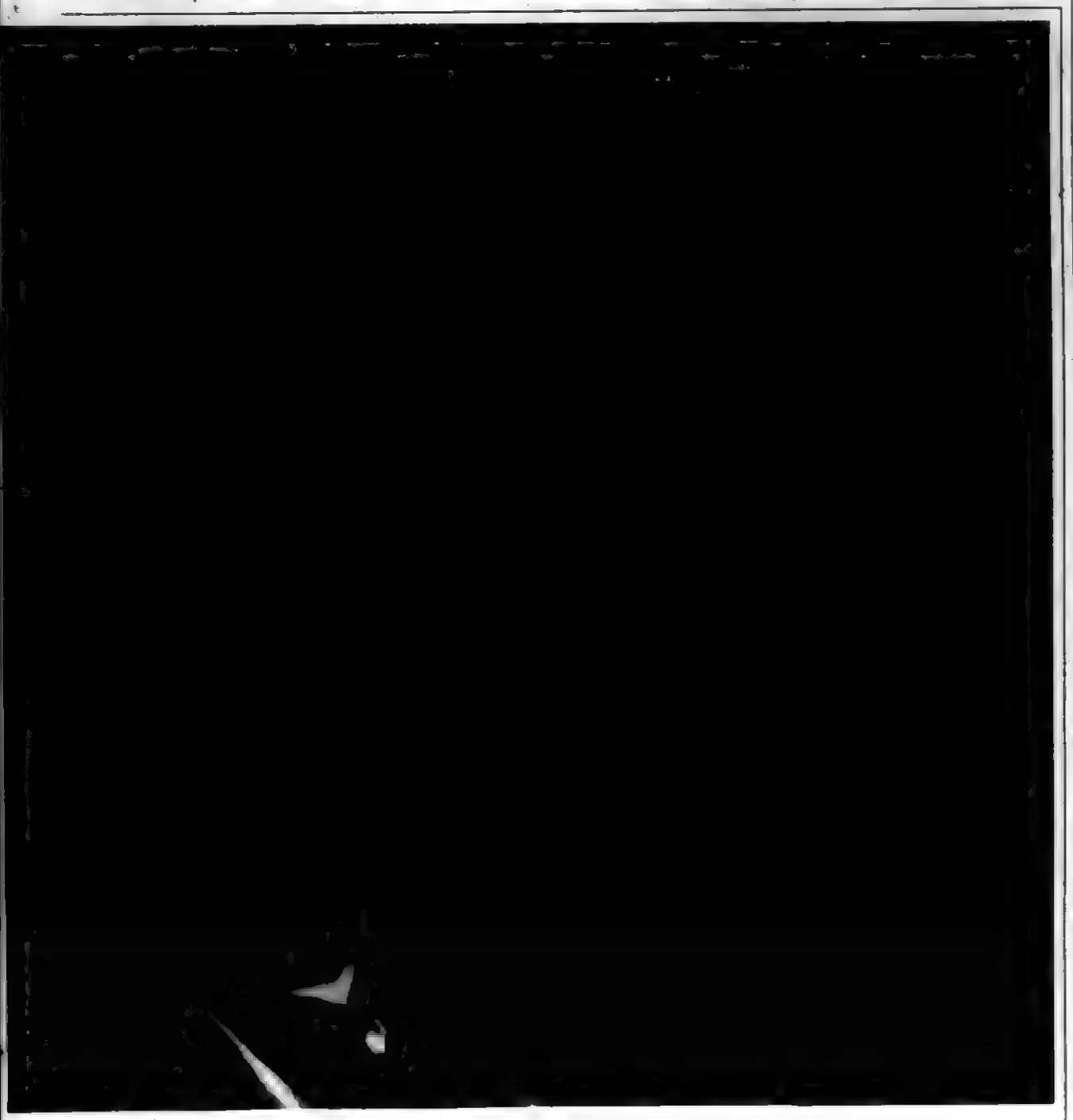
High bandwidth allows for both rapid response time and the use of a user-friendly graphical or video interface, such as the one currently found in Checkrobot's ACM System.

There are limitations, though. Prodigy's user interface certainly yields much higher bandwidth than text-oriented videotex systems, which have fared poorly in the past, yet Prodigy still cannot compete with the high-bandwidth environment of a glitzy, live display of merchandise in a store or even with television advertisements.

- **Ease of use.** Beyond a good interface, ease of use also depends on the complexity of information exchanged between the customer and the transaction processing system. For example, when a customer wants cash, he decides to withdraw an amount — say $50 — and tells the ATM.

Compare this with a novice ordering a fly-fishing rod through Prodigy. A good salesperson would know that certain rods are suitable for saltwater fishing, others for river fishing and still others for lake fishing. If the customer is not prompted for specific requirements, he could well end up with the wrong rod.

- **Native intelligence.** Built-in artificial intelligence or other "smart" capabilities can make self-service systems more useful, because such systems can aid in the interchange of complex information between the customer and the system. For example, the leading producer of elevators, Otis Elevator Co., provides its customers with PCs and the required software to guide them in selecting, ordering and scheduling the construction of elevators.



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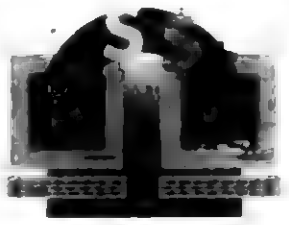
If the financial benefits of ACM System are firmly established, autoscanning may become a familiar everyday part of life — just like ATMs.

Prodigy: A promising infant

Prodigy Services, a joint venture combining IBM's technological expertise and Sears' retailing expertise, offers PC owners an "on-line electronic mall of information and shopping services." Operating from telephone networks connecting 22 minicomputer centers around the country, Prodigy provides shopping, banking, news and database access to an estimated 160,000 subscribers.

Prodigy's launch in October 1988 was greeted with skepticism because of the earlier failures of similar ventures. In particular, home banking services were expected to be widely accepted when they first became available in the mid-1980s. But earlier technology was not user-friendly, and applications were not geared to the mass market. Thus, those systems disappeared.

Prodigy faces stiff competition. Not only do 13 million computer owners subscribe to similar systems such as Compuserve, but telephone companies are also starting information ventures of their own. However, according to Sears Chairman Edward Brennan, Prodigy's edge is that it is broader and less expensive than its competitors.



David Flaherty

To meet mass-market appeal, Prodigy is menu-driven and friendly and costs $9.95 per month for unlimited use. Subscribers can order from Sears, J.C. Penney Co. and 45 other direct-mail retailers. They can also bank with more than a dozen affiliates, including Manufacturers Hanover Corp., and make plane reservations through American Airline's Sabre system. A wide range of news, financial and entertainment sources are also available.

The deliberate mass nature of Prodigy's marketing appeal has another advantage: It provides an attractive advertising medium. Almost 200 companies, including American Express Co. and J.C. Penney, pay Prodigy every time an advertisement is accessed, a lead is generated or a product is sold.

Edward Papes, Prodigy's chief executive, says he doesn't expect Prodigy to break even for another few years. However, IBM and Sears say they consider Prodigy a long-term project. If Prodigy continues to upgrade its electronic package for a growing market, it could change how Americans acquire a wide variety of goods and services.

Letting the customer do transaction processing is not a fad. It is driven by such factors as population demographics and industry competition.

As with the introduction of any new technology, some will fail, and some will succeed. Technological improvements in computing hardware and software and in the telecommunications infrastructure will allow for the introduction of new customer-driven systems. The successful ones will provide a perceived benefit to customers by convincing them, as Tom Sawyer did, that "it's a privilege." •

New ideas for self-service

Several promising technologies are emerging that will allow customers to handle more of the ordering burden:

Multimedia. A host of devices now coming to market will transmit video, voice and even three-dimensional pictures to potential customers. For example, a real estate office can simulate a walk through a house, or an architect can superimpose a home or garden addition to an existing property.

Automatic scanning devices. In a Milan, Italy, bank, for example, a customer can stack his U.S. bills in a device that returns lire and an itemized record of the transaction. The device handles 16 different currencies. And the scanner reportedly does a much better job than the human eye of detecting counterfeit bills.

Voice recognition. Like optical scanning, this is another powerful option. It works on the premise that most people are more comfortable speaking than keying or typing. A few working applications are in the field, and research continues. One system employs a chip in an ATM card that will verify the voice of the cardholder. This can be considered a "voice print" and offers voice withdrawals as opposed to the current method of using a key pad.

Handwriting recognition. Akin to optical scanning are machines that can read printed writing. Their use would allow office workers and customers to record information in the same way they always have — by filling in the blanks and checking off boxes. The potential also exists for processing handwriting in foreign languages with automatic translation.

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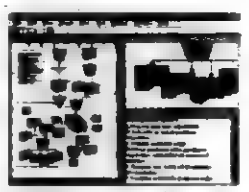

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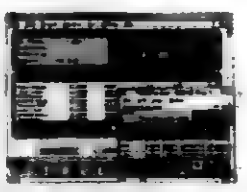

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What's up and coming in self-service

The United States Postal Service has completed installation of its new **Faxmail** network. The self-service system is offered in 263 post office lobbies around the country. Terminals are owned and maintained by Hotelecopy, Inc., a Miami-based company with the world's largest public-access facsimile network.

Aimed at small business and residential customers, the service has been well received, postal officials say. Optional services include confidential store-and-forward and mailbox features, typing of handwritten documents, translation into 14 languages, typing from dictation, faxing to multiple locations with a single call, desktop publishing and fax-to-telex service.

Faxmail terminals accept most major credit cards and send and receive both domestic and international fax messages. Domestic service, including any long-distance phone charges, costs $8.50 for three minutes (five to six pages) and $1.50 for each additional minute.

International messages cost $8.50 plus $2.50 per additional minute, regardless of destination.

•

IBM and Delphi Technology announced an agreement to develop **automated photo machines.** Delphi, an Atlanta-based photo processing company, will design the automated photo machine interactive multimedia merchandising kiosk. IBM will manufacture the units at its facility in Charlotte, N.C.

David Flaherty

The companies say that the machines will provide consumers with a convenient way to process their photographic film. The self-service will feature touch screens so that customers can easily process their orders. Kiosks will be located in high-traffic consumer locations such as supermarkets, large office buildings and mass-market retailers and will be available 24 hours a day, seven days a week. Film will be sent twice daily to Delphi's processing and distribution centers and returned to the kiosk overnight. Payment can be made with cash, check or credit card.

The initial system will use IBM Personal System/2s and IBM multimedia technology. The machines were also designed to dispense product promotional coupons for supermarkets and other merchandisers. Shipments will begin in the fall to selected supermarkets in the Southeastern states.

•

Workers at the **Kraft General Foods** group factory in Banbury, UK, are the first in Britain to collect their weekly wages from a **workplace cash dispenser.** The PC-based service lets some 900 workers collect their money at any time on payday. Employees insert a special plastic card into an on-site ATM at their workplace on payday to withdraw their cash. The system was developed by NCR Ltd. Kraft officials say that wage savings and productivity improvements will save the firm approximately 10,000 pounds per year.

•

Self-service bank machines on three continents were linked recently for the first time. Customers of **Midland Bank, Hong Kong Bank and Marine Midland Bank** now can withdraw cash and make balance inquiries from ATMs in the U.S., UK, Hong Kong and China. A typical transaction takes 10 seconds. Plans are for the network to be extended later this year to Oman, Qatar, the United Arab Emirates, Bahrain, the Philippines, Brunei and Thailand.

•

Philadelphia National Bank has successfully tested a **smart banking system** that can read checks, split deposits and give exact change, including coins. The bank uses a product called MAC Icon Services, developed by Core States Financial Corp. Ten banking organizations have already signed up to participate as charter members. On-line service is set for next year.

•

Pick n' Save grocery stores in suburban Milwaukee have installed a **self-checkout system** developed by Checkrobot, Inc. in Deerfield, Fla.

Several European companies are also experimenting with similar technologies. Nixdorf, Inc. in West Germany is now testing a similar system in Spain.

However, these systems don't always make it big. After a trial period, Kroger Co. in Atlanta dropped the Checkrobot system in two suburban stores. Company officials said the system was too impersonal.

•

Diebold and IBM say that a new joint self-service banking venture will focus on application systems and hardware for ATMs. Also planned are **information stations** that provide customers with financial information on their accounts. Final approval of the deal, announced in July, is expected later this year. The proposed new joint venture will be based in Canton, Ohio. •

JOSEPH MAGLITTA

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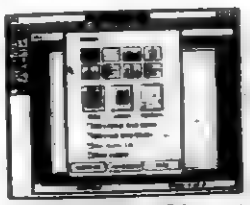

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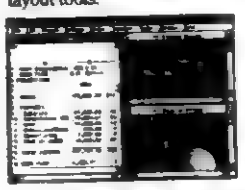

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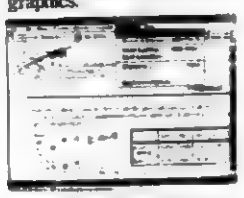

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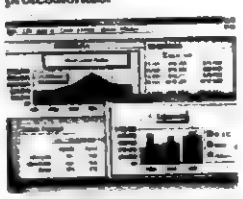

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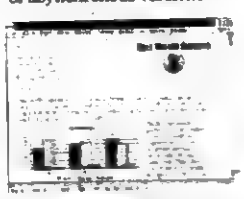

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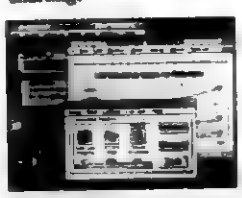

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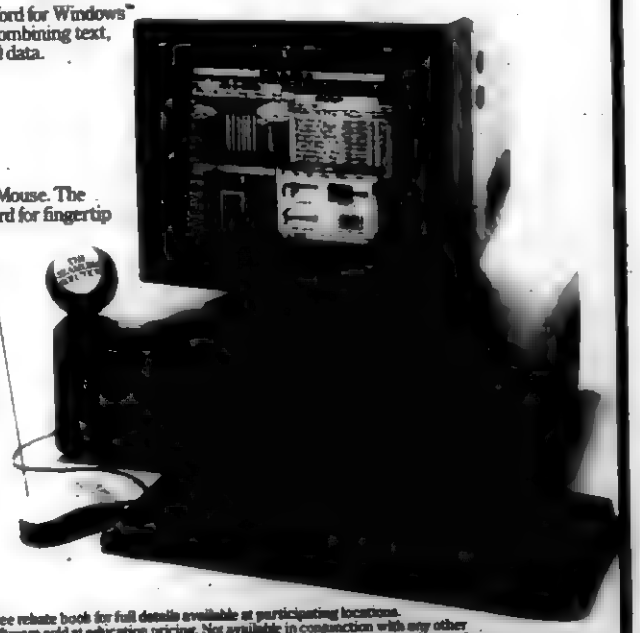

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NATIONAL
BRIEFS

Buy . . .

New York-based **American Express Co.** last week finalized its stock-swap acquisition of Burlington, Mass.-based database maker **Epsilon Data Management, Inc.** Valued at approximately $53 million, the deal gives American Express a proprietary database management software and services line that claims to let users target and communicate with customers and then analyze the input. While Epsilon will operate as part of its new parent's direct marketing group, however, Massachusetts apparently will not be left without it; the current headquarters will be retained.

■

Buy . . .

Microcomputer connectivity products vendor **Microcom, Inc.** made a major move on the Apple Computer, Inc. Macintosh market with last week's purchase of **1st Aid Development, Inc.**'s Macintosh-oriented disk recovery software line and related assets. Terms of the transaction, other than that it was consummated with cash and license fees, were not released by either company.

More national briefs on page 84

Compaq spells 10 years of success

Less innovation in overpopulated desktop arena calls for emphasis on high end

BY RICHARD PASTORE
CW STAFF

Despite ravenous competition and a desolate domestic market, the fastest-growing company in U.S. business history has hardly lost a step as it approaches the close of its first decade. Compaq Computer Corp. has molded and maintained a reputation for technological innovation, robust financials and gauging and satisfying users' needs, observers said.

Yet some of the Houston-based firm's strongest pillars — its product innovation, high margins and gangbuster European growth — seem to be increasingly wobbly, analysts added.

Compaq's products seem to create an indelible perception of premium quality in the minds of users. This is an invaluable reputation for a technology that boils down to an IBM Personal Computer clone. "We view them as more of a premium PC, and we pay a premium price for them as we would for an IBM computer," said Scott Novogoratz, director of MIS at Physicians Plus Medical Group in Madison, Wis.

"Everybody I've talked to [who's] used their products has been happy with them," added Melvin Boyer, director of MIS at Louisiana-Pacific Corp. in Portland, Ore.

Compaq prides itself on having a broad, solid product spectrum. In the fastest-selling PC market today — Intel Corp. 80386SX-based boxes — Compaq is well-positioned with a low-end, midrange, high-end and laptop entry all based on the chip.

"There's not a computer you could ask for that Compaq does not have," said JoeAnn Stahel, an analyst at Storeboard/Computer Intelligence in Dallas.

Compaq armed to face IBM on many fronts

Compaq has a more filled-out product line than IBM in microcomputer segments

	COMPAQ	IBM
Portables	8	1
286 (stationary)	1	2
386SX (stationary)	3	2
386 (stationary)	4	2
486 (stationary)	2	1
Multiprocessor	2	■

(Number of product lines currently in production)

CW Chart: Doreen Dahle

The same could not be said of Compaq's No. 1 rival, PC market leader IBM, which conspicuously lacks a laptop computer or 33-MHz Intel 80386-based PC. "There's no doubt that Compaq's been more nimble than IBM in the product development side," said Eric Zimits, an analyst at Rauscher Pierce Refsnes in Dallas.

Despite Compaq's past success, it is becoming increasingly difficult to innovate in the overpopulated desktop DOS arena, analysts said. "It's hard to differentiate your product if you're running the same operating system that everybody else is running," said Michael Goulde, a vice-president at Open Systems Advisor, a newsletter publisher and consulting firm in Boston. "It's becoming a lot tougher."

Consequently, the bulk of Compaq's research has gone toward pushing the high end ever higher. The firm was among the first to market with multiprocessor systems and desktop machines based on Intel's 1486 chip. Though the market for these powermongers has not yet fully bloomed, the machines promise high-margin rewards.

The multiprocessor Systempro has generally been regarded by observers as a slow seller. However, "it's a very high-margin item," noted Will Fastie, editor of the "Fastie Report," a technology newsletter published in Baltimore. "If Compaq felt they would be able to sell just 75,000 Systempros, they'd be jumping for joy."

Top-of-the-line boxes aside, Compaq's stubborn premium prices finally seemed to succumb to competitive pressure this year. In May, the firm introduced relatively cut-rate models for use as network nodes. Earlier this month, it lowered the cost of its market-leading LTE notebook PC for the first time [CW, Aug. 6].

Compaq co-founder and Chief Executive Officer Rod Canion confirmed analysts' expectations that the cost capitulation will continue (see story page 82). This should sit well with users who appreciate the quality they perceive in Compaq PCs but are loath to pay the premium. "Right now, we're often substituting clones for either a Compaq or IBM because budgetary contraints don't allow us to buy the premium product," Novogoratz said.

Despite the recent pricing machinations and prolific rollout schedule,

Continued on page 82

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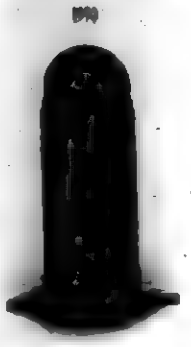

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Compaq won't be resting on its laurels

Compaq Computer Corp. co-founder and Chief Executive Officer Rod Canion recently spoke with Computerworld *Senior Writer Richard Pastore concerning lower prices, slow high-end sales, the health of the European market and new frontiers for the firm.*

Why is Compaq able to log double-digit growth and maintain its leadership position in this incredibly competitive and slowing market?
The biggest reason is our international business. The small investment we made in Europe in 1984 has really come back to pay handsome rewards. In the UK, we probably have our strongest market share position of anywhere in the world.

Analysts say there are early warning signs that Europe may be entering a market slowdown. With more than half of its revenue coming from Europe, how will Compaq be affected?
At some point we have to expect the European market to slow down, but I think it is premature to expect it in the near future. It's going to be at least another couple of years.

Where will Compaq turn if and when the European slowdown does occur?
There are two other very important markets. The first is Eastern Europe. We've got an early start there with dealers open in several of the countries. We also see this decade as the time to make a strong effort in Japan. Those [markets] will happen in the next five or six years.

Beyond that, there's no way that the less-developed countries cannot increase their use of computers; otherwise, they will fall hopelessly behind the rest of the world. There will be an acceleration of those markets for computers sometime this decade.

Have you given up on the U.S. market?
We still see the U.S. market as offering a lot of opportunity. From a new product standpoint, we are very well positioned to gain some share in the latter part

Compaq

FROM PAGE 81

Compaq's U.S. sales increased only 2% last quarter. However, its international markets grew 42%. Compaq's overseas operations now account for more than half of its total revenue. But while high growth in Europe has shielded the firm from the moribund effects of the domestic slump, it also renders the firm subject to the seasonal vagaries of the European markets.

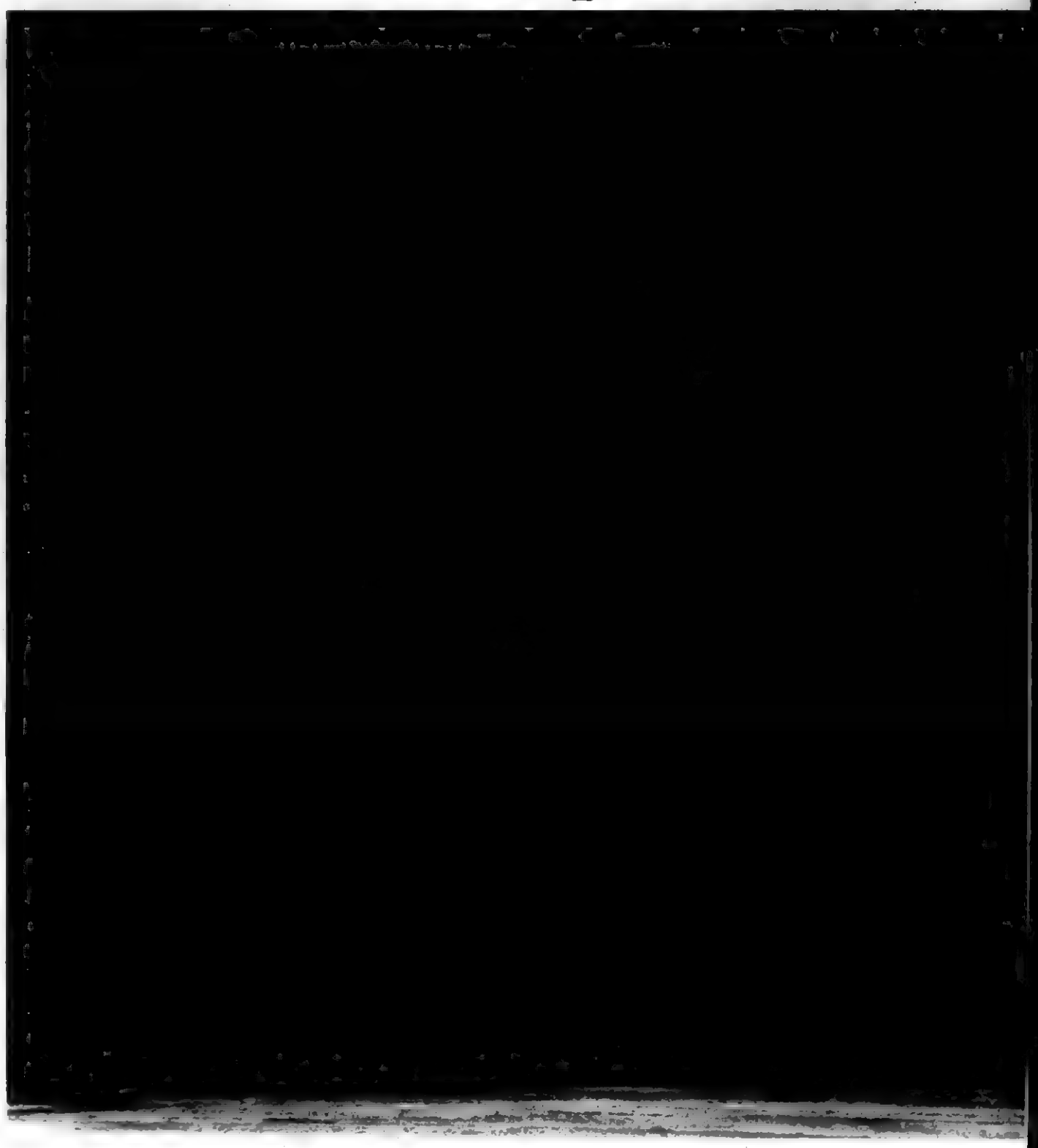
"If Compaq is still not showing any growth domestically and they get hit by a seasonal effect [in Europe], they could have a sloppy third quarter," Zimits warned.

Even more cause for concern is the indication that Europe may be cooling off. "Now there are some spot signs of weakness in Europe in the other hardware segments," said Jim Porter, an analyst at William K. Woodruff & Co. in Dallas. "Growth rates are slowing down; people are a little more nervous."

Demand for PCs in Europe is expected to be down overall by 16% this year over last, according to IDC Europe in London. Compaq's growth last quarter was down 14% from an incredible rate of 56% in 1988. Apple Europe, which is ranked No. 3 in Europe behind IBM and Compaq, saw a growth rate decline of 9% last quarter over last year [CW, Aug. 6].

While Compaq searches for new geographic markets in anticipation of a European slowdown, the firm will continue to do what it does best: "Keep their finger right on the pulse of the market," Zimits said. "They know exactly what the buyers want and what the end users are looking for in a system."

In The Complex World Of
A Simple, Practical



of this year in the U.S.

But competition from clone vendors in the U.S. seems keener than ever. Aren't they taking market share away from Compaq?
When Compaq enters a market and gains a strong lead, it's really hard to make an impact on us. Because of our higher performance, positioning and typically higher pricing, these kinds of companies normally impact IBM before they impact Compaq.

Still, there have been signs that Compaq is pricing more aggressively. Is that a direct response to your competition?
That's one way of looking at it. We're certainly not going to lead on price, but if anything, we've been a little bit too unaggressive on pricing in the last couple of years. As an overall rule, you're going to see Compaq be a bit more competitive.

You continue to heavily invest research dollars in high-end products, but some market watchers say that there is not much demand for Intel Corp. 1486-based boxes. Are your efforts there not paying off?
It will take a couple of years before the 486 shows up as a challenger to the 386. But it's important to us now, especially when you look at revenue. When we sell them, we're making quite a bit of revenue on each one.

It doesn't appear that you've managed to sell many Systempros, according to Storeboard/Computer Intelligence.
It's gotten some press that the Systempro hasn't met our expectations, but that's just not accurate. The fact that you can find dealers who say they can't sell it shouldn't be a surprise to anybody. We never expected all dealers to sell it.

Compaq is a radically different company than it was in 1985. Where do you expect it to be five years from today?
Whether the change will be as dramatic as in the past five years is harder to say. There's only so much farther you can go in becoming a well-known company. We don't have any kind of goal to replace IBM in five years. We're going to do the same kinds of things we've been doing.

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Firm plans cost-cutting measures

BY NELL MARGOLIS
CW STAFF

National Semiconductor Corp. last week announced its plans to restructure the company, seemingly in an attempt to soften the blow of lower-than-predicted earnings for its first quarter ended Aug. 26.

The company said it expects to take a one-time charge of $145 million in its first quarter; it also announced that it will cut its work force by 2,000 worldwide.

Reorganization of the Santa Clara, Calif.-based company will also include the following:

- Closing its high-speed, high-density Static Read Access Memory (SRAM) chip manufacturing fabrication line, produced at its Puyallup, Wash., plant.
- Closing its military product assembly and testing facility and consolidating these operations into other locations.
- Restructuring the company's ASIC division by reducing investment in CMOS gate arrays.
- Reducing the number of divisions in the company from six to four.

The changes being made correlate with a decrease in market demand for the SRAMs and "unsatisfactory margins" in the CMOS gate array market, according to National Semiconductor President and Chief Executive Officer Charles Sporck.

Additional reasons for the restructuring include lower demand from the military and increase in pricing pressure in other market sectors, Sporck said.

Timeplex upswing tied to moderation

BY ELISABETH HORWITT
CW STAFF

The cautious, middle-of-the-road course often proves the safest, particularly when your industry niche is suffering a downturn. Such is the lesson that could be extracted from recent financial upsets in the T1 switch industry.

Shortly after its feisty young competitors, Network Equipment Technologies, Inc. (NET) and Newbridge Networks, Inc., reported dismal second-quarter performances, staid old Timeplex, Inc. — a subsidiary of Unisys Corp. — announced revenue increases of 20% to 25% during the first half of this year as compared with the corresponding period in 1989.

This is a real turnaround compared with dominant industry trends of a year ago. At that time, high-end switch vendor NET was seriously challenging Timeplex's position as the dominant T1 switch vendor, while Newbridge chomped the firm's lunch at the low end. Timeplex was losing its customers' confidence through shipment delays of a year or more in its high-end Link/100 multiplexer and Timeview integrated network management system lines.

During the first two quarters of 1990, however, Timeplex apparently got its act together in several respects. By finally shipping the key products, the vendor was able to both satisfy a pent-up user demand and compete more effectively for new accounts, according to President Dewaine L. Osman. "We've just had our best two quarters in terms of new account type of activity," Osman said.

In addition, Timeplex and Unisys have finally put together an aggressive co-marketing strategy, he said. Timeplex expects 10% to 20% of its revenue dollars to come from sales to Unisys customers within the next year, he added. Previously, sales to the Unisys customer base have been "a trickle," Osman said.

Another key factor in Timeplex's comeback has been its strong international presence, Osman said. "We have distributors in 37 countries, while our competitors don't have that infrastructure in place," he said. Market growth for Timeplex has been "a little better internationally than growth in the U.S.," he added.

Timeplex President *Dewaine Osman expects continued revenue growth*

While admitting some concern about the possible effect of a U.S. recession on sales, Osman said he felt optimistic that he would see a 20% increase in revenue between fiscal years 1989 and 1990.

Meanwhile, Timeplex's rivals are being forced to attack the firm in its position of strength — the midrange switch — because their own primary markets are slowing down, according to Thomas Nolle, president of Voorhees, N.J.-based consulting firm CIMI Corp. "Both NET and Newbridge were successful while the T1 market was expanding rapidly, but a difficult economy has taken the glitz and glamour out of the T1 market, and communications managers are getting back to basics."

Conservative customers have less use for NET and Newbridge's emphasis on leading-edge technology, Nolle said. In contrast, Timeplex, while keeping up with emerging networking developments such as frame relay and fast packet, "never deviated from its midrange niche" and now presents a reassuring picture of stability and dependability, he added.

NATIONAL
BRIEFS

Bye-Bye

In the latest chapter of the Stardent Wars saga, **Stardent Computer**'s shareholders held a special meeting last week and voted to remove cofounders and former executives Allen Michels and Matthew Sanders III from the board of directors. Michels and Sanders recently filed a lawsuit accusing Stardent investor/partner Kubota of technology theft.

■

By and by

Last week, a federal bankruptcy judge gave struggling computer company **Kaypro Corp.** a six-week breather from creditors seeking to convert the firm's attempt to reorganize under Chapter 11 of the Bankruptcy Code to a Chapter 7 liquidation. Weighing in favor of the extension until Oct. 3, said His Honor, are the appointment of a new chief executive officer; sole secured creditor **Fujitsu**'s withdrawal from the pro-conversion camp; and upbeat forecasts for late summer sales.

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Hitachi's goodwill campaign banishing bad-boy image

BY JAMES DALY
CW STAFF

LOS ANGELES — Anyone in business knows that money doesn't talk — it screams.

Hitachi Ltd.'s Masayuki Kohama might understand this better than most.

For years, Hitachi has taken hits from U.S. congressional and corporate heads alike. The $48 billion maker of 20,000 products has been socked repeatedly with charges of corporate shenanigans ranging from allegations of industrial spying on IBM to dumping semiconductors in the U.S. and trying to monopolize the flat-panel display market.

In an effort to reverse this perception, Kohama has crafted a wide-ranging U.S. goodwill campaign that mixes cash with creativity and has but one objective: to polish Hitachi's notorious bad-boy image.

"A good deal of mending needed to be done," Kohama said from his 27th floor office overlooking the city. "The U.S. is our most important partner; we need each other."

Since arriving in the U.S. as Hitachi's senior representative in California four years ago, Kohama has worked long and hard donating money, organizing civic forums and striking an unusually high profile for a Japanese executive in his quest to have Hitachi perceived as a welcome neighbor.

Kohama has signed checks for more than $3 million, donating money to San Francisco earthquake victims, organizing a symposium on California transportation issues, supplying power systems to Rose Bowl parade floats and even turning up on a "Lou Rawls Parade of Stars" telethon to hand over a $10,000 check.

Under Kohama's guidance, Hitachi has also sponsored such tony cultural events as the elegant Kabuki theater and concerts by synthesizer artist Kitaro "so Americans will see that Japanese are not just cold, money-mad people," he said.

Kohama's mission is highly unusual for a Japanese firm. "In the U.S. there is the sense of being a 'good' company — one with both a corporate and social responsibility," he said.

Hitachi's Kohama

Such is not the case in Japan, he added, where social needs are the responsibility of the family or state and overt displays of self-promotion are considered distasteful.

Additionally, charitable donations are not tax-exempt in Japan. "In Japan, charity is the job of the government," he said.

However, such cultural readjustments are necessary if Japanese firms are to work successfully in the U.S. without prejudice, Kohama said.

To tackle the assignment of improving its U.S. reputation, Hitachi tapped the 28-year company veteran, who speaks fluent English and has worked in Beirut, Lebanon; New York; Cairo; and Athens.

Kohama's efforts appear to be paying off. Last month, Hitachi was given the prestigious Medici Award by the Los Angeles Area Chamber of Commerce. Hitachi — the only foreign firm among the half-dozen honorees — was specifically cited for its "spirit of international cooperation."

"We don't aim just for profit," Kahama said. "We're in this together. Without each other, we can't survive."

INTERNATIONAL BRIEFS

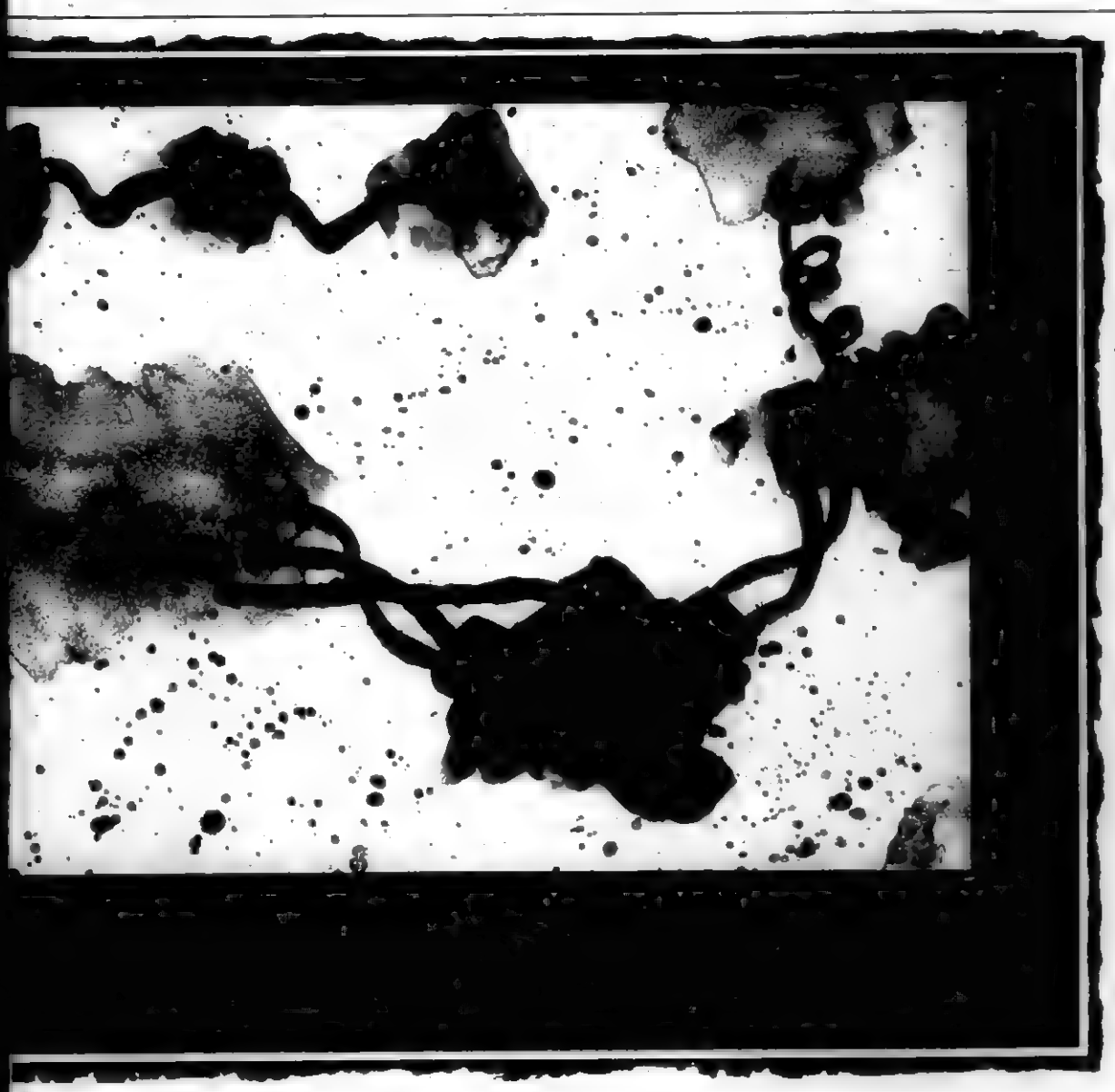
The French connection

In a move worth at least the proverbial thousand words on the shifting shape of the computer industry, **Hewlett-Packard Co.** is about to relocate its personal computer group from Sunnyvale, Calif., to Grenoble, France. Heading up the group — more than half of whose revenues currently come from HP's international operations — will be Jacques Clay, former general manager of the PC group's Grenoble division.

■

PCs OK in UK

For the first time, the value of commercial microcomputers sold in the UK last year accounted for more than 50% of total UK computer sales, according to a recent report in *The Financial Times*. Figures compiled by Pedder Associates, a consulting group that follows the UK computer market, showed the market at an estimated $10.2 billion, up 12.6% from the previous year. Business PC sales, Pedder said, grew 25% to $5.3 billion.



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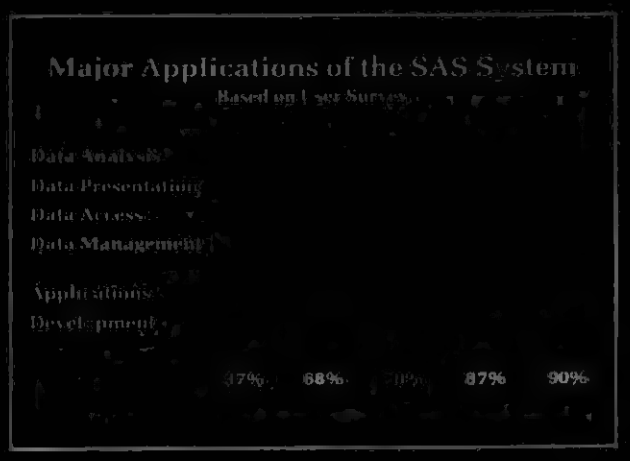

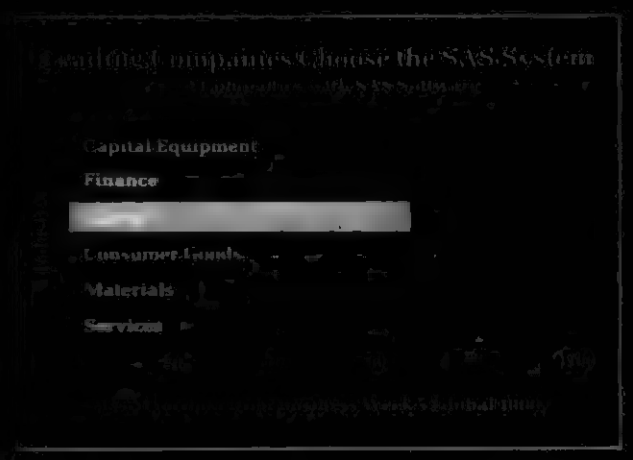

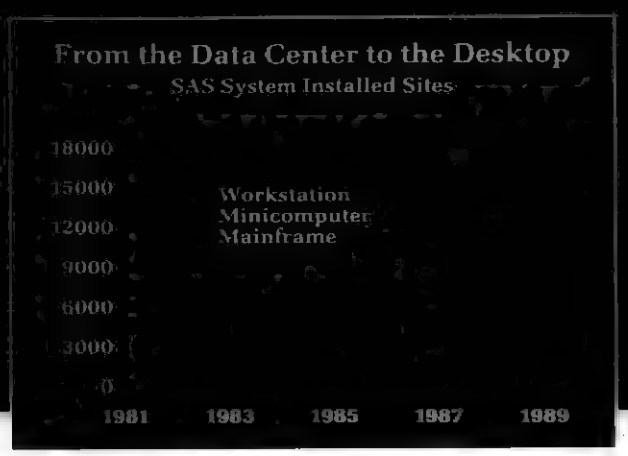

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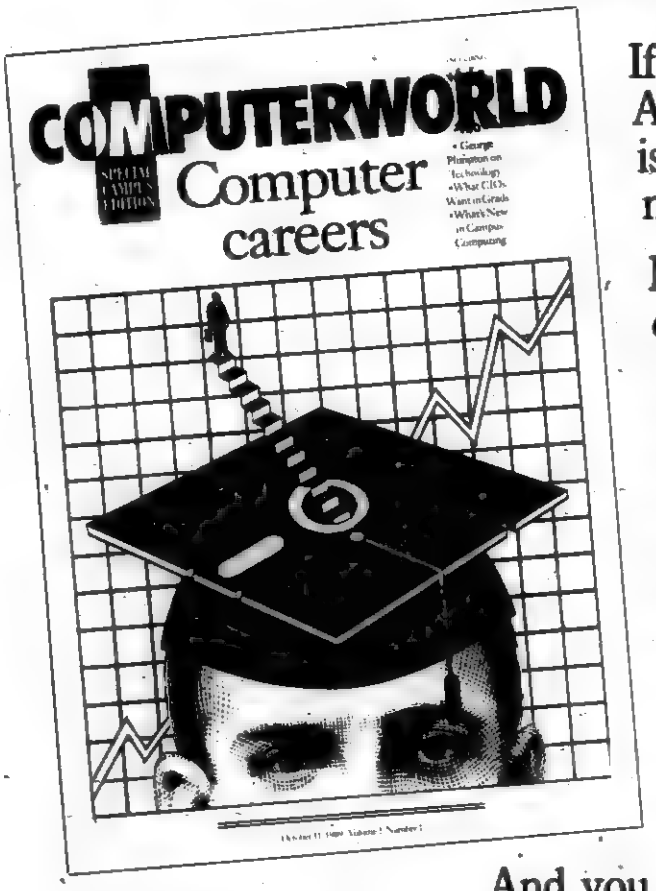

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Planned Editorial Features:

(subject to revision)

- MIS salary and job satisfaction survey
- Where are the best jobs?/What positions are hot?
- Experiences of recent MIS graduates in their first jobs and what helped them in school
- The MIS career ladder
- Profiles of acclaimed top level MIS executives
- The strategic advantage of computers and how they play a key role in running a company

Coming home to the IS effort

Specialists leaving the military are armed with valuable experience

BY CATHLEEN A. DUFFY
CW STAFF

After serving a four-year hitch in the armed services, many information systems specialists decide that a military career is not for them. Others retire from the service but still have plenty of working years ahead of them. How do these people fare in the job market? How valuable is their resume in the corporate IS world, and where are they most likely to find opportunities?

Some military IS work is so specialized — developing systems that control guns aboard naval ships, for example — that trying to transfer it to civilian life can be like cramming a size 10 foot into a size 4 shoe.

But the barriers aren't always insurmountable. Dave Flansbaum, managing director of the recruiting firm Source EDP in San Francisco, says he finds he can sometimes translate experience with arcane systems into terms relevant to the civilian world.

For someone who has worked on a naval artillery system, for instance, a resume might emphasize the programming languages that were involved rather than the applications.

Programming, however, can be different in the military because of the use of specialized languages, according to Carol Covin, a senior systems analyst at Electro-Tech International in Annandale, Va., and author of *The Computer Professionals Job Guide for the Washington, D.C., Area.*

Systems analysts, on the other hand, tend to do the same kind of work whether they're in the military or the private sector, Covin says.

When it comes to management, the military can provide its IS people with unusually valuable experience.

Senior officers seeking high-level IS posts at major corporations stand to gain from the experience of evaluating, acquiring and managing large-scale systems, says Norm Sanders, a managing director at executive search firm Russell Reynolds Associates, Inc. in New York.

Military officers also receive excellent training in leadership that can be applied directly to IS management in the corporate world, Covin says.

The type of experience someone actually acquires in the military can be a simple matter of good fortune, says Jim Marston, a retired Air Force colonel and now senior vice-president and chief information officer at American President Companies Ltd. Marston said he feels he was lucky: He managed all the computers for a national missile warning network, which consisted of about 300 systems around the world.

"If you're fortunate and you get assigned to something that's interesting and challenging like I did, your experience is a good one," he says.

Marston's first job upon leaving the Air Force was as vice-president of data processing and communications at American Airlines, where he found his involvement with the massive Sabre reservation system akin to his military work.

Tom Gildea, a former Air Force captain who is now vice-president of business information services at Helene Curtis Industries, also found that military experience provided an advantage in the commercial job market.

Gildea says that during the Vietnam war, he had access to all the best IS resources, including top technical experts and state-of-the-art IBM equipment. He found that the environment fostered creativity, which in turn helped prepare him for the more cost-conscious corporate world.

Defense contractors are perhaps the most natural place for former military personnel to pursue their careers. Military people are familiar with the contractors' requirements, and the contractors generally need the veterans' expertise. However, recent cutbacks in the U.S. defense budget mean these companies are not doing much hiring right now.

> THE TYPE OF experience someone actually acquires in the military can be a simple matter of good fortune.
>
> JIM MARSTON
> AMERICAN PRESIDENT COMPANIES

That situation can hurt veterans whose military background leads them to be inappropriately typecast as specialists at defense-related jobs. "If a hiring manager hasn't had any military experience, he will view it as a negative or a neutral at best," Flansbaum says. "There's this 'clunkhead' image — that people in the military don't know how to think on their feet, that they don't understand the civilian world."

However, there are other industries that provide a particularly good fit for people with experience in military information systems. "It would be unfair to say they're just out of luck because the defense industry as a whole is contracting," Covin says.

There's an abundance of opportunities in systems integration, and systems integrators are doing a tremendous amount of recruiting in the military, Sanders says. Governments and port or transportation authorities are other natural destinations, he says.

Veterans are also prized by consultants and contractors that work for civilian government agencies, Covin says. They understand the government's procurement needs as well as government standards and specifications.

On another positive note, IS specialists can generally expect to earn more money after leaving the service for corporate work, especially if they've served for a relatively short time. "[The military] tends to underpay and overwork you," Marston says.

Duffy is a Computerworld associate editor, features.

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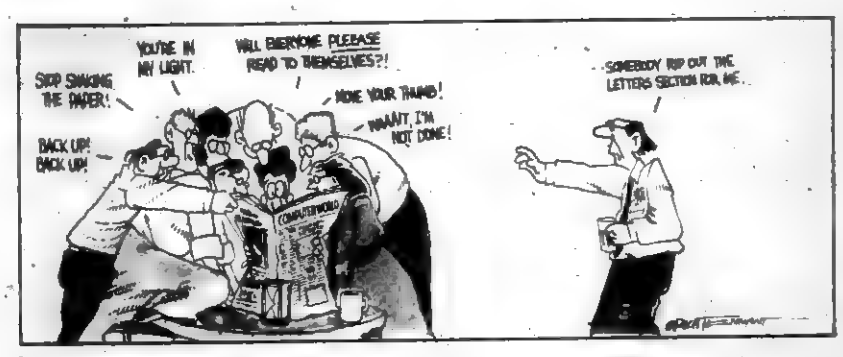

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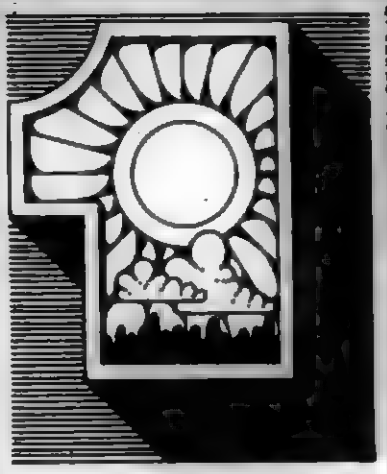

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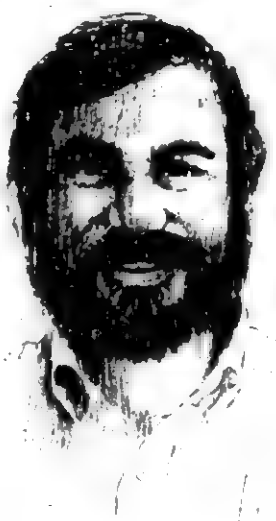

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MARKETPLACE

Languages: The new generation

Make sure your new programming language can deliver its potential

BY JESSICA KEYES
SPECIAL TO CW

An assembler was — and still is — a powerhouse of a programming language. It gives programmers a level of control over applications that few languages can match. Unfortunately, however, assembler is hard to learn and cumbersome to use for most applications.

Cobol became the programming language for businesses in the mid-1970s. It was easy to use and understand and was geared for business applications.

While firms trained Cobol programmers en masse, however, further change loomed. Batch applications gave way to on-line, real-time systems. Mainframes yielded to minicomputers and minis to workstations, personal computers and local-area networks. At the same time, development managers had to write more complex programs and write them faster and better.

Vendors responded with a flurry of editors, computer-aided software engineering tools and fourth-generation languages. However, development managers realized these products were concealing a fundamental flaw: They were using the wrong programming language.

A language need only be sophisticated enough to suit the requirements of the application in question. In some cases, this means only that it can run on a variety of platforms. This is perhaps the primary reason so many companies are turning to the C language.

With its portability to all makes and models of PCs, workstations, minicomputers and mainframes, C is a hard language to beat. The secret to this portability is libraries. C consists of a base language common to all platforms and a series of libraries with unique codes for particular platforms. This approach makes moving a payroll system from a mainframe to a PC as easy as loading and recompiling. And that's not all: There are C libraries to handle everything from complex statistical calculations to gallery-quality graphics.

C also combines business programming with systems programming. Systems programmers use assembler to write programs that direct the operating system. Languages such as Cobol were never given that capability. C, on the other hand, provides the extraordinary ability to direct the operating system from the middle of an application. On a PC, code in a payroll program could check to see whether there is sufficient disk space available on drive E prior to writing out a file.

One of the newer languages in the marketplace is Nantucket Corp.'s Clipper, which also features libraries and portability. Most of the Fortune 500 companies are trying it, along with many hackers. Its following is likely to grow significantly during the next five years.

Information systems organizations also realized that Cobol doesn't always cut the mustard as they pushed into artificial intelligence. For people long involved in AI, the languages of choice have been Prolog and Lisp. They provide the structures necessary to represent knowledge in the form of rules and to handle the circuitous process of human reasoning.

Lisp has actually been around since the mid-1950s. You won't find many shops willing to give up the ease of Cobol for the capabilities of Lisp because of the difficulty of using it. There are, however, pockets of Lisp expertise in companies that require complex knowledge processing. Many other people in the knowledge field have opted for Prolog over Lisp because it provides inferencing capabilities that make programming easier.

Perhaps the hottest new language for the decade ahead is C++. This extended version of C provides the ability to manipulate objects — discrete entities that can store their own data and procedural code.

Objects are independent of one another, but they communicate through messages. They are not modularized programs, but they are similar. A big difference is that objects do not have to be tailored to particular applications or environments. It is therefore possible to "glue" together a series of them, making for very rapid development.

C++ combines the functionality of C with the advanced capabilities of objects. Since objects are the stuff of knowledge representation, C++ is the new darling of the AI crowd.

All these languages are available through computer stores and catalogs. The prices of competing vendors' versions tend to be similar. Considerations to bear in mind when looking at them include the following:

- **Portability.** How easily can you move code from one platform to another?
- **Libraries.** How many of these prewritten codes come with the version or are available for it? Each one eliminates the need to write your own code for a function — creating windows or graphics, for example. They also facilitate portability.
- **Documentation.** How helpful are the manuals? Do they include all the error messages?
- **Training.** Some vendors provide videotapes or other training materials for their version. The prices of these aids vary widely.
- **Editors.** Does the compiler come with a good editor — the device that lets you write the code? A good one lets you write with a full screen, handles libraries and simplifies compiling.
- **Support.** Is there someone on the other end of the telephone to help you out?

Keyes is president of New Art, Inc., a management and computer consulting firm in New York.

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AT Model 239	$1,125	$1,325	$700
AT Model 339	$1,275	$1,400	$900
PS/2 Model 50Z	$1,550	$1,850	$1500
PS/2 Model 60	$2,200	$2,400	$2,100
Compaq Portable II	$975	$1,150	$875
Portable III	$2175	$2,500	$1,900
Portable 286	$1,275	$1,275	$1,100
Plus	$675	$750	$650
Deskpro	$825	$900	$800
Deskpro 286	$1,425	$1,625	$1,300
Deskpro 386/20	$2,800	$3,100	$2,700
Apple Macintosh 512	$375	$775	$275
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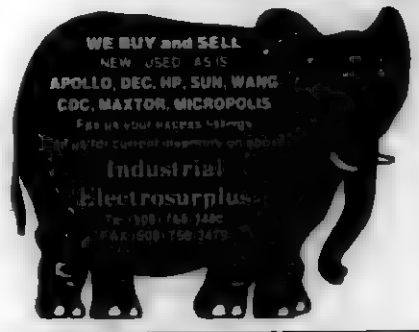

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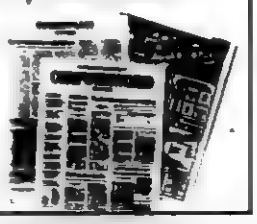

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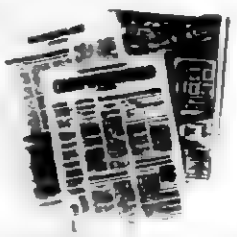

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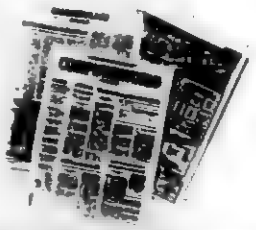

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Beware the dark side of 4GLs

Training can alleviate the inherent problems of user-friendly languages

BY JONATHAN SAYLES
SPECIAL TO CW

As replacements for procedural languages such as Fortran, PL/I and Cobol, fourth-generation languages (4GL) were to usher in the age of end-user computing. They were to release the hold that information systems people maintained over applications and free programmers from the atrocities of coding if-then-else instructions.

The liberal use of 4GLs, however, has brought a number of problems to the surface. The problems have little to do with the products themselves. Instead, they stem from the reasons why people use the products and, even more important, how people use them in production applications. Fortunately, IS organizations can use training to address the problems.

Since the early 1970s, people have used 4GLs such as Mark IV, DMS, Focus and Ramis to set up everything from large system prototypes to small and medium-size production systems and one-shot database queries. These products are extremely chic among business users, who make extensive use of their interfaces to relational databases such as DB2, SQL/DS, Oracle and Ingres.

Most of the popular 4GLs are inherently free-form. Their ability to provide carte blanche in software development is a big factor behind their success, particularly in prototyping large systems. They can make it extremely easy to build files, databases, screens and programs, then glue them together, demonstrate the application, make changes and refine requirements. Used in this way, 4GLs are an unqualified success.

However, the same capabilities can quickly bog down development when people use 4GLs to build true production systems, which must be verifiably correct, reasonably efficient and humanly maintainable.

Systems built with 4GLs are often put into production quickly, do not work as required and are difficult to change because of the lack of worthwhile documentation. They are often slow, inefficient and expensive to run.

The problems generally stem from the lack of rigor in the development and delivery methodology and the system's life cycle. There seems to be a double standard in many companies — one life cycle for traditional Cobol systems and another for 4GL applications — which lacks several key checks and balances.

The training program to address this situation should not dwell on the use of tools. It should consist of a staged curriculum aimed at combating the problems.

The following stages should be included:

• **Process testing and verification.** 4GLs are often prone to the ambiguities and subtleties of the English language. Software developers must apply rigorous testing and verification techniques to assure that users get the information out of the database that they think they requested. War stories abound of problems in this area, yet the typical two-day tour of 4GLs rarely includes the training to address them.

• **Production-mode 4GL development.** Companies carefully scrutinize few of the one-shot queries or small production systems that use non-procedural languages and 4GLs. These projects often lack design and code reviews, project management, system administration, version control, backup and recovery procedures and other nuances of production system development.

The argument has been that programmers didn't have the time for these steps or that users were not up to the task or didn't understand the procedures. But what on earth makes one database more of a production system than another one — the use of Cobol? Training in quality assurance and the management and control of production systems is just as necessary when using 4GLs as when using Cobol.

• **Efficiency issues.** This area gets a little tricky, since organizations tend to develop systems with a 4GL because a people-oriented issue such as flexibility or rapid development is more important than machine efficiency.

All the same, throwing caution to the wind when it comes to the CPU and I/O resources consumed by an application usually proves to be bad policy. Spending months tuning a system would negate the value of using a 4GL, but organizations should employ some minimal level of database and file I/O tuning.

• **Maintainability and structured development techniques.** Unless developers using a 4GL are creating a one-shot program, they must adhere carefully to documentation standards for production-quality systems. Most 4GLs have reasonably good built-in documentation facilities, and they should be utilized.

Users should also apply structured coding principles — they should not use "goto" statements, for example, and should employ intelligent naming standards and abbreviations.

Don't be deceived by the facade of simplicity in which 4GLs have been cloaked. Creating any quality production system takes time and effort. It doesn't matter whether one uses Cobol or a 4GL.

Sayles is director of educational services at The Systems Group, Inc. in Glastonbury, Conn.

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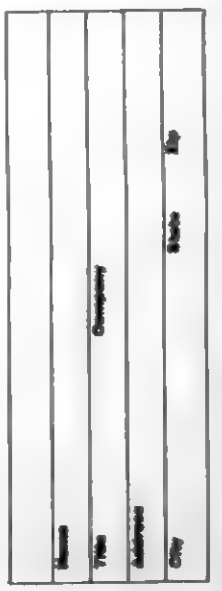

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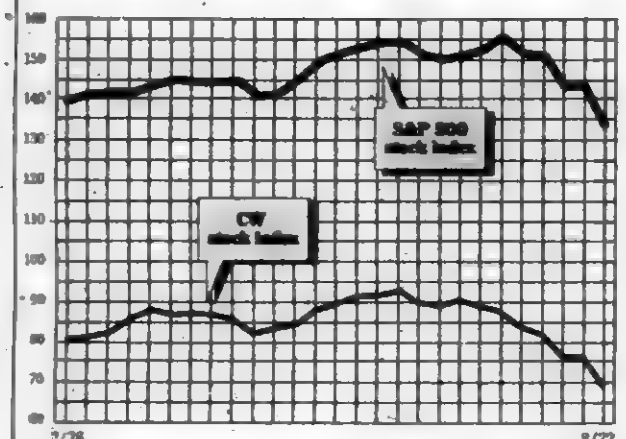

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E		PRICE			
X		52-WEEK RANGE	CLOSE AUG. 22, 1990	WEEK NET CHNGE	WEEK PCT CHNGE

Communications and Network Services

N	AMERICAN INFO TECHS CORP	68	55	56.125	-3.8	-6.3
Q	ANDREW CORP	26	16	18.25	1.8	10.6
Q	ARTEL COMM CORP	10	3	3.125	-0.4	-10.7
N	AT&T	47	32	32.125	-3.1	-8.8
Q	AVANTEK INC	7	2	2.5	-0.3	-9.1
N	AYDIN CORP	21	13	12.625	-0.3	-1.9
N	BELL ATLANTIC CORP	57	42	42.875	-3.6	-7.8
N	BELLSOUTH CORP	59	49	51.75	-2.0	-3.7
Q	COMPRESSION LABS INC	16	7	11	-2.4	-17.8
Q	CONTEL CORP	37	23	29.5	-2.4	-7.5
Q	DATA SWITCH CORP	4	2	3.25	-0.7	-17.5
Q	DIGITAL COMM ASSOC	27	16	15.875	-3.8	-19.1
Q	DYNATECH CORP	21	15	17.25	-0.3	-1.4
Q	FIBRONICS INTNL INC	13	5	7.125	-2.1	-23.0
Q	GANDALF TECHNOLOGIES	6	2	3.063	0.1	2.1
N	GENERAL DATACOMM INDS	7	2	2.5	-0.6	-20.0
N	GTE CORP	35	25	25.25	-2.4	-8.6
Q	INFOTRON SYS CORP	11	3	3.25	0.0	0.0
N	ITT CORP	65	51	52.5	-3.3	-5.8
N	M A COM INC	7	3	4.125	-0.5	-10.8
Q	MCI COMMUNICATIONS CORP	49	31	33	-3.5	-9.6
N	NETWORK EQUIP TECH INC	34	6	6.25	-1.0	-13.8
Q	NETWORK SYS CORP	15	7	9.375	-1.0	-9.6
N	NORTHERN TELECOM LTD	30	20	24.875	-1.5	-5.7
Q	NOVELL INC	58	19	21.75	-5.5	-11.2
N	NYNEX CORP	82	70	70	-6.0	-7.9
N	PACIFIC TELESIS GROUP	52	38	38.5	-3.5	-8.3
A	PENRIL CORP	9	5	6.375	-1.0	-13.6
N	SCIENTIFIC ATLANTA INC	29	18	18.125	-4.9	-21.2
N	SOUTHWESTERN BELL CORP	65	49	49.375	-3.4	-6.4
Q	3 COM CORP	19	10	11	-3.5	-24.1
N	US WEST INC	41	33	34	-2.1	-5.9

Computer Systems

Q	ALLIANT COMPUTER SYS	9	3	2.563	-0.5	-16.3
Q	ALPHA MICROSYSTEMS	7	2	1.875	-0.3	-11.8
Q	ALTOS COMPUTER SYS	8	5	8.125	0.0	0.0
A	AMDAHL CORP	19	11	11.125	-1.0	-8.2
Q	APPLE COMPUTER INC	50	32	35.125	-4.1	-10.5
Q	AST RESH INC	26	7	17.25	3.8	-17.9
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N	COMPAQ COMPUTER CORP	68	37	46	-7.4	-13.8
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N	IBM	123	93	99	-6.0	-5.7
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Q	IPL SYS INC	14	5	8.75	-1.3	-12.5
NE	MAI BASIC FOUR INC	6	2	1.75	-0.1	-6.7
N	MATSUSHITA ELEC INDL LTD	174	117	120	-7.0	-5.5
Q	MENTOR GRAPHICS CORP	26	12	12.625	-1.9	-12.9
N	NBI INC	2	0	0.172	-0.1	-26.5
N	NCR CORP	72	55	58.375	-6.6	-10.2
Q	PYRAMID TECHNOLOGY	36	13	16.75	-4.8	-22.1
Q	SEQUENT COMP SYS INC	34	14	21.25	-3.8	-15.0
Q	SHAREBASE CORP	2	0	0.516	0.0	0.0
Q	SUN MICROSYSTEM INC	37	15	28	-2.3	-8.0
Q	SYMBOLICS INC	2	0	0.313	-0.1	-16.5
N	TANDEM COMPUTERS INC	30	14	14.125	-3.3	-18.7
N	TANDY CORP	48	28	28.125	-3.8	-11.8
N	ULTIMATE CORP	11	5	5.375	-1.3	-18.9
N	UNISYS CORP	22	8	8.75	-1.0	-10.3
A	WANG LABS INC	7	3	4.125	0.8	22.2

Software & DP Services

Q	AMERICAN MGMT SYS INC	20	11	13.625	-2.8	-16.9
Q	AMERICAN SOFTWARE INC	18	8	8.75	-0.5	-5.4
N	AMACOMP INC	6	2	2.5	0.0	0.0
Q	ANALYSTS INTL CORP	24	14	16	-1.0	-5.9
Q	ASHTON TATE	15	8	7.75	-0.9	-10.1
Q	ASK COMPUTER SYS INC	11	7	8.125	-1.1	-12.2
N	AUTO DATA PROCESSING	80	41	48.375	-3.5	-6.7
Q	AUTODESK INC	60	33	46.75	-2.0	-4.1
Q	BMC SOFTWARE INC	30	14	23.25	-1.5	-6.1
N	BUSINESSLAND INC	14	2	2.75	-0.8	-21.4
Q	COGNOS INC	10	4	7	-1.4	-16.4
N	COMPUTER ASSOC INTL INC	18	6	7.125	-0.1	-1.7
Q	COMPUTER HORIZONS CORP	17	7	13.5	-0.5	-3.6
N	COMPUTER SCIENCES CORP	59	38	39.375	-2.3	-5.4
W	COMPUTER TASK GROUP INC	12	9	9.75	0.0	0.0
Q	COMSHARE INC	25	16	17.75	-3.3	-15.5
Q	CORPORATE SOFTWARE	18	8	11	-1.5	-12.0
N	GENERAL MTRS (CLS E)	38	24	29.25	-3.4	-10.3
Q	GOAL SYSTEMS INTL	18	10	13	.5	4.0
Q	HOGAN SYS INC	7	2	2.875	-0.4	-11.5
Q	INFORMIX CORP	18	7	7	-1.3	-15.2
Q	INTELLICORP INC	8	4	4	-0.3	-5.9
Q	LEGENT CORP	32	19	18.75	-3.3	-14.8
Q	LOTUS DEV CORP	39	16	17.25	-2.0	-10.4
Q	MICROSOFT CORP	81	29	53.75	-10.5	-16.3
Q	NATIONAL DATA CORP	35	9	9.5	-2.3	-19.1
N	ON LINE SOFTWARE INTL INC	11	6	6	-1.0	-14.3
Q	ORACLE SYS CORP	188	13	13.375	-2.3	-14.4
N	RANSOPHIC SYS INC	19	10	10.875	0.5	4.8
Q	PHOENIX TECHNOLOGIES INC	6	2	2.75	-0.1	-4.3
N	POLICY MGMT SYS CORP	43	30	36.625	-1.9	-4.9
Q	PROGRAMMING & SYS INC	25	15	15.5	0.0	0.0
Q	RELATIONAL TECH INC	10	3	3.375	-1.5	-30.8
N	REYNOLDS & REYNOLDS CO	27	16	15.75	-0.9	-5.3
Q	SAGE SOFTWARE INC	16	8	9.375	2.6	21.9
Q	SEI CORP	22	15	18.5	-1.3	-6.3
Q	SHARED MED SYS CORP	17	12	14	0.0	0.0
Q	SOFTWARE PUBG CORP	28	14	20.25	-2.9	-12.4
N	STERLING SOFTWARE INC	11	7	8.125	-0.8	-8.5
Q	SUNGARD DATA SYS INC	26	18	18.75	-2.3	-10.7
N	SYSTEM CENTER INC	25	12	11.5	-1.3	-9.8
N	SYS SOFT INC	29	16	22.25	-2.5	-10.1
Q	WORDSTAR	2	1	0.688	-0.2	-21.4

Semiconductors

N	ADV MICRO DEVICES INC	13	5	5.625	-0.4	-6.3
N	ANALOG DEVICES INC	10	6	6.25	-0.6	-9.1
Q	ANALOGIC CORP	11	8	8.75	-0.4	-4.1
Q	CHIPS & TECHNOLOGIES INC	26	11	11	-3.3	-22.8
Q	INTEL CORP	52	29	32.125	-4.9	-13.2
Q	MICRON TECHNOLOGY INC	16	7	8.25	-0.9	-9.6
N	MOTOROLA INC	88	53	67.5	-7.3	-9.7
N	NATL SEMICONDUCTOR	9	5	4.75	-0.4	-7.3
N	TEXAS INSTRS INC	44	27	27	-2.5	-8.5
A	WESTERN DIGITAL CORP	15	6	9.75	-1.3	-11.4

Peripherals

Q	ALLOY COMP	2	0	0.438	-0.1	-12.4
N	AMI INTL INC	6	2	1.625	-0.3	-13.3
Q	AUTO TROL TECH CORP	5	2	2.25	-0.5	-18.2
Q	BANCTEC INC	24	13	14.875	-3.9	-20.7
A	COGNITRONICS CORP	8	3	4.375	-1.1	-20.5
Q	CONNER PERIPHERALS	31	11	20.5	-4.1	-16.8
A	DATARAM CORP	22	8	10.75	-2.3	-17.3
N	EASTMAN KODAK CO	51	36	39	-3.6	-8.5
N	E M C CORP MASS	7	3	4.875	-0.8	-13.3
Q	EMULEX CORP	9	4	5.875	-0.1	-2.1
Q	EVANS & SUTHERLAND	35	18	23.75	-2.5	-9.5
Q	IDOT CORP	2	1	1	-0.3	-23.8
Q	INTERLEAF INC	8	4	4.25	-0.9	-17.1
Q	IOMEGA CORP	8	3	4.063	-0.4	-8.7
Q	MASSTOR SYS CORP	4	1	0.75	-0.3	-25.0
Q	MAXTOR CORP	17	7	7.5	-2.3	-23.1
Q	MICROPOLIS CORP	10	3	5.375	-1.1	-17.3
N	MINNESOTA MNG & MFG CO	91	68	79.125	-5.8	-6.8
Q	PERSONAL COMP PRODUCTS INC	8	4	4.25	0.4	9.7
Q	PRINTRONIX INC	15	9	10.75	-0.4	-3.4
N	QMS INC	21	9	13.625	-1.9	-12.1
Q	QUANTUM CORP	26	9	15.375	-3.8	-19.6
N	RECOGNITION EQUIP INC	8	4	5	-0.3	-4.8
Q	REXON INC	10	5	5.25	-0.5	-8.7
Q	SEAGATE TECHNOLOGY	20	9	9.75	-1.0	-9.3
N	STORAGE TECH CORP	35	9	19.5	-2.1	-9.8
Q	TANDON CORP	4	1	2	-0.4	-15.8
N	TEKTRONIX INC	22	12	12.5	-0.5	-3.8
Q	TELEVIDEO SYS INC	1	0	0.25	0.0	-11.0
N	XEROX CORP	69	40	39.75	-4.5	-10.2

Leasing Companies

N	CAPITAL ASSOC INTNL INC	7	1	1.375	-0.3	-18.5
N	COMDISCO INC	34	16	16.375	-1.4	-7.7
Q	LDI CORPORATION	18	12	11.75	-1.5	-11.3
Q	PHOENIX AMERN INC	5	3	2.938	-0.1	-4.1
Q	SELECTERM INC	8	3	3.125	-0.1	-3.8

Bear attack!

Tech stocks fall down and play dead under market assault

The bear market mauled technology stocks last week, ripping holes in the prices of several firms and stomping others down to new lows by the close of trading on Thursday. Angry bear paws took a big swipe at Microsoft Corp., knocking it down 8½ points by Thursday to 51¾.

IBM and Digital Equipment Corp. each felt the pain of 4½-point blows. DEC slid to a new low of 62½, while IBM closed Thursday at 96⅜, falling despite the introduction of new midrange machines.

Motorola, Inc. was another victim of Wall Street pessimism, suffering a 5-point plunge to 64¾. Other semiconductor makers escaped with smaller wounds, including Intel Corp., which was down 1 point to 33¼. News of personnel cuts and product phaseouts set National Semiconductor, Inc. back ⅝ of a point to a new low of 4⅜ (see story page 83). Texas Instruments, Inc. sagged to a new 52-week low of 26½, losing 1¼ points. Ashton-Tate Corp. also bottomed out, down 1⅛ points for the week to 7⅛. Oracle Systems Corp. nursed a 2¼-point wound, slipping to 12¾, and Borland International dropped 2⅛ points to 14½.

Some companies managed to avoid the sell-sell fury and came out slightly ahead by week's end. A two-for-one stock split went into effect Monday for Novell, Inc.; by Thursday, its price gained ⅛ of a point to 22. Computer Associates International, Inc. announced plans for a common share buy-back, sending its price up ⅝ of a point to 7⅛. News of a fat federal contract helped propel Wang Laboratories, Inc. Class B issues forward ½ a point to 3¾.

KIM S. NASH

NEWS SHORTS

Hacker hit with prison term

The reputed mastermind of a nationwide gang of some 150 hackers and "phreaks" was recently sentenced to 27 months in prison, reportedly the stiffest such sentence ever. Leslie Lynn Doucette, who used the handle Kyrie, had pleaded guilty to using illegally obtained computer access codes to steal telephone services. Authorities said the ring Doucette headed, apparently the largest ever uncovered in the U.S., caused the loss of more than $1 million in services.

U.S. losing network edge

The U.S. telecommunications industry remains a world leader in such high-tech areas as advanced switching and transmission equipment, local-area networks and business information services, but U.S. competitiveness has plummeted in the customer premises equipment market, according to the recent report by the U.S. Department of Commerce. From 1984 to 1987, U.S. market share fell 64 percentage points in data private branch exchanges and 59 points in statistical multiplexers.

Businessland draws suit

Two shareholders filed class action suits against Businessland, Inc. and some of its officers last week, alleging violations of federal securities laws in the wake of the firm's year-end loss of $23 million. The suits, filed in U.S. District Court for the Northern District of California, do not specify an amount for damages.

Nippon Steel enters PC market

Japanese steel giant Nippon Steel Corp. will test its mettle in the crowded notebook personal computer arena. Nippon, among the world's Top 30 businesses in market value, announced last week the formation of its Librex Computer Systems, Inc. subsidiary. The independently run, San Jose, Calif.-based firm will usher in its first PCs — Intel Corp. 80286- and 80386SX-based notebooks — in the fourth quarter. Librex will leverage the resources of Nippon's Electronics and Information Systems division.

Encore offers multithreading

Encore Computer Corp. last week announced what it said is the first Open Systems Interconnect (OSI) product to take advantage of the multithreading capabilities of AT&T's System V Streams product. Multithreading allows the system to act as a communications server that can concurrently handle requests to send files or messages from both remote applications and local clients. This means that a system running Encore's OSI software will be able to exchange mail with one system via the OSI X.400 protocol while exchanging files with another via the OSI File Transfer and Access Method.

Clear view of code?

Next month, look for Clear Software, Inc. in Brookline, Mass., to ship Allclear, a general-purpose flowcharting application that provides a two-dimensional visual map of the massive amount of code or patterns and relationships within complex logic. Allclear is a follow-up to Clear for Dbase, which has sold 15,000 copies. Allclear has already received a glowing review from "Softletter" publisher Jeffrey Tarter, who said that developer Vadim Yasinovsky has a "metaphor that will become an important contribution to software design."

Kavner leaves Sun board

AT&T executive Robert M. Kavner resigned from Sun Microsystems, Inc.'s board of directors last week. Kavner, AT&T group executive for data systems and federal systems, has sat on Sun's board since June 1988 under a January 1988 agreement in which AT&T acquired 20% of Sun and the two companies decided to work together on Unix System V, Release 4. Kavner said that AT&T no longer needs a place on Sun's board because joint development work has gone smoothly.

CA struts system software stuff

BY JOHANNA AMBROSIO
CW STAFF

ST. LOUIS — Computer Associates International, Inc. blitzed its system software users conference last week with eight new products in the workstation, Digital Equipment Corp. VAX and IBM mainframe arenas.

Much of the new systems software, however, may not be available for a year or more. All of the new packages are scheduled to enter beta testing in the fourth quarter of 1990, and CA executives said that, as a rule, they will be generally available six months later. Prices were not available as of press time.

The new software fulfills some of the company's promises to unify its software under the CA '90s architecture, CA executives said. "We have a cohesive approach to offering integrated systems management solutions within a product line and across product lines," said Mark Wasilko, senior vice-president of marketing. He also pointed to the new products' adherence to IBM's Systems Application Architecture and DEC's Network Applications Support (NAS).

The new products represent four of CA's systems software families: automated production control, automated storage management, data center administration and performance management and accounting.

Most of the new VAX products are versions of existing CA software for IBM mainframes. These include CA-7/VAX, an automated scheduler; CA-1/VAX for tape management; and CA-PMA/Chargeback/VAX for chargeback and accounting. Users will be able to choose between conformity to Decwindows or IBM's Common User Access, CA said.

Also new is CA-Visa, a systems administration management package for the VAX. Where the other VAX software is targeted at shops that want similar systems management tools across both IBM and DEC platforms, Visa is intended for shops that are VAX-only. Visa supports Decwindows and NAS, CA said.

VAX alert

Users, for their part, said they were looking forward to the new VAX products. The Church of Jesus Christ of Latter Day Saints in Salt Lake City already uses CA systems software on its Amdahl Corp. 5880 mainframe. The church would consider putting similar software on its 50 VAXs, according to Russ Duncan, production control manager. "It's very helpful to provide the tools that are in the current IBM world [for] the VAX," he said.

Steve Petruno, supervisor of the production support group at the Salt River Project in Tempe, Ariz., agreed. "It would be great if our schedulers didn't have to know two different scheduling products. And it would also be nice to allow the abend messages on the VAX to automatically appear on our IBM version of CA-7," he said.

Nor did the possibility of having to wait a year for the VAX software appear to faze users. "We're currently trying to align our architecture to see if we really need both the Amdahl and the VAXs," Duncan said. "If we decide to go over totally to the VAXs, it will take us that long to convert anyway."

However, CA announced more than just the VAX software. New on the workstation side are CA-ASM/Workstation, a personal computer-based system for managing tape and other media, and CA-Dispatch/PC, which allows mainframe-resident reports to be downloaded to a PC or a local-area network. Both run under DOS and have IBM mainframe counterparts.

New IBM mainframe systems software packages were also unveiled. These included CA-ASM/Archive for automated backup and archiving and CA-Maxiamon VM, a network performance monitor for the VM operating system.

Additionally, CA said it is now supporting IBM's CICS, Release 3.1.1, throughout its systems software product lines and has brought out new versions of eight existing IBM mainframe products. These included CA-Dispatch 5.0; ASM2 Version 4.0 for direct-access storage device (DASD) management and reporting; CA-Dynam Family for media management; CA-Netman 4.8 for problem, change and configuration management; and CA-Jars/DSA 6.0, a DASD space accounting package.

Gupta's database server to support Netware 386

BY JEAN S. BOZMAN
CW STAFF

SAN FRANCISCO — Gupta Technologies, Inc. edged a bit closer to Novell, Inc. last week as Gupta Chief Executive Officer Umang Gupta pledged to port his SQL-based database server to Novell's Netware 386 operating system during the next one to 1½ years.

Novell owns slightly less than 20% of Gupta, which expects to have $15 million in revenue this year. As such, Novell is one of Gupta's six major investors.

Gupta products include SQL Windows, a graphical user interface that accesses remote databases from DOS machines, the SQLbase database server and SQLnet, a local-area network connectivity package. "We expect our products to run in three major environments: Unix, Netware and OS/2," Umang Gupta said. "We do not intend to port our products to 80 different platforms," he added, in a veiled reference to Oracle Systems Corp.

A statement of direction distributed to the 400 customers attending the conference said, "Novell's investment means that customers can look for easy integration with the Netware 386 network operating system." Gupta plans to ship a Netware Loadable Module of SQLbase Server in early 1991. Future gateways connecting Netware SQL to IBM's DB2 and Oracle's relational database management system are also in the works, Gupta said.

Gupta CEO Umang Gupta

For all the talk of Novell, users at the conference seemed particularly interested in a new release of SQL Windows that has improved memory management for desktop-to-mainframe interactive applications. "We are already using Gupta's SQL Windows for financial applications," said an MIS manager from Prudential Insurance Co. in Roseland, N.J. "I'm looking forward to the enhancements, particularly support for Microsoft Windows 3.0."

SQL Windows 2.0, which is being beta tested at more than 100 value-added reseller and user sites, is set to ship in the fourth quarter. It will support Microsoft Corp.'s OS/2 Presentation Manager and Gupta's SQLbase 4.0.

CEO Gupta also announced future support for IBM's SQL/DS and Ingres Corp.'s RDBMS. Other laboratory projects at Gupta include support for OS/2 Extended Edition and Microsoft's/Sybase Corp.'s SQL-server.

IBM offers bug detection

BY MAURA J. HARRINGTON
CW STAFF

WHITE PLAINS, N.Y. — IBM introduced a software service last week that could change the way in which information systems managers support and maintain applications installed on their systems.

The Failure Analysis and Support Technology Service, dubbed FASTService, runs off of an Application System/400 machine and is designed to automatically detect failures, bugs and problems in application software as well as to capture and record these problems as they occur, the company said.

According to IBM's Alan Hu, director of software services at the national services division, this method of software maintenance is made possible through the use of implanted software probes, or error-detection macros, which the application programmer installs throughout critical junctures of the application. Once the error is captured by the probe and stored on the database, IBM's Automated Service Interface provides electronic connections to the user's customer support group for notification of the problem, Hu said.

At your service

IBM's latest service offering is said to automatically detect application software problems and determine what action is needed

Source: IBM CW Chart: Doreen Dahle

FASTService supports customers running either MVS/XA or MVS/ESA using Cobol, PL/1 or assembler, the company said.

Hu said that while FASTService works for both systems software and applications software, the focus among beta testers has been on its use for applications software. "This is a revolutionary concept . . . These tools will enable early detection and handling of the unrecognized problems . . . applicable to all software," Hu said.

FASTService, though similar to other diagnostic and failure-analysis tools, is unique in that it takes an active approach to maintenance rather than a reactive approach, Hu added. "This product is going to make a big difference in software development, operations and problem management," he said.

"A lot of times there are failures in software that you don't really notice. This product cuts down on the length of time that customers need to take to find out where that line of code is that actually caused the problem," said Rebecca Segal, an analyst at Framingham, Mass.-based market research firm International Data Corp.

Segal added that while there are some software problem management systems, to her knowledge there are no software services already on the market similar to FASTService, which is available now on a per-bid basis, according to Hu.

David Paige, help desk coordinator at Children's Hospital in Boston, said that at present, most of the logging of software maintenance and services is done manually, leaving less free time for the service people to do other things.

"We'd be interested in anything that can correct a software problem as seamlessly as possible," Paige said.

Ed Orlando, a technical support specialist at Rochester, N.Y.-based Bausch & Lomb, Inc.'s applications software help division, agreed. "Right now, we use IBM's Infoman [software problem management system], which requires us to manually report each problem into the system. It would make life a lot easier if we had automatic logging," Orlando said.

Another aspect of FASTService that makes the product unlike the software problem management systems available on the market, Hu said, is its ability to automatically report problems to customer support when there are problems, for example. However, this is only possible if the system is on an IBM-based Netview network, Hu said.

FASTService is scheduled for availability in March 1991.

DB2

FROM PAGE 1

statements of direction for connecting DB2 to the Application System/400 and OS/2 database management systems.

Not all users are ready for distributed database management, but many are anticipating using it in the future.

"If it were available on Friday, we wouldn't know what to do with it," said Dan Kavanagh, senior vice-president of information systems at Metropolitan Life Insurance in New York. "But it is part of our architectural direction. As we start to implement [Systems Application Architecture] and cooperative processing, we're going to need to pull data from different files and bring that down to the workstation."

IBM has also apparently solved the problem of two-phase commit, an essential element of any truly distributed scheme, some sources said. Although it was unclear whether the feature would be in the next version of DB2, implementing two-phase commit would remove a big obstacle to distributed data management.

Two-phase commit handles an interruption or a problem during a database update from multiple locations by automatically rolling back the database to where it was before the update was attempted.

"IBM definitely has it," said Ali Hazzah, president of Safe Harbor, Inc. in Pelham, N.Y. "That's the good news. The bad news is that you won't need it, not at first, because the new version of DB2 will support only one update location. If you can only update from one place, you don't need two-phase commit."

In addition to the distributed features, the new release of DB2 will also sport more performance-oriented features, which include the following:

- Concurrent index recovery. This allows DB2 to manage and recover multiple indexes without having to stop and restart the application.
- Direct links into VS Cobol II applications.
- Faster and more efficient reorg and sort commands.
- An increase in the maximum possible number of concurrent users.
- Multiple image copies — the ability for DB2 to manage multiple copies of tables. This way, if a database administrator needs to make duplicate copies of something for security or other reasons, DB2 can deal with them.

Know your SQL

The new release of DB2 will be the first product to implement IBM's distributed database management scheme, which IBM is calling Distributed Relational Data Architecture (DRDA).

In essence, DRDA spells out how the DBMS will communicate among the System/370, AS/400, Personal System/2 and RISC System/6000 product lines. IBM published specifications for DRDA on June 26. The rest of the specifications will be available in the third quarter, said George Zagelow, manager of architecture standards at IBM's Santa Teresa Laboratory.

The goal of DRDA, Zagelow said, is "to allow users of SQL to take advantage of distribution with minimal changes to the SQL they know." This will allow programmers to write software on one machine that goes against databases in another machine without dealing with communications procedures.

DRDA will encompass the following points:

- **SQL functionality will increase in steps during the next few years and will eventually allow programmers to write applications that do not need to know where data is physically stored.**
- **IBM will at first allow distributed computers very limited update access into one DBMS. Over time, on-line access and updating by distributed computers to one or more DBMSs will be possible.**
- **Initially, DRDA will incorporate like-to-like distribution — from one DB2 database to another, for example. Eventually, all of IBM's strategic databases will be able to communicate with one another.**

JOHANNA AMBROSIO

IBM

FROM PAGE 1

information from and make information accessible to various administration applications.

- A user front end, consisting of a common set of definitions for icons, command actions and notification mechanisms through which the user or application can invoke various administrative applications and access administrative data through Systemsview.

Also defined will be a graphics-based workstation that will reportedly be able to do some administrative functions locally, as well as interact with host-based administrative applications via the user front end. The Netview graphics workstation introduction, also expected next month, will reportedly comply with this front end.

- New products to provide more effective management of software and hardware assets as well as overall management of production operation and scheduling.

A number of third-party vendors will add substance to Systemsview by announcing their intention to hook their systems, databases and storage administration software to IBM's framework, said Brian Jeffrey, managing director at Palo Alto, Calif., research firm International Technology Group. In addition, major local-area network vendors such as 3Com Corp., Novell, Inc. and Ungermann-Bass, Inc. will announce support "for that component of the architecture that runs down to LAN management," Jeffrey said.

Of major concern to users who do not happen to be "all-IBM shops," however, is whether Systemsview will attempt to keep them inside the traditional IBM straitjacket of a central, proprietary host architecture, according to John Payne, a telecommunications analyst at Charles Schwab & Co. Firms such as Schwab, which have a variety of workstations and hosts besides IBM's, "want to manage their [millions of instructions per second] across the enterprise" by providing peer-to-peer information exchange between systems, he said.

IBM, however, has yet to indicate whether or how it intends to set up such a bidirectional flow for Systemsview, said Payne, who attended an IBM briefing about the architecture last year. Indeed, few of IBM's rivals will "want to give away the family jewels" by feeding their administrative information to an IBM mainframe, he added.

IBM PLANS A slow rollout that will enable users and third parties to migrate gradually to Systemsview compliance.

IBM does "expect to distribute" the Systemsview architecture, as well as enable it to manage other vendors' host systems, Haile said.

IBM plans a slow rollout that will enable users and third parties — as well as its own Systems Application Architecture (SAA) systems — to migrate gradually to Systemsview compliance, Haile said. For example, existing IBM database products will slowly converge on the Systemsview data structure, Haile said. All IBM SAA systems, including OS/400 and OS/2, will eventually tie into Systemsview, he added.

The role of the IBM Repository in Systemsview has yet to be decided, Haile said.

Users try to catch the HP Wave

New Wave Computing plan puzzles users and challenges developers

BY J. A. SAVAGE
CW STAFF

BOSTON — Hewlett-Packard Co. tried hard to impart its strategy for the next decade at Interex, the annual HP users group meeting held last week in Boston. However, the strategy, New Wave Computing, escaped many users and had HP executives vowing to do a better job of marketing in the coming year.

HP may be having a tough time getting its ideas across to the Interex crowd, but the man usually credited for driving HP into reduced instruction set computing and open systems said HP will have an even tougher time pulling off the new products technically.

"It's a significant technical challenge," said Joel Birnbaum, vice-president and general manager of the firm's information architecture group. "There's a huge problem in decentralized networked systems in protecting security, recovering from errors and doing preventative and [on-line] maintenance." He said that the problems are becoming apparent, but there are no solutions yet.

While marketing New Wave Computing is a tricky path so far, marketing the concept will be easier than mastering the technology, Birnbaum said.

Officially, New Wave is defined as a group of products and methods that allow users to create networks for computers that work together. HP technology that helps create such networks includes object management for encapsulating specific applications to work across multivendor platforms and sharing CPU resources through HP's Network Computing System.

A sampling of users at Interex found that many customers have little understanding of the underlying products and technology.

"I understand the potential impact of New Wave, but I don't understand what it is," said Neil King, support services manager at Scott Paper Co. in Vancouver, B.C. "I want to go out and kick the tires, but I haven't seen any evidence of it to kick."

Mike Killoren, operations manager at Valley School Supply in Appleton, Wis., agreed: "I think they have a problem explaining it. Everyone talks about it, but no one knows what it is."

After attending an HP presentation intended to explain HP's "commitment to open systems" and describe New Wave Computing, Killoren said he still had little idea of the meaning of New Wave Computing.

The company will continue to hammer away at New Wave, vowed Bill Murphy, director of marketing in the networked systems sector. HP is basing its survival on open systems. Even its proprietary minicomputer operating system, MPE, will be opening up to allow Unix applications to run on it (see story below).

This is as much a financial gamble for HP as it is a technical one, according to Birnbaum.

"As you go to more open systems, open markets, the systems become more a commodity and the profit margin is lower," he said.

To counter the risk of opening up to standards, Birnbaum said, the best direction is for HP to become a "leading components supplier."

Unbundling anger

The attempt to wean users off HP's proprietary systems prompted vociferous complaints at the Interex user conference last week in Boston.

While boos and hisses greeted HP executives in a roundtable discussion on unbundling Turboimage database software from the operating system, users were not angry enough at the vendor to picket the closing session and walk out, as some had planned.

With obvious audience support, Fred White, a programmer at independent software vendor Adager in Sun Valley, Idaho, told HP executives that users felt betrayed by the decision to unbundle.

"Ever since 1976, HP always had given it as a freebie — not as a product, but part of the operating system," he said. According to White, HP refused to unbundle in the mid-1980s when the company wanted users to upgrade hardware. Because it was not offered separately from the operating system, users had to rewrite some applications for the database so it would run on new operating systems versions for the more powerful computers.

Software vendors such as Adager have developed their products to use Turboimage underneath. Now, if users want some third-party software, White said, they will have to buy Turboimage as well.

HP has said, however, that the price of the product will not reflect any increased cost in the entire package but will be sold separately. "Some customers want third-party database packages," said Rich Sevcik, general manager of HP's data management systems division. "We wanted to be more competitive in the emerging third-party marketplace."

Other user complaints echoed past roundtable discussions. Users grumbled about the lack of HP marketing savvy and the lack of technical and product sophistication on the part of HP's sales force. As in the past, HP executives replied: "We're working on it."

J.A. SAVAGE

HP to add Unix window to proprietary system

BY J. A. SAVAGE
CW STAFF

BOSTON — In another 18 months, Hewlett-Packard Co. users will not have to buy the company's Unix-based hardware to run Unix applications. The company's workhorse minicomputer, based on the proprietary MPE operating system developed 20 years ago, will have a Posix interface as a window to Unix, the company announced at the Interex users group meeting last week in Boston.

The addition of Posix (the common interface and the applications program interface) and other commercial standards such as the X Window System and the Open Software Foundation's Motif will allow users of HP's 3000 series to run Unix applications and proprietary applications simultaneously, according to Willem Roelandts, vice-president and general manager of HP's computer systems group. However, users will probably experience a degradation in the performance of Unix applications. "We're aiming at 10%," Roelandts said.

The concept of a dual operating system is attractive to Brent Sundberg, a systems developer at Quadax, Inc. in Cleveland. "We'd like to have the Unix market open to us," he said. With this option, Quadax, which supplies billing services for health organizations, would not have to purchase new hardware.

While admitting that a dual operating system is appealing, Tom Collins, manager of common support systems for keyboard maker Keytronic Corp. in Spokane, Wash., was skeptical about the portability of software. "They're assuming that software is really Posix-compliant. [Software developers] like to say it is, but that's not always true."

HP has not announced how the addition will be marketed — whether it will be part of new MPE operating systems releases or sold separately, Roelandts said.

Other announcements

Also announced at Interex was a midrange Unix-based computer. The HP 9000 Model 860S is aimed at commercial on-line transaction processing. It has the same CPU as the lower-end 855S, which runs about 22 million instructions per second but with larger and faster cache memory, and it offers a 30% increase in transactions per second, according to Roelandts.

HP also introduced a new storage product that combines a hard disk and an optical disc for Unix systems. The product is described as an optical-storage server with a total of 22G bytes of storage. The server, contained in two deskside boxes, uses software to shuttle data between the fast-response hard disk and the archival optical discs. Often-used data will stay on the hard disk, Roelandts said. "If you want a file a month later, though, it will take a minute to get it back," he said. The server will also work with Sun Microsystems, Inc.'s workstations

A software product for Unix computers, called Openspool/UX, was introduced. According to the company, it acts as a mainframe spooler for scheduling, executing and routing printer and plotter requests.

Openmail support extended to desktop Unix systems

BY JEAN S. BOZMAN
CW STAFF

SANTA CRUZ, Calif. — Hewlett-Packard Co. has extended support for its HP Openmail electronic mail system to The Santa Cruz Operation's Unix System V/386 operating system, the company said at last week's SCO conference.

Support for desktop Unix applications shipped by SCO means that HP Openmail can be sent across multiple Unix hardware platforms, including HP processors that run the HP/UX Unix system. SCO joined AT&T and Intel Corp. last week in an effort to standardize Unix on such varied platforms (see story page 7).

Openmail adheres to the X.400 international E-mail standard and transmits text, data and images, said Neil French, marketing manager for HP E-mail.

HP said last week's announcement means that users of the SCO Unix version of Openmail can communicate with Openmail users on HP computers, non-HP computers and independent mail services.

Openmail is priced at $2,395 for a single SCO server supporting 16 users. Support for an additional 16 users costs an additional $1,395. The product is scheduled for shipment next month.

Second-class postage paid at Framingham, Mass., and additional mailing offices.
Computerworld (ISSN 0010-4841) is published weekly, with a single combined issue for the last week in December and the first week in January by CW Publishing/Inc., 375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171.
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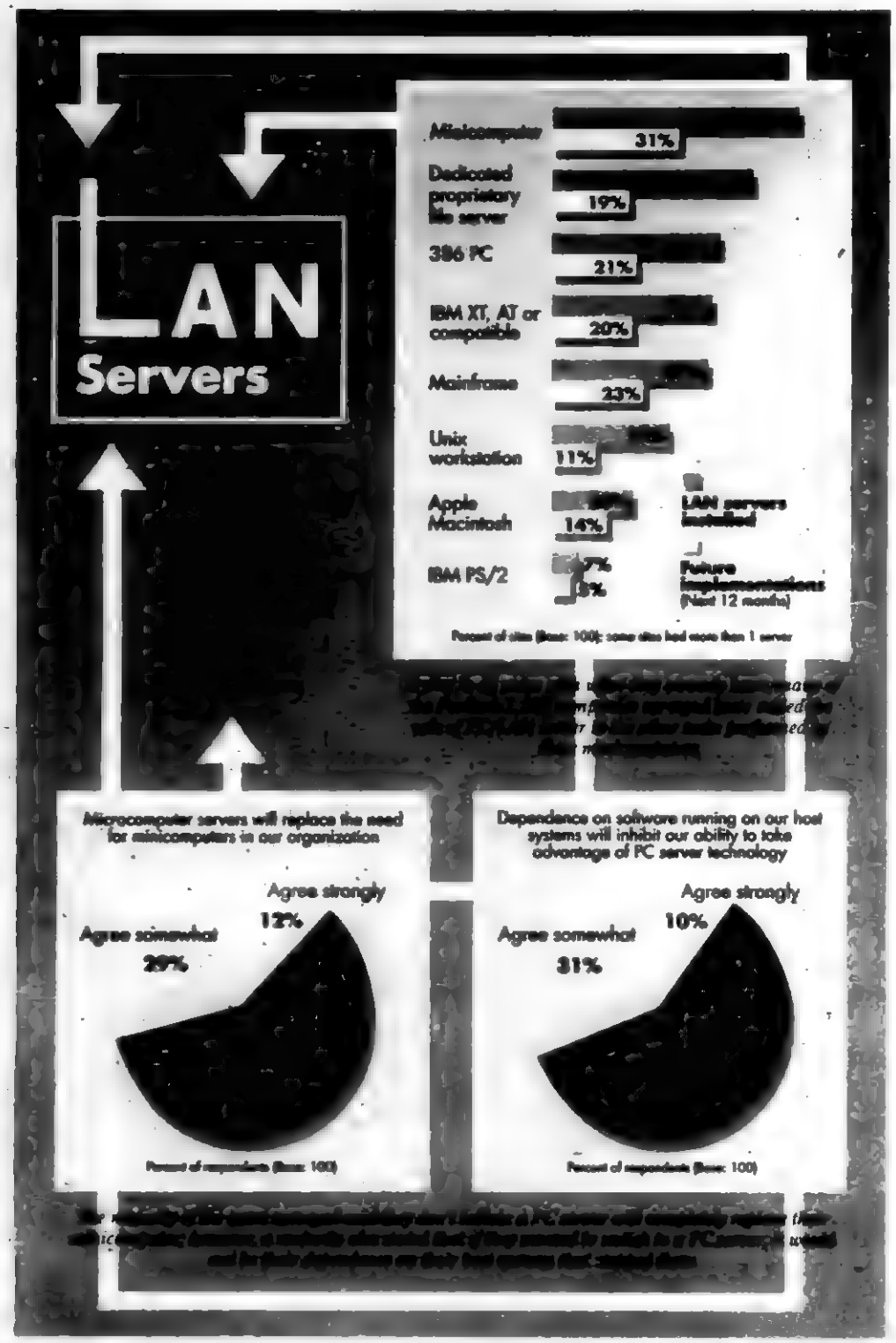

Source: Hartman Research Group, Newton, Mass

CW Chart: Doreen Dahle

NEXT WEEK

Motorola makes no bones about its strategy to become one of the world's best manufacturers, and that means heavy use of CIM and robotics in diverse business units. Manager's Journal looks at how **Margaret Eastwood**, corporate director of manufacturing systems, coordinates CIM and makes sure that the focus stays on business.

David Joel

IS professionals in some jobs are plucking compensation fruit much more than others. Top IS execs in wholesale and retail trade, meanwhile, seem to be on the heels of their colleagues in other industries. Take a look at *Computerworld's* annual salary survey for a wealth of information examining pay in nine industries and 14 regions.

INSIDE LINES

Mainframe checks out of Hyatt

Chicago-based Hyatt Hotels threw the switch last week and cut over from an IBM mainframe-based reservations system to a cluster of four Unix-based AT&T System 7000 parallel processors. In its first week of operation, the new reservations system was handling 8,000 reservations per day for 160 Hyatt hotels. The cutover followed several months of "stress-testing," according to sources at Informix Software, which supplied the database for the RISC-based processors.

Ready, willing and able

IBM's mighty marketing clout notwithstanding, sometimes it takes a disaster to bring in the customers. Such was the case with IBM's Business Recovery Services Center in Franklin Lakes, N.J., which opened in April 1989. The first customers to use its hot site facilities showed up only a couple of weeks ago, victims of Manhattan's week-long blackout. John Nevola, manager of the unit, said "We were starting to feel like the Maytag repairman for a while there. But we were ready when it happened." Three customers — a trading firm, a bank and an insurance company — used the center during the blackout.

MVS to finally peer up

Along with the 140-odd products that IBM is expected to bring out Sept. 5 will be the long-awaited Advanced Program-to-Program Communications server for MVS, which will finally allow mainframe applications to communicate as peers over an LU6.2 network. While a limited version of LU6.2 now exists for VTAM applications, the new server will take a lot of the communications grunt work off application developers' hands and will also form the basis for IBM's expected announcement of a peer-to-peer Netview link.

Not much tolerance left for this

File-server mirroring, the next incarnation of fault tolerance, could get a private showing at Networld in Dallas next month. Sources close to Novell say the Provo, Utah-based maker of network operating systems could debut its long-awaited System Fault Tolerance Level III to a select audience then.

Poison pen pals

A letter to select customers and analysts from Microsoft executive Peter Higgins was penned to "clear up some confusion" about the level of Windows 3.0 compatibility to be offered by Lotus' as yet unshipped 1-2-3 Release 1.3 spreadsheet. Higgins ticked off all the ways in which the Lotus product will not exploit Windows 3.0, suggesting 1-2-3 Release 1.3 will not use Windows' graphical user interface and that its use of memory limits worksheet size. Lotus fired back with a letter of its own, suggesting that Microsoft must be nervous because it "seems to be trying to confuse the issue as much as possible." Lotus stressed that 1.3 is a graphical spreadsheet and has a new virtual memory management system that lets users build larger worksheets, among other things.

Covering the Global a bit differently

While many companies have lately asked their employees to cut costs whenever possible, surely Cleveland-based Sherwin Williams Co. didn't expect employee Jim Dragel to bike to San Diego, where he is planning to attend the Global Software, Inc. user group conference. Dragel, an avid cyclist and manager of accounts for the paint company, headed out of Cleveland on Aug. 5 and was last spotted in Oklahoma, a Global spokesman said. He was due in San Diego this past Saturday.

Computerworld editors who received Serious Blackjack Tutor disks a couple of weeks back were thrilled, figuring to get some table time in prior to the next Las Vegas trip. But a week later came a message from Blachly Data Systems, the program's publisher, alerting users that the disk had been infected with the Stoned virus. Bill Blachly sent out 48 of the disks before the virus — which displays a pro-marijuana message — was discovered, he said. Pot and disk infections are contraband in this office, but information is not. Call in the legal hot goods to News Editor Pete Bartolik at (800) 343-6474, fax them to (508) 875-8931 or contact COMPUTERWORLD on MCI Mail.

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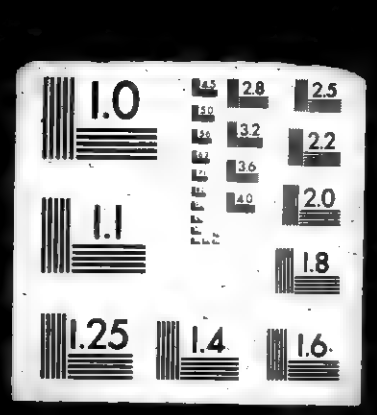
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VOL 24

ISS 36

SE 3 1990

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UNIVERSITY MICROFILMS INTERNATIONAL,
ANN ARBOR, MICHIGAN

THE NEWSWEEKLY OF INFORMATION SYSTEMS MANAGEMENT
September 3, 1990 · Vol. XXIV · No. 36 · 96 Pages · $2/Copy · $48/Year

COMPUTERWORLD

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VDT work breaks, ergonomic improvements would be required under a proposal aimed at San Francisco firms employing more than 15 people. Page 12.

When Douglas Aircraft's MD-11 jetliner rolls onto the tarmac, half the company's 1,400 IS staffers will either have been dismissed or reassigned. Page 10.

Off-season peak pushes airline reservation systems to the limit as travelers rush to beat deadlines for fall travel bargains. Page 91.

Inventor shakes Silicon Valley with news of microprocessor patent that could earn him big royalties, Page 4.

Military unit depends on decision support system to orchestrate Middle East airlift. Page 6.

SNA users buy into Token-Ring LANs in increasing numbers but struggle with enterprisewide connectivity issues. Page 8.

The software leasing market could be a lucrative niche for computer leasing companies. Page 65.

RISC benefits on PCs? Some vendors push add-in boards to provide the performance boost that engineering workstations claim. Page 37.

Lessors await Summit bounty

But bargain hunting and IBM Credit Corp. could dash dealers' hopes

BY NELL MARGOLIS
and ELLIS BOOKER
CW STAFF

When IBM announces Summit, its long-awaited next-generation mainframe, the news will send a shiver of joy through the computer leasing industry. At least, that is what leasing executives think.

Those executives said they expect a twofold harvest: a bumper crop of profits from leases of the new mainframes and the yield of a reinvigorated aftermarket as customers snap up the used systems that Summit supplants.

That aftermarket may not prove to be as lucrative as the lessors think, however, if leasing customers obtain the low-cost deals they anticipate from an increased supply of used equipment. In short, customers anticipate more deals at better prices as a bunch of bruised independent lessors vie for shares of the newly revved-up market (see story page 93).

The Summit debut, said Thomas Donovan, an analyst at Technology Investment Strategies Corp., will do nothing to alter most of the harsh realities that have wreaked havoc on the computer leasing industry.

"There will still be heavy competition, especially from ICC," he said (see story page 92). IBM's leasing subsidiary, IBM Credit Corp., dominates the leasing sector; estimates are that it writes 70% of all new leases of 3090s.

Continued on page 92

Thar's gold in them thar hills!

While Summit will likely push down prices of older equipment, high-end 3090s still command substantial value

3090 model	First shipped	Current list price	Fair market value (May 1990)
600E	Second quarter, 1987	$11,896,335	44%
600S	Fourth quarter, 1988	$13,482,325	55%
600J	Fourth quarter, 1989	$13,482,325	64%

Source: Technology Investment Strategies Corp. CW Chart: Paul Mack

Perspective

Times have changed since the 3090 rollout. Page 93.

Hard times hit DBMS companies

BY JEAN S. BOZMAN
CW STAFF

SAN FRANCISCO — The relational database management system industry, a bright spot amid the battered midrange and large-system market of recent years, is showing signs of fatigue. The primary vendors are scrambling to revise plans as profits fail to live up to expectations.

Vendors are quick to fault a slowing domestic economy, but on closer inspection, it appears that at least part of the relational mauling is self-inflicted. On top of their other troubles, RDBMS vendors seem to be scrambling for increasingly scarce new orders by using heavy discounting.

Chris Kenber, executive vice-president at Ingres Corp., confirmed the trend. "All of us are chasing quarterly sales targets, so you get extremely aggressive discounting on software products," said Kenber, who directs all marketing and sales activity for the company. "It rarely moves the customer decision, but it does create a new low standard of pricing."

It may also have severely damaged the financial reputation of Oracle Systems Corp., which had to restate quarterly revenue

Continued on page 91

Compatible LANs prove to be elusive

BY PATRICIA KEEFE
and JIM NASH
CW STAFF

Underwhelmed by incremental enhancements to local-area networking products, users want to know what the leaders in the personal computer network industry are doing to make their systems really work together.

Colleen Brisboe, a systems engineer at General Motors Corp.'s Electronic Data Systems subsidiary, said that is the one question she would ask Novell, Inc. and Microsoft Corp.

Brisboe is one of many network managers who are quickly growing impatient with simple linking of LANs and inferior third-party interoperability software. These managers want systems that allow users on one network to actually manage events on another company's network without having to learn all the intricacies of both.

Mike Butler, automation manager at Palm Beach International Airport in West Palm Beach, Fla., said his department has standardized on 3Com Corp.'s 3+Open operating system because it links the many proprietary airport systems and applications he must support.

Butler explained that he is unwilling to add any other operating systems, no matter what advantages they offer, because of the uncertainty and complexity

Continued on page 8

DOLLARS & CENTS

How your salary stacks up

Want to know who makes the most money in information systems? Which industries pay the best? In which cities your paycheck goes the furthest? Whose salaries have grown the most?

Computerworld's fourth annual salary survey tabulates the total compensation (salary plus bonuses) for a range of IS positions by company size, region and industry. Some revelations are:

- The difference in total compensation between IS executives in organizations with $50 million in annual revenue or assets and those with $500 million is more than $43,000.
- New York, Boston and Northern California are No. 1, 2 and 3, respectively, when it comes to paying their IS chiefs top dollar.
- After adjusting income for the cost of living, IS executives in New York come out ahead.
- Utilities firms making $500 million or more per year pay their IS executives more money than companies of comparable size in other industries (see chart at right).
- Information center managers' salaries have declined during the last four years, while chief information officer-level pay rose.

The survey results begin on page 57.

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16 I dream of **GENIE**: GE Information Services lowers the cost of its on-line services.

91 Flash flood: A tidal wave of penny-pinching air travelers washed up on the shores of harried travel agencies, who drew on extra CPU power to stay afloat.

Quotable

"I need a commitment in my hand by the end of this year that a solution will be found. I just want a plain business solution."

JOSE BORGES
SOUTHERN CALIFORNIA GAS

On the need for links between OS/2 and Novell networks. See story page 8.

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IN DEPTH

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Mail fraud! Cambridge, Mass.-based Forrester Research is warning users to stop buying electronic mail packages. Citing a study of 50 large corporations, Forrester claims that E-mail has failed to live up to expectations of customers, who'd rather use fax or voice mail. Companies have gotten duped into buying a tangle of incompatible E-mail systems that don't provide even basic communications among their users, with the net result that they 'are better off just using the telephone,' the research firm claims. It seems that poorly hatched buying plans have done what neither rain nor snow nor sleet nor gloom of night could.

Cindy Charles

Dreyer's Rodger Lindquist finds minicomputers a tasty alternative to the rocky road of mainframes. Page 29.

Michael Norton

A hot way to keep system costs in check. Page 63.

EXECUTIVE BRIEFING

■ **IBM users who lease mainframes** are looking forward to a bonanza of great deals on used 3090s after IBM's Summit announcement later this month. Meanwhile, computer lessors are looking to write plenty of business on the new high-ticket mainframes to shore up their battered profit margins. It will add up to a busy mainframe shopping season this fall, with IBM sales reps cutting deals to make year-end quotas — and new high-end entries from Amdahl and Hitachi Data Systems joining the fray. **Pages 1, 92 and 93.**

■ **Bechtel's veteran IS chief,** H. William Howard, is the new vice-president of information technologies at Inland Steel in Chicago. Howard had been with Bechtel for 17 years, including six years as head of IS. Bechtel, the San Francisco-based construction giant, has not yet named Howard's replacement. **Page 4.**

■ ***Computerworld's* fourth annual salary survey** reveals that large utilities pay the most to their IS executives. New York, Boston and Northern California are the highest paying areas for IS talent, and there is a large gap nationwide between salaries of IS personnel at large companies and small ones. **Page 57.**

■ **The massive U.S. military buildup in the Middle East** is being orchestrated by an extensive decision support system at Illinois-based Scott Air Force Base. A 50-member crisis action team monitors events on a classified local-area network, then uses the Digital Equipment Corp. VAX-based Global Decision Support System to schedule flights, cargo and drop-off points for 1,000 aircraft. **Page 6.**

■ **A discounting war** has apparently hit the RDBMS industry, as ever-aggressive rivals such as Oracle and Ingres have turned the heat up a notch. While analysts point to longer buying cycles, the downturn has wrought lower restated earnings at Oracle, layoffs at Sybase and other troubles for vendors. **Page 1.**

■ **Douglas Aircraft has slashed or reassigned half its IS work force,** more than 700 jobs, as part of a staff consolidation to focus on the forthcoming MD-11 commercial jet. The McDonnell Douglas unit will concentrate its efforts on factory-floor automation. **Page 10.**

■ **Mandated work breaks for VDT users** would be required under a law proposed by the county board in San Francisco. If passed, the bill would require VDT users to take 15-minute breaks every two hours. Local employers, including United Airlines and AT&T, have not responded formally, but they say they are concerned about the bill's implications for businesses. **Page 12.**

■ **Corning Asahi Video Products** won the Society of Manufacturing Engineers' award for the best use of CIM. Information technology at the firm's State College, Pa., plant preserved one of the last factories in the U.S. making glass for TV tubes. **Page 47.**

■ **On-site this week:** Written drivers' tests are a misnomer at the Milledgeville, Ga., Department of Public Safety. License applicants do not use pencils; they take the test on terminals linked to a Bull HN LAN. The electronic system processes more applicants and tabulates results faster than a manual one. **Page 38.** Dreyer's Grand Ice Cream in Lafayette, Calif., runs its business coolly and smoothly on HP minicomputers. Eschewing mainframes at a $300 million company was unthinkable 10 years ago, but Dreyer's likes the flexibility and lower costs of the minicomputers — and says it sees plenty of upgrade room in the HP family for the future. **Page 29.** Chicago real estate firm LaSalle Partners is also forsaking the mainframe path and moving applications from a 4341 to PC LANs. **Page 41.**

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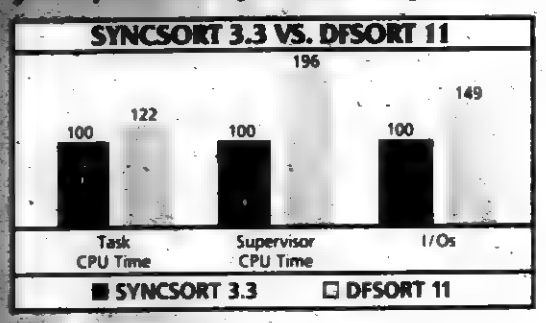

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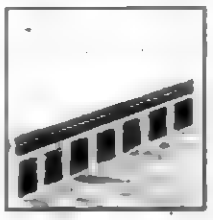
Micro chip patent rewrites history

BY MAURA J. HARRINGTON
CW STAFF

A California engineer staked claim last week to inventing the single-chip microcomputer. But although a patent granted in July was first claimed in 1970 and predates all other microcomputer patents, the stir it made in Silicon Valley is unlikely to be felt soon — if ever — by computer users, observers said.



Gilbert Hyatt claimed that the impact of his patent is broad and covers anything that includes a CPU and an input/output device.

However, analysts and patent lawyers agreed that the short-term impact on end users is virtually nil and that red tape in the U.S. Patent Office and court system could tie up the case for years before anything comes of Hyatt's 20-year-old invention.

Hyatt indicated that he would be attempting to gain royalty payments from semiconductor vendors that he said infringe on his patent. "I don't think there's going to be litigation with any other vendors regarding this patent, because the patent is very broad and very strong, and we're ready to go into negotiations with a major electronics corporation on a joint venture for this," he said.

Hyatt received a patent numbered 4,942,516 on July 17, 1990, for his "computer on a chip" — a microcomputer having a CPU, operand memory and read-only memory on one integrated circuit chip. The claim was filed in December 1970 for work dating back to 1968.

"If the patent was valid and infringed and asserted, it could affect all microprocessors made or developed since the patent was filed," said attorney Gary Hecker, a partner at Los Angeles-based Hecker & Harriman who specializes in patent protection cases of computer hardware and software.

Though he is not directly involved in the Hyatt case, Hecker said that because of the complexity of the case, it is unlikely that end users or chip vendors will be affected by the patent in the near future.

Hyatt *expects no royalty troubles*

"This was an extraordinary, lengthy and exhausted patent process," Hecker said. "Typically, a filing process would be from two to five years, not 20. So the interpretation, scope and validity of those claims can't be assessed until this lengthy file can be examined, which I guess will begin fairly soon and last up to several years."

However, analyst Andrew Seybold in Santa Clara, Calif., and publisher of "The Outlook On Professional Computing," said that even if Hyatt were to receive modest royalties from chip manufacturers, that "would make him a very wealthy man."

While Hyatt said he will have minimal trouble in collecting what he feels are moderate and fair royalties, some analysts disagreed. "Pennies per chip has virtually no impact on the end user, but if I were any of these companies, I'd look at this carefully, and if I thought it was unfair — no matter how small the fee — I'd pursue legal action," Seybold said.

Microcomputer chip manufacturers, most of whom admitted to being taken by surprise by Hyatt's patent award, reacted with caution, saying their lawyers were studying the patents.

Bechtel IS chief leaves for Inland Steel

BY JAMES DALY
CW STAFF

SAN FRANCISCO — H. William Howard, vice-president of information technology at the Bechtel Group, Inc., has packed his bag and headed east to assume the position of vice-president of information technologies at Inland Steel Industries, Inc. in Chicago.

"It's time for new challenges," said Howard, who spent six of his 17 years at Bechtel as head of its IS department. "It's a very good opportunity to do some interesting and different things."

No replacement in Bechtel's systems group has yet been chosen for Howard, who assumed his new position at Inland on Sept. 1.

At Inland, Howard will report to Frank W. Luerssen, chairman and chief executive officer of the $4.2 billion firm, and assume responsibility for the corporatewide information technology needs of the company's 20,000 employees.

"IT'S A very good opportunity to do some interesting and different things."

H. WILLIAM HOWARD
INLAND STEEL

Howard, 55, worked his way up the corporate IS ladder at Bechtel. He started as assistant to the general manager in 1984 and held positions in all facets of the IS organization, including programming, communications, project management, operations and user support.

Before joining Bechtel, Howard held managerial roles at Memorex Corp. and Systems Industries, Inc. and had earlier positions at IBM and Rogers Engineering Co.

He is a 1956 graduate of Princeton University and a 1962 graduate of Stanford University's Graduate School of Business.

CORRECTIONS

U.S. District Judge Vaughn Walker did not grant a continuance in the Apple Computer, Inc. copyright suit against Microsoft Corp. and Hewlett-Packard Co. (CW, Aug. 27). A ruling in the case is expected in the near future.

The description of the author of the Aug. 20 Marketplace column was incorrect. The author, James R. Taylor, is vice-president and manager of the User Liaison Group at Sanwa Bank of California.

In the Aug. 20 issue, the product listing in the Systems and Software section for Data Summary, Inc. included an incomplete phone number. The correct number is (708) 795-0606.

A mainframe data center automation offering from Boole & Babbage, Inc. called Auto Operator, was omitted from the Aug. 27 Product Spotlight chart on console automation. Auto Operator is a family of products. The base product supports IBM's MVS and DB2. Options are also available for IMS, CICS and Netview. The price range is $22,500 to $80,000.

Microsoft starts help group for systems installer needs

BY JAMES DALY
CW STAFF

REDMOND, Wash. — Microsoft Corp. extended a helping hand to befuddled systems installers last week with the announcement of the birth of an international consulting group aimed at helping large corporate customers construct complex information systems.

Additionally, the company continued on its bent to provide support options for OS/2 with the introduction of On Call for OS/2, a phone-in technical support service for users of the system.

Microsoft officials said the Information Technology Integration Services group will use a multipronged approach that includes executive education, planning, design, custom application development and on-site systems support.

ITIS will be headed by Robert L. McDowell, formerly a partner and national director of strategic business systems at Ernst and Young.

"Customers need more than just a collection of products," McDowell said, adding that ITIS also intends to augment its initial offerings by partnering with a few large systems integrators.

Microsoft Chairman Bill Gates called ITIS "a natural extension" of the firm's expansive computing and connectivity offerings.

Although OEMs will continue to serve on the front line of OS/2 support, the On Call for OS/2 program will offer supplemental assistance for all OEM releases of OS/2, starting with Version 1.2.

However, customers may want to keep an egg timer handy when making a call: The cost of the service, which is available 8 a.m. to 5 p.m. Monday through Friday, will run $2 per minute. The On Call for OS/2 phone number is (900) 896-9600.

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STANDARDS	ANSI SQL	✓	✓
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NEWS SHORTS

Poor sales drive down HP prices

Two weeks after Hewlett-Packard Co. reported a quarterly decrease in profits that industry analysts blamed in part on poor personal computer sales, the vendor dropped its PC prices by as much as 24%. This is the second reduction in as many months on two of HP's Vectra computers — the 286/12 and QS/16S — which were reduced by $400 on Aug. 1. The new price cuts affect 11 models and range from $300 to $4,600. According to the investment firm Shearson Lehman Hutton, Inc., HP's PC orders have fallen "significantly" within the past year, particularly in the U.S.

Killer tornadoes miss data centers

The killer tornadoes that ripped through northeastern Illinois last Tuesday did not harm any data centers, according to disaster-recovery vendors. Neither Rosemont, Ill.-based Comdisco Disaster Recovery Services, Inc. nor Wayne, Pa.-based Sungard Recovery Services, Inc. received alerts or disaster declarations as a result of the storms, which claimed more than 24 lives.

VM gets LU6.2 support

Hoping to double its market by tapping the 8,000 or so VM sites in the nation looking for remote-to-host and host-to-host networking, Spectrum Concepts, Inc. last week announced a version of its Advanced Program-to-Program Communications/LU6.2 tool for IBM VM environments. Since 1987, Spectrum has marketed MVS and PC-DOS implementations of the communications software. The newest product is, called XCOM 6.2 VM.

First Fidelity signs EDS

With its eye on reduced costs and a chance to move its applications to a single platform, First Fidelity Bancorp. in Lawrenceville, N.J., signed a 10-year contract last week to have Electronic Data Systems Corp. manage its data centers. Under the agreement, EDS will consolidate the bank holding company's data center operations at a single site, offer jobs to current First Fidelity data center personnel and, during the next 18 months, convert First Fidelity's applications systems on a unified platform. However, the bank, which has $29.8 billion in assets and offices in New Jersey and Pennsylvania, will continue direct management of applications systems maintenance and development.

Trade panel: Dumping hurts U.S.

The seven small U.S.-based makers of flat-panel display technology that accused major Japanese manufacturers last July of dumping similar screens on the U.S. market finally found a sympathetic ear in Washington, D.C. The International Trade Commission issued a unanimous ruling last week that the domestic market is being injured at the hands of the 12 named overseas suppliers, which include such companies as Hitachi Ltd., Sharp Corp. and Seiko Epson Corp. Action is currently being taken by the U.S. Department of Commerce; its ongoing investigation is expected to yield a ruling before the end of this year.

Notebook PC from Zeos

Zeos International Ltd., a 9-year-old PC manufacturer based in St. Paul, Minn., introduced its first lightweight PC last week. Based on Intel Corp.'s 80286 microprocessor, the Zeos Notebook computer weighs just under 7 pounds and costs $1,995 for 1M byte of memory, an IBM Video Graphics Array backlit display, a 20M-byte hard disk drive, a 1.44M-byte floppy drive and an 82-key keyboard, a spokesman for the company said. Features include a two-hour battery life and a one-hour "quick charge" recharging time. The battery can also be "trickle-charged" if the PC is plugged in while in use. The Zeos Notebook computer is due out by mid-September and is available directly to end users, the company said.

More news briefs on page 91

Desert airlift computer-aided

BY GARY H. ANTHES
CW STAFF

SCOTT AIR FORCE BASE, Ill. — The U.S. Air Force is using a new computer system to orchestrate the mammoth airlift that has sent 1,150 flights and 75 million pounds of cargo to the Middle East in three weeks.

Within hours of President Bush's order to send forces to stand against Iraq's incursion into Kuwait and potential threat to Saudi Arabia, the Military Airlift Command (MAC) established a crisis action team, now a 50-person group holed up in a special command center here.

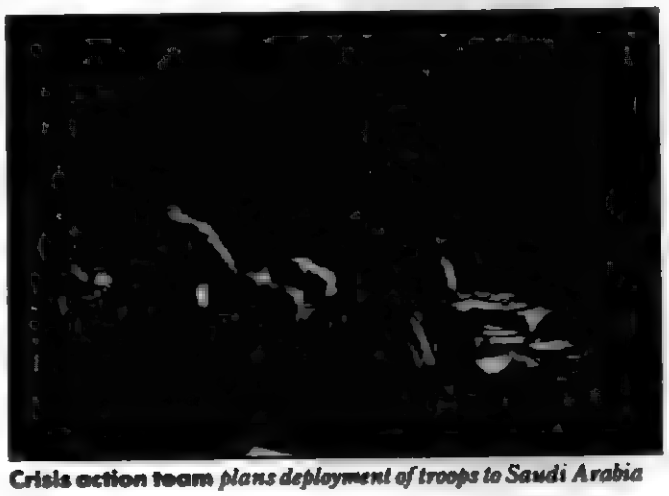
The team is using a host of computer tools to plan and monitor the round-the-clock deployment of U.S. troops and goods to Saudi Arabia.

The crisis action team activated an emergency module of MAC's Global Decision Support System (GDSS), a distributed system for planning and monitoring military air shipments.

GDSS provides decision support to military officers responding to external events and requests; it schedules and plans the resulting flights; and it monitors the execution of those plans by Air Force commands around the world.

"GDSS is based on a philosophy of centralized control and decentralized execution," said Maj. Michael McDermid, a MAC officer involved in developing the system.

The crisis team uses a classified local-area network to monitor events in the Middle East and track MAC aircraft. The LAN has gateways into global networks managed by the Defense Communications Agency, linking the command center to most military installations worldwide.



Crisis action team *plans deployment of troops to Saudi Arabia*

Using the special software module, the team combines information from the Middle East, deployment plans from the U.S. Central Command, requests from operational commanders and aircraft status information from the GDSS database and issues general directives — for example, "Send five C-141 transport planes from point A to point B on Sept. 3."

Those directives flow to the heart of GDSS, an unclassified system that puts together schedules and detailed flight plans and monitors their execution in near real-time. GDSS assigns planes from an inventory of 1,000 aircraft, specifies routes, plans en-route stops and aerial refuelings and specifies cargo pickups and drops.

"If we didn't have GDSS, we couldn't do command and control [procedures]," McDermid said flatly. "We could never go back to a manual system."

Although GDSS is being used much as it existed before the Persian Gulf emergency, some software modifications have been made. Access to GDSS data, normally available to MAC personnel only, has been extended to a few military commands elsewhere, McDermid said. Such access is read-only, and MAC has taken pains to establish hardware and software "guards" to prevent access to GDSS by other users on the military networks to which it attaches.

The GDSS databases reside on Digital Equipment Corp. VAX computers at MAC headquarters and at six other Air Force installations, five in the U.S. and one in West Germany.

The large VAXs are backed up by arrays of Microvaxes, which are connected along with smart and dumb terminals in Ethernet-based local-area networks at each location. The seven GDSS sites are linked in a Decnet-based wide-area network via leased lines.

For added survivability, MAC maintains an alternate data path over a subnet of the Transmission Control Protocol/Internet Protocol-based Defense Data Network. Terminals with access to the classified network are diskless to simplify security concerns.

Reserve call-up has little impact on IS

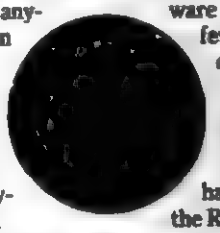
BY MAURA J. HARRINGTON
CW STAFF

As U.S. National Guard and Reserve units begin mobilizing for Middle East duty, some information systems managers in the U.S. do not expect much impact on their own staffs.

"Personally, I'm concerned about us being over there. But we don't have anyone in our area that is in the Reserves right now," said Steve Shinsato, director of MIS at Van De Kamps, Inc. in Los Angeles.

"If I did have people [enlisted], I wouldn't have any problem with encouraging them to go and supporting them if they did," Shinsato added.

"I don't think there is anyone in our division that is within the draft age, so I don't think we will be affected," said Willie Williams, supervisor of computer operations at Control Data Corp. in Torrance, Calif., who served in the U.S. Army in Germany between 1960 and 1962. He added that he would support anyone willing to serve in the Middle East.



At the Atlanta office of Sears, Roebuck and Co., the office manager for the IS division said no employees have been affected.

"I've thought about the situation, and certainly we'd hold their job for as long as we could if anyone did serve, but virtually there is no one in that situation in our office," said Christine Young, a Sears office manager.

Meanwhile, industry vendors such as Xerox Corp., based in Stamford, Conn., and Nynex Corp. in White Plains, N.Y., among others, have enhanced their policies for employees involved in the crisis.

At Dun & Bradstreet Software Services in Atlanta, fewer than 1% of the company's employees would be affected by a call, a spokesman said.

IBM said that it has had some employees in the Reserves leave to serve in the Middle East. Last year, IBM reported that 1,263 employees received military leave to serve in the Reserves.

IBM and other industry vendors have agreed to pay the difference between any employee's paycheck and military pay for up to 120 days.

The Problem With Buying Software From A Hardware Company

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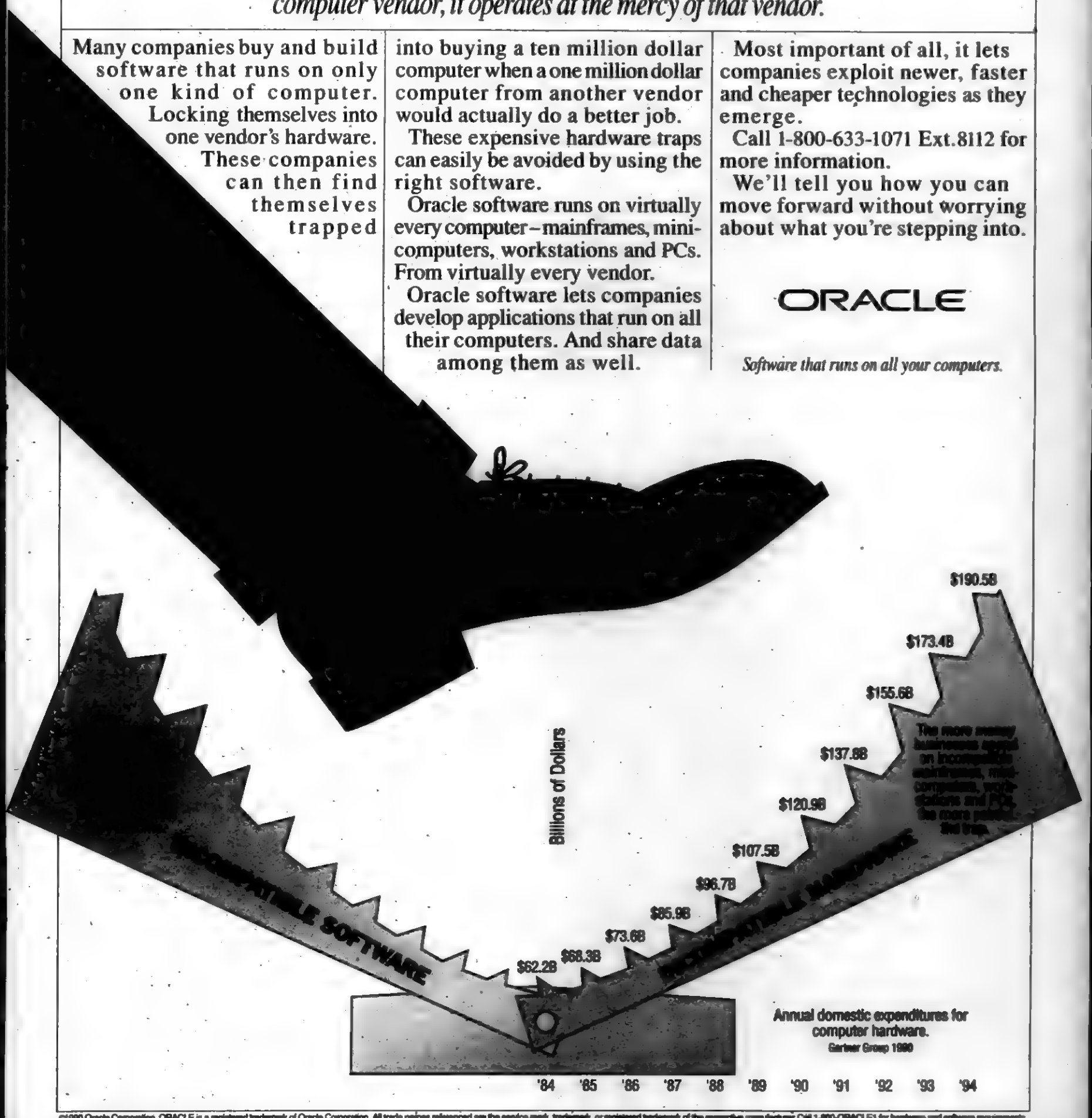

Annual domestic expenditures for computer hardware.
Gartner Group 1990

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Figuring out Token-Ring SNA

BY ELISABETH HORWITT
CW STAFF

As corporate IBM Token-Ring installations finally approach critical mass, information systems managers face the same corporatewide interconnectivity issues their Ethernet brethren began tackling several years back — but with a wicked SNA twist.

Approximately 25% of all IBM Systems Network Architecture (SNA) mainframe installations now also have IBM Token-Rings, according to Focus Research (see chart). An increasing number of Fortune 500 companies are moving past the initial implementation of a few isolated Token-Rings to "interconnecting and forming a big network and moving all of your traffic over it," said Robin Layland, an engineering consultant at The Travelers Corp. "People with Ethernet have already done bridges; now Token-Ring and SNA are getting into the act."

"The million-dollar question" is how to come up with a common networking architecture that allows local-area network users to access corporatewide computing resources, whether the computer is a personal computer server on a LAN or an IBM host, according to John Payne, a telecommunications analyst at Charles Schwab & Co.

In their quest for answers to this question, Token-Ring SNA shops are meeting with difficulties that Ethernet managers never had to lose sleep over. "Oh, what a tangled web we weave," one frustrated communications manager moaned.

The major advantage Ethernet installations have over IBM Token-Ring shops is that most major PCs and non-IBM hosts can now be linked over the same Ethernet LANs, using common communications protocols such as Transmission Control Protocol/Internet Protocol (TCP/IP), Netbios and Digital Equipment Corp.'s Decnet.

Grasping the Token

Token-Ring sites with SNA constitute almost 25% of all SNA mainframe sites in the U.S. and Canada

	Number of sites
IBM mainframe	10,000
IBM mainframe with SNA	5,069
IBM mainframe with IBM Token-Ring	1,871
IBM mainframe with SNA and Token-Ring	1,334

Source: Focus Research Systems, Inc.
CW Chart: Marie Hames

In contrast, IBM hosts tend to be enthroned in the center of a hierarchical network, speaking an SNA language that has somehow never caught on in the LAN world, according to Layland. "IBM blew it way back when they made Netbios the LAN protocol," Layland said.

Indeed, Travelers recently abandoned its idea of using IBM front ends to link LANs to one another because that would force LAN users to stick with the SNA protocol, Layland said. "Suppose someone comes out with the greatest insurance application that happens to use Netbios or TCP/IP?"

IBM "recognizes the requirement" of interconnecting LANs to LANs and hosts using the same communications platform, according to vendor spokesman Frank Whitten.

Travelers is seriously evaluating the idea of connecting its LANs via Network Equipment Technologies, Inc. T1 switches equipped with Cisco Systems, Inc. router cards.

Each host would be attached to one LAN via a front end so that users on one LAN could access hosts in the same way they would access any remote LAN resource — via the router connection.

Other companies said they feel the need to formulate an overall connectivity strategy before they start evaluating particular products. Schwab has some Token-Ring sites now and is considering a much broader rollout that would be part of a broader strategy for "collaborative processing and cooperative work group computing," Payne said.

Allied Signal, Inc. is in the process of moving business applications off a mixed bag of minicomputers to either IBM mainframes or Token-Rings. However, the firm is not yet sure exactly how it will connect its LANs and IBM hosts, according to Allied technical consultant Alan Manley.

In particular, the Morristown, N.J., manufacturer is struggling with how to interconnect remote LAN sites both with one another and with an IBM mainframe "in the center of the U.S." that acts as an electronic mail center running IBM's Professional Office System, Manley said.

Senior Writer Joanie Wexler contributed to this report.

LANs

FROM PAGE 1

they would add to his networks.

But for market leader Novell, working hand-in-hand toward interoperability with some network vendors may not be attractive, given the efforts and intentions of other vendors to crack Novell's viselike grip on the network operating system market.

Novell's newest competitor, Microsoft, is in the process of hiring 500 new employees to help it tackle the LAN market — which is, for all intents and purposes, Novell. Thus, Novell must weigh the risks of participating in a technology exchange that would inevitably offer Microsoft a leg up in the name of interoperability.

Novell, which has sewn up roughly 65% of the PC networking installed base with its Netware line, has pledged to interoperate with other network operating systems. However, some claimed that it has not delivered on the PC network level and has begun to backtrack on previous statements.

Jamie Lewis, an analyst at Clarke Burton Corp. in Salt Lake City and a former Novell employee, said Novell has reneged on statements that it would write the Netbios user interface into its protocol stack as it did with Appletalk, for example.

"We work through [IBM's] bridges, we work through its Token-Ring," said Darrell Miller, executive vice-president for marketing and services at Novell. Miller said interoperability with Apple Computer, Inc. and Unix remain higher priorities for Novell than working directly with Microsoft.

However, that strategy carries the risk of alienating Novell users who are migrating to OS/2 and finding development difficult. Jose Borges, a business systems analyst at Southern California Gas Co., said Novell's inability to run IBM Netbios-based applications may force him to switch to an OS/2-based LAN Manager system in order to develop in-house applications.

Microsoft's Mike Murray, manager of network products, said the choice of working toward greater network interoperability belongs to Novell Chief Executive Officer Ray Noorda.

"If I were Ray Noorda, I'd be wrestling with that very issue," Murray said. "I think it makes good sense for users to know that Novell and Microsoft are working together to achieve interoperability, and we'd like to see that happen."

"Balderdash," responded Kanwal Rekhi, Novell's executive vice-president of product development. Rekhi and Noorda have both said cooperation between the two companies could begin if Microsoft would settle a $500,000 contract dispute that has remained unresolved since Novell acquired Excelan, Inc., which had been developing some code for LAN Manager.

Microsoft, whose LAN Manager has captured about 10% of the market, is reworking the product to make it more of a standard core system on which OEMs can build their own networks.

On another front, 3Com, which has realigned its 3+Open line to tackle networking interoperability directly, introduced a server last week that runs on both 3+Open and Netware (see story at left). However, that server cannot fully integrate DOS and OS/2 environments, and users still must know some aspects of Netware.

Brisboe, who has yet to use 3Com's new server, said, "I've worked on 3Com, Novell, AT&T and Banyan networks — installing, configuring and maintaining them — and it's a struggle with all of them. But connecting any two together? I don't see that at all."

Hub hookup

3Com announced an alliance with Synoptics Communications, Inc. last week that will allow each company a toehold in their respective product lines. 3Com also announced an 80486-based server as well as the capability to run its 3Server systems on Novell, Inc. networks.

The agreement between 3Com, based in Santa Clara, Calif., and Synoptics, located in Mountain View, Calif., will have 3Com reselling Synoptics' System 3000 Ethernet intelligent wiring hubs. The System 3000 will also become an option on 3Com's network management system. Synoptics will use 3Com's managed adapter cards in its own management system. The deal offers each greater market visibility.

Also last week, 3Com announced software drivers for its 3Server/500 and new 3Server/600 machines that will support Novell's Netware. Combined with 3Com's 3+Open Connection for Netware, the enhancements allow systems managers some management functions across their networks. The drivers are scheduled for delivery in the first quarter of 1991. No price has been announced.

Mary Lenahan, a marketing engineer at 3Com, said the DOS-based system was limited to handling "a subset" of OS/2 capabilities. Also, she explained, 3+Open users would need to know some Netware commands.

JIM NASH

Incompatibility hinders gas company

BY JIM NASH
CW STAFF

Incompatibility between Novell, Inc.'s Requester for OS/2 and IBM's OS/2 Extended Edition has stymied software development at a Southern California utilities company.

Jose Borges, a business systems analyst for Southern California Gas Co., has 1,200 workstations operating on 15 networks, six of which are DOS-based.

Borges said he cannot access two key applications on IBM's OS/2 product through Requester for OS/2 and will switch to a version of Microsoft Corp.'s LAN Manager if compatibility cannot be established.

Southern California Gas is developing a mainframe distributed processing program that requires Database Manager and Communications Manager. Bob Holmes, a computer analyst at the gas company, said workstations currently running Requester for OS/2 Version 1.2 will not support IBM Netbios-based applications on that particular workstation.

For example, Holmes said, if a manager is running IBM 3270 emulation through a Systems Network Architecture gateway on the network, emulation will not work on workstations running Requester. "That's because Communications Manager is required to run the emulation application, and that application uses IBM Netbios," he said.

Bob Young, product line manager for Novell Netware clients, acknowledged problems, saying that despite initial product statements that said Requester would support all Netbios applications, there were limitations. However, he said, the applications could not be transported between networks.

Borges said he did not know about transporting applications over internetworks. "My applications are due in June 1991," he said. "I need a commitment in my hand by the end of this year that a solution will be found. I want a plain business solution."

New Twist On An Old Problem

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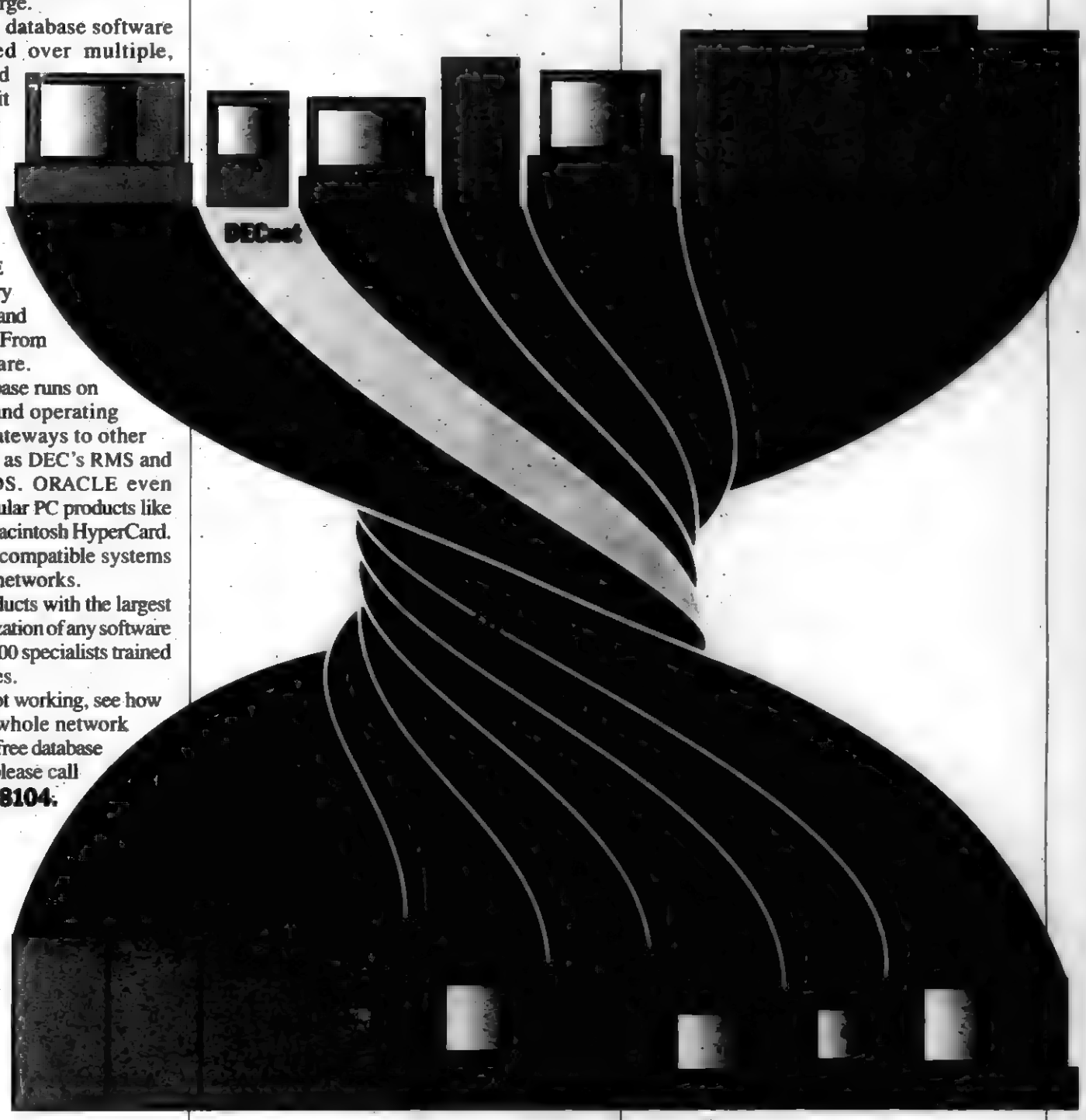

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Douglas Aircraft IS reconditioned

BY JEAN S. BOZMAN
CW STAFF

LONG BEACH, Calif. — There is a tremendous push at Douglas Aircraft Co. to get the new MD-11 commercial jet out the hangar door this fall. But nearly half of Douglas' information systems staff will not be standing at the hangar to see the jumbo jet take off from Long Beach airport. About 700 of 1,400 IS staff members have been laid off or reassigned to a division that decides whether to automate certain factory "processes."

With orders pouring in, the MD-11 jet, a replacement for the DC-10, is seen as the return ticket to profitability at the $4.7 billion commercial aircraft division of $14.5 billion McDonnell Douglas Corp. But IS support for the MD-11 engineering and development projects is being dismantled in favor of factory-floor support and construction of the planes.

"We wanted to create an organization that looked at process prior to anyone automating it," said Pauline Nornholm, general manager at Douglas' Automated Systems Center, who heads up IS at Douglas.

Since February, there have been three IS reorganizations — including one in April and another in July. Only 710 of 1,400 IS staffers are still working in data processing, a reduction from 1,089 last spring, Nornholm said.

During the next few months, most of the remaining IS staffers will be brought to a central location here. This move will rein in scores of programmers and analysts who have been working at 28 buildings scattered throughout Orange County. "We're going to move 600 people into a central location, and we will make that happen by the end of 1990," Nornholm said.

The IS recentralization is seen as a logical answer to long-standing problems at Douglas. "My end users, my customers, are 12 miles away in the main plant," said one senior IS manager, who did not wish to be identified. "How am I supposed to give them good support when I'm working all the way over here?"

The automation effort is part of the firm's Total Quality Management System, which top executives view as a weapon in McDonnell Douglas' battle with Europe's Airbus Industrie for second place against Seattle-based Boeing Corp.

"The reality is that most of the military contractors are marginally profitable," said Wolfgang Demisch, director of research at UBS Phillips & Drew in New York. "If they're continuously on the lookout for what they can save through personnel reductions, they're making themselves less attractive as a place to have a career of any type, including data processing."

Wean from E-mail

By recentralizing the staff, Nornholm hopes to reduce dependence on electronic mail systems within the company. Douglas Aircraft shut off its IBM Professional Office System (Profs) in mid-July, leaving more than 22,000 users without access to a companywide E-mail system [CW, July 16]. Removing the resource-hungry Profs system will allow Douglas to remove one or more IBM mainframes, Nornholm said, saving hundreds of thousands of dollars.

Even though no formal replacement for Profs has surfaced, users are patching together alternative E-mail systems, Douglas IS staff members reported. "We have many smaller systems, including Ethernet, Decmail, HP Desk, Microsoft Mail and others," one senior manager said. The replacement E-mail network should be in place by year's end, the manager said.

Users said they remain worried about the quick succession of layoffs, cutbacks and changes in the organization. "There's an uneasiness in the air," one senior systems analyst said. "You never know what's around the corner, and who's going to be the next one fired."

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San Francisco considers VDT employee safety legislation

BY J. A. SAVAGE
CW STAFF

SAN FRANCISCO — The county Board of Supervisors is considering a comprehensive measure that would establish VDT work conditions at companies of more than 15 employees.

Frustrated by the lack of protective action for users of VDTs from the California Occupational Health and Safety Administration (Cal-OSHA) and the state legislature, nine of the 11 officials on the board have expressed support for the VDT worker safety ordinance.

Local businesses have yet to organize any opposition to the bill, although several contacted last week expressed their concern. The ordinance would apply to workers who spend more than half their workday at terminals and would require employers to provide 15-minute work breaks every two hours and antiglare screens on request and specify nonglare lighting and light intensity.

The following other provisions would:

- Mandate adjustable chairs and desks and set a minimum standard for the thickness of chair upholstery.
- Minimize noise from impact printers.
- Require a minimum distance of five feet between a worker and the back of a terminal to minimize exposure to magnetic fields.
- Ask the director of public health to report to the county on studies of health effects from electromagnetic radiation.

The ordinance exceeds requirements in 1988 legislation for Suffolk County, N.Y., which was overturned by a state supreme court late last year and is on appeal. That court ruled that the state preempts the county in worker protection. The judge's opinion stated, however, that his decision "in no way" meant that workers were adequately protected.

"We have a different constellation of factors in California," said Laura Stock, associate director of the Labor Occupational Health Program at the University of California at Berkeley. "People have been trying for years to get the state legislature and Cal-OSHA to institute regulations without any luck. Without those regulations, people are still working in poor conditions."

The bill's supporters said they expect intense lobbying against it, but it is too new for companies and organizations to have formal positions. United Airlines, which employs more than 600 people in its San Francisco reservations office, is having its legal department review it. "We are concerned," a spokeswoman said.

AT&T does not yet have a formal position on the San Francisco ordinance but took a position against a similar proposal late last year in a neighboring California county. In a letter to county supervisors, AT&T stated, "A plethora of local, state and federal regulations on VDT use would make it extremely difficult and burdensome for an interstate company like AT&T to comply with them." The measure was not adopted.

Sue Lee, director of the Small Business Advisory Commission in San Francisco, said her organization has yet to take a formal stance, but she said, "Business folks don't like to be told what to do, no matter how serious the problem, or how much they want to do what's right."

Some firms are taking it in stride. A spokesman for Pacific Bell, which has over 45,000 VDT workers in the state, said that the ordinance would probably have little effect on the company. Pacific Bell announced in July that it was undertaking an $8 million ergonomic redesign "to improve working conditions," he said.

The ordinance will be considered Sept. 18 in the City Services Committee (San Francisco city and county share jurisdictions) and will likely be heard by the board of supervisors by early next month.

Apple readies low-end intros

BY JAMES DALY
CW STAFF

CUPERTINO, Calif. — Apple Computer, Inc. users will get what they've long been hollering for next month when the company announces a trio of low-cost machines that analysts said could help Apple regain some of the ground it has lost to makers of inexpensive IBM Personal Computer clones.

Six weeks before the scheduled Oct. 15 arrival date, however, there are already reports of a possible glitch in the delivery schedule: A much anticipated low-end color model is not expected to arrive until early next year, which would eliminate it from the Christmas sales rush and potentially stifle the excitement that is typically generated by new product introductions.

While most observers praised Apple's intention, some analysts said the low-end introductions will not go far enough. "They'll make Apple customers today remain Apple customers tomorrow, but I don't think they'll bring in new people," said Jim Poyner, an analyst at William Woodruff & Co. in Dallas. "Apple is about two years behind the curve in introducing these, and I think that's going to hurt them."

Analysts said that while the new models will sound the death knell for Apple's current entry-level systems — the Macintosh Plus and Macintosh SE — they should also help invigorate Apple's softening domestic PC market.

"Apple needed a complete refurbishing of its low end," said Benny Lorenzo, an analyst at San Francisco-based research firm Volpe, Covington and Welty. "They're facing an increasingly tough battle against IBM clones, especially with Windows 3.0."

Microsoft Corp.'s recently introduced Windows 3.0 is a user interface that many users and analysts said they feel emulates the simplified windows-and-icons screen display that helped propel the well-received Macintosh to stardom.

If Windows 3.0 succeeds in a big way, Apple could have a tough time recovering; there are more than 40 million DOS-based PCs in the marketplace, compared with about 4 million Macintoshes, according to Woodruff.

Sources said that leading next month's announcement will be the Macintosh IISI, a high-performance machine based on Motorola, Inc.'s 68030 microprocessor that will offer eight-bit color and will cost about $3,800.

The Macintosh LC, a low-cost color system using a 20-MHz Motorola 68020 microprocessor and also offering eight-bit color and 9M bytes of random-access memory, was also announced. Both an external color monitor from Sony Corp. and the LC will include room for a chip board that will allow it to run applications for the Apple II.

The LC is expected to be priced at about $2,800.

The Macintosh Classic is expected to be the low-end machine users have been waiting for. The 16-MHz Motorola 68000-based machine will offer either a 40M-byte hard drive or dual floppy drives, along with a built-in 9-in.-diagonal monochrome monitor; it is expected to resemble the Plus and SE it replaces. No expansion slot will be offered.

The Macintosh Classic is expected to cost about $1,500, with street prices expected to dip below $1,000.

Apple reportedly paid dearly for the "Classic" name. According to Guy Rabbat, chief executive officer at Modular Computer Systems, Inc., Apple paid his firm $1 million to acquire rights to the name. The 20-year-old Fort Lauderdale, Fla.-based company manufactures the Modcomp Classic real-time computer system.

Apple is also expected to announce new system software that will take advantage of the increased capabilities of the new machines as well as a new monitor design.

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Dell extends PC line at high, low ends

BY RICHARD PASTORE
CW STAFF

AUSTIN, Texas — Dell Computer Corp. broadened its personal computer lineup last week with five new machines ranging from a high-performance laptop to its first high-end tower servers. The mail-order pioneer also trod into minicomputer territory with the announcement of a disk array controller for its new servers.

Dell is squaring off against Compaq Computer Corp., the only other major PC vendor to offer PC-based disk array technology. Disk-drive arrays outperform single- and dual-drive configurations by assigning data across a number of drives and permitting simultaneous seeks.

"It is a critical technology for really high-end servers," Chief Executive Officer Michael Dell said. "Our customers want more disk I/O, not more processing power." Consequently, Dell pulled its developers off a multiprocessor project and set them to work on an array controller that will reportedly sell for about $1,000 when it ships in the fourth quarter.

Analysts agreed with Dell's refocus on I/O. "With the 486, users have more than enough processing power, but as the PC gets into minicomputer territory, I/O becomes the predominant worry," said George Thompson, an analyst at Datapro Research Corp. in Delran, N.J.

Compaq Systempro users praised the faster disk throughput that array technology makes possible. "It's ingenious technology," said Mark Olsen, a systems analyst at Cox Cable, Inc. in San Diego. "The fact that the data is distributed across two drives makes it easier to access."

Dell's 486-based tower systems come in 25- and 33-MHz versions and are based on the Extended Industry Standard Architecture bus. Prices for the 425TE, available now, range from $6,749 to $15,399. The 433TE, which will ship next month, costs from $8,949 to $17,599. Dell also added 25-MHz and 33-MHz Intel Corp. 80386 desktop systems — priced at $2,749 and $3,349 — to its product line, and a $3,599 80386SX-based portable.

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IBM distributor sues to continue sales

BY MICHAEL FITZGERALD
CW STAFF

XL/Datacomp, Inc. filed a three-point suit in an Illinois district court against IBM, alleging, among other things, unprofessional and "disparaging" conduct as the two companies phase out a remarketing agreement. The loser in the case is likely to be the customer.

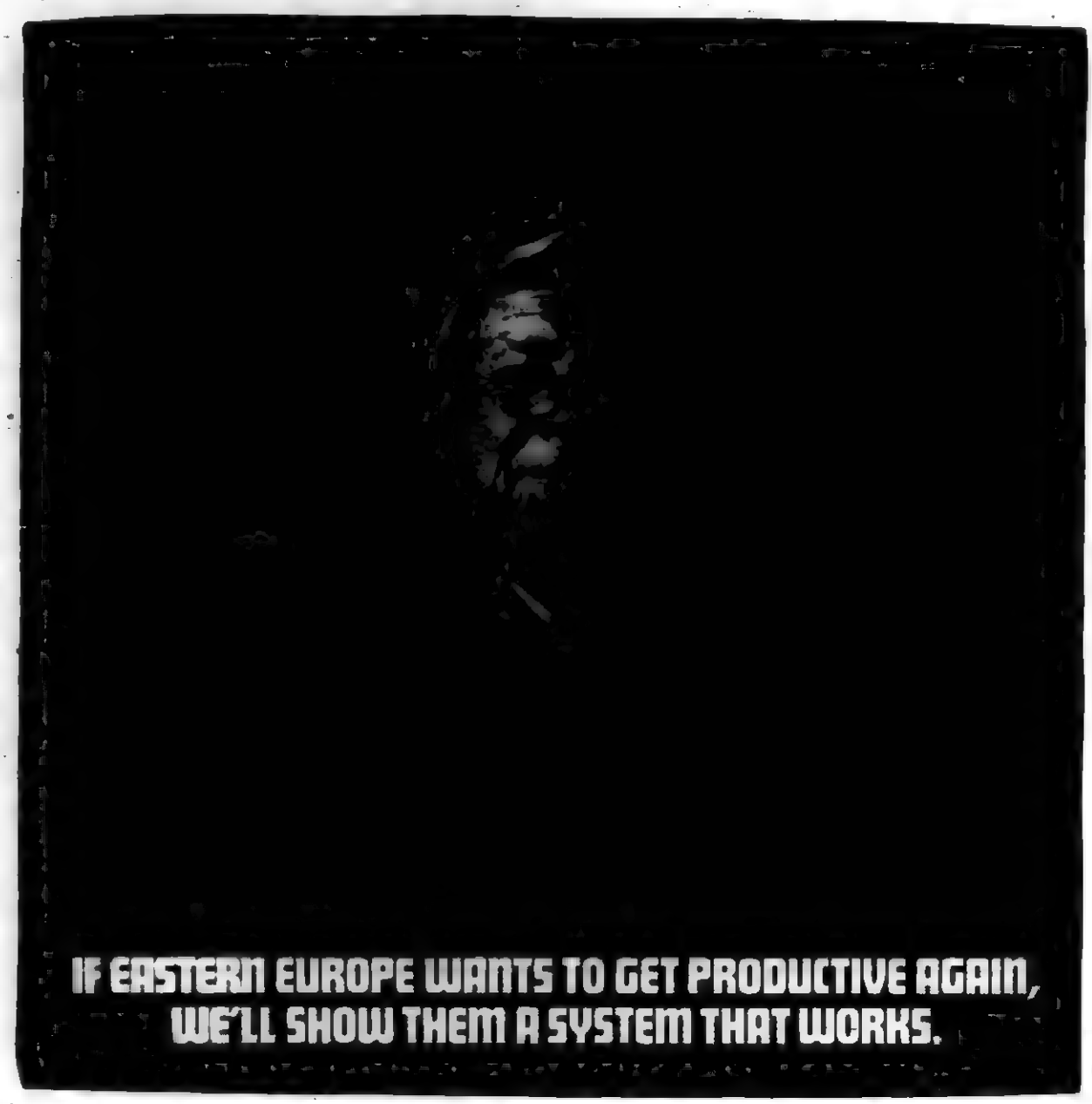
Datacomp has also accused IBM of illegally attempting to stop Datacomp from supporting customers it won under the remarketing agreement and for violating a separate agreement to sell peripherals to Datacomp through 1991.

Industry sources said the suit is fallout from IBM's decision to stop deep discounts on Application System/400 machines to major distributors, such as XL/Datacomp.

"IBM got tired of these guys selling the boxes without adding any value," one source said. "It's not an awful nice thing to do to customers, but IBM can get away with an awful lot — he who has the gold makes the rules."

At stake for Datacomp, a $340 million firm that distributes and supports midrange computers and applications software, are 5,000 customers.

According to John Walden, Datacomp's general counsel, IBM has its sales force telling Datacomp customers: "Datacomp will no longer be able to provide them with support service after December of this year and will not be able to deliver products that you order from them right now. So if you want delivery and support, you better do business with IBM." IBM refused to comment on the issue.



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How many printers do you need?

BY J. A. SAVAGE
CW STAFF

Hewlett-Packard Co. would like to see a printer on every desk. With the lion's share of the nonimpact printer market, HP keeps lowering printer prices to make the printer-on-every-desk concept financially feasible. But no matter how cheap, users appear to be resisting personal printers.

"We'd all get fat from lack of exercise," said David Kelly, information systems analyst at the Federal Reserve Board. With a heavy printing requirement, Kelly said his department, which has over 200 workstations or X terminals, is getting away from small printers located every 20 feet. He is considering mainframe-size lasers on a network.

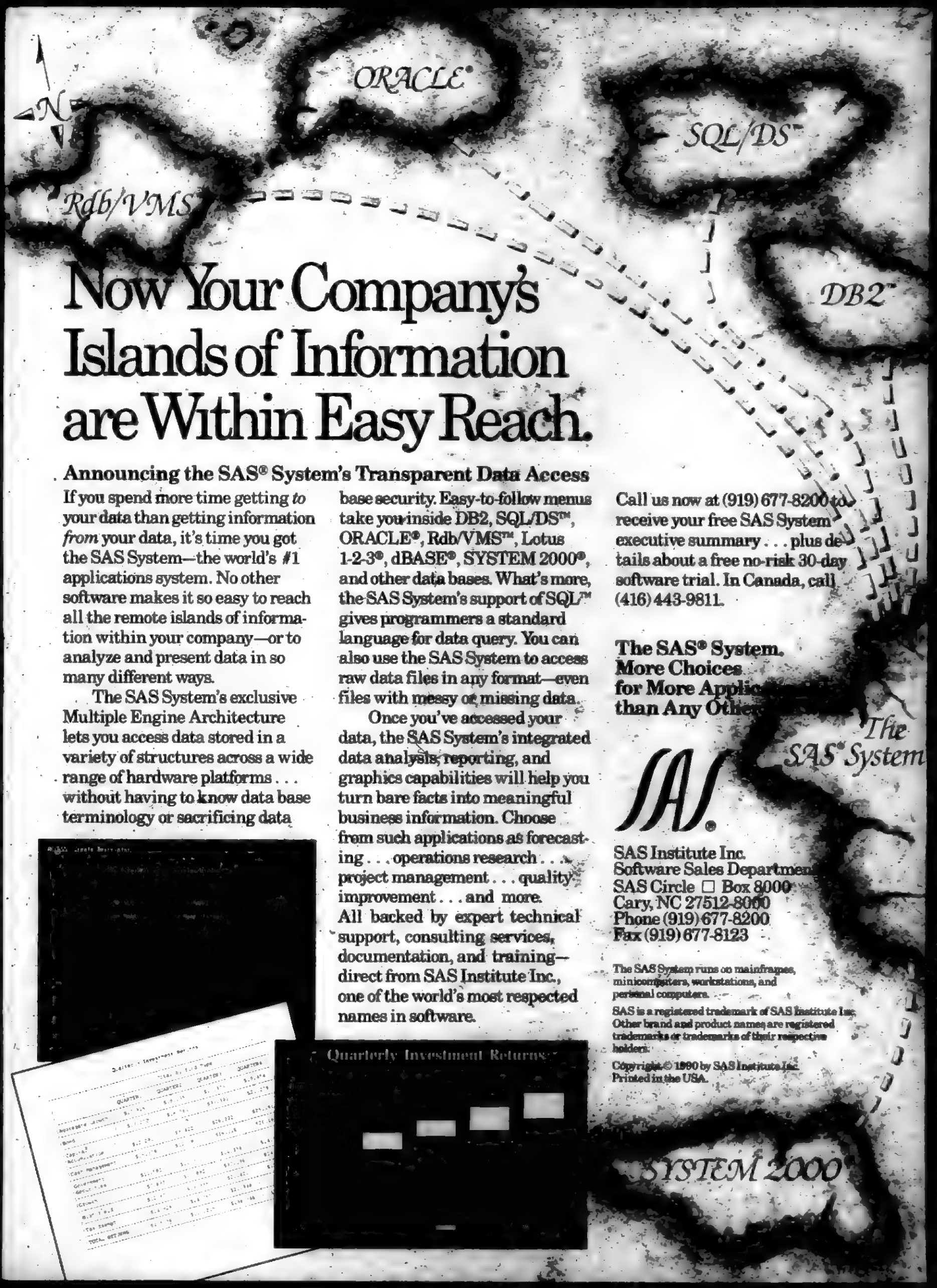
"We're not sure there is a price point at which we would put a printer on everyone's desk, no more than we'd put a copy machine on everyone's desk," an AT&T spokesman said.

Users said desk space is too valuable to be taken up by personal printers. Phil Cohen, director of research computing at the Research Institute of Scripps Clinic in La Jolla, Calif., said that while printers are necessary, one on every desk is "silly."

Trying to displace impact printer sales, HP introduced a $729 ink jet printer last week, the Deskjet 500. The new model is priced almost $300 below earlier models.

Although HP practically owns the nonimpact printer market, it is facing some bad publicity over its Laserjet IIP printers. While the firm is not calling it a recall, it has identified 70,000 printers with faulty power supplies. The power supply, provided by Canon U.S.A., Inc., fails after 1½ years of use, according to the company.

An HP spokeswoman said about half of its customers have been notified, and a special hot line — (800) 233-5153 — has been set up for customer complaints. Only models bought before March with a serial number that begins with 3 have the defect. Printers will be fixed for free at local HP service centers.



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IBM enhances Windows Connection

BY PATRICIA KEEFE
CW STAFF

Indicating that it is not blind to user interest in Windows 3.0, IBM last week rolled out Version 2.0 of Windows Connection, said to integrate host sessions with desktop applications running under Microsoft Corp.'s Windows 3.0 environment.

The enhancement theme to the package, which was first introduced last fall, lies in using a graphical user interface to eliminate a variety of host access issues for workstation users. Not only can users jump back and forth between a host session and a Windows applications while viewing both on the same screen, but it is now easier to transfer data back and forth, IBM claimed.

IBM is also able to shield users from cumbersome host commands. "I can now double-click on the left mouse button and activate an [IBM Professional Office System] command, eliminating all those additional keystrokes [I used] in the past," said Thomas Murphy, product administrator for Windows Connection. "You can be in the host environment and still have the advantages of a [graphical user interface]."

Given that users often customize their keyboards, Version 2.0 allows for a pop-up key pad that provides all buttons in graphical form. "There are 18 keys that I can bring up on my screen to activate various host commands, including a macro. I can invoke a macro from this," Murphy said.

File transfer also takes on a graphical flavor. Users no longer have to go into a DOS shell and use a string of commands to change the naming convention to go from a DOS file to a host file. It is all done graphically.

IBM joins a rapidly crowding field. Competitive packages include Rumba from Wall Data and Digital Communications Associates' Irma link.

Available Sept. 28, the IBM package will allow users to access hosts running VM, MVS or Application System/400 operating systems. It will run in two of Windows 3.0's three modes: standard and enhanced. Users who want to use 3.0's real mode should stick with Version 1.0 of Windows Connection, Murphy said.

Priced at $214 per user, Windows Connection Version 2.0 requires an IBM Personal Computer or Personal System/2 with 1M byte of memory, Windows 3.0 and IBM's PC 3270 Emulation Program Entry Level, IBM Personal Communications/3270 or AS/400 PC Support. Upgrades from Version 1.0 cost $85.

GENIE's flat rate prices no dream

BY ELLIS BOOKER
CW STAFF

ROCKVILLE, Md. — GENIE, the on-line service from GE Information Services, announced a $4.95-per-month flat-rate pricing structure last week for access to more than 100 of its services.

GENIE officials said the new pricing policy is the result of a market research effort that began 18 months ago. They denied that the move was in response to the rapid growth of Prodigy Service Co., the videotext service from Sears, Roebuck and Co. and IBM that charges a flat $9.95-per-month charge.

"We got the results of the research in December," GENIE spokesman Steve Haracznak said. People, he added, are "apprehensive about the clock ticking," and traditional per-minute pricing structures have kept potential subscribers away from on-line information services.

Steve Hein, a spokesman for White Plains, N.Y.-based Prodigy, said that based on research begun in 1984, flat-rate pricing "is what will bring these services into the American home." Prodigy currently claims 460,000 subscribers, which is more than double GENIE's subscriber base.

Columbus, Ohio-based Compuserve, Inc., the nation's largest information services provider with close to 600,000 members, has no plans to alter its time-based pricing structure at this time, according to a company spokesman. Compuserve does, however, offer discount plans for a few of its most popular services, such as its interactive chat lines and on-line shopping system.

Under Star Services, which goes into effect next month, users will pay $4.95 per month for evening, weekend and holiday access to the GENIE network.

Services that are not covered by the flat-rate option include personal computer bulletin boards, software libraries, financial services, chat lines and multiplayer games. While on-line, users can switch back and forth between the flat-rate and per-minute service. GENIE's prime-time rate for 300, 1,200 and 2,400 bit/sec. access remains unchanged at $18 per hour.

Four-year-old GENIE also reduced its hourly charge last week to $6 per hour during off-peak hours for services not covered by the new monthly rate.

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■ The Association of Computing Machinery's Special Interest Group on Computer Graphics has released a videotaped report on high-definition television, computer workstations and virtual reality interfaces. "HDTV & The Quest for Virtual Reality" consists of two one-hour videotapes, full transcript, supplemental product information and other documentation and is priced between $295 and $505, depending on videotape format. The report is intended to be a practical buying and planning guide for anyone involved with workstations, video or motion-picture production and closed-circuit applications, the association said. For more information, call (800) 523-5503.

Single ISDN chip

■ AT&T has developed a single-chip transceiver that meets Integrated Services Digital Network (ISDN) standards and has reduced the price of the two-chip transceiver it now sells for ISDN applications. ISDN is intended to simplify the delivery of advanced telecommunications services, such as simultaneous voice and digital communications, via twisted-wire pairs and other conventional means. The new device, like the chip pair that preceded it, will serve on both the central office and customer sides of the two-wire communications link, AT&T said.

As easy as AC

■ Verran Eletronics Ltd. says it has a method to untangle the spaghetti cabling that inevitably results when companies frequently need to move computer equipment. The English firm markets a device called the Verran AC Datalink, which allows computers to communicate via a building's AC wiring. The Datalink, no larger than a portable compact disc player, plugs into an AC outlet on the sending and receiving ends. It will be sold by GEC-Marconi Software Systems in Reston, Va.

Getting smart with your business

Business intelligence systems bring military planning tactics to decision-making

BY MICHAEL ALEXANDER
CW STAFF

The current standoff in the Middle East could be either bad or good for business, depending on what your company's executives think will happen next. Some executives will act to minimize the impact of higher oil prices on profits, while others will look to reap unexpected benefits from the military buildup. The key is having enough of the right information on which to base business decisions.

Gathering and using information to advantage is the underlying theory of business intelligence systems, which attempt to bring to business the information gathering and analyzing methods of government intelligence agencies, much in the same way that military strategic planning tactics shifted into business practice after World War II. The difference is that the tool for gathering and analyzing information and distributing it to the proper decision makers is not a network of spies but a local-area network of personal computers.

"The people who fought the Cold War want to take the idea of intelligence gathering and convert it into a management tool," said Herbert Meyer, president of Real World Intelligence, Inc., one of only a handful of companies developing business intelligence systems for corporations. Meyer was a vice-chairman of the Central Intelligence Agency's U.S. National Intelligence Council during the Reagan administration.

The information that goes into these systems is culled from on-line wire services and other databases, magazine articles, annual reports and a variety of other sources. As the business intelligence system sops up information, analysts use text retrieval software to filter and sort it into such categories as competition, customers, politics, economics, technology and other categories relevant to the corporation. Later, the information is packaged into easily digestible bulletins and reports that are distributed — often daily — to decision makers.

Business information systems — for which Real World Intelligence charges $125,000 to $150,000 for hardware, software and consulting on how to develop a corporate intelligence profile — differ somewhat from competitive intelligence systems, which focus mainly on the competition, and executive information systems, which are rarely text-based or designed to filter information before distributing it, Meyer said.

Getting hot

Even though business information systems are in their infancy, "by 1992 or 1993 they will be the hottest item in the information world," predicted Jerry Wasserman, who tracks information industries worldwide as a vice-president and director at Arthur D. Little, Inc. in Cambridge, Mass.

With the Middle East crisis as a backdrop, a business information system could help executives map out a strategy to raise prices or seek alternative suppliers if the cost of oil were to cross a predetermined threshold. At another firm, executives might see the crisis as an opportunity to boost sales of defense-related equipment.

"What happens now is some expensive people spend expensive time trying to analyze an issue that might or might not be important," Wasserman said. "When I talk to really intelligent managers, the concept [business intelligence systems] is immediately salable. The skepticism comes around when they ask if you can make it work."

What usually "works" is a system no more complex than five or six personal computers or workstations linked in a local-area network and sophisticated natural-language text retrieval software, according to Michael Pincus, president of Mnemotrix Systems, Inc. in Cleveland. His firm provides the technical expertise needed to build business intelligence systems.

Hands-off approach

Pincus advocated that business intelligence systems be installed and administered with little involvement from the firm's IS managers. "When MIS is involved, you have to buy into all of the problems of any large corporate system," he said.

Also, few IS operations are geared to handle massive text databases, and few have installed natural-language text retrieval software that simplifies sifting and sorting information.

"The databases do not exist, and there is no clear idea of text management in MIS," noted James Tunis, president of Lincoln National Information Services, Inc. in Fort Wayne, Ind., an affiliate of Lincoln National Corp., a $23 billion-per-year insurance and financial services corporation.

His division recently completed the installation of a corporatewide office productivity network for 6,000 users that combines elements of business intelligence, executive information, electronic mail, database text retrieval and other systems.

"It is not a single tool that has some sort of huge, mystical database in back of it; that doesn't exist," Tunis said. "What does exist is the ability for any one of 6,000 users to send out questions to the areas that might have the answer."

David Sheldon

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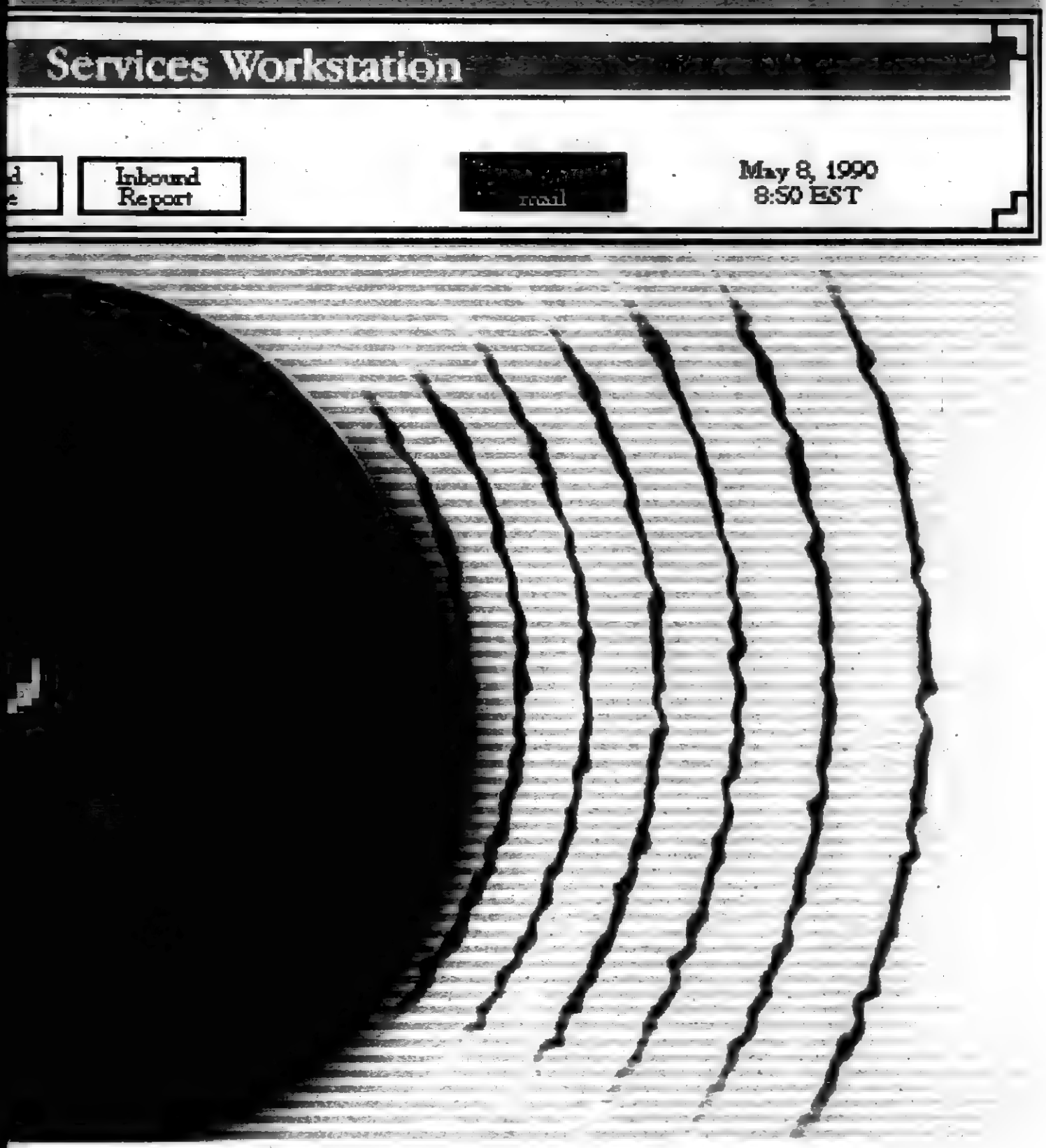

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EDITORIAL

Enlightened age

BY ITS OWN estimate, IBM absorbs one of every five dollars spent on information systems throughout the world. By other accounts, the figure is closer to one dollar in four.

Whatever the case, when you consider the thousands of companies around the globe chasing the $280 billion spent annually on IS, IBM's share is pretty astounding. Of that share, the critical mass of income for IBM is centered around the mainframe and all its attendant storage, connectivity and software revenue.

This Wednesday, IBM will unwrap its next-generation mainframes. The company will do so at a time when the future of mainframe computing is still being ardently questioned and aggressively doubted. Exactly *who* is doing most of the questioning and doubting is another matter. Given that IBM is expecting near double-digit mainframe growth once Summit reaches its full cycle in about a year, it clearly isn't the mass of corporate customers to whom the company has been speaking.

These days, support for the future of mainframes and the people who control them is coming from the oddest of quarters. Last month, *PC Week*, a leading microcomputer publication, admitted that the mainframe will play emerging roles on the corporate scene in the 1990s. That's from a publication that has consistently equated the mainframe with the brontosaurus.

Now, that publication says that "a growing number of departments will need their own IS directors." Mainframes and PCs actually coexisting, with IS folks providing the systems template? Even at the departmental level? Gee, isn't all that enlightening?

Even *Byte*, a longtime staple magazine within the PC user community, asked a panel of experts in a recent issue: "What do you think of the reassertion of power by data processing and MIS departments?" At *Byte*, the reassertion of the power is taken for granted. The responses were fascinating. Said one expert: "As long as you don't book yourself onto the network, you're OK." That will get you a long way in the '90s.

The rancor of PC zealots who have condemned the use of any platform not powered by a microprocessor is giving way to something they have consistently ignored — something called market reality. If there's one thing that smart IS managers and successful companies have known for a long time, it is this: It's not a mainframe world or a PC world or a mini world. For these people, platform loyalty doesn't matter a bit.

What does matter is that the available tools, whatever they may be, can be harnessed to get the job of corporate computing done with the least expense and the greatest speed. Running small spreadsheets on a mainframe makes as much sense as running a corporate communications hub with a PC. That's why companies don't do these things. That's why PCs have such a brilliant future and why mainframes will still be sold in 1999 and why IBM will still be in business along with those thousands of other companies.

LETTERS TO THE EDITOR

Responsibility

The cartoon that appeared at the top of your editorial page [CW, July 16] implies that large corporations are bearing up on smaller companies to quickly become EDI-capable. While I agree that this situation does unfortunately exist in some instances, there are growing numbers of examples of more responsible corporate behavior.

One such example was contained in an article in that very same issue: "Sears puts foot down, insists on EDI ability." Sears is most definitely going the proverbial "extra mile" by supplying both free software and training so that the transition to EDI for its suppliers will be all the more smooth.

While not all organizations have the resources of Sears, there are many other steps they can and do take to make EDI a win-win proposition for all involved. A bill has been introduced in the House of Representatives that directs the Small Business Administration to conduct a study of the impact of EDI on small businesses.

The Electronic Data Interchange Association presented the lead testimony at the hearing and has offered to assist SBA with the study. This is part of the association's Small Business Partnership Program, which includes providing tools needed by small businesses to get up and running with EDI in a cost-efficient fashion and assisting all organizations, both large and small, with establishing effective trading partner relationships.

Jerome L. Dreyer
President and CEO
The Electronic Data Interchange Association
Alexandria, Va.

Sooner, not later

I read with interest your editorial on the current rash of lawsuits in the proprietary rights area [CW, July 23]. I agree that the increase in litigation is unfortunate. It is, as you suggest in many ways, a symptom of slowdown in development.

However, I take issue with your last sentence: "Creativity often suffers when the lawyers get involved." The solution is to get the lawyers involved early, evaluate the risks and then take steps to minimize the likelihood of dispute.

In 30 years of studying the legal problems of the computer industry, my experience has been that much litigation arises because one or both of the parties did not bring the lawyers in until the contractual arrangements were too far along, or the product was on the market, or some financial commitment had been made that could not later be changed.

Lawyers are trained to foresee pitfalls and find creative legal solutions to them. Too often, the computer people avoid consulting knowledgeable lawyers until too late.

I find that the old aphorism regarding an ounce of prevention is particularly applicable to the computer industry.

Robert P. Bigelow
Edgartown, Mass.

Multiuser future

In "Multiuser DOS group plans to compete with LANs" [CW, July 30], you quote Citibank's Brian Illari as saying that "multiuser DOS sounds like a contradiction in terms." With nearly 40 million DOS-based PCs on the market, the majority of which are used by single users, I believe that there is certainly a strong foundation for that perception.

Indeed, that is one of the main reasons for the formation of the Multiuser DOS Federation. Times change, and new technologies emerge, including those that now extend the reach of DOS from one to many users. As a vice-president in charge of LANs, Illari clearly has his biases. But let's face facts: Local-area networks were created as a way of managing the proliferation of single-user PCs. Their evolution into so-called "client/server" systems doesn't fundamentally change how LANs operate. However useful LANs have proven to be, they remain expensive, complex systems — systems that, one study pointed out last year, are down 6% of the time.

Dozens of companies today produce multiuser DOS products, from systems software and serial-port boards to graphics workstations and remote video controllers. They are succeeding in the marketplace because more and more business are beginning to realize they don't need LANs for every DOS work group.

Jack Dyer
Vice-President and General Manager
Theos Software Corp.
Walnut Creek, Calif.

Computerworld *welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor In Chief,* Computerworld, *P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701. Fax number: (508) 875-8931; MCI Mail:* COMPUTERWORLD.

Superhighways for computing

SEN. ALBERT GORE

It's time we redefined "infrastructure" for the Information Age. Thirty years ago, the interstate highway system made sense for postwar America. Today, a nationwide network of information superhighways is needed to move the vast quantities of data that are creating an information gridlock.

We have more data than we can use. The Landsat satellite, for example, which can take a complete photograph of the Earth's surface every two weeks, has been recording pictures for 18 years. But 95% of those images have never been seen by human eyes. We have automated the process of collecting information without automating the process by which we absorb its meaning.

We have enough data to answer almost any question, but the sheer volume of data threatens our ability to answer any question. We are dealing not only with information, data we have internalized, but also with "exformation," data outside our conscious awareness that keeps us off balance because we know it exists even if we don't know where or how to use it.

Supercomputers can help us handle this vast surplus of information. Supercomputers can, if properly used, give us the ability to instantly create elaborate visual models of the world around us and watch the way its elements interact, without the limitations of time and space.

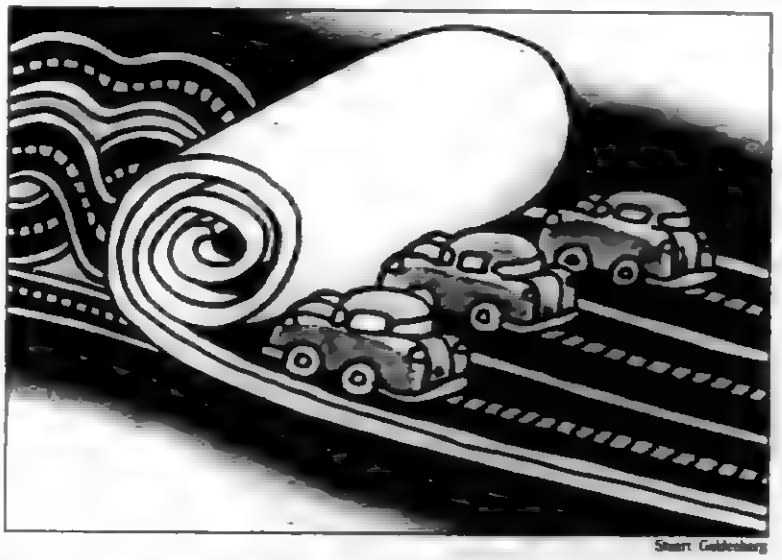
But most of the people who could benefit from supercomputers don't use them. You can direct-dial Fairbanks, Alaska, from your breakfast nook, but you can't use the full power of a supercomputer without being in the same building. Our existing network of telephone lines will not carry the quantity of data supercomputers generate fast enough to make those elaborate graphic images. Today's networks suffer from what one expert calls "graphic jams."

As Yogi Berra once said, "What we have here is an insurmountable opportunity."

If we had the information superhighways we need, schoolchildren could plug into the Library of Congress and explore a universe of knowledge. Teams of scientists and engineers working on the same problem in different locations could work together in a "co-laboratory" if their supercomputers were connected.

Medicine would benefit enormously. The "Human Genome Initiative" has already begun to store huge volumes of data about the sum total of all the genetic information that makes up the human species, including details about the 3 billion nucleotides in human DNA. Before the end of this century, doctors will routinely use this digital information to diagnose genetic-based diseases.

Our understanding of the environment will find greater richness and detail. The stunning pictures from the Voyager mission to Neptune represented more than 1 trillion bits of data, but that's nothing compared with the data about our own climate system that will be produced in the "Mission to Planet Earth" program. If you quantify all the scientific information that currently exists about Earth, that much data will be beamed down from orbiting satellites every day during the mission's peak years.



Stuart Goldenberg

How do we, as Americans, prepare for this new world? The answer is a nationwide network of fiber-optic data highways to link supercomputers and digital libraries.

Congress is moving forward in a bipartisan way to adopt legislation I first introduced 11 years ago to create the network and digital libraries, stimulate development of more powerful supercomputers and increase the number of trained scientists and engineers capable of helping us make the best use of supercomputers. Four separate Senate Committees — Commerce, Budget, Energy and Armed Services — recently endorsed the network. President Bush, though dozens of his administration's own advisers are urging that these proposals be adopted, is hesitating. Other nations are not.

Japan has announced plans to connect every factory and home to a high-volume network during the next two decades, estimating that when it is complete, as much as one-third of Japanese gross national product will come from new goods and services made possible by the network.

Europe, soon to be unified, is not far behind Japan in its plans. The U.S. still has a large lead in this area, but if we don't act to exploit that lead, it will disappear. For example, we make two-thirds of the supercomputers in the world — more than anyone else — but the real benefit comes from using them, and we don't. That's where the network comes in.

We didn't expect a turnpike company to build the interstate highway system, and we can't expect a private company to build the information superhighway. But, like the interstate system, once the information superhighway is complete, the demand for its use will skyrocket. And, as user fees are collected, private operation will be feasible. However, right now, it is a classic chicken-and-egg problem: Because there's no network, there's no apparent demand for its use; because there's no demand, there's no network.

Our challenge is to process data into information, refine information into knowledge, extract from knowledge understanding and then let understanding ferment into wisdom. Supercomputers, digital libraries and a national information superhighway are critical if we are to begin to meet that challenge.

Gore is a U.S. senator (D-Tenn).

We bring you the phone — now in living color

CHARLES LECHT

Last week, Nippon Telegraph and Telephone Co. installed an experimental commercial color television picture telephone (CTVPT) in my office. It's the first of these phones installed in Japan — except at NTT — so I can't call anyone except personnel in NTT laboratories, where the CTVPT is undergoing testing and evaluation. I'm extremely excited about the possibilities this type of communication offers.

The CTVPT is about the size of a standard desk telephone, except for a 4-in. video display mounted to the rear on an arm that tilts for better viewing. The display is about 1.5 in. thick; the arm also holds a video camera. The camera captures a 40-degree angular view and may be tilted up and down to span an additional 40 degrees of height.

Included with the CTVPT is a keyboard for various text-creation uses. It doesn't take much imagination to envision this as a future platform for users to obtain all the services PCs now offer — in this case, using telephone lines from NTT's central host, which contains the complex hardware and software needed to operate the CTVPT system.

The system also comes with an encoding/decoding box that controls the device and may be placed under a desk. This box has I/O ports for standard TV/stereo connection. The entire system is National Television Standards Committee (NTSC)-compatible, which means that the signals the CTVPT receives can be shunted to any standard TV/stereo for large-as-life viewing or to a VCR for later viewing.

To use the phone, I first had to install a 64K-bit line between the local telephone office and my own. This is the line on which NTT has based its Integrated Services Digital Network.

The CTVPT currently allows two usage modes: "real-time" or "store for later retrieval." In the first mode, people communicate on-line; the voice is continuous, but the picture changes every second. In the second mode, people store a message in a video mailbox for later retrieval by a recipient.

In the near future, the video display rates will reportedly increase to virtually continuous speeds. This will probably occur on multiple 64K-bit telephone lines. At that time, the world will have its first continuous color TV picturephone service in the public domain. Doubtless, some color and/or resolution will be lost if the technology reaches continuous speeds, but in my opinion, this will be hard to notice for most applications because of current TV technology. The color tuning of most people's TVs isn't good enough to display what they may receive.

Because the CTVPT uses a standard NTSC signal, the potential uses of this telephone stagger the mind, even in this age of mind-staggering techno-events. I think of the CTVPT as a micro-TV station that rivals the personal computer in the power it packs for its size. The fact that it can also be a personal computer with word processor, spreadsheet and other applications makes it potentially more valuable than a PC.

Of course, there are a few problems associated with the arrival of a CTVPT. Every step forward made through scientific innovation is accompanied by scores of complaints from various business and governmental interests who claim the step has been onto their toes.

For example, the various businesses and agencies that conduct and regulate video broadcasting, telecommunications, videocassette entertainment, theaters and so on are all probably going to go bananas over the possibility that CTVPT may threaten their domains. The regulators of communications signals who are worried about our broadcast morals (or lack thereof) are also petrified about the possibilities the CTVPT offers in the sex business.

The copyright folks and their watchdog lawyers are doubtless jittery; they feel the CTVPT will be used to illegally copy copyrighted materials and to illegally distribute these via the phone.

We can only hope that these folks do not have their way, or CTVPT usage may sadly be withheld from a public that can surely benefit from its arrival. It's far less likely that objections to the CTVPT will win out in Japan, where there is a shortage of lawyers, compared with America, which is drowning in them.

As for me, I see only good with the coming of age of the CTVPT. Aside from the obvious benefits the CTVPT offers people who are sick, aged, lonely, remotely located, mute or deaf, many other possibilities emerge that can drastically improve the quality of all our lives.

Lecht is an IDG News Service correspondent based in Tokyo.

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Author of "Inside dBASE IV," President, Pacific Systems Design Workshop Inc., San Carlos, CA:

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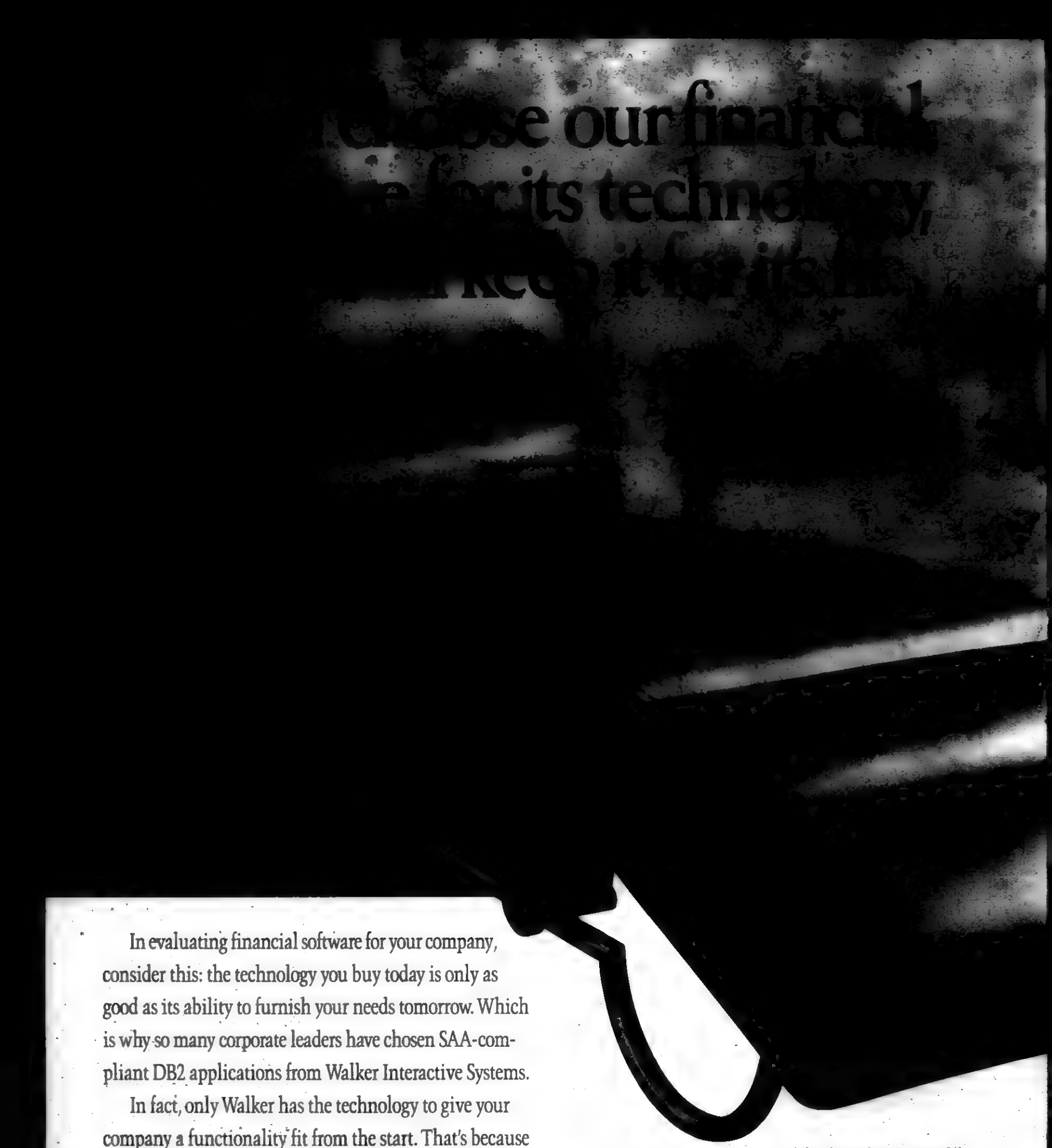

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COMMENTARY

J.A. Savage

Carrying a torch for HP

I detected an unusual note of skepticism at this year's Hewlett-Packard users Interex conference in Boston. Maybe it's the reluctance of users to move to open systems, where HP is pushing hard. Perhaps it's the private worries of HP executives over the company's ability to make its strategies work technically and profitably. Perhaps it was just the unseasonably cool, drippy weather.

In the past, Interex has been a love fest. Users cooed at HP executives, "Feed me just a few more of those chocolate-dipped strawberries, the way you always have. Don't make me eat those cantaloupe bits; they'll upset my system." HP has always whispered back, "Sure, sweetie. I wouldn't want you to change a thing."

But HP appears serious about this open marriage — oops, open systems thing.

"Here, just try these. You'll like them."

("Gag. Choke. Cry.")

It's probably the best long-term survival strategy for the company. It's probably the best long-term strategy for users. But hey, now is now, hassle is hassle, money is money, and short-term profits are required.

HP's push to open systems is loosely defined in its 1990s strategy called New Wave Computing. That means, loosely, that everything, no matter

Continued on page 30

AS/400 tiptoes into server role

Cooperative processing tools could open new market to IBM minicomputer

BY MARYFRAN JOHNSON
CW STAFF

With the promise of cooperative processing software that allows IBM's Application System/400 minicomputers to share their work load with IBM workstations or personal computers, vendors such as Computer Associates International, Inc. and Information Builders, Inc. are helping the computer giant boost the role of its premier midrange line as a host processor or client/server anchor.

"IBM has accurately sensed that client/server is more than the latest buzzword," said Kevin O'Neill, vice-president of research at Business Research Group in Newton, Mass. "This is a profound shift in the marketplace, and it's affecting IBM's traditional base among the Fortune 1,000 companies."

Yet IBM officials still tread cautiously when using the term "server" for the AS/400, because the machine has been marketed more as a general-purpose, departmental processor. Analysts are quick to point out that the AS/400's price and performance are far from competitive with specifically targeted servers.

View from a Prism

One customer counting on IBM adapting to a shifting market is Harry Wallaesa, corporate vice-president of MIS at Campbell Soup Co. in Camden, N.J. Campbell is one of the early test sites for Prism/CP, a new Personal System/2 version of Marcam Corp.'s integrated manufacturing, logistics and cost accounting system.

"We would like to have a transparent view of data from the plant floor to our mainframe systems at the corporate data center," Wallaesa said. "It's not always been easy to create that kind of environment, but this announcement is a huge step toward that ultimate goal."

IBM's announcement in New York two weeks ago highlighted a range of cooperative processing applications, from manufacturing and financial packages to clinical assistance for doctors, purchasing at remote locations, materials management and insurance forms processing. The firms included Spectrum Healthcare Solutions, Software 2000, PDA, Inc., American Software, Inc., J.D. Edwards & Co. and Comshare, Inc.

All of their applications are still in development or early field testing stages, however, with delivery dates stretching out over the next year. In most cases, the vendors are not adding new features or functions but merely enhancing an established midrange application — redesigning it with graphical user interfaces, pull-down menus and windowing capabilities — to run on a PS/2 under OS/2 Extended Edition or a PC running MS-DOS.

Among the users watching this flurry of activity with keen interest is Mrs. Fields Cookies, where MIS director Paul Quinn is planning to develop his own in-house cooperative processing applications using an AS/400 as a file server for PC-based applications.

The enhanced C language compiler just announced by IBM for the AS/400 makes it possible to write applications in C for the IBM midrange and workstation environments and save programming costs, he explained.

In Travis County, Texas, an AS/400 Model B70 is becoming an "extended departmental processor" with a financial package from Orlando, Fla.-based HTE, Inc. running in cooperative processing mode in several departments, MIS director Frank Curcio said. When the new system goes "live" this October, the AS/400 will serve as host to multiple modules of the application, which are split up to run on dumb terminals in offices for the county auditor, purchasing, personnel and the treasurer's office.

"The way I feel, you can call it a group processor, a departmental processor or a hierarchical processor — but anything that works is what you need to take advantage of," Curcio said.

Users not rushing to IBM software services

ANALYSIS

BY MAURA J. HARRINGTON
CW STAFF

Although IBM has labored to build up its National Service division over the past 1½ years, profits have not come easily.

While users have applauded the company's efforts to accommodate its customers more than ever, tight budgets and cost-consciousness have made customers slow to accept IBM's new software support services.

According to its second-quarter and first-half fiscal year earnings report released recently, IBM posted a mere 5.7% increase in profit for support services in the first half of fiscal year 1990. By comparison, the company chalked up a 16% increase in software sales and a 36% increase in rentals and financing.

Among the service offerings announced in the past two years by IBM were the Business Recovery Services program and various networking support services, including IBM Helpdesk, a toll-free, 24-hour support line assisting Personal System/2 users with third-party application software problems.

According to Thomas Esposito, vice-president of marketing for the National Service division, IBM has changed its strategy from a product focus to a customer focus by placing a heavy investment in its 1-year-old software services, such as Helpdesk and Softwarexcel.

"We no longer say, 'This is what you need to buy.' Now we let them decide what they need, and we'll service it," including application software support, Esposito said.

"What IBM is offering its customers is a way to reduce their service costs," said analyst Howard Anderson, managing director at The Yankee Group, a market research firm that is based in Boston.

IBM's recent introduction of FASTService, a failure analysis and support technology software product running on an Applica-

Continued on page 30

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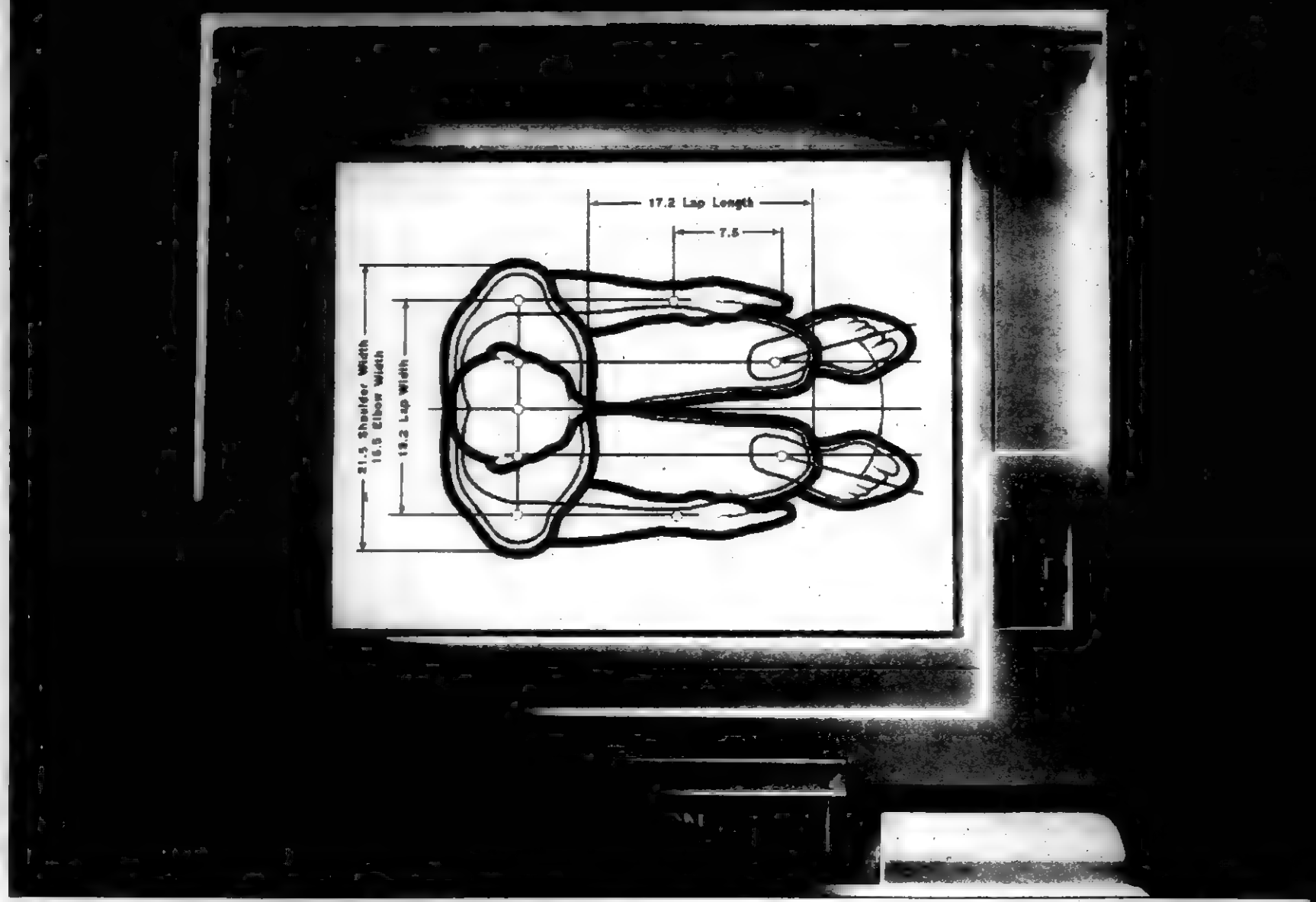

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with the knowledge needs may expand, retty much the same.

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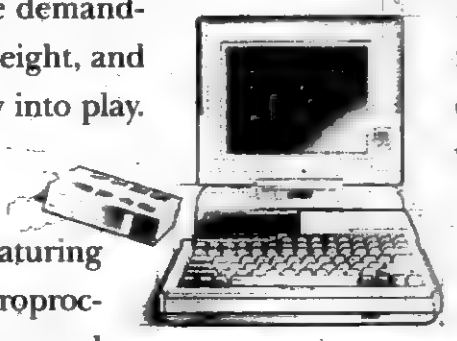

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The Epson laptop indicates its own vital signs—battery life, speed, and disk drive in use—on a unique LCD status bar, and even has the good sense to turn off its own screen and hard drive when not in use.

The LT 386SX offers a degree of speed, power and flexibility once limited to desktop computers. In fact, there is one feature of this remarkably engineered bit of technology that a desktop can only envy. Its size.

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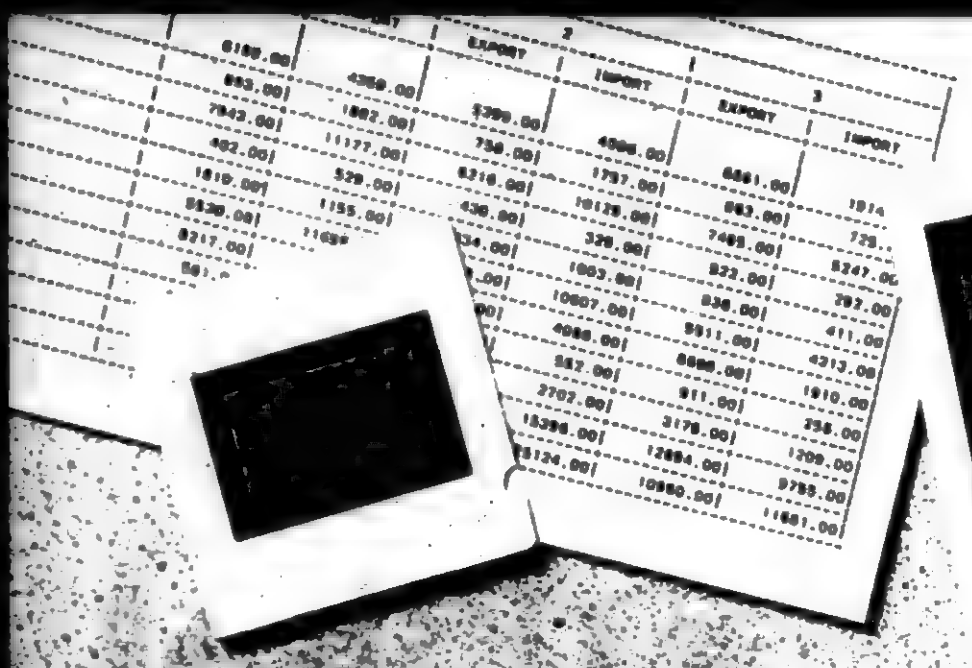

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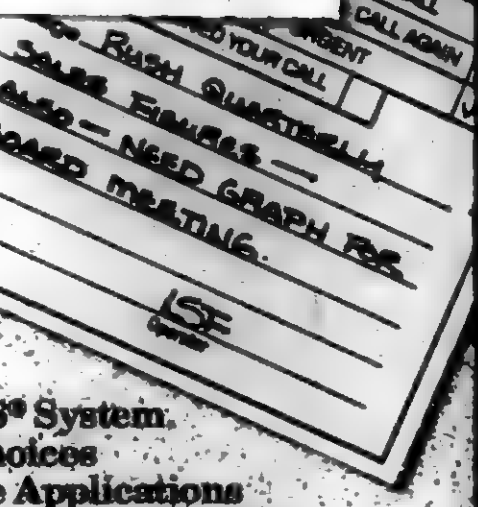

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The sweet flavor of success

As Dreyer's grows, the power of HP minis grows to match it step for step

ON SITE

BY J. A. SAVAGE
CW STAFF

LAFAYETTE, Calif. — Rodger Lindquist, the manager of information systems at Dreyer's Grand Ice Cream, needs a pocket protector, not because he has a pocket full of pens that might leak on his starched white shirt, but because of his tasting spoon.

Lindquist carries a plastic spoon in his pocket so he can taste ice cream without the hassle of searching for a utensil. And a few drips of rocky road could ruin his shirt.

Ice cream is serious business for Dreyer's, a $300 million-and-growing company. But Lindquist is not even considering moving up to mainframes to manage the growing business. He is sticking with Hewlett-Packard Co. minicomputers and growing with them as they grow in power.

"If we were this size 10 years ago, we would have been stuck with mainframes, but we've been able to grow as minicomputers grow, and the prices and power are phenomenal," Lindquist said. "Why in the world would you want the hassle of mainframes?"

While Dreyer's hardware configuration grew, the custom software stayed vanilla, adding little in the way of functions.

Dreyer's started in the early 1980s with a HP Series 3000 Model 30 running at about 1 million instructions per second (MIPS) and is now up to a Model 950 running at 15 MIPS for its administrative tasks.

A warehousing system installed last year on an early-1980s Model 52 keeps the inventory of perishable desserts moving from warehouse to trucks to keep it from melting down before distribution.

Although the warehouse is 36 miles away, Lindquist said it is easier to monitor the computer in the main office and use leased lines to the warehouse than it is to position the computer remotely and have a separate staff.

It is not that he is opposed to decentralizing operations. A Fort Wayne, Ind., manufacturing plant has its own data processing. Dreyer's also has a new distribution center in New York; as that grows, it would be a candidate for decentralized operations, Lindquist said. "With minicomputers, it's easy to peel off a database, cut your telecommunications costs and run it locally."

Lindquist said Dreyer's can continue minicomputer growth along with the company's own growth, because "it's a focused company. We just do more of what we're doing now; we don't go out and buy a pizza manufacturing company."

That focus allows Dreyer's to keep its computing needs straightforward. It does not have to add much new functionality to accommodate new business; it just has to grow in size as the size of the business grows.

Lindquist does not need a mainframe or fault-tolerant computer because, although the ice cream can melt, there is a big share of human responsibility in the market. The computers do go down on occasion, but "they are never down long enough to affect routes," Lindquist said.

Route drivers and managers are at the front lines in the ice cream market. If they do not have a computer telling them what to load on the trucks for their routes, they still know what their stores usually need. Much of the administrative functions run in batch, so they are not affected by a little downtime, according to Lindquist.

Dreyer's maintains a small IS budget — about $1.5 million. But Lindquist said he expects it, as a proportion of revenue, to grow during the next few years: "Once new users, like the distribution center in New York, find what they can get out of a CPU, the use will go up." Still, Lindquist is not considering jumping to mainframes, serene in the knowledge that HP has a growth path available to increase CPU power by swapping boards in his current minicomputer.

As for that spoon, Lindquist explained that Dreyer's employees are encouraged to buy, and taste, competitors' ice cream and feed back information to the company on quality differences. "We can put ice cream on our expense accounts," he said.

Cindy Charles

Dreyer's Lindquist puts his ever-ready tasting spoon to good use

NEW DEALS

UK postal service installs AS/400 midranges

The British Postal Service will be installing more than $18 million worth of IBM Application System/400 midrange computers in what IBM said is the largest distributed processing application in Europe. The Royal Mail business of the post office will also install $6 million worth of personnel and payroll applications from **Software 2000** in Hyannis, Mass., at 64 sites in England, automating information on more than 140,000 employees. The computers will communicate by means of an X.25 network, with system management controls centralised on an AS/400 Model B70.

The Computervision business unit of **Prime Computer, Inc.** recently announced a $3.3 million contract with **Ontario Hydro**, a major Canadian public utility. The contract reportedly constitutes the largest sale to date for Prime's Canadian operations and calls for Computervision's Calma Dimension-III architectural, engineering and construction software and 40 graphics workstations to be used in Ontario Hydro's design and construction branch. The hardware and software will be used to create three-dimensional computerised plant models, according to the firm.

Eastman Kodak Co. announced a major purchase of mainframe applications software from **SAP America**, a subsidiary of $300 million West German vendor SAP AG, which is Kodak's applications vendor in Germany. Kodak will use SAP's R/2 system of 10 business applications in its business units, according to Kodak information systems chief Katherine Hudson. SAP America President James Benaman said R/2 will replace some current third-party packages as well as some internally developed applications.

Orange County Superior Court in Santa Ana, Calif., is installing a $1.3 million image processing system — the first of its kind in a U.S. court of general jurisdiction, according to Alan Slater, the court's executive officer. Initially planned for use in the court's probate department, 40 workstations from Filenet Corp. in Costa Mesa, Calif., will be used to put 844,000 pages of wills, guardianships and other probate documents on-line through a high-capacity optical disc library. Incoming documents will be scanned and stored in digitized form, which will allow simultaneous review from the workstations by court personnel, attorneys and the public. The installation is expected to serve as a model for other courts at local, state and federal levels. It is funded under a $117,000 study grant from the Federal State Justice Institute, which intends to eventually publish a cost/benefit analysis of the system's impact on court operations.

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Services

CONTINUED FROM PAGE 25

tion System/400 midrange machine, is also designed to save the customer unwanted service costs, although it will not be generally available until March 1991 [CW, Aug. 27].

Anderson said that although customers demand Help and service programs, IBM's software services in the past have not grown as quickly as he expected they would.

As an example, Anderson mentioned Softwarexcel, a service designed to enable customers to solve their own systems problems by remotely entering information about their problems into IBM's Remote Technical Assistance Information Network (RETAIN). RETAIN is a database that contains solutions to previously solved problems, an IBM spokesman said.

Trickling in

"Given the enormous potential of Softwarexcel, we would have expected the users to flock to it. The customers are coming but not in the droves we had expected," Anderson said.

"Certain aspects of IBM's services have improved over the past year," said Rebecca Segal, an analyst at International Data Corp., a market research firm in Framingham, Mass.

The quality of service and IBM's increased flexibility with contract negotiations, for example, have gotten better, Segal said.

"But I think [IBM is] having problems . . . with some of their software services, particularly the Softwarexcel product," Segal added.

Why have customers not bought into the software product?

"Because the IBM account executives themselves didn't fully understand the product until a couple of months ago," Anderson said.

He suggested that another possible reason for IBM's slow growth is the competition it faces in the software services area.

Third-party personal computer application software support competition is cropping up from the likes of Digital Equipment Corp. and Andersen Consulting, Anderson said.

"We have electronic customer support [Softwarexcel], and that hasn't been all that great, but it has picked up in the last few months," said Richard Deckard, vice-president of information systems at Atlanta-based Manheim Auctions, a division of Cox Enterprises, Inc.

"I think that in terms of our services, the competition is more of a decision from our customers as to whether they will support their products in-house or call IBM," Esposito said.

One client agreed. "As far as its network services go, [IBM's] Helpdesk product is too expensive. We found we could provide the same services for 30% less," said Gerald Ried, first vice-president at Firstar Information Services Corp., a division of the First Wisconsin National Bank of Milwaukee.

Service roulette

Deckard, who has purchased both hardware and software support from IBM for its 27 automobile auction houses in the U.S. and Canada, said the quality of IBM's services is inconsistent.

"Some of their support services seem to be really good, and some aren't that good at all. It really depends on where you are in the country," he said.

According to Robert O'Neill, data center director at Fort Worth, Texas-based Pier 1 Imports, Inc., IBM's services are nevertheless getting better.

"In the last few years . . . [IBM has] gotten more flexible as to what it's willing to do for us," O'Neill said.

Assistance available for IBM systems users

The following is a list of systems and networking services that are offered by IBM through its National Service division.

- **Data Center Support.** Help with consolidation and restructuring, development and testing.
- **End User Support.** IBM's Helpdesk, education and training.
- **Network Support.** Network traffic analysis and network problem management.
- **Applications Software Support.** FASTService, automatic problem identification/recording/routing of problem assignment to appropriate personnel.
- **Software Support.** Softwarexcel, custom installation/migration, Systemextra, problem management product services.
- **Business Recovery.** Disaster planning, large and midrange hot sites around the country.
- **Availability Management.** IBM and non-IBM repair and maintenance services.
- **Maintenance.** On-line service director, more flexible terms and conditions.
- **Site services.** Site planning, equipment configuration/installation, Quickstart/Customized Operational Services Express, which includes data center design and construction, cabling and relocation.

MAURA J. HARRINGTON

Kodak custom outsource deal sans Helpdesk

Eastman Kodak Co., one of the earliest and largest in a series of companies signing IBM corporate outsourcing agreements announced last year, said that although there was discussion of signing up for software support, the company had decided against using IBM's Helpdesk service in favor of keeping its software services in-house.

The Kodak/IBM agreement, which was announced last July but really began in October of last year, called for IBM to "design, build and manage a new state-of-the-art data center for Kodak at its Rochester, N.Y., headquarters," IBM said.

However, the outsourcing agreement has been the exception to the rule for IBM in terms of the number of customers seeking "total outsourcing solutions," compared with the company's customer base.

During the past year, only four out of 12 potential outsourcing customers — including Kodak — signed customized outsourcing agreements with IBM, said William Wilson, general manager of Franklin Lakes, N.J.-based IBM System Services, National Service division.

The other three outsourcing agreements were with New Orleans-based Hibernia National Bank, Atlanta-based Bank South and Memphis-based First Tennessee Bank, Wilson said.

"Of the 12 customers [approached], seven decided to stay in-house with some restructuring help from us, and one company was lost to a competitor," Wilson acknowledged.

MAURA J. HARRINGTON

Savage

CONTINUED FROM PAGE 25

what company it's married to, is supposed to get along with everything else, no matter what. Like an extended family that actually gets along with no petty jealousy or greed, New Wave Computing is supposed to allow one application to schmooze on over to an idle CPU (even if it's on another operating system) and do its work.

In order to get there from here, HP users will have to make a few changes. For instance, HP said it would unbundle a database product from its proprietary operating system. Not that it will cost more, but it will just be separate. Users are clearly upset by having to deal with an a la carte approach. In fact, they were so upset that before the annual meeting ended, rumors of users picketing the company were floating about. No kidding.

HP is nervous about changes, too. One HP executive is clearly stressed by the lack of technical solutions posed by New Wave Computing. He said that the problems — such as security and error recovery — in heterogeneous systems are at least becoming clear. And, as such, they can be tackled.

HP also appears a bit nervous about its bottom line. Just one week before the users meeting, its quarterly results showed a 5% decrease. By plunging into standards and becoming a commodity supplier, HP runs the risk of being undersold and losing market share.

Perhaps the meeting shouldn't have been so near the home of the Boston Tea Party, although in this case it's the resistance to revolution, rather than insistence on it, that's brewing restlessness.

It's almost as if users are losing an old lover, one who's joined a cult or something. Yet beneath the jilted feeling, if you asked HP users to try a new amore, one with a three-letter name, they would rather stay alone in their room and pout about HP.

Savage is a *Computerworld* West Coast senior correspondent.

NEW PRODUCTS — SOFTWARE

Compilers

Esoft, Inc. has released a modular upgrade of its integrated multiuser information system.

The Data Base System Version 1.1 includes transparent file sharing and shared-screen updating features that enable users to create multiuser Dbase-compatible applications from remote and local workstations. The product was designed as an add-in for Esoft's The Bread Board System, which enables a single personal computer to provide up to 32 users with shared files and data.

A single-user system costs $395. A 16-user version sells for $995, and a 32-user system is priced at $1,795.

Esoft
15200 E. Girard Ave.
Aurora, Colo. 80014
(303) 699-6565

Applications packages

Syntelligence, Inc. has introduced a software application package that uses expert system technology to improve the quality, efficiency and consistency of a bank's commercial loan review, credit administration and portfolio management tasks.

The Lending Examiner can continuously monitor and re-evaluate commercial loans and rate them from best to worst. Potentially problematic loans are flagged before they become major liabilities. The product runs on an IBM System/370, Personal System/2 or Personal Computer AT. A license fee costs $130,000, and a nonstandard interface for spreading systems is $20,000.

Syntelligence
1000 Hamlin Court
Sunnyvale, Calif. 94088
(408) 745-6666

Computervision, a business unit of Prime Computer, Inc., has introduced a software package that provides manufacturing firms with a data management framework to ensure an accurate flow of engineering data throughout heterogeneous computer-aided design and manufacturing environments.

EDM is composed of four modules: EDM Vault (offered free with a basic EDM system), EDM Projects ($10,000 per workstation), EDM Programming ($15,000 per workstation) and EDM Client ($2,500 per workstation).

The product runs on Digital Equipment Corp. VAX/VMS and IBM VM/SP machines.

A basic system costs $160,000.

Computervision
100 Crosby Drive
Bedford, Mass. 01730
(617) 275-1800

CAD Information Systems, Inc. has announced a comprehensive engineering standards and specifications productivity package. Cadis-Fasteners is a computer-aided design-ready system that enables engineers and designers in manufacturing firms to access text and graphics standards and specifications and transfer the information into designs and documents.

The system runs on personal computers running Autocad, Sun Microsystems, Inc. workstations and Digital Equipment Corp. VAX/VMS systems. It is available for $8,175 per CPU.

Cadis
6551 S. Revere Pkwy.
Englewood, Colo. 80111
(303) 799-1311

NEW PRODUCTS — HARDWARE

Power supplies

Sola Electric has announced Sidekick Micro and Sidekick Plus, two uninterruptible power supplies that feature a maintenance-free internal battery that provides five minutes of reserve time under a full load.

Sidekick Plus is a microprocessor-based unit designed to protect critical systems from blackouts, brownouts, surges, spikes and sags. It is available in 1,300- and 1,800-VA models.

Sidekick comes with VA ratings from 180 to 520 and sells for $199 to $599, depending on VA model. The 1,300- and 1,800-VA Sidekick Plus models cost $1,495 and $1,795, respectively, the company said.

Sola Electric
1717 Busse Road
Elk Grove Village, Ill. 60007
(312) 439-2800

I/O devices

Rena Systems, Inc. has announced a bar-code system for converting mailing lists in an address database to nine-digit ZIP codes.

The ZIP + 4/Carrier Route system automatically matches addresses in a user's database with the correct nine-digit ZIP codes.

A software package that includes monthly updates costs $3,295 for the first year, $2,895 for the second year and $2,395 for the third year.

Rena Systems
290 Hansen Access Road
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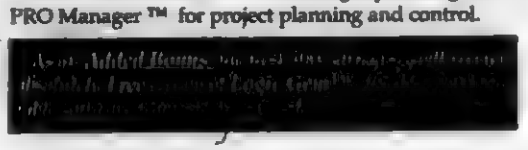

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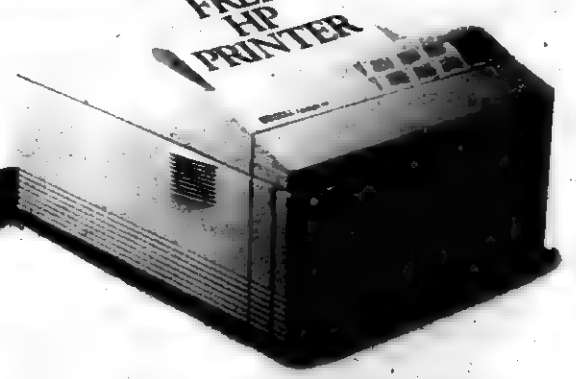

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COMMENTARY

Michael Fitzgerald

Turn down the volume

Wake me when it's over.

The Battle of the Bands, I mean. You know, the Gang of Nine against Into Blue Music (IBM, for short) for best single of the decade.

It seems that all the hype and passion generated by the Gang of Nine's decision to break with IBM on personal computing architecture was just not enough to interest buyers. People read about how IBM, grown tired of having so many younger bands playing its songs — and selling more of them — decided on a new style, Micro Channel Architecture, better known as MCA.

MCA was supposed to be music to the ears of the corporate computing audience, offering faster throughput, multitasking and the like. IBM also decided not to license MCA, a move it expected would let it dominate the PC market.

But IBM thought wrong, largely because music lovers everywhere didn't care much about arcane architectural issues. In the meantime, IBM's rival groups were working on a response to MCA. Compaq, Zenith and others saw IBM's development of MCA as strictly a power play, designed to leave the rest of the industry high and dry, with no real way to compete directly. It was, in effect, an at-

Continued on page 40

With friends like these. . .

Is Windows cracking the fragile relationship between Microsoft and IBM?

ANALYSIS

BY PATRICIA KEEFE
CW STAFF

Friends are friends, pals are pals, and buddies knife each other. At least that seems to be the code by which partners IBM and Microsoft Corp. are living these days, thanks in great part to an environmental shell for DOS called Windows.

So much so that the word on the street last week, as well as at the recent Windows Applications show in Boston, reached fever pitch. IBM is supposedly so irritated over OS/2's sluggish growth — which it blames in part on Windows 3.0's success — that it is ready to go off and do its own version of OS/2.

Meanwhile, at least one West Coast analyst maintains that Microsoft will never provide a smooth Windows-to-OS/2 migration path, instead milking Windows for all it is worth.

One report from analysts and developers is that IBM plans to add the Rexx job control programming language in its 2M-byte version of OS/2 or a later IBM-only revision. This is not seen as useful to anyone but mainframe shops using Rexx who want to hook their personal computers into the mainframe. Microsoft uses Basic.

At least one analyst envisions a scenario similar to what IBM and Microsoft did with MS-DOS and PC-DOS or MS-Net and PC-Net. The core remained the same, but IBM added a significant number of proprietary enhancements to the software.

A well-known developer recommended that if IBM does take proprietary steps with OS/2, it should take on a partner. The implication was that IBM needs help in developing microcomputer operating systems. The developer also added that if this does happen, he will ask his customers which OS/2 to write for.

For users like Price Waterhouse information systems director Sheldon Laube, any feuding between IBM and Microsoft matters only if it delays the release of the 32-bit OS/2 2.0. Other users and developers worry about having to choose between two versions of OS/2. What seems the most clear is that IBM will forge ahead with the so-called OS/2 Lite — a trim, 2M-byte version of the operating system — with or without Microsoft's support.

IBM appears determined to pitch this version of OS/2 against DOS-based Windows 3.0. Many analysts and users are skeptical. "OS/1 1.3 is just stupid," said Bill Bluestein, an analyst at Forrester Research, Inc. in Cambridge, Mass. "The idea of doing OS/2 on [an Intel Corp. 80286] is just nuts. What will they have to take out of it in order to make it work?"

So why is IBM doing this? Would-be OS/2 developers said that every time Microsoft "postpones" the release of OS/2 2.0, it extends the window for making money off of Windows 3.0.

"Last year, the relationship was pretty bad, and [Microsoft Chairman Bill] Gates stepped in personally and shored it up," the West Coast analyst said, adding that things fell apart again after Windows 3.0 shipped. Both IBM and Microsoft deny that their relationship is anything but businesslike.

It's worth noting that IBM arrived at that decision 10 months after it symbolically linked arms — and more important, product strategy — with Microsoft at the November Comdex/Fall '89. In what many observers are now calling a purely political move, the two admitted the error of their argumentative ways and pledged to provide a single voice on a number of OS/2 issues: developers kits, servers, Extended Edition and a less memory-intensive version of OS/2.

Yet almost a year later, the servers remain different, Extended Edition remains bundled and, while the duo have produced a 2M-byte OS/2, only IBM seems to think it's important enough to market.

According to an IBM spokeswoman who insisted on speaking for the IBM executives involved, the company remains committed to those goals. But she could not provide a timetable or even say if these promises would be fulfilled this year. "We're seeing some softening of their resolve," said David Cearley, an analyst at Gartner Group, Inc.

IBM's Extended Edition may be OS/2's best-seller, but it is Windows 3.0 that will be the best-seller overall this year. It has already sold 1 million copies, and Microsoft expects to hit 2 million by year's end. Its very success could be the undoing of a long-term and very fruitful relationship.

OS/2 Lite taste test

The pros:

- Demonstrably better performance.
- Better file management and loading of applications.
- Lower memory requirement that brings OS/2 to a broader spectrum on the market.
- The potential to attract more developers to port their software to OS/2.

The cons:

- Windows 3.0's performance on a 286 is not acceptable to many, so some critics contend that OS/2 Lite will fare worse.
- Users say either that they will still have to upgrade their 1M-byte 286 desktops or that they are already configured with 4M bytes.
- Applications are a bigger issue than memory.
- The possibility that Microsoft will not ship OS/2 Lite.

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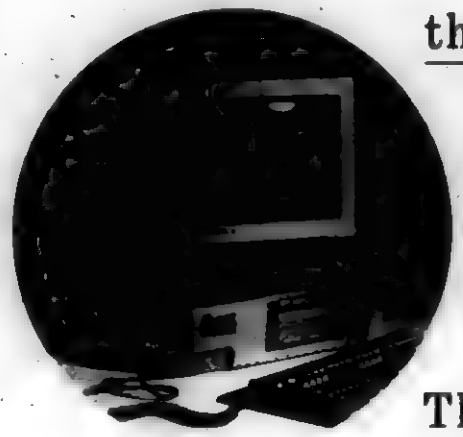

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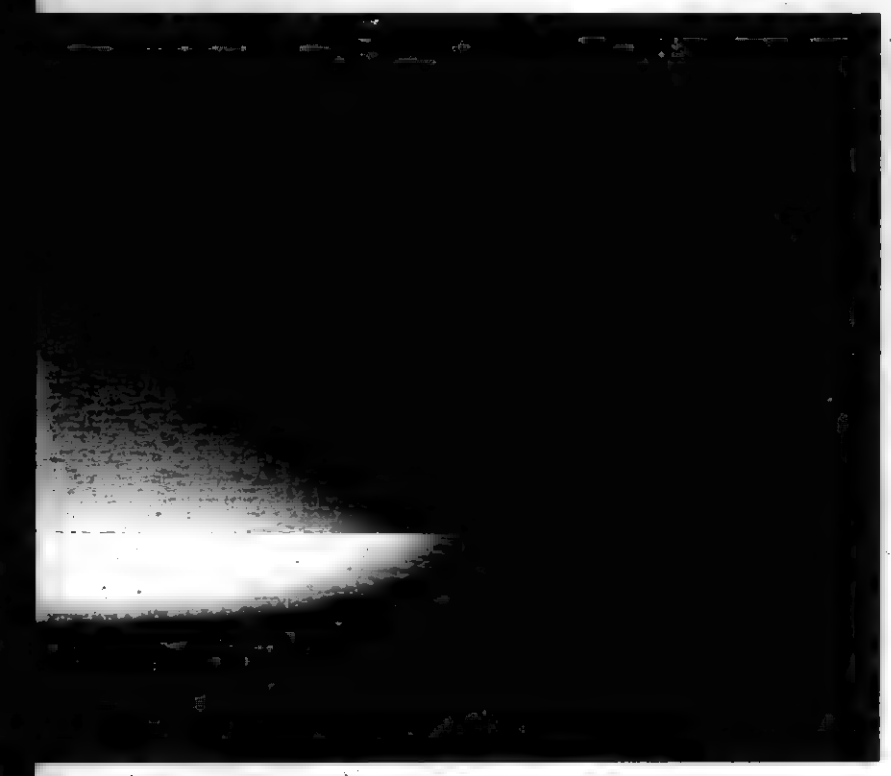

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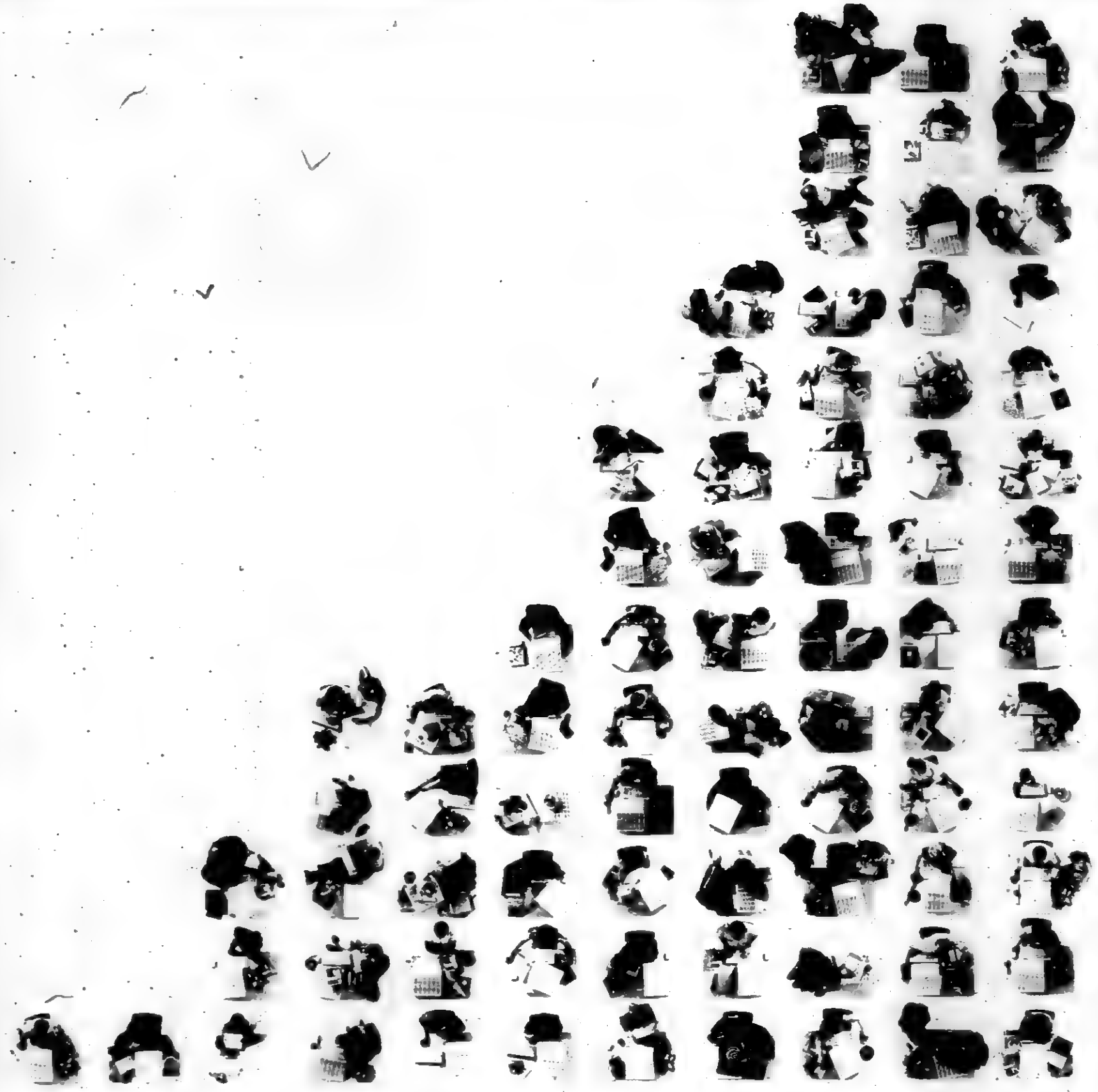

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Mating Intel PCs with RISC

BY RICHARD PASTORE
CW STAFF

For the legions of users enjoying the familiar comforts of DOS applications and Intel Corp.-based personal computers, RISC technology may seem a foreign threat. But at least two vendors have recently brought the camps together on the same desktop, and users said they like the functionality the pairing provides.

In the past, makers of reduced instruction set computing (RISC) workstations have offered Intel coprocessor options. Though these matchups stirred relatively little market interest, vendors continue to try this approach [CW, Aug. 13]. However, others — including Yarc Systems Corp. in Agoura Hills, Calif., and Alacron, Inc. in Thornwood, N.Y. — are taking the opposite tack. These firms are offering RISC coprocessor boards for use in native Intel/DOS boxes.

These hybrids have some advantages. "You would use such a machine to avoid the situation of having two keyboards on your desk," said Richard Shaffer, president of Technologic Partners in New York.

"Since a lot of people out there have PCs, there's certainly a good reason to plug in a [RISC] card rather than going out and buying a $10,000 Sun [Microsystems, Inc. workstation]," added Pat Wood, vice-president of research and development at Pipeline Associates, Inc.

The most important advantages for power users are price/performance and compatibility. The RISC coprocessors provide computing-prowess orders of magnitude greater than an Intel 80286 or 80386 CPU. Yet they still allow access to the legions of DOS-based productivity tools.

The cards run applications about 2½ times faster than a 33-MHz 386 PC, said Danny Braswell, manager of signal processing at Nichols Research Corp. in Huntsville, Ala. Nichols uses RISC cards from Yarc and Alacron.

"The Yarc card gets about twice the performance of a [Sun] Sparcstation 1 Plus, which is a $10,000 box," added Wood, whose software development firm has installed Yarc cards in its 286- and 386-based IBM PC compatibles.

Card users typically require RISC's computing muscle for such application areas as graphics, engineering and optical character recognition. However, these same users are comfortable with their DOS-based tools and do not want to spend the money to completely switch over to RISC technology, according to George Thompson, an analyst at Datapro Research Corp. in Delran, N.J.

"The reason we don't like to go [with Sun] is because the tools are so much more expensive there," Braswell said. A user gets more kick for the cash with a coprocessor board than he would with a Sun workstation, Braswell contended.

However, users should not expect miracles from this technology tag team. The RISC board is not an Intel accelerator. Lotus Development Corp.'s 1-2-3 will run the same as always on the Intel chip. Users must buy or develop applications to run with the particular type of RISC chip used on the coprocessor board.

Users have run across other limitations. Though it is possible to run Intel coprocessors or RISC applications in background with an environment such as Microsoft Corp.'s Windows, some users said they would prefer to have Unix handle the multitasking. The Yarc card does run Unix.

Also, in PCs operating at multiple clock speeds, boards have sometimes locked up when operating at the fastest speed, Wood said. The only ready solution is to run RISC applications at the slower clock speed, he added.

Cross pollination
Two RISC coprocessors looking for work in Intel-based PCs

[illegible]		
RISC coprocessor	[illegible]	[illegible]
Clock speed	[illegible]	[illegible]
Peak MIPS	30	25
Format	AT bus	AT bus
PC Platform	Intel-based	Intel-based
Operating system supported	DOS, Unix	DOS
Price	$8,995	$4,595

CW Chart: Doreen Dable

Third-party dissension unnerves Apple users

BY JAMES DALY
CW STAFF

While many Apple Computer, Inc. users remain as loyal as mutts to the firm and its popular Macintosh personal computer line, some have expressed uncertainty about Apple's future in wake of the increasing din from dissatisfied third-party product developers.

At the Macworld Expo in Boston last month, vendors and analysts launched a frontal assault on the Cupertino, Calif., firm, attacking its products, pricing and positioning [CW, Aug. 13].

In more recent interviews, Apple users generally agreed with the panel's complaints and said the mounting severity of developer dissatisfaction is eroding their confidence in Apple's ability to remain a welcome corporate partner. Most are beginning to wonder if Apple's pugnacious reputation with developers will result in research and development efforts being steered away from the $5 billion firm.

"Apple hasn't introduced a new technology in four years, and the only reason the company goes forward is because of third-party developers," said Mike Bailey, a systems integrator at Lockheed Missiles and Space Corp. "If these developers cannot work with Apple, there is going to be trouble."

A likely realignment scenario could heavily involve Microsoft Corp., Bailey said. He added that Microsoft's recent introduction of its Windows 3.0 graphical user interface was seen by some observers as an able substitute to Apple's simplified windows-and-icons user interface.

The panel included Claris Corp. President Bill Campbell, T/Maker Graphics President Heidi Roizen, Symantec Corp. President Gordon Eubanks and Aldus Corp. President Paul Brainerd. It called for a number of changes at Apple, including lowering prices, broadening its product line, stabilizing management, increasing connectivity with the DOS world and second-sourcing Macintosh technology.

Apple is reportedly ready to address some of these concerns: It plans to unveil two models in October with street prices expected to begin at less than $1,000.

Still, Campbell called the current Apple product lineup and pricing "out of whack" with the rest of the industry. Although some users classified his barbs as sour grapes — Apple recently announced that it would retain Claris as a subsidiary and renege on its pledge to spin off the unit — they conceded that if Apple does not make changes, it could hurt its own product sales.

Third-party reliance

"I'm just hoping some of these third-party vendors stay in business, because we have a lot riding on their products," said Bill McCloud, document publications systems manager at the Jet Propulsion Laboratory in Pasadena, Calif.

The upcoming announcements have calmed user concerns. "Apple has a lot going on behind the scenes, so I'm not ready just yet to get up on my soapbox and start screaming about what's wrong with the company," said Kim Arledge, microcomputer coordinator at the University of Texas.

For now, though, most users are content to sit tight and see how Apple handles the ball developers have lobbed into its court. "I don't think our multiyear R&D efforts are going to get yanked around by short-term changes like Apple's rethinking of the Claris situation," said Ray Palkovic, director of information managment at GTE Mobil Communications Group in Houston.

Despite the complaints, Apple continues to play the role of the Teflon company: No matter how bad Apple's problems, most users said they had no plans to abandon their Macintosh systems. "The versatility of the Macintosh usually flattens out whatever rough spots Apple may be going through," said Rick Chistjansen, manager of automation support at Manville Corp. in Denver. "I put $6,000 worth of computer [equipment] on a person's desk, and they not only use it for their job, but it also becomes a way of life."

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Driving into the age of automation

Georgia residents use network of diskless PC stations to take their driver's license exams

ON SITE

BY SALLY CUSACK
CW STAFF

MILLEDGEVILLE, Ga. — Taking a written driver's license examination at the Milledgeville, Ga., Department of Public Safety is as easy as pushing a button these days. Applicants simply present the required personal data to the licensing examiner, cross the room to an assigned workstation and begin the test.

This summer, Milledgeville became the third post in the state to install the local-area network-based system. Developed by Bull HN Information Systems, Inc., the network consists of 21 diskless personal computer stations equipped with customized keyboards and software graphics designed to illustrate the multiple-choice questions for both standard and commercial driver's license tests.

"People seem to understand the machines better than the paper questionnaire," noted Ronnie Murphy, chief examiner at the center. Murphy tests about 150 people each week. Prior to the computer installation, applicants were tested at the Milledgeville post or at a third-party testing facility.

When applicants enter the center, they go to a work area to turn in the documents authorizing the test. The information is taken by an examiner at a designated examiner's station, and the applicant is assigned a machine. All the machines are numbered, Murphy said, and by the time the person walks over to the designated box, all personal information is displayed on the screen, including name, date of birth, sex and Social Security number.

"The screen provides information about the test and provides a sample question," he said, adding that each key pad has been customized with the letters A, B, C and D. "If someone fails a particular test, they are instructed to go back to the work area, where the examiner's station is, for further instruction."

Twenty terminals on-site display the exam. Dubbed Netstations, each has a bolted-down keyboard to create a virtually tamperproof system, according to Bull. There is also an Intel Corp. 80386-based server connected to the test stations via a 3Com Corp.-based Ethernet LAN. All systems operate with the Automated Driver License Testing System (ADTS), developed by Bull and written in Quickbasic, with a database that maintains more than 500 multiple-choice questions.

The typical configuration is set up in a countertop arrangement, a Bull spokesperson said, and the server is usually hidden away, out of sight. The examiner's station is usually an Intel 286-based machine, but a diskless PC Netstation can also be used if the examiner so desires.

At each station, the software presents the driver with an on-screen, multiple-choice question. The driver then enters the selections by pressing the corresponding letter on the keyboard. The computer randomly selects 50 questions, some drawing on general knowledge and others that test knowledge specific to the driver's specialty licensing areas. Graphic displays include road signs, intersections, traffic lights, roads and other symbols commonly associated with driver's license testing.

> "PEOPLE SEEM TO understand the machines better than the paper questionnaire."
>
> RONNIE MURPHY
> DEPARTMENT OF PUBLIC SAFETY

In Milledgeville, the equipment was installed and training was completed in approximately one week. Of the 20 Netstation test computers, one has been designated to accommodate handicapped drivers. "The machine is placed lower than the others and allows space for a wheelchair in front of the screen," Murphy said. "The other 19 stations require that a person be standing to take the exam." The Bull ADTS can also be configured in several different languages and can be administered in audio mode for applicants that may require an oral exam.

A major advantage of automation is that the machines figure individual scores and provide percentages of pass/fail results — factors that used to be tabulated manually, Murphy said. Now the center can move drivers through at a faster rate. The software also provides internal question response tracking, which targets questions that may be vague or difficult to understand. Only supervisors are authorized to change or delete questions.

The Milledgeville post plans eventually to be tied into a computer at its Atlanta headquarters, but a specific date has yet to be set. The ADTS is currently used in several states, including New Jersey and Florida.

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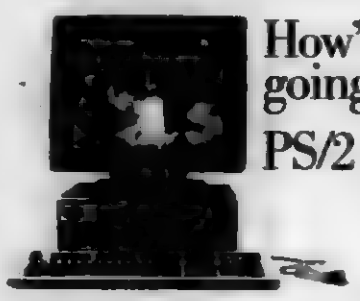

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Fitzgerald

FROM PAGE 33

tempt by IBM to force everyone else into retirement.

The Gang of Nine looked at what they felt was a flaw in IBM's plan: Add-in boards for the old Industry Standard Architecture machines wouldn't work under MCA. So they told buyers, "We can give you all those great sounds in the same industry-standard style you're used to. We're going to make new music, too, but you don't have to throw out all your old boards." Thus was born the Extended Industry Standard Architecture (EISA).

IBM came out with its new sound first, in 1987 (it still produces its former pop sounds, too). The Gang of Nine came out in force just this year. But the delay didn't hurt it because neither machine has proven a chart buster. Nor are sales expected to increase much in the next two years or so. Why? Did the artists lose their commercial touch?

Maybe, says that hep critic Seymour "Sy" Merrin, speaking from the swing town of silicon, Palo Alto. "The reason nobody's too terribly concerned about MCA vs. EISA is that whatever they want to do, there'll be a board that'll do it," Sy shrugs.

For instance, MCA and EISA machines will run on the same local-area network and will even run the same software. Dig those crazy sounds, cats.

What has happened is that both architectures have their value; two solid, stable standards exist, and users will have a choice as to what they want to hear, when they tire of the old sounds. And tire they will, eventually, industry critics say.

They expect that the listening public will eventually love both types of machines, but for now, users are happy with what they have. Both IBM and the Gang of Nine would like it to be otherwise but have succeeded only in offering powerful machines that offer users a choice, for a change.

Perhaps IBM and the Gang of Nine should listen to the song played by Bill Gates and the Microsofts; their remake of Windows has, if nothing else, kept it high on the play list. Actually, big, memory-eating programs like Windows might just get people to clamor for both EISA and MCA. Meanwhile, I think someone pulled the plug on the amplifiers — I just don't hear anything worth all that early fuss.

Fitzgerald is a *Computerworld* Midwest bureau correspondent.

MICRO BITS

Outbound to offer Mac-friendly laptop

Apple Computer, Inc. and **Outbound Laptop Systems** have reached an agreement that will allow Outbound to offer its nine-pound Macintosh-compatible laptop and related peripherals without infringing on Apple's intellectual property rights.

Microsoft Corp. is tapping **Sytron Corp.**'s tape backup software for packaging in its upcoming LAN Manager 2.0 operating system. **IBM** has also given the nod to Sytron's Sytos Plus for use as a backup-and-restore utility for OS/2 1.2 and DOS 3.3 and 4.0. The backup software package will support IBM's 6157 tape drives and 3½- and 5¼-in. disk drives in the Personal System/2.

IBM Canada has acquired an **11%** stake in **Delrina Technology, Inc.**, a developer of personal computer-based business forms processing software. Delrina plans to port its Perform package for OS/2 and Presentation Manager. A Windows 3.0 version is slated to ship this summer. IBM already markets a DOS-compatible version of Perform under its Forms Available When Needed program.

Indigo Software Ltd. and **IBM** signed a cooperative software marketing agreement under which IBM's direct sales force will market the Indigo printer software, including Jetform-Design, Jetform-Filler, Jetform-Server and Jetform-Merge.

Hewlett-Packard Co. and **Mentor Graphics Corp.** have signed a three-year, $400 million contract under which Mentor will purchase HP Apollo division workstations, servers and other hardware and software products and services.

EIS includes AI functions

AUSTIN, Texas — Execucom Systems Corp. has introduced Paradigm, a workstation-based executive information system (EIS) that uses built-in artificial intelligence capabilities said to help users interpret data.

Paradigm examines the information in the user's database through a menu-driven, point-and-pick process that shows the current status of the organization by interpreting specific performance variances or simulating specific business scenarios, the company said.

Paradigm is designed to combine financial management modeling, AI, spreadsheet systems, analytical tools, application building, database access query and analyses, said Steve Murchie, Execucom's Paradigm product manager.

Due out this month, Execucom's EIS runs on Digital Equipment Corp.'s Vaxstation workstations. Priced at $1,500 per workstation, it will be marketed to senior executives and systems analysts and is compatible with other Execucom EIS planning tools.

MAURA J. HARRINGTON

NEW PRODUCTS

Software applications packages

Vmark Software, Inc. has announced Uni-verse Release 5.4, a multiuser, multitasking relational database management system and application development environment.

The product, which runs on all major Unix systems, is compatible with Prime Computer, Inc.'s Prime Information systems and Pick Systems' Pick. It is available for $315 or $375 per user, depending on the number of users.

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Natick, Mass. 01760
(508) 655-3700

Viewstar Corp. has announced VS Retrieve, a Windows-based software application that provides tools for querying, retrieving, viewing and outputting documents managed by Viewstar's back-end document database management system.

The product supports viewing of standard-size business documents and large-format engineering drawings. It supports all defined modes of windows operation, including real, standard and enhanced 386 modes.

VS Retrieve uses Microsoft Corp.'s Windows 3.0 as its chief operating environment. A single-user license costs $1,450, and other licenses range from $6,887 to $79,750, depending on number of users.

Viewstar
5820 Shellmound St.
Emeryville, Calif. 94608
(415) 841-8565

Prisma Software Corp. has introduced an upgraded version of Your Way for Microsoft Corp.'s Windows Version 3.0., a software package designed for users of IBM Personal Computers and compatibles.

The product features Data Exchange and Dynamic Data Exchange functions that enable users to share data within their own systems and among applications. The upgrade runs under Windows 2.1 or 3.0 and is priced at $289.

Prisma
17000 Preston Road
Dallas, Texas 75248
(214) 380-6370

Data storage

Softsource's Block Librarian storage and retrieval system has been upgraded to support up to 50 libraries to provide a total of 500,000 blocks.

Release 10.5 enables users to create separate libraries for electrical symbols, architectural symbols and other libraries. An interactive storage feature enables graphic representations of blocks to be generated immediately after a block is defined and placed in a cell, the vendor said.

The product operates under Autocad Version 2.5 or higher and runs on Novell, Inc. networks. It is priced at $495, and registered current owners can upgrade their systems for $50.

Softsource
301 W. Holly
Bellingham, Wash. 98225
(206) 676-0999

Softsource's Block Librarian provides 500,000 blocks

Sun Moon Star has announced the 286-12/CD system and CD-Set, two compact disc/read-only memory (CD-ROM) products that enable users to access reference materials from a personal computer.

The 286-12/CD, priced at $2,995, includes a 40M-byte hard disk drive, a color monitor, a mouse and CD-Set-Go, Sun Moon Star's installation software package. CD-Set provides CD-ROM capabilities to users of IBM Personal Computer ATs or compatibles. It is available for $995.

Sun Moon Star
1941 Ringwood Ave.
San Jose, Calif. 95131
(408) 452-7811

Software utilities

Varteck International, Inc. has introduced a product designed to emulate the MS-DOS versions of its PS-Menu software package.

Unix PS-Menu provides users with a menu interface across MS-DOS, personal computer local-area network, Microsoft Corp.'s Windows and Unix platforms. Its menu system allows users to run advanced Unix commands and create global and private menus.

The product is priced at $295 for Santa Cruz Operation Xenix 286 systems and $495 per CPU for SCO Xenix/Unix 386 workstations.

Varteck
3 Regent St.
Livingston, N.J. 07039
(800) 356-1770

Microcom, Inc.'s Software Division has announced an enhanced version of Relay Gold for Microsoft Corp.'s Windows Version 3.0.

The software package provides users of Windows 3.0 with mainframe connectivity such as asynchronous and token-ring gateways. Relay Gold includes a Systems Application Architecture Common User Access graphical user interface that can be controlled with a mouse and supports IBM's High-Level Language Application Programming Interface.

The product began shipping last month to existing customers for $299.

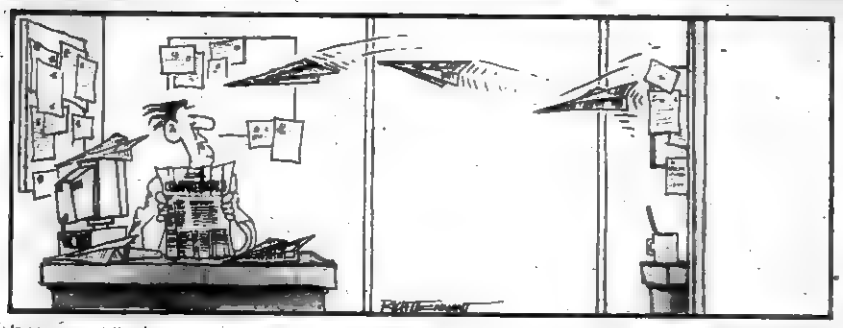
Microcom
500 River Ridge Dr.
Norwood, Mass. 02062
(617) 551-1000

Advanced Computer Innovations, Inc. has released Wordport Version 1.2, a word processing conversion software package that runs on IBM Personal Computer XTs, ATs, Personal System/2s and compatibles.

The menu-driven software can be used to directly convert document files between all versions of Wordperfect Corp.'s Wordperfect, Wordstar International's Wordstar, Microsoft Corp.'s Microsoft Word and IBM's Displaywrite programs without requiring an intermediate conversion.

Wordport Version 1.2 requires a disk drive and 256K bytes of memory. It is priced at $149.

Advanced Computer Innovations
30 Burncoat Way
Pittsford, N.Y. 14534
(716) 383-1939



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23. Dir./Mgr. Sys. Development, Sys. Architecture
31. Mgrs., Supry. of Programming, Software Dev.
32. Programmers, Software Developers
60. Sys. Integrators/VARs/Consulting Mgt.
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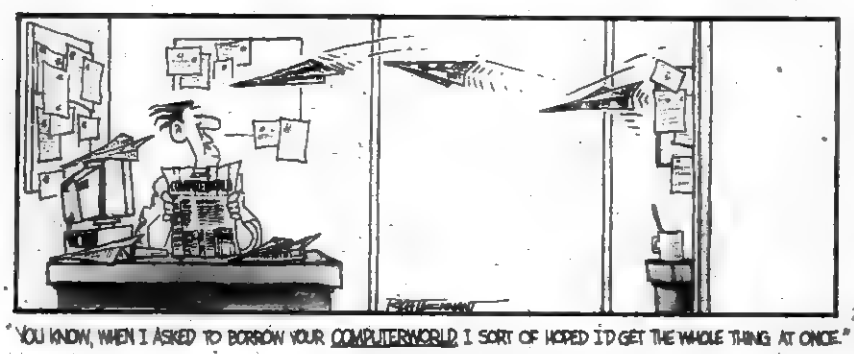

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80. Manufacturer of Computers, Computer-Related Systems or Peripherals
85. System Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
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60. Sys. Integrators/VARs/Consulting Mgt.
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12. Vice President, Asst. VP
13. Treasurer, Controller, Financial Officer
41. Engineering, Scientific, R&D, Tech. Mgt.
51. Sales & Mktg. Management
OTHER PROFESSIONALS
70. Medical, Legal, Accounting Mgt.
80. Educator, Journalists, Librarians, Students
90. Others _____
(Please specify)

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COMMENTARY

Jeffrey N. Fritz

Jumping the ISDN ship

They're dropping like flies. One by one, vendors are abandoning the Integrated Services Digital Network (ISDN) customer premises equipment (CPE) market.

Infotron in Cherry Hill, N.J., was one of the first to call it quits. The firm, which offered both an ISDN terminal adapter and a personal computer communications card, pulled out of the market early last spring.

Hayes Microcomputer Products in Norcross, Ga., received a lot of attention when it announced its ISDN communications card and created an even greater stir with the announcement that it would append the standard AT command set to add ISDN support. But later Hayes suspended ISDN product development. Users were shocked. The addition of Hayes to the market had signaled a validation of ISDN by perhaps the premier modern manufacturer.

There have been others as well. A few months ago, Richardson, Texas-based Vadis announced its departure from the ISDN market. Until very recently, Vadis could be found displaying ISDN products at trade shows and conferences.

Continued on page 42

Moving away from mainframes

LaSalle expects its switch to PC LANs to pay off in savings and flexibility

BY ELISABETH HORWITT
CW STAFF

CHICAGO — LaSalle Partners, Inc. is taking a slow and considered approach to moving applications from IBM 4341 mainframes to personal computer local-area networks and possibly some Unix-based multiuser systems as well.

Considering itself "too small to make a major investment in MVS ESA 3090s, which is the way IBM is pushing us," said Vice-President of Information Systems Michael Jones, the 700-person real estate investment management firm wants to take advantage of the cost performance and application flexibility benefits of PC networking.

"We think we can more effectively address on PCs the differences between our businesses" in terms of business applications such as portfolio management, property management and asset valuation, Jones said.

In addition, Jones said he hopes LANs will help users work together much more effectively through electronic mail and groupware programs that "foster exchange of information, intergroup projects and group scheduling. Ultimately, I see every professional in the company using LANs." LaSalle currently has 550 to 600 PCs installed, Jones said, with most professionals using Intel Corp. 80386-based systems.

LaSalle's Jones *opts for benefits of PC networking*

Another major benefit that LaSalle hopes to gain from downsizing is the ability to cost-effectively develop a flexible, SQL-based querying system that will save users from "having to call MIS for their reports," Jones said.

The current mainframe-based querying package from D&B Software Services is difficult for users to learn and use, he added. However, "the costs of implementing DB2 on the mainframe are too large for the benefits. We can get there more effectively on a LAN," he added.

LaSalle said it expects to move 70% of its data down to distributed group systems while retaining the other 30%, which needs to be centrally controlled, on the mainframe, Jones said.

However, the company plans to take things slowly to ensure that it picks products that do things right the first time around, Jones indicated. With a staff of 35 people, Jones does not have a Fortune 500 IS director's resources for correcting the technical glitches that tend to crop up in immature products, he said. "They can just throw bucks at a problem."

Some problems have cropped up already. For example, as part of its evaluation of Microsoft Corp.'s MS-DOS vs. OS/2-based PC platforms, LaSalle tested Windows with DOS, only to find that the software "requires almost as much memory as OS/2," said technical services

Continued on page 46

Good Netware support hard to come by — ever

BY JIM NASH
CW STAFF

Netware computer network administrators needing technical support are caught in the worst of two worlds.

As one user points out, mainframe managers get high-quality support from a few good vendors and distributors, but at a dear price. Personal computer users can find free support almost anywhere, but it is of questionable reliability.

Users of Novell, Inc.'s Netware cannot find reliable support at any price, one administrator said.

On both national and regional levels, users are asserting that nobody has seen the troubles they have seen — not even Novell. In light of this, Netware systems administrators are talking about a user-expert database, one that would catalog companies to whom they can turn with specific networking problems.

Frank Goodyear, president of the Orange County Netware Users Association, said that for the past year, systems managers have been gathering informally to brainstorm ways in which users can help each other without involving Novell. Goodyear is also a Novell reseller.

It is no secret that one of the most bruising chinks in Novell's armor is its user support. Even company executives acknowledge the shortcoming. The Provo, Utah-based networking giant's solution has been to "push knowledge out to resellers and minimize direct calls to Novell," a Novell spokesman said.

As part of that strategy, Bob Gimigliano, Novell's major account manager in Southern California, said he and Goodyear identified about a dozen large Netware users last year and gathered them together for informal talks about their problem-solving experiences with Netware. Gimigliano said similar efforts are taking place in other regions.

Today, the Southern California group includes University of California campuses in Los Angeles, San Diego and Irvine, as well as Bergen Brunswig Corp.,

Continued on page 42

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ISDN device for AS/400 to debut

IBM and Teleos join forces, aim application platform at niche markets

BY SALLY CUSACK
CW STAFF

EATONTOWN, N.J. — A development partnership between IBM and Teleos Communications, Inc. has yielded an Integrated Services Digital Network (ISDN) device for building ISDN applications on the IBM Application System/400.

Targeted at third-party software vendors, the Teleos IRX9000 ISDN Resource Exchange is a computer-to-switch ISDN application platform specifically designed to support IBM's Callpath/400 software over a Token-Ring network. This allows third-party application builders to integrate ISDN networking capabilities with the data processing functions of AS/400 minicomputers.

"The primary question here, as always, is does it have any measurable impact on the deployment rate of ISDN?" said Thomas L. Nolle, president of CIMI Corp., a Voorhees, N.J.-based consulting and research firm. "This really doesn't sound like something a large number of people are going to use. The product would have to apply to a broad range of businesses on a cost-justifiable basis to serve as

the magic bullet for the ISDN marketplace."

According to a Teleos spokesman, the company is predicting that telemarketing and teleservices are niche markets in which the device will be most strongly deployed. There are currently 22 IBM business partners building AS/400-based telephony applications, he said.

The IRX9000 connects to the AS/400 via a proprietary 4M bit/sec. Token-Ring Interface Unit. Software options reportedly include a multipoint bridging capability via the interface unit, which enables users to interconnect Token-Ring local-area networks from multiple locations using ISDN.

Access to Callpath/400 services is provided through Systems Network Architecture LU6.2 sessions on the Token-Ring network, and AS/400 applications can access relevant database information and apply it to the intelligent routing of calls from or through the IRX9000. Calls are defined as data, image, audio or voice.

Product features include intelligent call routing capabilities and a key pad free-agent interaction function with which users can initiate all telephone commands from the computer terminal, eliminating the need to interact with the telephone keypad.

Scheduled for release in the first quarter of 1991, IRX9000 will range in price from $45,000 to $100,000, not including the AS/400 and AS/400 software.

BIT BLAST

Vendors plan for Interop conference

Thirteen hardware, software and chip vendors will participate in an Open Network Computing interoperability demonstration at the Interop '90 Conference Exhibition, Oct. 8-12 in San Jose, Calif., according to **Interop, Inc.**, the show's sponsor. Among the participants will be **3Com Corp.**, **Auspex Systems, Inc.**, **Netwise, Inc.**, **Novell, Inc.**, **Sequent Computer Systems, Inc.**, **Sun Microsystems, Inc.** and **AT&T** subsidiary **Unix Systems Laboratories, Inc.**

Northern Telecom, Inc. has developed a frame-relay interface to its DMS 100 and DMS 250 Supernode central office switches, providing local and interexchange carriers with the basis for virtual private data networks that can deliver to users on demand bandwidth of up to 1.5M bit/sec. over dial-up lines, according to Northern. The twisted-pair connections reportedly support up to 1,000 concurrent data sessions. Total capacity for the new trunks is up to 45M bit/sec., the vendor said.

New York Telephone is testing a system that is said to allow travelers to dial up stock prices or make hotel or plane reservations on public computer terminals at **John F. Kennedy International Airport**. The terminals give customers access to 150 different travel, financial, entertainment and information services through New York Telephone parent **Nynex Corp.**'s Info-Look Gateway Services.

Westinghouse Communications is implementing a CCITT X.400-compliant electronic mail network to support international communications among various business units of parent company **Western Electric Corp.**, customers, suppliers and other subscribers to Westinghouse's corporate mail service. The mail service will deliver mail to users of IBM's Professional Office System and Digital Equipment Corp.'s Vaxmail in the proprietary systems' own formats, the Westinghouse subsidiary said. More than 13,000 users are on the system now, with 8,000 to be added soon.

Nynex and **Sun Microsystems, Inc.** are jointly developing a multimedia information and communications system that is said to permit the storage, processing and transmission of voice, data, video and image. The system, which has already been demonstrated, now includes an interface to Probity, a physician's practice management system.

Fritz

FROM PAGE 41

Even stalwart AT&T has been rumored to have plans to drop out of the ISDN CPE market. Although AT&T Network Systems officials never seem to confirm or deny changes to future ISDN plans, rumors continue to fly at various conferences and trade shows.

While the possibility exists that this is just a market shakeout, some users are wondering if it signals the beginning of the end for ISDN technology.

Sluggish ISDN sales coupled with user uncertainty about ISDN's future has caused a depressed ISDN CPE market to sink even lower. From the vendors' point of view, there is little advantage to being the first on the block with ISDN equipment. Vendors can easily choose to sit on the sidelines and watch the field. If significant ISDN activity develops later on, they can always reenter the field.

Do vendor departments mean that ISDN is about to become a dead issue? Probably not. Major players, such as AT&T, Northern Telecom and Siemens, have too large an investment in ISDN to stand around and watch it die. However, careful attention must be applied — and soon — to the problem of the lackluster CPE market. There are ways of injecting new life into ISDN CPE sales, but it will take some quick action on the part of the vendors, local telephone carriers and users.

Vendors need to reconsider their pricing structure. Charging $1,500 for an ISDN communications device is not likely to produce a flood of orders. Right or wrong, users say they expect ISDN data equipment to be priced no higher than a top-of-the-line modem, which translates to slightly over $600.

Similarly, $800 is viewed as an exorbitant price for what most users consider to be a telephone. Vendors argue that with its voice features and data capabilities, an ISDN desk set is not comparable to an analog telephone. Unfortunately, most users are simply not listening. The current perception is that ISDN vendors want too much money for a telephone. In the final analysis, however, it is user perception, not necessarily the facts, that will count.

The cure does not rest only on the vendors' shoulders. Local telephone carriers and users must change their perceptions toward ISDN service. Users must be prepared to go a little further out on the limb with their ISDN deployment plans. Carriers must recognize that it may not be possible to achieve an immediate payback for their substantial investments in ISDN switching equipment.

Without subsidization, many of the telecommunications services we enjoy today would never have been given a chance to survive. Therefore, the state public service commissions must be made to understand that ISDN is a unique new service. The commissions must give consideration to the special treatment that is required if ISDN is to prosper. Most importantly, the local carriers must be allowed to price ISDN lines to sell.

THERE ARE WAYS of injecting new life into ISDN customer premises equipment sales, but it will take some quick action on the part of the vendors, local telephone carriers and users.

The fact is, ISDN will not prosper until it is viewed as essential to continued corporate growth. Therefore, the design and implementation of cost-effective applications unique to ISDN is very important. It is these unique applications that will, more than anything else, create the desire for customers to purchase ISDN CPE and lines.

Once that happens, ISDN will finally be considered an essential service offering enhanced connectivity at a reduced cost.

Fritz is a data communications analyst at West Virginia University in Morgantown, W. Va.

Netware

FROM PAGE 41

Southern California Edison, Toshiba America, Hughes Aircraft Co., Grumman Corp. and Fluor Corp.

"We meet informally," said Bill Lawrence, network engineer in Edison's nuclear power generation department. "That's kind of how we've always gotten our support — informally." Lawrence said group members pick each others' brains for tips and answers. He added that he could support an on-line database, possibly as an extension of Novell's Netwire bulletin board on Compuserve.

Glen Kauffman at University of California, Irvine said he agreed with users supporting users, even if it does not directly benefit his organization. Kauffman is the manager of computer resources at the university's college of medicine.

He said that as part of the ad hoc Southern California group, he often feels more like a resource because corporations are still mastering local-area networks while University of California campuses are already tackling wide-area networking. Nevertheless, Kauffman said, such groups and similarly structured databases are important. He suggested loosely modeling any new database after Microsoft Corp.'s Knowledge Base.

Diane Norris, computer administration assistant at Tokiko America, an automobile equipment aftermarket manufacturer in Torrance, Calif., said she sees a need for a database administered both by users and Novell to combine practical experience with nationwide coordination.

Goodyear emphasized that many questions remain unanswered, such as who would administer the database. But he expressed optimism that a formal announcement on the matter could come soon after Networld '90 Dallas next month.

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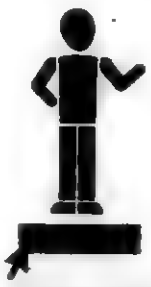

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*PC WEEK, May 7, 1990. **Direct LocalTalk connections dependent on NetWare 386 NLM due Fall, 1990. Macintosh connection achieved today via standard bridges.

SNMP-based tools ready for show

BY ELLIS BOOKER
CW STAFF

Although Interop '90 is still a month away, vendors of network management systems that use the Simple Network Management Protocol (SNMP) standard are already showing products.

At a recent Interop '90 "pre-staging" event in Boxboro, Mass., FTP Software, Inc. demonstrated SNMP Tools, its $300 SNMP-based network management product for personal computers. FTP is one of 50 vendors expected to attend the Oct. 8-12 Interop '90 in San Jose, Calif.

The Wakefield, Mass., developer already has a Transmission Control Protocol/Internet Protocol (TCP/IP) system for MS-DOS personal computers, PC/TCP, which was introduced in April 1986.

SNMP Tools uses the PC/TCP kernel and can therefore use Ethernet, Starlan, 802.5 and token-ring networks, the company said.

In addition, FTP announced that it had enhanced the basic SNMP protocol and that its product contains graphing and monitoring features such as the ability to display a color bar graph of one or more SNMP variables. The software also converts the SNMP syntax into more easily understood messages, FTP said.

An early user of the FTP product is Sean Welch, president of Xenocom, Inc., another developer of SNMP.

"It was a real joy to develop in the FTP environment," said Welch, whose Windham, N.H.-based company used the SNMP Tools developer kit to create an SNMP-based, end-user application that works in conjunction with Novell, Inc.'s own Lantern network monitor.

Dubbed Argus, the software will be previewed at this month's Networld '90 exposition in Dallas.

Xenecom is also using FTP's developer kit for a second product, a front end that would allow a network manager to gather management reports from multivendor, SNMP-based networks. Because vendors of SNMP-based systems have extended the management information base (MIB) — the object database defined by the SNMP standard — users require different monitors to gather performance data and other information from the network devices of different vendors.

"We're trying to develop an umbrella product, a list of objects," Welch said, adding that he is going to SNMP vendors in order to get the details on their MIB extensions.

SNMP Tools uses the PC/TCP kernel and can therefore use Ethernet, Starlan, 802.5 and token-ring networks.

"The hardest thing is to get the vendors to cooperate. They hold the key," said Welch, who hopes to have a product ready by December.

SNMP Tools runs on IBM Personal Computer/ATs, Personal System/2s or compatibles running DOS Version 3.1 or higher.

Current FTP customers who already have PC/TCP for DOS can purchase an add-in version of SNMP Tools for $100, the company said.

LaSalle

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manager Gregory Brunks. In addition, the system reportedly slowed down as soon as it had to handle multiple applications of any significant size. It also lacked drivers to access many mainframe applications, according to Brunks.

LaSalle now leans toward OS/2, which has built-in support of IBM 3270 connections, "more advanced multitasking" than Windows and lacks DOS' memory problems, Brunks said.

Another crucial question that now confronts LaSalle's IS group is which type of system provides the most cost-effective resource sharing for just a few users: a PC LAN or "a $12,000 Unix workstation with three terminals?" Brunks asked. The firm is likely to use OS/2 LANs for many of its corporate sites but install Unix-based multiuser systems for smaller sites, including the majority of the real estate properties that LaSalle manages, Jones said.

One issue Jones' group is still struggling with is how to ensure that critical applications get the same level of support from the PC-based vendors that they enjoyed from mainframe vendors, Jones said.

"In the mainframe environment, you get instant support with an 800 number; we're used to that," Jones said. By contrast, certain PC vendors have engaged Jones' people in games of telephone tag that lasted three days. Also, a value-added reseller's support for two existing Novell, Inc. LANs has been "terrible," he added.

The whole subject of LAN internetworking is a thorny one at LaSalle. One reason is that the $3,500 price tag of IBM Token-Ring bridges that are currently available is prohibitive for linking small work groups, Jones said, although an upcoming PC software-based bridge should alleviate this.

Intergroup data sharing is currently minimal across different LaSalle business groups, "although people may want to share tools and information on a limited basis," Jones said.

LaSalle's IS department said it hopes to decide by year's end how to set up its distributed computing platforms, how to parcel out applications among LANs, multiuser systems and mainframes and what products to buy in the key areas, Jones said. "We want it locked down so we can sell it to the management committee by late November or early December — in time for the budget process."

NEW PRODUCTS

Local-area networking hardware

Microtest, Inc. has announced the release of Lanport-II, a self-contained remote network access device that reportedly allows users to log in to a Novell, Inc. network from an IBM Personal Computer, Apple Computer, Inc. Macintosh or laptop.

Users can log in from home, a hotel or a remote office and upload or download network files, print documents or send messages to other network users.

A dial-out capability provides users of any workstation with access to on-line information services, electronic mail systems or remote computers.

The product works on Novell Ethernet-based networks and costs $695, according to the company.

Microtest
3519 E. Shea Blvd.
Phoenix, Ariz. 85028
(602) 971-6464

National Semiconductor Corp.'s computer enhancement group has introduced two products to its Ethernode family of Ethernet adapter cards.

Ethernode 16 is a 16-bit Nubus board for all models of the Apple Computer, Inc. Macintosh II series and is priced at $495.

Ethernode 32 SE/30 is a 32-bit direct-memory access board for the Macintosh SE/30 processor direct slot and costs $595.

Both boards include software drivers that are compatible with Apple's Ethertalk.

National Semiconductor
P.O. Box 58090
2900 Semiconductor Drive
Santa Clara, Calif. 95052
(408) 721-5149

Network management

Virucide, a software package from Parsons Technology, Inc., reportedly detects and destroys known computer viruses and restores most infected programs.

The software takes less than one minute to operate and requires an IBM Personal Computer XT, AT or compatible, 256K bytes of random-access memory and MS-DOS 2.0 or higher.

Virucide is priced at $49.

Parsons Technology
375 Collins Road NE
Cedar Rapids, Iowa 52402
(319) 395-9626

Gateways/ Bridges/Routers

Network Software Associates, Inc. (NSA) has announced the NSA SDLC Artic Subsystem, a software package designed to work with a real-time interface coprocessor card to improve performance of the company's Adapt family of personal computer-to-host and local-area network-to-host connectivity products.

The subsystem can be used with Adaptsna LAN gateway, Adaptasync Controller and Version 4.2 or higher of the Adaptsna family of stand-alone emulators for IBM Personal Computer ATs, XTs, Personal System/2s, laptops and compatibles. It is priced at $495.

NSA
39 Argonaut
Laguna Hills, Calif. 92656
(714) 768-4013

Zenith Communication Products has announced a modular network communications system designed to provide interconnectivity among Ethernet, token-ring and wide-area networks.

Galaxy Exchange supports twisted-pair, fiber-optic, broadband and baseband coaxial media, as well as Ethernet and token-ring protocols within the same enclosure, the vendor said. It can be configured with up to four different network interface modules.

The product is priced at $4,995, and individual interface modules range from $395 to $4,300.

Zenith
1000 Milwaukee Ave.
Glenview, Ill. 60025
(708) 391-8000

Advanced Computer Communications has introduced a front-end processor designed for Digital Equipment Corp. workstations that support the small computer systems interface standard.

The ACP 3250 can be used to route X.25 network traffic via a programmer's interface, Transmission Control Protocol/Internet Protocol (TCP/IP) and X.29 interfaces. When used under TCP/IP, the device enables a designated workstation to control wide-area network routing, the vendor said.

The product is priced at $5,250.

ACC
720 Santa Barbara St.
Santa Barbara, Calif.
93101
(805) 963-9431

The ACP 3250 *can route X.25 network traffic*

Newport Systems Solutions, Inc. has added a data compression feature to a version of its LAN² family of local-area network routers.

The LAN² LAN/Compression Router enables users to achieve an average compression ratio of 4:1 and increase the throughput of their communications lines without increasing line speeds. It can be used in Novell, Inc. Netware-based external and internal configurations.

The product, scheduled to ship this month, costs $4,195 for a two-port node and $7,795 for a kit containing two nodes.

Newport Systems Solutions
4020 Birch St.
Newport Beach, Calif.
92660
(800) 662-4677

Local-area networking software

Visionwest Software, Inc. has announced a software package designed to convert a local personal computer workstation into a diskless local-area network workstation.

Visionlock enables network managers to prevent printouts, unauthorized use of modems and introduction of viruses from a local workstation.

The product requires Novell, Inc. Netware Version 2.0A or higher and an IBM Personal Computer XT, AT or Industry Standard Architecture-compatible workstation operating under MS-DOS or PC-DOS Version 3.0 or higher. It is priced at $279.

Visionwest Software
21620 N. 19th Ave.
Phoenix, Ariz. 85027
(602) 581-6880

EXECUTIVE TRACK

Roger W. Brust has been promoted to assistant vice-president of application systems at **Broadcast Music, Inc.**, a New York-based clearinghouse for performers' rights and royalties for 100,000 songwriters and publishers.

Brust joined Broadcast Music's application systems staff in 1989 as director. Prior to that, he worked as a consultant at Consulting Connections, Inc., where he designed and implemented a turnkey communications network for the city of New York. He was previously vice-president of data center operations and corporate trust applications at Manufacturers Hanover Trust Co.

Brust holds a bachelor of science degree in computer technology from the New York Institute of Technology.

.....

Joseph J. Catino has been named information center manager in the MIS department at the **Massachusetts Water Resources Authority** in Boston. He is responsible for microcomputer support, office systems and the user help desk.

Catino previously owned a small consulting firm that maintained company financial records and negotiated vendor contracts.

Before that, he was director of the IS and administration department at the National Fire Protection Association and a clerk at the Bank of New England. Catino holds a bachelor's degree from Massachusetts Bay Community College.

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Changing jobs? Promoting an assistant? Your peers want to know who is coming and going, and *Computerworld* wants to help by mentioning any IS job changes in Executive Track. When you have news about staff changes, be sure to drop a note and photo or have your public relations department write to Clinton Wilder, Senior Editor, Management, *Computerworld*, Box 9171, 375 Cochituate Road, Framingham, Mass. 01701-9171.

Matchmakers in manufacturing

Eastwood brings together experience and opportunity to make Motorola 'best in class'

BY ELISABETH HORWITT
CW STAFF

At a computer-integrated manufacturing conference one year ago, Motorola, Inc.'s Peggy Eastwood cautioned a packed room of vendors and users about the perils of automation for its own sake.

"If one factory seems flawless, if it gets things out on time with low margins and only has one Macintosh, then why buy it a $100,000 package and a $400,000 computer system?" asked Eastwood, who had recently been appointed corporate director of manufacturing systems at Motorola. On the other hand, she pointed out, it is also a big mistake to bring in expensive computer systems "to compensate for sloppy management practices."

Eastwood's 16-person department at Motorola's Schaumburg, Ill., headquarters was created in 1989 "for the purpose of accelerating Motorola's move into manufacturing automation and computer integration," as part of a corporate initiative "to be best in class in manufacturing," says Mauro Walker, vice-president and corporate director of manufacturing.

The manufacturing systems department uses several strategies to ensure system quality and minimize development and implementation time, and most of them would come under the heading of "personal networking." Eastwood and her people act as matchmakers between one group that needs a particular technology or application, and another group that has successfully implemented that technology.

David Joel

Motorola's Eastwood: *Pricey systems won't compensate for sloppy management*

For example, Eastwood's department helped one group find ways to reduce work-in-process by taking it around to other groups at Motorola that had already reduced their own work-in-process, she says.

Eastwood and her staff also actively search out examples of successful technology implementation at other companies, "since almost every place excels at something," she says. Her department seeks out "things like just-in-time inventory, focused production lines or effective utilization of human resources in a highly automated environment," she says.

The company's recent performance attests to the effectiveness of this strategy: Motorola was the first winner of the Malcolm Baldrige Quality Award. It has also gained industry attention for its 6 Sigma Quality Program, whose long-term goal is to achieve near-defectless manufacturing at all Motorola business units by 1992.

Motorola's key initiatives are already "uppermost in everyone's minds as they consider projects which could

Continued on page 52

Corning TV stays alive with CIM

BY MITCH BETTS
CW STAFF

In the 1960s, back when U.S. companies still made color television sets, Corning, Inc. had five plants churning out the glass for TV tubes. By 1983, however, intense foreign competition had knocked out all but one of those plants, and even that one was in doubt.

In 1985, faced with a decision to either fight or abandon the market entirely, Corning executives opted to harness the power of computer-integrated manufacturing (CIM) and revitalize the remaining factory in State College, Pa.

It worked. The aggressive implementation of CIM, as well as total quality control and just-in-time principles, resulted in manufacturing costs that are now 22% lower than they were in 1985. Measures of product quality and manufacturing yields are way up, and product development time has been cut in half.

The bottom-line result is that the 1989 gross margin for the unit, Corning Asahi Video Products Co., is three times greater than in 1985, according to CIM project manager Jack L. Fulton.

In recognition of the company's "leading-edge CIM installation, resulting in significant productivity gains," the Society of Manufacturing Engineers has named Corning Asahi Video as the 1990 recipient of its prestigious Industry Lead Award.

Plant manager Mark H. Mitchell said that the CIM project helped the company to "stave off the capture of our market by imports." He attributed the success to "what we call a partnership in the workplace, which means we provide our employees with the best technology available, then we empower them to think through the best way to get the job done."

The plant uses CIM to integrate all accounting, ordering and billing procedures, as well as engineering and design functions. One of the biggest challenges, Fulton said, was applying CIM to the very complex processes used at a glass factory.

The glass-making process used at the State College-based facility has 215 steps and 6,500 variables, which have to be monitored continuously, he said. Applying CIM to a process industry was considered a risky venture, according to Fulton, but key executives vowed to be pioneers.

The company — a Corning subsidiary that is 39% owned by Asahi Glass Co. in Japan — will receive its award at the Autofact Conference in Detroit on Nov. 12.

At the same time, Arizona State University will receive an award for its CIM curriculum and research.

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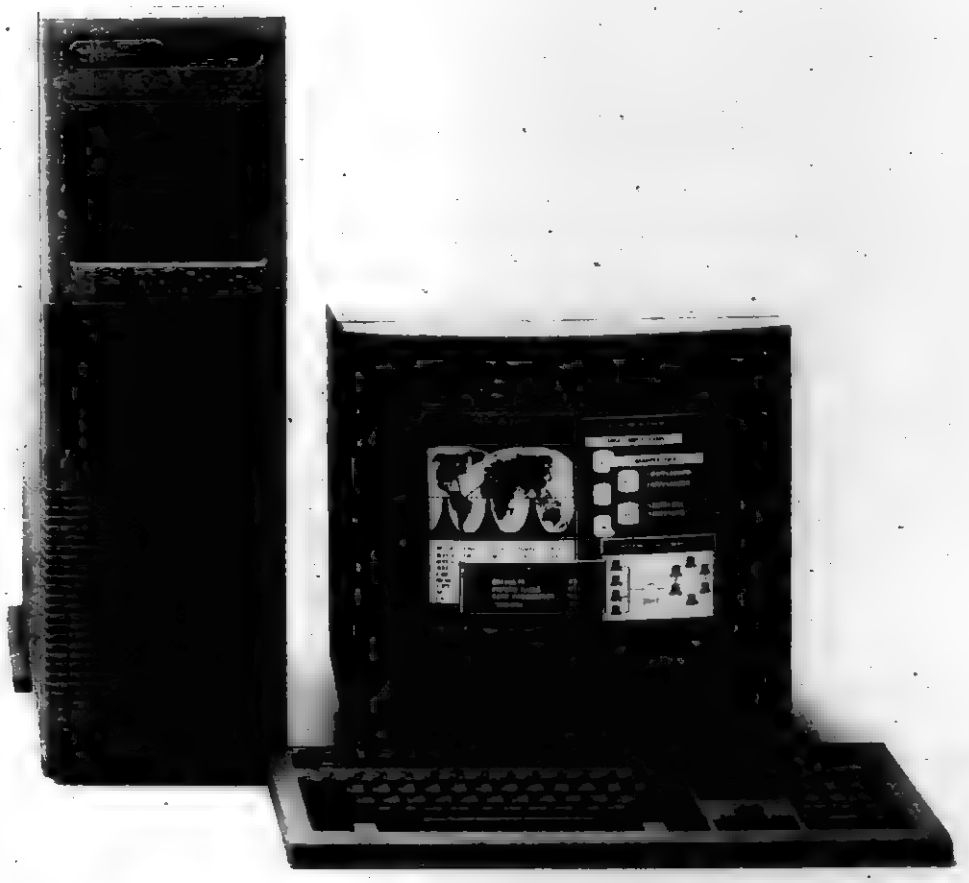

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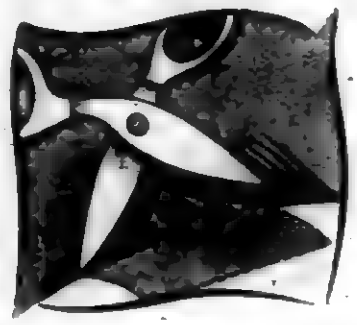

Tim Lewis

Summaries from leading scientific and management journals

Sloan Management Review

Summer 1990

"The new industrial engineering: Information technology and business process redesign"
By Thomas H. Davenport and James E. Short

■ Information technology organizations can play a key role in the redesign of business processes. They can convince senior management of the power of redesigning processes using information technology, absorb the new skills that redesign calls for and develop an approach or methodology for redesign.

Redesigning business processes involves a five-step approach: 1) developing the business vision and process objectives 2) identifying processes to be redesigned 3) understanding and measuring the processes 4) identifying the relevant information technologies and 5) designing and building prototype processes, perhaps using computer-aided software engineering tools.

Only a few firms have ventured into this area. One of these is Rank Xerox UK, a national operating company of Xerox Corp. The areas Rank Xerox targeted for redesign include customer-order life cycle, customer satisfaction, installed equipment management, integrated planning, logistics, financial management and personnel management.

As it restructured its business processes, Rank Xerox's financial performance has improved. Revenue grew 20%, delivery time was reduced from 33 days to six days, and jobs not related to customers decreased from 1,100 to 800.

University of Minnesota MIS Research Center

Working paper — May 1990

"The changing role of telecommunications technologies in the workplace: E-mail, voice mail and fax"
By Detmar W. Straub and Elena Karahanna

■ A survey of 100 users of the electronic mail system at a large transportation company confirmed that E-mail made communications among co-workers more efficient (especially for urgent messages), reduced paper-based correspondence and improved the decision-making process. Users felt that face-to-face meetings were more effective as a result of pre-meeting sharing of information through E-mail.

E-mail has also had an effect on social interaction at the corporation. It is used for social greetings, charity raffles and even for "calendar browsing." The company allows its staff to browse through the electronic calendars of co-workers to schedule meetings — a practice that could also be a source of gossip and determine political alliances.

As for company politics, one user noted: "People who are not on E-mail occasionally get left out of things."

MIT Sloan School Center for Information Systems Research

Working paper — May 1990

"Strategies for electronic integration: Lessons from electronic filing of tax returns"
By N. Venkatraman and Agit Kambil

■ Tax return preparation is information-intensive, yet computer technology has traditionally been used strictly behind the scenes. One of the reasons for this lack of information technology is that the tax business is seasonal, making cost justification of computer-related expenses somewhat tricky.

In the near future, however, information technology will be the major differentiating factor in the tax services market. Electronic filing is growing at a much quicker clip than the market for straight return preparation, in part because there are more opportunities for players in the filing market to promote services other than simple electronic filing.

The concept of "instant refund" will be a strong draw to people anxious to get their money back as soon as possible. For example, a bank could issue a refund anticipation loan to the filer in the amount of the refund due and then arrange to have the Internal Revenue Service make a direct deposit into the bank's account.

Financial institutions will also exploit the information content in the tax returns of consenting customers to develop new targets for investment packages. Taxpayers who feel comfortable filing electronically may also trust their filers to capture information about them in order to provide value-added services, such as ways to reduce next year's tax liabilities.

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Eastwood

FROM PAGE 47

include a change to their systems," Eastwood says. "They ask themselves, 'Will it improve product quality, reduce cycle time or contribute to customer satisfaction?' When they look at it in that light, the issue is not what brand of robot to buy but how the technology will further those goals."

Eastwood's group has the job of ensuring that those key corporate initiatives are applied to the systems development process itself — especially to support Motorola's product introductions in such competitive, fast-paced markets as semiconductors and cellular telephones. "Motorola clearly was involved in CIM and automation long before I came, but there is an increasing need to get those systems out quicker," she says.

It is common at Motorola to send managers or engineers from anywhere in the world to work for one to five months with a group that has mastered the technology that they are interested in.

"It gives them a chance to get firsthand experience with someone else at Motorola, so they can duplicate and improve on the technology," Eastwood says.

For example, when one group at Motorola wanted to expand its robot automation, it sent an engineer to work with Eastwood's staff to build 14 robot stations for the project.

Eastwood herself is apparently the fulcrum of her department's outreach efforts. "She's tough to keep up with," admits Robert Rush, a member of Eastwood's technical staff. "She's always encouraging me to be more aggressive, not to hold back. She knows more people in Motorola than you would expect for the amount of time she has been here, and she can always come up with a name when we need one."

One of the department's first jobs was to compile an information base — "some on paper, some electronic". — that tracks various projects going on at Motorola, "so everyone can see who is using what software package or working on a robot application of this type," she says.

The department has also compiled a database of "different people around the company who are technical experts in a topic," Eastwood says. It is also in the process of "creating forums where organizations can talk firsthand about success stories and lessons learned on projects," she adds.

The group can also act as a project coordinator that brings together cross-functional teams typically composed of people from engineering, manufacturing, financial and human resources, Eastwood says. Information Systems' level of involvement depends on the project and the group.

"Some of our groups don't have MIS per se," Eastwood says. "At others, MIS is very much on the factory floor. At still others, it is concentrated in the back room."

Getting the different departments involved ensures that conflicting priorities are identified and resolved. "Sometimes the original idea would make the software very complex, but someone is able to say, 'We don't really need that,'" Eastwood says.

One goal that Eastwood is currently focusing on is "closer involvement with Asian and European factories. Some non-U.S. facilities have real centers of excellence in areas that have received less attention in the U.S., so there is potential for a two-way contribution," she says. For example, some Pacific Rim factories "are especially in tune with ways to minimize manufacturing cost," Eastwood says.

Retaining focus

Peggy Eastwood's job history made her uniquely suited to the position of corporate director of manufacturing systems at Motorola. She has been involved in computer-integrated manufacturing and automation in all of her employment positions since she obtained her Ph.D. in computer science from Washington University in St. Louis.

Eastwood's first job was at RCA Space Center and involved working on software programs needed to support production of circuit boards and automated testing devices.

At McDonnell Douglas Corp. in St. Louis, she "got into robots," she says. While there, she also got involved with the U.S. Air Force's Integrated Computer-Aided Manufacturing program, which was an early attempt to "seriously look at the real potential behind CAM and CIM in the factory," Eastwood says.

The Air Force project gave Eastwood the focus she says she has retained ever since, "always looking at things from a broad perspective, always stressing the architecture and integration rather than islands."

Although manufacturing companies and vendors have been vaunting the idea of CIM for a decade, the concept "was a big deal in 1975 to 1976" when Eastwood first became interested in it, she says.

Nevertheless, Eastwood still finds that "the biggest challenge to my job is the scope." In addition to keeping abreast of the latest developments in computer, automation and management systems, Eastwood must stay in touch with all of Motorola's businesses, she points out.

"There are so many things to tackle and concentrate on, so picking which areas to focus on can be tough," she says.

ELISABETH HORWITT

CALENDAR

The Association for Systems Management (ASM) will present a two-day systems development seminar led by James Wetherbe, director of the MIS Research Center at the University of Minnesota. "Systems Development: Agenda for the 1990s" will be held at the Hotel Nikko in San Francisco Oct. 4-5 and repeated at the Park Plaza in Toronto Oct. 11-12.

Wetherbe, publisher of *MIS Quarterly* and the author of 12 books, will address topics including identifying strategic applications, reducing cycle time and backlog, overcoming resistance to change and getting systems requirements right the first time.

For more information, contact ASM at (216) 243-6900.

SEPT. 23-29

Networking/Unix '90. Atlanta, Sept. 24-25 — Contact: Sue Fredricks, Interop, Atlanta, Ga. (404) 230-2711.

The Expanding Glass House of the '90s. Toronto, Ont., Sept. 24-26 — Contact: Meta Group, Westport, Conn. (203) 226-4382.

PC Expo. Chicago, Sept. 25-27 — Contact: H.A. Bruno, Inc., Englewood Cliffs, N.J. (201) 569-8542.

SAA World Conference & Exposition. Los Angeles, Sept. 25-27 — Contact: Digital Consulting, Andover, Mass. (508) 470-3880.

The Intelligent Corporation Conference. New York, Sept. 26 — Contact: The Ruth Stanat Forum, New York, N.Y. (212) 725-4560.

Managing the Global Forces of Change: Strategies for Corporate Success in the '90s. Fort Collins, Colo., Sept. 27 — Contact: National Technology University, Fort Collins, Colo. (303) 484-0565.

Portable Computing and Communications Exposition and Conference. New York, Sept. 27 — Contact: Michael Sullivan, IDG Conference Management Group, Framingham, Mass. (800) 225-4698.

Operations Manager Conference. Laconia, N.H., Sept. 27-28 — Contact: Jerry Legallo, Portsmouth, N.H. (207) 438-2481.

SEPT. 30 - OCT. 6

Benefiting from Systems Integration. New York, Sept. 30-Oct. 2 — Contact: Abbey Chaloula, CMP Conference Group, Manhasset, N.Y. (516) 562-5717.

Venture Publishing Seminar. San Jose, Calif., Sept. 30-Oct. 2 — Contact: Bob Moody, VPUG (408) 227-5030.

Development Center Institute Fall Conference. Indianapolis, Sept. 30-Oct. 3 — Contact: Development Center, Indianapolis, Ind. (317) 846-2753.

Information Industry Association's Annual Convention & Exhibition. Boston, Sept. 30-Oct. 3 — Contact: IIA, Washington, D.C. (202) 639-8262.

Control, Audit and Security Conference. Atlanta, Sept. 30-Oct. 4 — Contact: Patsy Day, MIS Training Institute, Framingham, Mass. (508) 879-7999.

TCP/IP Protocol Suite. Burlington, Mass., Oct. 1-2 — Contact: State-of-the-Art Program, Northeastern University, Dedham, Mass. (617) 328-8055.

AS/400 Technical Conference. Hilton Head Island, S.C., Oct. 1-3 — Contact: AS/400 Technical Conference, Warrenville, S.C. (800) 552-9404.

Effective Methods for Information System Quality Assurance. Orlando, Fla., Oct. 1-3 — Contact: Quality Assurance Institute, Orlando, Fla. (407) 363-1111.

Information Industry Scenario Conference. Phoenix, Oct. 1-3 — Contact: Ashley Pearce, Gartner Group, Stamford, Conn. (203) 964-0096.

Information Technology Conference & Exposition. San Diego, Oct. 1-3 — Contact: Data Processing Management Association, Park Ridge, Ill. (708) 825-8124.

National Computer Security Conference. Washington, D.C., Oct. 1-4 — Contact: Tammy Grice, National Institute of Standards and Technology, Baltimore, Md. (301) 975-2775.

Sema Tech '90. Atlanta, Oct. 1-4 — Contact: Aim USA, Pittsburgh, Pa. (412) 963-8588.

CD-ROM Expo. Boston, Oct. 1-5 — Contact: Dorothy Ferriter, IDC, Framingham, Mass. (800) 225-4698.

Object-Oriented Systems Development. Washington, D.C., Oct. 1-5 — Contact: Barnett Data Systems, Rockville, Md. (301) 762-1288.

Unix Solutions Exposition and Conference. Anaheim, Calif., Oct. 3-5 — Contact: The Interface Group, Needham, Mass. (617) 449-6600.

Accessible Computer Technology Exhibit. Washington, D.C., Oct. 4 — Contact: Alan Douglas, ACT 111, Washington, D.C. (703) 557-6159.

OCT. 7-13

Pacific Northwest Software Quality Conference. Portland, Ore., Oct. 7-9 — Contact: Terri Moore, Pacific Agenda, Portland, Ore. (503) 223-8633.

Fox Developer Conference. Toledo, Ohio, Oct. 7-10 — Contact: Fox Software, Perrysburg, Ohio (419) 874-0162.

Indycon Electronic Show & Conference. Indianapolis, Oct. 8-9 — Contact: Indycon, Carmel, Ind. (317) 571-8462.

Eastern Exposition and Conference. Alexandria, Va., Oct. 8-10 — Contact: The American Public Communications Council of the North American Telecommunications Association, Washington, D.C. (800) 538-6282.

National Communications Forum. Chicago, Oct. 8-10 — Contact: National Communications Forum, Chicago, Ill. (312) 938-3500.

Southeastern Telecommunications Association Conference and Equipment Exposition. Miami Beach, Fla., Oct. 8-10 — Contact: SETA, Columbia, S.C. (803) 731-5640.

American Production and Inventory Control Society International Conference and Exposition. New Orleans, Oct. 8-12 — Contact: APICS, Falls Church, Va. (703) 237-8585.

Interop '90. San Jose, Calif., Oct. 8-12 — Contact: Interop, Inc., Mountain View, Calif. (415) 941-3399 ext. 200.

CASE World Conference and Exposition. Chicago, Oct. 9-11 — Contact: Digital Consulting Group, Andover, Mass. (508) 470-3880.

Northcon/90. Seattle, Oct. 9-11 — Contact: Northcon, Los Angeles, Calif. (213) 641-5117.

Executive Information Systems in Government. Washington, D.C., Oct. 9-12 — Contact: Conference Manager, USPDI, Inc., Silver Spring, Md. (301) 445-4400.

Computer Negotiations. New York, Oct. 10-11 — Contact: International Computer Negotiations, Inc., Water Park, Fla. (407) 740-0700.

Imaging '90 Conference and Exposition. New York, Oct. 10-12 — Contact: Michelle Graczyk, IRIS CAP International, Norwell, Mass. (617) 983-0130.

Info '90, International Information Management Exposition & Conference. New York, Oct. 10-12 — Contact: Cahners Exposition Group, Stamford, Conn. (203) 352-8477.

Microprocessor Forum. San Francisco, Oct. 10-11 — Contact: Microprocessor Report, Sebastopol, Calif. (707) 823-4004.

Understanding and Implementing On-Line Transaction Processing. New Brunswick, N.J., Oct. 10-11 — Contact: Jean Seiple, Data-Tech Institute, Clifton, N.J. (201) 478-5400.

International ACM/IEOR Conference on Information Retrieval. Chicago, Oct. 13-16 — Contact: Association for Computing Machinery, New York, N.Y. (212) 869-7440.

International Society for Hybrid Microelectronics (ISHM) Symposium on Microelectronics. Chicago, Oct. 13-17 — Contact: ISHM, Reston, Va. (800) 535-4746.

OCT. 14-20

Computer Services, Communications and Information Systems Seminar. Baltimore, Oct. 14-17 — Contact: Sarah Hess, Alex Brown and Sons, Baltimore, Md. (301) 727-1700.

Educom '90. Atlanta, Oct. 14-17 — Contact: Educom, Princeton, N.J. (609) 520-3340.

Retail Information Systems Conference and Exposition. St. Louis, Oct. 14-17 — Contact: NRMA, New York, N.Y. (212) 563-5113.

Data Entry Management Association Conference and Exposition. Las Vegas, Oct. 15-17 — Contact: DEMA, Norwalk, Conn. (800) 969-6485.

Beacon '90. Marlboro, Mass., Oct. 15-18 — Contact: Conference Management Corp., Norwalk, Conn. (203) 852-0600.

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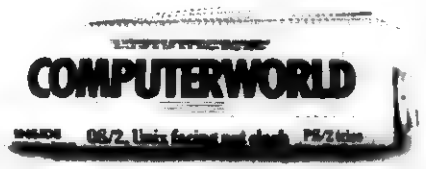

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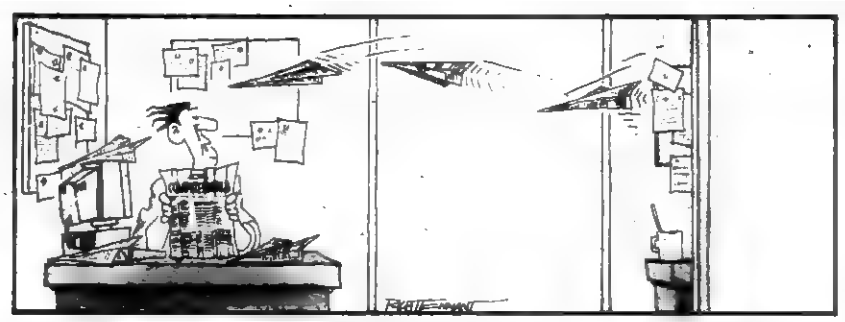

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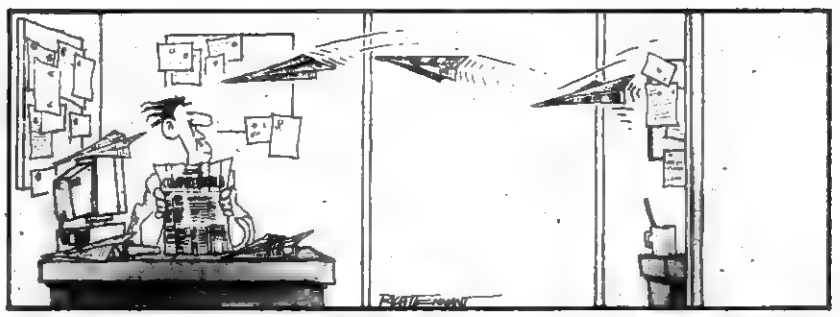

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As IS execs compare pay stubs, jobs in the Big Apple and positions in securities get the big bucks

BY DAVID A. LUDLUM
CW STAFF

If you're a top information systems executive working in wholesale or retail trade in Arizona — congratulations. Your income is growing fast compared with the salaries of your colleagues in other industries. Factor in your low cost of living, and the numbers look even better.

When it comes to compensation, some IS professionals are gaining ground at a faster clip than others, according to *Computerworld's* fourth annual salary survey.

The variations do not just reflect industry conditions and geography. Compensation is rising faster for some positions than for others across the board. This year, pay for IS managers or supervisors reporting to the top IS executive is up 14% from the level reported last year. Meanwhile, compensation for communications specialists and database analysts — two groups much in demand in recent years — has risen only 3%.

The more than 1,500 IS organizations responding to the survey report an average departmentwide salary increase of 5.7% for this year. That compares with nationwide increases of 5.7% for all executives and 5.4% for all salaried employees, according to William M. Mercer, Inc., a compensation consulting firm in Deerfield, Ill. Meanwhile, the U.S. government's consumer price index, a measurement of inflation, has risen 5.8% through July of this year.

Senior systems analysts, senior programmer/analysts and senior operating systems programmers also registered big gains since last year's survey, with compensation up about 10%. Laggards include database managers and administrators; they gained only 4%.

During the four years *Computerworld* has conducted its survey, top IS executives' salaries have jumped the most, rising 15.5% (see chart page 61). Senior systems analysts and senior programmer/analysts have done well over the four years, too, along with systems and programming managers. Data center shift supervisors, communications managers and senior programmers have chalked up the smallest overall gains. Their salaries grew by less than 5%.

Wanted: Communication skills

With the great value IS organizations now place on business knowledge and interpersonal skills, "pure" programmers tend to get salary increases that just keep up with the cost of living, says Richard Wonder, national director of the IS division at recruiting firm Robert Half International, Inc. Meanwhile, systems analysts — and programmers with the analytical and interpersonal skills expected of systems analysts — make more money.

"As time goes on, there'll be less need for pure back-room coders, because the trend in IS is toward end-user computing, decentralization and people who have business and technical skills," Wonder says.

The average salary for information center managers rose slightly this year after declining the last two years, but it remains nearly $1,600 below its 1987 level. Recruiters attribute the declines to a downgrading of the position; as information center managers moved on, they were succeeded by less experienced people.

This year's survey finds top IS executives — chief information officers, vice-presidents and IS directors — earning a total compensation of $75,600. That is a fraction of what IS chiefs at the biggest companies in the most competitive job markets make. However, it is a significant outlay for the survey's cross-section of small, medium and large companies across the U.S. "In a lot of communities, someone making $70,000 is one of the wealthiest people," says Skip Tolette, an executive recruiter at Schmitt Bishop Tolette in New York.

The organizations responding to the survey report average revenues or assets of $864 million. However, for three-fourths of the companies, that total is less than $500 million. At the largest companies — those with revenues or assets greater than half a billion dollars — the compensation for top IS executives is 38% greater than the overall average (see chart this page).

The really big bucks in IS go to a smaller group of highly visible executives. Jay Gaines, a New York executive recruiter, likens the arrangement to Hollywood's star system. "There's an awful lot of dollars chasing a handful of people," he says. "I think you have 50 top guys in the country who are on everybody's hit list." Only about 20 of them command pay of $750,000 or more, Gaines says. Individuals at Wall Street's major investment banking firms lead the list; there alone, six top IS executives make $700,000 or more. (CW, Jan. 15).

Big Apple, big bucks

This year's survey again finds top IS executives in New York making more money than their colleagues in other locations — a lot more. New Yorkers hold a 25% lead over their counterparts in Boston, home to top IS executives with the second biggest paychecks (see chart page 59).

The jobs in New York pay a healthy premium even after compensating for the high cost of living there (see chart page 59). One reason: There's a lot of competition for the best IS talent in New York. Another reason is that people demand a premium for working there. "It's a tougher place to get people to move to," Tolette says.

The regional ranking of pay for top IS executives does change when adjusted for variations in the cost of living. The Phoenix/Tucson area moves up the most after the adjustment — from seventh place to fourth. There's a strong demand for computer professionals in Arizona because the region has attracted a lot of software companies in recent years, says Dick Minogue, director of U.S. cost-of-living services at Associates for International Research, Inc., a compensation consulting firm in Cambridge, Mass.

The regional variations in pay for top IS executives apply to smaller companies more than big corporations, recruiters say. Bigger corporations in the outlying regions compete with companies in big cities for top IS executives, so they have to pay as much as those companies do.

Continued on page 59

AVERAGE TOTAL COMPENSATION BY COMPANY SIZE

		Revenue or assets		
	Total	Less than $50M	$50M to $499M	More than $500M
[redacted]				
CIO/VP/Director of IS	$75,611	$61,348	$76,207	$104,801
IS manager/Supervisor	$58,843	$49,171	$58,133	$75,110
[redacted]				
Manager, end-user computing	$49,463	$43,672	$47,923	$56,139
Information center manager	$47,100	$39,447	$45,637	$55,452
LAN manager	$41,177	$37,555	$40,390	$45,868
PC specialist	$33,306	$30,274	$33,753	$35,827
[redacted]				
Network manager	$50,493	$40,088	$48,526	$58,610
Telecommunications manager	$50,578	$42,619	$50,045	$55,555
Communications specialist	$38,231	$37,309	$36,664	$40,971
[redacted]				
Systems and programming manager	$56,159	$50,314	$54,661	$64,547
Project manager	$50,852	$48,772	$49,137	$52,579
Senior systems analyst	$45,669	$44,990	$44,411	$47,967
Systems analyst	$39,617	$37,894	$38,791	$41,220
Senior programmer/Analyst	$40,754	$39,146	$40,336	$42,841
Programmer/Analyst	$34,659	$32,865	$34,141	$36,602
Senior programmer	$34,631	$35,029	$34,768	$34,377
Programmer	$28,312	$27,545	$27,765	$29,880
[redacted]				
Technical services manager	$55,799	$52,624	$53,653	$62,836
Senior operating systems programmer	$47,886	$47,122	$46,012	$51,271
Operating systems programmer	$40,196	$36,691	$40,325	$43,140
Data center or operations manager	$42,878	$36,837	$41,773	$50,893
Data center shift supervisor	$30,926	$26,596	$29,700	$35,402
[redacted]				
Database manager/ Administrator	$50,938	$43,946	$48,892	$57,270
Database analyst	$42,561	$38,972	$42,367	$45,275

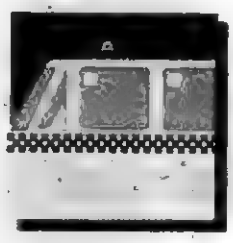
East or West, New York is best

AVERAGE TOTAL COMPENSATION BY REGION (SALARIES PLUS BONUSES)

	Total	Atlanta	Washington, D.C.	Boston	Chicago	Texas	Denver	Florida	Detroit	Southern California	Minneapolis	New York	Northern California	Arizona	Oregon/ Wash.
CIO/VP/ Director of IS	$75,611	$69,452	$79,368	$82,786	$80,864	$81,153	$64,612	$69,101	$70,296	$79,246	$71,456	$104,000	$82,077	$69,295	$67,606
IS manager/ Supervisor	$58,843	$56,843	$60,381	$66,950	$62,920	$63,318	$55,481	$51,754	$57,160	$61,679	$57,841	$78,623	$61,919	$50,333	$53,154
Manager, end-user computing	$49,463	$42,000	$51,304	$47,075	$49,000	$55,900	$43,680	$47,265	$45,225	$49,267	$47,548	$61,725	$59,792	$40,447	$47,000
Information center manager	$47,100	$44,441	$46,700	$47,125	$53,875	$51,691	$41,136	$42,457	$42,525	$42,500	$43,360	$54,562	$60,286	$47,300	$43,438
LAN manager	$41,177	$36,650	$37,725	$46,727	$42,364	$44,075	$40,269	$38,000	$40,792	$41,000	$42,482	$51,964	$47,154	$36,375	$35,364
PC specialist	$33,306	$31,679	$33,144	$34,108	$34,292	$33,963	$33,418	$30,881	$31,920	$36,897	$33,375	$36,655	$38,189	$29,581	$30,453
Network manager	$50,493	$44,063	$50,938	$61,250	$50,000	$53,528	$45,026	$49,656	$47,600	$48,143	$44,500	$67,643	$51,893	$47,231	$47,947
Telecommunications manager	$50,578	$44,611	$52,028	$50,737	$64,780	$52,853	$44,211	$40,278	$48,767	$49,667	$48,700	$68,654	$58,500	$48,088	$43,176
Communications specialist	$38,231	$36,654	$39,792	$38,950	$40,806	$38,478	$37,667	$32,136	$42,271	$40,533	$39,678	$49,250	$39,675	$34,700	$34,482
Systems and programming manager	$56,159	$52,713	$60,070	$57,776	$54,336	$59,537	$51,398	$51,845	$54,806	$58,407	$51,266	$70,236	$62,279	$52,665	$51,418
Project manager	$50,852	$47,479	$55,882	$51,303	$49,069	$48,607	$45,964	$48,207	$56,434	$53,824	$47,046	$58,618	$55,154	$48,271	$45,724
Senior systems analyst	$45,669	$45,179	$49,561	$45,614	$44,395	$47,467	$44,426	$42,697	$41,624	$48,286	$42,713	$52,694	$51,732	$43,205	$42,143
Systems analyst	$39,617	$36,652	$42,365	$36,929	$39,196	$39,935	$39,552	$38,050	$37,071	$43,773	$38,653	$46,326	$44,522	$37,650	$36,803
Senior programmer/ Analyst	$40,754	$42,026	$43,700	$40,751	$40,502	$40,881	$40,091	$38,780	$39,962	$44,433	$37,918	$46,741	$46,228	$37,767	$35,750
Programmer/Analyst	$34,659	$33,171	$36,122	$33,857	$35,409	$35,502	$34,151	$33,524	$33,312	$37,106	$32,233	$39,443	$41,244	$33,136	$31,220
Senior programmer	$34,631	$34,318	$36,109	$35,300	$34,025	$32,357	$33,842	$34,860	$32,889	$35,571	$32,000	$37,220	$43,929	$33,607	$29,531
Programmer	$28,312	$27,091	$29,941	$30,172	$28,564	$27,582	$27,952	$26,171	$26,169	$30,105	$26,981	$31,721	$37,389	$28,269	$24,742
TECHNICAL SERVICES AND OPERATIONS															
Technical services manager	$55,799	$53,853	$60,004	$60,452	$61,465	$58,111	$52,458	$46,600	$53,421	$55,964	$54,000	$69,813	$61,096	$49,574	$46,500
Senior operating systems programmer	$47,886	$47,167	$49,548	$46,472	$46,718	$53,248	$43,548	$43,467	$47,021	$52,815	$45,898	$62,125	$55,075	$45,961	$42,482
Operating systems programmer	$40,196	$36,413	$39,273	$40,271	$41,409	$45,024	$39,918	$37,068	$36,938	$37,750	$40,666	$44,565	$46,395	$39,000	$40,737
Data center or operations manager	$42,878	$37,624	$45,687	$44,713	$49,897	$43,198	$40,158	$38,444	$41,522	$39,519	$45,041	$52,769	$48,231	$38,933	$39,976
Data center shift supervisor	$30,926	$27,269	$31,383	$30,257	$32,728	$30,797	$30,252	$29,878	$30,362	$29,067	$31,732	$36,167	$36,162	$27,572	$29,828
DATABASE GROUP															
Database manager/ Administrator	$50,938	$51,105	$49,902	$51,083	$53,990	$52,350	$50,762	$46,500	$48,857	$44,538	$53,139	$68,067	$55,063	$49,357	$44,437
Database analyst	$42,561	$38,687	$45,028	$43,300	$43,200	$40,800	$42,682	$38,923	$40,833	$44,786	$44,850	$52,150	$51,636	$39,409	$38,325

The real payoff

Top IS executives in New York lead in compensation even after adjusting income for the cost of living. Top executives in Arizona make the biggest move up the ladder with the adjustment



1. New York

Total compensation	$104,000
Cost-of-living index	108.9
Adjusted compensation	$95,500*

2. Dallas/Houston

Total compensation	$81,153
Cost-of-living index	96.8
Adjusted compensation	$82,139*

3. Chicago

Total compensation	$80,864
Cost-of-living index	101.8
Adjusted compensation	$79,434*

4. Boston

Total compensation	$82,786
Cost-of-living index	104.5
Adjusted compensation	$79,221*

5. Baltimore/ Washington, D.C.

Total compensation	$79,368
Cost-of-living index	102.0
Adjusted compensation	$77,812*

6. Northern California
Total compensation: $82,077
Cost-of-living index: 109.1
Adjusted compensation: $75,231*

7. Phoenix/Tucson
Total compensation: $69,295
Cost-of-living index: 92.8
Adjusted compensation: $74,671*

8. Los Angeles/San Diego
Total compensation: $79,246
Cost-of-living index: 107.7
Adjusted compensation: $73,580*

9. Atlanta
Total compensation: $69,452
Cost-of-living index: 94.7
Adjusted compensation: $73,339*

10. Minneapolis/St. Paul
Total compensation: $71,456
Cost-of-living index: 98.1
Adjusted compensation: $72,840*

11. Miami/Tampa/Orlando
Total compensation: $69,101
Cost-of-living index: 97.1
Adjusted compensation: $71,165*

12. Detroit
Total compensation: $70,296
Cost-of-living index: 98.8
Adjusted compensation: $71,150*

13. Seattle/ Portland/Spokane
Total compensation: $67,606
Cost-of-living index: 95.8
Adjusted compensation: $70,570*

14. Denver
Total compensation: $64,612
Cost-of-living index: 95.3
Adjusted compensation: $67,798*

*Compensation divided by the cost index and multiplied by 100. Index devised by Associates for International Research, Inc.

Continued from page 57

Since last year's survey, top IS executives in wholesale and retail trade have bettered their lot compared with their colleagues in other industries. In 1989, the pay for CIOs and vice-presidents of IS was lower in that industry than in all other fields except education and government. This year's survey puts top IS executives in wholesale and retail trade in fourth place — ahead of their counterparts in insurance, manufacturing and health care (see chart page 60).

Companies in wholesale and retail trade have been turning to information technology to handle crucial functions such as automating inventory control, says Bob Lemke, a consultant at the William M. Mercer office in Chicago. "They're having to buy talent to catch up to the changes other industries have already made," he says.

COMPUTERWORLD ANNUAL SALARY SURVEY

Meanwhile compensation in industries that traditionally have paid the most for IS talent — investment and commercial banking — are steady or dropping when bonuses are taken into account, recruiters say.

The big spender image of financial services also looks less certain when one looks at stock options, Gaines says. The options tend to be less valuable at service companies than in manufacturing concerns, where they can be worth $100,000 or more for top-paying IS positions.

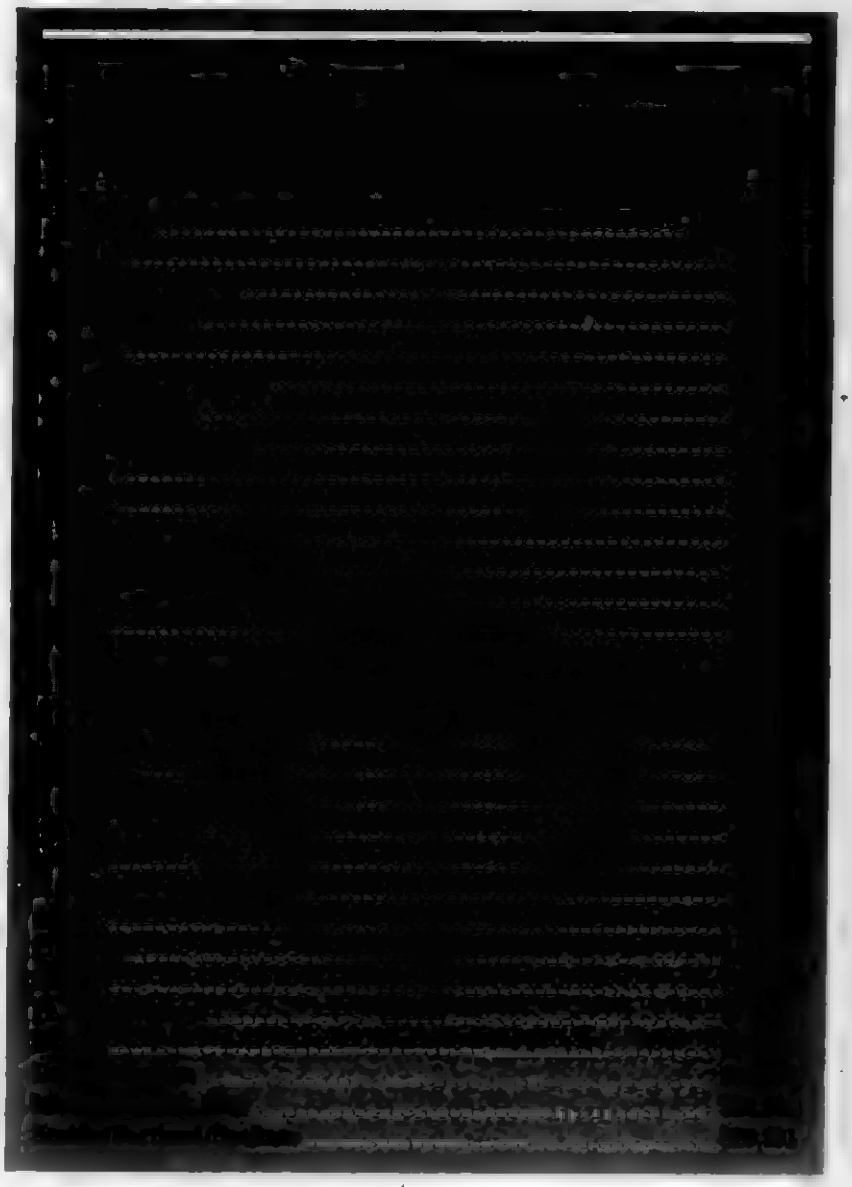
Programmers and analysts typically do not get stock options, but there is growing interest in paying them overtime for extra work, Lemke says. "I think the trend is to pay more straight-time overtime rather than comp time," he says. The reason? Companies believe the lure of overtime pay provides them with an edge in recruiting.

Experience in hot technical areas can also add to pay for programmers and analysts. According to Steve Joffe, a vice-president at recruiting firm Source Services Corp. in Paramus, N.J., the hot areas in applications development today include the following:

- Mainframe, on-line database systems, especially using IBM's DB2.
- Midrange systems using IBM's RPG III language or Digital Equipment Corp.'s VAX/VMS operating system, particularly with fourth-generation languages such as SQL, Oracle and Ingres.
- Personal computer systems incorporating relational databases and local-area networks, as well as Unix, C or Windows.

Experience with hot technologies can make up for a lack of business acumen or interpersonal skills and win programmers a healthy raise, Wonder says. He says he sees the need for RPG programmers following IBM's introduction of the Application System/400 minicomputer as the biggest change in the IS job market in the last year.

"Five or 10 years ago people almost looked down on RPG programmers," he says. "Now they're some of the most sought-after people around."

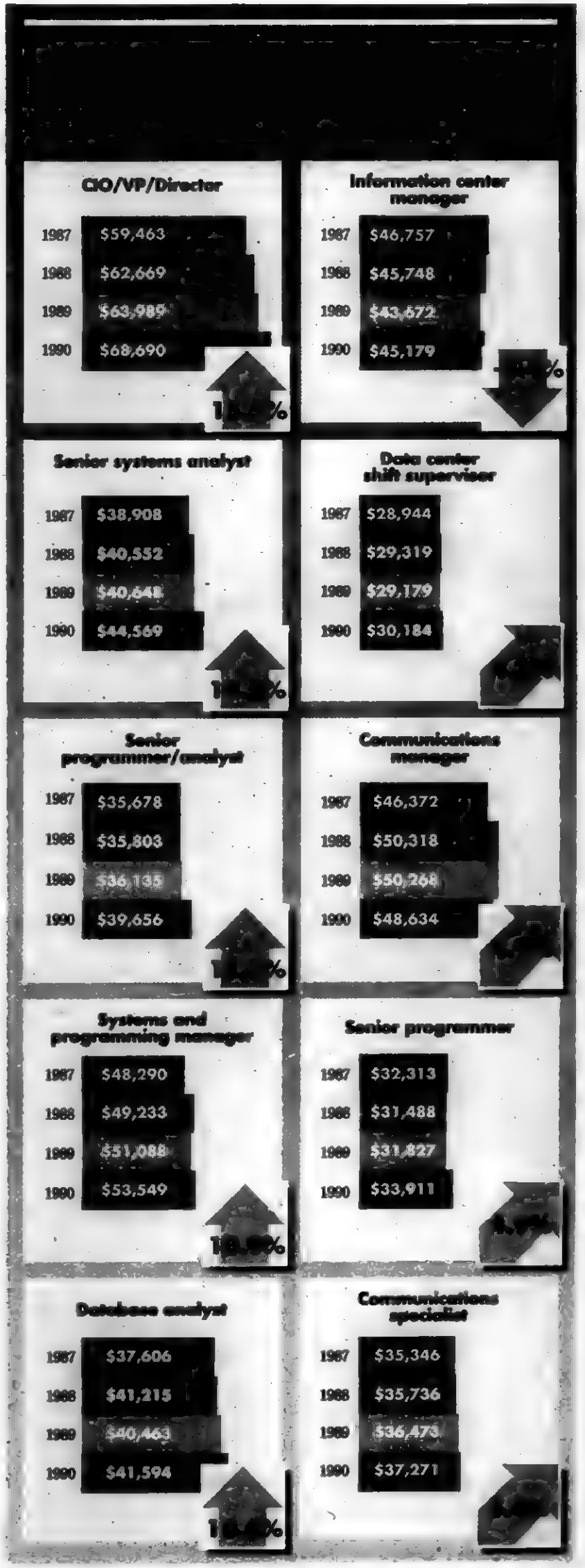


Securities blanket

IS chiefs in securities get top dollar, beat out utilities colleagues by $3,000

AVERAGE TOTAL COMPENSATION BY INDUSTRY (SALARIES PLUS BONUSES)

	Total	Banking	Insurance	Securities	Government	Wholesale/ Retail	Education	Utilities	Manufacturing	Health Care
CIO/VP/Director of IS	$75,611	$85,645	$78,572	$89,383	$65,679	$80,271	$62,639	$86,200	$76,848	$70,457
IS manager/Supervisor	$58,843	$65,603	$58,400	$66,554	$55,047	$60,891	$55,576	$64,073	$58,465	$53,963
Manager, end-user computing	$49,463	$53,384	$50,875	$52,300	$50,161	$48,114	$44,047	$59,053	$50,694	$44,500
Information center manager	$47,100	$48,808	$55,500	$54,143	$44,400	$47,150	$42,939	$52,950	$47,958	$41,333
LAN manager	$41,177	$43,533	$41,464	$37,650	$40,940	$36,575	$42,058	$44,184	$41,848	$39,417
PC specialist	$33,306	$31,684	$33,922	$33,717	$33,574	$32,768	$30,464	$35,533	$34,056	$32,634
Network manager	$50,493	$49,053	$53,639	$66,667	$46,711	$55,088	$48,920	$55,667	$47,681	$42,731
Telecommunications manager	$50,578	$50,675	$55,269	$68,136	$47,092	$52,771	$46,452	$55,147	$49,509	$45,400
Communications specialist	$38,231	$40,717	$41,559	$41,821	$35,788	$40,152	$32,577	$39,438	$37,396	$38,000
Systems and programming manager	$56,159	$62,970	$56,286	$61,271	$51,884	$55,381	$53,773	$61,952	$55,229	$52,712
Project manager	$50,852	$50,594	$49,214	$54,725	$48,441	$49,304	$61,404	$49,816	$49,686	$49,474
Senior systems analyst	$45,669	$47,148	$45,912	$46,271	$45,465	$46,648	$41,531	$45,513	$44,954	$42,393
Systems analyst	$39,617	$40,667	$39,483	$40,361	$39,969	$40,039	$37,567	$41,286	$39,384	$34,567
Senior programmer/ Analyst	$40,754	$40,544	$40,656	$40,756	$41,410	$41,519	$38,789	$40,713	$40,631	$38,995
Programmer/Analyst	$34,659	$33,659	$33,054	$33,688	$35,750	$34,536	$33,649	$35,952	$34,840	$32,055
Senior programmer	$34,631	$33,342	$33,682	$33,692	$35,679	$34,688	$35,425	$33,267	$34,523	$39,500
Programmer	$28,312	$27,200	$26,874	$28,000	$28,745	$28,732	$26,829	$28,586	$28,531	$25,979
Technical services manager	$55,799	$57,955	$59,359	$65,367	$52,042	$55,625	$45,192	$56,414	$56,017	$61,100
Senior operating systems programmer	$47,886	$47,552	$46,857	$58,769	$46,012	$47,397	$42,672	$48,318	$48,310	$45,584
Operating systems programmer	$40,196	$38,000	$39,680	$45,233	$38,905	$38,517	$34,800	$41,900	$41,167	$42,953
Data center or operations manager	$42,878	$45,100	$42,640	$47,740	$41,627	$38,138	$40,379	$49,417	$42,827	$42,095
Data center shift supervisor	$30,926	$32,214	$30,332	$32,659	$33,512	$29,089	$28,385	$33,973	$29,080	$28,849
Database manager/ Administrator	$50,938	$54,286	$59,600	$77,417	$46,032	$52,846	$46,519	$53,809	$48,179	$48,206
Database analyst	$42,561	$44,231	$43,225	$50,000	$39,833	$44,763	$37,237	$45,000	$40,792	$40,318



AVERAGE SALARIES AND BONUSES

	Average annual salary	Average additional compensation	Average total compensation	Average years of IS experience
IS MANAGEMENT				
CIO/VP/Director of IS	$68,690	$6,581	$75,611	16.0
IS manager/Supervisor	$55,236	$4,734	$58,843	13.0
END-USER SUPPORT				
Manager, end-user computing	$47,601	$2,608	$49,463	10.1
Information center manager	$45,179	$2,650	$47,100	10.2
LAN manager	$39,970	$1,999	$41,177	6.6
PC specialist	$32,321	$1,451	$33,306	5.1
NETWORK MANAGEMENT				
Network manager	$48,658	$2,702	$50,493	10.0
Telecommunications manager	$48,611	$2,749	$50,578	10.6
Communications specialist	$37,271	$1,445	$38,231	7.7
SYSTEMS AND PROGRAMMING				
Systems and programming manager	$53,549	$3,630	$56,159	12.9
Project manager	$49,345	$2,246	$50,852	10.8
Senior systems analyst	$44,569	$1,788	$45,669	10.4
Systems analyst	$38,525	$1,782	$39,617	7.4
Senior programmer/Analyst	$39,656	$1,696	$40,754	8.9
Programmer/Analyst	$33,819	$1,306	$34,659	5.5
Senior programmer	$33,911	$1,105	$34,631	6.5
Programmer	$27,581	$1,125	$28,312	3.2
TECHNICAL SUPPORT				
Technical services manager	$53,544	$3,174	$55,799	13.0
Senior operating systems programmer	$47,059	$1,323	$47,886	11.2
Operating systems programmer	$39,355	$1,301	$40,196	7.3
Data center or operations manager	$41,527	$2,005	$42,878	12.1
Data center shift supervisor	$30,184	$1,197	$30,926	8.5
DATABASE MANAGEMENT				
Database manager/ Administrator	$49,384	$2,193	$50,938	10.5
Database analyst	$41,594	$1,489	$42,561	8.0

Nuts and bolts

The fourth annual *Computerworld* salary survey was conducted in June by the Research Services unit of IDG Communications, Inc. The survey was mailed to 9,000 IS professionals using mailing lists from three sources: the Data Processing Management Association, the Applied Computer Research directory of top IS executives and *Computerworld*. The *Computerworld* portion of the listing consisted of companies ranked among the 1989 *Computerworld Premier 100* as well as top executives and subscribers who are managers of IS organizations. The 1,594 completed questionnaires constituted a response rate of 18%.

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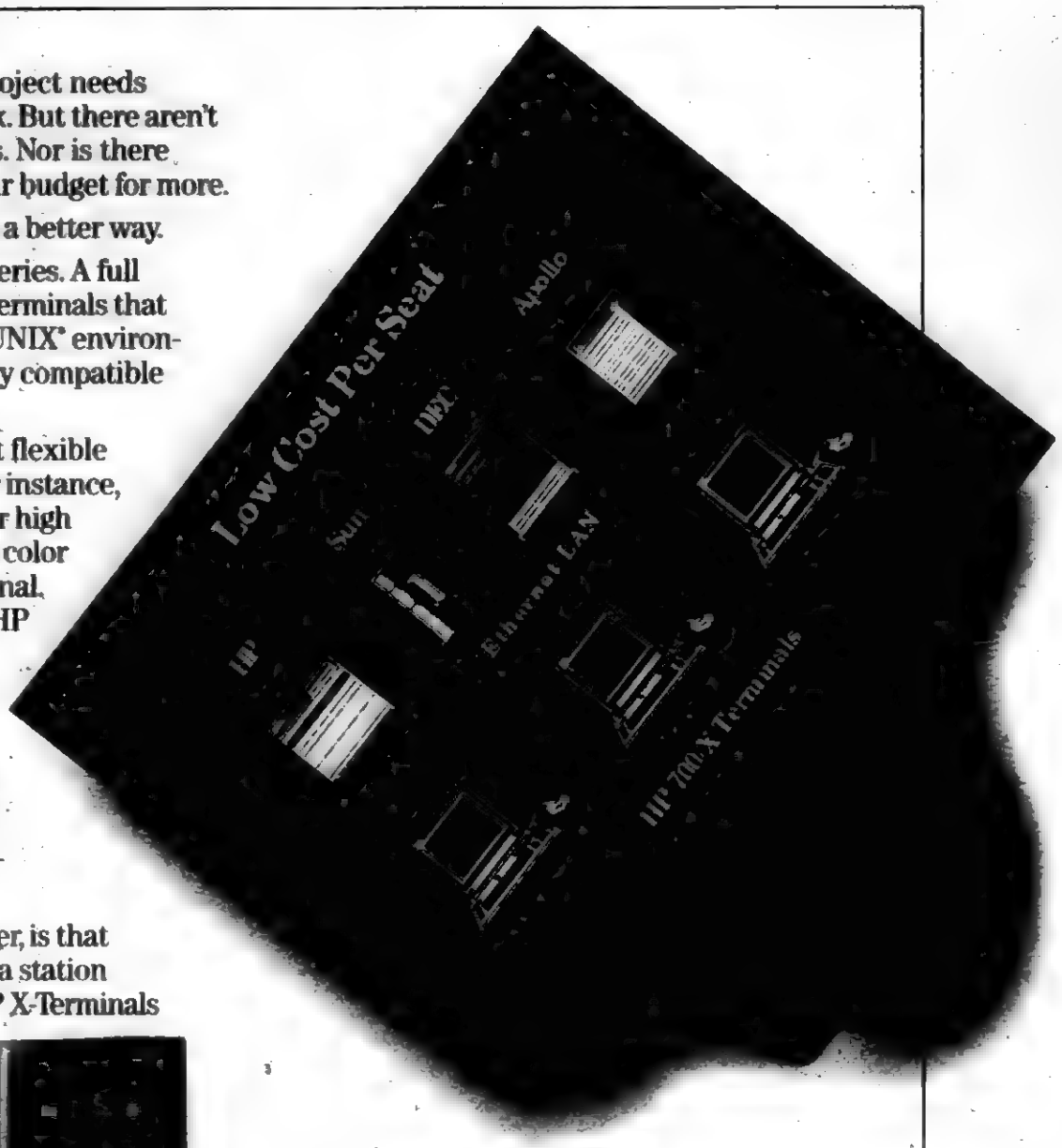
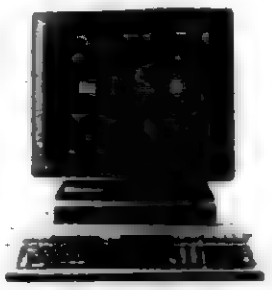


The best part, however, is that everyone who needs a station can now have one. HP X-Terminals start as low as $2995.**



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Desert downsizing

The Arizona Clearing House Association bet its business that PC LANs could replace its minicomputer, and it won

BY ROGER A. PHILIPS

Two years ago, Paul Finch Sr. made a proposal that, in the invisible and cautious world of bank clearinghouses, seemed both bold and risky. Why not, Finch asked, replace an aging Stratus Computer, Inc. system running Cobol with a new system based on networked personal computers?

On the surface, there was nothing extraordinary about the idea. After all, hundreds of organizations were shifting from mainframes and minicomputers to networked PCs in hope of boosting performance and cutting costs.

What differed here was the risk. The Arizona Clearing House Association (ACHA) was proposing to downsize its high-volume, round-the-clock mission-critical applications onto networked Intel Corp. 80386-based PCs. As far as Finch — ACHA's president and chief executive officer — knew, few if any organizations had attempted such a risky move.

The price of failure would be catastrophic: ACHA is the nation's third largest privately owned bank clearinghouse. Serving 113 financial institutions from its Phoenix headquarters, ACHA processes more than 65 million items per month. On peak days, the value of transactions processed can reach $300 million. A break in service could spell disaster for virtually every Arizona resident. Everything from direct deposits and social security checks to standard check-clearing and fund transfers would be affected.

Philips is general manager, international, for Vinsoft, a Phoenix software company.

Despite the possible risks, the benefits would also be great. Finch calculated an immediate $1.5 million in hardware savings, and laser-optical write-once read many (WORM) drives could save thousands in microfiche costs.

The idea of downsizing was already building momentum at ACHA. Two years earlier, applications were moved from an IBM 3090 mainframe to a Stratus minisupercomputer running Cobol. But, Finch says, even after the conversion, the arrangement was "at best, satisfactory." Furthermore, throughput was poor.

ACHA ran two main applications. The first was an on-line, real-time authorization system. In effect, the system says: "This transfer is OK to do now." The other application is a batch system supporting operations of automated clearing.

ACHA estimated it would cost $500,000 to redevelop the application software, whether or not the target hardware platform was a mainframe or a PC. Because of the first-in first-out nature of the application, no large sorts would be required, and transactions could be processed in real time. All these factors favored a PC network.

Around the same time, local-area networks and the new generation of 386-based PCs were drawing attention. "The 386s were hot on the street," Finch recalls. "So we started playing with capabilities, to see what it could do for DP. We took the arc/dearc benchmark and said, 'This thing can really crunch data. What if we had a bunch of these things?' We could architect the applications into a parallel processing model and segment it into workstations."

Internal business functions at ACHA had recently installed office LANs. The idea of combining PCs and LANs clicked.

Pitching the idea to the ACHA board of directors was pretty simple, Finch says. "I told them they could spend $2 million on superminis or spend half a million on an experiment that might work. The board was pretty astute. They went for it."

Finch and a key developer started by defining the basic structure of the system. A week later, the developer came back and handed a file to Finch in live mode. Soon after, a small development team was formed. Besides an ACHA information systems manager and systems specialist, the informal group included a three-member team from Teknow, a Tempe, Ariz.-based consultancy, one of whom was Finch's son, Paul Jr.

Working as a team, Finch and the others rebuilt the process to create an on-line application that could be dialed in to PCs. Because there are few software packages specifically written for automated clearinghouses, ACHA decided to write its own.

But there were several problems to be solved: Large data stores would be necessary, far beyond those available with conventional file servers. Uninterrupted service, a flexible growth path and a high level of system security were also essential.

Michael Norton

Finch, an industrial engineer with 30 years of computer experience, says he believed strongly that software prototyping was the way to go. He reasoned: "That's how they make airplanes and cars. Why can't we do that for software?"

The group produced several improved prototypes — versions dubbed wood man, tin man and stone man. When things looked in pretty good shape, and testing, change management and change control had been

- **$1.5 million hardware savings**
- **Checks for all of Arizona at stake**
- **1 million transactions per hour**

accomplished, developers polished the system off.

In October 1989, the system was ready. ACHA decided that a "flash conversion" to all 95 system users was the way to go. "It was the cleanest conversion of my life," Finch says.

The plan of re-engineering the software to mainframes if the LAN architecture didn't work out proved unnecessary.

PC parallel process

The LAN approach is essentially a parallel architecture with each PC asynchronously processing transactions while sharing database access through file servers. The architecture is an Arcnet topology-based LAN with identical Intel 386 machines at each node.

Btrieve, from Novell, Inc. in Provo, Utah, was selected as the file manager because, Finch says, a Btrieve model running on a 386 was faster than an equivalent method on an IBM 3090. Storage Technology Corp.'s 2.2G-byte disks provided the mirrored on-line direct-access storage device required. The system archived through laser-disk WORM technology. A six-second response time from archive was reached using a custom-developed interface, and the WORM technology made unauthorized alterations of the archived database difficult.

ACHA chose Quarterdeck Office Systems' Desqview for communications between itself and member institutions. Seven ports run at a 9.6K bit/sec. rate, but data is compressed at a 4-to-1 ratio, offering an effective rate of 44K bytes. The compression algorithm encrypts using a tamper-resistant rotating key.

Port protection is provided by a product called Defender from Digital Pathways, Inc. in Mountain View, Calif. Defender requires the calling institution to properly respond to a coded signal using a handheld 10-key decrypter before gaining access to the system. All lines are publicly switched dial-up types.

Each port is managed by a dedicated 386. Finch's rule of thumb is to add a port if all ports are ever busy for 15 minutes. Since most of the application processing is also performed by the port manager, system capacity can be added along with ports. The flexibility of the architecture is demonstrated by the fact that additional ports, together with their 386s, can be added overnight if necessary.

Finch says that since last fall the Novell, Inc. LAN has proven to be extremely reliable; there has been no downtime. Reliability is helped by meticulous operational conditions: a raised floor and an air-conditioned computer room with no PCs turned off — ever. Finch also plans a rolling replacement program for all PCs during a two-year period.

In any event, Finch says, the LAN offers a robust environment. A node may fail, but that doesn't affect other nodes, and the failing node can be readily replaced. File servers are duplexed with cables to provide redundancy. The operator's console is also an exact duplicate of a file server. The two can be swapped for additional backup capability. Operational tests have shown that such a swap can be accomplished in less than six months.

To further ensure uptime, ACHA has added a $15,000 uninterruptible power supply (UPS) that can supply 90 amps for two hours from batteries. This is superfluous, however, because the entire configuration draws only 20 amps. With this setup, a backup generator is unnecessary, because the UPS will permit at least eight hours of operation in the event of a complete power failure.

FINCH'S RULE of thumb is to add a port if all ports are ever busy for 15 minutes.

Restart/recovery is possible from any previous time using the laser disk archive. This has been used in the past to help member institutions that may have lost a source file.

Finch says the PC LAN approach has been excellent. Throughput, reliability and security have exceeded all targets. Networked PC costs were just $155,000 — compared with $1.5 million to $2 million for superminis or mainframes.

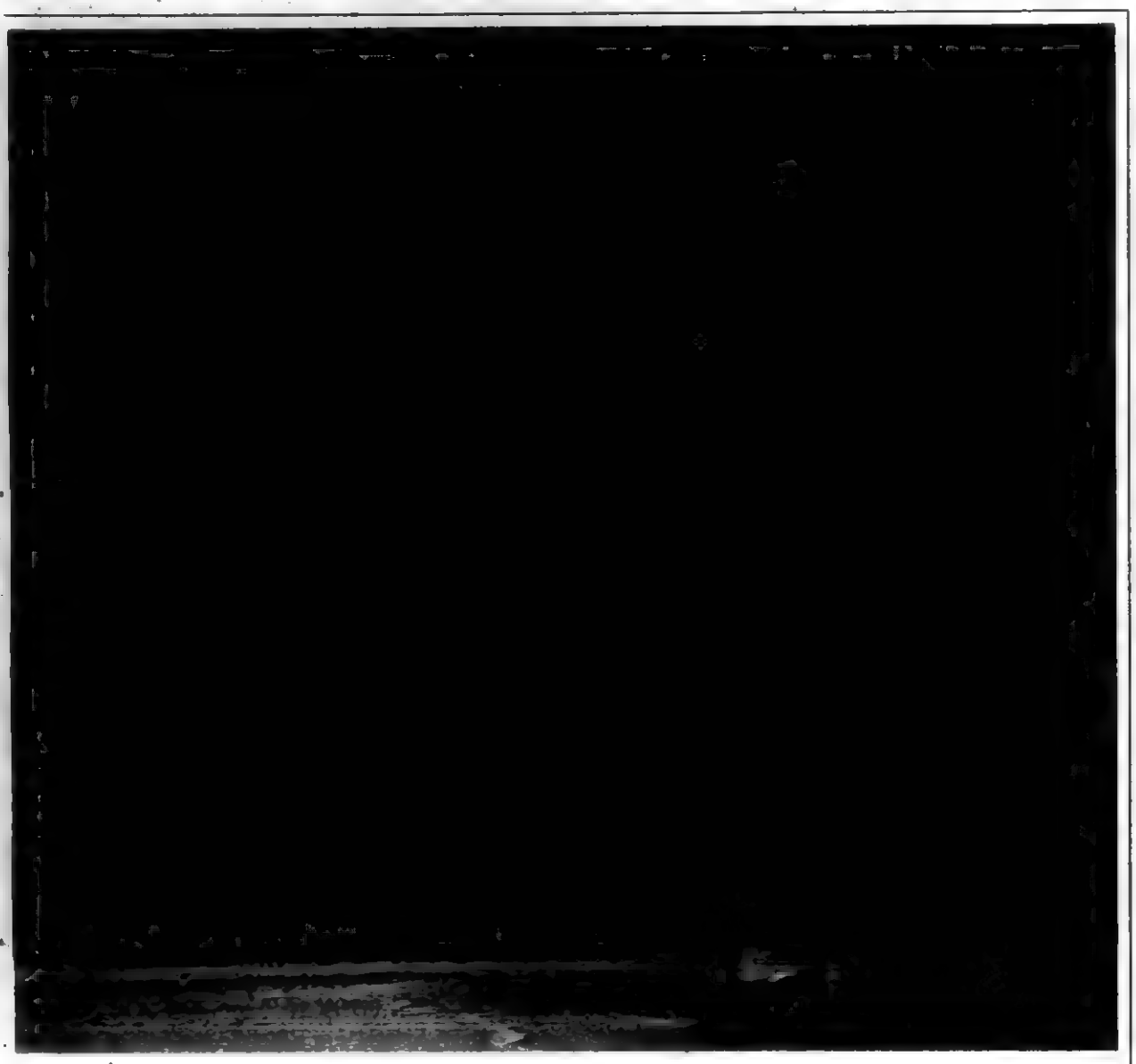
ACHA met its software development estimate of $500,000 using C and "lots of tools." Report processing was written in Cobol and transaction functions in C, Finch explains. All told, the project produced 150,000 lines of code and took between five and six man-years over an 18-month development cycle.

The new PC LAN system can process between 650,000 and 1 million transactions per hour, according to ACHA. In fact, Finch says, the PCs handle more volume than any mainframe could.

Another big payoff came from storage savings. By archiving to a WORM system instead of microfiche, ACHA eliminated some $4,000 to $5,000 in storage and maintenance costs. "Now, we can put 15 days of transfer history onto a disk for $125," Finch says. Users can also access historical transaction records on-line, which was not possible with microfiche.

Another bonus: The automated clearinghouse software worked so well, Finch says, that ACHA sold it to Teknow. The Arizona firm is gunning for the other two Goliath vendors in the industry: Visa U.S.A., Inc. and the Federal Reserve System, both of which sell their own systems.

ACHA is looking into using Intel 1486-based PCs on dual servers. "But for now, we've got more power than we can use," Finch says. ●



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NATIONAL
BRIEFS

Halfway to a billion

It is appearing more than likely that **Novell, Inc.** will reach the half-billion-dollar mark in revenue this year. The Provo, Utah-based networking company announced last week that its third-quarter net income had jumped 122% from last year's comparable period. Novell also stated that net income hit $26.1 million, up from $11.8 million during the third quarter of 1989. Net revenue for the period was $131.1 million, compared with $101.8 million last year, according to the company.

■

Smooth Saling

The **American Electronics Association** (AEA) voted Washington State Sen. **Jerry Saling** its 1990 "High Tech Legislator of the Year" last month. The award is presented each year to recognize state-level legislative efforts that contribute significantly to the growth and expansion of the electronics industry. Saling's championship of higher education — an issue that has been particularly targeted by the AEA — copped him the group's top honors this time around, according to the association.

Software tries out for leasing role

Despite criticism, small group of companies sees star potential in software leasing

BY ROSEMARY HAMILTON
CW STAFF

When Joe Burke, chief financial officer at General Logistics International, Inc., recently set out to license a Sybase, Inc. database management system, he financed the deal through Meridian Software Funding, a software leasing company and division of Meridian Leasing Corp.

He worked out a monthly payment plan, which he said is like "leasing a car." To Joe Burke, it was the most sensible way to make a major software commitment and not get killed by the upfront costs.

"They were really flexible and custom-made the package to fit our needs as far as financing was concerned," Burke said of Meridian. "You really can't do that with a bank."

These days, a small group of companies is hoping there are a lot of Joe Burkes in the information systems world. Together, these firms make up the emerging software leasing market, a niche still too young to call a success or failure. Some observers suggest this could be the next gold mine in the leasing market. Others say that it will never amount to much because there is too big a downside.

One thing is sure: Software leasing has caught the attention of the leasing industry. The Computer Dealers and Lessors Association (CDLA) plans its first workshop on software leasing at its upcoming meeting in October.

"There is great intrigue on behalf of the core body of CDLA members to know more," said Ken Bouldin, CDLA's president. "The basic position is that we have an obligation to introduce our membership to new markets. This one seems to be that."

Software leasing is actually not brand-new. A couple of low-profile companies — Software Leasing Finance Group in Sacramento, Calif., and Software Leasing Corp. in Beverly Hills, Calif., for instance — have been making a go of it for a few years. In addition, some of the bigger leasing concerns, such as IBM Credit Corp. and Comdisco, have offered leases on software in select cases, particularly when it is part of a big hardware deal, observers say.

What is new is the amount of attention software leasing has been getting lately. This comes in part because of increasing software costs. With software accounting for a bigger chunk of the IS budget, managers are now more than ever looking for alternative ways to finance it.

In addition, one of the biggest boosts to software leasing came within the last year when Meridian, a major hardware lessor, acquired privately held Software Funding and then set out to promote the business.

Even so, many IS managers are still unfamiliar enough with the concept to be leery of it, and some observers pooh-pooh it as too high-risk and too low-profit.

Simply put, software leasing provides users with a vehicle for financing software through a third party, much as they do hardware. But for the lessors, software and hardware are hardly the same.

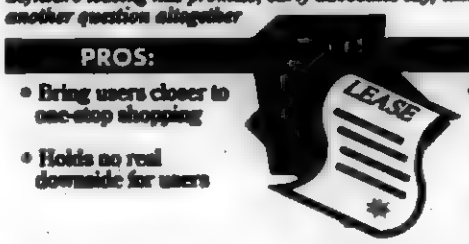
The biggest barrier to software leasing is the issue of software ownership. Large-scale users generally license software; they don't buy it outright. So-called "software lessors," therefore, are actually financial middlemen. The original vendors remain the owners of the software in question.

This makes software leasing riskier and likely not as profitable as hardware leasing, some observers say. In short, the lessor needs to rely too much on a particular client in a software deal. He counts on that customer not to back out of the contract and also to renew it once the term is up. In contrast, hardware lessors can remarket equipment many times over. It reduces their dependency on individual clients and allows them to make more money on a single item.

Continued on page 66

To buy or not to buy

Software leasing has promise, early advocates say; whether the market will perform is another question altogether



CW Chart: Marie Nelson

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1990 digital review TARGET AWARDS WINNER

Leasing

FROM PAGE 65

This risk is the reason Comdisco will not pursue software leasing as a specific line of business, said Robert Bardagy, a vice-president of the firm. Bardagy said Comdisco will continue its policy of leasing software in certain cases but will not dedicate a staff or division to it.

"We still haven't seen people lining up at the door for this," Bardagy said. "If I lease software to a company, the software can't be moved. If I get it back, I can't move it to another site. Unless you can do this, I don't see it as big business."

There are many software leasing proponents who expect it to become a shining star in the leasing industry. John Imlay, chief executive officer of Dun & Bradstreet Software, said he expects software leasing to take off soon. His company works with three software lessors, referring potential customers to them to arrange finance deals.

"It's just coming to the forefront," Imlay said. "You used to sell just payroll. Now you sell payroll integrated with other software, and these packages are a tidy sum."

The highest profile software lessor is Meridian's Software Funding division. Dave Smoot, who headed the company before Meridian acquired it and remains in charge, dismissed criticism.

Smoot acknowledged the risk but suggested some ways to work around it. First, he said, work only with reputable customers. Second, deal only in software that will likely stay at a customer's site for years. Meridian leases databases, software engineering tools and integrated application packages because they take a long time to install and often become part of a company's core information systems.

"Is there a risk to software leasing? Yes," Smoot said. "We could be left holding the bag. Would I do this for word processing? Probably not. That could get thrown out every year. But a database package that includes development languages — the customer probably builds products around that. What's the chance of them giving it up in three years?"

Gartner Group, Inc., a market research firm in Stamford, Conn., said it suspects that few other high-profile players will enter into software leasing, which will remain a minor market unless rules of software ownership change.

"Meridian has been successful because it's an offshoot of their hardware leasing business," said Barbara Sannerud, an analyst at Gartner Group. "I remain suspect that companies only doing this have a booming business at this time."

Yet Ned Livornese, a Washington, D.C.-based attorney who specializes in the leasing business, said, "I personally think it's going to take off."

While acknowledging the risks associated with software leasing, he also suggested that there is no real downside for the user. Eventually, he said, it could be users who end up driving the market. "From their perspective, I would think they should feel comfortable doing this."

An idea that wouldn't go away

About 10 years ago, Howard Smith was working at Management Science America Corp. (MSA), and the concept of software leasing popped into his head. Smith has since joined the ranks of computer industry entrepreneurs, but he has not been able to shake the idea of software leasing.

He tried to make software leasing work at MSA, but it was operated only on a limited basis. "I think Howard got the idea before its time," said Dun & Bradstreet Software CEO John Imlay, who was then president of MSA. MSA has since been acquired by Dun & Bradstreet and has merged into D&B Software. Today, Smith runs Software Leasing Corp. in Beverly Hills, and while it isn't a booming business, Smith said he's doing fine.

"I see this as a niche," Smith said. "We aren't making a lot of money, but some people find software leasing a more desirable alternative."

Recently, Smith made a deal with Price Waterhouse that allows his company to provide leasing services to the accounting firm's clients. Smith has built up a client base of about 30 since starting Software Leasing 3½ years ago.

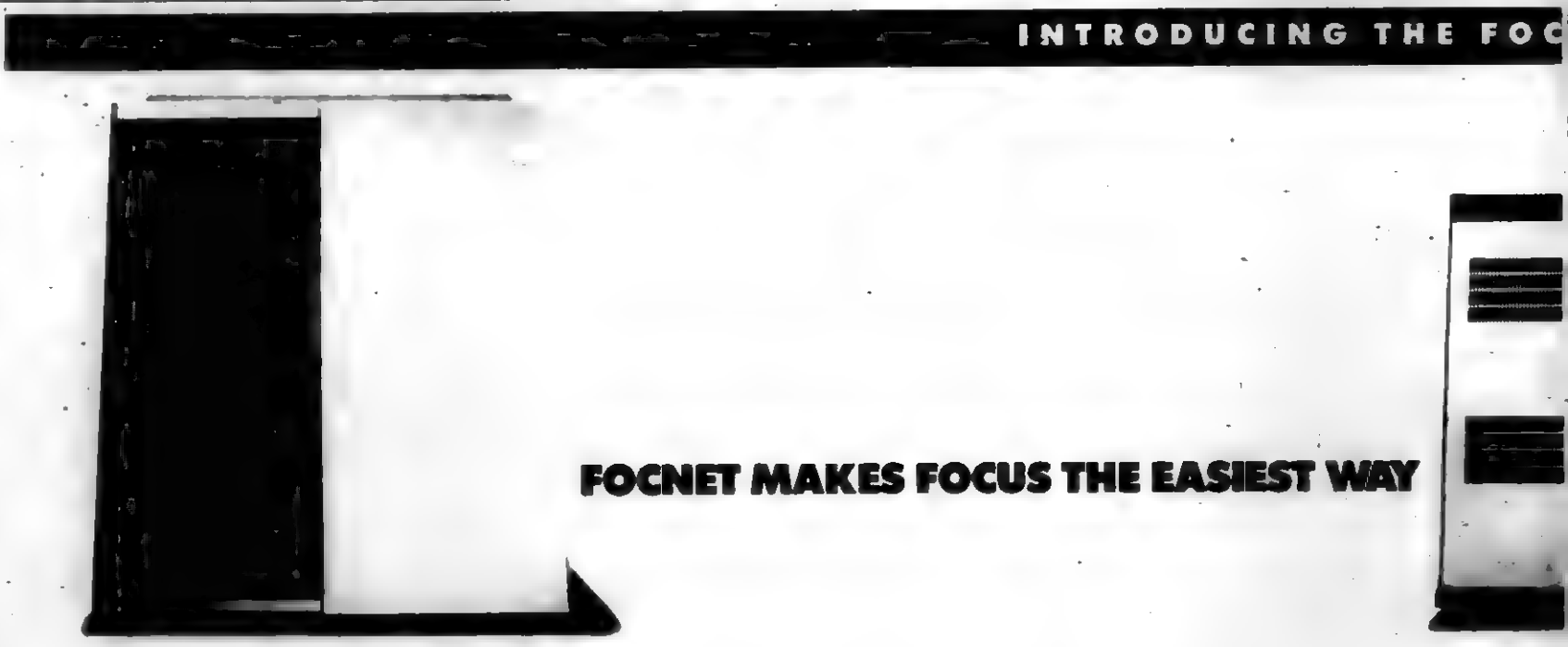
"For the first three years, it was like when I was first at MSA, and we spent a lot of time trying to convince people to buy software rather than write it themselves," Smith said, "Now, in the last six or eight months, the software companies are starting to get interested in this."

Between leaving MSA and starting Software Leasing, Smith took a breather from the computer industry, but the software leasing concept stayed with him. "I always thought it was an intriguing concept," he said.

In 1986, as he was starting up his own company, Smith called on Imlay again. "John said, 'I think this is something that can happen, but it's not quite the time,' " Smith said.

"John was right," Smith admitted. "It has taken about three years not only to educate the software companies but also to educate the buyers. They've never had this alternative presented to them before."

ROSEMARY HAMILTON



COMMENTARY

Patricia Keefe

Reading their flips

By now, everyone knows that George Bush, a good two years after issuing a Pollyanna "promise" not to raise taxes, just recently came to realize that the country has been facing a deficit that almost defies quantification.

But let's give President Bush the benefit of the doubt. After all, when pressed on taxes, what did he actually say? "Read my lips." We all know how hard it can be to read a bunch of mouthed words from across a crowded room.

Heck, he could have said just about anything. Maybe we heard what we wanted to hear. As the town gadfly once told me, "You should quote what I mean, not what I say." Uh-huh.

With that in mind, it might be a good time to take a look back at some computer industry flipflops. It's possible some of us missed the real message the first time (or two) around:

• *Apple.* Two-and-a-half years ago, the increasingly suspendered Pepsi generation created Claris as an independent software division. Apple promised anxious third-party developers that it would spin Claris off in a year.

Last month, Apple reneged, noting that software has become important. Gee, we always thought it was. Just ask Microsoft, which owns the Macintosh applications market, as well as what many see as Apple's biggest threat, Windows 3.0.

• *Ashton-Tate.* Last October, then-Chairman Ed Esber said that he would be personally responsible for getting the extremely late Dbase IV 1.1 out the door. Esber was relieved of that weight April 30, after he resigned as president and chief executive officer. Release 1.1 shipped in early August.

• *Novell.* Novell announced . . . actually, whenever Novell announces anything, it pays to check your memory banks — first to make sure the product isn't being reannounced, and second, to see what the initial ship date target was. For example, Netware 386 went from a one-time ship to a two-phased delivery (3.1) to a three-phased delivery (3.2). I can hardly wait for 3.4, or would that be 4.0?

• *Banyan Systems.* Banyan is given to making pronouncements about what will happen, say, six months down the road — it could be an initial public offering, several agreements with other industry players or users or, perhaps, support for Netware. Typically, six months come and go without anything happening. Obviously, the developer of Vines closes no deal before its time — and often not even then.

HEY, GUYS, you're either open or you aren't.

• *3Com.* Chairman Bill Krause delights in talking about how open he is with the press. Then again, according to Mr. Bill, an internal document regarding a would-be merger with Echelon doesn't exist, which is rather odd, since I'm looking at it as I write this. Maybe I need new glasses; CRTs can be hard on the eyes.

• *Microsoft.* The year of OS/2 has shifted from 1990 to 1993-1994. But you don't have the money in your budget anyway. Don't forget memory — first it's an issue, and then it isn't. Users like to note that when you start talking several hundred or thousand PCs that need memory upgrades, no matter how cheap the bytes, it all adds up.

• *Lotus.* The spreadsheet maker succeeded in making its interface an industry standard and then promptly sued people for copying it. Lotus is now trying to push an OS/2 interface as a standard interface. This time around, developers should extract an agreement not to sue.

• *DEC.* Here's a goodie. Those wacky engineers at DEC plan to work on an *open*, plug-and-play network architecture that deliberately excludes support for Sun Microsystems products. Hey, guys, you're either open or you aren't.

• *Texas Instruments.* Were it not for Dbase IV 1.1, TI could lay claim to having the most mobile delivery date in the industry. How many times has TI rescheduled or re-estimated delivery of its 4M/16M bit/sec. token-ring chip set? Five times, maybe? Will it ever ship?

Keefe is *Computerworld's* senior editor, PCs and workstations.

NATIONAL

BRIEFS

The E-mail of the species is deadlier than the mail

A recent report from Cambridge, Mass.-based market research firm **Forrester Research, Inc.** said that electronic mail has not been the boon it was cracked up to be. Based on interviews with 50 Fortune 1,000 companies, voice mail and facsimile machines are outstripping the once-popular on-line communication system. "Large companies have been duped into buying many incompatible E-mail systems on their [local-area networks]," said Forrester network strategy service director Mary Modahl. "They end up with a mish-mash that doesn't even provide basic communications between their users." Unless they are able to commit to a single E-mail vendor, Modahl concluded that "companies are better off just using the telephone."

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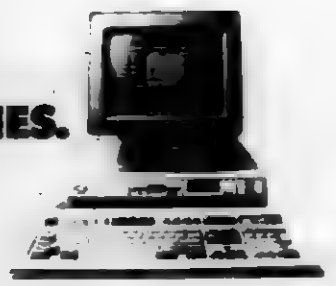

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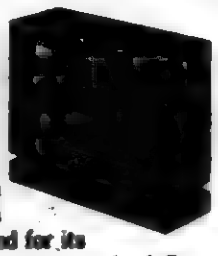
Zenith awarded government grant for HDTV

BY ELLIS BOOKER
CW STAFF

GLENVIEW, Ill. — Zenith Electronics Corp. welcomed its first government grant for its high-definition display technology last month. The award, from the Defense Advanced Research Projects Agency (DARPA), will go toward developing less costly manufacturing methods for Zenith's flat tension mask high-resolution monitors. Zenith said it expects the award to be over $1 million.

"The DARPA announcement reaffirms our belief that we have real, world-leading high-definition display technology and research programs," Zenith Chairman and President Jerry K. Pearlman said in a statement.



Zenith has been investing heavily in high-definition television (HDTV). The firm has reportedly allocated $10 million of its 1990 budget for research and development in this area and for its HDTV transmission system.

Pearlman called high-definition displays "one of the next big high-technology battlegrounds" between the U.S. and other countries. Zenith estimated the worldwide market for high-definition displays at 1 million units this year.

According to analysts, however, the award said as much about DARPA as it did about Zenith. "DARPA's trying to keep a little bit of profile in this business," said Dale Cripps, publisher of "HDTV Newsletter" in Portland, Ore.

Cripps noted that the dismissal of DARPA's longtime director Craig I. Fields this year [CW, April 30] had caused some to wonder if the agency would back away from some funding projects.

Reportedly, Fields' critics charged that his agency's funding policies bordered on setting U.S. industrial policy. One million dollars, Cripps continued, will further Zenith's research, "but it won't go far with hardware."

In addition to Zenith, DARPA picked five other companies for funding of military applications for high-definition displays: Norden Systems, Inc. in Norwalk, Conn.; MRS Technology, Inc. in Chelmsford, Mass.; Ovonic Imaging Systems, Inc. in Troy, Mich.; Microelectronics and Computer Technology Corp. in Austin, Texas; and Tektronix, Inc. in Beaverton, Ore.

DARPA already has contracts with seven other vendors to conduct display research.

INTERNATIONAL BRIEFS

How do you spell 'relief'?

For many of the customers stranded mid-Atlantic Computer Systems' unexpected collapse this past spring, the answer may be I-B-M. Atlantic's administrators recently named **IBM UK** the "preferred intermediary" for dealing with lessors and lessees of the fallen computer leasing firm, according to reports in the British financial press. Terms of the contract were not released.

■

Dial, Britannia

The sun set last week on the British electromechanical exchange. This move marked the end of old-style UK telecommunications and ushered in what **British Telecom** claimed is the first wholly digital long-distance telecommunications network to be created by a major country. The network is part of a British Telecom investment program estimated at upwards of $5.9 billion annually.

■

Information, get me Memphis

France Cables et Radio, a subsidiary of France Telecom, acquired a majority stake last month in Memphis-based network and services management vendor **Cyclix Communications Corp.** The deal marks the French communications company's first majority position in a U.S.-based firm.

■

OMG going strong

U.S.-based **Object Management Group (OMG)**, a vendor/user association dedicated to the promotion of object management technology, ended August with a banner week. The organization — up from nine members to more than 80 during the past 18 months — announced the addition of 11 new corporate and associate members, including the likes of Du Pont Co., Motorola, Inc. and Xerox Corp.

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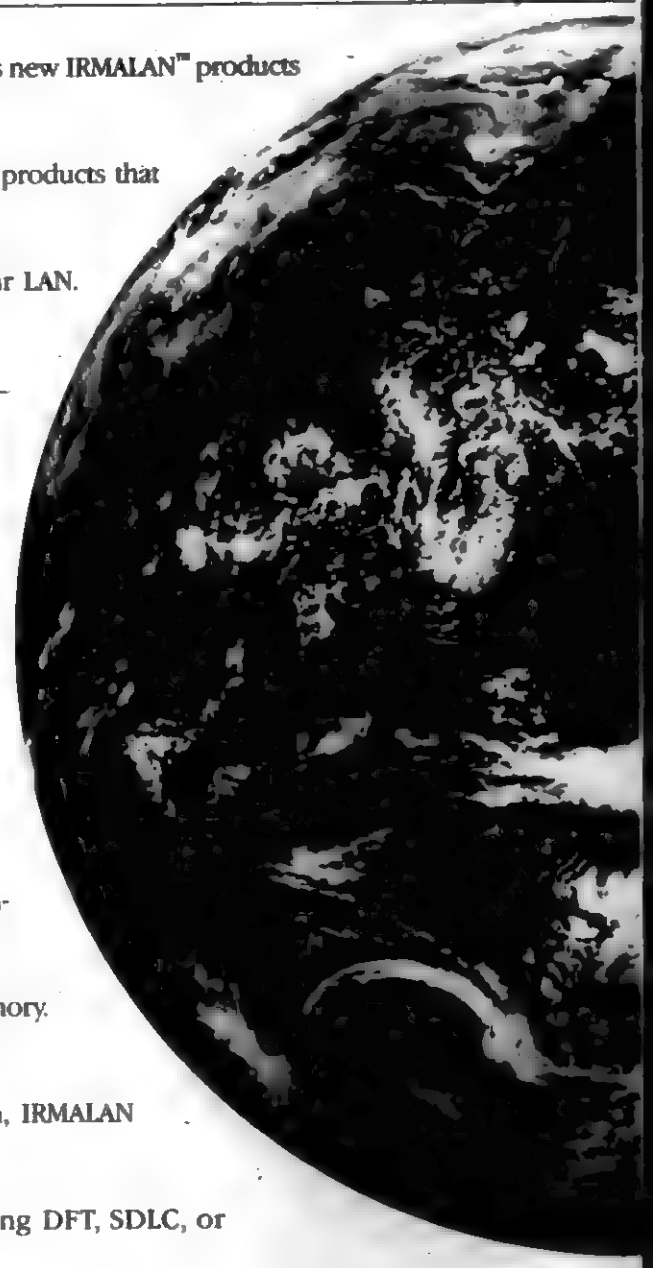

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Norsk Data comes back to post profit

BY DON RADOLI
IDG NEWS SERVICE

OSLO — For executives, employees, investors and customers of computer companies currently in the throes of painful product and corporate transitions, Norsk Data SA's second-quarter financial report may come as a welcome reminder that there can be light at the end of the tunnel.

The Norwegian computer maker turned systems integrator surprised local analysts late last month by posting a pretax profit of $461,538 before extraordinary items for the first half of 1990. Analysts had predicted losses ranging from $3 million to $8 million.

Despite the fact that the company's profit was modest, President and Chief Executive Officer Erik Engebretsen pointed out that the results for the first half of the year represent a $38 million turnaround, compared with the $37.5 million loss the company suffered in last year's similar period.

Analysts were quick to point out that without a foreign exchange gain of $2.6 million, the company would have posted a pretax loss. Engebretsen said the gain was due to a stronger-than-expected English pound and West German mark in relation to the Norwegian kroner.

Operating revenue for the period climbed 10% to $188 million from $172 million in the corresponding period last year.

"What is important for us is that this positive development occurs at a time when other major players in the computer industry are faced with a difficult and challenging time," Engebretsen said.

"This confirms that the painful measures we have had to take were necessary to ensure the healthy future of the company. Our role as a systems integrator does correspond to what the market currently requires," he added.

According to Engebretsen, the company made satisfactory gains in markets with a variety of products and applications. He noted especially positive developments in graphics, in the Scandinavian public sector and in computer-aided design and manufacturing solutions for the West German mechanical industry.

Orders in the first six months were level with last year's, reaching $188 million. Product sales accounted for 57% of this figure; maintenance, training and other services represented the remaining 43%.

The total number of employees at the end of the first half of 1990 was 2,634, compared with 3,333 at the end of June 1989 and 2,941 at the end of December 1989. Currently, 65% of the work force is located in Scandinavia, with the remaining 35% spread throughout Europe.

While heartened by the firm's newly trim profile, Engebretsen noted that maintaining and increasing the progress made to date is a challenge that will be confronted "in a very competitive marketplace and will continue to make heavy demands on the entire organization."

He said he envisages Norsk Data as a major player in the European computer market in the coming years. Apart from being a systems integrator, he revealed that the company has plans to develop a facilities management offering for European customers.

Per Holte Rosenkilde, president of International Data Corp./Norway, said Norsk Data had managed its turnaround operation in record time. He predicted revenue of $415 million for the year. According to Rosenkilde, other European and U.S. minicomputer makers will have to swallow the same bitter pill that Norsk Data was forced to take two years ago and reduce their work forces by about 20%.

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EXECUTIVE CORNER

Hughes LAN unit names president

Ungermann-Bass, Inc. founder and former executive Joe Kennedy is the new president and chief executive officer of Mountain View, Calif.-based **Hughes LAN Systems, Inc.**, a subsidiary of Hughes Aircraft Co. Kennedy, a networking industry veteran who most recently headed up 3Com Corp.'s government products division, was simultaneously appointed a senior vice-president of Hughes Network Systems.

Venture capitalist and longtime Kaypro Corp. affiliate **Geoffrey Soule** was unanimously elected president and chief executive officer of **Kaypro** last month. Soule's placement at the head of the beleaguered computer company reportedly aided in persuading the federal bankruptcy judge now presiding over Kaypro's Chapter 11 proceedings to give the company until Sept. 3 to prove that its attempted reorganization has a realistic chance of succeeding.

Eric Benhamou, president of **3Com**, has been named CEO of the networking firm, which is located in Santa Clara, Calif. Benhamou, 35, replaces **Bill Krause**, who will retain his position as chairman of the board.

Your next move may be on you

Corporate cost controls are taking the wind out of paid relocation benefits

BY JANET RUHL
SPECIAL TO CW

Can't stand the thought of another snowy winter? Wish you could move back home so the kids could grow up near their grandparents? Taking a new job with a company that offers paid relocation may be a way to move to your dream destination. But whether an employer will pay your relocation expenses depends greatly on what skills you have, what your salary is and where you want to go.

Many recruiters report that with today's business climate, the overall number of paid relocations is down. Job hunters looking for relocation to major urban areas are having the worst luck, says Rick Young, a recruiter at Corporate Personnel Consultants in Charlotte, N.C. He says that in some cases, companies in large cities refused to interview out-of-state candidates because they had no intention of offering a relocation package. Relocation activity is greatest in small towns in the Southeast because there is no pool of experienced information systems talent for employers to draw on, Young says.

Relocations to the Northeast have dropped because of the region's high housing prices, which have discouraged people from moving here, says Jim Bond, a senior placement manager at Robert Half International, Inc. in Hartford, Conn. In the Hartford area, paid relocations have decreased substantially because employers have become more cost-conscious, Bond says.

Midwest employers tend to offer relocation packages only to people moving from areas east of the Mississippi, says Mike Beckerat, a principal at Michael Thomas, Inc., a recruiting firm in Columbus, Ohio. One reason is that Easterners fit in better with the local lifestyle than do Westerners.

This kind of geographical exclusivity does not necessarily work both ways. Employers in the San Diego area will relocate people from anywhere in the country if they have skills that are not readily available locally, says Jack Friedman, staffing manager at Technical Directions, Inc. in San Diego.

Recruiters agree that their clients have gotten pickier about whom they relocate. In general, only candidates whose resumes demonstrate hands-on experience with the latest hot technologies need apply. While the particular software experience in demand varies from region to region, recruiters say that DB2 heads the list of skills their clients are willing to pay for, followed by a selection of fourth-generation languages and industry-specific applications. Bond reports that his clients tend to look for applicants who have worked for "brand-name companies."

In addition, most of the recruiters report that the heaviest relocation traffic falls within the $20,000 to $40,000 salary range. To some extent, this reflects the fact that the companies most willing to relocate employees are in areas where both the cost of living and therefore pay rates tend to be relatively low.

Companies in rural New England rarely pay to relocate anyone making more than $40,000, says John Hodska, who runs EDP Placement Associates in Stowe, Vt. However, these companies will relocate technical people willing to take a salary cut if they really want to live in the region; companies in other areas will rarely relocate an employee at a lower salary for fear he won't be happy taking a cut in pay and won't stay long.

The bulk of relocations involve programmers rather than managers, recruiters say. Bond says the only managers he sees companies pursuing with relocation in mind are IS directors with the precise hardware, software and industry background needed. However, Beckerat says, when managers are relocated, the packages offered them are more complete than those offered to programmers.

> **IN GENERAL, ONLY candidates whose resumes demonstrate hands-on experience with the latest hot technologies need apply.**

One group of employers that does seem to routinely offer relocation packages is the larger consulting firms. David Reingold, vice-president of personnel and recruiting at Computer Horizons Corp., which employs 1,500 consultants, says that it is standard in his industry to offer relocation packages because consultants must move all over the country to fill contracts.

The details of relocation packages vary, but there seems to be two common types. In the stripped-down version, the hiring company pays employees a lump sum ranging from $500 to $3,000. Out of this, they are expected to cover all moving expenses.

The more deluxe packages usually start with a payment for moving household goods. They also cover the costs of transporting a family and automobiles to a new destination, the expenses of one or two house-hunting trips and payment for temporary housing during the brief period surrounding the move.

Some companies will also pay the cost of points needed to get a new mortgage or will offer an amount equal to half a month's salary to be used for incidental expenses. How generous a company is with its relocation package depends on a number of factors, including its size and the job level at which the new hire is being brought in.

The single biggest change in relocation packages over the past few years — which may come as a nasty surprise to people who haven't relocated recently — is that companies now almost never buy out a newly hired employee's home. Beckerat reports that in the Midwest, this once-common benefit is not even offered to vice-presidents and IS directors.

Ruhl is a consultant and programmer in Connecticut and author of *The Programmer's Survival Guide: Career Strategies for Computer Professionals.*

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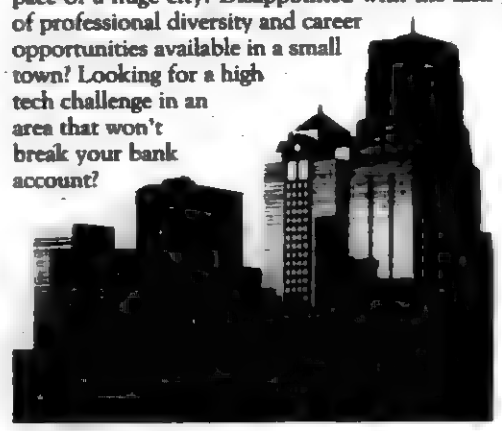

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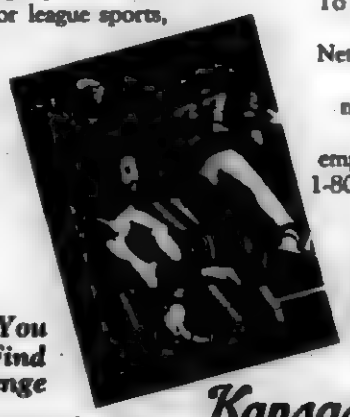

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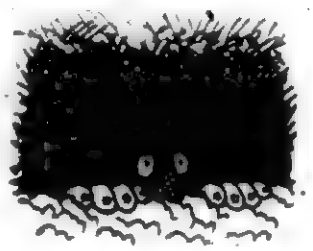

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ICS CONSULTING SERVICES, INC.
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Contact: Penny Sage or Steve Lucas

SENIOR SYSTEMS ENGINEER wanted. Duties: Working as part of a team providing production support for a Worldwide Engineering Releasing System which facilitates communication of engineering information between multiple automotive manufacturing and engineering facilities in 13 countries. Designing, developing, implementing, testing, and documenting changes and enhancements to this system, using an IBM 3090 computer and the following software, utilities and/or languages: IMS DB/DC, OS/MVS, MFS, OS/JCL, TSO/ISPF, STS, DB2/SQL, COBOL, PANVALET, UCC7 & CLIST. Need Master's in Computer Science and 1 yr exp as a Programmer Analyst. Designing and developing business application software, including a manufacturing system, using the following hardware, software, utilities and/or languages: IBM 30xx computer, IMS DB/DC, OS/MVS, MFS, OS/JCL, TSO/ISPF, STS 2, DB2/SQL, COBOL, PANVALET, UCC7 & CLIST. Must also have one university course in data structures, database management, systems programming, graphics theory and artificial language. Pay is $30,000 per year, 40 hrs/wk. Resumes to 7310 Woodward Ave., Rm 415, Detroit, MI 48202. Ref. #64890. Employer Paid Ad.

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Director of Product Management position is available with a computer equipment leasing company where an aggressive approach to asset management is needed. Strong interpersonal, organizational and managerial skills required. Background should include:

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Candidates should have executive experience with a school district or a service organization in the public or business sector; proven leadership ability; experience with technology preferred; MBA or Ph.D. preferred.

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Send letter of application and resume by September 15, 1990 to:

Tom Halvorsen,
Chairperson
Executive Committee

TIES
1925 W. County Road, B2
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SOFTWARE ENGINEER 40 hr/wk, 8-5, $38.5K/yr, OT as req. Resp include: engaging in computer software & hardware research & customer use; design & develop software using 8051 Family Assembly Lang. to be used w/customized real time microprocessor-based products; design, develop & implement communication software & operating systems; direct & coordinate resolution of hardware & software problems utilizing a strong grasp of Digital Systems; analyze & evaluate existing software packages & integrating them into existing & future software lines; design communication protocols & test routines; coordinate w/marketing & manufacturing depts, confer w/ other engineers re feasibility, cost effectiveness & customer demand for new & existing products; supervise product engineers. Education req.: B.S. in Computer Engineering. All exp. must be documented and include: 1 year in the position offered or 2 years as an Electrical Engineer and/or Project Engineer. Of the ed req. must have taken & completed at least 4 undergrad level courses in Digital Systems. Of the exp req. must include at least 6 months of exp. in the design of software using 8051 Family Assembly Language, 6 months of exp. supervising at least 2 professional project personnel & 6 months of exp. designing hardware for real time microprocessor based equipment. "Employer Paid Ad" Send resumes to: 7310 Woodward Avenue, Room 415, Detroit, Michigan 48202, Reference No. 62290.

Systems Programmer. Install and maintain DOS/VSE and a variety of IBM and other vendor's products. Tune CICS/VS performance. Trouble shooting of application systems written in COBOL or Assembler language. Disk management and VSAM space utilization. Configure VTAM network and define resources. Provide technical assistance to operation and programming staff. B.A./B.S. Computer Science. 1 year experience in job offered. 40 hours per week, 8:30 a.m. - 5:00 p.m. $30,800 per year. Send resumes to: ILLINOIS DEPARTMENT OF EMPLOYMENT SECURITY, 401 South State Street - 3 South, Chicago, Illinois 60605. Attention: L. Donegan, Reference #1753-D, AN EMPLOYER PAID AD.

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Prefer 5+ years systems programming experience or data base management. Working knowledge of the above software required.

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Prefer 4+ years data processing in a large mainframe environment with experience in the above software applications. Experience should include 6 months to 1 year recent hands on DB2 applications experience. Experience in financial related application areas desirable.

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USAA

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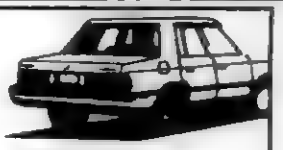
Explore the Motor City



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Renee Southard
Manager of Staffing & Placement
Keane Inc.

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To maintain its premier level of service, Keane employs nearly 1400 professionals in 20 offices throughout the East, Midwest, and Southeast. For Renee Southard, Manager of Staffing and Placement, Keane's aggressive growth plans require recruiting an average of 450 to 500 new employees each year.

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Charlotte, NC 28281
(704) 358-9012
(800) 277-SPC1

NASHVILLE
5115 Maryland Way
Brentwood, TN 37027
(615) 377-0711

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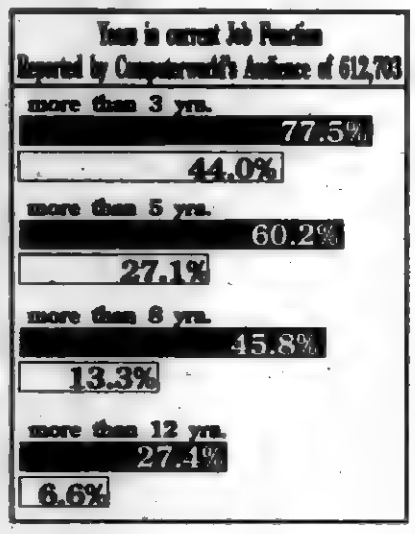

SOURCE: Skill Survey of Computerworld's Audience, May 1989

To place your ad regionally or nationally, call John Corrigan, Vice President/Classified Advertising, at 800/343-6474 (in MA, 508/879-0700).

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Independent oil and gas company in downtown Dallas seeks Programming Supervisor with at least 5 years of experience. Preferred candidates will have a degree in Computer Science, good communications skills, and working knowledge of COBOL Command Level CICS 1.7, MVS/JCL, TSO, and VSAM. Some experience with oil and gas accounting systems, personal computers, CA-1, and CA-11 would be helpful. Responsibilities will include software development/maintenance, and providing technical support and direction for the programming staff. Smoke-free workplace.

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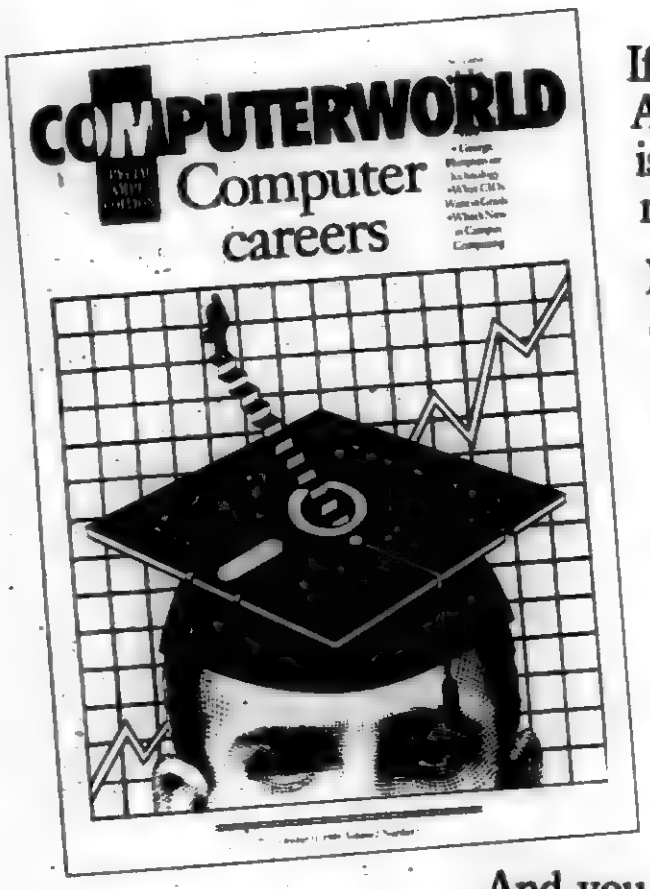
Now you have a new way to recruit university and college students planning computer careers:

Computerworld's third annual Campus Recruitment Edition

Issue Date: October 31, 1990
Close: September 28, 1990



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Planned Editorial Features:

(subject to revision)

- MIS salary and job satisfaction survey
- Where are the best jobs?/What positions are hot?
- Experiences of recent MIS graduates in their first jobs and what helped them in school
- The MIS career ladder
- Profiles of acclaimed top level MIS executives
- The strategic advantage of computers and how they play a key role in running a company

SYSTEMS ENGINEERS

Entergy Services, Inc., the technical service subsidiary of the Middle South Electric System, has openings for Systems Engineers. The current hardware environment consists of two IBM 3090/400's in an MVS/XA operating system environment supporting large IMS production applications.

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Analysis, design, coding, testing and documentation responsibilities in providing development, enhancement and maintenance support for varied applications such as Financial Accounting, Budget & Reporting, Customer Information, Engineering and Materials Management applications.

Successful candidates will have 2-5 years experience with any of the following:

MAINFRAME (IBM MVS)		PC (DOS/OS2)	
• COBOL	• CASE TOOLS	• FOCUS	• NOVELL
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• OS/JCL	• IBM Utilities		• dBase/FOXBASE

SYSTEMS PROGRAMMERS

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Entergy Services, Inc. offers an exceptional relocation package including a relocation allowance (one month's salary), paid moving expenses, paid house hunting trip, Mortgage Interest Differential, plus interim living. For more information, call our toll free number below or send resume to: **T. Porter, Entergy Services, Inc., P.O. Box 61000, New Orleans, LA 70161.** An Equal Opportunity Employer M/F/H/V

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- DB2/SQL
- IDMS/ADSO
- DATACOMM/IDEAL
- SMARTSTAR
- SYMAN/SYMIX
- IBM MIDRANGE
- PACBASE
- DEC/VAX
- ORACLE
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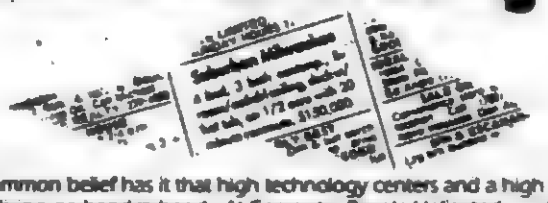

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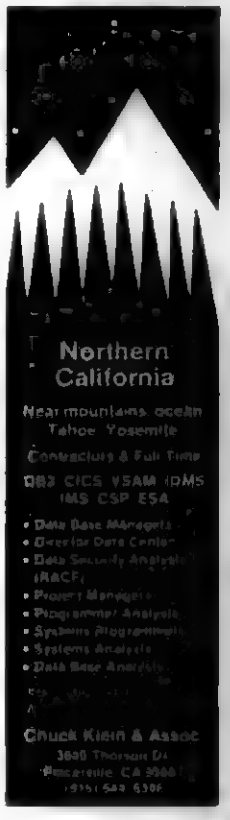

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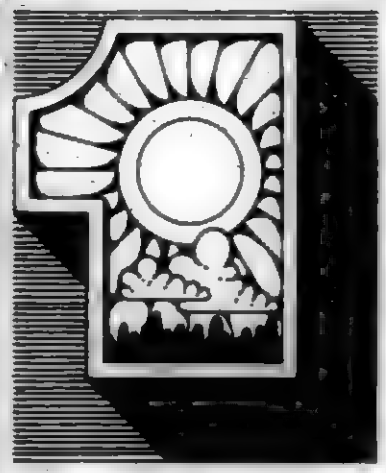

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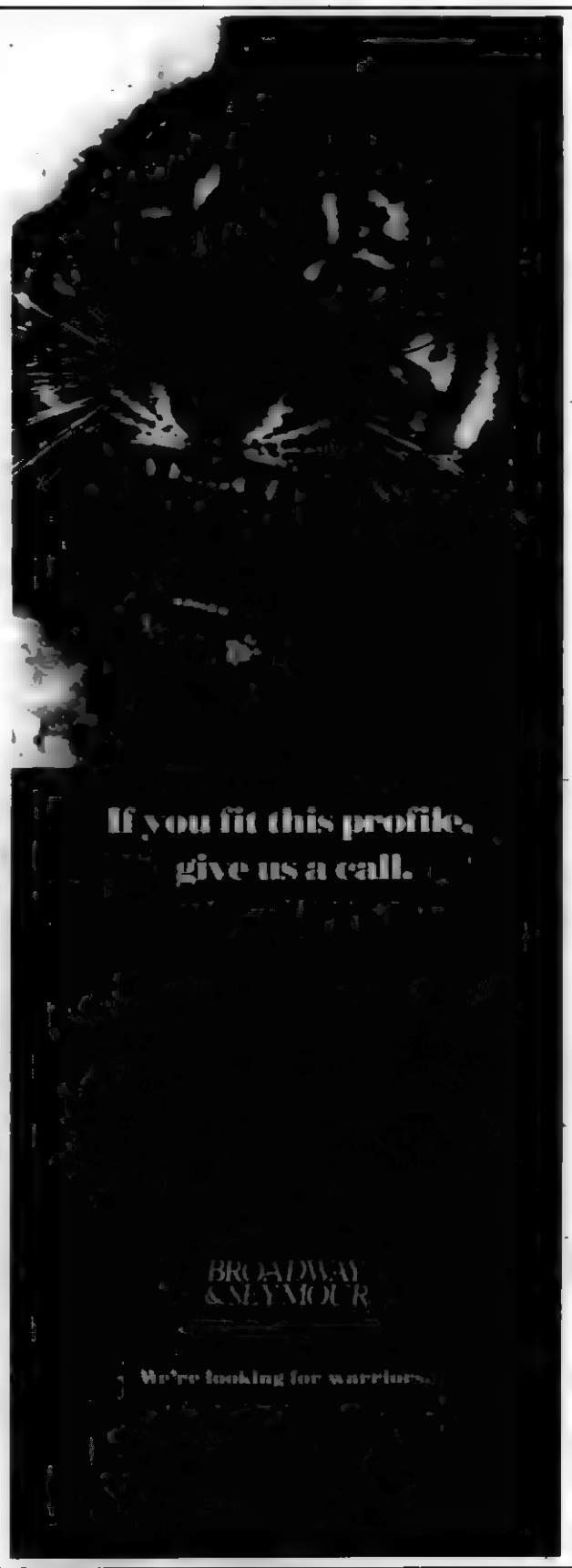

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The pitfalls of procurement

Selecting critical software packages calls for leadership by top managers

BY STEPHEN R. ROSENTHAL
and HAROLD SALZMAN
SPECIAL TO CW

Editor's note: This column is based on the author's research on procurement of application software at service companies. A more detailed treatment of the results appears in the Summer 1990 issue of Sloan Management Review.

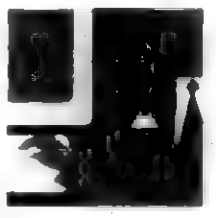
Application software controls many critical corporate functions; as a result, a new package can unleash major problems for employees and customers. It is therefore hard to understand why so many senior managers leave the procurement of mission-critical software to their technical support staff.

In most cases, senior managers only get involved when the value of a procurement rises above a certain threshold. When they do step in, they often reduce the process to a calculation of financial payback that submerges crucial concerns.

Senior managers should play a more active role in the acquisition of software with strategic implications or a major impact on operations. It is important for them to know where traps may lie and what they can do to make the process more effective.

Assessing the mission. One cannot evaluate the design of mission-critical software without first reflecting on the mission itself.

This step involves more than just modeling the operation's current structures and goals. Before investing in a major software package, managers must assess the extent of changes likely to occur in the services they are delivering.



As markets shift and competitors respond with new offerings and better performance, organizations must reconceptualize their mission. A new mission statement can lead to changes in the service/delivery system, including jobs, skills, organizational structures and operating procedures, as well as the introduction of new software. If a bank is moving toward "relationship banking," for example, the appropriate software supports tellers as they sell new products rather than just speeding up transaction processing.

Under this kind of scenario, managers assessing an application must ask new types of questions: What features and functions will facilitate strategic changes in the delivery of services? How can we use the software design to enhance our responsiveness to customers? How will users' jobs change?

Identifying operational objectives. Managers must understand what new software means from an operational viewpoint. They must look beyond the strategic mission and explore service operations, considering the functions of users and other affected groups. One approach is to appoint a task force of users to develop a list of operational objectives for the software.

Managers must teach the operating personnel and first-line supervisors that their job responsibilities include suggesting new software aids. Unfortunately, it can be difficult for both of these groups to do so; the task calls for a different mind-set than the handling of routine business transactions.

Getting the operating personnel to participate is not impossible, however. There is a growing understanding of techniques that manufacturing managers use to encourage factory workers to suggest improvements. The Total Quality Control movement, used by manufacturers and service organizations alike, has a similar spirit of open inquiry about future operations.

Managers can experiment with ways of encouraging workers to think creatively; the best incentives are goals of making jobs more interesting and helping workers provide customers with more effective service.

Zeroing in on flexibility. Senior managers have an important role to play in guiding the technical staff and operating personnel to evaluate vendors' claims about the flexibility of their software. Every feature and function has built-in limitations. Users must distinguish superficial indications of flexibility from the ones that are central to the application.

The biggest and most significant challenge is to understand the attributes that are not flexible and evaluate how critical they could be. To some extent, the answer will be unknowable because the people in charge of operations cannot fully appreciate how the software would fit current procedures. It is even more difficult to imagine how a package could raise obstacles to handling future requirements.

Senior managers can help direct the diagnosis by providing a vision or forecast of emerging requirements and strategies. One way of doing this is to assemble a task force of employees who are particularly close to the market and competitive dynamics in the industry and have them examine trends.

Another approach is to commission a study by consultants with special skills in "future" studies; forecasting techniques such as the Delphi approach may prove valuable. Another option is for managers to hold a retreat to brainstorm.

Admittedly, any approach is risky because one is dealing with future scenarios. However, one or more of them is likely to provide a concrete starting point in identifying key capabilities for new mission-critical software.

Rosenthal is a professor of operations management at the Boston University School of Management. Salzman is a research associate and lecturer at the university's Center for Applied Social Science.

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The BoCoEx index on used computers

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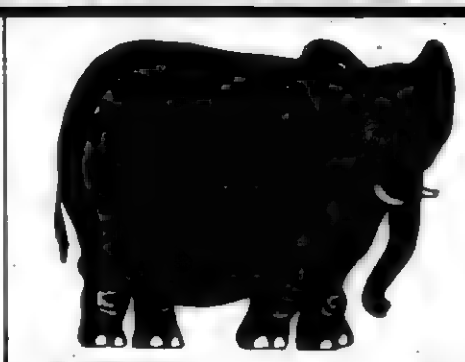

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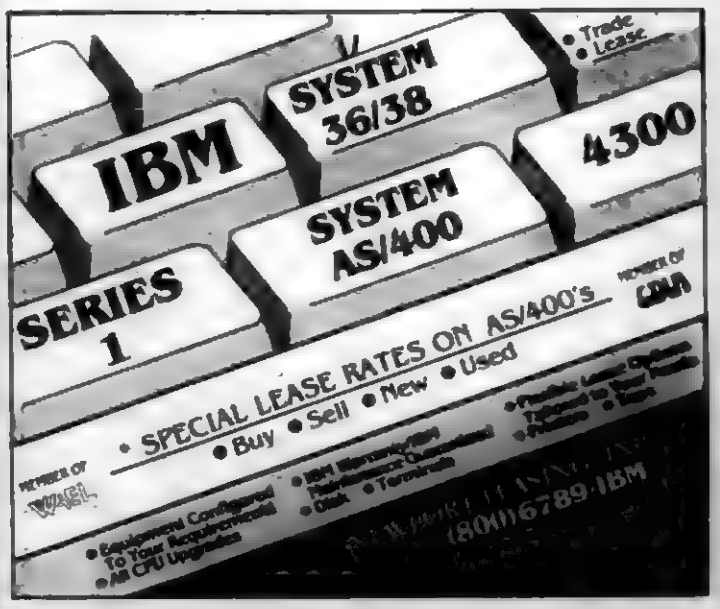

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Dealing with problem students

Disruptions are inevitable, but trainers can prepare for unruly types

BY NAOMI KARTEN
SPECIAL TO CW

Information systems managers who put themselves in the shoes of one of their trainers might find themselves scurrying back to their offices and locking the doors. Many managers may not realize that when they send their trainers off to teach a class, they may be sending them into the lair of the problem student.

It's important for IS managers to arm their trainers with the knowledge and techniques necessary to deal effectively and professionally with this dangerous species.

From the trainer's perspective, problem students fall into two categories. The first one is the troublemaker. This student is untamed by nature and seems to delight in giving the instructor — and just about everyone else — a hard time. The troublemaker will disagree vehemently with the trainer's instruction, repeatedly challenge points made or stubbornly resist participating in class activities. This behavior would not be a problem if it occurred in moderation; however, when it turns into relentless aggression, it becomes unsettling.

Fortunately, this type of student is not as common as the second one — the dominator. These students don't mean to be a problem and are often unaware that their behavior is disruptive. Dominators may be quicker or slower than others in absorbing the class material and may demand too much attention. They may ask more questions than time allows and make too many long-winded points. This type of student distracts the trainer and the entire class.

Any trainer will have a certain amount of material to cover under a tight schedule. To fit everything in, the trainer must minimize distractions and reduce the impact of any problems that do crop up. The trainer should take the following steps:

• **Establish ground rules.** Setting guidelines about what is and is not permitted will usually win the respect of the class. Students cannot be faulted for ignoring ground rules they aren't aware of. Problems in class can often be traced to the trainer's failure to lay down the law.

The trainer, for example, should explain how much time will be available for questions and when they are allowed. Ground rules will also address such things as when conversation among students is permissible, the length and frequency of breaks and how students should alert the trainer to problems they have.

• **Project an air of confidence.** Truly difficult students — the real troublemakers — are often very perceptive. When they identify a weakness in others, they rush in to take advantage of it. Trainers can prevent this situation by remembering to take charge of the class and act accordingly. Even though the trainer may not feel 100% confident, it is important not to reveal uncertainties or insecurities.

Many students are skeptical at the start of a class and expect the trainer to convince them that the class is not going to waste their time. So the first half-hour is especially important in getting off to a strong start. Instructors should also clearly state that they are available during breaks to meet with anyone who has a problem. This will help establish the instructor as the person in charge of the class.

• **Identify potential problem students.** A trainer might want to open a class with an activity that helps gauge students' attitudes. For example, if the class is small, the trainer should ask the students to describe relevant problems they are facing or their worst computer experience. The trainer can pose a question to the group as a whole or divide the class into smaller groups and assign an activity that generates interaction.

In a class for IS staff members, the trainer could ask the students to identify aspects of the subject that arouse skepticism. In an end-user class, the trainer could ask the students to describe the factors that have made their computer use productive or unproductive. These ice-breaking activities generate considerable interaction and give the instructor a chance to size up the group.

• **Use humor.** When a problem student surfaces, everyone else in the class is as aware of it as the trainer, and everyone is curious to see how the trainer will handle the situation. The best way is to get rid of the problem without embarrassing the student. Many trainers have developed their own amusing techniques. A trainer might announce (with a grin) that every class should have its officially designated problem student and ask if there are any volunteers. With such playful techniques, trainers can maintain control, defuse problems without causing embarrassment to the students and demonstrate a sense of humor.

When problem situations do arise — and a certain number are inevitable in every trainer's career — the trainer should try to learn from them. After the class has ended, the trainer should examine the situation and determine how to prevent a recurrence. It is no coincidence that the instructors who are best prepared to deal with problem students have the fewest.

Karten is president of Karten Associates in Randolph, Mass., and editor of the monthly newsletter "Managing End-User Computing."

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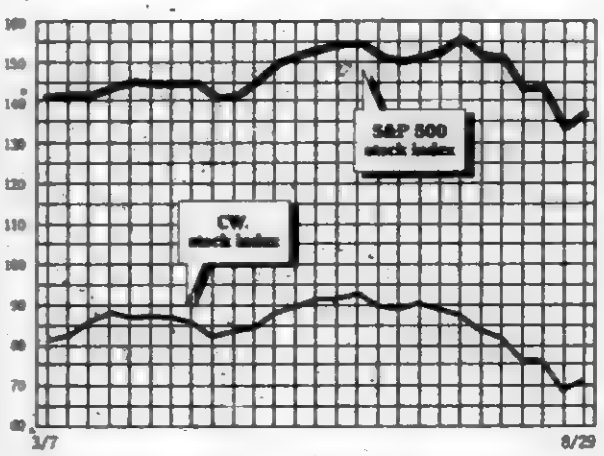
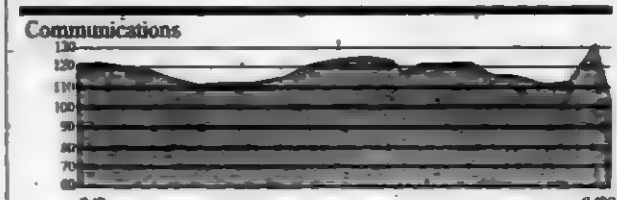
STOCK TRADING INDEX

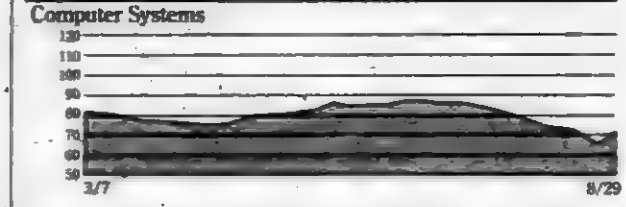


Indexes	Last Week	This Week
Communications	130.5	105.8
Computer Systems	66.8	70.5
Software & DP Services	98.2	101.1
Semiconductors	44.5	46.0
Peripherals & Subsystems	74.6	76.1
Leasing Companies	56.8	58.1
Composite Index	68.9	71.0
S&P 500 Index	133.8	137.0

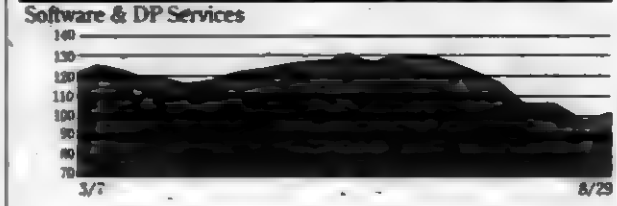
Communications



Computer Systems



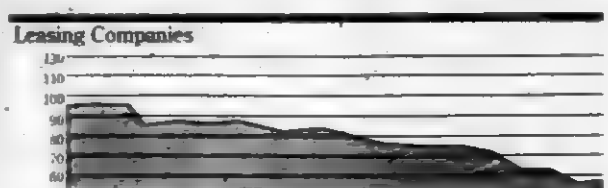
Software & DP Services



Semiconductors

Peripherals & Subsystems

Leasing Companies



CW CHARTS

Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, AUG. 29, 1990

EXCH		52-WEEK RANGE		CLOSE AUG. 29, 1990	WEEK NET CHNGE	WEEK PCT CHNGE
Communications and Network Services						
N	AMERICAN INFO TECHS CORP	68	53	55.5	-0.6	-1.1
Q	ANDREW CORP	26	16	18	-0.3	-1.4
Q	ARTEL COMM CORP	10	3	3.125	0.0	0.0
N	AT&T	47	30	32.5	0.4	1.2
Q	AWANTEK INC	7	2	2.625	0.1	5.0
N	AYDIN CORP	21	12	12.125	-0.5	-4.0
N	BELL ATLANTIC CORP	57	40	43.125	0.3	0.6
N	BELLSOUTH CORP	59	49	50.75	-1.0	-1.9
Q	COMPRESSION LABS INC	16	7	13	2.0	18.2
Q	CONTEL CORP	37	23	29.75	0.3	0.8
Q	DATA SWITCH CORP	4	2	3.313	0.1	1.9
Q	DIGITAL COMM ASSOC	27	15	17.625	1.8	11.0
Q	DYNATECH CORP	21	15	16.5	-0.8	-4.3
Q	FIBRONICS INTNL INC	13	5	8.25	1.1	15.8
Q	GANDALF TECHNOLOGIES	6	2	3	-0.1	-2.1
N	GENERAL DATACOMM INDS	6	2	2.625	0.1	5.0
N	GTE CORP	36	24	25.125	-0.1	-0.5
Q	INFOTRON SYS CORP	10	3	2.75	-0.5	-15.4
N	ITT CORP	64	50	52.875	0.4	0.7
N	M A COM INC	7	3	4.25	0.1	3.0
Q	MCI COMMUNICATIONS CORP	49	31	31.75	-1.3	-3.8
N	NETWORK EQUIP TECH INC	34	5	5.375	-0.9	-14.0
Q	NETWORK SYS CORP	15	7	10	0.6	6.7
N	NORTHERN TELECOM LTD	30	20	24	-0.9	-3.5
Q	NOVELL INC	58	19	25.5	3.8	56.6
N	NYNEX CORP	92	68	71.375	1.4	2.0
N	PACIFIC TELESIS GROUP	52	36	38.875	0.4	1.0
A	PENRIL CORP	9	6	7.125	0.8	11.8
N	SCIENTIFIC ATLANTA INC	29	17	19	0.9	4.8
N	SOUTHWESTERN BELL CORP	65	47	49.25	-0.1	-0.3
Q	3 COM CORP	19	8	8.75	-2.3	-20.5
N	U S WEST INC	41	32	34.625	0.6	1.8
Computer Systems						
Q	ALLIANT COMPUTER SYS	9	2	2.625	0.1	2.4
Q	ALPHA MICROSYSTEMS	7	2	1.875	0.0	0.0
Q	ALTOS COMPUTER SYS	8	5	8.125	0.0	0.0
A	AMDAHL CORP	19	11	12.375	1.3	11.2
Q	APPLE COMPUTER INC	50	32	37.25	2.1	6.0
Q	AST RESH INC	28	7	10	1.8	10.1
N	BOLT BERANEK & NEWMAN	9	4	5.75	0.8	15.0
N	COMPAQ COMPUTER CORP	88	37	50.5	4.5	9.8
N	COMMODORE INTNL	12	5	5.5	0.3	4.8
N	CONTROL DATA CORP	22	13	14.125	1.4	10.8
N	CRAY RESH INC	51	31	35.625	2.1	6.3
N	DATA GEN CORP	16	5	6.125	0.6	11.4
N	DATAPOINT CORP	6	1	1.25	-0.1	-9.1
Q	DELL COMPUTER CORP	14	5	11.125	0.0	0.0
N	DIGITAL EQUIP CORP	102	61	65.375	0.8	1.2
N	FLOATING POINT SYS INC	4	0	1.5	0.0	0.0
N	HARRIS CORP	40	24	24	-1.5	-5.9
N	HEWLETT PACKARD CO	53	31	36.5	3.8	11.5
N	HONEYWELL INC	112	73	94.125	1.9	2.0
N	IBM	123	93	103.875	4.9	4.9
Q	INFORMATION INTL INC	15	11	11.25	-0.3	-2.2
Q	IPL SYS INC	14	5	9.25	0.5	5.7
N	MAI BASIC FOUR INC	6	2	1.875	0.1	7.1
N	MATSUSHITA ELEC INDL LTD	172	117	128	8.0	6.7
Q	MENTOR GRAPHICS CORP	26	12	13.75	1.1	8.9
N	MSI INC	2	0	0.219	0.0	27.3
N	NCR CORP	72	55	61	2.6	4.5
Q	PYRAMID TECHNOLOGY	36	13	21.25	4.5	26.9
Q	SEQUENT COMP SYS INC	30	14	24.5	3.3	15.3
Q	SUN MICROSYSTEM INC	37	15	29.125	3.1	12.0
Q	SYMBOLICS INC	2	0	0.375	0.1	19.8
N	TANDEM COMPUTERS INC	30	14	16.375	2.3	15.9
N	TANDY CORP	48	27	27.75	-0.4	-1.3
N	ULTIMATE CORP	11	5	5.875	0.5	9.3
N	UNISYS CORP	22	8	8.625	-0.1	-1.4
A	WANG LABS INC	8	3	4	-0.1	-3.0
Software & DP Services						
Q	AMERICAN MGMT SYS INC	20	11	14.875	1.3	9.2
Q	AMERICAN SOFTWARE INC	18	8	8.375	-0.4	-4.3
N	ANACOMP INC	6	2	2.5	0.0	0.0
Q	ANALYSTS INTL CORP	24	14	17	1.0	6.3
Q	ASHTON TATE	15	7	7.375	-0.4	-4.8
Q	ASK COMPUTER SYS INC	11	7	8.125	0.0	0.0
N	AUTO DATA PROCESSING	60	43	50.375	2.0	4.1
Q	AUTODESK INC	60	33	50.875	4.1	8.8
Q	BMC SOFTWARE INC	30	14	24.75	1.5	6.5
N	BUSINESSLAND INC	14	2	2.625	-0.1	-4.5
Q	COGNOS INC	10	4	6.688	-0.3	-4.5
N	COMPUTER ASSOC INTL INC	18	6	7.5	0.4	5.3
Q	COMPUTER HORIZONS CORP	17	7	14	0.5	3.7
N	COMPUTER SCIENCES CORP	50	37	39.625	0.3	0.6
N	COMPUTER TASK GROUP INC	12	9	9.375	-0.4	-3.8
Q	COMSHARE INC	25	16	18.25	0.5	2.8
Q	CORPORATE SOFTWARE	16	8	12	1.0	9.1
N	GENERAL MTRS (CLS E)	38	24	30.25	1.0	3.4
Q	GOAL SYSTEMS INTL	18	10	11.625	-0.9	-7.0
Q	HOGAN SYS INC	7	2	2.5	-0.4	-13.0
Q	INFORMIX CORP	18	6	7	0.0	0.0
Q	INTELLICORP INC	8	4	4.125	0.1	3.1
Q	LEGENT CORP	32	18	20.125	1.4	7.3
Q	LOTUS DEV CORP	38	16	19	1.8	10.1
Q	MICROSOFT CORP	81	29	60.5	6.8	12.6
Q	NATIONAL DATA CORP	35	8	10.5	1.0	10.5
N	ON LINE SOFTWARE INTL INC	11	6	6.25	0.3	4.2
Q	ORACLE SYS CORP	188	11	11.625	-1.8	-13.1
N	PANSOPHIC SYS INC	19	10	10.875	0.0	0.0
Q	PHOENIX TECHNOLOGIES INC	6	2	3	0.3	9.1
N	POLICY MGMT SYS CORP	43	30	38	1.4	3.8
Q	PROGRAMMING & SYS INC	25	14	15.75	0.3	1.6
Q	RELATIONAL TECH INC	10	3	5	1.8	48.1
N	REYNOLDS & REYNOLDS CO	27	15	15.375	-0.4	-2.4
Q	SAGE SOFTWARE INC	16	8	11.125	1.8	18.7
Q	SEI CORP	22	15	19.25	0.8	4.1
Q	SHARED MED SYS CORP	17	12	14.125	0.1	0.9
Q	SOFTWARE PUBG CORP	28	14	22.875	2.6	13.0
N	STERLING SOFTWARE INC	11	7	8	-0.1	-1.5
Q	SUNGARD DATA SYS INC	26	18	18	-0.8	-4.0
N	SYSTEM CENTER INC	25	11	11	-0.5	-4.3
N	SYS. SOFT INC	29	16	21.25	-1.0	-4.5
Q	WORDSTAR	2	1	0.75	0.1	9.0
Semiconductors						
N	ADV MICRO DEVICES INC	11	5	5.25	-0.4	-6.7
N	ANALOG DEVICES INC	10	6	6.625	0.4	8.0
Q	ANALOGIC CORP	11	8	8.625	-0.1	-1.4
Q	CHIPS & TECHNOLOGIES INC	26	10	11.75	0.8	6.8
Q	INTEL CORP	52	29	35	2.9	8.9
Q	MICRON TECHNOLOGY INC	16	7	9	0.8	9.1
N	MOTOROLA INC	88	53	71.375	3.9	5.7
N	NATL SEMICONDUCTOR	9	4	5	0.3	5.3
N	TEXAS INSTRS INC	44	26	27.875	0.9	3.2
A	WESTERN DIGITAL CORP	15	6	9.625	-0.1	-1.3
Peripherals						
Q	ALLOY COMP	2	0	0.438	0.0	0.0
N	AM INTL INC	6	2	1.625	0.0	0.0
Q	AUTO TROL TECH CORP	5	2	2.375	0.1	5.6
Q	BANCTEC INC	24	13	15.25	0.4	2.5
A	COGNITRONICS CORP	6	3	5.25	0.9	20.0
Q	CONNER PERIPHERALS	31	11	22.75	2.3	11.0
A	DATARAM CORP	22	8	11.75	1.0	9.3
N	EASTMAN KODAK CO	51	36	39.875	0.9	2.2
N	E M C CORP MASS	7	3	5.375	0.5	10.3
Q	EMULEX CORP	9	4	5.625	-0.3	-4.3
Q	EVANS & SUTHERLAND	35	18	24	0.3	1.1
Q	IOOT CORP	2	1	0.875	-0.1	-12.5
Q	INTERLEAF INC	8	4	3.75	-0.5	-11.8
Q	IOMEGA CORP	8	3	5.063	1.0	24.6
Q	MASSTOR SYS CORP	4	1	0.625	-0.1	-16.7
Q	MAXTOR CORP	17	7	7.875	0.4	5.0
Q	MICROPOLIS CORP	10	3	5.125	-0.3	-4.7
N	MINNESOTA MNG & MFG CO	91	68	79.875	0.8	0.9
Q	PERSONAL COMP PRODUCTS INC	5	4	3.688	-0.6	-13.2
Q	PRINTRONIX INC	15	9	9.875	-0.9	-8.1
N	QMS INC	21	9	13.75	0.1	0.9
Q	QUANTUM CORP	26	9	18.375	3.0	19.5
N	RECOGNITION EQUIP INC	6	4	4.875	-0.1	-2.5
Q	REXON INC	10	5	5	-0.3	-4.8
Q	SEAGATE TECHNOLOGY	20	9	9.625	-0.1	-1.3
N	STORAGE TECH CORP	35	9	20.375	0.9	4.5
Q	TANDON CORP	4	1	2.063	0.1	3.2
N	TEKTRONIX INC	22	12	13	0.6	4.0
Q	TELEVIDEO SYS INC	1	0	0.344	0.1	37.6
N	XEROX CORP	68	39	41.75	2.0	5.0
Leasing Companies						
N	CAPITAL ASSOC INTNL INC	7	1	1.188	-0.2	-13.6
N	COMDISCO INC	34	15	17.125	0.8	4.8
Q	LDI CORPORATION	18	12	12	0.3	2.1
Q	PHOENIX AMERN INC	6	3	3.25	0.3	10.6
Q	SELECTERM INC	6	3	3.25	0.1	4.0

EXCH: N—NEW YORK; A—AMERICAN; Q—NATIONAL

Stop 'n shop

Tech firms' earnings seesaw as investors search for best buys

Scads of investors were far from clamoring for technology stocks last week, but they did do some selective shopping that helped hike some shares up by Thursday's close. One of the chosen ones was Microsoft Corp., which, after suffering a big fall the week before, regained 2¾ of its lost points to close Thursday at 60 points.

Money talked for Novell, Inc. as the company released its latest earnings figures — big numbers that apparently delighted investors and drove Novell up 1¾ points to 26.

After revising recently reported earnings statements, Oracle Systems Corp. was certainly not at the top of investors' buying lists. Oracle slipped 2⅜ points to end at 10¾, just one more in the string of weekly drops since the company announced poor financial figures last quarter.

3Com Corp. also took an earnings-related dive last week. On news that its bottom line would likely be smaller next quarter, 3Com's share price shrunk, too — down 2⅜ to 8¾.

Last week's pick-and-choose buying left both Digital Equipment Corp. and IBM ahead by 1⅜ points, with DEC at 64½ and IBM at 101¾. Lotus Development Corp. closed at 18½, up a point. Unisys Corp. lost ⅞ of a point to 8⅛, amid speculation of financial problems.

Semiconductor makers went every which way last week as questions surfaced about patent rights and possible infringements (see story page 4). Intel Corp. tumbled 2⅜ points to 33⅛, while Motorola, Inc. jumped 1¾ to 70⅛. National Semiconductor, Inc. and Texas Instruments, Inc. edged up ⅜ of a point each to 4⅜ and 27⅞, respectively.

Other firms felt only ripples of change: Apple Computer, Inc. gained ½ a point to close at 36¼; Sun Microsystems, Inc. inched up ¾ to 28⅜; Computer Associates International, Inc. receded by ½ a point to 7⅜ and Ashton-Tate Corp. rose ⅛ of a point to finish at 7½ points.

KIM S. NASH

NEWS SHORTS

Electronics deficit drops

The Electronic Industries Association chalked one up for the industry's aggressive export initiatives with last week's announcement that the U.S. electronics trade deficit fell approximately 60% in the first half of 1990. Electronic products exports reached approximately $36 billion, 14% over the year-end 1989 figure. Imports for the corresponding periods rose 3%. Industrial products led the import and export categories as of June, with $3 billion coming in and $4 billion shipping out.

U.S. inks cash management pact

Computer Sciences Corp. has been given a contract worth as much as $49 million to overhaul systems that support cash management, payments and other functions of the Financial Management Service, a bureau of the U.S. Treasury Department. The project, designated a Presidential Priority System because of its potential benefits, will employ electronic data interchange, electronic funds transfer and other automated aids to manage a daily cash flow of some $10 billion, including Social Security payments. Andersen Consulting and Grumman Data Systems also bid on the job.

UK adds high-speed net

The first 1G bit/sec. local-area network in the UK will blow into the European Centre for Medium-Range Weather Forecasts later this year. The high-speed network from San Jose, Calif.-based Ultranetwork Technologies, Inc. will be used as a backbone, connecting the weather bureau's Cray Research, Inc. Y-MP supercomputer, an IBM 3090 mainframe and workstations and slower LANs. The center uses complex numerical models of the Earth's atmosphere to produce its 10-day forecasts for 18 European countries, and transfers of gigabyte-size files across its computer network are not uncommon. According to Ultranetwork, the backbone will have the capacity of more than 10 Fiber Distributed Data Interface networks and support host connections of up to 100M byte/sec.

Snap, crackle . . .

Compaq Computer Corp. has admitted that at least some of its 10-month-old LTE and LTE-286 laptops are developing hairline cracks in their casing. A Compaq spokeswoman said the problem, which was apparently discovered after calls from customers, was merely "cosmetic" and would not affect the operation of the computer. She also said that Compaq believes the problem is limited to only a few of the 133,000 laptops the firm is expected to sell this year. Compaq has extended the warranty on LTE plastics an additional year and is looking into the cause of and best solution to the problem.

HP adds Laserjet, trims costs

Last week, Hewlett-Packard Co. introduced a Laserjet printer and slashed prices of its add-on memory boards for its Laserjet IIP and III models. The new HP Laserjet IIID printer, which debuts with a suggested retail price of $3,595, is the company's second with HP PCL 5 printer language and HP resolution enhancement technology. HP cut the price of the HP 33474B 1M-byte memory board from $95 to $335 and the HP 33475B 2M-byte from $750 to $560. The firm also slashed the price of its Deskjet ink jet printer model (see story page 14).

Oops oops at Visa Visa

Many Visa card users thought they were seeing double last month — and they were. It seems that Visa International's computers billed some accounts twice for a single purchase. Some customers mistakenly overpaid. The computer glitch affected Mastercard users, too, because Visa's credit-card processing center in San Mateo, Calif., handles some non-Visa business for its 22,000 member banks worldwide. The problem occurred July 28 because of a "rare and unusual processing error that was detected within hours," a Visa spokesman said. "We have taken the necessary steps to make sure that these types of processing errors do not happen in the future."

Agencies survive travel frenzy

BY CLINTON WILDER and MITCH BETTS
CW STAFF

They called it "Wicked Wednesday" at Passport Travel, Inc. in Overland Park, Kan. Passport was one of hundreds of travel agencies forced to cope with computer headaches last Wednesday when a deluge of bargain-hunting air travelers attempted to beat the midnight Aug. 29 deadline for super-cheap airline fares.

All three of the nation's major computerized reservation systems (CRS) experienced performance problems trying to handle the unprecedented demand and had to kick in backup CPU power to cope with the volumé.

Dallas-based American Airlines, Inc. said its Sabre reservation system processed an all-time high of 100 million messages on Wednesday — handling more than 3,000 simultaneous messages per second. The volume exceeded previous usage figures by 25%.

"We were prepared for an increased volume . . . but at the same time, I'm not sure we expected it to be this heavy," an American Airlines spokesman said.

In order to keep the whole Sabre network from crashing, Sabre selectively blocked certain incoming lines for intervals of 10 to 15 minutes, a spokesman said.

Passport Travel, which employs 80 travel agents using Sabre, had many agents working well into the night booking tickets delayed by slow system response.

"We get spoiled by the mechanics of the automation, so when [Sabre] doesn't go well, it really throws a wrench into the process," said Sharon Gardner, marketing manager at Passport. Gardner said Sabre was unable to provide fare information for itineraries that agents had booked, and credit card authorization was also either slow or nonexistent.

Adding to the agency's woes was a Midwestern heat wave, with 100-degree temperatures affecting data lines with slower transmission.

Sabre, which runs eight IBM 3090 mainframes at a data center in Tulsa, Okla., invoked the triadic processing capability of the IBM Transaction Processing Facility (TPF) Version 3.1, which allows three engines to run in a single processor.

Covia Corp., a Rosemont, Ill.-based partnership led by United Airlines, said its Apollo CRS tallied 42 million transactions on Wednesday, compared with the average 34 million per day. Apollo's data center in Denver reached capacity and added two processors, a spokesman said.

System One Corp. pressed several spare IBM 3090s into service to handle processing volumes that were 25% to 30% greater than normal, according to Bill Mowery, senior TPF consultant at the Miami data center.

Mowery said that System One anticipated greater volume from the incentive fares, but what really produced the processing crunch was the fact that the fares required tickets to be issued by the end of the day Wednesday. "We were not totally prepared to anticipate that big of a ticketing hit," he said.

RDBMS

FROM PAGE 1

and profit figures for three fiscal quarters last week, although the end result remained the same for the entire year.

Michael Musson, director of investor relations at the company, said an internal investigation showed that $15 million worth of revenue for contracts booked in the second quarter had to be accounted for in other quarters. The review concluded that overzealous saleamen had postdated contracts so that the revenue could be recognized earlier, Musson said.

Other signs of strain within the RDBMS community have recently become evident:

- Sybase Corp. was forced to lay off 90 workers — nearly 10% of its staff — because of lagging domestic sales of its RDBMSs and tools late last month. The firm failed to go public, despite widespread anticipation that it would do so in midyear, analysts said. Nevertheless, executives said, in contrast with soft North American orders, the European market is booming.
- Ingres announced a thin profit of $517,000 for its fourth quarter ended June 30 — down from $4.5 million a year earlier. Executives cited a one-time internal charge to build financial reserves against bad debts and a $1.5 million moving cost in the UK.
- Informix Corp. had a good earnings report, with growth running 30% over last year's figures. However, sales managers there also reported slower sales in some market segments.

Industry analysts and the vendors themselves said that most RDBMS firms are still growing, although not as quickly as before. But accustomed to growth rates of 30% or more, the vendors must make organizational changes to bring costs into line.

"The purchase cycle is getting slower, reflecting the recession or economic downturn this country is facing," said Tom Moore, a senior analyst at International Data Corp. in Framingham, Mass. "Users are still willing to part with their money, but they're scouting around a little bit more."

Executives at most RDBMS firms seemed to agree. "There's sort of a double whammy that hits you in U.S. sales," Kenber said. "There are fewer opportunities, and the decision cycle itself is being pushed out" into 1991.

At Oracle, sales failed to hit the hoped for $1 billion mark in fiscal 1990, topping out at $971 million. However, the firm, the largest in the RDBMS industry, predicted that it will go on to greater heights next year and will survive even if competitors fail.

Oracle's restatement was the second revision this year. Last April, the company reported that it had improperly booked $15 million in revenue for the third quarter that was not realized until the fourth quarter. That announcement led to a calamitous one-day stock drop, when Oracle stock lost one-third of its value.

Subsequently, Musson said, "Corporate finance dug around and found [another] $15 million worth of contracts in the second quarter that should have been recognized in different periods."

Musson said the company formerly provided a four-day grace period for salesmen to deliver actual signed contracts to headquarters. "Corporate [headquarters] had no way of knowing whether those contracts were actually signed on the last day of the quarter . . . or a few days later," he said. The grace period has been revoked.

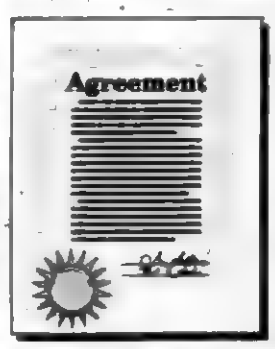
The stock market price for most RDBMS vendor stocks has fallen in recent weeks. Ingres' stock has been selling for $5 or less per share, making the value of all outstanding stock less than the annual $124 million in revenue.

Meanwhile, Oracle's stock tumbled from $14.50 per share down to $10.75 per share over the course of last week. "The two most important measures of high-technology stocks we use are the price-per-earnings multiples and the ratio of market value to revenue," said David Bayer, an analyst at Montgomery Securities in San Francisco. "Both of those are at an all-time low for Oracle."

Lessors

FROM PAGE 1

Changes in the tax laws, a troubled economy and incessant reminders that the computer industry in general has fallen on hard times have made it tough for independent lessors to find the money to finance leases. That, and the certainty that ever-savvier users will continue to demand better terms, is not the stuff of which leasing bonanzas are made, Donovan concluded.



However, he and other analysts agreed that Summit does hold one solid promise for the leasing industry — that of a reawakened leasing market.

"A lot of users have sat on their hands," said Charles Greco, an analyst at Technology Investment Strategies. Lessors, he said, need users who are ready and able to commit to future plans. In addition, "They need an injection of new, big-ticket (mainframe) products to maintain their structures; these guys can't live on doing AS/400s." The Summit announcement will deliver substantially on both such scores, Greco speculated.

His view seems widely shared among the analysts who follow computer leasing. Like most industry observers, James Wei, an analyst at Merrill Lynch Capital Markets, said he anticipated that Summit will arrive in stages [CW, Aug. 20]; similarly, he said, Summit's effect on the leasing industry will be a phased one. However, he said, the benefits for third-party lessors should be evident immediately.

IBM's announcement of the 3090 in 1985 paved the way for ICC's rise to its current majority share of the leasing market, but Wei said things have changed.

"We believe that the price/performance gain that Summit may represent is substantially more significant than that which the 3090 represented," Wei said. "Its better price/performance will cause older generations of mainframes to adjust; since they can't alter performance, what they'll change will have to be price."

When the adjustment occurs, Wei said, higher-end computing — in some cases, computing itself — will become affordable to a greater number of people, creating a new user base to be tapped by lessors. Add the thaw in frozen IS intentions, he said, and the result will be a cascade of benefits for lessors: "Leasing volume will increase, and lease duration is likely to be longer."

With the easy answers, however, Summit expectations raise tough questions for the leasing community, analysts noted.

For instance, Greco said, while the revitalized market vision entertained by lessors is not a pipe dream, its precise dimensions cannot be mapped "until we know how much it will cost to upgrade a 3090J to a Summit — and I don't mean just in dollars but also in pain and grief."

IBM's reported commitment to a smooth upgrade path for current 3090 J users distinguishes Summit from earlier major IBM mainframe debuts, making historical precedent a questionable measure of what the market can expect this time.

Looming largest, perhaps, is the issue of what role ICC will play in the post-Summit leasing market. In the pre-Summit scene, ICC has been the independent lessor's nightmare come true. The 9-year-old firm has leveraged its parent's gilt-edged credit rating into majority ownership of the leasing market and has earned a reputation — adamantly denied — for discounting leases (see story at right).

There is no assurance that ICC's domination of the 3090 leasing area will not recur with Summit, Wei conceded.

Even so, he and other analysts pointed out, the result could be less than devastating to other lessors, many of whom have recently begun to hedge their bets against the ravages of ICC by expanding their lease portfolios.

ICC ready and able

Summit "will be the moment of truth for IBM Credit Corp.," predicted Harvey Kinzelberg, chairman of Meridian Leasing Corp., currently ranked second among the country's independent computer lessors. Kinzelberg argued that the new entry's arrival will place IBM's 9-year-old leasing company at odds with its powerful parent's own sales force, which would rather sell new systems than remarket old ones.

Analysts agreed that the Summit debut may lead to a moment of reckoning. However, many said, that showdown is likely to come not for ICC but for the third-party lessors.

"ICC will still be out there, still aggressive, still going for market share," said Thomas Donovan, an analyst at Technology Investment Strategies Corp. in Framingham, Mass. The IBM subsidiary currently commands more than 50% of all 3090s leased, according to Donovan's estimate; to the extent that 3090s are upgradable, he said, Summit is going to be a virtual ICC preserve.

"Any product IBM announces represents more opportunity" for ICC, said Harry Kavetas, president of ICC and an IBM corporate vice-president.

That, Donovan said, could be putting it mildly. ICC has three powerful advantages over its leasing competitors, he said. "It knows exactly what IBM's blend of products is, and down to the most subtle detail," he said. "That's a knowledge advantage. It's got a triple-A credit rating: That's a market advantage. Through interaction with IBM's sales force, it knows exactly when a client wants to lease: That's a strategic advantage."

According to many third-party lessors, some of whom lay the misfortunes of their industry niche largely at ICC's Stamford, Conn., door, the IBM offspring is also playing with a fourth and unfair advantage: the ability to price leasing transactions as low as necessary to clinch the deal.

ICC vehemently denied this. "Our market is very competitive, and we price to that market," Kavetas said. "We will not, however, follow that market when we believe it's putting unprofitable prices into play, and we will not, knowingly, do deals which — for price or any other reason — are not expected to be profitable."

NELL MARGOLIS

Hitachi Data Systems to revamp leasing rules in fall

Hitachi subsidiary would like more third-party leases in order to expand market for HDS systems

BY JEAN S. BOZMAN
CW STAFF

SANTA CLARA, Calif. — Eager to keep the resale value of its processors high, Hitachi Data Systems Corp. will revise its leasing policies this fall, the company said last week.

"We want to make the third-party lessors more comfortable with our products," HDS vice-president and treasurer David Roberson told *Computerworld*. "And to do that, we have to lay out our policies regarding recertification of equipment, maintenance and reconfiguration."

HDS, the $1 billion mainframe firm owned by Hitachi Ltd. and General Motors Corp.'s Electronic Data Systems (EDS), leases nearly half of its IBM-compatible computers through its HDS Credit Corp. subsidiary. But the leases are generally written based on financing from a "silent partner," such as an insurance company.

In the future, HDS would like to see more leases being written by third parties such as Comdisco, Inc. in Rosemont, Ill., which leases IBM and Amdahl Corp. computers, HDS executives said. This would make it easier for customers to arrange financial alternatives to outright purchases and would also serve to expand the market for HDS systems if third-party companies aggressively market them.

"WE WANT TO make the third-party lessors more comfortable with our products."

DAVID ROBERSON
HITACHI DATA SYSTEMS

The HDS moves to gain acceptance with independent lessors do not rule out the possibility that some leases will be underwritten by corporate parent Hitachi Ltd., Roberson added. In recent weeks, HDS executives have been meeting with members of the Computer Dealers and Lessors Association (CDLA), industry analysts and customers in an attempt to explain their revised leasing strategy, Roberson said. Among the action items on HDS' new leasing agenda are the following:

- To be accepted as a member of the CDLA. HDS has already applied for CDLA membership.
- HDS will publish documents on its maintenance policies within two weeks and on its reconfiguration policies within two months.
- HDS is currently recruiting sales personnel for its wholly owned leasing subsidiary.

"It used to be very difficult to market a used Hitachi machine," said Kenneth Pontikes, president of Comdisco. "You had no cooperation, but that appears to be changing. They're doing what they have to do to gain acceptance."

Pontikes said that HDS disk drives are popular with customers but confirmed that relatively few processors from HDS (formerly National Advanced Systems) had been leased by CDLA firms in recent years. "NAS was seen as a small company, without the critical mass in the marketplace, and I don't think you found lessors being proactive in financing NAS equipment," he said.

Until now, potential third-party lessors have been wary of the downside risks involved in leasing HDS machines, and few leased HDS gear unless customers demanded it as part of a larger deal.

"It's a structural issue that has to do with HDS business practices," said Mark Hess, director of IBM large systems research at Gartner Group, Inc. in Stamford, Conn. "Someone has to be willing to break those machines apart and to reconfigure them. If HDS shows that it is willing to recertify a [leased] machine for maintenance, then the residual values would go up."

IBM hikes some — not all — prices

When it comes to price hikes, IBM seems to back into things. Last week, the company announced another across-the-board increase that appears to exclude more products than it includes.

The pricing action — this time at 4% — is the latest in a series during the last two years. IBM typically announces these hikes with a list of excluded items only.

Products excluded are: ES/3090s, Personal System/2s, OS/2, DOS, 3990 disk drives, memory for the RISC System/6000 and various maintenance services.

Also excluded are products announced or products that had price changes after June 1, 1990. This would include such products as the newest Application System/400 models.

Going from that list, the price hike will affect such systems as the 9370s and 4381s, according to an IBM spokesman. It would also include mainframe operating systems and DB2.

Users anticipate 3090 bargains

Assume Summit will pave way for great deals on used IBM mainframes

BY ELLIS BOOKER
and NELL MARGOLIS
CW STAFF

Computer leasing firms lining up to reap the spoils of Summit might have to climb over their customers. Users not necessarily in the market for the new mainframes are nonetheless looking forward to the IBM announcement, anticipating that it will release a flood of used mainframes into the market at unbeatable prices.

Darrell Ford, data center director at Southwest Community Health Services in Albuquerque, N.M., said he will play leasing companies off one another when the contract for his 3081 is up next April.

Ford's company has leased through Schaumburg, Ill.-based independent leasing market leader Comdisco, Inc. for the past 12 years. "This kind of a thing in the leasing life of my machine is perfect," he said.

Edward Smith, vice-president of data processing at Utica National Insurance Group in New Hartford, N.Y., has already factored the Summit announcement into his upgrade strategy. Utica National recently upgraded to a 3090 180J; with growing room left for it within the 3090 series, the firm will not jump to Summit, according to Smith.

"I would expect when Summit comes out, it will be over our heads," said Smith, who nevertheless hopes to be in a good position to upgrade at the end of next year. "By that time, we're hoping a couple of things are going to happen. Used boxes will be available, and IBM will be at the end of its fiscal year and be more willing to deal."

At Champion International Corp., a Fortune 100 paper company in Stamford, Conn., MIS network services director Thomas Walsh said he sees the advent of Summit as the opening of hunting season for new deals. Champion currently uses an IBM 3090 600E, leased last July through IBM's captive leasing company, IBM Credit Corp. That lease runs until 1992; Walsh said he foresees no major systems upgrade until then.

"But we do expect to be very well-positioned in '92, because at that time, we'll have a lot of options, including used [3090] 600Js," he added.

Walsh said he looks forward to wide-open options for systems and leasing arrangements. "I inherited the previous deal with IBM Credit Corp.," he said, noting that this will be subject to negotiation in 1992.

Users relish the prospect of picking and choosing among bottom-dollar deals on used 3090s. Lessors are looking forward to a shot in their marketing arms (see story page 1).

But which side is unrealistically relying on Summit to deliver more of a bonanza than is likely? Possibly both — but probably neither, analysts said.

After months of guessing and sitting tight on their budgets, information systems buyers will soon have before them new mainframe offerings from IBM and high-end competitors Hitachi Data Systems Corp. and Amdahl Corp.

Within these suddenly flexible parameters, analysts said, it is unlikely that any one extreme scenario will prevail. For instance, several speculated, it is probable that enough users will dump 3090s to depress the price — but not so many that the shaved profit per box will not be compensated for by the number of deals going down.

This time, it's a whole different ball game for IBM

ANALYSIS

BY ROSEMARY HAMILTON
CW STAFF

When IBM introduced the 3090 in 1985, customers were given no upgrade options from the previous generation, modest performance improvements with the initial new system and a two-year wait for the true 3090 raw performance improvement.

If there was an outcry from users, it was not very loud. But IBM cannot afford to take that same path today.

On Wednesday, when it presents its new mainframe generation, which sources are calling the ES/9000, IBM will face a market radically different from five years ago.

Put simply, the game is not about mainframes anymore. It is about selling good computing performance at a decent price. If IBM cannot offer that, users seem willing to look elsewhere.

"Why worship at any altar?" asked Tom Loane, information systems chief at Alamo Rent A Car, Inc. in Fort Lauderdale, Fla. "Is there something sacred about mainframes?"

Other users and analysts contacted last week suggested that IBM has to prove that its new generation is not just the latest in mainframe computing but a better deal than other large-scale computing options.

Workstations, personal computer local-area networks and other small systems pose perhaps the biggest challenge for IBM, users said.

"My applications are going on the smallest computer that I can put them on," said Frank Erbrick, IS director at United Parcel Service of America, Inc. Erbrick is still a dedicated mainframe user, but like many IS directors, he is adjusting his computing requirements to systems that make the most sense.

IBM is already trying to combat this type of approach with its new mainframe strategy, outlined earlier this summer. In short, it calls for a new mainframe that will serve as an overseer to an environment made up of smaller systems. By positioning the mainframe as the nerve center, IBM is saying that users should not select smaller systems in place of mainframes. Instead, IBM says mainframes will play a different but critical role in this new environment.

Most observers agree with this — to a point. While they say customers will need systems to oversee multiple smaller systems, they also say the overseeing system does not necessarily have to be a mainframe. And it certainly does not have to be a system in the multimillion-dollar price bracket in which traditional mainframes have long been.

As a result, IBM needs to find a price point that is aggressive enough to make the new systems a good deal. At the same time, however, IBM cannot let profit margins suffer or threaten its own midrange sales.

On the large-system front, IBM is faced with far more serious competition than ever before, particularly when it comes to its traditional mainframe rivals, Amdahl Corp. and Hitachi Data Systems Corp. Increasingly, users are committing to large systems vendors not because of who the vendors are but because of the deal they offer.

Also, IBM no longer has the luxury of long lead times in delivering product ahead of the plug-compatible manufacturers (PCM). Hitachi was ahead of IBM in introducing more powerful mainframes this year. And most industry observers expect that IBM will begin delivering the true power of so-called Summit in late 1991, which puts it on an even footing with Hitachi.

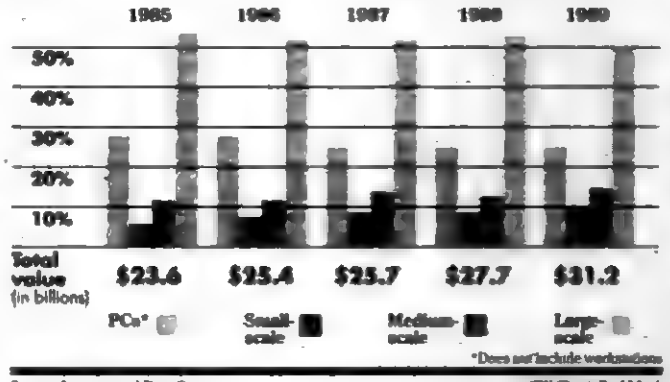
Observers said they expect IBM to use two weapons in facing this challenge. First, it will play up its newest release of MVS/ESA and claim a functional advantage over the PCMs until they achieve compatibility with it. Second, they will focus on its new mainframe strategy, pointing to its concepts of dedicated processors and system clusters, to further differentiate itself from Amdahl and Hitachi.

Users in particular expressed faith that IBM can take on the formidable task. "Good competition brings out the best in everyone," Loane said.

High stakes

While showing a slight decline over the life of the 3090 generation, large-scale hardware sales still account for half of IBM's equipment revenue

Percent of total value of worldwide shipments



Source: International Data Corp. CW Chart: Paul Mock

Second-class postage paid at Framingham, Mass., and additional mailing offices.
Computerworld (ISSN 0010-4841) is published weekly, with a single combined issue for the last week in December and the first week in January by CW Publishing/Inc., 375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171.
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Fujitsu expands product line, supercomputer war heats up

NEW YORK — Fujitsu Ltd. last week announced a Unix-based operating system optimized for use with its supercomputers and extended its VP2000 family with the addition of two new supercomputers. These include a four-scalar-processor, two-vector-processor system.

The UXP/M operating system is based on AT&T Unix System V Release 4 and is designed to run on the company's VP 2000 and M series of mainframe machines. It is expected to be available in April 1991.

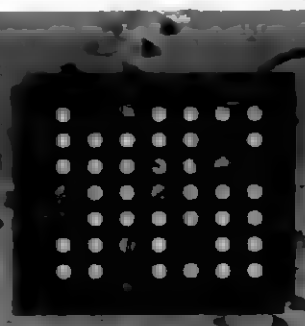
In general, Japanese supercomputers are not widely used in the U.S. According to Jeff Canin, an independent marketing consultant based in San Francisco, the most significant impact of the operating system announcement will be felt in Japan, where it "can be leveraged as a block against NEC in the international supercomputing competition."

According to Fujitsu, the new supercomputing machines, the VP2400/40 and the VP2200/40, are a response to increased user demands for large-scale program processing involving simulations. They offer a maximum performance of 5 billion floating-point operations per second (GFLOPS) and 2 GFLOPS, respectively.

Deliveries are scheduled to begin this month, and rental fees (in thousands of yen) range from about 79,000 to 103,000 per month.

SALLY CUSACK

TRENDS



ISDN

Although it's been virtually impossible to attend a communications conference without at least one speaker bringing up ISDN, most of the user community is still unclear about its pricing and overall impact on cost.

The reigning perception is that ISDN adoption will decrease costs. However, almost half of the respondents either expect an increase or are totally in the dark as to what will happen

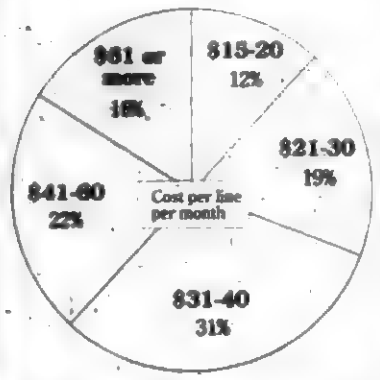
With ISDN, how do you feel costs will be affected?

	Increase	No change	Decrease	Don't know
Long-distance service	30	11	38	21
Local phone service	28	26	28	18
Data communications	25	8	49	18
Average response	**28**	**15**	**38**	**19**

Number of respondents (Base: 100)

88% of those surveyed believe Basic Rate Interface lines are more expensive than they actually are

What price do you think Bell operating companies charge for ISDN Basic Rate Interface service?

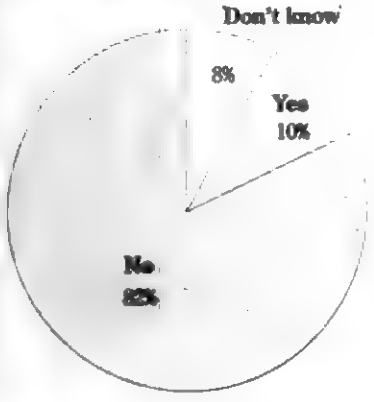


Actual cost is $19.50 (Illinois Bell)

Percent of respondents (Base: 100)

One reason for the lack of knowledge is that users are not being approached by vendors' sales forces

Have you been asked to purchase ISDN equipment or services?



Percent of respondents (Base: 100)

Source: International Data Corp., Framingham, Mass.

CW Chart: Doreen Dahle

INSIDE LINES

The foreign legion

Chaos Computer Club, West Germany's most active hacker group, is lining up members in the U.S., according to a hacker we know who is no slouch when it comes to illegal electronic break-ins. Members of the group were targets of the investigation that was the subject of *The Cuckoo's Egg*, Clifford Stoll's account of hackers-turned-spies for the KGB.

Whatever happened to . . .

Robert T. Morris, convicted in March of turning a worm loose on Internet, will file an appeal next week to overturn his felony conviction, according to Thomas Guidoboni, his attorney. The filing of the appeal has been delayed because the entire transcript of the trial, amounting to 1,300 pages, was not available until two weeks ago, Guidoboni said.

What to do about it all

Two bills wending through the U.S. House of Representatives would have made it a felony to unleash a computer virus, but both have died as a result of a jurisdictional turf war between the subcommittees on crime and criminal justice, according to a source. Key members of the subcommittee on crime — which typically handles bills related to malicious conduct such as the unleashing of viruses — were miffed that the rival subcommittee was doing the groundwork on the two virus bills. To assert its jurisdictional claim, the subcommittee on crime added a provision that makes loosing a virus a misdemeanor into the Comprehensive Crime Control Act of 1990. That leaves one bill in the Senate specifically aimed at applying stiffer penalties.

The ink looked Blue

An unattributed advertisement in the *Wall Street Journal* Friday portrayed a partially completed letter with an obscured letterhead from the company to IBM. The customer tells IBM that he wishes all his equipment worked together and says, "Workstation, mainframes, I don't care what you call them — we'll grow faster if they work together." It would seem to be a promotional blitz for this week's sweeping Summit — do we still call it a mainframe? — announcement.

Can they get it together?

Talk of a joint support group for Wordperfect, Novell and Lotus refuses to die. Novell users said last week that negotiations continue on such an alliance, which was first floated, then quickly rebutted, when Lotus and Novell announced their ill-fated merger plan.

But what's the price?

Borland rolls out the newest version of its 5-year-old Paradox database application Wednesday with an upgrade that will add IBM, Microsoft and Oracle connectivity. DEC RDB/VMS connections should arrive by the end of the year. The Scotts Valley, Calif.-based firm is expected to use Paradox to sideswipe an off-kilter Ashton-Tate, which finally got Dbase IV Version 1.1 out the door, nearly two years after the introduction of a bug-plagued Version 1.0.

In the RISC-y business

When the IBM RISC System/6000 was introduced, SPSS, Inc. was one of the chosen business partners for developing applications software for the machine and one of its bigger cheerleaders. All has not been hunky-dory since, though, as SPSS has had fits while using the RS/6000 as a development tool. The company won't say what the bugs are, just that things are getting better.

The nation's leading philosophers on the role of computers in society gather in Washington, D.C., next week for a conference on "Computers and the Quality of Life." Keynote speaker Ben Shneiderman of the University of Maryland is expected to call on IS designers and managers to prepare a social impact statement at the start of every "human-computer interaction project" to assess human requirements and possible adverse effects of the system. Do we need a Systems Pollution Agency? You tell us. Call News Editor Pete Bartolik at (800) 343-6474, fax your views to (508) 875-8931 or message us on MCI Mail at COMPUTERWORLD.

NEXT WEEK

Talk about lean and mean. With help from just two systems analysts, **Ken Krallman** is the entire information systems department at Carleton Technologies, a $35 million manufacturer of spacecraft life support equipment in Orchard Park, N.Y. Find out how Krallman shoulders this responsibility in a Manager's Journal profile.

Tony Gerard

Information systems personnel are more than happy with their calling, but they say they are troubled by the way other businesspeople — senior managers and computer users alike — fail to understand and appreciate what IS does. That's a major theme that runs through *Computerworld's* fourth annual job satisfaction survey.

Many businesses are already getting a competitive edge with AT&T ISDN.

Maybe even your competition.

If you think Integrated Services Digital Network (ISDN) is just a dream for the future, think again. The advanced technology of AT&T ISDN can give your business a competitive advantage today.

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AT&T ISDN is now available in over 300 cities across the country. And here is what it can do for you:

AT&T ISDN is working in Telemarketing:

Even before a telemarketer answers the phone, all account information about the caller can appear on-screen. Telemarketing companies are now giving immediate answers to their customers' questions. So orders get processed faster, sales opportunities are greater. And customers aren't left on hold listening to music.

AT&T ISDN is working in Transportation:

With AT&T ISDN's Call-by-Call feature, transportation companies are now centralizing control of their dispatch operations and combining various AT&T switched services on the same T-1 pipe. This flexibility means that more calls are being handled with fewer access lines. AT&T ISDN has helped transportation companies save thousands of dollars each month and has moved their businesses into the fast lane.

AT&T ISDN is working in Lodging:

Right now, when their switchboards are all lit up, hotels are using AT&T ISDN to route calls automatically to the next available agent, even if they're in another location. That maximizes their staffing efficiency. Also, with our automatic number identification feature, agents have become more accurate and are saving time, opening the door for more personalized service.

So now that you know how well it's working for your competition, let the advanced technology of AT&T ISDN increase productivity and save money for *your* business today.

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COMPUTERWORLD

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Profile: Networks, systems, software — Carleton Technologies' Ken Krallman does it all. Page 79.

Oracle falls short, will not meet 50% revenue growth plan; quarterly loss will require cost-cutting. Page 6.

Lotus readies Next spreadsheet with radical new look for Steve Jobs' workstation. Page 4.

AT&T jumps on Mac bandwagon, offering server software to let Apple units share printers and files with DOS, OS/2 and Unix machines. Page 6.

EDS protects your home — sort of. Integrator forms partnership with financier to acquire real-estate title insurance firm. Page 14.

S&L monitoring agency hires IS chief. Page 12.

Dallas lawyers sign up Wang imaging system and ISDN to link New York, Chicago offices. Page 25.

Electronic cameras and digital transmission transform *USA Today*'s photojournalism efforts in the Mideast crisis. Page 63.

Apple, Adobe bury hatchet in font war as antagonists ink pact to team up on Postscript future. Page 4.

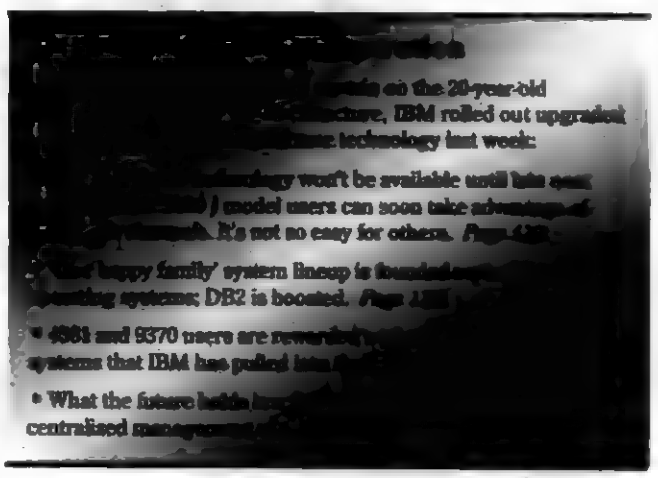
IBM kicks into mainframe overdrive

BY ROSEMARY HAMILTON
CW STAFF

POUGHKEEPSIE, N.Y. — IBM last week attempted to balance competitive needs for a new mainframe generational leap forward with customer demands for a smooth way to get there.

In unleashing its System/390 architecture, IBM faces a tougher audience than it encountered with the release of the System/370 series in 1970. In the face of brisk compatible mainframe competition from Hitachi Data Systems Corp. and Fujitsu Ltd.-backed Amdahl Corp., IBM cannot afford to alienate customers who may opt for more powerful systems on which to run existing software. Yet it must still provide aggressive price/performance improvements to customers who have pushed existing technology to the limit.

IBM's answer is to provide an upgrade path that uses existing 3090 CPUs as a springboard to the Enterprise System/9000



generation, offers compatible software and architecture functions to lower-performance systems and sets a framework for centralized systems management.

However, IBM left unanswered questions about whether the raw price/performance improvements will stave off the perceived mainframe threat of applications downsizing. The complexity of the 140-product announcement had many users saying that they would not know about their upgrade plans until they had more time to sort out the specifics.

"They've announced more MIPS, and that's exciting, but so have Hitachi and Fujitsu," said Henry Roberts, senior vice-president of data processing at The First National Bank of Chicago. "From what I saw, some of the architecture they described are excellent directions, but they are just directions at this point."

Whether IBM's strategy is successful will be determined largely during the next 12 months as IBM attempts to entice customers to buy initial System/390 systems that can take advantage of functions such as a fiber-optic-based channel architecture superimposed on the last breath of the System/370 line.

IBM plans to deliver a lineup of mainframes using 3090 J technology that will be available almost immediately, with new and much more powerful processor technology planned for four- and six-CPU systems one year down the line.

The company also pulled the formerly disparate 4381 and 9370 lines under the ES/9000 umbrella, offering higher performance than older models. All

Continued on page 123

Can your dealer support that server?

Users worry about retailers' ability to address departmental systems

BY RICHARD PASTORE
CW STAFF

One doleful refrain has dogged Compaq Computer Corp.'s Systempro and other high-end servers since their debuts: "PC dealers do not have the expertise to sell and support them." Although some customers are satisfied that dealers can do the job, others remain skeptical.

While some dealers may have the knowledge to service high-end hardware, users said they still would not trust resellers to support the server-based software and networked applications. In the long run, resellers may forfeit much of the support function to third parties and the users themselves, analysts concluded.

There are certainly some users who are happy with their dealers. Joseph Duane, president of Medical Cost Control, Inc. in Tampa, Fla., lauded his Systempro dealer, Monterey Waldec. "They have a very good technical staff, and the response time is excellent," he said.

With a Systempro order out for bid, the New York City Transit Authority offered qualified praise for the dealers it canvassed for product information. "Their knowledge level was fairly competent," said Patrick Farley, the transit authority's network administrator. "I feel I can find the support that I'll need for it."

Not all users are singing dealer hosannas, however. "I don't think they're going to be able to handle it," said Frank Vander Horst, project director

Continued on page 8

Satisfaction guaranteed

The 755 IS respondents to CW's fourth annual job satisfaction survey reveal how they feel about their profession. Page 90.

Unix eclipses 3090 star at Salomon

BY JOANIE M. WEXLER
CW STAFF

NEW YORK — At Salomon Brothers, Inc., the role of the IBM mainframe is diminishing and the future is open.

In addition to dropping the status of its IBM 3090s to "corporate servers," the global financial services firm is tossing out some large proprietary investments — including Prime Computer, Inc. and Quotron Systems, Inc. networks — in favor of a distributed AT&T Unix System V-based architecture.

"We want open, and we want standard," explained Ed Pillard, vice-president of Salomon's global network organization. "The more open your network is, the more vendor choices you have."

While the company would not comment on the cost of the new network, which will support more than 6,000 employees, the

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Quotable

"If I was in that [IBM] marketing manager's shoes, I'd be smiling now."

RICH WHITMAN
MARKETING MANAGER, DEC

On the prospect for IBM's ES/9000 line to stem customer defections to DEC. See story page 124.

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You can call me Ray, and you can call me Jay, but don't ever call me Summit! You all know Summit, that new generation of IBM mainframes in print all over our front page and plastered throughout the rest of the business and computer press as well. Problem is, the code name never existed within IBM. That didn't stop the press from erecting all sorts of neat visual images in our papers to hail the arrival of *something* code-named Summit. You have to admit, it sounds more interesting than ES/9000. Now the question remaining is, just who coined the term? If you know, contact us through our intermediary, Deep Throat.

Ed Kashi

UC Berkeley's Unix systems manager George Lavender talks about the computer center and plans for the school year. Page 33.

Robert de Michiell

Smart buildings get even smarter. Page 96.

EXECUTIVE BRIEFING

■ **The mainframe lives,** says IBM, as it releases a deluge of high-end hardware, software and networking products. Highlights of the event included details of three members of a new mainframe family sporting up to 200 MIPS performance, fiber-optic channels, coupled CPUs and up to 9G bytes of on-processor storage. Migration should be easier than ever before, with field-upgradable transitional models immediately available that offer modest performance boosts and fiber-optic links to remote DASDs. DB2 gets hardware- and software-aided performance boosts. IBM also defined an architecture for central systems management. The big winners: users of 4381, 9370 and VSE products. The big question: Are the performance benefits worth the steep costs? **Stories, pages 1, 122-125.**

■ **Despite all the talk** about strategic information technology, cost reduction is still what really counts to IS executives. That's according to the Diebold Research Program's study of information technology justification, conducted at more than 100 companies. **Page 114.**

■ **"It's thrilling,"** say IS professionals about their chosen careers, with challenge, technology and variety topping the lists of what they like most about their jobs. But respondents to *Computerworld*'s fourth annual job satisfaction survey say top managers and computer users often don't understand IS work or appreciate its importance. **Page 90.**

■ **Salomon Brothers dumps minis** in favor of Unix machines and relegates the mainframe to a server role. Officials say the benefits of open systems outweigh the conversion costs. **Page 1.**

■ **IBM will join** the burgeoning "superserver" market with an 1486-based multiprocessor PS/2 designed for multiuser and LAN applications. It could be an tasty alternative to Compaq and Netframe systems because IBM customers can buy directly from the vendor. **Page 8.**

■ **Apple's push into the workstation** world falls short. The Mac IIFX hasn't lit the workstation market on fire, but it has satisfied upgrade-hungry users. **Page 45.**

■ **AT&T allows Macs** into its arena, announcing software that lets Mac users share files and printers with MS-DOS, OS/2 and Unix machines. **Page 6.**

■ **S&L watchdog Resolution Trust Corp.** gets an IS chief. He's G. Brooks Dickerson, formerly of the U.S. Department of Housing and Urban Development. Resolution Trust has been criticized recently for tackling the S&L mess without a strategic plan. **Page 12.**

■ **You're thinking about retiring,** looking for adventure and anxious to travel. But you still want to keep your toes in IS. Well, International Executive Service Corps has such a program for volunteer executives. **Page 104.**

■ **Ashton-Tate users meet** with the vendor this week, impressed by Version 1.1 of Dbase IV but armed with calls for more cross-platform connectivity, a compiler and publication of Dbase standards. **Page 7.**

■ **On-site this week:** Imaging system helps Veterans Benefits Administration see light at the end of the paperwork tunnel. **Page 29.** "We're using more technology!" trumpets *USA Today*, which is using digital photography to push the deadline envelope. **Page 63.** All's quiet on the Midwest Stock Exchange as the click of keys has replaced the shouts of traders. **Page 49.** Shhh! The Library of Congress is quietly testing a combined package of videodisc images and hypertext software that may presage the library of the 21st century. **Page 53.** Tight budgets and active users keep staffers hopping at the University of California, Berkeley. The IS group supports a web of Sun, DEC and IBM systems, with a supercomputer thrown in for good measure. **Page 33.**

If DB2 Is The Answer, What The Heck Was The Question?

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	TOTAL		✓
	CA-IDMS		✓
	CA-DATACOM		✓
PORTABILITY Runs identically on...	MVS		✓
	MVS/XA	✓	✓
	MVS/ESA	✓	✓
	VSE		✓
	VM		✓
	PC-DOS		✓
	PC LAN		✓
STANDARDS	ANSI SQL	✓	✓
	FIPS	✓	✓
	SAA	✓	✓
	NAS		✓
DISTRIBUTED DATABASE	Remote Request	✓	✓
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Next hardware wave hits the beach

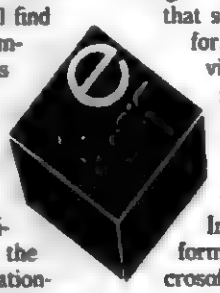
BY PATRICIA KEEFE
CW STAFF

The Sept. 18 rollout of the second wave of Next, Inc. hardware and related third-party software is expected by many industry observers to portend either a swan song for the struggling Next or the kickoff of its ultimate success.

The decisive factor here, a number of users and developers predicted, will likely be Improv. Developed by Lotus Development Corp., Improv is a high-end financial modeling package fronted by a graphical spreadsheet. It is also a complete departure from the traditional spreadsheet metaphor that Lotus built into a standard. That metaphor almost single-handedly helped to make the IBM Personal Computer a success — a fact that seems to have caught Next's attention.

Lotus has confirmed that Next is bundling Improv into a promotional package targeted at universities.

Improv is so radically different from the classic 1-2-3 architecture that users will find limited keystroke compatibility, no macros and no grid.



What users will find, said sources who have seen the product, are incredibly "slick" three-dimensional graphics, the ability to define a relationship in plain English, much greater flexibility and ease in reshaping and drawing data, database links and voice annotation. Expanded "views" allow users to open multiple spreadsheet windows based on the same data. A change made in one window will ripple across all.

"Diehard Lotus users will be thrown; it's a whole new way of doing things," one analyst said.

"This is fundamentally a new approach to spreadsheeting [that will] provide a quantum change within the basic areas that spreadsheets are used for," said Ed Belove, vice-president of Lotus research and development.

Sources claimed that Lotus' real interest lies in porting Improv to other platforms, starting with Microsoft Corp.'s Windows.

One analyst said Lotus is targeting three audiences: financial analysts, the top 5% of power users and "anyone who can afford a Next box."

It appears that Next is hoping Improv will provide the impetus needed to push so-far skeptical users into purchasing.

One package alone is not going to launch an avalanche of Next sales, and Lotus has two competitors. Next users also have their choice of Informix Corp.'s Wingz, unveiled earlier this year, and Ashton-Tate Corp.'s Powerstep spreadsheet, which was introduced last week.

Powerstep is getting good reviews from some beta testers who tend to classify it as a good, everyday spreadsheet. Ashton-Tate did not specify a shipping date and only estimated a price somewhere between $500 and $700. President Bill Lyons said he will wait for input from beta-test sites before announcing a delivery date.

Lyons characterized Powerstep as a "mainstream, heart-of-the-market" product built from scratch using Next's Interface Builder, a programmer's application development tool. The software includes such features as 3-D graphics with live rotation, voice annotations and publishing capabilities.

Senior Writer James Daly contributed to this story.

Apple/Adobe licensing pact cools feud

BY JAMES DALY
CW STAFF

Apple Computer, Inc. and Adobe Systems, Inc. agreed last week to bury the hatchet in their long-simmering feud — someplace besides each other's skulls.

The former partners-turned-antagonists cooled their rivalry with the announcement of a licensing agreement that will provide new products based on Adobe's Postscript software and Apple printer technology. Neither company would provide specifics on the deal.

While both firms have a long history of cooperation — Apple was an early investor in Adobe and its biggest customer — they have clashed bitterly during the past year over control of the technology standards that allow computers to translate ragged screen type and images into slick printer-generated fonts and graphics.

At last September's Seybold Computer Publishing Conference in San Francisco, Cupertino, Calif.-based Apple and software giant Microsoft Corp. said they were teaming up to develop alternatives to Postscript, a popular page description language credited with sparking the electronic publishing revolution. Apple officials said they were reluctant to become dependent on other companies for key technology components.

Some analysts, however, suggested that Apple and Adobe began to sense a common enemy in Microsoft. The Redmond, Wash.-based software company has become a major rival of Apple with the introduction of Windows 3.0, a program that gives IBM Personal Computers and compatibles the simplified windows-and-icons screen appearance that made Apple's Macintosh such a hit.

"I could never understand why Apple hacked Adobe off in the first place," said Jim Poyner, an analyst with William K. Woodruff & Co., a research firm in Dallas. "Apple needs to worry about a lot more things than ancillary software issues."

Early indicators are that the renewed alliance is long-term. "We are confident that the strengthening of the relationship between Adobe and Apple will lead to additional innovative products in the future," said John Warnock, chairman of Mountain View, Calif.-based Adobe.

The new agreement should also ease concerns among users who feared that the Apple/Microsoft pact, which is expected to yield another font technology called Truetype, could further complicate the job of integrating computer and printer systems based on the different technologies. Truetype represents a threat to Adobe's cash cow Postscript, according to analysts.

Latest severance plan sign of leaner times at DEC

BY MARYFRAN JOHNSON
CW STAFF

MAYNARD, Mass. — The other shoe finally dropped at Digital Equipment Corp. last week as company officials informed employees of a new, trimmed-down severance plan geared toward cutting 5,000 to 6,000 employees by the end of the year.

DEC's internal videotext news service, Livewire, carried details of the "financial support option" to all plants and work locations in the U.S., with some distribution abroad as well, a DEC spokesman said.

Markedly less generous than the company's previous severance plan — which encouraged some 3,000 employees to quit — this plan offers a base pay of only 13 weeks on full salary vs. the 40 weeks previously offered.

Longtime DEC employees can qualify for a maximum of 77 weeks of pay under this plan, as opposed to the 104 weeks offered originally. Like the previous plan, this one also offers a year's worth of medical, dental and life insurance coverage as well as assistance in finding another job.

The downsizing trend at the Maynard, Mass.-based vendor, which is struggling to cut down from 124,000 to 119,000 employees worldwide, should neither disrupt nor diminish customer service or field support, DEC spokesman Jeffry Gibson said. "Our intention is to eliminate unnecessary jobs," he said. "Service is something that is obviously needed."

Now that the specifics of the plan are fleshed out, the next step will be deciding which work groups and business units within DEC will be offered what some employees referred to as "the buyout."

The get-tough attitude of the new package seemed to be well-received on Wall Street. "The first package was excessively generous," said Shau Wang, an analyst at Smith Barney, Inc. in New York. "This is more of a get-off-your-duff kind of move."

CORRECTIONS

A mainframe data center automation offering from Boole & Babbage, Inc. called Auto Operator, was omitted from the Aug. 27 Product Spotlight chart on console automation. In the Auto Operator family of products, the base product supports MVS and DB2, and other options are available for IMS, CICS and Netview. The price range for the product is $22,500 to $80,000.

Sybase Corp. of Emeryville, Calif., reduced its 900-person work force by 50 in recent weeks, a company spokesman said last week. An earlier report [CW, Sept. 3] erroneously put the number at 90. No written announcement of the layoff was ever distributed outside the company.

CLARIFICATION

The salary survey chart on page 1 of the Sept. 3 issue listed the average total compensation (salary plus bonuses) for top IS executives in specific industries whose companies have annual revenues or assets of $500 million or more. Subsequent tables listed average salaries across all company sizes.

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NEWS SHORTS

Lotus upgrade bonanza

Spurred in part by the meager user migration to Release 3.0, Lotus Development Corp. is coupling the delivery of its 1-2-3 Release 3.1 spreadsheet this week with the launch of an aggressive In-Store Upgrade Program that is designed to enable users to turn in the original title page of their 1-2-3 reference manual to their retailer and obtain an upgrade to either Release 2.2 or 3.1. The company will also introduce an OS/2 version of its moderately successful Freelance graphics package as well as network enhancements to its Notes groupware environment.

DEC opens up bus protocol

Digital Equipment Corp. announced last week that it will allow developers of Futurebus+ products to use its internally developed protocol to improve bus throughput capability. The new protocol capability increases the speed by which disks, tape and other I/O devices can access computer memory, thereby improving overall system performance. Earlier this year, DEC declared its support for Futurebus-Plus, an industry-standard bus being developed by the Institute of Electrical and Electronics Engineers, Inc.

Apple lowers price ceiling

Apple Computer, Inc. made its current personal computer midrange offerings more competitive with the flurry of new hardware scheduled to arrive Oct. 15 by announcing last week that it is cutting $1,500 off the price of all models of its 1-year-old Macintosh IICI. The price of the 25-MHz Motorola, Inc. 68030-based system will be chopped by as much as 20%, according to Apple USA head Bob Puette. New prices will range from $5,969 for a version with 4M bytes of random-access memory and a floppy disk to $7,269 for the high-end model with a 80M-byte hard disk.

Software sniffs out pirates

The Software Publishers Association (SPA) stepped up its efforts to fight software piracy last week with the release of a program that allows users to sniff out illegal in-house software copies. SPAudit inventories commercial software on the organization's hard disks, prints a listing of how many copies of each application were found, then allows users to compare this report with purchase records to determine which applications are unauthorized. SPAudit complements the group's earlier SPA Self Audit Kit, the group said. Either of the two programs are available free of charge by sending a request to SPA Self Audit Kit, Suite 901, 1101 Connecticut Ave., N.W., Washington, D.C. 20036.

COS to embrace user groups

The Corporation for Open Systems (COS), a McLean, Va.-based consortium that has focused on networking standards, is planning to broaden its scope to become a home for user coalitions — such as the Houston 30 — that are promoting open computer systems, COS officials said last week. However, COS may "hand off" the work of specifying standards for software portability to another consortium, X/Open Ltd., according to officials.

IBM, Sears take Prodigy national

Prodigy Services Co., the videotex venture of IBM and Sears, Roebuck and Co., last week announced its nationwide rollout, made possible by the use of BT Tymnet, Inc.'s value-added network. Prodigy also announced software enhancements, such as IBM's Enhanced Graphics Adapter and Video Graphics Array graphics and mouse support, and added many new information features, including an on-line encyclopedia and the ability to order stamps from the U.S. Postal Service. Prodigy also revised its pricing structure to encourage yearly subscriptions of $119.40 (a monthly cost of $9.95); the month-to-month fee was raised to $12.95.

More news shorts on page 8

AT&T beckons Apple users

Software will allow Macintoshes to access DOS, Unix and OS/2 systems

BY JOANIE M. WEXLER
CW STAFF

MORRISTOWN, N.J. — AT&T Computer Systems has apparently heard the rising clamor of Apple Computer, Inc. Macintosh users demanding to be admitted into the corporate network. The company last week jumped on the Macintosh integration bandwagon and announced software for AT&T servers that lets Macintosh users share files and printers with MS-DOS, OS/2 and Unix machines.

Stargroup Server for Macintosh, which co-resides with AT&T's Stargroup LAN Manager Server network operating system, reportedly requires no changes for Macintosh clients. It works on AT&T's Intel Corp. 80386- and I486-based computers running the Unix System V, Version 4.0 operating system.

Trinity College in Hartford, Conn., has been alpha-testing the software for the past month. "It's been a very clean alpha, and we'll be first in line to buy an unlimited license," said Bernard Hecker, assistant director of computing at Trinity. "In terms of getting my job done, this stuff makes the future look much more peaceful."

Hecker, who operates three large Appletalk networks linked via Shiva Corp. Fastpath gateways to AT&T Starlan Ethernets, explained that the software eliminates the need for standalone Macintosh servers.

"We're not a leading-edge school; we make do with what we have," he said. "The software allows the same people to worry about everything — so we save both money and headaches, particularly in staff time spent backing up different servers."

Macs in demand

Jack Karp, vice-president of Meta Group, Inc., a Westport, Conn., consultancy, pointed out that Macintosh integration has surfaced as a major user issue. "Macs today account for 10% to 15% of microcomputer purchases. You'll find some degree of a requirement to integrate Macs into the corporate network in most companies," he said.

Phil Galli, a marketing manager at AT&T Computer Systems, said that the software product's print spooling capabilities allow a Macintosh to print to Adobe Systems, Inc.'s PostScript printers attached to either a DOS or Apple Localtalk network. "I don't believe anyone else can do that," he said.

One user looking to integrate Macintoshes with DOS personal computers and an IBM Application System/400 midrange system is Vince Melchiorre, director of information systems at Mrs. Paul's Kitchens, Inc. Although Melchiorre would be a candidate for purchasing an AT&T Unix server and the Macintosh integration software, he is leaning toward a Novell, Inc. local-area network that supports Macintoshes, particularly since IBM recently announced an Ethernet interface card for the AS/400.

"I'm still living in a proprietary world," he acknowledged. "I'm staying with the status quo until I really see a push toward open systems."

Stargroup Server for Macintosh, priced at $795 for eight users and $1,295 for an unlimited number of users, is slated to ship in December. AT&T Computer Systems, which purports a philosophy of interoperability and open systems, said it plans to port the software to other hardware platforms.

High-flying Oracle hit by first quarterly loss

BY JEAN S. BOZMAN
CW STAFF

REDWOOD CITY, Calif. — Oracle Systems Corp.'s bubble has burst. The company said last week that it will post a loss for the quarter ended Aug. 31 — the first-ever quarterly loss for the 10-year-old company.

After months of concern on Wall Street about the company's aggressive growth forecasts, Oracle said it experienced a 30% revenue growth during its first fiscal quarter. While such a growth rate would be the envy of many an industry chief executive officer, the firm has been spending on the assumption that it would attain 50% growth and will thus need to cut costs to meet reality, analysts said.

The news was delivered in a press release Thursday, and top Oracle executives declined to comment Friday on the projected 20-cent-per-share loss, citing a Securities and Exchange Commission requirement of a several-week "quiet period" following the close of the quarter.

The firm, once the darling of Wall Street investors with several years of 100% growth, said that the first-quarter results and "prevailing economic conditions which contributed to them" have led to revised fiscal year forecasts of 25% revenue growth.

Accordingly, Wall Street's prescription for Oracle is simple enough: Trim down.

A near-term layoff could come soon, analysts predicted. "They've got to cut costs, and their single greatest cost is their people," Tim McCollum, a first vice-president at Dean, Witter Reynolds in New York.

Nevertheless, "the company is still running at a rate that would give it more than $1 billion in revenues for fiscal 1991," said Kenneth Burke, a vice-president of research at Alex Brown & Sons, Inc.'s San Francisco office.

The first sign of an internal reassessment of Oracle's prospects came last April, when CEO Larry Ellison traveled to Wall Street following a dramatic stock loss linked to a bad third-quarter earnings report [CW, April 2]. There, he told analysts that the firm was cutting a 100% growth projection for the $971 million firm down to 50%.

Shortly thereafter, on May 22, a sales reorganization was announced, and most of Oracle's senior sales executives were reassigned to new duties. On Aug. 17, the company consolidated its debts through a syndicated revolving line of credit providing up to $250 million of credit. On Aug. 27, the firm restated its revenue and earnings for all four quarters of fiscal 1990, ended May 31 [CW, Sept. 3].

Earlier last week, the company announced that Oracle USA President Gary D. Kennedy, appointed to that position in the May reorganization, had been replaced by Michael Fields, 45, former vice-president of Oracle's field sales and consulting division. Kennedy will reportedly continue in his role as chairman of the Oracle Complex Systems subsidiary.

"They need to stabilize the organization," Burke said.

Users seemed to take the news in stride but expressed concern about Oracle's sales and marketing practices. "They just grew too big, too quickly," said Tony Ziemba, president of the New York Oracle Users Group.

"This incident points out, more than ever before, how important the users are to them," Ziemba added. "Most of their sales are now to their installed base. So, if the users are unhappy, there won't be any more growth."

Dbase users want company to stay on track

BY JAMES DALY
CW STAFF

ANAHEIM, Calif. — Ashton-Tate Corp. users will filter into the firm's biennial technical conference this week initially impressed with the revamped Dbase IV database. They will also bring a pocketful of suggestions on how the company can catch up with competitors that slipped into the power vacuum after an earlier, buggier version nearly brought Ashton-Tate to its knees.

"[The updated] Version 1.1 has cleared up a lot of things for us, but I see it as a starting point for more things to come," said Jack Bradford, EDP programmer and systems supervisor at the Minnesota Department of Natural Resources in St. Paul, Minn.

A quick wish list drawn up by early Version 1.1 users included a desire for greater cross-platform connectivity, delivery of the promised — but still undelivered — stand-alone compiler and even a long-shot request for the company to publish its standards and have users write to them.

"I just hope they keep up the momentum," said Bill Campbell, systems manager at South Carolina Water Resources in Columbia, S.C.

While Ashton-Tate currently offers platforms for Unix, Xenix and Digital Equipment Corp. VAX and VMS environments, users said more interoperability among the platforms is needed. A Dbase version for the Apple Computer, Inc. Macintosh is reportedly on the way.

Developers may also face a long wait for Version 1.1's Professional Compiler, whose release date could be from eight months to one year away, analysts predicted.

Ron Dennis, head of developer services at Ashton-Tate, said many of these topics will be covered at the four-day meeting. Heading the discussion topics will be an update on the firm's efforts to port Dbase IV to new hardware and operating system platforms, he said.

Longtime Ashton-Tate users have generally hung tough with the company throughout the long ordeal, which began nearly two years ago. In July, the Torrance, Calif.-based company pulled the curtain back on Dbase IV Version 1.1, which has so far been well-received by users.

Jumping ship

In the interim, however, some users have either headed over to products such as Fox Software, Inc.'s Foxbase or stuck with Ashton-Tate's preceding generation Dbase III Plus.

"If I sat here and waited for Ashton-Tate to give me a usable product, I would have been out of business," said Pat Adams, president of DB Unlimited, a consulting firm in Brooklyn, N.Y. "My loyalty is to my business and my clients, and I turned away clients who wanted to use Version 1.0 because I couldn't guarantee it."

Analysts said the expanded and upgraded Version 1.1 is expected to be a quick hit. Ashton-Tate officials estimated that the firm has sold more than 350,000 copies of Dbase IV and has reportedly reserved $5 million to cover the free upgrades to which registered users will be entitled. Version 1.1 ordinarily costs $795 per copy.

Paradox linked to SQL servers

BY JAMES DALY
CW STAFF

SCOTTS VALLEY, Calif. — Borland International rolled out a beefed-up version of its Paradox relational database management system last week, adding an SQL link that allows it to tap into an expanded selection of data servers.

The new release will add support for Microsoft Corp.'s SQL Server Version 1.0 and higher, Oracle Systems Corp.'s Server Version 6.0 and IBM's Extended Edition Database Manager Version 1.2. Support for Digital Equipment Corp.'s RDB/VMS will be available later this year, officials said, and the company is working with Sybase, Inc. and other vendors to provide connectivity to DB2, Teradata Corp. and others.

Borland Chairman Phillipe Kahn said one of the chief attributes of Paradox 3.5 and Paradox SQL Link is their ability to allow users to access remote SQL data without learning complex SQL programming. Paradox SQL Link also offers the ability to offer front-end support for SQL servers, he added.

Paradox 3.5 and Paradox SQL Link are priced at $795 and $495, respectively, and are available immediately. Registered Paradox 3.0 users can upgrade to Version 3.5 for $134.95 until Nov. 7. A runtime version of Paradox 3.5 will be available within a month for $29.95.

Borland is also shipping Paradox Multipack, which replaces Paradox LAN Pack. Multipack costs $995 and contains five user counts. One SQL Link package, with one user count, is required for each network. The cost of upgrading from the Paradox LAN Pack to Multipack is $295.

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NEWS SHORTS

ALR lowers price points

Advanced Logic Research, Inc. (ALR) released a new Intel Corp. 80386-based computer last week and dropped prices by $200 on two of its 80286-based Powerflex models. An ALR spokeswoman said the price drops were to "put us into alignment" with the industry. The Powerflex Model 1 will now sell for $995, and the Model 40 will retail for $1,295. The SX Powerflex, based on Industry Stapdard Architecture, starts at $1,196. ALR is offering 386SX upgrades for $199.

IBM dangles PS/2 software lure

IBM launched a Personal System/2 promotion last week featuring rebates, free software and easy credit terms. The "Grand Scale Sale," effective through Jan. 15, 1991, is intended to stir up the syrupy-slow domestic market, said Dataquest, Inc. analyst Steve Lair. IBM is dangling a $150 rebate for the purchase of any IBM operating system and a PS/2 Model 30-286, 50Z or 60. Potential Model 55SX and 65SX buyers are being tempted with a $300 rebate. Model 25 through 65 buyers will also receive six free software packages.

Wordperfect looks to New Wave

Wordperfect Corp. has announced that its Wordperfect for Windows word processor, currently under development, will be extended to support Hewlett-Packard Co.'s New Wave technology. The New Wave version will enable users to move and update information among applications and work with many applications on the screen at one time.

Windows training on video

Microsoft Corp. is now offering a video-based training package for Windows 3.0 developers. The self-paced learning tool updates the Windows 2.X video course. The updated program consists of five videotapes, a course workbook, a laboratory exercise book and four software disks containing lab exercises and sample programs. Estimated time of completion is 25 to 35 hours. The video's goal is to take what a typical developer might learn on his or her own in one to four months and compress that into a week of training, according to Microsoft. The full training course for a single student costs $2,995; workbook materials for additional students are $249 each.

Common frame of reference

Digital Equipment Corp., Stratacom, Inc., Cisco Systems, Inc. and Northern Telecom, Inc. announced last week that they will use a common specification for incorporating frame relay technology into their networking equipment. As a result of the agreement, DEC and Cisco routers will be able to connect over either Stratacom's private T1 switches or public networks based on Northern Telecom's Supernode central office switches using the frame relay interface, the vendors said.

Nationwide LAN support offered

Fraser, Pa.-based Bell Atlantic Business Systems Services last week announced it will team up with CGI Consulting, Inc. in Berwyn, Pa., to provide nationwide local-area network support services. The program, Lanplus, will include on-site maintenance, implementation, software and consulting, according to the firm. Pricing will be set on a scale based on the number of incidences and will initially support Novell, Inc. Netware 286 and 386 customers. However, it will expand in the coming months to customers running IBM's OS/2 LAN Server, 3Com Corp.'s 3+Open, Microsoft's LAN Manager, Banyan Systems, Inc.'s Virtual Networking Software and others.

American Healthcare picks Sprint

American Healthcare Systems has become the latest firm to choose U.S. Sprint Communications Co.'s Virtual Private Network service, signing a $36 million, three-year contract. The network will reportedly link the company's 1,100 facilities across the U.S. and provide pay telephone, patient calling and employee benefit-related services.

IBM server to challenge Compaq

BY RICHARD PASTORE
CW STAFF

Analysts and users confirmed reports last week that IBM would soon introduce two high-end Personal System/2 servers and that it plans to deliver a multiprocessor "superserver" to rival Compaq Computer Corp.'s Systempro. Observers also predicted that the boxes would shovel sand on the embers of rival superserver sales.

"To me, it is a direct competitor of what Compaq has done with the Systempro," an information systems executive at a large Eastern bank said. The source, who had been briefed by IBM, said one of the upcoming systems features dual Intel Corp. I486 CPUs, as does the Systempro. IBM did not discuss pricing, he noted.

IBM's pending server entries could spell trouble for the Systempro and other dedicated servers from AT&T and Netframe Systems, Inc. Users who mistrust dealers' competence in high-end service are more comfortable buying hardware and support directly from the manufacturer (see story page 1). Since IBM traditionally offers this direct-purchase option, it may lure wary customers away from Compaq and other vendors that do not offer direct sales and support.

Support issue

"It still bothers me that Compaq does not have direct support," said Stephen Rood, microcomputer technology manager at Coopers & Lybrand in New York. Direct support from a vendor like IBM "would certainly make a difference to me," he said. However, users who decide to buy the IBM product from an authorized reseller still have the option to buy direct IBM service, something else Compaq does not offer.

"The superserver already has a leg up because users can count on IBM" to integrate and service it," said John Dunkle, vice-president at Workgroup Technologies, Inc. in Hampton, N.H.

Besides dual 486 processors, the superserver will support large-capacity small computer systems interface (SCSI) disk drives and memory caching, according to sources briefed by IBM. The machine is expected to be available by midyear 1991.

IBM would not comment on the unannounced product but confirmed that it demonstrated such a system at Comdex/Spring '90 in Atlanta. That system featured 8M bytes of memory, nine 320M-byte SCSI hard disks, a 600M-byte compact disc/read-only memory drive and a 2.3G-byte tape backup unit.

According to Dunkle, two other high-end server models, the PS/2 Models 90 and 95, should debut by the end of this month or early October, depending on 486 chip availability. Based on the 486 chip, the desktop and tower units will run at 25 and 33 MHz, respectively, he said. Both boxes will feature SCSI adapters.

Dealer

FROM PAGE 1

at Coca-Cola Foods. Because his integrated manufacturing application involves many components and specialized software packages, Vander Horst decided his Systempro dealer would not have the expertise to support the total system.

Coca-Cola Foods has enough support resources in-house, according to Vander Horst. "The only service I get (from the reseller) is a place to buy the machine," he said.

At Coopers & Lybrand in New York, doubts about dealer competence helped dissuade microcomputer technology manager Stephen Rood from purchasing a Systempro.

"I'm talking about a big network with 2,500 nodes; I have to go back to a dealer for support? We were nervous about that," Rood said.

Coopers & Lybrand opted for the more powerful and expensive Digital Equipment Corp. VAX 4000, with direct service from DEC.

Several resellers acknowledged the high level of user wariness. "I don't think the Systempro sold the way everyone anticipated, mainly because of fear" of the new technology and dealers' ability to support it, said Pat Calabrese, sales representative at Monterey Waldec in Tampa, Fla.

As in the case of Coca-Cola Foods, systems software is often the bugaboo that scares users away from dealer support. Many users are opting for multitasking and multiuser Unix as their operating system of choice for high-end servers.

Indeed, The Santa Cruz Operation's SCO Unix is the only operating system available that will recognize the multiple CPUs of the Systempro and its competitors. Unfortunately, Unix is beyond the ken of many PC dealers, observers agreed.

More questions

Users also questioned dealer competence in high-end network operating systems. "I didn't feel any of the national computer chains were particularly strong with [Novell, Inc.'s] Netware 386," said Mark Olsen, systems analyst at Cox Cable, Inc. in San Diego.

Olsen wound up tapping a third-party service provider to support Netware 386 on his Systempro. Because he desired single-source support, he also switched his hardware maintenance from Inacomp Computer Centers to the third-party provider.

Like parents checking out a new day-care facility, some users interrogated their resellers with caution before buying.

Duane sent his computer-literate staffers over to the dealer to "feel them out on product knowledge." He also checked out the store's level of inventory and phone response times.

Once they have settled on a dealer for support, users said they would most often seek help for the job of integrating the server with network hardware and software.

For example, Duane turned to his dealer to bail him out of an incompatibility crisis. The Unix version he loaded on his Systempro did not support the machine's tape drive. The dealer lent him another drive until the necessary software driver became available.

"They came to our rescue," Duane said.

Another issue undermining customer confidence is the financial pressure on reseller resources. Recent losses at chains such as Businessland and The Computer Factory, Inc. will hamper efforts to enhance service, observers said (CW, Aug. 20).

At least one Businessland branch manager disagreed. Despite a $23 million loss in the last fiscal year, "the company is putting even more money into these programs," said Wayne Wegner, who runs a Businessland branch in Santa Monica, Calif.

Users are dubious. Duane is thinking of shifting his nonserver PC purchases from Businessland after reading the handwriting on the wall. The staff at the local Businessland showroom, he said, recently seemed to dwindle to the point where "you had to hunt for them."

Analysts do not hold great expectations for the future of high-end dealer service. The trend instead will be toward in-house support. There will also be a growing segment of third-party firms that render nothing but support.

"The person who supports the system will not be the person who sold you the system," predicted Frank Michnoff, an analyst at Meta Group, Inc. in Westport, Conn.

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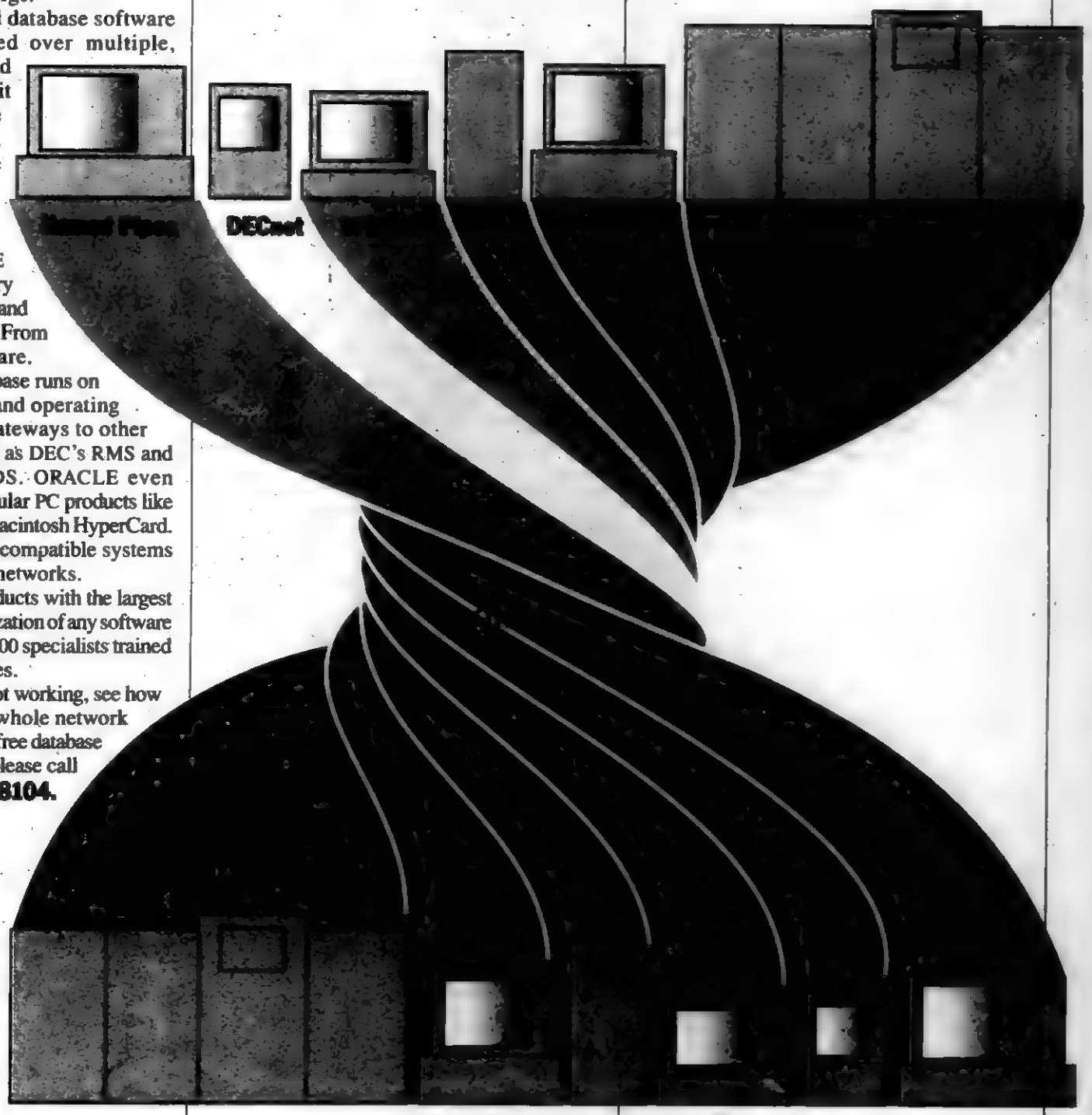

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Prime converting 50 line to CMOS

BY SALLY CUSACK
CW STAFF

NATICK, Mass. — Prime Computer, Inc. expanded its 50 series family of minicomputers last week with the addition of two midrange systems based on CMOS technology.

"Prime is planning to convert its entire 50 series line to CMOS by the end of 1991," said David Card, an analyst at International Data Corp. in Framingham, Mass. The announcement, he said, gives "the product line sort of a midlife kicker while assuring the installed base that the overall architecture does have a viable future."

Designated the 5320 and 5340, the computers use Primos, the firm's proprietary Pick-based operating system, and allow users to run applications created on any 50 series system without recompiling the existing programs. Gil Heath, product marketing manager for the 50 series, said the major thrust of the announcement is to satisfy the firm's installed base.

Heath also indicated that the migration to CMOS architecture will be painless for users because Prime has an aggressive trade-in program in place with established trading credits for every product it offers on the market.

The latest additions are packaged in the vendor's "No Trade-In Required" modular packaging, by which the system can grow incrementally when users swap in a more powerful CPU board or add higher capacity I/O controller and peripheral modules.

Whether the majority of users are ready to take advantage of the new systems or trade-up offerings remains to be seen. Larry Scott, director of information systems at Tippins, Inc. in Pittsburgh, said CMOS architecture is "nothing we have a need to jump into right now."

Tippins has been a Prime customer for seven years. According to Scott, the firm relies on a 6550 for all of its business applications and operational functions, and he said he feels that the box is "well suited" to the firm's automation requirements.

Priced from $60,753 to $119,427, the 5320 supports up to 128 users and offers memory configurations ranging from 16M to 192M bytes. The 5340, priced from $120,926 to $193,262, supports as many as 256 directly connected users and provides from 32M to 192M bytes of memory.

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IBM, partner seek OS ports

BY J. A. SAVAGE
CW STAFF

IBM and Metaphor Computer Systems, Inc. will obviate the need for independent software vendors to port applications to every operating system and platform if a partnership formed last week is successful.

Patriot Partners will produce base programs for software developers. The programs will work on OS/2 and several flavors of Unix.

Developers could then write new applications "without making themselves crazy" trying to port software to every operating system, said David Liddle, Metaphor's president and chief executive officer. "For instance, in multimedia, all developers should be able to use it without having to supply their own device drivers," he said.

Liddle said that while products would keep developers from having to know the details of OS/2 and AIX, IBM's version of Unix, IBM would still make those codes available. Instead of setting such a program within IBM, an arm's length was desirable, said Joseph Gugliemi, president of IBM's Application Solutions Division. Products applicable to IBM will go directly to it, while products applicable to other Unix implementations and OS/2 will be marketed through Metaphor.

Database Users Respond To Queries

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ORACLE for Macintosh received its share of acclaim from InfoWorld readers, who named it Macintosh Product of the Year.

InfoWorld readers also named Oracle's newest desktop product, ORACLE Server for OS/2, product of the year. As did subscribers of DBMS Magazine, who rated ORACLE Server for OS/2 the best database server.

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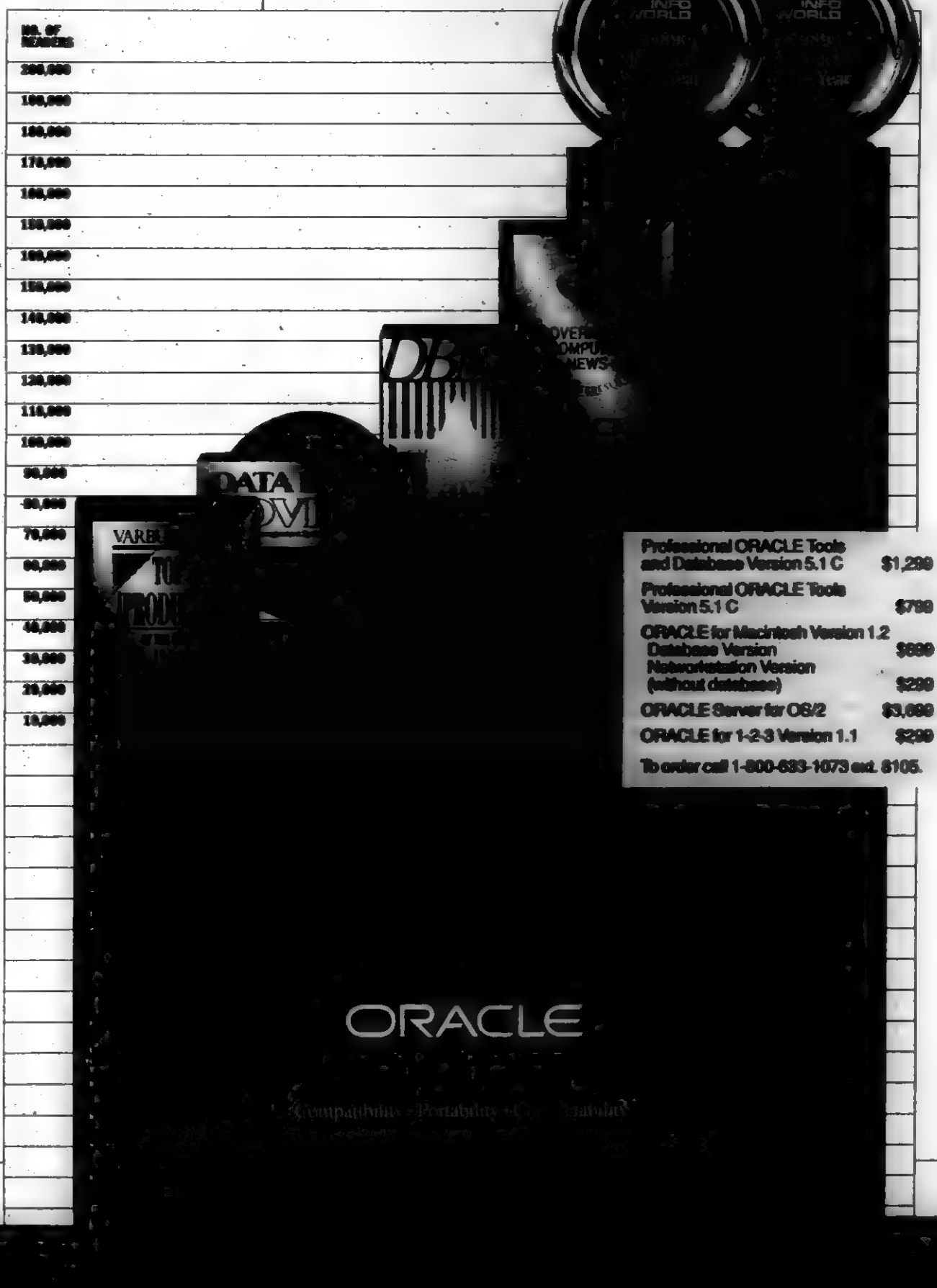

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S&L bailout group appoints HUD exec to top IS post

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — Resolution Trust Corp., the federal agency established last year to oversee the savings and loan industry cleanup, aquired its first information systems chief last week. The appointment of G. Brooks Dickerson as head of the new office of corporate information fulfilled a key recommendation made earlier this summer in a U.S. General Accounting Office (GAO) report that sharply criticized IS leadership at Resolution Trust.

Dickerson, previously deputy director of information policies and procedures at the U.S. Department of Housing and Urban Development, will be responsible for IS development and administration at the agency. An initial priority will be to coordinate strategic IS planning, a Resolution Trust statement said.

The GAO, the investigative arm of Congress, criticized Resolution Trust for its lack of a senior IS manager and its lack of a strategic plan, policies, standards and procedures for systems to achieve the corporation's objectives. It pointed out that Resolution Trust uses existing financial systems at other federal agencies but suggested that these would need to be replaced by systems tailored for Resolution Trust's unique mission. Systems are needed for financial reporting, asset management and disposition as well as savings and loan monitoring.

Earlier this year, Resolution Trust hired Price Waterhouse to identify information requirements and assess the ability of existing systems to meet the requirements. Price Waterhouse's report became the basis for a bid solicitation for hardware and software to support an asset management system.

Congressional auditors said Resolution Trust had expected to get a strategic plan from Price Waterhouse but development of such a plan was outside the scope of what the audit firm was asked to do. "Consequently, [Resolution Trust] risks acquiring and operating costly information technology that may not meet its needs, perform as desired, be cost-effective or be compatible with existing and future systems," the GAO said.

Intergraph airs low-end systems

BY SALLY CUSACK
CW STAFF

HUNTSVILLE, Ala. — Intergraph Corp. bolstered its low-end line of computer-aided design and manufacturing (CAD/CAM) workstations last week by unveiling the Series 2000 — a family of color graphics workstations and servers.

The workstations support two- and three-dimensional graphics applications, the vendor said, adding that more than 900 application packages from both Intergraph and third-party vendors are reported to be currently available for the systems.

The company has already received a $7.9 million contract from Brown & Root, Inc., a Houston-based international engineering design and construction firm, for 250 of the Series 2000 Unix-based workstations and servers.

According to Steve Yates, chief information officer at Brown & Root, the company standardized on Intergraph equipment about three years ago and hopes to increase productivity on the Unix-based platforms.

The engineering firm currently has several hundred DOS-based Intergraph Microstation machines, which will gradually be phased out over the next couple of years.

Bruce Jenkins, vice-president at Daratech, Inc., a Cambridge, Mass.-based CAD/CAM and computer-aided engineering market research firm, noted that the base configuration of the Series 2000 is competitive in price and performance with some of the other machines in its class, specifically Digital Equipment Corp.'s Decstation 3100 and 2100 and Sun Microsystems, Inc.'s Sparcstation 1.

"The basic difference," Jenkins said, "is that Intergraph does not purport to be a workstation vendor — it concentrates primarily on the CAD/CAM systems market and bundles its hardware with a sophisticated set of proprietary software applications."

The Series 2000 is available in four models, each of which comes with a 19-in. screen, a 12.5 million instructions per second reduced instruction set computing processor and 16M bytes of memory, expandable to 64M bytes.

The Series 2000 server also includes XNS and Transmission Control Protocol/Internet Protocol communications support. Pricing for the systems starts at $15,900, and the workstations are available for immediate shipment.

Intergraph also announced price reductions of 10% to 35% for its midrange to high-end Series 6000 workstations.

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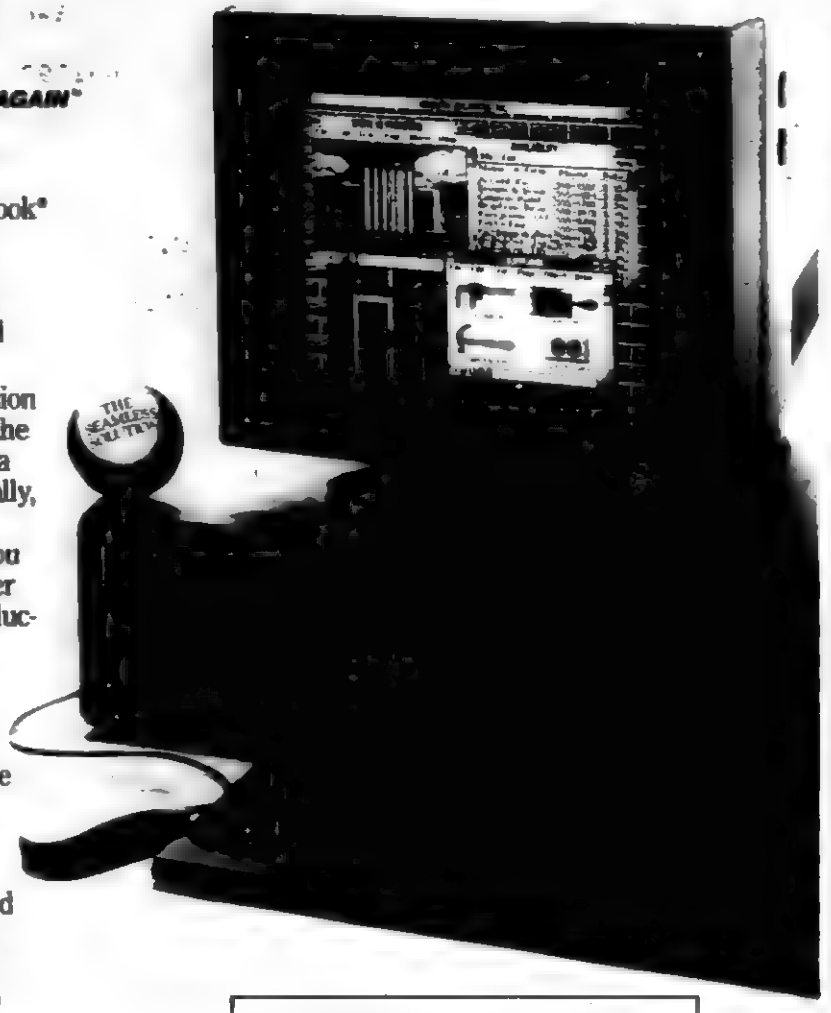

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EDS branches out into title insurance business

BY CLINTON WILDER
CW STAFF

DALLAS — Just a few months after entering the airline reservations business via acquisition, Electronic Data Systems Corp. (EDS) used the same method to stake its claim in the real-estate title insurance business.

EDS and a financial partner announced a deal last week to acquire Ticor Title Insurance Co. of California in Los Angeles. Terms were not disclosed, but an EDS spokesman said EDS will pay less than the $250 million it will spend for joint ownership of Texas Air Corp.'s System One airline reservations system in a deal announced earlier this year.

EDS is the largest provider of data processing services to the title insurance industry, so Ticor could provide a springboard for additional business.

As part of the acquisition, EDS will take over all of the information systems functions of Ticor and its parent holding company, Westwood Equities Corp. Westwood's 160 IS employees will be hired by EDS.

Ticor had been seeking a buyer for four years, and EDS' offer to take over IS made it an even more attractive suitor, according to Ticor spokeswoman Joanne Shanley. "They are far more sophisticated than we are" in IS, she said.

An early goal will be better networking of Ticor's current systems, Shanley said. To support 300 offices and 1,000 independent agents in the U.S., the firm runs a data center in Los Angeles with two IBM 3081s and a smaller System/38-based data center in San Francisco. Ticor will generate $200 million to $300 million in processing services revenue for EDS during the next 10 years.

EDS' acquisition partner is New Century Enterprises, Inc., a group formed by Chicago financier Jay Pritzker. Joint ownership terms were not disclosed.

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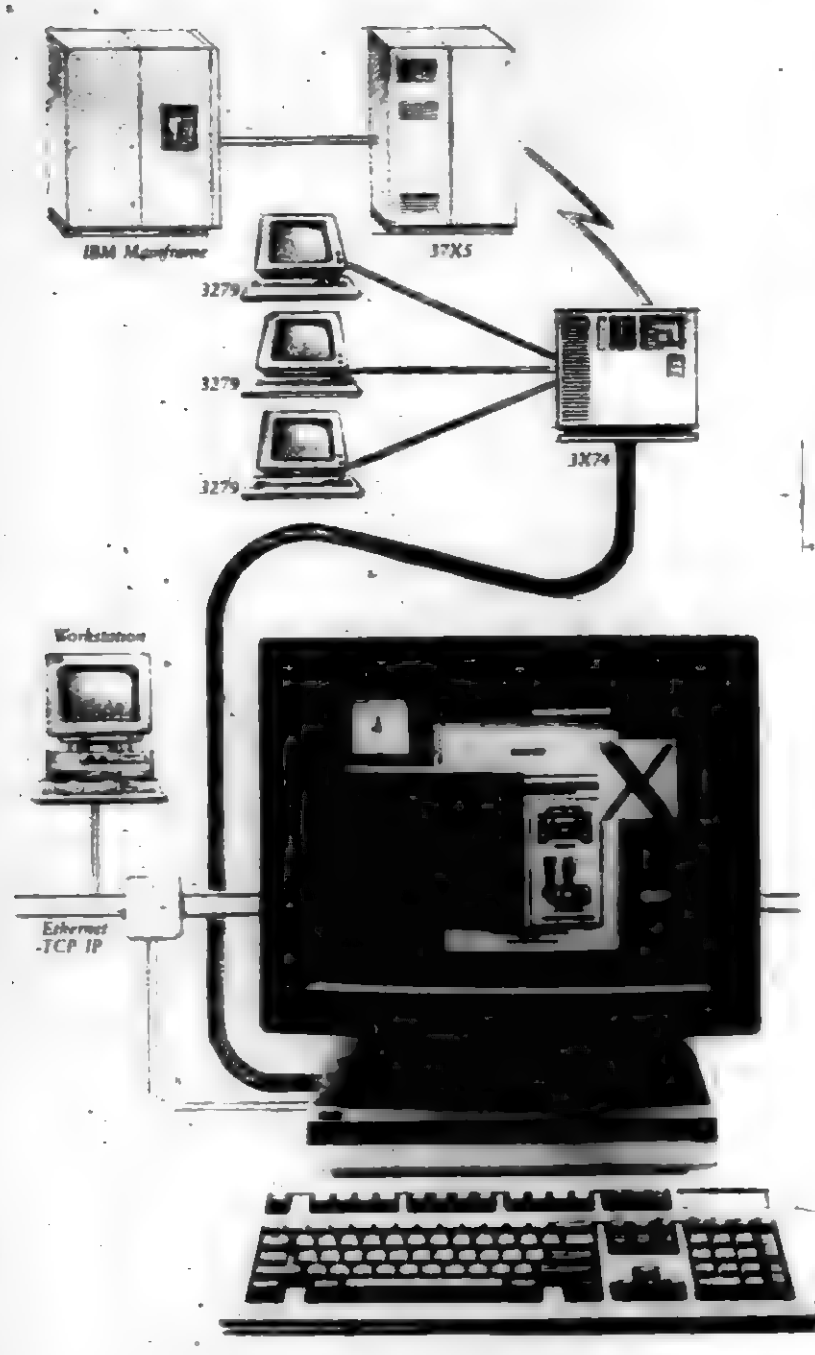

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Unix

FROM PAGE 1

client/server setup will replace a large, traditional terminal-to-host configuration for transaction processing, a Prime superminicomputer network supporting analytic functions and a Quotron network that handles sales, trading and data delivery.

The three networks have been connected "in very inelegant ways that are not terribly functional," said Emily Susskind, a vice-president in Salomon's technology division. "The interfaces are rigid and don't give users a look at the whole world."

She explained that there were three primary motives for the firm's shift from its traditional 3270 terminal-to-mainframe environment to Unix servers and workstations: graphics and windowing capabilities, more scalable cost structures by putting computing power where it is needed and flexibility in adding new functions and products.

Tear down the wall

Salomon Brothers, which is readying its computing environment for a move to a new building in Manhattan that will house its trading floor, intends to "knock down the Berlin Wall between environments," Susskind commented.

Within each of Salomon's large offices in London, New York and Tokyo, as well as in U.S., European and Asian branches, the firm will run Ethernet local-area networks with both local and backbone segments running Transmission Control Protocol/Internet Protocol. The configurations will generally consist of Unix file, computing and database servers and workstations to support such activities as trading, investment banking and foreign exchange.

Susskind said that the new network will relate to the firm's bottom line by reducing costs, not necessarily raising revenue.

"The technology will enable users to get information faster and thus find opportunities faster, but I'm not sure it can really affect business volume," Susskind noted. "We're just as happy to make fewer trades and make more money on each."

Joaquin Gonzalez, vice-president of global networking strategies at Meta Group, Inc., a Westport, Conn.-based consultancy, cautioned that network backup could be a big headache for companies moving to a distributed environment. Gonzalez explained that "it will take you an hour using a 64K bit/sec. line to back up each server, and most companies don't have such a line to each of their locations."

David Card, an analyst at Framingham, Mass.-based International Data Corp., agreed. "Server backup is a critical issue, and software to automate that process is still pretty rare. You'd probably have to do some of that work yourself at this stage."

Card said he is generally an advocate of downsizing, however, even with today's limited number of tools for rewriting applications.

"In almost any application, given the amount of investment that exists in low-end commodity products, it will probably be less expensive. But the big hassle comes in managing distributed data and peripherals," he said.

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ADVANCED TECHNOLOGY

Something old, something new

NASA's Magellan mission to Venus uses blend of technologies to right problems

BY MICHAEL ALEXANDER
CW STAFF

Space voyages have long been the stuff of science fiction, but the Magellan spacecraft now orbiting Venus arrived there using a curious combination of old and new technology. The robot spacecraft is controlled by two on-board computer systems that were designed 12 years ago and have been used in previous space missions.

The $550 million space vehicle, whose mission is to map the surface of Venus using radar, has been crippled for several weeks after the on-board computers inexplicably went into a protective mode that has twice prevented scientists from communicating with the spacecraft.

While two key computers aboard Magellan lack the computational horsepower of most desktop computer systems, they are reliable and designed to withstand the rigors of space travel, said spacecraft system engineer John Slonski.

There are two types of microprocessor-based computers aboard the spacecraft:

- A 16-bit attitude control computer that controls the thrusters, momentum wheels and other devices regulating the craft's attitude.
- An 8-bit command and data subsystem designed to operate as an on-board traffic cop, collecting radar data and routing it for recording and transmission.

This week, NASA scientists at the California Institute of Technology's Jet Propulsion Laboratory (JPL) hope to execute a series of computer commands that will reawaken the vehicle and allow it to resume its mission.

Magellan was carried into space by the Atlantis shuttle on May 4, 1989, and sent on its 152-million mile voyage to Venus with a mission to map the surface of the planet using radar. It was the first U.S. interplanetary mission since 1978 and the first in a string of missions planned for the 1990s to explore Venus, Saturn, Jupiter and Comet Levy in what NASA scientists have hailed as a new "golden age" of space exploration.

Until the problems began in August, NASA officials had hoped the Magellan project would help ease the public criticism that has followed the discovery of a serious flaw in the $1.5 billion Hubble telescope and several frustrating shuttle launch delays. The spacecraft entered orbit around Venus on Aug. 10, where it remains in an elliptical orbit of about 170 miles at its lowest point and about 5,000 miles at its highest point.

The computers, as well as other equipment in the 7,600-pound Magellan, were either inherited or copied from Galileo and other space missions.

"When Magellan was being designed in 1982-83, it was decided to borrow that design from Galileo and save costs," Slonski said.

Scientists now suspect that the computer problems may have occurred after the spacecraft triggered a rocket that braked the vehicle from 24,600 mph to 6,200 mph for its entry into orbit around Venus.

Either as a result of the 6-g stress of deceleration or the separation of the orbit-insertion rocket from the craft, a ground connection may have come loose and introduced electronic noise into one of the computer systems, Slonski said. That noise may now be affecting the data in the attitude control computer's registers and changing a bit in the computer's instructions.

"The two recent lost signals were due to the computer executing erroneous data and basically either stopping or going off and executing code that it wasn't supposed to execute," Slonski said.

Photo courtesy of NASA

Magellan *seeks to map 90% of Venus' surface by 1992*

Last week, NASA's scientists reprogrammed the space vehicle's computers to make it easier to check on the health of the craft and make subsequent program modifications.

The programming changes are written on the ground using computers manufactured by Unisys Corp. and Sun Microsystems, Inc. and are adapted into instructions that are understood by Magellan in a process called sequence generation.

"Some of the reprogramming involved is only on an order of 10 to 40 words," Slonski said. "The ground software can turn new words into commands that are transmitted to the command and data subsystem that will use direct memory access to go into the attitude control computer and replace the old words with new ones followed by a memory readout."

Magellan's mission is to map as much as 90% of the surface of Venus, using radar to peer through the dense clouds that shroud the planet. It had only begun to map the surface when the computer problems interrupted the mission.

The craft's command and data subsystem gathers data for 37 minutes out of each 3½-hour-long orbit and stores the data on digital tape at the rate of 800K bit/sec. After the data is gathered, the spacecraft turns around and points its sighting antenna toward Earth and shoots a stream of data back at 268K bit/sec. for about 2½ hours. The error rate on the ground is something on the order of one error in every 100,000 bits — exceedingly accurate under the circumstances, Slonski said.

The project is funded for a 243-day mapping mission, the length of one Venusian day. However, scientists hope to gain approval for an additional five mission cycles, at a cost of an additional $169 million, that will last through 1995. Those mission cycles would allow Magellan to fill gaps in the radar map and cover portions of Venus in the southern polar region that will be missed during the first run.

The craft is designed to use three types of radar data to map the planet's surface. On the ground, the radar data is processed by a supercomputer designed by scientists at JPL and a Digital Equipment Corp. VAX and is used to create aerial photograph-like images of Venus' surface, showing features about 120 by 120 meters — roughly the size of a football field — and 10 times better than the best previous data, according to radar office manager Raymond Pierseson.

The fault lies not in the stars, but in Magellan

The first of Magellan's two computer-related problems occurred on Aug. 16 when the spacecraft went into a calibration sequence intended to allow the vehicle to determine its position. The spacecraft swung away from Earth to point its star scanners at a set of stars, but when it failed to return to its position after the designated scan, the craft triggered its fault-protection logic — what NASA scientists call "random-access memory safing" mode. Several hours later, the craft inexplicably shifted from RAM safing to "read-only memory safing," a more protective mode.

Then on Aug. 21, for reasons that remain unclear, the craft's fault-protection logic instructed it to break off contact with Earth.

NASA scientists said they believe the two problems are connected and may have been caused when Magellan's command and data computer miscommunicated with its attitude control computer. The attitude controller, as a result of the miscommunication, triggered the RAM safing mode, scientists said.

The big fix

Phil Allin, administrative assistant at the Magellan project, detailed the sequence of commands that NASA scientists are using in an attempt to reawaken Magellan later this week:

In the first of a series of steps designed to take control of Magellan, NASA scientists reprogrammed the craft on Sept. 1 to switch from ROM to RAM safing, a mode that will enable the scientists to check on the health of the craft and to reprogram its computers more easily.

In the second step, executed last Tuesday, the scientists switched on Magellan's momentum wheels, designed to control the craft's attitude. In the third step, carried out last Wednesday, the scientists turned on one of the craft's star trackers, a move intended to allow the craft to reorient itself.

This week, scientists hope to switch on Magellan's high-gain antenna and wave-tube amplifier to re-establish the vehicle's highest level of communication and to download data stored on the spacecraft's digital tape recorders that NASA project staff members hope will offer clues to the cause of the problems.

"Assuming all is well, we will turn on the radar on Friday and start mapping on Saturday," Allin said.

MICHAEL ALEXANDER

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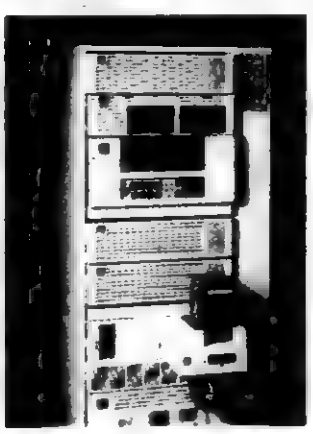

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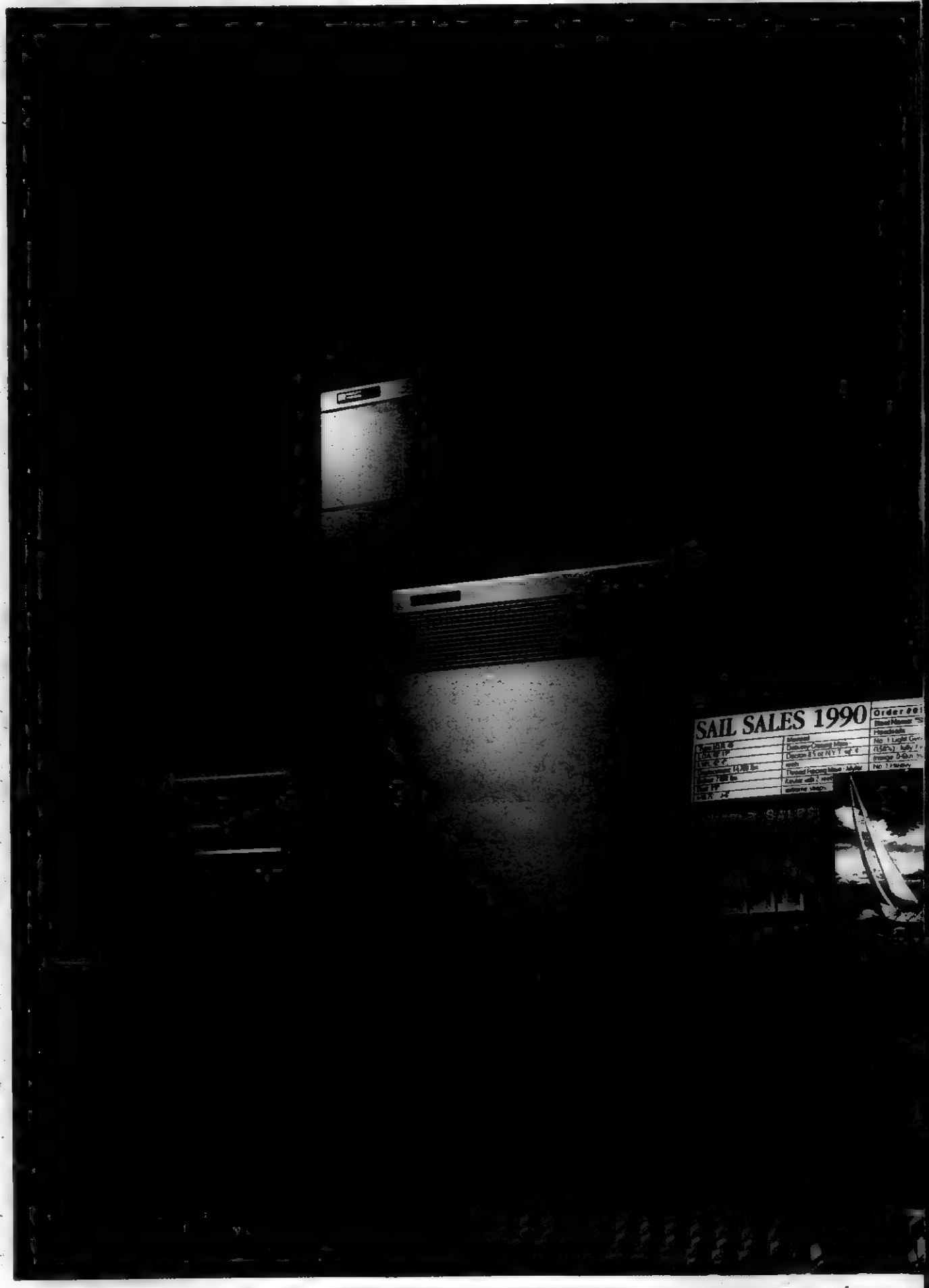

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EDITORIAL

Same old song

WHEN QUERIED FOR a reaction to IBM's big mainframe announcements last week, one analyst noted that the mainframe strategy of IBM or any other vendor will fall flat because of one reason: Senior corporate management is not going to shell out $5 million to $10 million dollars or more for a mainframe anymore.

This view is somewhat naive for several obvious reasons. But it also underscores a key point that has emerged regularly in our annual job satisfaction surveys, and this year's is no exception (see page 90). It is the same point raised in other *Computerworld* surveys, both of CEOs and senior information systems managers. It is a point that just doesn't seem to change very much.

That point is that the two camps — the corporate suite and the IS crowd — still do not speak well to each other and, often, *of* each other.

For this reason, it is entirely feasible that in some isolated cases, a valid mainframe purchase request (it doesn't have to be a mainframe, but any computer product or system that costs a lot of money) will be scotched because the relationship between the purchase and its value to the organization can't be communicated.

Right up there with poor top-level communications as a source of job dissatisfaction is poor communications with the IS client base — the user community. This, too, hasn't changed appreciably in any of our four annual satisfaction surveys.

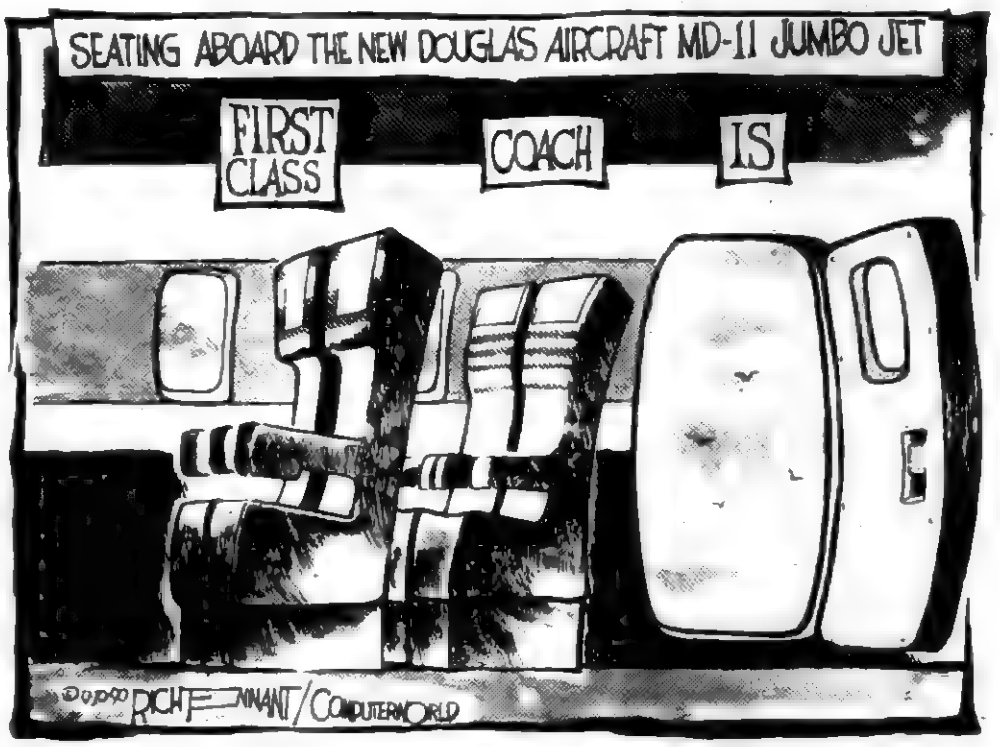
The fact that communications problems will exist to some degree between your boss and your clients is a given. But the extent to which the problems apparently exist and the lack of progress being made to mitigate them is both troubling and puzzling.

Even worse is the only visibly consistent reaction given by our survey to the communications problems — namely, to look for another job, as if the problems don't exist nearly everywhere else. It is safe to say that one result of the failure to the communication problem has been high-level IS turnover in the last couple years, in the 25% to 30% range by several estimates.

What the IS community seems either unwilling or unable to assume is a far greater sense of responsibility in resolving the great communications dilemma. That is a lead role neither the users nor corporate management is likely to play, nor should either do so.

In some companies, IS has formalized a sort of education process, replete with structured meetings that explain IS initiatives. An increasing number of IS organizations have set up multidisciplinary technology committees to discuss, develop and articulate systems plans.

There is no one-size-fits-all approach to resolving the problem of poor communication, except that IS must play the lead role in the process. Take a tip from Bo Jackson and "just do it." Our printing the same survey results year after year could get dull, not to mention risky for you.



LETTERS TO THE EDITOR

A real favorite

Regarding your product review "Making the case for Nomad" [CW, July 23], I feel that the benchmark has missed the point. Having spent my career developing and maintaining interactive systems for the federal government as well as private industry, it is my experience that maintainability is much more important to the vast majority of applications than performance. The fact that a batch job takes a few minutes longer to apply updates to a database is relatively insignificant when compared with the need for quickly correcting problems and handling exception processing.

Perhaps the most astonishing advantage that Nomad has over almost every other 4GL — and especially over SQL — was mentioned at the bottom of the page: "The solution was derived entirely with Nomad."

In today's bewildering world of CASE tools, third-generation languages with embedded SQL statements, precompilers and compilers, there is an incredible learning curve faced by programmers in order to become productive in a new environment. Having had an equal amount of experience with several other major database management systems, Nomad has emerged as my clear favorite.

Jeffrey L. Fowler
President
Decision Software, Inc.
Hyattsville, Md.

Misunderstood

I'm baffled at your categorization of IBM's ES/9370 family as "IBM's misunderstood mid-range" [CW, July 23]. This criticism usually accompanies faulting IBM for falling short of predicted 9370 shipment levels.

Those "failures" are mostly illusory. The 9370 in fact fully participates in the 370-architecture family descended from the System/360 introduced in 1964. The 9370 is simply a new and appealing point on the 370-architecture price/performance continuum.

Operating systems which run on 370-architecture processors — VM, VSE and even MVS — support 9370 processors. IBM and other vendor software that runs under those operating systems supports 9370 processors. Applications developed for those operating systems execute happily on 9370 processors. Similarly, while IBM would surely have liked to ship more 9370 systems, industry speculation inflated expectations so that actual numbers were bound to fall short.

Every justification used to purchase a 370-architecture system applies equally to a 9370. Installations that provide VM-based service for graphics, SAS, Profs or back-end support for legions of PCs are as likely to install a 9370 as they were to install 370/145s or 4341s in the past. There were no complaints about the lack of software for *those* machines.

Gabriel Goldberg
Vice-President
VM Systems Group
Vienna, Va.

Keeping abreast

I take exception to your article on unions and the "high-technology devil" [CW, July 23]. Your normally fine newsletter has fallen victim to the stereotypical school of cut-and-slash journalism. The reality is that unions are a reflection of America — some are on the leading edge of technology, while others are still in the Stone Age.

The United Paperworkers International Union has been using computer technology for many years. Our large membership files and accounting are resident on an IBM Application System/400 Model 45 with more than 20 terminals. We also have about thirty Personal System/2s running both stand-alone and networked applications. Our 12 regional offices are all computerized. We actively encourage our locals to purchase and use computers.

Our staff is active in local user groups, serving as officers from president to secretary. We attend Common and other seminars. We conduct computer training classes for local union officers at regional seminars.

This international union does not fight technology. Our membership and leadership know that our employers must succeed and be profitable. Technology, in the aggregate, does not replace jobs; it merely changes the character of the jobs. Productivity is the name of the game, and computers give us increased productivity and service to our members.

Patrick E. Hydrick
Controller and Director,
Data Processing
United Paperworkers
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Get with the program, please

DENNIS E. NOONAN

Nontechnical users tell me state-of-the-art in personal computing technology has had a profound effect on their work lives. They say getting a new item of hardware or software makes them feel dumb, complicates their lives and makes them work harder.

In the old days, most users worked in big companies and had data processing specialists and information systems people to take care of the messy parts, such as putting paper in the printer, doing disk backups and setting the system date. Some poor slob — usually the newest programmer — was assigned to show users how to run the application. Nothing worked the way it was promised, but at least you had someone to listen to your complaint.

Nowadays, everyone works for small companies or strategic business units. Everyone has a desktop personal computer with a 80M-byte disk and a color monitor. IS is dead. Call someone a "data processing specialist" and they will hang up on you. If the central IS people respond at all to your anguished pleas for assistance, they will send the director of user services — a 13-year-old technoid punk who will blame all of your problems on your lack of enough extended memory. And he will probably be right.

Computer gurus are wont to say, "You can never be too rich or have too much memory." But most nontechnical users aren't even aware of the 640K-byte barrier, much less someone who can define the difference between extended and expanded memory. One waggish user has suggested, "Why don't they just fix DOS?"

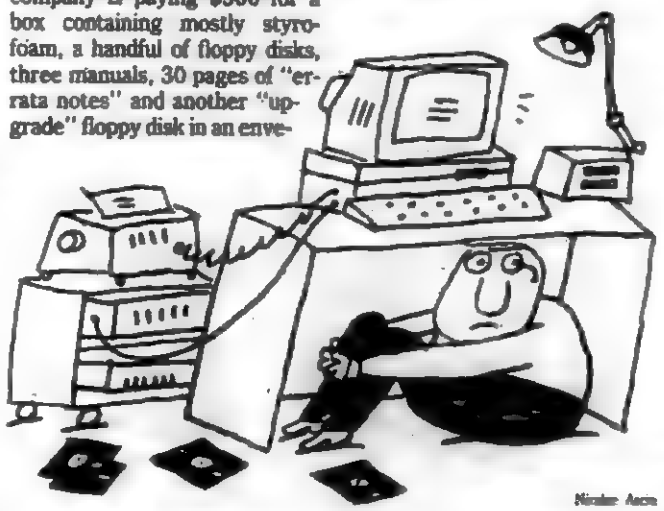
Noonan is a free-lance writer based in Wellesley, Mass.

Just a regular Joe

We're not talking about left-brainers who believe that the challenge of learning a new software package can be a form of entertainment, like doing a crossword puzzle. No, we are talking about your average, allegedly computer-literate professional user — the manager who needs to plan a new project, or the sales rep looking for a way to reduce paperwork. These people can get so focused on their own jobs that they want the solution to be simple and fast.

These folks have obviously not spent enough time reading product reviews, or they would realize that they were actually getting easy-to-learn, user-friendly productivity tools. I have no patience with people who tell me, "I don't have time to read protechnology rhetoric. I am trying to get a job done here!"

Personally, I don't see what all the fuss is about. Why should a person object to the fact that his company is paying $500 for a box containing mostly styrofoam, a handful of floppy disks, three manuals, 30 pages of "errata notes" and another "upgrade" floppy disk in an envelope that says, "Read Me First Or You Will Die!"



Nicolas Ancin

OK, I'll admit that this can be intimidating for the rank novice. For most people, though, after you've done it a few times, you learn not to be afraid. (Like most veterans, I don't even take the manuals out of shrinkwrap until I've blown up a few times!)

But no. Users say they want "usable" software. They want it to enhance the way they do a job. They say that most automation actually ends up making the job more time-consuming. I say that's because they need more memory and probably more expensive hardware to speed things up.

When they get a new application, nontechnical people say they just want to open the package, load a disk or two and type "go." But what fun is that? Anyone can use a menu-driven program. It takes smarts to run a spreadsheet macro. But these Neanderthals say they "don't want to spend half the day screwing around with the system." They just want to get some work done.

"Screwing around" is a nontechnical buzzword that means "printing out the read.me file, modifying the config.sys file, changing the path command in the autoexec.bat file, pulling off the cover and plugging the jumper switches, answering silly questions about the modem, setting DIP switches, running cables and calling 800 help line numbers that never have an available helper." And why should I have sympathy for some shnook who complains when his primitive floppy drive can't back up a 400K-byte file? In my opinion, a user who can't tell if his modem is fully or partially Hayes-compatible doesn't deserve to have access to on-line data services. This oaf will simply have to call his travel agent and get *him* to order airline tickets, just like it was in the old days.

In summary, I am sick and tired of coddling these whining, negative, nontechnical users. They will never be satisfied until PCs are as easy to use as a telephone or a stereo. If the users are not willing to invest the time and effort it takes to learn to use expensive and complicated computer systems, then why should design gurus pander to them?

Besides, many capable consultants make a good living, helping users understand these complex technical issues. With the economy in the state that it is, we certainly don't want to put any more of these guys out of work. Users want things to be as easy as pie. Borrowing from Marie Antoinette, I say let them eat cake!

A 'welcome' to the battle from a knowing veteran

DONALD INGRAHAM

"We want to help civilize the electronic frontier," says Mitch Kapor, the founder of the Electronic Frontier Foundation (EFF). Mr. Kapor, you couldn't be more welcome. If civilizing means establishing the rule of law and developing mores and ethics, you may be a bit late to break new ground. But civility is a continuing process, and one of the expectations of our Constitution is that we all contribute our concerns and experience and observations. The only restraint — and it is only ethical — is that we don't hide our agendas.

Your EFF seems to have arisen from a First Amendment concern. The First Amendment is the basic prohibition against our government passing a law "abridging the freedom of speech, or of the press. . . ." It seems to be fairly well-accepted that some speech can be curtailed — libel and slander, for example.

There are currently several proposals to punish speech that is likely to spread hatred or incite racism. As is true of all of our rights and has always been true of the First Amendment, the law is ever-changing.

There is one aspect of the free speech question that you are surely familiar with, Mr. Kapor: copyright. Copyright and patent and other legal recognitions of intellectual property are clearly intended to limit any free dissemination of speech that would compromise the property rights of the innovator. Even the late Abbie Hoffman claimed copyright for his work in *Steal This Book*.

There are dedicated courts and specialized legal experts who devote their time entirely to questions of whether a particular exercise of speech simply communicated an idea — spreadsheets — or pilfered a proprietorial expression of that idea — Lotus 1-2-3.

The beauty is that the restraints of copyright and patent are not imposed by the state but are available to the creator of that particular expression of the idea. We are all free to share; we can each try to stake a claim.

There is, however, an unavoidable conflict between rights — the right of one to control property against the right of another to communicate. It would help, if the EFF is to support a productive discussion, to agree up front on what is meant when we use the term "rights."

We may as well accept that "rights" means — at the very least — legally recognized activities. There are some that the state protects, such as the rights to take certain measures to protect one's property; there are others that establish areas in which the state cannot intrude, such as religion and privacy. The reality is that no rights are absolute, and any exercise is subject to legal review.

That much is basic civics. There is, unfortunately, a considerable amount of static on this point, compounded by what must be understood as a traditional ritual asserting that a right has been violated. This ritual asserts as a fact a proposition about which a decision has not yet been made. As long as we all recognize the bombast and rhetoric for the traditional warm-up of our adversary system, no harm is done. Overindulgence in this assertion, however, can be harmful.

Which is why, Mr. Kapor, some of us in law enforcement are a bit uncomfortable with your latest enthusiasm. One of your associates was critical of my office and of the local Bay Area Rapid Transit Police a few years ago when we were prosecuting a well-known computer enthusiast for his involvement in a scheme to falsify electronically coded tickets to defraud a transit district of its lawful fares. The thrust of your associate's remarks was that the offense did not really amount to very much and that his friend was too bright to be hassled in such a demeaning way.

You may recall that the recent prosecution of Robert T. Morris drew some of the same sort of comment from some industry "professionals." Most law enforcement people I know tend to hear in this opinion an assumption or unstated premise that some people, by virtue of their contributions or potential contributions to computer technology, should be exempt from the criminal process.

There we differ. A major project here on the electronic frontier is to come up with a legal structure that will not only accept but encourage legitimate innovation and dissemination of ideas but not lead to the kind of lethal pollution so well described by Clifford Stoll in *The Cuckoo's Egg*.

I think that such a structure has been developed in both federal and local law, and it is there to be reviewed and followed and respected or else amended in the ordinary course of legislation. This is a free country, and respect for procedure is one way to keep it that way.

Mr. Kapor, we do not know what it is about the present system that is bothering you and your associates. I hope that this note is accepted in the spirit which prompted it. The communications format that you have so amply funded (EFF) may make a lasting contribution to a dialogue that all too often has only arisen after the crime occurred, a point at which positions tend to be polarized and immediate personal concerns influence analysis.

On behalf of the rest of the veterans of the frontier, welcome.

Ingraham is an assistant district attorney in charge of the High Tech Crime Team in the Alameda County District Attorney's Office in Oakland, Calif.

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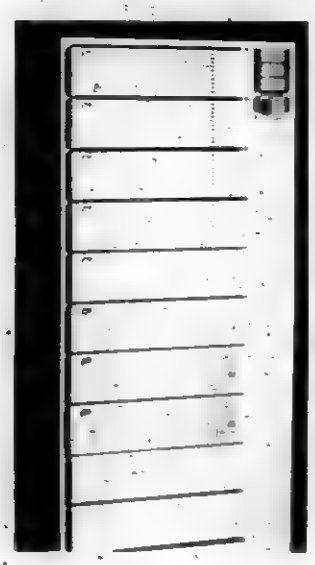

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COMMENTARY

Jean S. Bozman

Bargain shopping

With the winds of recession blowing fitfully across the land, many people are giving a second thought to buying those shiny mainframes right off the factory floor. No need to buy right away, they say. If there is an immediate need, why not lease? Or how about buying a used computer without the latest bells and whistles — or a smaller system to tide us over into better times?

It would be impossible to represent these notions as being universal. Each computer "shop" has its own buying game plan, its own capacity-planning scenario — and its own budget ceilings. User companies are enduring the recession and IBM's Summit is making its debut. At the same time, new nonmainframe technologies are emerging that some consider to be worthwhile alternatives to the state-of-the-art machine with the state-of-the-moment multimillion-dollar price tag.

All across North America, U.S. computer vendors report, there is a "cooling off" of large-ticket orders, and both hardware and software vendors are scrambling to Europe and Asia to make up the difference.

What's the reason for the

Continued on page 33

Trials and tribulations of TPF

ANALYSIS

BY JEAN S. BOZMAN
CW STAFF

For more than 20 years, IBM's Transaction Processing Facility (TPF) has silently stolen in and out of our lives like a cat burglar. It knows all about our airplane travel plans, our checking account balances and maybe even our medical prescriptions. This is largely because the 23-year-old operating system — once called the Airline Control Program — has been recognized by airlines, banks and retail operations as IBM's fastest commercial systems offering.

However, IBM's TPF speedster, which runs at a top rate of 2,000 transactions per second, lately seems to be running in place at some user sites. IBM marketers conceded that even as new sites, such as the French National Railroad, install TPF systems, others, such as the Bank of America, are dropping out. TPF was most recently enhanced in 1989, and a new version is not expected until 1992. Meanwhile, IBM has plans to make its other commercial operating systems and databases run much faster.

There are only 250 to 300 TPF licenses worldwide, according to International Data Corp. (IDC), a market research firm in Framingham, Mass. — dramatically less than the number of licenses for all other IBM operating systems (see chart). "This is definitely a niche market," said Bob Tasker, vice-president of IDC's software research group. "But TPF remains a strategic product for those who need heavy-duty power for straightforward processing tasks. If you need hundreds, or even thousands, of transactions per second, TPF is the vehicle; DB2 is not."

The system is unique among IBM operating systems for its raw horsepower. "We offer unlimited demand, and at certain transaction rates, nothing else even comes close," said Jim Dugan, who manages IBM's transportation marketing group, which markets TPF. "On paper, you could build a maximum [IBM 3090] configuration that would allow you to run at 10,000 transactions per second, if the demand was there."

Mighty mouse

IBM's TPF is dwarfed by the popularity of systems such as MVS, but the shops where TPF does show up tend to be big sites

	Estimated installations	
	Worldwide	U.S.
TPF	300	150
MVS	22,900	11,800
VM	19,600	10,000
DOS/VSE	23,000	12,700
Amdahl UTS	250	

Source: International Data Corp. CW Chart: Doreen Dahle

The high cost of TPF operations has worn some users out, however (see story page 35). Because TPF is a specialty operating system, there is a chronic shortage of TPF programmers, with only 8,000 worldwide — half of whom are in the U.S. "We find there's a need for 10% to 15% more TPF programmers than the number we can supply," reported Ray Moore, director of technical staffing for TPF at recruiting firm Triple I in Kansas City, Mo. "Some banks and hotels, including Ramada Inns, have tried [TPF] and pulled out, mainly because of the overhead and expense involved."

Soon there will be alternatives, analysts said, including IBM's next-generation Summit mainframes, which will use dedicated processors to make DB2 run 25% to 50% faster. "IBM's

Continued on page 35

Lawyers take imaging to the limit

BY SALLY CUSACK
CW STAFF

DALLAS — Multisite, multistate computer imaging capability is becoming a reality for lawyers and paralegals at Bickel & Brewer. The 6-year-old, 40-member law firm recently purchased a Wang Laboratories, Inc. imaging system to link its New York, Dallas and Chicago offices.

Reported to be the first installation of its kind in the country, the Bickel & Brewer configuration was purchased to eliminate time-consuming research, filing and retrieval functions associated with litigation. The company installed the Wang Integrated Image System (WIIS) in July on a Wang VS 5000 midrange computer, which is in turn connected to a Wang 7120 computer.

The company is currently installing AT&T Integrated Services Digital Network lines in its New York and Chicago offices and said it expects them to be fully operational under the new imaging system by early this week.

The imaging system is designed to be portable across the entire organization; more importantly, the system functions can be moved via terminals and personal computers to off-site locations, including courtrooms and client offices, according to Todd Garland, manager of the company's litigation consulting group.

"The WIIS system is IBM-compatible, so we are not locked into a one-vendor approach," Garland said. "We are in the process of imaging in a million documents, and we are saving the client about 50 cents per page by abstracting the documents into the system — over and above cost savings in the filing, retrieval and storage process."

Bickel & Brewer reportedly generates more than 2 million pages of documents per year, and the company estimates that the optical imaging system will save clients between $100,000 and $200,000 in storage costs per year.

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In the terminology of the modern workplace, power and speed have become the shorthand by which personal computers are measured.

The test of the designer's art, though, is to wring the greatest *performance* out of available megabytes and megahertz.

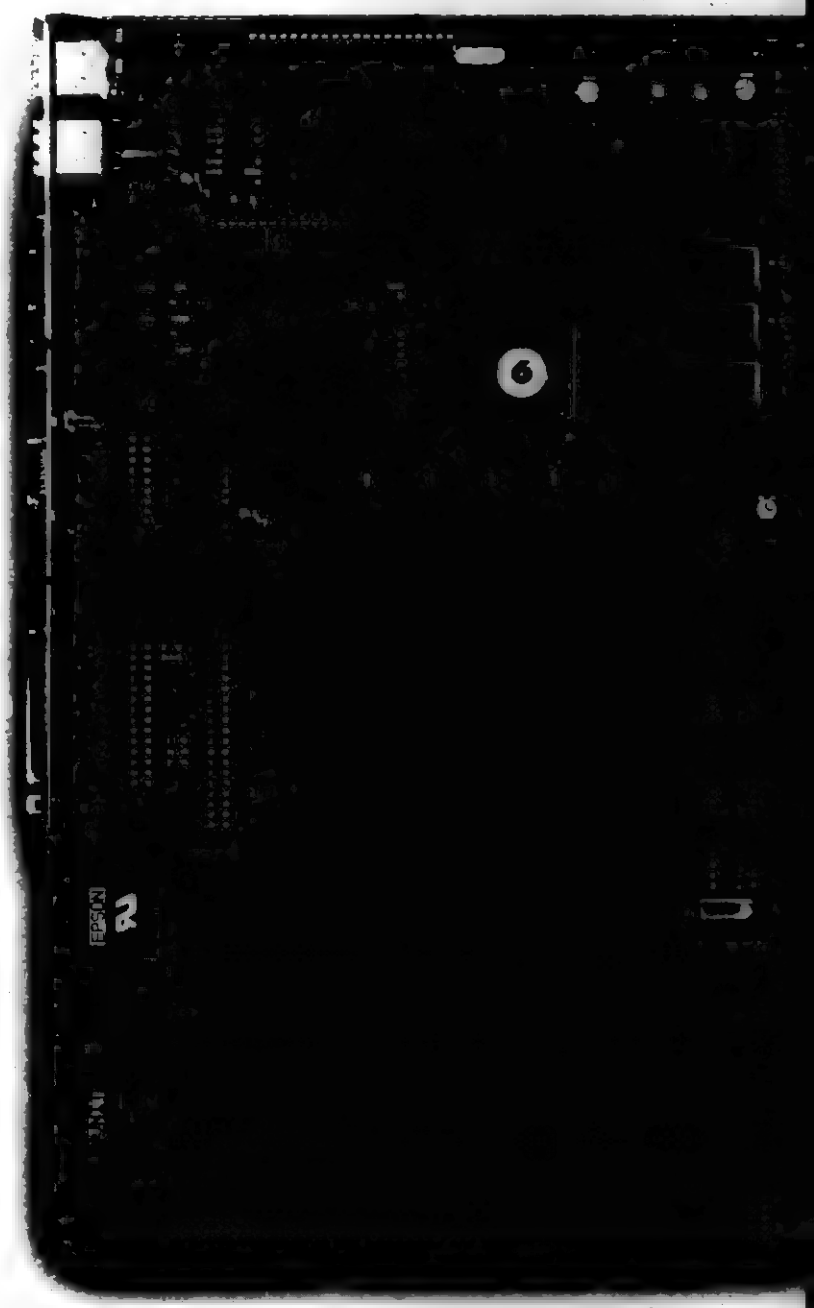
With a disarmingly clean, integrated design, Epson engineers have done just that in the new 286 and 386™ Series personal computers.

Consider the evidence:

1 *VLSI Chips. The compact footprint of Epson's new machines is made possible by integrating functions on VLSI chips such as these. Without them, separate boards would require separate slots, and the motherboard alone would be three times the size.*

2 *Surface Mount Technology. Used only by the most advanced manufacturers, SMT techniques protect the structural integrity of the board, which increases overall reliability.*

3 *Hard Drive Controller. The use of Integrated Drive Electronics on the hard disk eliminates the need to add a hard disk controller board. This simplified design means faster throughput and greater reliability.*



Epson's 386SX motherboard displays the elegant architecture necessary for optimal performance.

Feature configurations may vary with different models. Board shown is not actual size. 386 is a trademark of Intel Corporation. Epson is a registered trademark of Seiko Epson Corporation. © 1990 Epson America, Inc., 2780 Lomita Blvd., Torrance, CA 90505. (800) 922-8911.

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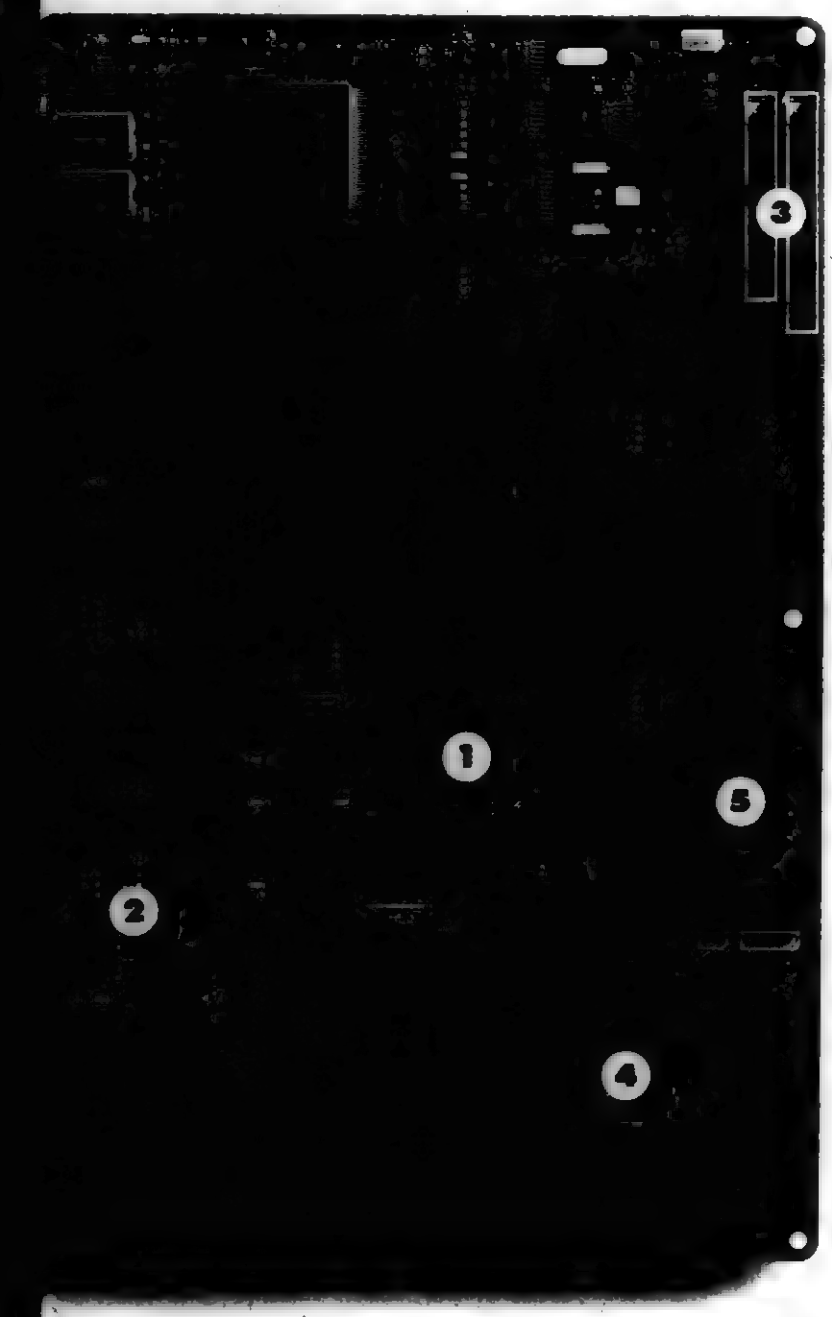

4 *Epson's proprietary BIOS. Epson has elected to develop its own BIOS, customized for each individual system, simply to ensure that your software will get the most out of our hardware.*

5 *High speed memory. In fact, at 70 nanoseconds, they are among the highest speed memory chips available. With them, memory access is faster. Snap-in SIMMS modules make memory upgrades easy and quick.*

6 *Super VGA video graphics are embedded on the motherboard. The result: more efficient data transfer, more reliable circuitry, optimized video performance.*

What the Epson design team has discovered is that *less* is very definitely more. By reducing the number of separate components through integration, performance is increased. The result is a flexible tool which is elegant, efficient and allows the effortless application of power and speed to the task at hand.

In fact, there is only one word that adequately describes the innovative design of these new Epson computers. Neat.

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A Comparison Chart of the Major Cooperative Processing Software Products:

FUNCTIONS:	SUPER-LINK®	Easel™	Mozart™	Arbiter®	IBM's HLLAPI™	IBM'S APPC™
Processing Topologies Supported						
Peer-to-Peer Processing	✓			✓		✓
Existing terminal-based systems	✓	✓	✓		✓	
Mixed Peer-to-Peer and existing systems	✓					
Application integrity/Software Distribution	✓		▬			
SAA/CUA Interface compatibility	✓	✓	▬			
Workstation Environments Supported						
PC/DOS	✓	✓	✓	✓	✓	✓
OS/2	✓	✓	✓	✓	✓	✓
PC/DOS to OS/2 application compatibility	✓					
LAN Server for shared applications and data	✓					
Multiple transaction servers on a LAN	✓					
Development Environment Comparison						
Object orientation	✓	▬				
Dictionary and documentation	✓					
Panel/Form painter for creation/maintenance	✓	✓	▬			
3270 screen capture: picture and attributes	✓					
CASE/Application Generation	✓	✓				
Intelligent (language-sensitive) editor	✓					
System and user-defined reusable code templates	✓					
Integrated compile/test/debug	✓	✓				
Execution time source debugging	✓	▬				
All development tools for DOS available in DOS	✓		✓			
Objects Supported						
CUA display images	✓	✓				
CUA dialog within display object	✓					
Validation within display object	✓					
Help processing	✓					
Error processing	✓					
Text window interactions	✓	▬				
Business graphics	✓	✓				
3270 definition	✓					
Interactions with 3270	✓					
Interactions with Peer-to-Peer	✓					
"Logon" Scripts	✓					
Application integrity/Software Distribution	✓					
Local Data Access						
Indexed files	✓		✓			
dBase	✓		✓			
Flat Files (random access)	✓					
Flat Files (sequential access)	✓	✓	✓			
Multiple read/write to files on LAN Servers	✓					
High Level Functions Directly Available in the Language						
Field-level context sensitive help	✓		✓			
Optional user learning mode	✓					
Display and selection from:						
Indexed files	✓		✓			
Sequential files	✓	✓	✓			
In-memory lists	✓	✓	✓			
Menu display and selection	✓		✓			
Determining 3270 screen identification	✓		✓			
Read/write to 3270 in a single command	✓					
Read/write to 3270 one field at a time	✓	✓	✓			
Determine dynamic 3270 attribute changes	✓					
Embedded user assistance (pop-up selection lists)	✓					
Data editing validation:						
Data type mask checking	✓		✓			
Single range limit check	✓		✓			
Field data driven range limit check	✓					
Date formatting validation	✓		✓			
Validation against local and LAN files	✓					
Required fields	✓		✓			
"Must Fill" fields	✓					
Zero not valid fields	✓		✓			
Peer to Peer Host Environments Supported						
MVS-CICS	✓			✓		✓
MVS-IDMS/DC	✓					
MVS/TSO	✓					
DOS VSE-CICS	✓			✓		
VM/CMS	✓			✓		✓
DEC VAX/VMS	✓					
Software Distribution Host Environments Supported						
MVS-CICS	✓		✓			
MVS-IDMS/DC	✓					
MVS/TSO	✓					
DOS VSE-CICS	✓					
VM/CMS	✓					
DEC VAX/VMS	✓					

Every effort to provide an accurate, fair and objective comparison has been made. However, no guarantee can be made as to the accuracy of this chart. SUPER-LINK® is a registered trademark of Multi Soft Inc., Lawrenceville, NJ. Mozart™ is a trademark of Aspen Research. Easel™ is a trademark of Interactive Images, Inc. Arbiter® is a registered trademark of Tallgrass Systems.

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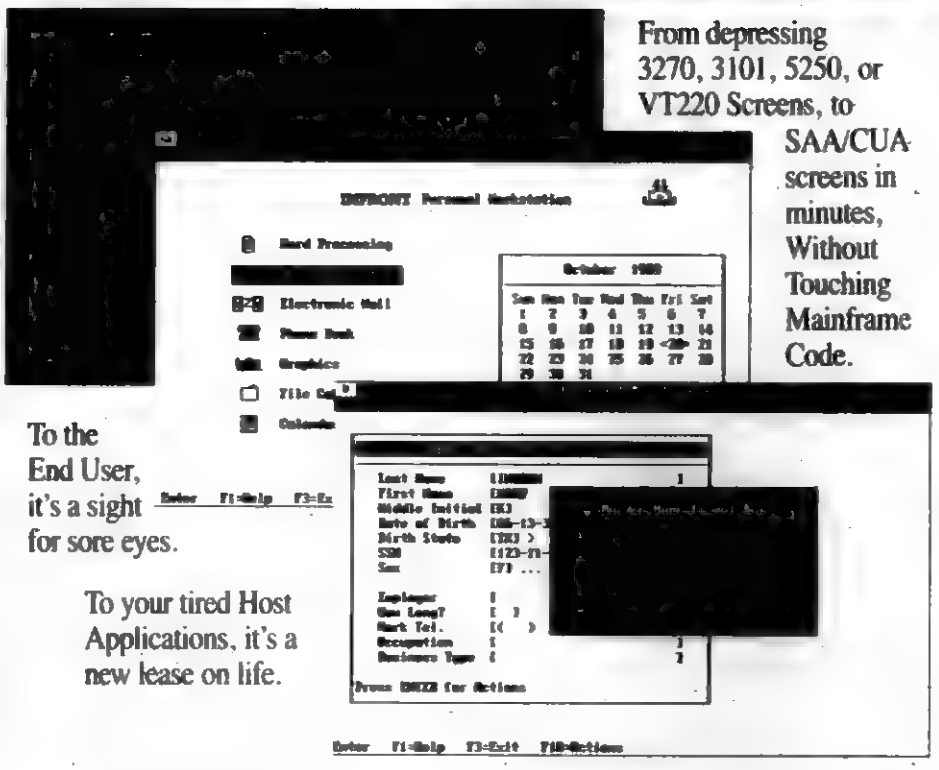

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VA, losing the paper war, fights back with imaging

ON SITE

BY ALAN J. RYAN
CW STAFF

If you think you've got paper storage problems, consider just one office of the Veterans Benefits Administration. When you get off the elevator at the fourth floor of the administration's building on Seventh Avenue in New York, you will see an entire floor of this city block-size building filled with file cabinets, which are crammed with paper.

The administration is required to save files on each veteran for 75 years after the veteran has died, said Mary Leyland, deputy director of vocational rehabilitation and education service at the Veterans Benefits Administration, a department within the Veterans Administration, in Washington, D.C.

The Veterans Benefits Administration has 37 million claims folders in offices around the country, and 20 million of them are active at any given time, Leyland said.

In 1987, the administration was implementing a new educational benefits program, called the Montgomery GI Bill. At that time, it was decided that rather than wind up with another floor full of paper, all claims filed under the Montgomery Bill should be scanned into an imaging system. VA administrators chose the St. Louis office, which serves 15 states, as the most promising site at which to begin. The imaging system will allow for electronic storage of documents that would otherwise be paper-based.

The $1.5 million project was based on a Filenet Corp. optical disc imaging system consisting of a jukebox, scanner, optical character recognition and Filenet terminals, incorporating a Wang Laboratories, Inc.-based word processing system and a Honeywell, Inc. financial system. It is linked to a Honeywell mainframe in Chicago.

The system was set up on a research and development basis in the St. Louis regional office, and it currently contains 35,000 files, Leyland said.

The imaging system is a stand-alone system in St. Louis, but it also links to the mainframe, where it can gather additional information.

The biggest challenges on the project involved integrating financial and word processing systems with the imaging system, Leyland said. The various tasks were sorted out in meetings among VA systems engineers, Wang engineers, Honeywell engineers and systems integrator American Management Systems, Inc. in Arlington, Va.

Next came the more important step of integrating the new system with the VA organization. The main users are adjudicators whose job is to process requests for GI bill claims, determine eligibility, look up discharge information, check to see if the school is approved, verify the number of credits the veteran is taking and issue checks.

Comfortable

They "took to the system like ducks to water," Leyland said. "We thought that while the adjudicators were computer-literate, perhaps this was more exotic than they could address. We shouldn't have thought that."

Using the new system and procedure, claims or school enrollment forms for the GI program come into the St. Louis regional office's mailroom. Before they are delivered to the adjudicators, the documents are scanned into the system.

"We have perfect control over incoming mail relating to veteran claims," Leyland said. "We always know where the information is, we prioritize the information, and we can control our work."

Users, used to working with files up to 10 inches thick, found that the imaging system gave them a clean desk and simultaneous access to files being used by another adjudicator.

Initially, the project was designed so that the adjudicator could have access to a veteran's entire claims folder. Large files might take as long as 70 seconds to retrieve. That has been modified so that now the user can either call up the five most recent files in any folder, which takes approximately five seconds, or call up the entire folder.

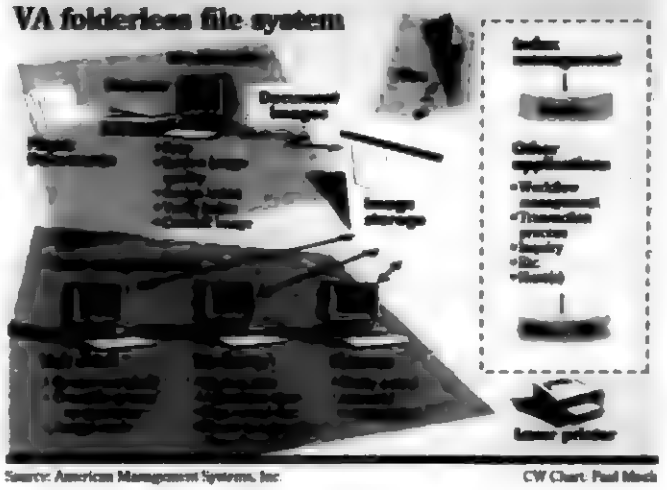
The system also automatically puts time-sensitive items at the top of the queue so that the adjudicator can see priority items as soon as a file is called up.

Imaging users now can call up financial information from a veteran on one side of the screen while viewing an application or claim on the other side. Adjudicators can also generate letters to claimants on another window.

"We didn't want two terminals," Leyland said. "We wanted windowing technology — a multifunctional terminal — and our consultant gave it to us. It was no small trick."

The imaging system is part of an overall migration strategy for the Veterans Benefits office. It is expected that all of the veterans benefits administration offices will be using imaging within the next five years, Leyland said.

VA folderless file system



Source: American Management Systems, Inc. CW Chart: Paul Mock

Administrators take Bull to school

BY SALLY CUSACK
CW STAFF

When Bull HN Information Systems, Inc. upgraded its relational database computer last spring, the company had hopes of expanding business among its top-of-the-line DPS 8000, 90 and 9000 computer user base. While it remains unclear whether Bull can have broad-based success with that system, a small group of users running the back-end database machine said they like what they see.

The Relational DBC System Model 386 supplements the company's Intel Corp. 80286-based machine, introduced to the market back in 1988. The enhanced version includes SQL capabilities and, like its predecessor, is based on Teradata Corp. technology coupled with the Bull Interel database management software resident on the host Bull computer.

Bob Hartsook, director of member services at the School Employees Retirement of Ohio, based in Columbus, has been using the Relational DBC 386 since its debut in March. He said he feels that the technology has already precipitated an increase in his department's productivity.

The School Employees Retirement services more than 50,000 retired school employees, excluding teachers, for the entire state, and it processes data on more than 100,000 active members at any given time. With the Relational DBC 386 machine functioning as a back end for the program's DPS 8000 mainframe, IS personnel have been able to process salary and demographically related queries in two to three minutes — a process that used to take 24 hours on the mainframe.

Quick return

According to Bob Coe, director of MIS, the organization paid about $500,000 for the machine and anticipates a return on investment in less than a year. He feels that the Relational DBC 386's performance is "a well-kept secret within the industry."

At least one longtime Bull customer saw no need for the upgraded model. The Jefferson County School system in Louisville, Ky., is using the older Relational DBC 286 version. The county enrolls 92,000 students in 155 schools.

John Balchunas, database administrator at Jefferson County Schools, said use of the Relational DBC is still in the development stage within the district. He has initiated several live projects, including one that tracks substitute teachers and provides their work history and availability.

"The program has actually cut down on the number of substitutes hired and saved the county money in the process," Balchunas said. Prior to the use of Relational DBC, employees were tracked manually, a time-consuming process.

The Relational DBC is tied to a DPS 8000 at the school system's IS headquarters. Ron Brown, lead analyst for student information, added that the county will also be using the database machine to track student information. The student information system will track student grades and will also be used to develop ad hoc profiles.

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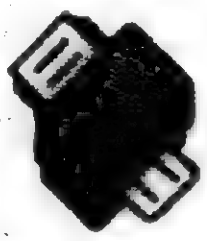

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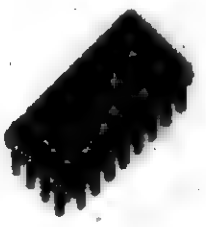

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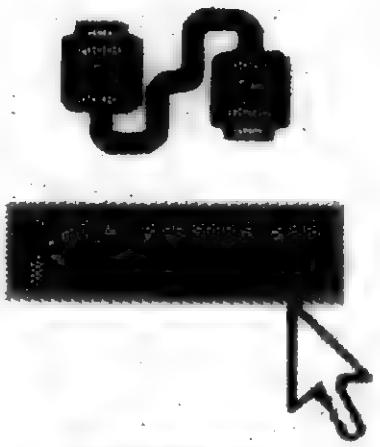
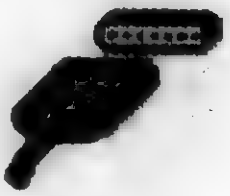


Desktop



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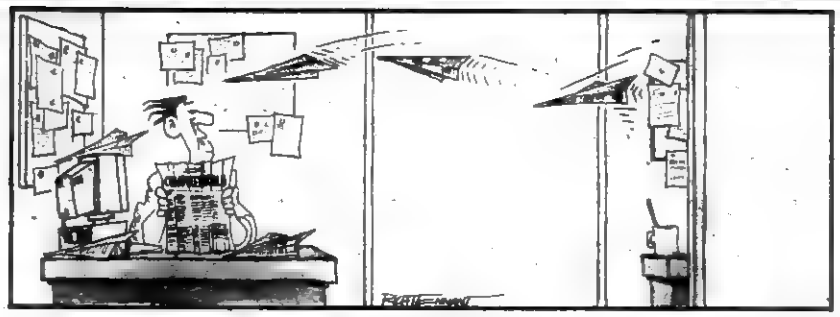

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No such thing as a perfect system

U.C. Berkeley manager Lavender keeps systems up and running, despite tight budget

ON SITE

BY MAURA J. HARRINGTON
CW STAFF

Working in what is known as a wellspring of Unix, staffers at the information systems and technology department at the University of California, Berkeley, are not exempt from a problem that almost everyone faces — a tight budget.

As George Lavender, manager of Unix systems, knows, no system is a perfect system. "There is no such thing as a system that doesn't break down," said Lavender, whose job includes making sure the system is up and running.

The IS and technology department, though not the only computer center within the university, is the largest. It includes two Sun Microsystems, Inc. Sunclusters: one with about 60 Sun 350 workstations, called the Web and used by more than 5,000 students, and two with 45 Sun 350s, used by the math department and the IS and technology staff.

The center also includes a Digital Equipment Corp. VAX 8800, which is being replaced by a VAX 6420, and a VAX 8650 system, both of which are general-purpose shared systems. The department houses an IBM 3090 system running MVS for administrative tasks and CMS for academic work. There is also a Cray Research, Inc. X-MP-14 supercomputer running Unicos, Cray's version of Unix, which is used for scientific work, according to George Marinos, a consultant who works in the university computer room.

Lavender, who has been working at Berkeley in the IS and technology department for more than 16 years, wears many hats. He teaches, does consulting, writes documentation for users, builds system implementations, installs system software and is in charge of upgrading the operating system, which mostly uses two flavors of Unix — the university's Version 4.3 and DEC's Ultrix Version 3.4, he said.

"Problems happen all the time, but it only makes me nervous when we're trying something new," Lavender said, "because with a tight budget, the pressure is on . . . We no longer have the luxury of slowing down our changes, and the problems become management problems." From the manager's point of view, it is harder to convert a system than to buy a new one because of the increased number of constraints on a conversion, such as meeting the needs and desires of the users, Lavender said. If the users are used to a specific system, it is also harder to get them to learn a new one, because although users want improvement, they are not as adaptable to change. However, Lavender said, while his smaller budget makes it difficult for his department to keep up with state-of-the-art technology, the job can — and will — be done.

This year, the IS and technology department is in the process of upgrading its DEC 8800-level VAX superminicomputer to DEC's 6420 VAX system.

"It's going OK, but because the 6420 is new, there are some bugs in it . . . There seems to be a bug that causes the system to crash occasionally . . . and the response from DEC is a lot slower than you'd think," said Lavender, who is also in charge of the conversion.

Ed Kashi

Berkeley's *IS & tech center survives tight times*

While any conversion is no small task, Lavender said it is not the equipment part of his job that gives him the most difficulty. The hardest part, Lavender said, is the user documentation and questions from students and teachers.

> "PROBLEMS happen all the time, but it only makes me nervous when we're trying something new."
>
> GEORGE LAVENDER
> UNIVERSITY OF CALIFORNIA, BERKELEY

"The knowledge of our computer users varies tremendously, making it difficult to accommodate everyone sometimes," Lavender said. "There are some users who barely know how to turn on a computer, and then there are some who are very knowledgeable."

Bozman

CONTINUED FROM PAGE 25

falloff of orders? Buying a state-of-the-art machine would be a No. 1 priority if you were running "infrastructure" computers that keep an airline or bank on-line. Those are the kind of resource-hungry applications that keep the mainframe salesmen busily writing orders for CPUs and disk drives.

However, some applications do not appear to require the latest and greatest. Factory applications can be run quite well on midrange machines made by IBM, DEC or Hewlett-Packard, thank you very much.

Hospitals and government agencies have been getting along on a combination of minicomputers and mainframes for the last 15 years or so, to no apparent ill effects. Utility companies and industry associations have been known to push some old mainframes for 20 years or more.

Now that we're in the 1990s, it appears that choosing software — and finding the appropriate place to run it — will be influencing users' buying decisions more than any other single factor.

Consumers finally seem to be buying into the client/server model, even if the IBM mainframe is the server, and the IBM Personal Computer is the client.

That's why Mutual Benefit Life in Newark, N.J., is leveraging OS/2 on the desktop to pry insurance claim files out of the mainframe.

That's why Frito-Lay is peeling layers of data off its centralized DB2 databases and analyzing sales and marketing information on the desktop.

In the Unix world, a variety of "new" machines are starting to take the place of the traditional mainframe host. Among these are computers made by Sequent Systems, Pyramid Technology and AT&T.

Just ask Hyatt Hotels, which recently unplugged an IBM 4381 mainframe and substituted a set of four Unix hosts to run its on-line reservations system.

Even proprietary architectures such as DEC's VMS operating system and Tandem Computer's Nonstop, VLX and Cyclone systems are being made to fit into this emerging client/server model.

The brave new world of information systems, then, is changing all the rules about purchasing computer power. You don't have to have a mainframe, but it helps. You can use a minicomputer as your host.

You can even run your entire business on a bunch of PC local-area networks, provided it isn't an airline, of course. In the early 1990s, tightened budgets — as much as anything else — are forcing new choices and forging new kinds of architectures.

Bozman is *Computerworld's* senior West Coast editor.

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HARD BITS

Stratus makes perceptive deal

Stratus Computer, Inc. and **Perception Technology Corp.** in Canton, Mass., will be marketing a voice processing system from Perception on Stratus' XA2000 fault-tolerant computers. Telecommunications suppliers and corporate network users will be the main target of the alliance, the firms said. Perception's voice processing applications include telemarketing, talking telephone directories, phone banking, order processing and 800 services.

Bell Atlantic Knowledge Systems, Inc. in Morgantown, W. Va., and **Digital Equipment Corp.** have agreed to develop compatible application software, with DEC promoting Bell's Laser software for its proprietary VMS and Unix-based Ultrix platforms. Laser is a C language-based expert system development environment used in applications such as credit verification, help desk programs and concurrent engineering.

DEC and **Sanchez Computer Associates, Inc.** will jointly market and sell Sanchez's Profile/Commercial Lending System to the banking industry. Profile/CLS can be built into a commercial bank's network and integrated with other DEC and third-party applications, company officials said. The product offers banks the ability to manufacture, price and deliver a new commercial product or service tailored to individual customers.

DEC and **Objectivity, Inc.** have announced a joint development and marketing partnership for Objectivity/DB, an object-oriented database management system. Objectivity/DB is a complementary solution to VAX RDB/VMS, DEC's relational DBMS. Objectivity/DB runs on multiple hardware platforms and supports software development across a variety of environments.

Tandem Computers, Inc. has announced that **Cellular Technical Services Co.** in Seattle has joined the fault-tolerant vendor's alliance program, which encourages development of application software for Tandem systems. Cellular Technical Services, a joint venture of Nationwide Cellular Services and Nynex Mobile Communications Co., develops real-time billing systems for providers of cellular phone service.

The 88open Consortium Ltd. has added **Encore Computer Corp.** in Fort Lauderdale, Fla., to its organization of systems and software suppliers, all of which support **Motorola, Inc.**'s 88000 reduced instruction set computing architecture. Encore brings its own industry-standard software applications to the consortium through its recently announced Encore '90 family, a line of high-performance, real-time Unix-based systems. Encore officials said they intend to encourage additional integration of 88open and Open Software Foundation activities.

TPF

CONTINUED FROM PAGE 25

focus is on speeding up its mainstream products," said Mark Hess, IBM systems program director at Gartner Group, Inc. in Stamford, Conn. "They're trying to speed up CICS and IMS under the MVS/ESA operating system."

Still, the staunchest supporters of TPF prize its speed and capacity to support thousands of end users. Among them are Citibank NA, Manufacturers Hanover Trust Corp., Visa International, American Airlines and United Airlines.

However, in many cases these TPF-based systems are running alongside standard MVS systems, users said. "TPF is designed to handle fairly simple transactions, compared with MVS and IMS," said Frank Auer, manager of infrastructure systems development at United Airlines' subsidiary Covia Corp. "Using TPF in a cooperative processing environment gives us the flexibility to use other mainframe systems to handle the more complicated transactions."

Meanwhile, new technologies threaten to overtake TPF by the mid-1990s. Tandem Computers, Inc. is pitching its fault-tolerant Cyclone mainframe against TPF and winning some accounts, including the Paris Stock Exchange. Still, analysts said they do not expect TPF to disappear soon. One sign: Programming teams at American Airlines and United Airlines are working with IBM under nondisclosure agreements to enhance performance on Summit machines under TPF 4.0.

Pump up the velocity

TPF delivers on its promise of high speed by shortening the path length between the central CPU complex and the multiple disk drives on which data is stored. A single airline passenger record is split up into dozens of short pieces, which are then written to dozens of disks simultaneously. This scattering of data enables TPF to call those airline records back into CPU memory at maximum speed.

By using shared memory, TPF portrays all data in a "single-system image." It does so at high cost, however, since the primary engine for TPF is a cluster of multimillion-dollar IBM 3090 systems, all churning at high I/O volumes. Monthly license fees for TPF run from $18,000 to $23,000 per machine.

Many users are upgrading to TPF Version 3.1, which lets TPF grab data from a "back-end" database such as IMS or DB2. TPF Version 3.1 supports up to 3,999 disk drives and allows system memory to be partitioned under IBM's PR/SM facility.

JEAN S. BOZMAN

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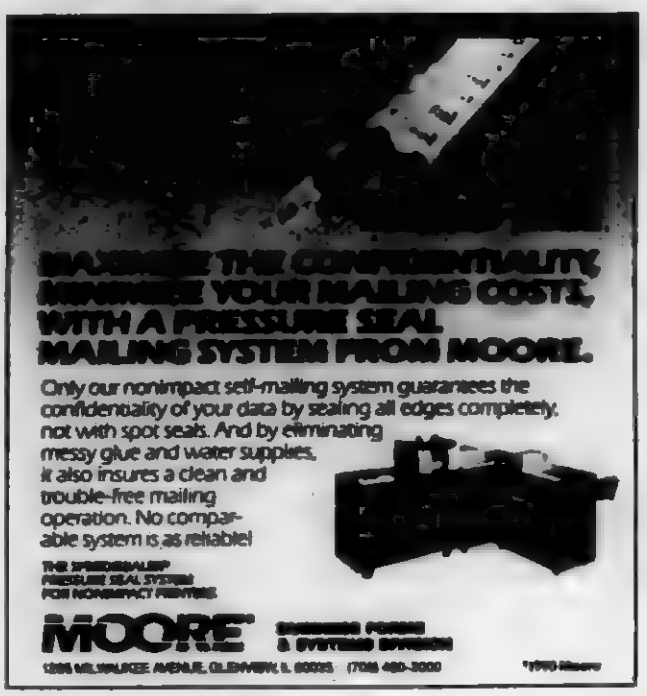
BIMSPOON — On-Line to Batch Print Spooling. Prints data passed from CICS application programs into the POWER spooling queue.
BIMSPLIT — May be used separately or with BIMSPOOL to print parts of an existing job to terminal printers at separate sites.
BIM-PDQ — POWER Dynamic Queuing performance enhancement. Eliminates 85% of the I/O to heavily used POWER queue.
BIM-PADS — Automatically alters or deletes DOS POWER spooled job entries at preset intervals.
BIM-ODIS — Comprehensive problem analysis and display of operational CICS system. ODISTRAK is an optional historical reporting feature to be used with BIM-ODIS to generate reports relating to system usage. DOS and OS.
BIM-BUFF — Significantly increases the performance of VSAM under DOS by dynamically managing VSAM buffers.
BIMTEXT — Word processing, document composition system. Create formatted documents from free-form input. DOS and OS.
BIMSWAP — Switch local 3270 BTAM terminals between multiple CICS partitions without special hardware or additional ports.
BIMCMPRS — CICS 3270 data compression system. Reduces response time for remote terminals significantly. DOS and OS.
BIM-PMAP — CICS BMS on-line map generation and maintenance. DOS and OS.
BIMECHO — Copies one CRT's output to another or printer for problem determination and demonstration. DOS and OS.
BIMP3270 — Comprehensive CRT screen image print facility. Copy to terminal printers or spool queue for system printer. DOS and OS.
BIMSERV — On-line display of library directories and entries, VSAM Catalog entries, disk VTOC's, etc.
BIMCNSOL — Multiple/Remote System Console function for CICS. Display-only or full input/display versions available.
BIMMONTR — DOS/VSE System Status, Performance Measurement, and POWER Queue display.
BIMSUBMT — On-line Job Edit and Submission facility.

BIM programs are cost-efficient, some less than $800, average $2500. You can save even more with our group package offerings. Products are available on permanent, annual, or monthly licenses, and shipped on a 30-day free trial basis. Product documentation is available on request.

BIM also performs systems programming consulting, with consultants based in Minneapolis and Washington, D.C. Computer time services are also available on our 4361-5 system, on-site or remote.

BIM® B I MOYLE ASSOCIATES, INC.
5786 Lincoln Drive
Minneapolis, MN 55436
612-933-2885
Fax (612) 933-7764



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Software Labs Division: (714) 889-2663 Systems Software Marketing Division: (916) 635-5535
Zantho Systems Division: (613) 727-1397

NEW PRODUCTS — HARDWARE

Processors

Radstone Technology has introduced a Motorola, Inc. 68040-based VME processor board that provides multiple local and external buses as well as multiple microprocessors and dual-ported memories.

The 68-41 single-board computer is equipped with up to 16M bytes of multiported dynamic random-access memory with cache-burst-fill support coupled to an on-board 40-MHz processor.

Pricing starts at $6,995.

Radstone Technology
20 Craig Road
Montvale, N.J. 07645
(800) 368-2738

Perception Technology's *Vocom 40 stores up to 350 hours of speech*

Perception Technology Corp. has announced the Vocom 40, a midrange voice processing system that uses Version 3.2 of Interactive Systems Corp.'s industry-standard Unix operating system as the platform for its application processor.

The product includes multiple-host connectivity; on-line application changes, system management and voice messaging capabilities; and call progress and out-dialing features. It can be configured to handle from 24 to 96 lines and can store from 15 to 350 hours of speech, the vendor said. Pricing ranges from $80,000 to $190,000, depending on configuration.

Perception Technology
40 Shawmut Park
Canton, Mass. 02021
(617) 821-0320

Data storage

Emulex Corp. has announced a small computer systems interface (SCSI) subsystem designed for Digital Equipment Corp. MicroPDP-11, Microvax II and Microvax 3300, 3900 and 5400 systems.

The Emulex SCSI Subsystem kit includes an Emulex SCSI host adapter, one or two embedded SCSI 5¼-in. Winchester disk drives, mounting hardware and cables.

Pricing begins at $6,125 for a kit, with one 760M-byte drive.

Emulex
P.O. Box 8725
3545 Harbor Blvd.
Costa Mesa, Calif. 92626
(714) 662-5600

I/O devices

Bottomline Technologies, Inc. has introduced a product equipped with a software package that enables a set of personalized starter checks to be printed for customers opening new bank accounts.

The BT 5015 Laser Check Printer allows banks to immediately print checks with a customer's name, address and phone number instead of requiring a standard two-week waiting period.

The printer can be attached to IBM Personal Computers, minicomputers and mainframes. It is available for $11,615.

Bottomline Technologies
One Court St.
Exeter, N.H. 03833
(603) 778-1924

JRL Systems, Inc. has introduced a laser output device that allows Ethernet attachments and Transmission Control Protocol/Internet Protocol file transfer protocol communications in a nonhomogeneous, multiple-workstation environment.

The 340SS High-Res Laser Engineering Graphics System is available in 300 and 400 dot/in. versions that create A- and B-size drawings and documents from computer-aided design systems and workstations under any of nine input formats.

Pricing is $22,995 for the 300 dot/in. version and $24,995 for the 400 dot/in. model.

JRL Systems
6101 W. Courtyard Drive
Austin, Texas 78730
(512) 345-7122

Spectragraphics Corp. has introduced a terminal that provides simultaneous multisession access in IBM 3270 and 5080 mainframe environments.

The Lanset 2100 enables users to access up to two 3270 and 5080 applications at once with a point-and-click-style graphical user interface window manager.

It connects with Ethernet local-area networks with Transmission Control Protocol/Internet Protocol to enable users to access multiple computers and applications in a distributed LAN environment.

The basic price is $12,700.

Spectraphics
9707 Waples St.
San Diego, Calif. 92121
(619) 450-0611

Interface Systems, Inc. has added two products to its ISI 8262-D series of high-speed band printers designed for coaxial attachment to IBM mainframes.

The ISI 8262-D13 can be used to produce solid-formed, letter-quality output at maximum speeds of 350 line/min, while the ISI 8262-D03 can print up to 700 line/min, the vendor said. Both are available with 48-, 64- and 96-character bands.

Pricing for the ISI 8262-D13 begins at $8,850; the ISI 8262-D03 starts at $10,800.

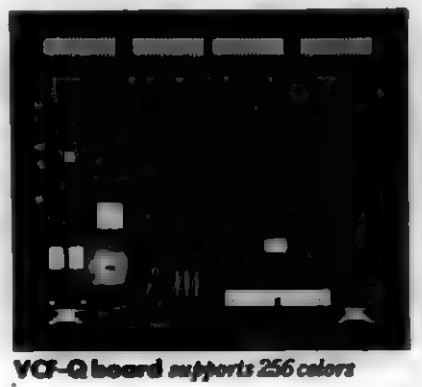
Interface Systems
5855 Interface Drive
Ann Arbor, Mich. 48103
(313) 769-5900

Laser Design, Inc. has introduced a line of three-dimensional laser digitizing systems designed for use in computer-aided design and manufacturing applications.

Models 1000, 2000 and 4000 of the Surveyor 3D Laser Digitizing System enable users to perform noncontact laser digitising, generate 3D surface information and then organize the data for computer-integrated manufacturing design applications.

Pricing ranges from $65,000 to $1 million, depending on type of model and configuration.

Laser Design
9401 James Ave. South
Minneapolis, Minn. 55431
(612) 884-9648



VCF-Q board *supports 256 colors*

Peritek Corp. has announced a 32-bit CPU-based 8-bit color graphics display controller that is compatible with Digital Equipment Corp.'s complete line of Q-bus-based computers.

The VCF-Q quad-height board includes a 24-bit color palette that supports 256 active colors. Its display memory can be expanded to 2,048 by 1,024 addressable pixels to produce a 1,280- by 1,024-pixel actual display or two pages of 1,024- by 1,024-pixel images for double-buffered displays, the vendor said.

Pricing begins at $2,500, and a complete system with a 19-in. monitor, cables, keyboard and software costs $5,595.

Peritek
5550 Redwood Road
Oakland, Calif. 94619
(415) 531-6500

Digital Equipment Corp. has introduced the VT1200 Windowing Terminal, a device that enables users to view and run one or more applications simultaneously.

The product is equipped with a 15- or 19-in. monitor that provides 1,024- by 864-pixel and 1,280- by 1,024-pixel reso-

Continued on page 40

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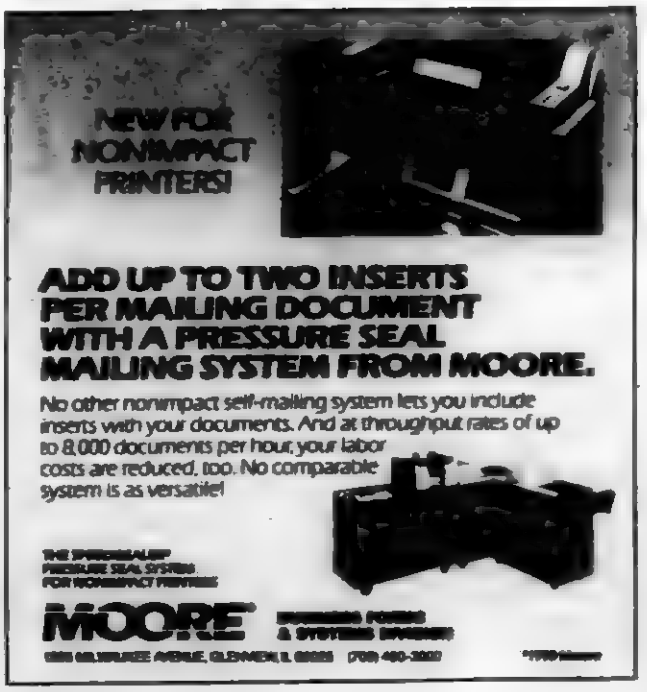
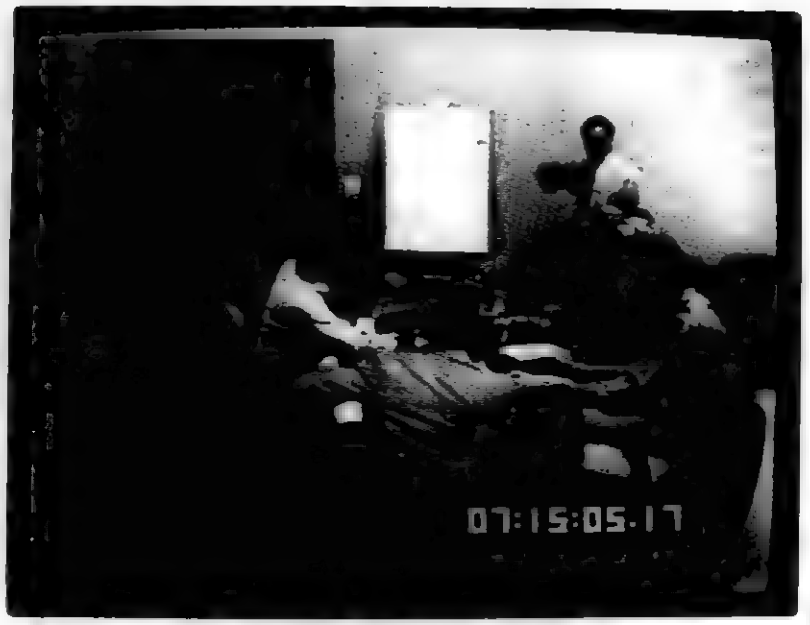
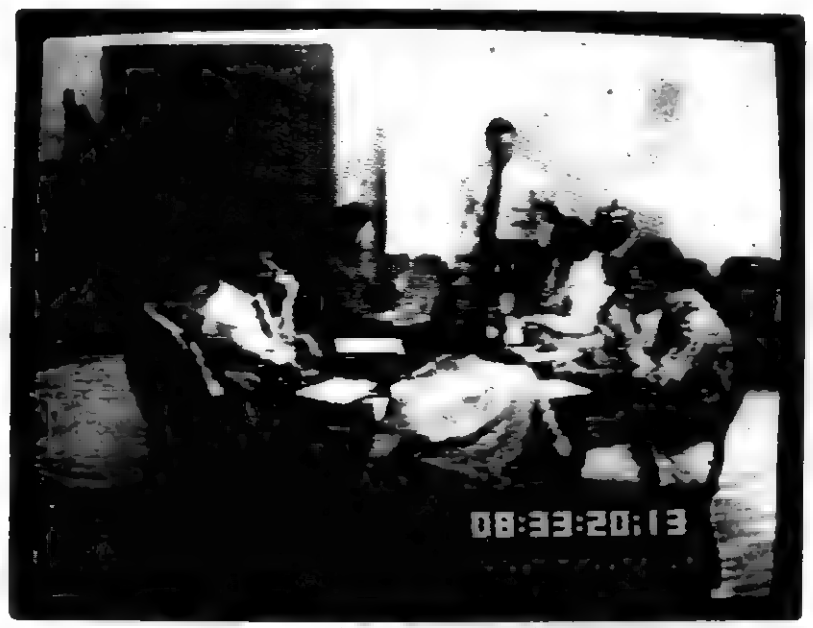




"My ultimate PC system? Well, for starters, it's got to be compatible with everything I've got already... so you can take a floppy from an old PC, pop it into a new one, and it will work."

"Networking PCs is a major pain. I'd like to see PCs designed to do networking without lots of configuration work... and still connect with all the networks I've already installed."

"We've got plenty of data... the challenge is to put it in the hands of decision makers in a form they can use. The perfect PC would be an ideal client to all my information systems."



"Every time I turn around, vendors change the operating system or interface. I want to be able to drop the hottest new box on my executives' desks and know their software will run."

Hidden camera reveals the se

Not long ago, we invited hundreds of IS managers to talk about their wildest desires in a personal computer system.

They talked. We listened. We videotaped. And when we got those tapes back to Silicon Valley, popped them in the VCR and started watching, it confirmed what we knew all along.

They wanted a personal computer system that was compatible enough with their existing PCs to trade files on floppy disks. Like Macintosh.®

They wanted a system with the power and flexibility to run thousands of business programs and almost any kind of operating system: MS-DOS, Macintosh and UNIX.® Like Macintosh.

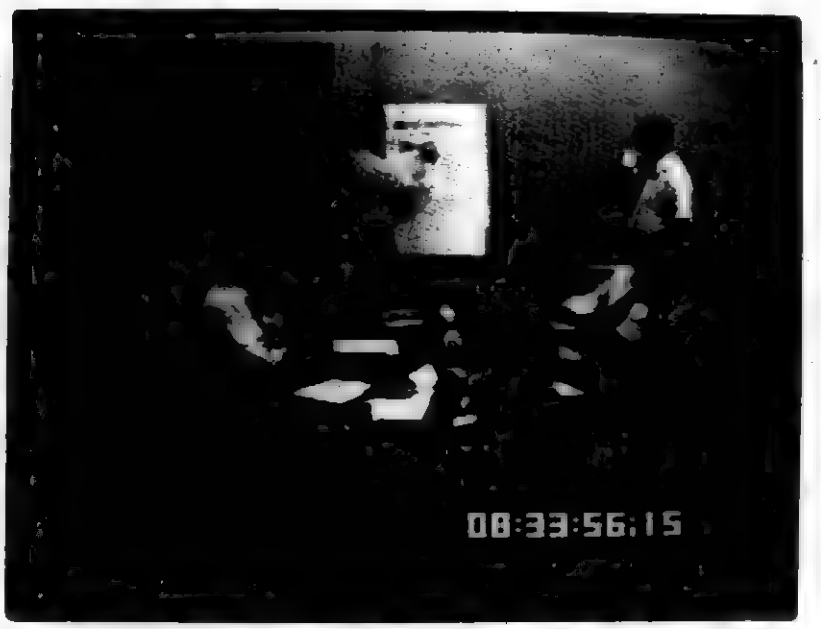
They wanted a graphical user interface with no compromise in performance. Like Macintosh.

And they wanted all their software to have a single way of working, so training and support costs could be dramatically lower. Like Macintosh.

© 1990 Apple Computer Inc. Apple, the apple logo and Macintosh are registered trademarks, and "The power to be your best" is a trademark of Apple Computer Inc. UNIX is a registered trademark of AT&T Corporation. MS-DOS is a registered trademark of Microsoft Corp. The above quotes are representative samples of what IS managers have told us.

"A graphical interface is clearly important... users love 'em. But the architecture has to be designed to handle it or the performance compromise is unacceptable."

"I'd like to see more discipline from software developers. Commands should be consistent for every application... it would eliminate the cost of constantly retraining."



"My company's needs go way beyond off-the-shelf software. I need serious development tools my existing programming staff can use to develop custom apps quickly and easily."

"Macintosh? No kidding?"

cret desire of 200 IS managers.

They wanted a system with sophisticated networking capabilities built in, that could let users access almost any host or file server via any kind of network. Like Macintosh.

They wanted all these things in a wide range of personal computers. That would all work the same way and run the same software. Like Macintosh.

And they wanted powerful development tools that would let their existing programming staff build applications quickly and easily. Like Macintosh.

In short, they wanted everything that Macintosh offers. But they just didn't realize they could have it today.

For all the details, see an authorized Apple reseller today.

Now that we know all of your secrets, it's time you found out about all of ours.

The power to be your best.™

Continued from page 37

lution, respectively. Each monitor also provides 100 dot/in. resolution and operates at a 72-Hz refresh rate.

The 15-in model is priced at $2,695 and is available 60 days after receipt of order. The 19-in. model costs $3,395 and is available now.

DEC
129 Parker St.
Maynard, Mass. 01754
(508) 635-8290

NEW PRODUCTS — SOFTWARE

System software

Goal Systems International, Inc. has announced Version 1, Release 2 of OPS/MVS, a software package designed to enable users of IBM MVS mainframes to manage system events and console message traffic.

The product includes an Automation Analyzer, a feature that allows users of OPS/MVS to examine events that occur in a data center and perform a statistical analysis of where an optimal gain can be achieved.

Pricing ranges from $25,000 to $80,000, depending on CPU size and number of options selected.

Goal Systems
7965 N. High St.
Columbus, Ohio 43235
(614) 888-1775

Development tools

Admins, Inc. has announced Admins/V32 Version 4.0, a Digital Equipment Corp. VAX/VMS integrated set of application development tools that includes Admins Data Dictionary.

The dictionary features a repository for information about various entities and relationships that compose an Admins-based information system.

The product began shipping in July to current customers at no charge as part of a software maintenance release. A four-user site license costs $16,000.

Admins
Cambridge Business Center
432 Columbia St.
Cambridge, Mass. 02141
(617) 494-5100

Eden Systems Corp. has announced Version 2.1 of Q/Auditor Cobol, a tool designed to measure the quality of Cobol programs.

The product includes more than 450 measurements that enable programmers to avoid error-prone conditions in maintenance and eliminate code reviews. Other features include a set of Metric Analysis Reports; Audit, Diagnostic and Diagnostic Summary Reports that are available in 80- or 133-column formats; and a percent grading system.

A site license for IBM MVS mainframes costs $30,000; a personal computer version sells for $950.

Eden Systems
14950 Greyhound Court
Carmel, Ind. 46032
(317) 848-9600

Applications packages

Access Technology, Inc. has introduced 20/20 Gold, a software package that bundles its 20/20 spreadsheet for Digital Equipment Corp. VAX/VMS with several 20/20 add-in connectivity products.

It includes a 20/20 database connection to two VAX/VMS database management packages; a 20/20 word processing connection for one VAX/VMS word processing package; a 20/20 software interface for DEC's All-In-1 office software package; and 20/20 Openlink, a tool that lets users and independent spreadsheet application developers build add-in functions to 20/20.

Pricing ranges from $1,020 for Vaxstation versions to $22,100 for VAX 6000 versions.

Access Technology
Two Natick Executive Park
Natick, Mass. 01760
(508) 655-9191

RMS Associates has announced a version of Realworld Corp.'s Realworld Accounting System that runs in native mode on any IBM Application System/400.

The integrated product is composed of 12 modules that feature uniform screen layouts, keyboard use and movement through programs. The package enables users to maintain records and perform accounting and control functions for more than 1,000 companies, the vendor said.

Sales Analysis, Check Reconcialition and Installation Kit modules are priced from $300 to $500; other modules cost $995 each.

RMS Associates
250 Eddy Dowling Highway
N. Smithfield, R.I. 02895
(401) 769-9404

Northern Research and Engineering Corp. has introduced a Unix-based version of MAX-AB, a specialized computer-aided manufacturing software system for creating five-axis machining instructions for producing turbomachinery components with sculpted blade surfaces.

Max-AB Version 1.3 can run on Silicon Graphics workstations and other workstations running Unix System V, Release 3.2. It is available for Digital Equipment Corp. VAX and Microvax systems or

Continued on page 42

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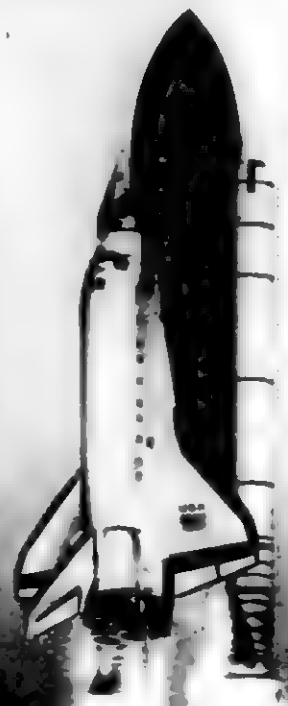
...PARITY™ DBSS



Within The Edit Session:

Functions
- Builds, tunes, tests and times SQL
- Provides an interactive tuning guide
- Hosts a complete on-line tutorial
- Standardizes SQL
- Delivers a comprehensive plan analysis

Features
- Contains an Applicator

Benefits
- Cuts development costs by 20% or more
- Tunes, tests and times SQL before the first pre-compile
- Minimizes programmer demands on DBAs' time
- Reduces CPU cost
- Requires no special education
- Promotes programmer awareness of efficient SQL

SCHEDULE THE ULTIMATE GOAL

Some job schedulers can eclipse your entire data center. You wait – to change your business to fit a scheduler. Operations waits – for system resources tied up by a scheduler. Like an eclipse, you can't do much but wait until the darkness ends.

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JOBTRAC saves resource time. Other schedulers freeze resources until the entire job completes – JOBTRAC has step-level resource management. And JOBTRAC uses ISPF Edit to define 24 jobs in a single screen. Many of our customers have scheduled hundreds of jobs – before lunch. With JOBTRAC, you're on your way to fully automated scheduling – in a single day.

Saving time. Saving resources. With Goal's Automated Systems Operations products – JOBTRAC, OPS/MVS, SAR, Express Delivery – you have the simplicity to get started and the power to reach your ultimate goals. To schedule your appointment with Goal, call 1-800-829-9002.

Goal Systems

Continued from page 40

Unix-based workstations. It costs $73,500, including source code.

Northern Research and Engineering
39 Olympia Ave.
Woburn, Mass. 01801
(617) 935-9050

Cyma, a division of Worldwide Technology, Inc., has announced Version 2.0 of its Professional Accounting Series Job Control software.

The product features an estimating capability that allows users to create estimates based on flat dollar amounts. It can also be used to track labor and materials or compare budgets and estimates.

Version 2.0 runs on DOS and local-area network platforms.

The product is priced at $995.

Cyma
1400 E. Southern Ave.
Tempe, Ariz. 85282
(602) 831-2607

Xerox Corp. has announced its Chess family of software products designed for manufacturing businesses.

The series enables manufacturing firms to manage and control assets and reduce inventory and overhead. It includes modules for several applications, including engineering, forecasting and master production scheduling.

The product is currently available for IBM Enterprise System 3000, 4300 and 9370 machines, as well as the RISC/System 6000 family of processors. Prices for a 15-application package for multiuser Intel Corp. 80320-based systems running Xenix begin at $50,000.

Xerox
5310 Beethoven St.
Los Angeles, Calif. 90066
(213) 306-4000

Trax Softworks, Inc. has introduced Version 3.0 of Edword, a word processing software package for mainframes.

The product can be customized to work with existing mainframe software to create reporting systems, letter-writing systems and communications facilities. It enables data to be printed from Xerox Corp. 2700, 3700 or 4045 series machines, Hewlett-Packard Co. Laserjet devices or IBM AFP machines.

Edword runs under VMCMS, TSO, CICS and Roscoe operating systems. License fees range from $6,200 to $23,370, depending on CPU size.

Trax Softworks
5840 Uplander Way
Culver City, Calif. 90230
(213) 649-5800

Utilities

Raxco Software, Inc. has announced a tape utility designed to monitor and manage the activities of magnetic storage on Digital Equipment Corp. VAX/VMS systems.

The Tapecontrol tape management system cross-references all tape mounts, dismounts and initializations; checks expiration dates on all tapes to prevent an accidental overwrite; and automatically maintains a database of all ANSI tapes.

License fees range from $2,350 to $19,500, depending on type of VAX configuration.

Raxco
2440 Research Blvd.
Rockville, Md. 20850
(301) 258-2620

Macro 4, Inc. has released its latest version of Words Online, an on-line help and text management software package.

Version 1.7 introduces Help windows and cut-and-paste features, both of which enable data to be transferred from a window into the fields of a transaction screen. The product is also enhanced with a facility that incorporates data held in IBM CICS files into Help displays.

VSE versions sell for $385 to $560 per month. MVS versions cost between $525 and $760 per month. Pricing is based on one- or two-year leases.

Macro 4
P.O. Box 187
Brookside Plaza
Mount Freedom, N.J. 07970
(800) 766-6224

Hamilton Systems, Inc. has announced Version 1.2 of Infobus, its information tool for users of TSO and ISPF.

The software package provides programmers with a mechanism for accessing and communicating daily information. It also enables programmers to access installations standards and data.

An introductory license fee costs $4,800 until Oct. 1.

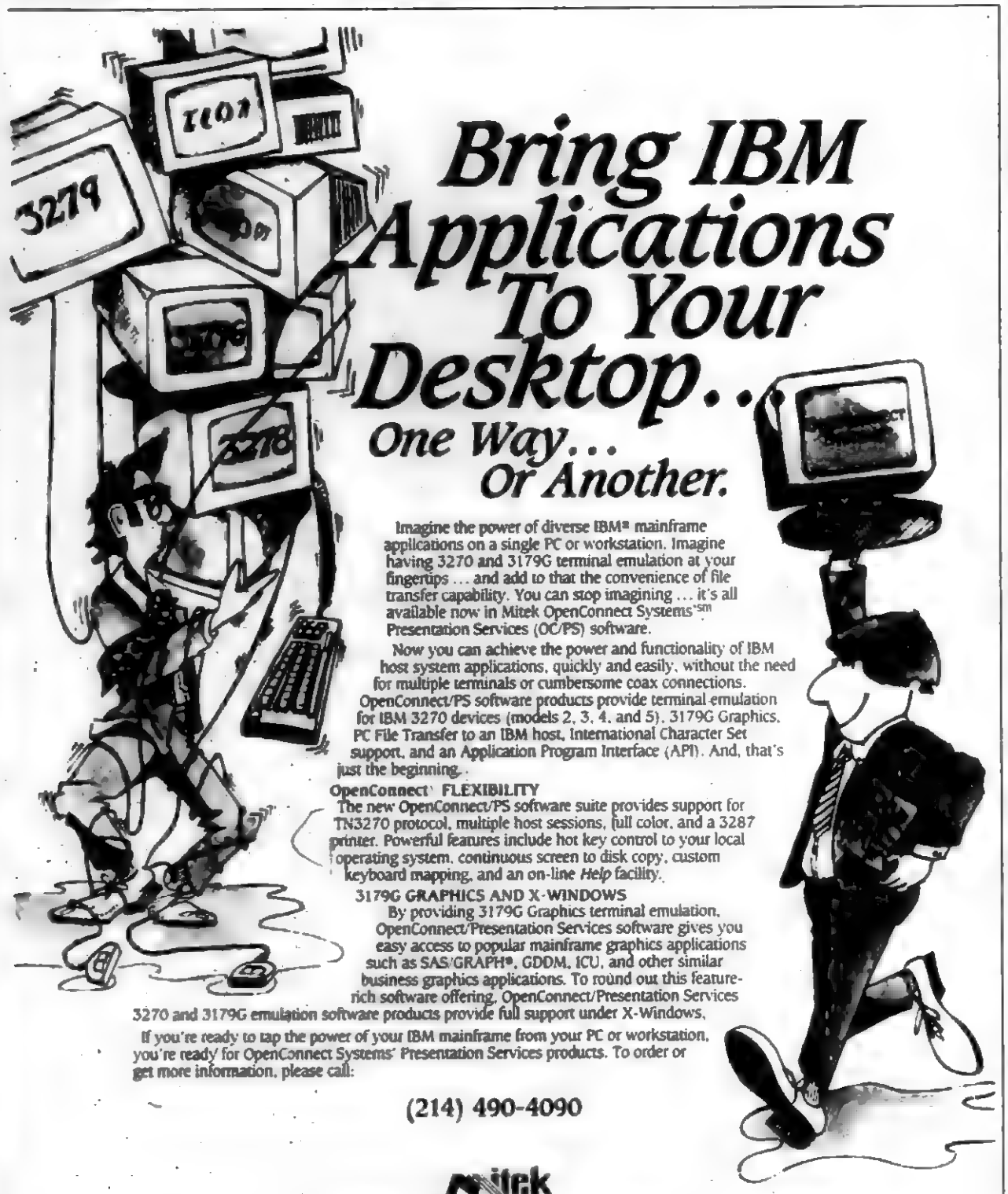
Hamilton Systems
2783 Knollsville Lane
Vienna, Va. 22180
(703) 560-3633

Visoft, Inc. has introduced Via/Smartedit, a tool that allows users of ISPF Editor to automate various enhancement and maintenance tasks.

The product uses Visoft's Analytical Engine to extract extensive information about how Cobol programs operate and store data in Visoft's Application Knowledge Repository. Users can then use this information to improve the ISPF basic command set and add commands that understand Cobol's logic.

Via/Smartedit is compatible with all versions of Cobol and requires ISPF Editor Release 2.0 or higher. It is priced between $25,000 and $39,500, depending on CPU class.

Visoft
3033 N. 44th St.
Phoenix, Ariz. 85018
(602) 952-0050



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Imagine the power of diverse IBM® mainframe applications on a single PC or workstation. Imagine having 3270 and 3179G terminal emulation at your fingertips ... and add to that the convenience of file transfer capability. You can stop imagining ... it's all available now in Mitek OpenConnect Systems'sm Presentation Services (OC/PS) software.

Now you can achieve the power and functionality of IBM host system applications, quickly and easily, without the need for multiple terminals or cumbersome coax connections. OpenConnect/PS software products provide terminal emulation for IBM 3270 devices (models 2, 3, 4, and 5), 3179G Graphics, PC File Transfer to an IBM host, International Character Set support, and an Application Program Interface (API). And, that's just the beginning.

OpenConnect' FLEXIBILITY

The new OpenConnect/PS software suite provides support for TN3270 protocol, multiple host sessions, full color, and a 3287 printer. Powerful features include hot key control to your local operating system, continuous screen to disk copy, custom keyboard mapping, and an on-line *Help* facility.

3179G GRAPHICS AND X-WINDOWS

By providing 3179G Graphics terminal emulation, OpenConnect/Presentation Services software gives you easy access to popular mainframe graphics applications such as SAS/GRAPH®, GDDM, ICU, and other similar business graphics applications. To round out this feature-rich software offering, OpenConnect/Presentation Services 3270 and 3179G emulation software products provide full support under X-Windows.

If you're ready to tap the power of your IBM mainframe from your PC or workstation, you're ready for OpenConnect Systems' Presentation Services products. To order or get more information, please call:

(214) 490-4090

Mitek
OPENCONNECT SYSTEMS℠
2033 Chennault Drive
Carrollton, Texas 75006
FAX: (214) 490-5052

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SO FEW SOLUTIONS.

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We're pioneering this application with the release of OPS/MVS Version 2. With its Resource Management Control Facility (RMCF), you use on-line screens to specify operating policy—even critical rule declarations that determine how resources are managed. OPS/MVS then enforces that policy automatically. You get automation benefits without programming.

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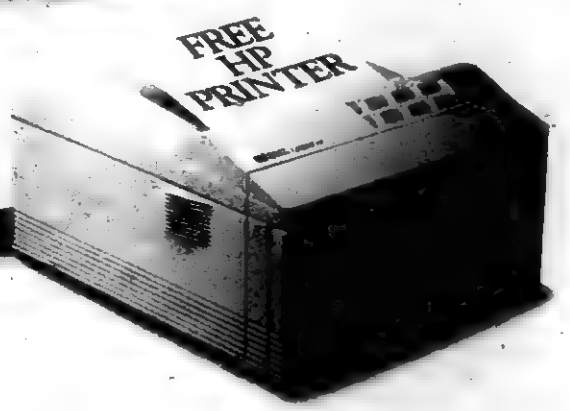

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For a limited time only, our PCs come with priceless bonuses: free HP LaserJet IIP, III, IIID and DeskJet 500 printers. Contact your participating HP dealer for full details. Call **1-800-752-0900, Ext. 1562** for the dealer nearest you.

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Offer ends December 31, 1990.

COMMENTARY

Douglas Barney

A choice is born

April 10, 1987 is a day I'll always remember and one that many at Lotus have consistently tried to forget. It was Lotus' fifth anniversary. They celebrated with a smooth annual shareholders' meeting, a party with the Pointer Sisters and a bevy of announcements.

That fateful week, Lotus promised new versions of 1-2-3 running on personal computers, mainframes and God knows what else. I think they even hinted at versions for microwaves and wristwatches. And they promised a database.

We haven't really seen the database, but more than three years later we are seeing Lotus' 1-2-3 running on all kinds of weird, nonspreadsheet-oriented machines. The biggest of the lot is the IBM 370 series. While 1-2-3 for IBM 370s has yet to hit the Softsel Hot List, it will be one of the decade's most important products — at least symbolically.

Products like 1-2-3/M signify a shift in corporate culture. Gone are the mantras and PC bigotry that characterized the early days. In are white shirts, cuff links and luxury cars. Also in are former IBM executives

Continued on page 53

Mac IIFX: Not yet to be feared

BY JAMES DALY
CW STAFF

CUPERTINO, Calif. — Six months after its release, Apple Computer, Inc.'s high-end Macintosh IIFX is still struggling to become a serious contender in the workstation world, but it has found an enthusiastic cheering section among power-hungry Apple users looking to upgrade.

The rollout of the 40-MHz Motorola, Inc. 68030-powered IIFX last March was Apple's clearest message to date that it wanted to play hardball with the big boys of the workstation community. Yet that effort appears to be less than an overwhelming success, Apple insiders and analysts said, because even Apple underestimated the ferocity of the workstation market.

Product manager Frank Casanova said that while the Macintosh IIFX series can compete with machines such as Sun Microsytems, Inc.'s Sparcstation 1, it has trouble keeping up with IBM's RISC System/6000 and Digital Equipment Corp.'s Decstation 5000. "The performance of the FX is nothing to apologise for, but [the RS/6000 and Decstation 5000] are real screamers," Casanova said.

Workstation vendors such as Sun and Hewlett-Packard Co. have kept up a steady schedule of price cuts and performance enhancements that have crimped Apple's efforts to move easily into the burgeoning market. Casanova claimed that the Macintosh IIFX has had some success in the workstation world.

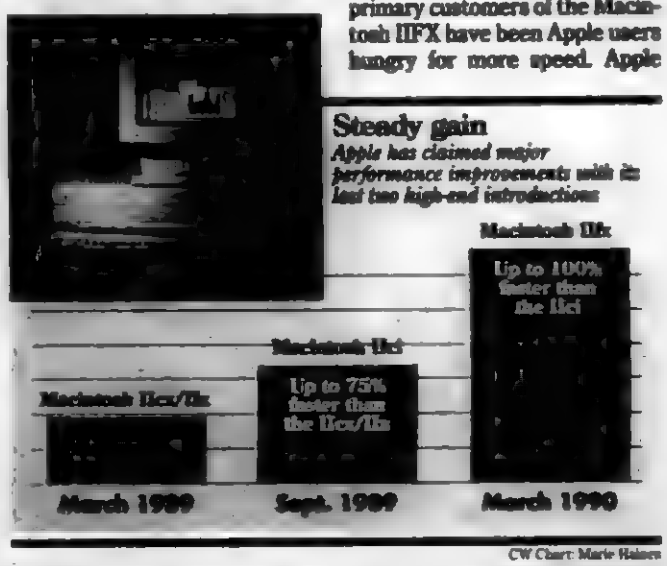
Some users suggested that Apple would have trouble securing a toehold in the workstation market until it can gain a higher profile in engineering schools. "You tend to put people with something they know, and right now that usually means a DOS-based PC or a Sun workstation," said Rick Christjansen, who works with the Macintosh IIFX as manager of automation support at Manville Corp.

Analysts said the Macintosh IIFX series faces the perception that Apple is no longer a leading-edge firm. "Apple hasn't come out with a ground-breaking technology in years," said Jim Poyner, an analyst at Dallas-based William K. Woodruff & Co. "They're still perceived as a maker of PCs, and that's going to be tough to shake."

Casanova said that so far, the primary customers of the Macintosh IIFX have been Apple users hungry for more speed. Apple has also targeted the Macintosh IIFX at power users in the medical imaging, simulation, financial and animation markets.

Analysts said the Macintosh IIFX does prove that Apple can provide a competitive product on the high end. "It was never intended to be a high-volume product, but where it's installed, it's been received tremendously," said Tim Bajarin, an analyst at Creative Strategies Research International in Santa Clara, Calif.

Casanova added that the series has also served as a proving ground for technologies that will filter down the Macintosh product line. The Macintosh IIFX was the first Macintosh to include a built-in cache and dedicated I/O processors, he said.



CW Chart: Marie Haines

PS/1 into successful national rollout

BY RICHARD PASTORE
CW STAFF

With its two-month, three-city trial run a reported success, IBM's Personal System/1 home computer went national recently. Unveiled in June, the PS/1 has performed at or above marketing expectations in Dallas/Fort Worth, Chicago and Minneapolis/St. Paul, IBM claimed.

To accompany the national rollout, IBM also introduced a dot matrix printer reportedly designed with the same ease-of-use features that went into the PS/1.

Sales in the three test regions were in the thousands, marketing manager Skip Gladfelter said. The PS/1 was also made available in Canada and Europe.

IBM-conducted surveys revealed that three out of four buyers were first-time home computer users, while 60% to 70% used personal computers in the office or at school. The most common reason for purchasing a PS/1 was for home business use or work brought home from the office. IBM said 80% of customers are paying $2,000 to buy the high-end model configured with a hard drive and color monitor.

The $449 PS/1 Printer is a 24-wire, letter-quality machine that comes packaged with cable, paper and configuration disks. It comes under the umbrella of the same support system covering the PS/1.

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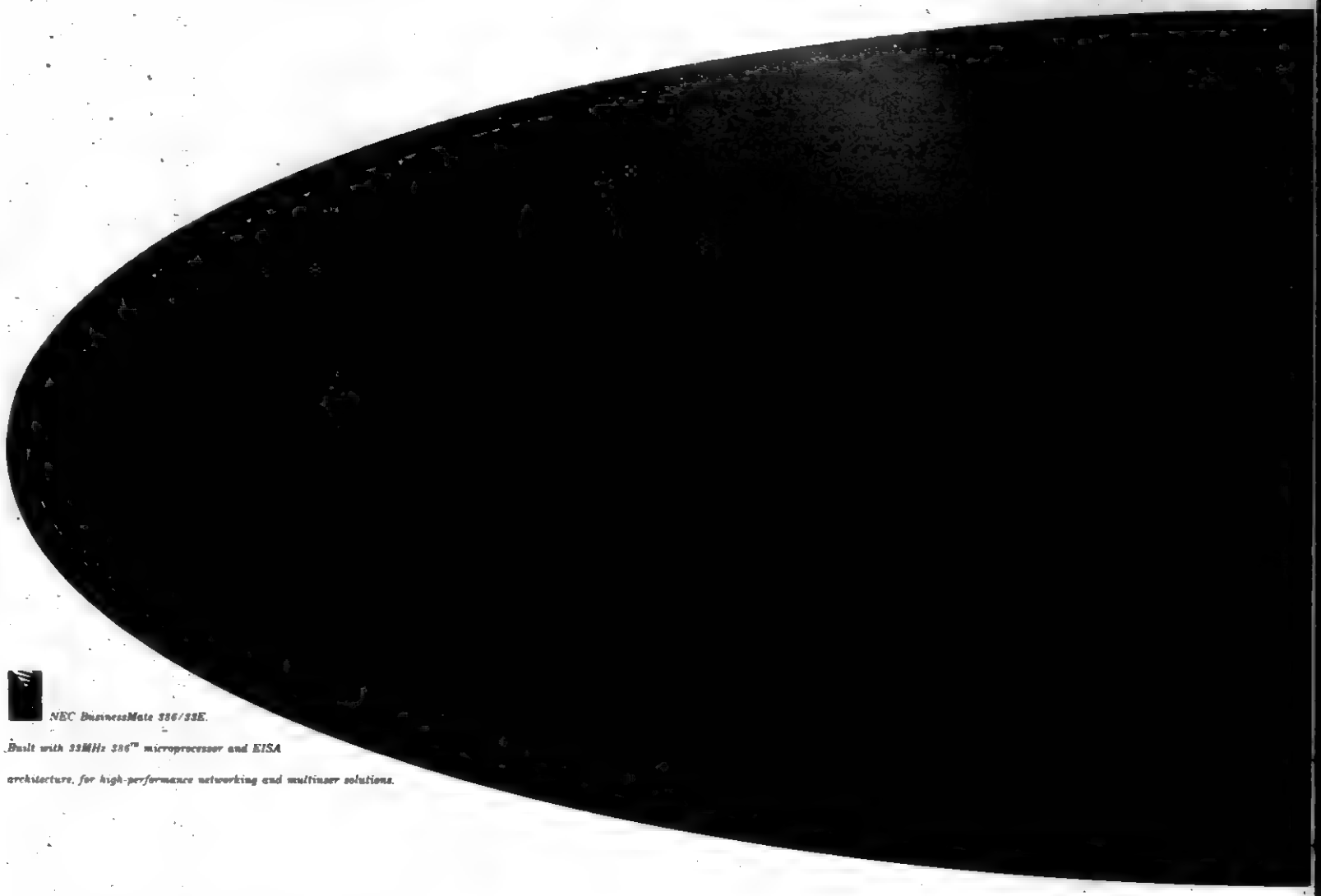

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All's quiet on the Midwest floor

Thanks to computerization, the MSE has increased volume but not noise

ON SITE

BY MICHAEL FITZGERALD
CW STAFF

It's 9:30 a.m., the thick of trading time, but noise is scarce on the floor of the Midwest Stock Exchange. In fact, it is almost quiet, although the exchange is the second-largest in the nation and fifth in the world.

Despite the quiet, heavy trading is occurring. Thanks to the highly automated trading environment the MSE installed in 1985 when it moved into new quarters behind the LaSalle Street Canyon, traders push keys far more often than they exercise vocal cords.

The exchange did this in part to meet Securities and Exchange Commission (SEC) requirements stemming from the commission's 1973 creation of its Intermarket Trading System. It also did so for business reasons. Mary Jo Moccia, now senior vice-president at the MSE, set up the system in 1975. Moccia said the exchange computerized because "the opportunity for additional volume was there," and increased volume could well have overwhelmed the exchange with paper.

Since that time, the MSE has passed the American Stock Exchange and has become the second largest stock exchange in the country.

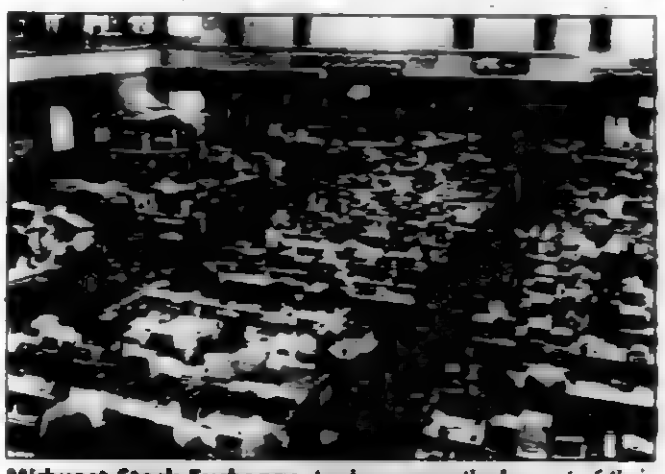
Today, the exchange is "in essence, completely automated," said Ron Dale, vice-president of business development at the MSE. This does not mean that trades are only made by computer, the way they are done at the Cincinnati Stock Exchange. Cincinnati, the nation's smallest exchange, is also the only one that is completely computerized. The handful of other regional exchanges are also heavily automated, doing approximately 70% of their trades automatically, according to Aldin Adkins at the SEC.

Typical of all these exchanges are electronic order routing and automatic execution of smaller size orders. The New York Stock Exchange does not allow automatic execution, but it does have an electronic limit order book — something most regionals do not use.

Dale estimated that 20% of the trades executed on the exchange are still done the old-fashioned way, where a broker takes the order over the telephone, writes it on a slip of paper and then negotiates a trade price. Most of these are blocks of 1,000 or more shares.

Otherwise, the trade comes in, either via telephone or through the computer, and is automatically matched with a buy or sell order. Specialists monitor trades via a workstation screen and can intervene in any trade with the push of a button.

The workstations would replace Rich, Inc. dumb terminals that include limited software giving specialists four separate functional screens. When they are installed in 1991, the Decstations will provide limited off-host processing by giving specialists the ability to do their own analytics, some charting and graphics, terminal handling and printing. They would also provide access to some custom programs currently on the host.



Midwest Stock Exchange *traders currently do most of their trading electronically rather than vocally*

The MSE is currently working on adding intelligent workstations, expected to be from the Digital Equipment Corp. Vaxstation 3000 series, to its trading system. The deal makers in each stock will be able to hook intelligent workstations into the MSE's host DEC cluster of three VAX 6410s, installed after the Oct. 13, 1989 minicrash. Two of the VAXs run the trading floor, processing 500,000 to 750,000 pieces of information per day, while the other serves as a hot backup and development system.

The workstations will use windowing techniques to give the specialists a more user-friendly environment. They also require less power and will use less host CPU time than the current dumb terminal.

The various changes in hardware and software are generally welcomed by the MSE's members, unlike the introduction of technology 15 years ago, which made a lot of brokers as nervous as frogs in a snakepit.

"Twenty years ago, brokers were the conduit for all orders," Dale said. "What has happened with brokers is that they've become more specialized over the years. In essence, to survive, the brokers have learned that they have to add value."

"The system has obviously changed the whole face of the business; there's no comparison to what it was before. It's like the difference between walking and riding," said Larry Augustyn, a specialist at Billings & Co. who has had more than 20 years of experience at the MSE.

The MSE tries to stay a step ahead of members' wants and to make changes quickly. Moccia said that within the system today "there are features that can be turned on when the members want them."

Some of the features introduced in the past differentiate the MSE from its fellow regionals. For instance, Supermax is a program that gives traders the opportunity to make trades at prices better than the market price. An algorithm in the program tracks trading in about 1,000 of the 2,500 stocks traded on the MSE, taking into account whether the last trade was down or up, and automatically executes trades at prices that may be better than the market's price at the moment.

Preventing the dreaded 'call' to virus busters

BY MICHAEL ALEXANDER
CW STAFF

Personal computer viruses are better designed, more destructive, harder to get rid of once they hit and spreading more rapidly than ever before. Should you be worried? That depends on which virus buster you talk to.

"It is the single biggest security exposure outside of users making errors," said William Hugh Murray, an information systems security consultant in Wilton, Conn.

The Jerusalem virus, named after the city where it was first spotted in early 1987, and its variants have reached a critical mass of sorts. "The Jerusalem B virus probably doubles every two months or so," Murray said. "At some point, we are going to be inundated."

There is no cause for alarm, said David Stang, director of research at the National Computer Security Association in Washington, D.C. While there are a huge number of viruses, "the probability of getting one in a business setting is very low."

Most damage is caused not by viruses but by naive computer users trying to rid their PCs of viruses after being hit, he added.

The latest count of PC viruses is about 240, according to John McAfee, president of Interpath Corp. and the Computer Virus Industry Association in Santa Clara, Calif. Thirty new viruses have turned up in the last 40 days alone, McAfee said.

Viruses that attack Apple Computer, Inc. Macintoshes number about 10 and are beginning to multiply rapidly, according to the virus busters.

Expert virus watchers agreed that viruses are more widespread than ever. What they disagreed on is how much of a threat they pose. Policies that restrict employees from running their own software on corporate machines and the judicious use of antivirus software should be enough to ward off viruses.

"It is a realistic concern — one that people should be aware of but not panic about," said Ken Van Wyk, coordinator of the Computer Emergency Response Team at Carnegie Mellon University. "As with any risk, people should be aware of the facts and how these things work and take intelligent and educated steps to avoid them."

"The advice we have had so far is to wait until you see it and then purge it," Murray said. "That is no longer the conservative approach. We ought to immunize every machine."

Purchasing antivirus software is cheap in comparison to the cost of removing a virus, Murray said. The two most popular programs — Software Concepts Design's Flu Shot and Interpath's Viruscan — cost $10 to $15 per machine with site licenses, he said. "Compare that to what you would have to pay to purge a virus from an environment, and that is trivial."

Katie Hogue, president of Media Markets, Inc. in Alexandria, Va., agreed. She has yet to recover from having two PCs at her firm hit with the 4096 virus about a month ago.

The virus, which appeared after the computers were upgraded at a local computer store, infected some 220 files on floppy and hard disks. "All of my disks were infected, and because I never made backup copies of my masters, we lost all of our programs," Hogue said.

> "ALL OF MY disks were infected, and because I never made backup copies of my masters, we lost all of our programs."
>
> KATIE HOGUE
> MEDIA MARKETS

The cost of replacing programs and disks and hiring technicians to eradicate the virus amounted to $4,000. It may be impossible to calculate the cost of not being able to use the two computers for a month.

"It would have been cheaper to buy new PCs," Hogue said.

The 4096 is one of a new generation of highly destructive "Stealth" viruses, first spotted in the U.S. nearly a year ago, that appear to be spreading faster than previous generations of the techno-diseases. They are called Stealth viruses because they have been designed by their authors to avoid detection by antivirus software, much as a Stealth bomber avoids radar. They are difficult to remove even when found. The Stealth viruses, which include the 4096, Fish, 512, V800, V2000 and Joshi, are highly prolific and will often change like chameleons to avoid detection or latch onto files as they are being scanned by antivirus software.

"The Joshi and 4096 appear to be doubling every month and are moving faster than the Jerusalem," McAfee said.

Stealth viruses are better designed than their predecessors but so is antivirus software, Stang said. "Virus detection software runs faster and catches more."

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Japanese take long-term view of OS/2

BY LORI VALIGRA
IDG NEWS SERVICE

TOKYO — With relatively few applications available, OS/2 has not yet become a staple for personal computers in Japan, although use is increasing among customers attracted to the operating system's multitasking and networking functions.

Japanese industry estimates put sales of OS/2 at between 60,000 and 75,000 units to date, but predictions for future sales vary greatly.

According to a recent survey by the Japan Electronic Industry Development Association, 1.7 million of the 2.8 million PCs expected to be sold in 1993 will be 32-bit machines. That means about 60% of the PCs sold in 1993 could be OS/2-based, according to some industry estimates. However, others put the figure closer to 20% to 30%.

Among the key factors that will determine OS/2's potential are to what degree graphics applications will proliferate and whether programmers will come up to speed with the more fully featured operating system.

"Software vendors aren't willing now to develop OS/2 applications because they're still making a profit from MS-DOS," said Hisashi Iyoda, manager of the PC systems engineering department at Fujitsu Ltd., which released OS/2 Version 1.0 in July 1988 and Version 1.1 in October 1989.

"They must invest heavily to develop OS/2 applications. Engineers cannot handle multitasking yet, and the manpower needed to develop OS/2 is much [greater] than with MS-DOS software. But eventually, those software vendors will be willing to make host- or network-related applications for IBM or Fujitsu," Iyoda said.

"Fujitsu has a strong commitment to OS/2. Our large system customers expect us to develop OS/2, and by the end of fiscal 1990, we expect to have 20,000 OS/2 systems installed plus another 30,000 on order," Iyoda said.

Sales increase

IBM Japan Ltd. would not disclose precise OS/2 shipment figures, although it confirmed selling 10,000 licenses of the original Version 1.0 in 1988, the first year IBM's OS/2 hit the market in Japan. Industry estimates put IBM Japan's sales to date anywhere from 20,000 to 40,000 copies.

NEC Corp., a major MS-DOS seller, has sold an estimated 9,000 to 13,000 copies of OS/2 in Japan and is using the operating system as a standard for employee workstations in its new headquarters in Tokyo, where it expects to install as many as 3,000 PCs during the next few years.

In an effort to popularize and standardize OS/2 in Japan, a group of 14 Japanese companies headed by a Nippon Telegraph and Telephone Corp. (NTT) subsidiary released a Japanese standard for OS/2 driver software in October 1989. The standard covered the hardware-specific aspects of OS/2 needed to handle Japanese Kanji ideograph displays and keyboards. That specification defines the standard screen resolution as 640 by 400 dot/in. and 1,120 by 750 dot/in. for high resolution.

The so-called Application Program Interface (API) also enables Japanese OS/2 applications to run across normally incompatible machines from different manufacturers. NTT reportedly plans to purchase 30,000 OS/2-based computers annually starting this year for its own use and to sell to other companies.

NTT's subsidiary, NTT Data Communications, a systems integration company, started the OS/2 driver project because it wanted standard OS/2 computers rather than a hodgepodge of MS-DOS applications, according to API project managers.

For OS/2 to make it in Japan, it is still necessary to improve the screen resolution for applications and enhance the man/machine interface, Iyoda said. "It takes time to improve OS/2. In five years, windows and graphics might be widely used, so OS/2 use will improve," he said.

The more immediate demand in Japan is for multitasking functions used mainly on PCs connected in local-area networks. "Large accounts need the multitasking of OS/2 for heavy-duty applications such as host communications and calculating data," explained Tetsuro Eto, deputy manager of marketing at Microsoft Japan.

For example, an IBM Japan installation at a medium-size hospital in Tokyo with 70 to 100 doctors uses OS/2 with LAN applications to access background information from patients' files and to consolidate information from different hospital departments, including the X-ray and blood laboratories, nurse stations and the pharmacy, each of which has its own PC on the token-ring LAN.

Each of the 70 or so doctors has a PC to issue orders to the X-ray department or the pharmacy via the network. The PCs are connected to an IBM series 4300 host that holds the patient database and accounting information.

This installation uses OS/2 1.1 Extended Edition because it requires IBM's Advanced Program-to-Program Communications facilities and LAN communications in addition to the database support it receives.

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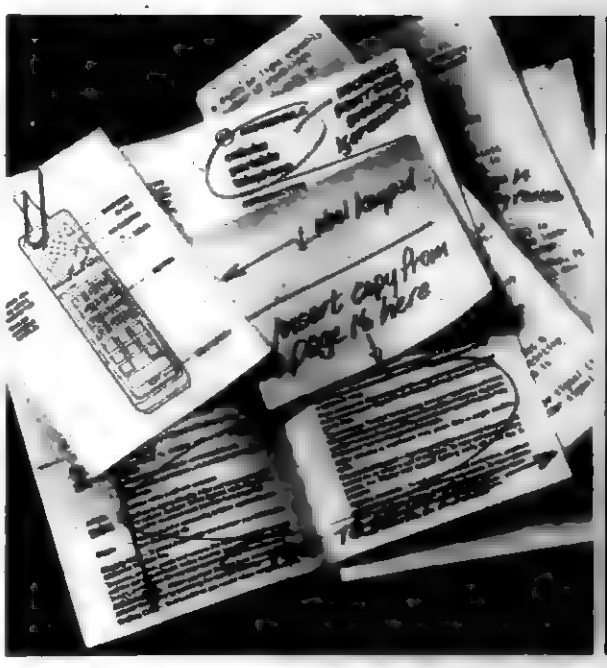

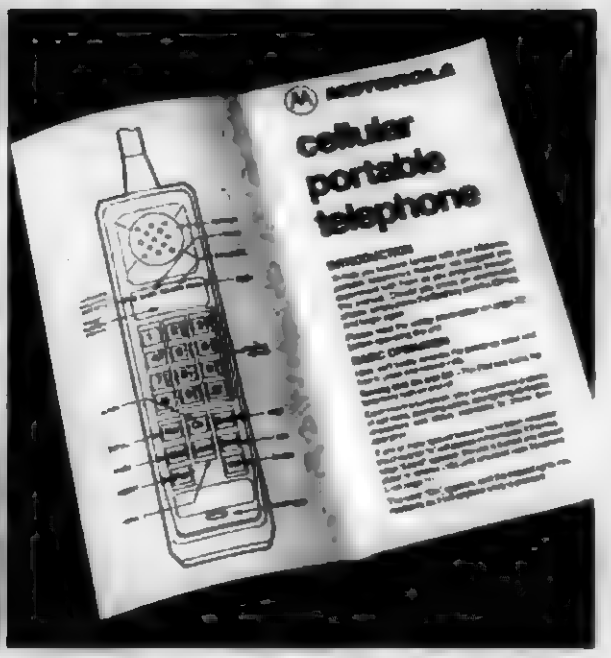

Motorola wrote the book on cellular phones. A Xerox system lets them rewrite it in minutes.

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Lotus partners to take on Notes support

BY PATRICIA KEEFE
CW STAFF

When Lotus Development Corp. introduced Notes last December, company officials admitted up front that they had no idea how to market and support the groupware environment. As it turns out, however, Lotus intends to rely heavily on third-party vendors to fill in the blanks.

Lotus recently unveiled details of the Lotus Notes Alliance Partner Program, under which a team of business partners, including developers and systems integrators, will help coordinate marketing, sales, development, service and support activities. The Alliance program will complement activities offered by Lotus' internal consulting group.

"People want us to do X, Y and Z with the package, and we are looking to third parties to do these things since we can only handle part of it on top of training and support," a spokeswoman said.

The program has already received kudos from one customer, Peter Olson, a vice-president of system planning at MCI Communications Corp. By working with Microsolutions, Inc., a systems integrator participating in the Alliance program, Olson said, he was able to bring new Notes-related applications online "in days and weeks rather than months and years" while rapidly expanding the number of MCI employees able to access those packages.

So far, Lotus has signed up a mix of 20 systems integrators and developers as Alliance partners. That number is expected to grow to 40, according to Lotus. Some partners are integrating their products into Notes; others are focusing more on implementing and deploying custom business applications written for Notes.

In particular, Moore said, Lotus is hoping to attract customers of development partners who have created products that are complementary to Notes. Those companies and their products include the following:

- Reuters Information Services — Reuters on Lotus Notes, a news and information distribution system.
- Sandpoint — Hoover, an active information agent.
- American Business Computer Development Systems, Inc.— EDI Excel, electronic data interchange extensions to Notes.
- Atex Commercial Publishing Systems — Work group publishing systems.
- Softswitch, Inc. — Softswitch Central, an enterprise messaging system.
- Touch Communications, Inc. — Worldtalk 400, an electronic messaging gateway engine.

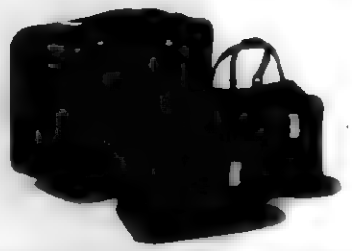
Notes users such as Price Waterhouse are also creating a large number of in-house Notes applications customized to particular department or corporate business needs.

Also participating in the Alliance program are a number of systems integrators who specialize in either networking or operating systems.

A 200-user Notes license, which includes five days of training, costs $62,500. There are plans to add a class on Notes deployment, which will go beyond technical issues to motivating user involvement with the environment.

LOTUS unveiled the Notes Alliance program, under which a team of business partners will coordinate marketing, sales, development, service and support activities.

After Trying Our Business Software, American Tourister® Sent The Others Packing.



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Dictionary has rhyme, reason

Houghton Mifflin Co. recently introduced *The American Heritage Electronic Dictionary*, the first of the company's Upon Request series of personal computer-based electronic reference software tools.

The electronic dictionary comes with Houghton Mifflin's Searchtext feature, which allows the user to conduct a reverse look-up by typing in the definition of a word rather than the word itself. It also includes Roget's II Electronic Thesaurus, which contains 42,000 words.

Other features in the software package include: the Look-Up feature with over 116,000 words available; Wildcard, which lets the user locate a word knowing only a few of its letters; and the ability to find rhyming words. The product also has a cut-and-paste feature that allows the user to call up the dictionary or thesaurus while editing text and insert new words from the reference to the text without exiting either program, a company spokesman said.

The electronic dictionary is now available directly from Houghton Mifflin for $89.95 plus shipping and handling. The minimum hardware configuration for the product is an IBM Personal Computer AT or compatible, 140K bytes of random-access memory and 3M bytes of memory on a hard drive. A Macintosh version is due out next month, the company said.

MAURA J. HARRINGTON

Library releases data via laser disc

ON SITE

BY GARY H. ANTHES
CW STAFF

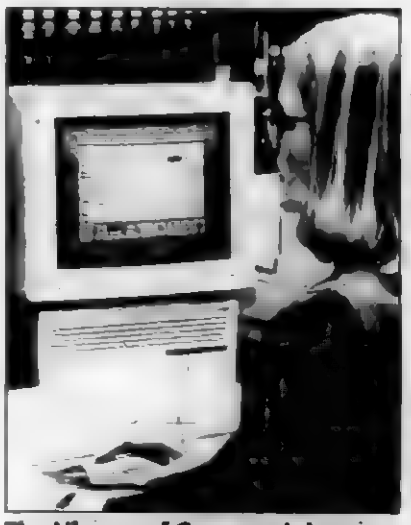
WASHINGTON, D.C. — The Library of Congress has tapped seven universities and a municipality to join in an experiment that may point the way to the libraries of the 21st century — digital depositories of text, photos, movies and recordings tied together by hypertext software and navigated with clicks of a mouse.

Beginning this fall, libraries at the eight institutions will get a series of test packages from the Library of Congress' American Memory project. They will include software and, in some cases, hardware with optical laser discs and videodiscs containing images of U.S. photographs, manuscripts, sheet music, motion pictures and recordings, most depicting life around the turn of the century.

The Library of Congress has distributed printed catalog cards since 1901 and machine-readable catalogs since the 1960s. Now, in what the library modestly calls the "next phase," it is gearing up for a fundamental extension of its mission, from the distribution of catalog information to the electronic dissemination of key portions of its vast collections.

The American Memory project [CW, June 26, 1989] is at the leading edge of this revolution in the Library of Congress' mission. Between 1990 and 1995, the project will use its $1 million annual budget to prepare between 15 and 20 collections for the electronic library at the rate of two or three per year.

The first package, a cluster of logically related Library of Congress collections, covers roughly the period from the U.S. Civil War to the start of World War I. Major components include the following:



The Library of Congress' *American Memory project looks to 21st century*

- 25,000 photographs of historic scenes from 1890 to 1920.
- A collection of 400 pamphlets written by black authors between 1820 and 1920.
- Films of U.S. cities and people from 1898 to 1910.
- Sound recordings of spoken-word recordings of political figures, stage performers and orators of the period.

The photographs and films are stored in analog format on videodiscs. All other items are stored digitally on compact disc/read-only memory discs, indexed by subject and key words much as books are catalogued in conventional libraries.

The Library of Congress ties it all together with Apple Computer, Inc.'s Hypercard running on a Macintosh computer and using Hypersearch from Discovery Systems, Inc. for information retrieval. Carl Fleischhauer, project coordinator, said the project is not committed to use of those products. The Library of Congress will later experiment with IBM Personal Computer implementations, he said.

Users of the system prototype can trace a theme across the components of the collection. For example, a researcher reading about turn-of-the-century architecture might find a reference to the neoclassical style and click the mouse on the word neoclassical to retrieve a definition of the style from another source. The student might then click on a reference to Thomas Jefferson found in that definition to retrieve a picture of Jefferson's Virginia home, Monticello.

In one of the first menus seen after logging on, the user may decide to go to the reading room for independent, self-directed research or to the Exhibit Hall, where tutorial information may have been predefined for a student or trainee.

Fleischhauer said the challenge of American Memory is not a technological one. "We're using existing technology. We're following the computer marketplace, not leading it," he said.

The hard work is getting information from thousands of faded, crumbling pages onto machine-readable media, Fleischhauer said. "We have a lot of wonderful things pertaining to history. How do you get it off of paper and into these kinds of gadgets so lots of people can get it?"

Libraries getting the first installment of American Memory are at Brigham Young University, Northwestern University, Oklahoma State University of Agriculture and Applied Science, West Virginia University, Willamette University, the U.S. Naval Academy, the University of Nevada and the Washoe County Library in Reno, Nev.

Barney

CONTINUED FROM PAGE 45

and, with them, an IBM-inspired view of computers. Out is the sometimes desperate and always defensive attempt to become a multiproduct company. Spreadsheets are a big business.

For nostalgists, this change is not appreciated. For pure PC buffs, it is a major distraction from the firm's central mission. Products such as 1-2-3/M won't help a podiatrist in Podunk, but it may be just the thing for an IS director in Dallas.

The versions Lotus offers or promises to offer are confusing and tax one's memory. They hit all the popular operating systems: DOS, OS/2, OS/2 Presentation Manager, Systems Application Architecture, Sun, Unix, Macintosh, VAX, IBM 370, etc. According to Lotus, the ones that are currently shipping include 1-2-3 for Deskmate, 1-2-3 Release 2.2 (for PCs), 1-2-3 Release 3.0 (for powerful PCs) and 1-2-3/G (for very powerful PCs), as well as the versions for Sun, Unix System V, DEC's VAX VMS, and IBM's VM and MVS. Still in the development pipeline are the Macintosh product and a full version for Microsoft's Windows. The Next product has not even been specified and may or may not be a spreadsheet.

Most of these products are not very significant, and some may not even be all that efficient. So why is it a good thing? Because these products provide choices. Unless you are with the Moral Majority or something, choice is a good thing.

Critics will point to previous, unsuccessful multiplatform strategies. Multimate announced one years ago prior to being swallowed by Ashton-Tate. Today, no one cares. Wordperfect has its product running on a lot of systems. Some care, but not all that many. Others claim that running a spreadsheet on anything but a PC is a waste of power. Not only are mainframe cycles expensive, but they also do not provide a particularly snappy environment for the end user. Besides, aren't those dinosaurs on their way out?

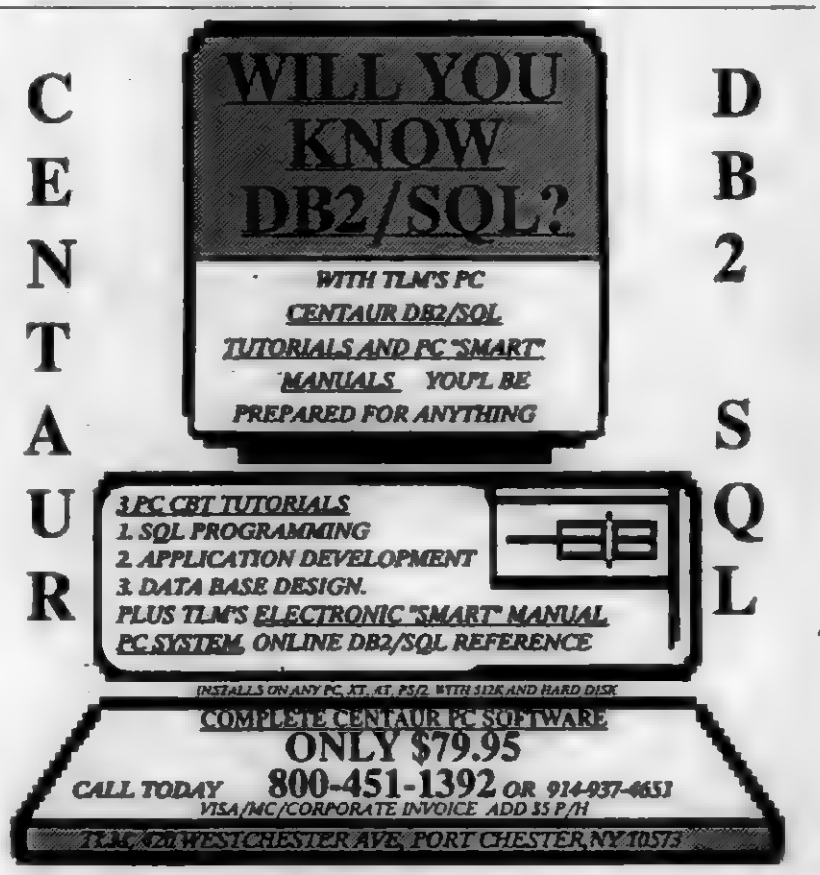
Both groups are missing the point. Spreadsheets are different from word processors. In fact, spreadsheets are a lot more like databases. Today, multiplatform database strategies make firms like Oracle very big — and very successful.

Despite the pundits' shrill cries of "downsizing or die," large and medium-size systems are still very effective for serving the needs of multiple users. They are at their best when storing, manipulating and providing data and tend to be at their worst when supporting end-user applications software. If 1-2-3 was just an end-user application software package, then critics of Lotus' multiplatform strategy would be right. Only a mental midget would tie up mainframe cycles changing column sizes.

Today, 1-2-3 is more of a corporate database than anything else, and databases are appropriate on a variety of systems. Personal databases belong on single-user microcomputers. Work-group databases belong on either PC servers or cost-effective minicomputers. Large corporate databases belong on systems controlled by information systems, which are often as not mainframes.

It doesn't matter if users want 1-2-3 as a database on large systems. Lotus is offering the choice, and choice works.

Barney is editor in chief of *Amiga World*.



NEW PRODUCTS

Systems

Brain Computer Corp. has introduced an Intel Corp. 80386-based personal computer equipped with a 25-MHz motherboard.

The Brain 386-25 features 1M byte of random-access memory, a 32K-byte cache, shadow RAM, a monochrome monitor and a 40M-byte hard drive.

The product is priced at $2,220.

Brain Computer
10000 Old Katy Road
Houston, Texas 77075
(713) 935-3638

Powermate *386/25S desktop system*

NEC Technologies, Inc. has introduced a personal computer designed to perform technical publishing, animation and computer-aided design and manufacturing applications.

The Powermate 386/25S desktop system includes a 32K-byte memory cache that contains 25-nsec static random-access memory.

The product is priced at $4,399 for a unit equipped with a 1.2M-byte floppy disk drive and $5,299 for a version with a 100M-byte hard disk drive.

NEC Technologies
1414 Massachusetts Ave.
Boxboro, Mass. 01719
(508) 264-8000

Software applications packages

Envision Solutions Technology, Inc. has introduced a raster-to-vector conversion program designed for personal computers.

Envision It can convert scanned, bit-mapped or binary images composed of dot patterns into vector-based images. A thinning option enables one or more layers of dots to be removed from an original scanned image during a conversion process.

The product requires an IBM Personal Computer, XT, AT or compatible, DOS Version 2.0 or higher and at least 512K bytes of random-access memory. It is priced at $399.

Envision Solutions Technology
822 Mahler Road
Burlingame, Calif. 94010
(415) 692-9061

Oxko Corp.'s Geys Windowstools Version 1.1, a software package designed to convert personal computers into workstations, is available for $195.

The product was designed to operate with Versions 2.11 and 3.0 of Microsoft Corp.'s Windows. It includes application tools for clarity, efficiency, complete information, multifunctionality, simple administration and time management. The package also includes 5¼- and 3½-in. floppy disks.

Oxko
P.O. Box 6674
Annapolis, Md. 21401
(301) 266-1671

Boardroom Accounting Software has announced a DOS upgrade of its Boardroom IV accounting program.

The Boardroom Version 1.1 single and multiuser integrated accounting software package includes menu access to Fox Software, Inc.'s Foxpro report writer, user-definable menus and scrolling point-and-shoot windows. Nine modules, along with manual and on-line Help facilities, are also included.

Single and multiuser site licenses cost $595 and $695 per module, respectively.

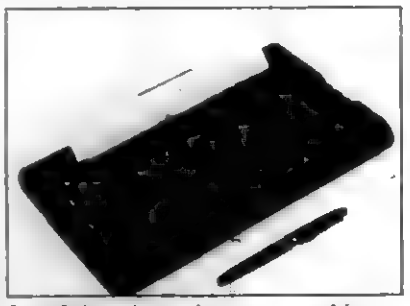
Boardroom Accounting Software
11 Koger Executive Center
Norfolk, Va. 23502
(804) 455-5811

Genus Microprogramming, Inc. has announced an addition to its GX development series of graphics programming tools.

GX Graphics was designed to allow users of IBM Personal Computers to add graphics to their software development applications. Standard graphics functions such as lines, circles and squares are provided along with support for mouse programming routines.

GX Graphics is scheduled to be available in the fourth quarter for $149. Source code sells for an additional $250.

Genus Microprogramming
11315 Meadow Lake
Houston, Texas 77077
(800) 227-0918



Road Warrior *prints text, graphics*

Peripherals

Computer Products Plus, Inc. has introduced a printer designed for remote printing of text and graphics.

The Road Warrior Wsp-200 enables users to print material at home or at hotels and offices without accessible printers. It has 24-pin Epson America, Inc. compatibility and includes a thermal print head for facsimile paper printing.

It can run on AC power with a recharging adapter or on an internal, rechargeable removable Nicad battery pack for 45 minutes to 1 hour. The product is priced at approximately $350.

Computer Products Plus
16351 Gothard St.
Huntington Beach, Calif. 92647
(714) 847-1799

3M Co. has announced a document management reader scanner that can accept any micrographic format and produce output in digital formats.

The 3M Model 7710 enables users to handle documents digitally and send them to local or remote output devices such as laser printers, small computer systems interface-based devices and personal computers. Other features include document masking and the ability to scan a page in less than three seconds.

Model 7710 is priced at $22,500.

3M Co.
P.O. Box 33600
St. Paul, Minn. 55133
(612) 733-9534

Applied Concepts, Inc. has introduced the ACI 1074 SCSI Plus Bus Repeater, a small computer systems interface (SCSI) bus extender that enables users to remotely locate peripherals an extra 6 meters.

The device interfaces directly with standard SCSI adapters, such as those used in personal computers, VME, Digital Equipment Corp. and Apple Computer, Inc. host systems. The product is completely transparent to the user and supports 5M byte/sec. data transfers over a 6-meter distance.

The ACI 1074 costs $350.

Applied Concepts
5350-H Eastgate Mall
San Diego, Calif. 92121
(619) 453-0090

Outbound Systems, Inc. will begin shipping an accessory product designed to expand the data transfer and management features of its Apple Computer, Inc. Macintosh-compatible laptop system.

The Outbound small computer systems interface (SCSI) Adapter and Emulator can be used to access any standard SCSI device from an Outbound laptop to use any Macintosh-compatible SCSI device. It can also be used as a SCSI emulator that enables Outbound's storage devices to act as SCSI devices.

The product is being bundled with Release 1.1 of Outbound's system software. It is priced at $149.

Outbound
4840 Pearl East Circle
Boulder, Colo. 80301
(303) 786-9200

Software utilities

Altered Image Software Ltd. has announced two products that allow users to migrate to X Window System-based environments.

Altered Image-SQL provides users of Informix Corp.'s Informix-SQL relational database management system with the functionality of the Open Software Foundation's industry-standard Motif front-end environment.

Altered Image Graphics is an information management tool that allows Informix-SQL data to be graphically displayed in chart formats.

Pricing for both products starts at $595 for single Unix workstation packages.

Altered Image
12 Millpond Court
Addlestone, Surrey, UK
(011) 44 932 842163

Future Domain Corp. has introduced a compact disc/read-only memory (CD-

Continued on page 58

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Fall 1990 Seminar Schedule

FOCUS APPLICATION TECHNOLOGIES SEMINARS

ALASKA		**NEW JERSEY**	
Anchorage	10/2	Princeton	10/31
		Morristown	11/27
ALABAMA			
Birmingham	9/27	**NEW MEXICO**	
		Albuquerque	10/4
ARIZONA			
Phoenix	10/4	**NEVADA**	
		Las Vegas	9/13
CALIFORNIA			
Sacramento	9/26	**NEW YORK**	
San Diego	10/18	Tarrytown	9/26
Long Beach	10/26	Buffalo	10/10
Woodland Hills	10/30	Rochester	11/13
San Jose	11/14	Melville	12/4
COLORADO		**OHIO**	
Colorado Springs	10/18	Cleveland	9/19
		Columbus	10/24
CONNECTICUT			
Danbury	10/23	**OKLAHOMA**	
		Oklahoma City	9/19
DIST. of COLUMBIA		Tulsa	9/20
Washington, DC	8/9		
Washington, DC	11/6	**OREGON**	
		Portland	9/26
FLORIDA			
Jacksonville	9/19	**PENNSYLVANIA**	
Tampa	9/25	Valley Forge	9/12
Fort Lauderdale	10/16	Pittsburgh	9/26
Tallahassee	10/25	Harrisburg	10/11
GEORGIA		**SOUTH CAROLINA**	
Atlanta	9/6	Columbia	10/1
Atlanta	11/6	Greenville	10/17
IOWA		**TENNESSEE**	
Des Moines	9/18	Knoxville	9/24
		Memphis	9/25
IDAHO		Nashville	10/11
Boise	10/11		
		TEXAS	
INDIANA		San Antonio	9/19
Indianapolis	9/18	Austin	9/20
		El Paso	10/3
KENTUCKY			
Louisville	10/12	**UTAH**	
		Salt Lake City	9/6
LOUISIANA			
New Orleans	9/12	**VIRGINIA**	
		Richmond	10/30
MASSACHUSETTS			
Mansfield	10/3	**WISCONSIN**	
Andover	10/11	Milwaukee	10/2
Framingham	10/18		
Springfield	11/15	**CANADA**	
		ALBERTA	
MARYLAND		Edmonton	10/4
Baltimore	9/17	Calgary	10/18
		BRITISH COLUMBIA	
MICHIGAN		Victoria	9/12
Grand Rapids	10/11	Vancouver	10/23
		MANITOBA	
MINNESOTA		Winnipeg	9/26
Minneapolis	10/24		
		NOVA SCOTIA	
MISSOURI		Halifax (English)	10/25
Kansas City	10/10		
		ONTARIO	
MISSISSIPPI		Ottawa	10/3
Jackson	10/10	Toronto	11/8
NORTH CAROLINA		**QUEBEC**	
Greensboro	10/1	Quebec City (French)	10/11
NEBRASKA		Montreal (English)	11/6
Omaha	10/23	Montreal (French)	11/7

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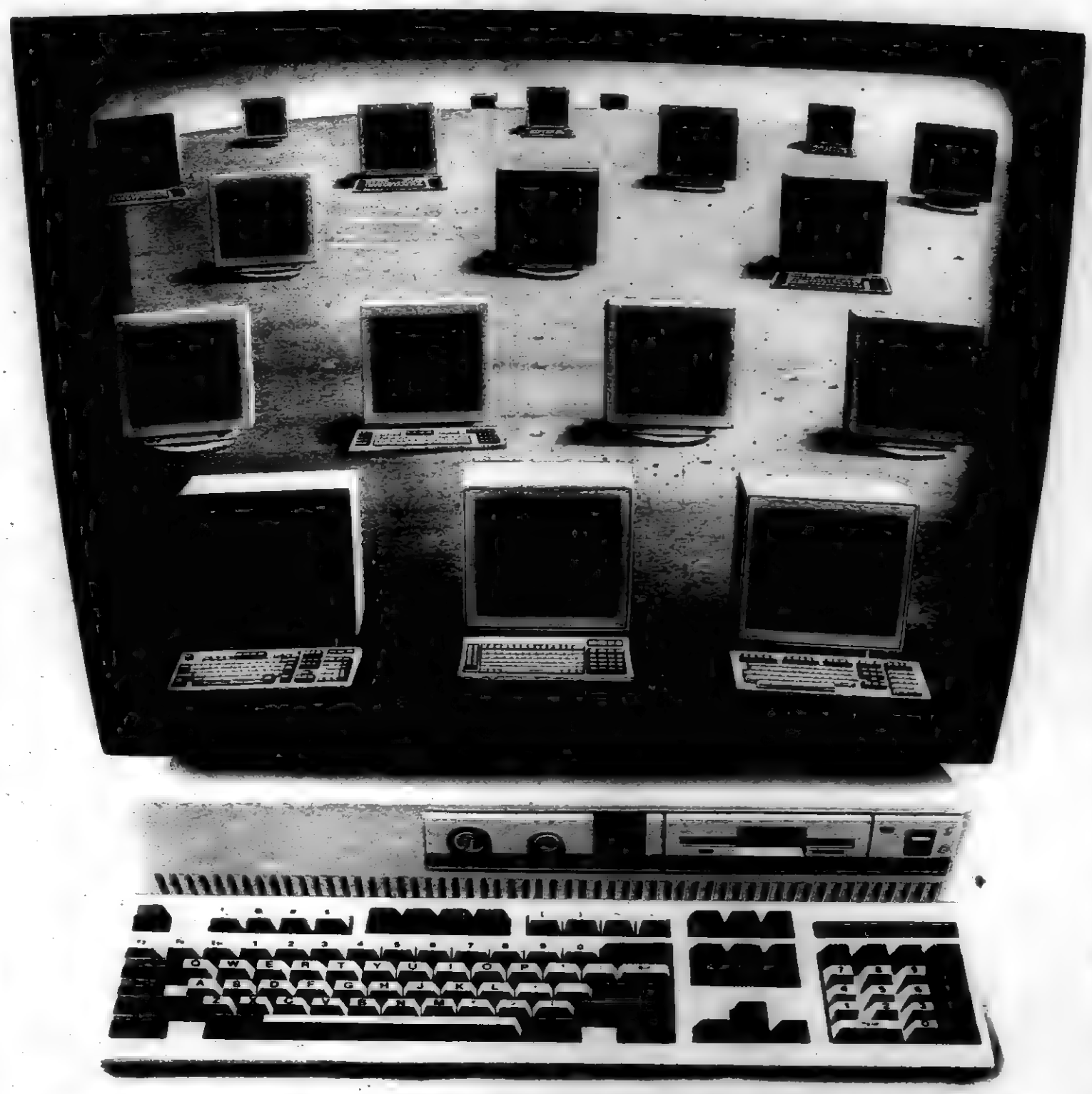
THE POWER OF FOCUS FOR UNIX



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Information Builders, Inc.

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Once again, Compaq unleashes a series of stunning performances.

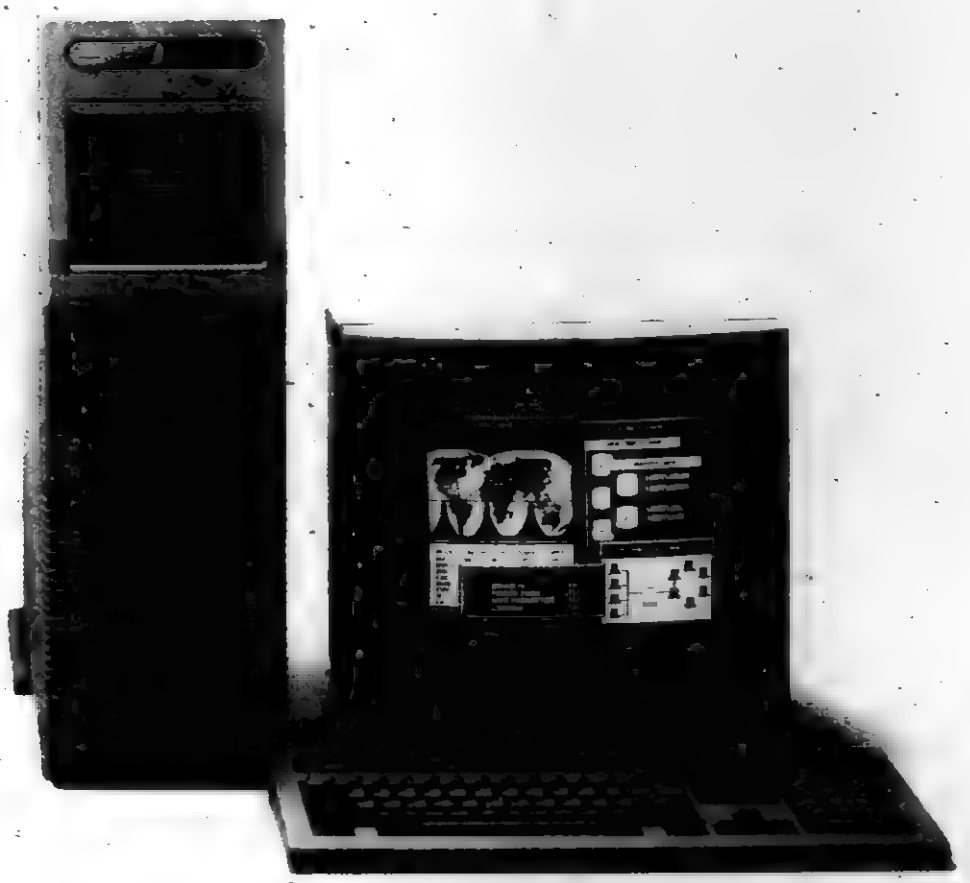
The new COMPAQ DESKPRO 486/33L and COMPAQ DESKPRO 386/33L Personal Computers are single-user PCs that deliver the utmost in power. And 33-MHz 486 models of the COMPAQ SYSTEMPRO Personal Computer System strengthen its position as the network server without equal.

For individuals, our powerful new desktops extract the highest performance from Intel's 33-MHz 486 and 386 microprocessors. So you can run the most complex CAD/CAE, scientific and business applications faster than ever. You can also take advantage of SCO's UNIX operating system and Microsoft's Windows. Plus run the thousands of industry-standard software products available under Microsoft's MS-DOS and MS OS/2.

Both machines fulfill your need for speed. They're optimized with high-speed cache memory designs, fixed disk drives and powerful Extended Industry Standard Architecture (EISA). So nothing slows you down.

Both offer unequaled growth potential with seven EISA expansion slots plus internal room for up to 100 MB of RAM and 1.3 GB of mass storage. The COMPAQ DESKPRO 386/33L

And this year's best performance. Group.



COMPAQ SYSTEMPRO also offers an upgrade path to 486 technology.

For networks, the COMPAQ SYSTEMPRO Family now delivers the ability to employ one or two 33-MHz 486 or 386 microprocessors. It's power you can put to work in the broadest range of connected environments, from resource sharing to departmental database management.

Inside you'll find innovations like a 512-Kbyte Server-Cache design, EISA I/O performance and drive array technology. You'll also find the ability to use up to 11 expansion slots and store up to 4.28 gigabytes of data.

These innovations are complemented by the COMPAQ DESKPRO 386N and COMPAQ DESKPRO 286N Personal Computers, PCs designed with specific network features. Put them all together with Novell's NetWare, Microsoft's LAN Manager, SCO's UNIX or other industry-standard network or multiuser operating systems and you'll get the greatest performance to ever hit the networks.

And the one place to see these performances live is your Authorized COMPAQ Computer Dealer. For the nearest location and more information, call 1-800-231-0900, Operator 131. In Canada, 1-800-263-5868, Operator 131.

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Continued from page 54

ROM) device driver that is available with Microsoft Corp.'s MS-DOS Extensions Version 2.1.

The FDU-CD enables users of IBM Personal Computer AT, XT, Intel Corp. 80386- or I486-based computers and Micro Channel Architecture-based systems to add up to 24 small computer system interface CD-ROM drives to a personal computer system. It comes in 3½- and 5¼-in. disk versions and is priced at $70.

The company has also released the FDU-FD floppy driver Version 1.0 ($25), which can expand a PC AT's floppy drive capability from two to four.

Future Domain
2801 McGaw Ave.
Irvine, Calif. 92714
(714) 253-0400

Software Publishing Corp. has announced PFS:Preface 1.0, a menu system and DOS manager that enables users to structure applications and the contents of their hard disks without needing to understand DOS syntax.

The product's application menu system provides users with mouse or one-key access to software applications. Other features include pull-down menus and file selector displays as well as a DOS window that provides an on-line guide to the DOS operating system.

PFS:Preface is available for the IBM Personal Computer XT, AT, Personal System/2 and compatibles. It costs $69.

Software Publishing
1901 Landings Drive
Mountain View, Calif. 94039
(415) 962-8910

Intelligence Manufacturing Co. has announced an artificial intelligence software package designed to enable users to make database queries and extract data by using English language sentences instead of common computer commands.

The Speak-EZ query system software can be used on systems operating Ashton-Tate Corp.'s Dbase III database management system as well as other compatible database systems such as Clipper, Foxbase and Wampum.

A single-user license costs $495, and a license for 50 or more users sells for $395.

Intelligence Manufacturing
340 Bridge Place
W. Sacramento, Calif. 95691
(916) 372-6680

Development tools

Mdbs, Inc.'s KG Software division has announced a software package designed to serve as an application generator during the production of diagnostic expert systems.

Guru Solveur allows maintenance experts to follow a four-step process of inputting data pertaining to breakdowns, symptoms, causes and solutions into a personal computer to generate a diagnostic expert system.

The product runs on IBM Personal Computer ATs and compatibles and requires a hard disk with 640K bytes of memory, the vendor said.

The product is priced at $4,995.

KG Software
P.O. Box 248
Lafayette, Ind. 47902
(317) 463-2581

Intelligent Environments has announced two additions to its Applications Manager family of development tools designed for IBM and Microsoft Corp.'s OS/2 Presentation Manager.

SQL/Workbench and CP/Workbench were designed to facilitate the creation of cooperative processing applications. SQL/Workbench enables database administrators to define SQL statements as well as program variable and security levels without affecting the application code, according to the company. CP/Workbench allows transactions, conversations, buffers and data types to be defined without changing a program.

SQL/Workbench costs $7,200, and CP/Workbench is priced at $4,200.

Intelligent Environments
2 Highwood Drive
Tewksbury, Mass. 01876
(508) 640-1080

Knowledge Systems Corp. has announced Math-Pac1/V, a software development tool designed for users of Digitalk, Inc.'s Smalltalk/V line of products.

The product enables Smalltalk users to perform mathematical operations while remaining within a Smalltalk application. It requires Smalltalk/V, Smalltalk/V286, Smalltalk/VPM or Smalltalk/Mac and hardware or software floating-point support.

Math-Pac1/V is priced at $199.

Knowledge Systems
114 MacKenan Drive
Cary, N.C. 27511
(919) 481-4000

Rodime Systems, Inc. has introduced a removable-cartridge disk drive for Apple Computer, Inc. Macintosh systems.

The R45 Plus is a half-height, 5¼-in. drive that includes a 44M-byte removable Syquent Technology cartridge and fully embedded small computer systems interface controller. It features an average access time of 20 msec and a disk transfer rate of 10M bit/sec. Self-test diagnostics and automatic error detection and correction are also included.

The product is priced at $1,399, including a two-year warranty for the drive and a one-year warranty for the cartridge.

Rodime Systems
851 Broken Sound Pkwy. NW
Boca Raton, Fla. 33487
(407) 994-5585

Multitasking

Aren't you glad Windows and OS/2™ aren't the only way to multitask and window on the PC.

It's all very well to look at screen after screen of colorful graphics and new programs. But the brutal truth is that these environments require extensive, expensive hardware upgrades for 80% of PC users. Not to mention new or upgraded software.

It all adds up to $1,200 to $2,500 per PC—and that's for the hardware and software alone. To say nothing about a major investment in the time it will take to learn new ways of working.

If all you want is enhanced productivity from your PC, that's too high a price to pay.

DESQview lets you run all these programs in multiple windows and multitask them—all without major modifications to the computer you own now. And without replacing or even upgrading your favorite programs.

DESQview does it all. For less.

DESQview runs the programs you know and love in multiple windows, multitasks them and even lets you choose whether or not to use a mouse. And it does it all today. In fact, DESQview's been doing it for over four years now.

People all over the world are using DESQview to manage customized work environments like those shown here. They are using it to cut and paste data between programs running in multiple windows, running sorts and recalculations in the background, and they're operating in text and graphics modes in windows side-by-side.

With no drama, no fireworks and no huge memory or disk space requirements.

In fact, DESQview runs on i486, 80386, 80286 and even 8086 and 8088 PCs. Its low memory overhead means you don't have to buy a faster computer and more RAM to compensate for the demands of a complex, memory-hungry 'graphical' operating system.

And DESQview builds on and extends DOS—the most robust, stable operating system available for your computer.

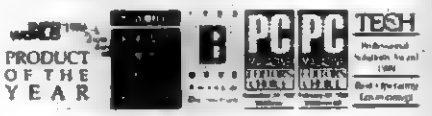
Plus, you don't give up any flexibility in choosing programs. DESQview runs virtually all DOS and DOS-extended programs and Windows programs as well.

No wonder major corporations all over the world have chosen to standardize on DESQview.

New DESQview 2.3 gets the most out of DOS. Even in Windows.

For a lot of users, what's exciting about Windows isn't Windows itself, but some of the great new programs that use it. Now you can run those programs in DESQview 2.3, and keep on using the unique DOS multitasking windowing capabilities of DESQview. (On 386 machines, DESQview 386 2.3 runs Windows programs side-by-side with 386 DOS-extended programs such as IBM Interleaf and AutoCAD 386.)

And of course, new DESQview 2.3 gives you all the other great strengths that made it the favorite of knowlegeable PC users. Some of our recently added features: support for mouse menus within windows;



Some of DESQview's recent awards.

flexibility for assigning and reassigning special keys within windows, support for 3270 and other terminal emulation, support for a wide range of hardware: CD-ROM, scanners, comm ports, etc. and help in handling troublesome TSRs. DESQview keeps up with software and hardware developments. As new standards develop, you'll find us supporting them.

As long as you're using DOS programs, you need DESQview.

Priam Systems Corp. has announced two 5¼-in. internal disk drives designed for IBM Personal Computer ATs or compatibles equipped with Intel Corp. 80286, 80386 or I486 processors; Novell, Inc. networks; and Unix and Xenix systems.

The ID340H is a 340M-byte enhanced small device interface (ESDI) half-height disk drive. The ID660 is a 660M-byte full-height device. Both drives allow two controllers and four ESDI drives to co-exist under The Santa Cruz Operation's Unix operating system.

The ID340H costs $2,827, and the ID660 sells for $4,480.

Priam
1140 Ringwood Court
San Jose, Calif. 95131
(408) 954-8680

Golden Triangle Computers, Inc. has announced a software package designed to automatically create a duplicate of the primary disk on Apple Computer, Inc. Macintosh II systems.

Disktwin works with a proprietary Nubus interface card, its software and a small computer systems interface disk drive to make a twin of a Macintosh II's primary disk. Copies of all files can be saved immediately on the twin, enabling users to recover from a primary disk failure without losing data, the vendor said.

The product is available for a list price of $999.

Golden Triangle Computers
4849 Ronson Court
San Diego, Calif. 92111
(619) 279-2100

Board-level devices

Acksys has announced a line of intelligent communication boards that include eight, 16 or 32 ports for IBM Personal Computer XT, AT and Personal System/2s equipped with an AT-compatible bus.

The MCC boards are based on Intel Corp. 12.5- or 16-MHz 80C188 microprocessors and include 256K bytes of built-in random-access memory and 64K bytes of erasable programmable read-only memory. Pricing ranges from $1,900 to $3,900, depending on model.

Acksys
401 N. Michigan Ave.
Chicago, Ill. 60611
(312) 222-1235

Rainbow Technologies, Inc. has introduced a memory-based hardware key designed to allow users of IBM Personal Computers or compatibles to protect their applications from unauthorized use.

Sentinelscribe uses challenge/response and algorithm encryption techniques that are said to allow an application program to write a device's memory for tracking, limited-use deadlines or accommodating software upgrades, the company said.

The product also features 120 bytes of electrically erasable programmable read-only memory.

Pricing begins at $49 for purchases of 10 to 20 units.

Rainbow Technologies
9292 Jeronimo Road
Irvine, Calif. 92718
(714) 454-2100

Zendex Corp. has announced the ZX-286/20, a 20-MHz clone of an Intel Corp. 286/12 single-board computer.

The product supports 1M to 8M bytes of jumper-selectable, dual-ported memory and includes capacity for as many as 1M byte of erasable programmable read-only memory. It can reportedly generate two multibus interrupts from up to 15 sources.

A basic unit with 1M byte of dynamic random-access memory is priced at $2,495.

Zendex
6700 Sierra Lane
Dublin, Calif. 94568
(415) 828-3000

Unix software

Zylab Corp. has announced the release of a color enhanced version of its Zyindex for Unix software package.

The software package enables users to set any one of 16 foreground and eight background colors for different components of windows and menus. It also supports 8-bit international character sets and features several search techniques. It runs on any Intel Corp. 80386- or I486-based machine with The Santa Cruz Operation's Xenix Release 2.3 or Unix System V/386 Release 3.2.

Zyindex for Unix's base list price is $695, and a four-user package costs $2,495. Additional users may be added for $695 each.

Zylab
3105-T N. Wilke Road
Arlington Heights, Ill. 60004
(708) 632-1100

Wordperfect Corp. has announced Wordperfect 4.2, a software package designed for Unix-based systems that support the 88Open Consortium Ltd.'s Binary Compatibility Standard.

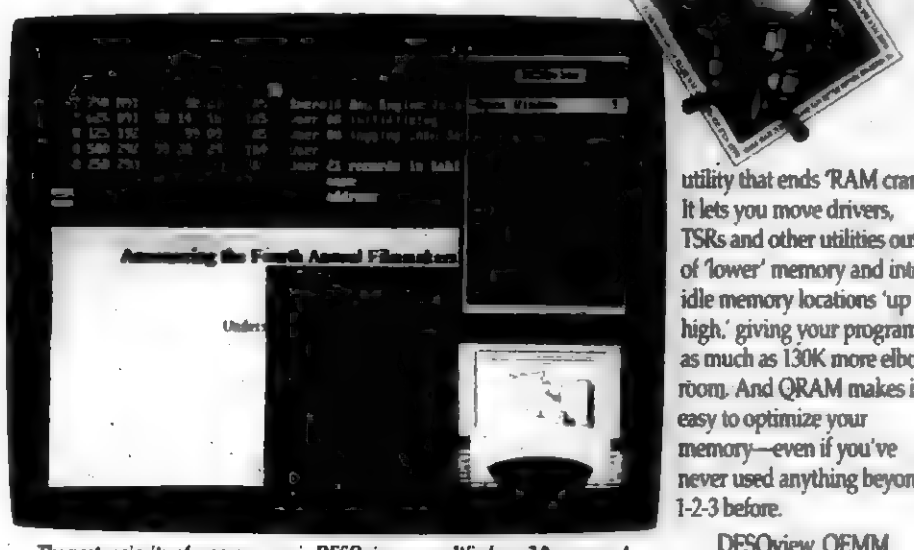
The product includes snaking and parallel columns, line numbering, macros and a rectangular block/move feature. A 115,000-word spell checker and a thesaurus consisting of more than 10,000 root words is also provided.

System requirements reportedly include 866K bytes of memory for the first user and 280K bytes for each subsequent user.

A single-user version costs $495, and pricing for multiuser versions begins at $995.

Wordperfect
1555 N. Technology Way
Orem, Utah 84057
(801) 222-5300

without tears



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QRAM is our memory optimizing utility that ends 'RAM cram.' It lets you move drivers, TSRs and other utilities out of 'lower' memory and into idle memory locations 'up high,' giving your programs as much as 130K more elbow room. And QRAM makes it easy to optimize your memory—even if you've never used anything beyond 1-2-3 before.

DESQview, QEMM, Manifest and QRAM help you get the most out of the software and hardware you own today.

To find out more about our family of productivity enhancement products, mail in the coupon below with the appropriate boxes checked. Or see your authorized Quarterdeck dealer.

The vast majority of programs run in DESQview—even Windows 3.0 programs! And some programs take special advantage of DESQview to enhance their operation. FNN NewsReal and products using Spreadsheet Solutions' @DV 'Hot Links', for example, use windowing, multitasking and interprogram communications.

Quarterdeck

Quarterdeck Office Systems, 150 Pico Blvd., Santa Monica, CA 90405 (213) 392-9851 Fax: (213) 399-3802

DESQview System Requirements: IBM Personal Computer and 100% compatibles (with 8086, 8088, 80286, 80386 or i486 processors) with monochrome or color display; IBM Personal System/2 • Memory: 640K recommended; for DESQview itself 0-145K • Expanded Memory (Optional): expanded memory boards compatible with the Intel AboveBoard, enhanced expanded memory boards compatible with the AST RAMpage; EMS 4.0 expanded memory boards • Disk: two diskette drives or one diskette drive and a hard disk • Graphics Card (Optional): Hercules, IBM Color/Graphics (CGA), IBM Enhanced Graphics (EGA), IBM PS/2 Advanced Graphics (VGA) • Mouse (Optional): Mouse Systems, Microsoft and compatibles • Modem for Auto-Dialer (Optional): Hayes or compatible • Operating System: PC-DOS 2.0-4.0; MS-DOS 2.0-4.0 • Software: Most PC-DOS and MS-DOS application programs; programs specific to Microsoft Windows 1.03-3.0, GEM 1.1-3.0, IBM TopView 1.1 • Media: DESQview is available on either 5¼" or 3½" floppy diskette.

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	QEMM-50/60 version 5.0	☐	☐	☐	$99.95	
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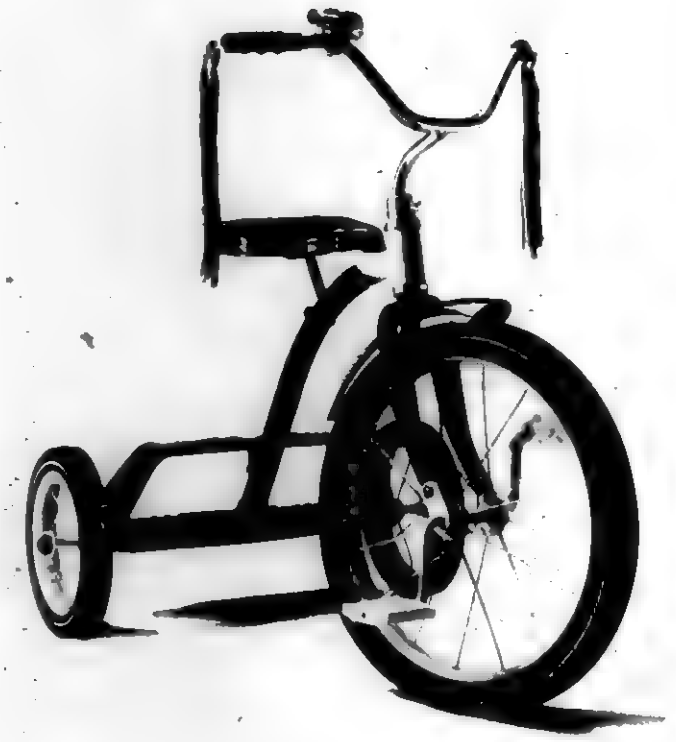

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Digitized photos meet deadline

ON SITE

BY GARY H. ANTHES
CW STAFF

ARLINGTON, Va. — *USA Today* photographer Frank S. Folwell recently went to Saudi Arabia armed with a Sony electronic still camera. Aided by a digital preprocessor, the telephone in his hotel room and an "electronic darkroom" at headquarters, Folwell can now bypass traditional photo processing — and many of his competitors — by shooting high-quality color pictures of events in the Middle East until minutes before press time.

A few days before his departure, Folwell was seated at a terminal in the photo department at *USA Today*, studying a dozen or so electronically rendered photographs on his screen. Using a mouse, he selected and blew up a photo of a young soldier on a Saudi Arabian airfield. The soldier is laden with supplies, conspicuous among them two enormous containers of bottled water. "We may use this one in the paper tomorrow," said Folwell, the paper's assistant director of photography.

The actual selection of photos is made by editors in News, Money, Life and Sports, each section with its own workstation on the local-area network. To demonstrate, Folwell cropped the photo with a few easy movements of the mouse. He then entered the exact size of the hole in the paper the photo would fill. A few more clicks, and shadows were lightened and color tones corrected. Although this particular picture did not need it, Folwell could also remove dust spots and other blemishes. Finally, he checked registration — the alignment of superimposed colors — and sent the photo to an output device.

As a matter of policy, *USA Today* will not alter the content of photographs, a controversial practice made possible by the electronic darkroom.

Folwell uses a Leafdesk Digital Darkroom developed by Leaf Systems, Inc. and provided as part of a new service soon to be offered by The Associated Press. The digital darkroom is just one component of a plan AP has to move newspapers from 1930s-vintage technology into the 21st century. Toward the end of this month, AP will begin transmitting photographs digitally via satellite at 1.5M bit/sec.

Dan Mac Medan/USA Today

***USA Today*'s Folwell** *(left) oversees digital photo editing center*

According to *USA Today*'s director of editorial systems, Jackie Greene, the paper receives almost 500 photographs per day from AP. They are scanned by AP and sent to newspapers using a relatively primitive technology similar to facsimile. A black and white photo takes nine minutes to print out, while a color picture takes a half-hour to emerge. If a noisy line causes blemishes, the photo must be sent again.

With the digital feed, black and white photos will be received in one minute and color in three minutes, Greene said: "We'll get a better selection on deadline; we won't have to take the first one off the machine."

In fact, a paper photo will not come off the machine at all. Pictures will be transmitted directly to the electronic darkroom for immediate or deferred viewing and processing. *USA Today* will continue to receive most of its Middle East shots from AP, while relying on Folwell and his electronic still camera for late-breaking news.

One year from now, AP will also move to better compression technology, which will reduce transmission time by another factor of five to 10. Folwell said AP will also employ new scanners providing greater resolution and more color tones.

Nine Leafdesk workstations, four Leaf file servers and various scanners, output devices and Apple Computer, Inc. Macintosh computers are attached to a Leaf Systems 80M bit/sec. token-ring network in the *USA Today* building. The servers, workstations and software support both distributed processing and distributed databases, said Robert Caspe, president of Natick, Mass.-based Leaf Systems. Time-consuming tasks and their associated data can be spawned by the Intel Corp. 80386-based workstations to run in background mode on one of the dual-80386 servers, he said. The LAN is also fault-tolerant.

Users lament: Take my LAN Manager, please

ANALYSIS

BY JIM NASH
CW STAFF

What is the difference between Microsoft Corp.'s LAN Manager network operating system and comedian Rodney Dangerfield? Dangerfield gets no respect and makes millions. LAN Manager just gets no respect.

LAN Boy. The LAN that time forgot. LAN woe. The puns played on Microsoft's local-area network product are legion. Even with the company's new plan to market the operating system directly, it is unclear whether users will ever give it a standing ovation.

Steve Larson, systems analyst at Smith-Corona Corp. in Cortland, N.Y., said the sheer number of computer services based on DOS will pull Microsoft into a greater role in networking. However, Larson said, it will not be a dominating role anytime soon. "They do have the capability and the knowledge to change the balance of power [in networking], but I don't think they will do it," he said.

Larson pointed to what he calls the last "steady-state" LAN Manager-based product, 3Com Corp.'s 3+Share, adding that 3Com's subsequent LAN Manager system, 3+Open, lacks the maturity or "steadiness" to handle Smith-Corona's four-network, 250-user system.

He said he is looking for "memory backup, E-mail, routing, file and print services all on one board."

> THE PUNS played on Microsoft's local-area network product are legion.

For some IS administrators, Microsoft may have more to overcome than a wan list of features. The company will have to erase from its memory bad experiences with LAN Manager-based systems from OEMs.

Denise DeTomaso, systems analyst at General Motors Corp.'s Electronic Data Services division, said the carmaker's Hydra Matic division in Warren, Mich., is abandoning its OS/2-based 3+Open network.

"Right now, we're going to trash our 3+Open and go with Netware 386," DeTomaso said. "We have had too many funky problems with no answers." For example, she said, her networked personal computer last month started demanding two

Continued on page 76

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CM12 BERRIEN COUNTY CPS 8/14/90 09:25:12
CASE SUMMARY

CASE NUMBER: 623804P** CASE NAME: Adams, Thomas** STATUS: R

NATURE OF REFFERAL:

Father has repeatedly threatened to injure his spouse and children. On 7/20/90 he struck his wife. Later the same day, he threw Thomas, 6 y/o to the floor, fracturing his ulna. Child was treated at local emergency room. Protective services was called. Upon initial investigation and with court approval child was released to the custody of his aunt pending a preliminary hearing in juvenile court.

PF1=RAPID PATH PF2=MAIN MENU PF3=CM MENU Do=SAVE DATA

Char Mode Replace Page 1 Count: *0

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Shopping at Sears via Compuserve

BY ELLIS BOOKER
CW STAFF

CHICAGO — Sears, Roebuck and Co. is serious about reaching customers through electronic networks.

The retail giant, which offers a catalog ordering service to subscribers of Prodigy Service Co. — the on-line information service that Sears and IBM jointly launched in October 1988 — initiated the same type of service on competing on-line networks late last month.

Sears placed an electronic version of its famous catalog on Compuserve, Inc.'s information network and General Electric Information Services' GENIE.

According to an official at Sears Catalog, a unit of Sears Merchandise Group, the on-line catalog on Prodigy contains about 5,000 product listings; those on GENIE and Compuserve contain between 1,000 and 1,500 listings.

Prodigy spokesmen were nonchalant about its sponsor's appearance on another information network. "We think it's entirely appropriate for Sears to be on Compuserve," said Steve Hein, a spokesman for White Plains, N.Y. Prodigy.

"I don't think it rattles anyone," agreed Karen Nielsen, a research analyst at Link Resources Corp. in New York. Direct-to-the-home retailing and marketing is part of a trend, she said, "and Sears is a natural player in that market."

Sears Catalog joins more than 100 other merchants who advertise and market goods in the "Electronic Mall," a service that debuted on Compuserve in 1985.

While Compuserve does not release figures on the number of people using its hundreds of on-line offerings, it does report that sales in the mall have gone up 76% compared with the same period last year, and orders have increased 44%.

Compuserve, an H&R Block company in Columbus, Ohio, is the nation's largest videotex provider; it claims 595,000 subscribers. Prodigy claims 460,000 subscribers, making it the fastest growing information services network in the nation.

Floppy disks are not all alike. For vital data, some brands are simply out of their depth.

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Dysan 100
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A Jewel in the on-line service

BY MICHAEL FITZGERALD
CW STAFF

Family outings to the grocery store, complete with hauling home eight bags of groceries, could become a memory, as Prodigy and grocers spread the word on computerized grocery services.

Jewel Foodstores, a division of American Stores Co., snubbed Prodigy, the IBM and Sears, Roebuck and Co. joint venture, and started a test market of its own on-line order and delivery service early last month. This gave Jewel a bit of a jump on its major competitor in the Chicago area, Dominick's Finer Foods, an independent chain. Dominick's recently announced it will join Prodigy.

Prodigy has yet to face head-to-head competition with on-line grocers in any of its seven other markets, which include Atlanta, Detroit, St. Louis, Washington, D.C., Houston, Denver-Boulder and Minneapolis-St. Paul.

Two peas in a pod

Jewel's effort is a joint venture with an Evanston, Ill.-based start-up, Peapod Delivery Systems. Peapod developed the IBM Personal Computer-based software and runs the whole process, including taking the orders, shopping and delivering the food.

Currently, the system pulls product information on some 12,000 items from Jewel mainframes. Like Prodigy, it accommodates goods in various sizes and prices. Shoppers can create a personalized shopping list of up to 50 items, "browse" through store "aisles" or simply type in a brand name to place an order.

Jewel spokeswoman Joyce Maffia said the company looked at Prodigy's on-line grocery service but decided that the Peapod system is "more affordable for the consumer, and the menus move more quickly and give more detail."

Peapod customers pay an initial fee of $15 for the software, plus a $35 annual membership fee. Prodigy for DOS machines costs $29.95 through Dominick's, and members pay a $9.95 monthly fee.

Analysts said that allowing consumers to shop at home adds to the likelihood that they will continue to shop with a particular store. But Fred Schneider, director of the industry food program at Andersen Consulting, expressed doubts about whether the home market is ready for computerized services — from Prodigy or anyone else.

Other analysts pointed to the popularity of the grocery service on the defunct Tel-Action videotex service as offering some possibilities for success. Still, the lack of PC penetration into the home market could work against either service.

Prodigy has discontinued grocery service in San Francisco and aborted its New York attempt in testing. But in Atlanta, stores in The Kroger Co. chain have been on-line through Prodigy for two years. Kroger started by having delivery and pickup orders routed through one high-volume store and has since expanded to allow pickup at all of its 60 area stores, while delivering through a second store. It reports some 50 users per day, with an average order of approximately $102.

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NOVELL

The Past, Present, and Future of Network Computing.

AT&T nets $100M in four custom network deals

BY ELLIS BOOKER
CW STAFF

AT&T's custom network business jumped $100 million late last month, as the carrier announced multiyear contracts to develop voice and data networks for four of its customers.

The four Tariff 12 contracts bring to 64 the number of customers for AT&T's Virtual Telecommunication Network Service (VTNS).

All four customers will hand off network management to AT&T, which will provide monitoring and network configuration from various control centers throughout the country.

When AT&T first launched VTNS in September 1987, it expected to provide each customer with a private control center, but the popularity of the option has caused AT&T to combine customers in the centers, according to an AT&T spokeswoman.

The announced customers are the following:

• Caterpillar, Inc. in Peoria, Ill., awarded AT&T a five-year, $22.5 million contract to link more than 100 Caterpillar locations, including international satellite links to Hong Kong, Singapore, Japan and Australia. Caterpillar, a maker of construction machinery, engines and turbines, said it expected to save more than $15 million in communications charges over the life of the contract.

ALL FOUR CUSTOMERS will hand off network management to AT&T, which will provide monitoring and network configuration.

• Avis Rent A Car System, Inc. awarded AT&T a $35 million contract to link its domestic car rental locations in the U.S. with its worldwide reservation headquarters in Tulsa, Okla., and various U.S. hubs. Avis maintains about 4,700 rental locations in 142 countries.

• Textron, Inc., a diversified aerospace, commercial products and financial services firm, said it had chosen AT&T for a three-year contract, covering inbound and outbound voice and data services to more than 500 locations in 40 states. The amount of the contract was not revealed, but Textron said it expected to save $2.5 million annually in communications charges.

• ITT Corp. in Farmington, Conn., tapped AT&T for a three-year, $37.7 million project to create a custom network and dedicated network management center linking 850 ITT locations worldwide.

Is your customer support forcing you to go to extremes?

Now there's an alternative to long-term service contracts, which your customers may not want, and support service, which *you* cannot afford to give away. The solution is AT&T *MultiQuest*® Service and it's an innovative support option that allows your customers to pay only for service as they need it.

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IBM mainframe, Mac versions of RPC tool debut

BY RICHARD PASTORE
CW STAFF

Netwise, Inc. recently announced IBM mainframe and Apple Computer, Inc. Macintosh versions of its remote procedure call tool set. RPC Tool facilitates transparent client/server and peer-to-peer distributed computing across multivendor networks at the software level.

The mainframe version works on IBM mainframes running MVS, CICS or VTAM. It facilitates client/server relationships with minicomputers and workstations from Digital Equipment Corp., Sun Microsystems, Inc. and IBM.

Specifically, RPC Tool will allow mainframe cooperation with DEC VAXs running VMS and Decnet/SNA VMS, and with workstations running Sun's SunOS and IBM's OS/2 Extended Edition.

The package, which includes a compiler and network library, supports the LU6.2 protocol. Available now, it can be licensed permanently for $100,000 to $200,000, or on a yearly basis.

RPC Tool "adds value to IBM's [Systems Application Architecture] by extending it to heterogeneous platforms," said Norman Judah, project leader at Esso Petroleum Canada. Judah has been implementing a mission-critical application that requires his IBM mainframe to be integrated into a local-area network. With RPC Tool, Judah can position the mainframe as a peer node on the LAN, where it acts both as a client and a server.

The Boulder, Colo.-based firm also announced RPC Tool for Apple's Macintosh. The product enables Macintoshes to interoperate transparently across a Transmission Control Protocol/Internet Protocol network with applications running on other vendors' systems. These include VAXs running VMS and Ultrix, Sun workstations, DOS and OS/2 personal computers and several Unix-based platforms. Set to ship in two months, it will cost $3,200.

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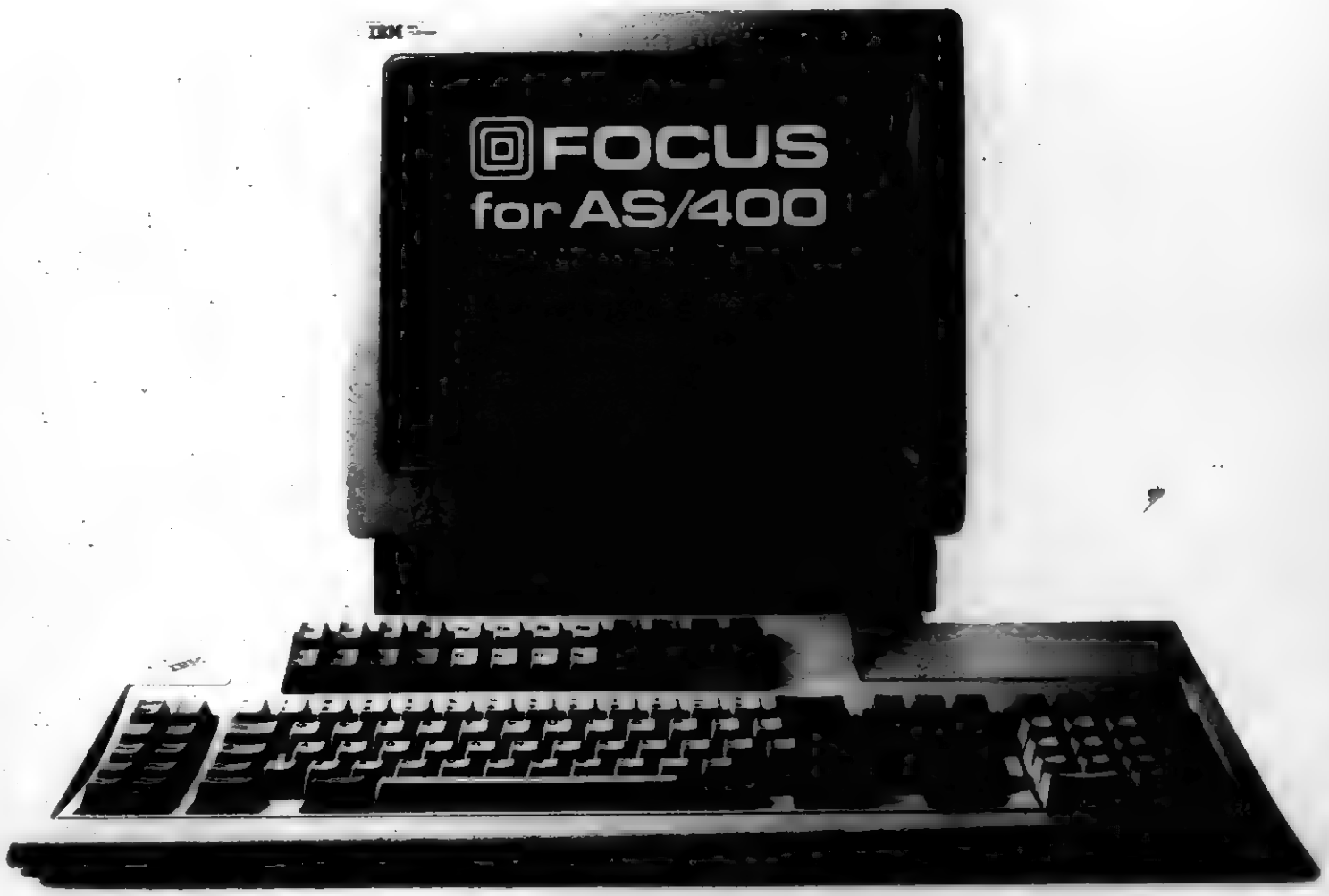

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No one is more familiar with multivendor connectivity than the people at Businessland. After all, we've designed, installed, and supported more multivendor networks than anyone else.

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THERE ARE A HOST OF REASONS TO CONNECT WITH MACINTOSH.

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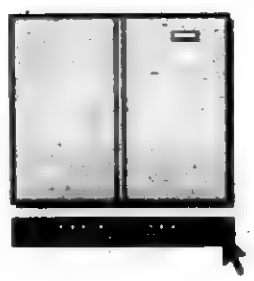
Thanks to third-party software known as Mitem-View,™ your developers can quickly create a "point and click" interface for Macintosh-to-mainframe applications without making any host modifications.

And with a unique Mac-to-host software tool set known as Mac-Workstation,® developers can create friendly front-ends to host applications that allow these applications to continue to evolve without modification of desktop software.



Not only does Macintosh connect into all environments, but Apple's Data Access Language makes it possible for your users to request and update information from host databases—regardless of what type of network technology, host system architecture, or DBMS they are using.

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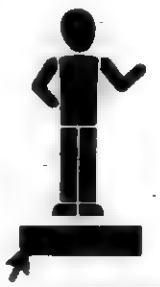

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To find out more about Macintosh connectivity and NetFRAME servers, and to receive a copy of a recent independent study conducted among MIS managers on the productivity benefits of Macintosh, contact us at 1-800-328-8383. Ask us to fill you in on all the network news.

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PC WEEK, May 7, 1990. **Direct LocalTalk connections dependent on NetWare 386 NLM due Fall, 1990. Macintosh connection achieved today via standard bridges.

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Verdix's multilevel LAN protects different types of sensitive data

BY GARY H. ANTHES
CW STAFF

CHANTILLY, Va. — Verdix Corp. late last month announced the first local-area network product able to support access by users with varying levels of security clearance to data with differing degrees of sensitivity.

VSLAN — the first LAN to be certified by the U.S. Department of Defense's National Security Agency (NSA) — is intended for use in the federal government and the commercial sector. It is expected to replace redundant LANs that have been set up to separate data with different levels of sensitivity.

The NSA's National Computer Security Center (NCSC) certified VSLAN at the B2 level of trust, a level of security between A1, with extremely rigorous safeguards, and D, which offers minimal protection.

VSLAN consists of a "trusted" workstation, which is used by the network security officer to input the organization's security policies and monitor and control the network, trusted Ethernet interface boards for each user device on the network and trusted software. VSLAN for a 16-node network would sell for approximately $45,000, Verdix said.

Verdix Chairman and President E. Gary Clark said the company will later introduce a lower-priced version, tailored especially for the commercial sector, without all the features necessary to earn a B2 rating from the NCSC.

Stephen T. Walker, president of Glenwood, Md.-based Trusted Information Systems, Inc., said the product is likely to find wide application in the commercial world, in LAN-based applications in which data exists with varying degrees of sensitivity.

For example, Walker said, financial institutions might create documents whose headers, or address information, is unclassified but whose text is classified. That application might also encrypt the body of the document, which would then be unclassified. VSLAN could ensure that the encrypted body remains protected while allowing free access to the encrypted text and its header.

Trusted Information Systems sells a version of the Xenix operating system that is soon to be certified by the NCSC at a B2 level of trust. Walker said a workstation running Trusted Xenix could be attached to a VSLAN network and could then access data at varying levels of sensitivity, depending on the authorization of the user. However, other devices on the LAN would only be able to access data at the level of classification that was established for them in advance.

Some units of the Defense Department, including the Military Airlift Command (MAC), have committed to using the product, Verdix said. MAC may use it in systems supporting the deployment of supplies to the Middle East, according to the company.

Spectrum tool links VM sites

BY ELLIS BOOKER
CW STAFF

NEW YORK — Spectrum Concepts, Inc. has announced what it claims is the first connectivity product for VM to use IBM's Advanced Program-to-Program Communications (APPC)/LU6.2 protocols.

Spectrum Concepts, which has implemented IBM's peer-to-peer communications product on a range of systems, is aiming Xcom 6.2 VM at the approximately 8,000 VM host sites.

While IBM has several communications products for linking its various computer platforms, Spectrum offers a single product, consolidating these functions. Beyond the extra expense of buying the different packages, Spectrum Vice-President Keith Eisenstark claimed, supporting these different software products means extra staff.

Spectrum said it expects the key users of the VM product to be those with lights-out data centers doing volume data file transfers. The company also said it hopes the speed of its product — 90,000 char./sec. over a 4M bit/sec. token-ring network — will be a major selling point.

"Speed is of the essence in a file-transfer product," Eisenstark said. "If it takes you 25 hours to back up, it doesn't really help you."

The vast majority of Spectrum customers, he said, are engaged in bulk file transfers, including the growing popularity of backing up local-area networks. "Ad hoc file transfer is only about 5% of what's going on," he said.

Features of Xcom 6.2 VM, like those of the other Xcom products, include automatic restart and recovery from line failures and audit-trail logging on both sides of the file transfer.

Prices for Xcom 6.2 VM, which comes with both command line and application programming interface modes, range from $19,120 to $49,520.

The beauty of a fiber optic network depends on what you run the light through.

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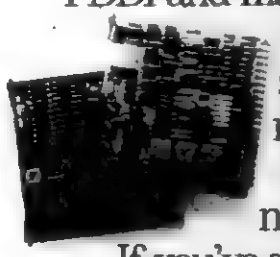

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EDI finally accepted by auto industry as the norm

BY GABRIEL SHAPIRO
SPECIAL TO CW

Electronic data interchange (EDI) may have passed a milestone, at least according to interviews with automobile industry and EDI experts at the yearly Auto-Tech conference in Detroit. Everyone interviewed this year said that EDI is now accepted as the "normal" way of doing business.

Auto-Tech's three years are easily delineated by categorizing conference attendees' reactions to EDI. In 1988, suppliers predominantly expressed fears about having to comply with the Big Three's requests to "do EDI." In 1989, these same suppliers showed quickly gained enthusiasm for EDI by actively seeking better ways to exploit EDI systems. This year, most companies talked about beginning to accept the realities of effecting truly useful EDI implementations and the need to apply EDI in as many corporate operations as possible.

Michael W. Gerus, project team coordinator for the 800-member Automobile Industry Action Group (AIAG), the cooperative trade association that puts on the show and coordinates EDI and other technical pursuits within the industry, is considered by many to be a guru on auto industry EDI.

He said, "We see the positives and negatives of this new realism. On the negative side, it is obvious that many industry members, the AIAG and I misjudged the length of time required to implement EDI. In some ways," he added, "I feel the industry should have reached its current phase several years ago . . . On the positive side, industry members are beginning to understand the high level of commitment necessary to doing EDI right."

In speeches, Philip E. Benton Jr., president and chief operating officer of Ford Motor Co., and Robert J. Schultz, vice-chairman at General Motors Corp., credited the AIAG with orchestrating major movement toward increased high-technology involvement by the automobile industry without giving unfair competitive advantage to any specific company.

Marv Grieshaber, past chairman of AIAG and manager of inventory control and procedures at Chrysler Corp., concurred with his corporate competition about AIAG's favorable impact. "We have made a huge amount of headway toward standardizing EDI through AIAG," Grieshaber said. But he also agreed with Gerus about the pace of EDI implementation within the industry. "There has to be an accelerated effort to implement EDI in a strategic, coordinated way."

He emphasized that current and future hard work at "standardizing American EDI will pay off years later when we won't have to adopt European standards. We want them to follow us, so we don't have to follow them."

"One thing for sure," Grieshaber said, "we're going to have to get out of EDI 101 and start getting more technical. The industry needs more direct, technical advice on handling company-specific implementations."

Gerus pointed out that attendance at Auto-Tech has gone up every year. "That shows increased awareness and interest in doing EDI and in doing EDI right.

"While it certainly has been more costly and taken a longer time to implement EDI than we first thought, we have learned many things about EDI implementation," he said. "We know that we must formulate a strategy for implementation based on thorough studies, allow suppliers more time to comply with auto companies' requests to do EDI and work closer with EDI software suppliers.

"I think that other industries can learn from our mistakes," Gerus added. "That could help them save time and money. As far as the auto industry goes, we have told them why to do EDI; now the AIAG must help show the industry how to do EDI."

Shapiro is a writer based in Ann Arbor, Mich.

LAN

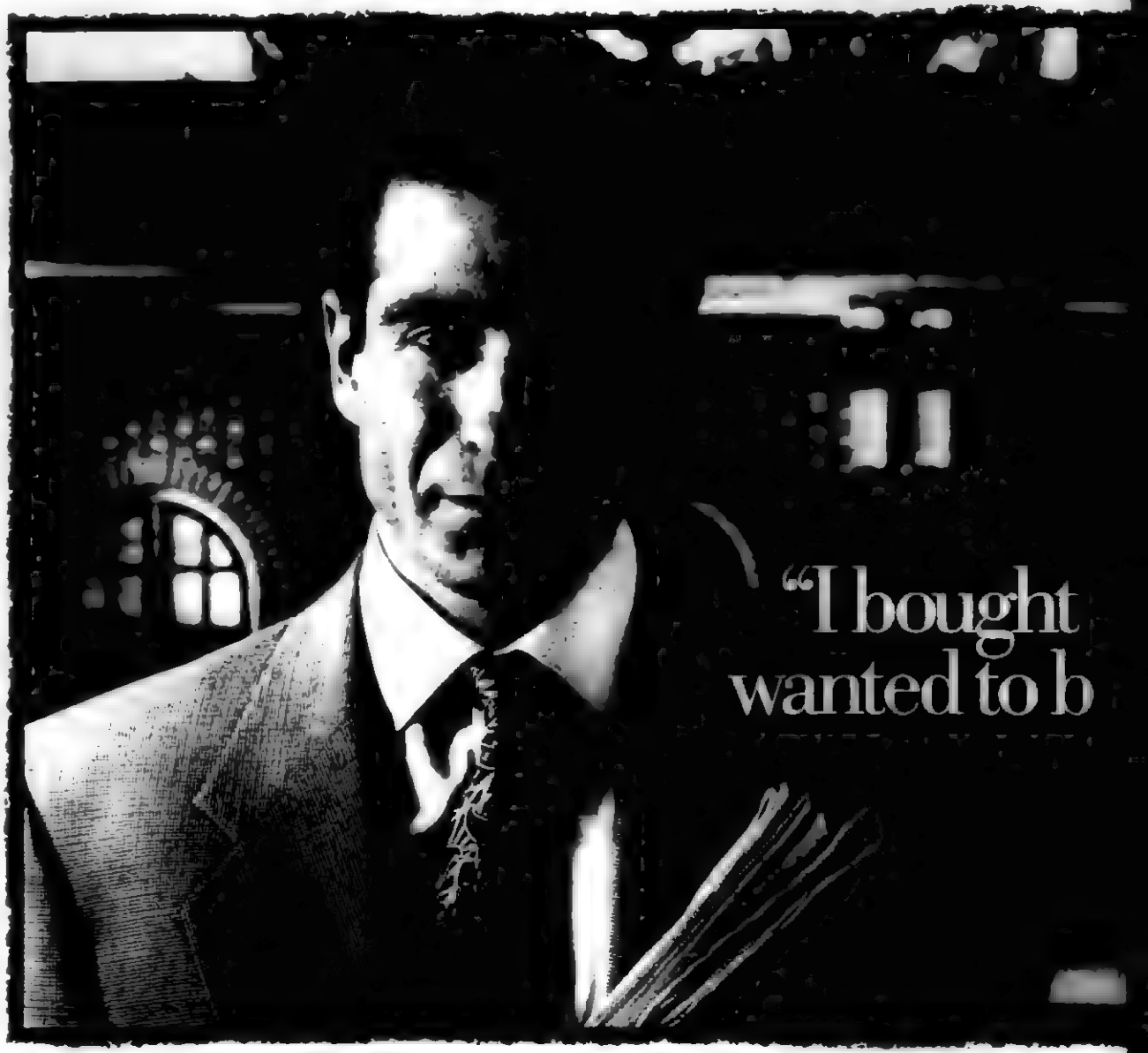
CONTINUED FROM PAGE 63

passwords instead of the customary one. Any two words were accepted to gain access, DeTomaso explained. Before a cause could be found, she said, the system returned to normal.

"The problem is not with OS/2, it's with 3+Open," she said. That is small consolation for Microsoft if all that users can remember are their bad experiences with a LAN Manager-based network.

There is support for LAN Manager — and some of it comes from upper management — but that support is largely in policy rather than practice. Management at some Fortune 1,000 companies has bet on Microsoft as a long-term player in networking, thus adding a dose of comfort for executives who have installed expensive information systems in the past only to watch their vendor fold.

In fact, said Leo Spiegel, executive vice-president of sales and marketing at reseller LAN Systems in New York, many large corporations formally standardized on LAN Manager years ago. But IS departments themselves have virtually ignored the directive, opting for systems they have perceived as more reliable and functional, he explained.



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NEW PRODUCTS

Network management

Hewlett-Packard Co. has introduced four Integrated Services Digital Network (ISDN) Primary Rate Interfaces for the HP 4954I wide-area network protocol analyzer, including the HP 18357A, 18358A, 18359A and 18366A.

The products combine with the HP 18356A ISDN Channel Selector to provide an ISDN interactive tester that allows users to send ISDN data to an implementation under test without editing, compiling or linking a program.

The products cost $7,200 or $10,000, depending on type of model. The HP 4954I sells for $24,600 to $29,800, depending on configuration.

HP
19310 Pruneridge Ave.
Cupertino, Calif. 95014
(800) 752-0900

Modems

Digital Pathways, Inc. has announced a product that is used for securing access to computer ports with dial modems.

The Digital Authentications Device includes security features and central management tools to facilitate the administration of multiple remote dial locations. A challenge/response authentication dialogue feature produces a random password for each user access attempt.

It is priced at $400.

Digital Pathways
201 Ravendale Drive
Mountain View, Calif. 94043
(415) 964-0707

Gateways/Bridges/ Routers

Intervoice, Inc. has introduced a digital bridge that acts as an interface for value-added digital network services, automatic call distributor or private branch exchange switching and host computer systems. Onelink provides users of switching systems with the functions of an Integrated Services Digital Network Primary Rate Interface.

It integrates database and telephone functions and acts as a protocol converter for advanced network functions.

Onelink costs $1,620 per channel for a single T span or less than $400 per channel for 384 channels or 16 T spans.

Intervoice
17811 Waterview Pkwy.
Dallas, Texas 75252
(214) 497-8720

Local-area networking hardware

David Systems, Inc. has announced a series of 10Base-T network adapter kits designed for use in 8- or 16-bit bus IBM Personal Computers or compatibles.

The Intelligent Concentrator Kit provides expansion capability for David's Intelligent Concentrator in six- or 12-port quantities.

The David Expressnet Kit includes a complete 10Base-T local-area network and comes in two configurations.

Volksnet Kit is also available in two configurations that provide a complete 10Base-T LAN for end-to-end connections.

Prices range from $375 to $5,795, depending on type of kit and configuration.

David Systems
701 E. Evelyn Ave.
Sunnyvale, Calif. 94086
(408) 720-8000

Lantana Technology, Inc. has introduced two token-ring controllers designed for IBM Personal Computer ATs and XTs.

The 8-bit Cypress/1-4 ($795) and 16-bit Cypress/3-4 ($695) feature 4M bit/sec. data transfer rates. Cypress/1-4 is a short-slot board for small systems and laptops. It includes 128K bytes of random-access memory buffers. Cypress/3-4 can be configured with up to 48K bytes of RAM buffers and can be used for file-server and graphics-intensive applications.

Lantana Technology
4393 Viewridge Ave.
San Diego, Calif. 92123
(619) 565-6400

Sureman Computer Corp. has announced the NS-2000, an Intel Corp. 80386SX-based diskless workstation.

The 32-bit 16/20-MHz system runs in an on-board dedicated CPU and comes with up to 2M bytes of memory, expandable to 8M bytes. Other features include serial, parallel and IBM Personal System/2 bus mouse ports and a 1,024- by 768-pixel 16-color Video Graphics Array card. The list price is $1,995 per unit.

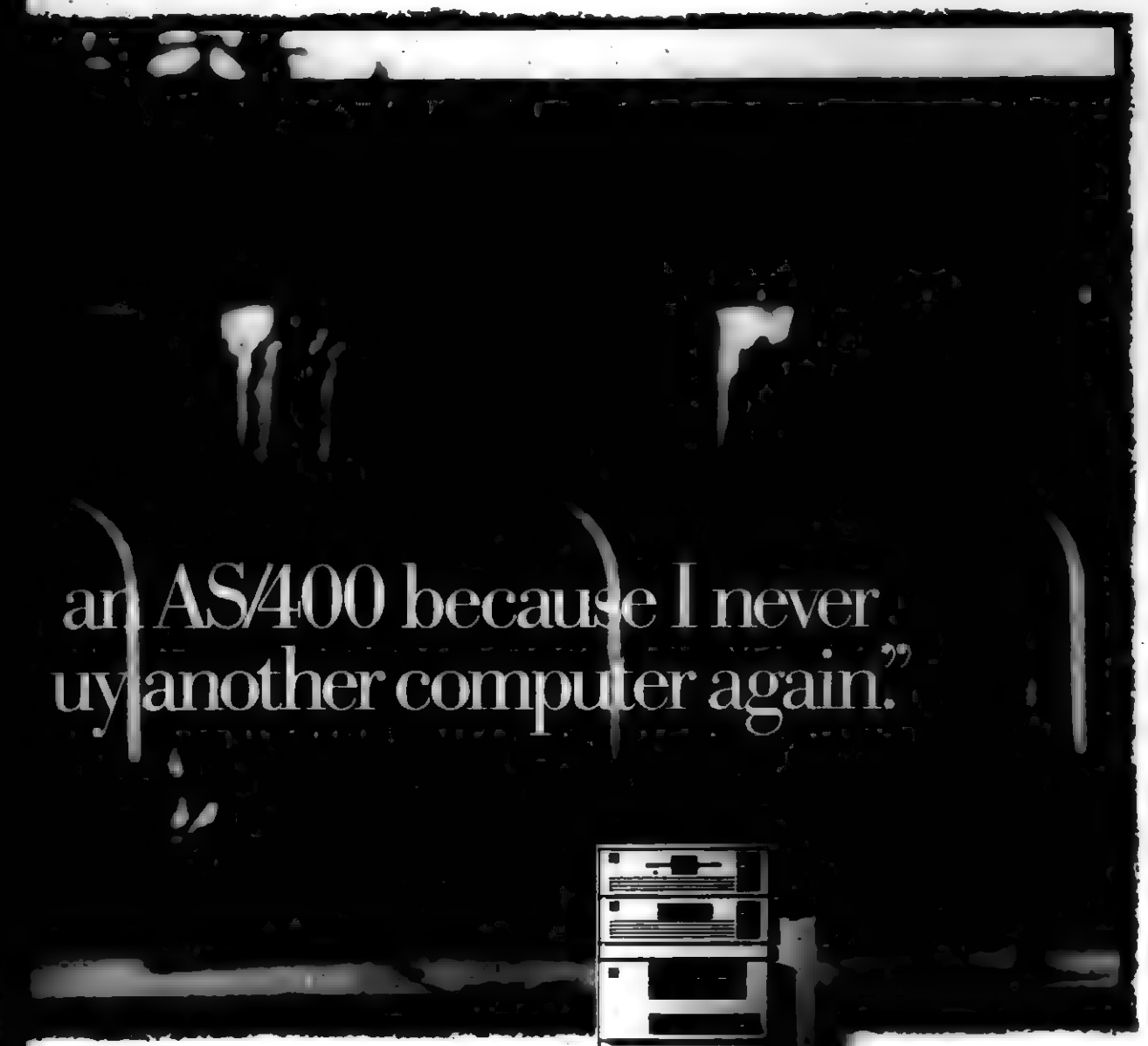
Sureman Computer
2850 Mesa Verde Drive East
Costa Mesa, Calif. 92626
(714) 545-1338

Monolithic Systems Corp. has announced an intelligent terminal concentrator that enables managers of Ethernet-based local-area networks to add serial devices to a network backbone via a single cable.

Lanconnect provides eight or 16 serial ports, and each port can service up to four simultaneous open sessions.

Eight- and 16-port versions are priced at $1,895 and $2,935, respectively.

Monolithic Systems
7050 S. Tucson Way
Englewood, Colo. 80112
(303) 790-7400



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The Newsweekly of Information Systems Management

MANAGER'S JOURNAL

EXECUTIVE TRACK

Myrl W. Kicklighter, former vice-president and systems director at Bank of America Corp., has been named to the new position of general manager at **Soft-Pac Corp.**, a vendor of personal computer-based management productivity software in Los Altos, Calif.

Before working for Bank of America in San Francisco, Kicklighter held executive positions in information systems with Gibraltar Savings in Los Angeles and Electronic Data Systems Corp. He reports to Soft-Pac President James D. McFarlin.

The Worldwide Information Services department at **Black & Decker Corp.** in Towson, Md., announced three appointments, all reporting to Sid Diamond, corporate vice-president of the department.

Harry Kleinhen was named director of operations. He has been with Black & Decker for almost 25 years in a variety of U.S. and overseas management positions.

Donald A. Lee was named director of planning & technology, joining the firm from Alexander & Alexander, Inc. in Baltimore. Lee holds a master's degree in electrical engineering from Georgia Institute of Technology.

Rosina L. Maiers has been named director of systems development. She was previously center director at the U.S. Department of Veterans Affairs in Austin, Texas. Maiers holds a bachelor's degree from Pennsylvania State University.

Who's on the go?

Changing jobs? Promoting an assistant? Your peers want to know who is coming and going, and *Computerworld* wants to help by mentioning any IS job changes in Executive Track. When you have news about staff changes, be sure to drop a note and photo or have your public relations department write to Clinton Wilder, Senior Editor, Management, *Computerworld*, Box 9171, 375 Cochituate Road, Framingham, Mass. 01701-9171.

An IS director who does it all

Carleton Technologies' Krallman is a fan of hands-on service for users

BY MARYFRAN JOHNSON
CW STAFF

Whenever Ken Krallman wants to meet with his network manager, his database administrator and his information systems director, all he has to do is look in the mirror.

"I tend to have very short meetings and make very quick decisions," says Krallman, IS director at Carleton Technologies, Inc. in Orchard Park, N.Y.

The $35 million aerospace manufacturer launched a new computing environment from ground zero in 1988, with the towering, genial Krallman running a one-man show. Carleton's former parent company sold the firm to UK-based F.R. Group PLC in 1987, and Krallman was hired the following year to shepherd through a total data conversion from IBM mainframes to Digital Equipment Corp. VAXs.

The move catapulted Krallman from an ivory tower into the trenches of defense and aerospace manufacturing. This was his first IS job in the business world after years of managing systems for mathematics researchers, students and college professors. He was Carleton's first IS director.

"The best thing that ever happened to Carleton was *not* having an MIS group when it was sold," says Krallman, 42. "Our former parent was a glass house, and that mentality would have come along with it."

Carleton has been supplying life support equipment for manned space flight, commercial and military aircraft and marine applications since 1957.

PROFILE: Ken Krallman

Tony Gerardi

Position: *MIS director, Carleton Technologies, Inc.*
Mission: *Supporting the business goals of a $35 million manufacturer following Japanese principles of quality control*

When astronaut John Glenn circled the earth in the *Mercury 7* spacecraft in 1962, the regulator for his oxygen system came from Carleton. Other famous clients include the F/A-18 Hornet (environmental control valves) and the Peacekeeper Stage 4 missile (pressure system relief valves).

Krallman's IS department now includes two systems analysts, one of whom was hired just months ago. The department prides itself on actively supporting the company goal of becoming a technically integrated manufacturer. "I believe that MIS is very much a service organization, and we have to talk to our customers," Krallman says. "The more we know what they're doing, the better off the company is. We are not MIS in a corner. The worst place to find us is in our offices."

A strong emphasis on Japanese-style quality control management permeates Carleton Technologies. Given a few minutes notice, Krallman can fish around in the paper sea that over-

Continued on page 80

Patents can be good on automated systems

BY MITCH BETTS
CW STAFF

Traditionally, patents have been used to provide 17-year protection for inventors of things such as zippers and better mousetraps. Today, in an economy full of junk bonds, mortgage-backed securities and other creative financial instruments, patent law is being stretched to provide exclusive rights to the innovations of the financial services industry.

Although the actual financial products or services cannot be patented, the automated business systems underlying those products can be, giving companies an unusual weapon in the battle to gain competitive advantage through strategic information systems [CW, May 30, 1988].

"Patents have the potential for causing the greatest reverberations in the financial industry," wrote attorneys at the Washington, D.C., law firm of Sutherland, Asbill & Brennan in a 26-page memorandum published last month.

"Competitors could well find themselves foreclosed from marketing a product or class of products for 17 years, or perhaps could do so only by paying royalties under a license," said the memorandum, written by attorney Peter K. Trzyna and his colleagues.

The most famous case of a strategic IS patent is the Cash Management Account, for which Merrill Lynch & Co. obtained a patent in 1982. It was challenged by competitor Paine Webber, Inc., but a 1983 court opinion upheld the patent because it involved "a method of operation on a computer to effectuate a business activity."

More recent patent awards have gone to Lazard Freres & Co. for a system that restructures debt obligations and to Citibank NA for an "automated investment system."

"In an industry that is becoming ever more automated and standardized, patent protection should be used creatively," Trzyna's memo said. "We recommend it highly, particularly for first-issue products."

The disadvantages of using patents include the fact that they are expensive — fees of $10,000 to $20,000 are typical for the first application, which may be rejected — and take 18 to 25 months to obtain.

However, the memorandum argued that patents are a powerful tool not to be ignored by either the innovators or the Johnny-come-latelies, who may be forced to drop their use of a new product or pay royalties to the patent-holder.

Krallman

CONTINUED FROM PAGE 79

whelms his desktop and haul up *Guide to Quality Control* by Kaoru Ishekawa. The Japanese text is based on principles espoused 40 years ago by W. Edwards Deming, the U.S. statistician and expert on companywide quality control.

"We have to be as good as any manufacturing company in the world, and we're clearly not there yet," Krallman says.

That does not mean the 300-employee company is not prospering, however. Annual sales growth is chugging along at 10% or more. "We actually have more work than we can handle these days," Krallman says with a satisfied smile. "Everybody is on overtime."

As a predominantly government contractor, Carleton's need for well-documented, accessible engineering designs was one of the key concerns in choosing a distributed computing style over a mainframe-centered environment.

The decision to break the mainframe mold at Carleton was spurred partly by the choice of new manufacturing, office and engineering software, and partly by management's determination to spread the net of computing power as widely as possible. A Carleton marine equipment facility in Tampa, Fla., is also based on DEC computers, which are linked by dial-in mode to the Orchard Park headquarters.

"Part of what we're about in empowering our people is getting meaningful decisions made at the lowest possible level in the organization," says John Burgess, president of Carleton. His six years working in Japan for the former parent company, Moog Industries, Inc., convinced Burgess to realign Carleton's management structure to encourage employees to work toward "optimizing" the company.

"The defense industry is operating in a different environment than it was five years ago. Our customers, and the government, are saying the old ways of doing business are expensive and wasteful," Burgess explains. "We're going to be doing it differently, because the choice is to change or be left behind."

In steering Carleton's IS operation toward this changing future, Burgess and his executives sought an individual with a companywide perspective as well as technical expertise. Krallman's academic and research slant to IS — as opposed to a purely business background — was considered a plus.

"One of the things that attracted us to Ken was that he had no desire to build an empire," Burgess recalls.

During Krallman's first weeks on the job, Burgess purposely did not tell anyone who the new IS guy's boss would be. The idea was for Krallman to focus on his new job with a wide-angle lens. One of Krallman's requirements in accepting the Carleton job was that he would report to the chief of operations and engineering rather than the chief financial officer.

"Things I may need to do might not be the best thing for a particular department but will be good for the whole company," Krallman explains.

That attitude sat well with the company president. "The financial people follow the wagon train and try to predict where that wagon train is going," Burgess notes. "Ideally, you want the scouts out in front. That's where MIS should be: anticipating the needs of the organization and facilitating those needs."

"I've got to stay a step ahead of my users," Krallman agrees. "If you develop a fortress mentality, the users will go right around you."

Krallman came to Carleton from Allied Signal Corp.'s Research Lab in Buffalo, where he managed computer systems for the center of applied mathematics. Before Allied, he worked for the State University of New York (SUNY) at Buffalo.

His Ph.D. work in finance at SUNY Buffalo was permanently derailed when his knowledge of Fortran landed him a research assistant job in the computer center. Eventually, he was running the center, teaching students and helping faculty solve their computer problems.

Yet the fast-paced, demanding atmosphere of a specialized manufacturer has been much more exhilarating, he insists. Since the Carleton plant operates 24 hours a day, Krallman is set up with a terminal and dedicated phone line at his home to monitor the system or run batch jobs from there.

"I look at the computer room like a utility room," he explains. "People who maintain a glass room to show off their automation don't understand the role of it. A computer system does nothing for you unless you have the people, the processes and the management to make use of that tool."

One of his newer projects is installing Vaxnotes on the DEC network to streamline communications among various engineering groups. The project conferencing and bulletin board features of Vaxnotes will be used to exchange information and keep everyone constantly updated.

"A long time ago, I figured that someone would eventually figure out how computers are vital to a company's survival," Krallman says. "There is not a single department we don't touch — if we're doing our jobs right, that is."

> "I BELIEVE MIS is very much a service organization, and we have to talk to our customers. The more we know what they're doing, the better off the company is."
>
> KEN KRALLMAN
> CARLETON TECHNOLOGIES

Six of one . . .

Carleton Technologies' IS director Ken Krallman thinks of his system architecture as a hybrid creature — halfway between classic two-tier computing and the interactive client/server mode, where an application is split between the minicomputer and workstations or PCs.

The computing base at Carleton Technologies rests on a DEC VAX 8550 minicomputer running Cincom Systems, Inc. manufacturing and financial software, and a VAX 3600 hosting computer-aided design and manufacturing packages from Schlumberger, Inc.

Analysis engineers run finite element analysis packages on a dozen IBM-compatible PCs from Gateway 2000, while project engineers and secretaries work on 30 Apple Computer, Inc. Macintoshes. More than a dozen manufacturing engineers use Vaxstation 3100s, and electronic mail use is extensive throughout the company on DEC VMS Mail.

As believers in hands-on help for users, the IS staff encourages users to try Cincom's Spectra, a query database language that allows users to get into an application to view and manipulate their data.

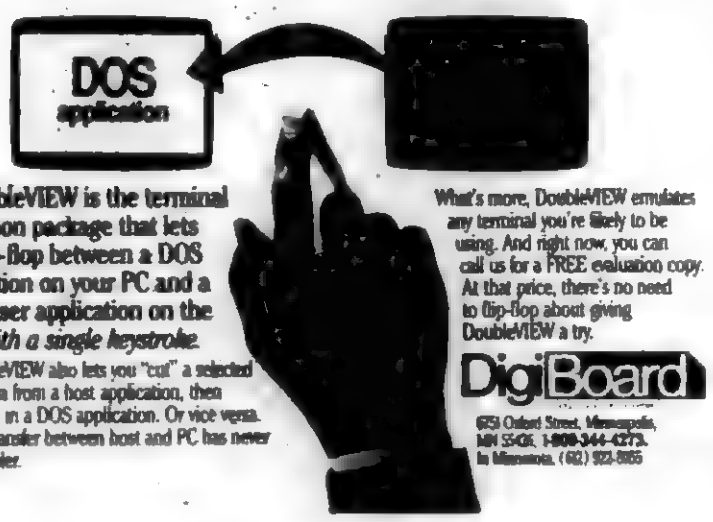
Dozens of dumb terminals are connected to the VAXs through DEC's Personal Computer System Architecture networking product, and the IS department also oversees a Novell, Inc. PC network and an Appletalk network for the Macintoshes.

"We do have networks that don't use the VAX, and that's fine," Carleton Technology President John Burgess says. "Unless there's a need for the information to be shared, we're not that big on putting it on the VAX."

"People treat computing as something big and spooky, but if you have to be an expert [on your desktop machine], then someone isn't doing a good job," Krallman says. "Our rule of thumb is that if it takes more than one screen to do what you want, give us a call. That's the way I do business."

MARYFRAN JOHNSON

Flip Flop, Flip Flop, Flip Flop.



DoubleVIEW is the terminal emulation package that lets you flip-flop between a DOS application on your PC and a multi-user application on the host *with a single keystroke.*

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MANAGEMENT BRIEFS

Manufacturers' VP given honor

Dave Maley, a vice-president at Manufacturers Hanover Trust Co. in New York, won the third annual **Developing the Human Side of Technology Award** from Bedford, N.H.-based Ouellette & Associates Consulting, Inc.

Maley led a proactive effort to improve service to information systems users at Manufacturers Hanover while IS was undergoing data center consolidation, restructuring and downsizing. The key, Maley said, was getting his employees in the wholesale computer services departments to view and treat users as their customers.

Honorable mention awards went to Beth Banks, senior training analyst at Ethicon in Somerville, N.J., and Margo Clyma, a manager of training at Scott Paper Co. in Philadelphia.

The International DB2 Users Group (IDUG) has announced its **call for papers** for the 1991 IDUG conference, which will be held in San Francisco May 19-23, 1991. Major topic areas include application development, database administration, management/decision support, new DB2 users, advanced DB2 users and systems programming.

Those interested in participating should send a 100-word abstract of their proposed presentation to IDUG, Suite 600, 111 E. Wacker Drive, Chicago, Ill. 60601. The phone number is (312) 644-6610. The deadline for receiving submissions is Oct. 15.

The Electronic Data Interchange Association (EDIA), based in Alexandria, Va., announced last week that it has transformed its users group, known as the EDI Council of the USA, into the EDIA User Action Committee.

The standing committee, which will be the association's "designated user advocate," is headed up by consultant R.T. (Bob) Crowley and Rachel Foerster, EDI market manager at Baxter Healthcare Corp.

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Open systems create security nightmare

BY JAMES DALY
CW STAFF

Although the advent of open systems architecture gains cheers from users, the homogenization of vendor offerings has also had nightmarish repercussions for security personnel, according to recent research.

The situation has become so bad that the percentage of security costs in total IS budgets is expected to more than quadruple from 2% to 9% by 1994, according to a report by Forrester Research, Inc. in Cambridge, Mass.

The Forrester report indicated that where proprietary systems are more prevalent, a computer virus may infect one type of computer but not another, and it could not reach all corporate systems. "The old [system] is so easy to secure because it's so damn difficult to get at," acknowledged one user who was interviewed.

However, that situation fell by the wayside with the advent of open systems such as Unix and OS/2 and the growing popularity of local-area networks and client/server computing.

"Standard systems are readily understood and compromised by attackers," the report said.

The report noted that security can sometimes be overlooked because it does not in and of itself increase company profits, cut costs or make the organization more money. But a single security breach can eliminate a hard-won competitive advantage or compromise critical strategic information in just a matter of minutes.

There is, however, one important caveat that must be considered when steeling up security.

"Users sometimes have a tendency to get carried away in their security," Forrester President George Colony said. "Only about 5% of your data needs to be highly secured. Assign a value to all your data and figure out what is most important before you wall off everything."

Secure structure

Once those concerns have been prioritized, security often becomes a keystone to the IS structure.

"Security is definitely going to be more of a proactive than a reactive concern," said Stephen Levandowski, vice-president of information at Levi Strauss International, a division of Levi Strauss & Co. in San Francisco. "We want to stop these problems before they come in the door." Levandowski said he expects his security budget to possibly triple during the next few years.

While a variety of issues worry users — viruses, hackers, thefts and information leaving the company via floppy disks — the threat from people inside the company and sloppy policies and practices seem to be the hottest concerns of planners, according to the report.

Quick reaction

As a result, users are already taking a shine to security-conscious systems designs: Novell, Inc.'s Netware 2.15 and 3.0, for example, were praised for their multilevel security systems, while Compaq Computer Corp.'s N-series personal computers were lauded because they can be configured to boot off a central server, eliminating the chance of data being stolen via floppy disks.

Conversely, the report criticized Microsoft Corp.'s LAN Manager and IBM's LAN Server for being too inflexible and tough to configure.

The report also indicated that enhanced auditability — ironclad knowledge of who is using which server, application or file — will become an essential part of future security concerns. With the use of MIT's Kerberos network authentication facility or RSA Corp.'s public key technology, companies will be able to ensure that servers are correctly matched to users. But the report warned that such devices will not be widely available for 18 to 24 months.

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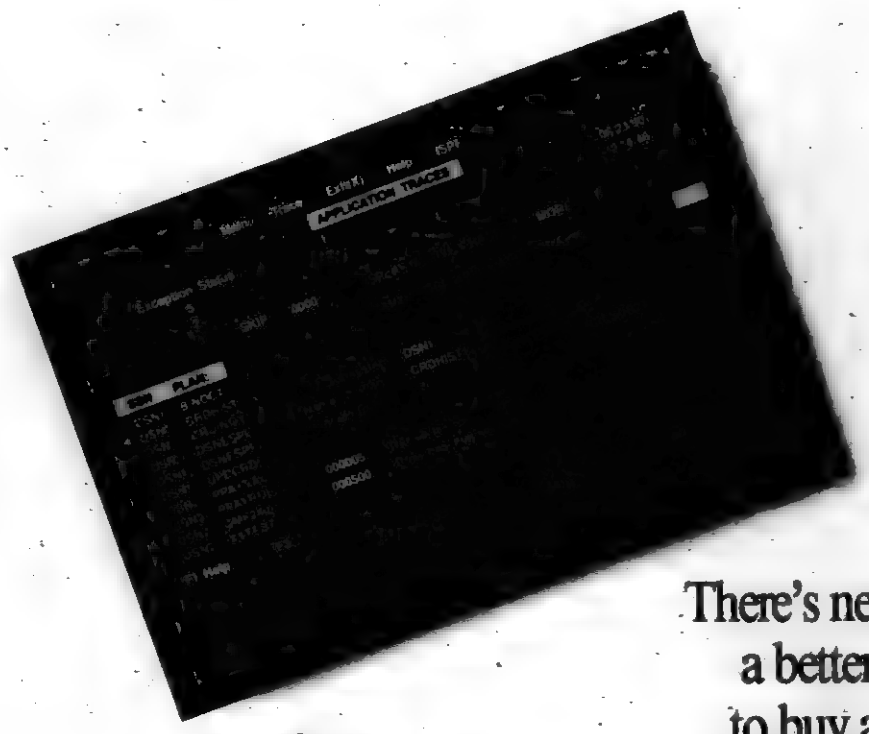

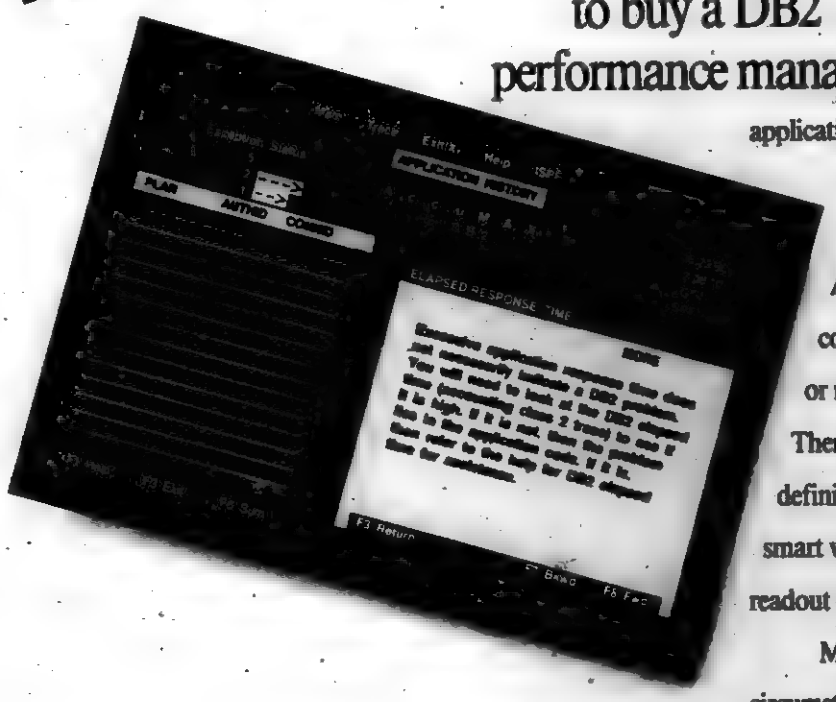

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VIDEO REVIEW

Strategic information technology use makes a move to video

COMPETING THROUGH INFORMATION TECHNOLOGY
By James I. Cash and F. Warren McFarlan
Harvard Business School Video Series
Nathan/Tyler, $2,000

Neither information systems nor business management are inherently visual subjects, so the academics and production specialists responsible for the Harvard Business School video series faced an uphill battle in creating their program on "Competing Through Information Technology."

Harvard's *Warren McFarlan*

Given the lack of action and the preponderance of "talking heads," the professors and the producers acquit themselves well. While the two-hour program drags in spots, it covers an impressive breadth of issues and background information that is well focused on the subject, without inducing slumber.

A variety of formats help keep the program moving. The two stars — Harvard professors F. Warren McFarlan and James I. Cash — lay out their principles along with a sparing measure of matrices and other analytical frameworks. Both McFarlan and Cash are well spoken. McFarlan brings to the program some of the wit that permeates his conference appearances and an intensity and enthusiasm rare for any business academic. The program includes a section on failed projects — not so viewers can avoid duplicating these "harebrained schemes," he says, but so they can pursue them in new and different ways.

There are also graphical renderings of the matrices and other conceptual frameworks, as well as video footage of the academic principles being put to work in a variety of corporations, much of it narrated by a professional announcer.

Finally, there are interviews with senior executives from some of these companies. The interviews and illustrations — the professors refer to at least 20 companies — lend a sense of reality to what might otherwise be a strictly academic discussion, as do a number of references that the professors make to points or companies described earlier in the program. One weakness is that most of their examples are well known. Another is a lack of probing in the interviews; they are less journalistic inquiries than vehicles for the subjects to pass along established insights.

The program does not represent a total victory for the video medium. Video lends itself to images and feelings, while this kind of program revolves around ideas. Viewers are likely to devote most of their attention to the 14-page viewer's guide, which encapsulates the principles, diagrams and analytical frameworks more succinctly than the tapes and in a form that one can refer back to frequently.

Wide variety

The professors and their production specialists use the various devices at their disposal to cover the following material:

- The varying degrees of importance IS has in different organizations.
- The historical evolution of IS management.
- The different ways in which systems can affect organization and control — in some cases centralizing and tightening, in others decentralizing and loosening.
- The ways in which systems shared by customers and suppliers affect industries.
- Strategic alliances aimed at sharing costs of development projects or creating relationships among companies in different industries.
- The different kinds of risk that development projects pose and how to manage them.

In keeping with the focus of Harvard Business School, the program is aimed primarily at general managers and top corporate managers in particular. Given the breadth of material and the concise manner in which it is covered, however, much of it should be relevant for IS managers, particularly those unacquainted with academic approaches to the strategic management of IS.

Now, about the cost. The package includes reprints of five *Harvard Business Review* articles and five copies of both the viewer's guide and a case study on Frontier Airlines. There is also a 10-page user's guide on presenting the program to different kinds of audiences. For the price — $2,000 ($1,600 for educational institutions) — it is unlikely the package would be worthwhile for casual viewers. It might prove worthwhile, however, to an organization committed to disseminating its message in a formal manner to all the necessary movers and shakers and intent on seeing that they follow up on what they hear.

Like a two-year MBA program at Harvard Business School — which currently costs nearly $33,000 — the value depends on what you do with it.

DAVID LUDLUM

Ludlum is a *Computerworld* senior writer.

Datacomm Commentary

"We have 1,900 reasons to rely on UDS modems"

Networking some 1,900 paint and decorating stores nationwide requires bold thinking; the broad geographic spread generates an awesome task for the Sherwin-Williams information network.

Sales, inventory, personnel and other operating data must move between each store and the corporate mainframe on a timely basis. Concurrent on-line credit card verification is another desirable capability.

Sync-Up™ 201/212 modems, by UDS, are the Sherwin-Williams solution.

These devices are tailor-made for Sherwin-Williams' divided communications responsibility — their low-speed (1200 bps) channel can be used for credit card verification, while operating data travel via the modems' higher-speed (2400 bps) circuit.

Versatility, reliability, economy. These are the reasons why Sherwin-Williams chose UDS. If you have similar system needs, follow the Sherwin-Williams example. Contact UDS, 5000 Bradford Drive, Huntsville, AL 35805-1993. Telephone 205/430-8000; FAX 205/430-8926.

—Bob Mulhern, Manager Systems Integration Paint Stores Group

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COMMENTARY

Albert L. Lederer

Listen and you shall find

The search for a firm's potential strategic information systems essentially serves two purposes. The first purpose is discovery. The techniques can help managers think up new and innovative applications. Presumably, imaginative ideas are scarce, and their discovery is a significant management challenge.

The second purpose is identification. Plenty of good ideas for strategic IS might exist within the firm. Managers, professionals and clerks — from both user and IS departments — may already have thought up plenty of clever ideas. In that case, the ideas don't need to be discovered because they already exist.

In the latter case, the problem is that the people are simply not being heard. Without diligent listening by IS managers, significant ideas may be lost forever.

Interviews with managers from 34 organizations recently generated 10 guidelines to help IS managers determine if they are listening. The guidelines arose from the interviewees' concerns that the IS managers in their firms were not listening to them.

Here are the 10 guidelines:

1. Don't let a past failure to develop strategic IS prevent you from trying again.

2. Beware of your own potentially insufficient understanding of technical issues. Perhaps surprisingly, some IS executives today have limited technical background. This can prevent them from understanding how a proposed strategic system can ever be successfully implemented. Hence, they doubt the systems and ignore their potential.

3. Don't reject an idea because it was "not invented here." Some IS executives display a "we vs. they" attitude. If a suggestion arises from outside their IS department, they may simply be reluctant to recognize it.

4. Keep your ego out of the process. Some IS executives exhibit overconfidence by believing their current systems are the best possible and that there is no need to explore further applications. Whether the executives actually believe this or not may be irrelevant; they are giving the impression to others in the firm that they are not interested in listening to new ideas.

5. Don't be overly concerned about financial returns. Many IS executives are very concerned about return on investment, net present value and so forth. No surprise here, given that their organizations' top management is often similarly concerned.

However, it is often difficult to calculate the costs and especially the benefits of strategic IS. Many strategic applications simply may never get off the ground because IS executives could not overcome their fear that potential benefits may fail to offset costs.

6. Don't be excessively concerned about political issues. If a proposed project doesn't extend the influence and power of the IS department, many IS executives will not support it. Likewise, interviewees suggested that IS executives can be more concerned about their appearance to top management than about their actual accomplishments. For example, if top management has initially rejected a proposal, many IS executives may never lobby for it again.

7. Beware of risk aversion. In some organizations, the fear of failure is great, and retribution for failure is a concern. The benefits of strategic systems may be long-term, and lengthy development durations give plenty of time for failure. Perhaps understandably, some IS executives are reluctant to move forward in the face of potential failure and retribution from their own management.

8. Don't become excessively preoccupied with technical issues. Some IS executives see new systems as technical challenges rather than business challenges. When the time comes to commit to a strategic IS proposal, they balk because the technology isn't sufficiently avant-garde.

9. Be sure that your understanding of your organization's business is sufficient. Many IS executives have little understanding of their organizations' business strategies or insufficient knowledge of particular application areas. Users sense this, and it creates conflict. IS executives feel they're listening, but users don't believe it.

10. Don't become too busy fighting today's fires to listen to suggestions from all quarters. Many IS executives are too tied up reacting to their current crises. They are preoccupied with projects that are behind schedule and problems tied to hardware operations. They don't feel confident delegating their responsibility for these activities to their subordinates. They are reactive.

Some IS managers are searching high and low for strategic IS applications, but perhaps these applications are already present in the minds and words of those around them. They merely need to recognize them — and then listen.

Lederer is associate professor of MIS at the Oakland University School of Business Administration in Rochester, Mich.

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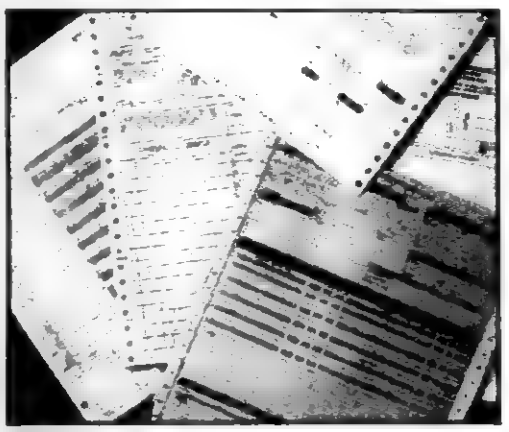

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CALENDAR

Users of Wang Laboratories, Inc. products in the U.S. will convene at Technetron '90 at the Boston Marriott Copley Place on Oct. 16-19.

Wang Chairman Richard Miller will speak at the conference dinner on Oct. 17. A keynote speaker is market analyst Thomas Willmott, vice-president of Aberdeen Group. A variety of technical and management seminars will be given by Wang representatives, customers and third-party vendors.

More information is available from the U.S. Society of Wang Users, Suite 205, 2138 S. 61st Court, Chicago, Ill. 60650. (708) 652-3888.

SEPT. 30 - OCT. 6

Benefiting from Systems Integration. New York, Sept. 30-Oct. 2 — Contact: Abbey Chakalis, CMP Conference Group, Manhasset, N.Y. (516) 562-5717.

Venture Publishing Seminar. San Jose, Calif., Sept. 30-Oct. 2 — Contact: Bob Moody, VPUG, San Jose, Calif. (408) 227-5030.

Development Center Institute Fall Conference. Indianapolis, Sept. 30-Oct. 3 — Contact: Development Center, Indianapolis, Ind. (317) 846-2753.

Information Industry Association's Annual Convention & Exhibition. Boston, Sept. 30-Oct. 3 — Contact: IIA, Washington, D.C. (202) 639-8262.

Control, Audit and Security Conference. Atlanta, Sept. 30-Oct. 4 — Contact: Patsy Day, MIS Training Institute, Framingham, Mass. (508) 879-7999.

TCP/IP Protocol Suite. Burlington, Mass., Oct. 1-2 — Contact: State-of-the-Art Program, Northeastern University, Dedham, Mass. (617) 320-8055.

AS/400 Technical Conference. Hilton Head Island, S.C., Oct. 1-3 — Contact: AS/400 Technical Conference, Warrenville, S.C. (800) 553-0404.

Effective Methods for Information System Quality Assurance. Orlando, Fla., Oct. 1-3 — Contact: Quality Assurance Institute, Orlando, Fla. (407) 363-1111.

Information Industry Scenario Conference. Phoenix, Oct. 1-3 — Contact: Ashley Pearce, Gartner Group, Stamford, Conn. (203) 964-0096.

Information Technology Conference & Exposition. San Diego, Oct. 1-3 — Contact: Data Processing Management Association, Park Ridge, Ill. (708) 825-8124.

National Computer Security Conference. Washington, D.C., Oct. 1-4 — Contact: Tammy Grice, National Institute of Standards and Technology, Baltimore, Md. (301) 975-2775.

Seam Tech '90. Atlanta, Oct. 1-4 — Contact: Aim USA, Pittsburgh, Pa. (412) 963-8588.

CD-ROM Expo. Boston, Oct. 1-5 — Contact: Dorothy Ferriter, IDC, Framingham, Mass. (800) 225-4698.

Object-Oriented Systems Development. Washington, D.C., Oct. 1-5 — Contact: Barnett Data Systems, Rockville, Md. (301) 762-1288.

Unix Solutions Exposition and Conference. Anaheim, Calif., Oct. 3-5 — Contact: The Interface Group, Needham, Mass. (617) 449-6600.

Accessible Computer Technology Exhibit. Washington, D.C., Oct. 4 — Contact: Alan Douglas, ACT 111, Washington, D.C. (703) 557-6159.

OCT. 7-13

Pacific Northwest Software Quality Conference. Portland, Ore., Oct. 7-9 — Contact: Terri Moore, Pacific Agenda, Portland, Ore. (503) 223-8633.

Fox Developer Conference. Toledo, Ohio, Oct. 7-10 — Contact: Fox Software, Perrysburg, Ohio (419) 874-0162.

Indycon Electronic Show & Conference. Indianapolis, Oct. 8-9 — Contact: Indycon, Carmel, Ind. (317) 571-8462.

Eastern Exposition and Conference. Alexandria, Va., Oct. 8-10 — Contact: The American Public Communications Council of the North American Telecommunications Association, Washington, D.C. (800) 538-6282.

National Communications Forum. Chicago, Oct. 8-10 — Contact: National Communications Forum, Chicago, Ill. (312) 938-3500.

Southeastern Telecommunications Association Conference and Equipment Exposition. Miami Beach, Fla., Oct. 8-10 — Contact: SETA, Columbia, S.C. (803) 731-5640.

American Production and Inventory Control Society International Conference and Exposition. New Orleans, Oct. 8-12 — Contact: APICS, Falls Church, Va. (703) 237-8565.

Interop '90. San Jose, Calif., Oct. 8-12 — Contact: Interop, Inc., Mountain View, Calif. (415) 941-3399 ext. 209.

CASE World Conference and Exposition. Chicago, Oct. 9-11 — Contact: Digital Consulting Group, Andover, Mass. (508) 470-3880.

Northcon/'90. Seattle, Oct. 9-11 — Contact: Northcon, Los Angeles, Calif. (213) 641-5117.

Executive Information Systems in Government. Washington, D.C., Oct. 9-12 — Contact: Conference Manager, USPDI, Inc., Silver Spring, Md. (301) 445-4400.

Computer Negotiations. New York, Oct. 10-11 — Contact: International Computer Negotiations, Inc., Winter Park, Fla. (407) 740-0780.

Imaging '90 Conference and Exposition. New York, Oct. 10-12 — Contact: Michelle Graczyk, BIS CAP International, Inc., Norwell, Mass. (617) 983-9130.

Info '90, International Information Management Exposition & Conference. New York, Oct. 10-12 — Contact: Cahners Exposition Group, Stamford, Conn. (203) 352-8477.

Microprocessor Forum. San Francisco, Oct. 10-11 — Contact: Microprocessor Report, Sebastopol, Calif. (707) 823-4004.

Understanding and Implementing On-Line Transaction Processing. New Brunswick, N.J., Oct. 10-11 — Contact: Jess Saiple, Data-Tech Institute, Clifton, N.J. (201) 478-5400.

International ACM/SIGIR Conference on Information Retrieval. Chicago, Oct. 13-16 — Contact: Association for Computing Machinery, New York, N.Y. (212) 869-7440.

International Society for Hybrid Microelectronics (ISHM) Symposium on Microelectronics. Chicago, Oct. 13-17 — Contact: ISHM, Reston, Va. (800) 535-4746.

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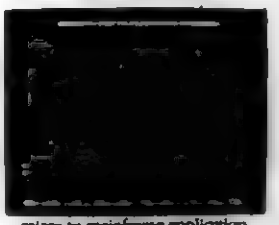

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Some walls are higher than others

While IS people are generally satisfied with their profession, they say they want more understanding, appreciation of their work

BY DAVID A. LUDLUM
CW STAFF

The Berlin Wall has fallen, and countries in Western Europe are opening their borders to one another. But here in the U.S., information systems people still suffer from a feeling of isolation.

Overall, IS people are more than happy with their calling, according to *Computerworld*'s fourth annual job satisfaction survey. However, when there is discontent, IS vice-presidents and programmers say, it is often because top managers and computer users do not understand the complexities of IS work or appreciate its importance.

A little more than half the people responding to the survey say they're satisfied or very satisfied with their current position (see chart facing page). Another one-fourth say they're somewhat satisfied with it.

Overall, the respondents agree that IS is an exciting profession, albeit a high-pressure one. Ask them what they like most about being in IS, and they're likely to say challenge, followed by technology and variety (see chart below).

One big challenge is watching costs. IS people need to squeeze more out of old systems and make sure that new technologies are cost-effective, says Hannah Foster, senior vice-president of IS at The Coast Distribution, a distributor of parts for boats and recreational vehicles in San Jose, Calif. Although costs of certain technologies are falling, the expense of specialized IS training is growing, she says.

Technology has moved up on the list of things the respondents like about their profession: It is the No. 2 choice in this year's survey, up from No. 4 last year.

During the last few years, there has been a lull in exciting new technologies, according to Michael Sepe, IS manager at Irvine Ranch Water District in Irvine, Calif. Today, technologies such as imaging and optical storage promise to create new ways of doing business, he says.

What the respondents liked least about their profession is related to problems with management and end users: poor communication, a lack of understanding and recognition of IS work as well as users' demands, complaints and mistakes.

The messages that the respondents would most like to pass on to top management are to improve communication, interaction and teamwork and to give IS people more recognition and involvement in decision-making.

"Improve communication" is the message from Larry Davis, MIS operating officer at Service Star Corp., a hardware, lumber and building materials wholesaler in Butler, Pa. His organization has created a customer information system that he says has far-reaching implications, but management needs to convince employees to change their ways and use it. "Its usage is optional until we get effective communication from top management that it shouldn't be optional," Davis says.

Managers continue to be frustrated by senior executives who don't understand technology. Gerard E. Tarpey, associate director of management and computer information systems at Pace University in New York, says he wishes that top managers knew enough about technology to understand when it's time to upgrade equipment. "It's like pulling teeth to get the OK for added horsepower," he says.

That lack of understanding can trickle down in an organization. IS professionals complain that some computer users don't understand how difficult it can be to create information systems. "It's not just a matter of flipping a switch and getting a report out," says James Evans, a senior programmer/analyst at Systematics, Inc., a facilities management company based in Little Rock, Ark.

Foster is troubled about a more general lack of understanding of IS, particularly the perception that IS organizations are somehow different and that IS people are "techno-nerds." IS people usually possess a clear understanding of business needs, she says.

Users and top managers also fail to appreciate the significance of IS work, survey respondents say. In developing systems, IS people create a "hidden infrastructure" and change the way business is conducted throughout an enterprise, says Mike Whaley, MIS/DP manager at Job Opportunities in Nevada, a nonprofit job training agency in Reno.

"There are a lot of things you tailor, and therefore you subtly change the way decisions are made," Whaley says. Training people to use computers also makes an impact on the enterprise that most people don't appreciate, he says.

Structurally frustrated

These misperceptions, misunderstandings and tensions can leave IS people frustrated. When asked about their biggest frustration, slightly more than half of the respondents point to office politics. As IS organizations gain clout within their enterprise, people in other areas can view the changes as empire building, Sepe says.

The IS organization at Irvine Ranch Water District is taking charge of telemetry systems used for remote control of water supplies — an area that had been the bailiwick of an engineering group. That change has created turf battles. "Engineering people say, 'You guys print paychecks. What do you know about telemetry?' " Sepe says.

Evans is also frustrated by politics. He recalls a client of his company ousting an IS consulting firm — wrongly, he says — after the consulting firm had cut back on the role of some IS executives. Those executives had the political clout to fight back.

One way of gaining political clout is to move into the executive suite. But three-fourths of the respondents to the survey say their company's IS department does not provide the right opportunities to advance to non-IS management positions.

An alternative to the move to a non-IS management position is to change jobs. Almost one-third of the respondents say they are always looking for job opportunities (see chart facing page). One-fifth of middle managers also have an eye out for opportunities, compared with 16% of senior executives and 31% of IS professionals.

Only 12% of senior IS executives say they are considering changing professions, and middle managers are more likely to be doing so than IS professionals. The most popular alternative is to be self-employed or own a business. ●

Two-edged sword

Change turns up on both a blessing and a curse when IS people list the things they like most and least about their work

What do you like the most?

1. Challenge

"We want to maximize and optimize the use of existing systems, not just change because there's something newer or better."

HANNAH FOSTER
SENIOR VICE-PRESIDENT FOR IS
THE COAST DISTRIBUTION

2. Technology

3. Variety

4. Constant change

5. Problem-solving

What do you like the least?

1. Communication
(Lack of communication with or recognition by management)

"Top managers don't communicate effectively what they want technology to do for them. If you allow them to be vague, that's all they are going to do."

LARRY DAVIS
MIS OPERATING OFFICER
SERVICE STAR CORP.

2. End-user mistakes and demands

3. Stress/Pressure/ Burnout

4. Long or odd hours

5. Ever-changing business and technology
Unrealistic deadlines
(tie)

CW Chart: Tom Monahan

How they compare

Senior executives express greater satisfaction with their jobs than middle managers and IS professionals, but all three groups share some common frustrations.

	Overall satisfaction with position (1=very dissatisfied, 4=very satisfied)	Most important factors	Satisfied with resources for understanding business?	Three biggest frustrations
Senior IS executive	3.26	•Success of the company •Variety of responsibilities •Salary	Yes: 55%	•End-user mistakes/demands •Management's lack of communication/ recognition •Long or odd hours
IS middle manager	3.06	•Salary •Health insurance •Success of the company	Yes: 40%	•Management's lack of communication/ recognition •Stress/Pressure/ Burnout •End-user mistakes/ demands (tie) •Unrealistic deadlines (tie)
IS professional	2.95	•Salary •Health insurance •Opportunity for advancement	Yes: 46%	•End-user mistakes/demands •Politics/Conflicts between departments •Management's lack of communication/ recognition (tie) •Stress/Pressure/ Burnout (tie)

Travelin' shoes

More IS professionals than middle or senior managers are on the lookout for job opportunities

	Senior IS executive (Base: 215)	IS middle manager (Base: 259)	IS professional (Base: 233)
Always looking for job opportunities	9%	7%	15%
Currently seeking a job change	7%	10%	14%
Not actively looking but would look into a good opportunity	33%	34%	47%
Might accept a new position with my company	14%	19%	18%
No desire to change jobs	19%	31%	7%

When asked whether they are considering changing their profession, mid-level managers seem the most ready to move

Senior IS executive	IS middle manager	IS professional
Yes: 12% No: 88%	Yes: 21% No: 79%	Yes: 17% No: 83%
Base: 212	Base: 249	Base: 222

Business matters

IS respondents in utilities and health care say they're the most satisfied with the resources their companies provide for understanding business issues

"Are you satisfied with the resources your company provides for better understanding your business?"

	No:	Base
Health care	33%	27
Utilities	34%	35
Banking	43%	44
Insurance	43%	49
Wholesale/Retail	51%	85
Government	57%	77
Education	59%	56
Manufacturing	60%	141
Other financial services	72%	32
Overall	54%	

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The newspaper for information systems management

Buildings with smarts

Today's intelligent structures let tenants make changes without fuss

BY MICHAEL FITZGERALD

When TRW, Inc. decided to install a series of local-area networks in its corporate headquarters, it was able to move ahead with the project in a straightforward fashion because of the brains in its building.

Raised floors and modular offices were built into the new world headquarters building TRW moved into in 1985. The intelligent building was designed specifically to accommodate the changes in technology that TRW knew would come.

For smart buildings such as TRW's, computer-controlled temperature, lighting, security and fire systems are just the basics. Nowadays, the emphasis is on flexible cable and port setups for networking computers and moving terminals and phones around without massive system changes.

"There was no way of knowing five years ago what type of wiring we'd need over the projected 50-year life of the building," according to John Fralick, director of information resources at Lyndhurst, Ohio-based TRW. "But one thing that was very clear to us was that information technology was going to be very important to [employees] and that . . . anything we bought at move-in time would become obsolete and probably be replaced more than once over the building's lifetime."

Because of this foresight, two major system changes and the widespread implementation of LANs have not required any internal construction work. TRW was able to rework office space and remove coaxial cabling with little difficulty, as well as install LANs based on Ethernet and token-ring wiring.

The building's brains still do not extend quite as far as some people would like, however. Fralick reports that some visitors express disappointment that the elevators don't talk.

Defining smart buildings

Just what is a smart building?

Ask a developer about intelligent buildings, and he'll tell you that "a building becomes an intelligent building as soon as it is fully rented." For its part, the smart building buzzword emerged in the early 1980s as a marketing vehicle for a United Technologies Corp./AT&T joint venture that offered shared tenant services, a service that locked a structure's tenants into a building-based private branch exchange. The joint venture was sold in 1986.

What it means to be a smart building has evolved since then. Building IQs vary greatly, according to Richard Geissler, executive director of the Intelligent Building Institute in Washington, D.C. Geissler says a smart building consists of an automated system for one or more of the following:

- Heating/ventilation/air-conditioning (HVAC) controls.
- Lighting.
- Fire/life/safety systems.
- Security systems.
- Electrical power regulation.
- Escalators and elevators.
- Information pathways.

The flexibility of information pathways, such as TRW's ability to change its wiring with a minimum of hassle, is currently a hot point for developers and tenants. A raised floor, for instance, was a requirement for Merrill Lynch, Pierce, Fenner & Smith, Inc. to move into Olympia & York, Inc.'s World Financial Center in New York.

Bringing in the brain

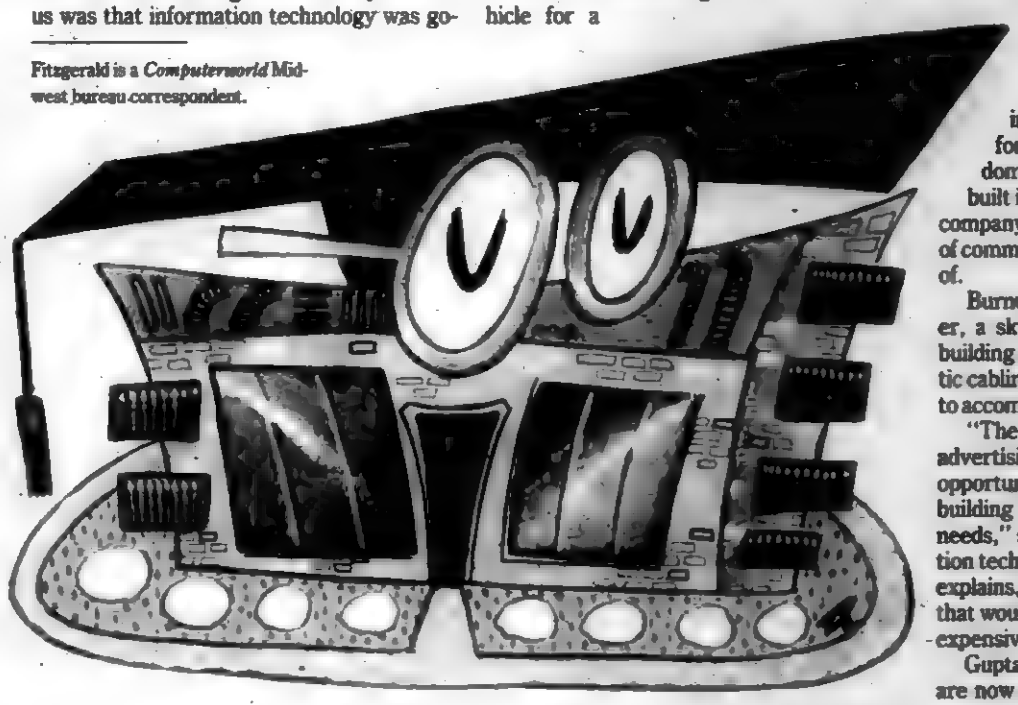
Some organizations go even further in their quest for intelligence. Take, for example, Leo Burnett Co., a large domestic advertising agency. When it built its new headquarters in Chicago, the company went for the most intelligent kinds of communications services it could get ahold of.

Burnett moved from the Prudential Tower, a skyscraper built in 1955, to its own building in part to take advantage of fiber-optic cabling and a floor design that was laid out to accommodate a 1,200-node LAN.

"The building is specifically designed for advertising professionals, and we took the opportunity at the same time to wire the building so it would accommodate our needs," says Raj Gupta, director of information technology at Burnett. The LAN, Gupta explains, "made some applications possible that would have been too cumbersome or too expensive to do before" in the Prudential.

Gupta says that the creative departments are now able to share clip art files and that media buyers can access a common database

Fitzgerald is a *Computerworld* Midwest bureau correspondent.



Robert de Michiell

- **From HVAC to elevators**
- **'We've just touched the tip of the iceberg'**
- **Flexibility is a virtue**

of information. In some cases, the wiring even enables Burnett to share files with clients. "It's absolutely worth the money, and something that we've just touched the tip of the iceberg on," Gupta says. "There's so much more that can be done, and we're in the process of making progress on that."

TRW's Fralick adds, "It's worked out just as we expected. It's been very easy to rewire, to remove abandoned cable, and there are no constraints to rewiring. We've got flexibility here."

Yet it's ironic that TRW didn't even want a smart building, although they were popular at the time.

"Nobody said, 'Let's build a smart building,'" Fralick explains. "It was, 'Let's build a building that could accommodate changes in technology, because we're not smart enough to know what [those changes] are going to be over the life of the building.'"

Headquarters at Leo Burnett

The drawback of smart buildings is their cost and the difficulty of integrating the various computer-controlled building systems together (see story at right).

It still costs a lot to build a smart building, even though systems are much cheaper than they used to be and the cost of technology such as fiber optics has become less prohibitive.

"There's a limit to how much smartness a city can support when [intelligence] gets translated to rent," says Bea Sennewald, senior vice-president at Henningson, Durham & Richardson, an architectural and engineering firm.

But analysts say that costs are dropping to the point at which certain types of automated systems compete on price with the old-fashioned pneumatic systems. Developers that stay on to manage the buildings they build generally seem to prefer smart systems.

"The cost in absolute terms ain't chicken feed, but in relative terms, it's pretty inexpensive," says The John Buck Co.'s Kenneth Hanson, general manager of Buck's 35 West Wacker building, Leo Burnett's headquarters. "This was a more than $200 million building. [Automated systems] save a significant amount of money on a long-term basis because you need fewer engineers on-site."

At some point, intelligent buildings will be less focused on the technology and more focused on usability and quality of work life. The emphasis will likely shift to issues such as whether the lighting is designed appropriately for the work involved.

"If [the building] is functionally lousy — for example, it may have state-of-the-art wiring but no windows — is it still intelligent? In my mind, no," says Ray J. Clark, a partner at the Chicago office of Skidmore Owings & Merrill, an architectural firm that has constructed a number of intelligent buildings, including the AT&T Building and the NBC Tower, both in Chicago, and Citibank's headquarters in New York. "An intelligent building is one that responds to the needs of people in all ways. Telecommunications is only a small part of it."

Geissler agrees: "The building has to be flexible enough to do whatever makes you work the best. It's different from just technology." •

My system will call yours, OK?

BY KRIS HERBST and CARRIE KENT

Intelligent building design is moving away from the concept of literal integration of different building systems. Now favored is one- or two-way "intercommunication" between independent, standalone computer-controlled systems.

For example, a dialogue between an HVAC system and a fire/life/safety system would not let the HVAC system dictate the performance of its companion.

As in real life, however, dialogues are not always equal. In case of an alarm, the fire/life/safety system *would* be allowed to control the HVAC system. The two would intercommunicate but only on a one-way basis. However, two-way communication could be permitted between one zone of HVAC and another zone so that they could make mutual adjustments.

Compromises of this sort are needed because complete intercommunication among building systems still eludes intelligent building designers. "The one thing the intelligent building [has yet to achieve] is tying this all into one system," says Theodore York, director of technical support at the Software Productivity Consortium in Herndon, Va., and a smart building tenant (see story below).

A major difficulty in establishing full communication among all systems has to do with language; proprietary protocols of individual manufacturers speak primarily to their own equipment, says Barry Donaldson, executive vice-president of Tishman Research Corp. The New York-based firm is a division of Tishman Construction and Realty, Inc., one of the world's largest construction and real estate development companies.

Donaldson says that the development of an open communications protocol, consisting of a single language or a series of languages, translators or gateways, would enable freer communications and greater interoperability.

Some developers have already put their protocols in the public domain, hoping to create an industry standard. Among them: AT&T's Integrated Services Digital Network offerings, Bull HN Information Systems, Inc.'s Variable Air Volume Net Protocol for the building industry and Auto-Matrix, Inc.'s Public Host Protocol and Public Unitary Protocol.

The Intelligent Building Institute in Washington, D.C., has completed studies analyzing the feasibility of using the current protocols or developing an entirely new protocol. Europe and Japan are also hard at work researching and developing protocols.

Although development of an open protocol in the U.S. is at least one year away, intelligent building industries in Europe, South Korea and Japan "are benefiting from significant government involvement through standard setting and capital investment," according to Richard Geissler, executive director of the Intelligent Building Institute.

Herbst and Kent are free-lance writers based in Washington, D.C.

This smart Virginia building has all the right moves

A truly smart building is a flexible building. Folks at the Software Productivity Consortium (SPC) in Herndon, Va., will tell you that being able to move systems and people around at will is a big plus.

The SPC is a joint venture funded by 12 leading U.S. aerospace companies to develop software productivity tools. The tools will help create embedded software for aircraft, missiles and defense applications. The SPC is also the anchor tenant at Herndon's Center for Innovative Technology complex.

According to Theodore York, director of technical support at the SPC, making changes in SPC's old, dumb building was a nightmare. "Moving employees required calling three technicians: a network technician, an electrician and a telephone man," he explains. "They all had to be available to come on the same day. Often two would have to stand around and wait while the third one worked, to the tune of $75 per hour."

In the SPC's new building, there's no waiting. Twelve-inch raised flooring envelopes the three-story, 61,000-sq-ft SPC offices. Besides freeing up valuable office space by eliminating electrical closets on each floor, the access floor also makes moving new and old systems a snap.

"I have 61,000 cubic feet of electrical closet [space]. That is enough space for anything," York boasts.

> "I HAVE 61,000 cubic feet of electrical closet [space]. That is enough space for anything."
>
> THEODORE YORK
> SOFTWARE PRODUCTIVITY CONSORTIUM

Considering how often SPC workers change location, flexibility is key. Like many large firms, SPC has about 30% of its workers change location each year.

But the building's planners already knew that.

SPC's access floor consists of two-sq-ft panels that can be easily removed to make wiring changes. A carpet square is held firmly in place on each panel by magnetic strips. Cabling passes between floors in vertical risers that are designed to look like support columns when they pass through office spaces.

One of two types of outlet boxes can be placed in any square foot of floor space, thereby accommodating 61,000 possible locations. A general-purpose box contains one video broadband outlet, two regular power outlets and one regular RJ11 telephone connector. A network outlet box provides two conditioned power outlets (for "clean" power), one Ethernet connector and one token-ring network connector from Hewlett-Packard Co.'s Apollo division.

These boxes hang on the underside of the access floor and include an opening at the top that is flush with the floor. They are easy to move and can be placed wherever office workers need to plug in their equipment.

Cables from each box are bundled into a "whip," which is hard-wired to one of 16 distribution points on each floor. Whips extending from each distribution point cover an area about 20 feet in diameter, serving up to eight office locations.

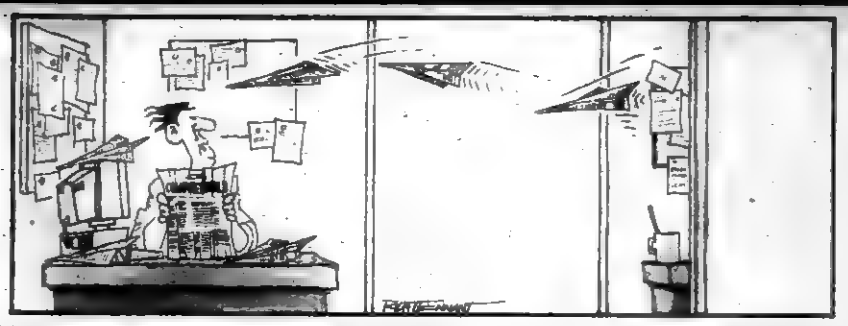
Now, York says, moves can be made without any technicians by just plugging into another box and making an assignment change on the private branch exchange. "It's like plugging a fixture into a light socket," he explains.

Keeping track of circuit-breaker assignments and how each wire in the system is being used is done with a personal computer-based database and word processing package.

York says he is extremely pleased with the way the SPC's building functions. He estimates the payback on the cost of SPC's intelligent building features will be anywhere from two to four years, given SPC's 30% annual employee movement rate.

Beyond that, there are other savings resulting from the ability to quickly make and schedule changes, thereby causing minimum disruption to highly paid software engineers, York adds.

KRIS HERBST AND CARRIE KENT



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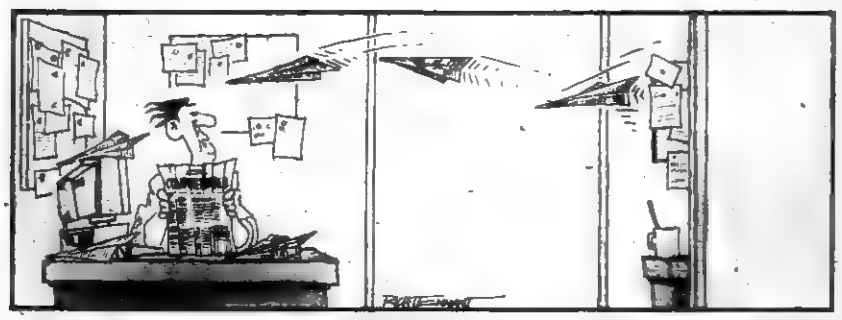

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32. Programmers, Software Developers
60. Sys. Integrators/VARs/Consulting Mgt.
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41. Engineering, Scientific, R&D, Tech. Mgt.
51. Sales & Mktg. Management
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NATIONAL
BRIEFS

What recession?

. . . asked the **Software Publishers Association** (SPA) late last month as it issued a report showing North American software sales for the second quarter of 1990 up 43% over last year's comparable period, the strongest such showing for the industry niche since 1988. Based on sales figures from 150 leading U.S.-based personal computer software firms, the industry association showed second-quarter sales at an estimated $1 billion. "If the U.S. economy is faltering," SPA research director Ann Stephens said in a prepared statement, "it certainly isn't due to lackluster sales in the software industry."

■

Where?

Borland International recently lost its bid to have a say as to which court will resolve its legal battle with Lotus Development Corp. A Los Angeles federal court's dismissal of Borland's action against Lotus will have no effect on the question of whether Borland's spreadsheets infringe on Lotus' 1-2-3 copyright; nevertheless, the action leaves the federal court in Boston to decide on which coast the case will be heard.

How to play in networking traffic

Vendors are learning to keep on eye on user directions to avoid getting run over

BY JOANIE M. WEXLER
CW STAFF

Paul Mock

In today's networking climate, it is tough to determine what users really want from their suppliers.

Perhaps to hedge their bets, vendors seem to be opting to go two ways at once.

Many users say they are anxiously awaiting the day when there are technical standards in place that will allow them to choose from a Chinese restaurant-style menu of multivendor products that interoperate. At the same time, however, many of these companies acknowledge that they highly value the volume discounts, service clout and relief from integration headaches they get by putting all their equipment eggs in one vendor basket.

Lee Figliuolo, vice-president of IS operations at Progressive Insurance Co. in Mayfield Heights, Ohio, for example, is using a spectrum of Racal-Milgo networking products. He cited the network management glue between single-vendor products as a major advantage to one-stop shopping.

"I came to Progressive from Merrill Lynch, where we had one of everyone's modems and multiplexers," he explained. "It was tough to keep personnel trained on the myriad systems and keep folks on my payroll."

Added Figliuolo, "If you don't have a network management system that talks to all these tools, you wind up with managers on roller skates."

The $300 million Racal-Milgo — traditionally viewed as a modem and multiplexer vendor — is the largest company within the $554 million Racal Data Communications Group, owned by $3.2 billion parent Racal Electronics PLC. In the past 18 months, the Racal Data Group has acquired three companies, merged Milgo with its leased-line modem cousin, Racal-Vadic, and formed one joint partnership.

The moves have given the Racal Data Group a product range that includes high- and low-end multiplexers, dial-up and leased-line modems, internetworking products, network management, local-area network equipment and fiber and satellite businesses.

Racal's strategy closely resembles many other vendors' efforts to stockpile the varied equipment and expertise needed to provide the high degree of service that will distinguish suppliers in a standards-based world. From such industry giants as AT&T and Hewlett-Packard Co. to smaller vendors such as Codex Corp. and Timeplex, Inc., it is in vogue to be positioned as a "solutions" provider.

Some vendors, such as AT&T, offer true systems integration — if they don't make it, they will go out and buy it — while others, such as Racal-Milgo, primarily perform systems integration of their own equipment.

Several manufacturers have also formed technical alliances with major internetworking vendors in preparation for the flood of data traffic expected to be unleashed between local-area networks via wide-area communications links in the next 12 to 18 months.

"We view a vendor's ability to solve all our problems as a strength, not a weakness," commented Tom Scribner, director of information management services at Countrymark, Inc., an agricultural cooperative headquartered in Delaware, Ohio. "But you have to do your homework and make sure your vendor can deliver what he promises. If the vendor you've chosen serves your needs, you look brilliant. On the downside, you could wind up just having to survive the contract."

Jim Hartman, director of IS opera-

Continued on page 102

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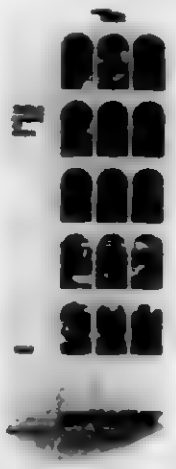

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Taiwan to boost its telecom industry

BY CHRIS BROWN
IDG NEWS SERVICE

TAIPEI, Taiwan — Taiwan's output of telecommunications products is set to get a major boost over the next few years, according to the latest report from the government-backed Market Intelligence Center (MIC).

The country's worldwide market share for telecommunications products — including telephones, wireless phones, radar, facsimile machines, modems and private automatic branch exchange equipment — is currently only about .1%. But that share should begin to grow, thanks to several government-led initiatives to target new markets.

Beginning this fall, Taiwan will see a lineup of new homegrown technology for Integrated Services Digital Networks (ISDN). The ISDN products have been researched by the nonprofit Electronic Research & Services Organization (ERSO) during the last two years.

Several Taiwanese firms are now negotiating with ERSO to license ISDN technology, which includes a 64K bit/sec. interface card for personal computers, a digital telephone and a V.24 terminal that handles data speeds between 300K and 19.2K bit/sec.

BEGINNING THIS fall, Taiwan will see a lineup of new homegrown technology for ISDN. The ISDN products have been researched by the nonprofit Electronic Research & Services Organization for the last two years.

Quoting market research from ERSO, the MIC report forecast that the worldwide market for ISDN equipment will exceed $370 million by the end of 1991. The report emphasized the need for Taiwan's companies to move into higher end products. Figures from San Jose, Calif.-based market research firm Dataquest, Inc. revealed that the vast majority of installed modems are low-end (under 9.6K bit/sec.) units. High-speed modems (above 9.6K bit/sec.) may account for only 15% to 18% of the market, but their sales total represents as much as 70%.

Taiwan is also looking for steady growth in new areas such as private branch exchange sales, fax machines and fax cards. Fax machine exports rose dramatically between 1987 and 1989. Last year, fax exports accounted for sales of $16.1 million, but this figure — plus the $15.7 million Taiwan made exporting fax cards last year — is predicted to increase by as much as 50% by 1991.

Meanwhile, in related news, Taiwan will go ahead with plans to build another high-technology research zone following the example of its enormously successful Hsinchu Science-based industrial park.

Administrators at the Hsinchu park recently announced that site planning on the second zone will begin before the end of this month. Three engineering firms have been chosen to submit bids for the planned 2,470-acre development.

Planning for Taiwan's third and fourth high-tech zones will begin once a site is chosen for the second park, according to officials at Hsinchu. The new science park is desperately needed in Taiwan. Plans have been under discussion for the last several years to expand the original park in Hsinchu, but the government has had trouble acquiring the surrounding land.

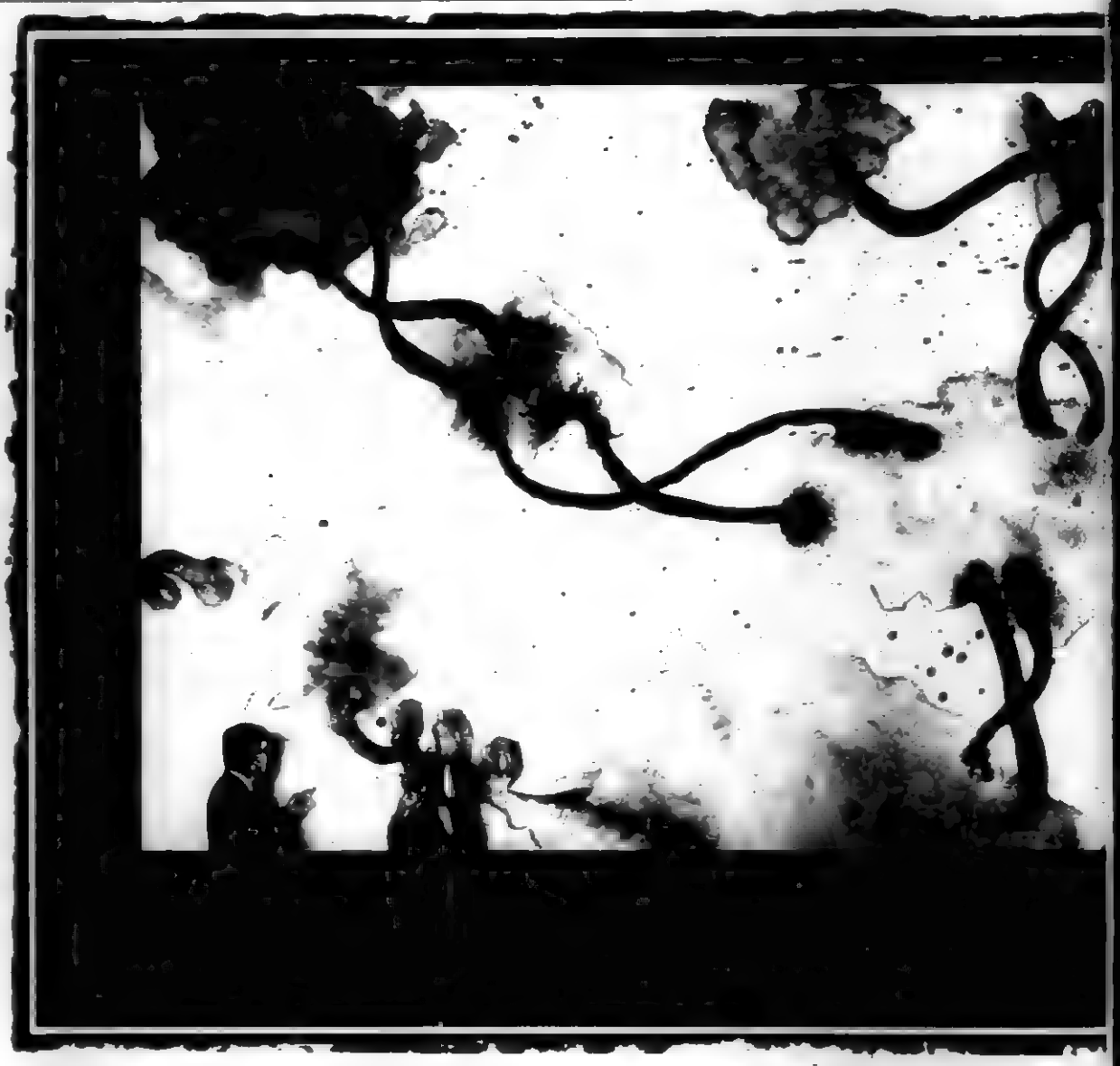
The second science park will closely resemble the Hsinchu model in both layout and administration. Government services, from export licensing to loan provisions, will be handled by the central administration. There will also be facilities to house goods ready for export.

Five sites in Taiwan have been chosen as possible locations for the new park. No official site will be named until next month, however. Meanwhile, Taiwan has chosen Ireland as the site of its European industrial park, which will be built before the opening of the European Common Market in 1992, Hsinchu directors said.

In addition, after four years of debate, Taiwan's National Science Council (NSC) has put forward a proposal to establish the country's first high-speed computing center. The NSC plans to open the center to both academia and industry within the next two years. Taiwan's fledgling semiconductor and aerospace industries are considered contenders for the new facilities, but most of the processing time will go to academia.

Professor Chang Shan-jeng at Taiwan University estimated that the cost of building the computing center, which will probably be located at the Hsinchu park, will be approximately $74 million.

Chang said discussions on the first stage of the project, including training and site design, could begin as soon as next month. System selection might begin during the 1991 National Science Conference, which would make the center operational by about 1992.



"That reminds me, now that we've managed to network everything, who's going to manage our network?"

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EXECUTIVE CORNER

1988 presidential award recipient named to TEAC

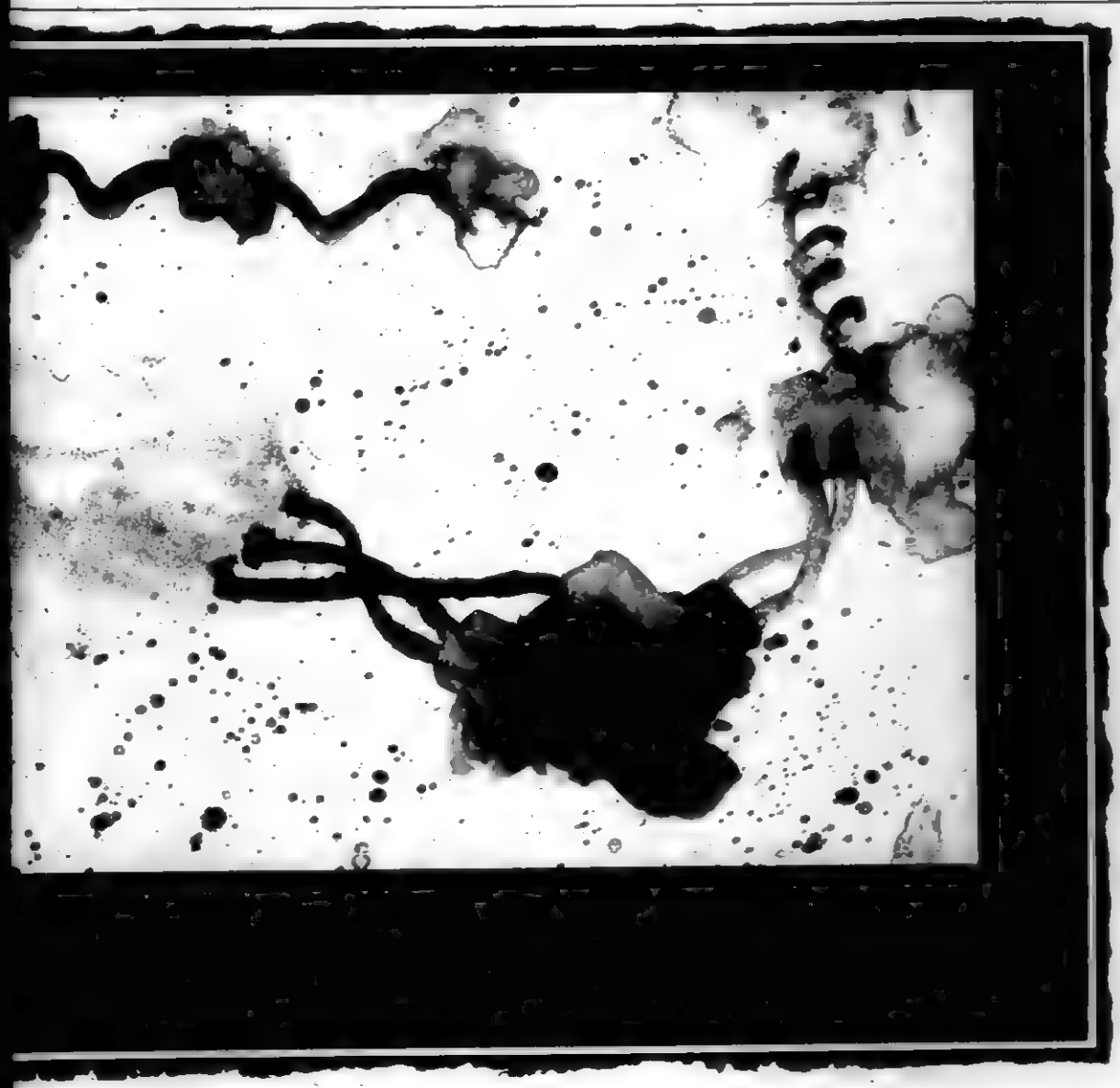
Roland S. Gerard, group vice-president at Frederick, Md.-based Plantronics Data Communications Group, was recently appointed by U.S. Secretary of Commerce Robert Mosbacher to a four-year term on the federal **Telecommunications Equipment Technical Advisory Committee**. Gerard, the recipient of a 1988 presidential award for export excellence, will join his nine fellow TEAC members from throughout the U.S. in advising the Department of Commerce on technical questions that affect the level of export controls concerning telecommunications and related equipment and technology.

Leading independent computer lessor **Comdisco, Inc.** has a new man in Europe: **Joseph Kafka**, former senior vice-president of marketing for Comdisco in the U.S., is now senior vice-president of Comdisco Europe. Kafka, who will oversee all continental sales, marketing, operations and administrative activities for the company, replaces Michael Joseph.

Industry veteran **Donald J. Massaro**, who started out as a disk-drive engineer at IBM and went on to co-found Shugart Associates in 1973, has been named chairman of Sunnyvale, Calif.-based storage system vendor **SF2 Corp.** In addition to his new post, Massaro will continue as chairman of Metaphor Computer Systems, Inc., a desktop decision support systems developer that he cofounded eight years ago.

San Jose, Calif.-based electronic design automation systems supplier **Valid Logic Systems, Inc.** recently created a new position — president and chief operating officer — and named industry veteran **L. George Klaus** to fill it and assume a seat on the company's board. Klaus, whose executive stints include three years at Amdahl Corp., most recently headed up Sytek, Inc., which was acquired last year by Hughes Aircraft Co.

John B. Landry, a veteran software firm executive who, during his career at former McCormack & Dodge Corp., was widely credited with the development of the Millenium financial applications software system, joined the board of directors of San Francisco-based financial software house **Walker Interactive Systems** last month.



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German computer firm executive Rolf Hilchner speaks German and English; American naval officer Tony Kendall speaks English and German. Together, they manage the Deutschland Roundtable, a service recently added to **GE Information Services'** GENIE on-line information service. The bilingual roundtable, according to GEIS, will let subscribers access and trade a panoply of information on current German culture, including the latest reunification developments, ongoing German scientific and technological finds and German recipes, travel tips and business opportunities.

■

Bearish time for Bull

Although soundly profitable in recent years, Paris-based **Groupe Bull** took a sharp downward swing late last month when it posted a record $348 million loss for the first half of 1990. The firm, said Chairman and Chief Executive Officer Francis Lorentz, was hit hard by the costs of doing business in an increasingly competitive, suddenly standards-mad computer industry. However, according to the company, Bull could come charging back in the second half of the year, when more than 50% of its revenue traditionally hits the bottom line.

■

Bullish time for PC distribution

A report issued recently by U.K.-based market research firm **Romtec PLC** pegged the total value of the third-party personal computer distribution market in Europe's largest countries — the U.K., France, West Germany, Italy, Spain and the Scandinavian countries — at $5.5 billion. However, unlike other computer industry niches, according to the report, third-party distribution is dominated by companies that are locally owned.

Siblings wrestle for the family name

BY ALEC BROWN
IDG NEWS SERVICE

What's in a name? Shakespeare asked the question in the 16th century, and two current controversies on opposite sides of the world indicate that it has not yet been answered.

The confusion coiling around the question of which of two Olivetti offshoots can use the Ing. C. Olivetti & Co. name in New Zealand might prove as hard to untangle as a bowl of pasta.

Olivetti Systems and Networks, based in Wellington, New Zealand, is steaming over advertising and promotions for Olivetti products by Auckland-based Home and Office — which, like its current antagonist, was created when Olivetti split its New Zealand operations into two companies with presumably separate territories.

Olivetti Systems and Networks manager Peter Masters claimed Home and Office is causing the confusion. "Home and Office used the Olivetti logo in a dominant position in advertising, whereas the Home and Office logo should have been dominant, with a smaller Olivetti-authorized distributor title below," he said.

> "WE'VE GOT as much right to use the name as they have."
>
> GARY MCNABB
> OLIVETTI HOME AND OFFICE

However, Home and Office director Gary McNabb stands behind his company's right to use the Olivetti name. "We've got as much right to use the name as they have," he said. "We have permission to use the Olivetti name, and all our advertising is approved from Olivetti Office."

McNabb said his company calls itself Home and Office but added, "We have the Olivetti name quite prevalent on our letterhead."

Masters said that the two companies usually do not meet in the market. "They operate on high-volume sales with low margins, whereas we operate on low volumes and high margins," he explained. "We offer a support facility, whereas they just sell boxes."

According to Masters, when Olivetti originally split into two separate New Zealand operating companies, Olivetti Systems and Networks was assigned the high end of the market — for example, financials and corporations, including the faster personal computers. Meanwhile, Olivetti Home and Office was to take the commodity end of the market, including all PCs from the home market to word processing systems.

At the top end of this range lie the faster PCs. However, McNabb said the original brief for the two companies defined Systems and Networks' area to be minicomputers and mainframes, whereas Home and Office was given office products. "This includes PCs, but due to the downturn in the industry, Systems and Networks is starting to move into the PC market," he said. "But the question of how the confusion came about is still to be resolved."

Meanwhile, on the other side of the world, companies are spatting over which has the right to be known as Big Blue.

Big Blue Products, Inc., an office equipment vendor based in Northport, N.Y., claimed the name based on years' worth of business done under it.

IBM, on the other hand, lays claim to Big Blue on the basis of worldwide identification of the words as its corporate nickname.

Each of the Big Blues contends that the other's use of the name is bound to cause confusion in the eyes of potential customers. At this point, IBM has applied for trademark registration of the name; Big Blue Products has filed a formal opposition to the IBM application.

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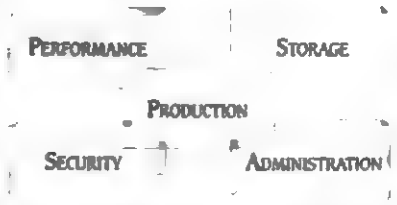

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CA loses moral victory to employee

BY ELLIS BOOKER
CW STAFF

CHICAGO — Patrick Navin claims that he has won a moral victory against Computer Associates International, Inc.

Last spring, his win was legal and financial. On May 21, Navin, 36, won a $6,216 verdict against the Garden City, N.Y., software maker after a judge at the First District Circuit Court in Cook County, Ill., ruled that CA had breached Navin's employment contract after acquiring his former employer in June 1987.

At that time, Navin was celebrating his sixth week of employment at Uccel Corp., a Dallas-based IBM systems software vendor. Navin, who worked in the company's Rosemont, Ill., office, was the product manager for ACF2, an IBM mainframe security product.

CA announced its intention to aquire Uccel in early June 1987 and followed through on the $760 million stock-swap purchase in August, following a U.S. Justice Department green light. Within days of the acquisition, Uccel's new parent dismissed 300 Uccel employees — some 25% of the firm's work force — in an effort to consolidate the two software companies.

"The massive cuts took place while I was away on my honeymoon," Navin said.

The main issue in Navin's suit, filed last December, concerned a retroactive personnel policy addendum that basically covered the amounts that those whose jobs were cut would receive in severance pay. Navin, in his suit, maintained that CA disregarded this document, which was issued shortly before Uccel ceased to be an independent company.

"With so many acquisitions," Navin said, "it seems CA is very concerned [lest] this case set a [precedent]." He went on to encourage others who might have been adversely affected by a CA acquisition to "explore their legal recourse."

However, the lawyer who handled the case for CA refuted this idea. "First, from a strictly legal view, [this case] has no precedential value," said Jim Dashiell, an attorney at McNeela and Griffin in Chicago. "Second, frankly, the court was dead wrong on the law."

> "THE MASSIVE cuts took place while I was away on my honeymoon."
>
> PATRICK NAVIN
> FORMER UCCEL EMPLOYEE

Dashiell said he believed that the case would be reversed if taken to a higher court — an alternative that CA is not, in fact, pursuing.

"You have a company being purchased, and the officers decide to make for themselves a self-serving parachute," said Dashiell, who characterized the disputed personnel policy as "an attempt to give [Uccel's] employees extravagant severance." He said the policy was not authorized by CA or with its knowledge.

Dashiell noted that Navin did accept a position at CA and then resigned voluntarily.

Dashiell said that CA, which "strenuously disagreed" with the conclusion of Judge Carl Cipolla in the half-day hearing on the Navin matter, did not pursue an appeal of the ruling because "it was a small case and a small judgment." He added that CA had prevailed in a few other claims from former Uccel workers brought before the U.S. Department of Labor in 1988.

Privately, Navin said that the "enormous emotional trauma" of the case still has him shaken. But a triumphant Navin began his written statement this way: "It is a sad day for corporate America when a solitary employee has to take a billion-dollar company to court to enforce a valid employee contract."

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Networking

FROM PAGE 97

tions at Wisconsin Physicians Service Insurance Corp., works mainly through a systems integrator. "All I'm interested in is something that works," he said. "Let's face it — the concept of open systems among different vendors is not really here yet."

Hartman added that one-stop shopping eliminates finger-pointing among vendors by minimizing the number of suppliers he has to deal with.

"Minimizing vendors is a very helpful thing to be able to do at present but results in a tailored solution instead of allowing a user to pick the product that works best," countered Lincoln Faurer, president of the Corporation for Open Systems (COS) International, a nonprofit research and development consortium comprising 63 member firms (see story at right).

"If you are a firm only concerned with interacting with yourself, one-stop shopping can serve you well. But more and more businesses find that they need to connect with far-flung companies," Faurer said.

Another open systems advocate, Ed Pillard, a vice-president at Salomon Brothers, Inc. in New York, is installing a Unix-based worldwide network. "For any given component of our network, we try to standardize on one vendor — but one that will interact with other network components," he said. "If you're running a lot of modems and multiplexers, it's better to use one vendor. But you should be sure that that vendor will pass open protocols."

Pillard added that modems and multiplexers, which operate at Layers 1 and 2 of the Open Systems Interconnect (OSI) model, "will pass just about any protocol. It's at Layer 3 that you have to start worrying about manageability and interoperability," he said.

"OSI doesn't really impact the physical layer," agreed Mark Leary, director of communications and network research at Technology Investment Strategies Corp. in Framingham, Mass. "So modems and [multiplexers] live on in the OSI future. The difference is in the computer system at the higher levels."

> "LET'S FACE IT — the concept of open systems among different vendors is not really here yet."
>
> JIM HARTMAN
> WISCONSIN PHYSICIANS SERVICE INSURANCE

Mario Nunez, operations manager for Salt Lake City, standardized on Codex modems and multiplexers mainly for the same network management benefit that Racal-Milgo user Figliuolo described. "Eventually, we will migrate to open systems," he said. "Codex says not to worry about OSI, and so far, they have not let us down."

One endeavor that could help immensely on the integrated network and systems management front is the Open Software Foundation's (OSF) recent request for technologies for what it calls its Distributed Management Environment (DME). DME is slated to provide a consistent infrastructure across multivendor platforms and operating systems. Customer sites could be using the integrated package sometime in 1991, according to OSF business area manager Jonathan Gossels.

Harold Anthony, president of National Integrated Support Systems, a systems integration house headquartered in Orlando, Fla., commented, "If I were a user having to make decisions today, I'd figure the life cycle of a product is three to five years — and the true OSI world is further away than that. Standards will be developed and accepted, but you have an enormous installed base of personnel and equipment that you just can't change overnight."

COS marks the spot

In 1985, COS International was formed in the U.S. primarily to monitor OSI standards development. OSI standards aim to allow the interconnection of information processing systems that are open to one another by the mutual use of agreed-upon communications protocols.

The organization, which comprises North American and European computer, telecommunications and user companies, has instituted what it calls the COS Mark program. COS will test a product for conformance to current versions of OSI standards and sanction it with a "COS Mark" if it passes, explained Lincoln Faurer, president of the organization. If the product is COS-marked and fails to interoperate, COS will resolve the interoperability problem, Faurer said.

"What the user really wants is product conformance tested in an environment that is accredited and built to a narrowly specified standard," he added.

Faurer acknowledged, however, that while "the ideal OSI world will have a critical mass of OSI products available . . . right now there isn't enough OSI functionality to be carefully drawn to spec and tested." Therefore, he said, "the user has to decide how important the OSI world is to him and plan his migration to it."

JOANIE M. WEXLER

High-tech firms in slump

BY J. A. SAVAGE
CW STAFF

Now that Labor Day 1990 is just a memory and the country has gone back to work, accounting and managment consulting firm Grant Thorton predicted that some people may not be working as much as they would like. With few exceptions, the firm said in a recent report, high-technology industries are in for a bad year.

Regions with little high-tech manufacturing, such as the Southeast and Southwest, had fairly robust economic climates last year and can look forward to the same in the coming months, Grant Thorton's 11th annual "Manufacturing Climates Study" said.

Not so, however, for the traditional bastions of the computer industry. The Chicago-based firm singled out New England, California's Silicon Valley and Atlanta as the areas that have been hardest hit by layoffs in computer and telecommunications businesses.

"What goes up, must come down," the report on New England's economy said. The area is being hit by a regional recession led by the high-tech, defense and financial industries. The report called it "a minor shakeout" in the minicomputer industry, particularly at Wang Laboratories, Inc. and Data General Corp.

A two-year slowdown in personal computer sales is forcing Silicon Valley manufacturers and related suppliers to lay off workers. IBM and AT&T have eliminated thousands of jobs in Atlanta over the past few years, the report stated.

However, the report also said that there is a bright side to the economy in regions not traditionally known for their high-tech businesses.

In Michigan, there is a growth in high-tech companies in what is called "Automation Alley" near Detroit. According to the report, hundreds of companies, employing an aggregate 33,000 people, are newly located there. Michigan is also the second leading state in the nation in per capita spending on industrial research and development, according to Grant Thorton.

The telecommunications workers Atlanta is losing are being picked up in Kansas City, Mo. According to the report, about 23,000 miles of fiber-optic cable radiate from the city, where the headquarters for U.S. Sprint Communications Co., United Telecom and, more recently, AT&T's credit-card operations, which relocated from New Jersey, are located.

Texas is also doing well by the computer industry. Thirty miles north of Houston, 12 high-tech companies and six research institutions have formed what some are calling the "Research Forest." Grant Thorton reported that this diversity from an oil-based economy will help the area grow in the 1990s. Being home to Compaq Computer Corp. also helps, as that company continues to expand. In Austin, Texas, employment is growing because of IBM's software development shop and other high-tech industry.

The Grant Thorton report also highlighted Oklahoma, where Hitachi Data Systems has doubled the production from its Norman disk drive plant.

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'Adventurous IS folk wanted'

The IESC needs skilled IS professionals to advise Third-World countries

BY JOSEPH SIMONS
SPECIAL TO CW

When I retired in 1982 as a senior adviser in the information systems department at Exxon Corp., I volunteered to serve as a consultant on several overseas projects through the International Executive Service Corps (IESC).

This activity has brought me to developing countries around the world, including Mexico, Costa Rica, Ecuador, Peru, Uruguay, Zimbabwe, Morocco, Egypt and Jordan.

These assignments aim to help locally owned private enterprises and essential government entities increase their productivity, upgrade their management skills and improve their basic technologies.

The IESC sends highly experienced U.S. executives and technical advisers, most of them recently retired, to organizations that have requested help. The average technical assistance project is about 2½ months — long enough to provide assistance and develop guidelines for the client to follow in the future.

About 800 projects are completed each year in locations as near as Mexico, Barbados and the Dominican Republic and as far away as Kenya, Indonesia, Thailand and the Philippines. They are funded by contributions from clients, grants from the U.S. Agency for International Development and contributions from individuals and corporations in the U.S.

A large portion of these projects require the use of experienced IS professionals. Unfortunately, this is a new field, and few of us have reached retirement age.

Joseph Simons

These projects require a personal and professional commitment by the executive volunteer and his spouse. Living accommodations are spartan, and there is no compensation other than transportation and a very modest per-diem living allowance. However, the rewards can be great in the form of interacting with the local people, experiencing the culture and making a significant contribution to the economic and social development of a Third-World country.

One of the projects I was assigned to involved the Cold Storage Commission in Bulawayo, Zimbabwe. As in many large enterprises in the Third World, this agency recognized the need for IS to improve management, planning and operations. It also wished to automate routine business transactions to compensate for the lack of clerical and accounting skills in developing countries.

My goal was to define a long-range IS plan for the entire organization, including the head office in Bulawayo, the cattle ranches and feed lots and the eight abattoirs (slaughterhouses) and processing facilities located throughout the country.

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- Visiting selected abattoirs and meat processing plants.
- Defining user specifications for a distributed management information and finance system for headquarters and field locations.
- Evaluating hardware and software vendors in Zimbabwe.
- Developing a step-wise implementation plan by using a combination of internal and contracted IS resources.

It is essential to demonstrate your professional credentials at an early stage to win the confidence of local management. You can accomplish this by acquiring an understanding of the business operations and objectives. You can enhance your credibility by bringing with you some examples of new technology, such as laptop computers, spreadsheets and word processors.

There are, however, difficulties in any of these consulting projects. The executive volunteer works as a lone wolf. When you retire, you no longer have access to all the technical resources of an employer. It is your responsibility to accept only projects you are fully qualified to handle.

Although a wide selection of personal computer hardware should be readily available, pirated software is endemic. The result is an absence of technical manuals, authorized software packages and training facilities. For situations requiring a specific technology, you should procure demonstration copies and manuals prior to your departure.

The volunteer projects are team efforts on the part of the volunteer and his or her spouse. Some spouses serve as equal participants, some assist part-time in the writing and editing of technical reports, and others engage in volunteer efforts with local schools, social services and arts and crafts organizations.

THE REWARDS CAN be great in the form of interacting with the local people, experiencing the culture and making a significant contribution to the economic and social development of a Third-World country.

After-hours and weekend activities are an essential part of the experience. These can include traditional leisure activities — golf is great in Zimbabwe — and visits to nature preserves and historic sites. For computer people, there are opportunities to meet with native college students to discuss technology and career opportunities.

Consider signing up for just one 2½-month project with the IESC. I'm sure you will want to make it an annual activity as long as you stay current with our fast-moving technology. You can obtain registration by calling the IESC at (800) 243-4372.

Simons is a former executive from Exxon Corp. Since his retirement in 1982, he has worked as a consultant to the New York City Human Resources Administration. He is also a volunteer executive with the IESC.

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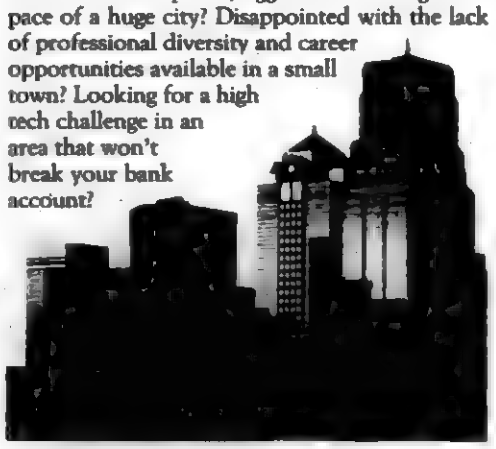

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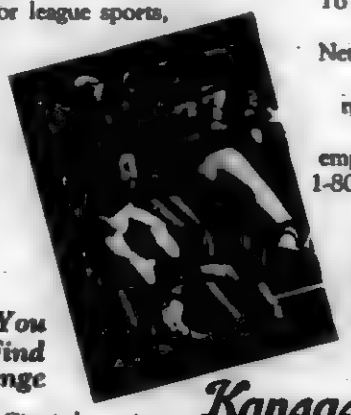

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Qualified applicants should have at least five years' supervisory and managerial experience in an educational computing center, a working knowledge of voice and data communications networks, appropriate technical background in computer systems and their uses, excellent oral and written skills, and a degree from a recognized institution of higher education.

Applications and nominations, postmarked by September 28, 1990, should be submitted to:

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Vice President for Administration
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Complete applications must include a current resume plus names and addresses of three references.

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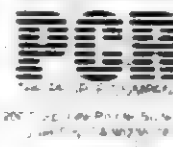

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Position requires 4 + years experience utilizing a relational database engine, preferably DATACOM/DB. Desirable experience includes formal participation in the physical DB design activity of development projects. A four-year degree is preferred.

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Head, Information Services Projects

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The Administrative Systems group supports the administrative computing needs of the institution. Primary responsibility of the position is to provide leadership in the development and support of administrative computing services, including the direct management of the administrative systems staff. This responsibility includes management of daily activities including production and maintenance, as well as interaction with administrative users, faculty, department heads, Computing Center staff, administration, and state agencies. The development and articulation of short-term plans and long-range strategies is also expected. The environment includes a VAX 8210 running VMS, Information Associates Series-Z Software, COBOL, FOCUS, Datatrieve, a campus-wide Ethernet network, and personal computers (predominantly IBM). Central VAX hardware is part of a VAXcluster managed by the CSM Computing Center.

Minimum qualifications include a bachelor's degree from an accredited college or university and seven years of progressively responsible experience in administrative or business computing. Four of the years must have been in a university or college environment. The ability to work cooperatively with administrators, users, faculty, and other professionals is crucial to the success of an individual in this position. The ideal candidate will also have:

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- experience with IA Series-Z software in a VAX/VMS environment
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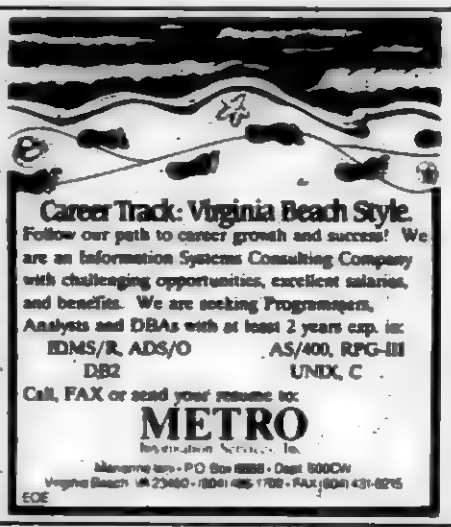

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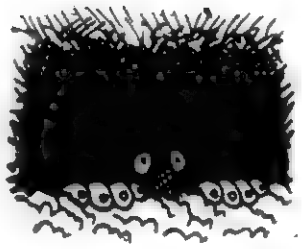

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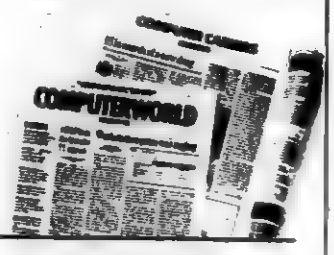

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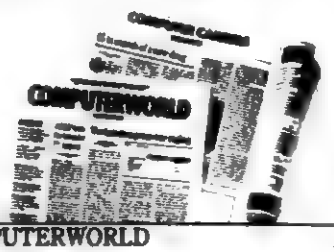

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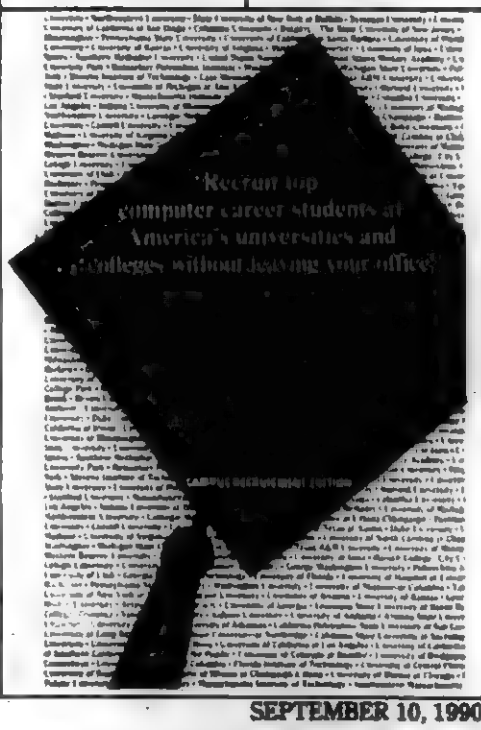

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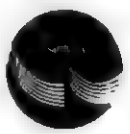

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Managers rank intelligent cost reduction as their top investment goal

BY CATHLEEN A. DUFFY
CW STAFF

Imagine you're playing *Jeopardy!* and Alex Trebek says to you, "The No. 1 motivation for information technology investments." You'd better answer: "What is cost reduction?"

According to The Diebold Research Program's study of information technology justification, conducted at more than 100 companies, that answer's right on the money.

Everyone is talking about strategic information technology, but when it comes right down to it, everyone is really watching the bottom line.

"Reducing costs is a key competitive factor these days and certainly can't be disregarded," says Tony DiRomualdo, associate director at Diebold Research. "But if it's just blind cost reduction without some intelligent objectives that have some competitive and strategic implications, I think it's foolhardy."

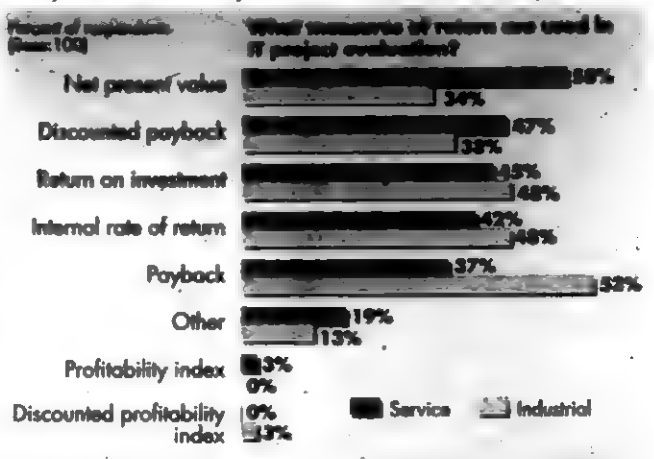
The study revealed that most companies look at information technology as an expense rather than an asset.

Diebold Research posed questions such as which financial measures the companies use to weigh investments, what it takes to justify a project and whether they consider intangible costs and benefits.

However, the most surprising finding was that 88% of the respondents weigh intangible benefits of information technology, DiRomualdo says. Such a high percentage was not expected at all, he says, because that kind of thinking wasn't pervasive in the past.

Cash and carry

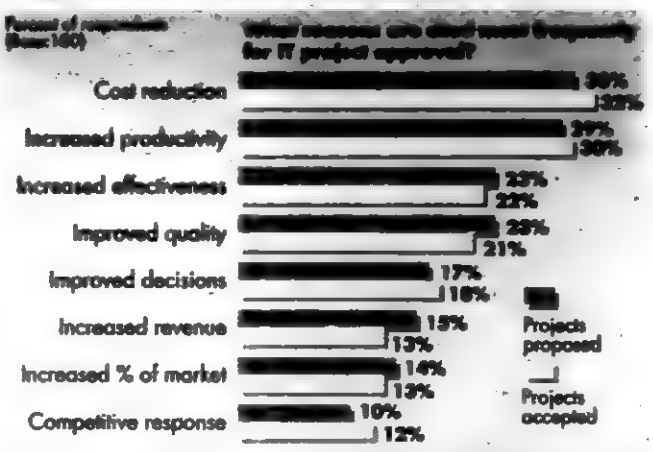
Hard financial measures of return on investments take the lead



Source: The Diebold Group, Inc. — CW Chart: Doreen Dahle

The almighty dollar

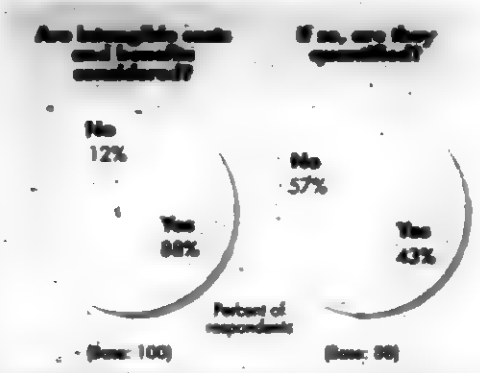
Although there is awareness and desire to apply information technology strategically, the main emphasis is on cost reduction



Source: The Diebold Group, Inc. — CW Chart: Doreen Dahle

The untouchables

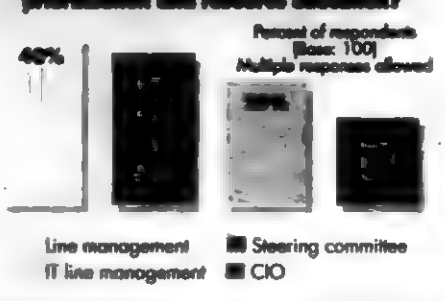
Intangible measures of return are often considered, but they are not always quantified



Source: The Diebold Group, Inc. — CW Chart: Doreen Dahle

Decisions, divisions

Business unit management and senior company executives are assuming greater control over information technology investments



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AT Model 239	$1,125	$1,325	$700
AT Model 339	$1,250	$1,400	$900
PS/2 Model 50Z	$1,550	$1,850	$1500
PS/2 Model 60	$2,200	$2,400	$2,100
Compaq Portable II	$975	$1,150	$875
Portable III	$2175	$2,500	$1,900
Portable 286	$1,275	$1,275	$1,100
Plus	$675	$750	$650
Deskpro	$825	$900	$800
Deskpro 286	$1,425	$1,625	$1,300
Deskpro 386/20	$2,800	$3,100	$2,700
Apple Macintosh 512	$375	$775	$275
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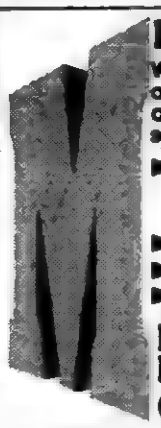

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When terminals are terminal

Making the move to PC LANs can be a strain, but it's not in vain

BY MARK DUNCAN
SPECIAL TO CW

Now more than ever, technological change is a fact of systems development life. Not only is technology radically altering applications development and maintenance, but it is doing so at an alarming rate.

Not the least of these changes is the movement of some organizations from a rather staid environment, in which a dumb IBM 3270-type terminal serves as a programmer's window to mainframe resources, to one in which a personal computer or workstation provides access to a mainframe via a local-area network.

The old environment is so entrenched that the shift can be threatening to programmers and other members of the technical staff. The information systems training organization faced with preparing the instruction needed to provide a smooth transition for applications developers migrating to LANs should be aware of the following issues:

Resistance to change. The trainer must realize that there will be resistance to change — some of which may possibly be quite strong. Rather than battle it, he should address it constructively. He should point out the merits and strengths of the LAN environment rather than remind everyone of the shortcomings in the previous one.

Naturally, the degree of resistance will vary. Younger or less experienced applications staff members may accept the new environment more readily than the people who wield a decade or more of familiarity with the traditional mainframe.

The trainer, however, could put these differences to work for him: If he thinks that the willingness of some staff members to accept LANs will be an incentive for others, then a mixed audience of junior and senior people in training sessions may be a good idea in many cases.

Training in terminology. Switching to a LAN environment brings with it a whole new lexicon. While it's not essential for applications developers to understand LAN lingo to the same degree as, say, LAN technicians, they need to be familiar with the new terms. A simple glossary containing a basic set of terms is a good start. The glossary might include token-ring, server, gateway, backbone link, etc.

PC training. Obviously, the most tangible change will be the placement of a PC on the developer's desk. The application developer will need time and training to get accustomed to the new equipment. Although the PC will emulate 3270 performance, the look and feel of it will certainly be different. A printer as well as a processing unit will be attached. The keyboard may be slightly different, and because the PC will only be emulating a 3270, some functions may be represented by different keys. Typically, the PC monitor will provide color when displaying output, a change from the traditional white-on-black or green-on-black of terminals.

Many of these adjustments are trivial and may not require classroom training. Cumulatively, however, they play a significant part in the resistance to change.

Help during transition. During the change to a LAN-based environment, trainers must see to it that help is always available to applications staff members when they need it. This is a crucial point: Making assistance awkward or difficult to get or providing incorrect information will fuel ill will toward the new environment. First-class help should be provided by the LAN support group, the PC support group and the information and development centers.

Benefits briefing. Trainers should help convince application developers that a LAN will enhance rather than degrade their work. A true workstation will take nothing away from them in terms of mainframe access and will add the versatility of a modern PC to their tool set.

Facilities such as electronic mail and word processing that were not readily available or were only available through the mainframe generally are standard offerings in a LAN environment. Application developers simply did not have certain functions available to them before, such as graphical output on their terminals and local printers.

Many software tools relevant to systems development are now available on PCs — project management software, analysis and design tools, documentation tools and so on.

Awareness of new policies. PCs and microcomputer software will probably expose application developers to new departmental and organizational policies. Technical staff members must be educated about the dangers of viral infection from pirated software. The sheer portability of PC software makes it almost impossible to enforce rules about what is allowed on PCs. It will be some time before security and audit procedures for PCs match those of their mainframe siblings. In the meantime, staff members must simply be encouraged to practice "safe software" behavior.

Emphasize new skill potential. Even to mainframe diehards, PCs can become addictive. Resisting the spectacular capabilities of modern PCs and associated software is difficult. Applications staff members will often confess that PC software is just plain "neat" to play with.

Management must be generous with opportunities that capitalize on this enthusiasm. If staff members are allowed to get training in a PC language, for example, then acceptance of the new environment will increase.

The transition from a traditional terminal-to-mainframe environment to one with PCs and LANs doesn't happen overnight. Preparing applications developers cannot, therefore, be a one-time event. It must be ongoing — during, through and beyond the transition.

Duncan is a quality assurance manager at a large Dallas bank.

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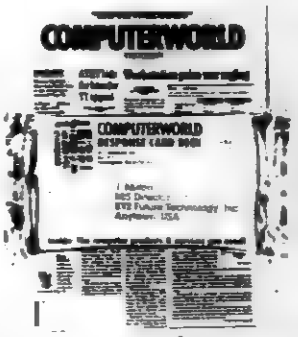

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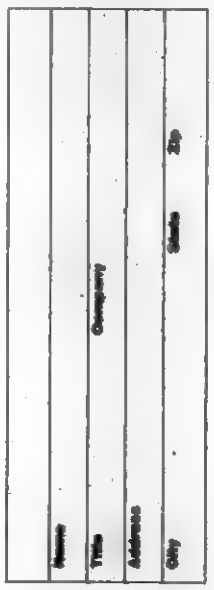

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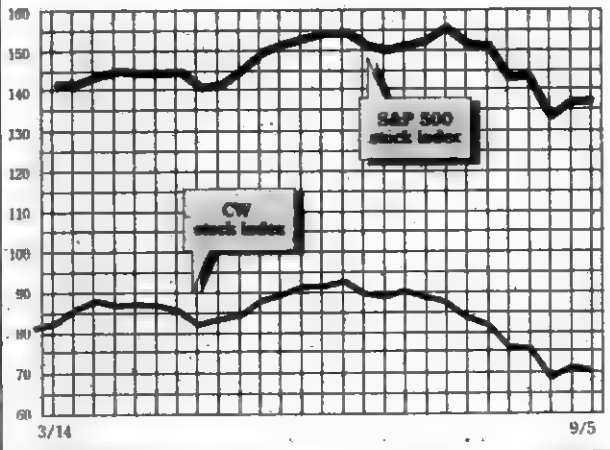

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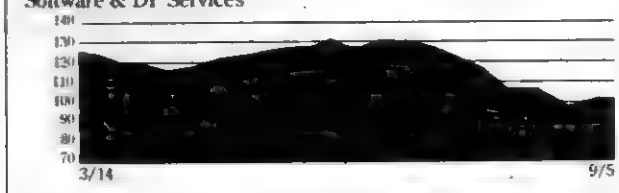
Computer Systems	70.5	69.2
Software & DP Services	101.1	101.3
Semiconductors	46.0	45.2
Peripherals & Subsystems	76.1	76.8
Leasing Companies	58.1	59.4
Composite Index	71.0	70.8
S&P 500 Index	137.0	137.1

Communications

Computer Systems

Software & DP Services



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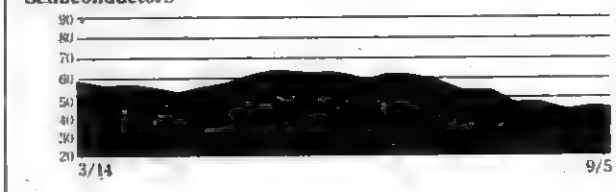
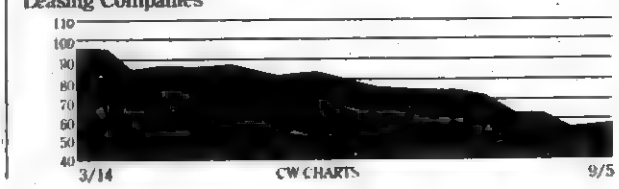


Peripherals & Subsystems

Leasing Companies



CW CHARTS

Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, SEPT. 5, 1990

EXCH		52-WEEK RANGE		PRICE CLOSE SEPT. 5, 1990	WEEK NET CHANGE	WEEK PCT CHANGE
Communications and Network Services						
N	AMERICAN INFO TECHS CORP	66	53	55.25	-0.2	-0.5
Q	ANDREW CORP	35	16	18	0.0	0.0
Q	ARTEL COMM CORP	10	3	3	-0.1	-4.0
N	AT&T	47	30	32.125	-0.4	-1.2
Q	AVANTEK INC	7	2	2.5	-0.1	-4.8
N	AYDIN CORP	21	12	11.625	-0.5	-4.1
N	BELL ATLANTIC CORP	57	40	42.125	-1.0	-2.3
N	BELLSOUTH CORP	59	49	50.5	-0.3	-0.5
Q	COMPRESSION LABS INC	16	7	13	0.0	0.0
Q	CONTEL CORP	37	23	30.875	1.1	3.8
Q	DATA SWITCH CORP	4	2	3.375	0.1	1.9
Q	DIGITAL COMM ASSOC	27	16	16.375	-1.3	-7.1
Q	DYNATECH CORP	20	15	16.25	-0.3	-1.5
Q	FIBRONICS INTNL INC	13	5	8.625	0.4	4.5
Q	GANDALF TECHNOLOGIES	6	2	2.75	-0.3	-8.3
Q	GENERAL DATACOMM INDS	6	2	2.625	0.0	0.0
N	GTE CORP	36	24	26.125	1.0	4.0
Q	INFOTRON SYS CORP	10	2	2.875	0.1	4.5
N	ITT CORP	64	50	52.125	-0.8	-1.4
N	M A COM INC	7	3	4.25	0.0	0.0
Q	MCI COMMUNICATIONS CORP	40	31	33.625	1.9	5.9
Q	NETWORK EQUIP TECH INC	34	5	5.375	0.0	0.0
Q	NETWORK SYS CORP	15	7	9.625	-0.4	-3.8
N	NORTHERN TELECOM LTD	30	20	24	0.0	0.0
Q	NOVELL INC	39	19	26	0.5	2.0
N	NYNEX CORP	92	69	70.125	-1.3	-1.8
N	PACIFIC TELESIS GROUP	53	36	40.375	1.5	3.9
A	PENRIL CORP	9	5	6.625	-0.5	-7.0
N	SCIENTIFIC ATLANTA INC	29	17	17.625	-1.4	-7.2
N	SOUTHWESTERN BELL CORP	65	47	48.125	-1.1	-2.3
Q	3 COM CORP	19	8	9.25	0.5	5.7
N	U S WEST INC	41	32	34.5	-0.1	-0.4
Computer Systems						
Q	ALLIANT COMPUTER SYS	9	2	2.5	-0.1	-4.8
Q	ALPHA MICROSYSTEMS	7	2	1.75	-0.1	-6.7
Q	ALTOS COMPUTER SYS	8	5	8.25	0.1	1.5
A	AMDAHL CORP	19	11	12.625	0.3	2.0
Q	APPLE COMPUTER INC	50	32	38	-1.3	-3.4
Q	AST RESH INC	26	8	18.5	-0.5	-2.6
N	BOLT BERANEK & NEWMAN	9	4	5.875	0.1	2.2
N	COMPAQ COMPUTER CORP	68	37	45.375	-5.1	-10.1
N	COMMODORE INTNL	12	5	5.5	0.0	0.0
N	CONTROL DATA CORP	22	13	14	-0.1	-0.9
N	CRAY RESH INC	51	31	35	-0.6	-1.8
N	DATA GEN CORP	16	5	6	-0.1	-2.0
N	DATAPOINT CORP	8	-1	1.25	0.0	0.0
Q	DELL COMPUTER CORP	14	5	11.875	0.6	5.7
N	DIGITAL EQUIP CORP	101	61	86.5	1.1	1.7
N	FLOATING POINT SYS INC	4	0	1.5	0.0	0.0
N	HARRIS CORP	40	24	24.375	0.4	1.6
N	HEWLETT PACKARD CO	53	31	34.375	-2.1	-5.8
N	HONEYWELL INC	112	73	97.875	3.8	4.0
N	IBM	123	93	102.375	-1.5	-1.4
Q	INFORMATION INTL INC	15	10	10.5	-0.8	-6.7
Q	IPL SYS INC	14	5	9.25	0.0	0.0
N	MAI BASIC FOUR INC	6	2	2.125	0.3	13.3
N	MATSUSHITA ELEC INDL LTD	172	117	125	-3.0	-2.3
Q	MENTOR GRAPHICS CORP	26	12	13.75	0.0	0.0
N	NBI INC	2	0	0.188	0.0	-14.2
N	NCR CORP	72	56	61.125	0.1	0.2
Q	PYRAMID TECHNOLOGY	36	19	20.6	-0.8	-3.5
Q	SEQUENT COMP SYS INC	34	14	24.25	-0.3	-1.0
Q	SUN MICROSYSTEM INC	37	15	28.125	0.0	0.0
Q	SYMBOLICS INC	2	0	0.313	-0.1	-16.5
N	TANDEM COMPUTERS INC	20	14	14.75	-1.6	-9.9
N	TANDY CORP	48	28	27.875	0.1	0.5
N	ULTIMATE CORP	11	5	5.75	-0.1	-2.1
N	UNISYS CORP	22	8	8.5	-0.1	-1.4
A	WANG LABS INC	6	3	3.75	-0.3	-6.3
Software & DP Services						
Q	AMERICAN MGMT SYS INC	20	11	14.25	-0.8	-4.7
Q	AMERICAN SOFTWARE INC	13	8	8.875	0.5	6.0
N	ANACOMP INC	6	2	2.375	-0.1	-5.0
Q	ANALYSTS INTL CORP	24	14	17.5	0.5	2.9
Q	ASHTON TATE	15	7	7.75	0.4	5.1
Q	ASK COMPUTER SYS INC	11	7	8	-0.1	-1.5
N	AUTO DATA PROCESSING	60	44	50.625	0.3	0.5
Q	AUTODESK INC	60	33	49.25	-1.6	-3.2
Q	BMC SOFTWARE INC	30	14	26.25	1.5	6.1
N	BUSINESSLAND INC	14	2	2.75	0.1	4.8
Q	COGNOS INC	10	4	8.75	0.1	0.9
N	COMPUTER ASSOC INTL INC	18	8	7.375	-0.1	-1.7
Q	COMPUTER HORIZONS CORP	17	7	13.75	-0.3	-1.8
N	COMPUTER SCIENCES CORP	53	37	40.25	0.6	1.5
N	COMPUTER TASK GROUP INC	12	9	9.25	-0.1	-1.3
Q	COMSHARE INC	25	16	18.25	0.0	0.0
Q	CORPORATE SOFTWARE	16	8	11.5	-0.5	-4.2
N	GENERAL MTRS (CLS E)	38	24	31.25	1.0	3.3
Q	GOAL SYSTEMS INTL	16	10	12	0.4	3.2
Q	HOGAN SYS INC	7	2	3.125	0.6	25.0
Q	INFORMIX CORP	18	6	6.75	-0.3	-3.6
Q	INTELLICORP INC	8	4	4.625	0.5	12.1
Q	LEGENT CORP	22	18	21.25	1.1	5.6
Q	LOTUS DEV CORP	38	16	18.25	-0.8	-3.9
Q	MICROSOFT CORP	81	29	59	-1.5	-2.5
Q	NATIONAL DATA CORP	35	8	10	-0.5	-4.8
N	ON LINE SOFTWARE INTL INC	11	6	5.75	-0.5	-8.0
Q	ORACLE SYS CORP	188	10	10.625	-1.0	-8.6
N	PANSOPHIC SYS INC	19	10	11.25	0.4	3.4
Q	PHOENIX TECHNOLOGIES INC	6	2	3	0.0	0.0
N	POLICY MGMT SYS CORP	43	30	37.625	-0.4	-1.0
Q	PROGRAMMING & SYS INC	25	14	16	0.3	1.6
Q	RELATIONAL TECH INC	10	3	4.5	-0.5	-10.0
N	REYNOLDS & REYNOLDS CO	27	16	15.25	-0.1	-0.8
Q	SAGE SOFTWARE INC	16	8	10.625	-0.5	-4.5
Q	SEI CORP	22	16	18	-1.3	-6.5
Q	SHARED MED SYS CORP	17	12	14.5	0.4	2.7
Q	SOFTWARE PUBG CORP	28	14	23.75	0.9	3.8
N	STERLING SOFTWARE INC	11	7	7.375	-0.6	-7.8
Q	SUNGARD DATA SYS INC	26	16	19	1.0	5.6
N	SYSTEM CENTER INC	23	10	9.5	-1.5	-13.6
N	SYS. SOFT INC	25	16	22	0.8	3.5
Q	WORDSTAR	2	1	0.688	-0.1	-8.3
Semiconductors						
N	ADV MICRO DEVICES INC	11	5	5.875	0.6	11.9
N	ANALOG DEVICES INC	10	6	6.5	-0.1	-1.9
Q	ANALOGIC CORP	11	6	8.5	-0.1	-1.4
Q	CHIPS & TECHNOLOGIES INC	28	10	11.5	-0.3	-2.1
Q	INTEL CORP	52	29	32.5	-2.5	-7.1
Q	MICRON TECHNOLOGY INC	16	7	8.625	-0.4	-4.2
N	MOTOROLA INC	66	53	60.125	-2.3	-3.2
N	NATL SEMICONDUCTOR	9	4	4.75	-0.3	-6.0
N	TEXAS INSTRS INC	44	26	27.375	-0.5	-1.8
A	WESTERN DIGITAL CORP	15	6	9.25	-0.4	-3.9
Peripherals						
Q	ALLOY COMP	2	0	0.75	0.3	71.2
N	AM INTL INC	6	2	1.625	0.0	0.0
Q	AUTO TROL TECH CORP	5	2	2.25	-0.1	-5.3
Q	BANCTEC INC	24	13	15.25	0.0	0.0
Q	COGNITRONICS CORP	8	2	5	-0.3	-4.8
Q	CONNER PERIPHERALS	31	11	22.25	-0.5	-2.2
A	DATARAM CORP	22	8	11.5	-0.3	-2.1
N	EASTMAN KODAK CO	51	36	41.5	1.8	4.1
N	E M C CORP MASS	7	3	5.25	-0.1	-2.3
Q	EMULEX CORP	9	4	8	0.4	6.7
Q	EVANS & SUTHERLAND	35	18	23.75	-0.3	-1.0
Q	ICOT CORP	2	1	1	0.1	14.3
Q	INTERLEAF INC	8	3	3.375	-0.4	-10.0
Q	IOMEGA CORP	6	3	5.25	0.2	3.7
Q	MASSTOR SYS CORP	3	1	0.625	0.0	0.0
Q	MAXTOR CORP	17	7	7.875	0.0	0.0
Q	MICROPOLIS CORP	10	3	5.5	0.4	7.3
N	MINNESOTA MNG & MFG CO	91	66	78.75	-1.1	-1.4
Q	PERSONAL COMP PRODUCTS INC	5	4	4	0.3	8.5
Q	PRINTRONIX INC	15	9	10	0.1	1.3
N	QMS INC	21	9	14.875	1.1	8.2
Q	QUANTUM CORP	28	9	18.875	0.5	2.7
N	RECOGNITION EQUIP INC	8	4	5.125	0.3	6.1
Q	REXON INC	10	5	4.75	-0.3	-5.9
Q	SEAGATE TECHNOLOGY	20	9	9	-0.6	-6.5
N	STORAGE TECH CORP	35	10	19.875	-0.5	-2.5
Q	TANDON CORP	4	1	2.188	0.1	6.1
N	TEKTRONIX INC	21	12	14.375	1.4	10.8
Q	TELEVIDEO SYS INC	1	0	0.344	0.0	0.0
N	XEROX CORP	88	38	40.75	-1.0	-2.4
Leasing Companies						
N	CAPITAL ASSOC INTNL INC	7	1	1.375	0.2	15.7
N	COMDISCO INC	34	15	17.75	0.6	3.6
Q	LDI CORPORATION	18	12	13.5	1.5	12.5
Q	PHOENIX AMERN INC	5	3	3.75	0.5	15.4
Q	SELECTERM INC	8	3	3	-0.3	-7.7

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Avalanche

Tech firms find themselves unable to avoid 'stockslides'

Summits seem to be the order of the day lately — both the political superpower variety and the popular term for new IBM mainframes. However, there was not a summit to be found among technology stocks last week, as share prices continued to fall like bricks.

Witness Motorola, Inc. The chip maker's stock careened down 10⅜ points last week to close Thursday at 61½ as rumors floated about poor future earnings. Other semiconductor firms also got the cold shoulder from investors, including Intel Corp., which dropped 2⅛ points to 31¼, and Texas Instruments, Inc., which lost 1½ points to 26⅛ — just a hair above its 52-week low.

On the positive side, after announcing that it has designs on copying Intel's 80386 chip, Advanced Micro Devices, Inc. gained ½ a point to close at 5⅛. IBM picked up ½ a point to close at 102¾ after the debut of its new mainframe. Amdahl Corp. also advanced, up ⅝ of a notch to 13.

Digital Equipment Corp. and Unisys Corp. each stumbled ⅛ of a point; DEC closed at 64¾ and Unisys ended at 8⅜. The glow from the good earnings news that Novell, Inc. recently reported has evidently faded; Novell fell 1⅜ points last week to 25⅛.

Then again, investors tread cautiously among software companies in general. Microsoft Corp. lost 4 points to 57½ and Oracle Systems Corp. closed at 9⅜, down 1⅜ points. Lotus Development Corp. hopes today's planned unveiling of a new 1-2-3 spreadsheet release will boost its stock higher than last Thursday's closing price of 18, which was down 1 point for the week.

Adobe Systems, Inc. and Apple Computer, Inc. agreed to jointly develop new products; Adobe stock then ballooned 3¾ points to 28¾, while Apple dipped 1¼ to 35¾ points. Others on the desktop scene also slipped. Compaq Computer Corp. was down ⅜ of a point to 45½, and Sun Microsystems, Inc. sagged ½ a point to 28¼.

KIM S. NASH

ES/9000 upgradability a first

BY ROSEMARY HAMILTON
CW STAFF

You can get there from here.

Or so IBM told its 3090 customers last week when it introduced a new generation of mainframes to which, for the first time, customers can upgrade from existing high-end systems.

While this migration is brand new, IBM will be borrowing from the past in the way it actually delivers raw performance. Like previous mainframe generations before it, the Enterprise System/9000's true performance gains will not be available for several months to a year.

Some of the key functional advances, such as the fiber-optic channels and system complexes, will be delivered in phases through 1991. Meanwhile, the raw performance improvement of the System/390 generation, on which the two top-of-the-line ES/9000s will be based, is scheduled for shipment in the third quarter of next year.

However, based on interviews with several customers last week, the delivery schedule comes close to matching their own plans and should not cause many headaches.

"This gives me a clear picture for what I need to do for the next three years," said George Perera, a group director of information systems at Ryder Truck Rental, Inc. in Miami.

A few users said they were unclear about whether the upgrade paths would be the most cost-effective route.

"My preliminary reaction is that we won't upgrade the 600J . . . That's about $9 million in upgrade costs to a 900 series," said Jim Harder, director of IS at Boise Cascade Office Products, a subsidiary of Boise Cascade. "The alternative is keep the 600J and get a smaller 390, which would give you a decent pop and would probably cost you considerably less money — say, $4 million, maybe."

Paired up

The ES/9000 was rolled out with a new mainframe architecture, ESA/390. Together, they are designed to eventually provide high-end users with a greatly improved large-system environment. High-end systems will run in the range of 200 million instructions per second and handle up to 9G bytes of processor storage. They can be linked together in complexes of as many as 48 processors that can be centrally managed to allow the use of lights-out remote sites.

In addition, most existing 3090 J customers have a reasonable migration ahead; users of some entry-level Js and earlier 3090s face a more rigorous upgrade path involving transitional model 9000T systems that provide a stepping-stone to ES/9000s (see chart). IBM is offering either field upgrades or asset swaps, depending on the model.

"It's comforting that [the migration] calls for nothing remarkably different," said John Wood, manager of computer networks at the Royal Bank of Canada.

While the future looks promising, customers can expect performance gains to be delivered in the following manner:

Currently, the raw performance improvement of the new generation is available only with the high-end models 820 and 900, scheduled for release in the third quarter of 1991. These systems will require a complete box swap or new purchase.

The six other water-cooled models are essentially the same engine as exists today in the J models. While a move to one of these systems offers little in terms of raw performance from a comparable 3090, it does provide two key things: the functional advancements of the ESA/390 architecture and the new environmentals, which include the new frame and power supplies.

However, IBM is also making most of the functional improvements available on J models. Unless the environmentals are a critical factor, the only difference between most high-end J models and high-end ES/9000s would be the price a customer can get out of IBM.

The two key functional improvements are Escon and Sysplex. Escon is a new fiber-optic-based channel architecture that is the most significant I/O change from IBM since the early 1960s, company executives said.

Both the physical medium and the method for transmitting data are new. Combined, they will allow users to set up storage devices miles away from the processor and transmit data at speeds more than twice as fast as the current 4.5M-byte limit.

IBM will initially deliver converter devices for controllers this year, which will allow users to install the fiber cable and adopt the new architecture. However, they will not benefit from the high-transfer rate until adapters become available for controllers later in 1991.

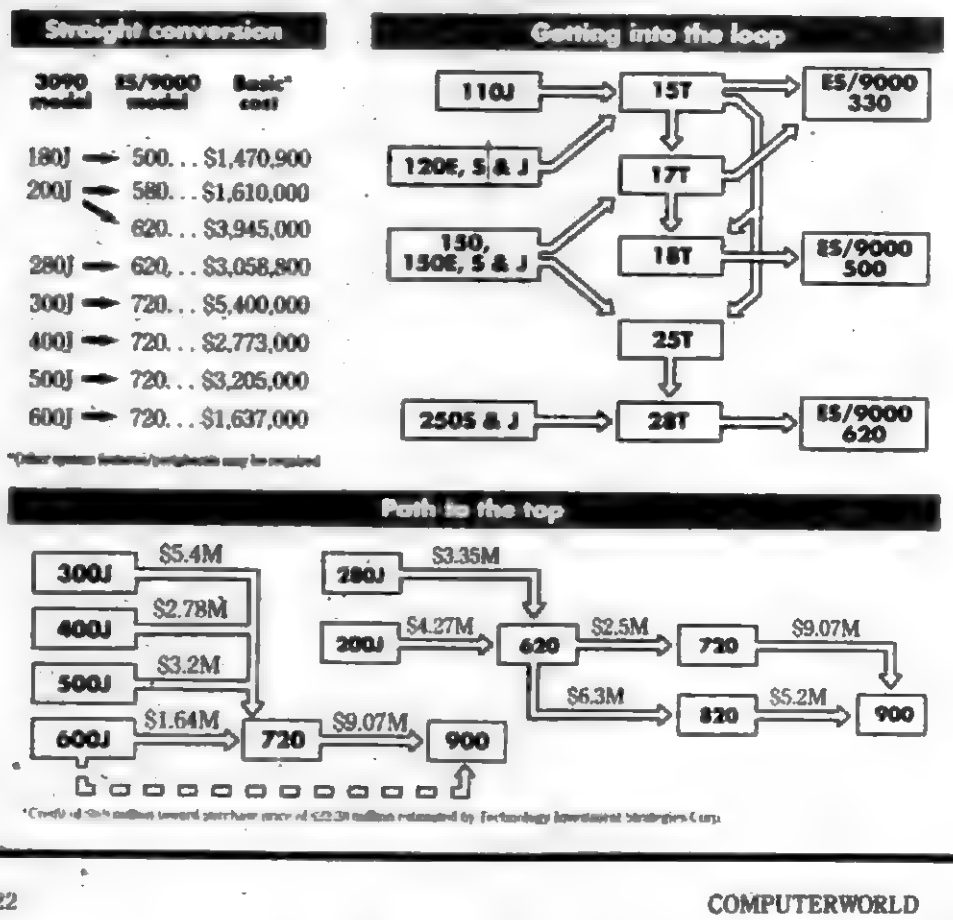
The initial Sysplex function focuses more on centralized management than it does on a tightly coupled processor cluster functioning as one huge mainframe. For now, Sysplex will provide some initial features that allow users to begin managing multiple processors from a central location.

"They expressed their vision beautifully," Carl Greiner, a vice-president at Gartner Group, Inc., said of the ES/9000 rollout. "What was missing was some of the facts. In terms of availability, a lot of it isn't until next year."

Midwest bureau correspondent Michael Fitzgerald contributed to this report.

Connecting the dots

ES/9000 upgrades can be simple or complex, depending on where you start



PCMs don't flinch from IBM assault

BY JEAN S. BOZMAN
CW STAFF

SAN FRANCISCO — Users of IBM-compatible mainframes are still poring over the technical details of IBM's mainframe announcement last week, but few seem ready to abandon Amdahl Corp. and Hitachi Data Systems Corp. for the high end of the Enterprise Systems/9000 line.

"There were no surprises," said Amdahl customer Ed Wojciechowski, director of information resource management at Sundstrand Corp.'s aerospace group in Rockford, Ill. "I have confidence that the plug-compatible manufacturers will be able to provide the same capabilities we can buy from IBM."

"It looks like Amdahl and Hitachi will be right in there swinging with [IBM]," said Ed Kelly, manager of planning and technology in the information systems department at Arco Oil and Gas Co. in Dallas, which operates two IBM 3090s and an Amdahl 5890/300.

While Amdahl has yet to announce its response, the firm's 43% owner, Fujitsu Ltd., announced a mainframe line last Tuesday that is clearly intended to steal IBM's thunder.

In an announcement short on performance specifications, Fujitsu revealed a five-model line M-1800 series, including an 8-CPU top end that the company claims is the highest performance general-purpose mainframe in the world.

ESA-compatible

One interesting twist on the M-1800 is that it has limited compatibility with IBM's Enterprise Systems Architecture (ESA). "It can run some IBM MVS/ESA applications," said New York-based Hitachi Ltd. spokesman Robert Pomeroy.

HDS, the other major IBM-compatible vendor that is jointly owned by Hitachi Ltd. and Electronic Data Systems Corp., announced its new EX 310 and EX 320 high-end machines in a June bid to best the Summit announcement [CW, June 11].

Plug-compatible manufacturers (PCM) are still hoping to beat IBM's uniprocessor MIPS rates — something analysts rate at roughly 40 million instructions per second. The HDS machine has a uniprocessor that runs at more than 40 MIPS, said Frank Gens, vice-president of Technology Investment Strategies Corp. in Framingham, Mass.

Abundant surprise

Some PCM users were impressed by the plethora of IBM software improvements, saying they may add weight to a bid from IBM. "It's very important for us to maintain one kind of software from the bottom to the top, as you would in IBM's [Systems Application Architecture]," said one IS manager from Quebec who operates Hitachi and IBM mainframes.

Industry analysts said IBM's product moves present some technical challenges to Amdahl and HDS. However, the task of duplicating ES/9000 functions will be eased by IBM's disclosure of the channel protocols, which are scheduled to be published within 120 days. "Our feeling is that we'll see the PCMs respond to those specifications in 12 to 18 months," Gens said.

Whatever the hurdles are, they do not seem insurmountable, analysts said.

"I don't see IBM's technical challenge as being anything more than a nine-month hurdle for PCMs," said Dale Kutnick, director of Meta Group, Inc. in Stamford, Conn.

IBM's pricing was also somewhat benevolent, Kutnick said. "The price umbrella is much broader than the PCMs could have hoped for, and they'll be able to sell their boxes at much higher prices than they might have expected," he said.

Senior Editor Clinton Wilder contributed to this report.

IBM

FROM PAGE 1

ES/9000 models will use the same new I/O architecture and support the streamlined Enterprise Systems Architecture-based operating systems.

But it is at the upper reaches of the ES/9000 line that the rewards and risks are greatest.

On the one hand, it means risking the alienation of some very high-end customers who would prefer getting all the new power immediately instead of gradually.

On the other hand, by the time the true new generation advances hit the market, IBM's competitors will likely be delivering their own new systems.

The initial reaction from users was that although IBM laid out a wealth of potential riches, many need time to digest the options.

"I wouldn't go into the [new] high-end just for the sake of getting there," said John Wood, manager of computer networks at the Royal Bank of Canada. "The existing J upgrades may make more sense. We need some more information."

Blue Cross of Western Pennsylvania, on the other hand, found its answers early and has been running an ES/9000 Model 720 — the top model that will initially be available — since last month, replacing two 3090 300E models.

According to Charles Southworth, chief information officer at Blue Cross, the deal offered by IBM was viewed by management as "a compelling financial decision."

New design *of ES/9000 circuit increases processing efficiency*

The new models offer a 16% to 20% price/performance improvement over comparable J models. According to Technology Investment Strategies Corp., IBM's high-end ES/9000s will cost from $100,000 to $115,000 per million instructions per second (MIPS), a significant drop from the 3090J range of $120,000 to $140,000 per MIPS.

Some observers suggested that the list pricing is too high.

"It seems to me that rampant discounting will continue," said Tom Loane, information systems director at Alamo Rent A Car, Inc. "No one is going to pay those prices."

IBM focused on several key issues:

- **A new generation transition.** IBM delivered six models that use essentially the same engine as their 3090 counterparts married to all-new power and channel architecture features. These models began shipping this month. The two high-end ES/9000s, the Models 820 and 900, will contain a brand-new engine and are scheduled for availability after mid-year 1991.

IBM will offer field upgrades to J users for the first six water-cooled models. Analysts said current 600J users will be offered asset swaps to the true new generation when it is available.

The upgrade lure is the availability of Escon, IBM's fiber-optic-based channel architecture and Sysplex, a concept for linking together up to 48 processors that can be centrally managed.

- **A single family of large systems.** The goal is to present a single line of processors, giving customers far-reaching growth paths.

However, there are still two distinct processor groups: air-cooled and water-cooled. There is no way to jump from the first group to the second without a major installation project.

- **Movement toward the large system of the future.** IBM outlined its strategy earlier this year for large systems that will eventually replace the do-everything mainframe with large clusters of systems consisting of dedicated processors that together function as a corporate nerve center.

Another step was taken with the unveiling of IBM's Systemview, which promises over time to integrate various systems management tools within a consistent user interface and data structure.

Midwest Correspondent Michael Fitzgerald contributed to this report.

The transition team

Several water-cooled ES/9000 mainframes will be available this month, with the top of the line scheduled to come within a year

S/370 predecessor	ES/9000 model	Estimated* MIPS	Number of processors	Scheduled availability	Purchase price
Not applicable	900	202.5	6	Q3/91	$22,900,000
	820	145.3	4	Q3/91	$16,475,000
3090 J models	720	112.5	6	9/90	$11,085,000
	620	79.6	4	9/90	$8,500,000
	580	62.2	3	9/90	$6,075,000
	500	43.5	2	9/90	$4,425,000
	340	22.2	1	9/90	$2,430,000
	330	15.3	1	Q2/91	(upgrade only)

*Estimates by Technology Investment Strategies Corp.

CW Chart: Darren Dahle

Enhancements fill in operating system gaps

BY JOHANNA AMBROSIO
CW STAFF

POUGHKEEPSIE, N.Y. — Several across-the-board enhancements last week brought continuity to IBM's fractured operating system line and will probably draw big smiles from the VSE community.

All three operating systems — MVS, VM and VSE — can now run across the entire System/390 spectrum, IBM said. That means users are no longer required to follow a painful migration process to jump from midrange to mainframe, a necessity which has kept many users in the VSE fold despite longtime IBM urgings to move to MVS.

MVS, VM and VSE are all under the rubric of Extended Systems Architecture (ESA). Where MVS/ESA has already been available, VM and VSE now also join the ranks of having 31-bit addressability.

VSE, which has long been the poor stepchild of the operating system family, got a major boost with the addition of ESA capabilities. The new version can support up to 24 times the real memory of previous versions and has 30% more address space available. PR/SM is also supported now, as are 3390 direct-access storage devices.

In fact, the new VSE has a lot more in common with MVS. VSE/ESA users have access to higher levels of CICS and VTAM, which are closer to the MVS versions of those products. Cobol II and Cross System Product are available to both operating systems, as is SQL.

Positive response

IBM's software moves met with generally good reviews. "I consider it really positive that IBM is doing things to close the gaps," said Kathleen Rowe, manager of the systems software division at Guide International, the Chicago-based IBM user group. "This allows us to choose one operating system and run it on an entire family of processors, and you couldn't really do that before."

"The operating systems are more consistent now," said Jim Henderson, executive vice-president at Dun & Bradstreet Software. "The fewer differences you have to support, the better off we all are."

Other enhancements announced by IBM include the following:

- VM/ESA rolled out three separate VM versions — VM/SP, VM/SP HPO and VM/XA SP — into one. Older versions will continue to be supported. The new operating system supports 31-bit addressing and improved systems management facilities, including the ability to participate in the Systemview architecture. The addition of Data Spaces allows frequently used data to be kept close to the processor to boost performance.

While the unified VM offerings bring some unity to the line, users may face a conversion effort getting to VM/ESA. IBM said developing VM/ESA required "changes in some of the internal control structures" of the operating system, and it has published VM/ESA conversion guides for users wanting to take this step.

- MVS/ESA SP Version 4.0 incorporates a concept called "sysplex," or system complex, and other components that allow users to manage multiple MVS systems from one central location. Also new are dynamic reconfiguration features that allow users to add I/O devices without having to take the system down.

Also, Advanced Program-to-Program Communications is available for the first time directly from within MVS under the new release. Previously, users had to go through the CICS teleprocessing monitor to access peer-to-peer networking.

- IBM also introduced new CICS releases. CICS/ESA Version 3.0, Release 2, which runs under MVS, includes the Systems Application Architecture Common Programming Interface for Communications and will be available next year. CICS VSE 2.1 is slated to be available in December.

DB2 users get boost, but it will have a price

BY JOHANNA AMBROSIO
CW STAFF

POUGHKEEPSIE, N.Y. — Users who continue to demand better DB2 performance will find it in the new release IBM introduced last week. However, there is a hitch: To take full advantage of the enhancements, users will need to invest in new hardware, and they will not be able to get their hands on the new release until October 1991.

In addition to the performance boosts, IBM has added more distributed features to DB2. Now users of DB2 can read and write to SQL/DS databases, and vice versa. SQL/DS was also upgraded to handle the distributed functions. However, the DB2 software supports only one update location at a time, and DB2 users must run MVS/ESA. For its part, SQL/DS must be running under the new version of VM, called VM/ESA.

IBM released a statement of direction saying that similar distributed functionality will be provided among DB2 and the database managers of OS/2 Extended Edition and OS/400.

Release 2.3 of DB2 contains some performance boosts even without what IBM is calling "processor assist." The software now sorts and joins with revamped algorithms that are much more efficient, IBM said.

To really make the data fly, IBM is providing a processor that plugs into mainframes. This offloads some of the DB2 processing and can improve sort times by 25% to 50% or more, IBM said. The processor is available for host computers that run MVS/ESA, beginning with the 3090J Model 180 and higher.

Another speed-related feature is reduced time for binds, from up to an hour down to "seconds," IBM said. A bind is required when a DB2 application is changed. Also, where the old version of DB2 required users to bring the application down for a bind, the new version allows the application to continue to run.

Other DB2 announcements included the following:

- A new version of the Query Management Facility (QMF) that allows users to write queries that go against distributed databases. The new QMF supports CICS directly; past versions could only use TSO.
- An English-language query system called SAA Language Access, which acts as a front end to QMF and other IBM products, including Application System/400.
- A tool called Data Propagator, which allows IMS database updates to be automatically reflected in DB2.

Enhanced role for 9370, 4381

IBM midrange users need only upgrade to increase system performance

BY MARYFRAN JOHNSON
CW STAFF

IBM stirred up the stagnant waters of its midrange 9370 and 4381 lines last week with 10 new air-cooled systems offering an eagerly awaited upgrade path and a 20% to 30% performance boost.

"We stretched our machine out to the very end, and it's only got a few more feet to go," said 4381 user John Bjork, computer operations manager at Pick'n Pay Stores, Inc. in Matthews, N.C. "This is long overdue."

Indeed, IBM has a substantial and hungry installed base for its older midrange computers. Computer Intelligence, a market research firm based in La Jolla, Calif., said it figures there are at least 6,330 sites with 4381s in the U.S. and another 6,650 sites with 9370s.

The new processors, swept along on the tail end of the razzle-dazzle surrounding IBM's Enterprise System/9000 family, were given new numbers in keeping with the "one big happy family" marketing concept prevalent in this announcement.

The power boost to the ES/9000s took the 9370 line into the range of 2 million instructions per second (MIPS) to 8 MIPS, while the next generation of 4381s is four times more powerful and spans 8 MIPS to 40 MIPS. That makes the successors of the 4381 as powerful as a good chunk of the 3090 J line, ranging from the Model 110J at 7.7 MIPS to the Model 180J at 22.2 MIPS. While existing 4381s cannot be upgraded to any of the ES/9000s, four models of the 9370 line can.

For customers who are worried about converting software from an old 4381 to the ES/9000 line, Chuck Celejewski bore good tidings. The vice-president of information services at Marriott Corp.'s food and services management division in Bethesda, Md., said the four-hour software conversion and installation process was "the easiest, least painful one I've ever been through."

As a beta-test site user of an ES/9000 Model 320, Celejewski said he is logging in a 45% increase in speed over his 4381 and has saved $250,000 originally budgeted to move to the water-cooled 3090 mainframe environment.

In the 9370 world, perhaps the most welcome news for capacity-strained customers is the ability to marry into the next generation of the 4381 family through the ES/9000 Model 170. That model can be upgraded to the next-tier Models 210 and 260 — although not until the last quarter of 1991, when the 170 becomes available.

At Lerner Shoes, Inc. in Salisbury, N.C., the delay in the Model 170's availability was a bitter-sweet pill to swallow. IS director Harvey Borden was in the midst of drafting his budget request last week, allowing for a $165,000 upgrade charge to move from his present 9377 Model 90 to the Model 170.

"I really like the fact that IBM is adding additional MIPS, and the Model 170 is 2.4 times faster than the top-of-the-line 9370 we have now," Borden said. "But the catch is, I have to pay for it this year but wait until next year to get it."

In systems software, midrange users gained greatly expanded processor storage and memory capabilities through VSE/ESA and VS/ESA (see story page 123).

"This is a big announcement for VSE customers," said Susan Gannon, an analyst at Technology Investment Strategies Corp. in Framingham, Mass. "IBM has put the best parts of ESA into VSE."

Those best parts will allow VSE users to go from 12 partitions to 200 partitions — using PR/SM to logically divide the system into several operating environments — and from 16M bytes of real virtual address space to 384M bytes.

The upgrade paths should help IBM stem the loss of customers from its older midrange base, several analysts said. Even at Digital Equipment Corp., the competitors acknowledged that selling DEC VAXs into 4381 accounts would be a tougher task than before.

"If I was in that [IBM] marketing manager's shoes, I'd be smiling now," said Rich Whitman, marketing manager for the VAX 9000 mainframe. But he could not resist pointing out how "DEC-like" certain parts of the announcement were.

At Pick'n Pay, Bjork has been weighing his IBM options against another competitor, Hitachi Data Systems Corp., which by his figuring runs about $50,000 per MIPS vs. the $65,000 to $75,000 per MIPS cost of the ES/9000 midrange.

Pick'n Pay now runs the MVS/XA operating system on the largest 4381 model, which serves as the main corporate processor supporting 700 stores in 18 states.

"I do like this opportunity to grow from infancy to adulthood without having to go across boxes," Bjork said. However, he added that to stay competitive with vendors such as Hitachi, IBM would have to move beyond even 40 MIPS for its new midrange offerings.

One big happy family

4380 and 9370 successors have been pulled into the same ES/9000 family as high-end mainframes

S/370 predecessor	ES/9000 model	Environmental distinction	Number of processors	Scheduled availability	Purchase price
4380 series	480	Air-cooled	2	3/91	$3,120,000
	440		2	3/91	$2,400,000
	320		1	9/90	$1,470,000
	260		1	9/90	$1,125,000
	210		1	1/91	$820,000
	190		1	3/91	$575,000
9370 series	170	Rack-mounted	1	Q4/91	$255,480
	150		1	12/90	$165,480
	130		1	12/90	$109,480
	120		1	12/90	$70,480

CW Chart: Doreen Dahle

At last: A pathway to LAN interconnectivity

BY ELISABETH HORWITT
CW STAFF

POUGHKEEPSIE, N.Y. — It was Christmas for local-area network managers last week as IBM finally addressed their demands for effective LAN management, LAN-to-LAN interconnectivity and IBM host support of industry standards.

Perhaps the most significant of the interconnectivity announcements was a new version of the 3172 interconnect controller that links multiple Ethernet and Token-Ring LANs to multiple hosts. The 3172 Model 2 is IBM's first product to support the Fiber Distributed Data Interface standard for 100M bit/sec. networking, the vendor said.

IBM also announced 3172 support for Systems Network Architecture (SNA) and its new Enterprise Systems Connection Architecture for transmitting data at high speeds between host computers.

Banc One Services Corp. may be able to use the upgraded 3172 to concentrate "a multiplicity of LAN links" into a single connection to the host front-end processor, according to Ronald Cybyske, senior vice-president at Banc One.

This would potentially allow the firm to "greatly reduce the number of our [3700 series controllers]," he added.

IBM made a statement of direction for 3172 support of Open Systems Interconnect (OSI) protocols. The device currently supports only the Manufacturing Automation Protocol 3.0 subset of OSI.

In addition, IBM announced VTAM support for the 3172, which provides the first direct link to Ethernet and Token-Ring LANs for IBM's OSI Communications Subsystem, an IBM spokesman said. A second VTAM enhancement allows physical units, such as the Application System/400 and Personal System/2, to be added to an SNA network without the need to take the network down for a system generation.

Another significant LAN product introduced by IBM last week was the LAN-to-LAN Wide-Area Network Program, said to support communications between Netbios applications on geographically dispersed LANs over an SNA network.

The product addresses the needs of many users who want to use existing SNA links to interconnect LANs [CW, Sept. 3]. However, IBM's method of encapsulating Netbios transmissions in SNA envelopes to achieve this is "a Band-Aid solution" that should cause serious performance degradation, said David Passmore, a partner at Ernst & Young.

Frontal assault

IBM also addressed long-standing user complaints about the lack of LAN management tools with several introductions. LAN Network Manager Version 1.0 is said to provide an OS/2 Presentation Manager interface and improved alarm filtering, minimizing traffic sent up to Netview. Version 1.1 is said to support more than 80 Netview commands, compared with the current 12-command level.

Also announced was LAN Station Manager, which is said to collect data about LAN workstations and their assets, including their location on the network, peripherals and types of applications used, IBM spokesman John McElroy said.

IBM presents . . .

- The engine for the all-new generation Models 820 and 900 is based on new thermal conduction modules (TCM). Each TCM has a 63-layer crystallized glass ceramic substrate, which is almost double the amount of layers in the previous TCMs.
- IBM announced Systems Application Architecture (SAA) versions of Imageplus software for the MVS/ESA and OS/400 operating systems.
- The 8230 Token-Ring Network Controlled Access Unit announced last week is an intelligent hub that is said to attach up to 80 workstations to either a 4M or 16M bit/sec. Token-Ring over both fiber-optic and coaxial cable.
- Some 1,500 software applications from IBM and third parties are available for the new System/390 family. This is the largest number of packages ever available for a new IBM product on announcement day, IBM executives said.
- A new release of Repository Manager/MVS, Version 1.2, will allow OS/2 Extended Edition to access host repository services. The specifications are slated to be available in the first quarter of next year.
- New releases of two IBM AD/Cycle tools will be available in mid-1991. Workstation Interactive Test Tool, Release 1.2, allows for high-volume testing of on-line SAA applications; more testing features have been added, as has a new user interface. Software Analysis Test Tool, Release 1.2, another testing tool, will support OS/400 applications.
- VS Cobol II has been enhanced to support the new VSE/ESA operating system and CICS running under VSE. It is scheduled to be available by December.
- Meanwhile, in Tokyo last week, reports circulated that IBM and Hitachi Ltd., once at odds over a Hitachi patent infringement incident, will enter a technical cooperation agreement to develop an Open Software Foundation-compliant Unix-based application.

System management's future

IBM offers promise of centralized control of decentralized data centers

BY ELISABETH HORWITT
CW STAFF

POUGHKEEPSIE, N.Y. — One of the starring roles IBM laid out last week for its revamped mainframe family was providing centralized management of customers' enterprisewide, distributed data center operations.

Major IBM users and third-party systems vendors praised the concept of IBM's Systemview, which promises to integrate various systems management tools within a consistent user interface and data structure. However, some said they would hold off final judgment — and support — until IBM has provided a firmer framework.

"The idea of a consistent interface and data structure" for administrative tools appeals to Ronald D. Cybyske, a senior vice-president at Banc One Services Corp. Systemview "sounds like a good initial step," he said.

"The problem we and everyone has is that there is no such thing as a one-vendor network," said David Thewlis, manager of computer systems and services at the Kaiser Permanente Medical Care Program in Northern California. "IBM has identified a commonality of administrative functions, and there is no earthly reason why they can't all be managed from a common orientation."

"I think Systemview is a blueprint for what system management will look like in large data centers," said Jack Van Kinsbergen, chief technical officer at system management software vendor Boole & Babbage, Inc. Boole & Babbage was one of several vendors that indicated they would support Systemview through its user interface and data structure when IBM makes those available.

IBM said it plans to release specifications for the Systemview user interface in the first quarter of next year and for the data structure in the third quarter. To make life easier for third-party application developers, the user interface supports "any flavor of [IBM's] Common User Access," an IBM spokesman said.

In contrast, the Systemview data structure is still being defined, spokesmen said, although IBM has already determined that it will be accessible via SQL.

IBM also announced the following administration products, which are slated to conform to Systemview:

- IBM Systems Application Architecture (SAA) Asset Manager/MVS is said to allow customers to set up a DB2 database to keep track of various hardware, software and related elements for accounting, inventory and problem management purposes.
- IBM SAA Delivery Manager allows an MVS or VM host to act as a centralized administrator and distributor of software and data to OS/2 programmable workstations.
- Enterprise Systems Connection Manager manages and monitors Escon, IBM's fiber-based high-speed links between hosts.
- IBM Operations Planning and Control/ESA, a product previously available only in Europe, allows managers to control data processing operations through centralized scheduling and initiating of production batch jobs.
- Workstation Data Save Facility/VM Release 1.0 is said to allow a VM system to act as a server that provides centralized backing up, archiving and restoration of data files on IBM OS/2 Extended Edition, AIX and PC-DOS systems.

While the initial Systemview announcement was mainframe- and IBM-oriented, IBM plans to extend the platform to other SAA computers and other vendors' systems, vendor spokesmen said. IBM said last week that recently announced management products for OS/400 will support Systemview.

IBM sees its own hosts as central administrators of multivendor networks, company spokesman Irving Wladawsky-Berger said. Digital Equipment Corp., like IBM, hopes to provide a platform for this type of integration. "So we'll compete to see whose systems will be the main platform," he said.

With Systemview, IBM has finally come up with something that is analogous to DEC's Enterprise Management Architecture, which also provides common data structure and user interface support for a variety of management and performance applications, according to David Passmore, a partner at Ernst & Young.

IBM's Systemview announcement comes none too soon, because DEC will unveil plans for managing IBM Systems Network Architecture systems via its EMA MCC:Director, a DEC spokesman said.

Opening the doors to Netview

Perhaps the most solid component of IBM's Systemview introduction last week was a new version of Netview that has been groomed to play a key role in the "open" systems administration framework.

Already designed to collect alerts, alarms and other data from various IBM and non-IBM systems, Netview will act as a Systemview linchpin that collects key administrative information and stores it in the Systemview database so that it is accessible to various administrative applications, an IBM spokesman said.

"The problem in the past was that Netview had its own sort of database, and other products couldn't tap into it," said David Passmore, a partner at Ernst & Young.

IBM actually rewrote Netview so that Version 2.0 could share Systemview's SQL-based database structure, Passmore said. This is crucial if IBM is to provide a consistently updated record of systems and network configurations, network performance and other key data that may be useful to asset, performance, problem and change management applications, Passmore added.

In addition, IBM introduced tools that make it easier for users to automate Netview applications, according to IBM Vice-President Ellen Hancock. Such tools, which IBM plans to add to in the near future, will be available to third-party application developers via Netview, she said.

The ability to potentially automate operations would minimize the need for data center managers to "directly interact with the system," freeing them "to solve human rather than computer problems," said David Thewlis, manager of computer systems and services at Kaiser Permanente Medical Care Program in Northern California.

Netview's automation tools, coupled with the simpler, more consistent user interfaces promised by Systemview, should free managers such as Thewlis from system administration functions that are really "immensely complex clerical tasks," he said.

Not that IBM plans to centralize management of all its SAA elements, Passmore said. Indeed, OS/400, OS/2 and VTAM all retain their own configuration and management databases and systems. In addition, IBM has just announced LAN Network Manager programs that can manage Token-Ring local-area networks either independently or in conjunction with Netview. "This shows IBM's recognition that not all customers will want mainframes," he said.

IBM has also announced the long-awaited LU6.2 support for Netview as a method for third-party devices and applications to communicate directly with a Netview host.

Although IBM will continue to provide the original Netview/PC interface, LU6.2 allows third-party vendors to "make more extensive use of the network management facility," partly by freeing them from the limits of Netview/PC's messaging formats, Hancock said.

LU6.2 support fosters users' ability to distribute network and systems management functions across multiple hosts, which can trade information in peer-to-peer fashion, she said.

Also announced was a graphics-based end-user interface for monitoring SNA resources on OS/2 workstations, which will comply with the Systemview user interface, IBM said. The vendor's existing Netview interface, Netcenter, will eventually converge with the new product, according to company spokesmen.

ELISABETH HORWITT

Cryptographic feature to cut processing overhead

IBM introduced last week what it said is the industry's first integrated cryptographic feature (ICRF) and a new cryptographic architecture for high-volume transaction processing applications.

The ICRF and its associated software, called the integrated cryptographic service facility/MVS (ICSF/MVS), enable customers to process large amounts of data up to four times faster than IBM's previous high-end processor encryption offering, resulting in a dramatic reduction in the cost of encryption, the company said.

IBM's *tamper-resistant ICRF*

The ICRF consists of a tamper-resistant thermal conduction module (TCM) for water-cooled models of Enterprise System/9000 processors and a key-entry unit.

Customers use the key-entry unit to enter master cryptographic keys into a secure key-storage unit connected to the TCM by a tamper-resistant shielded cable.

ICRF and ICSF/MVS support up to 1,000 IMS Fastpath transaction/sec., a rate that is achieved by running ICRF operations at processor speeds rather than the channel speeds of previous offerings, using MVS/ESA features and keeping cryptographic keys in processor storage rather than moving them between the processor and I/O devices.

Second-class postage paid at Framingham, Mass., and additional mailing offices.
Computerworld (ISSN 0010-4841) is published weekly, with a single combined issue for the last week in December and the first week in January by CW Publishing/Inc., 375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171.
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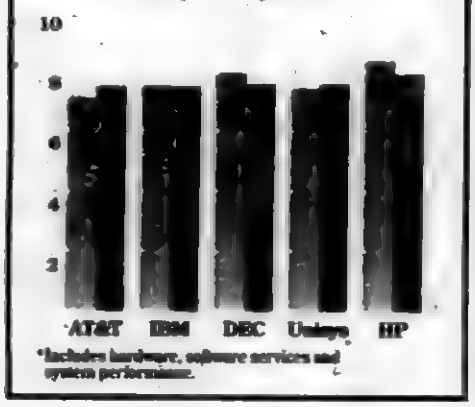
TRENDS

Customer Satisfaction

As the market becomes more competitive, it will be harder for vendors to separate themselves from the pack in terms of overall customer service. Already, users are beginning to see the gaps closing among most major vendors

Overall user satisfaction*

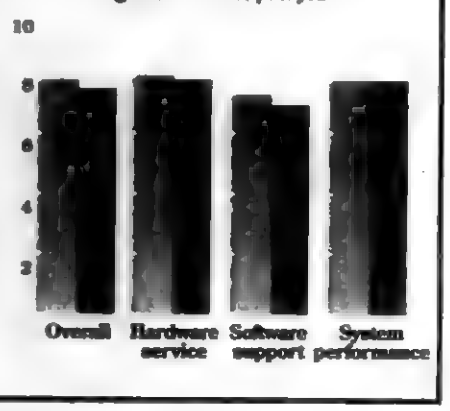
Hewlett-Packard drops in overall user satisfaction but still takes top honors, while AT&T and Unisys move up from the previous year



*Includes hardware, software services and system performance.

User satisfaction by category

Generally, customers are satisfied with the service provided by vendors, but perceived improvements in these services have stagnated over the past year

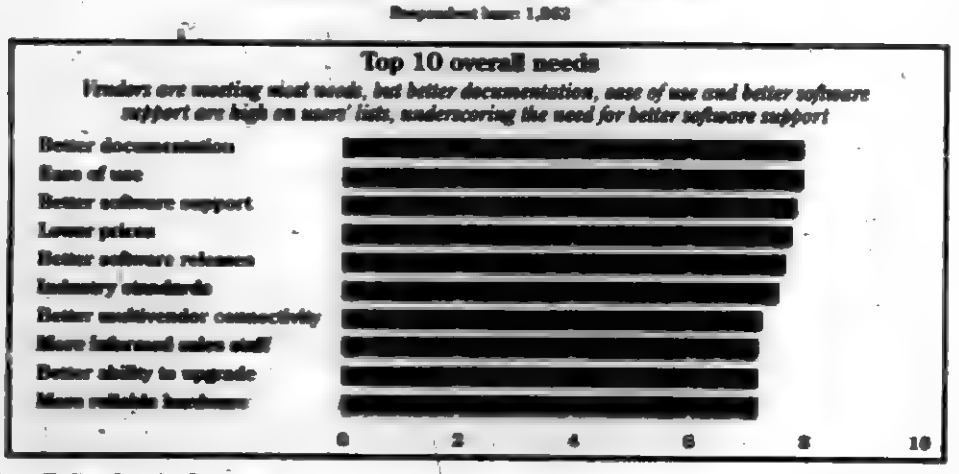


1 = Very dissatisfied
10 = Highly satisfied
1988
1989

Respondent base: 1,062

Top 10 overall needs

Vendors are meeting most needs, but better documentation, ease of use and better software support are high on users' lists, underscoring the need for better software support



Source: The Sierra Group, Inc., Tempe, Ariz.

CW Chart: Paul Mock

NEXT WEEK

Are you struggling with the choice of keeping personal computer service and support in-house or going outside to a dealer, value-added reseller or other third party? Seems you are not alone. IS managers will reveal the good, the bad and the ugly of personal computer service options in next week's PCs & Workstations section feature.

M.E. Cohen

Choosing a mainframe is getting trickier as the machines start to tackle jobs they have never had to do before. Product Spotlight provides advice on how to evaluate big machines for all kinds of tasks. There is also a detailed chart comparing recently introduced mainframes and a Buyers' Scorecard presenting user ratings of five 3090-size systems.

INSIDE LINES

MCC to get a consultant

Andersen Consulting and MCC are slated to announce Sept. 20 that Andersen is signing up as the 22nd shareholder company in the Austin, Texas-based research consortium. The cost for a shareholder to join MCC is $250,000, which entitles that company to share in revenue from the licensing of MCC technologies and gives it governance rights and a seat on the board of directors.

Not all smiles in the oil patch

The consolidation of Dallas-based Texas Oil & Gas's oil and gas exploration and production with that of Houston-based Marathon Oil (both owned by USX Corp.) will mean major cutbacks and serious consolidation of both IS departments. The move will "happen very soon," a source close to Texas Oil & Gas said. The company would not comment. The merger, announced last June, will consolidate IS operations of USX's energy segment into "one small IS shop," which will either be operated out of Finley, Ohio, where Marathon's IS shop is located or be outsourced, the source said.

IBM to take the Nextstep?

It'll be a big month for Steve Jobs' Next. In addition to a scheduled Sept. 18 unveiling of a color version of its hybrid computer, which will feature a slew of third-party application support, look for IBM to release a version of AIX later this month complete with support for Nextstep. At least that's the word from a dealer quoting a copy of IBM's "green sheet," a bulletin sent regularly to dealers alerting them of upcoming product news.

More important things to do

Ripples from the Persian Gulf grow larger here at home. 3Com announced the names of three beta-test sites for its new line of beefed-up multivendor servers. There would have been more, a company spokesperson said, but the government beta testers backed out, saying they suddenly had more mission-critical things to do related to Iraq's invasion of Kuwait.

Low-end EIS on tap

Though neither company will confirm or deny it, Microsoft and Software Publishing are expected to jointly unveil a new EIS aimed at lower budgets and less ambitious needs during Networld '90 Dallas. A source who saw the product says it was developed by Software Publishing to help managers retrieve text, graphics and spreadsheets (or portions thereof) from any active PC or server that runs OS/2.

How important is computer security?

Some staffers at the National Institute of Standards and Technology's (NIST) computer security resource center are dusting off their resumes as a result of rumors that budget cutbacks will lead to a 40% staff reduction beginning Oct. 1. Under the Computer Security Act of 1987, NIST has responsibility for developing computer security standards for civilian and unclassified government computer systems — a growing task that may not jibe with cutbacks.

World o' nets

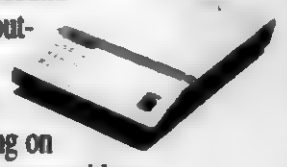
Next week at Networld '90 Dallas, DEC will deliver on promises made at Decworld '90 and finally let everybody know how it plans to manage IBM's SNA systems via its multivendor network management platform, MCC Director, a company spokesman confirmed. General opinion is that DEC will copy AT&T and use System Center's Netmaster to extract SNA data from IBM's Netview — a task comparable to opening a can of tuna with a shoehorn. DEC is also expected to roll out the long-awaited OSI-compatible Decnet Phase V on time.

Litigious-minded Lotus may sadden judges, but it hasn't killed the humor at Borland International, which is working on an updated version of its Quattro Pro spreadsheet that should be ready soon. The code name for Version 2.0 while in R&D: Buddha, "because it's supposed to assume the Lotus position," Chairman Phillipe Kahn said. If you'd like the industry to lighten up, contact News Editor Pete Bartolik with suggestions. Call (800) 343-6474, fax to 508-875-8931 or send those bars via MCIMail to COMPUTERWORLD.

NEC modems keep information moving as if your life depends on it.

In a 911 emergency, to risk a communications breakdown is to risk a life. So if you don't want to take any chances, make sure your modem can handle the pressure in a crisis.

In Florida, NEC's I Series Intelligent Chassis System is now helping coordinate the life-saving efforts of Lake County's 911 services. The county chose the system after tests found NEC's I-Chassis modems outperformed others. And they've proved their round-the-clock reliability by being on the job there for more than a year without a single failure.



Since NEC modems are designed to rapidly and accurately transmit huge volumes of data, Lake County's 911 operators can now quickly pinpoint accident locations, provide traffic instructions, find patient medical records, and dispatch back-ups when needed. And because NEC's Dual Modem Card links 911's control center to NEC Dial-up Modems in remote locations, Lake County feels it has found the best data networking solution attainable.

Each individual I Series Chassis supports a wide variety of applications and products. These include synchronous and asynchronous operation in dial-up or leased line networks. Line speeds ranging from 300 bits/s to 56k bits/s with both analog and digital capabilities. As well as compatibility with CCITT standards such as V.32 and V.42/bis. Plus, the system's built-in flexibility eliminates product obsolescence by making it easy to add, mix, and match other chassis and data communications devices as network requirements change.

No matter what business you're in, you need a modem that can keep facts and information on the move without causing a crisis of confidence. So choose wisely. Choose NEC's I Series Intelligent Chassis System and Network Manager. For a free assessment of all your data networking needs, **call (800) 222-4NEC.**

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NEWS RELEASE

INTEGRAL ANNOUNCES TRADE-IN PROGRAM FOR MSA AND M&D CLIENTS

Uncertainty Created By Dun&Bradstreet Acquisition Prompts Special Integral Financial and Human Resource Program

Walnut Creek, CA — In response to overwhelming requests from within the newly combined MSA and M&D client base, Integral today announced a financial and human resource software trade-in program designed to provide organizations with proven, stable and enduring business solutions.

Under the terms of the Integral program, D&B Software clients who trade in existing financial or human resource systems will receive up to 30% off the price of a new financial or human resource system from Integral. Integral's trade-in program offers superior application performance and a clear technical direction to these D&B Software clients — and at a significant savings.

The program originated in response to strong and rapidly growing concern among the D&B Software client base over questions of product continuation, commitment to support, and overall D&B Software company strategy and technology direction. In recent coverage of the D&B Software user conference, COMPUTERWORLD noted that "many left the conference skeptical and confused about how the company will 'bridge' the redundant applications software lines it has acquired."

Since 1972, Integral has developed and serviced the most functionally rich and technically advanced financial and human resource systems in the industry. Today, Integral has installed software products at more than 2000 client locations. Recently Integral was awarded IBM's *Outstanding Business Partner of the Year Award* for the second consecutive year.

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THE NEWSWEEKLY OF INFORMATION SYSTEMS MANAGEMENT
September 17, 1990 · Vol. XXIV · No. 38 · 164 Pages · $2/Copy · $48/Year

COMPUTERWORLD

INSIDE

In Depth — Beyond the smoke: The scoop on OOPS. Page 115.

Product Spotlight — Get out your erasers. The rules in the mainframe evaluation game are changing. Page 101.

MVS users skittish about IBM enhancements, but VM, VSE users are in hog heaven. Page 149.

Decnet Phase V rolls out on schedule, but don't strain your eyes looking for OSI support. Page 10.

Token-ring users get relief from 16M bit/sec. twisted-pair jitters. Page 14.

Fibers, tokens and LAN Managers are among the product-packed topics at Networld '90. Page 147.

NCR expected to place its chips on Intel, replacing most of its computer line with microprocessor-based systems and launching an office integration thrust. Page 6.

Researchers focus on taking the guesswork out of voice recognition. Page 23.

Today's expert systems tools have the IS manager in mind. Page 29.

Going beyond disaster, some IS groups are being tapped to develop business recovery plans. Page 93.

The imaging gold rush has begun as vendors run to cash in on a potentially explosive market. Page 117.

Users savor upgrade options

BY ROSEMARY HAMILTON
CW STAFF

Several IBM customers who began exploring the maze of Enterprise System/9000 upgrade options last week came to the same conclusion: While it is a pain in the neck to narrow down the many choices, it sure beats being told what to do by IBM.

"We are looking at about four or five different scenarios right now," said Richard Mason, an assistant vice-president at CSX Technology, the information services group of CSX Corp. "We feel we are well-positioned to exercise any option we want."

This is a new game for 3090 users. With the ES/9000, IBM has for the first time provided upgrade paths for existing high-end mainframe users. Users can select from field upgrades, asset swaps, two-step upgrades, transitional systems or the straight, old-fashioned system purchase. Furthermore, current high-end 3090J customers can implement some of the new software features introduced with the System/390 generation.

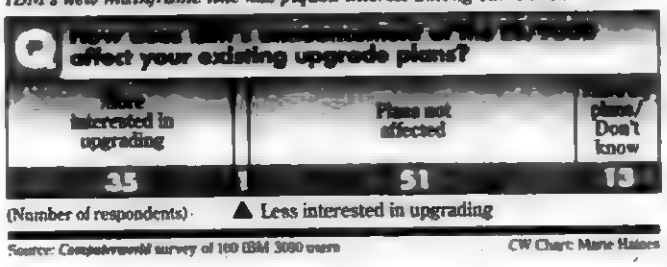
While the choices can be mind-boggling, users said the ES/9000 allows them to come up with a plan that best suits their needs.

So, while some users are leaning toward gradual moves to the new processor line, others are figuring out ways to get there as quickly as possible. Although some are dismissing certain moves as unnecessary for their organization, others are taking those very steps.

For instance, the ES/9000 Model 720, which is essentially a

Continued on page 148

Making the grade
IBM's new mainframe line has piqued interest among current 3090 users



Source: *Computerworld* survey of 100 IBM 3090 users — CW Chart: Marie Haines

Global nets rewrite delivery rules

BY ELISABETH HORWITT
CW STAFF

Data networking has become the weapon of choice for global package handlers out for a bigger piece of the international market. However, the major contenders have run up against a thicket of obstacles in their race to deploy communications lines to couriers, dispatch centers and customers in far-flung regions of the globe.

Federal Express Corp., United Parcel Services and DHL Worldwide Express are all deploying the same basic networking applications, which are designed to ensure that customers get their packages on time or at least know the reasons for the delay. These include the following:

- Electronic links that give customs prior warning of which parcels need special attention, thus minimizing border delays.
- Wireless connections to radio frequency terminals in couriers' vans, which ensure prompt pickup of new orders and allow headquarters to track packages' progress.
- Direct links to the handler's data center that allow customers to process invoices, place new pickup orders and locate delayed parcels on their own personal computers.

The current contention for network presence

Continued on page 8

Giants back deal for Ingres

Ask enlists help to buy ailing database vendor

BY JEAN S. BOZMAN
CW STAFF

MOUNTAIN VIEW, Calif. — Aided by the deep pockets of two allies, Ask Computer Systems, Inc. last week said it would purchase Ingres Corp., the $157 million relational database firm that has been sputtering along on low cash reserves in the face of stiff competition.

Ask anted up the price of $110 million in cash through an equity relationship with both Electronic Data Systems Corp. and Hewlett-Packard Co., which, in exchange, bought a combined 30% of Ask stock.

EDS and HP, which will collectively put up $60 million, will play a larger role than that of silent investors, Ask Chief Executive Officer Sandra Kurtzig said. "EDS and HP have a broader interest in this," she told *Computerworld* last week. "We're clearly going to encourage them to develop applications outside the manufacturing area" in which Ask concentrates its efforts.

Ingres users seemed a little concerned last week, even though they said they were relieved that the vendor was not going out of business.

Frank Pellegrino, manager of

Continued on page 4

PCs repel workstation wave

BY J. A. SAVAGE
CW STAFF

As workstation prices closed in on those of personal computers during the last year, many pundits predicted that powerful workstations would replace PCs on the desktop. However, faced with the cold reality of an entrenched PC operating system installed base and lack of commercial workstation applications, vendors are now trying to avoid the comparison.

Instead of ousting PCs, reduced instruction set computing workstation vendors, analysts and some users believe that workstations in the mid-1990s will occupy a niche of network-intensive use that is now in its infancy, with applications that cannot be handled by today's PCs.

A year ago, some analysts thought that as long as a workstation cost the same as a PC, users would logically gravitate toward the more powerful workstation. But users contacted by *Computerworld* said that there was no price point at which they would simply use workstations as a PC replacement.

Elaine Bond, senior vice-president of Chase Manhattan Bank NA's Corporate Systems Group, said she might consider replacing PCs with workstations but her decision has less to do with price than with the capacity of the workstation or PC and the necessary computer power for the job.

"It won't be a PC replacement market as much as an

Continued on page 14

Strong mainframe need despite downsizing

Has application offloading decreased your company's need for mainframes?

Responses from 100 users of 3090 [illegible] mainframes

See ratings, page 105

CW Chart: Marie Haines

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"Isn't it wonderful?"

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On IBM's move to add ESA features to the VSE operating system. See story page 149.

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Yeahandwetalkfasttoo. If perceptions mean anything, executives both here and in the UK agree that the pace of work in the U.S. is faster than in Britain. That finding, from a series of studies by Robert Half International, Inc. that compared work habits in the two largest English-speaking countries, concluded that while Americans honor the newest and fastest ways of getting the job done, the culture of the Brits is based on respect for tradition, thoroughness and stability. The studies are intended to aid companies planning to expand into the new Europe of 1992. It is expected to take considerably longer to garner results from within the UK.

Hardware galore in listing of late-model mainframes. Page 101.

Di Almasy

Even before it's time for a human taste test, Campbell's soups go through the expert systems taste test under the direction of Michael Mignogna. Page 33.

EXECUTIVE BRIEFING

■ **IBM mainframe users are weighing a variety of options** as the dust settles from the recent ES/9000 announcement. Some large users, including Manufacturers Hanover and Blue Cross/Blue Shield of Western Pennsylvania, have already chosen IBM transitional machines while awaiting next year's Model 900s; other users are more cautious. No one is rushing to the new MVS operating system — but VM and VSE users are pleased with the new upgrade options for those systems. **Pages 1, 148 and 149.**

■ **Almost 50 IS managers have banded together** to lobby vendors for open systems. Members of the User Alliance for Open Systems intend to specify nonproprietary systems in future RFPs. The group includes General Motors, Du Pont, Eastman Kodak and Deere. **Page 4.**

■ **Workstations are not replacing PCs** in most IS shops, despite falling workstation prices. Users say price is less of an issue than displacing the entrenched DOS operating system and application base. Analysts predict that workstations will find a new niche of network-intensive processing as the decade progresses. **Page 1.** Meanwhile, Compaq has cut PC and memory prices in response to lower priced competitors. **Page 6.**

■ **Ingres is getting a new parent** — three, in fact. A complex agreement announced last week gave the No. 2 relational database company to Ask Computer Systems, with EDS and HP as 30% equity partners. The deal left Ingres users wondering about the new owners' different roles, while Ingres CEO Paul Newton hinted he may leave after the ownership transition. **Page 1.**

■ **Disaster recovery planning** is not enough anymore. Progressive companies are now forging "business resumption plans" that include business functions as well as data center operations — and putting the IS chief in charge of such planning. **Page 93.**

■ **Leaders in the package delivery industry** are seeking to leverage networking technology overseas the way they transformed their domestic businesses, but they are finding major obstacles. The technical and political barriers are preventing Federal Express from moving ahead of UPS and DHL, although those firms face the same hurdles. **Page 1.** DHL has called on a new man, CIO Michael Lanier, to revamp its domestic IS. **Page 8.**

■ **Mrs. Fields Cookies spun off its software development group** into a new company, Fields Software Group. The firm sells expert systems for retail and food operations. **Page 12.**

■ **Companies in the market for another mainframe** may need to update their evaluation processes, particularly if they are planning to use the machine as a powerful server or as part of a distributed setup. New vendor strategies and the need to preserve all options argue for a rethinking of the selection process. **Page 101.**

■ **End-user computing managers** are finding themselves well prepared to head in any direction within their company, even into end-user roles. Because they work with just about everyone in the company and are absorbing strong business skills, their career paths are becoming more flexible. **Page 128.**

■ **On-site this week:** Campbell Soup relies on an expert system to ensure its famous "mmm-mmm good" quality. **Page 33.** Piecework is no longer piecemeal at Ditto Apparel of California, the U.S. manufacturing arm of Jordache. Ditto uses a revamped payroll accounting system based on the Wang VS 5000. **Page 40.** The nonprofit New Jersey Symphony Orchestra stays in better tune with its contributors by using PCs that download data from an AS/400 and generate thank-you and follow-up letters without rekeying. **Page 67.**

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Ingres

CONTINUED FROM PAGE 1

database applications at the Public Broadcasting Service, has used Ingres for two years, including its latest database version, Ingres 6.3. "It's difficult to imagine that the merger would not affect the product," said Pellegrino, who is active in the national Ingres user group. "It would be nice if they were able to keep their identity within the Ask organization. Then you'd feel like you were still dealing with Ingres. But I don't think that's going to happen. I don't see where this merger buys me a whole hell of a lot."

Intuitive feeling

"I had a feeling Ingres was going to get bought, because their stock price was getting so low, and their salesmen were expressing some concerns about the finances," said Linda Vitelis, principal analyst at Syscon Corp., a Washington, D.C., government contractor. "My feeling is that if Ask takes a hands-off approach and lets the Ingres engineers do what they do best, this deal has a good chance of success."

Industry analysts were somewhat less optimistic. "If the economy were to go sour, the combined firm would have a cash-flow bind," said Paul Bloom, an analyst at investment firm Volpe, Welty and Co. in San Francisco. "But it was a smart move on Ask's part, one that I believe will prove to be financially astute in the long run."

"This merger may not fly with users because there's nothing overwhelmingly synergistic about the Ingres installed base and Ask's manufacturing clients, who tend to be manufacturing engineers," said Rob Anderson, a senior vice-president at Stratagem in San Francisco. Many users contacted by *Computerworld* were not yet aware of the impending merger.

According to Ingres and Ask executives, Ingres will be absorbed by $207 million Ask, emerging as a single entity combining Ask's manufacturing applications expertise and Ingres' relational database management systems and tools technology.

"We don't expect the Ingres name to survive the merger," said Ingres CEO Paul Newton. Newton said he was not sure if he would play a role in the combined company, adding: "I might elect to do something else, but I've made a commitment to making a successful transition."

If approved by Ask shareholders — a process that could take two months — the merged company would be a $360 million firm with a combined work force of 2,100.

Analysts said they expect layoffs will result because of duplication of management and administrative functions. Ingres management had been faulted by both users and analysts as having done too little to position and market the Ingres database and application development tools, which many regard as technically superior to Oracle Systems Corp.'s products.

Ask and Ingres have become strong business partners in recent months, with Ask acting as an Ingres value-added reseller. But Ask executives said they felt they alone could not field the broad array of applications that Ingres users require.

"We see the Ingres database and our own Ingres-based products as a solution for those users who want portable, distributed applications," said Ask CEO Les Wright. "But when you look at the overhaul of [computer] resources most corporations will have in the 1990s, it takes a company with EDS' resources to pull it off."

HP is expected to announce a raft of Ingres/Ask-related products within the next two weeks, said Dennis McGinn, general manager of HP's industry marketing group within HP's Advanced Manufacturing Division.

McGinn, who was central to the negotiations, said Ask had sought several equity partners to make a partnering venture for the 1990s. "They approached DEC and EDS at the same time they approached us," McGinn said. "Sandy [Kurtzig] felt they needed to get control of Ingres because the Ingres product was central to Ask's future."

At a glance

Ingres had growth spurts, but Ask had staying power

Ingres

Paul Newton
CEO

	Revenue (in thousands)	Income
1987	$46,565	$2,477
1988	$87,386	$7,464
1989	$130,716	$6,201

Ask Computer Systems

Sandra Kurtzig
CEO

	Revenue (in thousands)	Income
1987	$98,305	$8,001
1988	$142,414	$10,795
1989	$186,293	$13,490

CW Chart: Paul Mock

Leasing firm posts loss

BY NELL MARGOLIS
CW STAFF

LAKEWOOD, Colo. — Battered by both internal and industrial hardships, Capital Associates, Inc. late last week posted a $16.8 million loss on revenue of $151.4 million for its 1990 fiscal year ended May 31.

The red ink marked a massive slide for the computer leasing firm, which boasted profit of $8.6 million on sales of $138.2 million last year and appeared to be poised for growth.

"This is both a troubled Capital Associates story and a troubled leasing industry story," said Cam Philpott, an analyst at the regional company of Boettcher & Co.

Woes suffered by large Capital lessors such as Integrated Resources, the huge investment trust now in Chapter 11, left them unable to meet scheduled lease payments to Capital. A fourth-quarter, pretax $22 million charge to cover customer defaults and written-down inventory largely triggered the annual loss, Capital said.

However, more ominous than a one-time charge, Philpott said, is the fact that Capital's core businesses — including equipment remarketing, traditionally a strength for the firm — are operating at a loss.

A reorganization that ended a disruptive rule by triumvirate and established current Chief Executive Officer Richard Kazan firmly at the head of the company was a smart move but an expensive one, Philpott said.

Capital's recent move into the Japanese used and leased computer market in alliance with a subsidiary of a major Japanese bank was strategically savvy but "is eating up funds" in the short term, Philpott added.

Such particular problems, he said, are playing out against the backdrop of a third-party computer leasing market still riven by foundering worldwide economies and the increasingly aggressive onslaught of IBM subsidiary IBM Credit Corp.

User super group forms, pledges open systems push

BY MITCH BETTS
CW STAFF

WARREN, Mich. — Last week the Houston 30 begat the Warren 45, which begat the User Alliance for Open Systems.

The coalition of 45 information systems managers created a formal structure and name for itself, agreed to join the Corporation for Open Systems (COS) and sketched some of its plans to break down barriers to open systems.

The IS managers said they could exercise their clout with vendors by specifying open systems in requests for proposals (RFP) but that they must first persuade top management in their firms to accept the idea.

Bruce Gengler, project manager at Deere & Co., said that if all User Alliance firms could simultaneously demand open systems in their RFPs, it would demonstrate user solidarity and readiness to buy open systems.

"We need to convince management to do this," said Michael Kaminski, manager of General Motors Corp.'s Manufacturing Automation Protocol program.

The group's mission is to convince vendors to provide nonproprietary hardware and software products that permit interoperability and portability of applications among multivendor systems [CW, June 25]. It includes some of the biggest technology users in North America, including GM, Du Pont Co., Eastman Kodak Co. and McDonnell Douglas Corp.

The meeting produced the following list of action items:

- Maintain a list of open systems products certified by COS and X/Open Ltd.
- Publicize case histories of successful open systems projects.
- Lobby to change accounting rules that make open systems difficult to cost-justify.
- Create a process so that a consolidated list of user requirements can be communicated to the vendor community.
- Include open systems in corporate business plans.

The coalition voted to join COS so long as the User Alliance keeps its separate identity.

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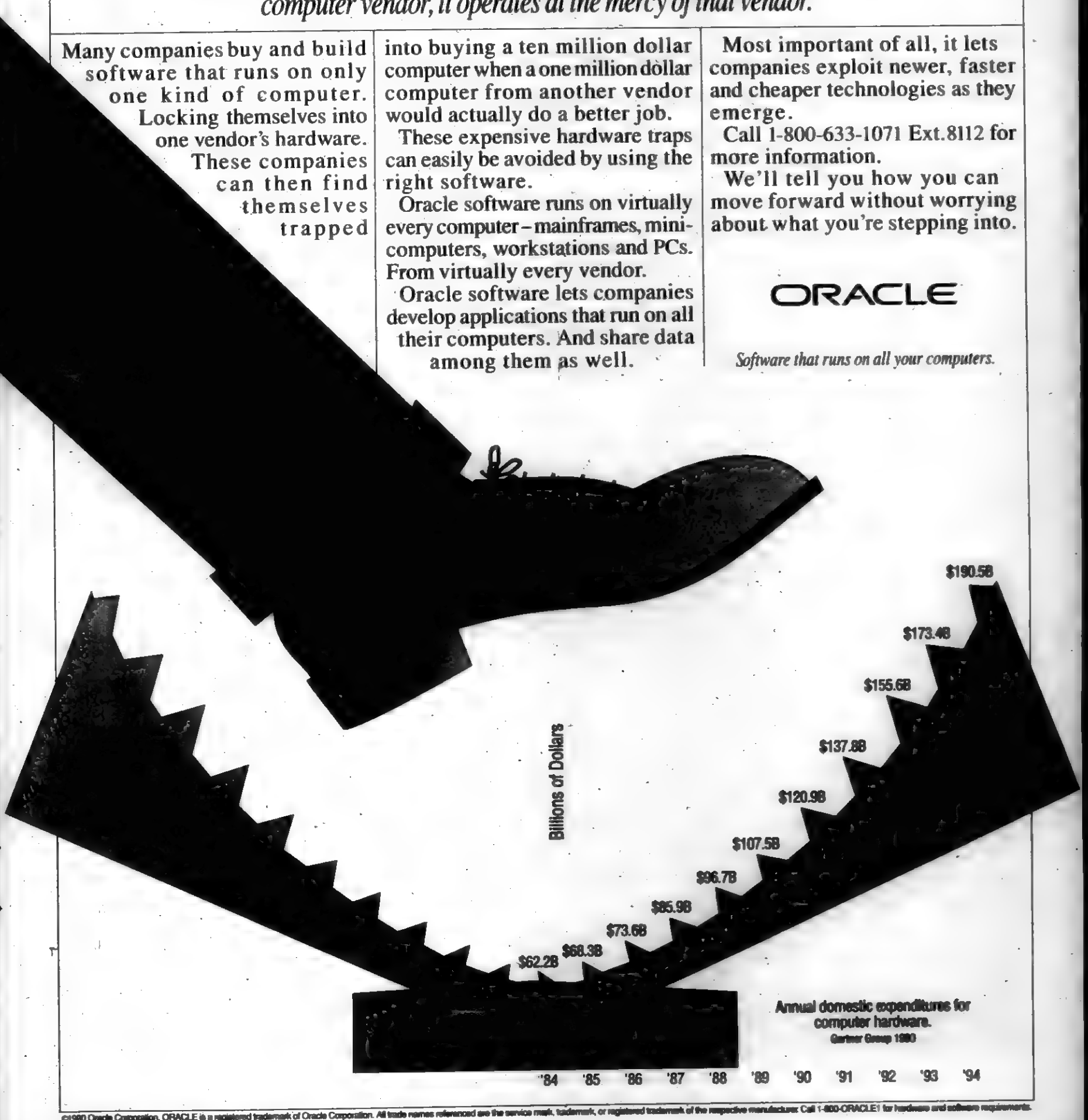

Annual domestic expenditures for computer hardware.
Gartner Group 1990

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NEWS SHORTS

Ink dries on System One deal

Electronic Data Systems Corp. (EDS) last week finalized its deal announced in February to share ownership of the System One computerized reservation system (CRS) with Continental Airlines and Eastern Airlines. EDS will pay $250 million to become the first non-airline to own a CRS and will also take over Continental and Eastern's information systems operations for 10 years in a service contract valued at $4 billion. The deal is subject to the approval of a bankruptcy court in New York, which has jurisdiction over Eastern.

Slow growth at Tandem

Tandem Computers, Inc., the $1.6 billion maker of fault-tolerant computers, said last week that it may not realize its growth expectations for its fiscal year, which ends Sept. 30. "Our sales activity is at an all-time high, but our order-close rate is slower than expected," Tandem Chief Executive Officer James Treybig told a Boston meeting of industry analysts. Treybig said sales of Tandem's high-end Cyclone system, its Integrity S2 fault-tolerant Unix system and its Nonstop SQL database software were strong in some regions of the world, including Japan, Southeast Asia and Europe. However, he added, sales in the U.S., UK, Australia and Canada are slower than expected.

Sara Lee's Owens moves to Carrier

John W. Owens, a 28-year veteran of Sara Lee Corp., is the latest high-profile IS executive to change jobs. He has been named vice-president of IS at Carrier Corp., a subsidiary of United Technologies Corp. Owens, president-elect of the Society for Information Management (SIM), had been vice-president of IS and chief information officer at Sara Lee's Hosiery Division in Winston-Salem, N.C. In that position, he was a co-winner of the inaugural SIM Partners in Leadership Award in 1987 for restructuring and automating the nationwide distribution system for L'eggs hosiery. Owens said he left Sara Lee, where he had worked in several different divisions, on good terms. "I had no reason to leave; it was just a matter of wanting a new challenge," Owens said.

Aion fills out top posts

Co-founder Harry Reinstein is still the chairman at Palo Alto, Calif.-based Aion Corp. The other seats in the executive suite at the knowledge-based applications software house, however, have new occupants as of last week. Former Panaophic Systems, Inc. executive James R. Gagnard is Aion's new president and chief executive officer. Computer-aided software engineering marketing veteran Alan L. Codlind signed on as vice-president of marketing. Aion co-founder Larry Cohn ceded his presidential title to Gagnard and will man a new post: executive vice-president of technical operations.

New director named at Andersen

Chicago-based Andersen Consulting last week named Paul J. Cosgrave to the new position of managing partner, technology and integration services — Americas. Cosgrave, 40, will head the $1 billion practice from New York and have overall leadership for the systems management and integration operation in North, Central and South America. Cosgrave has held numerous management posts within Andersen since 1982.

VAXs, supers on speaking terms

To accommodate Digital Equipment Corp. VAX minicomputer network users who need access to supercomputers, Alliant Computer Systems Corp. last week announced a software option to its Concentrix 5.0 and Concentrix 2800 2.0 Unix operating systems, which drive Alliant's FX/Series supercomputers. Alliant said that it has more than 500 supercomputer installations, about 80% of which coexist with DEC VAXs. The company's new $15,250 DNX/LAT software reportedly uses a standard Ethernet controller and can run concurrently with Transmission Control Protocol/Internet Protocol. LAT, or Local Area Transport, is a proprietary DEC network protocol.

More news shorts on page 147

NCR to map whole new course

BY PATRICIA KEEFE and ELLIS BOOKER
CW STAFF

NEW YORK — In a dramatic shift, NCR Corp. is expected tomorrow to announce sweeping plans to abandon its Motorola, Inc. roots and recast itself as the office integrator of the 1990s.

According to sources who were briefed by the firm, NCR will roll out a seven-layer, three-year product plan that includes Open Systems Interconnect-based network software and a range of hardware based entirely on Intel Corp.'s microprocessor processor line.

In short, NCR has told analysts it is betting the company on Intel. The switch comes at a time when Motorola is under pressure to deliver its late next-generation 68040 chips. There have been reports that some hardware vendors have been forced to go to other chips or delay product launches. NCR could not be reached for comment.

The new NCR System 3000 line "is all CISC-based as opposed to RISC-based," said consultant Frank Dzubeck, president of Communications Network Architects, Inc. in Washington, D.C.

Users will have quite a bit to pick from under NCR's new order, which will be extended to include Intel's as-yet-unreleased 50-MHz I486 and 586 chips.

The hardware line to be announced tomorrow ranges from notepad computers at the low end to a top-of-the-line gigantic multiprocessor server called the Model 3700. It will be designed to look like a mainframe and target on-line transaction processing and decision support. Slated for release in 1992, it will feature more than 1,000 loosely coupled processors, hardware disk arrays, AT&T's Unix System V, Version 4 and will offer up to 250,000 million instructions per second (MIPS) at full capacity. Teradata Corp. is said to be working on the project with NCR under a joint development agreement signed six months ago.

Layered below this will be the following multiprocessor servers: the Model 3600, which features 4,000 MIPS and a maximum of 256 processors; the Model 3500, which offers two to eight processors, maxing out at 320 MIPS; and the Model 3400, which offers one to four processors.

Next will come the single-processor 3300, which gives users four expansion slots and a choice of either an 80386 or an I486. Below that will be the small footprint Model 3200, which offers two expansion slots and a full 386 chip. Finally, NCR will offer a 386-based notebook and a notepad computer. Pricing was unavailable.

"This whole thing is a gigantic commitment to Intel. They feel that Intel's commitment to future releases through the year 2000 gives them plenty of room to grow and expand," Dzubeck said.

Next month, NCR will make a bold stab at making a name for itself in office integration with the two-phased unveiling of Cooperation, described by sources as being based on Hewlett-Packard Co.'s New Wave — very IBM Officevision-like and built on C++ and object-oriented technology.

The key to Cooperation, sources said, is that unlike similar products from Digital Equipment Corp., AT&T, IBM and HP, it will be a shrink-wrapped, open system. Capable of running on any platform, it will reportedly support DOS, Windows, OS/2 and Unix System V.4.

"I would characterize it as what IBM is trying to do with Officevision," said Judith Hurwitz, editor of Patricia Seybold's "Unix in the Office" newsletter. "Users of the '90s will be looking for an integrating infrastructure, which is what this is."

The announcement overall represents a third attempt for NCR, which is one of the oldest computer companies, to reposition itself. Although analysts said they are excited by the announcement, particularly at issue are Intel's delivery schedules and NCR's ability to sell software— and sell it through nondirect channels.

And then there is the installed base. NCR is said to have detailed an elaborate migration strategy for users of its existing Motorola-based Tower product line. Dzubeck said NCR will come out with one more Motorola-based Tower, "and then that's it." Hurwitz said that since it's Unix, migrating applications from Motorola to Intel should not be a barrier.

Compaq cuts prices in bid to block clones

BY RICHARD PASTORE
CW STAFF

HOUSTON — Compaq Computer Corp. last week trimmed personal computer and memory prices an average of 20% and 25%, respectively. A reaction to competitors' stabs at its market share, Compaq's reductions are intended to help stanch the flow of customers to low-priced clone vendors, observers said.

"They're losing share to some of the quality clone companies, and they're responding to it," said Stephen Smith, an analyst at Paine Webber, Inc. in New York.

Smith said AST Research, Inc., Advanced Logic Research, Inc. and Dell Computer Corp. (see story page 122) are among the companies exacting their pounds of flesh.

The PC cuts affect most of Compaq's Intel Corp. 80386SX- and 80386DX-based line as well as its single Intel 80286-based offering. The price of the high-end Deskpro 386/25e Model 120, for example, was cut from $8,499 to $6,999.

Compaq officials claimed that the move comes in preparation for the fourth quarter, which is normally their briskest.

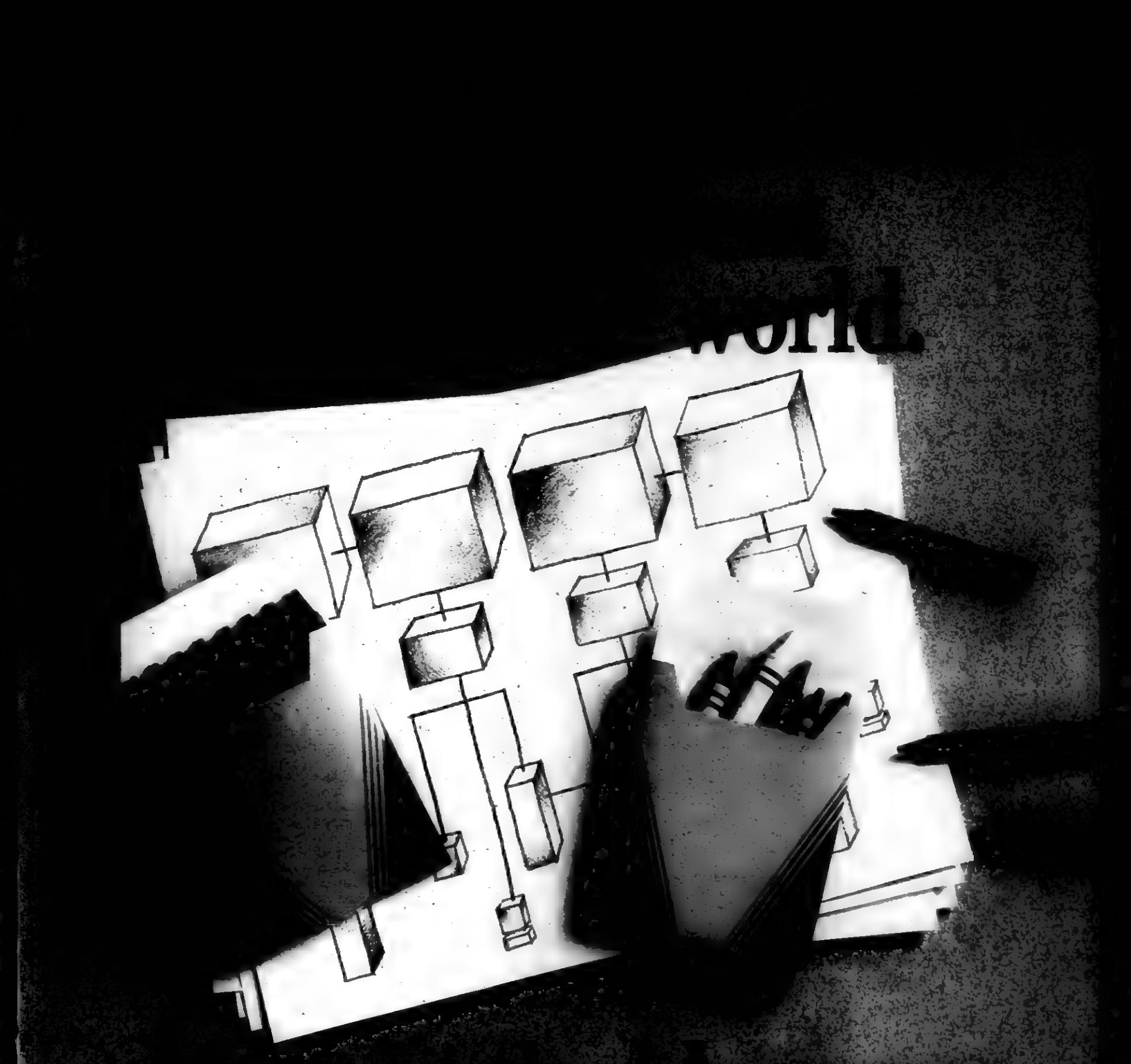
Whatever the case, evidence shows that Compaq's pricing gambit may be coming none too soon. At the New York Transit Authority, Compaq's privileged position as one of only four approved vendors is being threatened by cost-conscious users.

"There's been a call in some of the departments for PCs that cost less," said Bob Cucinotta, chairman of the authority's PC Technical Advisory Committee. The group has been considering adding one or two so-called second-tier clone vendors to its approved vendor list. However, last week's cuts could squelch the momentum for new vendors, Cucinotta said.

Some users said they doubted the price cuts would change their minds. Papa Gino's of America, Inc. has some Compaq units, but it chose AST boxes for its new restaurant delivery system. "To buy one [Compaq PC] is OK, but to put them into a lot of stores would be really hard to justify," said Anthony Lewis, manager of systems analysis at the Massachusetts-based restaurant chain. "I may give them a second look, but I'm very pleased with AST," he said.

Unlike some of the second-tier firms, Compaq has a lot of cost margin to play with — some say too much margin. "Compaq is pretty far out in terms of the price umbrella," said Eric Zimits, a financial analyst at Rauscher Pierce Refsnes in Dallas.

Even Compaq Chief Executive Officer Rod Canion recently acknowledged that his company's prices were a bit out of line [CW, Aug. 27]. "We're willing to be more aggressive where it's appropriate," he said. "We're not going to cut prices where there's no competitive reason."



Delivery

CONTINUED FROM PAGE 1

centers around Europe, Asia and the Far East, with skirmishes occurring in such remote regions as rural South America and Africa. Past advantages seem to have disappeared in the general struggle against recalcitrant foreign administrations, glutted radio frequencies and primitive analog switches.

Fedex, which pioneered the concept of a centralized tracking system in the U.S., has no clear technological advantage in Europe over UPS, "which is doing similar things now," said Bill Synnott, director of the banking technology center at KPMG Peat Marwick subsidiary Nolan Norton & Co. And while DHL has only begun to play catch-up with Fedex's domestic information systems, DHL has historically taken the technological lead overseas (see story below).

Although Fedex remains a technology-driven firm from the top down, its overseas technology rollout has gone more slowly than in the U.S. Part of the reason is that outside of the U.S., the carrier has had to rely heavily on "local trucking people" still using traditional radio systems, Synnott said.

Indeed, Fedex has installed its Digitally Assisted Dispatch System (DADS) network in six countries so far and is adding new countries to the network at a rate of only one per quarter, a company spokesman said. The primary reason: "regulatory and infrastructure difficulties."

One "infrastructure difficulty" confronting Fedex is the scarcity of radio frequency bandwidth in Europe, said Patrick Greenish, managing director of the company's international telecommunications group. As a comparative newcomer to the overseas market several years ago, "we were obviously poor man at the plate," Greenish said. In the UK, the company wound up having to share its radio frequency channel with archrival DHL, "which raises a tremendous security issue," he added.

Fedex hopes to ease this bottleneck in 1992, when two European companies are expected to provide "skypagers," Greenish said. These satellite-based networks "will allow you to cover continents with a single radio frequency," he added.

Not that Fedex's rivals have found it any easier to cast their lines across Europe. DHL, which started out as a global carrier in 1969 and reportedly has the biggest slice of the global market, has sophisticated links to its customers and couriers in the Far East and Australia but few such links in Europe.

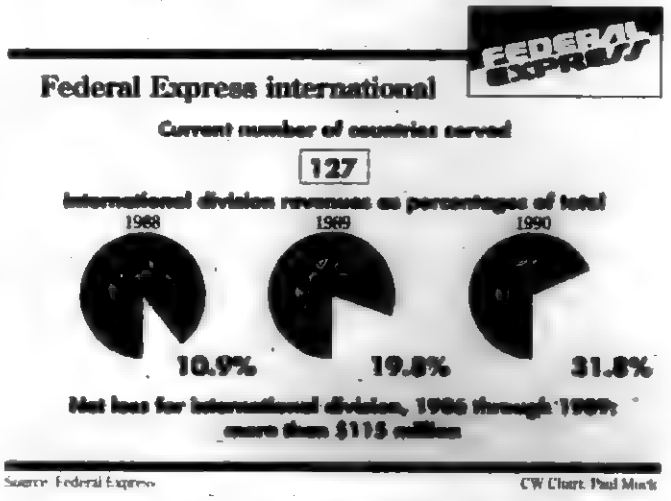
In cities such as Sydney, Australia, Hong Kong and Tokyo, where populations are concentrated and labor costs high, "it makes sense to automate and make couriers as efficient as possible" by means of radio frequency tracking and electronic customer ordering systems, said Jonathan Bye, DHL's director of automation. The carrier plans to expand its systems in Europe and the U.S. during the next two years, he added.

Both UPS and Fedex have made a major push in the last few years to set up direct links between local dispatch centers and data centers that keep track of packages and customer information. However, such links are not available in all countries.

"In areas where communications are not as robust and modern as in the U.S.," UPS uses public packet-switching services, according to UPS manager of telecommunications Douglas Fields.

Some areas, such as rural Mexico, are inaccessible even to the packet services and require special tactics (see story page 23).

UPS has put in an application for status as a nondominant common carrier internationally so that it can "strike an arrangement with an underdeveloped country," Fields said. UPS would provide "technology and maybe capital" for network facilities, such as very small-aperture terminal satellite links, which the country would eventually take over, he added. In return, UPS would get the bandwidth it needs at wholesale rates.



Time to take control at DHL

BY ELISABETH HORWITT
CW STAFF

SAN FRANCISCO — Like a gunslinger who is brought in as sheriff to clean up the town, DHL Worldwide Express's new U.S. chief information officer has the job of rebuilding the package handler's domestic information systems operations from the ground up.

CIO Michael Lanier's task of creating a viable, aggressive U.S. operation is a crucial one, given that DHL needs to blunt archrival Federal Express Corp.'s technical edge in the U.S. if it wants to make a dent in the domestic market, according to Tony Robertson, a transportation securities analyst at Alex. Brown & Sons, Inc.

However, the job will not be a pushover by any means, according to Lanier and other sources within DHL. "The organization chart I inherited had a large number of positions that had never been filled," and there was a "brisk turnover of top-notch folks" during the past few years, Lanier said.

Behind this unsettled situation was "a confusion over direction and leadership issues," in which division management was sending mixed messages about the overall direction and priorities of the domestic IS organization, Lanier said. "Good folks can only stand hopping from one foot to another so long before they want to play in a different sandbox."

Lanier and other sources inside DHL refused to comment on the leadership qualities of Lanier's predecessor, William Piggott, who retired from DHL shortly before Lanier took on the job. An AT&T spokesman confirmed that prior to joining DHL, Piggott had retired from AT&T in January 1987 after working at the company for more than 30 years. Piggott was unavailable for comment.

Andy Freeberg

DHL's Lanier *takes off on IS renovation*

"A large part of my business plan is to obtain credibility and firm senior management support" for what comes down to "retooling the IS infrastructure from the ground up," Lanier said. The current chart calls for a 165-person organization, with 45 openings yet to be filled. The organization is expected to grow to 220 people, Lanier said.

Management has already shown its support by approving a major recruitment campaign that covers senior and middle management positions, as well as those in a wide variety of technical fields, Lanier said.

In addition, Lanier has made use of his extensive contacts in the IS field to get assistance for the early phases of his project. "He's called in markers from all over, saying, 'I need some help.' I met him for lunch, and that night I was working" at DHL, said Tony Lazzeroni, an independent consultant.

One of the long-term goals behind the restructuring is to make DHL's domestic IS operations less dependent on its international counterpart for systems and applications development, service and support, Lanier said. DHL has historically concentrated its IS resources overseas, where it has risen "head and shoulders above the competition" in its IS strategic deployment, according to Jonathan Bye, DHL's director of customer automation.

Not so coincidentally, DHL is an acknowledged leader in the international package-handling market, Robertson said.

In contrast, DHL's domestic IS division has been like the younger sibling that gets the older child's hand-me-downs, while its rivals forged ahead, Bye said.

DHL needs to get its IS act together in the U.S. in order to wrest some of Fedex's 45% to 50% share of the U.S. shipping market, Robertson said. Fedex's aggressive, multimillion-dollar IS strategy has "created a standard of information excellence that's hard to beat and continues to improve it," Brown added.

Lanier hopes within the next few months to get a good handle on DHL's business priorities, and then put together "a revised architectural and technology plan" that will both support those priorities and bolster the company's competitive offensive, he said.

DHL's U.S. installation currently consists of a wide range of "systems that don't talk to each other," Lanier said. Even more serious is the firm's lack of a cohesive network architecture to link its domestic and international sites and support such strategic applications as package tracking, shipment control and customer service, he added.

While refusing to speculate on what type of technology will be chosen, Lanier said that they are "certainly looking closely at relational technology and distributed technology over networks."

Lanier "definitely has a tough job" revamping both DHL's IS organization and operations, Lazzeroni said. However, his past work history makes him well-suited for the task, colleagues attested.

During his four years as senior vice-president of IS at Charles Schwab & Co., Lanier "was responsible for putting together a fast, interactive nationwide system that allowed brokers to answer customer questions quickly," Bye said. "That's the way this industry is going and where we want to go — toward a seamless portfolio of applications" that support better customer service, he added.

Lanier left Schwab shortly after the October '87 stock market crash because the San Francisco investment firm "was in a consolidation and paring-down process, and I was interested in doing more, not less," he said. In the intervening two years before joining DHL, Lanier started his own consulting firm, which "focused on business development and, where appropriate, the use of technology, for small to medium-size businesses," he said.

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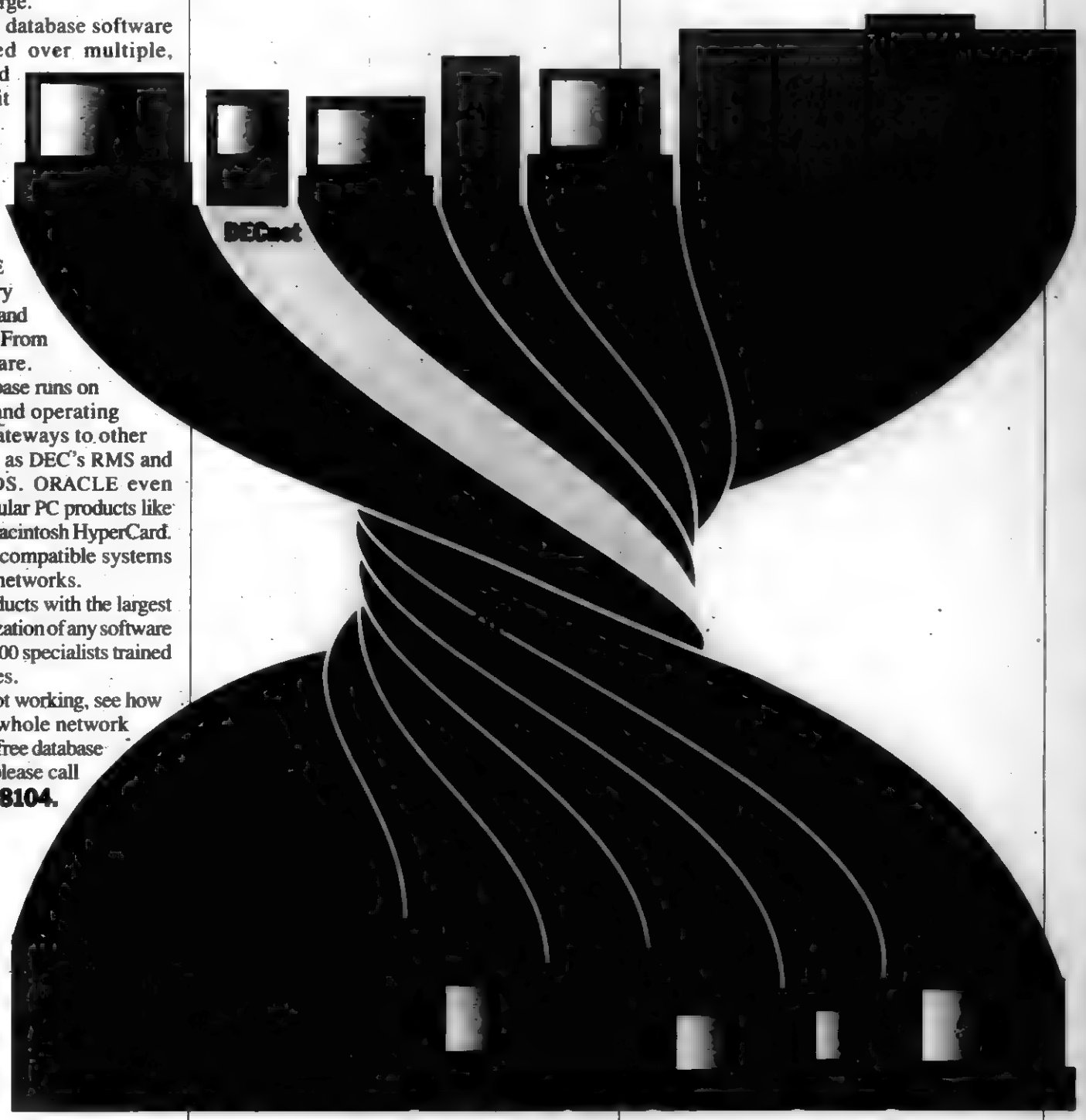

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Decnet Phase V rollout begins, minus OSI support

BY ELISABETH HORWITT
CW STAFF

DALLAS — Digital Equipment Corp. last week made good on its 3-year-old promise to begin the rollout of Decnet Phase V this month — minus the crucial VMS implementation of the Open Systems Interconnect (OSI)-based networking architecture, however.

Decnet Phase V for VMS will be available "sooner rather than later" during a "phased 18-month rollout" of Phase V, according to DEC spokeswoman Betty Eagan. DEC announced some OSI software for Ultrix, the company's version of Unix, in Europe last week.

The introduction of native OSI support for Decnet is crucial to DEC's strategy to "supplant IBM's SNA as the backbone architecture of choice for the enterprise," said Steve Wendler, a program director at Gartner Group, Inc. who is working with DEC as a consultant on the project. However, a slippage of six to nine months is "not too bad on a three-year project," he added.

Many users were also inclined to be lenient with DEC's tardiness, given that their own OSI migration plans are still vague or long-term.

"Any OSI migration we do will be done carefully over an extended period of time," said Stan Rose, vice-president of technical architectures at Bankers Trust Co. "I would prefer that DEC took the time to release a reliable product rather than release something early for the sake of meeting a deadline."

Eagan would give no definite reasons for the delay but said that DEC has had to incorporate a number of capabilities and features into Phase V that have emerged from discussions with customers during the past year or two. In particular, she said, users wanted a gradual migration path that would provide backward compatibility with existing Decnet Phase IV systems and minimize user impact in terms of systems performance and reliability.

Customer feedback also convinced DEC of the need to fully integrate Transmission Control Protocol/Internet Protocol (TCP/IP) into Decnet, Eagan said.

Bankers Trust recently began eyeing TCP/IP as a way to link reduced instruction set computing-based Unix systems, vice-president Sholom Bryski said.

While DEC now offers OSI software for its VMS Decnet Phase IV systems, Phase V's native support will provide price and performance benefits to users, another DEC spokeswoman said. The rollout will also include routers and bridges to interconnect Decnet Phase IV, Phase V and TCP/IP systems, DEC said.

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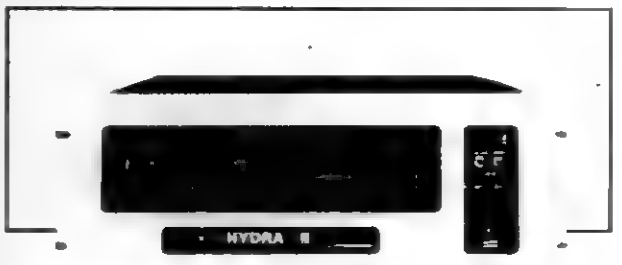

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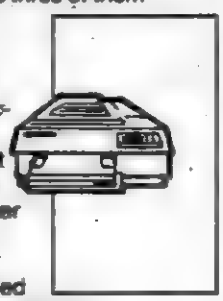

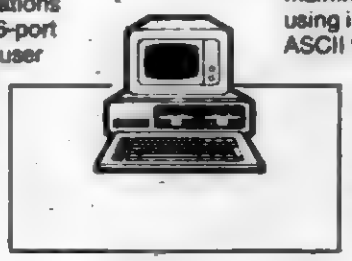

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DEC smooths SNA landing

BY ELISABETH HORWITT
CW STAFF

DALLAS — One week after IBM pushed out its Systemview strategy for centralized enterprise management, Digital Equipment Corp. told users that they could have multivendor network management their way — centered on an IBM host, on DEC's network management platform or extending across both in peer-to-peer fashion.

DEC and Systems Center, Inc. announced at Networld '90 last week that they will develop products to allow the Decmcc network management platform to communicate on a peer-to-peer basis with both IBM's Netview and System Center's Net/Master offerings for managing IBM Systems Network Architecture installations.

The products, whose release date was not disclosed, will reportedly allow DEC and IBM network managers to access each other's databases and monitor and control each other's installations using their own systems' familiar commands.

Approximately 5,000 enterprises worldwide have a need for integrated network management across DEC and IBM environments, according to recent studies by Stamford, Conn.-based research firm Gartner Group, Inc.

Users welcomed the vendors' flexible approach to integrated network management. At G.D. Searle & Co., for example, separate network control centers need to manage the interchange of data between the DEC and IBM sides of the house. "I think it's very important that each user group be served by the local environment, but at the same time, there is integrated troubleshooting to stop fingerpointing where links are shared," said Keith Addison, a network planner at the pharmaceutical firm. The proposed offerings would also allow IBM and DEC network control centers to take over for each other when a system fails or one center shuts down for the night, Addison added.

Greg Fahey, a manager of network planning and operations at Blue Cross/Blue Shield of Minnesota, said he likes the idea of being able to send alerts and statistical data back and forth between his company's existing Net/Master host and DEC network control center, for troubleshooting purposes.

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DEC focuses on Europe to boost lagging business

BY MARYFRAN JOHNSON
CW STAFF

CANNES, France — Antoine Ivanes arrived at the Decville '90 exhibition last week with a bit more on his mind than many of the other European executives milling about the cavernous Palais des Festivals.

Ivanes is MIS director at Somfry, a manufacturing firm in Cluses, France, which will decide next week between IBM and Digital Equipment Corp. for a complete overhaul of its computer systems.

"We want one vendor to integrate it all for us," Ivanes explained, striking upon a major theme trumpeted at Decville. "At this point, it looks like it will be DEC."

At this European version of Decworld, DEC officials drummed on topics dear to the hearts of their continental customers, who last year accounted for 40% of the Maynard, Mass.-based firm's sales revenue. When Canada, Asia and other non-U.S. accounts are added, international business represents 56% of DEC's fortune.

"The opportunities are better here than in the U.S., based on what we can see today," said Mark Steinkrauss, a DEC finance officer.

For Somfry's $2 million systems project, there was no single factor swinging the pendulum in favor of a pair of DEC VAX 4000s over IBM's Application System/400 midrange machines. What pulled DEC into the lead on this bid was not only projected cost savings but integration support and anticipated ease of employee retraining, Ivanes said.

European customers tend to buy about 30% smaller systems than their U.S. colleagues and move more cautiously when it comes to new technology, said Pier Carlo Falotti, president of DEC Europe. "We must prepare to sell 50% more every year," to overcome what he called "this little moment of difficulty" in DEC's financial history, he observed.

DEC's European customers run mainly multivendor operations and are interested in Unix-based operating systems, particularly with the 1992 market unification of Europe looming ever closer.

One marketing problem DEC confronts in Europe is the obscure reputation of Ultrix, its own version of the University of California at Berkeley Unix operating system. In one session at the conference, a Unix marketing manager asked how many in the audience realized DEC sold Unix and then despaired when no hands were raised.

Some customers are convinced that when it comes to "open systems," DEC is at least improving its reputation. "DEC really does have more to offer in open systems than IBM," said Graham Lynch, general manager of information systems for the brewery division of Guiness Brewing Worldwide Ltd. in London.

Guiness' multivendor environment includes IBM, DEC, Hewlett-Packard Co. and other vendors, but Lynch stressed that business needs, not technology, will drive the company's gradual movement toward a client/server architecture.

"The network is becoming the heart of the company," said Frans Van Hardenberg, telecommunications director at Telesystems France, a division of France Telecom. "Yet customers don't want to be dependent for their whole network on one supplier."

For users such as Shaul Dukeman, corporate vice-president of Elscint Ltd. in Haifa, Israel, it was the promise of multivendor networking that held the greatest allure at Decville. "Interconnecting computers seems to be an easier task with DEC," Dukeman said.

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Software dough lures Mrs. Fields

BY MICHAEL FITZGERALD
CW STAFF

Cookie maker Mrs. Fields, Inc. is cooking up a recipe for software sales.

The Park City, Utah-based food retailer announced last week that it has spun off its software development arm into a separate company, Fields Software Group. The new company will market specialized versions of its Retail Operations Intelligence system, developed to run Mrs. Fields Cookies stores and the company's La Petite Boulangerie bakery subsidiary.

Paul Quinn, vice-president of MIS at Mrs. Fields Cookies, was named president of Fields Software Group.

Fields' products will include both IBM Personal Computer-compatible-based and Application System/400 solutions. The current product line consists of five expert systems for such tasks as labor scheduling and operation functions, electronic mail, computer-aided instruction, inventory management and other products. Target markets include fast-food vendors, specialty food vendors, specialty retail stores, restaurants and convenience stores. Quinn said that in the future, the company will produce software for supermarkets.

Quinn said Fields Software Group will announce a deal with its first big client, a major fast-food chain, probably within the next two weeks.

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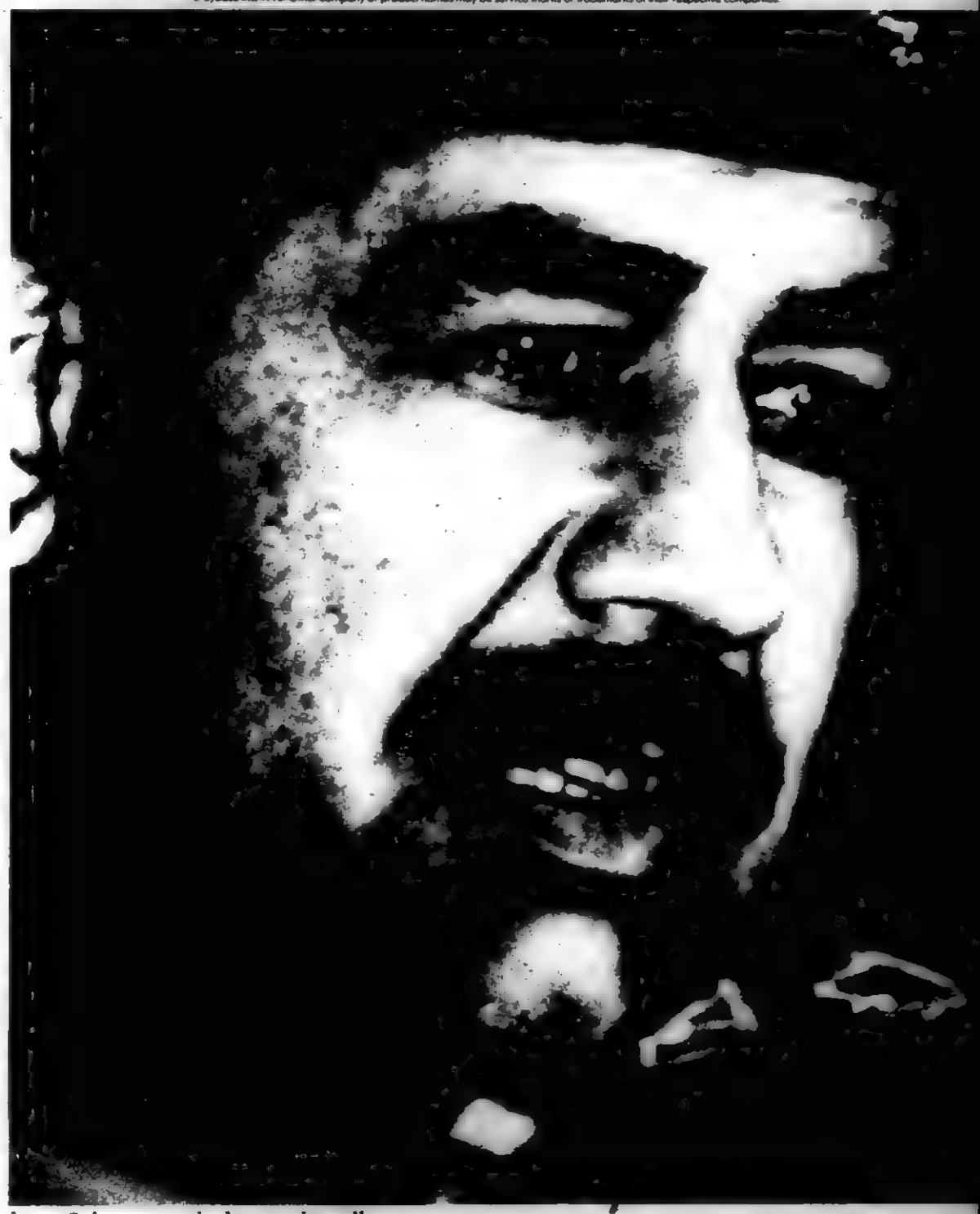

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Proteon, TI tool tackles jitter on twisted pair

BY JOANIE M. WEXLER
CW STAFF

DALLAS — Would-be 16M bit/sec. token-ring users who are jittery about the reliability of large unshielded twisted-pair networks received soothing news from Proteon, Inc. and Texas Instruments, Inc. at last week's Networld '90 show.

The two companies jointly announced the Jitterbuster, a kit of components and microcode that token-ring network interface card vendors can incorporate into their products to resynchronize data signals at every node on a network. The technology addresses problems in 16M bit/sec. networks running on unshielded twisted-pair, the medium most prone to electromagnetic interference.

Jitter — signal distortion during data transmission — can accumulate node-to-node in large networks to the point where the data can no longer be interpreted. The cumulative distortion problem in 16M bit/sec. networks was brought to the industry's attention in June, when token-ring vendor Madge Networks Ltd. publicly recalled its 4M/16M bit/sec. adapter cards because of jitter problems discovered in large configurations.

The jitter issue was unanticipated because it had not surfaced in 4M bit/sec. token-rings.

User benefits of Jitterbuster are dependent on token-ring adapter card vendors incorporating the technology into their products. Pulse Technology, Inc., Thomas-Conrad Corp. and Apple Computer, Inc. are currently among the vendors evaluating the technology for their boards, according to Proteon.

At least one user sees an imminent use for jitter protection at his company, which is wired predominantly with unshielded twisted-pair. Rich Coulson, securities network associate at Principal Financial Group in Des Moines, Iowa, is running 4M bit/sec. token-rings using Madge adapter cards. He said he will soon need to upgrade to 16M bit/sec. because the company plans to implement bandwidth-hungry image processing applications.

Colin Mick, executive director of the Open Token Foundation, added, "Jitterbuster poses a good interim and possibly final solution" for extending networks reliably beyond TI's recommendations of what its Falcon analog chip — cited by Madge as the culprit in its boards' jitter problem — alone can support.

PCs

FROM PAGE 1

expanding market for complex applications, such as global trading," said George Weiss, an analyst at Gartner Group, Inc. in Stamford, Conn.

Even the most gung-ho RISC workstation marketing organizations are not proclaiming that workstations will replace PCs. "People almost want us to get into the PC market, but that's not what we want to do," said Edward Zander, vice-president of corporate marketing at Sun Microsystems, Inc.

Sun's alternatives

Instead of competing with PCs, Sun is looking to go against servers based on Intel Corp.'s complex instruction set computing (CISC) 80386 or 80486 CPUs and, in the process, sell workstations as nodes on a network.

Mips Computer Systems, Inc. basically agreed with Sun. Mips will sell its systems, such as servers, complementary to PCs, according to John Hime, vice-president of the Systems Product Group.

However, Mips has a two-pronged strategy. The company is also attempting to get PC vendors to use its architecture in their products, according to Mips President Chuck Boesenberg. He would not say which PC vendors are currently in discussion with Mips.

Silicon Graphics, Inc. also has plans to get into the low-price range but is still planning on developing a new niche in low-end graphics-intensive computing, rather than displacing PCs. "I don't see why someone who is using a spreadsheet needs to run it on graphics-based hardware," said Alan Trimble, chief developers advocate at the company.

The MS-DOS operating system is adequate for most users' needs, a fact that presents a formidable barrier to change. With the addition of Microsoft Corp.'s Windows 3.0, users see a new lease on life for the PC. "It will be a hard pull from DOS, especially with Windows," Weiss said.

Unix, the most common workstation operating system, has fewer commercial applications but is more robust than DOS. Michael Goulde, an analyst at Open Systems Advisor in Boston, said, for instance, that Unix is better suited for multitasking when users move toward that need.

Vendors are working hard, with some success, to get more applications running on Unix. Commercial applications — such as the ubiquitous Lotus Development Corp.'s 1-2-3 spreadsheet, which is newly ported to Sun's workstations — are increasingly springing up on Unix.

Yet simply porting applications to Unix is not enough to get users to change. Dorothy Deran, director of research information systems at Syntex Research in Palo Alto, Calif., said that running spreadsheets and word processing packages on workstations is a waste of power, and simply running PC programs adds no value.

Deran said it mattered little whether she could find the DOS applications she uses now ported to Unix. "We can't afford to throw the [PC] technology away. We haven't even paid for it," she said.

Still, most vendors, such as Hewlett-Packard Co., see bringing down the price of workstations as important. Zander said that his company will not put out a $1,000 workstation, but the price will certainly go below the current list of $4,995 for its diskless monochrome model, the Sparc SLC. HP also has a workstation priced under $5,000, but it is not based on RISC architecture.

Although users said their decision to buy or not to buy workstations has little to do with price, they were only marginally more concerned with the power of the hardware.

For Bond, it will not be a choice between a $2,000 PC and a $2,000 workstation. If a $2,000 workstation is what a teller needs, then that is what will be procured. If a $2,000 workstation is needed by a branch manager, the bank will get a workstation. "We will tailor computer power and storage to the job," she said.

Workstation apathy

With Intel's 80486 CPU beginning to hit the PC market, users see a migration path for their current computers, further eroding any urgency felt by users to move to workstations.

"If I could buy a workstation for the price of a 486, I'd still buy the 486," said one user who saw the 486 as a migration path to more power without the pain of porting applications.

The 15 million instruction per second (MIPS) 486 may be plenty powerful for most users in the short term.

But analyst John Dean at Montgomery Securities in San Francisco said that as the gap between the power of CISC processors, such as Intel's, and RISC processors widens, users will not be so complacent. "Soon there will be a 40 MIPS chip [the Mips R4000] to compete with the 486," he said.

Vendors are betting that future, network-dependent applications will be the new commercial niche for workstations — what Zander calls industrial-strength networking. Those applications — pulling up databases, windowing and communications all at once — are still in their infancy.

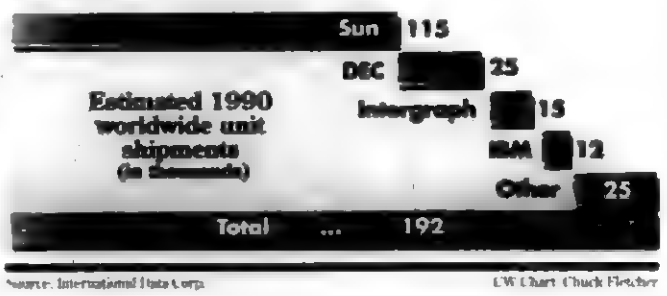
That is just what David Wood, vice-president of information systems at Medlantic Healthcare Group in Washington, D.C., will consider next year. "No vendor told us this, but we thought we could save some money by using workstations on a major server for new applications to support a cancer center," he said.

Multimedia may be the blockbuster application that broadens the workstation market, according to several sources. The entire workstation market stands at about $6 billion, according to Weiss, and he said he expects it to grow about 30% per year until 1995 — about the time multimedia is expected to hit.

"When the business world gets to the point where secretaries produce videos for the boss instead of overheads, then they'll need workstations," Trimble said.

Adding up the numbers

Although raw horsepower draws a lot of attention to workstations, actual shipments are miniscule compared with projected PC shipments of 23.7 million in 1990.



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Ashton-Tate to make run at Mac market with Dbase IV

BY JAMES DALY
CW STAFF

ANAHEIM, Calif. — Ashton-Tate Corp. — still reeling after a defective version of its flagship Dbase IV database scared off both users and profit — hopes to spring back with a direct assault on the lucrative Apple Computer, Inc. market this fall, Ashton-Tate officials confirmed at the firm's technical conference last week.

Leading Ashton-Tate's offensive will be Dbase IV Runtime Plus for the Macintosh, which is expected by the end of the year. The application will offer cross-platform connectivity between Macintosh, MS-DOS, Unix and Digital Equipment Corp. VAX and VMS systems and will allow developers to take full advantage of the Dbase IV applications programming language, company spokesmen said.

If Ashton-Tate is successful, analysts said, the move could also have a big payback for Apple, which has pushed to get the Macintosh into the business and federal sectors but lacks a muscular third-party database offering akin to Ashton-Tate's once-dominant Dbase line.

Ashton-Tate officials said the Macintosh database market is a fertile one because it is still relatively fragmented and without a clear leader. "There is no entrenched database product in the Macintosh market right now," said Dave Proctor, general manager of the Database Division. "We intend to put one there."

Although firms such as Claris Corp., Fox Software, Inc., Acius, Inc. and Odesta Corp. provide Macintosh database offerings, "there has never been one blockbuster product, so the Macintosh has never gained a reputation as a database product," said Joan-Carol Brigham, an analyst at International Data Corp. in Framingham, Mass.

Ashton-Tate first waded into Macintosh waters in 1987, but it stumbled badly. Dbase Macintosh was skewered by developers because it was not Dbase language-compatible. The application was sold in August, however, to Miami-based New Era Software Group, Inc., wiping the slate clean for Ashton-Tate's new Apple offering.

President Bill Lyons acknowledged that the firm is trying to regain its balance on what has turned out to be a very slippery surface. "The database market has remained essentially stagnant for the past two years," he said. Lyons attributed the general database market malaise to Ashton-Tate's problems with Dbase IV Version 1.0, which he said caused many users to defer their database buying plans.

Version 1.0 was a failure of spectacular proportions. A replacement application, Version 1.1, was released in late July.

In the interim, Ashton-Tate's share of the market took a nosedive. Figures from Audits and Surveys, Inc. indicated that the company's percentage of the database market fell from more than 60% in 1989 to 48.6% today.

Ashton-Tate also moved to broaden its user base into the expansive Sun Microsystems, Inc. marketplace last week with the announcement of Dbase IV for Sun, a full implementation of Dbase IV Version 1.1 for the SunOS operating system. The product is slated for fourth-quarter availability with prices beginning at $995.

DB2™

PRODUCTIVITY
PERFORMANCE

...PARITY™ DBSS

Within
The Edit Session:

Functions
- Builds, tunes, tests and times SQL
- Provides an interactive tuning guide
- Hosts a complete on-line tutorial
- Standardizes SQL
- Delivers a comprehensive plan analysis

Benefits
- Cuts development costs by 20% or more
- Tunes, tests and times SQL before the first pre-compile
- Minimizes programmer demands on DBAs' time
- Reduces CPU cost
- Requires no special education
- Promotes programmer

Stoll to star in *Nova* adaptation

Clifford Stoll, the astronomer-turned-computer gumshoe-turned-best-selling author (*The Cuckoo's Egg*), is now a television star. On Oct. 2, the Public Broadcasting Service's *Nova* series will begin its 18th season with *The KGB, the Computer and Me*, a reenactment of Stoll's book starring Stoll as himself.

Stoll *stars in TV hacker plot*

While working at the Lawrence Berkeley Lab in California, Stoll became internationally famous in the world of hackers when he traced a 75-cent discrepancy in a computer billing report to a group of West German hackers. These infamous hackers were gathering military intelligence and selling it to the KGB. Though investigators disbelieved him, Stoll relentlessly pursued his quarry, and the authorities eventually jumped in and busted open the hacker/spy ring. His account of the incident became a best-selling book.

"This is a classic mystery story, but it takes place against a totally new landscape of data networks and computers," said Robin Bates, producer of the program. While following the book's plot line, the show offers exclusive interviews with the hackers themselves, including the ringleader Marcus Hess. "You get a good idea of what the hacking scene is like in Germany," Bates said.

It's HAPPENING again.

What's the best storage solution for handling the never-ending data explosion?

At a recent Gartner Group conference on storage products, ten percent of the participants said that they now have more than one terabyte of data stored in their computer systems. That's a lot of data.

And certainly a sign of the times—as we stand on the threshold of yet another massive growth of data collection, with the ability to incorporate image, voice, and unstructured objects into computer storage.

Until now, the logical solution has been to create bigger, faster disk drives, meeting the challenge of sheer quantity with devices that can store trillions of bits and retrieve them in millions per second.

But, as we move into the 1990s, focusing on quantitative advances in storage capacity alone no longer solves the problem of staying ahead of the information explosion. "More" and "faster" are not enough. Such solutions do not take data safety into account. Nor do they consider the subtleties of data priorities, or the complexities of meshing various technologies and topologies to achieve the most efficient combinations.

Storage and data availability are indeed critical issues. Because all the processing power in the world, all the networking capacity, the most highly-evolved operating systems, and the best applications will mean nothing if the right data isn't available at the right time, from the right source, for the right user.

How to meet this storage challenge? Digital feels the answers come via high availability subsystems, robust storage system management, and balanced I/O performance—as embodied in our Digital Storage Architecture (DSA).

DSA
A Leadership Approach

The Digital Storage Architecture is the most advanced storage architecture in the industry, offering unparalleled investment protection.

DSA is designed to optimize the use of system resources, with high data integrity and availability, balanced I/O performance, and low cost of ownership. This is accomplished through its almost complete independence of hardware and software changes, as well as the robustness to withstand changing technology.

The result is the ability to migrate DSA devices across the Digital product line, giving almost unlimited flexibility and extensibility, plus easy incremental growth.

DSA does this by separating the physical characteristics of the storage devices from the "logical" view that the application program has of them. For example: the DSA concept of a disk device is simply a randomly accessed collection of fixed length logical blocks; the concept of a tape is a sequentially accessed collection of variable length logical blocks.

continued ➤

The DSA Family

Currently, there are two major implementations of DSA:

(1) The high-end SDI (Standard Disk Interface) implementation, which utilizes the HSC70, KDA50, KDB50, and KDM70 controllers, to attach the ESE20 solid-state disk, the RA series of disks, the SA series of disk arrays, and the TA series of tapes (such as the TA90) to all of our system buses.

(2) The DSSI (Digital Storage *System* Interconnect), which places the controller function in devices (now called Intelligent Storage Elements) like the RF30, RF31, RF70, and RF71.

For more information on these DSA products, or any other Digital products and services, call 800-DIGITAL (800-344-4825).

DSA isolates the I/O subsystem from the host, allowing intelligence to be placed in the subsystem itself, and off-loading the host from the chore of managing and tracking the actual I/O operation. Thus, a large number of I/O commands can be queued up in the storage subsystem and then returned in the most optimal manner.

Storage Management Affords Higher Data Availability

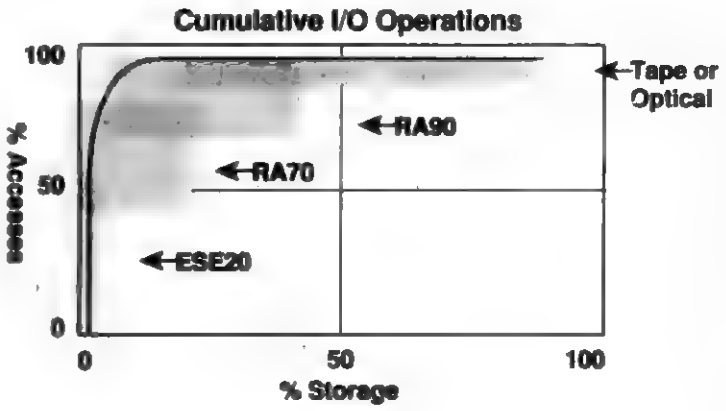
When it comes to something as crucial as data availability, Digital works with a very simple equation:

Reliability + Fault Tolerance + Fault Management = Data Availability.

Our products are already quite competitive in reliability. But no matter how high the reliability, problems can still occur across a large number of devices. And creating fault-tolerant systems for every application requires far too much redundancy, not to mention cost.

Thus, we've combined the concept of problem prediction with automatic failover to create a fault management system that can achieve high levels of availability—VAXsimPLUS.

VAXsimPLUS is an expert-based fault management system that predicts problems with very high accuracy. It works by constantly monitoring all of the error and status codes for a designated set of Digital storage devices, and then comparing the frequency and patterns of these codes against a knowledge base of failure characteristics for those specific devices.



▲ **Balanced I/O performance means matching the need to the storage device.**

It utilizes an autocopy feature, either with a designated spare disk or with a low-priority shadow disk, to automatically replace the problem device—while online—with no interruption to the users' application.

VAXsimPLUS is available today for all Digital RA and RF disks, plus the ESE20 and TA90 tape system. It can be set up to span disks across networks and VAXclusters on a worldwide basis.

Seeking Balanced Performance

When configuring an I/O subsystem, the objective must be to achieve a balance between CPU performance and the I/O subsystem's ability to access information.

In recent years the growth of CPU power has greatly outpaced the growth of disk I/O performance. As a result, more creative ways are needed to balance the I/O needs—other than just relying on disk technology to keep pace.

The actual response time in an I/O request is highly influenced by the workload being placed concurrently on the I/O system by multiple users at any given time.

From extensive system monitoring, we've found that roughly 50 percent of the I/O requests go to as little as one percent of the online storage, and 80 percent of the I/O requests go to only 20 percent of the online storage. That high-activity one percent contains a number of small files that are always "hot;" these are easily identified and quite consistent.

This means that the real answer to improved I/O performance is to balance the I/O subsystem by matching the I/O demand to a device that satisfies the performance/cost tradeoff in the most effective manner.

Digital offers a full range of devices that satisfy this I/O demand profile, as well as the tools to balance the load. We say the solution is to place the very hottest files on the fastest member of the storage hierarchy (namely, a solid-state disk, like our ESE20), and then spread the rest of the high-activity files among as many actuators as possible.

Make Room for DSA

For your entire computer system to run effectively over the long haul, you need a storage system that can handle ever-increasing amounts of data—efficiently and cost-effectively.

With DSA, you get high availability, balanced I/O performance, and robust storage management—working to bring every user instant access to a world of information.

And that's what computing is really all about.

Shopping for Storage

Here are several key criteria that can be helpful in evaluating storage systems:

High Availability
Check for full DSA compliance, which brings with it the benefits of DSA high data availability and integrity features, such as complete status and error reporting.

Balanced I/O Performance
Look for actual "delivered" I/O performance—not just mechanical specifications. You'll want performance figures under actual workloads that take into account all factors, not only seek time, but also rotation, data transfer, and command overhead.

Cost of Ownership
Compare the statistics on full cost of ownership, including purchase price, maintenance costs over time, residual value, and cost of downtime. You'll see for yourself that raw specs and upfront costs may not be the most critical factors for the long-term efficiency and cost-effectiveness of your storage system.

Name Change. The connectivity products clustered under Digital's Personal Computing Systems Architecture (PCSA) have been named DEC LanWORKS and DEC EtherWORKS. Some examples of this new nomenclature include: VMS Services for PCs, now DEC LanWORKS for VMS; DECnet PCSA Client for DOS, now DEC LanWORKS for DOS; PCLAN/Server 3100, now DEC LanWORKS 3100—to name a few.

New Name. Digital's integrated CASE environment is now known as COHESION. Designed to support the unified development, deployment, and management of software, the COHESION environment is built on Network Application Support (NAS). It supports the development of NAS applications as well as software for IBM mainframes, plus a range of microprocessors and supercomputers.

More MUMPS. Digital recently announced a new version of its MUMPS software implementation—VAX DSM (Digital Standard MUMPS) Version 6. This provides users with new transaction processing capabilities, failover recovery in a VAXcluster environment, enhanced security, and portable runtime software for integration of applications with other MUMPS systems.

New Interface in Place. As Digital's implementation of the ISO Manufacturing Message Specification (MMS) standard, the DECnet/VMS network interface now enables VMS-based applications to communicate directly with plant floor devices such as PLCs and robots from multiple vendors. Applications do not need to be rewritten, thus reducing the need for communication software.

Turn on a VT420. Digital's new generation of terminals—the VT420 series—offers dual-session capability, off-screen memory, faster communication baud rates, a shorter keyboard, and improved ergonomics.

Easy System UPGRADES

One package provides hardware and software upgrades, plus one year of services, for one low price.

Digital's Easy System Upgrades take the complexity out of cabinet upgrades by offering one part number and one price to upgrade existing VAX and MicroVAX systems to the more powerful and efficient VAX 6000, VAX 4000, and MicroVAX 3000 systems.

Each Easy System Upgrades part number delivers the following components:

- Built-in value for existing system.
- Hardware upgrade
  - VAX 6000 VMS System Building Block (SBB)
  - VAX 6000 VAXcluster SBB
  - VAX 4000 SBB
  - MicroVAX preconfigured system.
- VMS paid-up license.
- Software upgrades for all Digital layered software products (except ALL-IN-1).
- One year standard hardware warranty.
- One year software product services (except ALL-IN-1).
- Installation of new hardware, deinstallation of existing hardware, reconnection of existing CPU options.
- Up to 12 months to return existing hardware.

Easy System Upgrades also provide cabinet upgrades for your existing MicroVAX II, MicroVAX 3500/3600, VAX-11/7XX, and VAX 82XX/83XX systems.

CURRENT SYSTEM	UPGRADE SYSTEM	PART NUMBER	DELIVERED*	STANDARD PRICE**
MicroVAX 2000	MicroVAX 3100	DV-31CU1-AA	DV-31BT1-AA	$ 11,800
MicroVAX II	MicroVAX 3400/1-10 VMS	DV-340U1-AA	DV-340T1-BA	50,200
	MicroVAX 3400/1-20 VMS	DV-340U1-BA	DV-340T1-BA (+QL-001AS-B2)	82,000
	MicroVAX 3400 Unlimited VMS	DV-340U1-CA	DV-340T1-BA (+QL-001AS-B2/BX/BY)	88,480
	MicroVAX 3800	DV-380U1-AA	DV-380T1-AA	95,000
	VAX 4000-300 Base*** 1-40 VMS	DV-43JU1-A9	DV-43JT1-A9	131,000
MicroVAX 3500/3600	VAX 4000-300*** Unlimited VMS	DV-43JU1-E9	DV-43JT1-A9 (+QL-001A2-B4)	111,500
VAX-11/750	VAX 4000-300*** Unlimited VMS	DV-43JU1-B9	DV-43JT1-A9 (+QL-001A2-B4)	126,900
VAX-11/750	MicroVAX 3800	DV-380U3-AA	DV-380T1-AA	95,000
VAX-11/78X (780 or 785)	VAX 4000-300 Unlimited VMS	DV-43JU1-C9	DV-43JT1-A9 (+QL-001A2-B4)	125,000
VAX-11/7XX (750,780,785)	VAX 6000-210 Base	62XMC-AE	62AMB-AE	164,000
	VAX 6000-310 Base	63XMC-AE	63AMB-AE	219,000
	VAX 6000-410 Base	64XMC-AE	64AMA-AE	294,000
	VAX 6000-210 VAXcluster	62XCC-AP	62ACB-AP	189,000
	VAX 6000-310 VAXcluster	63XCC-AP	63ACB-AP	244,000
	VAX 6000-410 VAXcluster	64XCC-AP	64ACA-AP	319,000
VAX 82XX	VAX 6000-210 Base	62XMF-AE	62AMB-AE	159,000
	VAX 6000-310 Base	63XMF-AE	63AMB-AE	209,000
	VAX 6000-410 Base	64XMF-AE	64AMA-AE	274,000
	VAX 6000-210 VAXcluster	62XCF-AP	62ACB-AP	184,000
	VAX 6000-310 VAXcluster	63XCF-AP	63ACB-AP	234,000
	VAX 6000-410 VAXcluster	64XCF-AP	64ACA-AP	299,000
VAX 83XX	VAX 6000-310 Base	63XMH-AE	63AMB-AE	199,000
	VAX 6000-410 Base	64XMH-AE	64AMA-AE	269,000
	VAX 6000-310 VAXcluster	63XCH-AP	63ACB-AP	224,000
	VAX 6000-410 VAXcluster	64XCH-AP	64ACA-AP	294,000

* "DV" Easy System Upgrades deliver a preconfigured MicroVAX 3XXX. VAX 4000 and VAX 6XXX Easy System Upgrades deliver a VMS Base System.
** All prices are U.S. and subject to change.
*** New offering as of July 2, 1990.

Print It
with a Digital Printer

From dot-matrix to laser, for most any application, in any environment, networked or standalone, and across all price ranges—Digital has the printers you need.

The following gives you a complete picture of our extensive printer families, including a few new members.

Introducing the DECIaser 2100 Family

Digital recently introduced two new laser printers to support a wide range of printing needs—the DECIaser 2100 and DECIaser 2200.

As replacements to the LN03 and LN03 PLUS printers, both these printers are designed to fit on your desktop or on an optional printer stand. Both handle multiple paper sizes and transparencies, and print up to 10,000 pages per month.

The DECIaser 2100 prints one-sided (simplex) documents and offers a single input paper tray which can be adjusted to handle multiple paper sizes.

The DECIaser 2200 prints two-sided (duplex) documents. It offers two input paper trays so that you can have two different types of paper sizes loaded into the printer at the same time. It also can accommodate the optional envelope feeder.

Both these printers are currently available and ready to work—either in a networked printing environment on a terminal server, or for personal printing on a video terminal, printer port, or PC.

The new DECIaser printers. ▼

Did you know?

. . . that you can bring the power of PostScript to all your Digital printers? DECprint Utility for PostScript to Sixel Printing for VMS Software is a software product that enables you to do just that. It's a less expensive way for you to use an existing sixel printer for your low-volume printing needs.

Something for Every User, Every Task, Every Place

Word processing, data processing, electronic publishing, business graphics, science and engineering—whatever the application, Digital offers a choice of printers that can handle the job. Not to mention a selection that can work well in a variety of environments—from individual workstations to small department and office clusters, large offices, or computer rooms.

Here's a brief description of our printer families:

Dot-Matrix Printers	
LA70 Personal Printer:	Low-cost, dot-matrix, simple business graphics.
LA75 Companion Printer:	Dot-matrix, simple business graphics.
Letterprinter 210 (LA210):	Dot-matrix, text and graphics with wide carriage.
LA324 MultiPrinter:	High-resolution, wide-carriage, impact dot-matrix.
Print Band Printers	
LP37:	1,200 lines per minute, monthly output 150,000 pages.
LP29:	2,000 lines per minute, monthly output 300,000 pages.
Line Dot-Matrix Printers	
LG31:	300 lines per minute, monthly output 25,000 pages.
LG01:	600 lines per minute text only printer, monthly output 50,000 pages.
LG02:	600 lines per minute text and graphics printer, monthly output 50,000 pages.
Networked Laser Print Systems	
PrintServer 20 (LPS20):	20 pages per minute, simplex and duplex printing, monthly output 40,000 pages.
PrintServer 40 Plus (LPS40 Plus):	40 pages per minute, simplex only printing, monthly output 100,000 pages.
Desktop Laser Printers	
LN03 Image (LN03O):	Fast laser printer for compound documents.
ScriptPrinter (LN03R):	8 pages per minute, desktop, PostScript laser printer.
DECIaser 2100 (LN05):	8 pages per minute, sleek desktop laser printer for simplex printing.
DECIaser 2200 (LN06):	8 pages per minute, sleek desktop laser printer for simplex and duplex printing and two paper trays.
Color Printers	
Companion Color Printers (LJ250/LJ252):	Seven color (plus white) ink-jet printer, which gives you up to 256 colors; in parallel and serial versions for sheet printing.

For More Printing Power: The PrintServer Family

Do you have an ideal printer in mind? One that brings you more speed, more typefaces and font styles? One that prints images, and can put multiple pages on a single piece of paper so you can see the flow of an entire presentation at once? How about one that even manages itself?

You can have all this and more with Digital's PrintServer 20, a 20-page-per-minute duplex networked laser printer. Or with the PrintServer 40 Plus, which prints up to 40 pages per minute.

This PrintServer family is made for sharing. If you use VMS, ULTRIX, UNIX, MS-DOS, or Apple Macintosh operating systems, the PrintServer family offers you complete, shared printing solutions. If you have a UNIX LAN with Sun workstations, you can still use this printer for your department's printing needs.

Digital's PrintServer 20 and PrintServer 40 Plus are networked laser printers connecting to standard Ethernet networks. Chances are, you've already made your Ethernet investment, so all you need to do is hook up the printer and start printing. Depending on your Ethernet environment, the PrintServer family offers printing support for VMS, ULTRIX, and Berkeley-based UNIX systems on Ethernet networks.

Will these products handle all your applications? We think so.

Applications that support PostScript printing are easily accommodated. The PostScript page description language, by Adobe Systems, Inc., offers 29 resident PostScript typefaces in a variety of sizes, weights, and styles. You can even rotate type, and print textures, patterns, and halftones. And you can print scanned images within your documents.

For those applications that support other printers, the PrintServers have software interpreters which translate ASCII, ANSI/sixel, ReGIS, and Tektronix 4010/4014 files into PostScript language output.

All this, and you don't have to worry about print management functions. The PrintServer software handles these functions automatically—the software communicates with the computer system's printing job and the PrintServer system.

The following are trademarks of Digital Equipment Corporation: ALL-IN-1, the DIGITAL Logo, DECIaser, DECprint, DSSI, HSC, LA, LN03, LN03 PLUS, MicroVAX, PrintServer, RA, ReGIS, SA, SDI, TA, ULTRIX, VAX, VAXcluster, VAX DSM, VAXumPLUS, VMS, VT.
IBM is a registered trademark of International Business Machines Corporation. MUMPS is a registered trademark of Massachusetts General Hospital. UNIX is a registered trademark of American Telephone & Telegraph Company. MS-DOS is a registered trademark of Microsoft Corporation. Macintosh is a registered trademark of Apple Computer, Inc. PostScript is a registered trademark of Adobe Systems, Inc. Sun is a trademark of Sun Microsystems, Inc. Tektronix is a registered trademark of Tektronix, Inc.

ADVANCED TECHNOLOGY

TECH TALK

Upscale coding system

■ United Parcel Service (UPS) has begun testing a new package encoding system that has greater information density than traditional bar coding and can be read by a scanner while moving rapidly on a conveyor belt. Called the Upscode system, the UPS-designed code contains approximately 100 alphanumeric characters on a 1-in. square label. The cells contain customer shipping information and can hold 30% to 50% more data than conventional bar codes. The new system speeds package sorting, UPS said.

Speedier processors

■ AT&T Microelectronics in Berkeley Heights, N.J., has combined six of the world's fastest computing digital signal processors (DSP) on a single industry-standard circuit board to help computer developers create and simulate advanced applications in graphics, audio, images and other areas in real time. The AT&T digital signal processors are mounted on a high-bandwidth VMEbus circuit, which developers can plug into a system under development, adding significant signal-processing power. The VMEbus-linked DSPs can achieve 150 million floating point arithmetic operations per second, according to AT&T.

Gigabytes in cartridges

■ 3M Co., the inventor of ¼-in. data cartridge technology, is close to finishing development work on a new high-performance 1.35G-byte data cartridge system. The company has shown off a prototype of the new drive, which features sustained read-and-write operations at 120 inches per second, edge and burst seek for the 30-data track layout of the QIC-1350 format, full track erase capability and a single-plane read-while-write head. The SCSI-based drive provides a sustainable data transfer rate of 597K bit/sec., more than three times faster than 4mm digital audio tape drives, 3M said last week.

Subtracting the emotional component

Researchers study how to help speech recognition devices cope with 'stressed speech'

BY SALLY CUSACK
CW STAFF

If you have ever talked to a computerized speech-recognition system, you know that you have to speak *very* slowly and *very* clearly to get the machine to understand you.

Responses charged with anger, fear or anxiety or efforts to compensate for a noisy background can cause significant changes in a person's speech patterns, said Mark Clements, professor of electrical engineering at the Georgia Institute of Technology in Atlanta.

Clements and fellow researchers have discovered that there are some consistent patterns of "stressful speech" across a broad range of speakers. These patterns could help a speech processor automatically filter out the emotional component, allowing the machine to more easily recognize the remaining "normal" speech.

To function properly, recognition devices must be "trained" in what each combination of sounds means. Because each person produces slightly different sound patterns when speaking the same words, today's most reliable equipment, trained to respond to a single individual, is useless in general situations.

The Georgia Tech research team has isolated a key component of human speech that could aid automated recognition devices in understanding different persons with a diverse range of vocal styles. Called "glottal waveforms," they are produced by the periodic opening and closing of the vocal cords located at the upper part of the larnyx. This opening and closing function is the impetus that generates actual sound, and recent study has shown that individual glottal waveforms are susceptible to stressed conditions. Experiments have proved that there are certain consistencies across different speakers and different phrases — a predictable pattern of modification — that machines could be programmed to identify.

Kathleen Cummings, a graduate student and researcher, said the university has developed a method of extracting the glottal waveform from the overall speech waveform using digital signal processing technology. The process of separating the two is called "de-convolving" and currently is being performed with the aid of a Sun Microsystems, Inc. Sun-4 workstation and optical disc technology.

"We also use two different databases. One is a stressed speech database from MIT's Lincoln Labs, which was developed using nine actors," said Cummings. The other is a "repository we created on our own, using sound that has been stored and digitized onto an optical disc."

Georgia Tech's Cummings *(left) and Clements study glottal waveforms consistent in stressed speech*

Cummings said that the scientists must figure out how to filter out both the emotion and identity of the speaker before standard word recognition can be implemented successfully across a broad range of applications.

One of her colleagues in speech research, Beth Carlson, also a graduate student, foresees a variety of commercial applications, including telephone catalog orders, credit card and banking transactions and speech-synthesized learning toys for children. Carlson is focusing her research on methods of reducing and eventually eliminating the effects of outside noise interference on speech recognition machines.

"Noisy environments are more common than not," she said. "I am looking at a particular distance measure that is found to emphasize or de-emphasize speech patterns most and least affected by noise." Carlson has found that the distance measure can be used to identify those parts of the speech signal that are similar.

In the commercial sector, there are currently several products in the works to advance the speech-recognition market. Texas Instruments, Inc., headquartered in Dallas, has been researching and developing applications for several years, with a primary focus on the telecommunications industry. "We must be able to provide speech recognition capabilities independent of the type of telephone used or the quality of the channel," said Joe Picone, a senior member of the technical staff.

Computerworld national correspondent Mitch Betts contributed to this report.

Spread spectrum secures client/server systems

BY J. A. SAVAGE
CW STAFF

Client/server architecture lets users have freedom of configuration at a good price. What it does not do is adequately protect data security and provide an elegant physical path to move data around a local-area network.

An emerging method of network communication, spread spectrum technology, scrambles data at the sending end and unscrambles it in receipt to protect your data's security — at least within individual networks. By using radio waves, it also allows information to be zapped across LANs without the need for a Medusa's head of cabling.

Not surprisingly, spread spectrum spreads data across a wide frequency bandwidth. It also operates at low power. This is unlike FM radio, for instance, which sends over a narrow band at high power. Data is sent in a "pseudorandom" sequence instead of sequentially. The receiver is tuned to the same sequence to decode and reassemble the data.

Usually, a piece of information is transmitted as a pulse. Spread spectrum takes that pulse and turns it into a complex bar graph, according to Bert Keely, director of marketing for Agilis Corp. a Mountain View, Calif.-based spread spectrum company. "Every bit is split into 16 chips and sent out through the air," he said.

Developed by the military during the last few decades, spread spectrum is attractive in surveillance for two reasons: It is difficult to intercept because the power is so low, and it is difficult to jam because the spectrum is so broad. "To jam it, you'd have to send out such a broad noise of your own that you'd end up jamming your own system," said Julius Knapp, deputy chief of the authorization and evaluation division of the Federal Communications Commission in Columbia, Md.

Companies like Agilis, Qualcomm, Inc. and Cylink Corp. are applying the military's development to computer networks. Agilis, for instance, has 16 different sets of senders and receivers. Theoretically, 16 different LANs could operate within close proximity without getting confused, and the data would be secure within those LANs.

EDITORIAL

Wild pitch

THERE IS NO joy in relational databaseville. Once-mighty Oracle has struck out.

In saying two weeks ago that it expects to report its first-ever quarterly loss, Oracle has become the latest shooting star to lose some of its twinkle. Oracle's problems are indicative of a general malaise in the relational database community, one that may be far more serious for smaller companies — and their customers — than for market leaders.

Last week, Ingres decided against continuing the battle alone and sold out to Ask Computer Systems. Sybase, which looked to be on top of the world at one point after receiving endorsements and cash infusions from Apple and Microsoft, has laid off 10% of its work force.

Like most firms that hit a rough spot, RDBMS vendors blame the economy. That's part of the problem, but this story is beginning to sound familiar. A market category heats up, causing a lot of vendors to rush in to fill the void. Competition intensifies, leading to overblown promises, some of which are actually kept. Vendors resort to price-cutting in a mad dash to get their sales figures up to the levels necessary to avoid a stock market bloodbath. Books are juggled to shine the best possible light on quarterly profits.

Eventually, Humpty-Dumpty always falls off this wall. Unkept promises begin to turn off potential customers, while thinner margins created by price-cutting create pressure on the bottom line. Companies eventually face the choice of where and how dramatically to cut expenses. Some, such as Ashton-Tate, elect to take the hit all in one quarter. Others, such as Cullinet, let the blood ooze until there's no strength left.

Either approach is bad news for customers. Choosing a database vendor is a long-term decision involving mission-critical software that ties the user tightly to the vendor. Although the buying decision may be strategic, users are still prone to respond to short-term price cuts and new product promises made by vendor representatives anxious to close the sale. That's only natural when the buyer is under pressure from above to make the choice that will cost the company the least in the next fiscal quarter. Vendors are all too willing to play this game. Promises don't cost nearly as much as R&D.

The old saw "you get what you pay for" holds true here. The industry has shown that discounting isn't a long-term strategy. Remember the low-cost PC software wars some years back? How many of those firms are around now? What's left of the discount plug-compatible mainframe market that flourished in the early 1980s? Isn't price-cutting usually a response to a problem, rather than a strategic thrust?

There's no reason to think the profit problems in the RDBMS sector are anything more than a hiccup. The technology continues to hold promise as the most effective way to manage information in a downsized and distributed environment. Let's hope that these latest problems will cause some introspection and lead to a more measured view of what constitutes value for the dollar.

LETTERS TO THE EDITOR

Look and feel good

Regarding the Viewpoint section [CW, Aug. 13] on the arguments for and against the "look-and-feel" decision in the recent *Lotus Development Corp. v. Paperback Software International, Inc.* court case, it may be instructive to look at what is going on in another segment of the computer software market. IBM is actively promoting Systems Application Architecture (SAA) for use on its machines. SAA is likely to provide the same look and feel on different machines running different applications.

A software developer in New York and another working independently in California, using SAA methodology on an IBM Application System/400, are likely to produce software that has the same look and feel. The command and function keys will be the same, and the menus and screens will be similar.

Why does IBM promote this? Probably because it might help them sell more machines. If Lotus ever provides 1-2-3 for the AS/400, as has been rumored, it will be interesting to see what the look and feel of the product is like.

Leon F. Stewart
President
Britz Publishing, Inc.
Madison, Miss.

System geriatrics

Judith Finn's feature article on older machines [CW, Aug. 20] was an excellent presentation of the reasons for using machines that could be termed obsolete. However, the article did not discuss one of the critical drawbacks of this strategy: the difficulty of retaining and attracting skilled technical personnel.

The best technical people generally have a strong preference to work with the latest technology; to do otherwise is regarded as a career risk because the programmer may be viewed as obsolete if he or she works with an outdated system. As a result, the true cost of maintaining an older system may be higher than expected because some programmers will have no interest in working with these systems, and those who will consider these positions may require increased financial incentives. This situation is occurring in the IBM midrange market. One of the foremost concerns of programmers interviewing with System/36 and System/38 shops is when the conversion to an Application System/400 will occur. An unsatisfactory answer to this question by the hiring manager may kill the prospect's interest in the position.

Eugene Brian Sawyer
Analytical Consultant
Whittman-Hart
Lombard, Ill.

Aesop story

I read with interest your article "The real Japan" [CW, Aug. 13]. It is indeed remarkable that Japan has managed to emerge from the ruins of the past and become an important international player and ally. It is also rather obvious that the U.S. has been resting for too long on its own economic and technological superiority while other countries were busy trying to catch up.

This complacency and overreliance on past performance can backfire, as the familiar "hare and tortoise" fable tells us. America needs to return to its traditionally exploratory and entrepreneurial spirit in order to regain its past momentum. Advanced research and constant innovation are needed to improve our competitiveness. We should be striving for quality solutions and products and not be misled by the illusion of "short-term" profits. This will help us compete successfully in the global marketplace and thereby restore America's place in the world.

Dr. Gus A. Galatianos
President
Advanced Computer Consulting International
Whitestone, N.Y.

Need for speed

Your review on "Power, flexibility 1-2-3/G's strong suits, but not speed" [CW, July 30] is very good. You have come to the same conclusion that many of us have. It's a powerful product, especially now with the addition of the "what-if" Solver utility, but it lacks recalculation speed.

I have one question that has been asked at numerous trade shows and of 29 operators at Lotus: Is Lotus going to have support for the Intel I860 math coprocessor, which is now in production? The 80387 is really no help, and this seems to be the right answer.

They have the operating system and now the product; all they need is speed.

Michael Della Bella
PC Software Support
Edith Roman Associates, Inc.
New York

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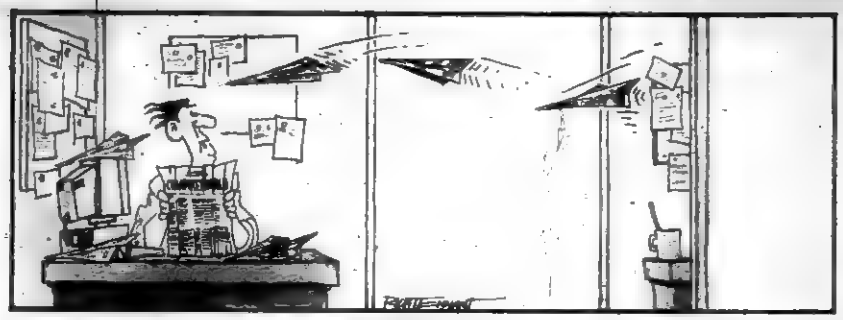

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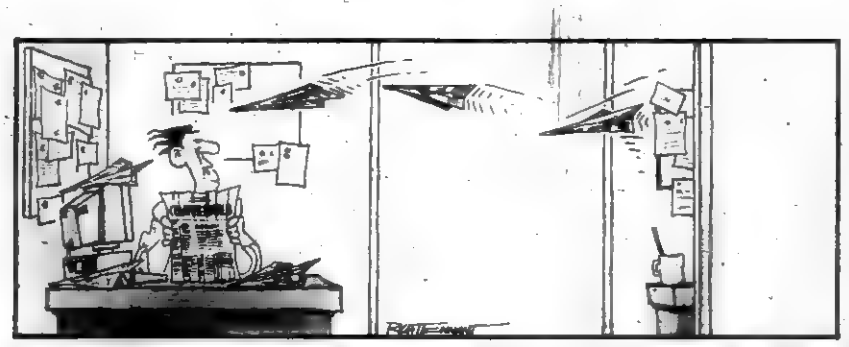

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Stay put, or keep moving up?

FRANK GENS

On Sept. 5, IBM changed the rules of the mainframe world in a big way for customers and competitors. With the announcement of the Enterprise System/9000 family, Big Blue delivered on its unprecedented promise to provide physical upgradability from the 3090J line to the ES/9000. By announcing upgrade prices that are attractive enough to encourage many customers to follow that path, IBM has added a new weapon in its battle to maintain account control.

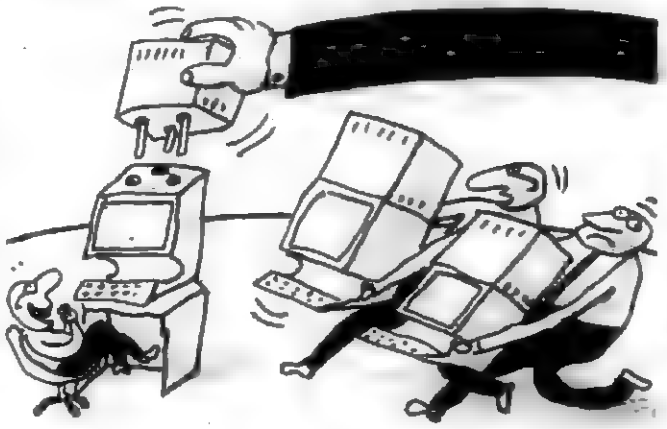
The upgrades from the 3090J to the ES/9000 have several important impacts. The new migration paths will do the following:

• **Lower the customer migration barrier.** Customers are likely to move more quickly to the ES/9000 because they are able to move to the next platform incrementally (via upgrade) without having to go through the pain of getting authorization to acquire a completely new footprint. The upgrade path makes moving to the ES/9000 simpler for many customers who might otherwise have stretched out such a decision. This has a positive impact in keeping IBM's revenue flow steadier than in earlier mainframe transitions.

• **Limit plug-compatible manufacturer opportunities and maintain IBM market share.** Customers who are adding capacity via an upgrade are much less likely to seek competitive bids from Amdahl or Hitachi Data Systems than those planning a box swap. By allowing a large number of customers to upgrade to the next platform, IBM is effectively preempting the PCMs from competing in many of those migrations. Thus, upgradability provides IBM with a strong weapon in its attempt to shore up its market share and maintain account control.

• **Maintain IBM Credit Corp.'s hold on the lease base.** When a user who leases a system looks to upgrade to a larger system, the incumbent lessor — who holds title to the box that will be upgraded — is in a much stronger position than any lessor who wants to compete for the lease on the upgrade. Thus, IBM's upgrade strategy for moving 3090J customers to ES/9000s will provide lessors who have a strong share of the 3090J market with an equally strong share of the ES/9000 lease business. IBM Credit Corp. reportedly did 70% to 80% of the lease deals on 3090Js. It is now clear why it was so aggressive: It will be able to leverage its J position into an equally strong position on ES/9000s.

But it's hardly time to blow "Taps" for Amdahl and HDS. Upgradability has been the rule for the past five years within the 3090 family, and Amdahl and HDS have certainly done pretty well. During this mainframe transition, it won't be any harder for PCMs and independent lessors to take business from IBM (and ICC) than during the past several years. It just won't offer as rich an opportunity to step into new accounts as earlier transitions provided.



Obviously, the success or failure of IBM's upgrade strategy will depend on customers' behavior. I believe the reaction in the average 3090 J shop will be very favorable. During the past five years, many customers have demonstrated that they prefer adding capacity via upgrades rather than through a box swap. Indeed, enough customers favor the upgrade strategy that IBM currently receives more than 50% of its large systems hardware revenue from mainframe upgrades.

Happily for Amdahl and HDS, there is a very important community which has demonstrated very little interest in upgrades: IBM's largest customers. These accounts — many with a large number of 600 J-class IBM and PCM systems installed — often are more inclined to roll in an entirely new system than to upgrade installed machines. Many large customers maintain a swap strategy to "keep IBM honest" by showing a willingness to replace an IBM system wholesale with an Amdahl or HDS box.

Further, because the physical upgrade path for 600 J customers is less attractive than the "financial upgrade" (discounted box-swap) that IBM has announced, upgrading to the ES/9000 will be even less relevant to the large shop.

Upgradability will also be of mixed interest to 3090 non-J shops. With about two out of three 3090 customers still in S, E or Base machines, this community is very important to IBM's mainframe plans. From a price/performance standpoint, customers with 3090 Base, E or S systems have less of an incentive to move to the ES/9000 via upgrade than do J customers. Further, non-J customers must go through the logistical headache of upgrading to a 3090 J before stepping up to an ES/9000.

As customers evaluate the ways in which they may move to the next generation of IBM and PCM mainframes, they should draw upon the No. 1 lesson of 3090 upgradability: While upgrades offer an attractive, nondisruptive way to add capacity and features, the nondisruptive installation of an upgrade is sometimes accompanied by a noncompetitive price.

Thus, customers shouldn't simply default to an upgrade whenever more capacity is needed. It is important to remember that there remain viable alternatives: PCM systems, used IBM and PCM systems, upgrading used IBM systems, etc. As noted earlier, upgrades tend to maintain the status quo. And, as the largest of IBM's accounts know, the best-priced solution is presented not in the status quo but in a competitive, customer-controlled environment.

Gens is vice-president at Technology Investment Strategies Corp., a market research firm in Framingham, Mass.

One man's 'natural' is another's 'what is this?'

HARVEY P. NEWQUIST III

There has been a tremendous amount of discussion lately over the merits of computer input devices, especially with the recent introduction of a slew of products that feature handwriting recognition. Along with the hype surrounding this form of data input, there is also increasing talk of the use of natural language to improve the querying efforts to a variety of systems. Yet, whether the method is handwriting, voice, conversational English, touch screens or any of the other hallyhooed technologies, it all boils down to natural interfaces.

But just what is a "natural interface?" I'm sorry, but to me, and probably to thousands of people who've been using computer keyboards for the past decade, handwriting is no longer natural. Not only has my handwriting never been good (I nearly failed the Palmer Penmanship course in fourth grade), but its quality has fallen dramatically in the years I've used a keyboard.

It's also a pain; when I sign checks, I get hand cramps before I even fill out the date line. Legibility is therefore a problem for me in using anything that depends on the chicken-scratching that I call handwriting. I can't expect a machine to recognize something I've written that I can barely decipher myself.

Voice recognition is being touted as an even more natural interface — perhaps the ultimate interface that humans will use to control computers. That's fine when you are accustomed to uttering one-word answers or creating memos that aren't longer than one or two sentences.

But have you ever used a dictaphone, or tried to compose a grammatically correct report using a tape recorder? Unless you are an experienced "talkie," you will find that dictating a memo is a hell of a lot more difficult than typing it. I have a lawyer friend who swears by recording devices such as dictaphones, and he is capable of whipping out dozens of memos and letters per day by using his microphone-based interfaces. On the other hand, he will not consider using a keyboard. Watching him at a computer keyboard, I can understand why: His slow hunt-and-peck search on the keys gives one the kind of pained anticipation that parents feel watching their kids trying to ride a bike for the first time without training wheels.

What you like

The point is simply that "natural" depends in every case on what the user feels most comfortable doing. Natural to me is certainly not natural to my lawyer friend or to someone like my grandmother, who insists on handwriting every piece of correspondence she undertakes.

Then there is the issue of what constitutes natural language to an experienced computer user. Having used DOS ever since it was introduced (and having the emotional scars to prove it), I still habitually omit spaces between commands in other environments because DOS does not allow for blanks. I work with people who were weaned on Macintoshes, and when faced with DOS interfaces (or something really fun, such as Ashton-Tate's Dbase), the first thing they want to know is, "Where are the mouse and the screen icons?" Clearly, natural here is also a question of preference and experience.

In writing about natural language for years as part of the artificial intelligence business, I have seen many attempts to create front ends that use conversational English instead of the strange little grammatical bastardizations that make up computer jargon. Being familiar with Dbase commands, for instance (a fact I'm not necessarily proud of), I can get almost any information I want out of my personal computer with just a couple of macro keystrokes or some tersely worded commands. They were not enjoyable to learn, but these commands now work more quickly for me than trying to formulate the same system request in plain English.

Another problem with creating a universal natural interface of any kind, whether it be keyed-in English, spoken word or handwritten word, is that almost everything is context-specific. This means that if you're George Will, the use of the word "run" probably has something to do with the score of the Yankee game. If you're in quality control at Hanes, "run" probably means a tear in a nylon stocking. If you're in any data center, "run" means the execution of a specific system process. The *Random House Dictionary* has 179 definitions for "run," most of these context-specific. In asking computers to understand a spoken or written word, then, we must either provide the machine with a context for understanding, or make it intelligent enough to figure out what the user means.

Thus, tagging any technology with the promise of revolutionizing the industry as we know it, especially where it concerns input devices and the way users relate to their machines, is going to have to be taken with so many grains of salt. Before you toss out your keyboards for the allure of handwriting or voice input devices, remember that you may be committing an unnatural act.

Newquist writes and consults on artificial intelligence and other advanced high-technology topics from his office in Scottsdale, Ariz.

The real trick is not to wait: Become your own IS director

READER'S PLATFORM

GARY BERLIND

David Liddle's Viewpoint article, "Business computing gets stuck" [CW, Aug. 20] exposes the disparity between the vision that computer folks have long held for the automated workplace and the ever-so-boring spreadsheet/word processing reality that prevails today. Surely, the question "Where's the beef?" needs to be asked, and if Liddle's statement is correct — that 80% of business professionals are still working without a significant computer resource — it is important that we do some contemplation.

At the heart of the matter, however, may simply be what a former colleague of mine was fond of calling SMOP — (a Small Matter Of Programming). SMOP has been around since the first end user purchased his first mainframe, hired his first information systems director and proceeded to very quickly learn the meaning of patience.

SMOP isn't a bad thing; it's just the time required to get a system built, regardless of the kinds of tools that are being used. Since it took years and years for corporate America to develop its armament of mainframe-based systems, it's only reasonable to allow some time for the development of the "next generation" of office automation applications. Please show a little patience, Mr. Liddle.

How can one compare the ambitiousness of many of today's highly interactive Apple Macintosh- and Microsoft Windows-based departmental systems with their batch-mode and block-mode forebears of just a few years ago? Better tools lead to better systems, no doubt, but it still takes *time* for good systems to get put together, no matter how marvelous the technology.

Let us not be distracted by hardware razzle-dazzle either. Though the astonishing advances we've been seeing in hardware technologies now make it possible to have departmental systems far better than (and at a fraction of the cost of) their mainframe counterparts, SMOP remains a software function not a hardware one.

String together a bunch of Macintoshes or personal computers in a local-area network, add a server and whammo! Interactivity, file sharing, responsiveness and all the rest. But all the while, SMOP is there too, quietly raining on the entire technological parade. That, I contend, is why 80% of the office is sitting there with its spreadsheets and word processors, waiting stonily for the Applications Messiah to arrive.

Liddle seems to be unaware of the giant strides that have been made in the past two or three years by independent software developers who have been working behind the scenes to develop an impressive array of microcomputer-based vertical applications for business — applications that actually work.

These vertical applications are currently being built by hordes of dedicated developers all over the world, using a palette of tools that would have been unthinkable just a few years ago. From Omnis and 4D to Clarion and Foxbase, a wonderful assortment of tools that allow for the (relatively) quick development of complete application systems for diverse business situations already exists.

Many of these vertical application systems are complete, desktop-based business management packages, often exceeding in power and functionality the business applications that have traditionally taken IS departments years to put together. Because they use PCs and Macintoshes as their workstation-like front ends, the user interfaces of these systems offer the consistency, functionality and ease of use that Liddle is pleading for.

A ground swell

What has begun to take place already is a subtle, virtually unnoticeable, but nevertheless very important shift in the way that many of tomorrow's business applications are being built. Not in corporate America, perhaps, where old IS departments dwell, safely ensconced in their impenetrable layers of 20-year-old Cobol code. But in the brave new world of independent desktop business system application development, virtually anyone with enough interest, talent and analytical ability can become his own IS director.

True, not all the efforts coming out of this "IS underground" are going to succeed. But think for a moment about the sheer numbers involved and take heart, Mr. Liddle. Imagine thousands, maybe even tens of thousands of dedicated individuals, working on their own time (and without the hassles of big-company bureaucracies) to solve business automation problems using PCs and Macintoshes, using the most potent programming tools that have ever been available.

The answer to closing the gap between media hype and office reality doesn't necessarily lie in more and better tools but in graciously giving the present situation a bit more time to mature.

Berlind is president of Desktop Innovations, Inc., a Berkeley, Calif.-based software company.

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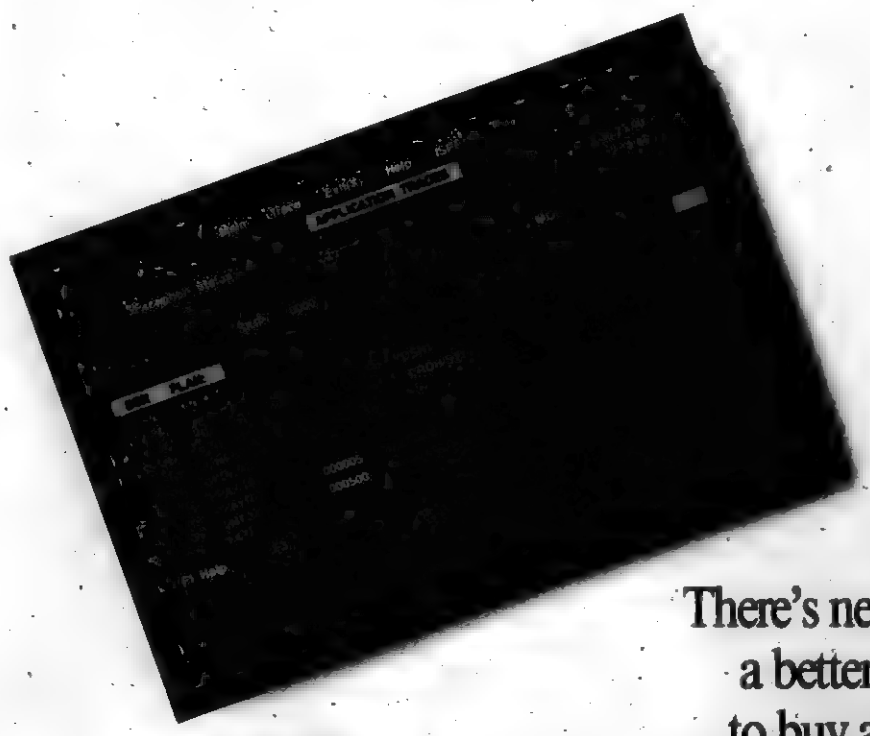

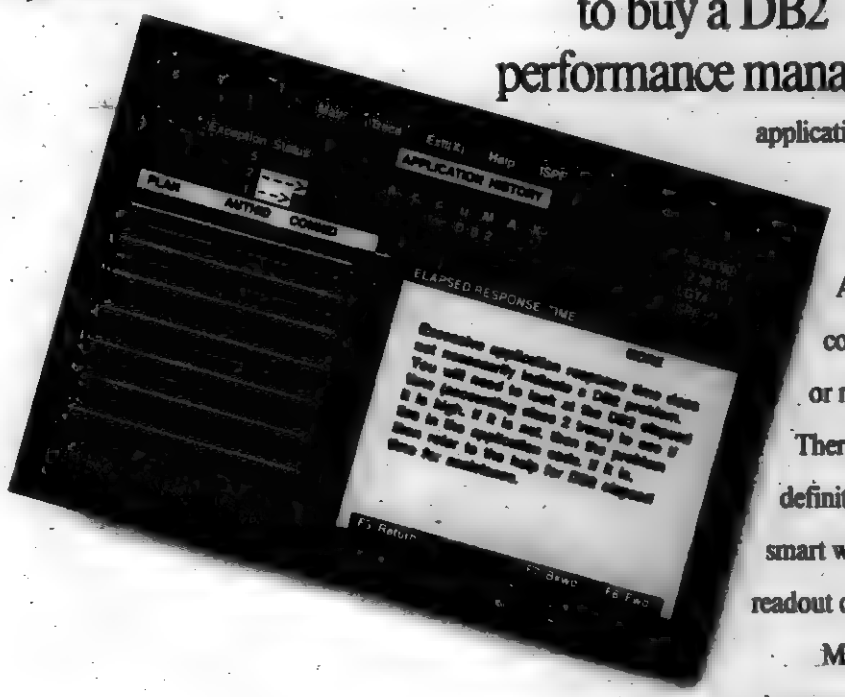

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COMMENTARY

Gary Anthes

You still can't beat the brain

The National Commission on Superconductivity recently recommended developing a superconducting computer operating at petaflops speed, or about 1 million times faster than today's fastest supercomputers.

Any way you look at it, petaflops is a lot of floating-point operations per second. It's one quadrillion, a million billion, 10^{15} or 1,000,000,000,000,000 calculations in the time it takes to flick a fly off your nose. It's also the amount of work the fastest Cray supercomputer can do running nonstop for about two weeks or an Apple Macintosh with a robust service contract could turn out in 8,000 years.

The prefix peta is just beginning to creep into computer terminology, extending up the family of power prefixes that includes kilo, mega, giga, tera, peta and exa. If there isn't one already, there will surely soon be a company with a name like Petaperformance Processors, Inc.

Computer enthusiasts and computer journalists love to think about the high, high end of computing, while the low, low end gets neglected. Consider the slide rule. It's good for maybe .2 flops if you really know what you're doing, and that's with lousy accuracy.

The slide rule was invented in the 17th century and disappeared for all practical purposes in the mid-1970s, abruptly

Continued on page 39

Expert systems for everyone

No longer the domain of 'techies,' development tools aim at IS managers

ANALYSIS

BY JOHANNA AMBROSIO
CW STAFF

It used to be that only experts could use expert systems development tools. They were written in obscure languages that few information systems professionals knew, and they required special-purpose, expensive hardware as delivery systems.

No longer. Many expert systems development tools now have the IS manager in mind [see story page 33]. Today's tools are written in C instead of Prolog or LISP, run on a wide range of standard computers instead of on specialized machines and have links into corporate databases.

Users have noticed the change in philosophy. "Integration is where the tools have made the greatest stride," said Ed Mahler, manager of decision support and artificial intelligence systems at Du Pont Co. in Wilmington, Del. "The expert systems you can develop now are callable from and to other programs and have much-improved database access."

Michael Smith, a senior AI specialist at Eaton Corp. in Milwaukee, has been using expert systems shells since 1985. "Back then, there was nothing that anyone doing actual work could really use. They weren't bug-ridden; they just weren't powerful enough because they lacked too many things," Smith said. Today's tools are much more stable and fully featured.

At the customers' whim

Expert systems vendors are responding to the needs of large users. "Most of the vendors are now willing to work for the customer instead of making the customer work for them," said David Blanchard, editor of "AIweek," an industry newsletter.

"The mantle's been passed to the second-generation products and companies that understand MIS and the business world," said Robert N. Goldman, president of AI Corp., a software vendor in Waltham, Mass. "To the original vendors in the business, this was their college Ph.D. thesis that they then sold. But as smart as they were, they just didn't have the business background to really commercialize the technology."

It is not just software vendors that are after the IS business. Computer manufacturers including IBM, Digital Equipment Corp., Sun Microsystems, Inc. and Hewlett-Packard Co. also sell expert systems tools that they developed in-house or that they are selling for the software suppliers.

International Chip Corp. in Columbia, S.C., said it believes it has the better system with a hardware/software combination called Rex and Cake. Rex is a chip-based dedicated inference engine that fits into an IBM Personal Computer XT and thus delivers higher performance than software-only schemes, the company claimed. Cake is its expert systems shell.

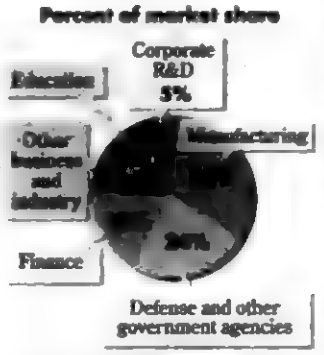
Even some original expert systems vendors are changing their stripes. Intellicorp in Mountain View, Calif., was one of the earliest players in the market when it introduced the Knowledge Engineering Environment, a LISP system, in 1983. This June, the company began shipping Kappa PC, a DOS-based tool kit.

Unix tools are coming soon, Intellicorp President Thomas P. Kehler said. "We had to invest substantially to move to general-

Continued on page 38

Industry experts

Expert systems are most likely to have found homes in the manufacturing or government sectors



Source: Expert Systems Strategies

Hundreds of packages get ES/9000 nod

BY ROSEMARY HAMILTON
CW STAFF

When IBM rolled out the Enterprise System/9000 recently, it acknowledged the hundreds of third-party software packages that would support the new platform or one or more of its software offerings.

The company has been relying increasingly on this strategy since the successful launch of the Application System/400 two years ago, which was the first time IBM highlighted third-party offerings as a critical component of an announcement.

It certainly helps IBM to present a complete package, but it also benefits users by providing them with third-party offerings that are current with the latest IBM generation.

Nearly 150 companies announced support for either the ES/9000's hardware platform or specific software components, including the latest release of the MVS/ESA operating system as well as the ESA versions of the two other IBM mainframe operating systems, VM and VSE. Third parties also announced support for other IBM software offerings, including DB2, the Enterprise System Connectivity, or Escon, fiber-optic-based channel architecture and Systemview.

Most well-known providers of application, database and systems software appear on the list of more than 100 companies that will support the ES/9000 platform. These packages include On-line Software International, Inc.'s Ramis application generator; Dun & Bradstreet Software's Millenium and Expert Series of financial, human resources and manufacturing applications; and Must Software International's Nomad fourth-generation language.

Several vendors targeted specific components of the IBM announcement. Computer Associates International, Inc. pledged support for the ESA version of the IBM VSE operating system.

System software companies such as Boole & Babbage, Inc., Goal Systems International, Inc. and Legent Corp. announced their support for IBM's Systemview, a strategy intended to provide centralized management across an enterprise.

Other companies committed to Escon include Candle Corp. and SAS Institute, Inc.

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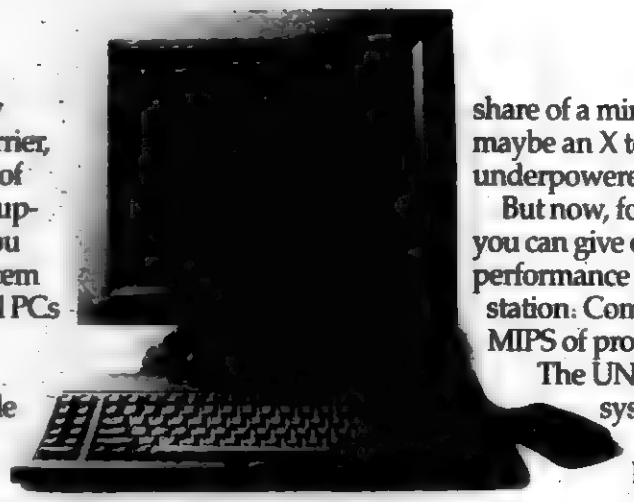

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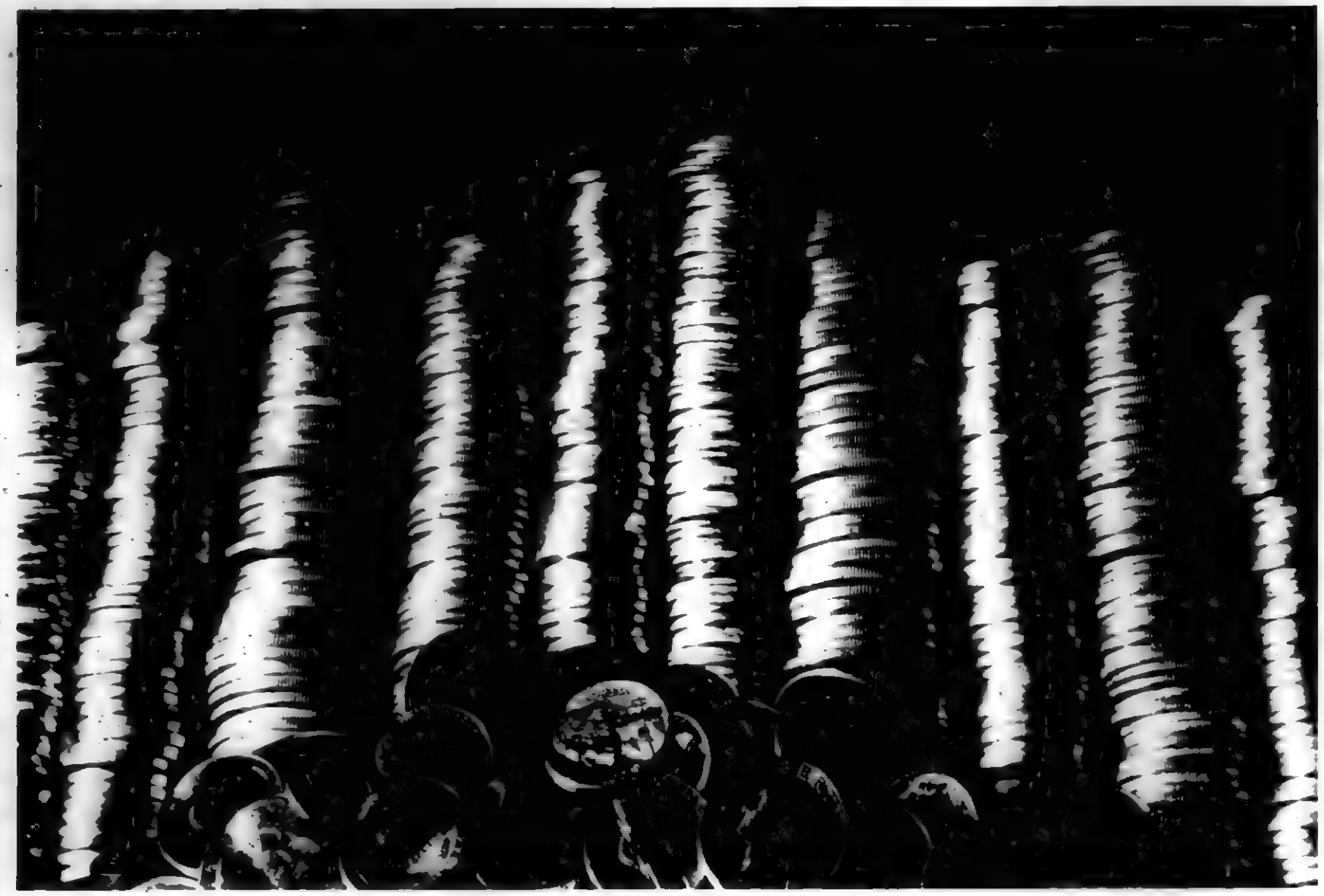

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Simon says soup is good food

Campbell's expert system controls quality, saves more than $2M per year

ON SITE

BY JOHANNA AMBROSIO
CW STAFF

CAMDEN, N.J. — How does Campbell Soup Co. ensure that its soup is "mm-mm good"? An expert system, chosen and implemented by an end-user department, helps the company determine when something goes wrong with the processing of the soup and what to do about it.

The expert system, dubbed Simon, was installed two years ago and became fully operational a year later. "We tested it for a year to make sure it's right," said Michael S. Mignogna, corporate process authority at Campbell. "We wanted to make sure that when it decided something, it was the same as if one of our people had made the decision." Thus far, the system has saved Campbell's about $5 million. Simon was written using Aion Corp.'s Aion Development System shell.

Mignogna's department, thermal process development, sets the standards for how soup should be cooked to ensure sterility and to avoid conditions such as botulism. It also makes the calls about what to do if something goes wrong.

For instance, a batch of cream of mushroom needs to be cooked for 50 minutes at 250 degrees, and halfway through the cooking, the plant loses steam pressure or the conveyor belt slows down. Mignogna's group has to decide whether to OK that batch for sale or destroy it. The goal is to destroy as few items as possible while guaranteeing quality. "It's that one can of soup that we worry about," he said.

Before Simon was installed, Mignogna's department used a General Electric Co. time-sharing arrangement. Then in 1985, Mignogna and his engineers converted the time-sharing application to run on an IBM Personal Computer. "I wouldn't say it was the most efficient system," Mignogna said, "but it worked." And it saved the approximately $4,500 a month that the time-sharing system cost.

All told, Simon has saved Campbell between $2 million and $3 million a year. Most of this is accounted for by products that would have been destroyed under the old system but that were really safe. "That sounds like a lot of money," Mignogna said, "until you realize that Campbell makes five billion to 10 billion cans of soup a year."

> "WE WANTED to make sure that when [Simon] decided something, it was the same as if one of our people had made the decision."
>
> MICHAEL S. MIGNOGNA
> CAMPBELL SOUP

With the old PC system, whenever there was a problem the plant would notify Mignogna's people and send data about all the conditions. Thermal process would look at the data and use the PC program to do mathematical simulations to decide whether the product was safe. This process took up to eight weeks, and the product in question needed to be held in a warehouse until a decision was made.

With Simon, however, that decision-making process is cut to about three minutes, and most of the decisions are made by Simon with little human intervention. When something goes wrong at the plant, a quality control person enters data into Simon on a personal computer. Four plants have PCs that run Simon locally. Mignogna's group also has a PC with Simon on it.

If the expert system determines that the problem will not impact quality, it authorizes the product to be released. "It's the same as if I signed it off," Mignogna said. If the problem is determined to be more serious, the product is put into isolation in a warehouse, and Mignogna's group reviews the paperwork and does a risk analysis.

Simon makes the decisions about 90% of the time, Mignogna said. In the other 10%, all the data may not be immediately available. Nor does Simon contain rules for all the possible combinations — such as container defects, for instance. "These are the sorts of things that are not toxic and won't kill anyone," Mignogna said.

Because the expert system can separate the business rules from the mathematical calculations, Mignogna said, either can be changed without affecting the other. This can come in handy when Campbell adds new products or changes the recipes for old ones. When the company introduced its low-salt soups, for example, Simon needed to be changed to accommodate. "Salt is a preservative, so when you take it out, there's some impact," Mignogna said.

Besides the cost savings, benefits include improved efficiency of the decision-making process and improved morale at the plants, Mignogna said. Plant employees feel more in control of things because they no longer have to wait for his group to make a decision.

In the future, the Simon systems in the plants and Mignogna's group will be linked so Mignogna can pull information out of the plant PCs. Currently, the only way Mignogna can update his files is to dial into the plant PCs. "We're waiting for our MIS department to make all the connections," he said.

Cambell's Mignogna *credits Simon with improving morale*

EMC unwraps tool set for IBM's midrange

BY ROSEMARY HAMILTON
CW STAFF

EMC Corp. recently rolled out a package of goodies for IBM midrange users that includes a disk device that can hold up to 17.1G bytes of data, an add-on memory board for high-end users and capacity planning software.

The EMC SL/935-EXP disk device, targeted at IBM Application System/400 and System/38 users, will provide up to five times the storage in the same size cabinet as the IBM midrange storage device, the 9335, EMC said.

The company also said the device uses only 30% of the electrical power consumed by the 9335 and generates only 25% of the heat. The ES/935-EXP can be installed in either an AS/400 cabinet or a rack enclosure provided by either IBM or EMC. The controller sells for $5,500 and one head disk assembly unit will cost $14,500. A complete unit will sell for $34,000.

EMC will provide add-on memory boards for AS/400 B70 users that are based on 4M-bit memory chip technology. The 32M-byte boards allow B70 users to double main memory from 96M bytes to 192M bytes, the company said. The price is $24,000.

Finally, EMC has begun offering Systems Management Service, a software package for AS/400 capacity planning. The software is designed to collect data on a daily basis and relay that information to the EMC service organization. Using that data, EMC will compile monthly reports for a customer that analyze current system performance and project future capacity needs.

System Management Service is priced on an annual basis according to CPU size. A typical B70 yearly fee would be $9,900, while a fee for a low-end B10 would be $1,830.

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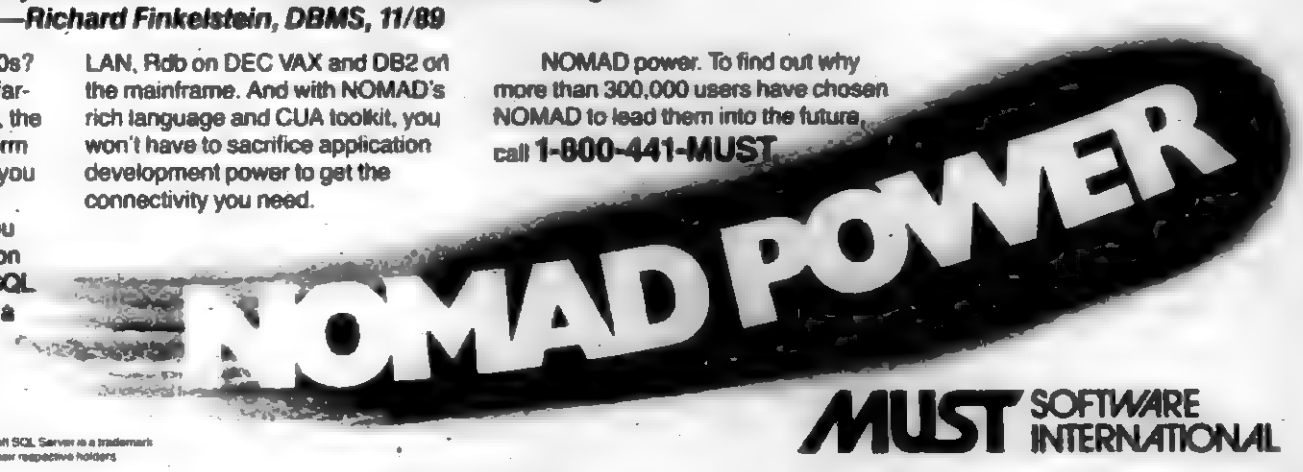

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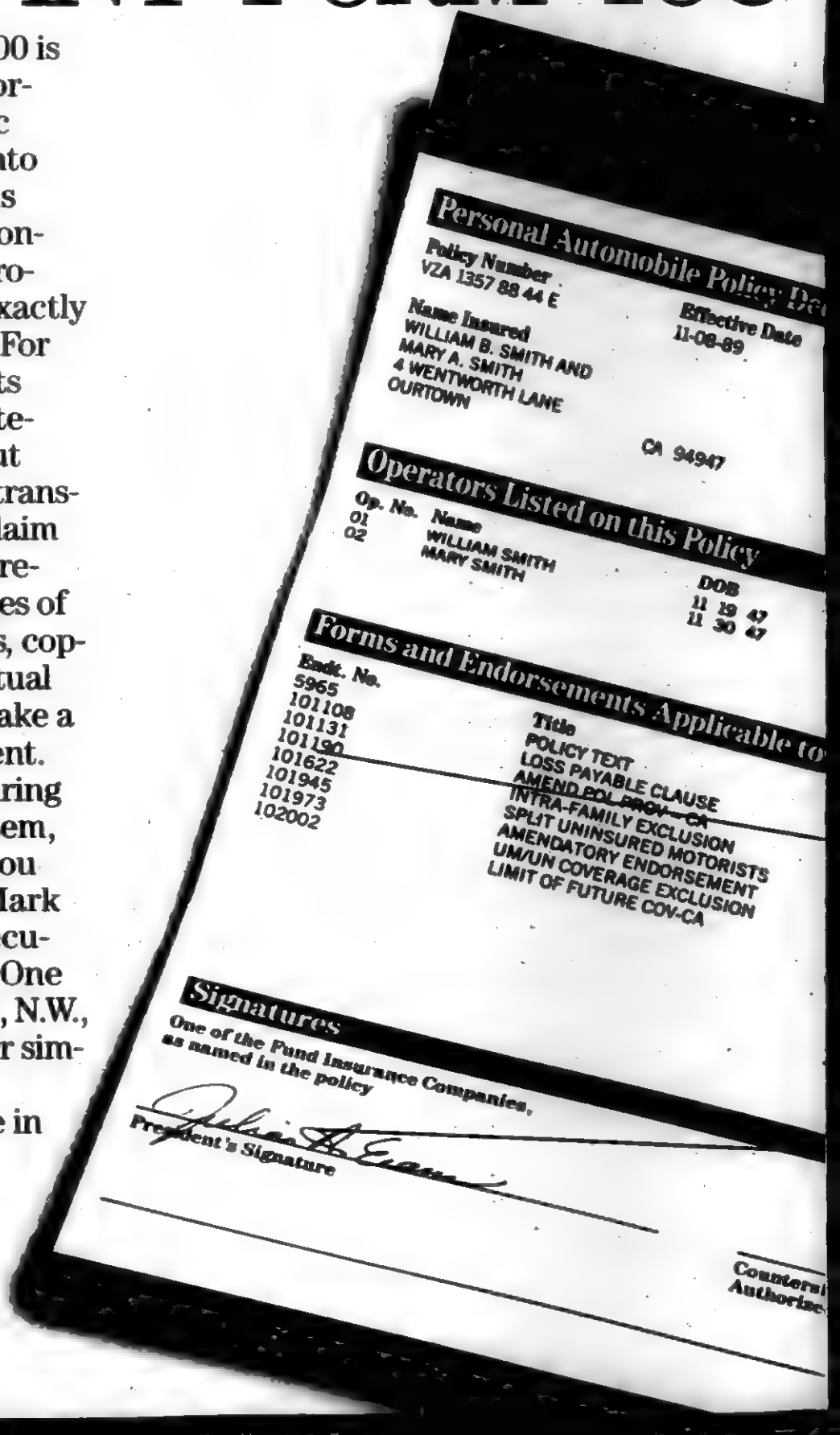

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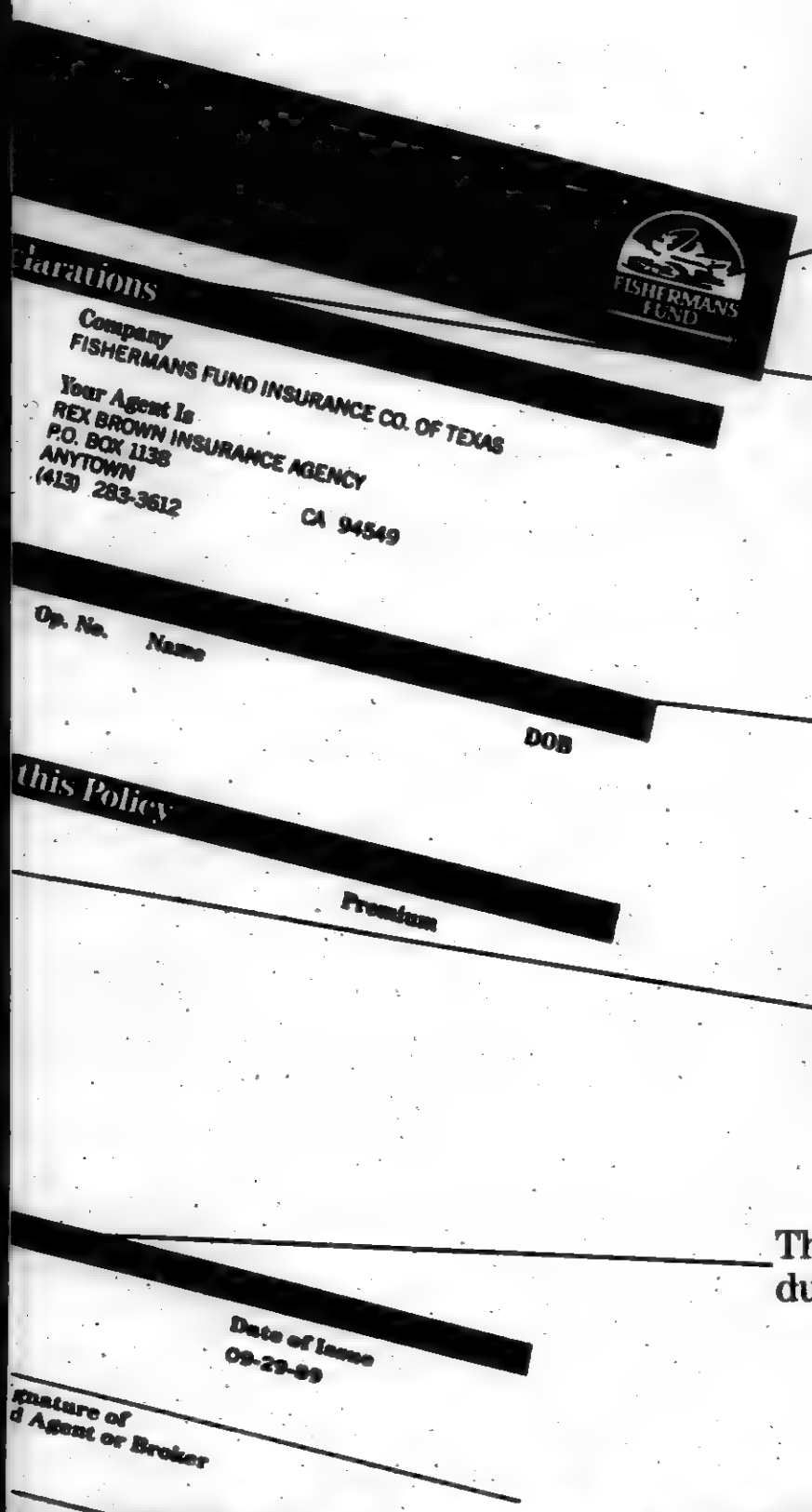

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PRODUCT REVIEW

Cincom's case for integration

Cincom Systems, Inc.

This is the fourth in a monthly series of performance benchmarks that for the next several months will focus on the integration of computer-aided software engineering (CASE) and fourth-generation language (4GL) products. The benchmarks are monitored by an independent team headed by David Whiteside, managing director of Computing Futures Ltd. and his associate, Prof. Eberhard Rudolph, formerly of the University of Auckland, for exclusive publication in Computerworld.

Each product is observed in action over a three-day period, during which a vendor team solves the case study project costing system, an application that is familiar to most information systems professionals. The team's mission is to demonstrate the capability of the major CASE/4GL environments to deliver complete and complex business solutions under "live fire" conditions. In this issue, we look at Cincom Systems, Inc.'s development tools, centered around Mantis and Supra, which also interface with the Information Engineering Workbench (IEW) CASE tool developed by Knowledgeware, Inc.

•

Carried out by Cincom in the UK, the solution to the benchmark fell short in one small detail. One function would not have passed normal QA tests, although it was formally correct. Despite this shortcoming, the level of completion was rated "very good."

•

The team of three specialists completed the benchmark in almost 72 hours — a time well in excess of some previous solutions. Some of the extra time had to be attributed to using SQL. Further time was lost because of a bug in Mantis, which rendered the SQL database inaccessible for a while. Thus, speed of development was "fair."

•

The maintenance effort of 11 hours was much more favorable. The modular development enforced by the composition feature certainly contributed to the efficiency of the development team. The speed of maintenance was rated "very good."

•

The documentation was another strong feature of the Cincom environment. An overview is provided by the graphic presentation of the IEW CASE tool at the design level combined with the bill-of-materials listing of the implementation. We rated documentation "very good."

•

Using the third-party IEW made integrating the tool kit difficult. Because an IEW and Mantis interface was completed just at the beginning of this year, the bridge between these two environments is still patchy, with Mantis' and Supra's specific parameters passed as IEW comments to generate code [containing syntax errors]. The integration of the Cincom development tools Mantis and Easy is also not complete. Therefore, the integration of the CASE tool was "poor."

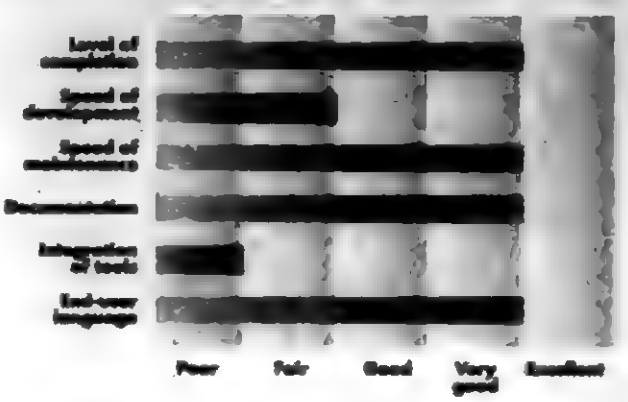
•

The Easy end-user query language handled the simple inquiries but required some programmer experience when handling time data or when specific data views had to be defined in addition to the existing ones. We regarded it as "very good."

•

In conclusion, Cincom's benchmark had mixed results. Integration of the IEW is at an early stage. At the implementation level, repetitive detail work is required of the developer, with no support in some basic functions. But the maintenance of software development is well supported, which allows the composition of individual program functions and effective documentation.

Consultant's assessment



Cincom's tool kit

- Supra – Database system that includes SQL support
- Mantis – Fourth-generation language for mainframe and PC development
- Easy – End-user decision support tool
- PC Connect – PC utility
- CASE Interchange – Mantis interface from IEW
- IEW – CASE tool (Knowledgeware product)

Development and maintenance report card

Performance is graded from A (excellent) to F (poor).

ANALYSIS AND DESIGN: B
The design component of the IEW was used to derive the data model and to define some program logic in a short time. Any refinements made later, however, could not be fed into the IEW environment. Compound data keys were not supported.
Strength: It has a proven design environment with good graphics.
Weakness: It is restricted to a one-way process in a single-user PC environment.

DATABASE SETUP: C
Using a Cincom-developed CASE Interchange file, the Supra SQL database was generated almost instantly. The data structure, however, had syntax errors that had to be fixed manually.
Strength: It can generate data from CASE design.
Weakness: The generated database may not be syntactically correct.

FILE MAINTENANCE TRANSACTIONS: C
This step took longer than expected. The delay was primarily because of limitations in the SQL templates, which could not provide generalized functionality. As a result, a lot of detail code had to be specified explicitly, much of which was repetitive.
Strength: Many design specifications can be used directly.
Weakness: Not much assistance is provided to design logic details.

COMPLEX TRANSACTIONS: D
Time was lost when a Mantis problem made the database inaccessible. More difficulties were encountered with time values. The final solution was correct but clumsy to work with.
Strength: Complex transactions can be composed from elementary functions.
Weakness: Time conversions and complex screen layouts are cumbersome.

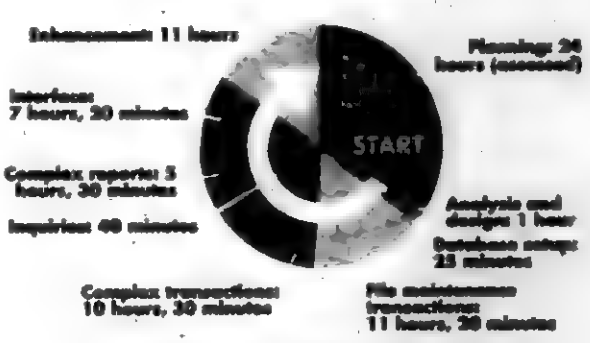
INQUIRIES: B
Using the query language Easy, the job was done without much difficulty. Again, some effort was required for time conversions.
Strength: The standard inquiries can be done by non-IS staff.
Weakness: Solutions with Easy require a special program to be integrated into Mantis selection menus.

COMPLEX REPORTS: B
This section required Mantis for a solution. The task was completed in a short time and in full compliance with requirements.
Strength: Mantis can cater to complex reporting.
Weakness: A lot of detail work is required by the programmer.

INTERFACE: B
The Ashton-Tate Corp. Dbase file was exported as an ASCII file, which was read by Mantis without any difficulty. The program logic of the complex transaction step was reused, but major alterations were required to transform the on-line processing logic to meet the requirements of the batch interface function.
Strength: Mantis can access PC data.
Weakness: Batch reporting is not well supported.

ENHANCEMENT: B
The team opted to add a further field to an existing file rather than add a further file, which would have given a more general solution. With the help of the bill-of-materials program lists, the necessary changes were incorporated without delay.
Strength: It has good overall documentation facilities.
Weakness: Only a short-term solution is provided.

Staging the benchmark



Total effort: 71 hours, 45 minutes
Elapsed time: 34 hours, 30 minutes
Team size: 3

The solution was developed on the Cincom data center in Cincinnati, which consists of a cluster of IBM 3080 series mainframes offering the MVS operating environment. The computer facilities were accessed from Maidenhead UK via the Cincom Netmaster system, which supported several hundred concurrent users worldwide.

Details of the products are available from Cincom Systems, Inc., 2300 Montana Ave., Cincinnati, Ohio 45211, (800) 888-0115.

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Systems

FROM PAGE 29

purpose hardware," he told a recent gathering of venture capitalists. "It was a painful transition, but a necessary one. We have to provide tools for the real world."

About a dozen expert systems software houses are targeting the corporate IS world. These include Bell Atlantic Knowledge Systems, Inc. in Philadelphia; Aion Corp. in Palo Alto, Calif.; Neuron Data, Inc. in Palo Alto; AI Corp. in Waltham, Mass.; Inference Corp. in Los Angeles; Gensym Corp. in Cambridge, Mass.; Information Builders, Inc. in New York; and MDBS, Inc. in Lafayette, Ind.

The technology at the base of these products is an expert systems shell. This provides a development environment for IS staffs to design applications that use knowledge gleaned from humans and put into a computer. At the heart of the shell is a knowledge-representation model and search routines.

Usage varies

Specific implementations of the reasoning engine and other particulars do, of course, vary. What most of the products do have in common is that they run across a range of systems, from IBM mainframes and DEC minicomputers to Unix-based workstations and personal computers running DOS or OS/2.

If the products do not yet support all these platforms, the vendors have promised that they will.

Many of the shells also support commercial graphical user interfaces, including Motif, Decwindows, Microsoft Corp.'s Windows and others.

Some vendors also provide supporting tools for forms design and debugging, for example, as well as developer libraries. Also, scaled-down versions of the full environments are available to build smaller expert systems applications, like Guru First Step from MDBS. In October, Aion will ship Path Builder and Checklist Builder, tools to help end users design expert systems.

The products also have hooks into most of the popular database management systems on the market, including Oracle, DB2 and others. However, there are differences in how the tools implement these hooks, warns Avron Barr, president of Aldo Ventures, Inc., a Palo Alto consulting firm.

"Some allow you to send a query to a database and pull the information out," he said. "But that's quite a different thing than building an environment that allows you to describe where the information is and then have the application use that information in an integrated fashion."

HARD BITS

Quotron, DEC offer exchange system

Quotron System, Inc. and **Digital Equipment Corp.** will offer Quotron's new F/X Trader electronic foreign exchange dealing system to more than 40 banks worldwide, the companies recently announced. Quotron, a leading provider of financial information services, will rely on DEC for site preparation, hardware and software installation and support. F/X Trader is an information and trading system that allows traders to negotiate transactions from their IBM Personal System/2 Model 70 workstations connected through DEC's Decnet software and Decsystem 3100 servers to access a global interbank network.

DEC has rolled out a disaster recovery service that includes reselling Chicago-based CHICOR Information Systems, Inc.'s Total Recovery Planning System coupled with new emergency services and hot-site centers for users. New services from DEC include 11 business recovery centers throughout the U.S. and a Chicago-based hot site with a backup computer facility, the company said. Prices for the IBM PC-based software range from $9,500 to $50,000.

Unitech updates security software

In an effort to give Unix users more security options for their systems, Unitech Software, Inc., a Unix-based systems software vendor based in Reston, Va., last week introduced Version 3.0 of its Usecure security software product.

The new version includes an enhancement that the company dubbed Upass, a Unix password management and control module designed to implement the U.S. Department of Defense guidelines for security password management, a Unitech spokesman said.

Upass features include the ability to store passwords as one-way encrypted data, so that the passwords cannot be viewed through the database.

Upass also provides automated password and log-in audit trail reporting, which allows the systems administrator to view any attempts to penetrate the system in real time and supports access by the systems administrator to individual user security profiles.

An on-line Help system is designed to aid users in setting up or changing their own passwords.

The package also gives administrators the ability to set up "super user" access, giving that user access to all files under all passwords, according to the spokesman.

Upass can run under several different Unix-based systems, including those of Sun Microsystems, Inc., Digital Equipment Corp., Hewlett-Packard Co., Unisys Corp., NCR Corp. and others.

In beta testing now, Unitech's Upass enhancement will cost from $1,000 to $4,000. The company said the new version will be available soon.

MAURA J. HARRINGTON

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Anthes

FROM PAGE 29

shoved aside by the electronic calculator. Early models were made of ivory and were called Napier's bones, after the Scottish mathematician who invented logarithms, on which the devices are based.

Seymour Cray, the patriarch of supercomputing, once said he had a "social problem" as a graduate student at the University of Minnesota because he had a circular slide rule while nearly everyone else had the straight-stick kind. But Seymour was not daunted; in his first job, he used the rule to help design what was to become the Univac 1101 mainframe.

Now, 40 years later, Cray uses a Macintosh personal computer to help him design the next generation of supercomputer, a machine whose gallium arsenide logic chips will give it a theoretical peak speed of 16 billion flops (gigaflops), or 6 times faster than today's fastest Cray computer.

The economics of all this are rather daunting. We can assume that Napier spent a few scant pounds on slide rule development, and the device lasted for some 300 years. Now, by one estimate, Cray Computer will spend more than $300 million bringing the Cray-3 to market. And that machine is likely to survive competitive onslaughts for a few short years, at best.

Actually, the slide rule doesn't do floating-point operations. It just finds a few significant digits, leaving the placement of the decimal point to "wetware" — what the scientists among us call the user's brain.

No one really knows how fast that is, but one estimate says the brain computes at 10 trillion operations per second. (The brains of people like Napier and Cray presumably do a bit better than that.)

At 10 teraops, the brain is faster than today's best supers by a factor of 10,000. Not bad for a device that uses neither superconductivity nor gallium arsenide.

Anthes is Computerworld's Washington, D.C., correspondent.

Apparel maker moves to Wang systems

ON SITE

BY SALLY CUSACK
CW STAFF

COLFAX, La. — When Ditto Apparel of California, Inc., replaced two aging IBM System/34s with three Wang Laboratories, Inc. VS 5000 computers last January, it ushered in a different generation of automation for its piecework inventory process.

According to Cecil Holden, Ditto's controller, the VS 5000 will generate a bar-coded ticket that will be issued to individual pieceworkers — employees who get paid on a per-piece, per-day basis. Within the apparel industry, the term "piece goods" refers to the material itself, while "goods and trim inventory" denotes buttons, ribbons, zippers and other accoutrements.

The piecework payroll was previously done manually by payroll clerks, Holden said, with the number of pieces multiplied by the pay rate to calculate the individual's earnings for the day. The final numbers were then keypunched into the System/34.

"What we're doing is upgrading the software to generate bar codes that will capture payroll calculations on a daily basis," Holden said. "The payroll clerk will be able to read the bar code data via the VS 5000, and all other production cycle information will reside on the system as well." The systems also are used to automate production control, raw materials inventory and costing system functions.

The apparel maker is the U.S. manufacturing arm of Jordache, Inc., the New York-based clothing and design company widely recognized for its label on blue jeans. Ditto has four plants in Louisiana and one in Texas. With a total of 1,800 pieceworkers on its payroll and shipments of $65 million last year, Ditto wanted to maintain better control of its manufacturing process by moving to an automated production planning system.

Ditto has plans to link three of the sites — the Colfax headquarters, another Louisiana plant and the Texas facility — together for a more streamlined approach to data collection and analysis. Four sites in Louisiana and one facility in Texas are currently running Wang equipment, connected via 9.6K bit/sec. leased lines.

The company conducted an in-house analysis earlier this year and contracted Coopers & Lybrand to help with the study. "We needed an objective third-party view," Holden said. "The software really drove the hardware purchase. We decided we needed a good, integrated management and manufacturing planning package to meet our needs specific to the apparel business."

The criteria included a product that could control all aspects of inventory from the raw material purchase to the finished product, and Holden and his staff evaluated 30 various software packages before deciding on the AIC Apparel Production system, a package from Centennial Computer Services, Inc., an Atlanta-based software house and an authorized Wang value-added reseller.

The AIC package was written by Advanced Intelligence Corp. in Los Angeles and provides applications for sewn-goods manufacturing and importing, accounting, warehousing and shipping, as well as shop floor control and factory management.

The decision to use the Wang equipment was based on price/performance considerations, and while the payroll portion of the software runs across multiple platforms, the inventory and costing programs are based on Wang systems.

Somewhere in the middle

Holden noted that Wang was not the "highest priced bidder, but it wasn't the lowest, either." He indicated that the company invested about $500,000 into the system and said he feels the cost will be justified in reduced personnel requirements in payroll handling. "It will also give us a quicker, better response time for customer inquiries," he said.

In addition, Holden said that the vendor's ability to service the machines was taken into consideration. Colfax is located in the middle of the state, 4½ hours from New Orleans and two hours from Freeport, where the nearest major airport is located.

The response to date? So far, so good. "We had Wang out for the installation, and other than one or two calls generated by people operating the system, that was it," Holden said. The company has apparently encountered no problems with the hardware itself, and the software has required only a few minor adjustments. Ditto plans to put all production cycle data on the Wang machines.

The company also has plans to install a Wang imaging system this fall to orchestrate and implement the division's design and illustration needs. These are typically specification sheet items, such as pants and a shirt, that could be visually depicted in an on-line environment prior to full production to correct errors or miscalculations.

And the IBM System/34s? "I guess we're gonna try and sell 'em," Holden said. "Got any ideas?"

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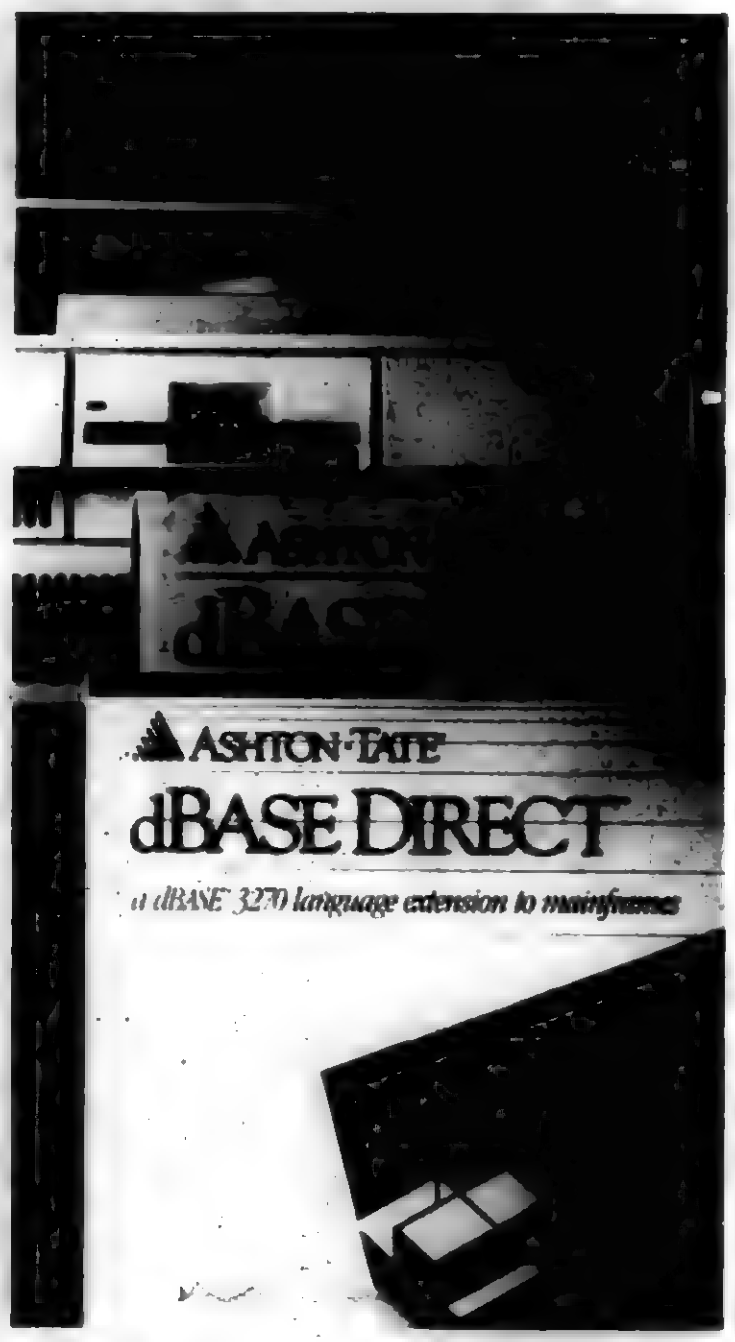

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NEW PRODUCTS — SOFTWARE

System software

Software Pursuits, Inc. has announced VM/XRM, a VM extended real memory product that enables users of VSE guest machines running under VM/SP to use more than 16M bytes of memory without having to use VM/HPO or VM/XA.

The product includes Software Pursuits' VSE/XRM and MVT/XRM products, both of which provide up to 64M bytes of memory.

Pricing for perpetual licenses ranges from $25,000 to $42,000, depending on CPU size.

Software Pursuits
1420 Harbor Bay Pkwy.
Alameda, Calif. 94501
(415) 769-4900

Database management systems

Automated Technology Associates has announced Atabase Revision 4.2, a real-time, entity-relation database for operations-driven applications.

Client/server software enables users to perform distributed database applications processing, and a report generator allows users to make database queries and access information by using standard SQL commands, the company said.

The product is available for the Hewlett-Packard Co. HP 9000, 800 and 300 series of minicomputers and Digital Equipment Corp. VAX systems.

Pricing ranges from $7,500 to $22,500, depending on CPU size.

Automated Technology
9000 Keystone Crossing
Indianapolis, Ind. 46240
(317) 573-9000

Allen Systems Group, Inc. has announced Release 4.0 of Fast/Access, a tool that reduces the time needed to perform I/O on a Computer Associates International, Inc. IDMS database.

The product operates under MVS/SP, MVS/XA and MVS/ESA and can be applied at job, job-step or file levels. It can be installed in less than one hour without requiring an IPL or any changes to application code, the vendor said.

Perpetual license fees range from $14,600 to $95,000, depending on CPU size and type of group.

Allen Systems
750 11th St. S.
Naples, Fla. 33940
(813) 263-6700

Development tools

XA Systems Corp. has added a data file compare facility to Data-Expert, a data manipulation tool used for testing and maintenance of IBM mainframe-based applications.

The new feature enables programmers to compare data sets of any file organization against any other, including IBM's VSAM or Sequential. Cobol or PL/1 record layouts are used to help users define selection and comparison criteria for two data files.

The product is available for $42,000.

XA Systems
983 University Ave.
Los Gatos, Calif. 95030
(408) 395-1800

Telesoft has announced two Ada software tools designed to facilitate embedded systems development.

Tele-Ada Link and Tele-Ada Kit work in conjunction with the Telegen 2 Ada Development System to enable programmers to produce code on Sun Microsystems, Inc. systems or Digital Equipment Corp. VAX hosts.

Tele-Ada Link costs between $2,500 and $20,500, and Tele-Ada Kit is priced between $8,000 and $64,600. Pricing is based on system configuration.

Telesoft
5959 Cornerstone West
San Diego, Calif. 92121
(619) 457-2700

Magec Software has introduced Release 2.3 of its automated Cobol development system.

The Magec Integrated Systems Environment has been enhanced with domain definitions. Domains are global data definition models that assist data administrators in standardizing definitions of various types of data.

Magec supports IBM and compatible mainframes operating under MVS, VSE and VM/CMS with CICS and other database management systems. Pricing ranges from $1,000 to $200,000, depending on CPU and type of operating system used.

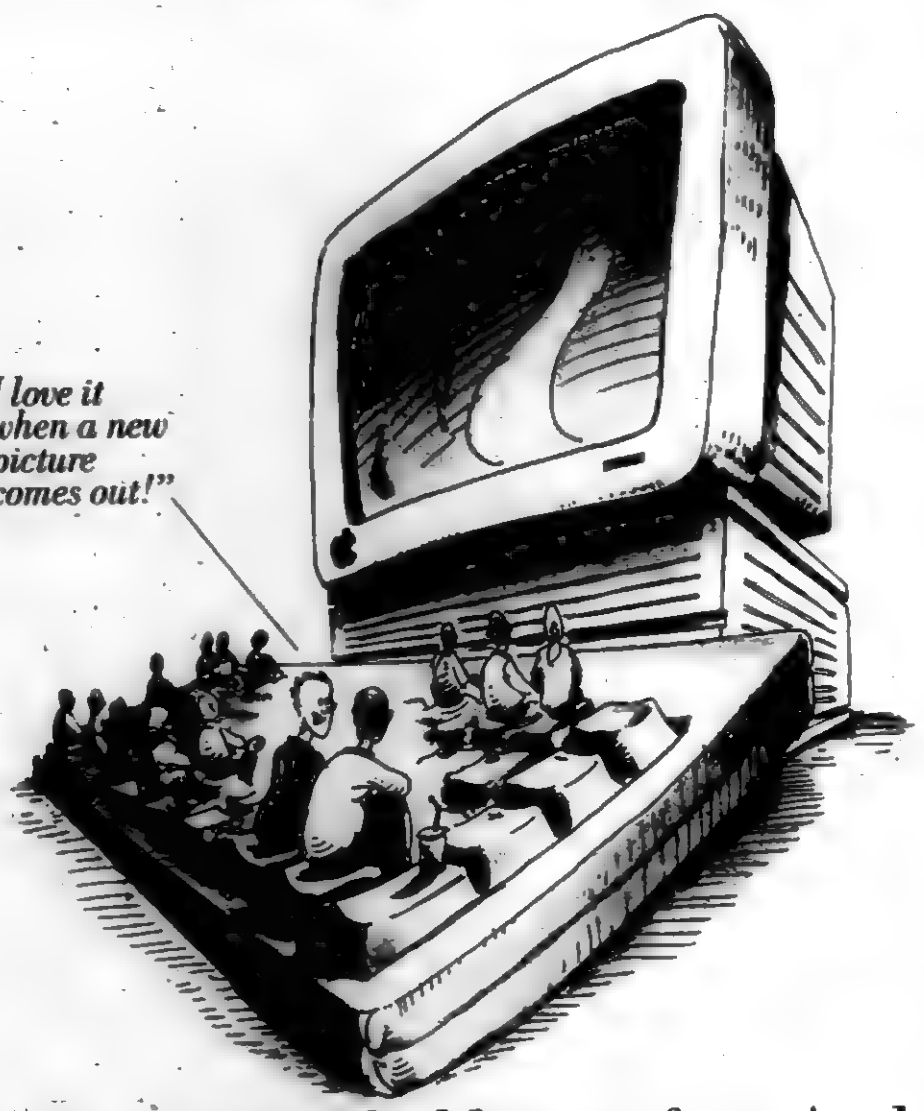
Magec Software
P.O. Box 260319
Plano, Texas 75026
(800) 336-2432

Applications packages

Systems Union, Inc. has announced Sun-Account Version 3.4 of its international financial management software package designed for North American corporations with overseas offices.

The product runs on single-user, multiuser and networked environments, including personal computers, PC-based local-area networks, Digital Equipment Corp. VAXs and Unix-based systems. It includes features for handling the Federal

Continued on page 44



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Continued from page 42

Accounting Standards Board's 52 and 89 accounting requirements.

Prices for site licenses range from $3,500 to $100,000, depending on CPU size, type of operating system and number of users.

Systems Union
244 E. 48th St.
New York, N.Y. 10017
(212) 753-7777

Access Technology, Inc. has announced Release 2.1 of its Vivid Presentation Graphics software package for Digital Equipment Corp. VAX/VMS computers.

The package includes an extensive business-oriented clip-art library of more than 50 images and complete support for color Postscript printing devices. The latter feature enables users to preview color output to printing devices in what-you-see-is-what-you-get formats.

Prices range from $800 for a Vaxstation version to $20,000 for a VAX 8000 version. An additional clip-art package containing 540 images per series costs $150 for Vaxstations and $850 for VAX 8000 machines.

Access Technology
2 Natick Executive Park
Natick, Mass. 01760
(508) 655-9191

The SAS Institute, Inc. has announced plans to allow users of Digital Equipment Corp.'s All-In-1 to be linked with its SAS Applications System.

The connection enables users of any DEC VAX to run applications based on Version 6.0 of SAS under DEC's VMS operating system while remaining in the All-In-1 environment. First-year annual license fees range from $1,900 to $15,700, depending on CPU size.

SAS Institute
P.O. Box 8000
SAS Circle
Cary, N.C. 27512
(919) 677-8000

Software Engineering of America, Inc. has announced Release 3.2 of its Operator Dynamic Dialog Subsystem, an enhanced version of its rules-based system designed to facilitate operations console message management in IBM MVS environments.

Release 3.2 includes VTAM applications and data set allocation monitoring, compatibility with IBM's TSO REXX and TSO CLIST calls and the ability to read and write records in user-defined data sets.

The product is priced from $14,700 to $24,500.

Software Engineering of America
2001 Marcus Ave.
Lake Success, N.Y. 11042
(516) 328-7000

Unisys Corp. has announced features that will be included with Release 90.01 of its PALS Library Management System, which is scheduled to be available in the first quarter of 1991.

An authority control module will provide users with on-line access to machine-readable catalogue (Marc) authority records and automated authority checking. A Marc editor lets users download, correct and upload PALS database records, the company said.

The product runs on Unisys' 1100 and 2200 series mainframe systems. Prices range from $12,000 to $22,000, depending on type of platform.

Unisys
P.O. Box 500
Blue Bell, Pa. 19424
(215) 986-2243

PDS, Inc. has added a version of its Human Resource Manager to its Financial Software and Personnel/Payroll system.

The system was designed to operate on IBM Application System/400 machines. It can be installed as a complete payroll, personnel and benefits system, or any of the three modules may be used independently, the vendor said.

Prices range from $30,000 to $75,000, depending on CPU and size of employee database.

PDS
Meetinghouse Business Center
2240 Butler Pike
Plymouth Meeting, Pa. 19462
(215) 828-4294

Keyword Office Technologies Ltd. has announced a document interchange software application package designed for Unix systems.

Keypak (Unix) allows revisable document exchange and information sharing among users of different Unix-based systems, document editors, electronic mail systems or workstations.

The product is packaged in three configurations: Base, Wppak and Cwppak. Workstation license fees range from $300 to $1,500. System licenses cost between $300 and $13,000. Prices depend on configuration and type of license.

Keyword Office Technologies
2816 11th St. N.E.
Calgary, Alta., Canada T2E 7S7
(403) 250-1770

Dynasoft Corp. has announced Version 4.0 of Dynaplan, its spreadsheet software package that supports IBM MVS and VM operating systems. It features prefix commands that facilitate the changing of spreadsheet fields. It also enables multiple graphs to appear on a single screen.

Prices range from $4,000 to $35,000, depending on CPU size.

Dynasoft
6300 N. River Road
Rosemont, Ill. 60018
(708) 696-4440

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NEW PRODUCTS — SYSTEMS

I/O devices

Cyberchron Corp. has announced 16- and 19-in. color monitors designed for use in adverse environmental conditions.

The CRM-16 and CRM-19 feature screens with 1,280- by 1,024-pixel resolution and a wide-bandwidth video amplifier that delivers fine-grain video images.

Prices for both models range from $7,000 to $10,000, depending on quantity and number of options purchased.

Cyberchron
P.O. Box 160
U.S. Route 9
Cold Spring, N.Y. 10516
(914) 265-3700

Precision Image Corp. has introduced two monochrome electrostatic plotters that feature a drive system designed to provide accuracy of .005%.

The M124 D-size power plotter, which costs $29,900, and the M136 E-size, which costs $33,900, incorporate a proprietary drum-based technology that holds material tightly in place with a vacuum seal to prevent shrinkage and stretching caused by humidity or tension variations, the vendor said.

The plotters can be operated from any mainframe, minicomputer or microcomputer equipped with standard hardware and software.

Precision Image
501 Chesapeake Drive
Redwood City, Calif. 94063
(415) 366-8900

Visual Technology, Inc. has introduced an X Window System-based gray-scale display station designed for office automation and manufacturing environments.

The Visual X-15 Turbo X Display Station includes a 20-MHz Motorola, Inc. MC68020 processor, 2M bytes of dynamic random-access memory and a 15-in. landscape display that features 1,152- by 900-pixel resolution at a 70Hz refresh rate.

The product is available 30 days after receipt of order. Prices begin at $2,975 for a unit with 2M bytes of RAM and a gray-scale monitor.

Visual Technology
120 Flanders Road
Westboro, Mass. 01581
(508) 836-4400

Laser Design, Inc. has introduced Datasculpt, a three-dimensional scan data editing software package designed for use with its Surveyor laser digitizing systems and other computer-aided design and manufacturing (CAD/CAM) environments.

The product enables users to graphically manipulate coordinate-scan data of models for CAD/CAM applications. It can be used on IBM systems equipped with an Intel Corp. 80386 processor or Unix-based Silicon Graphics, Inc. workstations. The system is priced at $9,500.

Laser Design
9401 James Ave. S.
Minneapolis, Minn. 55431
(612) 884-9648

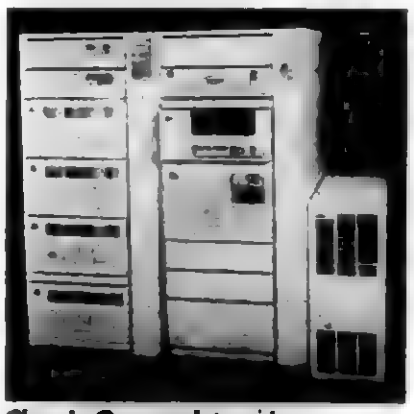
Power supplies

Clary Corp. has announced an on-line 5-kVA uninterruptible power supply designed for IBM Application System/400 machines.

The Onguard Series 40D provides eight to 25 minutes of on-line, sine wave power for up to three racks of an AS/400. Its RS-232 interface reportedly ensures automatic shutdowns during utility failures. The product also sustains power during extended brownouts while saving battery backup for the file server in case of a blackout, the vendor said.

The Onguard Series 40D is priced at $10,950.

Clary Corp.
320 W. Clary Ave.
San Gabriel, Calif. 91776
(818) 287-6111



Clary's Onguard *provides emergency power for an AS/400*

Liebert Corp. has announced a line of uninterruptible power supplies (UPS) that are designed for use with midrange systems.

The Series 300 UPS provides continuous power to midrange computers such as IBM's Application System/400, telecommunications equipment and other sensitive electronic devices, according to the company.

The products are available in 10- to 125-kVA models. Prices range from $17,500 to $51,700, depending on kVA capacity.

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IDC WHITE PAPER

Image Management Systems

IMAGE MANAGEMENT SYSTEMS

EXECUTIVE SUMMARY

With corporate icons such as American Express Co., Citicorp and Federal Express Corp. realizing savings of 20% and more through the use of image management systems, widespread use of the technology seems likely to occur in the near future.

While some of the best known applications include processing checks and credit card receipts, image systems are also specifically designed for engineering drawings, mapping systems and general business forms. They coexist with other complementary technologies such as optical character recognition (OCR), microform – microfiche and microfilm – and electronic data interchange.

Dating back to the late '60s, image management systems were originally designed to make paper documents available for on-line display and retrieval. As the systems evolved, however, that philosophy gave way to the currently accepted concept of automating the entire paper handling process.

Beginning with Wang's entry in 1987, the major systems vendors started rapidly lining up behind image systems. Unisys Corp., IBM, Digital Equipment Corp., Hewlett Packard Co. and NCR Corp. have joined this segment of the market. Another company, FileNet Corp., played a pioneering role in developing turnkey image systems.

The third party market has also blossomed. These vendors can customize basic systems for a particular application, concentrate on one part of the system, such as OCR, or provide the components of the system platform. This flexibility has attracted the attention of the major systems vendors, many of whom have signed deals with multiple third party firms.

Image systems will continue to stimulate the development of computer technology as they force users to upgrade their management systems.

IDC stresses the competitive advantages to be gained from image management system implementation and urges users to investigate their promise and invest in their use.

IMAGE MANAGEMENT SYSTEMS

AN IDC WHITE PAPER FOR INFORMATION SYSTEMS MANAGEMENT

INTRODUCTION: WHAT IMAGE MANAGEMENT SYSTEMS CAN DO FOR YOU

HOW IMAGE SYSTEMS WORK
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- Indexing
- System Performance

A BRIEF HISTORY OF THE IMAGE MANAGEMENT SYSTEMS INDUSTRY
- Microform Moves Aside
- The Software Evolution

TYPES OF IMAGE SYSTEMS
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- Engineering Drawing Systems
- Mapping Systems

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- Microform
- Electronic Data Interchange

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- Why are Image Systems Strategic?
- High-Value Applications
- The American Express Paradigm
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- Digitizing Documents at the Earliest Possible Point
- Electronic Routing
- Digitization
- Reducing Data Entry Errors
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- Eliminating "Knowledge-based Downtime"

THE SYSTEMS VENDORS

THE ROLE OF THIRD PARTIES

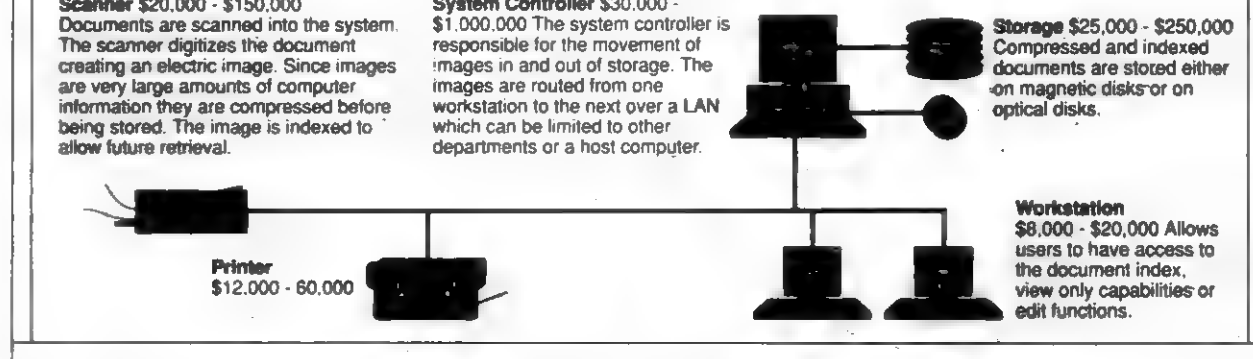
A USER'S GUIDE TO THE MOST COMMON MISTAKES

TRENDS AND ISSUES
- Standards
- Future Technological Developments

IMAGE MANAGEMENT SYSTEMS

THE GREAT TECHNOLOGICAL QUEST FOR THE MYTHICAL PAPERLESS OFFICE MAY FINALLY BE LAID TO REST. IMAGE MANAGEMENT SYSTEMS HAVE COME NOT TO SLAY THE PAPER BEAST BUT TO TAME IT. ALLIED WITH ON-LINE TRANSACTION PROCESSING, RECORD MANAGEMENT AND OTHER OFFICE SYSTEM TECHNOLOGIES, IMAGING WILL IRREVERSIBLY CHANGE THE NATURE OF THE WHITE-COLLAR WORKPLACE. ■ TO DATE, IMAGE SYSTEMS HAVE DELIVERED PRODUCTIVITY GAINS EXCEEDING 20% AND PROVIDED SIGNIFICANT COMPETITIVE ADVANTAGES TO COMPANIES SUCH AS AMERICAN EXPRESS CO., CITICORP, FEDERAL EXPRESS CORP. AND CONSOLIDATED FREIGHT. ■ IMAGE MANAGEMENT SYSTEMS AND IMAGE PRO-

Image management systems components



A typical image management system may range in price from $95,000 to $1,285,060 depending on configuration.

cessing are the two most common terms used to describe a system that allows users to digitize a business document and move the image of that document from one workstation to the next for more effective processing. This technology is easy to use but requires careful planning if its potential is to be fully realized. This paper will show how users who implement their systems wisely reap the many benefits they offer.

And those benefits are extensive. They range from reducing data entry errors, to streamlining information flows within organizations, to reducing physical storage space. In the digital world of image management systems, users can greatly increase the speed and efficiency of processing a wide variety of documents, including checks, credit card statements and insurance policies, to name but a few.

Just as there is a wealth of applications, there is also a variety of systems that run them. Although general business documents like job applications and item processing documents like checks come to mind first, there are also systems dedicated to engineering drawings and mapping applications. The common thread that links them is their ability to allow people to work faster and better.

Like so many computer-based technologies, image management systems date back to the mid-1960s. Those early systems gave way to more modern analog systems in 1978 and their digital successors debuted in 1982. Now major systems vendors and third party firms are combining their skills to offer the most advanced products - products that can have a direct impact on the tens of billions of dollars businesses spend on paper-based systems every year.

Although the worldwide market for image management systems has been slow to grow, IDC predicts it will reach $25 to $35 billion by the late '90s. By that time, the need for data entry, which is arduous and error-prone, will have diminished dramatically.

There are two prominent misconceptions about image management systems. The first is that they portend the end of paper-based offices. This is not the case. What they offer is a more streamlined work flow for paper-based offices. The second misconception is that image management technology is the same as optical disk technology. This is also wrong. Optical disk technology is an enabling storage technology for image management systems and as such only a subset.

This discussion of image management systems provides the reader with an understanding of how image management systems work, their history, the various types of systems and high-value applications. It also describes system functions and benefits, the roles of vendors, the most common user mistakes, standards and future technological developments.

HOW IMAGE SYSTEMS WORK

In terms of hardware, an image management system is normally composed of a combination of scanners, workstations, servers, storage and printers in a network. Basic software includes a database management system for image indexing and software to run each of the hardware components. Depending upon the specific application requirements, some vendors also offer a microfilm camera and microfilm storage as an option.

In a typical system, a general business document is fed into the scanner much in the same way documents are used with copier and facsimile machines. The scanner then reduces the document to a series of 1s —commonly refered to as on-bits—to a dark area of the document or 0s—to a white portion of the document.

As a result, the image appears to the computer as an unintelligible series of bits. The computer can't search for a specific word or phrase since the document is an image as opposed to a text file. Therefore, to retrieve the image, users have to assign specific index information, either manually or automatically, so the computer can identify it.

A data compression process ignores white space between letters and stores the dots comprising them. Depending on the compression technique used, this reduces the number of bits stored to a range from 15-to-1 to 50-to-1. Despite the use of advanced compression techniques, a bit-mapped image can consume 500K bytes or more. As a result image management system users frequently require very large amounts of computer storage, storage which can be relatively economical when based on optical disk. Magnetic disk storage costs $8 per megabyte, while optical-disk storage costs only $1 per megabyte.

If users want to retrieve a document they enter index information into their workstations. The workstations send that information to a database management server, which in turn relays the request to the storage portion of the system. When the request is fulfilled, the images are sent back over the network to the user workstation. Finally, the image of the document is decompressed before it is displayed on the workstation screen.

Scanners

There is a broad range of scanners to meet the demand for multiple applications. They offer varying rates of resolution. The resolution of a scanner is the clarity or level of definition provided for the scanned image. This is generally defined as dots per inch; each dot is called a pixel. The majority of scanners use 200-, 240- or 300 dot/in. In order to increase resolution, scanning time, image size and required storage must also be increased. The amount of processing power required to decompress and compress the image also grows.

The major vendors selling the scanners do not usually manufacture them. As a result, many scanner interfaces are incompatible with their counterparts from other companies. This means vendors must write specific software drivers for almost every scanner they support. Because this is time-consuming and expensive, vendors limit the number of scanners they support.

Of all the components in a system, scanners have the highest rate of failure. IDC recommends that users have a backup scanner available at all times. Users should also specify in the purchase contract the time in hours it will take the vendor to repair the original or install the backup.

Indexing

Indexing is critical to image management systems and one of their biggest benefits. In paper-based systems, indexing is generally limited to one field, e.g., the notation tab of a file folder. Image management systems are more flexible, allowing multiple methods of retrieval, e.g., by name, account number, date of application, etc. Each additional index field offers another way to access a document. However, this increased accessibility also increases the amount of manual keying required to enter the document into the system. Further, more index fields add to the total index size, increasing general system overhead.

System Performance

Although, as mentioned, a scanned image may range in size up to 500K bytes or more, conventional computer architectures are designed to handle 4K bytes and smaller blocks of data. This inconsistency has made it very difficult to blend display technology, workstations, networks, DBMSs and storage in an eloquent form, and has slowed product development.

Image management system performance is difficult to assess on a general basis. Because there are many individual factors that affect performance, it should only be judged on an application-by-application basis.

A BRIEF HISTORY OF THE IMAGE MANAGEMENT SYSTEMS INDUSTRY

The image management systems industry was initially pioneered by system integrators such as Litton Integrated Automation and TRW Financial Systems.All the early market factors created an ideal environment for systems integrators. The technology was strategic for many large U.S. corporations, the applications were unique from one industry to the next, the technology was generally unavailable and system requirements were substantially different from one company to the next.

During the late '70s and early '80s, the integrators managed to install relatively dramatic demonstrations of the technology at companies such as Federal Express, Emery Air Freight and Boeing. The focus of the integrators was on basic hardware and software capabilities for scanning images, displaying them effectively and integrating leading-edge components. These early systems were designed to make "paper" documents available for on-line display and retrieval, as opposed to automating the entire paper process.

Meanwhile, the traditional vendors of microfilm products such as Eastman Kodak, Bell & Howell and 3M feared that as the price of storage fell, many companies would bypass microfilm and elect to store their records on a more accessible on-line medium such as optical disk. It was from this defensive posture that all three companies began investing substantial resources in developing image systems—systems that largely mimicked their existing products but replaced microfilm and microfiche with optical disk technology.

Microform Moves Aside

This represented an historic transition, as microfilm and microfiche—together known as microform—had been time-tested and economical archival methods for more than 25 years.

The vital point is, once a document has reached the records management area, all active processing has already been accomplished. Records management exists because legal or business requirements demand some documents be maintained for extensive periods of time, e.g., 30 years for a typical mortgage. Some government records must be saved for as long as 100 years. Retrieval rates vary depending on the type of application. Microfilm is the least expensive storage medium for central repositories of documents that have completed the processing cycle and are not likely to be retrieved soon or often.

The first company to realize just how far-reaching document processing technology could be was formed in the early '80s. FileNet Corp. introduced the first turnkey image management system in 1984, a system that featured optical disk storage with gigabyte capacity. It followed up with a workflow software package. The optical disk storage was a new way to digitize business information—95% of which still exists on paper despite the advancements of the computer age and office automation. But, FileNet said at the time, paper was still the most appropriate storage medium for the vast majority of information. It felt the best way to process that paper was with workflow software, which automatically moves data from one processing step to the next.

The Software Evolution

Today, work-in-progress software has built on the base of workflow software and become a key element in image management systems. This software is designed to automatically reactivate processing when previously missing information becomes available.

As a current example, a major U.S. oil company spent several months reviewing its accounts payable application and determined that adding image capabilities would produce tremendous savings in data entry, ease of access to original documents and increased specialization in processing accounts.

At that time, the average cost of processing a transaction, including all hardware and software, was less than $20. This was in an environment where necessary documentation was not always available for processing. This meant the process frequently bogged down while additional documentation needed to complete the transaction was located.

The cost of processing these transactions with missing documents was almost eight times higher than a straightforward transaction. A simple calculation revealed that almost 60% of the oil company's accounting department costs were contained in the management of these accounts. Simply put, the cost of work in progress was killing them. And this company had the most sophisticated IBM mainframe available and a multi-million dollar investment in accounting software.

By adding an image management system with excellent work-in-progress software, the oil company was able to reduce its transaction processing costs by almost 30%

IMAGING: THE BIG PICTURE

Flexibility and business vision will shape imaging in the 1990s.

Did you know that if you loaded all the documentation relating to a Boeing 747 – all the designs, the mechanical drawings, the operations manual and so forth – onto an actual 747, the plane wouldn't be able to get off the ground? The sheer weight of the paper – some 450,000 pounds – would well exceed the maximum allowable load.

That's essentially what is happening in the business world today: Companies and governments are being weighed down by paper. All too often, they find themselves having to manage thousands, even millions, of new documents each year. As a result, they spend vast amounts of time and money simply shuffling the paper needed to support their business activities.

Imaging Relieves the Paper-Processing Bottleneck

Imaging technology has reached the point where we can cost-effectively relieve that paper-processing bottleneck and automate those areas of the workplace that heretofore couldn't be automated. In spite of the proliferation of computers in recent years, only about 1% of all corporate information is managed with computers. Nearly all the rest is on paper. So we really haven't eliminated a lot of paper; in many cases, we've only created more. While computerization has certainly streamlined many business processes, it has for the most part simply automated existing operations – "paving the cow path," one wit has called it. Imaging, though, allows us to go beyond that and put paper-based business information online.

Unisys: A Leader in the New World of Imaging

Unisys is committed to being a leader in this new world of imaging. Over the past year, we have established cooperative agreements with many of the industry's leading imaging vendors – companies such as FileNet, Sigma Imaging Systems and Access – and we will continue to pursue such agreements with other innovative companies. We feel that this adds value to the systems we offer our customers and allows us to address their information management needs completely.

In mid-1989, we established a Corporate Imaging Office to coordinate the various activities within our imaging program. Known as InfoImage, this program is based on the concept that electronic imaging is much more than the ability to serve up pictures of documents. Rather, it's a whole new dimension in information management that can lower costs, speed up the delivery of visual information, improve customer service and, most important, enhance decision-making and management processes.

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The InfoImage Suite of Solutions

In the fall of 1989, Unisys became the first major vendor with a full-scale imaging solution on the general market with the announcement of two imaging products: InfoImage IIPS (Image Item Processing System), which addresses the banking industry's need to handle a growing volume of paper checks; and InfoImage EDMS (Engineering Document Management System), which is designed to help manage the drawings and other visual information used by manufacturers, utilities and large facilities. More recently, we announced InfoImage Folder, a system that enables companies to manage related documents in electronic "file folders," routing them to the appropriate people for action and tracking work progress.

In the coming months, our InfoImage suite of solutions will expand with the release of new products.

A Modular Approach to Grow With Evolving Technology

In developing our InfoImage products, we've chosen to rely on nonproprietary, open systems and to build our products around industry standards as much as possible. What's more, we've taken a modular, building-block approach with our imaging systems. This ensures that these systems can grow easily as a company's imaging needs grow, and that a business won't be locked out of future technological developments – an improvement in optical storage, for instance, could be easily incorporated without having to scrap an entire system.

We recognize that imaging is an evolving technology, and we believe that this modular approach, along with our commitment to open systems, means that our imaging customers will have the flexibility to keep up with change, whether it's in information systems or the business environment.

Integrated Image-Enabled Information Systems

Underlying our InfoImage program is the philosophy that imaging should not be viewed and treated as an isolated, separate technology. It is really a tool to manage information, and to be most effective in an organization, it must interact with the other tools that manage information. That means integrating imaging into the overall information system.

In short, we feel that it is important to offer image-enabled information management solutions. Our technical expertise, combined with our long history of working closely with customers in government, manufacturing, banking and virtually every other industry, puts us in a good position to provide integrated systems tailored to a company's specific needs.

The Unlimited Potential of Imaging

We believe that the imaging marketplace will rapidly evolve over the next five years – and Unisys expects to be an integral part of it. As imaging is incorporated into traditional information systems – and indeed becomes a fundamental part of data processing – we'll see a whole new element added to the management of information.

Companies, of course, will be able to store and retrieve information more efficiently than ever before. But while the immediate benefits of imaging – the cutting of costs and the improvement of customer service – are already well documented, the long-range benefits and usefulness will undoubtedly go far beyond that. Once you get an appreciation of this technology, every time you turn around you'll see another use for it. And the fact is, nobody really knows what the real potential of imaging is, in terms of new products, new services, even new kinds of businesses. As one report recently pointed out, "the book on imaging has not yet been written." With InfoImage, we'll be working with customers to do just that, and explore the vast potential of imaging as we move into the 1990s.

UNISYS

We make it happen

while decreasing data entry errors by 25%. It also gained the less tangible benefits of improving supplier relationships and reducing finance charges.

TYPES OF IMAGE SYSTEMS

There are four generic image management system types. Each is based on document size and other factors relevant to the information. The size is important because it impacts the type of input and output peripherals, workstation needs and many basic architectural considerations.

General Business Systems

These systems vary depending on whether they are oriented toward transaction processing or a central repository function. In a transaction processing environment, image management systems improve the economics of managing the active life cycle of the document. In a central repository, the goal is to store vast quantities of images over a prolonged period of time.

Item Processing Systems

Item processing is a unique form of image management due to the small size of the documents and the very high scanner throughput required when processing them. For example, many banks process hundreds of thousands of checks daily within short periods of time, and the entire U.S. banking industry will process approximately 50 billion checks in 1990 at an average cost of five cents per check. Image management systems can increase processing throughput by 20 to 30% over previous systems. When this increased throughput is coupled with the decreased processing costs offered by image management systems, banks plainly benefit.

Engineering Drawing Systems

Engineering drawings may depict complex, two-dimensional product specifications or design plans for a simple bolt. Some of these drawings are up to 100 feet long or longer. They require special-width scanners and plotters in conjunction with specialized drawing software. Although many engineering companies employ CAD/CAM systems to create and manipulate drawings, those systems are not able to convert the massive base of paper drawings that currently exist. Image management systems can act as a bridge between these two environments by electronically converting the paper drawings and storing them in digital databases.

Mapping Systems

Mapping systems are typically used to manage land use by government agencies. They can be used to assess tax bases by depicting the amount of available land, the number of buildings on the land and the number of new buildings the open land will allow. Mapping systems can also depict gas mains and underground wiring that may be impacted by construction. They need color and graphic capabilities as well as compatibility with dissimilar systems at other government agencies. The Italian government, which rents many buildings and offices to its citizens, is currently using mapping image management systems to measure the floor space in these buildings in order to assess taxes on their use.

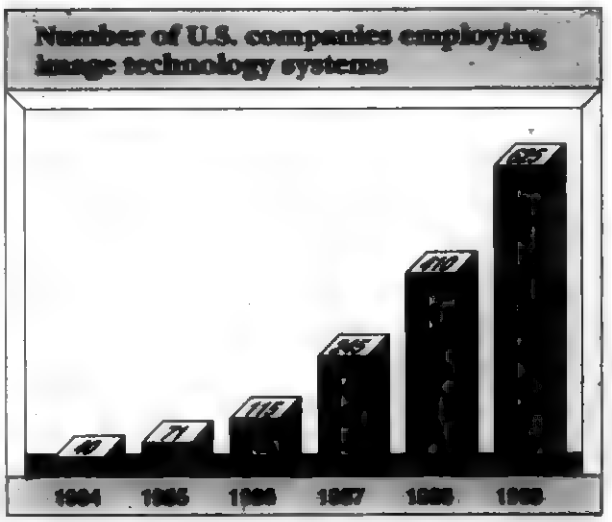


Image management systems have enjoyed rapid growth in the U.S.

COMPLEMENTARY TECHNOLOGIES

Image management systems must coexist with other technologies such as optical character recognition (OCR), microform and electronic data interchange (EDI).

Optical Character Recognition

OCR is an alternative to manually indexing a document as required with image management systems. OCR views the dark and light areas around a specific letter and interprets, for example, a T from a P. It is important for users to realize that the OCR function takes processing time and specific software. The decision to manually index documents or use OCR depends on the application under consideration. OCR is most useful on structured documents such as business forms.

Microform

The two components of microform microfilm and microfiche, are the mos cost-effective methods for storing inac tive documents on a long-term basis However, they are not appropriate fo companies that can't tolerate a long out of-file time, or for situations where docu ments may need to be accessed fo active processing or reference.

Electronic Data Interchange

Electronic data interchange (EDI) is pri marily used to transmit and receive busi ness documents, such as orders and bills between manufacturers and sup pliers, according to predefined electronic formats. EDI works well in established customer supplier relationships in which both parties have approximately the same level of automation The problem with EDI is, the great majority of business com munication involves users who either can't utilize EDI because of the incompatible software and standards, or simply need more capabilities than EDI can provide. In these situations imaging is appropriate.

VALUE, FUNCTIONS AND BENEFITS OF IMAGING

Why are Image Systems Strategic?

Image management systems are strategic because they give users a competitive edge. They effectively allow companies to implement improve ments in management controls, reduce transaction costs and differentiate them selves from the competition—the mos compelling reason of all for investing human and financial resources.

High-Value Applications

IDC refers to applications in which image management systems can provide a high return on investment as high-value applications.

Banks are obvious prospective users High-value banking applications are check processing, mortgage loan processing mortgage loan servicing, credit-card appli cation processing, consumer loans IRAs/Keoghs, international trade finance international funds transfer, trust and stock ownership transfers. Of all these, IDC believes check processing, an industry in its own right, holds the most promise.

The high-value applications for image management systems in insurance are

underwriting, claims processing and investment management. In the pharmaceutical industry, image management systems show a high rate of return in case report form applications, regulatory affairs and medical libraries. Many high-value applications occur at the departmental level.

The American Express Paradigm

In its push to become the preeminent vendor of credit card services, American Express has been in the vanguard of image management system implementation. Now entering the fourth phase of its image management project, the company has leveraged its two-year lead in image implementation to enhance its statement printing operation and in so doing, differentiate its products from the competition's. The company's new monthly billing statement that depicts an image of each individual transaction is a good example. It has reduced its billing costs 25% and is working to reduce the amount of keying and, therefore, the number of data entry errors. The net effect of all this will be twofold: American Express will have the lowest costs and offer the most services.

Key Functions and Benefits

One key to successful image management system implementation is understanding its functions and benefits, for there are many of both. When functions and benefits are fully realized, users will save money, increase productivity and more efficiently utilize personnel. The first step in understanding functions and benefits is understanding how documents flow in and out of companies.

Organizations are required to process two general types of information—external and internal. It is very difficult to control the form of incoming external information. Examples of external information include credit-card applications, mortgage loan applications, insurance applications, checks, requests for new drivers licenses or replacement birth certificates.

Internal information includes such items as sales reports, memos and production information. Controlling how it is created, disseminated and finally stored is easier than controlling external information. This control is being enhanced by the advent of increasingly standardized systems and more effective methods of document exchange.

Because there are so many nuances in implementing image management systems, the benefits and system design issues vary tremendously, depending on the particular application. Notwithstanding these industry and application differences, image management systems represent the best way to process external information. Building on that attribute, image management systems offer the following functions and benefits:

Digitizing Documents at the Earliest Possible Point

Mail rooms are the main points of entry for external information, and as such, likely candidates for image management systems. Managing the mail room has become an enormous challenge for large companies. In fact, many companies hire outside services to manage their mail operations, in the same way some data centers are managed. The reasons are simple: While the cost of the mail room was once assigned to general company overhead, more and more companies are trying to charge back departments for these services. Also, companies are trying to realize economies of scale.

Image management systems can reduce the sorting process and provide cost reporting and charging. Users benefit by capturing information at the first point of entry into the organization.

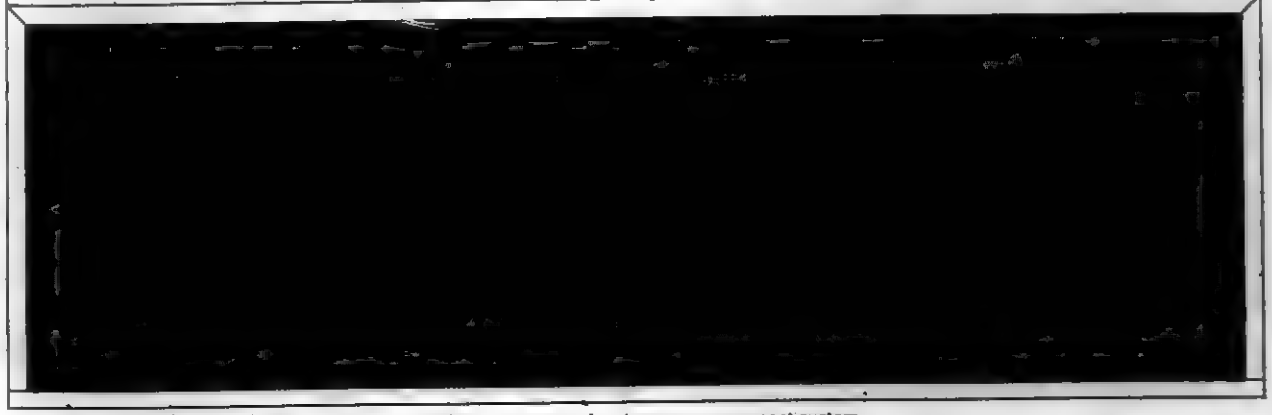
Example: One large health insurance organization processes more than 80,000 claims per day. When processed through a sorting procedure in the mail room, almost 1% of them were lost or misplaced in the initial sort. The second sort, by claim type, had a misplacement rate of 3%. A third sort, by processing category, had a 4% misplacement rate. The costs of tracking and rerouting documents plus managing the process and generating reports was costing this company in excess of $4 million per year. As a result, the organization is now evaluating image management systems.

Electronic Routing

Electronic routing offers a level of structure and flexibility that a paper-based environment simply cannot attain. Two of the main benefits of electronic routing are multiple access and automatic rerouting. Paper-based business systems generally are serial—there is only one copy of the original document and only one person can access it at a time. In contrast, image management systems provide simultaneous access to the same document, allowing many elements of the business process to occur in parallel. In many cases, the total number of steps in the process can be reduced significantly while the time to process is shortened dramatically.

If an operator in a document processing operation is out sick or on vacation, the image management system can be configured, by either manual intervention or system defaults, to send the operator's workload to a back-up person. The system can

Insurance underwriting application



The improved efficiency and reduced work flow justify the expense of an image management system.

Unisys InfoImage Solutions. Take

e the paper out of paperwork.

Checks, blueprints, photos, claims, signed authorizations, maps – images that are vital to business and government.

And up until now, it's paper that's choking the information process. All because, unlike numbers and letters, images couldn't be manipulated electronically.

Quick access to documents, sharing them, moving them around and doing it cost effectively is what the Unisys InfoImage suite of imaging solutions is about. They're practical, modular solutions that fit easily into your existing information system, no matter whose name is on it.

Practical – because Unisys recognizes that not all documents are the same:

Customer Files. Those documents with signatures, handwritten annotations or photographs that couldn't be stored or sent electronically in the past are now efficiently handled with InfoImage Folder. With online access, you can respond fast to customers, process applications, handle claims.

Checks. Unisys InfoImage IIPS dramatically changes the way financial institutions handle paper and process checks. It reduces the heavy backroom staff burden and increases payment processing speed.

Engineering Drawings. InfoImage EDMS captures all of those oversized drawings and allows any organization quick access to a complete and accurate set. From engineering to purchasing to the shop floor.

InfoImage solutions from Unisys. They take the paper out of your paperwork. For more information and a demonstration diskette, call 1-800-448-1424, ext. 39.

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UNISYS

We make it happen

also be configured to take advantage of each operator's unique talents.

Example: A bank that processes mortgage loans routes them to operators based on the mortgage's value and whether it is residential or commercial. The system then automatically makes sure no operator has more than five mortgages in his or her work queue at a time.

Digitization

The advent of digital technology opened the door for image management systems, and gave them the opportunity to realize their true problem solving potential. One problem they have scaled back is out-of-file conditions.

Misplaced or out-of-file conditions have been a continual problem for businesses, particularly in their efforts to improve customer service operations. Digitizing and suitably indexing images ensures that files can never be misplaced and out-of-file conditions will never exist.

Example: The third largest private health insurance company in the United Kingdom recently announced its intention to service its 500,000 policy holders with an image management system. This company processes 4,000 claims per day. Locating a file within the paper-based system can be extremely unpredictable, since on average 5% of all client files will be in an out-of-file position at any time. The filing department is required to move 25,000 files per week, and at any time, 20,000 files will be out of the system.

Files that become misplaced on a permanent basis obviously pose an even larger cause for concern. In fact, a U.S. insurance company that lost the files of one particular client faces a $60 million lawsuit because the insurance company disputes the client's coverage claims.

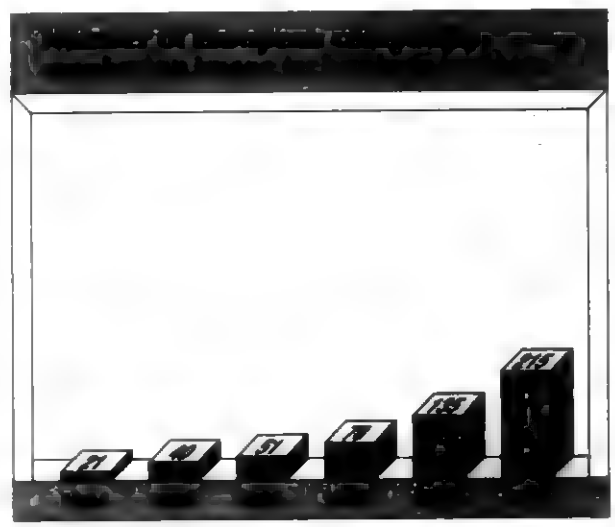
Reducing Data Entry Errors

Data entry is a notoriously mundane and poorly paid job with high turnover. Because of these factors, many errors creep into the process. However, this negative trend can be reversed.

Example: A local government agency implemented an image management system using sophisticated software that made the screen image of the document identical to the form data was being entered from. As a result, data entry errors were reduced 25%.

Numerous studies aimed at determining how to increase productivity and decrease errors have been undertaken. They have found the only two ways to improve data entry are increasing the amount of control the operator has over his or her environment, and ensuring the clarity of the input material. Image management systems reduce operator fatigue because they produce consistently clear images and can be configured for frequent operator breaks.

Research shows that operators work most efficiently when they have only one image on the screen at a time. In order to make sure they move as quickly as possible from one screen to the next, users may program these systems so any one of their final keystrokes on one screen will prompt the next one. Unisys has extensive empirical evidence showing that an ideally configured image system can lead to a 100% increase in productivity across the entire population of data entry clerks in a check processing environment.



Although increasing, European implementation lags behind the U.S. pace.

As OCR technology improves rapidly, the amount of keying will be reduced substantially. Intelligent document design is a critical element in this process. Potential users should start planning their document design now.

Facilitating Business System Redesign

Image management systems allow improvements in business systems beyond parallel processing and cleaner data entry. As management controls improve, the number of tasks in a process can be reduced.

Example: Using an image system and workflow automation—which expedites the movement of paper images from one processing point to another—an insurance company reduced the number of handling stages for an insurance claim from nine to three. Eliminating steps in the process is a crucial element of image management systems.

Reducing Physical Storage Space

Storage space is valuable and expensive. It is not unknown for companies to move entire operations to new buildings because of storage costs and availability. Many insurance companies in the U.S. are using 25% of their total office space for file storage.

Example: By implementing an image management system, a pharmaceutical company that generates 10 million records a year reduced its required storage space and avoided moving to a new building.

Reducing Document Retrieval Time

Increasingly, companies are competing to see who can give the best service. The faster claims or applications are processed and customer inquiries are answered, the more likely a company is to beat the competition.

Image management systems excel at retrieving complete customer records quickly, allowing operators to answer questions in a minute or less. This results in dramatically fewer return calls to customers, and in some cases, lower requirements for customer representatives. It also results in happier customers.

Several companies that employed image management systems to recall records were initially afraid customers would balk at the time they waited on the telephone while their image-based records were retrieved. Since most records include images and data, the solution called for retraining sales operators in telephone techniques and requesting image files upon first customer contact. This provided baseline information and kept the customer service process going until the complete set of images could be retrieved and displayed.

Example: The cost of returning customer service calls is staggering in many companies. A major New York bank discovered it could save enough money purely on telephone costs to yield

three-year payback on a multi-million dollar image system.

Improving Document and System Security

Paper-based systems offer limited security. The vast majority of image management systems have excellent security capabilities, including the ability to restrict access down to the individual document.

Example: A nuclear power plant wanted to minimize the number of engineering drawings that its employees could access. To do so, it implemented an image management system with a restricted amount of workstation memory and no local printing. The reduced memory reduced the number of drawings that could be accessed, and the absence of local printing made sure the drawings would remain in the system.

Improving Management and Government Report Capabilities

Image systems generate customized reports that make it easier for companies to track internal information. This reporting function is critical to organizations that are subject to government regulation.

Example: A midwestern bank was accused several times in the past five years of discrimination in its mortgage lending practices. Although the bank was able to prove that this was not the case in all but one charge, the cost of refuting the claims, including collecting the necessary documentation, were damaging. The bank subsequently employed an image management system to increase customer service and address legal questions cost efficiently.

Providing a Productivity Measuring Tool

Image management systems provide a very good basic tool for looking at individual productivity. This tool can sometimes be perceived as threatening. However, if used wisely, it can identify where bottlenecks occur and help effect a remedy. Example: A U.S. hospital rewards bonuses to clerical workers based on the number of accounts receivable they settle.

Eliminating "Knowledge-Based Downtime"

Frequently, by the time someone receives a paper-based document, that individual has forgotten why he or she requested it in the first place. As a result, users spend a significant amount of time reevaluating documents. IDC calls this "knowledge-based downtime." In many cases, it decreases personal productivity by up to 15%. In addition, it is not unusual for knowledge workers to spend a total of 20% of their work day just trying to locate documentation.

Example: Based on information from available documents, state government tax auditors audited certain individuals and organizations. However, all documents needed to perform the complete audits weren't available. By the time they were—usually two-to-three days—the auditors were forced to access their original documents to remember why they wanted to do the audits in the first place.

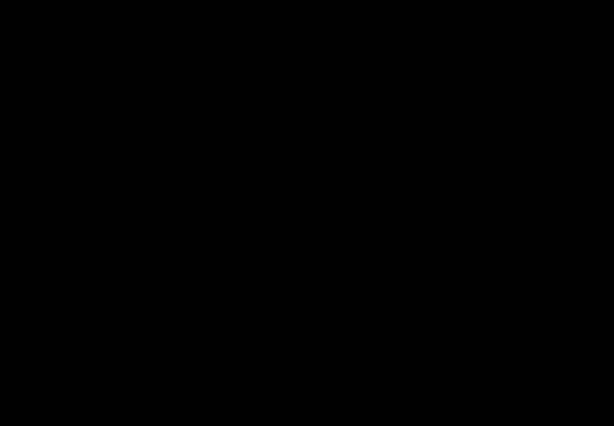


Image management systems can manage this avalanche of paper.

THE SYSTEMS VENDORS

In 1987, Wang was the first systems vendor to enter the image management systems market. IBM followed suit a year later, in 1988. Although it was late to market compared to Wang, IBM still made somewhat of a hasty entrance by its normal standards. When it felt user demand and saw the market was heating up, Big Blue bypassed its normal meticulous preparations and jumped in.

Having entered the market in 1989, Unisys has developed an open and standardized environment. It has integrated and is installing outside technology into user-specific applications.

Unisys uses FileNet's back-end capabilities for file clustering, and its look-ahead software for retrieval. It has also licensed Sigma Imaging Systems' workstation software, which runs on a range of workstations.

Most of the other systems vendors such as Digital Equipment Corp., Hewlett Packard Co. and NCR Corp. have recently announced products. They are also developing alliances and third party relationships to service the industry- and application-specific demand for image management systems.

DEC has built image functionality into the lowest levels of its system architecture for almost six years, e.g. extensions to VMS. HP and NCR elected to play catch-up by acquiring software technology from Plexus Software, Inc. The two biggest technical challenges to all these vendors are seamlessly incorporating image technology into their existing office system architectures and developing workflow and procedural automation software. IDC believes most of them are ignoring software development in their quests for seamless integration.

THE ROLE OF THIRD PARTIES

Third party vendors can play several roles in the image management system market. First, they can customize a base system for a particular application. Second, they can concentrate on a particular part of the system technology such as OCR. Third, as in the case of Unisys, they can actually provide the components of the system platform. Because of their narrow focus in either capacity, they can be an important source of technology development.

Having realized the value of vertical market-oriented third parties, Wang signed up more than 100 third parties, while DEC, which maintains traditionally strong third party relationships, has more than 40. IBM, which in recent years abandoned its policy of strictly internal product development, has selected 30 third parties.

This diverse market requires systems vendors who intend to work with third parties to understand the needs of a wide range of users who want their systems developed by familiar vendors. This puts pressure on the vendors to offer a development environment that lends itself to customizing products across a broad range of applications.

A USER'S GUIDE TO THE MOST COMMON MISTAKES

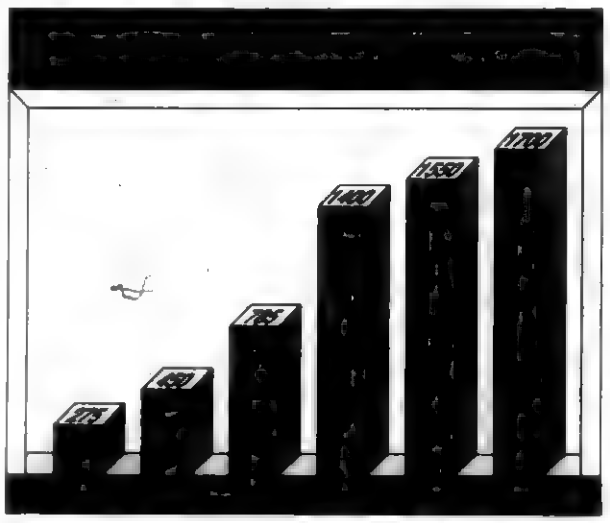
There are plenty of potential pitfalls when implementing an image management system. Here are some dos and don'ts:

Do write a thorough, well-researched RFP. The vendor community has drawers full of RFPs it cannot respond to because they were so poorly written.

This is because many prospective users are not properly evaluating their needs in terms of functions and features. There is also danger in letting a vendor help you write an RFP. Since many system features are proprietary, a vendor could slant the RFP to the point where its competitors would not even bother to bid. That may result in a noncompetitive environment that costs the user a 15-20% premium. The solution is to get help. This can come in the form of an outside consultant or an internal task force.

Do change your business system. Image management systems are not meant to operate in a void. If you are going to get the most out of them, it is necessary to make adjustments. This can result in modifying business practices, which in turn may result in hiring or reassigning personnel. The point here is that a user will maximize the value of its investment by looking at its system overall, rather than simply automating discrete steps that exist today.

Don't wait for standards. There are sufficient standards to ensure that an adequate migration path can be put in place. By waiting for standards many companies could dilute a competitive advantage. In fact, many large banks and aerospace companies waited until they were at a competitive disadvantage before implementing systems. The message: Waiting is not free.



While the U.S. leads Europe in implementation, Japan has about one-third more companies using systems. However, the dollar value of U.S. shipments is higher because more Japanese systems are based on less expensive personal computers rather than the larger processors more common in the U.S.

Don't put in a pilot system. Many users have put in small pilot systems for test or demonstration purposes. Since the technology is already proven in thousands of commercial installations, this is a waste of money. It can also be misleading. A pilot system with four or five workstations will not elicit the same architectural issues, or deliver as much performance as a larger system. As a result, user expectations can be skewed. This is not to say that the use of departmental technology and limiting the scope of the first application is not a valid strategy. IDC encourages users to build systems based on a modular approach.

TRENDS AND ISSUES

Standards

Since no user wants its image management system to exist as an island of automation, most vendors have invested substantial resources to ensure their products are compatible with the IS world. As a result, the majority of image systems are able to emulate common terminals such as IBM 3278s and DEC VT-100s. Many also offer coexistence at the network level and run on popular database management systems from such firms as Oracle and Informix.

Many image management systems have made concessions to the data world by supporting SNA and TCP/IP Ethernet connectivity. Most also use standard CCITT Group 3 and Group 4 compression algorithms. Despite this, many systems will not communicate with popular operating systems without extensions and the addition of proprietary board-level technology. Many also use proprietary hierarchical indexing techniques for the image index.

The standards that are available for such things as cartridge size and disk sector usage are receiving broad support. In addition, image management system vendors are pushing for standards that will provide compatibility across their competing products. New image transmission protocols are also needed, as existing data transmission protocols are insufficient for the larger image blocks that may be 50K bytes, 100K bytes, and larger.

There is a delicate balance to maintain here. Because the technology is still evolving rapidly, standards run the risk of being ignored in the quest for increased performance and functionality. This leaves a wide open market for innovative companies that want to make their product the de facto standard.

Future Technological Developments

As image management technology matures, it will continue to place development demands on computer technology. Just as the large blocks of data composing a single image have pushed the limits of current systems, networks will have to be upgraded to accommodate heavy image traffic in the future. In an effort to keep pace, vendors have extended the capabilities of their database management systems and written extensions to SQL. Proprietary methods have also been employed to speed up the process of storing images to optical disk and reducing the number of seeks required to retrieve documents.

The most important design advancements will come in software. IDC expects to see enhanced intelligent character recognition and more flexible user interfaces. More advanced workflow software will allow users to designate processing paths without using a lower level language. Image management applications will also increasingly migrate away from proprietary processors to more universal host environments.

Component advancements will be marked by the movement of compression and decompression capabilities to the chip level on controller boards, where previously they were found on image processor boards. The storage densities of both magnetic and optical disks will continue to at least double almost every three years for the foreseeable future. There will also be advancement in subsystem interfaces and monitor technology.

Image management system technology has already shaped the way many companies undertake many of their fundamental business activities, and it is clear that it is affecting the development of general office system products. Image system technology will become so integrated with on-line transaction processing and office system environments, that by the mid '90s it will be impossible to separate the three areas. By that time, image management system users will have a seamless, standardized environment and the luxury of picking the best products from a competitive market.

But they shouldn't wait. The competitive advantages of image management systems are available today to those who decide to act.

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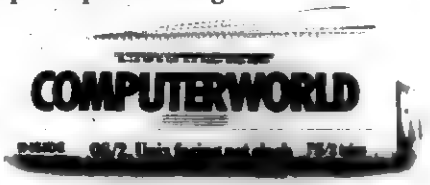

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COMMENTARY

James Daly

Its own worst enemy

Want to make a quick bundle in the Silicon Valley? Print up a few thousand bumper stickers with "Honk if you hate Bill Gates" printed on them and charge a couple bucks a piece. They'll be gone by nightfall, I guarantee. The horn blasts filling the valley, however, could be deafening.

While Microsoft's boy-wonder chief executive officer may elicit wide-eyed wonder from armchair entrepreneurs, the simple act of forming the syllables of his name is becoming an increasingly distasteful job for many. Sure, part of it may have a subliminal jealous edge, stemming from the fact that Gates reminds everyone of the nebbish they stuffed into lockers in high school and who later went out and made a fortune.

A more likely reason, though, is Microsoft's frequent use of business tactics that turn friends into enemies and enemies into candidates for the rubber room. In only a few short years, Microsoft has become the computer industry's common enemy, the J.R. Ewing, the George Steinbrenner, the Donald Trump, the Leona Helmsley — the company everyone loves to hate.

Continued on page 74

Faster Intel 486 may be snoozer

BY MICHAEL FITZGERALD
CW STAFF

Intel Corp. is working on a new 50-MHz I486 microprocessor, skipping over the 40-MHz level entirely. News of the chip drew yawns from analysts, but some users said they think it could prove valuable.

Intel sources said the new processor, tentatively named the 4650, is expected to be commercially available sometime in 1991. It may even find some buyers if it is timed right. Last week, Intel officials denied published reports that said the 50-MHz chip is behind schedule.

Michael Purcell, manager of technology planning and information resources at Baxter Healthcare Corp., said that Baxter does not see an immediate need for the chip but may want machines based on the chip in a year or so, depending on how its database projects develop.

"Anyone who wants to run database servers and offload things [from] mainframes would definitely be interested, but speed is the least of our problems," Purcell said. "How do you provide data integrity and the reliability? CPU performance isn't as big an issue as configuration, management and design of systems using new servers, and that's independent of the clock speed of servers."

The heat is on

Why would Intel come out with another 486 at a time when its 386 chips are just beginning to outsell the 286s and its original 486s are still not yet selling at high volumes?

Well, for starters, there is competitive pressure, observers said.

"Intel needs to worry about maintaining their preeminent position, and the more high-end stuff they have, the more defense they have [against chip clone makers]," said Michael Slater, editor and publisher of the Microprocessor Report. "They're also trying to keep the technical workstation market from going completely to the RISC environment."

Most reduced instruction set computing (RISC) chip makers are developing 50-MHz versions of their chips, so Intel needs to keep pace in the market, he said.

Dataquest, Inc. analyst Alice Leeper pointed out that the 50-MHz chip was part of the plan when the I486 was announced. "It was just a question of time," Leeper said. She added that the chip will be expensive and not easy for mainstream users — at least not in the short term.

"There's no question that the added speed adds value, but that's not the hardest problem," Purcell said. "The real problem is people and changing your organization to make fullest use of the technology."

FEATURE: PC SERVICE

PC service's mixed bag

BY MARTY LEVINE
SPECIAL TO CW

When a personal computer goes on the fritz at Dynamics Research Corp., an Andover, Mass.-based contractor for the U.S. Department of Defense, the company relies on internal resources to figure out what went wrong and to fix it.

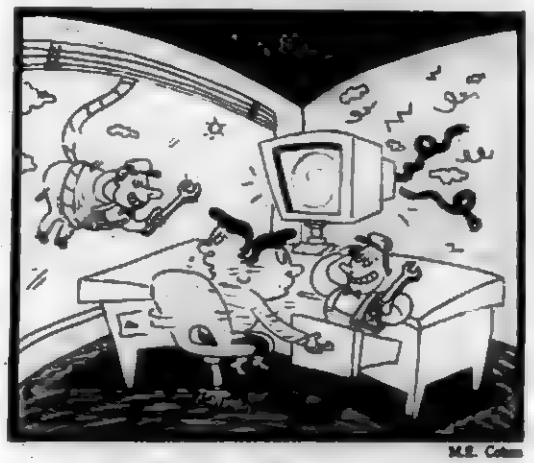
"We have a group of three or four people in the company who are pretty good at servicing PCs," says Brian Camenker, a staff systems analyst at Dynamics Research. Only if the service personnel can't find the part internally will they go outside and order it, Camenker says.

Cannibalizing spare machine parts is only one of a myriad of approaches to servicing PCs, but like most others, it may not address all of the maintenance and service issues that can crop up in a company. PC managers are increasingly turning to a patchwork of options to keep their PCs up and running, weaving together in-house expertise, dealer support and specially crafted outside service agreements.

Kent State University in Kent, Ohio, for one, has converted its service department into a pay-as-you-go operation.

"End users on campus can have a contract with our computer equipment services group on a time and materials basis," says Grace Bush, deputy director of computer services at the school. "They've got a large inventory of parts

Continued on page 72



M.E. Cohen

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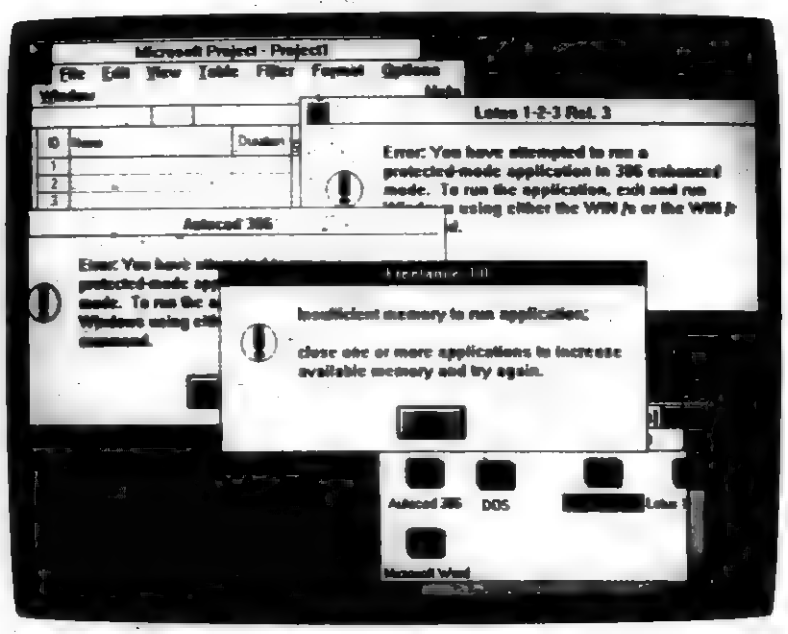
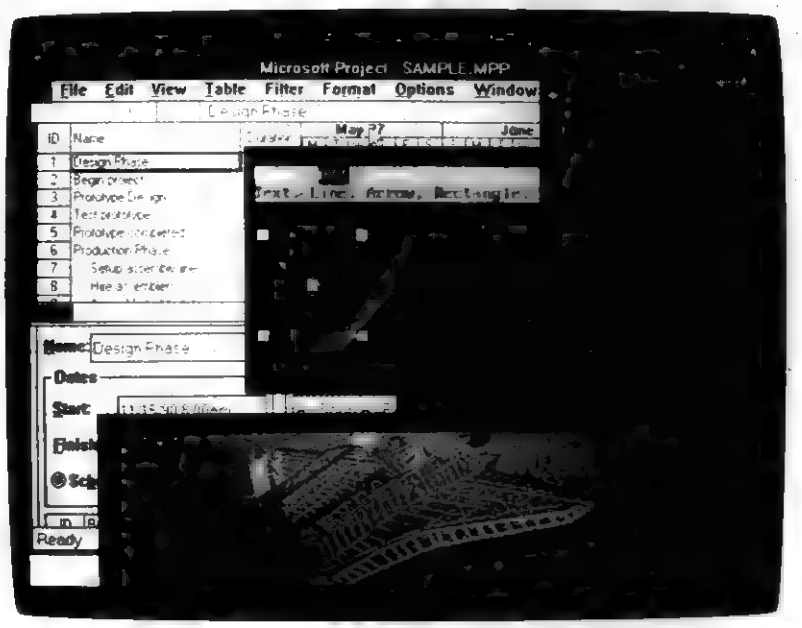


Windows 3.0. The multitasking, windowing environment.



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This comparison was made using a system like the one you might run: Both shots show an ALR FlexCache 33/386 running DOS 3.3 with VGA display adaptor, Novell NetWare v3.01 Rev. A, with IPX/SPX v3.01 Rev A, Microsoft Mouse 7.00, and Microsoft SMARTDrive v3.03 disk cache. Buffers were set to 20. For the Windows screen, we ran Microsoft Windows 3 HIMEM.SYS and EMM386.SYS. For the DESQview screen, we ran QEMM 386 v5.1.

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Voice system reins in agency's costs

Texas welfare office expects $11,000 daily payback from PC-based system

BY RICHARD PASTORE
CW STAFF

AUSTIN — When your organization is as much as $800 million in the red, it is often hard to justify expenditure for computer equipment. But at the beleaguered Texas Department of Human Services, an expected payback of $11,000 per day made it easy.

The state's welfare agency is implementing a personal computer-based voice response system intended to curb the overprescription of a popular and costly class of ulcer medication. The savings resulting from the system should be close to $4 million annually, including $1.6 million in state Medicaid funds.

This savings looms even larger in light of a system implementation cost of only $10,000. The turnkey list price was $45,000 to $48,000, but vendor equipment and services donations reduced that figure to $10,000. However, toll-free telephone service costs could add as much as $24,000 to $30,000 per year to the bill, depending on use.

Even so, "as an MIS person, I have never seen a payback of this magnitude for this type of investment," said project technology leader Mark Moore.

Dosage dilemma

In late 1988, the agency determined that many physicians were prescribing maximum dosages of certain ulcer medications far longer than the eight weeks recommended by the drug manufacturers and approved by the Food and Drug Administration.

Over half of the Medicaid patients who received the drug were prescribed levels that exceeded manufacturer recommendations, said Robert S. Nash, the agency's chief pharmacist and coordinator of the program. It was a costly overdose for the state. Texas spent $18 million on the five drugs in this class last year — 8% of its entire Medicaid drug budget.

Unless the agency found a cost-effective way to limit use to the manufacturer's recommended levels, the high cost and escalating number of Medicaid patients "could have put coverage of these drugs in jeopardy," Nash said.

The agency looked at four or five vendors of voice-response systems and found some that cost more than $1 million. It eventually tapped Atlanta-based Eva Technology, Inc., which donated some of the hardware and conducted surveys to determine potential users' reactions. With Eva's help, the agency installed the system in eight weeks and wrapped up the in-house programming in 200 man-hours.

The system, which is a pilot installation for the vendor, should be fully functional this month and consists of two IBM Personal Computer ATs configured with Innovative Technology, Inc.'s Nita Audio voice boards and drivers. The PCs are each loaded with 2M bytes of memory and 30M-byte hard disks. One box acts as a backup to the other to guarantee 100% uptime. Four toll-free telephone lines hook into the PCs, which are linked by dial-up lines to the agency's Unisys Corp. 2200 mainframe.

A mainframe-based homegrown program conducts a weekly search of a database of Medicaid clients and identifies those that have reached the eight-week maximum dosage limit for the ulcer drugs. The program then automatically downloads these records — an estimated 15,000 per week — to a database in the PC.

When one of 10,000 participating physicians or 3,500 pharmacists calls the toll-free inquiry line, a prerecorded voice response will ask for his user access code and patient information. If the name is found in the PC's database, the voice will inform the caller that the patient has reached the limit and only a low-level maintenance dosage will be approved for Medicaid payment. If the name is not found, the caller gets a green light to fill a maximum dosage prescription.

Each response takes 30 to 45 seconds. Moore said he expects hundreds of calls per day, though the system can handle thousands. The PCs also keep track of who called, when, for what patient and what the response was. This data is uploaded to the mainframe weekly. "With that information back on the mainframe, we can see what we would have had to pay out," Moore said.

The possibility exists that the system can be applied to other drugs, but that will be some time down the road, Nash said.

However, other states could benefit now. "This is a problem that everyone contends with nationally," Nash said. The rest of the nation could save a total of $100 million to $180 million in Medicaid with similar systems, Moore estimated.

PCs take center stage in orchestra's fund-raising

ON SITE

BY RICHARD PASTORE
CW STAFF

NEWARK, N.J. — Jacques Cousteau needs donations to save sea turtles. Your Public Broadcasting Service station is pleading for pledges. The March of Dimes is descending on your door. Competition for contributions is expanding even as the money supply tightens.

To avoid getting lost in this charitable crowd, the nonprofit New Jersey Symphony Orchestra is hoping for an edge from personal computer-based fund-raising techniques.

"The competition for limited resources is much more intense; if there is a downturn in the economy, people tend to tighten their purse strings," said Tom McGrath, computer operations manager for the orchestra's 30-person administrative office. The 85-piece orchestra, which is operating on a $6.5 million budget, will perform about 150 concerts across New Jersey and neighboring states this season.

PCs are playing an integral role in fine-tuning the group's fund-raising. For example, donors are more apt to renew their pledges if they are personally acknowledged on a timely basis, McGrath said. PCs are making that possible.

Under the orchestra's old system, pledges and personal data were keyed into an IBM Application System/400 Model B10, which holds a customized database of 32,000 individuals that is accessed by virtually all of the orchestra's departments. When time permitted, the development department staff members rekeyed the donation data into their PCs and generated thank-you form letters.

"Re-keying radically increased the chance of error," McGrath said. "Sometimes things would fall between the cracks" — donors would get duplicate mailings or none at all.

Today, a donor whose gift is received on Monday will hold a personalized acknowledgment letter in his hand on Thursday.

The timeliness is made possible by IBM PC-compatibles, which download pledge data from the AS/400 each evening via IBM's PC Support communications software. The next day, development staff members use the PCs to select one of 12 thank-you letter styles and perform a mail merge that places the donor's name and address into the appropriate letter. The system has cut entry time in half.

"We get more control with the PC. [The users] can print whenever they want, not when I get around to it," McGrath said.

Arthur Pastore

N.J. Symphony *computes for scarce dollars with PCs*

Besides reducing turnaround time, the orchestra is using PCs to sharpen its prospect targeting. "We don't want to wildly shoot from the hip, investing time in prospects that don't have interest in the symphony," McGrath said.

The goal is to monitor and hone the effectiveness of the costly prospect name lists with which the orchestra conducts mass mailings.

The development staff enters the day's incoming pledges into a Borland International Quattro spreadsheet, including the numeric code indicating which prospect list the donor's name originally came from.

The staff manipulates the donation dollar figures each day to show which name list is getting the best results, how quickly the various lists generate responses and so on.

The benefits of the PCs extend up to the director of development's office. When the director is on the telephone trying to coax a gift from a potential patron, he has that person's on-line data file at his fingertips.

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Plan pushes 1-2-3 upgrades

BY PATRICIA KEEFE
CW STAFF

CAMBRIDGE, Mass. — Spurred in part by meager user migration to Release 3.0, Lotus Development Corp. is coupling the delivery of 1-2-3 Release 3.1 with the launch of an in-store upgrade program designed to enable users to upgrade their Lotus spreadsheets more easily.

The in-store upgrade promotion comes at a time when Lotus' market share is under heavy fire from an aggressive marketing campaign fronted by competitor Borland International.

At an analysts meeting earlier this year, Lotus executives conceded publicly for the first time that competitors were impacting sales. "I guess it would be fair to say that not as many people upgraded to Release 3.0 as we had hoped," a spokeswoman said last week. "That's in part what Release 3.1 is all about" [CW, Aug. 20].

However, she also claimed that twice as many users upgraded to 3.0 as upgraded to Borland's Quattro Pro and Microsoft Corp.'s Excel combined. Overall, eight times as many Lotus users have upgraded to 1-2-3 Release 2.2, which features the desktop publishing capabilities lacking in 3.0, she added.

The in-store program is part of a major marketing campaign aimed at reaching millions of potential upgraders, many of whom stuck with Releases 2.0 and 2.2, as well as new 1-2-3 customers — the same audience targeted by Borland's low-cost Quattro Pro campaign.

Instead of having to wait 48 hours for Lotus to mail out an upgrade, users simply turn in the original title page of their 1-2-3 reference manual to a retailer. This allows them to upgrade instantly to either Release 2.2 or 3.1. Participating resellers include Egghead Discount Software, Computerland and Software House.

"[This] is one of a variety of programs we are putting in place to drive new and additional business opportunities for Lotus products though dealers," said Harris Lancaster, Lotus' director of reseller marketing.

Lotus will also launch a substantial advertising campaign in most business and trade publications, as well as its largest direct mail campaign ever, consisting of 1.7 million pieces.

Users will still have the option of upgrading their spreadsheets by ordering through the Lotus *Select* catalog or by calling (800) 872-3387.

According to Storeboard, Inc., 1-2-3 accounts for the largest percentage of personal computer software sales sold through computer specialty stores. To date this year, 1-2-3 has garnered 10.3% of retail sales, more than any other PC package, including word processing, according to Storeboard.

Lotus revamps 3.0, graphics

BY PATRICIA KEEFE
CW STAFF

Summer is definitely over at Lotus Development Corp., which kicked off a busy fall last week with three introductions spanning a spate of platforms. These included an OS/2 version of its moderately successful Freelance graphics package; delivery of 1-2-3 Release 3.1, a Microsoft Corp. Windows 3.0-compatible spreadsheet announced in June; and a minor upgrade to its Notes groupware.

These announcements served as preludes to a Sept. 18 unveiling of Improv, Lotus' financial modeling package for Next, Inc.'s workstation [CW, Sept. 10].

The delivery of 3.1, a character-based spreadsheet that can run under Windows, coincides with the launch of an instant upgrade program available through resellers. Release 3.1 provides the desktop publishing capabilities missing from its predecessor, Release 3.0, but also functions as a stopgap until 1-2-3 for Windows, a full-blown Windows 3.0 application, ships next year.

Freelance Graphics for OS/2 has so far garnered more praise than its DOS-based predecessor, Freelance. Reviewers and beta testers reported that the OS/2 version bears little resemblance in look or feel to the existing DOS version. However, it shares the same charting code and works as one product with 1-2-3/G.

"It's a fabulous package," one beta tester said. "The functionality is so much better [than the current DOS package]." The real issue, the beta tester said, is the addition of a what-you-see-is-what-you-get graphical interface. When coupled with about 50 chart styles and Smartmasters — families of professionally designed graphical templates that prove a consistent fill-in-the-blank approach to creating presentations — it provides users with "real advanced" desktop presentation.

According to Joan-Carol Brigham, a graphics analyst at International Data Corp., the OS/2 package is tightly coupled with the graphing capabilities available under the OS/2-based 1-2-3/G spreadsheet. Unlike with DOS Freelance, users can make a change once in a master file and have it ripple through related slides, eliminating time-consuming manual inserts. The package is slated to ship in the fourth quarter.

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MICRO BITS

Microsoft taps Sytron's tapes

Microsoft Corp. recently tapped **Sytron Corp.**'s tape backup software for packaging with its upcoming LAN Manager 2:0 operating system. **IBM** also gave the nod to Sytron's Sytos Plus for use as a backup and restore utility for OS/2 1.2 and DOS 3.3 and 4.0. The backup software will support IBM's 6157 tape drives and 3½- and 5¼-in. disk drives in the Personal System/2.

Indigo Software Ltd. and **IBM** signed a cooperative software marketing agreement under which IBM's direct sales force will market the Indigo printer software, including Jetform-Design, Jetform-Filler, Jetform-Server and Jetform-Merge.

Central Point Software and **Wangtek** announced that they will bundle Central Point's PC Backup software with tape backup systems manufactured by Wangtek — specifically, its 40M- and 80M-byte drives.

Microsoft has announced that it is now shipping Version 1.1 of Word for Windows. It was designed to take advantage of the interface improvements to Windows Version 3.0 and includes customer-requested file conversion improvements between the Word product family and macro functionality. Word for Windows can now read and write Word for Apple Computer, Inc. Macintosh files directly.

IBM Canada has acquired an 11% stake in **Delrina Technology, Inc.**, a developer of personal computer-based business forms-processing software. Delrina plans to develop a version of its Perform package for OS/2 and Presentation Manager. A Windows 3.0 version is slated to ship this summer. IBM already markets a DOS-compatible version of Perform.

Informix Corp. and **Du Pont Co.** have inked a pact that will enable Du Pont to market and resell Informix's database management software products for use with Du Pont's Macblitzer computer. Macblitzer uses reduced instruction set computing technology to combine the processing power of Unix and the Macintosh through the Macintosh graphical user interface.

Wordperfect Corp. has begun shipping Planperfect 5.1, which features extensive mouse support and can share printer and font file information. It is completely compatible with Wordperfect 5.1 and includes an Office 3.0 shell, worksheet summary and list files. It costs $495. Also shipping is Letterperfect 1.0, an entry-level word processor priced at $299 and aimed at new users.

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Occam makes stats simple

BY JEAN S. BOZMAN
CW STAFF

WATERTOWN, Mass. — Statistics, no matter how exciting, do not lend themselves to easy analysis by the human brain — consider, for instance, baseball statistics. Yet plotting the frequency of Babe Ruth's home runs shows the burst of record-shattering slugging in the 1920s and '30s much better than rattling off the numbers by heart would.

Start-up company Occam Research Corp. has stepped up to the plate of modern Apple Computer, Inc. Macintosh II applications and is offering its relational database management system as an engine to analyze the numbing rows and columns of data found in corporate spreadsheets. Occam's product, called Muse, allows users to browse through "databooks" in typical Macintosh point-and-click fashion to discover underlying patterns in the on-screen spreadsheets.

"We're using natural-language English commands to control everything," explained Robert Roeper, a former Colgate-Palmolive Co. executive who is now Occam's marketing vice-president.

"We took four years of data, about 20 different Colgate-Palmolive products, and were able to cut that data into 60 slices," Roeper said. "Muse gives you a window on all that data without making you drill down through it, line by line."

Occam President George Potts built Muse on a homegrown relational database manager, a natural-language interface and the Macintosh's user-friendly icons. "Language-driven data analysis for corporate managers is a new way of looking at data and turning it into useful information," said Potts, who started the firm in 1988. The $695 package is scheduled to ship in the first quarter of 1991. Muse runs on Macintosh SEs and Macintosh IIs with at least 2M bytes of main memory and at least Version 6.0.5 of the Macintosh operating system.

One unusual product feature of Muse is its ability to ask the computer English-language questions by issuing voice commands. Speaking into a microphone, Potts was happy to order his Macintosh II to display a comparison of Ty Cobb's and Babe Ruth's slugging records. Both color graphs showed steady hitting — and a burst in their most productive years.

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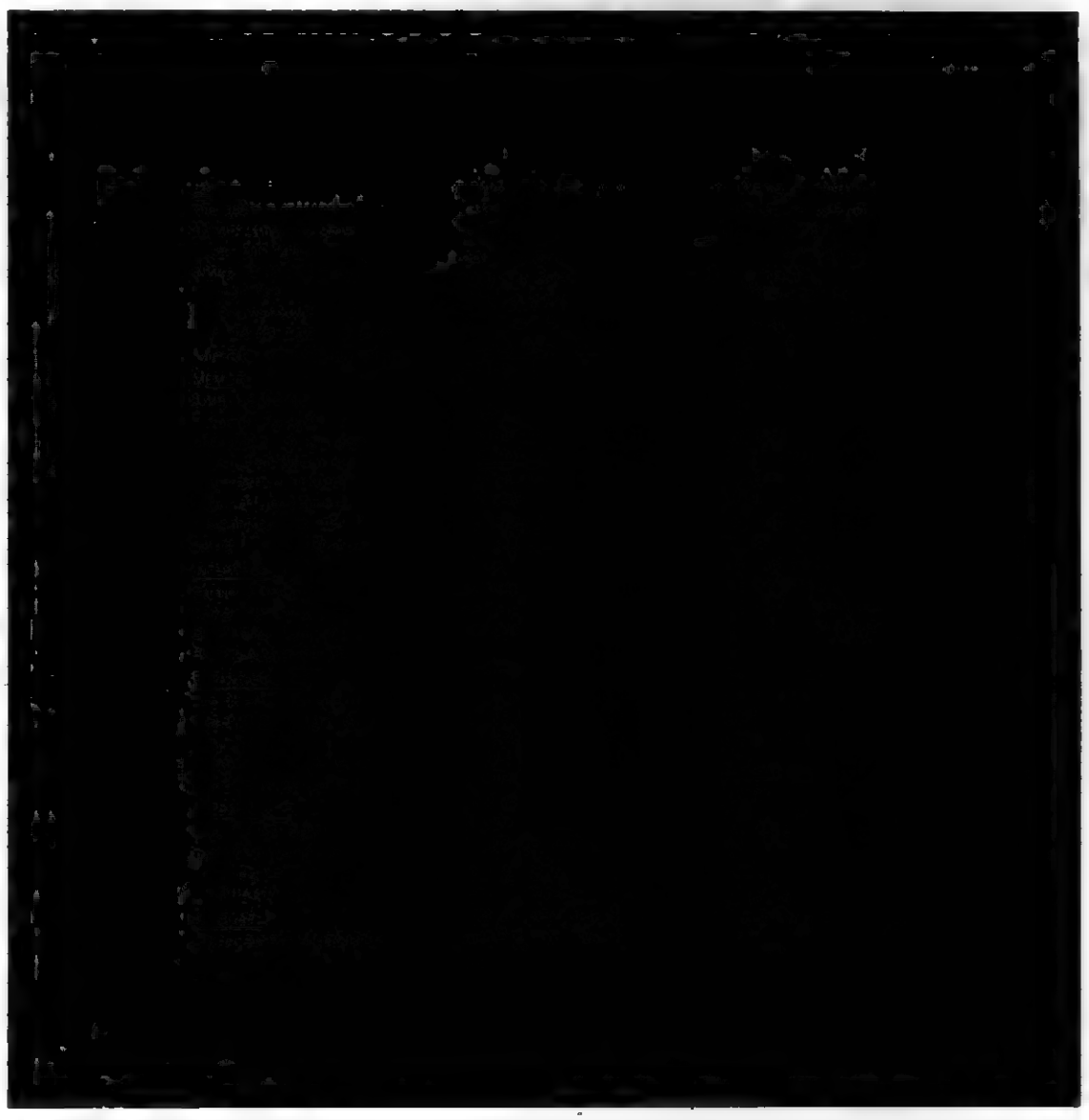

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PC service

CONTINUED FROM PAGE 65

for a quick turnaround." For complicated repairs, such as hard disk drives, the service group subcontracts the work to outside service companies.

If anything, a combination approach is likely to gain in popularity because few companies are willing to invest in the people and resources necessary to keep service solely an internal affair, consultants say. However, comprehensive outside solutions are tough to come by.

PC managers and consultants who follow the service industry note that with outside service also comes the potential for loss of control over critical equipment, the possibility that the service provider won't fulfill its commitment and the likelihood that the service provider will fall short because it doesn't understand the customer's problems.

Part of the routine

Problems with service "happen all the time," says Jeff Kaplan, a director of The Ledgeway Group, a Lexington, Mass.-based consulting firm. "You talk to IS people and they say they prefer to [keep service] in house. Of course, central IS, which tried to ignore [PC service] or hoped it would go away, is trying to play catch-up. You can't say that any one approach is better than another."

How companies service their PCs relates closely to the machines' importance to operations. For financial institutions and other companies at which several hours of downtime can steamroll into a mini-crisis, the cost for fast turnaround seems to be a grudgingly acceptable part of doing business.

However, for an increasing number of companies, blanket service contracts, with high annual fees in exchange for fast turnaround, are unacceptable.

Before going out on his own as a network consultant for large corporate customers such as Morgan Guaranty Trust, Lazard Freres and General Electric Consulting Services, Brian Livingston was responsible for PC maintenance at the New York office of the Union Bank of Switzerland.

"The type of service that's mainly required on microcomputers is the replacement of video boards, hard disks and motherboards. We found it was preferable for our own staff to replace video boards," he says.

The bank went to an outside service for hard disks and motherboards and had a commitment with a retail chain for anything else on a per-cost basis, he says. Even with hourly fees for service of $105 for the first hour and between $60 and $75 for each additional hour, the arrangement saved the bank thousands of dollars. The combination of in-house and out-of-house service "cost us 20% of what we had been spending on a service contract."

Faced with blanket service contracts that typically range from $150 to $1,000 per PC, more and more companies are reaching the same conclusion.

One IS director for a Chicago-based investment banking firm suspects that when the numbers are in from a cost and benefit review he plans to do next year, his firm will cancel its service contracts in favor of a more flexible approach. "The fact of the matter is that very few things go wrong. The basic things just don't tend to break down. It makes sense to just stock spares for when they do," says the manager, who requested anonymity.

The same local dealer that built the company's approximately 25 PCs also services them. While the director finds little fault with the dealer's ability to handle basic repairs, the relationship falls short in two critical areas: Costs are too high for straightforward problems, and the dealer can't handle the more complicated — and more critical — problems.

"As we get into larger hard disks, 150 and 200 [megabytes], the controllers are sometimes a bit strapped. It's a software problem that's hard to diagnose, and even when you pull out a part and think you've got the solution, it may not be the case," the IS director says.

How does he handle those situations? "We used to have technicians come in and replace the drives, but now we handle it ourselves. We know what to look for, and we're better able to control things. I think you'll find that situation in a lot of shops."

That holds true in particular for LAN sites and companies with complex hardware/software configurations. "Unless they're very obvious problems, it's hard to get [the PC] to reproduce it," says Paul Zagaeski, a senior analyst for The Yankee Group, a consulting firm in Boston. "The service contract is one of the more expensive ways of handling the problem."

Getting a working PC back on a user's desk is only one aspect of service, he adds. Too often, the problem is tied to a specific software application, and he says most service technicians lack the skills to handle those situations.

Nothing to depend on

That attitude can also be traced to the spotty record of some vendors, value-added resellers (VAR) and third-party service companies, PC managers and consultants say. While individual companies within all three categories have forged successful service relationships with customers, it's a hit-and-miss pattern.

"A company such as IBM has a pretty strong reputation," Zagaeski notes. "Compaq has a mixed reputation. And then you look at Dell — one of the things they sell is 'the best service in the industry.' But it can still vary from one part of the country to the other within one company. It depends on the people you're dealing with in your market."

Zagaeski points out that as vendors search for ways to cut costs, service becomes an increasingly inviting target.

VAR service, both regional and national, has also been erratic, and many corporate PC managers remain leery of third-party service providers — particularly independents that may or may not outlast the length of the contract.

"I've used two, and I didn't have much luck with either of them," the Chicago-based IS director says. "One went out of business, and the other forgot we were a customer."

Although many corporate PC managers complain that dealers offer the same mixed bag of support, more of them turn to dealers for support than any other outside option, industry experts say. That shouldn't come as much of a surprise, considering how aggressive some of the larger chains have become in the last year.

The Ledgeway Group estimates that retailers such as Businessland and Computerland derive 5% to 7% of their total revenue from service-related activities.

In the past 12 months, Businessland and Computerland have revamped their service programs, ostensibly to offer greater flexibility as well as better overall support.

"It's one of our three key issues, along with distributing product and the cost of operation," says Alan Andrus, Computerland's senior vice-president for service and support.

In large part, that concern reflects the evolution of the chain's customer base; five years ago, walk-in retail business represented 60% of the chain's volume, while large accounts added up to 10%, the company says. Small business sales made up the remainder. In 1990, the numbers have reversed, with large accounts bringing in 60% of sales, compared with 10% for retail traffic.

As recently as 1987, Andrus concedes, Computerland's service "was not well organized. That's why I think so much of service is in-house today." Perhaps the most significant change in Computerland's service operations has been the "Cap and Retainer" program it rolled out last year to address the concerns of customers fed up with high annual contract fees. "The program reflects the good history some customers have with their equipment," Andrus says.

The program sets an annual retainer based on the customer's prior service needs. Service beyond that level is charged an hourly rate with an annual cap; total service charges in any one year will never exceed the cost of a blanket service contract.

"There are some companies that will love the [retainer program] because they feel they're only paying for what they get. But others may not like it because they want a flat number for budgetary purposes," says Leslie Fiering, an analyst at Gartner Group, Inc. in Stamford, Conn.

Also part of Computerland's revamped service program is an inventory option, in which the customer keeps spare machines on hand to replace those that fail. Computerland then picks up and repairs the problem machines and returns them to the company's spare inventory.

Levine is a free-lance writer based in Forest Hills, N.Y.

The top 10 service features

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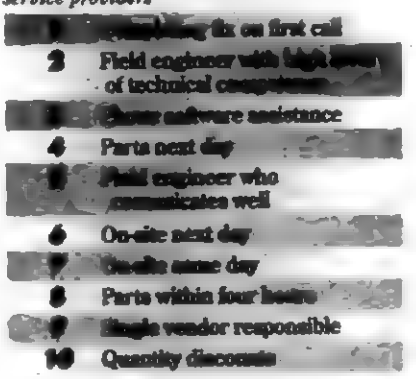

Source: The Ledgeway Group — CW Chart: Paul Mock

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Daly

FROM PAGE 65

So pack the Chevy full of those bumper stickers and let's go. First stop: Adobe in Mountain View. For years, Adobe and Apple enjoyed a fruitful symbiotic partnership. Apple was an early investor in Adobe and the biggest customer of its Postscript page description language. Postscript is often credited with launching the desktop publishing explosion, a phenomenon that in turn made a fortune for Apple.

But last September, Gates slipped in through the back door and announced that he and Apple CEO John Sculley were jointly developing a page description language of their own called Truetype, effectively hacking off Adobe. CEO John Warnock sputtered with rage, calling the move "the biggest bunch of garbage and mumbo-jumbo I've ever heard in my life."

It should be no problem unloading some of the bumper stickers at Adobe. Warnock may even want to stock up: They make great stocking stuffers.

Now we're off to Cupertino. While Apple was yukking it up with Microsoft after the Truetype bombshell, Microsoft was busy developing Windows 3.0, a program that gives IBM Personal Computers and compatible machines the simplified windows-and-icons user interface that made Apple's Macintosh such a big hit.

After the Windows 3.0 announcement in May, Apple's smiles suddenly turned icy — it's tough to beam when your buddy is trying to eat your lunch. Recently, Apple began scratching around at the door of its old friend Adobe, and the two have since inked an agreement to cooperate on future Postscript-based technology.

There's also the story about the tiff that reportedly occurred between Microsoft and Apple before the formation of Apple's software offshoot Claris. Sensing a threat, Gates supposedly warned Sculley that if Apple created Claris, Mac development would be a very low priority item indeed at Microsoft. Sculley would not be shoved around, however, and market forces later made Gates eat his words with a knife and fork.

Next, we'll set up our stand outside 3Com in Santa Clara. Microsoft and 3Com jointly developed the LAN Manager network operating system and were supposed to jointly market it as well. Until this year, Microsoft, which manufactures LAN Manager, only sold it through OEMs such as 3Com and IBM.

A little while back, however, Microsoft decided it could do a better job selling LAN Manager on its own, meaning that Microsoft will compete directly with 3Com and IBM. IBM is a big boy and can get no sympathy, but 3Com is a much tinier potato in the stew. How's that saying go? "With friends like these . . ."

Any of our little gems left? We could take a drive over to Santa Teresa, where IBM has a big headquarters and development lab. IBM and Microsoft were once the best of pals when they co-developed the OS/2 operating system. But now, IBM is supposedly miffed over the slowpoke pace of OS/2 acceptance, which one analyst blames on the fact that Microsoft will never provide a smooth Windows-to-OS/2 migration path and will instead milk Windows for all it's worth.

Or maybe we can unload some bumper stickers by meeting up with OS/2 users throughout the valley. Microsoft keeps shifting the amount of memory users will need for the system to run effectively.

Yeah, call Bill Gates a sharp businessman. Call him a marketing visionary. You can even call him a tough cookie. But don't worry: We'll have more of the bumper stickers printed up in about a week.

Daly is a *Computerworld* West Coast senior correspondent.

HOW'S THAT saying go? "With friends like these . . ."

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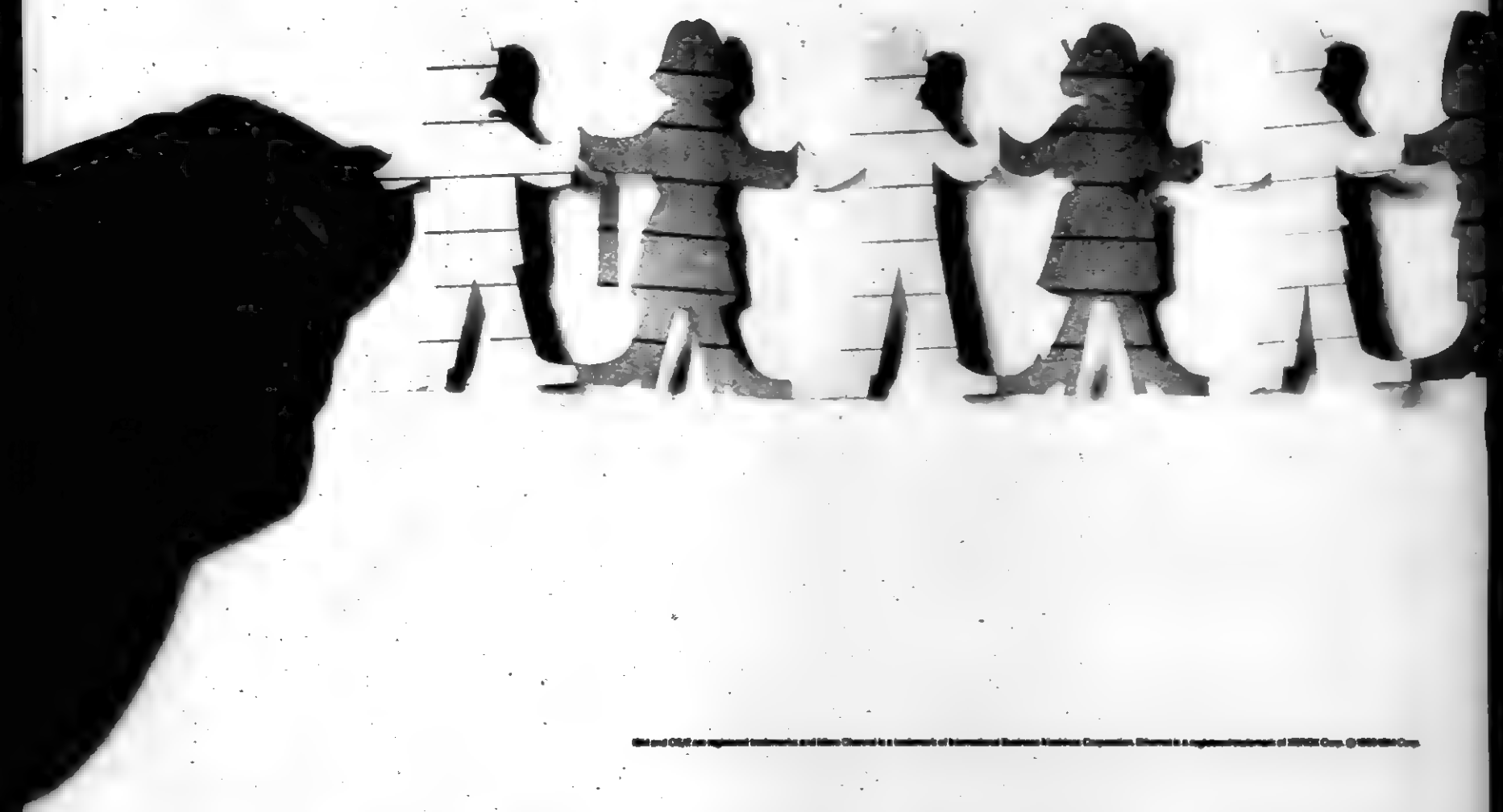

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NEW PRODUCTS

Systems

Epson America, Inc. has introduced the Equity 386SX Plus, an enhanced version of its Intel Corp. 80386SX-based personal computer.

The system includes 32-bit industry-standard architecture that enables users to access 80386 processor-oriented applications. It is also compatible with 8088- and 80286-based software packages.

The 386SX Plus is priced at $1,999 for a 1M-byte version with a 3½- or 5¼-in. floppy disk.

A system with a 40M-byte hard disk drive with 2M bytes of built-in memory and a 5¼-in floppy disk drive costs $2,999.

Epson America
2780 Lomita Blvd.
Torrance, Calif. 90505
(213) 539-9140

Cumulus Corp. has announced a small-footprint, Intel Corp. 80386SX-based personal computer that can be configured with monochrome or color monitors and floppy or hard disk drives.

The GLC/CO desktop PC features 1M byte of random-access memory; a 3½-in., 1.44M-byte floppy disk; a 16-bit IBM Video Graphics Array adapter; a monitor; and a dual-button mouse. Two serial ports, one parallel port and 256K bytes of video memory are also included.

Pricing ranges from $1,195 to $1,895, depending on type of configuration.

Cumulus
23500 Mercantile Road
Cleveland, Ohio 44122
(216) 464-2211

Fortron/Source Corp. has introduced a 25-MHz Intel Corp. I486-based file server.

The Netset EISA 486 is based on Extended Industry Standard Architecture (EISA). It can store up to 8M bytes of random-access memory and ensures a maximum data transfer rate of 32M byte/sec. at EISA burst mode, the vendor said.

A basic system includes a 150M-byte small computer systems interface (SCSI) hard disk drive, 4M bytes of RAM and an EISA SCSI-based hard disk drive controller. It is priced at $9,500.

Fortron/Source
6818-G Patterson Pass Road
Livermore, Calif. 94550
(415) 373-1008

Software applications packages

Abtech Corp. has announced an Abductory Induction Mechanism (AIM) machine learning tool designed for IBM Personal Computer ATs, XTs and compatibles.

AIM-PC provides users with a complete environment for creating, evaluating and implementing network models that contain mathematical functions not constrained by neuron analogies, the vendor said. System requirements include DOS 3,3 or higher, 640K bytes of random-access memory and a hard drive. A math coprocessor is recommended.

Pricing begins at $495.

Abtech
700 Harris St.
Charlottesville, Va. 22901
(804) 977-0686

Macromind, Inc. has announced a developer's version of Macromind Three-D, a three-dimensional animation, rendering and video production tool for users of Apple Computer, Inc.'s Macintosh.

The product comprises three modules: 3-D Works, an animation module for importing 3-D models; Render-Works, a visualization module in which color, texture maps and other attributes are applied to models and animations; and Image-Works, a compositing and output module for digitally composing 2- and 3-D images and animations.

The product costs $1,495.

Macromind
410 Townsend
San Francisco, Calif. 94107
(415) 442-0200

Holland Systems Corp. has announced a family of computer-aided software engineering products designed for Intel Corp. 80286-based IBM Personal Computer ATs or compatibles equipped with 640K bytes of memory.

Proplanner, Prodeveloper and Promanager include integrated software that supports detailed methodologies such as just-in-time education and on-site consulting.

Prices range from $3,300 to $19,500, depending on model, type of license and hardware configuration.

Holland Systems
305 E. Eisenhower Pkwy.
Ann Arbor, Mich. 48108
(313) 995-9595

Financial Systems Software (UK) Ltd. has announced an upgrade to its Universal Yield add-in and Universal Options add-in products.

The enhanced products support Lotus Development Corp.'s 1-2-3 Release 3.0 running under DOS or OS/2. The add-in products handle most fixed income products as well as European and U.S. options on shares, bonds, commodities, futures and currencies.

Prices range from $570 to $1,520, depending on type of product and type of

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The NEW SAS® System

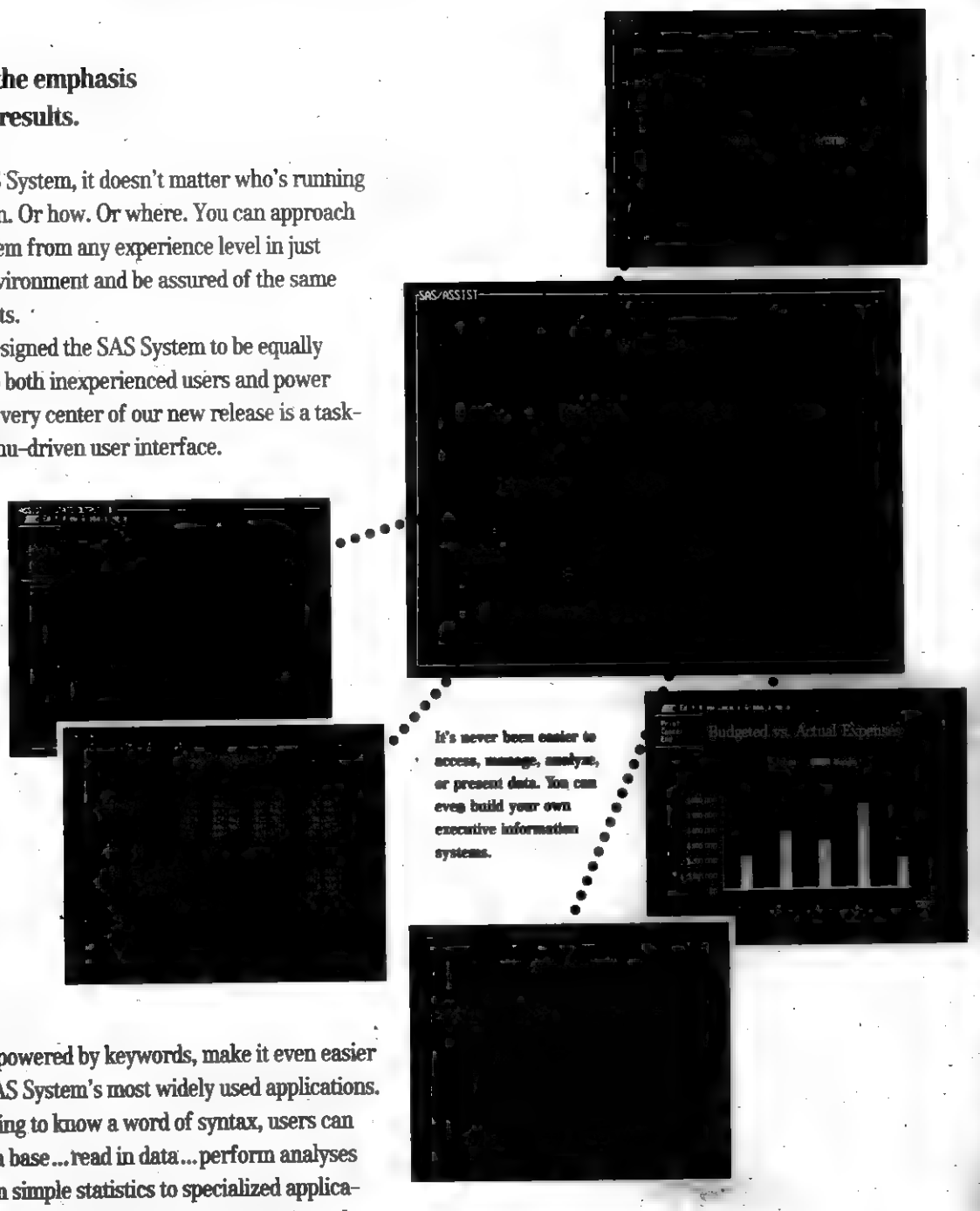
The world's #1 applications system

And now the SAS System means even more. It means you have the flexibility to choose software from an *applications* point-of-view instead of a hardware point-of-view. It means you can master the four key data-driven tasks — data access, management, analysis, and presentation — through a single software system. It means you can extend applications to more computer users, regardless of experience level. And it means you'll be the beneficiary, not the victim, of emerging computing technologies.

We've put the emphasis on the end results.

With the SAS System, it doesn't matter who's running an application. Or how. Or where. You can approach the SAS System from any experience level in just about any environment and be assured of the same reliable results.

We've designed the SAS System to be equally responsive to both inexperienced users and power users. At the very center of our new release is a task-oriented, menu-driven user interface.



It's never been easier to access, manage, analyze, or present data. You can even build your own executive information systems.

The menus, powered by keywords, make it even easier to run the SAS System's most widely used applications. Without having to know a word of syntax, users can access a data base...read in data...perform analyses ranging from simple statistics to specialized applications such as forecasting, project management, and quality improvement...and generate a variety of reports and graphs.

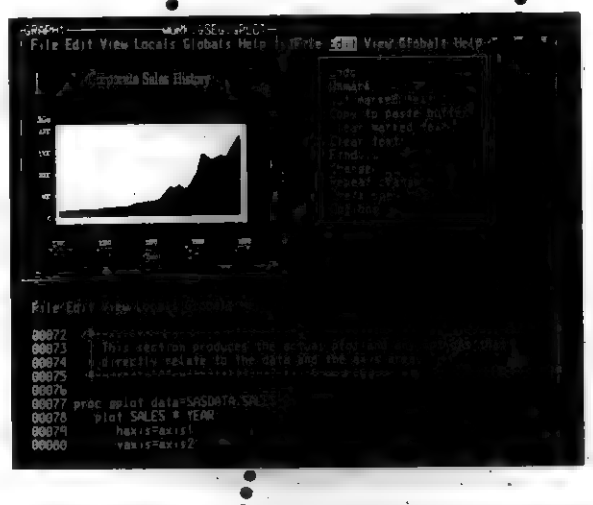
If you're approaching the SAS System from an applications development viewpoint, you'll find all the capabilities you'd ever expect in a powerful and productive programming environment. And then some.

There's a command-driven interface especially for systems analysts, applications developers, MIS personnel, and the Information Center staff.

From this interactive windowing environment, you can use the SAS System's English-like commands to build applications in a fraction of the time. And you can customize any application any way you choose by adding user-friendly menus and fill-in-the-blank screens.

A dynamic programming interface lets you customize your development environment. As your program takes shape, so do the results.

Monitor programs as they execute. Pull-down menus make editing, file management, and other essential programming tasks easy.



Directly access and manipulate the SAS System's English-like command language.

We've made sure you'll never get boxed in.

While the industry struggles to define a common operating environment, the SAS System eliminates the need for one.

Our exclusive MultiVendor Architecture™ gives you the power to decide where a particular application belongs — in the data center, at the departmental level, on the desktop, or a combination of all three. The SAS System, and the work you do, is portable across the entire range of computing environments.

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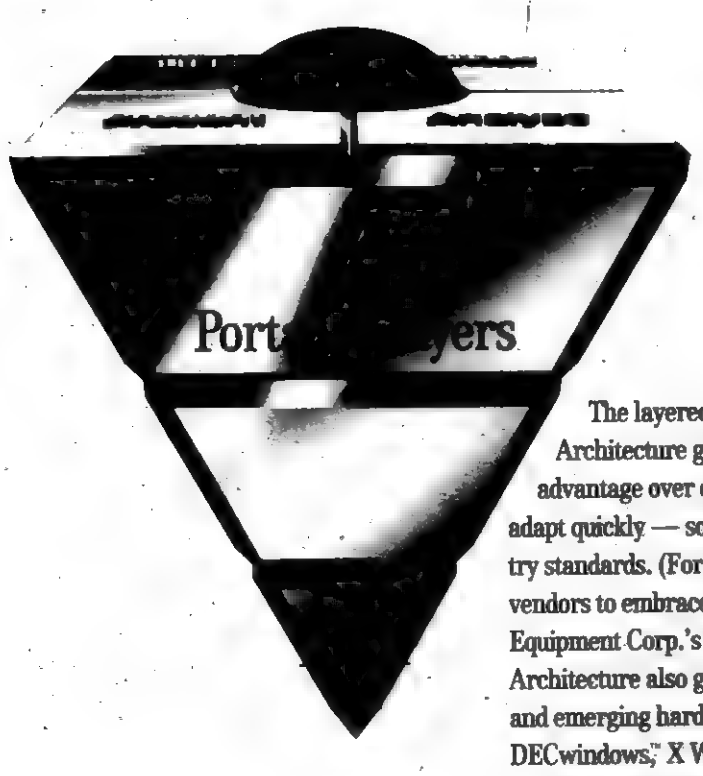

The layered approach of our MultiVendor Architecture gives the SAS System a unique advantage over other software. The SAS System can adapt quickly — sometimes instantly — to new industry standards. (For instance, we were among the first vendors to embrace both IBM Corp.'s SAA and Digital Equipment Corp.'s NAS in one system.) MultiVendor Architecture also gives you the freedom to exploit new and emerging hardware technologies — such as DECwindows,™ X Windows, Presentation Manager,™ and other native windowing interfaces — without worrying about your existing inventory of applications.

With the SAS System, you'll always have state-of-the-art software for state-of-the-art equipment. You'll never again be boxed in to a particular hardware platform.

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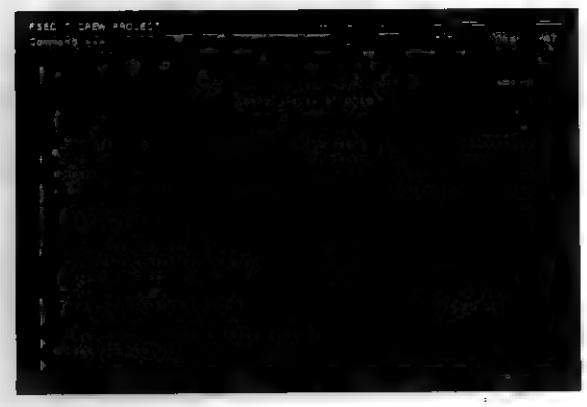
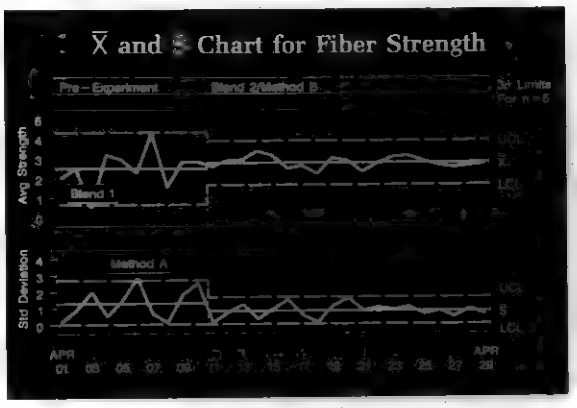
But getting data from place to place is just part of the challenge. Data *management* is also key, and the SAS System responds with efficient ways to enter new data... edit and query data files... and manipulate your data. You can even merge data from totally different kinds of files. And your inexperienced users can enter their data through customized fill-in-the-blank screens that look exactly like your business forms.



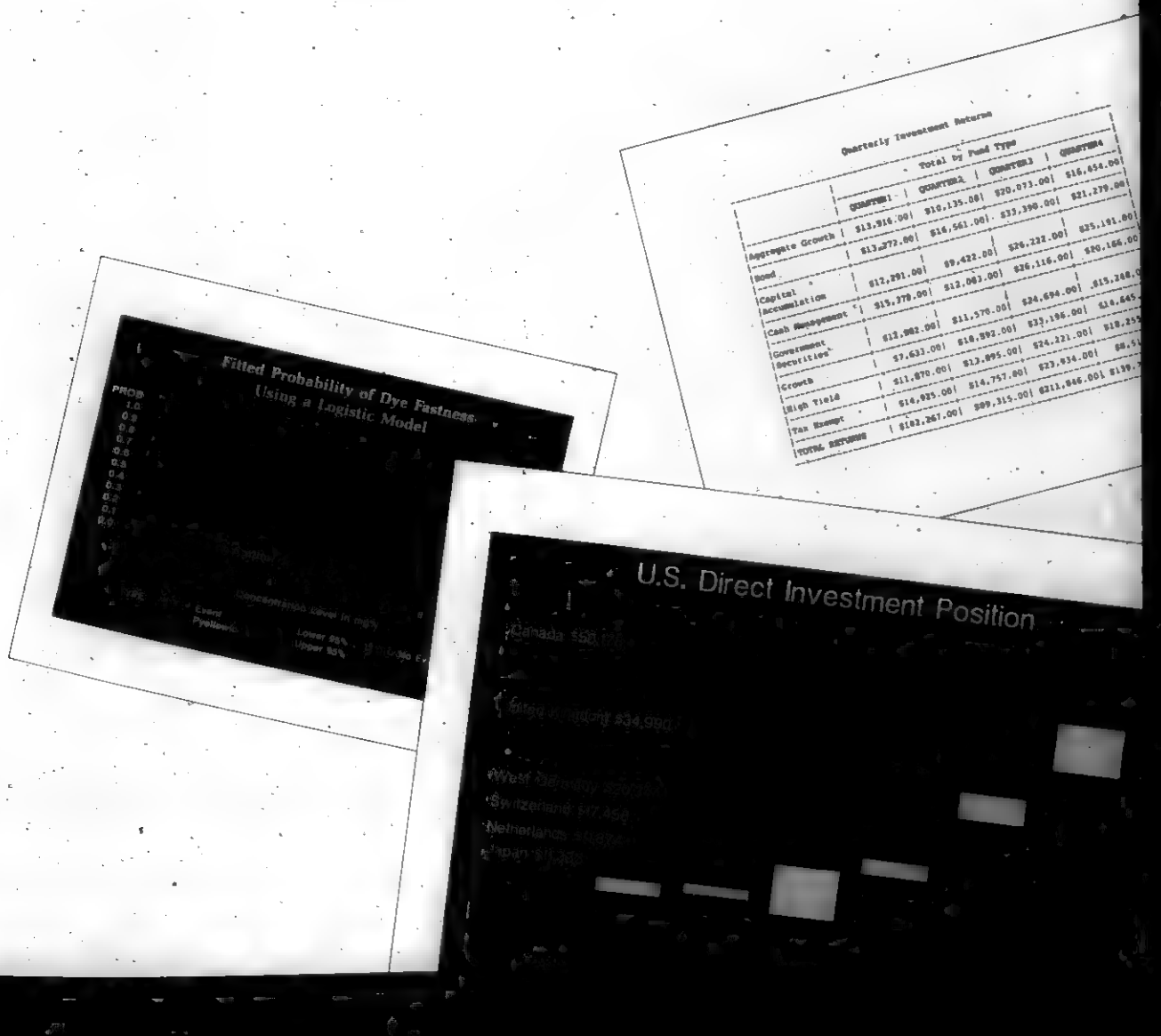
Users can take a common-sense approach to data entry using fill-in-the-blank screens.

Turning data into meaningful information has always been a hallmark of the SAS System. And now you'll find more ways to *analyze* data than ever before... everything from descriptive statistics to advanced multivariate techniques. You'll also find specialized tools for virtually any kind of business need: planning, forecasting, electronic spreadsheets, operations research, decision support, and more. Plus the most sophisticated methods for statistical quality improvement and experimental design.

And once you have analyzed your data, the SAS System makes it easy to get the attention you, and your data, deserve. Our data *presentation* capabilities are unsurpassed — from simple printed lists to spectacular full-color graphics. Here's just a sample:



You can rely on our software to handle all your analytical needs.



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(71) 628-4200

Software utilities

Intex Solutions, Inc. has announced a version of Rescue Plus that is compatible with Lotus Development Corp.'s 1-2-3 Release 3.0 spreadsheet.

Version 1.3 of Rescue Plus was designed to recover lost or damaged 1-2-3 files. It provides normal and severe recovery levels for corrupted spreadsheets and includes an undelete feature for recovering bad sectors or recovering data from one drive to another.

The product is priced at $150.
Intex Solutions
161 Highland Ave.
Needham, Mass. 02194
(617) 449-6222

Knowledgeset Corp. has announced a Sun Microsystems, Inc. Sparcstation version of its Graphic Knowledge Retrieval System (KRS), a software package designed to run under Sun's Open Windows 2.0.

The product enables data stored on compact disc/read-only memory to be immediately retrieved from DOS-based personal computers, Apple Computer, Inc. Macintosh systems or Sparcstations.

The Sparcstation version of Graphic KRS will be available in the fourth quarter. Pricing begins at $112.
Knowledgeset
888 Villa St.
Mountain View, Calif. 94041
(415) 968-9888

Vogon Enterprises Ltd. has announced Qic-Pak, a line of hardware and software packages designed to facilitate data interchange among computer systems on industry-standard ¼-in. data cartridge tapes.

The family includes Qic-Pak-I ($695), Qic-Pak-II ($995) and Qic-Pak-III ($1,995), each of which can be used on IBM Personal Computer ATs, XTs or Micro Channel Architecture-based systems running MS- or PC-DOS. Qic-Pak-III features Qtape, a utility that enables users to extract data that has been recorded in various backup formats.
Vogon Enterprises
94 Easthampstead Road
Wokingham, Berkshire
RG11 2JD, UK
(044) 734 890042

OS/2 software

Inner Media, Inc. has announced a software package designed to expand OS/2 Presentation Manager applications further than the confines of a single personal computer screen.

The Wideangle Desktop Expansion program provides a desktop consisting of nine contiguous screen-size workplaces. Each workplace contains at least one application, and users are able to move among any of the nine stations.

The product can be installed in any OS/2 Presentation Manager System. It is priced at $129.
Inner Media
60 Plain Road
Hollis, N.H. 03049
(603) 465-3216

Board-level devices

Antex Electronics Corp. has introduced an add-in board designed for IBM Personal Computers and compatibles that integrates high-fidelity digital stereo audio output, extended IBM Video Graphics Array graphics and NTSC-compatible video output onto a single card.

The AV-16 Audiographics card can be used for applications in which audio must be digitally stored, processed and interleaved with full-color graphics.

The product is priced at $895.
Antex Electronics
16100 S. Figueroa St.
Gardena, Calif. 90248
(213) 532-3092

Commax Technologies, Inc. has announced an Intel Corp. 1486-based IBM Enhanced Industry Standard Architecture (EISA) bus-based board that features hardware and software speed control to enable users to switch between 25- and 8-MHz operations.

The Excell 486 EISA is a 32-bit CPU board designed to be binary code-compatible with the Intel Corp. 80386 processor. It accepts a 32-bit interface EISA bus address card and includes 4M bytes of standard dynamic random-access memory.

The product is priced at $3,600 for quantities of 100.
Commax Technologies
2031 Concourse Drive
San Jose, Calif. 95131
(408) 435-5000

STB Systems, Inc. has introduced Powergraph Ergo-VGA, a graphics card that adds the Video Electronics Standards Association's (VESA) 72-Hz refresh options to all display modes in the hardware level.

The product supports VESA-compatible extended graphics and text modes at the firmware level. It incorporates advanced BIOS functions and a VESA compatibility interface in read-only memory.

Other features include 256K bytes of random-access memory and a maximum graphics resolution of 1,024 by 768 pixels with 256 colors. A 1M-byte unit is priced at $499.
STB Systems
P.O. Box 850957
Richardson, Texas 75085
(214) 234-8750

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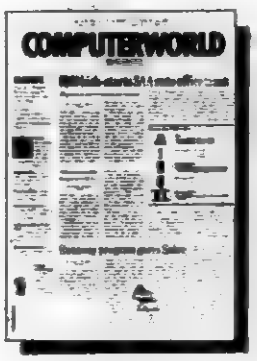
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COMMENTARY

Ellis Booker

Images bite big bytes

The electronic imaging bandwagon has picked up lots of passengers of late — an enthralled group of computer vendors, chief executive officers and applications developers. But at least one person stands on the sidewalk, worriedly shaking her head. It's the data network administrator.

Her anxiety comes from this simple fact: Sending image files (even compressed files) across computer networks, particularly wide-area networks, is a bandwidth-intensive undertaking. Consider that the average compressed electronic mail note is .5K bytes, whereas the average compressed image is around 70K bytes. Sending the former over a 2.4K bit/sec. synchronous line takes around 1.67 seconds; the latter takes close to four minutes.

Even speedy local-area networks may sag under the weight of this new requirement. Vendors confidently report that a properly designed network can convey images at under 20 seconds a pop. But take out your watch. Tick off 20 seconds. That can be an eternity for users who have come to expect subsecond response time.

Continued on page 92

ISDN approaches compatibility

BY ELLIS BOOKER
CW STAFF

Slowly but surely, the incompatibility problems clouding the Integrated Services Digital Network (ISDN) landscape are lifting.

Public network switches from Northern Telecom and private branch exchange (PBX) switches from AT&T were recently interconnected over a Primary Rate Interface line.

ISDN, an end-to-end digital technology for the public phone network, specifies two access types: a Basic Rate Interface composed of two 64K bit/sec. B channels for voice and data traffic and one 16K bit/sec. D channel for carrying packet data network signaling and control information.

While users and ISDN watchers welcomed news of yet another interoperability test, several complained that past irreconcilable differences among switching systems — AT&T and Northern gear are by far the two most widely used by local and interexchange carriers — are partly to blame for ISDN's slow deployment in this country. They also noted with frustration that even within a single vendor's product line, ISDN equipment may not interoperate.

"Everyone's putting pressure on [Northern] and AT&T," said W. Edward Hodgson, manager of computing and communications at Schindler Elevator Corp. in Morristown, N.J.

Hodgson, a chairman emeritus of the ISDN Users' Workshop of the 3-year-old North American ISDN Users' Forum, speculated that technical representatives from both AT&T and Northern resisted requests to modify their switch architectures.

In the meantime, Hodgson said, specific applications developed by the user community will wait. Even once these compatibility issues are settled, he said

Continued on page 82

New federal database aims to snag problem doctors

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — The U.S. Department of Health and Human Services (HHS) has begun taking names — the names of bad doctors.

The agency is building a nationwide database of physicians and dentists with records of malpractice, which hospitals are required to check before they hire or retain any doctor.

HHS officials said they hope the National Practitioner Data Bank will strengthen the ability of the medical community to police itself and "reduce the likelihood that incompetent practitioners can avoid detection by moving from one state to another," said Robert G. Harmon, administrator of the Health Resources and Services Administration, an HHS unit.

Harmon estimated that the database will receive roughly 50,000 reports of malpractice per year and that the program will respond to about 1 million queries per year.

The database will reside on an Amdahl Corp. 5880 mainframe at a Unisys Corp. facility in Camarillo, Calif. In January 1989, Unisys won a five-year, $15.9 million contract to design and run the database.

Many aspects of the program, established by the U.S. Congress in 1986, are mandatory. All malpractice payments and disciplinary actions made after Sept. 1 must be reported to the database, for example.

Furthermore, all hospitals must query the database every two years to check on their current staff of medical professionals, as well as new applicants they are considering. Queries cost $2 per name searched.

The American Medical Association supports the program and believes it has adequate protections for the privacy of doctors, especially since individual records will not be made public, a spokesman said.

To ensure confidentiality and security, access to the database is limited to authorized organizations involved in medical licensing, clinical privileges and professional society membership. The general public will not have access, except to aggregate statistics, because Congress felt the information requires some professional interpretation.

In fact, because of concerns over security, there will be no dial-up access to the database at all, according to John Hansan, the Unisys project director. Instead, paper reports to the Camarillo facility will be keypunched into the database and queries answered in hard-copy or magnetic-tape formats, Hansan said.

Doctors listed in the database will routinely get a copy of reports about them and have the opportunity to dispute the accuracy of the reports.

Parallel process

Sources such as insurance companies and state medical boards feed malpractice case information into the National Practitioner Data Bank

Source: U.S. Department of Health and Human Services — CW Chart: Paul Mack

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SPF/2 includes 75 ISREDIT commands that interface with IBM's REXX. You may use these to write your own commands in REXX and, if you wish, assign them to the 48 programmable function keys.

Existing mainframe REXX edit macros may be downloaded to run with **SPF/2** and CLIST macros may be easily converted to REXX.

SPF/2 is compatible with OS/2 Standard and Extended Editions, Versions 1.2 or later. However, Standard Edition users will not have access to macro capabilities due to the unavailability of REXX in that environment.

3270 COMPATIBILITY

SPF/2 processes keystrokes in the same manner as the OS/2 Extended Edition 3270 Emulator, including NEW-LINE, ENTER and status display indicators.

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"Our existing systems were reaching critical plateaus," according to Dean Van Daalwyk, manager of marketing computerization at Snap-on. "We needed a high-performance network that was flexible enough to adapt to our business, not vice versa. NetWare gave us that flexibility."

Snap-on depends on more than 5,000 independent dealers worldwide to move its products. And each U.S. branch depends on a NetWare network for tool availability. As Bill Raasch, manager of branch systems analysis puts it, "Our Novell network ensures that we have the right inventory in stock. Running our system on NetWare allows us the speed and flexibility to improve and maintain high service levels at our 54 branches."

Thanks to great products, dedicated dealers and a reliable network, Snap-on continues to lead its industry. "NetWare 386 gives us the power to service many more dealers per branch," continues Raasch. "And Novell gives us the type of responsible leadership necessary to take our network into the future."

Only Novell offers the maturity and reliability of an eighth generation network operating system. And only NetWare delivers the flexibility to keep Snap-on moving.

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NOVELL

The Past, Present, and Future of Network Computing.

User firms eye disaster-recovery net

BY GARY H. ANTHES
CW STAFF

At least two dozen New England companies are considering the formation of a partnership to develop a digital microwave network for redundant, fault-tolerant communications of data and voice.

The private shared network would provide multiple-access, diverse-route connections to local telephone companies and the long-distance networks of AT&T, MCI Communications Corp., U.S. Sprint Communications Co. and other fiber-optic carriers in Boston and New York.

Each company site would have two microwave antennas providing alternate communications paths at speeds up to 45M bit/sec. Each of these nodes would also serve as a repeater site for the network as a whole. If communications were interrupted because of a cut cable at one location, for example, communications would be reconfigured to a different carrier or to a different pathway using the same carrier.

"The ideal is to catch every carrier at two locations," said Dick Kaufman, president of Richard N. Kaufman & Associates Ltd., which is advising the companies considering the partnership.

A network operations center would be established and jointly run by member companies. It would monitor the network and redirect traffic when problems occurred, Kaufman said. Depending on the sophistication of the center's software, the network might also offer bandwidth on demand for handling a company's peak-load requirements.

"It's a third alternative to communications," Kaufman said. "You can go to a carrier for a virtual private network, you can build your own, or you can enter into a partnership arrangement with a bunch of users." He said the arrangement ought to offer more flexibility and lower costs for the members, but he said the driving force behind the idea is disaster recovery.

Kaufman said each member will subscribe in advance to a certain amount of network capacity. Then, the company will share in the cost and ownership of the network in proportion to that bandwidth and the number of miles it extends.

A second phase of the project might include adding a shared satellite uplink for very small-aperture terminal communications, Kaufman said. "The goal is to have a very secure network with all kinds of alternate routing and redundancy."

Kaufman said the firms involved include insurance companies, manufacturers, a chemical company, a data processing services firm and a number of other firms, most with multiple offices in the Boston/New York corridor.

ISDN

CONTINUED FROM PAGE 79

there will be a lag time as existing applications are transferred to new ISDN networks.

Remaining incompatibility between customer premises switches and those used by local and long-distance central offices are "still problematic," agreed James A. Johnson, a deputy program manager at Barksdale Air Force Base in Louisiana. But he went on to note that "normally you will have one or the other swiching vendors . . . your problem is long-haul interconnectivity. If they're working that out, that's a big plus."

Johnson was part of the ISDN interoperability trial at Mather Air Force Base in Sacramento, Calif. That test, ended prematurely in April on word that the base would be closed in 1993, is being reinitiated at Barksdale and will be running again in 12 to 18 months, Johnson said.

"As users, we're extremely anxious for these [compatibility] issues to be resolved," said Jeffrey Fritz, a data communications analyst at West Virginia University's telecommunications department. "It seems like ISDN has taken a long time to get where it needs to go."

The university recently skirted difficulties in its own ISDN test laboratory when it learned that the local telephone provider had decided to upgrade a central office in downtown Morgantown, W. Va., with an AT&T 5ESS and not a Northern Telecom machine, which might have been unable to work with the 5ESS that supplies the main campus' Centrex ISDN.

Northern and AT&T have already hammered out an interoperability scheme for Northern's Meridian 1 Communications System (both the Meridian SL-1 and the SL-100 PBXs) and AT&T's interexchange switch, the #4ESS. The two said last week that work to link the Meridian 1 and the #5ESS, a local phone company switch from AT&T, is under way and is expected to be completed in 1991.

The test involved the following ISDN services: voice traffic, circuit-switched data, calling line identification and call-by-call service selection, which attaches network routing instructions to each call instead of designating a specific facility for all calls placed over one trunk line.

Field testing of the DMS-250 and DMS-100 and AT&T's Definity Generic 1 and Generic 2 systems are set to begin in the fourth quarter.

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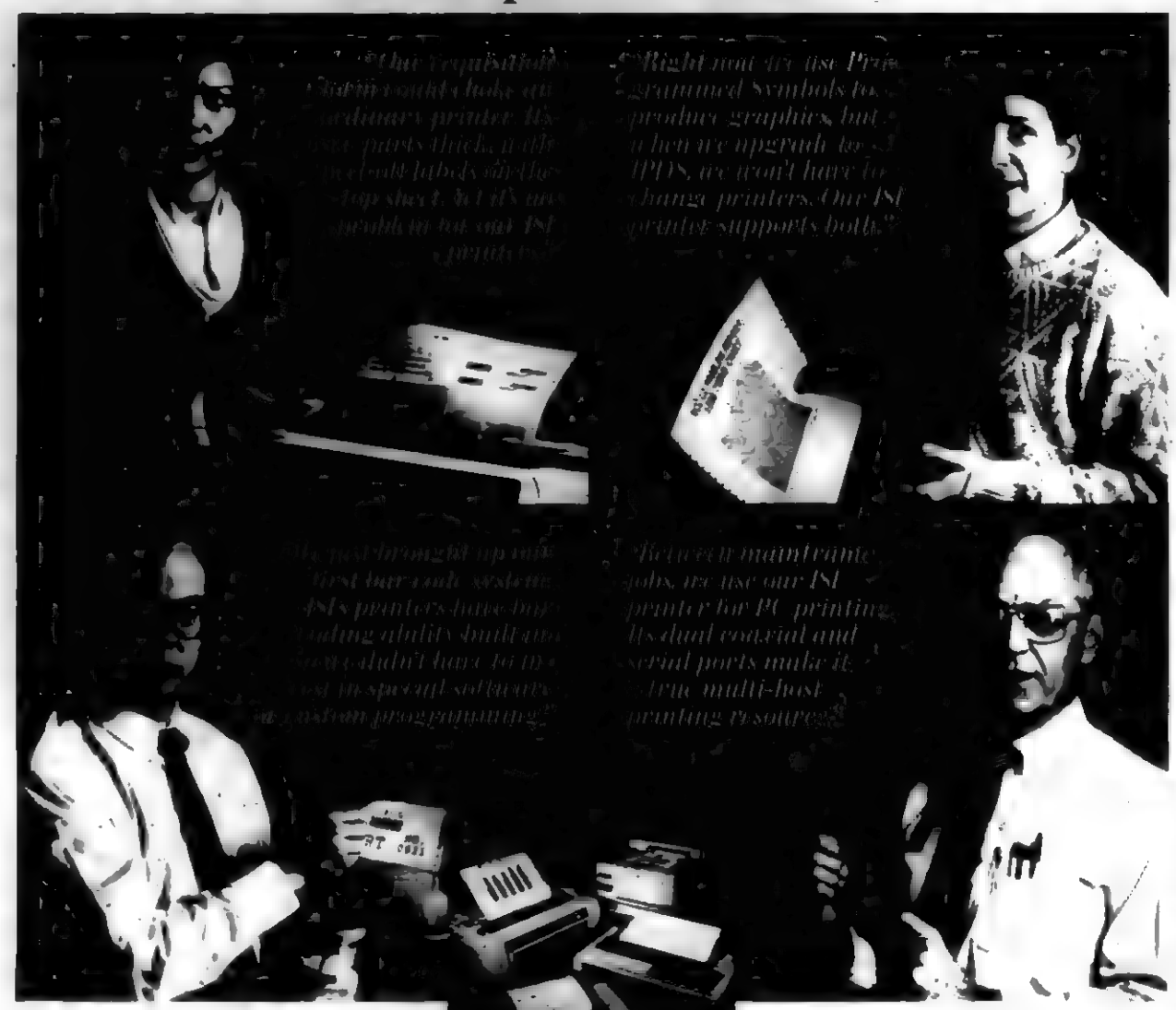

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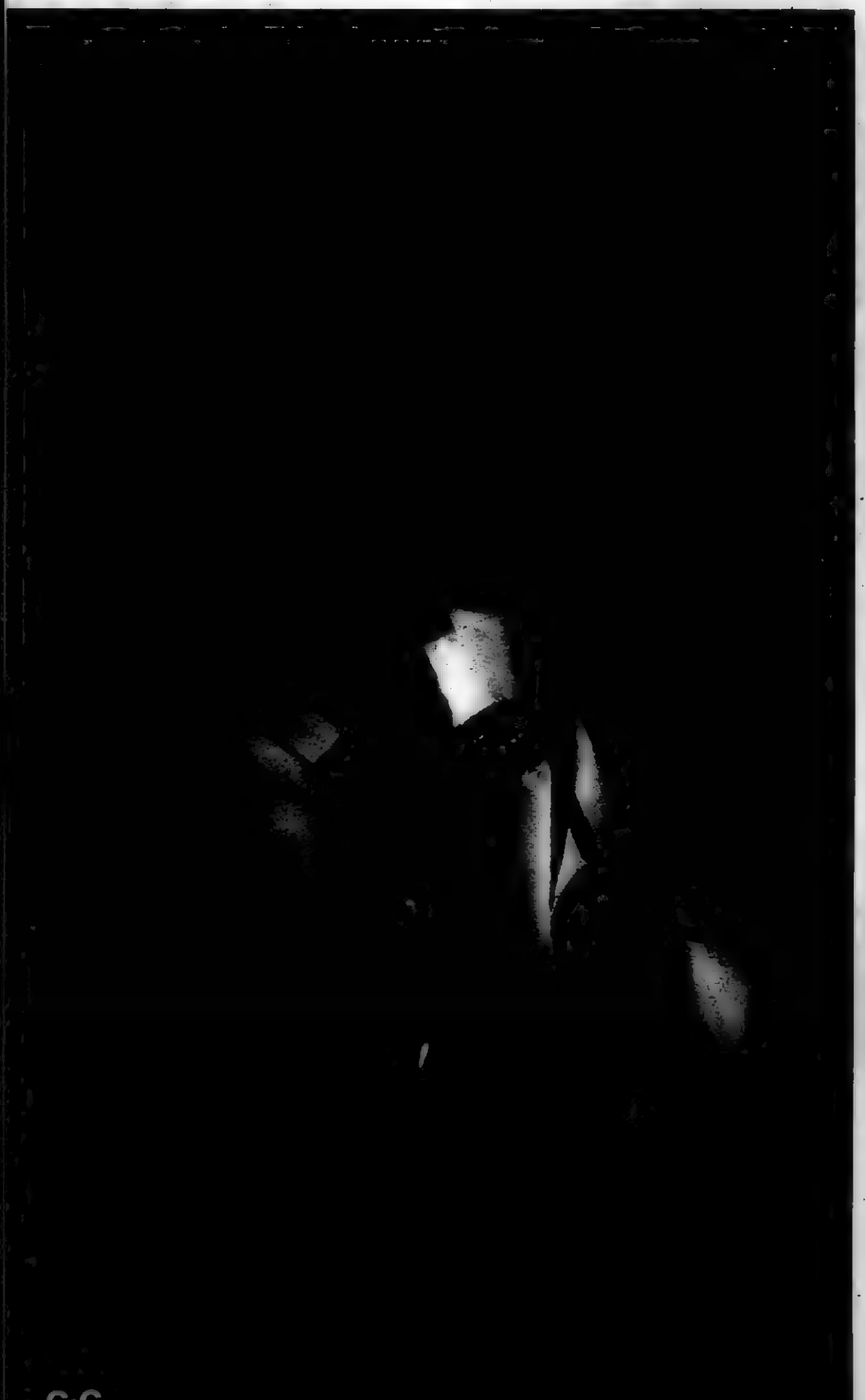
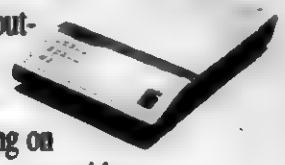


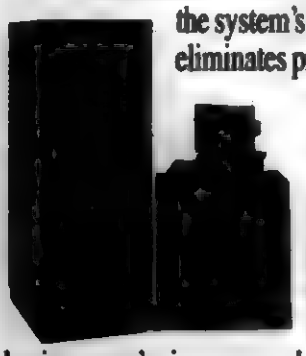
In a 911 emergency, to risk a communications breakdown is to risk a life. So if you don't want to take any chances, make sure your modem can handle the pressure in a crisis.

In Florida, NEC's I Series Intelligent Chassis System is now helping coordinate the life-saving efforts of Lake County's 911 services. The county chose the system after tests found NEC's I-Chassis modems outperformed others. And they've proved their round-the-clock reliability by being on the job there for more than a year without a single failure.



Since NEC modems are designed to rapidly and accurately transmit huge volumes of data, Lake County's 911 operators can now quickly pinpoint accident locations, provide traffic instructions, find patient medical records, and dispatch back-ups when needed. And because NEC's Dual Modem Card links 911's control center to NEC Dial-up Modems in remote locations, Lake County feels it has found the best data networking solution attainable.

Each individual I Series Chassis supports a wide variety of applications and products. These include synchronous and asynchronous operation in dial-up or leased line networks. Line speeds ranging from 300 bits/s to 56k bits/s with both analog and digital capabilities. As well as compatibility with CCITT standards such as V.32 and V.42/bis. Plus, the system's built-in flexibility eliminates product obsolescence by making it easy to add, mix, and match other chassis and data communications devices as network requirements change.



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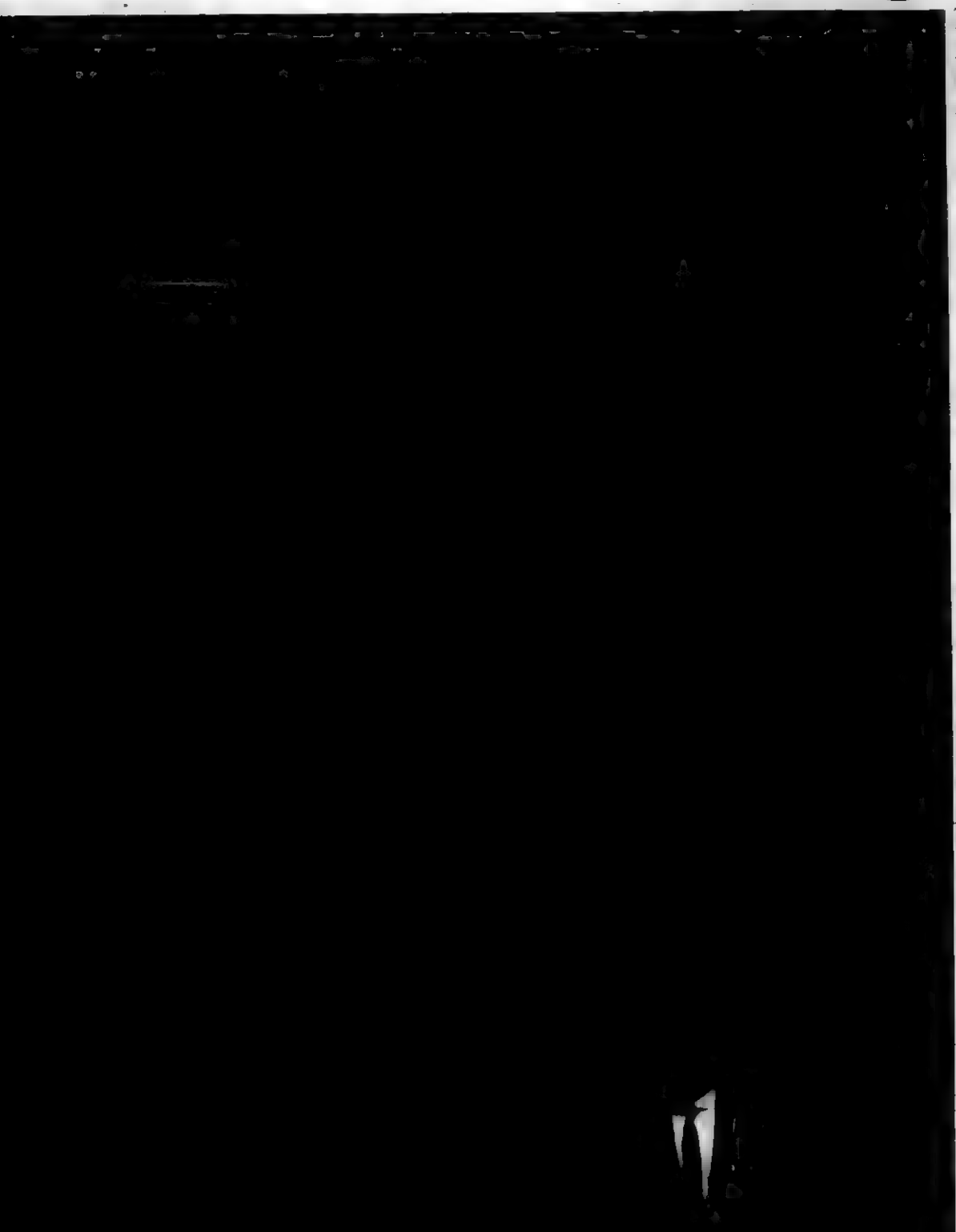

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Networld management needs resurface

BY JIM NASH
CW STAFF

A rising, grumbling tide of network discontent washed over Networld '90 Dallas last week. For months, users and analysts had become increasingly vocal in their demands for greater network management abilities, both in heterogeneous and homogeneous workplaces.

Several Networld '90 introductions addressed these demands. AT&T Computer Systems announced Release 3.4 of its Stargroup LAN Manager Server network operating system with support for AT&T's Unix System V Release 4.0, AT&T's Starserver E work group system and 16M bit/sec. token-rings. The company also introduced a software product called Systems Manager that manages Simple Network Management Protocol devices in local- and wide-area networks and provides a graphical user interface.

Northern Telecom, Inc. announced DPN Lanscope, a software package that is said to perform problem isolation and performance and usage monitoring across LANs that are interconnected via Northern's DPN-100 packet switches.

Hewlett-Packard Co. announced software that lets the HP 4972A LAN protocol analyzer troubleshoot LANs based on Ethernet and Novell, Inc.'s Netware.

Wave Technologies Training, Inc. in St. Louis announced new training, support and network management services.

Of particular interest in terms of network management was activity that went on throughout the conference — behind a shroud. Lante Corp. managed the immense number of connections and interactions specially organized for Networld '90 from a draped partition within its Shownet booth. Lante's system was designed to locate the position and scope of any network problem within 30 minutes, said company President Mark Tebbe.

Overall, Lante was in charge of getting products from companies such as AT&T, CC:Mail, Inc., IBM, Gupta Technologies, Inc., 3Com Corp., Novell and Spider Systems working in concert. The consulting firm has designed a lot of networking tie-ins, including a promotional golf game and comprehensive messaging services.

Electronic mail software vendor CC:Mail coordinated electronic requests for information based on the types of products marketed by companies. Lotus Development Corp.'s Notes software product posted messages, user-group session times and party updates. Custom software was created by Lante to monitor the application level of the network.

While Lante had asked several vendors to provide commercially available network management products, Tebbe claimed that none of the available offerings could manage a heterogeneous environment that included IBM's LAN Server, Microsoft Corp.'s LAN Manager 2.0, Novell's Netware 386 Version 3.1 and 3Com's 3+Open Version 1.1e.

In the end, Tebbe said, he wrote a single-use program to capture and interpret the packets that were flying around the Dallas Convention Center. "It's not magic," he said. "We just hacked together what we needed. It's a kludge — I'll be the first to admit it."

Network General's Sniffer and Novell's Lanalyzer were used to monitor the operating system level. On the physical level, there was token-ring, Ethernet and fiber. Cabletron Systems, Inc.'s Lanview and Network General's Sniffer monitored that layer.

BIT BLAST

Codex, Proteon make connection

As part of its strategy to be a full provider and integrator of communications systems, **Codex Corp.** has signed an agreement to market **Proteon, Inc.'s** full line of token-ring networking and internetworking products.

Under a joint technology development agreement, **Data Switch Corp.** will incorporate **Proteon's** local-area network technology into its data processing and communications switching and control systems. Data Switch plans to announce products based on the integration this fall.

U.S. Sprint Communications Co. has filed a price reduction for the 56K bit/sec. data services it provides for FTS 2000, the federal government's telecommunications system. It will be the seventh time the firm has lowered its prices on FTS 2000 services.

Interlink Computer Sciences, Inc. has announced a support agreement with **IBM** under which users can call up IBM's National Service Division support center for first-level support of Interlink products. Interlink sells a family of products to interconnect IBM and Digital Equipment Corp. communications systems, as well as connections between IBM and Transmission Control Protocol/Internet Protocol networking environments and a bridge and router software line.

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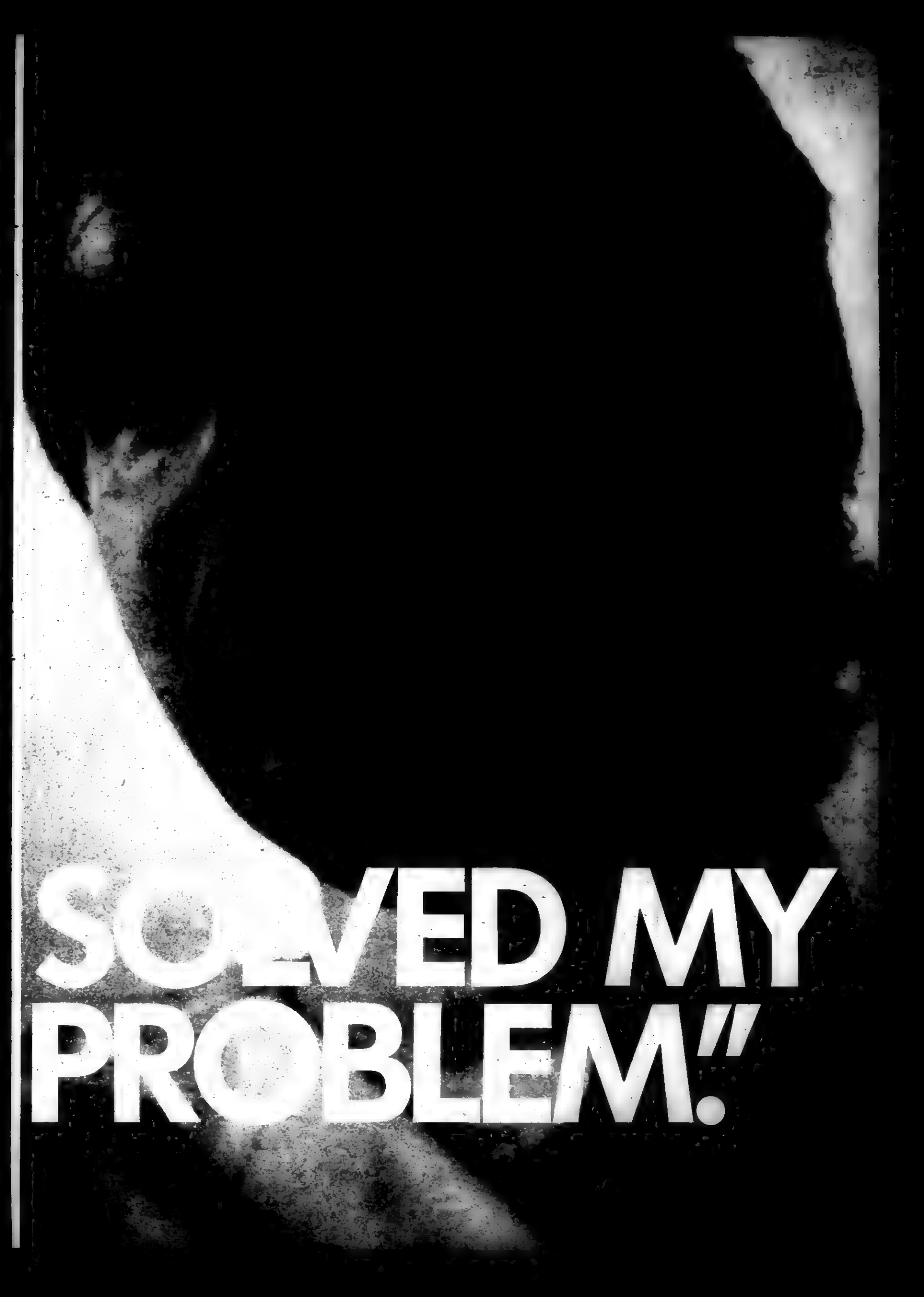

SOLVED MY
PROBLEM!"

3Com aims for open territory

BY JIM NASH
CW STAFF

SANTA CLARA, Calif. — Over at 3Com Corp., the wagon train is again changing course. Late last month, executives said they are nearing delivery of a server that they claimed will work as easily with Novell, Inc.'s Netware as their own 3+Open.

The unveiling was not unexpected. Last year, months before being crowned chief executive officer and president of 3Com, Eric Benhamou busied himself writing the outline for the Santa Clara, Calif., company to follow to a more open future.

Last month's promise that he would deliver a 3/Server 500 capable of running Novell's Netware by next spring gives more support to that outline. The question is, are 3Com employees saddling a dying horse?

A 3Com spokesperson said that 3+Open users will need to know some Netware screens and a few of the commands, but beyond that, users can use 3+Open commands to work with Netware and do not need a great deal of knowledge of Novell's products, she added.

Wall Street worries

News of the ambidextrous server and an Intel Corp. I486 upgrade board were not enough to buoy sliding Wall Street confidence.

Analyst Joe Bellace at Merrill Lynch & Co. frowned about price reductions in the firm's bread-and-butter business, Ethernet adapter boards, and his perception that 3Com is moving too slowly in smart wiring hub and internetworking markets.

For at least some users — particularly those who are migrating between Netware and LAN Manager-based operating systems such as 3Com's 3+Open — the server is clearly good news.

Toshiba America, Inc. in Irvine, Calif., is switching saddles. Now a solid Netware shop, Toshiba America is moving entirely to LAN Manager. Terry Bergman, senior personal computer coordinator at Toshiba, said he is not happy about the company's marketing decision to switch, but 3Com's server might at least ease the pain.

"Without communication between the two [operating systems], you don't have a good migration strategy," Bergman said.

Lacking a need to migrate from one system to the other, 3Com's new server, loaded with a 486 card, could enjoy a brief celebration by users in small niches.

"I'd prefer to keep it simple," said Tom Burkman, a systems analyst at Midway Airlines in Chicago. That means that Midway, which has standardized on Netware, would be unlikely to throw a wild card like a 3Com server into its mix, Burkman said. Even if a 486 board could boost Novell's power, Burkman said he would look the other way.

"Somehow, some way, I think you might be in for trouble."

At the Fortune 100 level, 3Com might become irrelevant. Martin Sinnott at NCR Corp. said, "There's a consolidation going on. We're finding that [Microsoft Corp.'s] LAN Manager is the preferred technology." Sinnott is director of development at NCR's workstation division.

Word of 3Com's new server "makes me a happier business person," said Bill Bailey, director of planning at Unum Life Insurance. He said he expects a "ripple effect" to bring similar interoperability to other vendors, "but personally, the task at hand is to solve problems, not play with toys." Bailey said Unum would continue to use its IBM LAN Server, which is also based on LAN Manager.

Sinnott said Dayton, Ohio-based NCR is selling OS/2 LAN Manager, SQL Server and Communications Server — all Microsoft products — directly with its PCs. He said large companies in particular view LAN Manager as the more open system.

Proteon shines up network hub with fiber backbone

BY JOANIE M. WEXLER
CW STAFF

Token-ring users, choose your media.

Proteon, Inc.'s recent rounding-out of its Series 70 intelligent wire center to support 16M bit/sec. fiber backbones allows companies to knit together their shielded or unshielded twisted-pair local-area networks and manage the whole internetwork through the vendor's Tokenview Plus and Tokenview Manager systems.

Intelligent wire centers, also called smart hubs, have skyrocketed in popularity for logically configuring LANs of any topology within the hub and physically arranging the nodes in a star configuration. This allows a connection to each node, alleviating network management guesswork.

Proteon is not alone: Synoptics Communications, Inc. recently enhanced its System 3000 wiring center, which originally supported Ethernet LANs over various media, with token-ring capabilities. The company last month added two new modules: one supporting 16M bit/sec. token-rings over voice-grade unshielded twisted-pair, and one that supports 4M bit/sec. token-rings over both shielded and unshielded twisted-pair.

While Proteon purports to consider industry standards a major priority, there has been little progress by the IEEE 802.5 token-ring standards committee toward a standard for running 16M bit/sec. token-ring networks over the fiber medium. Proteon has not mentioned plans for hub support of Fiber Distributed Data Interface (FDDI), the near-complete ANSI standard for 100M bit/sec. LANs that is gradually finding acceptance.

Proteon does, however, offer an FDDI router for use by companies running the high-speed FDDI LAN as a backbone.

"The fiber support rounds out Proteon's offering, but overall, the amount of token-ring networks running over fiber is very small," commented Susan Frankel, an analyst at Framingham, Mass.-based International Data Corp.

Frankel said that in 1990, just 2% of all non-FDDI token-ring nodes will connect to fiber, adding that the percentage will grow to just 6% by 1994.

"It's not clear to me what the rationale was for not moving to FDDI as a backbone," said Kevin O'Neill, vice-president of network research and consulting at Business Research Group in Newton, Mass. "Maybe, like other vendors with investments in proprietary technologies, Proteon is holding off until FDDI becomes more accepted before cannibalizing its existing product."

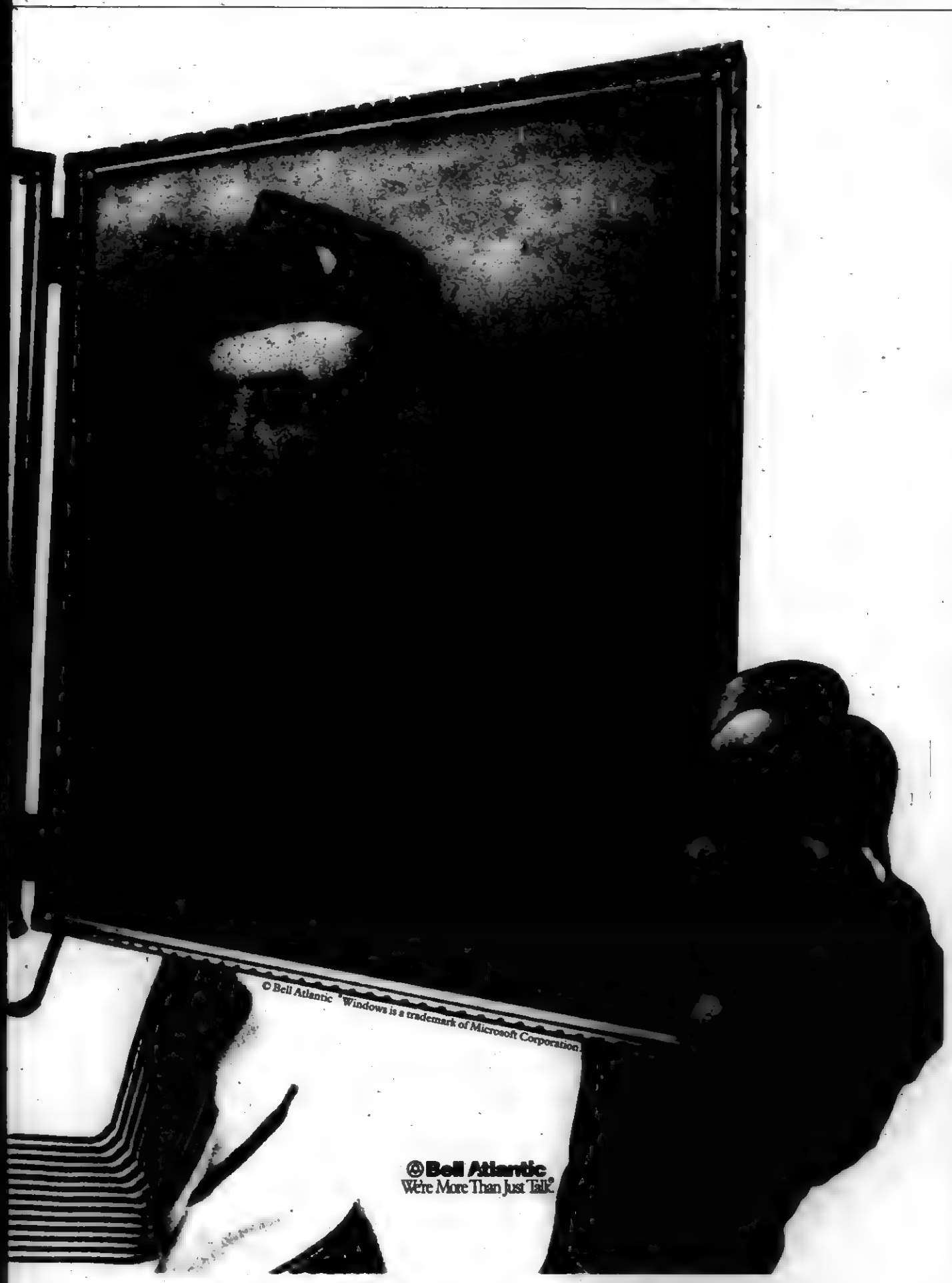
Proteon has offered its proprietary Pronet-80 fiber backbone network, which runs at 80M bit/sec., since 1985.

Cost-conscious

The company said it hopes that because of many information systems managers' current budget crunches, more firms will turn to it as a lower-cost alternative to IBM, claiming that its 16M bit/sec. fiber system is about 38% cheaper than IBM's and citing its centralized token-ring management offering as an edge over its competitor. IBM announced a Token-Ring management workstation and software earlier this month.

Proteon's Tokenview Plus is a station that manages a single ring; Tokenview Manager gathers network management data from Tokenview Plus systems on multiple rings for a conglomerate picture of the interlinked network.

O'Neill said that "a number of IBM accounts will be interested in Proteon's 16M bit/sec. fiber backbone as a cost-effective way of linking their 4M bit/sec. token rings. In terms of the general market, however, there's a question mark as to its positioning."



Booker

CONTINUED FROM PAGE 79

Imaging proponents legitimately counter that in the days before these ambitious imaging applications emerged, white-collar professionals spent far more time hunting for paper records or requesting those documents.

Earlier this year, the Police Department in Rochester, N.Y., installed a Wang Laboratories imaging system for managing the 16,000 motor vehicle accident reports it processes annually.

Response time on the Wang VS-hosted system also depends on where the images are located. "We have three scenarios for display [of images]," said Richard Babin, manager of police information systems. "If the image is on magnetic media, typical response time is under 5 seconds . . . If it's on an optical disc and the disk is mounted in a drive in our jukebox, it's 10 to 15 seconds. The third scenario is if the image is on optical disc but not mounted [and the robotic jukebox must load it first]. That response time is 45 to 50 seconds."

Asked what would be an "acceptable" response time, Babin says 90 seconds, although he acknowledges that this wait might be thought intolerable by some people.

"I think you have to keep in mind what the manual process was like in terms of how long it took to do something, how long it took to run around or make copies . . . and the frustration of waiting," Babin said, adding that an unanticipated benefit of the imaging application has been a dramatic boost in department morale.

However, while the local components in imaging setups have some solutions, including installation of a 100M bit/sec. Fiber Distributed Data Interface (FDDI) LAN, wide-area networking is much more problematic. At 19K bit/sec., the single image will take half a minute to shoot down the line. Even with a 64K bit/sec. pipeline, a typical image would still take just under nine seconds to transmit.

A 64K bit/sec. channel can be found in an Integrated Services Digital Network (ISDN) line, and ISDN, unfairly regarded by many as a technological stepchild, could gain some advocates if it was used for this purpose.

The Rochester police hope to implement an ISDN Centrex connection within six to eight months, according to Babin, who said a test last week of a 94K-byte file over the single 64K bit/sec. B channel took 10 seconds. Displaying the image on a workstation will add some more delay, but Babin seems to be confident that he can get performance of less than 20 seconds.

A final networking issue is the backup of what promise to be enormous image databases. A law firm, for example, is scanning up to 10,000 pages a day, seven days a week; an engineering company has put more documents into its image database in three months than it did in 20 years of using conventional data processing.

Here again, the marketplace's growing need for bandwidth may propel local and long-distance providers to accelerate deployment of fast-packet, Sonet and broadband ISDN networks.

Meanwhile, will users wait those extra few seconds for their pictures? I'm not so sure. Even the strongest proponents of imaging will concede that this tool succeeds only when users accept it. For that to happen, users will insist on dramatic improvements over their familiar, paper-based ways of working.

I'll wager that a 20-second response time will start showing up in many customer proposal requests to vendors and that this threshold will become the maximum delay users will tolerate.

Booker is Computerworld's Chicago bureau chief.

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NEW PRODUCTS

Network management

Sungard Recovery Services, Inc. has unveiled a disaster-recovery software package designed for users of IBM Token-Ring local-area networks.

The Sun-Net 802 T/R uses an IBM 3745 front-end processor equipped with a token-ring interface coupler to interface with a subscriber's bridging equipment to recover Token-Ring networks. The product supports 4M or 16M bit/sec. Token-Rings and communicates at a maximum speed of 1.54M bit/sec.

Pricing ranges between $300 and $500 per month, depending on type of contract and type of access used.

Sungard
1285 Drummers Lane
Wayne, Pa. 19087
(215) 341-8700

Triticom has announced a product designed to monitor token-ring traffic and ring errors in real time while operating within 4M bit/sec. IBM/IEEE 802.3 Token-Ring local-area networks.

Tokenvision includes four real-time monitoring display modes: station display, skyline, statistics and MAC statistics.

System requirements include an Intel Corp. 80286- or 80386-based personal computer running PC-DOS or MS-DOS Version 3.1 or higher. The product costs $495 or $995 with an optional 16K bit/sec. token-ring adapter.

Triticom
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MANAGER'S JOURNAL

EXECUTIVE TRACK

Glen R. Winans II has been promoted to vice-president of information systems at **Automated Training Systems (ATS)**, a Woodland Hills, Calif.-based provider of audio training services for IBM midrange computer users.

Winans was promoted from data processing manager, a position in which he managed the IS and technical support departments. As vice-president, he maintains those duties and adds responsibility for managing the research and development department.

Winans joined ATS in 1988 in the sales department. Before that, he was manager of programming for the city of Topeka, Kan., a programmer at Idaho Statesman and an operator at United Information Utilities, Inc.

.....

The U.S. National Commission on Libraries and Information Science (NCLIS) in Washington, D.C., has named **Peter R. Young** as executive director. He has worked at the Faxon Co. in Westwood, Mass., since 1988, where he serves as director of academic information services and as director of the Faxon Institute for Advanced Studies in Scholarly and Scientific Communication.

Young, who holds a bachelor's degree from the College of Wooster in Ohio and a master's in library science from Columbia University, takes the place of John G. Lorenz, who had served as acting executive director since the departure of Susan K. Martin in June.

.....

Who's on the go?

Changing jobs? Promoting an assistant? Your peers want to know who is coming and going, and *Computerworld* wants to help by mentioning any IS job changes in Executive Track. When you have news about staff changes, be sure to drop a note and photo or have your public relations department write to Clinton Wilder, Senior Editor, Management, *Computerworld*, Box 9171, 375 Cochituate Road, Framingham, Mass. 01701-9171.

Disaster recovery takes broader view

IS managers' disaster expertise is in demand for 'business resumption planning'

BY GARY H. ANTHES
CW STAFF

When fire broke out on the 10th floor of a Penn Mutual Life Insurance Co. building one afternoon last year, some of the 12 million gallons of water pumped by the Philadelphia Fire Department found its way to the firm's seventh-floor data center. Although damage was extensive, Penn Mutual had put together a traditional data center recovery plan; by the following morning, computer processing had resumed at a Sungard Recovery Systems, Inc. backup site.

However, other critical business functions didn't fare so well; the fire destroyed important manual records supporting a number of insurance activities. Now, Penn Mutual and Harris Devlin Associates, a Sungard subsidiary, are putting together what has become known as a business resumption plan — a belated recognition that an organization does not live by data processing alone.

Information systems managers are increasingly being tapped by top management to develop these enterprisewide plans, expanding the scope of disaster planning far beyond the traditional and comfortable data center boundaries. The new responsibility carries significant risks and rewards for IS managers.

Comdisco Disaster Recovery Systems, Inc. has broadened its traditional computer recovery services to include business recovery offerings. After the San Francisco earthquake last year, brokerage firm Charles Schwab and Co. took steps to move its computer processing to a Comdisco facility in

New Jersey. But it did not stop there. It also moved some critical back office operations to another Comdisco facility 20 miles north of San Francisco where Comdisco had standby offices equipped with telephones and computer workstations.

"The traditional approach assumes the tornado only affects the data center," says John Maxwell, director of membership services and technical support at the Association for Computer Operations and Management (AFCOM). "Chief financial officers are driving disaster recovery now. They're starting to realize that if they can't resume most business functions in a heartbeat, they're in trouble."

In most cases, Maxwell says, CFOs are turning to IS managers for corporatewide plans because they have the most experience with disaster planning and because they are likely to have a broad knowledge of the critical areas that depend on computer technology. Maxwell says disaster-recovery planning methods developed for computer operations can also be readily adapted to functions that are entirely manual.

Robert P. Campbell, president of Advanced Information Management, Inc., a firm specializing in information

Continued on page 94

Sound IS investment based on teamwork

BY SALLY CUSACK
CW STAFF

Quantifying money spent on information technology is often an elusive yet essential task for information systems managers, but a recent study by The Diebold Group, Inc., a New York-based management consulting firm, said there may be hope for those designated to evaluate information technology expenses and investments. The answer may lie in an approach that blends teamwork with the ability to prove both hard benefits and soft benefits from technology.

According to Diebold, analyzing information technology investments is a multidimensional issue, and productivity analysis must take place on all levels, beginning with the individual and progressing outward to incorporate the global economy. Once this premise is established, one must identify the correlations between levels.

"This becomes more problematic as one drills down to the department, work group and individual levels," said Anthony P. DiRomualdo, associate director of Diebold Research Programs. "They are more complex, more qualitative and more fuzzy."

DiRomualdo also noted that traditional macroeconomic relationships have failed to determine a relationship between investment and productivity — a factor that has further strained the relationship between top management and IS. Aggregate measures of IS costs are more visible than aggregate measures of benefits.

For IS executives to succeed, they must develop a strategic, business-oriented view of information technology spending and investments. Based on the study, Diebold recommends the following steps:

- Combine hard quantifiable and soft nonquantifiable measures of IS costs and impacts.
- Incorporate multiple perspectives.
- Balance business and technical tradeoffs.
- Link performance measures with business objectives.
- Involve both line and IS managers.

Diebold coordinates analysis between IS and line management. This "teaming approach" between IS and line management will aid in avoiding both technological and business risk, the report states, while the justification processes must address both the business and technology domains.

According to DiRomualdo, possibly the most critical issue revolves around the fact that a companywide perspective of information technology is lacking in many companies. "Executives must be proactive in correcting this situation," he concludes.

Recovery

FROM PAGE 93

security, says an outdated but still dominant notion is that the IS manager can arrange for offsite data storage, sign a contract with a backup processing firm and then declare planning done. "Now, senior management is changing MIS' charter, and many IS managers will be surprised to find out [recovery planning] includes all corporate functions," he says.

Irving Pollack, manager of IS at Credit Lyonnais' U.S. headquarters in New York, says he "nagged" top management several years ago to let him develop a bankwide plan. It paid off. When the lights went out in lower Manhattan last month, the bank moved 100 people to a Comdisco hot site in New Jersey where the bank had contracted for computer capacity and 9,000 square feet of office space [CW, Aug. 20].

Pollack says all but two of 35 data processing and back-office functions, previously identified as critical in the recovery plan, were restored within six hours.

IS hitch could mean business disaster

Percent of respondents (Base: 160)

Functional area	Dependence on computer support: Total	Heavy	Moderate	Slight
Accounting	29%	60%	8%	3%
Finance	13%	56%	23%	9%
Personnel & administration	6%	41%	28%	26%
Sales & marketing	10%	41%	29%	20%
Inventory & distribution	25%	47%	15%	13%
Production (goods & services)	19%	45%	19%	17%
Overall dependence on computing	19%	66%	14%	1%

Source: Center for Research on Information Systems, University of Texas at Arlington

"We could have done it even quicker, but our truck overturned in the Lincoln Tunnel on the way [to the hot site]. It's the only thing we didn't plan for."

There are risks for IS managers in taking on this expanded role, including the danger that they will underestimate the magnitude of what has to be done. "The IS manager may just see it as data center warmed

Build a strong case

What if your CEO has not asked you to do the business resumption plan?

Robert P. Campbell, president of Advanced Information Management, Inc., says IS managers must lobby for top management support for business resumption planning if that support is lacking. This can be done in part by citing government regulations, especially in industries such as banking, and by recounting horror stories of others' disasters.

However, the problem with these negative motivators is that they are short-lived. The most effective tool is the ability to build a strong business case for comprehensive plans, Campbell says.

Campbell uses a method by which business functions are identified and analyzed in terms of the impact their loss would have, over time, on the company's ability to do business, its revenue stream, its expenses and its overall reputation.

Once management approves an approach, get going on it, Campbell says. "If you can't get something done in six months, interest of top management flags."

Dan Galloway at First American Bankshares advises the IS manager to get outside help for the job. "The general business areas have difficult requirements. Besides, that will get you more credibility with top management."

GARY ANTHES

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over," Campbell says. "With the data center, he can focus on just one entity. Now he may have to have 50 plans, each unique. And he has to understand the business functions."

But there are rewards, too. "The chief information executive starts to gain substantially in stature because he's been pushed into all levels of business and gained visibility at the highest levels of management," Campbell says.

Dan Galloway, manager of project and technical management at First American Bankshares, Inc., a seven-bank holding company based in Washington, D.C., is putting together a recovery plan for the banks that extends an existing data center plan to critical business functions outside of data processing.

Galloway agrees that his position, just two levels below that of chairman, is a reflection of the importance of the business recovery planning function. "It's deserving of a relatively senior position," he says.

To Maxwell, the obvious risk in planning is that the plans may fail when needed in an emergency. "You can't just develop a plan, you have to test it," he says. "Any plan not tested on a regular basis has a 60% chance of failure."

Maxwell once headed computer security at a publishing firm, and one Saturday he decided to test part of the company's plan by telephoning the key managers responsible for executing disaster recovery. Not one person could be reached, and as a result, they now wear beepers on weekends, he says.

Eighty-five percent of 160 respondents to a 1987 survey by the Center for Research on Information Systems at the University of Texas at Arlington said they were totally or heavily dependent on computer systems. But only 63% reported having disaster recovery plans, and of those, 39% said they had never tested their plans.

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Look at the other guy

BY CLINTON WILDER
CW STAFF

ST. LOUIS — Want to convince your company's senior executives that you are making effective use of information systems? Try telling them what your competitors are doing.

Tom Lutz, vice-president and chief information officer at Armco Advanced Materials Corp., uses that approach with his senior management team.

Lutz shared his strategy with attendees at the recent Enterprisewide Information Management Conference sponsored by the Center for the Study of Data Processing at Washington University in St. Louis.

"Our customers compare the quality of our steel to that of Nippon Steel and Kawasaki Steel [Corp.], so why not compare IS?" Lutz asked.

Information exchange

But wait, you say. That is proprietary information that we could never find out. Right? Not so, Lutz said. In many cases, competitors can be surprisingly open about sharing IS success stories.

Lutz has formed an "information exchange" with some firms in the steel business. "It works well, and it's not collusion," he said. Beyond that, much data about competitors' use of IS can be found in the public domain.

Lutz said that too often, IS departments judge themselves only by internal performance measurements, while the only business measure that really counts is competing in the marketplace. A performance report rating IS on that basis earns a lot of credibility with senior management, he said.

"I was able to show that we developed a system in less than a year that took one of our competitors six years," Lutz said. "That really meant something."

IS executives should think of their role as empowering line managers to do their jobs better with IS, according to Lutz.

"After the system is up, who is accountable for realizing the benefits of the system? It has to be the line managers," he said. "Our job is to make every business function head into a hero."

Finding a Gameplan to help IS

BY JOHANNA AMBROSIO
CW STAFF

If you are tired of playing games with your employees, do not read this. However, if you are willing to give it another shot, there is one game said to help information systems departments improve relationships with end users and upper management.

Called Gameplan, the software combines expert systems technology and simulation to help IS staff members figure out how to introduce new technology into their organization most effectively. It takes the form of a game in which IS department employees win and lose points depending on their strategies. At the end, the game promotes or demotes players depending on their performance.

IS managers who have tried Gameplan said it works for them. "It helps us look at various options to help our end users achieve their business plans," said Kees Vreugdenhil, IS director at Union Gas Ltd. in Chatham, Ont.

The company brought in Gameplan about one year ago. Since then, about 60 IS staff members and 10 end users have played the game. "Before we approach user departments about a new project they requested or we thought of, sometimes we use the software to help us anticipate what to expect," Vreugdenhil said.

Gameplan was developed and is sold by consulting firm N. Dean Meyer and Associates, Inc. in Ridgefield, Conn. Originally released for sale in 1987, Version 3.0 recently became available. Gameplan runs on personal computers under DOS and is priced at $695.

When the game begins, the players define the corporate culture of their particular organization. Then, based on that culture, the game takes the players through a simulation in which they figure out how to introduce end-user computing into that organization. As the players continue, they choose different options such as forming a steering committee or publishing a strategic plan, for example.

Although end-user computing is used as the model, a Dean Meyer spokesman said that the principles apply to introducing any new technology.

Richard Quillin, IS manager for the city of Albuquerque, N.M., said his department uses Gameplan as a training tool. "It helps people who are technical understand the political process of introducing technology," he said. "It's a good tool."

However, it is not the kind of thing that can be used on a weekly or even a monthly basis, IS managers agreed. "If you do it too often, you learn how to beat the system," said William Heuser, vice-president of information services at the New York City Transit Authority.

"But Gameplan makes it very obvious that you need to think about how new initiatives are brought up to management, and the people who participate bring back a much better understanding of how they all work," Heuser added. "It shows you how your co-workers think."

CALENDAR

OCT. 7-13

Pacific Northwest Software Quality Conference. Portland, Ore., Oct. 7-9 — Contact: Terri Moore, Pacific Agenda, Portland, Ore. (503) 223-8633.

Fox Developer Conference. Toledo, Ohio, Oct. 7-10 — Contact: Fox Software, Perrysburg, Ohio (419) 874-0162.

Making CASE Work. Scottsdale, Ariz., Oct. 8-10 — Contact: CASE Research Corp., Bellevue, Wash. (206) 453-9900.

Eastern Exposition and Conference. Alexandria, Va., Oct. 8-10 — Contact: The American Public Communications Council of the North American Telecommunications Association, Washington, D.C. (800) 538-6282.

National Communications Forum. Chicago, Oct. 8-10 — Contact: National Communications Forum, Chicago, Ill. (312) 938-3500.

Southeastern Telecommunications Association Conference and Equipment Exposition. Miami Beach, Fla., Oct. 8-10 — Contact: SETA, Columbia, S.C. (803) 731-5640.

American Production and Inventory Control Society International Conference and Exposition. New Orleans, Oct. 8-12 — Contact: APICS, Falls Church, Va. (703) 237-8585.

Interop '90. San Jose, Calif., Oct. 8-12 — Contact: Interop, Inc., Mountain View, Calif. (415) 941-3399, ext. 200.

CASE World Conference and Exposition. Chicago, Oct. 9-11 — Contact: Digital Consulting Group, Andover, Mass. (508) 470-3880.

Northcon '90. Seattle, Oct. 9-11 — Contact: Northcon, Los Angeles, Calif. (213) 641-5117.

Executive Information Systems in Government. Washington, D.C., Oct. 9-12 — Contact: Conference Manager, USPDI, Inc., Silver Spring, Md. (301) 445-4400.

Computer Negotiations. New York, Oct. 10-11 — Contact: International Computer Negotiations, Inc., Winter Park, Fla. (407) 740-0700.

Imaging '90 Conference and Exposition. New York, Oct. 10-12 — Contact: Michelle Graczyk, BIS CAP International, Inc., Norwell, Mass. (617) 983-9130.

Info '90, International Information Management Exposition & Conference. New York, Oct. 10-12 — Contact: Cahners Exposition Group, Stamford, Conn. (203) 352-8477.

Microprocessor Forum. San Francisco, Oct. 10-11 — Contact: Microprocessor Report, Sebastopol, Calif. (707) 823-4004.

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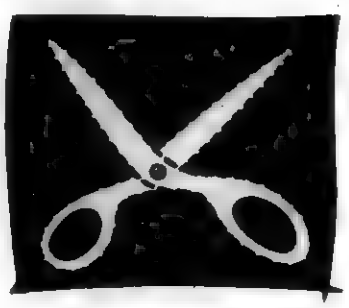

Tim Lewis

Summaries from leading scientific and management journals

"The computer speed barrier"

By Michael Leibowitz

Technology Review
Aug./Sept. 1990

■ For every 11 inches a computer signal travels, one-billionth of a second is lost. High-performance workstations, minicomputers and mainframes have become so fast that distances separating chips — not the chips themselves — can be a major bottleneck.

That is why researchers are hot on the trail of interconnection technology, the study of how to pack integrated circuits together to minimize the path that electrical signals must travel. Approaches include the following:

• Multichip modules. Multichip modules compress the capabilities of four 12-sq-in. printed circuit board assemblies into a single 5-sq-in. module. The modules contain ultrafine conductive lines that compactly link several dozen microchips.

• Wafer-scale integration. In conventional chip making, 40 or more microchips are cut out of a single 6-in. silicon wafer. In wafer scale, the disk is never cut up, and connections between microchips are made directly on the wafer. One company is selling a pair of 6-in. wafers that together offers 40M bytes of memory.

Wafer scale nearly eliminates excess space and the handling of individual microchips but has been hampered by its inability to isolate defective chips that occur on a silicon wafer.

• Z-plane technology. Z-plane stacks chips on top of each other, with conductive lines running up the sides of the stack. A z-plane can hold 20 to 100 chips, packing 40M bytes of memory in a space the size of two sugar cubes.

"Informal technology transfer between companies: information leakage or know-how trading?"

By Stephan Schrader

MIT
Working paper, May 1989

■ It is well known that employees of firms in the same industry often share technical information — whether at conferences or in a legendary Silicon Valley bar. But the notion that this information exchange is a kind of dangerous "information leakage" must be rejected.

What employees are really engaging in is "know-how trading," a practice that winds up benefiting the companies involved, according to a study of 294 technical managers in the steel industry. The managers provide technical information with the expectation of getting some beneficial information in return.

The study suggests that the economic performance of companies allowing this informal information exchange is higher, not lower, because know-how trading prevents redundant research activities.

To this end, technical managers readily share cost-saving ideas but avoid leaking information to their strongest competitors, especially quality information that could result in a competitor having a better product.

"The chief technology officer"

By Paul S. Adler
and Kasra Ferdows

California Management Review
Spring 1990

■ The title of chief technology officer has been creeping its way into the ranks of senior corporate management at a number of large corporations. Unlike its close equivalent, vice-president of research and development, a chief technology officer is considered to be *the* senior executive for all technical matters. He plays an integrating role among product, production process and information technology.

In companies that have chief technology officers, there were several common factors behind the creation of such a position. Companies said they wanted better control over R&D efforts, the ability to bring the technological base and top management together, better overall leadership and congruity among separate business units.

Specific responsibilities usually include the following:

• Coordinating technology among different business units, avoiding duplication of tasks and assisting and ensuring the transfer of information.

• Keeping corporate management abreast of developments.

• Supervising all technological endeavors.

• Assessing the technological implications of new endeavors, acquisitions, joint ventures and strategic alliances.

• Managing those activities performed by outside organizations such as universities and regulatory agencies.

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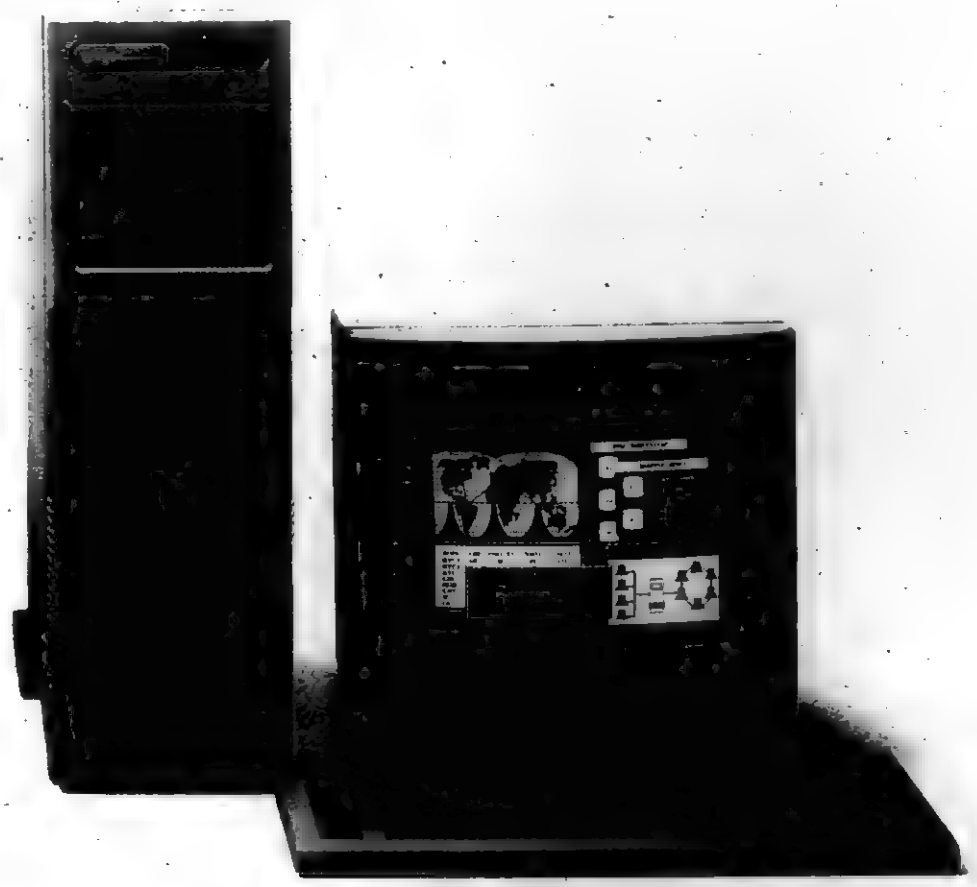

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MAINFRAMES

Buying one today is a different game

BY ALLAN BAUMGARTNER

It used to be that a mainframe was a mainframe was a mainframe. If it said "mainframe" on the box, you'd set it up as a standalone system to store many millions of instructions per second (MIPS) of data and churn out batch processing applications. The choice of which machine to buy was fairly straightforward, dependent mostly on power capabilities and available software.

Today, data center managers often have other things in mind for these machines. Even corporations that have not yet begun to think in terms of future computing architectures know that mainframes do not necessarily have to operate as application islands. They know that these machines will be increasingly woven into the overall fabric of the enterprise.

While most purchasing decisions are still straightforward upgrades from older models, newer usage scenarios, including distributed and cooperative processing or a client/server model, are starting to change the evaluation process, adding weight to considerations such as corporate culture and connectivity.

What is important to buyers is that as the game plan changes, so does the selection strategy.

Field service

When you think of a dedicated departmental server, what might immediately spring to mind is a minicomputer or an Intel Corp. 80386- or 1486-based personal computer or workstation on a local-area network. However, data-intensive departmental applications are starting to overwhelm the I/O capabilities of many LAN servers.

What mainframes bring to the picture are database facilities that enable users to construct data-intensive applications with relative ease. While it usually requires a confident innovator to step up to a mainframe departmental platform, no-nonsense software and the availability of plug-and-play databases attract managers leery of LAN limitations.

To start your evaluation of mainframes for a departmental application, you will first need to determine how much of the application development work you are willing to manage yourself, what is available in the way of off-the-shelf application software and how much you are willing to spend.

When choosing a hardware environment, it is best to look at what software the vendor has to offer. Specialized providers offer departmental platforms and applications: For example, Control Data Corp. is the place to turn for engineering, and Tandem Computers, Inc. offers nonstop, or fault-tolerant, applications. For government applications, check out Bull HN Information Systems, Inc.'s products.

Less-specialized mainframe vendors will help customers find experienced value-added developers for a department's application. Unisys Corp. can point out a diversity of applications, particularly in hospitality, government, banking and airlines.

There is already a long list of value-added resellers that offer midrange business applications to high-end IBM Application System/400 models; however, a new breed is also starting to port corporate departmental applications to this platform.

You may also want to consider a used mainframe. It will cost less and be many times as powerful as the most powerful workstation server. However, many used machines are not installer-friendly, and the software comes without vendor support.

In IBM shops, if you need to downsize and regain control in a hurry, the accepted technique is to extract an existing application out of the IBM 370 corporate processor and install it on a departmental IBM 9370 machine.

OLTP joins the fray

Ever since the CICS operating system was developed 10 years ago, most production systems have been built on the on-line transaction processing (OLTP) model. Competition is fierce in this arena, producing an excellent selection of OLTP software and hardware from Digital Equipment Corp., Unisys, Bull HN, Tandem, IBM and others.

When approaching the evaluation of OLTP machines, it is best to throw out the old rules of selecting the application first. The enterprise's entire cooperative processing strategy needs to be considered along with the application software. This is because there is more at stake than just the machine running the application.

Other considerations also enter the picture: whether the users will work on terminals or workstations, whether the mainframe or workstation will present the transaction; where the database data will reside; whether the database software will manage the anticipated size of the database; how long it will take to develop the application; how many programmers it will require; the project schedule;

Baumgartner is president of International Computer Contracting Corp., a San Jose, Calif.-based computer and communications marketing firm specializing in the acquisition, installation and service of large computer systems.

INSIDE

Past and Future
What has been and what is yet to come. Pages 102, 103.

Buyers' Scorecard
User reviews of top-selling 3090-size systems. Page 106.

Recent Releases
A guide to mainframes shipped 1988 through 1990. Page 110.

and projected cost.

Together, the choice of application software and cooperative processing environment should drive the choice of mainframe architecture. Two important capabilities — database hardware assistance and relational logic analysis — are starting to appear on Hitachi machines in Japan, and with its in-line database analysis offered on the Enterprise System/9000 line, IBM is starting to offer these capabilities as well.

If you need to combine ad hoc queries for research and development with the OLTP production environment, it is important to choose one of the recent systems based on relational databases. On traditional systems, ad hoc queries are usually excluded from the OLTP production environment because they require system resources. These more recent systems have mitigated this restriction.

If yours is a new OLTP application, programmer productivity is paramount. Hence, you may want to consider an easy-to-use development environment.

Nearly all of the non-370 architectures have a clear advantage in this arena. These architectures offer slightly less costly hardware and less costly system software and are much less complex. The keep-it-simple focus enables users to develop applications much faster, with fewer human resources. Likewise, fewer systems software specialists are needed, and users can adapt and evolve the system quickly. Some studies have suggested that overall human productivity may show as much as an order of magnitude improvement outside the IBM 370 environment.

Client/server mainframes

OLTP models were the predecessor for the client/server model. Traditionally, mainframes optimized for OLTP answered predefined formatted queries. On-line queries are now being preprocessed at the front end by workstations before being passed on to a mainframe database server.

As in choosing a machine for OLTP applications, it is necessary to have a complete picture of the prospective client/server architecture before choosing a mainframe. You need to ensure that all the system's components can either be acquired or fabricated.

Users will want to evaluate the workstation presentation software in conjunction with the database access tools. The prevalent practice calls for the presentation software to translate

"Year in review"

Arrivals and intros:

- Tandem, Stratus roll out competing systems they claim are the first to target fault-tolerant on-line transaction processing (October 1989, April 1990)
- DEC turns mainframe vendor with 512M-byte VAX 9000 debut (October 1989)
- IBM begins shipping 3090J series with modest performance increase (October 1989)
- HDS pulls ahead in speed race against IBM and Amdahl with 150-MIPS processor (June 1990)
- NEC takes lead with machine capable of 500 MIPS in scientific calculations (July 1990)
- Unisys announces the A16, the first mainframe based on Motorola's bipolar logic chip (July 1990)
- Fujitsu triples power of current high-end model, outmuscling HDS' machine by 10% and beating IBM to high-end punch. The new engine is expected to also be used in Amdahl's future "Eagle" machine (September 1990)
- IBM announces long-awaited ES/9000, with five fiber-optic machines shipping immediately, other capabilities to follow (September 1990)

Discounts and deals:

- IBM announces various across-the-board price hikes but makes exceptions for many products (March, August 1990)
- IBM customers reportedly receive discounts of up to 50% on 370 architecture systems and software as IBM tries to appease current user base waiting for 3090 follow-on. IBM also offers up-front discounts on next-generation "J Prime" machines (June 1990)
- Bogged down by delays in shipping the VAX 9000, DEC takes a cue from IBM, offering customers special deals such as loaner machines and discounting (July 1990)

Stated strategies:

- IBM steps out of character and outlines its next-generation strategy. Its new mainframes will have processors dedicated to specific operations such as database management, data sorting and security (August 1990)
- HDS sets out to revise and publish leasing policies regarding recertification of equipment, maintenance and reconfiguration (September 1990)
- IBM offers incentive program for ES/9000 upgrades, especially for 3090 E customers upgrading to J models. Only J models are upgradable to the ES/9000 (September 1990)

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"Year to come"

Arrivals and intros:

- IBM expected to fill in capabilities announced with ES/9000 debut. Features include dedicated processors that are specialized to run database management, data sorting and security; enterprisewide data access; functional connectivity; initial clustering for OLTP; fiber-optic channels; and CMOS technology.
- HDS expected to deliver its high-end machine with fiber-optic channels. Will also announce price/performance improvements on EX line to compete with ES/9000.
- Amdahl expected to announce future strategies for next-generation "Eagle" machine as well as enhancements to existing 5990s. Machine specifications expected to closely resemble the new Fujitsu machine.

Discounts and deals:

- Customers anticipate continued deals and altered pricing structures on 3090s and used equipment as a result of ES/9000 announcement.

Stated strategies:

- IBM claims it will roll back some of the discounting that occurred in the past year, apparently attempting to taper price wars. Whether customers will accept this is not yet known, because they have become accustomed to IBM price flexibility.
- Since both HDS and IBM have announced next-generation machines and offered attractive "transitions" for their installed bases, competition will reach a high point. All mainframe vendors will strive for "account control" within their individual installed bases.

Forecast information provided by Framingham, Mass.-based market research firm Technology Investment Strategies.

CW Chart: Paul Mock

the transaction into one or more asynchronous SQL queries for the mainframe to process.

The mainframe plays the role of a data vault. Its important attributes are an efficient database service, extensive communications access for large numbers of users, a secure operating system and intensive disk I/O.

MIPS, on the other hand, are irrelevant. Instead, SQL queries are the appropriate measure for comparison, and most vendors can produce their latest SQL benchmarks. In the very special case of large databases with linear indexes, such as phone numbers, names and license plates, the Tandem Cyclone has a reputation rivaling IBM's.

For connectivity concerns, all mainframes offer excellent communications transport hardware and software, which communications designers can connect with your enterprise's networks.

Communications software interlocking at the transaction level is the difficult question and should be a factor in your evaluation. Prospective mainframe vendors can help with both proprietary and open systems software.

While the ideal server is not yet available, IBM and the plug-compatible manufacturers (PCM) now imply that IBM mainframes and the PCMs' hardware structures should eventually include a traditional von Neumann dispatcher, a parallel database processor backed by intelligent semiconductor storage, which is in turn backed by parallel disk access. This should be intelligently cached to answer most requests for data from silicon.

Until these machines are delivered, it makes sense to anticipate their availability and standardize on basic SQL database access.

Sharing the wealth

Distributed applications come closest to users' vision of cooperative processing, where multiple databases and their underlying platforms are integrated to work together.

IBM's Systems Application Architecture is the best-known environment, and every mainframe vendor is rushing to develop its own proprietary cooperative processing solution. Real products to evaluate and test, however, are not so easy to come by. The choices consist of making your own or trusting your vendor.

Applications that cannot be moved off the mainframe include the following, according to 50 IS directors at Fortune 500 firms surveyed by The Sierra Group, Inc.:

- **Financial reporting, payroll.**
- **Human resources applications.**
- **Order processing.**
- **Applications requiring worldwide, enterprise networking.**
- **Corporate switching software.**
- **Automated teller machine and main bank applications.**
- **Heavy-duty account processing.**
- **Big number crunching.**
- **DB2 database programs.**

Essential management tools for system designers are the database and dictionary, distributed database and repository.

Clearly the mainframe choice is secondary to the underlying system software environment. Several database vendors, including IBM, are designing on the customer's blackboard — promoting dual database and two-phase commit — while alpha-testing prototypes.

Some vendors can offer development tool sets, while others are content to emphasize connectivity. At least one vendor — Unisys — can point to a demonstration distributed database managed under the

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cover of its MCP operating system. Drastically reduced high-speed communications costs and relational databases have made demonstration distributed databases an alternative to consider.

Today, all mainframes have impressive communications capabilities, and what doesn't plug together is readily converted in a black box.

The real communications challenge is in the application-to-application, database-to-database software pipe. Peer-to-peer and two-phase commit are capabilities you will be looking for if you choose to develop your own distributed applications.

At colossal corporations with centralized computing, the architectural possibilities are diminished. A colossal data center is one that processes more than 500 MIPS capacity and supports more than 10 data centers.

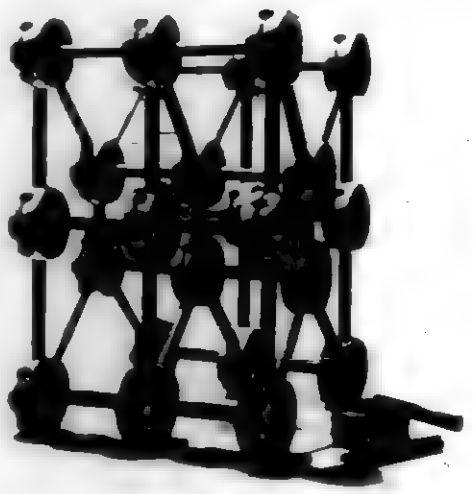
In this environment, information systems managers seek to contain the necessary enterprise data in as few holding tanks as possible. This procedure results in relatively few IS installations, a demand for the largest machines on the market and a minimal need for departmental data processing.

These firms require the largest available database, the largest storage engine and confidence in an infinite growth path. Usually, they turn to the latest and largest IBM processor.

While there are advantages to centralized processing, such as application and database integration, efficiency, accuracy, fewer operations personnel and lower costs, there are negatives to consider as well. These include vulnerability, systems software complexity, communications costs and a ceiling on growth.

Whether it is a plan committed to paper or a less formal sense of future computing, data centers are looking to cooperative processing to do away with these negatives. The evaluation procedure will become only more interesting as more vendors arrive with products that back up their stated plans. •

THE MAINFRAME IBM WON'T PUT TOGETHER FOR YOU.



When Meridian's technical whizzes get going with their inventory of parts and features (we call them "tinkertoys"), they can build you a mainframe solution—like a customized IBM 3090—that will fill your exact needs. Something the 3090's parent company won't always do for you.

Let's say you want to go from a 150 to a 150S. That's an upgrade that doesn't exist from IBM. But it does from Meridian. We'll search our extensive inventory for the right tinkertoys, then we'll custom build your machine for you. Of course, we don't stop there. We also get your 150S certified by IBM, so you won't have to worry about service.

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TECHNOLOGY LEASING SERVICES

What next?

Studies say it, the press says it, and now, even IBM is saying it: The functions mainframes have traditionally performed are vastly different from what these machines will be doing in the future. As a result, mainframes will start to offer functionality never before found on these machines, such as dedicated processors, fiber-optic cabling, better connectivity and OLTP clustering capabilities.

Does this jibe with the users' version of the story? We asked IS managers how they are using their current mainframes and how their evaluation process will change in their next mainframe purchase.

Richard Lester
Vice-President of IS
Associated Grocers, Inc.
Seattle

— **Current mainframe:** "We use a Hitachi XL 80 for all our business applications, including inventory management, billing and electronic services for our customers such as scanning, E-mail and electronic payment processing."

— **Planned purchase:** "We upgraded from the XL 60, which we purchased in 1987, to an XL 80 this year, so we won't be buying another mainframe for a few years. However, the most important features spurring the decision to buy a new mainframe would be a significantly improved price/performance ratio.

Also, fiber-optic channels would be great. Any large operation has a web of cables under the floor, so a smaller mass of wiring to handle would make maintenance of the data center that much easier.

Another important feature is faster channels, something reaching 6M bits or beyond, if that's ever available.

The No. 1 consideration we have, though, is reliability and service from the vendor."

Michael Kelly
Vice-President of MIS
Chicago Mercantile Exchange, Inc.
Chicago

— **Current mainframe:** "We recently installed our second IBM 3090J series, and we also have Tandem's Nonstop Cyclone. The IBM is used for all the clearing functions, RISC functions, regulatory functions and exchange administration. On the Tandem, we run order reporting, price reporting and price ticketing."

— **Planned purchase:** "Price/performance is probably the most important thing. We will probably migrate toward the new Tandem

Continued on page 109

New methods to look at the conventional buy

BY ALLAN BAUMGARTNER

People will always buy mainframes for conventional uses, such as batch processing applications and upgrading an old model when it runs out of capacity.

Batch processing may be considered archaic, but the need for answers to large data and computational problems continues to this day. In fact, our appetite for solutions to larger problems — and ones with greater precision — is growing.

Conventional batch processing presumes extensive data processing and calls for inexpensive millions of instructions per second and massive I/O. Price/performance is also important, suggesting systems from Bull HN Information Systems, Inc., the plug-compatible mainframe (PCM) processors from Amdahl Corp. and Hitachi America Ltd., as well as older, used mainframes.

NEARLY HALF of all mainframes purchased are used, and most of these — $5 billion worth in the U.S. — are from IBM.

The great majority of all mainframe acquisitions are driven by growth and the need for more of the same type of capacity. But even in upgrading, the rules have been altered somewhat. All high-end mainframes can now be enlarged by adding additional processing units — a practice known as clustering.

In cluster formations, the operating system presents a single image to the application. Therefore, users evaluating clustered mainframes need to compare their capacity forecast with the operating system and mainframe combination.

To prevent users from achieving capacities with clustering beyond what they themselves offer, manufacturers prohibit certain combinations or discourage users from choosing them through high pricing.

Used merchandise

If no new functions are needed, batch processing and upgrade candidates can consider a used machine. Evaluation of these machines is almost purely a price/performance comparison after space and operating systems compatibility requirements are met.

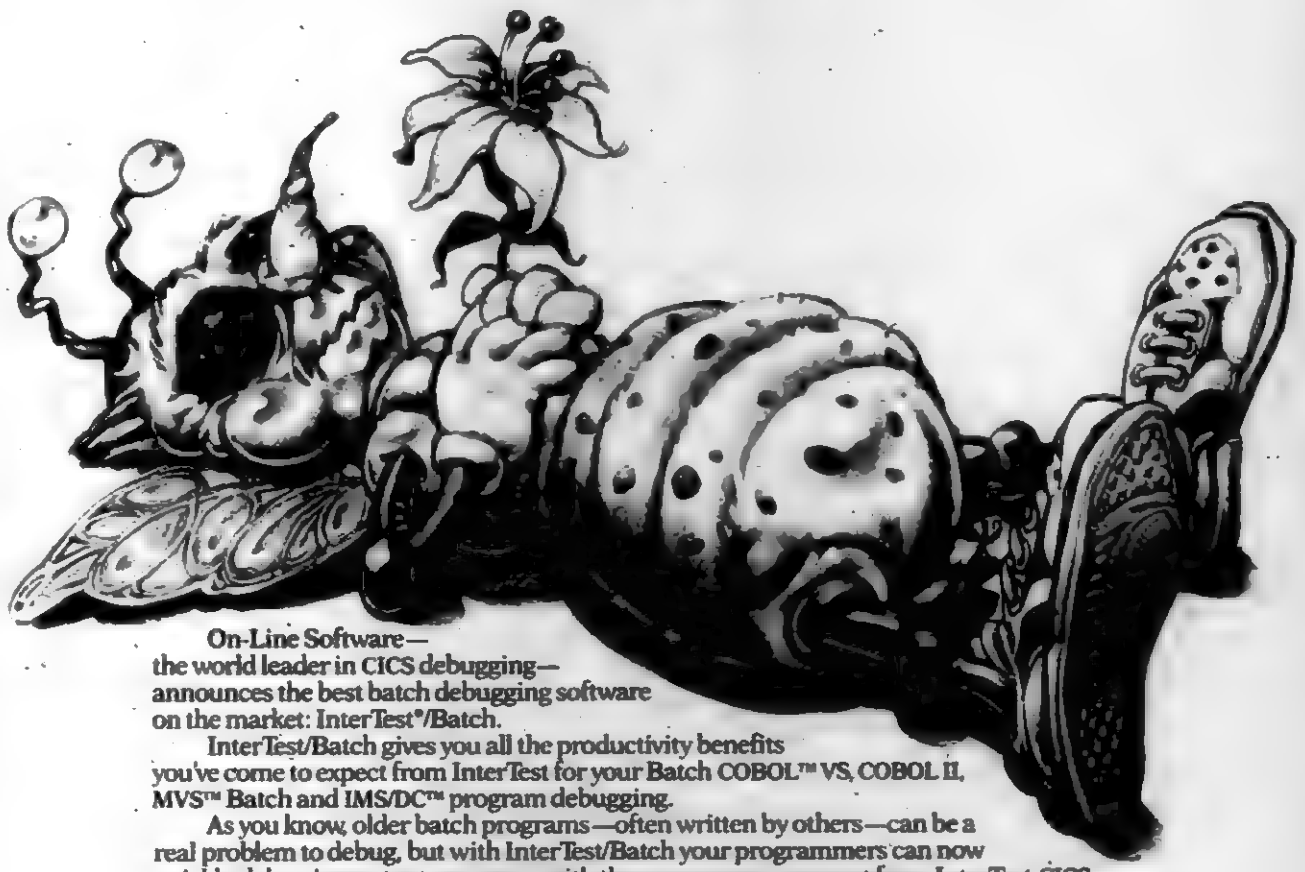
Nearly half of all mainframes purchased are used, and most of these — $5 billion worth in the U.S. — are from IBM.

Selecting an upgradable vs. a nonupgradable model is a significant factor when purchasing a used IBM machine. The majority of machines bought and sold are no longer upgradable to IBM's newest models in the 3090J series. Since 3090s have been around for a long time, however, many of the upgradable models are available from independent brokers and lessors.

While IBM has always guaranteed its used machines, the PCMs such as Hitachi and NCR Corp. charge outrageous prices to recertify machines. In addition, complex mainframes require technical expertise — from either the manufacturer or an independent firm — that is available for a price. Both of these factors can reduce resale values and increase the cost of acquiring a used mainframe.

In general, the opportunity for acquiring non-IBM equipment is improving rapidly as IBM's competitors recognize the turf they have ceded to IBM. Hitachi recently announced that it is redoing its used-machine policies, and sales of used non-IBM machines are expected to surge during the next few years. •

The Company That Did This For CICS Is Now Doing The Same For Batch.



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BUYERS' SCORECARD

Amdahl, Hitachi top mainframe matchup

BY MICHAEL L. SULLIVAN-TRAINOR
CW STAFF

There are a few things you can count on in life. Jerry Rice catching a long bomb from Joe Montana. Roger Clemens striking out the side in at least one inning. Jose Canseco slugging a pitch out of the park.

Now add Amdahl Corp.'s 5890 and Hitachi Data Systems Corp.'s EX 80 mainframes to the list. Users of the two systems gave them the highest reliability ratings (9.6 out of 10) and the highest scores overall in the Buyers' Scorecard survey of more than 100 users of mainframes from the top five vendors.

The survey compared ratings from users of IBM's 3090 200J (30 respondents) and Amdahl's 5890 300E (30 respondents), Hitachi's EX 80 (16 respondents), Unisys Corp.'s 2200-633 and A/17 (12 respondents) and Bull HN Information Systems, Inc.'s DPS 90-92/93 (20 respondents). Scores are derived by multiplying the ratings each user group gave its own product by the importance factors all users assigned to the 13 criteria. (See methodology next page.)

Despite its dominance in the market, IBM's 3090 scored fourth in the overall ratings and finished last in significant areas such as capacity, memory access time and cost.

"IBM is the market leader, and the 3090 is reliable," says Susan Gannon, high-end systems analyst at Technology Investment Strategies Corp. in Framingham, Mass. "It offers competitive price/performance but not always the best price/performance."

Users' concerns about price and performance may have been intensified during the time of the survey because of announcements from the major vendors about their next-generation mainframes. For example, the new features of IBM's Enterprise System/9000 machines make current 3090s less attractive and focus buyers' attention on the cost per million of instructions per second, Gannon says.

Amdahl and Hitachi users surveyed rated the two mainframes highest in performance (9.3 out of 10 for both), while Amdahl (8.6) edged slightly ahead of Hitachi (8.5) and the rest of the pack (a full 1.5 points behind) in ratings of cost per processing cycle.

"The 5890 is not as quick as the 3090, but it is very reliable, and the overall performance is excellent," says Jeff Tucker, operations manager at Affiliated Computer Systems Corp. in Dallas.

Users marked reliability, overall performance and compatibility with installed hardware as the most important areas of the 15 factors measured. Amdahl topped compatibility, followed by IBM and Hitachi in a second-place tie.

The Unisys and Bull mainframes received high ratings in three areas. Unisys tied for second with Hitachi in providing sufficient capacity. Bull captured second in efficient memory access and cache performance.

The lowest rating overall went to Bull (6.7) for efficient environmental controls. IBM scored lowest (7.1) in acquisition and maintenance costs. ●

Mainframes

Total scores reflect all criteria and their user-assigned importance. Response base: 30 users per product for IBM and Amdahl, 20 for Bull HN Information Systems, 16 for Hitachi and 12 for Unisys

Product	Three highest ratings	Three lowest ratings
Amdahl Corp.'s 5890 300E SCORE 75	Reliability Overall performance Compatibility with installed systems	Cache performance Environmental controls Floor-space requirements
Hitachi Data Systems Corp.'s EX 80 SCORE 74.3	Reliability Floor-space requirements Overall performance	Networking support Acquisition/maintenance cost Cache performance
Unisys Corp.'s 2200 633, A/17 SCORE 69.9	Reliability Ease of operation Overall performance	Networking support Acquisition/maintenance cost I/O channel control
IBM's 3090 200J SCORE 69.3	Reliability Compatibility with installed systems Service and support	Acquisition/maintenance cost Floor-space requirements Cost per cycle
Bull HN Information Systems, Inc.'s DPS 90-92/93 SCORE 68.4	Reliability Overall performance Ease of operation	Environmental controls Networking support Acquisition/maintenance cost

KEY RATINGS

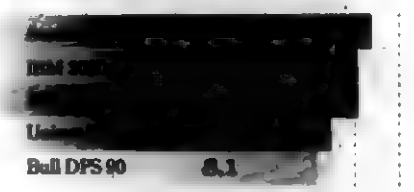
Amdahl 5890 tops three of six key ratings by very slim margins and ties with Hitachi's EX 80 for the two most important factors to users: reliability and overall performance. IBM comes close to the top in service and compatibility, its two areas of traditional strength

User importance rating:

9.7 Reliability

9.0 Overall performance

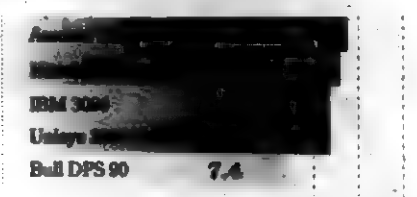
9.0 Compatibility with other installed hardware



8.9 Sufficient capacity

8.8 Quality of service & technical support

8.7 Efficient I/O performance



CW Charts: Doreen Duble

A CLOSER LOOK

Bull HN's systems near the top in memory access time and cache performance but score low in most other criteria. Unisys' mainframes score in the middle-to-low range across the board

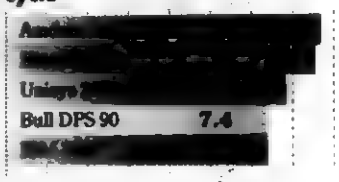
User importance rating:

8.6 Effective I/O channel control

8.6 Effective networking support

8.5 Effective memory access time

8.4 Reasonable cost per processing cycle



8.4 Reasonable acquisition & maintenance cost

8.2 Efficient cache performance

8.0 Ease of operation

7.9 Efficient environmental controls

7.7 Reasonable floor-space requirements

Loyalties

Would you buy the product again?

(Reasons based on most frequently stated responses)

Amdahl 5890

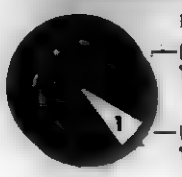
Response base: 20

Number of respondents

Likely
The reasons:
Good service & support

Unlikely
The reasons:
Old technology

Hitachi LX 80



Response base: 16

Number of respondents

Likely
The reasons:
Reliability

Unlikely
The reasons:
Costs more to operate than comparable systems

Unisys 2200, A 17

Response base: 12

Number of respondents

Likely
The reasons:
Longtime Unisys environment

Unlikely
The reasons:
Moving to 3390

IBM 3090

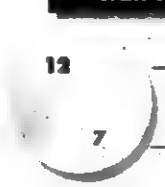
Response base: 29

Number of respondents

Likely
The reasons:
Good service and support

Unlikely
The reasons:
Technology obsolete in four to five years

Bull DPS 90



Response base: 19

Number of respondents

Likely
The reasons:
Reliability

Unlikely
The reasons:
Lack of packaged software

"Verbatim"

What do you like best/least about this product?

Amdahl 5890

Likes	Dislikes
Reliability	Not user-friendly
Price/performance	Memory constraints
Service and support	Slow reaction to IBM software updates

Hitachi LX 80

Likes	Dislikes
Reliability	Doesn't support IBM software well
Environmental requirements	Service and support
Cost of system	Difficult to bring in new system

Unisys 2200, A 17

Likes	Dislikes
Reliability	Lack of software
Performance	Inability to provide network management
Ease of use	Not compatible with other vendors' systems

IBM 3090

Likes	Dislikes
Reliability	Price is high
Speed	Cost for the performance
Service and support	Not large enough

Bull DPS 90

Likes	Dislikes
Reliability	Lack of off-the-shelf software
User-friendly	Not compatible with other mainframes
Speed	Channel capacity

METHODOLOGY

Products rated in *Computerworld*'s Buyers' Scorecard on Mainframes were selected in the following manner: The products had to be from one of the top five vendors in the mainframe market in terms of installed base and revenue. They also had to be the largest capacity systems that were comparable in terms of size and features across all five vendors.

Because of a smaller base of installed systems from Unisys Corp., Hitachi Data Systems Corp. and Bull HN Information Systems, Inc., the minimum number of respondents required for the survey was reduced from 30 to 12 in the case of Unisys and 15 in the case of Hitachi and Bull. Both the Amdahl Corp. and IBM ratings were based on 30 respondents each.

The total scores, which were weighted according to the criteria that all respondents find most important, were computed by multiplying the mean scores all users assigned to the importance of each criterion by the mean scores each user group gave to its own product.

Three-quarters of the 108 respondents were operations managers, and the rest were IS managers. Ninety-four percent of them have been involved with mainframes for five or more years.

Respondents acquire their mainframe systems mostly through direct purchase (53%), and most expect to continue doing so (43%). Another 35% lease from third parties, while 15% lease from the vendor.

Ninety-three percent acquire their mainframes new, and 7% acquire them used. Most of the cost of these systems is in the CPU (28%), according to respondents, and peripherals (17%). Other costs: personnel (16%), operating systems (14%), applications (7.6%), maintenance (7.5%), environmental controls (6.4%), documentation (6%). The survey was conducted by First Market Research in Austin, Texas.

ACKNOWLEDGMENTS

Computerworld would like to acknowledge the assistance provided by the following individuals and organizations in the preparation of this month's Buyers' Scorecard: Bob Djurdjevic, Annex Research; Susan Gasson, Technology Investment Strategies Corp.; John Logan, Aberdeen Group; Computer Intelligence; and Installed Technology International.

Cross-breeding produces new options

Midsize firms, individual departments eye high-end machines from midrange vendors

BY BARBARA DEPOMPA

It may look like a mainframe, act something like a mainframe and be bought to perform mainframe functions — but is it a mainframe?

That's not an easy question to answer when it comes to the high-end models released in the past year by traditional minicomputer vendors. Digital Equipment Corp.'s VAX 9000, Tandem Computers, Inc.'s Nonstop Cyclone series and other machines are lower in price yet close in functionality to the IBM 3090 and comparable mainframes from plug-compatible manufacturers and proprietary mainframe vendors Unisys Corp. and Bull HN Information Systems, Inc.

Just how robust are these mainframe-like boxes, and who should consider purchasing them?

SMALL MAINFRAMES are attractive to Fortune 1,000 firms that need an adjunct processor in addition to their host to perform specialized applications.

The best way to approach these questions is to consider typical mainframe functionality. Many analysts, including Peter Kastner at Boston-based market research firm Aberdeen Group, define mainframes as systems that cost at least $1 million, offer speeds of more than 10 million instructions per second and 100 transactions per second, store at least 50G bytes of data, use high-capacity peripherals and can accommodate more than 500 users.

Each of the small mainframes — including the VAX 6400 and the just-released 9000, the Cyclone, Control Data Corp.'s Cyber series, Data General Corp.'s MV40000, Hewlett-Packard Co.'s 980, Prime Computer, Inc.'s 6550 and even high-end IBM Application System/400s — fit these specifications while staying within a $200,000 to more than $2 million price range for fully configured models.

Prime's 6550 runs closer to the low end of the scale, while the VAX 9000 can reach well beyond the $2 million mark.

The lower price is especially appealing to midsize companies with annual revenues in the $150 million to $200 million range, according to Dale Kutnick, president of Meta Group, Inc., a Westport, Conn.-based consulting firm. In these firms, processing needs may not demand a large mainframe, not to mention the fact that the budget may not allow one.

Two small mainframes that do especially well in batch processing are the Prime 6550 and DG MV40000. These machines are usually considered high-end systems for smaller companies. Another consideration, however, is that while these smaller mainframes perform the four key functions found on all mainframes — batch processing, transaction processing, database processing and network management — some machines are tailored for one or two of these areas and are less robust in the others, says Frederick Withington, an independent consultant based in New York.

These smaller mainframes actually outperform their larger counterparts in some specific areas, Withington says. For instance, the Cyclone and VAX 9000 outperform the IBM 3090 in on-line transaction processing applications.

Small mainframes are attractive to Fortune 1,000 firms that need an adjunct processor in addition to their host to perform specialized applications.

At Dow Jones & Co.'s Information Services Division, Tandem's VLX, TXP and CLX systems perform transaction processing functions on a distributed relational database at a lower cost than a large mainframe, according to Frank Panella, director of systems development at the firm. The division plans to upgrade to a Cyclone within the next six to nine months. "No other vendor has been able to prove to me they can provide the level of distributed relational database capabilities that Tandem did," Panella says.

The systems run the on-line information retrieval and news wire services while a separate organization within Dow Jones handles the general-purpose mainframe computing requirements.

Panella estimates that the Tandem systems save him millions of dollars compared with a typical mainframe installation, not to mention the savings in floor space and electricity required to run the computers.

In a traditional mainframe environment, Panella says, he would have to buy a larger machine than he really needed and wait for his business to grow into it. With

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the Tandem systems, "I can add a single processor board and not have to spend money on the five additional processor boards that come in the next largest mainframe model before I need them," he says.

Another factor that attracted Panella to Tandem's systems is "the quickness with which we can add processors and peripherals," he says.

In a mainframe environment, it would require seven or more hours to add a new processor, he explains. "And we'd have to do it over the weekend so we could shut down the system and perform a SYSGEN on the operating system in order make use of the additional capacity." With the Tandem setup, the system can remain running while the processors are added.

While the VAX 6400 and 9000 are popular for transaction processing as well, their strength also lies in number crunching. One DEC 6400 user in the federal government says his system is used to calculate engineering statistics for government projects in defense. "When clustered together, the 6400 gives us mainframe performance for our application," says the user, who asked not to be identified.

Playing with numbers

Other machines optimized for numeric-intensive and scientific/engineering applications are CDC's Cyber series and HP's 980 models.

At the Delaware Lottery Commission in Dover, Del., a Cyber mainframe sifts through millions of lottery numbers to find the winning match, according to Weldon Reynolds, operations manager at the commission.

Despite the strengths of these smaller mainframes, Kutnick says, the larger machines — optimized for batch processing and capable of storing huge amounts of data — are still better suited for running a corporation's accounts-receivable or accounts-payable applications.

Because these systems are offered by established minicomputer and scientific computing vendors, they each offer mature operating environments for their customers. Both DEC and HP have announced higher end models for delivery in the fall, including a dual-processor version of HP's 980. •

Continued from page 104

machine next.

We have no plans to change our architecture in the near future, and we have no plans for IBM's Enterprise System/9000."

James Peiffer
Computer Center Manager
Dresser Industries, Inc.
Dallas

— Current mainframe: "We use three Amdahl mainframes — the 5870, 5860 and V-8. We service 65 to 70 operating units around the world, so we run the full range of applications — from integrated manufacturing, financial and human resources applications to individual programs in these areas. We also run training, office automation and engineering applications."

— Planned purchase: "We plan to replace our three Amdahl mainframes with just a single machine at the end of this year or early next year.

The newest mainframes on the market far exceed our requirements for power and speed, so we aren't forced to sit around and wait for the next vendor announcements. I can look beyond the typical initial high-price and lower reliability curves of any of the brand-new products and buy the slightly older, more proven machines that have reached a more moderate market price.

The IBM ES/9000 announcement does not affect our buying decision because we have no processing requirements that would mandate our buying an ES/9000 or ES/9000-class machine.

We used to spend a lot of time evaluating a machine's compatibility and reliability factors. Over the last generation or two of mainframes, however, we've seen reliability become almost a given."

Dick Price
Vice-President of IS
Peabody Holding Co.
St. Louis, Mo.

— Current mainframe: "We use IBM MVS/XA and VM/XA. On MVS, we run general business applications, such as inventory, general-ledger and accounting applications.

On VM, we do general-purpose time-sharing, planning, budgeting and engineering."

— Planned purchase: "We will take one of two routes: Either purchase a used 3090 Model 300 in the next two years to get more horsepower to run our engineering applications, or we will move the applications off the mainframe to Unix-based workstations and networked servers.

It depends on how fast I can move things to Unix. I'd like to move budgeting and planning applications to networked PCs in an OS/2 environment in the same time frame." •

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Late-model mainframes*

VENDOR	PRODUCT	PRIMARY MARKETS[1]	MOST COMPARABLE SYSTEM	NUMBER OF CPUs IN LARGEST SYSTEM	MEMORY RANGE (bytes)/ CACHE CAPACITY (bytes)	MACHINE CYCLE TIME (nsec)	WORD LENGTH	NUMBER OF CHANNELS/ CHANNEL SPEED (byte/sec.)	DISK CAPACITY (bytes)	DISK TRANSFER RATE (M byte/sec.)	PERFORMANCE (MIPS[2] unless otherwise specified)	PERFORMANCE (MFLOPS[3])	BENCHMARK[4]	SUPPORTS ETHERNET OR TOKEN RING	OPERATING SYSTEMS	DISTRIBUTION CHANNELS	BASE PRICE
Amdahl Corp. (408) 746-6000	5890-190E	DP, OLTP, SE	IBM 3090J	1	32M-256M, 96K	15	32	16-48, 4.5M	Unlimited	4.5M	18.4	NA	NA	Both	MVS, TPF, UTS, VM	Direct	$2,163,000 with 32M-byte memory, 16 channels
	5890-190E	DP, OLTP, SE	IBM 3090J	1	32M-256M, 96K	15	32	16-48, 4.5M	Unlimited	4.5M	22.4	NA	NA	Both	MVS, TPF, UTS, VM	Direct	$2,542,000 with 32M-byte memory, 16 channels
	5890-290E	DP, OLTP, SE	IBM 3090J	2	64M-256M, 192K	15	32	32-64, 4.5M	Unlimited	4.5M	34	NA	NA	Both	MVS, TPF, UTS, VM	Direct	$3,704,000 with 64M-byte memory, 32 channels
	5890-390E	DP, OLTP, SE	IBM 3090J	2	64M-256M, 192K	15	32	32-64, 4.5M	Unlimited	4.5M	42	NA	NA	Both	MVS, TPF, UTS, VM	Direct	$4,326,000 with 64M-byte memory, 32 channels
	5890-390E	DP, OLTP, SE	IBM 3090J	2	256M-512M, 192K	15	32	64-96, 4.5M	Unlimited	4.5M	42	NA	NA	Both	MVS, TPF, UTS, VM	Direct	$6,786,000 with 256M-byte memory, 64 channels
	5890-400E	DP, OLTP, SE	IBM 3090J	3	128M-512M, 384K	15	32	64-112, 4.5M	Unlimited	4.5M	58	NA	NA	Both	MVS, TPF, UTS, VM	Direct	$7,057,000 with 128M-byte memory, 64 channels
	5890-600E	DP, OLTP, SE	IBM 3090J	4	128M-512M, 512K	15	32	64-128, 4.5M	Unlimited	4.5M	75	NA	NA	Both	MVS, TPF, UTS, VM	Direct	$8,111,000 with 128M-byte memory, 64 channels
	5890-350	DP, OLTP, SE	IBM 3090J	1	64M-256M, 128K	10	32	32-64, 4.5M	Unlimited	4.5M	34	NA	NA	Both	MVS, TPF, UTS, VM	Direct	$3,920,000 with 64M-byte memory, 32 channels
	5890-700	DP, OLTP, SE	IBM 3090J	2	64M-512M, 256K	10	32	32-64, 4.5M	Unlimited	4.5M	49	NA	NA	Both	MVS, TPF, UTS, VM	Direct	$4,758,000 with 64M-byte memory, 32 channels
	5890-700	DP, OLTP, SE	IBM 3090J	2	64M-512M, 256K	10	32	32-64, 4.5M	Unlimited	4.5M	63	NA	NA	Both	MVS, TPF, UTS, VM	Direct	$6,597,000 with 64M-byte memory, 32 channels
	5890-700	DP, OLTP, SE	IBM 3090J	2	128M-1G, 256K	10	32	64-128, 4.5M	Unlimited	4.5M	63	NA	NA	Both	MVS, TPF, UTS, VM	Direct	$7,725,000 with 128M-byte memory, 64 channels
	5890-1100	DP, OLTP, SE	IBM 3090J	3	128M-1G, 384K	10	32	64-128, 4.5M	Unlimited	4.5M	91	NA	NA	Both	MVS, TPF, UTS, VM	Direct	$10,166,000 with 128M-byte memory, 64 channels
	5890-1400	DP, OLTP, SE	IBM 3090J	4	128M-1G, 512K	10	32	64-128, 4.5M	Unlimited	4.5M	120	NA	NA	Both	MVS, TPF, UTS, VM	Direct	$12,221,000 with 128M-byte memory, 64 channels
Bull HN Information Systems, Inc. (508) 294-6000	DPS 8000/83	DP, OLTP	IBM 3090-170J	3	32M-256M, 192K	NP	36	48-64, 3M	1G-85G	NP	NP	NA	75 TPS DC = (actual)	Both	GCOS8	Direct	$1,835,000 with 32M-byte memory, two consoles, power supplies, three I/O processors
	DPS 8000/84	DP, OLTP	IBM 3090-180J	4	32M-256M, 256K	NP	36	64, 3M	1G-85G	NP	NP	NA	100 TPS DC (actual)	Both	GCOS8	Direct	$2,370,000 with 32M-byte memory, two consoles, power supplies, four I/O processors
	DPS 9000/91	DP, OLTP, SE	IBM 3090-400J	1	128M-512M, 128K-512K	NP	36	64, 4.5M	1G-unlimited	NP	NP	NA	273 TPS DC, 17.5 LP (actual)	Both	GCOS8	Direct	$5,856,400 with 128M-byte memory, I/O processor
	DPS 9000/92T	DP, OLTP, SE	IBM 3090-600J	2	256M-1G, 256K-1M	NP	36	128, 4.5M	1G-unlimited	NP	NP	NA	518 TPS DC, 3.5 LP (actual)	Both	GCOS8	Direct	$11,248,400 with 256M-byte memory, two I/O processors
	DPS 9000/93	DP, OLTP, SE	IBM 3090J	3	256M-1G, 384K-1M	NP	36	192, 4.5M	1G-unlimited	NP	NP	NA	764 TPS DC, 52.5 LP (actual)	Both	GCOS8	Direct	$17,117,200 with 256M-byte memory, three I/O processors
	DPS 9000/94	DP, OLTP, SE	IBM 3090J	4	256M-1G, 512K-1M	NP	36	256, 4.5M	1G-unlimited	NP	NP	NA	1010 TPS DC, 70 LP (actual)	Both	GCOS8	Direct	$22,967,400 with 256M-byte memory, four I/O processors

*All products listed became available after 1988 or are scheduled to ship before January 1991. All listings are marketed as mainframes; specific capabilities vary widely from machine to machine.
[1]Listed in descending order according to size: DP = Batch commercial data processing; SE = Scientific engineering; OLTP = On-line transaction processing.
[2]Millions of instructions per second.
[3]Full-precision millions of floating-point operations per second; sustained (S), peak (P).
[4]Per-second performance ratings, based on the following industry-standard benchmarks: DH = Dhrystones Version 1.1; DC = Debit/Credit (transactions based on 95% subsecond response); LP = Linpack (100 x 100 full-precision in MFLOPS); LL = Livermore Loops (harmonic mean; 14 loops). Vendors supplied either actual or estimated benchmark figures.
[5]One DEC MIPS equals the performance of the VAX-11/780.
[6]Specifications for IBM machines were collected from numerous sources, including in-house sources; written materials supplied by the vendor and Datapro Research, a market research firm in Delran, N.J. MIPS were supplied by Technology Investment Strategies Corp., a market research firm in Framingham, Mass.

The companies included in this chart responded to a recent survey conducted by *Computerworld*. When a vendor is unable to provide specific information about its product, the abbreviation NP (not provided) is used. When a question does not apply to a vendor's product, the abbreviation NA (not applicable) is used. Further product information is available from the vendors.

PRODUCT SPOTLIGHT

VENDOR	PRODUCT	PRIMARY MARKETS[1]	MOST COMPARABLE SYSTEM	NUMBER OF CPUs IN LARGEST SYSTEM	MEMORY RANGE (bytes)/ CACHE CAPACITY (bytes)	MACHINE CYCLE TIME (nsec)	WORD LENGTH	NUMBER OF CHANNELS/ CHANNEL SPEED (byte/sec.)	DISK CAPACITY (bytes)	DISK TRANSFER RATE (M byte/sec.)	PERFORMANCE (MIPS[2] unless otherwise specified)	PERFORMANCE (MFLOPS[3])	BENCHMARK[4]	SUPPORTS ETHERNET OR TOKEN RING	OPERATING SYSTEMS	DISTRIBUTION CHANNELS	BASE PRICE
Bull HN Information Systems, Inc. (508) 294-6000	DPS 7000 300/700 series	OLTP, DP	DEC 9000, IBM 3090	6	16M-512M, 64K-384K	30	9	10-80, 5.4M	2G-288G	2.4M	3P	3P	35-80 DC	Ethernet	GCOS7	Direct	$1,000,000 with 64M-byte memory, 10 channels, one tape drive, 455-byte disk
Control Data Corp. (612) 853-8002	Cyber 2000V	SE, DP	IBM 3090-400J	2	128M-256M, 1628K	9.4	64	10-36, 3M-25M	0.5G-9216G	3M-24M	86.2 (per processor)	150 (S), 220 (P)	1500 TP1 DC, 32 LP, 14.7 LL (estimate)	Ethernet	NOS/VE	Direct	$2,700,000 with 128M-byte memory, 10 channels, console, power supplies
	Cyber 2000S	SE, DP, OLTP	Larger than twice the IBM 3090-180J	2	128M-512M, 1628K	9.4	64	10-36, 3M-25M	0.5G-9216G	3M-24M	52.9 (per processor)	27 (S), 27 (P)	1500 TP1 DC, 12.9 LP, 11.7 LL (estimate)	Ethernet	NOS/VE	Direct	$2,200,000 with 128M-byte memory, eight channels, console, power supplies
	Cyber 980-11	SE, DP, OLTP	DEC VAX 6000-410, 420, IBM 3090-120S, 4381-92E	1	64M-256M, 32K	11.2	64	24-52, 3M-25M	0.5G-9216G	3M-25M	10.53	2.0 (S)	204.62 TPS DC, 2.0 LP, 2.2 (24 loops) LL (actual)	Ethernet	NOS, NOS/VE, NOS/BE, Unix	Direct	$705,000 with 64M-byte memory, 24 channels, 20 I/O processors
	Cyber 980-31	SE, DP, OLTP	DEC VAX 6000-420, IBM 3090-150S	1	64M-256M, 32K	11.2	64	24-52, 3M-25M	0.5G-9216G	3M-25M	17.55	3.3 (S)	335.44 TPS DC, 3.3 LP, 3.7 (24 loops) LL (actual)	Ethernet	NOS, NOS/VE, NOS/BE, Unix	Direct	$1,057,500 with 64M-byte memory, 24 channels, 20 I/O processors
	Cyber 960-32	SE, DP, OLTP	IBM 3090-170S, 180S	2	64M-256M, 32K	11.2	64	24-52, 3M-25M	0.5G-9216G	3M-25M	35.1	6.44 (S)	654.11 DC, 6.44 LP, 7.22 LL (actual)	Ethernet	NOS, NOS/VE, NOS/BE, Unix	Direct	$1,676,000
	Cyber 962-11	SE, DP, OLTP	DEC VAX 6000-410, 420, IBM 4381-92E, 3090-120S	1	32M-256M, 32K	11.2	64	8-36, 3M-25M	0.5G-9216G	3M-25M	10.53	2 (S)	204.62 TPS DC, 2 LP, 2.2 (24 loops) LL (actual)	Ethernet	NOS/VE, Unix	Direct	$533,500
	Cyber 962-31	SE, DP, OLTP	VAX 6000-420, IBM 3090-150S	1	64M-256M, 32K	11.2	64	8-36, 3M-25M	0.5G-9216G	3M-25M	17.55	3.3 (S)	335.44 TPS DC, 3.3 LP, 3.7 (24 loops) LL (actual)	Ethernet	NOS/VE, Unix	Direct	$961,750
	Cyber 962-32	SE, DP, OLTP	IBM 3090-170S, 180S	2	64M-256M, 32K	11.2	64	8-36, 3M-25M	0.5G-9216G	3M-25M	35.1	6.44 (S)	654.11 TPS DC, 6.44 LP, 7.22LL (actual)	Ethernet	NOS/VE, Unix	Direct	$1,570,250 with 64M-byte memory, eight channels, 10 I/O processors
Digital Equipment Corp. (800) 344-4825, (800) 554-4000	VAX 9000 Model 210	SE, DP, OLTP	IBM 3090-180J	1	256M-2G, 128K	30	32, 64-bit data path, 64-bit vector processor	128, 3M	7.3 terabytes	2.8M (Peak: 5.6M)	48P	89 (Linpack 1,000 by 1,000) (S), 125 (P)	TPC-A: 70 (ACMS/RMS), 144 (DSM)	Ethernet	VMS, Ultrix, VAX System V	Direct, OEM	$1,344,000 with 256M-byte memory, two channels, power supplies, operating system, one Ethernet adapter
	VAX 9000 Model 410	SE, DP, OLTP	IBM 3090-180J	1	256M-2G, 128K	30	Same as above	128, 3M	7.3 terabytes	Same as above	4P	Same as above	Same as above	Ethernet	VMS, Ultrix, VAX System V	Direct, OEM	$1,600,000 with 256M-byte memory, hardware features, power supplies, operating system, one Ethernet adapter
	VAX 9000 Model 420	SE, DP, OLTP	IBM 3090-300J, 3090-400J	2	256M-2G, 256K	30	Same as above	128, 3M	7.3 terabytes	Same as above	7P	150 (Linpack 1,000 by 1,000) (S), 200 (P)	30t	Ethernet	VMS, Ultrix, VAX System V	Direct, OEM	$1,920,000 with 256M-byte memory, two hardware features, power supplies, operating system, one Ethernet adapter
	VAX 9000 Model 430	SE, DP, OLTP	IBM 3090-400J	3	512M-2G, 384K	30	Same as above	128, 3M	7.3 terabytes	Same as above	11P	225 (Linpack 1,000 by 1,000) (S), 275 (P)	30t	Ethernet	VMS	Direct, OEM	$2,304,000 with 512M-byte memory, two hardware features, power supplies, operating system, one Ethernet adapter
	VAX 9000 Model 440	SE, DP, OLTP	IBM 3090-600J, 3090-900J	4	512M-2G, 512K	30	Same as above	128, 3M	7.3 terabytes	Same as above	19P	212 (Linpack 1,000 by 1,000) (S), 260 (P)	30t	Ethernet	VMS	Direct, OEM	$3,300,000 with 512M-byte memory, two hardware features, power supplies, operating system, one Ethernet adapter
	Vendor: VAX 9000-420 (2)	SE, DP, OLTP	IBM 3090-600J	6	512M-4G, 512K	30	Same as above	128, 3M	7.3 terabytes	Same as above	18P	318 (Linpack 1,000 by 1,000) (S), 390 (P)	30P	Ethernet	VMS	Direct, OEM	$4,450,000 with one VAX 9000-420, one hardware ITP, Ethernet adapter
	Vendor: VAX 9000-440 (4)	SE, DP, OLTP	IBM 3090-600J	18	2G-8G, 2M	30	Same as above	128, 3M	7.3 terabytes	Same as above	60P	1,240 (Linpack 1,000 by 1,000) (S), 2,000 (P)	30P	Ethernet	VMS	Direct, OEM	$16,000,000 with four VAX 9000-440, one hardware ITP, Ethernet adapter

PRODUCT SPOTLIGHT

VENDOR	PRODUCT	PRIMARY MARKETS[1]	MOST COMPARABLE SYSTEM	NUMBER OF CPUs IN LARGEST SYSTEM	MEMORY RANGE (bytes)/ CACHE CAPACITY (bytes)	MACHINE CYCLE TIME (nsec)	WORD LENGTH	NUMBER OF CHANNELS/ CHANNEL SPEED (byte/sec.)	DISK CAPACITY (bytes)	DISK TRANSFER RATE (M byte/sec.)	PERFORMANCE (MIPS[2] unless otherwise specified)	PERFORMANCE (MFLOPS[2])	BENCHMARK[3]	SUPPORTS ETHERNET OR TOKEN RING	OPERATING SYSTEMS	DISTRIBUTION CHANNELS	BASE PRICE
Hitachi Data Systems (408) 970-1000	9806 EX Series Models 30, 50, 70	DP, SE	IBM 3090-180J	1	32M-256M, 64K-64K	17-30	32	8-32, 3M, 4.5M, 6M	NP	3M, 4.5M, 6M	8.3, 12, NP	NP	2.9, 4.8 LP, 2.3, 3.8 LL	Both via external channel-to-lan	MVS/ESA, MVS/XA, MVS/370, VM/XA, VM/SP, VM/HPO	Direct	$749,000, $1,177,180, $1,378,000 with 32M-byte memory, eight channels
	9806 EX Series Models 30, 40, 44	DP, SE	IBM 3090-180J	2	32M-512M, 32K-64K	17-30	32	8-32, 3M, 4.5M, 6M	NP	3M, 4.5M, 6M	14, 21.7, NP	NP	NP	Same as above	MVS/ESA, MVS/XA, MVS/370, VM/XA, VM/SP, VM/HPO	Direct	$1,529,000, $2,243,360 $2,625,000 with 32M-byte memory, eight channels
	9806 EX Series Models 50, 60, 100	DP, SE	IBM 3090	1, 2, 4	64M-1G, NP	14.5 (model 50)	32	16-128, 3M, 4.5M, 6M	NP	3M, 4.5M, 6M	22.3, 70, 88	121, 364, 486 (P)	17.9 LP, 9.9 LL	Same as above	MVS, VM, MVS/ESA, MVS/XA, VM/XA	Direct	$2,304,300, $8,406,200, $9,550,000
	9806 EX Series Models 60, 80	DP, SE	IBM 3090	1, 2	64M-1G, NP	14.5	32	32-64, 3M, 4.5M, 6M	NP	3M, 4.5M, 6M	28.3, 50.9	121 (P) (model 60)	49 LP, 9.88 LL (scalar), 13.5 LL (vector) (model 60)	Same as above	MVS, VM, MVS/XA, VM/XA, MVS/ESA	Direct	$3,450,100, $4,932,400
	9806 EX Series Model 85	DP, SE	IBM 3090	2	256M-1G, NP	14.5	32	32-96, 3M, 4.5M, 6M	NP	3M, 4.5M, 6M	39	NP	NP	Same as above	MVS, VM, MVS/XA, VM/XA, MVS/ESA	Direct	$6,847,900 with 256M-byte memory, 32 channels
	9806 EX Series Model 70	DP, SE	IBM 3090	2	64M-1G, NP	14.5	32	32-64, 3M, 4.5M, 6M	NP	3M, 4.5M, 6M	40.2	NP	NP	Same as above	MVS, VM, MVS/XA, VM/XA, MVS/ESA	Direct	$3,766,900 with 64M-byte memory, 16 channels
	9806 EX Series Models 75, 95	DP, SE	IBM 3090	2, 4	256M-1G, NP	14.5	32	64-128, 3M, 4.5M, 6M	NP	3M, 4.5M, 6M	49.6, 70	NP	NP	Same as above	MVS, VM, MVS/XA, VM/XA, MVS/ESA	Direct	$7,148,200, $8,994,400 with 256M-byte memory, 32 channels
	9806 EX Series Model 85	DP, SE	IBM 3090-180S	8	256M-2G, 384M-2GB	14.5	32	32-128, 3M, 4.5M, 6M	NP	3M, 4.5M, 6M	NP	NP	NP	Same as above	MVS/ESA, MVS/XA, MVS/370, VM/XA, VM/HPO	Direct	$6,100,000 with 256M-byte memory, 64 channels
IBM (800) 426-3333	3090 Models 100S, 120S, 150S, 170S, 180S	All	NA	1	32M-128M, 64K-128K (per CPU)	15-18.5	32	16-32, 3M, 4.5M	729.8M-22.7G per controller	4.5M	5.5-20.5	133 (P) (180S)	19 LL (180S) (estimate)	Both	MVS/ESA, MVS/SP, MVS/XA, VM/HPO, VM/XA	Direct	$1,018,000 (120S), $1,713,000 (150S), $2,185,000 (170S), $2,973,000 (180S)
	3090 Models 200S, 250S, 280S, 300S, 380S, 400S, 540S, 600S	All	NA	2-6	64M-512M, 128K (per CPU)	15-17.75	32	32-128, 3M, 4.5M	729.8M-22.7G per controller	4.5M	23.0-102	266 (P) (200S), 399 (300S), 532 (400S), 667 (500S), 798 (600S)	NP	Both	MVS/ESA, MVS/SP, MVS/XA, VM/HPO, VM/XA	Direct	$3,350,000-$12,836,000
	3090 Series Models 110J, 120J, 150J	DP	NA	1	32M-64M, 64K (per CPU)	18.5	32	16-32, 3M, 4.5M	729.8M-22.7G per controller	4.5M	7.7-12.9	NP	NP	Both	MVS/ESA, MVS/SP, MVS/XA, VM/HPO, VM/XA	Direct	$830,000, $1,017,100, $1,712,100
	3090 Models 170J, 180J	DP	NA	1	32M-128M, 64K-256K (per CPU)	18.5, 14.5 (180J)	32	16-32, 3M, 4.5M	729.8M-22.7G per controller	4.5M	15.3-22.2	NP	NP	Both	MVS/ESA, MVS/SP, MVS/XA, VM/HPO, VM/XA	Direct	$2,184,600-$2,972,100
	3090 Models 250J, 280J, 200J, 300J	DP	NA	1-3	64M-256M, 64K-256K (per CPU)	14.5	32	32-64, 3M, 4.5M	729.8M-22.7G per controller	4.5M	23.8-62.2	NP	NP	Both	MVS/ESA, MVS/SP, MVS/XA, VM/HPO, VM/XA	Direct	$3,349,300-$7,001,100
	3090 Models 380J, 400J, 500J, 600J	DP	NA	3-6	128M-512M, 256K (per CPU)	14.5	32	32-128, 3M, 4.5M	729.8M-22.7G per controller	4.5M	59.3-112.5	NP	NP	Both	MVS/ESA, MVS/SP, MVS/XA, VM/HPO, VM/XA	Direct	$7,989,600-$12,929,900
	ES/9000 Series Models 340, 560, 580, 620, 720	DP	NA	1-6	Up to 512M, NP	NP	NP	64-128, 10M	2.25G-4.5G per controller	10M	22.2-112.5	NP	NP	NP	MVS/ESA, VM/ESA, VSE/ESA	Direct	$2,450,000-$11,065,000
ICL (800) 888-7200, (+44 61 223 1301	Series 39 Level 15XP Model L15XP	OLTP, DP	IBM AS/400-B35	1	8M-32M, NP	170	32	3-3, 5M	1.5G-600G	2.4M	1.1	NA	4.3 TPS DC (estimate)	Ethernet	VME	Direct, VAR	$44,880 with 8M-byte memory, CAPS, power supplies
	Series 39 Level 25XP Models L25XP/1, L25XP/2, L25DXP	OLTP, DP	IBM AS/400-B45 to B60	3	16M-96M, NP	170	32	3-10, 5M	1.5G-600G	3M	1.5-2.8	NA	5.6-10.4 TPS DC (estimate)	Ethernet	VME	Direct, VAR	$68,640 with 16M-byte memory, CAPS, power supplies
	Series 39 Level 35XP Models L35XP/1-4, L35DXP	OLTP, DP	IBM AS/400, 4381-91E	4	16M-256M, NP	170	32	256-36M, 5M	1.5G-600G	3M	1.9-7.3	NA	7.4-25.9 TPS DC (estimate)	Ethernet	VME	Direct, VAR	$82,400 with 16M-byte memory, CAPS, power supplies
	Series 39 Level 45 Models L45/1, L45/2	OLTP, DP	IBM 4381-22 to 4381-91E	2	16M-128M, NP	25	32	2-12, 5M	1.5G-600G	3M	3.8-7.2	NA	15.6-28.9 TPS DC (estimate)	Ethernet	VME	Direct, VAR	$407,880 with 16M-byte memory, CAPS, power supplies
	Series 39 Level 55 Models L55/1, L55/2	OLTP, DP	IBM 4381-91E to 4381-92E	2	32M-128M, NP	25	32	2-12, 5M	1.5G-600G	3M	6.1-11.7	NA	25.6-45.5 TPS DC (estimate)	Ethernet	VME	Direct, VAR	$494,520 with 32M-byte memory, CAPS, power supplies

PRODUCT SPOTLIGHT

VENDOR	PRODUCT	PRIMARY MARKETS[1]	MOST COMPARABLE SYSTEM	NUMBER OF CPUs IN LARGEST SYSTEM	MEMORY RANGE (bytes)/ CACHE CAPACITY (bytes)	MACHINE CYCLE TIME (nsec)	WORD LENGTH	NUMBER OF CHANNELS/ CHANNEL SPEED (byte/sec.)	DISK CAPACITY (bytes)	DISK TRANSFER RATE (M byte/sec.)	PERFORMANCE (MIPS[2] unless otherwise specified)	PERFORMANCE (MFLOPS[3])	BENCHMARK[4]	SUPPORTS ETHERNET OR TOKEN RING	OPERATING SYSTEMS	DISTRIBUTION CHANNELS	BASE PRICE
ICL (800) 998-7200, (+44) 61 223 1301	Series 39 Level 66 Models L66/1, L66/2	OLTP, DP	IBM 3090-114J to 170J	2	32M-128M, MP	26	36	3-12, 6M	1.5G-6G	3M	9.7-18.5	NA	39.4-72.8 TPS DC (estimate)	Ethernet	VME	Direct, VAR	$1,000,000 with 32M-byte memory, CAFS, power supplies
	Series 39 Level 80 Models L80/1-4	OLTP, DP	IBM 3090-150J to 300J	4	32M-256M, MP	26	36	3-96, 6M	1.5G-6G	2M	15-68	NA	58-175 TPS DC (estimate)	Ethernet	VME	Direct, VAR	$1,530,570 with 32M-byte memory, CAFS, power supplies
	Series 39 SX 550/20 Model SX 560/20	OLTP, DP	IBM 3090-300J	2	128M-256M, MP	11.8	32	8-32, 6M	1.5G-6G	3M	60	NA	212 TPS DC (estimate)	Ethernet	VME	Direct, VAR	$3,900,000 with 128M-byte memory, CAFS, power supplies
	Series 39 SX 580/20 Model SX 600/20	OLTP, DP	IBM 3090-400J	2	128M-512M, MP	11.8	32	8-32, 6M	1.5G-6G	3M	90	NA	310 TPS DC (estimate)	Ethernet	VME	Direct, VAR	$5,877,000 with 128M-byte memory, CAFS, power supplies
NCR Corp. (513) 445-2075	NCR 9800 Model AP 4	OLTP, DP	IBM, 9370, 3090, 4381, AS/400, Tandem VLX504, 506, 512, Unisys A series	24	8M-384M, 2.05M	33	32	4-24, 1.5M	816M-256G	2.5M	NA	NA	3.5-160 DC (combination of actual and estimates)	Both	VRX/E, Unix via proprietary software	Direct	$231,821 with 8M-byte memory, four channels, one tape drive, three power supplies, 816M-byte disk
	NCR System 10000 Models 35, 55, 65, 75, 85	OLTP, DP	IBM AS/400, RS/6000	4	2M-64M, 1M-32M	110	8	2-30, 1.5M	2.4G-20G (Model 85)	1.5M	3.25	NA	NA	Both	Proprietary Interactive Transaction Executive (ITX)	Direct	$500,000 with 48M-byte memory, 16 channels, 72 terminal connections, one cartridge drive, eight power supplies, 2.4G-byte disk (Model 85)
Tandem Computers, Inc. (800) 669-5000	ZA9000 Continuous Processing Systems Models 2300, 2400, 2600, 2800	OLTP	DEC VAX 8000, IBM 3090, Tandem Cyclone	48 (4-cpu loosely-coupled)	64M-1G (duplexed), 1.5M-6M	40	32	2-112, 4M per channel	1.6G-240.8G (duplexed)	2.48M/I	NA	NA	ZAMP-C: 206,250 TPH moderate mix (model 2300), 1,086,684 TPH moderate mix (model 2800)	Both	VOS	Direct, OEM, VAR	$1,300,000-$3,150,000 with 64M- to 256M-byte duplexed memory, two- to eight-channels, power supplies, two- to eight-duplexed 787M-byte disks
Tandem Computers, Inc. (408) 725-6000	Nonstop Cyclone, 900 series	OLTP	IBM 3090 series	224	64M-2G, 256K-2048K	NA	32	4-64, 5M	1348M-9 terabytes	NP	NA	NA	NP	Both	Tandem's Guardian 90	Direct, OEM, VAR	$1,250,000 with 64M-byte memory, four channels, one terminal, one tape drive, power supplies, 1.6G-byte disk
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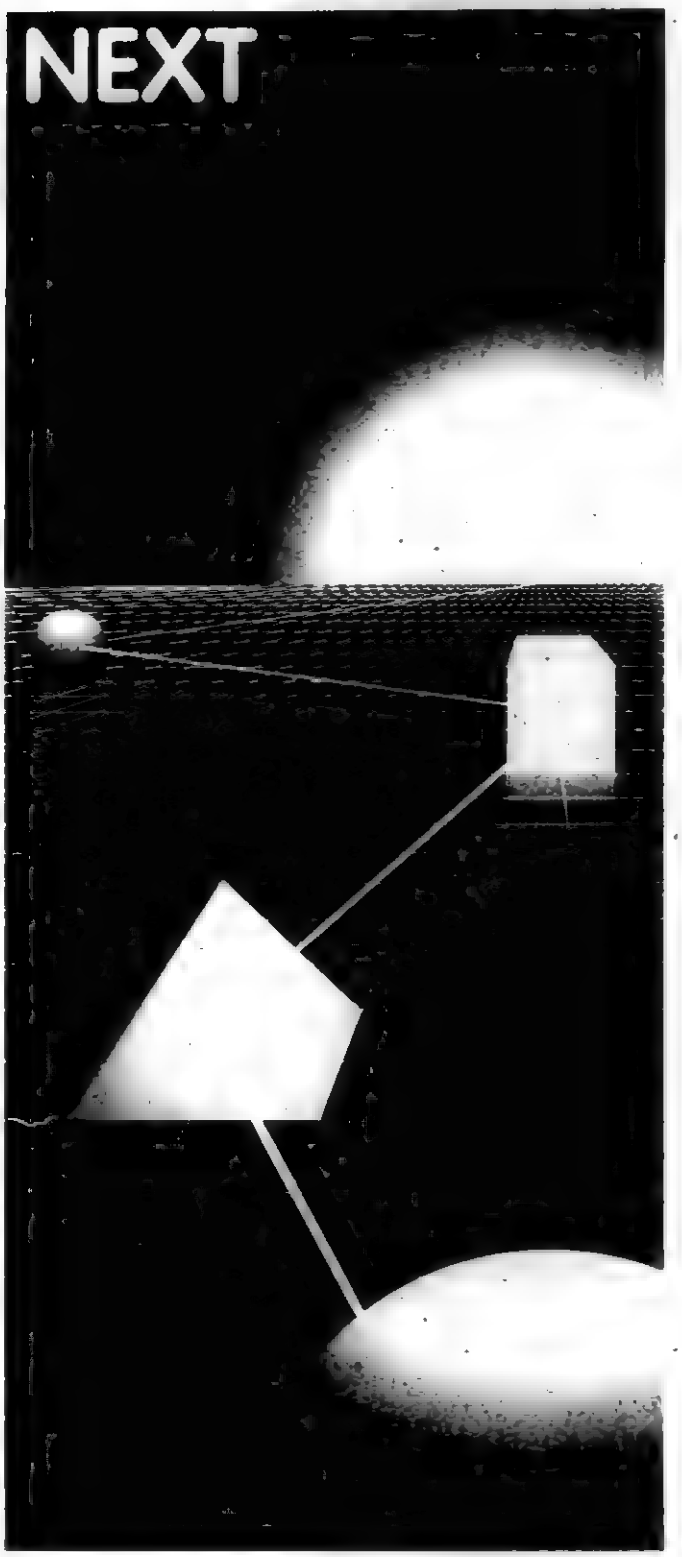

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The scoop on OOPS

Lots of smoke surrounds object-oriented programming systems and technology. Here's a fast primer on what you need to know

BY SHAKU ATRE

Object orientation has become the oat bran of the software market, just as relational databases were five or six years ago. Although many people say that object-oriented programming systems will do something good, a lot of them aren't exactly sure what. They just don't want to let on that they don't know.

There's a good chance that object-oriented technology will compete with relational technology or that relational technology will try to adjust to keep up to date by adding features that provide the benefits of object orientation. Either way, object orientation is something that every information systems manager should be somewhat familiar with.

The following short list highlights the basic truths about object orientation without any hype:

• **The big idea is simple.** The main concept behind object orientation is that repetitive programming code should be written only once and shared by a number of other programs.

• **It is a descendant of Unix.** Object orientation's origins lie within the programming language C++. That, in turn, means its origins are in Unix. Because Unix is going to be a major choice for operating systems in the coming decade, object orientation will have a major following in future years.

• **It has wide database appeal.** After making an impact on programming, object orientation has moved on to the database environment. Unlike relational technology, its origins are wider than those of a database environment. As a result, object orientation will command a much larger sphere of influence in the coming decade.

There is another reason why object orientation will have wider appeal than relational technology. Relational technology's origins were in Digital Equipment Corp.'s VAX/VMS (Oracle, Ingres, Sybase, etc.) and IBM's MVS (DB2) proprietary operating systems. Consequently, even if relational technology provided flexibility in handling data structure changes, portability between various hardware and systems software platforms was impossible until SQL was accepted by many vendors. However, the many SQL extensions added by various vendors makes the dream of portability elusive.

• **There is no founding father.** Unlike relational technology, object orientation does not have a theoretical foundation. There is no equivalent of "Dr. Codd" for object orientation. One unfortunate result of this is that it will be very difficult for users to employ some type of yardstick for measuring the "objectivity" of an object-oriented system.

• **People do not live by data alone.** Relational technology concentrates its focus only on data. It emphasizes that the processes or actions should be categorically separated and should not be considered during the design process.

In contrast, object orientation emphasizes that the real world cannot live by data alone. It is the *actions* done to or with data that give a real world view.

• **Data and objects are one.** One of the building blocks of object orientation is that an object contains both data and procedures or actions. Some procedures, or methods, are made known to other objects. These methods are public methods, while other methods are kept private. Data is encapsulated by methods, and various objects are grouped into classes. Some objects have characteristics

Manuel King

Atre is president of Rye, N.Y.-based Atre Computer Assistance, a division of Coopers & Lybrand.

• A good bet to overtake relational

• There's no 'Dr. Codd' here

• Patience is required

similar to other objects, and these characteristics are inherited. This object-oriented hierarchy differentiates itself from the relational systems.

• **The terms are more complicated than the concepts.** In object orientation, encapsulation and inheritance compete with tuples and cardinality of relational technology. It appears that object orientation is not taken seriously unless the term "paradigm" or other big words are used. Jargon aside, the concepts are just as simple as those of relational technology.

• **It promises productivity.** Object-oriented programming languages and object-oriented database management systems are supposed to increase programmers' productivity by supporting modular programming and providing flexibility.

Modular programming is supported by modules called objects that can be shared. A vendor is supposed to supply a library of objects. Object-oriented DBMSs are a blend of systems software and applications software, whereas relational database management systems are systems software and not applications software. RDBMSs support a data dictionary/directory system but do not supply its contents.

• **There are a wide range of applications.** Initially, relational databases were supposed to be used more effectively for decision support systems than conventional networking or hierarchical databases. However, now that RDBMSs are moving into the production environment and into on-line transaction processing, object-oriented databases are a good choice to take their place in decision support systems.

Other good application areas for object-oriented databases are those requiring large amounts of small, heterogeneous data — everything from text, graphics, images, voice and facsimile — and areas that require a great deal of connectivity between them. Computer-aided design and manufacturing, computer-aided publishing and imaging are all good possibilities. For example, a bank may want to not only maintain a record of checking account transactions but also keep on-line photocopies of the checks.

• **The technology is still young.** Most of the object-oriented DBMS vendors are relatively new and have not expended a great deal of effort in creating support software — for example, tools, debuggers and utilities. The result is an almost "do it yourself" mode. By comparison, RDBMSs have a myriad of supporting infrastructural tools for performing the mundane, but necessary, activities of backup, recovery, checkpoint, logging and more.

• **Two types of vendors.** Existing RDBMS vendors, such as IBM, Oracle Systems Corp., Ingres Corp., Sybase, Inc., Digital Equipment Corp. and Computer Associates International, Inc., will add object-oriented features to their existing products. To gain attention and market share, new object-oriented DBMS vendors will fight many of the same battles that nonrelational and relational vendors did five or six years ago.

• **Cultural change is needed.** One of the major differences between relational technology and object orientation is that the latter pretty much requires a culture change. The relational approach kept data structures and algorithms (program logic) separate, as had been the case in the past. Because object orientation puts data and algorithms together as objects, it requires a different mind-set and a completely different method of programming.

Programmers will have to trust other programmers while using the private methods of an object. This requires a more communal way of thinking. Ultimately, programmers will make or break object-oriented technology. •

Selected object-oriented languages and vendors

Actor
The Whitewater Group
600 Davis St.
Evanston, Ill. 60201
(312) 328-3800

Advantage C++
Lifeboat Associates
1163 Shrewsbury Ave.
Shrewsbury, N.J. 07702
(201) 389-8950

C-Talk
CNS, Inc.
7090 Shady Oak Road
Eden Prairie, Minn. 55344
(612) 944-0170

C++
Guidelines Software
P.O. Box 749
Orinda, Calif. 94563
(415) 254-9183

Eiffel
Interactive Software Engineering, Inc.
270 Storke Road
Goleta, Calif. 93117
(805) 685-1006

Exper-Common Lisp
Expertelligence
Suite 302
5638 Hollister Ave.
Goleta, Calif. 93117
(805) 967-1797

Smalltalk-80
Parcplace Systems
1550 Plymouth St.
Mountain View, Calif. 94043
(415) 691-6700

XLISP
Compuserve by: D. Betz
Compuserve ID 76704,47

Object-oriented guide

What are the right questions to ask?

A number of issues need to be considered before you get dazzled or disenchanted by object-oriented technology. The following are some key questions:

• **Do I have the right technical environment?** If C, C++, Unix, X Window System or Smalltalk aren't in use in your organization, then object orientation is not for you — at least right now. Almost all object-oriented technologies run on Unix workstations or Apple Computer, Inc.'s Macintosh. It will take at least a few more years before object-oriented DBMSs will run on DOS-based platforms. Borland International's C++ and Microsoft Corp.'s C++ compilers may expedite the process.

• **Am I looking for a long-range solution?** An object-oriented DBMS is not a "quick fix" to existing problems. Before using an object-oriented DBMS, a firm has to invest substantial effort into designing the objects. Object-oriented DBMSs may not deliver great benefits if the objects are not "complex."

Object-oriented DBMSs store complex data types, such as text, graphics or voice information, that RDBMSs cannot handle. An example of a complex data type could be storing a withdrawal transaction from a checking account with a copy (image) of the check stored for reference.

• **Am I willing to try a prototype?** Before determining whether an object-oriented DBMS is for you, consider a small prototype. Prepare an entity-relationship diagram. In the diagram, each data item (entity) has a set of associations (relationships) with other data items. These diagrams are used to map the underlying structure of a database so that formal database record definitions and integrity rules can be created.

Because the main theme of object orientation is that there should not be one type of system in the database or file system and another in the program, flow of data through the system should be represented via data flow diagrams and state-transition diagrams. Entity-relationship diagrams, data flow diagrams and state-transition diagrams can then be used to verify with the user that the systems analyst's understanding of the system's behavior is correct and could be used to generate program specifications that match the understanding. Superimposing database design and process design is quite time-consuming but crucial for object orientation to be successful.

• **Am I willing to wait for a payoff?** As far as application program development in an object-oriented environment is concerned, not much productivity increase will be seen in the first few years until a library of objects and object modules is built. After the library is built and application programmers are able to use the modules repetitively, productivity will improve.

As with other technologies, patience is also a virtue with object orientation.

• **Am I willing to start educating my staff today?** A prudent manager should start educating the organization about object-oriented technology. Object orientation is a promising technology that is going to make big waves in the 1990s. Even if object-oriented technology doesn't turn out to be the oat bran of the software market, it may help some ills of the industry if prescribed and used properly.

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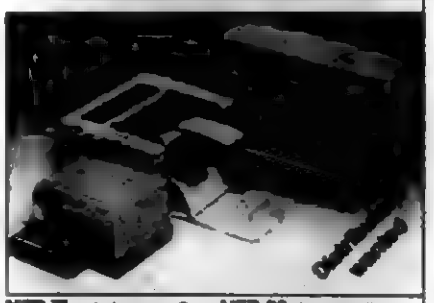

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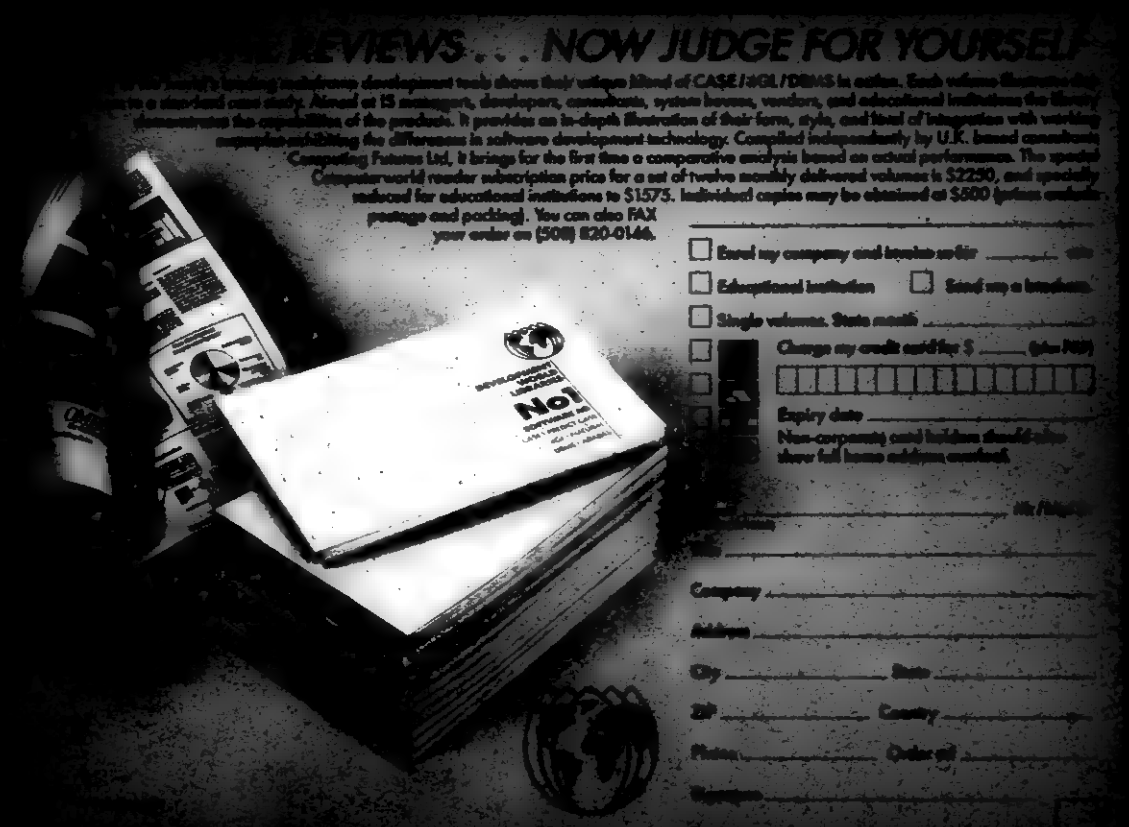
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But wait, there's more

Stardent Computer, Inc: co-founders and former executives **Allen Michels** and **Matthew Sanders**, who were given the boot by the board shortly after the two rocked the computer industry by filing technology theft charges against the firm's Japanese partner/investor **Kubota Corp.** this past summer, are singing another somebody done somebody wrong song. Earlier this month, the two added an unlawful termination charge to their suit — and added Stardent Chief Executive Officer **J. William Poduska** and the company as defendants.

■

Many happy returns

They're baa-aack. The nation's **venture capitalists** are rededicating their efforts to the field that proved so fertile for them a few years back: computer technology. A recent survey conducted by New York-based market research company Technologic Partners, Inc. showed venture investing in computer-related companies in the first quarter of 1990 at $285 million, which was up 44% over that amount in last year's comparable period.

More briefs on page 122

Cracking open imaging's golden egg

Image processing market growth of 30% to 50% per year fuels dreams of rich profits

BY ALAN J. RYAN
CW STAFF

The document image processing market is hardly the stuff of fairy tales, but its phenomenal growth potential may have some executives dreaming of golden eggs.

"There [are] a billion zillion dollars to be made in this area," said Ben Levitan, a manager at Nolan Norton & Co. in Lexington, Mass., an information technology firm of KPMG Peat Marwick.

Image processing — taking paper documents and scanning them into electronic form where the data can be manipulated and accessed simultaneously by whomever needs to see it — is hot. The market is growing at a compound annual rate of 30% to 50%, according to analysts, and there is no end in sight.

Gregory C. VanBuren, a consultant at the industry management section of Cambridge, Mass.-based consulting firm Arthur D. Little, Inc., said that document image processing is the fastest growing segment of worldwide data processing.

BIS CAP International, Inc., a Norwell, Mass.-based research and consulting firm, estimates that the market will reach $2 billion by 1993. Analysts at Nolan Norton endorse figures that say the market could climb as high as $12 billion by the mid-'90s.

"The whole notion of information management is not just breaking it down into data entities, but managing the work that goes on in businesses," Levitan said. Imaging, he said, is a compelling technology for corporate decision makers because it is the unfulfilled promise of data processing coming through.

"Imaging is going to make a major difference," Levitan said. "It will offer [the] benefits of what goes through the tube rather than the tube itself."

Early comers into the potentially lucrative market have been quick to grab market share and positioning. However, there are plenty of slower starters who will be able to make a mint in the multibillion-dollar market-to-be, according to analysts.

Picture this

Imaging system installations are expected to hit the $2 billion mark within three years

Year	Installed base	Value of systems installed
	1,224	$340M
*1990	2,413	$540M
	4,381	$920M
*1992	7,458	$1.4B
	12,674	$2.8B

*Projected

Source: BIS CAP International, Inc. CW Chart: Paul Mock

Today's big names in imaging include Wang Laboratories, Inc., IBM and Filenet Corp.

"Imaging is *the* strategic product for Wang," Levitan said. "They will be key players and won't step back — if they can sort out their financial troubles."

Also contending for the field are such companies as Xerox Corp. and Digital Equipment Corp. Players in the near future will likely include Bull HN Information Systems, Inc. and Apple Computer, Inc., analysts speculated.

Tomorrow, however, there could be another tier of imaging providers that will look at the businessworld from a different perspective, Levitan said. These imaging providers, he said, will have radical approaches.

For instance, he said, if a company like Sun Microsystems, Inc., with its large installed base of desktop workstations, were to enter the imaging arena, it could make progress quickly. Such an entrant, Levitan said, would "have the desktop and could work from the desktop back."

It is unlikely to be only vendors that board the imaging bandwagon, according to industry observers. System integrators will play a big role in the imaging market by helping users to put together pieces of equipment that were not meant to work together. Also, consultants will be called in to many companies to help with business process redesign that imaging will bring about.

One expected result of the not-yet-surfaced vendors will be imaging on a much smaller scale than that on which it has been done to date.

Because the market is so new, Levitan said, the big players five years from now could be very different from today's top five.

By the end of the current decade, said Richard Schwartz, an analyst at Shearson Lehman Hutton, Inc., the imaging market will "reach into every nook and cranny" of business.

With the expense of imaging projects so high for users, most of the big imaging projects happening today are limited to big companies with large

Continued on page 126

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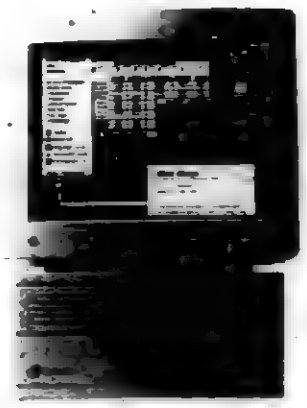

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*PC WEEK, May 7, 1990. **Direct LocalTalk connections dependent on NetWare 386 NLM due Fall, 1990. Macintosh connection achieved today via standard bridges.

Semiconductor group seeks tax credits

BY GARY H. ANTHES
CW STAFF

ARLINGTON, Va. — An econometric model commissioned by the National Advisory Committee on Semiconductors (NACS) has turned up an unexpectedly strong correlation between depreciation schedules and investment in capital equipment. A study released here by the NACS said that reducing the depreciation period for semiconductor manufacturing equipment from its current five years to three years would cost the U.S. Treasury $180 million but would boost industry spending on new state-of-the-art equipment by some $450 million.

That would go a long way — but not all the way — toward helping U.S. industry catch up with its Japanese counterpart, the NACS said.

The NACS is using the figures to bolster its recommendations that the federal government stimulate capital formation in the semiconductor industry by beefing up the research and development tax credit, reducing capital gains taxes and allowing accelerated depreciation of manufacturing equipment.

"The sensitivity of investment to depreciation is surprising," said Ian M. Ross, the NACS chairman and president of AT&T Bell Laboratories. Of the four proposals in the study, only the acceleration of semiconductor equipment depreciation has not been extensively studied by Congress or the Bush administration, Ross said.

The NACS also proposed the following:

- Reduce the capital gains tax rate to 20%. That would boost industry spending by 7%, or $285 million, the NACS said.
- Increase personal saving incentives. The NACS estimated that a 2% reduction in interest rates — which could result from more savings — would increase capital investment in the industry by 3%.
- Bolster the research and development tax credit by making it permanent, by increasing the credit rate and by broadening the base to which it applies.

Jerry R. Junkins, chairman and president of Texas Instruments, Inc. and an NACS member, said the loss of tax revenue that would stem from liberalizing depreciation rules should be viewed as a short-term sacrifice for a greater long-term gain. "But it's an open question whether it can be accommodated in the current budget summit."

Ross said that the Bush administration is studying the proposals, but that he had not heard any conclusions. He said the proposals would be beneficial to any industry with high capital investments and high R&D costs.

The NACS also looked at the effects of switching to a one-year depreciation schedule and found that would boost annual capital spending by 26%. That would increase capital expenditures as a percent of sales from its current U.S. average of 18.5% to 23.3%. In Japan, the ratio now stands at 25.5%, the NACS said.

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INTERNATIONAL BRIEFS

Why are we in Vietnam?

For **OTC International Ltd.**, the answer appears to be: to make telecom deals. The Sydney, Australia-based company spent the past five years creating an earth station and related telecommunications facilities in Vietnam. Upon recent completion of the contract, the parties signed on for a continuation of the activities. This time, OTC International has bagged what it claims is the biggest telecommunications-based export contract ever entered by an Australian firm: a projected decade's worth of international network and domestic infrastructure development to be done under the auspices of Vietnam's Directorate General of Telegraphs. OTC International's revenue under the contract is estimated at $195 million.

■

G'dye and g'bye

Struggling Dutch electronics company **Philips NV** earlier this month handed over the lion's share of responsibility for its Australian computer and telecommunications interests to **Imageering**, a distributor based in Sydney. Under their agreement, according to a Philips spokesman, the company will take a stake in Imageering, which in turn will take an equity position in Philips' customer support operations. Financial details remain to be worked out, he said. The move, the spokesman maintained, is not part of — but actually strategically predates — the restructuring plans announced by Philips earlier this year in a bid to boost its flagging fortunes.

COMMENTARY

Patricia Keefe

To exchange — or not exchange

At a time when it is seeking a mutually beneficial technology exchange with Novell, Microsoft recently launched an ambitious assault on Novell's lifeblood reseller channel and end-user market share.

This has no doubt alerted Novell officials to the risks involved in participating in a technology exchange that would enable Microsoft to more quickly provide promised interoperability between its OS/2 LAN Manager and Novell's Netware.

"Novell [today] fears it would somehow legitimize the competition by doing these things," says Jamie Lewis, an analyst at Clarke Burton Corp. and a former Novell employee.

"Exactly," says Mike Murray, Microsoft's manager of network products, who claims the ball is in Novell's court. "If I were in [Novell CEO] Ray Noorda's shoes, I'd be asking myself, 'Does this [technology exchange] make sense?' "

According to Murray, Noorda is standing under a two-edged sword. If he plays ball with Microsoft, he may be helping a competitor.

However, a refusal could undermine years of saying that Novell's interests lie purely in expanding the LANscape and helping all LANkind.

Boy, is this true. Noorda has been slinging this hash ever since I can remember. Maybe now is the first real put up or shut up test of Novell's self-sacrificing theme song.

If Novell declines to share information, and it's looking like it might, thanks in part to an older, unresolved contract dispute with Microsoft, Murray says he can still pull off interoperability between the two product lines. It will simply take a little longer.

He has to. Interoperability is vital to pushing Microsoft's so far weakly received LAN Manager. More than widespread accessibility and the added functionality of LAN Manager 2.0, interoperability is one of two keys to getting the Fortune 1,000 — mostly weaned on Netware — to take LAN Manager seriously. Some estimates suggest that 50% to 75% of IBM Token Rings run Netware.

Microsoft also faces reseller skepticism. "LAN Manager 2.0 is better than 1.0, but nobody wants it," says one dealer. Why? Because users just do not want to take a chance on Microsoft, he claims.

Many large corporations formally standardized on LAN Manager several years ago, but IS ignored the directive, adds Leo Spiegal, an executive vice-president at LAN Systems. Providing safe passage back to Netware might help assuage some of those fears.

The second, and separate, bellwether for Microsoft revolves around synchronizing IBM's LAN Manager-based OS/2 LAN Server and LAN Manager.

Although the IBM server is LAN Manager-based, there are enough differences between the two products so that users are allegedly reluctant to purchase either for fear of picking the wrong one.

However, 10 months after pledging to make the two mirror images, IBM and Microsoft are still at work on the project, with no delivery date in sight. It won't happen before year's end, Murray says. IBM says it remains committed to the project.

Moreover, since many users grumble about LAN Server's capabilities, a Netware link looks like Microsoft's best bet.

It may look like Novell is holding the cards, but in actuality, that might not be the case. It, too, has a stake in interoperability — more so in the long term.

While many Netware users shrug when asked if interoperability with LAN Manager is important to them, those who are migrating to OS/2 are concerned. Novell has not adequately answered their OS/2 support questions.

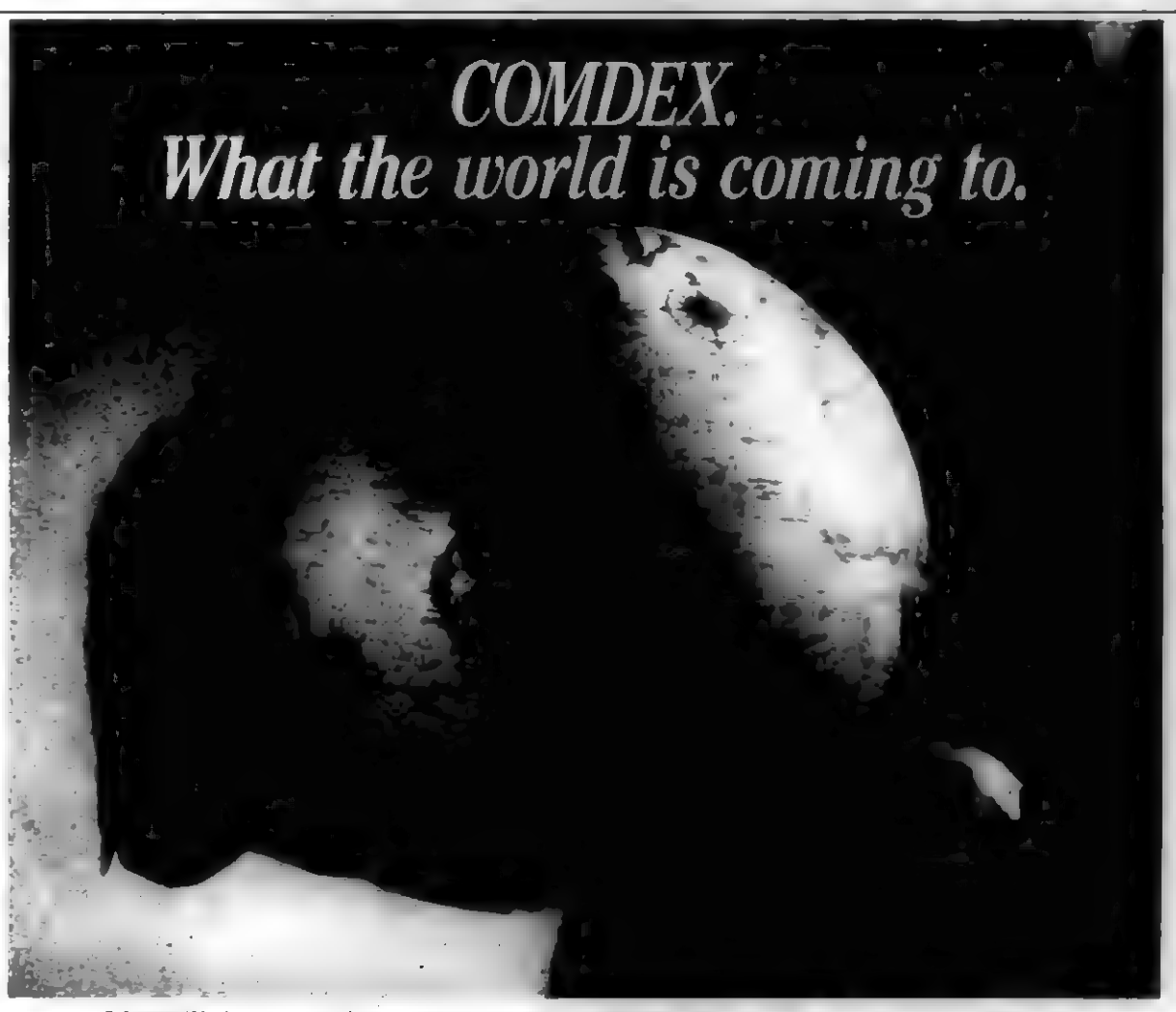
NOORDA HAS BEEN slinging this hash ever since I can remember. Maybe now is the first real put up or shut up test of Novell's self-sacrificing theme song.

As the downsizing trend picks up and users move from islands of LANs into a true client/server environment, Microsoft and Novell may well find themselves facing the same growing chorus: When can your server talk to his server?

We are already seeing signs of user impatience over this issue. At least two firms have decided to abandon Netware for LAN Manager. The reverse, in which users decline to install LAN Manager, is probably also true.

It just may be that the networking leader of the 1990s will be the one most able to interconnect with its competitor's equipment.

Keefe is *Computerworld's* senior editor, PCs and workstations.



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CW 9017

Dell launches tough attack on Compaq

BY PATRICIA KEEFE
CW STAFF

AUSTIN, Texas — Armed to the teeth with new products and a bodacious ad campaign, Dell Computer Corp. is going after neighbor and rival Compaq Computer Corp. with guns blazing.

Dell claims that its most aggressive assault yet on what it sees as the new "gold" standard — Compaq — is scoring hits. Not only does Joel Kocher, Dell's senior vice-president of U.S. sales and operations, claim to have logged a 50% increase in requests for information in just 10 days, but Compaq last week announced a slate of 20% to 25% price cuts.

Dell's plan of attack is two-pronged. Coinciding with the introduction two weeks ago of its first high-end servers and a disk array controller, the mail-order clone maker also unleashed a massive advertising campaign, including 12-page magazine inserts, targeted at readers of the major personal computer and business publications. Zingy ad copy takes a no-holds-barred approach to comparing Dell and Compaq service and pricing.

First, the promotion picks off cheap clones. Then it gets down to business, training the big guns on Compaq. The first shot asks: "Can you stomach spending an extra $10,000 for a PC network or Unix workgroup server when the big extra is dubious service? Servicing servers is beyond most Compaq dealers."

From there, readers are treated to a visual comparison of analogous Dell and Compaq products, capped by one-liners such as "Lap of Luxury," over an Intel Corp. 20-MHz 80386SX-based Dell laptop priced at $3,899, contrasted with "Lap of Lunacy" over a $6,799 Compaq offering. "How those other guys can charge so much is insane," the ad states.

According to Dell, the firm has historical reason to believe in the hard-hitting approach. This campaign follows an earlier one in which Dell attacked the dealer channel. "It really helped launch Dell," said Dan Ness, an analyst at La Jolla, Calif.-based Computer Intelligence.

A Compaq spokeswoman stated that last week's price cuts were simply a "natural response to preparing for the fourth quarter," traditionally the company's busiest. In a prepared statement, Compaq North America President Mike Swavely suggested that "customers who have been considering other products will want to take another look at Compaq."

Dell, obviously, isn't buying it, but neither are some PC analysts.

Compaq is somewhat vulnerable right now, partially because of product availability problems, according to Bob Brown, a marketing consultant at Norcross, Ga.-based R.G. Brown and Associates, and Steve Hess, an analyst at Creative Strategies Research International.

"If you look at the figures Compaq has been reporting, there seems to be an opportunity [for us]," Kocher said. He said Dell hopes to convince corporate users who are looking to add a third product to their short lists that they do not have to sacrifice Compaq-level quality for price.

Also, sales of its high-end Systempro server have failed to meet projections, so Compaq is cracking down on dealers who fail to complete required training.

While Compaq grapples with user doubts about purchasing high-end equipment from dealers, Dell is pushing its reputation for solid service and support.

The Compaq spokeswoman conceded that "all [of those mentioned] are all valid points" but insisted that none were "overriding concerns in the decision to decrease prices."

"Dell is trying to portray themselves as a premium brand at value price, rather than a premium brand at a premium price," said Bruce Stephen, a hardware analyst at International Data Corp., a Framingham, Mass.-based market research firm. It is attempting to do this in part by riding Compaq's coattails, Ness added: "How better to position yourselves than by associating your name with someone who has a better position?"

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NATIONAL BRIEFS

Hell no, we won't go

However Vienna, Va.-based **Systems Center, Inc.**'s recent acquisition of Reston, Va.-based neighbor **Unitech Software** was received in other quarters, it certainly roiled the waters out in Lisle, Ill., where **Unitech Systems, Inc.** is headquartered. The 8-year-old company, which is privately held and determined to remain so, is suffering from some folks' misapprehension that it is about to be bought by Systems Center. Anyone who remains confused, listen up: Unitech Software is a Unix systems utility developer and is about to be acquired. Unitech Systems is a reconciliation and verification software purveyor to the IBM VMS and VSE markets and is not for sale, one of its executives said.

Did we say that?

BY RICHARD PASTORE
CW STAFF

A Dell PC in a retail store window? Never happen.

Such has been the refrain in the halls of mail-order pioneer Dell Computer Corp. since its founding in 1984. But beginning next month, Dell's entire personal computer line will be showing up in windows of Soft Warehouse, Inc., the nation's largest computer superstore dealership. Soft Warehouse boasts 13 superstores; all other superstores in the market are regional chains.

Although Dell has happily fiddled while traditional retailers like Businessland, Inc. burned, it has lately taken notice of the growing success of the superstores. These cavernous outlets sell PCs for virtually the same low prices as do the mail-order firms but have the advantage of the in-person touch.

Dell's agreement with Soft Warehouse "is a recognition that there's a limit to how much corporate America will buy by telephone," said Seymour Merrin, president of Merrin Information Services in Palo Alto, Calif. "It's the only way to expand their business."

"We wanted a conduit that was aimed at the less-sophisticated user," agreed Joel Kocher, Dell's senior vice-president of U.S. sales and operations. The small and medium-size business customer and home market buyer — the superstores' bread and butter — was not attracted by Dell's direct-mail channel of distribution, Kocher said.

Dell's infrastructure is overripe for the significant sales volume increase it hopes to gain from the agreement. The company's ill-timed move to an expanded manufacturing plant 11 months ago coincided with the bust in the domestic PC market. With only one shift operating, and that at less than capacity, Dell needs to better leverage this facility, Merrin said.

Soft Warehouse, a $300 million firm, reportedly will price the Dell line exactly the same as Dell's catalog prices. Its salespeople will be trained to sell and support the hardware, and each box comes with Dell's toll-free and next-day on-site support.

COURT REPORT

A $48.3 million award won by a Pasadena, Calif., gas and oil exploration company was recently reduced to $1.9 million by a U.S. District Court judge in Los Angeles. In so deciding, he wrote a new chapter on one of the most celebrated computer liability cases in years.

On Aug. 15, Tulsa, Okla.-based Seismograph Service Corp. was ordered to repay Geophysical Systems Corp.(GSC) the $1.9 million GSC paid for seismic data processing software in the early 1980s. The award was for what Judge A. Wallace Tashima found to be violations of California's fair competition statute, said Seismograph attorney Steve Holtman.

In its original complaint, Pasadena, Calif.-based GSC claimed that it was forced into Chapter 11 in 1983 because Seismograph's software did not perform as promised. A jury in 1988 awarded GSC $48.3 million for breach of warranty and covenants and unfair treatment by Seismograph, Holtman said.

The judge threw out the bulk of the jury's award and called for a new trial. This summer, a new jury dismissed all breach of warranty and covenent charges, Holtman said. However, Judge Tashima said that he, himself, would rule on the unfairness charge. He said that he believed GSC had proved that it had been treated unfairly.

Tandy Corp. and its Grid Systems Corp. subsidiary are going after Texas Instruments, Inc. on antitrust charges. In a complaint filed earlier this month, Tandy and Grid alleged that TI is making systems makers ante up excessive license payments for invalid patents.

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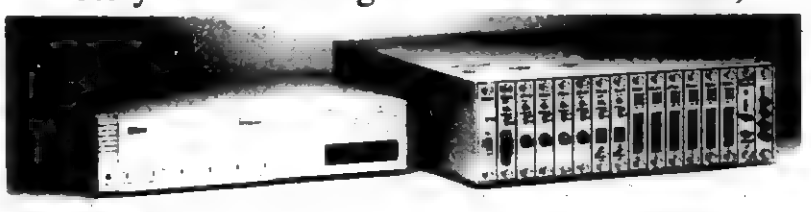
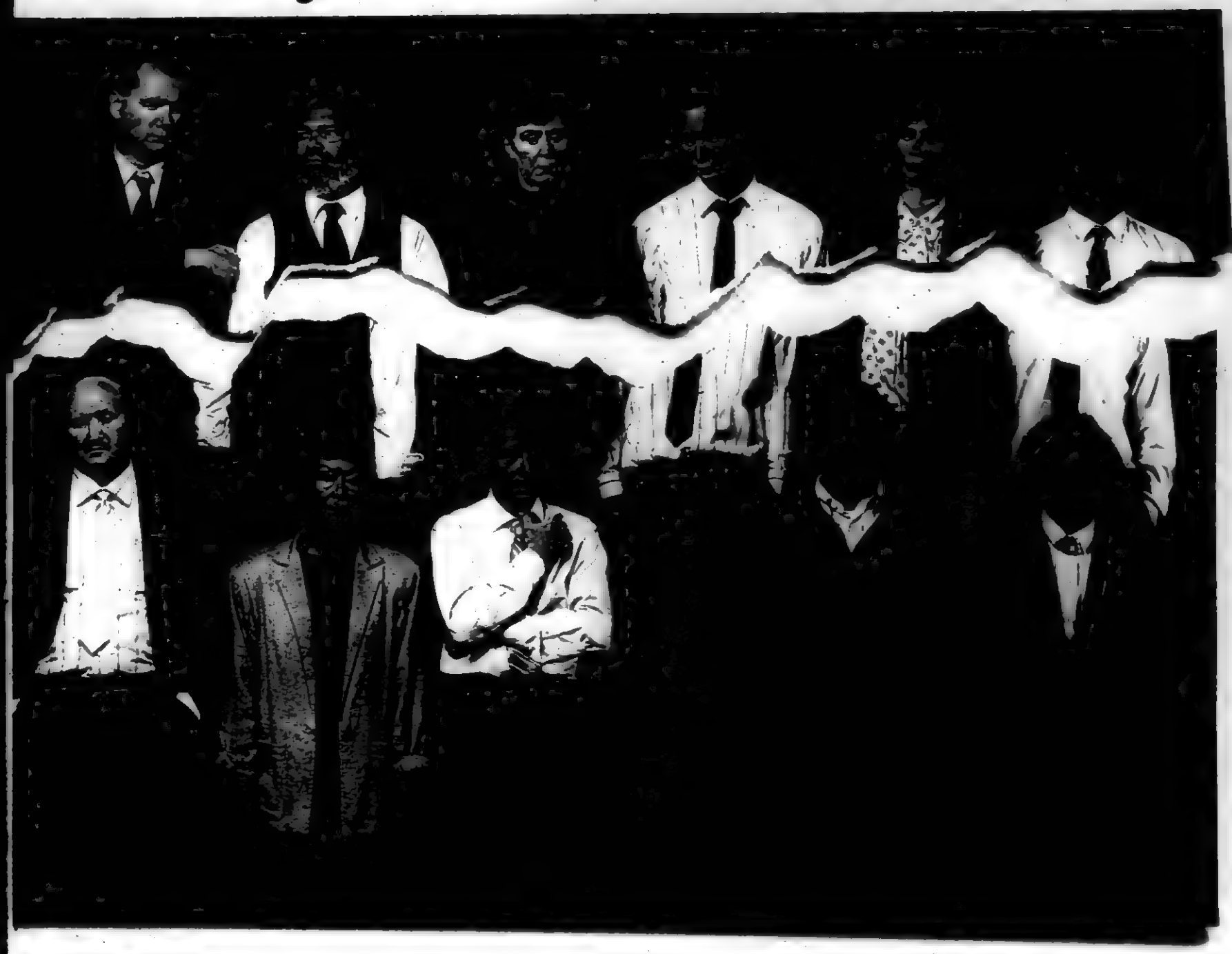


with my network downstairs.



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Bull posts first-half losses, analysts question its stability

ANALYSIS

BY PHILIPPE ROSE
IDG NEWS SERVICE

PARIS — After recording solid profits between 1985 and 1988, Groupe Bull posted a record $348 million in losses for the first half of 1990.

According to Chairman and Chief Executive Officer Francis Lorentz, the firm, like other manufacturers, was a victim of the worldwide computer market's shift toward standard products.

The year started on a disappointing note as Bull found itself facing the cost of a difficult internal restructuring. Magnified by harsh price competition, the drop in profit margins increased. Despite the disappointments, Bull management remains optimistic for the rest of 1990 because approximately 60% of group revenue comes in the second half, Lorentz said.

Bull is not alone in its problems. European manufacturers overall are in stormy waters. However, that fact cannot absorb all of the blame for Bull's slide. Bull is suffering from more fundamental handicaps, stemming from its product range, company structure and financial situation.

Bull's slate of product offerings is too extensive, with maintenance and upgrade services adding to overall group costs, the company acknowledged. End users have also criticized Bull for its sluggishness in opening up to standards and its uncompetitive pricing. Furthermore, recent corporate structural changes — notably the integration of Zenith Data Systems and U.S.-based Bull HN Information Systems, Inc. — have slowed business.

Bull productivity, when measured in terms of revenue per employee, remains below that of most competitors. In 1989, this figure rose to $117,000, which is equivalent to per-employee revenue at Italy's Ing. C. Olivetti & Co. and UK-based International Computers Ltd. In stark contrast, IBM's per-capita output for the same year reportedly was 40% greater.

In a market that is rapidly turning global, Bull is competing with U.S. companies that boast large and loyal installed bases and Japanese firms that face a protected domestic market. In this context, Bull's plan of action is very limited.

Analysts remain pessimistic about the possibility of group profitability for Bull this year. Despite a reduction in its work force and a $278 million subsidy from the French government, Bull's return to a competitive position seems uncertain.

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Imaging

CONTINUED FROM PAGE 117

budgets. However, Levitan sees market potential to open up imaging to small companies — for instance, a local hardware store or bakery. "There are lots of venture [capital] people looking into ideas like that, looking for mass markets and alternative distribution," Levitan said.

The difficulty of making a mark in the imaging field is real, however. "It's an easy business to get into, but very difficult to prosper in," Schwartz said.

The electronic imaging market will reach across many multibillion-dollar markets, he said. Still, he added, for most companies entering the imaging field, the operating costs probably cannot be covered until a company realizes gross profits approaching the $10 million mark and sales of $20 million.

Additionally, said Schwartz, selling imaging products to user companies is different than selling anything else. "This business has a unique set of selling dynamics to be learned," he said.

Schwartz noted that vendors in the field "learn to get comfortable with discomfort."

Proprietary solutions

Many of the early entrants into the imaging field created proprietary solutions for single users. In this decade, it is expected that more vendors will begin to mix and match in order to integrate by application. Off-the-shelf hardware and software for imaging will be greatly improved, Schwartz speculated.

As users look more and more to open systems, the fate of proprietary solutions could be cast into question, Levitan said. However, he added, users who are waiting for standards in imaging may be missing the boat: "Waiting for standards is like waiting for Godot."

As long as a company puts in an imaging system that can be integrated with its other systems where it is needed — even if it requires some technical finagling — the benefits of imaging can be realized today, market observers agreed.

"Ford Motor Co. has something like 16 imaging applications, and none of them talk to each other, but each are valuable," Levitan said. "Most of them went in as working pilots, and now the users won't let [Ford] take them out."

For that reason, though, Levitan said he advises companies that want standardized solutions within their walls to create consistent and enforceable standards policies.

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An IDG Communications Newspaper

End-user managers: Versatile players

BY NAOMI KARTEN
SPECIAL TO CW

End-user computing wasn't born yesterday, but most organizations find it hard to pin down a specific career path for the people responsible for managing it. Generally, end-user computing managers can either climb higher under the information systems umbrella or pack their technological bags of knowledge and head into the user side of the company.

Originally, user support was strictly an IS function. End-user computing managers — information center managers, client services managers, personal computer support managers and managers of support groups — focused mainly on selecting hardware and software. They also established and provided training and support services and formulated policies and standards in the selection and use of computers.

What has happened, though, is that end-user support groups have become more business-oriented than product-oriented. Companies have broken away from hiring strictly technical staff and are hiring people from diverse occupations — including chemists, musicians, first-grade teachers and end users — for support positions.

The information centers find that end users in particular bring an understanding of the user community and knowledge of the industry that is extremely valuable, says Dave Flansbaum, managing director at Source EDP's San Francisco office. They're armed with the ability to better understand, serve and support users, he says.

Because of this melding of business and product support, many end-user computing managers are finding themselves highly marketable.

"All end-user computing managers had *better* be able to move to the business side with all the experience they've drawn," says Tom Lutz, vice-president and chief information officer at Armco Advanced Materials Corp., a specialty steel manufacturer.

One of the most obvious areas these managers can move into is user departments — finance, marketing and public relations. One of Lutz's colleagues left the end-user computing area and headed into human resources, handling industrial relations with the labor union. "The key is that she already understood many of the different things going on throughout the business, so it was a natural move," he says.

Michael Boeldt, an end-user computing manager at The Company Store, which manufactures down feather products in LaCross, Wis., says that his current position has given him a good working knowledge of all areas of the company. He says he would be well prepared should he want to move into an end-user department.

"Basically, these managers interface with all levels of the organization, and it tends to be a very high-visibility position. It's quite natural, if they're doing a good job, for them to catch the eye of somebody else within the company," according to Flansbaum.

Many managers who have made this type of move into the user community say that the most amazing thing is how their perspectives change. A trivial spreadsheet problem looks dramatically different when viewed within the context of business deadlines, pressures and commitments.

End-user computing managers are also heading into hardware, software and research organizations.

For instance, a few managers who were quoted frequently by the press came to the attention of some large industry research firms. They're now responsible for major research studies in the microcomputing field, tracking industry trends in hardware and software. The value is not just in their knowledge of the technology but in how it's being used.

These managers are viable candidates for IS positions, too. For example, one former information center manager at a bank became a manager of data security and quality assurance at another company and found tight overlap between his old and new responsibilities.

Many avenues

Other IS areas in which end-user computing managers have been tracked are: planning positions, directors of training or user services and database managers charged with the development of a comprehensive database.

The biggest difference in placing end-user computing manager-types as opposed to other IS staff people is that their background is tied to a specific knowledge, Flansbaum says.

These managers' marketability is based on their *business* expertise in a particular type of company: They may be experts on manufacturing, financial systems or health care systems, he says.

"An IBM mainframe Cobol programmer could work at any type of company because of the commonality of hardware and software," Flansbaum adds.

End-user computing management is not an end-of-the-road job. It has become an area that can offer significant opportunity to professionals coming from numerous directions, and it can open up opportunities to move in at least as many future directions.

Karten is president of Karten Associates in Randolph, Mass., and editor of the monthly newsletter "Managing End-User Computing."

Dollar signs

End-user computing managers stand on the high ground in end-user support

Average total compensation (salary plus bonuses)

Title	Average compensation	Company size by revenue or assets: Less than $50M	$50M to $499M	More than $500M
Manager of end-user computing	$49,463	$43,672	$47,923	$56,139
Information center manager	$47,100	$39,447	$45,637	$55,452
LAN manager	$41,177	$37,555	$40,390	$45,868
PC specialist	$33,306	$30,274	$33,753	$35,827

Source: CW 1990 Salary Survey

CW Chart: Doreen Dahle

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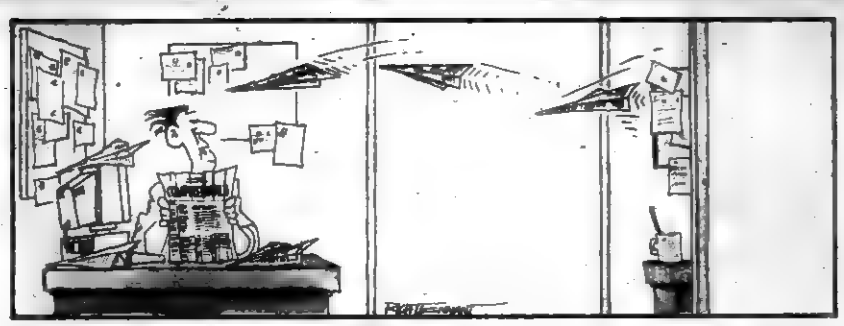

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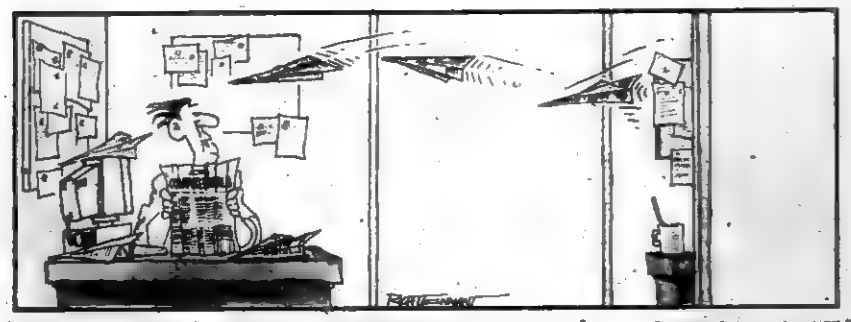

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For more information, call Greg Alleyne at 1 800 899-5326 or send/fax your resume to his attention at (301) 752-7695. Keane, Inc., 36 So. Charles St., Suite 2350, Dept. CW, Baltimore, MD 21201. An equal opportunity employer.

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Look at what the Computer Careers Network lets you do: Customize your recruitment program. The Network's five newspapers - *Computerworld, InfoWorld, Network World, Digital News, and Federal Computer Week* - let you tailor your recruitment program to your specific needs. You can buy as many as five newspapers with add-on options. That way you can recruit from the combination of computer and communications professionals that's best for you.

Target your ad placement. You can place your advertising exactly where you want. If you wish to recruit within a specific area, you can advertise in the regional editions of the newspapers you choose - East, West, or Midwest. Or you can extend your reach by running in two regions - or even nationally. Plus - you can still take advantage of stand-alone national rates for individual newspapers.

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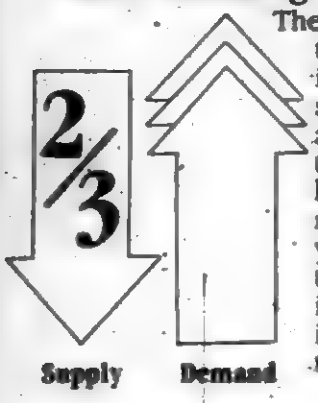
A few important tips on recruiting computer professionals

Finding computer talent isn't as easy as it used to be. In fact, there was a time when you'd just run an ad in the local newspaper and you could make a hire without waiting too long or spending too much.

But times have changed. And like so many facets of today's business, so has the effectiveness of traditional recruiting methods.

What's more, many of today's recruiters *don't use* today's most efficient methods — methods that save time and money for some widely unknown reasons.

The supply of qualified professionals isn't meeting demand



The American Council on Education reports that the number of college students choosing computer careers is down two-thirds since 1982. To make matters worse, there are more computers in today's business that require the skills of this shrinking market than ever before. And while you may never consider the company next door your competitor, it likely *is* competing for the same computer talent today. The result is a classic supply/demand problem that isn't changing for the better -and that's sure to make your recruiting tougher in the '90s.

Ads in local papers don't reach your major hiring market anymore

That's because they generally reach "active" job seekers — those who actively seek out the local newspaper to find jobs — and who a recent *Computerworld* job satisfaction survey found to represent 2 in 10 of today's computer professionals. The study also found that 7 in 10 of today's computer professionals are "passive" job seekers — those who would *consider* new job options, but likely never look for them in the local newspaper. (The remaining small percentage are "non-movers" content with long-term jobs.)

For every 10 of today's computer job seekers . . .
2 are Active
7 are Passive
1 is a Non-mover

In short, this means that your ad in today's local newspaper reaches no more than 20 percent of today's computer job seekers. What's worse, if you're not using other vehicles that reach far more job seekers, your local newspaper expenses are as inefficient as their limited audience.

More job seekers see your ad in Computerworld than in any other newspaper — Sunday, daily, or trade

That's because *Computerworld* reaches over 612,000 qualified computer professionals every week — the largest audience of its kind, and one that's rich with passive and active job seekers.

That's why more companies advertise more jobs in *Computerworld* than in any other professional newspaper. And why *Computerworld* is the *single place* where America's computer professionals *expect* to see the most jobs every week.

Computerworld gives you regional editions

A key option when you need a regional candidate and want to avoid national response and relocation. Yet if your search is national in scope, *Computerworld* can also give you more widespread national exposure than any other source.

Computerworld needs just 3 working days for your ad to appear

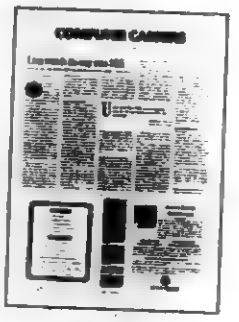
That's comparable to most local newspapers. And why your ad can quickly appear in the next issue to start generating quality response.

Computerworld costs no more than local papers

And with a regional line rate of just $10.80, your cost-per qualified candidate reached is better than *any* newspaper - Sunday, daily or trade. Or just about any other source, for that matter.

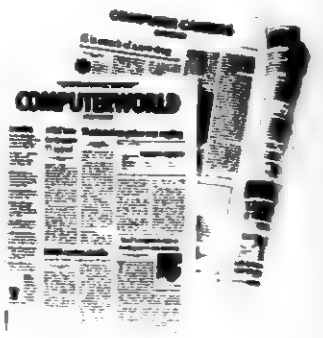
Computerworld leads candidates to your ad

Just look at this week's Computer Careers section. You'll find a career editorial topic that will stir the interest of virtually any computer job seeker — passive *or* active. It's just one of countless reasons *Computerworld* is America's newspaper of choice on computing. No matter how much the times change.



And while times may change, some things won't. Whether you *use* computers, *make* computers, or sell products and services *for* computers, *Computerworld* is still your major source of news today. And your major source of computer professionals tomorrow.

For more recruiting tips, call John Corrigan, Vice President/Classified Advertising, at 800/343-6474 (in MA, 508/879-0700).



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President
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Consulting comes first at CIBER — and that's even reflected in their name. CIBER stands for Consultants in Business Engineering and Research, a national company that's been providing top consulting services to the information processing departments of business and government clients since 1974.

In order to deliver superior services, the company needs to attract qualified consultants. And from there, CIBER — like any other business — needs to market itself to clients. CIBER meets both challenges with *Computerworld*, says company President Bob Stevenson.

"CIBER demands the most when it comes to hiring consultants, just as clients demand the most from consulting services. In addition to being technically competent, CIBER consultants should have both a professional attitude and a commitment to our clients.

"To attract this calibre of consulting talent, we go to the same source we use to attract clients — Computerworld.

That's because we know Computerworld *is effective. We get national exposure to potential client companies, and we recruit highly qualified professionals for our consulting positions.*

"In both instances, the quantity and quality of responses we've gotten from Computerworld *have been better than those generated by any other form of advertising we've tried. We're definitely seeing a high return on our investment with* Computerworld.

"The bottom line is that Computerworld *works well for us. So we'll continue to rely on* Computerworld *as an important — and effective — part of our future."*

Computerworld. We're helping serious employers and top computer professionals get together. Every week. Just ask Bob Stevenson.

For all the facts on how *Computerworld* can put you in touch with qualified personnel, call your local *Computerworld* Recruitment Advertising Sales Representative today.

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An IDG Communications Newspaper

"Our ads in Computerworld had the resumes pouring in and the phones ringing."

— Linda Huebscher
Manager of Employment
Unisys

With more than 60,000 customers worldwide, Unisys is a $10 billion information systems company that applies leading-edge technology to provide the best possible solutions to its customers.

So naturally, says Linda Huebscher, Manager of Employment for the company's Product & Technology Operations division in Roseville, Minnesota, Unisys wants the best technically trained personnel on its team. And for the most successful recruitment of such qualified professionals, Linda explains, Unisys turns to *Computerworld.*

"We recently embarked on two major recruitment campaigns for systems programmers. First, we need to support our development of Unix-related products and services. Second, we seek systems programmers to help us capitalize on our lead in fourth generation language (4GL) technology.*

"We want programmers who are well qualified, aggressive and systems motivated. The market for programmers with Unix kernel and shell development experience is extremely competitive. Just as it is for professionals with backgrounds in C programming, relational database and 1100 systems technology.

"And we are confident we'll find these professionals through Computerworld. *I asked our key systems programmers and managers which periodicals are most widely read by our top programmers. I was told in no uncertain terms that* Computerworld *is at the top of their reading lists.*

"That became clear when we saw the results. Our ads in Computerworld *had the resumes pouring in and the phones ringing. We averaged 28 responses for each ad we ran. But most importantly, we made several very good hires."*

Computerworld. We're helping serious employers and top computer professionals get together every week. Just ask Linda Huebscher.

For all the facts on how *Computerworld* can put you in touch with qualified personnel, call your local *Computerworld* Recruitment Advertising Sales Representative today.

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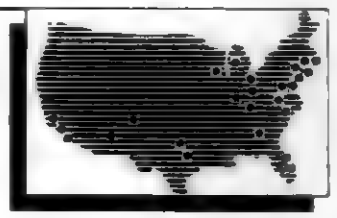

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Data Processing

DATABASE SPECIALIST

Sverdrup Technology, Inc. is a company engaged in providing skilled scientific, engineering and technical support for PROPULSION, ENERGY, and SPACE programs for NASA Lewis Research Center in Cleveland, Ohio.

A performance analyst is needed to monitor and tune the performance of database applications developed using ADABAS/NATURAL and running under MVS/XA and CICS. The selected candidate will monitor NATURAL/CICS transactions as well as batch throughput and make recommendations for improvement. Responsibilities will also include monitoring and tuning the usage and load of ADABAS as well as general DASD performance.

Three or more years experience as an ADABAS database analyst or NATURAL programmer with experience in ADABAS commands is required. Past experience with performance tuning/monitoring in a mixed batch and on-line environment and knowledge of MVS/XA, JCL, and CICS is desirable. Experience with a performance monitor, preferably REVIEW, is a plus. This position requires a 4-year Computer Science degree or equivalent.

Located in Brook Park, Ohio, a pleasant small-town suburb of Cleveland, we offer a low cost of living with a high quality of life. We are minutes away from Lake Erie and water sports, and are surrounded by the famous Emerald Necklace natural park system.

If you qualify and are interested in joining our team of professionals, please submit your resume to: **Dave Dubay, SVERDRUP TECHNOLOGY, INC., 2001 Aerospace Parkway, Brook Park, OH 44142.** Principals Only. No Phone Calls, Please. An Equal Opportunity Employer M/F/H/V

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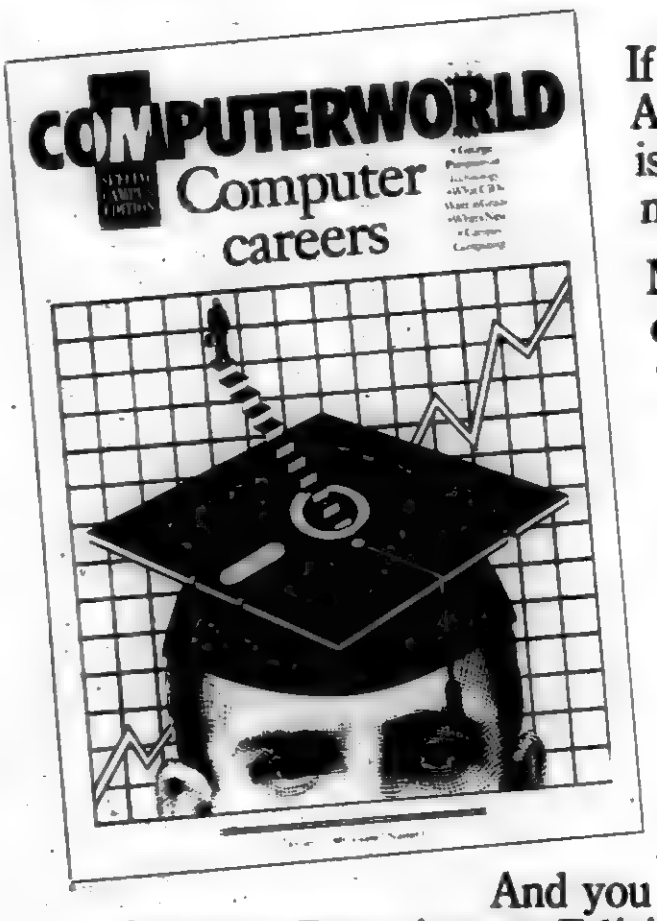

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(subject to revision)

- MIS salary and job satisfaction survey
- Where are the best jobs?/What positions are hot?
- Experiences of recent MIS graduates in their first jobs and what helped them in school
- The MIS career ladder
- Profiles of acclaimed top level MIS executives
- The strategic advantage of computers and how they play a key role in running a company

MARKETPLACE

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BY ALEX RANDALL
SPECIAL TO CW

Unloading used personal computers and circulating PCs through an organization creates unique problems for corporations.

The job of unloading a cluster of used computers usually falls to the corporate microcomputer manager. It's important for this person to prepare for the sales over the long term, choose the best means of disposal and tie up various loose ends. The advice that follows should help.

Start thinking about selling computers while you're buying them. If you expect to sell the machines and want to recoup as much as possible, buy a name brand. If you're going to use them for something like monitoring fire alarms and don't expect to upgrade, any old clone will probably do.

Avoid depreciation hassles. Use a rapid depreciation schedule, and plan to sell the equipment for more than its book value as soon as you need to upgrade. Re-evaluate the estimated useful life of your computer equipment and its value on a regular basis.

Consider upgrading computers about every two years or every two product cycles. When a manufacturer releases a new model, it depresses the value of the preceding one. When it introduces a second upgrade — the second obsolescence — it kicks down the first model's value. The most profitable time to sell is when serious rumors of this second technological displacement are going around.

Maintain and track equipment. Try to hold onto the boxes and packing materials for the computers you buy, and keep all the parts for your machines intact. Don't cannibalize. Also, discourage employees from individualizing their computers with stickers and decals. Give them the tools and encouragement they need to keep their machines in good working order.

It is essential to replace broken and lost parts with standard ones. Cheap clone components seriously depress the value of equipment. A bunch of Apple Computer, Inc. Macintoshes with inexpensive, brandless hard drives is like a bunch of Macintoshes with no hard drives at all. People want to buy things they're comfortable with.

It also helps to maintain a database of all computer equipment your organization buys. The records should contain information on things such as configuration, location, serial number, dealer, invoice number, depreciation schedule, residual value and replacement cost.

Choose an outlet. Determine the means of disposal on the basis of the volume of equipment you're selling. Brokers will deal in small lots. Liquidators will take on somewhat larger ones, but don't expect a great deal.

If you are moving a massive amount of gear — a big department's or a whole company's worth — an auction can be a good way to clear it out. Auctions often fetch top dollar. Bidders can drive the prices to near or even above current retail value. For example, after the demise of Software Arts, Inc., founder Dan Bricklin said he actually sold some equipment at his auction for more than he originally had paid.

If you are replacing older computers with new ones, shop around for a dealer who will take the older machines as trade-ins. Then negotiate for a great deal. If your dealer doesn't take trade-ins, push the issue. If the sale is large enough, the dealer may arrange for a third party to handle the used equipment.

Consider internal options. Companies may also find advantages in disposing of PCs internally. Selling machines to staff members encourages the individuals to take work home, and they might get a tax break on the purchase. Some companies work out generous payroll deduction plans that make it easy for employees to buy PCs.

Large corporations may adopt an internal redeployment plan for moving assets from one location to another. One large company operates a miniature, self-contained secondary market, maintaining an active database of transactions and machines in circulation.

The idea of divisions treating one another as customers is nothing new in corporate accounting, especially in the manufacturing sector. Internal "sales" can save time and energy and ensure that usable technology is recycled.

Attend to legal issues. A neat sale ties up all the loose ends and doesn't neglect the interests of software companies or the state. When you sell or donate computers, the issue of software licensing comes into play. Check the publisher's stipulations.

Microsoft Corp., to cite one example, does not restrict you from transferring license rights to someone else for free or for a fee — provided you do not keep copies of the program.

If you do not remove licensed applications from a hard disk before selling a computer, and you continue to use the software after copying it onto a new machine, you're probably breaking the law.

Unless you actually sell the software, destroy all copies of it at your site and the terms of the license agreement are accepted by the buyer, be sure that your hard disks are clean.

Sales taxes for the transfer of used computers is a thorny issue. Taxes vary from state to state. If you make it a practice to trade in the used computer marketplace, you are not making casual sales, which are exempt from a sales tax in most states. In that case, you'd better take care of your legal responsibilities. Check the requirements in your state.

Randall is president and founder of the Boston Computer Exchange and the co-author of *Alex Randall's Used Computer Handbook* from Microsoft Press.

The BoCoEx index on used computers

Closing prices report for the week ending September 7, 1990

	Closing price	Recent high	Recent low
IBM PC Model 176	$475	$660	$250
XT Model 086	$500	$700	$350
XT Model 089	$675	$825	$475
AT Model 099	$1,050	$1,375	$850
AT Model 239	$1,125	$1,325	$700
AT Model 339	$1,250	$1,400	$900
PS/2 Model 50Z	$1,550	$1,650	$1425
PS/2 Model 60	$1,900	$2,200	$1,600
Compaq Portable II	$975	$1,150	$875
Portable II	$975	$1,150	$875
Portable 286	$1,275	$1,450	$1,100
Portable 386	$3125	$3450	$2950
LTE 286	$2100	$2525	$2000
Deskpro 286	$1,425	$1,625	$1,300
Deskpro 386/20	$2,800	$3,100	$2,700
Apple Macintosh 512	$375	$775	$275
512E	$450	$450	$350
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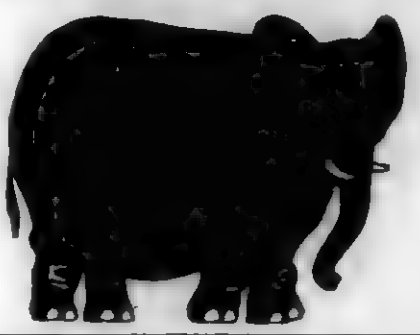

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* Source: STAT Resources Profile of Computerworld Subscribers, November 1987.

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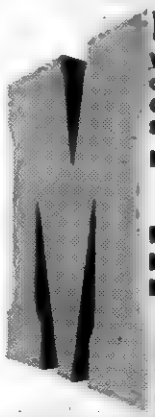

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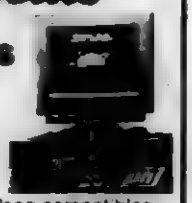

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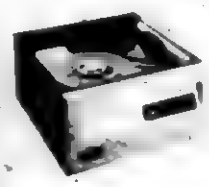

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Getting Help intuitively

Navigating on-line manuals can be easier with hypertext

BY JESSICA KEYES
SPECIAL TO CW

On-line manuals have become popular as an adjunct to classroom training. There are many good reasons for adding on-line instructional methods to the training mix. One is the difficulty of scheduling off-the-job training sessions. Another is the finite capacity of human memory for long-term storage of infrequently used information.

However, the real potential of on-line manuals has barely been scratched. Most are on-line renderings of paper manuals. While paper manuals can be perused with a quick flick of a thumb, on-line translations are usually quite cumbersome to traverse. This is because manuals are sequential in nature.

For example, suppose you want to develop an on-line manual that instructs a user about desktop publishing. The first topic discusses the video screen, naming the different components such as text cursor, art tool kit, text menu, file menu and so on. If the user read this manual all the way through, he would probably have a pretty good understanding of desktop publishing.

The problem is, few people learn or inquire in this way. When a user sees a short description of, say, the art tool kit, it may pique his curiosity. In a conventional on-line system, he'd have to back out to the menu, look to the appropriate entry, call up this information, exit the selection, go back to the menu, locate the menu item where he was originally, call up this information and then scroll until he found the place where he had left off.

WHAT IS NEEDED to make on-line instruction a full-fledged alternative to formal group training is fast and intuitive access.

Unfortunately, this type of on-line instruction is hardly conducive to effective learning. As such, it can only serve as a supplement to a steady diet of classroom training. What is needed to make on-line instruction a full-fledged alternative to formal group training is fast and intuitive access.

The good news is that the method and means exist to permit the creation of on-line instruction manuals that are easy to use, fast on retrieval and able to drive directly to the point. The method is hypertext, and the means is a variety of hypertext-based development packages for all hardware platforms.

Hypertext products are readily available in the microcomputer marketplace but are not available as stand-alone packages in a mainframe environment. Mainframe hypertext systems are usually a component of a larger system, generally text-retrieval packages that average in the five-figure price range. On personal computers, though, they're fairly inexpensive — usually priced well under $1,000. However, they're not all the same, and managers would do well to survey the playing field before making a purchase decision.

Using these tools, it is possible to write applications in such a way that users can teach themselves most or all of what they need to know — working at their own pace and in context.

Going back to the desktop publishing example, someone who uses a hypertext-based training system would be able to rapidly call up explanatory information on handling graphics without having to cross through an endless series of menus and text screens.

When a hypertext training tool is built, selected key words on each screen of text are tagged. These tags, which are words or phrases within the text that are highlighted on the screen, are then linked to additional text that offers the user a fuller explanation of the tool.

Of course, where there is good news, there usually is some bad news, and hypertext is no exception. The bad news is that hypertext training systems are difficult to develop because they require intimate knowledge of a particular subject in order for a meaningful and complete set of tags to be created.

In addition, from a technical perspective the development of hypertext is usually a multistep process that can be prone to error and failure. This should be kept in mind if the information is volatile and requires constant upkeep. If the text is changed, modifications to the hypertext tags need to be made as well.

The biggest problem by far with hypertext is a lack of integration capabilities. Most hypertext development packages were designed to be stand-alone systems. This poses a real challenge to a developer who wants to integrate one of these off-the-shelf packages into another application.

In spite of any limitations, hypertext remains very much an advanced method of delivering on-line manuals out in the field. Hypertext permits access to information in the same way that people think. Having a hypertext training tool that sits inside of your application brings the teacher out of the classroom and into the office.

Keyes is president of New Art, Inc., a management and computer consulting firm in New York.

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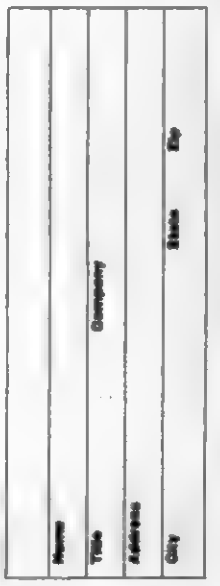

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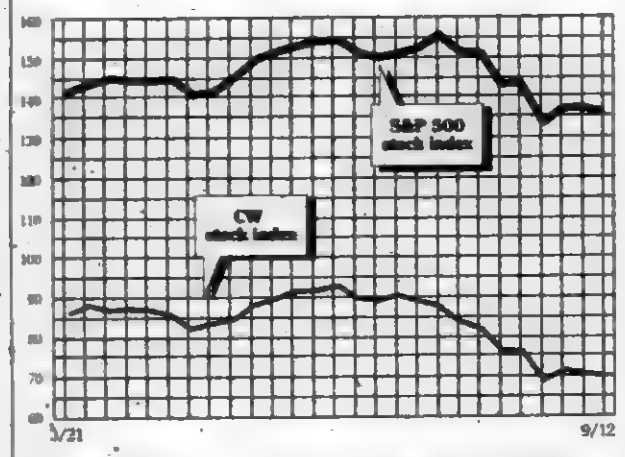
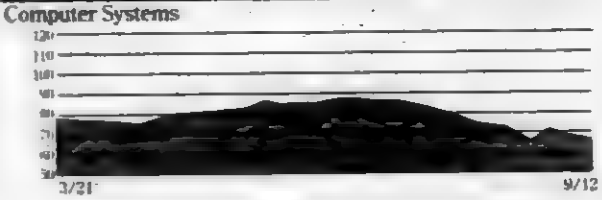


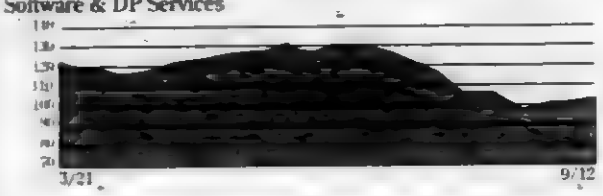
Indexes	Last Week	This Week
Communications	105.1	104.6
Computer Systems	69.2	67.8
Software & DP Services	101.3	102.4
Semiconductors	45.2	45.4
Peripherals & Subsystems	76.8	75.6
Leasing Companies	59.4	56.8
Composite Index	70.8	70.0
S&P 500 Index	137.1	136.3

Communications

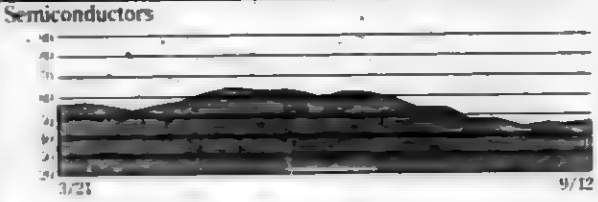
Computer Systems



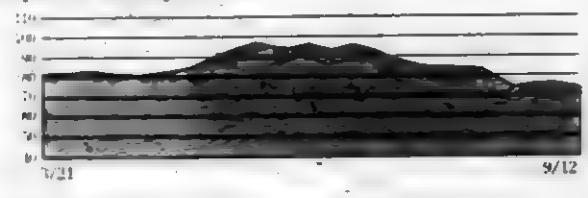
Software & DP Services



Semiconductors



Peripherals & Subsystems



Leasing Companies

CW CHARTS

Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, SEPT. 12, 1990

EXCH		52-WEEK RANGE		PRICE CLOSE SEPT. 12, 1990	WEEK NET CHNGE	WEEK PCT CHNGE
Communications and Network Services						
N	AMERICAN INFO TECHS CORP	68	53	56.25	1.0	1.8
Q	ANDREW CORP	26	16	18	0.0	0.0
Q	ARTEL COMM CORP	10	3	3	0.0	0.0
N	AT&T	47	30	30.625	-1.5	-4.7
Q	AVANTEK INC	7	2	2.625	0.1	5.0
N	AYDIN CORP	21	11	10.75	-0.9	-7.5
N	BELL ATLANTIC CORP	57	40	43.5	1.4	3.3
N	BELLSOUTH CORP	59	49	50.25	-0.3	-0.5
Q	COMPRESSION LABS INC	16	7	13.25	0.3	1.9
Q	COMPUTER NETWORK TECH	0	0	0.01	0.0	0.0
Q	CONTEL CORP	37	23	30.375	-0.5	-1.6
Q	DATA SWITCH CORP	4	2	3.875	0.5	14.8
Q	DIGITAL COMM ASSOC	27	15	15.875	-0.5	-3.1
Q	DYNATECH CORP	20	15	16.125	-0.1	-0.8
Q	FIBRONICS INTNL INC	13	5	8.75	0.1	1.4
Q	GANDALF TECHNOLOGIES	6	2	2.875	0.1	4.5
Q	GENERAL DATACOMM INDS	8	2	2.5	-0.1	-4.8
N	GTE CORP	36	24	25.5	-0.6	-2.4
Q	INFOTRON SYS CORP	10	2	2.75	-0.1	-4.3
N	ITT CORP	64	50	52.375	0.3	0.5
N	M/A COM INC	7	3	4	-0.3	-5.9
Q	MCI COMMUNICATIONS CORP	49	31	33.875	0.3	0.7
N	NETWORK EQUIP TECH INC	84	5	5.5	0.1	2.3
Q	NETWORK SYS CORP	15	7	9	-0.6	-6.5
N	NORTHERN TELECOM LTD	30	20	23.125	-0.9	-3.6
Q	NOVELL INC	59	19	26.5	0.5	1.9
N	NYNEX CORP	92	68	69.25	-0.9	-1.2
N	PACIFIC TELESIS GROUP	52	36	41.25	0.9	2.2
A	PENRIL CORP	9	6	6.75	0.1	1.9
N	SCIENTIFIC ATLANTA INC	29	17	17	-0.6	-3.5
N	SOUTHWESTERN BELL CORP	65	47	47.625	-0.5	-1.0
Q	3 COM CORP	19	8	8.5	-0.8	-8.1
N	US WEST INC	41	32	34.875	0.4	1.1
Computer Systems						
Q	ALLIANT COMPUTER SYS	9	2	2.75	0.3	10.0
Q	ALPHA MICROSYSTEMS	7	2	1.5	-0.3	-14.3
A	AMDAHL CORP	19	11	12.5	-0.1	-1.0
Q	APPLE COMPUTER INC	50	32	34	-2.0	-5.6
Q	AST RESH INC	26	8	19	0.5	2.7
N	BOLT BERANEK & NEWMAN	8	4	5.625	-0.3	-4.3
N	COMPAQ COMPUTER CORP	69	37	44.25	-1.1	-2.5
N	COMMODORE INTNL	12	5	5.5	0.0	0.0
Q	COMPUTER AUTOMATION INC	6	0	0.5	-0.1	-11.2
N	CONTROL DATA CORP	22	13	13	-1.0	-7.1
N	CRAY RESH INC	51	31	35.25	0.3	0.7
N	DATA GEN CORP	16	5	5.5	-0.5	-8.3
N	DATAPOINT CORP	5	1	1.25	0.0	0.0
Q	DELL COMPUTER CORP	14	5	11.75	-0.1	-1.1
N	DIGITAL EQUIP CORP	100	61	61.625	-4.9	-7.3
N	FLOATING POINT SYS INC	4	0	1.375	-0.1	-8.3
N	HARRIS CORP	40	24	24.75	0.4	1.5
N	HEWLETT PACKARD CO	52	31	35.125	0.8	2.2
N	HONEYWELL INC	112	73	94.5	-3.4	-3.4
N	IBM	123	93	107.875	5.5	5.4
Q	INFORMATION INTL INC	18	10	10.5	0.0	0.0
Q	IPL SYS INC	14	5	9.25	0.0	0.0
N	MAI BASIC FOUR INC	6	2	2	-0.1	-5.9
N	MATSUSHITA ELEC INDL LTD	172	117	128.25	3.3	2.6
Q	MENTOR GRAPHICS CORP	26	12	12.5	-1.3	-9.1
N	NBI INC	2	0	0.188	0.0	0.0
N	NCR CORP	72	55	60	-1.1	-1.8
Q	PYRAMID TECHNOLOGY	36	13	19.5	-1.0	-4.9
Q	SEQUENT COMP SYS INC	34	15	22.5	-1.8	-7.2
Q	SUN MICROSYSTEM INC	37	15	28.375	-0.8	-2.6
Q	SYMBOLICS INC	2	0	0.438	0.1	39.9
N	TANDEM COMPUTERS INC	30	11	11.625	-3.1	-21.2
N	TANDY CORP	48	26	25.75	-2.1	-7.6
N	ULTIMATE CORP	10	5	5.375	-0.4	-6.5
N	UNISYS CORP	21	8	8.375	-0.1	-1.5
A	WANG LABS INC	8	3	3.625	-0.1	-3.3
Software & DP Services						
Q	AMERICAN MGMT SYS INC	20	11	13.25	-1.0	-7.0
Q	AMERICAN SOFTWARE INC	18	8	9.375	0.5	5.6
N	ANACOMP INC	6	2	2.375	0.0	0.0
Q	ANALYSTS INTL CORP	24	14	17.5	0.0	0.0
Q	ASHTON TATE	15	7	7.875	0.1	1.6
Q	ASK COMPUTER SYS INC	10	7	7.875	-0.1	-1.6
N	AUTO DATA PROCESSING	60	44	49.375	-1.3	-2.5
Q	AUTODESK INC	60	33	46.5	-2.8	-5.6
Q	BMC SOFTWARE INC	30	14	23.625	-2.6	-10.0
N	BUSINESSLAND INC	14	2	2.625	-0.1	-4.5
Q	COGNOS INC	10	4	7.625	0.9	13.0
N	COMPUTER ASSOC INTL INC	18	6	6.625	-0.8	-10.2
Q	COMPUTER HORIZONS CORP	17	7	15.5	1.8	12.7
N	COMPUTER SCIENCES CORP	59	37	39.75	-0.5	-1.2
N	COMPUTER TASK GROUP INC	12	9	9.125	-0.1	-1.4
Q	COMSHARE INC	25	16	18	-0.3	-1.4
Q	CORPORATE SOFTWARE	16	8	12	0.5	4.3
N	GENERAL MTRS (CLS E)	38	24	33.25	2.0	6.4
Q	GOAL SYSTEMS INTL	18	10	11.5	-0.5	-4.2
Q	HOGAN SYS INC	7	2	3.25	0.1	4.0
Q	INFORMIX CORP	18	6	7	0.3	3.7
Q	INTELLICORP INC	8	4	4.375	-0.3	-5.4
Q	LEGENT CORP	32	18	20.25	-1.0	-4.7
Q	LOTUS DEV CORP	39	15	17	-1.3	-6.8
Q	MICROSOFT CORP	81	30	57.375	-1.6	-2.8
Q	NATIONAL DATA CORP	35	8	10.5	0.5	5.0
N	ON LINE SOFTWARE INTL INC	11	6	6	0.3	4.3
Q	ORACLE SYS CORP	188	7	8.25	-2.4	-22.4
N	PANSOPHIC SYS INC	19	10	11.375	0.1	1.1
Q	PHOENIX TECHNOLOGIES INC	5	2	3	0.0	0.0
N	POLICY MGMT SYS CORP	43	30	37.25	-0.4	-1.0
Q	PROGRAMMING & SYS INC	25	14	16	0.0	0.0
Q	RELATIONAL TECH INC	10	3	9	4.5	100.0
N	REYNOLDS & REYNOLDS CO	27	15	14.875	-0.4	-2.5
Q	SAGE SOFTWARE INC	16	8	10.375	-0.3	-2.4
Q	SEI CORP	22	15	17	-1.0	-5.6
Q	SHARED MED SYS CORP	17	12	14.875	0.4	2.6
Q	SOFTWARE PUBG CORP	28	14	24	0.3	1.1
N	STERLING SOFTWARE INC	11	7	7.125	-0.3	-3.4
Q	SUNGARD DATA SYS INC	28	16	18.5	-0.5	-2.6
N	SYSTEM CENTER INC	25	9	8.875	-0.6	-6.6
N	SYS. SOFT INC	29	16	20.75	-1.3	-5.7
Q	WORDSTAR	2	1	0.75	0.1	9.0
Semiconductors						
N	ADV MICRO DEVICES INC	11	5	5.875	0.0	0.0
N	ANALOG DEVICES INC	10	5	6.375	-0.1	-1.9
Q	ANALOGIC CORP	11	8	9.625	1.1	13.2
Q	CHIPS & TECHNOLOGIES INC	26	10	11.375	-0.1	-1.1
Q	INTEL CORP	52	30	32.75	0.3	0.8
Q	MICRON TECHNOLOGY INC	18	7	9	0.4	4.3
N	MOTOROLA INC	88	53	60.875	-8.3	-11.9
N	NATL SEMICONDUCTOR	9	4	5	0.3	5.3
N	TEXAS INSTRS INC	44	25	28.5	1.1	4.1
A	WESTERN DIGITAL CORP	19	6	8.625	-0.8	-8.8
Peripherals						
Q	ALLOY COMP	2	0	0.438	-0.3	-41.6
N	AM INTL INC	6	1	1.625	0.0	0.0
Q	AUTO TROL TECH CORP	5	2	2.375	0.1	6.6
Q	BANCTEC INC	24	13	15.75	0.5	3.3
A	COGNITRONICS CORP	8	3	4.75	-0.3	-6.0
Q	CONNER PERIPHERALS	31	11	22.25	0.0	0.0
A	DATARAM CORP	22	8	12.375	0.9	7.6
N	EASTMAN KODAK CO	50	36	41.5	0.0	0.0
N	E M C CORP MASS	7	3	5.5	0.3	4.8
Q	EMULEX CORP	9	4	5.875	-0.1	-2.1
Q	EVANS & SUTHERLAND	35	15	25	1.3	5.3
Q	ICOT CORP	2	1	0.875	-0.1	-12.5
Q	INTERLEAF INC	8	3	3.125	-0.3	-7.4
Q	IOMEGA CORP	8	3	4.813	-0.4	-8.3
Q	MASSTOR SYS CORP	3	1	0.813	0.2	30.1
Q	MAXTOR CORP	17	7	7.375	-0.5	-6.3
Q	MICROPOLIS CORP	10	3	5.125	-0.4	-6.8
N	MINNESOTA MNG & MFG CO	91	68	78.625	-0.1	-0.2
Q	PERSONAL COMP PRODUCTS INC	6	4	3.75	-0.3	-8.3
Q	PRINTRONIX INC	15	9	9.75	-0.3	-2.5
N	QMS INC	21	9	13.875	-1.0	-6.7
Q	QUANTUM CORP	26	9	17.625	-1.3	-6.8
N	RECOGNITION EQUIP INC	8	4	5.125	0.0	0.0
Q	REXON INC	10	4	4.688	-0.1	-1.3
Q	SEAGATE TECHNOLOGY	20	8	8.5	-0.5	-5.6
N	STORAGE TECH CORP	35	16	18.875	-1.0	-5.0
Q	TANDON CORP	4	1	2	-0.2	-8.6
N	TEKTRONIX INC	21	12	14.5	0.1	0.9
Q	TELEVIDEO SYS INC	1	0	0.281	-0.1	-18.3
N	XEROX CORP	67	39	39.125	-1.6	-4.0
Leasing Companies						
N	CAPITAL ASSOC INTNL INC	7	1	1.188	-0.2	-13.6
N	COMDISCO INC	34	15	17.5	-0.3	-1.4
Q	LDI CORPORATION	18	12	13	-0.5	-3.7
Q	PHOENIX AMERN INC	5	3	3.5	-0.3	-6.7
Q	SELECTERM INC	8	3	3.25	0.3	8.3

EXCH: N—NEW YORK; A—AMERICAN; Q—NATIONAL

Still kicking

Tech stocks stabilize somewhat after stint in intensive care

Technology stocks finally showed signs of life again after their recent deadly dull weeks. Software maker Ingres Corp. soared after announcing that it will sell out to Ask Computer Systems, Inc. Ask's offer of $9.50 per share for Ingres stock pushed its price up to 9, a gain of 4½ points.

Digital Equipment Corp. is apparently failing to assuage investor fears about its financial state, causing DEC stock to sag 6 points last week to close Thursday at 59¼. Although it rode high early in the week on the new product announcements of the week before, IBM dipped suddenly Thursday, closing at 105, down ½ of a point for the week.

Texas Instruments, Inc. took a turn skyward, moving up 1 point to 27¼. As news spread that last month's semiconductor orders were up, so went their share prices. Intel Corp. advanced to 32¼, up ½ of a notch, and National Semiconductor, Inc. picked up ¼ of a point to close at 5. Motorola, Inc. lost ⅛ of a point, however, closing at 61⅜.

Tandem Computers, Inc. moved like there was no tomorrow, perhaps because investors thought there might not be. After the company announced the possibility of low fourth-quarter financials, Tandem skidded 1⅜ points to close at 11⅝. Other microcomputer makers also lost a bundle. Both Compaq Computer Corp. and Apple Computer, Inc. fell 1⅜ points, Compaq to 43¼ and Apple to 33⅜.

Lotus Development Corp. stumbled 2 points to 16, just a slip of its former self: Its current price is a full 68% less than its 52-week high of 39¼ points. Elsewhere in software, Novell, Inc. gained ¼ of a point to 26, while Microsoft Corp. lost ¼ of a point to 57½.

Among telecommunications firms, AT&T sank 1 point to 30⅛, MCI Communications Corp. fell ¾ of a point to 33, and United Telecommunications, Inc. added ⅛ of a point to close at 25⅛.

KIM S. NASH

NEWS SHORTS

Split decision on IBM

IBM recently won a sweeping victory on the copyright portion of the series of copyright and antitrust claims, counterclaims and defenses that have been going on between IBM and computer reconfigurer Allen-Myland, Inc. (AMI) since 1985. Predictably, AMI filed an appeal within days. However, the Philadelphia federal judge also found that IBM's price-setting on 3090 microcode virtually prohibited splits — the practice, used by AMI and others, of reconfiguring one large processor as two smaller ones — and, in so controlling a third party's activities, violated the 1956 Antitrust Consent Decree. IBM is also contemplating an appeal, an IBM spokesman said.

Timeplex goes with the flow

Revving up to meet the shifting, data-intensive needs of the T1 market, Timeplex, Inc. last week announced its intent to face off with its competitors by supporting frame-relay technology. Frame-relay is an Integrated Services Digital Network (ISDN)-based standard protocol that offers a high-speed interface to wide-area networks to ensure optimal use of network bandwidth and low network delay. The company is gaining the frame-relay expertise through the acquisition of Irvine, Calif.-based Doels, Inc. Timeplex also announced a T1-to-ISDN Primary Rate Interface gateway, which will allow private T1 network users to interface with public ISDNs.

Computergate hits New Jersey

An electronic version of Watergate is playing out, shaking up the New Jersey political community. One of the state's top Republicans resigned on Sept. 7 after admitting he knew that Democrats' computer files were breached. John Kohler, executive director of the Republican General Assembly staff, resigned after revealing that, contrary to his previous statements, he knew about "improper access to Democrat staff computer records," according to a statement released by the assembly GOP office. An assembly staff member who is alleged to have actually done the break-ins was fired earlier this year, according to published reports. The Attorney General's office and an assembly ethics committee are investigating.

Pacific Bell promotes Hancock

Jack Hancock , Pacific Bell's vice-president of information systems, has a new slice of the $9.6 billion organization that was restructured recently. Hancock, 60, is now executive vice-president of Pacific Bell's Product and Technology Support group, one of three corporate executives reporting to Philip Quigley, Pacific Bell's chief executive officer. "The job is expanded," Hancock said. "So I'll spend less time dealing with information systems and internal communications." Hancock's new focus will be the integration of the company's IS infrastructure with Pacific Bell's development of telephone and communications services, including call-waiting and Centrex.

Toshiba disk plans sting Conner

Toshiba Corp. last week announced its plans to manufacture its own 2½-in. hard disk drive for personal laptop and notebook-size computers. The news, when heard on Wall Street, sent stocks falling at Conner Peripherals, Inc. — a leading disk drive manufacturer — down $1.625 last Thursday to $20.625 per share. However, James Porter, president of Mountain View, Calif.-based Disk/Trend, Inc., said the reaction was overblown. Toshiba, which accounts for about 5% of Conner Peripherals' sales, should not harm Conner in the long run, Porter said.

SS7 to flourish in 91?

AT&T said last week it will deploy Signaling System 7 (SS7) throughout its long-distance network by early 1991. SS7, an out-of-band signaling scheme for the public network that enables faster setup of calls through the network, is regarded as a necessary precursor to the ISDN; SS7 itself provides a number of valuable end-user services, including automatic number identification.

OS/2 network tie-ins get third-party boost

BY JIM NASH
CW STAFF

DALLAS — Fresh from a nationwide road trip organized to raise the profile of LAN Manager Version 2.0, Microsoft Corp. executives converged on Networld '90 last week to beat the OS/2 drum and announce a handful of networking product tie-ins.

Microsoft Chief Executive Officer Bill Gates was on hand as Software Publishing Corp. (SPC) introduced Infoalliance, an executive information system-like package that runs exclusively on OS/2. Gates said his company had been working with SPC on the product for two years.

Microsoft officials said the announcement heralded proof that OS/2 is coming into its own. Gates predicted that Infoalliance would be the first of many software products that will require OS/2, which has suffered from lackluster sales.

Later, Mike Murray, Microsoft's general manager of networking products, announced Version 2.5 of a similar application called Q+E. The software is made by Pioneer Software and is DOS-based.

"It took OS/2 to build Infoalliance," said Fred Gibbons, president and CEO of SPC. The product retrieves text, graphics and spreadsheets from IBM OS/2 Extended Edition's Database Manager, Ashton-Tate Corp.'s Dbase III Plus and Dbase IV for reports and other decision-assistance tasks. The base package costs $2,995.

Acknowledging OS/2's slow growth, Gibbons said SPC intends to work Infoalliance into the market slowly. The company, has, for example, chosen only three resellers. "We don't want to overpromise," Gibbons said.

Coca-Cola Co. in Atlanta performed beta testing on Infoalliance. Tim Byers, project manager for Coca-Cola's DOS, OS/2 and Windows development, was on hand at the announcement and said his department developed Keystone, a retail survey application, using the software.

Byers said the end-user orientation cut down on the number of programmers directly involved in bringing up Keystone, but he added that he would like to see an Apple Computer, Inc. Macintosh version. He said Coca-Cola is running 200 copies of Infoalliance on Extended Edition with Microsoft's Presentation Manager front ends.

Q+E is a database query and edit tool. With it, users can connect Windows applications such as Excel with external databases. The new version is compatible with Microsoft's Windows Version 3.0 and costs $149.

Plastic fiber showcased for LANs

BY JOANIE M. WEXLER
CW STAFF

DALLAS — In the latest bout of creative cable-swapping in the local-area network arena, Codenoll Technology Corp. and General Motors Corp. proclaimed last week at Networld '90 that plastic fiber technology will drop-kick twisted-pair wire and coaxial cable out of walls, floors and elevator shafts forever.

The two companies announced that a six-year joint venture has culminated in a technology that will allow companies to run plastic fiber cabling to desktops less expensively than when using twisted-pair, coaxial or existing glass fiber cabling. At the show, Codenoll demonstrated a plastic fiber Ethernet local-area network and advocated the technology for use in other LANs, such as 100M bit/sec. Fiber Distributed Data Networks (FDDI).

GM is in on the act because plastic fiber has long been used in the automotive industry for connecting the microprocessors that control the radio, steering, engine, transmission, suspension and other operations in a car.

Codenoll President Mike Coden cited a maximum 100-meter distance between nodes for plastic fiber compared with the 2-km internodal distances specified in the FDDI standard, which is based on glass. Coden said that plastic fiber has the ability to send data at 300M to 400M bit/sec. speeds, although the FDDI standard specifies 100M bit/sec. and some industry observers actually cite some data rate limitations using the plastic medium.

"In our development activity, we've been pushing the speed of plastic fiber to higher and higher data rates until it came into the appropriate realm for LANs," said Bob Steele, staff development engineer at GM. "Now we're looking to swap out the twisted-pair portion of our network for plastic fiber because of the simplicity of termination and its low cost compared with data-grade twisted pair."

Coden offered the following approximate prices per foot for the various data transmission media: plastic fiber, 10 to 15 cents; unshielded twisted pair, 14 cents; coaxial cable, 14 cents; glass fiber, 28 to 40 cents; shielded twisted pair, 62 cents.

Other key advantages of plastic fiber reportedly include its immunity to electromagnetic interference, unlike its copper counterparts; its ease of installation; and durability in comparison with glass fiber.

Cabletron goes token-ring

DALLAS — Cabletron Systems, Inc. showed those attending Networld '90 last week its new line of 4M and 16M bit/sec. token-ring network management products. The announcements marked Cabletron's expansion beyond its traditional role as an Ethernet goods supplier.

The Rochester, N.H., firm introduced network interface cards for IBM Personal Computers, including Micro Channel Architecture-based devices, and for Apple Computer, Inc.'s Macintosh II. Also unveiled were management applications offering local and remote management down to the port level.

According to the company, the products will run on shielded and unshielded twisted-pair and fiber-optic cables.

Competitor Synoptics Communications, Inc. in Mountain View, Calif., announced a low-end DOS-based network management application to isolate and troubleshoot problems. Called Lattisnet Basic Ethernet Network Management, the product is aimed at smaller networks.

Other announcements rolled out at Networld '90 included the following:

- A joint announcement from the CCITT X.400 Application Program Interface Association and X/Open Ltd. of Version 2 of the specification for their messaging-gateway application programming interface (API). The groups also announced a messaging API standard enabling X.400 messaging capabilities such as submission, deliverance and retrieval to be written directly into word processing, spreadsheets and other nonmessaging applications.
- Ungermann-Bass, Inc.'s network protocol stack based on Microsoft Corp.'s Network Driver Interface Specification (NDIS). The Santa Clara, Calif.-firm's product, called TCP/IP for NDIS, allows for greater third-party adapter throughput.

JIM NASH

Upgrading ES/9000 by the rules of the game

BY ROSEMARY HAMILTON
CW STAFF

There are several official rules to the Enterprise System/9000 upgrade game.

It also appears that IBM will be willing to offer some decent deals to users.

While the company announced price increases for upgrades within the 3090 family on Sept. 5, a number of price breaks that have been in place will be continued until the end of the month.

"We expect to ship large numbers of upgrades to Js," said Bernard Puckett, president of IBM's Data Systems Division, in an interview earlier this month. "We'll be offering a price break on base, E and S-to-J upgrades."

Two of the early ES/9000 users indicated that IBM negotiated good deals for the purchases, although they would not provide any details.

Aside from the unofficial bargaining that may take place, the following are the official ES/9000 upgrade rules as provided by Thomas Waldron, IBM large systems product marketing manager:

First, users must upgrade to the ES/9000 from a full-function J platform. That means a Model 180 or above.

Users on base, E or S models need to get to a J if they want to field upgrade to a ES/9000 in the future.

A move from a J model to an ES/9000 can be accomplished as a field upgrade for the first several water-cooled ES/9000 models. Users are required to take a step up when they do this.

The one exception to this rule is the horizontal upgrade provided for 600J users to the Model 720.

At the moment, they have no way to increase capacity, so this is an accommodation to get them onto the new platform.

Moves to ES/9000 Models 820 and 900 require a complete swapout, because they will contain brand-new engines.

The systems are scheduled for shipment in late 1991.

Currently, IBM will provide financial incentives to certain high-end 3090 users that will allow them to credit the value of their current system toward the purchase of a ES/9000 Model 900.

However, users cannot use the credit in upgrading to a Model 820. Waldron provided no specific reason why.

Upgrades

FROM PAGE 1.

3090 600J engine in a new package, is considered a pointless move by some high-end customers because it basically provides only new packaging. Yet several other companies recently installed that very system.

For Manufacturers Hanover Trust, the Model 720 is a stop along the way.

The company plans to eventually run two ES/9000 Model 900s as part of a consolidation plan to replace several 3090 E and base models, said Michael Satzenberg, vice-president of technical services. However, the company did not want to wait for the Model 900s, which are scheduled for availability in the third quarter of next year.

So the company opted for a two-step upgrade to the Model 900. Satzenberg said his company made a deal with IBM that called for the installation of two ES/9000 Model 720s, which will then be upgraded to Model 900s when they become available. The Model 900s are based on new engines but will have the same frame as the Model 720s. The move calls for a complete swapout on the first round with the Model 720s and then a lesser upgrade to the Model 900s.

The first Model 720 was installed earlier this month, and the second one is scheduled for delivery in October.

Blue Cross/Blue Shield of Western Pennsylvania installed a Model 720 in order to get a needed performance boost and get on the new mainframe platform, said Charles Southworth, chief technical officer.

The system replaced two 3090 300Es that were coming off lease.

"The 720 gives us at least the 600J performance and then it sets us up for a move to the next level," Southworth said.

Other users expect a more gradual move to the new platform.

George Perera, a group director of information systems at Ryder Truck Rental, Inc. in Miami, is currently sketching out a multiyear plan.

The company now runs a 3090 400 E and will likely move to a Model 500 J. The next step would be an ES/9000 Model 720, Perera said.

At that point, Ryder would be on the new platform and could add capacity by an engine swap later on.

"These are not final decisions but are very likely possibilities," Perera said. "For the next three years, there's going to be a box there if I need it."

ES/9000's muscle caught their eye

More bang for the buck and the availability of fiber-optic cabling between CPUs and peripherals were the two items that most often caught the eyes of potential buyers when IBM released its wave of products two weeks ago.

In a *Computerworld* telephone survey of 100 IBM 3090 users conducted last week, 40 of them said they are planning to acquire an Enterprise System/9000. Nearly half of those users said they expect to make the switch within the next year.

Twenty-five of the 40 users who plan to upgrade expect to replace an existing 3090. IBM has taken unprecedented steps to smooth the upgrade path to the new mainframes.

Although IBM's Sept. 5 announcement featured a flood of operating system and networking enhancements, it is still raw muscle that caught users' fancy. Asked what factors are most important in their decision to acquire an ES/9000, most users cited better price/performance, speed and capacity.

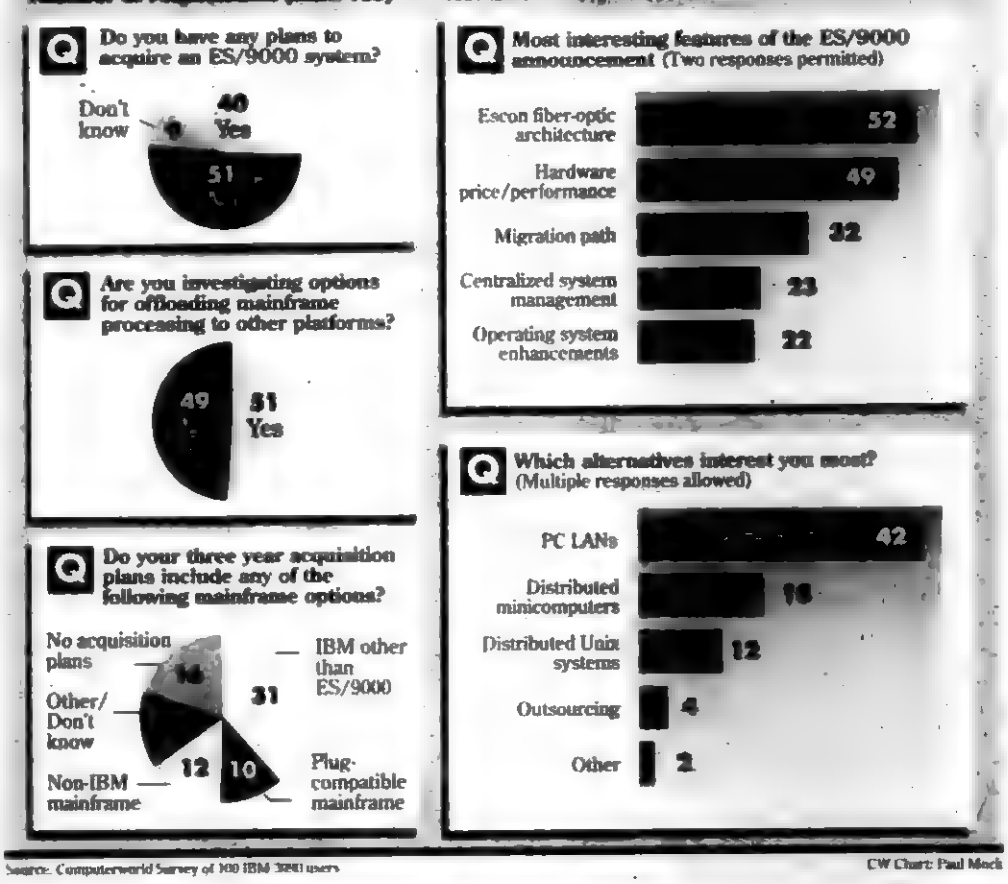
Another hit is the Escon architecture, which allows CPUs and direct-access storage devices to be placed up to 5.6 miles apart. More than half the respondents said Escon was one of the two most interesting aspects of the announcement.

The survey was conducted between Tuesday and Thursday last week. Respondents included members of *Computerworld*'s Editorial Advisory Board and 3090 users whose names were provided by Installed Technology International, Inc. About half the sites have more than 50 million instructions per second of mainframe power.

MAURA J. HARRINGTON

Tough customers

There's no overwhelming rush to the ES/9000, and buyers are examining other options such as downsizing or using existing equipment



Source: Computerworld Survey of 100 IBM 3090 users

CW Chart: Paul Mock

Epson leaps onto 80386SX notebook bandwagon first

BY MICHAEL FITZGERALD
CW STAFF

Epson America, Inc. last week became the first company in the U.S. to announce a notebook computer based on the Intel Corp. 80386SX chip. Analysts said they expect most of the major portable computer makers to release similar machines before the end of the year.

Earlier 386SX-based portables have been laptop machines weighing in at more than 10 pounds.

With delivery scheduled for later this year, the Epson NB3 computer will weigh 5.8 pounds and offer 1M byte of random-access memory, a removable 20M- or 40M-byte hard drive, black-on-white IBM Video Graphics Array graphics and a 3½-in. floppy disk.

In addition, Epson will offer a docking station — a frame that recharges the NB3 and includes added capabilities — that features an up to 120M-byte hard drive and two slots for standard AT cards. The docking station and the notebook machine together weigh 9½ pounds. Epson said pricing information will be available in four to eight weeks. However, analysts predicted that the machines will retail from $4,000 to $5,000.

Among other makers, Compaq is widely rumored to be releasing a below seven-pound, 386SX-based version of its popular LTE line of notebook computers, although the company refused to comment. Bruce Stephen, an industry analyst at International Data Corp. in Framingham, Mass., said he expected Comdex/Fall would be "SX notebook city," with major announcements and product exhibitions from most portable makers.

"There's going to be a whole slew of these by the end of the year," agreed Andrew Seybold, an industry analyst at Dataquest, Inc. in San Jose, Calif. Seybold said that these machines were aimed at the desktop market. "It's not going to do well as a second machine."

There's no rush to MVS upgrade

Although they applaud MVS/ESA Release 4.0, few users are ready to buy

BY JOHANNA AMBROSIO
CW STAFF

Some IBM MVS users are just saying "no," or at least "not now," to the new release of the operating system that IBM announced with its Enterprise System/9000 mainframes earlier this month.

Users said there appears to be nothing wrong with MVS/ESA Release 4.0; indeed, many lauded its new systems management and other features. However, most said they are not ready to upgrade and probably will not do so for at least a year.

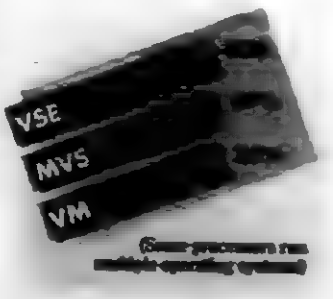
Large users said that because the top-end ES/9000s that take full advantage of the new MVS version will not be available for a year, there is no rush. Small and medium-size users have other reasons — finances, other priorities and their own corporate strategies among them — that bar an immediate switch.

Kathleen Rowe, manager of software support for Trans Union in Chicago, said that MVS 4.0's dynamic reconfiguration features are "a big deal to us because it means fewer interruptions, more flexibility and less funny hours for our support people." She also said that the ability to run Advanced Program-to-Program Communications from within MVS is a good feature. "People have been asking for this for a long time," Rowe said.

Still, because her company is building a new data center and is bringing in new hardware, "I'm not positive whether we'll be upgrading to the new version; at least, not this year," Rowe said. She added, however, that Trans Union's general policy is to be not more than one year behind new announcements.

First Alabama Bancshares in Montgomery is just now upgrading to Version 3.0 of MVS/ESA. "The new release just doesn't provide anything we need right now," said Delmar Epton, executive vice-president of the operations department. "The ideas of hyperbatch and expanded storage excite us, but they're a couple of years away." His company opted not to go with the 3090J and is instead choosing the 3090E. "In two years, we'll go directly to the new hardware and the new software and skip the J completely," Epton said.

Respectable following
MVS is second only to VSE on IBM 4381 and larger systems



Source: International Data Corp.
CW Chart: Chuck Fletcher

Tom Loane, vice-president of computers and communications services at Alamo Rent a Car, Inc. in Fort Lauderdale, Fla., said, "I haven't seen a reason why I would want to upgrade right now. We're on MVS/ESA 3.1, and it's damn good — one of IBM's better products. There's no rush to get to 4.0, and there's an unwritten rule that says that any release number that ends in zero is suspect anyway."

Other, smaller shops noted that because they are still running MVS/XA, upgrading to any version of ESA is too much of a strain. "Going over to ESA would entail a hardware upgrade, and we're just not ready for that," said Kenneth Scharf, vice-president of MIS at Fisher Camuto, a Stamford, Conn., wholesaler of women's shoes.

"The retail market is very soft right now, so we're operating behind the leading edge of technology," Scharf said. "The idea is to take advantage of the lower equipment prices on the used market and stay a few steps behind the latest products to reduce our operating costs."

VM, VSE users upbeat on potential

BY JOHANNA AMBROSIO
CW STAFF

IBM's VM and VSE users say new versions of the operating systems introduced earlier this month symbolize IBM's commitment to products that have long been outside the mainstream.

The only question for VM users is how much conversion will be required to move over to VM/ESA from the three existing VM versions. "The scope of the conversion will depend on which VM version you currently run," said Cyrus Mead, group VM manager at Guide International in Chicago.

"If you're running VM/XA, it will probably be rather minimal," Mead said. "We expect more effort will be required for people running VM/SP HPO and VM/SP, particularly for those still on Release 5.0, which the majority of the user base is." Nevertheless, he added, "we don't expect any really horrendous problems."

Despite glitches that may arise, Mead said, the response of most VM users has been "quite favorable" toward the new VM system. "Everyone's wasted a tremendous amount of time and effort trying to keep things current among all three systems."

Other advantages of VM/ESA are improved workstation support and IBM's promise that it will assume all responsibility for the integrity of VM/ESA.

Other VM users were a bit less enthusiastic. "I'm intrigued with ESA, but it's a real bear to get there from where we are," said Hugh O'Connor, director of management information services at the Jockey Club, a thoroughbred registry organization in Lexington, Ky., which is currently using VM/HPO. "We might bypass XA and go directly to ESA, but I hear that conversion is very significant."

For their part, VSE users are celebrating Release 1.0 of VSE/ESA. "Isn't it wonderful!" said Pete Clark, a systems programmer at Olan Mills, Inc. in Chattanooga, Tenn. "I'm tickled to death. VSE users have been waiting for a long time for a lot of this; it's the most significant announcement in VSE history. To see VSE turn 180 degrees from nonstrategic to strategic is pretty significant."

Clark said he is very excited about many of the features, such as more real memory support, added partitions and new direct-access storage device support.

Equally as exciting, he said, are IBM's statements of direction to add to VSE 2G-byte address space and data spaces, which allow data to be written to memory instead of to tape or disk.

Even VSE users with no immediate plans to move to ESA say the new version seems to be on track. "It's smart on IBM's part to recognize that the VSE base is not biting the bullet to upgrade to MVS," said Ken Dallwig, corporate director of information systems at Crown Central Petroleum Corp. in Baltimore. "I feel good that it's a strategic product now."

Still, he will not be going over to the new release soon. "We've hit some limitations in VSE, but we've learned to live with them. We just can't justify going over to the new hardware to take full advantage of the new software."

Those sentiments were echoed by Judie Smith, manager of technical support at Bangor Hydro-Electric Co. in Bangor, Maine. "I don't see ESA in our near future, although ESA's virtual partitions may be meaningful to us at some point," she said.

Second-class postage paid at Framingham, Mass., and additional mailing offices.
Computerworld (ISSN 0010-4841) is published weekly, with a single combined issue for the last week in December and the first week in January by CW Publishing/Inc., 375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171.
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CA expands DBMS families with SQL, DB2 transparency

BY JOHANNA AMBROSIO
CW STAFF

WASHINGTON, D.C. — Computer Associates International, Inc. folded SQL into its database product mix last week with new versions of Datacom and IDMS that conform fully to the ANSI Structured Query Language (SQL) standard.

Datacom and IDMS now also sport IBM DB2 "transparency," which means that CA users can purchase and run DB2 applications without having to change code or buy DB2. This is the first time that SQL and any DB2 compatibility have been included in IDMS and Datacom.

Further, CA said it will release versions of both its database management systems for Unix and for Digital Equipment Corp. VAXs. Users said they are excited about the SQL compatibility. "SQL is critical because it's an industry standard," said Robert Cancilla, technical services manager at Fremont Compensation Insurance Co. in Los Angeles and a beta-test user for Datacom 8.0. "And CA's implementation is even better than IBM's." CA claimed its SQL runs three times faster than IBM's version.

George Emmanuel, manager of manufacturing and database systems consulting services at Hughes Aircraft Co. in Long Beach, Calif., has not actually seen the new IDMS release.

Still, he said, he is looking forward to the SQL functions. "I have 7,000 users who want access to the corporate database. SQL allows me to make all that available to them."

"We can now add value to our existing system, IDMS, instead of having to bring in another DBMS," he added.

CA's implementation of SQL is about 99% compatible with IBM's version, according to Dominique LaBorde, CA vice-president of research and development. "The goal is 100%, and we'll achieve that in our next release," he said.

Release 8.0 of Datacom and Release 12.0 of IDMS do several things for users, he said: "You can integrate relational and navigational databases, and you can run DB2 applications against IDMS and Datacom without making any changes to the databases." In other words, users can employ Datacom, a navigational database, for its speed and still have access to relational data through SQL.

Further, LaBorde said, "Our DBMSs run across mainframes and personal computers — unlike IBM, which has different database managers for each platform. And ours are not just ports; they're engineered for each specific environment."

CA announced MS-DOS versions of its mainframe DBMSs in July. When all the PC pieces become available during the next year or so, fully distributed applications will be possible between the mainframe and PC versions, LaBorde said. This will include full two-phase commit, he said.

CA is already working on the next release of Datacom, Version 8.1, which is scheduled for availability in mid-1991. It will include additional performance and security features.

TRENDS

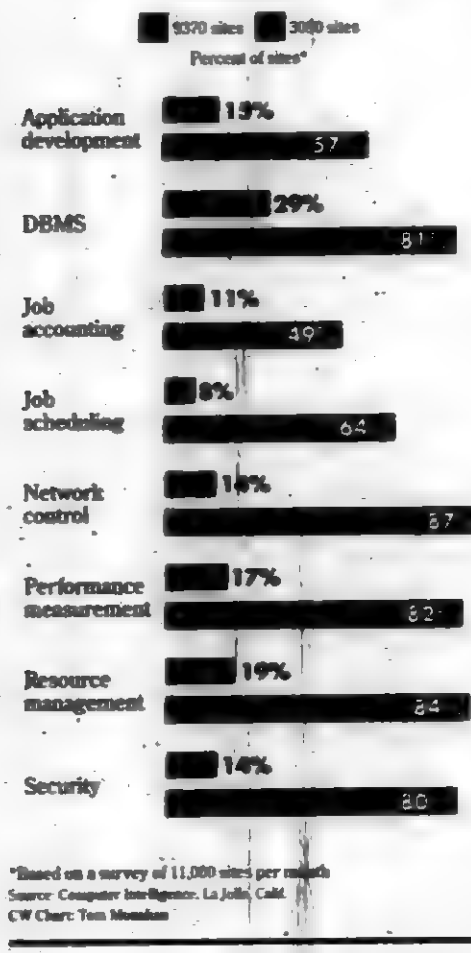
Software Implementation:

The IBM 9370 vs. the 3090

While 3090 systems are better equipped to handle a broad range of software, the 9370 still plays a supporting role. Contrasting software use implies a need for central processing support from larger systems rather than software incompatibility

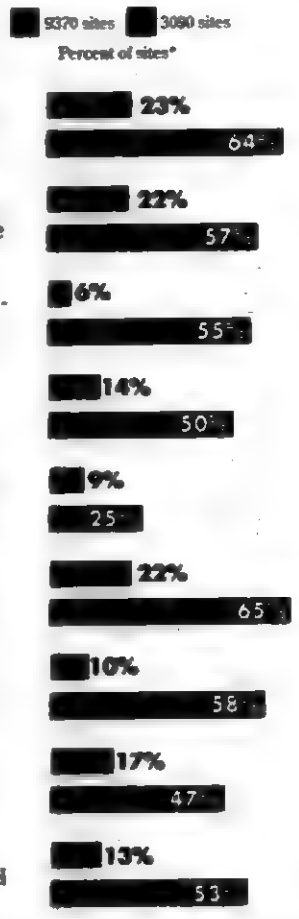
System software penetration

High use of system software on the 3090s is especially evident in areas dealing with system management



Application software penetration

Mirroring system software, application levels at 3090 sites are three to four times higher than at 9370 sites



*Based on a survey of 11,000 sites per month
Source: Computer Intelligence, La Jolla, Calif.
CW Chart: Tom Monahan

NEXT WEEK

The most far-reaching change in information system management in the next decade may be the overlap of careers in IS and general business. One individual with a particularly clear perspective on that issue is **F. Warren McFarlan**, a professor at Harvard Business School. Learn McFarlan's views in a Manager's Journal interview.

Stephen Lewis

Consortiums cannot work in America . . . or can they? After seven years, Microelectronics and Computer Technology Corp. (MCC) has finally started to pay dividends for its members. What is happening down in Austin, Texas, and what has MCC done to turn things around? See In Depth for a closer look at this consortium.

INSIDE LINES

Everybody's doing the mainframe

Now that IBM, Fujitsu and Hitachi Data Systems have had their turns, Amdahl is ready to announce a mainframe this week. Industry analysts said they expect that tomorrow's introduction will exceed 50 million instructions per second in raw processing power. Most analysts expect Amdahl to match or exceed IBM's Enterprise System/9000 announcement by promising fiber-optic channels, support for new MVS/ESA capabilities and intentions to match IBM functionality now hidden in proprietary IBM microcode.

Steal this modem

Leemah Datacom Security Corp. recently wrapped up its second annual challenge to hackers, who were given the chance to retrieve a secret message stored in two PCs protected with a Leemah callback modem. While hackers failed to break in, the challenge was not as big a success as officials predicted. Even though the company added a second PC and challenge site to accommodate what they thought would be a mass hacker attack, only 2,009 hackers tried and failed to hack into the PCs compared with nearly 8,000 failed attempts last year. Apparently, many hackers feared that the company was cooperating with the government in a sting operation.

But can it pick up MTV?

Xerox Corp. is being incredibly secretive about its new do-all product, code-named (of all things) Zenith. Various reports say it's sort of a hybrid photocopier/computer, but some sources say it could revolutionize the high-end printer market. Zenith definitely has Postscript capabilities and can be networked. It is also supposed to offer state-of-the-art imaging capabilities, "paperless" copying and facsimile capabilities, for starters. All Xerox will say is that it will be releasing products that incorporate digital technology before the end of the year. Look for the answers on October 2, insiders say.

Put your trust in government

The head count at the National Security Agency's computer security center is down to 12 people, from 300 earlier this year, according to a source. "They have either been reassigned or just gone," the source said. The computer security responsibility is being "dumped" on the National Institute of Standards and Technology, our source added. Meanwhile, over at NIST, the computer security head count is at 12, down from 30 as a result of budget cutbacks.

OSI feeling blue

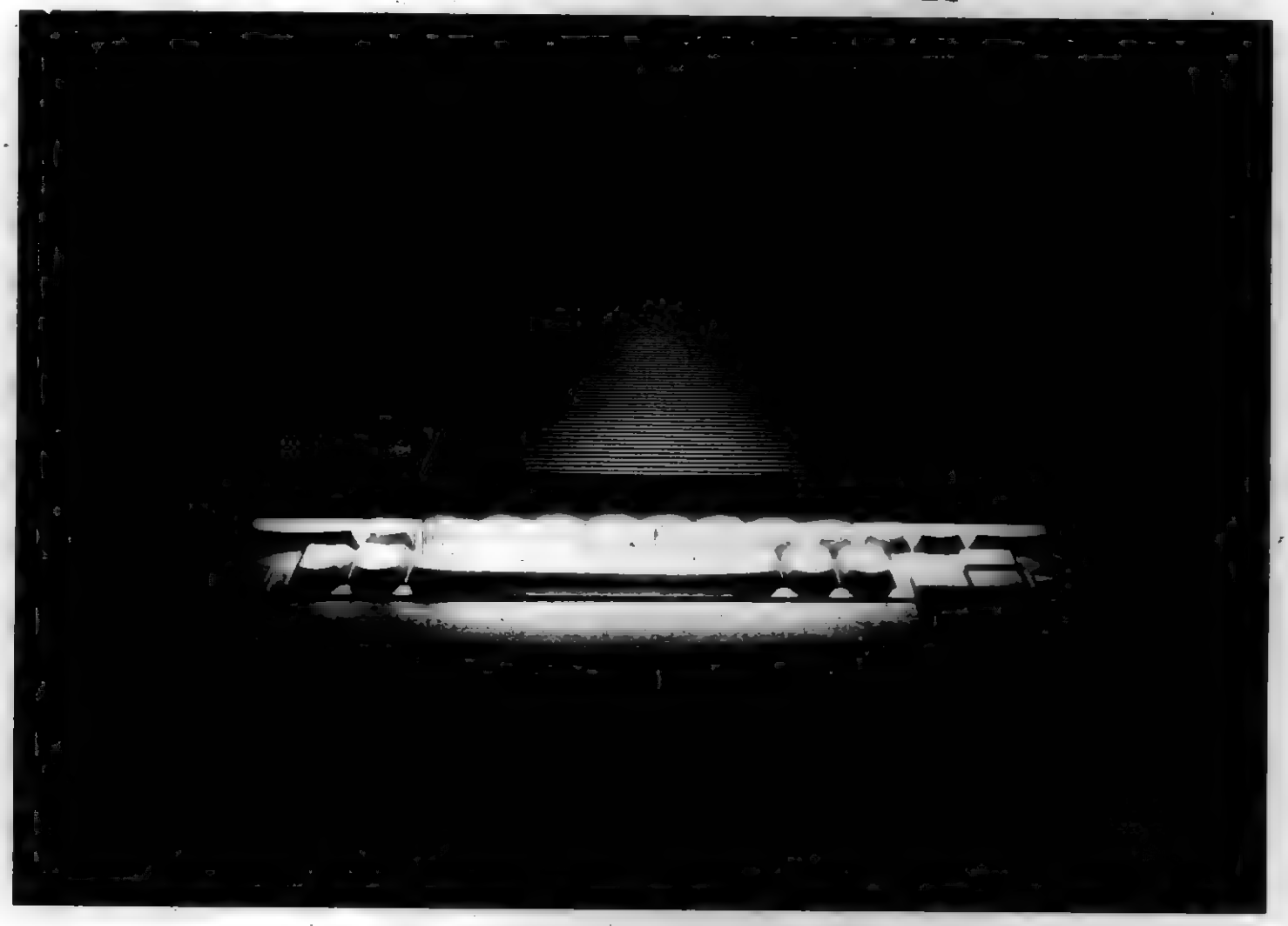
As if DEC needs more problems, IBM is expected to fill the gaps in its Open Systems Interconnect suite this week. Among the announcements expected are OSI support for IBM's OS/400 and OS/2 families as well as for Officevision; X.400 for the Risc System/6000; and a new version of the OSI Communications Subsystem for IBM mainframes, which will have Government OSI Profile compliance and X.400 support. Meanwhile, DEC still doesn't have OSI support out the door in Decnet Phase V.

Modesty in motion

Cabletron Systems is gearing up for a Tuesday announcement of what it deems the most comprehensive enterprise network management system in the history of the universe. The company revealed that the new system revolves around artificial intelligence-based software, is Unix-based and protocol-independent. It sports a graphical user interface and will manage everything from a computer network to a telephone system to a manufacturing floor to an air-conditioning unit.

A reseller who begged not to be identified said unusually harsh incentives were employed by Microsoft in getting its LAN Manager 2.0 out the door. The reseller reports that posters appeared here and there suggesting "Ship or Die." It's always been "Publish or Perish" around here, especially when the newswires are buzzing like they've been lately. Ship your own news tips over to News Editor Pete Bartolik via telephone at (800) 343-6474, fax at (508) 875-8931 or on MCI-mail address COMPUTERWORLD.

The new look of power.



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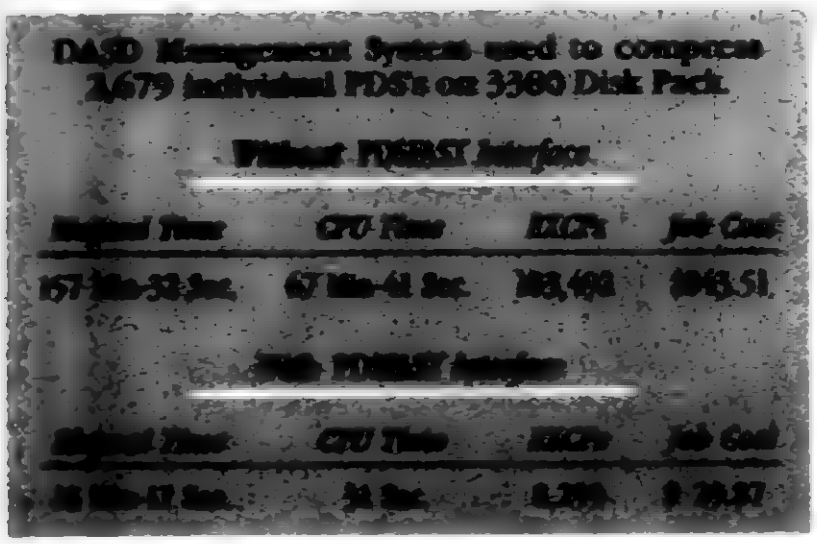

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COMPUTERWORLD

INSIDE

Product Spotlight — Look in the mirror before making a minicomputer purchase. Page 75.

Reconcilable differences? IBM and Microsoft say they've improved development processes, but outsiders view division of responsibilities as a parting of the ways. Page 4.

NCR takes chips to new levels with plans to standardize on Intel processors from PCs to mainframe replacements. Page 8.

Amdahl offers more MIPS than IBM's ES/9000 but needs a longer rollout schedule to deliver. Page 4.

Memory bash: Third parties up in arms over cost of adding memory to ES/9000 models. Page 121.

Outsourcing's hidden cost bite

BY CLINTON WILDER and NELL MARGOLIS
CW STAFF

Information systems departments that choose outsourcing may run into a hidden and potentially costly surprise — jacked-up bills from outsourcing vendors hit by hefty license transfer fees from software houses.

Computer Associates International, Inc. was cited by several outsourcing services vendors as particularly tough on the issue. "Only one vendor has drawn a line in the sand," one outsourcing company representative said.

Garden City, N.Y.-based CA is taking an aggressive stance in seeking revenue when its customers attempt to transfer software licenses — including outsourcing vendors. Such practices have angered some outsourcing users and could threaten the savings that make outsourcing an attractive option to some IS shops.

Do you expect to consider full or partial outsourcing during the coming year?
(Number of respondents)

Based on a poll of 69 Computerworld Premier 100 IS managers

The transferees' "assumption was probably that they could just move this [software] around without having to pay for it," said Bryan Shepherd, CA's executive vice-president of marketing. "Well, that isn't the case."

The software license transfer issue is a touchy one and is the subject of intense negotiations in several current outsourcing situations. Many users and outsourcing vendors acknowledged the problem but refused to name the software company or companies involved. One IS director said his situation may soon involve litigation.

Outsourcing vendors hit by the fees feel they must pass them on to the users just to stay in the outsourcing business. "We're not trying to gouge people, but if we're going to be charged more, we have to go to

Continued on page 12

Besieged Oracle acts to quell loss

BY JEAN S. BOZMAN
CW STAFF

REDWOOD CITY, Calif. — It will be a vastly restructured and greatly humbled Oracle Systems Corp. that faces customers at its annual user group conference this week. The company said last week that it will pare down its domestic work force by 10% and that several key executives are departing as it attempts to deal with the expected $20 million quarterly loss it predicted earlier this month.

Oracle customers, some of whom view the company's marketing practices as extravagant, are not concerned by the raw numbers; nevertheless, some are wary that cost-cutting might begin to take its toll on support and development as the company attempts to update more than 80 releases of its software for various hardware platforms.

Oracle's growth plans have been trimmed in recent months from 100% per year — its norm for the last 10 years — down to 50% last spring and again this

Continued on page 120

IBM mainframe checks out, Unix checks in at the Hyatt

BY ELLIS BOOKER
CW STAFF

CHICAGO — Hyatt Hotels Corp. last month unceremoniously shut the door on the IBM 4381 mainframe that had been running its customer reservation system since 1982 and replaced it with four Unix-based processors from AT&T.

The $12 million project makes Hyatt perhaps the largest commercial installation at which Unix has been deployed for online transaction processing.

The hotel chain's decision is also a watershed of sorts, lending credence to a growing body of evidence that Unix-based "open systems" *can* handle applications that until recently were widely regarded as the sole province of proprietary mainframes and specialized software.

"The technologists were intrigued with Unix," John Biggs, Hyatt's senior vice-president of accounting and administration, said in an interview last week. "But from a business standpoint, what it gives us is flexibility."

For Gordon Kerr, Hyatt's vice-president of MIS, the issue was one of productivity — specifically, the chance to use fourth-generation development tools. With an older IBM transaction processing system in use at Hyatt, Kerr said, "You need three to four years of experience to be productive . . . but only one to two years with a 4GL."

Kerr said he assumes his support costs will drop from the current $7 million to $8 million per year level. "I expect that by making this change we'll realize 20% cost savings," he said.

Hyatt was already along the road with Unix before it tackled

Continued on page 121

COMPUTERWORLD BUYER'S SCORECARD

Cost of ownership

HP 3000 users are most satisfied with their overall cost of ownership

See ratings page 80

Product	Score*
Response base: 50 users per product	
HP 3000 Model 925	67
IBM AS/400 Model 60	61
AT&T 3B2 Model 600	61
DEC VAX 6000 Model 210	55

*Scores are based on product ratings combined with importance assigned to each criterion.

CW Chart: Paul Mock

IN DEPTH: SIZING UP MCC

R&D group finds shoes it can fill

BY GLENN RIFKIN
CW STAFF

There's nothing tougher on a ball player than great expectations. The same holds true for a research consortium. Just ask MCC.

The Microelectronics and Computer Technology Corp., the first major consortium in the U.S., has been fighting an uphill battle ever since it was founded in 1983 with the unrealistic perception — set off by the furor caused by a major Japanese artificial intelligence push — that it would fend off Japan in the race for global technology dominance.

Ray Kaltschmidt

MCC's chairman, Devo

Seven years later, after a bumpy start, MCC is building a quiet success story, fulfilling its mission to offer corporations a way to leverage long-term research. Though the technical achievements of its four diverse internal programs vary in importance, MCC has outlived the naysayers who have waited for its demise. In so doing, it has found a workable structure that is attracting more and more shareholders and members and has become a model for other U.S. consortiums such as Sematech.

Unfortunately for MCC, it had no blueprint for success because it was the first major U.S. consortium. Mistakes were made, processes took longer than expected to be smoothed into place, and only in the past two years has real progress begun to show.

In addition, the sensitivity of its work and relationships with shareholder companies make it somewhat difficult for MCC to boast about its achievements. A series of significant, although

Continued on page 87

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"We can never let the ownership go, because the only asset we have is our software."

BRYAN SHEPHERD
COMPUTER ASSOCIATES

On the license transfers in outsourcing cases. See story page 1.

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IN DEPTH

1 At the age of seven, **Microelectronics and Computer Technology Corp.** is building a quiet success story. By Glenn Rifkin.

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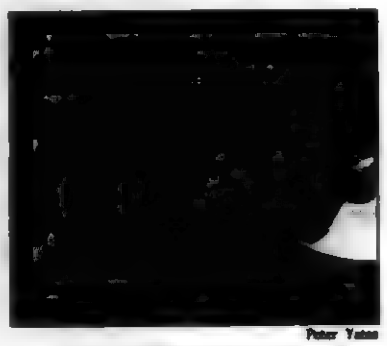
From Ruth Stanat's *The Intelligent Corporation*: "A growing number of IS departments have actively become involved in developing corporate intelligence networks, especially because many have become more closely associated with the sales and marketing functions of organizations. In addition, the IS departments as a whole are increasing in manpower, corporate backing and budgets to finance a shared information network . . . The IS function will gain a stronger presence in the corporate intelligence network, primarily because most CIOs have information systems or data processing backgrounds."

Hardware choices abound in listing of late-model machines. Page 75.



Peter Yates

Steelcase and Mark Greiner believe that multimedia is the way to sell furniture. Page 56.

EXECUTIVE BRIEFING

■ **There's a hidden cost to outsourcing for some users** — big software license transfer fees from Computer Associates and other software vendors. The charges assessed against outsourcing vendors are usually passed along to the outsourcing customer, which has caused some users to rethink their outsourcing decision or switch service vendors. CA says it's simply protecting the company's only real assets — software licenses. **Page 1.**

■ **Hyatt Hotels has chosen Unix** to displace IBM's operating system for transaction processing. In what could be the largest commercial installation of Unix for transactions, Hyatt's move lends credence to the growing movement toward open systems for business workhorse applications. Hyatt moved its reservations system from an IBM 4381 running TPF to four Unix-based processors from AT&T. **Page 1.**

■ **The nation's first major R&D consortium** is quietly building a success story — seven years after its bumpy start. Microelectronics and Computer Technology Corp. (MCC) has overcome the unrealistic early expectations that it could fend off Japan in the global technology race. Today, observers say that MCC is fulfilling its mission of helping U.S. member corporations leverage its long-term research. **Page 1.**

■ **Amdahl continued the current mainframe one-upmanship race** by announcing new systems that can couple eight CPUs for a total of 350 MIPS. But like the IBM ES/9000 they outrun, Amdahl's entries won't be available until late next year. **Page 4.**

■ **IBM made good on its OSI promise** by endorsing the international standard across its major operating systems. Now it is the users' turn to sort out the new offerings in their own environments. **Page 10.**

■ **The failure of an executive information system** project at Mutual Benefit Life provides a good case study for the "don'ts" of EIS implementation. The insurance firm says it has learned its lessons — and may try again. **Page 69.**

■ **Beauty is in the eyes of the beholder** when it comes to purchasing a minicomputer today: One person's trusty departmental processor may not work as well as another's server. For that reason, it's a good idea to figure out what type of buyer you are before evaluating the machines. **Page 75.**

■ **AS/400 proficiency is in great demand these days** — and the void far exceeds the supply of experienced professionals. The U.S. AS/400 installed base has tripled since January 1989, and recruiters are scrambling to fill all of the new openings. **Page 104.**

■ **Multimedia is graduating from the classroom** and entering the business world in more areas than just training. However, IS managers considering multimedia approaches to applications should take care in buying equipment. There are wide price swings and several configuration issues to ponder. **Page 112.**

■ **On-site this week:** An Apple multimedia application has changed the way designers think about office furniture at Steelcase in Grand Rapids, Mich. **Page 55.** Group Hospitalization and Medical Services, a Washington, D.C.-based insurer, is using the French connection — France's Minitel videotex network — for eligibility verification for members who need medical care overseas. **Page 64.** Elsewhere in the insurance world, the Auto Club of Southern California employs IBM's Imageplus imaging system to process 33,000 pieces of paper daily. **Page 25.** A bull in Steel City — a **Bull 8000 mainframe**, to be exact — serves more than 2,000 municipal employee users in the city of Pittsburgh's IS department. **Page 29.**

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Microsoft, IBM split OS/2 licensing

BY PATRICIA KEEFE
CW STAFF

No, IBM and Microsoft Corp. did not file for divorce last week. They opted instead for a much-needed separation on microcomputer operating systems development, leaving more questions unanswered than resolved.

At least that was the verdict from users and other industry observers after the firms announced a license agreement extension that was couched in terms of a unity pledge, the second such treatise in less than a year [CW, Nov. 20].

IBM is now the primary developer of the 16- and 32-bit OS/2. Microsoft will focus on DOS and Windows and continue its efforts to build a portable OS/2 for reduced instruction set computing systems; it will also continue to support OS/2 OEMs. The partners will jointly define product specifications, contribute to each project and cross-license all resulting technology.

With reservations, Microsoft has agreed to offer OS/2 Lite, a 2M-byte version of OS/2, said Steve Ballmer, Microsoft's senior vice-president of systems development. In return, IBM has licensed Windows Version 3.0.

Users interviewed last week said the announcement would have little or no impact on their desktop strategies.

Dan Lautenbach, IBM's director of OS/2 marketing, said there is no rift and denied that IBM is impatient with Microsoft: "We are disappointed that OS/2 has not been accepted faster than it has, but we were not surprised by Windows' success."

Left unanswered, industry observers said, are a multitude of issues, including the following:

- How far will IBM go in tailoring OS/2 to its hardware platform and mainframe connectivity?
- Will IBM actively resell Windows?
- Will IBM and Microsoft position OS/2 Lite and Windows 3.0 as competitors?
- Will Microsoft extend Windows' functionality beyond limits set in last fall's announcement?

Also uncertain is whether the effort to "reaffirm" a strong relationship between IBM and Microsoft is for real.

"The credibility of these kinds of announcements is not too high; remember, they clarified their position in November, too," said Charles Colpitt, director of workstations and personal computer software at The Travelers Corp. in Hartford, Conn. IBM and Microsoft's first stab at surmounting differences over OS/2 and Windows was at Comdex/Fall '89.

Meanwhile, the plan to divvy up control of OS/2 development as an "efficiency" move was roundly applauded by analysts as pragmatic and long overdue.

"I think the rift has been overplayed. Let's face it, they are just formalizing what has been going on for a long time," said Nancy McSharry, an analyst at International Data Corp.

Developers were cautiously upbeat. "The only way to develop a successful operating system is to have the group most motivated to finish it. Clearly OS/2 is strategic to IBM," said Fred Gibbons, president of Software Publishing, Inc. IBM said last week that it will begin delivery of advance beta-test copies of the 32-bit OS/2 Version 2.0 in December; the finished product is slated to ship in June, said Ron Adinolfi, a vice-president at Swiss Bank Corp.

But questions remain. "The fundamental questions regarding the migration path of Windows to [OS/2] Presentation Manager and whether Windows is going to be part of [IBM's Systems Application Architecture] still need to be answered," Ashton-Tate Corp. President William Lyons said.

IBM and Microsoft officials declined to elaborate on their new development arrangements or update unkept promises made at Comdex/Fall.

Ten months after the fact, the partnership has failed to complete at least two goals: convergence of their LAN Manager-based file servers and unbundling of IBM's OS/2 Extended Edition.

A follow-up announcement in about a month is expected to reemphasize support and monetary commitment to further development of OS/2 and to provide some direction, if not details, about IBM's Windows and Officevision strategy.

Amdahl reacts to ES/9000 with processor power play

BY JEAN S. BOZMAN
CW STAFF

SUNNYVALE, Calif. — Amdahl Corp. muscled past the top end of IBM's recently announced Enterprise System/9000 line last week, announcing a new high-end machine with eight processors that the company promised will deliver nearly 350 million instructions per second (MIPS).

Yet none of the high-end machines from IBM or Amdahl — or Hitachi Data Systems Corp.'s EX 310 and EX 320, announced in June — will be available until mid-1991 or later, industry analysts pointed out.

Amdahl announced 10 models in the 5990 series, but the more powerful 5995 M models will not be available until late 1991, with the six- and eight-way configurations waiting in the wings until second-quarter 1992.

"If Amdahl had its way, it wouldn't be announcing these boxes with a 1½-year lead time," said Bob Djurdjevic, president of Annex Research in Phoenix. He noted that IBM and IBM-compatible vendors are taking market risks by announcing machines more than a year ahead of delivery.

Reacting to the stretched-out delivery schedule, potential users were hesitant last week to express any purchase commitments. "The good thing with Amdahl is we expect it will help keep prices down," said George Sekely, vice-president of computers and communications at Canadian Pacific Co.

"We have quite a few Amdahl systems, but it's just an announcement," said Bill Friel, an ex-vice-president at Prudential Service Co. Clearly, the prospect of competitive pricing pressure on IBM was welcome.

"I want to know how the new Amdahl machines compare to those [IBM] machines," said Bill Vetter, manager at Illinois' communications and computer services bureau. "I believe that neither vendor should forget there's always an alternative."

Although Amdahl jumped the gun on IBM in terms of the number of tightly linked processors it can configure, analysts expect IBM will have its own eight-way version. Jim Cassell, an analyst at Gartner Group, Inc. in Stamford, Conn., said he expects IBM will announce an eight-way version next year for delivery in '92.

The first six models of the Amdahl 5995 computer line featuring 10-nsec cycle time will start shipping this month. Shipments of more powerful 7-nsec models are planned for the fourth quarter of 1991. Prices range up to $32.1 million.

The uniprocessor is rated by Amdahl at more than 50 MIPS; analysts pegged IBM's uniprocessor at more than 40 MIPS.

Amdahl engineers still do not know how long it will take them to match IBM's new ES/9000 features, including the new Escon fiber-optic channel features. "Obviously, we're still analyzing [IBM's] Sept. 5 announcement," said Erika Williams, vice-president of processor product management at Amdahl.

Amdahl also promised to support ES/9000's encryption and security features, its Sysplex features and the latest version of the IBM operating systems.

Amdahl unveiled new features of its own, including a "concurrent maintenance" system that will allow Amdahl mainframes to operate while preventive maintenance is carried out on parts of the computer. "If the machine is designed properly, you can take one of those processors off-line and work on it, even replace it, while the rest of the machine continues to operate," said Mark Hess, program director of IBM large-scale systems research at Gartner Group.

Amdahl claimed more than 1,000 mainframe sites but would not specify the exact distribution of installed machines.

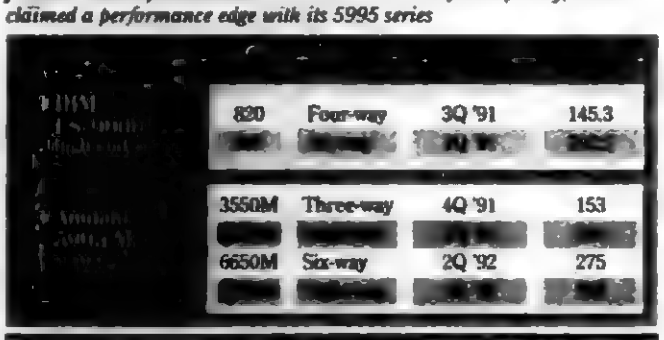
"Over the next five weeks, each 5990 user worldwide will receive a proposal specifically tailored to their environment," said Chuck Fonner, Amdahl's vice-president of systems marketing.

Amdahl will continue to ship its older 5890 machines.

Senior Editor Rosemary Hamilton contibuted to this report.

Fighting machines

Just two weeks after IBM announced its new mainframe family, Amdahl claimed a performance edge with its 5995 series



Source: Technology Investment Strategies Corp./Gartner Group, Inc. CW Chart: Paul Mock

CORRECTION

The hardware assist option announced with IBM's DB2, Release 2.3 [CW, Sept. 10] is microcode that is already included in the System/390 hardware family, not a processor add-in. Also, DB2 application binds still require users to bring applications down, but only for a few seconds.

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NEWS SHORTS

Investors cite Unisys, CDC, Xerox

The United Shareholders Association, a Washington, D.C.-based group of shareholder rights activists, has named Unisys Corp., Control Data Corp. and Xerox Corp. to its list of 50 corporations targeted for reform. At annual corporate meetings in 1991, the activists will offer proposals to eliminate poison pills, require shareholder approval of golden parachutes and establish confidential voting in corporate elections.

IBM must replace 3390 fans

IBM confirmed a report last week of a manufacturing snag with its 3390 disk drives that will require it to replace fan units on all models installed between May and August 1990. Technology Investment Strategies Corp., a research firm in Framingham, Mass., issued a report late last week detailing a flawed fan design that caused some 3390 head disk assembly units to shut down, trapping data being accessed. IBM confirmed that the problem was causing disruptions but not loss of data. Bill Reedy, IBM marketing director for storage systems, said the firm will be replacing all fan units at the customers' convenience. Technology Investment Strategies said this will affect approximately 25% of the close to 8,000 units shipped to date.

Globex schedule slips

The Chicago Mercantile Exchange, Chicago Board of Trade and Reuters Holding PLC recently announced that Globex, the after-hours international electronic trading network, is behind schedule. Originally expected to be up and running by late October, the partners now say it will be available in the first quarter of 1991. A source close to the project confirmed that testing of the system has been slower than expected but said that there were no serious problems with the software.

Sybase offers MVS tools

Relational database management system vendor Sybase, Inc. last week introduced products designed to help integrate IBM MVS mainframe applications into network computing applications. The three new products include Sybase Open Server for CICS, designed to give access to all MVS data, applications and services; Sybase Open Gateway for DB2, which works with CICS and gives users an SQL-based gateway; and Sybase Netgateway, which is a network gateway designed to control and monitor communications between the IBM MVS mainframe and other client platforms, the company said. The Sybase products are slated to ship by the fourth quarter of 1990.

Burton named president at Legent

When software vendors Duquesne Systems, Inc. and Morino Associates, Inc. merged two years ago to become Legent, Inc., the new company said it would seek a reputation as a hungry but benevolent acquirer: a firm in whose hands acquired executives could expect to be delighted, not deleted. John Burton would probably say that the Vienna, Va.-based software house is making good on its goal. Burton, the former vice-president of marketing at Legent's first acquisition — change control software maker BST — became president of Legent last week.

Profits grow at 3Com

3Com Corp. last week announced encouraging first-quarter financial figures and the availability of Microsoft Corp.'s LAN Manager Version 2.0 in its product line. Net income for the first quarter rose to $5 million compared with $1.2 million for the first quarter of last year. Sales reached $106.2 million in the first quarter compared with $89.1 million a year ago. Meanwhile, the Santa Clara, Calif., company announced that it would begin shipping LAN Manager, Microsoft's network operating system, bundled with 3+Open menus and the 3+Open NetBios protocol at the end of this month. There was no word on when the new Microsoft operating system would be incorporated into 3Com's own LAN Manager-based 3+Open LAN Manager Version 1.1.

More shorts on page 121

Unisys probes S/36 territory

RAMP offers alternative to midrange AS/400 migration

BY MARYFRAN JOHNSON
CW STAFF

BLUE BELL, Pa. — Unisys Corp. plunged into unfamiliar waters last week with the introduction of a line of midrange computers that offers an alternative growth path for IBM System/36 users.

The System/36-look-alikes, dubbed Unisys RPG Application Migration Package, or RAMP, will be marketed to customers unwilling to migrate to IBM's AS/400 line.

"This is a viable product for Unisys to get a toe in the water" of the midrange market, according to Teresa Elms, president of Elms Technical Communications, a market research and consulting firm located in San Diego.

Based on the Unisys entry-level A series mainframe processors, the RAMP machines come in four single-processor models ranging in price from $19,900 to $115,000, a dual-processor model for $210,000 and a quad-processor model for $400,000. Storage capabilities run the gamut from 12M bytes to 192M bytes, and the systems support from 28 to 336 workstations.

Familiar menus

Unisys beefed up the CPU with the addition of an A series RPG II compiler, special workstation controllers to support IBM 5250-compatible terminals and printers and runtime software that maintains the menu-driven user interface familiar to System/36 faithfuls.

An automated migration facility allows relatively painless porting of System/34 or System/36 RPG II program libraries and data files to Unisys RAMP, the company said.

"This will appeal only to a subset of the System/36 population, but it does give them a growth path," Elms said. "[Users] can keep their [RPG II] software as it runs today, with no reprogramming, and they can keep all their terminals and peripherals, too."

The ability to hang onto peripherals could give Unisys — a virtual stranger to the IBM and commercial midrange markets — the boost it will need for this strategy to succeed, said John Logan, an analyst at Aberdeen Group in Boston.

In the U.S., Unisys will market its RAMP line only through value-added resellers, according to company officials, and 60% of its sales are expected to be from the international marketplace in Europe, Asia and South America.

Net management comes full Spectrum

BY JOANIE M. WEXLER
CW STAFF

ROCHESTER, N.H. — Network managers will be able to hang up their roller skates for good if a centralized, artificial intelligence-based enterprise network management system announced last week by Cabletron Systems, Inc. delivers on its promises.

Cabletron's Spectrum — a multilevel, object-oriented system recommended for heterogeneous networks of 1,000 nodes or more — is a Unix-based, protocol-independent platform designed to manage every device on a network, including nonintelligent equipment.

Cabletron acknowledged that its biggest sales challenge will be convincing companies that are wavering in their integrated network management decisions and are unfamiliar with Cabletron that the company is a viable player in the enterprise network management arena.

However, "in terms of what users want, Spectrum is the most extensible, flexible, open platform that's ever been offered," commented Jill Huntington-Lee, an analyst at Datapro Research, Inc. in Delran, N.J.

"This sounds like a product whose time has come," added Steve Patrick, director of computing services at Bradley University in Peoria, Ill. Patrick, who was unfamiliar with the $105-million-a-year Cabletron, said, "I would tend to be cautious with a new vendor, but I've certainly seen products hyped from the big players that wound up being less than expected."

Spectrum can reportedly evolve to let users view all their equipment from various perspectives and manage it from one workstation. The ability to isolate network management data into slices using one system prevents users from "peering into a big bowl of spaghetti that you can't see the bottom of," said Roger Dev, Cabletron's director of software engineering.

Currently, most integrated — or enterprisewide — network management involves several elemental systems that manage equipment from a particular vendor, then filter and pass critical data up to an enterprise system. The enterprise system then consolidates the data into a broad — but shallow — view of the whole network.

This multitiered approach requires managers needing deeper levels of detail about particular network segments to shuttle between different stations running individual elemental systems.

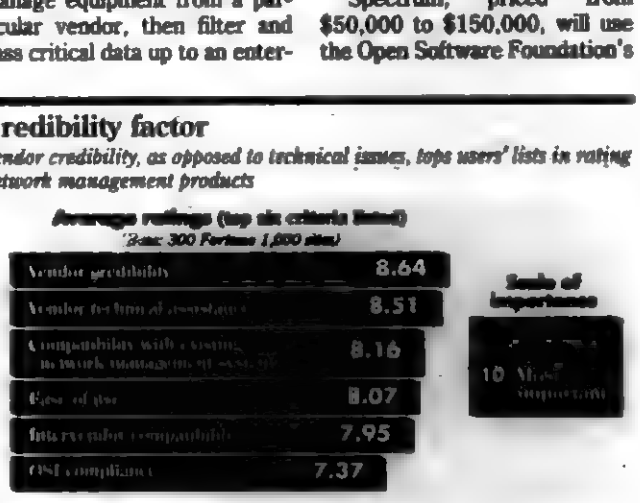
What differentiates Spectrum from IBM's Netview and other vendor schemes, said Chris Oliver, Cabletron's director of engineering and manufacturing, is that "the others rely on you to cause an action when you find out what's going on," while Spectrum handles both problem-finding and solving.

L. Michael Sabo, a Spectrum beta-test user at SSDS, Inc., a systems integrator in Littleton, Colo., said, "The product has everything our customers are asking for, and we've specified Spectrum on two major bids."

Spectrum, priced from $50,000 to $150,000, will use the Open Software Foundation's Motif graphical user interface and initially support three network management protocols, including the popular Simple Network Management Protocol. It is expected to be available in January for Sun Microsystems, Inc. Sparcstations, and several other common platforms, including Intel Corp. 80386-based personal computers, will be phased in.

Credibility factor

Vendor credibility, as opposed to technical issues, tops users' lists in rating network management products



Source: Business Research Group — CW Chart: Paul Mock

Jobs' Next unveils do-or-die systems, software

BY JAMES DALY
CW STAFF

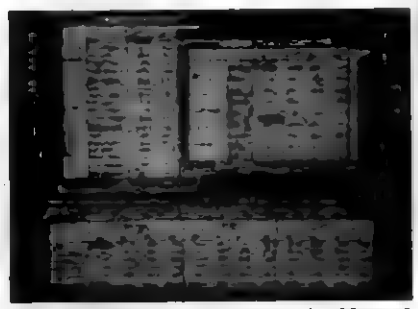
SAN FRANCISCO — It was put-up-or-shut-up time for Steven Jobs and his Next, Inc. venture last week as he unleashed a barrage of slick workstations and software packages designed to recharge the struggling company.

"This is the future of Next," Jobs said as he strolled across the stage at Louise M. Davies Symphony Hall, the same pulpit from which the firm unveiled its first products in October 1988.

Questions remained, however, as to just how long that future will be. Analysts said time could be running out for Next, which was born with a silver spoon in its mouth five years ago.

"Next has all the pieces in place, but [it] still needs to create the market buzz," said Jonathan Seybold, an analyst at Seybold Seminars in Malibu, Calif.

Although sales have been scarce — with even Jobs admitting that they are short of his expectations — Next has survived by mining a deep venture capital vein that includes $100 million from Japanese giant Canon, Inc., $20 million from billionaire Ross Perot and a licensing deal with IBM estimated to be worth more than $10 million.



Lotus' Improv *spreadsheet for Next offers different views of data relationships*

Analysts said, however, that the introduction will keep Next well equipped for the second wave of its assault on the desktop market. "Next has addressed the major weaknesses of its original computer," said Nicholas Baran, editor of "Baran's Tech Letter," an independent newsletter based in Sandpoint, Idaho, for Next computer users.

Leading the rollout were four models based on a 25-MHz Motorola, Inc. 68040 microprocessor. Each can execute about 15 million instructions per second, making them approximately three times faster than the 68030 that shipped with the original machine and comparable to Sun Microsystems, Inc.'s Sparcstation 1+.

The systems include the following:

- The low-end Nextstation begins at $4,995 — less than half the price of the original Next computer — and is scheduled to be available in November.
- Nextstation Color, a 16 bit/pixel color version of the same machine, will sell for $7,995 and ship in the first quarter of 1991.
- Nextcube, which can be used as a desktop server or high-end workstation, will retain the original computer's cube shape and sell for $7,995 when it is available in November.
- Nextdimension is a version of the Nextcube fitted with an additional 32 bit/pixel color board and color monitor. It will sell for approximately $14,000 when fully configured with photorealistic color and video capabilities and will be available in the first quarter of 1991.

Todd Rulon-Miller, Next vice-president of sales, said the firm already has orders for 15,000 of the new machines — more than double the 7,000 machines International Data Corp. estimated the company has sold since its original introduction.

Jobs waved away concerns about the availability of the 68040, the production of which has been held up repeatedly because of design flaws. One Next staff member, however, privately confessed that "delivery of the chips has been slow."

Next also cleared up a problem by including a built-in 3½-in. floppy disk drive that stores 2.88M bytes of information on each machine. The original came with only an erasable optical disc, and developers often refused to deliver software on the more expensive optical discs.

Complementing the hardware rollouts and Release 2.0 of the operating system were software applications specifically designed for the Next environment. Packages from dozens of companies, including Lotus Development Corp., Wordperfect Corp., Oracle Systems Corp., Adobe Systems, Inc. and Frame Technology Corp. were presented.

Early users said that the new software will put Next over the top. "There's no other platform out there that can touch them; they're five years ahead of the competition," said Carmi Weinzweig, a research computerist at the Argonne National Laboratory in Argonne, Ill. Weinzweig said he has been evaluating the older models and now expects to have 100 Next machines installed by the end of next year.

The star of the software show was clearly Lotus' Improv spreadsheet, which Jobs had earlier called the "compelling application" that will lure users to Next. Improv, which was designed for Next, clears up the complications sometimes associated with spreadsheets by using English commands instead of numerical syntax.

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NCR scraps proprietary history for Intel, Unix

BY ELLIS BOOKER
CW STAFF

NEW YORK — NCR Corp. forged into new territory last week, becoming the first of the old-line mainframe companies to abandon its proprietary hardware and software architectures in favor of a broad line of machines built around a common microprocessor family and Unix.

The breadth of the NCR System 3000 planned lineup is ambitious, spanning from portables running MS-DOS and OS/2 and topping out with mainframe-class, parallel processor systems. Moreover, the choice of Intel Corp.'s microprocessor platform to replace an established mainframe base, along with selection of Unix Version 4 as the primary operating system, confirms the ascendancy of the microprocessor and telegraphs the open systems trend in the industry, analysts said.

NCR also unveiled a storage system for the System 3000. Called the 6298, it will use redundant array of inexpensive disks (RAID) technology and will feature 20 interlinked drives offering a total of 8.4G bytes of storage. In addition to midrange systems and high-end targets, NCR unveiled three high-end desktop models using Intel's 80386SX microprocessor and two versions of the I486 chip. Low-end desktops and portables will be added later.

"Usually, people keep these things quiet," but NCR decided to shock everyone and reveal their plans for the next two years, said Frank Dzubeck, president of Communications Network Architects, Inc. in Washington, D.C.

NCR officials, for their part, were not bashful about heralding the significance of the move. "This is the most important announcement in NCR's history," said Chief Executive Officer Charles E. Exley last Tuesday in New York. Exley positioned the 3000 as NCR's general-purpose computing family for the 1990s.

Observers outside the Dayton, Ohio, company restrained their enthusiasm, however, noting that the top-of-the-line level, the 3700, will not even appear until the third quarter of 1992.

"They've put something together that is quite dramatic," Dzubeck said. "Whether this all plays out in the next two years is the question."

The answer to that may rest on how easily NCR can move customers from its existing line of Unix and proprietary minicomputer and mainframe systems to the 3000. Another obstacle, analysts said, will be how successful NCR is at promoting Unix applications that can take advantage of the multiprocessor, loosely coupled, message-passing architecture of the two top levels of the new family.

NCR's customers fall largely in the retail and banking sectors and are composed of two discrete groups: users of the NCR Tower, a Unix machine based on the Motorola, Inc. 68000 microprocessor, and the NCR System 10000 minicomputer and NCR 9800 mainframe.

Clearly hoping to rev up excitement among its current customers while quieting any fears about moving to the System 3000, NCR spent considerable time last week sketching out its migration strategy.

Moving Tower users to the System 3000 should be uneventful, NCR officials promised, because this line already runs Unix.

Regarding 9800 customers, NCR said its 2-year-old Union, a hardware and software product that permits Towers to be connected to a 9800 system bus, will also enable System 3000s to link to a 9800 environment.

System 10000 users, however, must await a new offering termed Galaxy, according to NCR President Gilbert P. Williamson. During the 1990s, Galaxy will allow those customers to use most of their existing applications on top of Unix in the System 3000 — without changes or recompilation. Galaxy is scheduled to be available in the first half of next year.

"I believe it was May '89 that NCR said if you weren't Unix [now] you would be," said Donald K. Whittington, MIS manager at Michigan Sugar Co. in Saginaw, Wis. Michigan Sugar, an NCR customer since 1978, uses the System 10000 running the NCR ITX operating system.

"Migration paths are by far NCR's strongest point," said Whittington, who added that he was excited about the technology and the chance to try relational databases. Likewise, Tower user Richard Lester, vice-president of Information Services at Associated Grocers, Inc. in Seattle, said he was looking forward to "extending the capability of open systems." But Lester said he did not intend to remove the company's IBM-compatible mainframe. "We won't replace the mainframe in the glass house," he concluded, "but we will push operational functions out to relational databases."

Tech challenge

The System 3000's two top levels, the 3600 and 3700, present technological challenges. Both will use loosely coupled parallel architectures using the Intel I486 platform.

The 3600 will use more than one hundred 486s and achieve more than 4,000 million instructions per second (MIPS) performance, NCR said. The 3700 will have thousands of the processors, bus speeds in the tens of gigabytes per second — thanks to an as-yet-unannounced next generation of interconnect systems — and exceed 100,000 MIPS, NCR said.

But Wesley Melling, an analyst at Gartner Group, Inc. in Stamford, Conn., questioned whether the systems up through the 3600 would be appropriate for on-line transaction processing because the architecture has "significant single points of failure." NCR said it will work with database companies and other developers to make the System 3000 a success. Representatives from six leading database vendors pledged to support the System 3000.

NCR executives also said they will use their strategic relationship with Teradata Corp. In April, NCR acquired a 10% stake in Teradata, which has an SQL multiprocessor database management system technology.

"It'll be interesting to see how [NCR's competitors] react," concluded Jim Wegmann, a Tower user and senior vice-president of EDP and systems at Chicago's Talman Home Federal. "If they meet it like-to-like, with the same horsepower and vertical integration, the only winners will be customers."

New era at NCR

The middle and upper tiers of NCR's planned system lineup will initially reach 320 MIPS and then soar into enterprise systems, promising thousands of MIPS

CW Chart: Chuck Fletcher

EMC plans compact discs for mainframes

BY ROSEMARY HAMILTON
CW STAFF

EMC Corp. plans to introduce a mainframe disk subsystem alternative this week that packs 24G bytes of data into a cabinet smaller than the average refrigerator.

The Symmetrix product line is the company's biggest push yet for IBM's large system storage business, and so far some low-end mainframe customers who beta-tested the product give it good reviews.

"I've been impressed," said Brian Johnson, a technical consultant at Arkwright Insurance Co. in Waltham, Mass. "I've seen nothing wrong with it."

EMC is scheduled to release the 24G-byte unit on Tuesday and follow with a 4G-byte unit later this year. It plans to introduce a 256G-byte high-end model in early 1991.

The EMC offering, which the company calls a series of integrated cached disk arrays, is a departure from the current mainframe disk drive units. It loads all the subsystem elements, including controllers, disks and backup battery supplies, into one cabinet.

The basic design relies on 5¼-in. drives that store 1G byte of data each. On their own, these smaller drives cannot match the performance of today's bigger mainframe disk drives. To bring performance up to par with current offerings, the EMC unit uses a processor that provides several high-level functions and a large cache unit that is critical in getting the data to and from the processor at high speeds.

The on-unit processor can emulate an IBM disk drive environment, allowing the EMC unit to attach to a mainframe and fool the operating system into thinking it is just another 3380 or 3390, company officials said. It also provides several key mainframe drive-like functions, such as disk mirroring, which provide fault tolerance of data.

The cache unit, expandable to 4G bytes, can be loaded with large volumes of data, which stay in a ready state until called by the processor. Data can then be delivered at high-speed cache rates instead of the slower rates that would result if a search was required across many small disks.

Because of the different designs, it is difficult to compare the performance of an EMC unit with that of an IBM disk drive. EMC claims to have outdone IBM drives in its own testing. IBM, meanwhile, suggested that disk array technology such as EMC's products cannot provide the high-performance necessary in a transaction processing environment.

EMC's ***IBM mainframe-compatible drive array***

However, one apparent advantage of EMC's product is the environmental factor. The unit takes a fraction of the floor space of a mainframe drive, requires no special power supply other than an ordinary wall unit and generates far less heat.

The compact size was a major consideration to Johnson. "If you saw our computer room, you'd know how important [floor space] is," he said. "It would have been almost impossible to add another standard 3380."

Johnson has been testing a Symmetrix Model 4404, which has a capacity of 4G bytes, since last month. While he has not yet committed to it, he said the unit has held up to test runs so far. One job that typically took 45 minutes to complete with IBM drives took only six minutes with the EMC unit, he said.

The EMC device is based on the redundant array of inexpensive disks (RAID) concept, which has been gaining attention in the storage market lately; last week, NCR announced it would use RAID devices in its new systems lineup. EMC also departs from RAID by providing its own integrated cache techniques and other proprietary functions.

To date, there are no full-blown RAID products available, although IBM and most of the storage companies are working on it. EMC's product is an initial RAID implementation, and company officials said future Symmetrix releases will expand on it.

"EMC is bringing out a product that is a forerunner of what the others will do," said Paul Wolfsteater, an analyst at Gartner Group, Inc.

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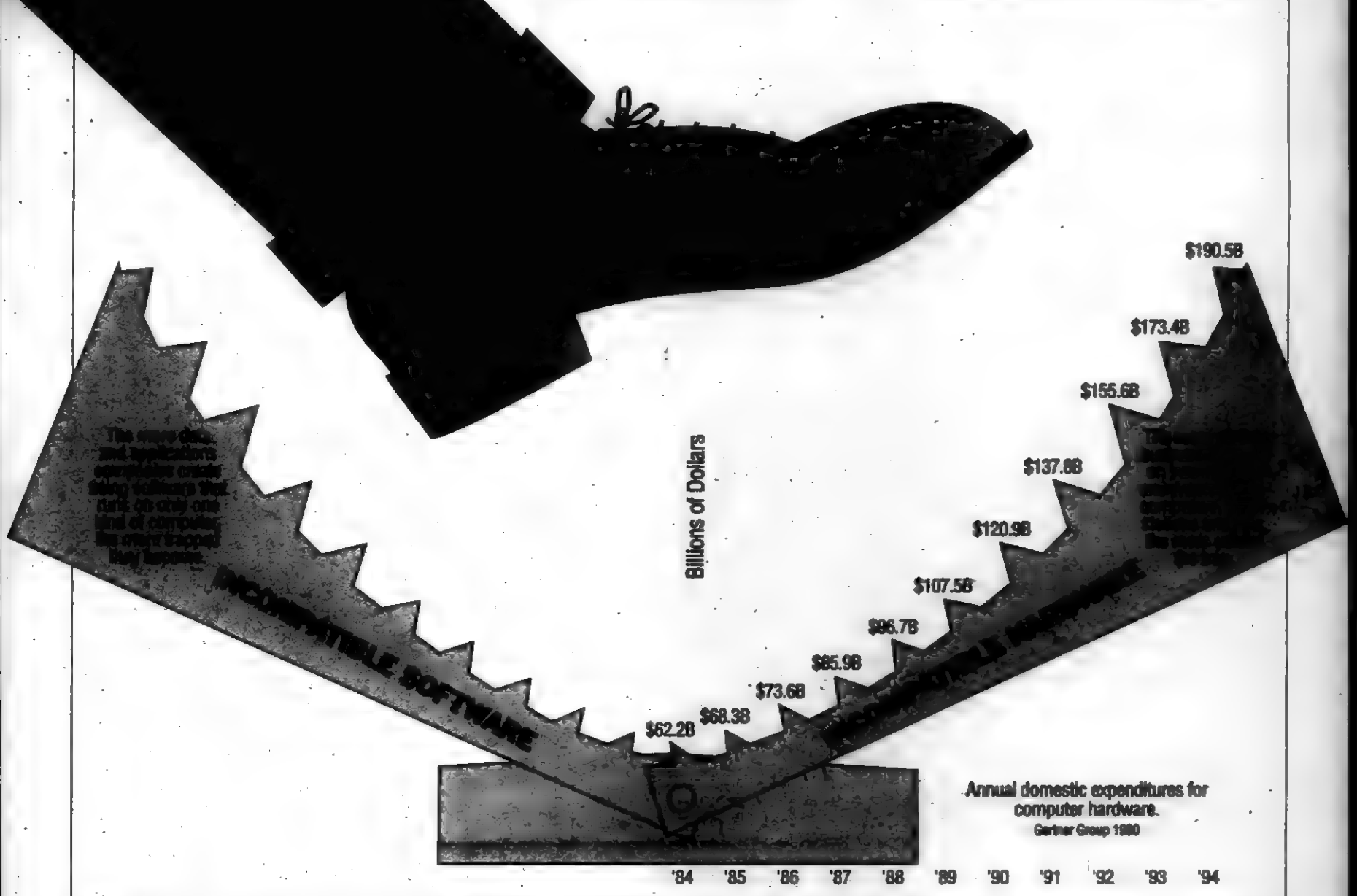

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IBM delivers on OSI promise

BY ELISABETH HORWITT
CW STAFF

NEW YORK — IBM essentially passed the OSI ball to users last week, making good on its promise to deliver the Open Systems Interconnect standard across its major systems, including OS/2 Extended Edition and OS/400.

Several members of the User Alliance for Open Systems spent time last week "trying to sort out how we are going to get these things implemented on our own systems," said David Judson, a senior technology adviser at a U.S. Air Force group.

Among IBM's OSI announcements last week were the following, all of which are said to comply with the Government OSI Profile specifications:

- OSI/Communications Subsystem for OS/2 Extended Edition, which will run on top of the OS/2 Communications Server, providing OSI-to-LU6.2 integration, IBM said. The product will be available next March for $750.
- A statement of direction for OSI Communications Subsystem for the OS/400, which will be available the third quarter of 1991.
- MVS and VM OSI/Communications Subsystem Release 1.1, which supports a direct connection to 802.3 local-area networks with support of other major LAN protocols, including Fiber Distributed Data Interface, IBM said.
- Software that is said to allow IBM's Officevision, Professional Office System and Disoss users to exchange messages with systems that comply with the OSI X.400 electronic mail standard.

"IBM is delivering on those pieces of OSI they said they would deliver [at the] big OSI presentation two years ago," said Steve York, manager of information exchange technologies at Hughes Aircraft Co.

Hughes is interested in using X.400 on its OS/2 servers as a means to interconnect various LAN-based E-mail systems directly, York said.

Not taking chances

Judson's priorities for the Air Force Manufacturing Technology Directorate's Integration Technology Division are to ensure that the new version of IBM's OSI Communications Subsystem complies with the OSI specifications defined by the Corporation for Open Systems' test suite. Such compliance would eliminate the need for a "Band-aid approach" to integrating IBM systems with the division's OSI network, he said.

In a statement of direction, IBM said it would enable an OS/2 server running the OSI Communications Subsystem to act as an OSI gateway for OS/2 workstations on a LAN. This would save users from having to implement the full OSI stack and LU6.2 on the same OS/2 system.

IBM made no commitment to enable its OS/2 or OS/400 system to act as an OSI gateway for a corporate Systems Network Architecture backbone — a boon to firms whose OSI installations are too small to justify a mainframe gateway, said Thomas Nolle, president of consulting firm CIMI Corp.

One question IBM left unanswered was the future roles OSI and LU6.2 will play in linking its systems with non-IBM hosts.

The California Legislative Data Center decided to use a homegrown LU6.2 package as the basis for an architecture to handle data exchange between its IBM and Digital Equipment Corp. systems, said Joe Papa, a systems software specialist at the center. The center could not wait for DEC and IBM to fully support OSI, Papa said.

The IBM Information Network service also announced that it has merged its European Screenmail and U.S. Expedite Mail E-mail service offerings into one X.400-compliant service that links to AT&T, General Electric Information Services, MCI Communications Corp. and U.S. Sprint Communications Co. E-mail services.

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Outsourcing

CONTINUED FROM PAGE 1

the customers," said Joe Scott, director of East Coast business development at Litton Computer Services, Inc.

At Eastman Kodak Co., whose outsourcing deals with IBM and Digital Equipment Corp. have been the talk of the industry, Vice-President and Director of Corporate IS Katherine Hudson said one software vendor is giving Kodak fits on license transfers. "Ninety-nine percent of our vendors have been just fine in allowing us to switch the license, except for one company that I won't name," she said. "I'm thinking of visiting the company president myself."

Software license transfers have always been an issue in IS shops affected by mergers and acquisitions, but the IS focus on outsourcing during the past year has brought the issue to a head.

In April, CA published a product pricing handbook for its customers to spell out this and other pricing policies (see story below).

"Historically, I think this has been a little confusing to [users]," Shepherd said. "They thought they'd *bought* the product — that's *never* true. We can never let the ownership go because the only asset we have is our software." If outright ownership of the software transferred, he said, legal intellectual property protection would be lost, "and this isn't just CA — it's true for any software company."

The issue gets stickier when the software in question is among the many products that CA has picked up in its acquisition binge of recent years. Scott said CA is seeking fees for Litton customers who want to use Litton's Cullinet Software, Inc. database and manufacturing applications.

"CA has taken a position that third parties are not able to provide use [to customers] without a new license or significant fees," Scott said. "We bought the software a long time ago, and our licenses don't specify anything about that."

Shepherd said that CA has no blanket policy with regard to "grandfathering" of license contracts for acquired products. "We're always open to negotiation," he said.

In at least one instance, a software vendor's insistence that a user buy a new six-figure license for an application caused the user to switch outsourcing vendors to Power Computing, Inc., which already held a service bureau license for that application. The user "was told initially it was no big deal to transfer the license, then the amount kept increasing until it antagonized the customer," said Rich Boswell, national sales manager at Dallas-based Power Computing. He declined to name the software vendor.

"If the fees are sizable, that could sway a decision on whether to outsource," said John Brown, MIS director at AM General in South Bend, Ind., which outsourced IS operations to Pittsburgh-based Genix Enterprises earlier this year.

Users who have outsourced said that software vendors vary widely in their responses to outsourcing situations. "Some will facilitate it, while others make you jump through all kinds of legal hoops," said Herbert Chaplin, vice-president of group IS at American Ultramar Ltd. in Tarrytown, N.Y. "These are the types of things you tend to overlook" in outsourcing decisions, he said. The firm's oil-refining and marketing unit outsourced processing to Power Computing last year.

The license transfer issue has become more acute in recent months. "Two years ago, software vendors seemed more inclined to say, 'Yes, we'll do that for you,' " said outsourcing consultant Rich Schmitt, president of Schmitt Consulting Group, Inc. in St. Louis. "Recently, it has become, 'Yes, we'll do it, but there's a lot of money involved.' "

Software vendor Legent Corp. is currently marketing management support software to IS "so you're better prepared to respond to any outsourcing initiatives," the company said. Notwithstanding that, Legent said it does not take a hard line on license transfers when one of its customers decides to outsource.

"We will lose some licenses . . . [But] in all honesty, what are you going to do?" said Legent director Mario Morino. "Outsourcing is inevitable." And, he added, "The outsourcing vendor is a huge potential client."

Price of doing business

In April, CA published a product pricing handbook to spell out pricing policies for its customers. When a CA product is transferred to a new owner, he must do the following:

- Pay a one-time transfer fee equal to the cost of a current one-year charge for use and maintenance. Industrywide, that figure is roughly 10% to 15% of the current license fee above.
- Pay all outstanding bills owed to CA for any product. "Why should we transfer a license to a company that owes us money?" asked Bryan Shepherd, CA's executive vice-president of marketing.
- Make sure that the IS shop transferring the license has also paid all outstanding invoices to CA.

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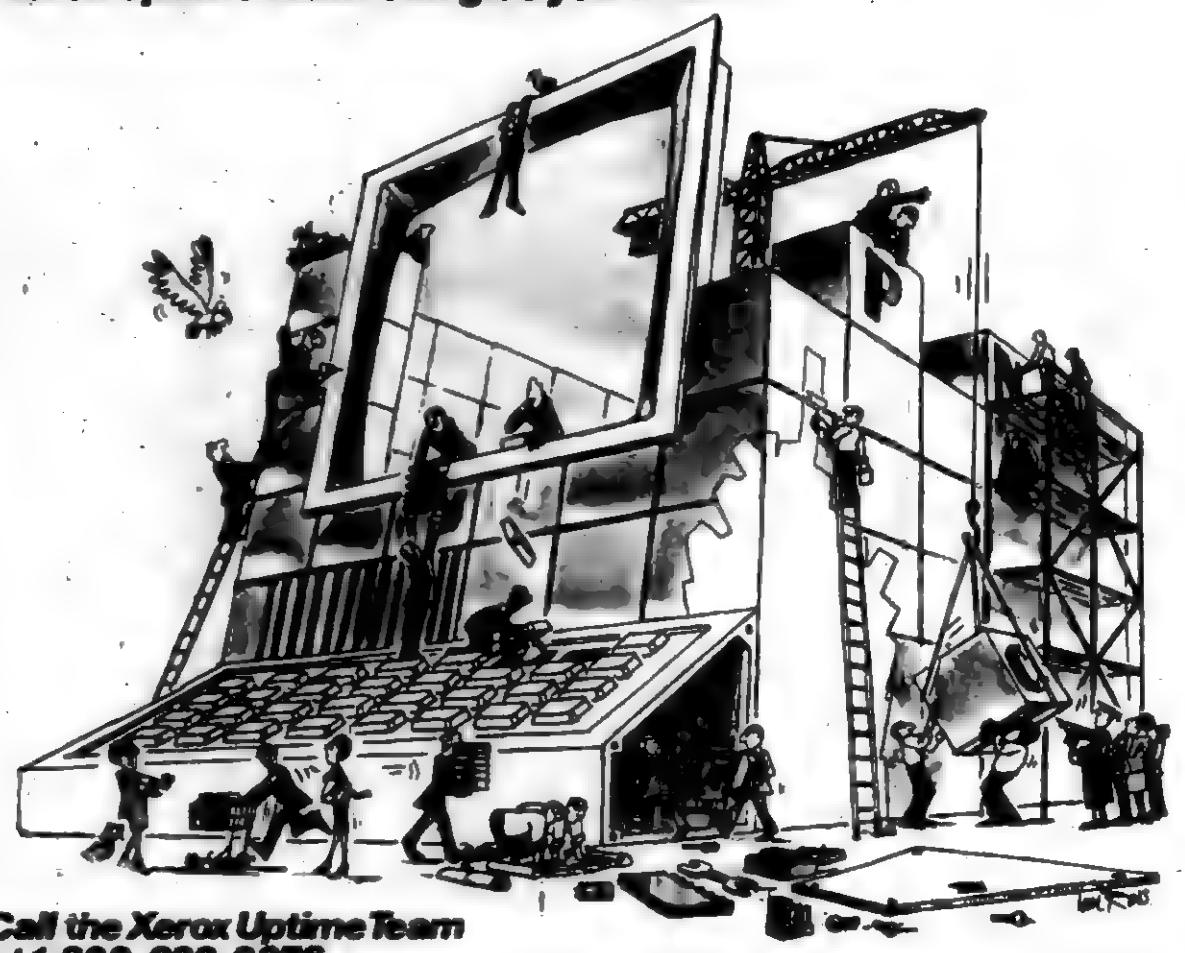

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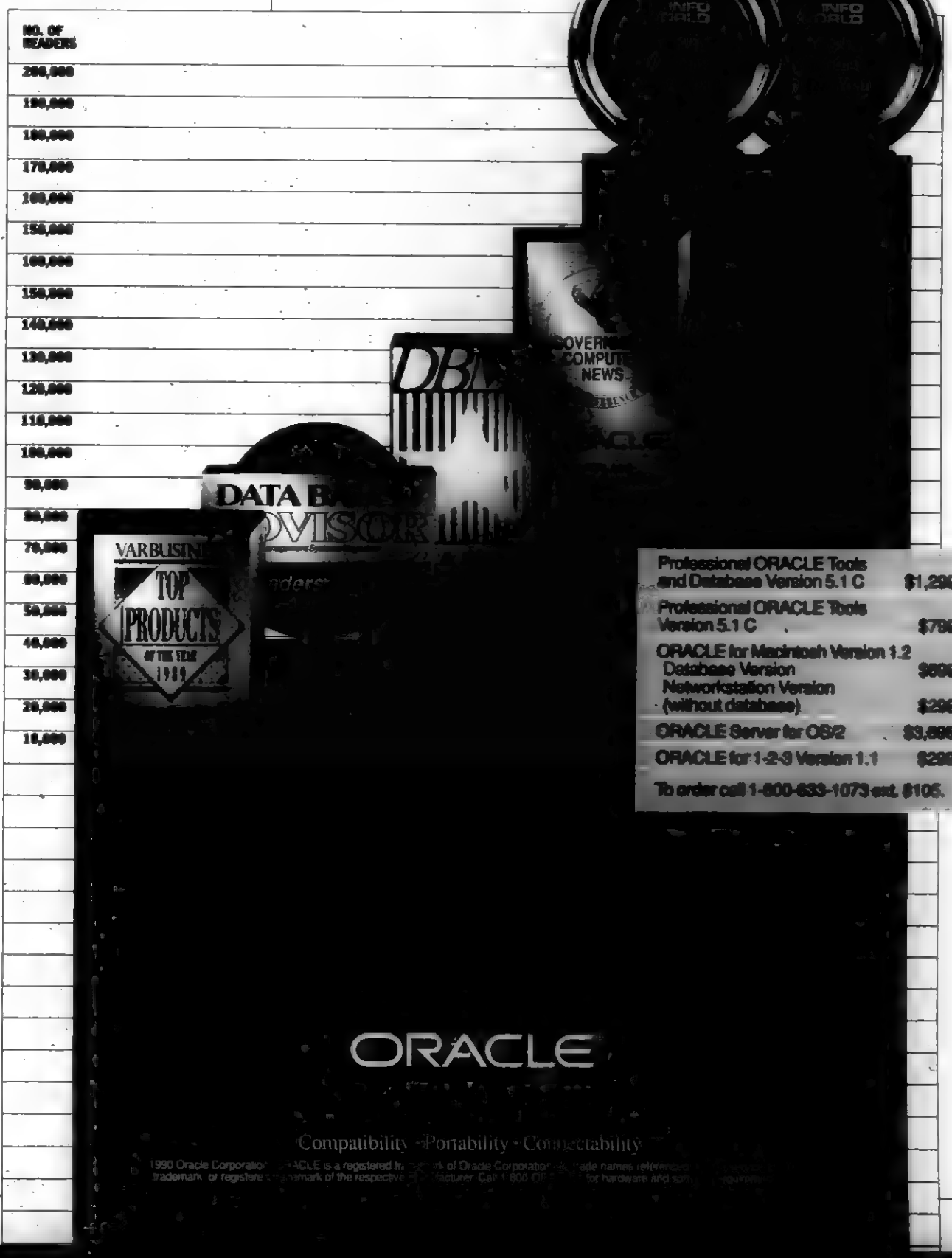

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Xerox software moves to Sun, IBM

BY J. A. SAVAGE
CW STAFF

For years, consumers have been able to obtain innovations in ease-of-use software pioneered by Xerox Corp.'s Palo Alto Research Center on computers made by Apple Computer, Inc., Hewlett-Packard Co. and Xerox itself. Last week, Xerox moved to build on its poor market share by porting its software to Sun Microsystems, Inc.'s Unix-based workstations and the IBM Personal Computer platform.

Called Globalview, the software is much the same as Xerox's product for its proprietary machines, called Viewpoint, which was developed in the early 1980s. Networking, a graphical user interface and text editing is slated to be available with the product in November.

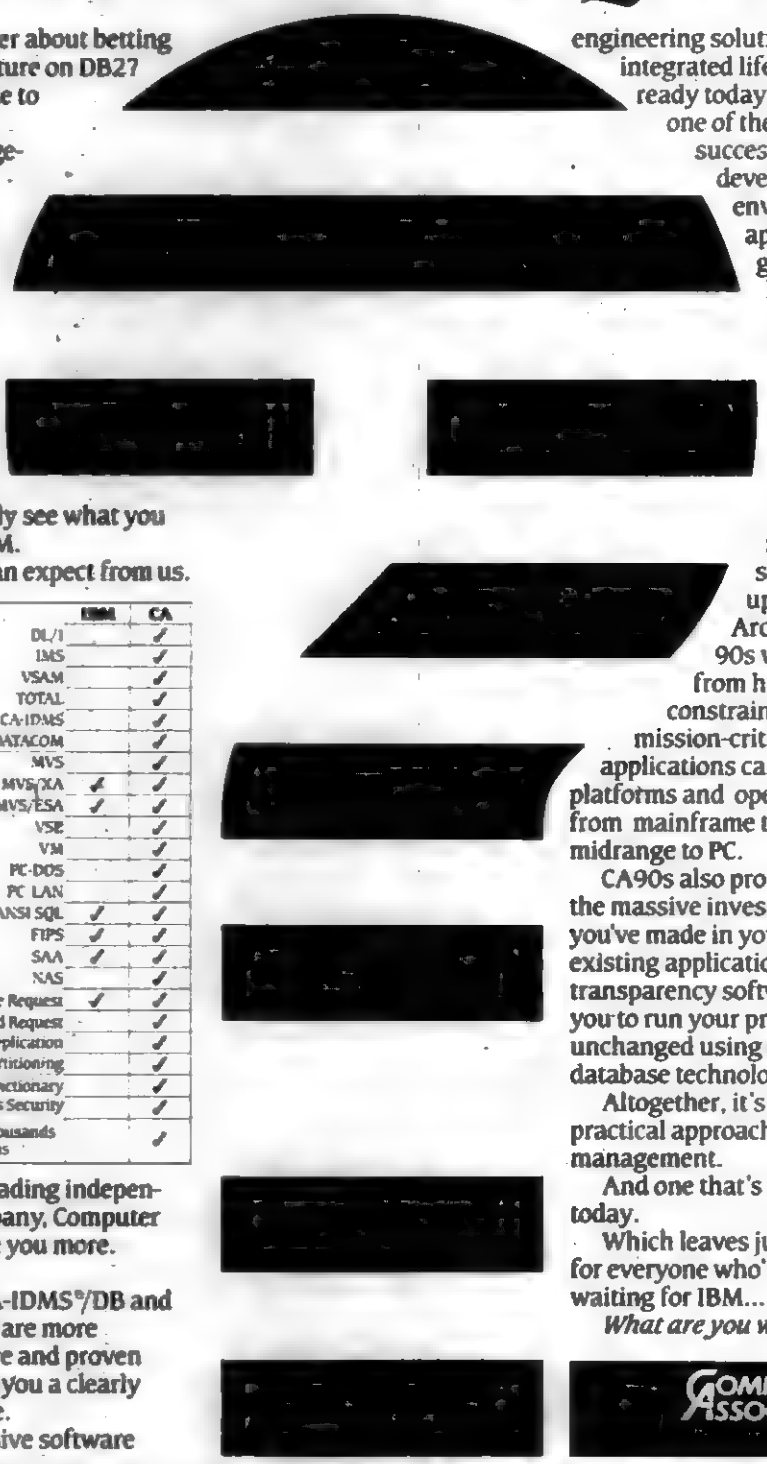
Although there are drawbacks — such as the lack of interoperability with other applications and the need to use Xerox's proprietary server for the workstations — this announcement puts Xerox in a position where other workstation firms claim to be headed in the next few years: heavily network-dependent, commercial work-group computing [CW, Sept. 17]. The software even eclipses Sun's own plans to offer similar products. "We don't believe we have anywhere near the application capability represented by [Xerox]," said Scott McNealy, Sun's chief executive officer.

In the first quarter of next year, Xerox plans to offer three major applications on its Unix systems: document search and retrieval, a manager for collaborative projects and language translation for French, German, Italian, Portuguese and Spanish. However, these applications will require either a Digital Equipment Corp. VAX host, or for translation, an IBM mainframe.

Pricing for the software on a Sun IPC workstation starts at $9,995. An add-in board for OS/2 or DOS PCs is listed at $3,995. The board works with PCs based on Intel Corp.'s 80286, 80386 and 1486 processors and includes an Ethernet connector, according to Bill Lowe, executive vice-president and president of development and manufacturing at Xerox.

While acknowledging that Xerox has good technology, Andrew Allison, editor of the "RISC Management Newsletter" in Los Altos, Calif., said it would still be a hard sell. "People are more interested in standards and interoperability than running in a whole new environment."

If DB2 Is The Answer, What The Heck Was The Question?



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	MVS/ESA	✓	✓
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	VM		✓
	PC-DOS		✓
	PC LAN		✓
STANDARDS	ANSI SQL	✓	✓
	FIPS	✓	✓
	SAA	✓	✓
	NAS		✓
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System 7.0 late — again

CUPERTINO, Calif. — Apple Computer, Inc. repeated a refrain last week that has become unpleasantly familiar to its customers: The arrival of System 7.0 will be delayed again.

Company officials nudged back the scheduled arrival time of the long-delayed operating system by as much as six months, pushing it from the end of this year to the first half of 1991.

Roger Heinen, Apple vice-president of software engineering, said the added time will increase developer feedback and allow a more complete suite of applications to be available when the software finally ships.

Apple officials added that a test version of System 7.0, which developers can begin writing applications to will be available next month.

The operating system, which controls the inner workings of the Macintosh as well as the interface, was first expected to ship last spring. That date was pushed to next month and then to the end of this year.

Heinen added that grumbling users will be well rewarded when the system arrives. "System 7.0 will shatter traditional notions of what personal computers can do," he said.

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ADVANCED TECHNOLOGY

TECH TALK

Athena transfers from MIT

■ Athena, the innovative computing environment that was developed at MIT, is expected to be up and running at two other college campuses this fall. North Carolina State University and Iowa State University have signed contracts totaling $7 million with Digital Equipment Corp. to install Athena systems software and link together hundreds of DEC workstations. Students at each campus will be able to use the Unix-based system to access files, software and electronic mail.

Let's work together

■ The National Science Foundation has handed out a total of 11 awards, worth more than $4.5 million, during the second year of its coordination theory and collaboration technology initiative. The objective of the awards is to stimulate multidisciplinary research that could eventually lead to improved understanding of human and machine coordination as well as the technology needed to support collaboration. The awards will support a number of cooperative research projects ranging from a test-bed development for scientific collaboration among a community of biologists to experimental systems for decision support in business settings.

Make way for robots

■ The First International Robot Olympics are scheduled to kick off later this week in Glasgow. In opening ceremonies, a two-wheeled robot will light a torch and carry it through the streets to a sports complex at Strathclyde University, followed by a robot parade. The robot "athletes" will compete in a variety of races (two legs, four legs, wheels and tracks), collision-avoidance tasks, wall-climbing competitions, speech communication skills and swimming events in the university pool. Yes, winners will even receive medals.

Split vote on advanced-tech groups

In the final analysis, predicting the value of new technologies may take a crystal ball

BY MICHAEL ALEXANDER
CW STAFF

A growing number of companies are counting on advanced technology groups to keep an eye on what is coming down the pike, but there is some uncertainty about what role such groups should play in information systems planning.

About half of the 75 corporations that participated in a study released early this year by the Index Group, Inc. in Cambridge, Mass., have formally established advanced technology groups, according to Sarah Kaull, associate director of Index's Prism research service. However, it is unclear from the survey how vital a role advanced technology groups play in those corporations. "Many companies were unclear what their charter is," Kaull said. "They are investigating technology that is not all that new." (See chart.)

"Advanced technology groups get a mixed review," said Norman Weizer, a senior consultant at Arthur D. Little, Inc. in Cambridge, Mass., who specializes in advanced technology forecasting. "The people in them are extremely technology-oriented, and sometimes they get on a favorite hobby horse and try to push the technology into the company. They find a neat solution and then go looking for problems."

It is increasingly important to keep an eye on what is coming down the pike for competitive reasons and be ready to integrate new technology into existing architecture as soon as it becomes commercially viable, said John Lindquist, senior IS manager of technology research at S.C. Johnson & Son, Inc. in Racine, Wis. The company set up its advanced technology group about two years ago. That group in turn advises an executive technology direction committee that ultimately decides whether to adopt a new technology.

Keeping abreast of emerging technology is an integral part of the IS function, but it does not require a dedicated individual or group to do it, several IS managers said.

"We do not have a dedicated group, but I do insist that our top-notch professionals survey new technology and periodically see whether there is an opportunity to deploy it," said Larry Cassity, vice-president of computer services at Ashland Oil, Inc. in Ashland, Ky. "My personal experience with them is that you have a difficult time bringing technology to market. You have folks dedicated to new technology, but they are not in tune with the business; therefore, it becomes an exercise unto itself."

Understanding the needs of a business unit is critical, Lindquist said. Whether the group is able to fulfill its charter is more a matter of corporate culture, he added. "In a formal organization where the culture is driven by protocols and hierarchy, it is difficult to succeed; an informal culture is more likely to succeed." The real key is to involve the business unit in new technology analysis and acquisition from the very beginning.

Linda Bleck

Large corporations with IS departments in excess of 250 members would probably benefit most from a separate technology organization, if for no other reason than to ensure that there is no duplication of effort in analyzing new technology, Cassity said.

Imaging, computer-aided software engineering, object-oriented programming and other technologies are being closely scrutinized at Ashland Oil and have moved from pilot programs into actual use, Cassity said.

The company keeps a eye on technology that appears to be about two years away from becoming commercially viable. Anything beyond that is too speculative because technology changes too rapidly, Cassity said.

Deciding what technology to explore is more a matter of intuition than a clear-cut sense of what the payoff will be in increased productivity, lower costs or any of the other usual measures, several IS managers said.

"It's a gut call," said Davis Keyes, second vice-president of marketing technologies at Protective Life Corp. in Birmingham, Ala. Keyes is a member of a group of IS executives that has been mandated to develop a three- to five-year technology plan.

"Take imaging," he said. "If you try to justify it solely on recommendations in cost savings, you're not going to do it. You can say that you anticipate an improvement in customer business, but that is going to be a gut call." If the company can shave two weeks off the time that it takes to approve an insurance policy and put it into effect, customers are probably more likely to buy, he said. What that is worth in dollar amounts "is where the crystal ball comes in."

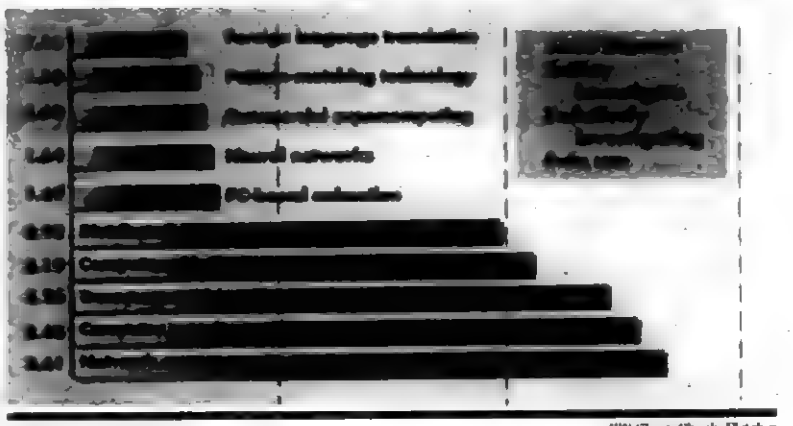
"We have several different groups that get involved in advanced technology to some degree or another," said Jeffrey Knepper, director of tax technology at Touche Ross & Co. in Washington, D.C.

Knepper is responsible for keeping an eye on emerging technology for the tax consulting practice at his firm. He said that he has counterparts in auditing, management and other practices maintained by Touche Ross. Technology that has "firmwide implications," such as local-area networks are analyzed and decided upon by an advanced technology task force.

"That particular technology is so important to the strategic future of the firm that it warranted a more formal approach," Knepper said. "It did not belong to one group to do all of the work and come up with one standard."

Looking, but not touching

Corporate interest in advanced technology is high, but active test programs are rare



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EDITORIAL

All talk, no action

We have an announcement to make.

Despite increasing competition from other computer publications as well as from the business press, *Computerworld* will become the *only* publication you will need to read to answer any and all questions related to your job as a business professional. You simply won't need another.

We'll be faster, tougher and smarter than that big business daily. We'll have all the news that's fit to print.

And we'll have it all together for you in 1½ to two years.

Wow, if we could make promises like that and find people gullible enough to believe us, we really would be as big as the big business dailies. And while a "read my lips," made-to-be-broken vow might help someone get elected president, promises and lip service shouldn't form the foundation of something as critical as mainframe buying plans.

What we're talking about is this anachronistic resurgence in one-upmanship from the mainframe vendors. What had become fairly reasonable announcement and delivery schedules are now being pushed to the point of absurdity, clothed neatly in the stock excuse of "needing to show our customers some direction."

The vendors — Amdahl, Fujistu, Hitachi and IBM — are certainly doing that. They've got their public relations departments working overtime to prove that each is the firstest with the mostest, even though at this point none of them has any significant advantage over the others in terms of what they can actually provide a customer (unless you can take "direction" to the bank, of course).

The fact is that a lot can happen between September 1990 and whenever in 1991 or 1992 the mainframes built around new architectures roll off assembly lines. Ask DEC about unforeseen glitches in producing the VAX 9000, its new mainframe thrust. Ask IBM about the problems it had with some of its 3090s. For that matter, ask any hardware vendor about the many pitfalls that can and often do widen that time chasm between the unveiling of a product and its actual bug-free delivery to customers.

You could say this relapse into the marketeering days of yesteryear was inevitable, given the increasing competition in the IBM-compatible market as shown by a weakening in IBM's market share in the past few years. But does it really serve customers in any meaningful way? Or is it more like so many of these grand architectural schemes and environments (all with catchy little names, by the way) that almost all the big vendors feel compelled to foist onto the buying public?

If market confusion is what the suppliers want to create within the user base, they seem to be doing a good job of that. Now, can they really deliver on all these promises?

We'll certainly be watching. After all, we've got this incredible charter to live up to during the next 18 to 24 months.

LETTERS TO THE EDITOR

4GL fan

In warning us all of the inherent dangers of fourth-generation languages (4GL) — "Beware the dark side of 4GLs" [CW, Aug. 27] — Jonathan Sayles may be overstating his case with respect to data management.

Our company uses the Powerhouse 4GL by Cognos, Inc., and we agree that creating machine-efficient systems is a challenge. But our data is verified by a dictionary and is arguably more reliable than if it were passed around the playing fields of third-generation languages. Our 4GL makes possible projects that we would otherwise be unable to tackle with our limited staff.

Bernard Rice
Programmer/Analyst
Star Publications
Chicago Heights, Ill.

Be the business

We were, unfortunately, not surprised with the results of your latest job satisfaction survey, "Some walls are higher than others" [CW, Sept. 10].

We agree with that issue's editorial, which stated that information systems must take the lead in attacking the frustrating, counterproductive communication problem with senior management and the user community. Specifically, the IS manager must not focus mainly on attempting to educate users about IS issues and initiatives. While this approach will bear fruit over time, why not improve communication more quickly by changing the variable you have more control over: your own behavior.

The IS manager must speak the business person's language and display return-on-investment discipline, strategic vision and the ability to build support across the organization.

How can IS managers keep their sights consistently on business goals and not on the means of achieving those goals? They can do this by talking with users and senior managers in their own language: business benefits. By emphasizing first and foremost the business objectives — improved revenue, profitability or customer service, for example, they can determine to what extent, if any, a technology can help achieve those goals. Communication vastly improves because users and executives are talking about their own areas of major concern and effort.

It is time for the IS community to recognize its true role as business people with expertise in using technology to advance business goals.

Peter S. Karp
President
Jo-Ann Osipow
Manager
Technology Value Assessment
Business Science International, Inc.
Englewood Cliffs, N.J.

Chicago blues

Regarding the Electronic Data Systems Corp. article by Ellis Booker, "EDS speeds Chicago parking ticket collection" [CW, Aug. 27], which noted EDS as the new contractor for the city of Chicago's parking system, your statement "EDS replaces Computil Corp.," needs to be clarified.

The fact that the city of Chicago's administrative procedures for handling parking tickets were old and ineffective would seem to imply that Computil was using an old system to service the contract. It was quite the contrary.

Despite the old administrative system that the city of Chicago was using, we were able to collect more revenue than any of the city's previous vendors.

Ms. Fryklund's comment that Chicago's system is about the worst of any big city is accurate. However, it has nothing to do with our services but rather the ineffective way in which the city managed its parking ticket program.

The new contract requires the vendor to manage and staff the Parking Violations Bureau for the city of Chicago. We are a service bureau that provides data processing services such as traffic processing for municipalities. IBM selected our software to bid for the Chicago contract. We chose not to bid for a facility-type management contract. Unfortunately for Computil, IBM decided to bid a price considerably higher than any of the other vendors that submitted bids, and obviously, EDS won.

I wish the city of Chicago and EDS the best of luck, but the fact remains that Computil collected more revenue than previous vendors and stabilized an antiquated, bureaucratic parking system.

Alfonso J. Izzi
President and
Chief Executive Officer
Computil Corp.
Clifton, N.J.

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IS tasks for the under-30 crowd

MICHAEL B. COHN

We computer folks think we are pretty important. But to my local supermarket, we're chopped liver. I know this because in aisle five, where they keep the magazines, I can barely find the computer stuff. We're buried at ankle level, somewhere between the business stuff and the off-road-four-wheeler stuff. Even worse, we're outnumbered by pro wrestling magazines three to one.

But pro wrestling is not the problem. The problem is women's magazines. Supermarkets carry rows and rows of women's magazines, leaving just half a row for teen magazines, and practically nil for news from Silicon Valley.

Now I'm not complaining about this. Nor am I making some sexist argument, especially while my wife is in charge of our checkbook. But the bottom line is, if you have something important to say, you probably should say it in a women's magazine.

That leaves me in a bit of a jam. I am constantly rejected by women's magazines. They want pieces on health. Careers. Marriage. They do not think relational databases are funny. I've tried to work within their format. I've submitted articles like "Referential integrity on 300 calories a day." Still no takers.

I was not bitter about this until recently, when my cubicle mate pinned up an article from a women's magazine titled "30 things women should do before 30." The list was loaded with acts of daring and romance, such as "learn to skydive" and "get a foot massage from a very gorgeous man."

There were also some fairly cosmopolitan travel goals, career goals, family goals and athletic goals. For anyone to have time for even half the stuff, the foot massage would have to be pretty quick.

So here's my chance to get even. How about "30 things IS-ers should do before 30"? Of course, we probably can't squeeze in all 30 things, either. So let's settle for a dozen, in case a meeting or two runs over.

1. Achieve the impossible. Go to Comdex in Las Vegas and have a hotel clerk actually find your room reservation.

2. Be brave and test the waters. Have lunch with a headhunter, casually mention that you're no longer "technically active" and still, somehow, convince him to pick up the check.

Arthur Matson

3. Get promoted the hard way. Earn it by fixing bugs 60 hours a week. Rise into management, move into your own office and learn what it's like to handle people problems 40 hours a week — while still fixing bugs 60 hours a week.

4. Stand up to the directors of a big, important company. Walk into a project meeting and proclaim, "No! It's too late! I will not change the specs!"

5. Pack up your desk from a big, important company.

6. At least once, "go by the book." Start with a structured diagram. Then draw a flow chart for each major routine. Pseudo-code the whole program, and conduct a structured walkthrough. Code it all (with no GO TOs), attend a code inspection, develop unit test scenarios, stress test every possible logic path and keep a log of all test results. To top it off, finish the thing as close to schedule as possible — or at least a few days before your retirement luncheon.

7. Be a young entrepreneur. Start a PC venture in your garage, build it into a $3 billion-per-year mega-corporation, fall prey to a ruthless internal coup and somehow still find time for JV tennis and the Glee Club.

8. Pay your dues as an IS consultant. Put in three years with the Big Eight in about six months.

9. Set aside uninterrupted time to learn the intricacies of the system — like 48 hours straight, trying to get month-end processing out the door.

10. Appreciate the stress and challenge of working the help desk. Man the phones for at least a week or until you become the "next available representative" — whichever comes first.

11. Experience the satisfaction of finishing a four-year project. Don't tell anyone that it was supposed to be a four-month project.

12. Solve the most puzzling problem that faces IS today: ■ the PC on your desk has the same power as the computer that took up a whole floor 30 years ago, how come everybody in your department has a cubicle the size of a medicine chest?

Cohn is trying to be a computer salesman in Atlanta.

Universal products: Key to functional integration

PHIL CIOLFI

Many in our industry have pronounced 1990 as the year of integration. Will integration become reality in 1990? Not if the prerequisite for integration is to adopt a standard.

All over the world, computer users enter and re-enter the same information into multiple computer systems. The widespread incompatibility of computer systems and applications software results in a terrible waste of time, poor utilization of human resources and other unnecessary costs.

Conventional wisdom tells us that by adopting a single standard, integration is possible. Unfortunately, just the opposite may be true.

Yes, users can have compatibility across hardware platforms and software applications without needing to radically change the configurations of their existing systems. Now, however, the computer industry is faced with new challenges that will drive standards beyond compatibility at an electronic level to adding value at a strategic level.

In this "new and improved" age, businesses are striving to increase productivity by maximizing the functionality of their computer systems. Implementing a new computer system or augmenting a current system with task-oriented software can provide companies with a significant competitive edge.

In addition, the move toward globalization has created a desire for computing environments to exceed the borders of their organizations. Businesses must be able to share vital information with strategic allies worldwide. In other words, users need functional integration.

Ironically, the existence of multiple standards and the ever-apparent lack of cohesion among standards propagators have caused confusion in the user community and may ultimately become barriers to achieving advanced functionality. What's more, waiting for a standards body or consortium's agreement to adopt one particular standard can cause painful headaches for systems integrators.

The solution to functional integration, therefore, is to create products that are *universal*, not just standard. What's the difference? Universal products allow unrestrained flow of information, whereas standards, by definition, are restrictive.

Standards create a framework in which manufacturers can develop products that achieve varying degrees of compatibility. This allows users to procure new compatible technologies and manufacturers to market to a large user base.

On the other hand, manufacturers are forced to conform to accepted standards during product development — an arrangement that can prevent true state-of-the-art products from ever reaching the marketplace. Worse yet, the alternative to conformity is the introduction to the industry of yet another standard. Unfortunately, both scenarios prevent manufacturers from creating new options and end users from choosing appropriate technology.

Universal products are the answer to the integration needs of the user community. Products in this category are defined as unrestrained because they integrate disparate applications and computing systems without conforming to standards. They also add value by allowing end users to implement their choice of hardware and software, regardless of host requirements.

In addition, they permit manufacturers to utilize innovative technology because it can be integrated into any current user environment. All these elements result in functional integration.

THE SOLUTION TO functional integration, therefore, is to create products that are *universal*, not just standard.

If a high level of functionality is achieved, what is declared an industry standard is of minimal interest to the users.

This year, rather than issue a call for a particular integration standard, we should call for products that are universal: i.e., interfaces in modular form designed to link new and existing applications. Defined as Application Interface Software (AIS), these products create a universal environment by linking all applications and systems together regardless of standards.

AIS is a new software category that embraces the concept of universality. It is positioned to address the marketing goals of the manufacturer and the functionality issues of the end user. Using AIS, manufacturers can develop revolutionary, unique stand-alone products that can be integrated across varying platforms.

AIS bridges various applications with an interface program that is built using a simple, macro-like language. This language controls the information transfer. Integration is performed as it captures, interprets, packages and delivers information from one application to another.

Using AIS with front-end products, developers are free to create innovative, integrated applications. Existing applications that already comply with a standard can also be integrated with AIS. Ultimately, this capability will allow users to more effectively employ anticipated standard applications such as Systems Application Architecture-compliant software and the derivative of the Open Software Foundation.

AIS products separate the innovative technology from the vehicle that makes the technology transferable. That way, the manufacturer's product becomes universal without the restrictions imposed by standards. Manufacturers benefit by selling more products, and users benefit by being able to integrate desirable applications and systems that will generate increased productivity.

Growth in the computer business is fostered by innovation. Let's not ask manufacturers to write a symphony, then tell them they have to write it in the key of C. Universal software opens the door to creative development.

Ciolfi is president and founder of Selecterm, a terminal leasing and software company based in Danvers, Mass.

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COMMENTARY

Rosemary Hamilton

Sorting the fallout

IBM's Enterprise System/9000 announcement was one of the biggest events in the company's history and consisted of a few hundred new products and prices.

What's the value of this? The sheer size of it certainly made the point that IBM was taking a big step in the large systems market. It gave customers a boost to think that IBM had such a comprehensive plan.

But there is a downside for customers, too. Throughout the last few weeks, customers have been sorting through huge stacks of letters and talking to their sales representatives.

The goal here is to figure out exactly what has been announced — never mind what it means. As simple a goal as that may sound, it has not been easy.

Some users said it will take at least a month before they can begin putting together a plan of action. Others initially got inaccurate information, either by word of mouth or just by missing pieces of the announcement. One customer contacted after the announcement was upset because, as he understood things, the 9370s were shut out from the ES/9000 family. Another believed that the ES/9000 Model 720, which is based on a 3090 600J engine, would feature the new processor technology, which has commonly been referred to as Summit.

Continued on page 33

Auto club maps imaging route

ON SITE

BY JEAN S. BOZMAN
CW STAFF

COSTA MESA, Calif. — Southern California is well known for its streams of cars winding along interstates and jamming city freeways, traveling in all directions under the bright California sun. Not as well known are the mountains of paperwork these vehicles generate in the form of insurance policies and accident claims.

That is something the $1 billion Auto Club of Southern California knows all too well, since it holds 600,000 policies for 1 million cars owned by its 3.6 million members. Each day, there are 33,000 more pieces of paper to file at this American Automobile Association affiliate, one of the nation's three largest auto clubs.

There is a light at the end of this traffic tunnel, though. About 18 months ago, the group decided to deploy IBM's Imageplus electronic imaging storage and retrieval system. The club's new Image Capture Optical Network (ICON) uses an IBM 3090 mainframe as a giant file server. "This is a place where centralized processing really does make sense," said C.L. Murray, group manager of data processing. "All the information has to be available to all the offices."

Auto Club's Murray *expects to save $2 million per year with imaging*

For all the storage problems they cause, the 45 million pieces of paper in active files and 75 million pieces in inactive files cannot be tucked away and forgotten. They must be shared with the club's 80 branch offices in 13 counties. Under the old paper-based system, headquarters employees had to access the master paper files. However, since the master file could not leave headquarters, the document had to be photocopied or sent through electronic mail to one of 3,500 IBM 3270 terminals scattered throughout the organization.

Dozens of Bell & Howell scanners convert paper documents into numbered electronic files. An index is then stored in IBM's IMS database. For the sake of end users, these computerized folders can be opened up on-screen and read like a paper file.

"You want to keep track of documents in a file folder, just like you would do it manually," Murray said. "The difference now is that the work flow is electronic rather than mechanical."

Scanned document images will be staged through active disk-drive memory for eight to 10 days. The final resting place for documents will be a set of 2G-byte optical platters that can be archived on racks, dramatically reducing the need for shelf space. ICON's optical drive, also called a "jukebox" because of the way it stores optical discs, is manufactured by Filenet Corp., also in Costa Mesa, and is resold to customers by IBM.

Imageplus is costly to implement, largely because it relies on high-end mainframe horsepower

Continued on page 33

Third parties add AS/400 backup options

BY MARYFRAN JOHNSON
CW STAFF

Storage and tape backup options for IBM's midrange Application System/400 recently broadened with "intelligent" backup tape systems from American International Devices, Inc. and a new disk drive from IPL Systems, Inc.

American International last week unveiled a tape system and tape array using reduced instruction set computing (RISC) processors — similar to those in IBM's RISC System/6000 workstation and server line — for diagnostics and other functions, such as unattended backup and tape quality testing.

The AI/T490 Intelligent Tape System is a ½-in. cartridge system that is compatible with the IBM 3480/3490 products and priced at $47,600 for a 1.4G-byte model.

Its data transfer rate of 3M byte/sec. is the same as IBM's 3490 tape drive.

American International's single-drive model has a 200M-byte capacity, while the dual-drive model has 400M bytes. Either system can be enhanced with one or two automatic cartridge stack loaders, which hold up to seven 200M-byte cartridges each, for a total system capacity of 2.8G bytes of unattended backup.

Also introduced was the AI/T366 Intelligent Tape Array, which contains three 8mm drives operating as one logical drive at a combined transfer rate of 716K byte/sec. It provides 6.6G bytes of unattended backup.

IPL Systems' officials announced the 7636 Disk Array, a 1.8G-byte disk array for IBM AS/400 models B30 to B70.

Priced at $15,000, $22,800 and $30,600, the three IPL models feature IBM-manufactured disks and are available immediately in rack-mounted and tabletop configurations.

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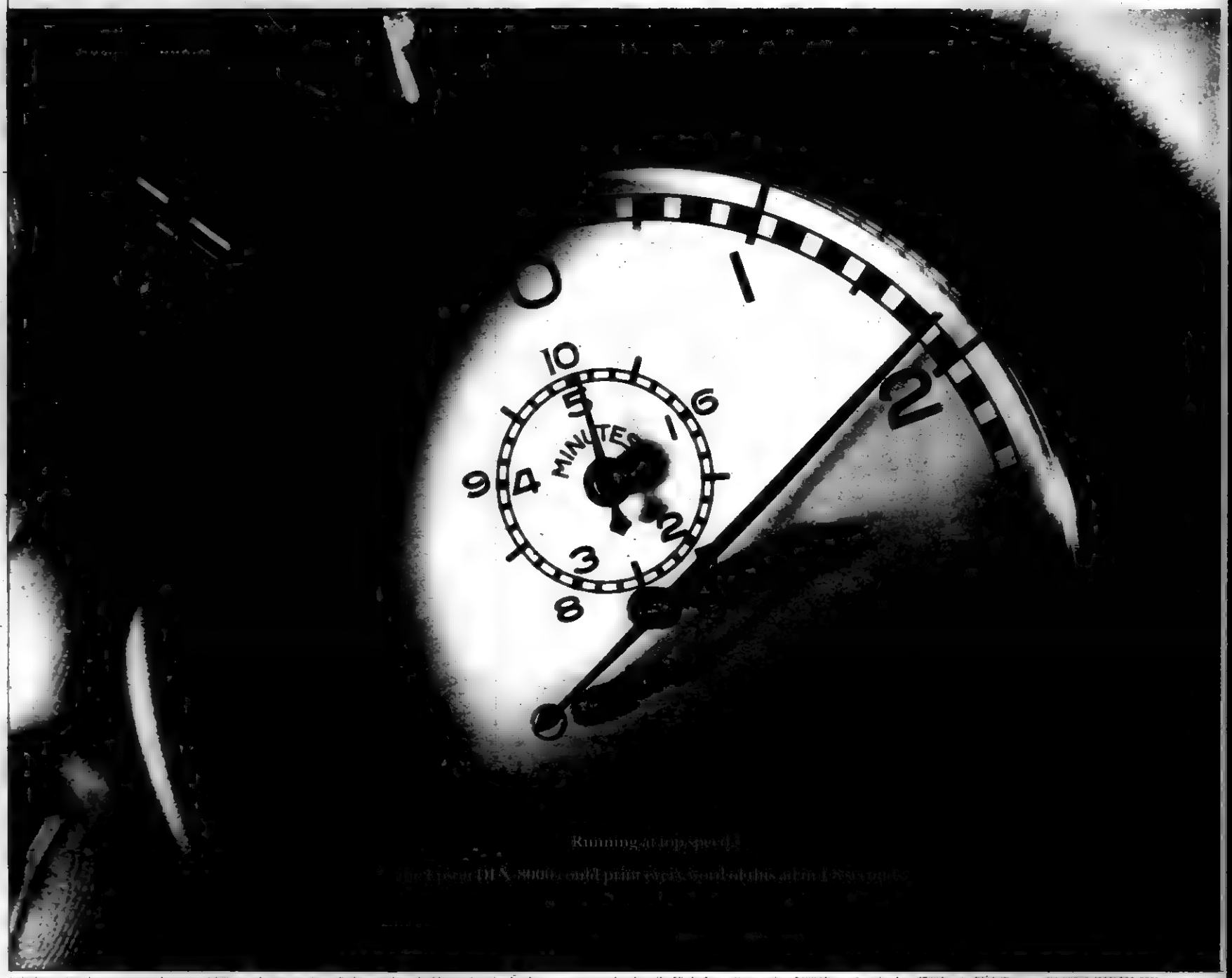

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A Comparison Chart of the Major Cooperative Processing Software Products:

FUNCTIONS:	SUPER-LINK®	Easel™	Mozart™	Arbiter®	IBM's HLLAPI™	IBM'S APPC™
Processing Topologies Supported						
Peer-to-Peer Processing	✓			✓		✓
Existing terminal-based systems	✓	✓	✓		✓	
Mixed Peer-to-Peer and existing systems	✓		✓			
Application integrity/Software Distribution	✓		—			
SAA/CUA Interface compatibility	✓	✓	—			
Workstation Environments Supported						
PC DOS	✓	✓	✓	✓	✓	✓
OS/2	✓	✓	✓	✓	✓	✓
PC DOS to OS/2 application compatibility	✓		?			
LAN Server for shared applications and data	✓		?			
Multiple transaction servers on a LAN	✓					
Development Environment Comparison						
Object orientation	✓	—				
Dictionary and documentation	✓					
Panel/Form painter for creation/maintenance	✓	✓	—			
3270 screen capture: picture and attributes	✓					
CASE Application Generation	✓	✓				
Intelligent (language-sensitive) editor	✓					
System and user-defined reusable code templates	✓					
Integrated compile/test/debug	✓	✓				
Execution time source debugging	✓	—				
All development tools for DOS available in DOS*	✓		✓			
Objects Supported						
CUA display images	✓	✓				
CUA dialog within display object	✓					
Validation within display object	✓					
Help processing	✓					
Error processing	✓					
Text window interactions	✓	—				
Business graphics	✓	✓				
3270 definition	✓					
Interactions with 3270	✓					
Interactions with Peer-to-Peer	✓					
"Logon" Scripts	✓					
Application integrity/Software Distribution	✓					
Local Data Access						
Indexed files	✓		✓			
dBase	✓		✓			
Flat Files (random access)	✓					
Flat Files (sequential access)	✓	✓	✓			
Multiple read/write to files on LAN Servers	✓					
High Level Functions Directly Available in the Language						
Field-level context sensitive help	✓		✓			
Optional user learning mode	✓					
Display and selection from:						
Indexed files	✓		✓			
Sequential files	✓	✓	✓			
In-memory lists	✓	✓	✓			
Menu display and selection	✓		✓			
Determining 3270 screen identification	✓		✓			
Read/write to 3270 in a single command	✓					
Read/write to 3270 one field at a time	✓	✓	✓			
Determine dynamic 3270 attribute changes	✓					
Embedded user assistance (pop-up selection lists)	✓					
Data editing/validation:						
Data type mark checking	✓		✓			
Single range limit check	✓		✓			
Field/data driven range limit check	✓					
Date formatting/validation	✓		✓			
Validation against local and LAN files	✓					
Required fields	✓		✓			
"Must Fill" fields	✓					
Zero not valid fields	✓		✓			
Peer to Peer Host Environments Supported						
MVS-CICS	✓			✓		✓
MVS-IDMS/DC	✓					
MVS/TSO	✓					
DOS/VSE-CICS	✓			✓		
VM/CMS	✓			✓		✓
DEC VAX/VMS	✓					
Software Distribution Host Environments Supported						
MVS-CICS	✓		✓			
MVS-IDMS/DC	✓					
MVS/TSO	✓					
DOS/VSE-CICS	✓					
VM/CMS	✓					
DEC VAX/VMS	✓					

Every effort to present an accurate chart has been made, however no guarantee can be made (1/2/90). Super-Link® is a registered trademark of Multi Soft, Inc., Lawrenceville, NJ. Mozart™ is a trademark of Aspen Research. Easel™ is a trademark of Interactive Images, Inc. Arbiter® is a registered trademark of Tangram Systems.

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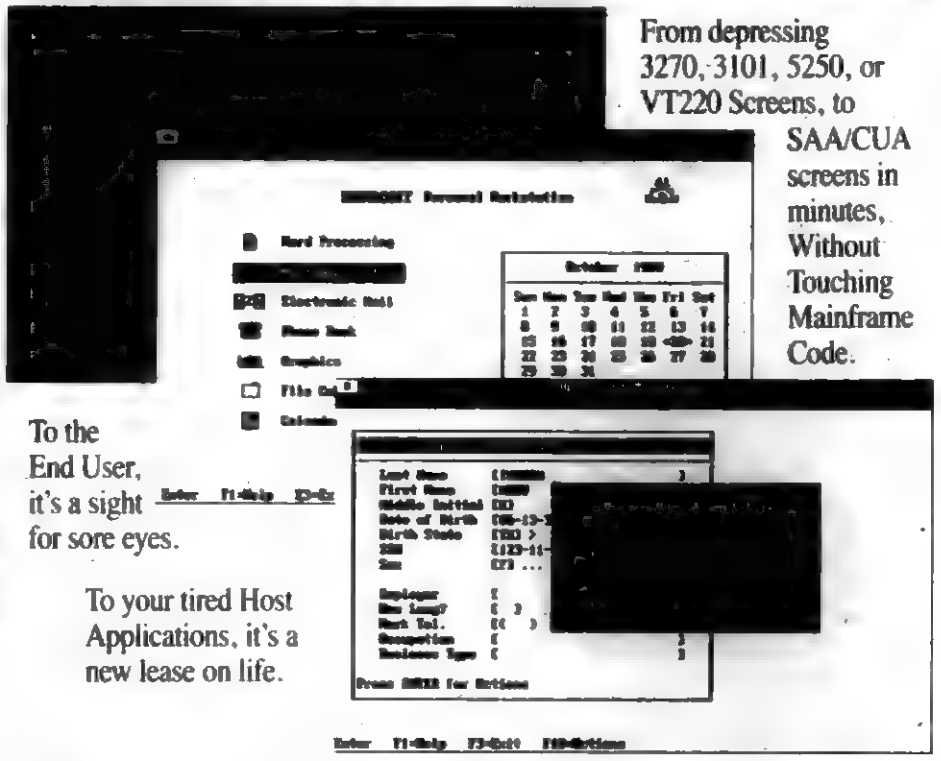

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Pittsburgh: Bullish on IS future

ON SITE

BY SALLY CUSACK
CW STAFF

PITTSBURGH — Once enveloped by smokestacks and factories, Pittsburgh is now striving to be known for its universities, sporting events, beautiful parks and world-class museums. Behind its new cultural facade, the city depends on an intricate web of hardware and software to maintain its municipal departments and public facilities.

Pittsburgh values *information technology*

The political climate often affects decision-making in the public sector, and "each municipality has its own peculiarities and requirements with reference to applications and software," observed Wendy S. Bell, assistant manager at City Information Systems. "We're fortunate, however, as we have a city administration that values the use of information technology." During the last three years, the city has aggressively supported the move toward end-user computing by approving more purchases of personal computers and office systems.

To integrate its 15 separate municipal divisions, Pittsburgh depends on a Bull HN Information Systems, Inc. Bull 8000 running under the Gcos8 Release SR3000 operating environment. The dual-processor mainframe communicates with 15 Bull DPS6 minicomputers scattered throughout the city, servicing some 2,000 end users on a daily basis over direct and twisted-pair cables for local lines. Bell estimated that there are more than 200 PCs connected to various DPS6s and indicated that the city is working to link up a stand-alone Unisys Corp. machine currently being used as a vehicle fleet management system.

A Bull customer for more than a decade, Ed Walkowski, manager at City Information Systems, said he feels that a single vendor strategy creates an easier environment in which to develop software and implement communications. He said he also feels confident that Bull's efforts in open systems integration will allow the city's IS to bring in other vendors.

Most of the city's applications are written in-house, especially at the mainframe level. Much of it is written with an eye toward doing work from remote locations via the network. There are more than 40 applications on the mainframe, including packages for cash management, refuse truck routing, traffic court and ticketing, pension and personnel and payroll functions. Pittsburgh also utilizes Bull's Office One Plus for electronic mail communications on a citywide basis, and the service is invaluable, Walkowski said.

"We're starting to develop applications based on E-mail, particularly in the area of official documentation for legislative correspondence, and the system has dramatically reduced our hard-copy interoffice communications," he said.

Walkowski added that the E-mail software resides on each minicomputer and his department is busy linking the mid-ranges together — a joint effort between in-house staff and Bull technicians. "The HDLC network was basically in place," he noted, "[so] it's more a matter of assigning name nodes on the Datanets and doing some software work on each Level 6."

The different divisions most frequently access the time collection module portion of the personnel and payroll system, Walkowski said. Most users also take advantage of office automation applications running on the individual departmental computers. The 8000 processes each request for information via the Datanet front-end communications processor and uses a fourth-generation language compiler to generate reports. The city currently runs Bull's DM4TP hierarchical database, which allows the minicomputers to function in on-line, terminal emulation mode to access all production databases.

Over the years, City Information Systems has recruited employees from other departments throughout the city in order to "help us move forward and meet our customer needs," Walkowski said. Hearkening back to his early days at the data center, he recalled that the structure was then "people-dependent." He observed that although data processing staff numbers have remained static during the past 20 years, productivity has dramatically increased. "We're always looking at technology to improve the work force," he said.

Imaging and micrographics booming

BY ELLIS BOOKER
CW STAFF

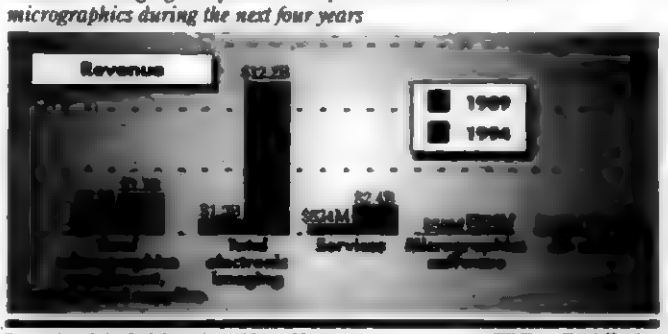
The imaging and micrographics marketplace was worth $4.3 billion last year and will grow at a compound annual rate of 34% during the next five years, said a recent survey by the Association for Information and Image Management (AIIM).

In addition to surveying 96 of its trade members, Silver Spring, Md.-based AIIM approached 726 end-user companies. These users, the study reported, currently plan to spend about equal amounts on micrographics and electronic imaging.

The users also expressed concern over what they perceive as impediments to imaging today. The relatively high cost of electronic imaging remained an issue for these users. Another concern was the lack of standardization among vendors and the need for applications beyond storage and retrieval. Users also called for greater interaction among various imaging and micrographic technologies.

Zoom time

Electronic imaging is expected to surpass and then overwhelm micrographics during the next four years



Source: Association for Information and Image Management — CW Chart: Chuck Fletcher

In the study, entitled "Information and Image Management: The State of the Industry, 1990," AIIM trade members reported revenues of $1.2 billion in electronic imaging and $2.3 billion from micrographics systems. The remaining revenues included $634 million for image management services and $112 million in miscellaneous sales.

Revenue grew 28% over last year, the study stated, noting that "the adoption of electronic imaging, in particular, will be more cautious in 1990 through 1992, then increase significantly in later years."

Overall, the research projects worldwide information- and image-management revenue to climb to nearly $20 billion by 1994. Three years ago, a Coopers & Lybrand study commissioned by AIIM predicted the market would grow to $6.5 billion by 1996 [CW, March 30, 1987]. The current report was produced by Temple, Barker and Sloane, Inc.

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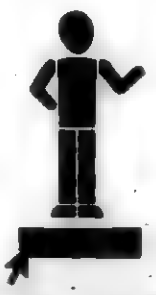

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*PC WEEK, May 7, 1990. **Direct LocalTalk connections dependent on NetWare 386 NLM due Fall, 1990. Macintosh connection achieved today via standard bridges.

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Beacon extends VSAM functions

BY MAURA J. HARRINGTON
CW STAFF

BOSTON — Beacon Software International recently introduced its first software product designed to give added functionality to IBM's VSAM data management system.

CICS Connection allows multiple programs to update the same VSAM file and provides simultaneous on-line and batch access, said Beacon President and Chief Executive Officer Robert Mushinski.

CICS Connection is able to do this, he added, by centralizing the batch and on-line I/O requests through VSAM and giving total control of I/O activity of both batch and on-line programs to CICS, thus allowing both types of programs to update the same VSAM.

Under VSAM, the batch program would normally have to own the file rather than let CICS control the process — as CICS does for on-line programs by keeping track of the I/O activity for each file, Mushinski said.

Other features in CICS Connection include the ability of the user to control the number of simultaneous requests sent to VSAM and the time increments in which they are sent, Mushinski said.

"[CICS Connection] does essentially the same thing [as a database management system] in terms of concurrency capabilities and is an alternative for users who don't have the time or money to integrate a database management system into their computer system," Muchinski said.

The product can also act as a stopgap measure to allow both on-line and batch programs to update the same VSAM file while a DBMS is being developed.

CICS Connection is available at an introductory price of $45,000 per site license.

Fujitsu adds fault-tolerant CPU

BY LORI VALIGRA
IDG NEWS SERVICE

TOKYO — In its third major product announcement in less than a month, Fujitsu Ltd. recently ventured further into multivendor computer environments and international markets with a new fault-tolerant communications processor that supports a variety of communications protocols, including IBM's Systems Network Architecture (SNA).

Fujitsu expects to sell 2,000 of the Sure System 2000s in the first three years of sales — 1,500 to the domestic market and another 500 to multivendor system sites overseas. That underscores Fujitsu's international market positioning, which started in earnest during the past year or so.

Earlier, the company introduced a version of AT&T's Unix System V for its supercomputers and M series mainframes that will enable Fujitsu to sell its computers more easily overseas. Then it brought out a super fast mainframe series that will compete with IBM's Enterprise System/9000 mainframes.

Fujitsu has set up an expansive working environment for its communications processor. It supports such standard protocols as SNA, Open Systems Interconnect, Transmission Control Protocol/Internet Protocol, Fujitsu Network Architecture (a variation on IBM's Systems Application Architecture) and the Japan Chainstore Association network.

The System 2000 is aimed at customers in the global money market, automatic banking services and credit-card cashing services that need all-day operation and the ability to upgrade their systems during operation. It also eliminates the need to use an M series mainframe as a hot backup machine.

The product is the first communications processor to be introduced within Fujitsu's Multienvironment Information System Solution from under the Domain Concept architecture umbrella introduced with last week's high-end mainframes. The System 2000 is currently available in five models ranging from two- to six-processor modules with monthly hardware rental fees ranging from $9,000 to $19,667. The SXO operating system costs $1,537 per month.

Lori Valigra is the Tokyo bureau chief for the IDG News Service.

Imaging

CONTINUED FROM PAGE 25

and large disk drives to make the system hum. ICON has already cost $3 million for the initial investment in equipment and software, which is a significant part of the club's annual IS budget of more than $20 million.

However, the payoff may not be far off. "If we didn't expect to be saving $2 million a year by 1993," Murray said, "we wouldn't be doing it."

ICON will use one-fourth the capacity of the club's IBM 3090 Model 200 — soon to be upgraded to a Model 400 — and one-third of its 120G bytes of hard-disk capacity. "This is a very data-intensive technology that's redefining the way we do capacity planning," said Frank Bereznay, the club's manager of technical services. Imageplus users must have MVS/ESA, since the program uses the PR/SM memory-allocation facility and the Systems Managed Storage facility.

Architecturally, ICON is a kind of client/server application, one in which the "server" is the mainframe and the "client" is an IBM Personal System/2 Model 55, specially outfitted with compression/decompression cards that reduce the 467K bytes of data on a scanned document to 80K bytes per page. The PS/2 workstations, priced at $8,500 each, use oversized display monitors to show the forms' fine print.

The club started writing applications for the ICON system in 1989 and was one of the first nine sites to implement Imageplus on an early support program from IBM. A small-scale production test of ICON, using just 5,000 club member accounts, began in February. A full-blown production system is scheduled to come on-line in December.

The December switch coincides with IBM's shipment of Imageplus Version 2.0, announced on Sept. 5.

Version 2.0 reportedly consolidates all image storage in IBM's DB2 relational database, including support for the indexing of file folders. New application programming interfaces will allow users to tie existing MVS/ESA applications into the Imageplus system, an IBM spokeswoman said. Support for storage of color images will also be shipped in December, IBM said.

Hamilton

CONTINUED FROM PAGE 25

These are just the basics of the announcement. Never mind the challenge presented by all those other customer letters — the ones not mentioned on announcement day — such as a cryptic note concerning price cuts on selected memory features for 3090s.

It is a difficult task for customers to get an understanding of this package, and IBM needs to make an extra effort to provide information as clearly as possible. However, at times it has seemed that IBM overwhelmed even itself with the volume of product information it released.

Take the matter of mainframe upgrades. At the IBM ES/9000 announcement in early September, an IBM executive mentioned 3090J model upgrade price breaks for 3090 base, E and S model users. That made sense. It seems obvious that IBM would want to move users to the new platform or up the 3090 line as soon as possible.

But when another executive was asked about the price breaks a week later, he insisted that no such policy existed.

A follow-up conversation with an IBM spokesman corrected the second executive's remarks. It turns out that there have been upgrade incentive policies in place, and they will continue to be available until the end of this month. The policies vary, but one example is a plan that allows a low-end 3090E user to upgrade to a J model in two steps at the price of a one-step upgrade, which is typically less expensive.

In between these conversations, another item came up that truly confused matters. It seems IBM also issued a customer letter on Sept. 5 for price increases on 3090 model upgrades to J processors. When an IBM spokesman was asked about this, he said he was not familiar with this particular customer letter.

So, what do we learn here? That IBM executives are human, too, and that they are still absorbing some of the nitty-gritty details of the announcement? I suspect users will understand — up to a point.

IBM, after all, made the decision to deliver such a big package to the market. Now it's up to IBM to provide information as straight as possible, so customers can get on with their jobs of making decisions.

Hamilton is Computerworld's senior editor, systems and software.

"VIKING DATA ENTRY SYSTEM IS THE ONLY ONE WITH THE FLEXIBILITY TO DO EVERYTHING WE NEED IT TO DO."

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Cambria has used VDE for four years, simplifying very difficult data entry jobs for customers from virtually every conceivable industry or business.

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VIKING SOFTWARE SERVICES

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AT&T ISDN is working in Transportation:

With AT&T ISDN's Call-by-Call feature, transportation companies are now centralizing control of their dispatch operations and combining various AT&T switched services on the same T-1 pipe. This flexibility means that more calls are being handled with fewer access lines. AT&T ISDN has helped transportation companies save thousands of dollars each month and has moved their businesses into the fast lane.

AT&T ISDN is working in Lodging:

Right now, when their switchboards are all lit up, hotels are using AT&T ISDN to route calls automatically to the next available agent, even if they're in another location. That maximizes their staffing efficiency. Also, with our automatic number identification feature, agents have become more accurate and are saving time, opening the door for more personalized service.

So now that you know how well it's working for your competition, let the advanced technology of AT&T ISDN help increase productivity and save money for *your* business today.

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NEW PRODUCTS — SOFTWARE

Computer-aided software engineering

Direct Technology Ltd. has announced Automator QA, a test system designed to create intelligent processes (agents) that automate software testing procedures.

The product resides in a personal computer that is linked to a host. It is said to reduce the time needed to create an application for testing character-based software running on mainframes or minicomputers by a ratio of 3 to 1. Its QA View and QA Report features enable users to view failures in different screens or analyze data. Built-in clocks are also included.

An entry-level system costs $5,495.

Direct Technology
10 E. 21st St.
New York, N.Y. 10010
(212) 475-2747

Utilities

Demax Software, Inc. has announced a product designed to process disk configurations — known as striped disks — which are used primarily by Digital Equipment Corp. VAX 9000 machines.

The Squeezepack defragmenter can make fragmented files contiguous and consolidate free space to minimize the number of disk accesses.

Prices range from $245 to $3,395, depending on VAX configuration.

Demax Software
999 Baker Way
San Mateo, Calif. 94404
(800) 283-3629

Applications packages

Applied Software, Inc. has announced Almost TSO, an MVS VTAM application environment that supports multiple users per address space executing TSO applications such as ISPF, SDSF and DB2.

Almost TSO can be used to convert most TSO applications to VTAM by changing the log-on from TSO to Almost TSO. It can be used to implement interactive applications that ordinarily require CICS, the company said.

The product is available for MVS/SP, MVS/XA and MVS/ESA systems. It costs between $12,000 and $25,000.

Applied Software
P.O. Box 13027
840 U.S. Highway No. 1
N. Palm Beach, Fla. 33408
(407) 626-4818

Advanced Data Management, Inc. has announced a software package designed to allow users of IBM mainframes and compatibles to schedule batch jobs for processing at a later time or on a recurring basis.

The Personal Job Scheduler enables developers to compile and test new systems while using fewer millions of instructions per second. Other features include job queuing; the ability to list, delete or modify pending jobs; and automatic event notification.

The product can run on machines equipped with IBM's MVS/XA or MVS/ESA with TSO. It costs $10,000 per CPU.

Advanced Data Management
15 Main St.
Kingston, N.J. 08528
(609) 799-4600

Compilers

Telesoft has announced an Ada cross compiler designed for developing embedded real-time applications with Motorola, Inc. 88000 reduced instruction set computing-based processors on Digital Equipment Corp. VAX/VMS hosts.

The Telegen 2 cross compiler includes a multithreaded runtime support package that provides deterministic interrupt latency behavior for real-time embedded applications.

The product is priced between $12,600 and $102,000, depending on configuration.

Telesoft
5959 Cornerstone West
San Diego, Calif. 92121
(619) 457-2700

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For information, call 800-642-0177. In Canada, call 416-620-4844. Outside U.S. and Canada, call 44-71-631-3696.

RAMIS users come join us at the 1990 RAMIS Roundtable, October 21–25, in Nashville, TN. For RAMIS Roundtable information, call Lisa Jones at 201-585-6759.

On-Line Software INTERNATIONAL

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IDC WHITE PAPER

Image Management Systems

IMAGE MANAGEMENT SYSTEMS

EXECUTIVE SUMMARY

With corporate icons such as American Express Co., Citicorp and Federal Express Corp. realizing savings of 20% and more through the use of image management systems, widespread use of the technology seems likely to occur in the near future.

While some of the best known applications include processing checks and credit card receipts, image systems are also specifically designed for engineering drawings, mapping systems and general business forms. They coexist with other complementary technologies such as optical character recognition (OCR), microform – microfiche and microfilm – and electronic data interchange.

Dating back to the late '60s, image management systems were originally designed to make paper documents available for on-line display and retrieval. As the systems evolved, however, that philosophy gave way to the currently accepted concept of automating the entire paper handling process.

Beginning with Wang's entry in 1987, the major systems vendors started rapidly lining up behind image systems. Unisys Corp., IBM, Digital Equipment Corp., Hewlett Packard Co. and NCR Corp. have joined this segment of the market. Another company, FileNet Corp., played a pioneering role in developing turnkey image systems.

The third party market has also blossomed. These vendors can customize basic systems for a particular application, concentrate on one part of the system, such as OCR, or provide the components of the system platform. This flexibility has attracted the attention of the major systems vendors, many of whom have signed deals with multiple third party firms.

Image systems will continue to stimulate the development of computer technology as they force users to upgrade their management systems.

IDC stresses the competitive advantages to be gained from image management system implementation and urges users to investigate their promise and invest in their use.

IMAGE MANAGEMENT SYSTEMS

AN IDC WHITE PAPER FOR INFORMATION SYSTEMS MANAGEMENT

INTRODUCTION: WHAT IMAGE MANAGEMENT SYSTEMS CAN DO FOR YOU

HOW IMAGE SYSTEMS WORK
- Scanners
- Indexing
- System Performance

A BRIEF HISTORY OF THE IMAGE MANAGEMENT SYSTEMS INDUSTRY
- Microform Moves Aside
- The Software Evolution

TYPES OF IMAGE SYSTEMS
- General Business Systems
- Item Processing Systems
- Engineering Drawing Systems
- Mapping Systems

COMPLEMENTARY TECHNOLOGIES
- Optical Character Recognition
- Microform
- Electronic Data Interchange

VALUE, FUNCTIONS AND BENEFITS OF IMAGING
- Why are Image Systems Strategic?
- High-Value Applications
- The American Express Paradigm
- Key Functions and Benefits
- Digitizing Documents at the Earliest Possible Point
- Electronic Routing
- Digitization
- Reducing Data Entry Errors
- Facilitating Business System Redesign
- Reducing Physical Storage Space
- Reducing Document Retrieval Time
- Improving Document and System Security
- Improving Management and Government Report Capabilities
- Providing a Productivity Measuring Tool
- Eliminating "Knowledge-based Downtime"

THE SYSTEMS VENDORS

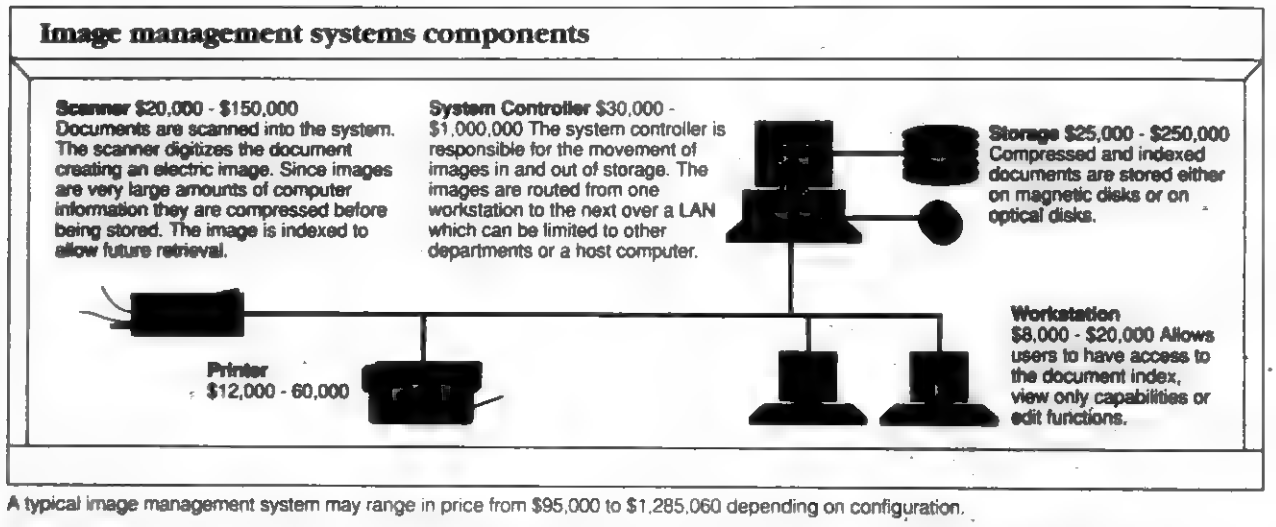
THE ROLE OF THIRD PARTIES

A USER'S GUIDE TO THE MOST COMMON MISTAKES

TRENDS AND ISSUES
- Standards
- Future Technological Developments

IMAGE MANAGEMENT SYSTEMS

THE GREAT TECHNOLOGICAL QUEST FOR THE MYTHICAL PAPERLESS OFFICE MAY FINALLY BE LAID TO REST. IMAGE MANAGEMENT SYSTEMS HAVE COME NOT TO SLAY THE PAPER BEAST BUT TO TAME IT. ALLIED WITH ON-LINE TRANSACTION PROCESSING, RECORD MANAGEMENT AND OTHER OFFICE SYSTEM TECHNOLOGIES, IMAGING WILL IRREVERSIBLY CHANGE THE NATURE OF THE WHITE-COLLAR WORKPLACE. ■ TO DATE, IMAGE SYSTEMS HAVE DELIVERED PRODUCTIVITY GAINS EXCEEDING 20% AND PROVIDED SIGNIFICANT COMPETITIVE ADVANTAGES TO COMPANIES SUCH AS AMERICAN EXPRESS CO., CITICORP, FEDERAL EXPRESS CORP. AND CONSOLIDATED FREIGHT. ■ IMAGE MANAGEMENT SYSTEMS AND IMAGE PRO-



A typical image management system may range in price from $95,000 to $1,285,060 depending on configuration.

cessing are the two most common terms used to describe a system that allows users to digitize a business document and move the image of that document from one workstation to the next for more effective processing. This technology is easy to use but requires careful planning if its potential is to be fully realized. This paper will show how users who implement their systems wisely reap the many benefits they offer.

And those benefits are extensive. They range from reducing data entry errors, to streamlining information flows within organizations, to reducing physical storage space. In the digital world of image management systems, users can greatly increase the speed and efficiency of processing a wide variety of documents, including checks, credit card statements and insurance policies, to name but a few.

Just as there is a wealth of applications, there is also a variety of systems that run them. Although general business documents like job applications and item processing documents like checks come to mind first, there are also systems dedicated to engineering drawings and mapping applications. The common thread that links them is their ability to allow people to work faster and better.

Like so many computer-based technologies, image management systems date back to the mid-1960s. Those early systems gave way to more modern analog systems in 1978 and their digital successors debuted in 1982. Now major systems vendors and third party firms are combining their skills to offer the most advanced products - products that can have a direct impact on the tens of billions of dollars businesses spend on paper-based systems every year.

Although the worldwide market for image management systems has been slow to grow, IDC predicts it will reach $25 to $35 billion by the late '90s. By that time, the need for data entry, which is arduous and error-prone, will have diminished dramatically.

There are two prominent misconceptions about image management systems. The first is that they portend the end of paper-based offices. This is not the case. What they offer is a more streamlined work flow for paper-based offices. The second misconception is that image management technology is the same as optical disk technology. This is also wrong. Optical disk technology is an enabling storage technology for image management systems and as such only a subset.

This discussion of image management systems provides the reader with an understanding of how image management systems work, their history, the various types of systems and high-value applications. It also describes system functions and benefits, the roles of vendors, the most common user mistakes, standards and future technological developments.

HOW IMAGE SYSTEMS WORK

In terms of hardware, an image management system is normally composed of a combination of scanners, workstations, servers, storage and printers in a network. Basic software includes a database management system for image indexing and software to run each of the hardware components. Depending upon the specific application requirements, some vendors also offer a microfilm camera and microfilm storage as an option.

In a typical system, a general business document is fed into the scanner much in the same way documents are used with copier and facsimile machines. The scanner then reduces the document to a series of 1s —commonly refered to as on-bits—to a dark area of the document or 0s—to a white portion of the document.

As a result, the image appears to the computer as an unintelligible series of bits. The computer can't search for a specific word or phrase since the document is an image as opposed to a text file. Therefore, to retrieve the image, users have to assign specific index information, either manually or automatically, so the computer can identify it.

A data compression process ignores white space between letters and stores the dots comprising them. Depending on the compression technique used, this reduces the number of bits stored to a range from 15-to-1 to 50-to-1. Despite the use of advanced compression techniques, a bit-mapped image can consume 500K bytes or more. As a result, image management system users frequently require very large amounts of computer storage, storage which can be relatively economical when based on optical disk. Magnetic disk storage costs $8 per megabyte, while optical-disk storage costs only $1 per megabyte.

If users want to retrieve a document, they enter index information into their workstations. The workstations send that information to a database management server, which in turn relays the request to the storage portion of the system. When the request is fulfilled, the images are sent back over the network to the user workstation. Finally, the image of the document is decompressed before it is displayed on the workstation screen.

Scanners

There is a broad range of scanners to meet the demand for multiple applications. They offer varying rates of resolution. The resolution of a scanner is the clarity or level of definition provided for the scanned image. This is generally defined as dots per inch; each dot is called a pixel. The majority of scanners use 200-, 240- or 300 dot/in. In order to increase resolution, scanning time, image size and required storage must also be increased. The amount of processing power required to decompress and compress the image also grows.

The major vendors selling the scanners do not usually manufacture them. As a result, many scanner interfaces are incompatible with their counterparts from other companies. This means vendors must write specific software drivers for almost every scanner they support. Because this is time-consuming and expensive, vendors limit the number of scanners they support.

Of all the components in a system, scanners have the highest rate of failure. IDC recommends that users have a backup scanner available at all times. Users should also specify in the purchase contract the time in hours it will take the vendor to repair the original or install the backup.

Indexing

Indexing is critical to image management systems and one of their biggest benefits. In paper-based systems, indexing is generally limited to one field, e.g., the notation tab of a file folder. Image management systems are more flexible, allowing multiple methods of retrieval, e.g., by name, account number, date of application, etc. Each additional index field offers another way to access a document. However, this increased accessibility also increases the amount of manual keying required to enter the document into the system. Further, more index fields add to the total index size, increasing general system overhead.

System Performance

Although, as mentioned, a scanned image may range in size up to 500K bytes or more, conventional computer architectures are designed to handle 4K bytes and smaller blocks of data. This inconsistency has made it very difficult to blend display technology, workstations, networks, DBMSs and storage in an eloquent form, and has slowed product development.

Image management system performance is difficult to assess on a general basis. Because there are many individual factors that affect performance, it should only be judged on an application-by-application basis.

A BRIEF HISTORY OF THE IMAGE MANAGEMENT SYSTEMS INDUSTRY

The image management systems industry was initially pioneered by system integrators such as Litton Integrated Automation and TRW Financial Systems.All the early market factors created an ideal environment for systems integrators. The technology was strategic for many large U.S. corporations, the applications were unique from one industry to the next, the technology was generally unavailable and system requirements were substantially different from one company to the next.

During the late '70s and early '80s, the integrators managed to install relatively dramatic demonstrations of the technology at companies such as Federal Express, Emery Air Freight and Boeing. The focus of the integrators was on basic hardware and software capabilities for scanning images, displaying them effectively and integrating leading-edge components. These early systems were designed to make "paper" documents available for on-line display and retrieval, as opposed to automating the entire paper process.

Meanwhile, the traditional vendors of microfilm products such as Eastman Kodak, Bell & Howell and 3M feared that as the price of storage fell, many companies would bypass microfilm and elect to store their records on a more-accessible on-line medium such as optical disk. It was from this defensive posture that all three companies began investing substantial resources in developing image systems—systems that largely mimicked their existing products but replaced microfilm and microfiche with optical disk technology.

Microform Moves Aside

This represented an historic transition, as microfilm and microfiche—together known as microform—had been time-tested and economical archival methods for more than 25 years.

The vital point is, once a document has reached the records management area, all active processing has already been accomplished. Records management exists because legal or business requirements demand some documents be maintained for extensive periods of time, e.g., 30 years for a typical mortgage. Some government records must be saved for as long as 100 years. Retrieval rates vary depending on the type of application. Microfilm is the least expensive storage medium for central repositories of documents that have completed the processing cycle and are not likely to be retrieved soon or often.

The first company to realize just how far-reaching document processing technology could be was formed in the early '80s. FileNet Corp. introduced the first turnkey image management system in 1984, a system that featured optical disk storage with gigabyte capacity. It followed up with a workflow software package. The optical disk storage was a new way to digitize business information—95% of which still exists on paper despite the advancements of the computer age and office automation. But, FileNet said at the time, paper was still the most appropriate storage medium for the vast majority of information. It felt the best way to process that paper was with workflow software, which automatically moves data from one processing step to the next.

The Software Evolution

Today, work-in-progress software has built on the base of workflow software and become a key element in image management systems. This software is designed to automatically reactivate processing when previously missing information becomes available.

As a current example, a major U.S. oil company spent several months reviewing its accounts payable application and determined that adding image capabilities would produce tremendous savings in data entry, ease of access to original documents and increased specialization in processing accounts.

At that time, the average cost of processing a transaction, including all hardware and software, was less than $20. This was in an environment where necessary documentation was not always available for processing. This meant the process frequently bogged down while additional documentation needed to complete the transaction was located.

The cost of processing these transactions with missing documents was almost eight times higher than a straightforward transaction. A simple calculation revealed that almost 60% of the oil company's accounting department costs were contained in the management of these accounts. Simply put, the cost of work in progress was killing them. And this company had the most sophisticated IBM mainframe available and a multi-million dollar investment in accounting software.

By adding an image management system with excellent work-in-progress software, the oil company was able to reduce its transaction processing costs by almost 30%

IMAGING: THE BIG PICTURE

Flexibility and business vision will shape imaging in the 1990s.

Did you know that if you loaded all the documentation relating to a Boeing 747 – all the designs, the mechanical drawings, the operations manual and so forth – onto an actual 747, the plane wouldn't be able to get off the ground? The sheer weight of the paper – some 450,000 pounds – would well exceed the maximum allowable load.

That's essentially what is happening in the business world today: Companies and governments are being weighed down by paper. All too often, they find themselves having to manage thousands, even millions, of new documents each year. As a result, they spend vast amounts of time and money simply shuffling the paper needed to support their business activities.

Imaging Relieves the Paper-Processing Bottleneck

Imaging technology has reached the point where we can cost-effectively relieve that paper-processing bottleneck and automate those areas of the workplace that heretofore couldn't be automated. In spite of the proliferation of computers in recent years, only about 1% of all corporate information is managed with computers. Nearly all the rest is on paper. So we really haven't eliminated a lot of paper; in many cases, we've only created more. While computerization has certainly streamlined many business processes, it has for the most part simply automated existing operations – "paving the cow path," one wit has called it. Imaging, though, allows us to go beyond that and put paper-based business information online.

Unisys: A Leader in the New World of Imaging

Unisys is committed to being a leader in this new world of imaging. Over the past year, we have established cooperative agreements with many of the industry's leading imaging vendors – companies such as FileNet, Sigma Imaging Systems and Access – and we will continue to pursue such agreements with other innovative companies. We feel that this adds value to the systems we offer our customers and allows us to address their information management needs completely.

In mid-1989, we established a Corporate Imaging Office to coordinate the various activities within our imaging program. Known as InfoImage, this program is based on the concept that electronic imaging is much more than the ability to serve up pictures of documents. Rather, it's a whole new dimension in information management that can lower costs, speed up the delivery of visual information, improve customer service and, most important, enhance decision-making and management processes.

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The InfoImage Suite of Solutions

In the fall of 1989, Unisys became the first major vendor with a full-scale imaging solution on the general market with the announcement of two imaging products: InfoImage IIPS (Image Item Processing System), which addresses the banking industry's need to handle a growing volume of paper checks; and InfoImage EDMS (Engineering Document Management System), which is designed to help manage the drawings and other visual information used by manufacturers, utilities and large facilities. More recently, we announced InfoImage Folder, a system that enables companies to manage related documents in electronic "file folders," routing them to the appropriate people for action and tracking work progress.

In the coming months, our InfoImage suite of solutions will expand with the release of new products.

A Modular Approach to Grow With Evolving Technology

In developing our InfoImage products, we've chosen to rely on nonproprietary, open systems and to build our products around industry standards as much as possible. What's more, we've taken a modular, building-block approach with our imaging systems. This ensures that these systems can grow easily as a company's imaging needs grow, and that a business won't be locked out of future technological developments – an improvement in optical storage, for instance, could be easily incorporated without having to scrap an entire system.

We recognize that imaging is an evolving technology, and we believe that this modular approach, along with our commitment to open systems, means that our imaging customers will have the flexibility to keep up with change, whether it's in information systems or the business environment.

Integrated Image-Enabled Information Systems

Underlying our InfoImage program is the philosophy that imaging should not be viewed and treated as an isolated, separate technology. It is really a tool to manage information, and to be most effective in an organization, it must interact with the other tools that manage information. That means integrating imaging into the overall information system.

In short, we feel that it is important to offer image-enabled information management solutions. Our technical expertise, combined with our long history of working closely with customers in government, manufacturing, banking and virtually every other industry, puts us in a good position to provide integrated systems tailored to a company's specific needs.

The Unlimited Potential of Imaging

We believe that the imaging marketplace will rapidly evolve over the next five years – and Unisys expects to be an integral part of it. As imaging is incorporated into traditional information systems – and indeed becomes a fundamental part of data processing – we'll see a whole new element added to the management of information.

Companies, of course, will be able to store and retrieve information more efficiently than ever before. But while the immediate benefits of imaging – the cutting of costs and the improvement of customer service – are already well documented, the long-range benefits and usefulness will undoubtedly go far beyond that. Once you get an appreciation of this technology, every time you turn around you'll see another use for it. And the fact is, nobody really knows what the real potential of imaging is, in terms of new products, new services, even new kinds of businesses. As one report recently pointed out, "the book on imaging has not yet been written." With InfoImage, we'll be working with customers to do just that, and explore the vast potential of imaging as we move into the 1990s.

UNISYS

We make it happen

while decreasing data entry errors by 25%. It also gained the less tangible benefits of improving supplier relationships and reducing finance charges.

TYPES OF IMAGE SYSTEMS

There are four generic image management system types. Each is based on document size and other factors relevant to the information. The size is important because it impacts the type of input and output peripherals, workstation needs and many basic architectural considerations.

General Business Systems

These systems vary depending on whether they are oriented toward transaction processing or a central repository function. In a transaction processing environment, image management systems improve the economics of managing the active life cycle of the document. In a central repository, the goal is to store vast quantities of images over a prolonged period of time.

Item Processing Systems

Item processing is a unique form of image management due to the small size of the documents and the very high scanner throughput required when processing them. For example, many banks process hundreds of thousands of checks daily within short periods of time, and the entire U.S. banking industry will process approximately 50 billion checks in 1990 at an average cost of five cents per check. Image management systems can increase processing throughput by 20 to 30% over previous systems. When this increased throughput is coupled with the decreased processing costs offered by image management systems, banks plainly benefit.

Engineering Drawing Systems

Engineering drawings may depict complex, two-dimensional product specifications or design plans for a simple bolt. Some of these drawings are up to 100 feet long or longer. They require special-width scanners and plotters in conjunction with specialized drawing software. Although many engineering companies employ CAD/CAM systems to create and manipulate drawings, those systems are not able to convert the massive base of paper drawings that currently exist. Image management systems can act as a bridge between these two environments by electronically converting the paper drawings and storing them in digital databases.

Mapping Systems

Mapping systems are typically used to manage land use by government agencies. They can be used to assess tax bases by depicting the amount of available land, the number of buildings on the land and the number of new buildings the open land will allow. Mapping systems can also depict gas mains and underground wiring that may be impacted by construction. They need color and graphic capabilities as well as compatibility with dissimilar systems at other government agencies. The Italian government, which rents many buildings and offices to its citizens, is currently using mapping image management systems to measure the floor space in these buildings in order to assess taxes on their use.

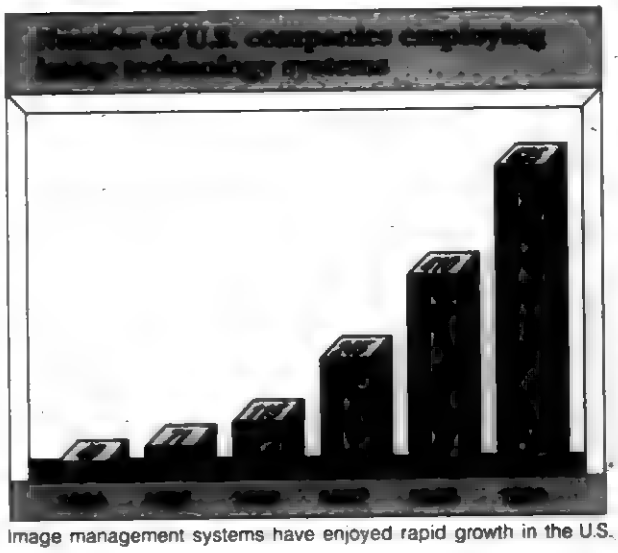


Image management systems have enjoyed rapid growth in the U.S.

COMPLEMENTARY TECHNOLOGIES

Image management systems must coexist with other technologies such as optical character recognition (OCR), microform and electronic data interchange (EDI).

Optical Character Recognition

OCR is an alternative to manually indexing a document as required with image management systems. OCR views the dark and light areas around a specific letter and interprets, for example, a T from a P. It is important for users to realize that the OCR function takes processing time and specific software. The decision to manually index documents or use OCR depends on the application under consideration. OCR is most useful on structured documents such as business forms.

Microform

The two components of microform, microfilm and microfiche, are the most cost-effective methods for storing inactive documents on a long-term basis. However, they are not appropriate for companies that can't tolerate a long out-of-file time, or for situations where documents may need to be accessed for active processing or reference.

Electronic Data Interchange

Electronic data interchange (EDI) is primarily used to transmit and receive business documents, such as orders and bills, between manufacturers and suppliers, according to predefined electronic formats. EDI works well in established customer-supplier relationships in which both parties have approximately the same level of automation. The problem with EDI is, the great majority of business communication involves users who either can't utilize EDI because of the incompatible software and standards, or simply need more capabilities than EDI can provide. In these situations, imaging is appropriate.

VALUE, FUNCTIONS AND BENEFITS OF IMAGING

Why are Image Systems Strategic?

Image management systems are strategic because they give users a competitive edge. They effectively allow companies to implement improvements in management controls, reduce transaction costs and differentiate themselves from the competition—the most compelling reason of all for investing human and financial resources.

High-Value Applications

IDC refers to applications in which image management systems can provide a high return on investment as high-value applications.

Banks are obvious prospective users. High-value banking applications are check processing, mortgage loan processing, mortgage loan servicing, credit-card application processing, consumer loans, IRAs/Keoghs, international trade finance, international funds transfer, trust and stock ownership transfers. Of all these, IDC believes check processing, an industry in its own right, holds the most promise.

The high-value applications for image management systems in insurance are

underwriting, claims processing and investment management. In the pharmaceutical industry, image management systems show a high rate of return in case report form applications, regulatory affairs and medical libraries. Many high-value applications occur at the departmental level.

The American Express Paradigm

In its push to become the preeminent vendor of credit card services, American Express has been in the vanguard of image management system implementation. Now entering the fourth phase of its image management project, the company has leveraged its two-year lead in image implementation to enhance its statement printing operation and in so doing, differentiate its products from the competition's. The company's new monthly billing statement that depicts an image of each individual transaction is a good example. It has reduced its billing costs 25% and is working to reduce the amount of keying and, therefore, the number of data entry errors. The net effect of all this will be twofold: American Express will have the lowest costs and offer the most services.

Key Functions and Benefits

One key to successful image management system implementation is understanding its functions and benefits, for there are many of both. When functions and benefits are fully realized, users will save money, increase productivity and more efficiently utilize personnel. The first step in understanding functions and benefits is understanding how documents flow in and out of companies.

Organizations are required to process two general types of information—external and internal. It is very difficult to control the form of incoming external information. Examples of external information include credit-card applications, mortgage loan applications, insurance applications, checks, requests for new drivers licenses or replacement birth certificates.

Internal information includes such items as sales reports, memos and production information. Controlling how it is created, disseminated and finally stored is easier than controlling external information. This control is being enhanced by the advent of increasingly standardized systems and more effective methods of document exchange.

Because there are so many nuances in implementing image management systems, the benefits and system design issues vary tremendously, depending on the particular application. Notwithstanding these industry and application differences, image management systems represent the best way to process external information. Building on that attribute, image management systems offer the following functions and benefits:

Digitizing Documents at the Earliest Possible Point

Mail rooms are the main points of entry for external information, and as such, likely candidates for image management systems. Managing the mail room has become an enormous challenge for large companies. In fact, many companies hire outside services to manage their mail operations, in the same way some data centers are managed. The reasons are simple: While the cost of the mail room was once assigned to general company overhead, more and more companies are trying to charge back departments for these services. Also, companies are trying to realize economies of scale.

Image management systems can reduce the sorting process and provide cost reporting and charging. Users benefit by capturing information at the first point of entry into the organization.

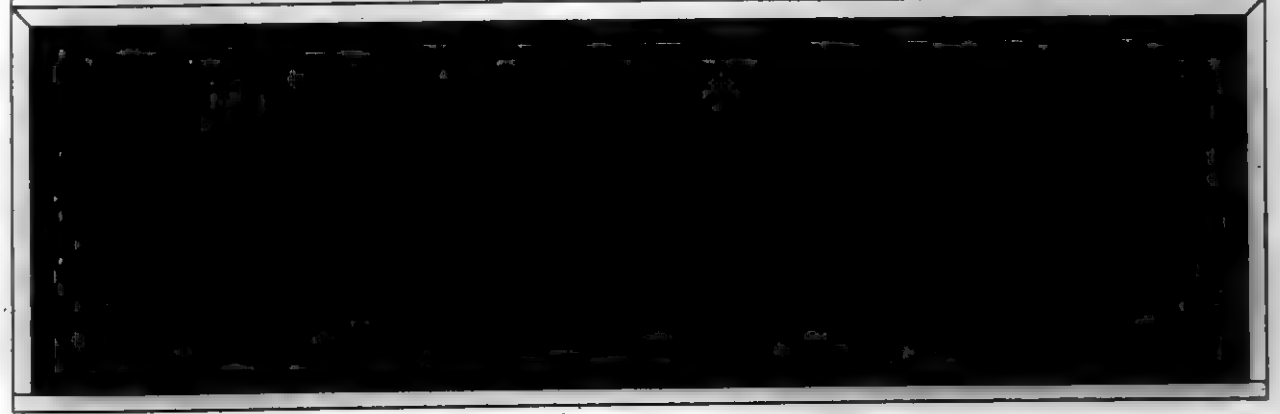
Example: One large health insurance organization processes more than 80,000 claims per day. When processed through a sorting procedure in the mail room, almost 1% of them were lost or misplaced in the initial sort. The second sort, by claim type, had a misplacement rate of 3%. A third sort, by processing category, had a 4% misplacement rate. The costs of tracking and rerouting documents plus managing the process and generating reports was costing this company in excess of $4 million per year. As a result, the organization is now evaluating image management systems.

Electronic Routing

Electronic routing offers a level of structure and flexibility that a paper-based environment simply cannot attain. Two of the main benefits of electronic routing are multiple access and automatic rerouting. Paper-based business systems generally are serial—there is only one copy of the original document and only one person can access it at a time. In contrast, image management systems provide simultaneous access to the same document, allowing many elements of the business process to occur in parallel. In many cases, the total number of steps in the process can be reduced significantly while the time to process is shortened dramatically.

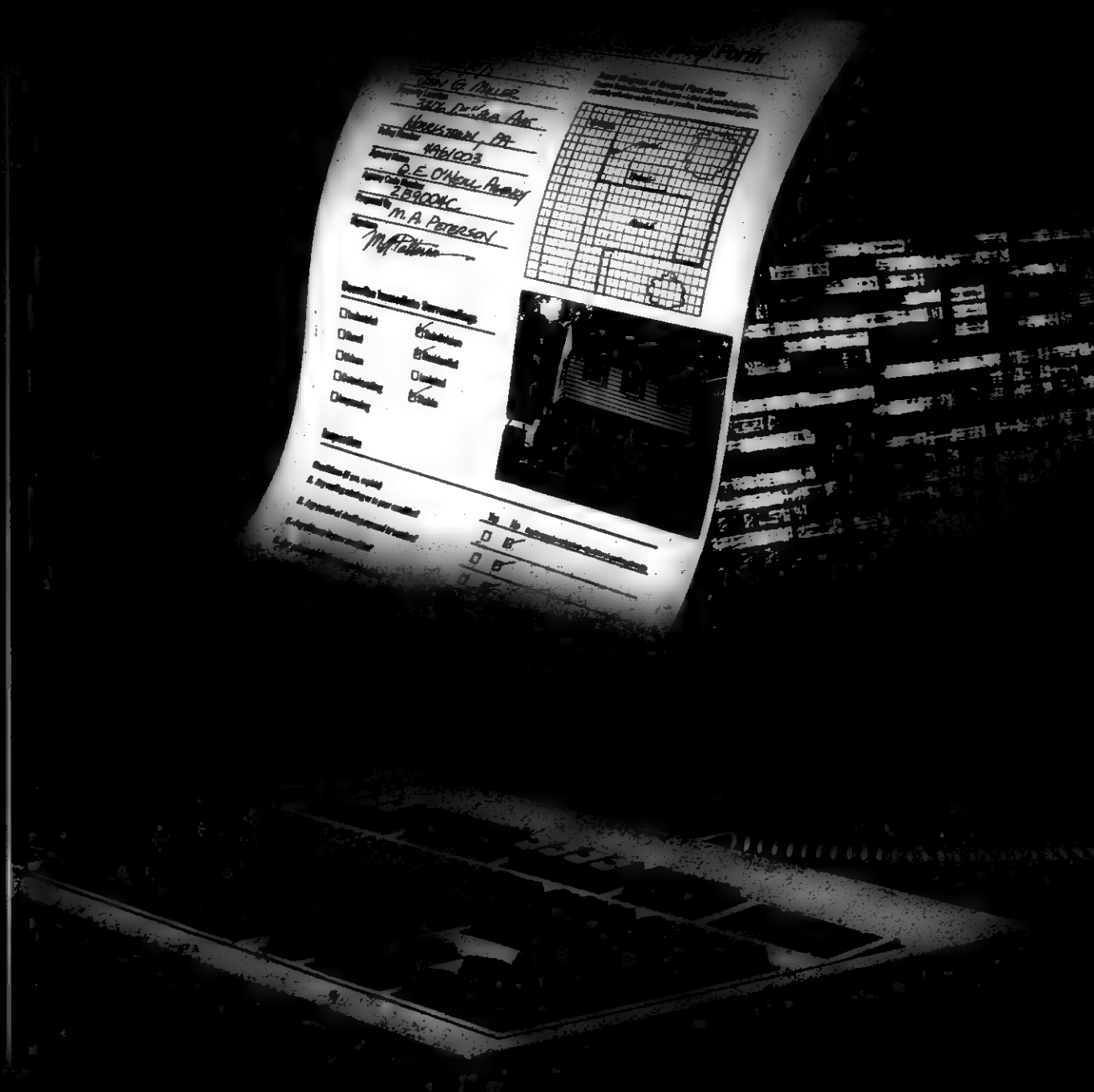
If an operator in a document processing operation is out sick or on vacation, the image management system can be configured, by either manual intervention or system defaults, to send the operator's workload to a back-up person. The system can

Insurance underwriting application



The improved efficiency and reduced work flow justify the expense of an image management system.

Unisys InfoImage Solutions. Take



the paper out of paperwork.

Checks, blueprints, photos, claims, signed authorizations, maps – images that are vital to business and government.

And up until now, it's paper that's choking the information process. All because, unlike numbers and letters, images couldn't be manipulated electronically.

Quick access to documents, sharing them, moving them around and doing it cost effectively is what the Unisys InfoImage suite of imaging solutions is about. They're practical, modular solutions that fit easily into your existing information system, no matter whose name is on it.

Practical – because Unisys recognizes that not all documents are the same:

Customer Files. Those documents with signatures, handwritten annotations or photographs that couldn't be stored or sent electronically in the past are now efficiently handled with InfoImage Folder. With online access, you can respond fast to customers, process applications, handle claims.

Checks. Unisys InfoImage IIPS dramatically changes the way financial institutions handle paper and process checks. It reduces the heavy backroom staff burden and increases payment processing speed.

Engineering Drawings. InfoImage EDMS captures all of those oversized drawings and allows any organization quick access to a complete and accurate set. From engineering to purchasing to the shop floor.

InfoImage solutions from Unisys. They take the paper out of your paperwork. For more information and a demonstration diskette, call 1-800-448-1424, ext. 39.

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also be configured to take advantage of each operator's unique talents.

Example: A bank that processes mortgage loans routes them to operators based on the mortgage's value and whether it is residential or commercial. The system then automatically makes sure no operator has more than five mortgages in his or her work queue at a time.

Digitization

The advent of digital technology opened the door for image management systems, and gave them the opportunity to realize their true problem solving potential. One problem they have scaled back is out-of-file conditions.

Misplaced or out-of-file conditions have been a continual problem for businesses, particularly in their efforts to improve customer service operations. Digitizing and suitably indexing images ensures that files can never be misplaced and out-of-file conditions will never exist.

Example: The third largest private health insurance company in the United Kingdom recently announced its intention to service its 500,000 policy holders with an image management system. This company processes 4,000 claims per day. Locating a file within the paper-based system can be extremely unpredictable, since on average 5% of all client files will be in an out-of-file position at any time. The filing department is required to move 25,000 files per week, and at any time, 20,000 files will be out of the system.

Files that become misplaced on a permanent basis obviously pose an even larger cause for concern. In fact, a U.S. insurance company that lost the files of one particular client faces a $60 million lawsuit because the insurance company disputes the client's coverage claims.

Reducing Data Entry Errors

Data entry is a notoriously mundane and poorly paid job with high turnover. Because of these factors, many errors creep into the process. However, this negative trend can be reversed.

Example: A local government agency implemented an image management system using sophisticated software that made the screen image of the document identical to the form data was being entered from. As a result, data entry errors were reduced 25%.

Numerous studies aimed at determining how to increase productivity and decrease errors have been undertaken. They have found the only two ways to improve data entry are increasing the amount of control the operator has over his or her environment, and ensuring the clarity of the input material. Image management systems reduce operator fatigue because they produce consistently clear images and can be configured for frequent operator breaks.

Research shows that operators work most efficiently when they have only one image on the screen at a time. In order to make sure they move as quickly as possible from one screen to the next, users may program these systems so any one of their final keystrokes on one screen will prompt the next one. Unisys has extensive empirical evidence showing that an ideally configured image system can lead to a 100% increase in productivity across the entire population of data entry clerks in a check processing environment.

Although increasing, European implementation lags behind the U.S. pace.

As OCR technology improves rapidly, the amount of keying will be reduced substantially. Intelligent document design is a critical element in this process. Potential users should start planning their document design now.

Facilitating Business System Redesign

Image management systems allow improvements in business systems beyond parallel processing and cleaner data entry. As management controls improve, the number of tasks in a process can be reduced.

Example: Using an image system and workflow automation—which expedites the movement of paper images from one processing point to another—an insurance company reduced the number of handling stages for an insurance claim from nine to three. Eliminating steps in the process is a crucial element of image management systems.

Reducing Physical Storage Space

Storage space is valuable and expensive. It is not unknown for companies to move entire operations to new buildings because of storage costs and availability. Many insurance companies in the U.S. are using 25% of their total office space for file storage.

Example: By implementing an image management system, a pharmaceutical company that generates 10 million records a year reduced its required storage space and avoided moving to a new building.

Reducing Document Retrieval Time

Increasingly, companies are competing to see who can give the best service. The faster claims or applications are processed, and customer inquiries are answered, the more likely a company is to beat the competition.

Image management systems excel at retrieving complete customer records quickly, allowing operators to answer questions in a minute or less. This results in dramatically fewer return calls to customers, and in some cases, lower requirements for customer representatives. It also results in happier customers.

Several companies that employed image management systems to recall records were initially afraid customers would balk at the time they waited on the telephone while their image-based records were retrieved. Since most records include images and data, the solution called for retraining sales operators in telephone techniques and requesting image files upon first customer contact. This provided baseline information and kept the customer service process going until the complete set of images could be retrieved and displayed.

Example: The cost of returning customer service calls is staggering in many companies. A major New York bank discovered it could save enough money purely on telephone costs to yield a

three-year payback on a multi-million dollar image system.

Improving Document and System Security

Paper-based systems offer limited security. The vast majority of image management systems have excellent security capabilities, including the ability to restrict access down to the individual document.

Example: A nuclear power plant wanted to minimize the number of engineering drawings that its employees could access. To do so, it implemented an image management system with a restricted amount of workstation memory and no local printing. The reduced memory reduced the number of drawings that could be accessed, and the absence of local printing made sure the drawings would remain in the system.

Improving Management and Government Report Capabilities

Image systems generate customized reports that make it easier for companies to track internal information. This reporting function is critical to organizations that are subject to government regulation.

Example: A midwestern bank was accused several times in the past five years of discrimination in its mortgage lending practices. Although the bank was able to prove that this was not the case in all but one charge, the cost of refuting the claims, including collecting the necessary documentation, were damaging. The bank subsequently employed an image management system to increase customer service and address legal questions cost efficiently.

Providing a Productivity Measuring Tool

Image management systems provide a very good basic tool for looking at individual productivity. This tool can sometimes be perceived as threatening. However, if used wisely, it can identify where bottlenecks occur and help effect a remedy. Example: A U.S. hospital rewards bonuses to clerical workers based on the number of accounts receivable they settle.

Eliminating "Knowledge-Based Downtime"

Frequently, by the time someone receives a paper-based document, that individual has forgotten why he or she requested it in the first place. As a result, users spend a significant amount of time reevaluating documents. IDC calls this "knowledge-based downtime." In many cases, it decreases personal productivity by up to 15%. In addition, it is not unusual for knowledge workers to spend a total of 20% of their work day just trying to locate documentation.

Example: Based on information from available documents, state government tax auditors audited certain individuals and organizations. However, all documents needed to perform the complete audits weren't available. By the time they were—usually two-to-three days—the auditors were forced to access their original documents to remember why they wanted to do the audits in the first place.

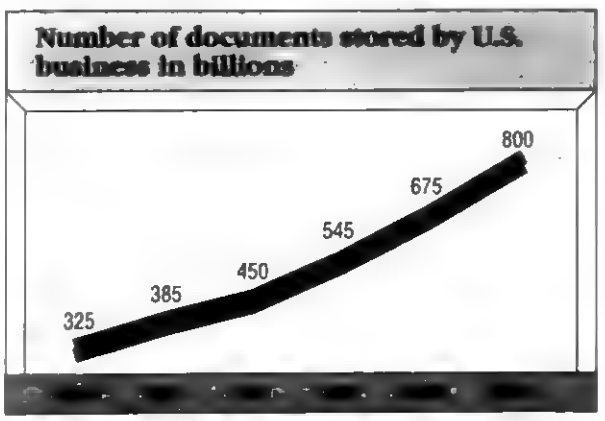


Image management systems can manage this avalanche of paper.

THE SYSTEMS VENDORS

In 1987, Wang was the first systems vendor to enter the image management systems market. IBM followed suit a year later, in 1988. Although it was late to market compared to Wang, IBM still made somewhat of a hasty entrance by its normal standards. When it felt user demand and saw the market was heating up, Big Blue bypassed its normal meticulous preparations and jumped in.

Having entered the market in 1989, Unisys has developed an open and standardized environment. It has integrated and is installing outside technology into user-specific applications.

Unisys uses FileNet's back-end capabilities for file clustering, and its look-ahead software for retrieval. It has also licensed Sigma Imaging Systems' workstation software, which runs on a range of workstations.

Most of the other systems vendors such as Digital Equipment Corp., Hewlett Packard Co. and NCR Corp. have recently announced products. They are also developing alliances and third party relationships to service the industry- and application-specific demand for image management systems.

DEC has built image functionality into the lowest levels of its system architecture for almost six years, e.g. extensions to VMS. HP and NCR elected to play catch-up by acquiring software technology from Plexus Software, Inc. The two biggest technical challenges to all these vendors are seamlessly incorporating image technology into their existing office system architectures and developing workflow and procedural automation software. IDC believes most of them are ignoring software development in their quests for seamless integration.

THE ROLE OF THIRD PARTIES

Third party vendors can play several roles in the image management system market. First, they can customize a base system for a particular application. Second, they can concentrate on a particular part of the system technology such as OCR. Third, as in the case of Unisys, they can actually provide the components of the system platform. Because of their narrow focus in either capacity, they can be an important source of technology development.

Having realized the value of vertical market-oriented third parties, Wang signed up more than 100 third parties, while DEC, which maintains traditionally strong third party relationships, has more than 40. IBM, which in recent years abandoned its policy of strictly internal product development, has selected 30 third parties.

This diverse market requires systems vendors who intend to work with third parties to understand the needs of a wide range of users who want their systems developed by familiar vendors. This puts pressure on the vendors to offer a development environment that lends itself to customizing products across a broad range of applications.

A USER'S GUIDE TO THE MOST COMMON MISTAKES

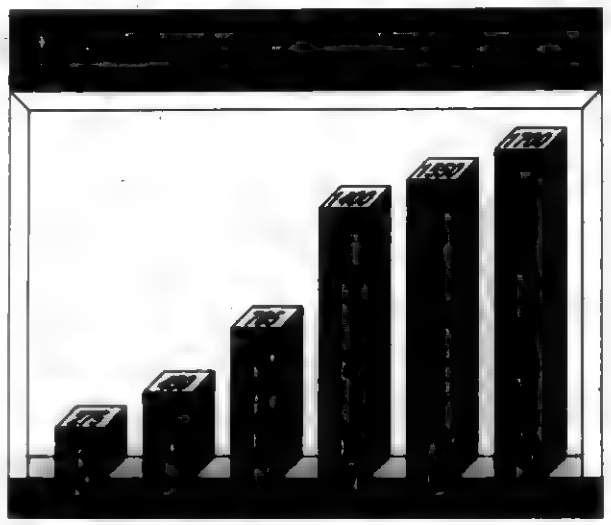
There are plenty of potential pitfalls when implementing an image management system. Here are some dos and don'ts:

Do write a thorough, well-researched RFP. The vendor community has drawers full of RFPs it cannot respond to because they were so poorly written.

This is because many prospective users are not properly evaluating their needs in terms of functions and features. There is also danger in letting a vendor help you write an RFP. Since many system features are proprietary, a vendor could slant the RFP to the point where its competitors would not even bother to bid. That may result in a noncompetitive environment that costs the user a 15-20% premium. The solution is to get help. This can come in the form of an outside consultant or an internal task force.

Do change your business system. Image management systems are not meant to operate in a void. If you are going to get the most out of them, it is necessary to make adjustments. This can result in modifying business practices, which in turn may result in hiring or reassigning personnel. The point here is that a user will maximize the value of its investment by looking at its system overall, rather than simply automating discrete steps that exist today.

Don't wait for standards. There are sufficient standards to ensure that an adequate migration path can be put in place. By waiting for standards many companies could dilute a competitive advantage. In fact, many large banks and aerospace companies waited until they were at a competitive disadvantage before implementing systems. The message: Waiting is not free.



While the U.S. leads Europe in implementation, Japan has about one-third more companies using systems. However, the dollar value of U.S. shipments is higher because more Japanese systems are based on less expensive personal computers rather than the larger processors more common in the U.S

Don't put in a pilot system. Many users have put in small pilot systems for test or demonstration purposes. Since the technology is already proven in thousands of commercial installations, this is a waste of money. It can also be misleading. A pilot system with four or five workstations will not elicit the same architectural issues, or deliver as much performance as a larger system. As a result, user expectations can be skewed. This is not to say that the use of departmental technology and limiting the scope of the first application is not a valid strategy. IDC encourages users to build systems based on a modular approach.

TRENDS AND ISSUES

Standards

Since no user wants its image management system to exist as an island of automation, most vendors have invested substantial resources to ensure their products are compatible with the IS world. As a result, the majority of image systems are able to emulate common terminals such as IBM 3278s and DEC VT-100s. Many also offer coexistence at the network level and run on popular database management systems from such firms as Oracle and Informix.

Many image management systems have made concessions to the data world by supporting SNA and TCP/IP Ethernet connectivity. Most also use standard CCITT Group 3 and Group 4 compression algorithms. Despite this, many systems will not communicate with popular operating systems without extensions and the addition of proprietary board-level technology. Many also use proprietary hierarchical indexing techniques for the image index.

The standards that are available for such things as cartridge size and disk sector usage are receiving broad support. In addition, image management system vendors are pushing for standards that will provide compatibility across their competing products. New image transmission protocols are also needed, as existing data transmission protocols are insufficient for the larger image blocks that may be 50K bytes, 100K bytes, and larger.

There is a delicate balance to maintain here. Because the technology is still evolving rapidly, standards run the risk of being ignored in the quest for increased performance and functionality. This leaves a wide open market for innovative companies that want to make their product the de facto standard.

Future Technological Developments

As image management technology matures, it will continue to place development demands on computer technology. Just as the large blocks of data composing a single image have pushed the limits of current systems, networks will have to be upgraded to accommodate heavy image traffic in the future. In an effort to keep pace, vendors have extended the capabilities of their database management systems and written extensions to SQL. Proprietary methods have also been employed to speed up the process of storing images to optical disk and reducing the number of seeks required to retrieve documents.

The most important design advancements will come in software. IDC expects to see enhanced intelligent character recognition and more flexible user interfaces. More advanced workflow software will allow users to designate processing paths without using a lower level language. Image management applications will also increasingly migrate away from proprietary processors to more universal host environments.

Component advancements will be marked by the movement of compression and decompression capabilities to the chip level on controller boards, where previously they were found on image processor boards. The storage densities of both magnetic and optical disks will continue to at least double almost every three years for the foreseeable future. There will also be advancement in subsystem interfaces and monitor technology.

Image management system technology has already shaped the way many companies undertake many of their fundamental business activities, and it is clear that it is affecting the development of general office system products. Image system technology will become so integrated with on-line transaction processing and office system environments, that by the mid '90s it will be impossible to separate the three areas. By that time, image management system users will have a seamless, standardized environment and the luxury of picking the best products from a competitive market.

But they shouldn't wait. The competitive advantages of image management systems are available today to those who decide to act.

COMMENTARY

Richard Pastore

IBM image losing luster

Rumor has it that this fall is going to be a prolific one for IBM's Personal Computer division. It had better be.

Observers have been suggesting for years that IBM Personal Computers do not offer the best value, are not the most innovative, are not tops in quality or performance and do not constitute the broadest product line. But the number of critics seems to be growing as the competition from low- and high-priced clones heats up.

You'd expect users to dump on IBM's prices. But more ominously, during the past year an increasing number of users have complained about poor quality, subpar performance and a lack of models suitable for their particular needs.

It seems the only thing IBM PCs have to recommend them is the comfort factor afforded by the three venerable and rock-solid initials on the box. IBM would not be wise to rest on this single laurel, however. Compaq, Apple and Tandy have been producing PCs for three decades among them; these firms are becoming fairly comfortable to a lot of users.

IBM is by far the market-

Continued on page 60

A dilemma made for multimedia

New office furniture design demanded innovative application

ON SITE

BY MICHAEL FITZGERALD
CW STAFF

In 1988, when Steelcase, Inc. was readying its Context product line, a radically different concept in office furniture, it wanted to make sure the product did not flop because it was too different for the traditionally staid office furniture market. Its solution was not mundane: Steelcase developed an on-line multimedia application that actually lets designers create office space on a computer screen, right down to fabric selection.

Despite its innovative styling, Context created two major problems for Steelcase.

"We had to raise the understanding of the design community as quickly as we could, and we had to find a way to basically retrain them and change the way they thought about furniture, so they could appreciate the designs they could do with this furniture," said Mark Greiner, director of information strategies at Steelcase.

At the time, multimedia was something Steelcase was just dabbling in, Greiner said. But Apple got wind of this and approached Steelcase to have it become a showcase corporation for multimedia. The two companies began discussions, and Apple produced a prototype — really just an on-line catalog — that sparked ideas at Steelcase, which brought 15 people together for a three-day meeting in the hills outside of Santa Fe, N.M.

Peter Yates

Greiner changed *attitudes about furniture*

From this meeting stemmed the decision to promote and support Context through the use of multimedia tools, and ultimately, a decision by Steelcase to support every major product unveiling with the use of multimedia. The strategy consisted of two parts: an on-line information system, which is finished, and a planning system, which is approximately 60% done.

The information system contains all the

Continued on page 62

Upgrade plan buoys Interleaf outlook

BY MAURA J. HARRINGTON
CW STAFF

CAMBRIDGE, Mass. — Interleaf, Inc. is expected to announce a major upgrade to its flagship product next week in a move that some analysts claim could help put the company back on its feet after more than nine months of struggling to survive a major, but necessary, reorganization. Last November, the company exited the hardware industry and cut 18% of its staff to survive the onslaught of decreasing software prices.

Interleaf's Technology Publishing Software (TPS) system Version 5.0, scheduled for announcement Oct. 4, is considered a major upgrade to Version 4.0 and is expected to include a new feature called active documentation. This feature allows the system to identify the user and help interpret spreadsheets and graphics that have been preidentified as important to the user.

"The active document technology is a major step forward for this technology. I don't think there is anyone else with anything quite like it," said David Nelson, an analyst at Shearson Lehman Brothers in New York.

Details on the active document feature announcement were drawn from analysts and confirmed by Interleaf.

With the active document feature, the system could, for example, identify that user by his log-in, open a document, pull important figures from any other document and automatically display them to that user when he logs in, or it could bring up a document for viewing in several different formats, according to Alex Henderson, an analyst at Prudential Bache Securities in New York.

"This product could revolutionize the way tables are made," said Andrew Poole, a Version 5.0 alpha-test user and a software engineer at Texas Instruments, Inc.'s Documentations Systems Group in the company's Design Automation Division in Dallas.

"With Version 5.0 of Interleaf's TPS product, users are able to gain access to routines that weren't previously available," he said.

With the active document feature, Poole said TI would be able to write most of a user manual before products are finished and then automatically insert additional information later.

The active document feature can also limit access to authorized users and automatically update any graphs attached to the document, Poole said.

The COBOL Programmer Workstation and Its Impact on Productivity
The Micro Focus Developers Seminar Schedule

Oct 2nd	Detroit, MI
Oct 16th	Atlanta, GA
Oct 25th	Honolulu, HI
Nov 8th	Vancouver, Canada
Nov 15th	Washington, DC
Nov 15th	Birmingham, AL
Nov 20th	Omaha, NE
Nov 29th	Seattle, WA

The Programmer Workstation environment uses personal computers as intelligent distributed workstations for developing, testing and maintaining host-based COBOL applications. At these Developers Seminars you will

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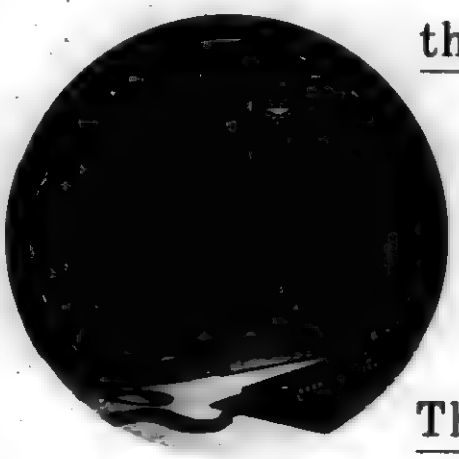
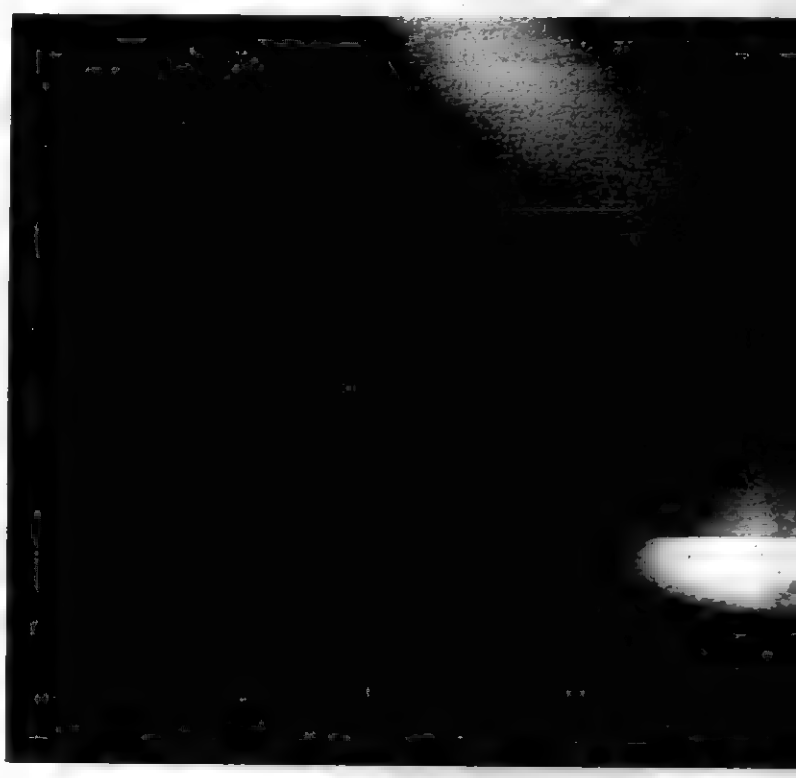
Introducing the NEC PowerMate® SX/20. If you want a system that will make a noticeable impact on your company's productivity, it's worth a look, for a lot of reasons.



The most important one being, it's from NEC.



Which means that not only does the PowerMate SX/20 give you advanced technology, excellent performance and uncompromised quality, it also offers you the security that your system will be fully supported in the years ahead by people who will be there when you need them.

Fact is, NEC Corporation is a 24-billion-dollar company. As well as the world's third largest manufacturer of personal computer systems.

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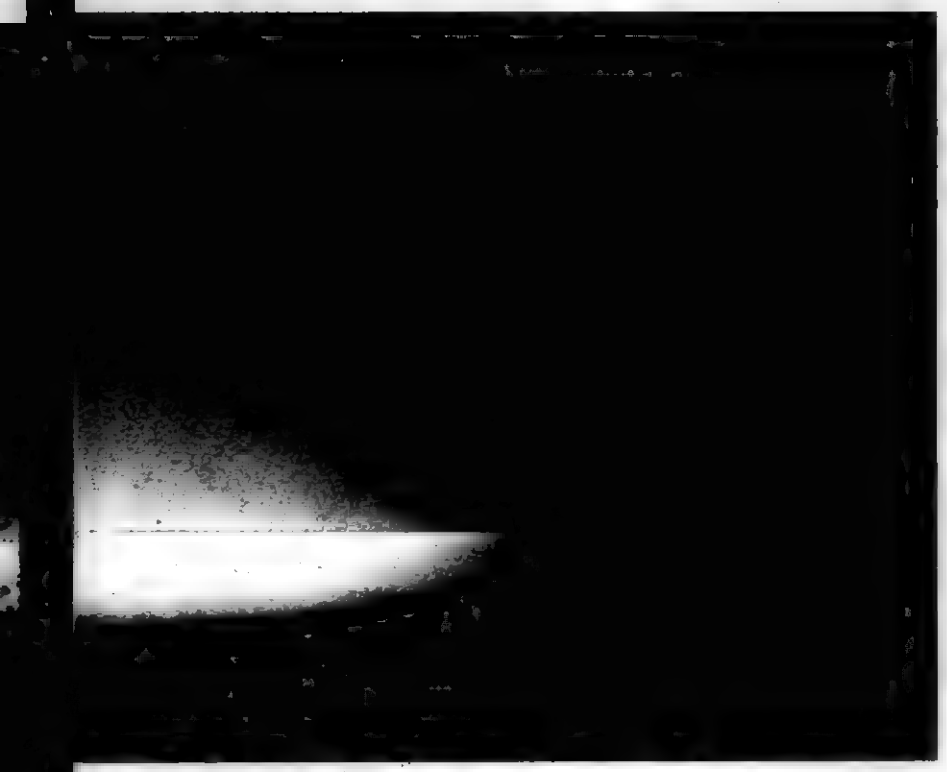

Best of all, it gives you something no one else can give you at any price: NEC. A company that knows the personal computer industry, inside and out.

For additional information, call 1-800-NEC-INFO.

The PowerMate SX/20. Choosing it will gain you a certain amount of attention. All of it good.

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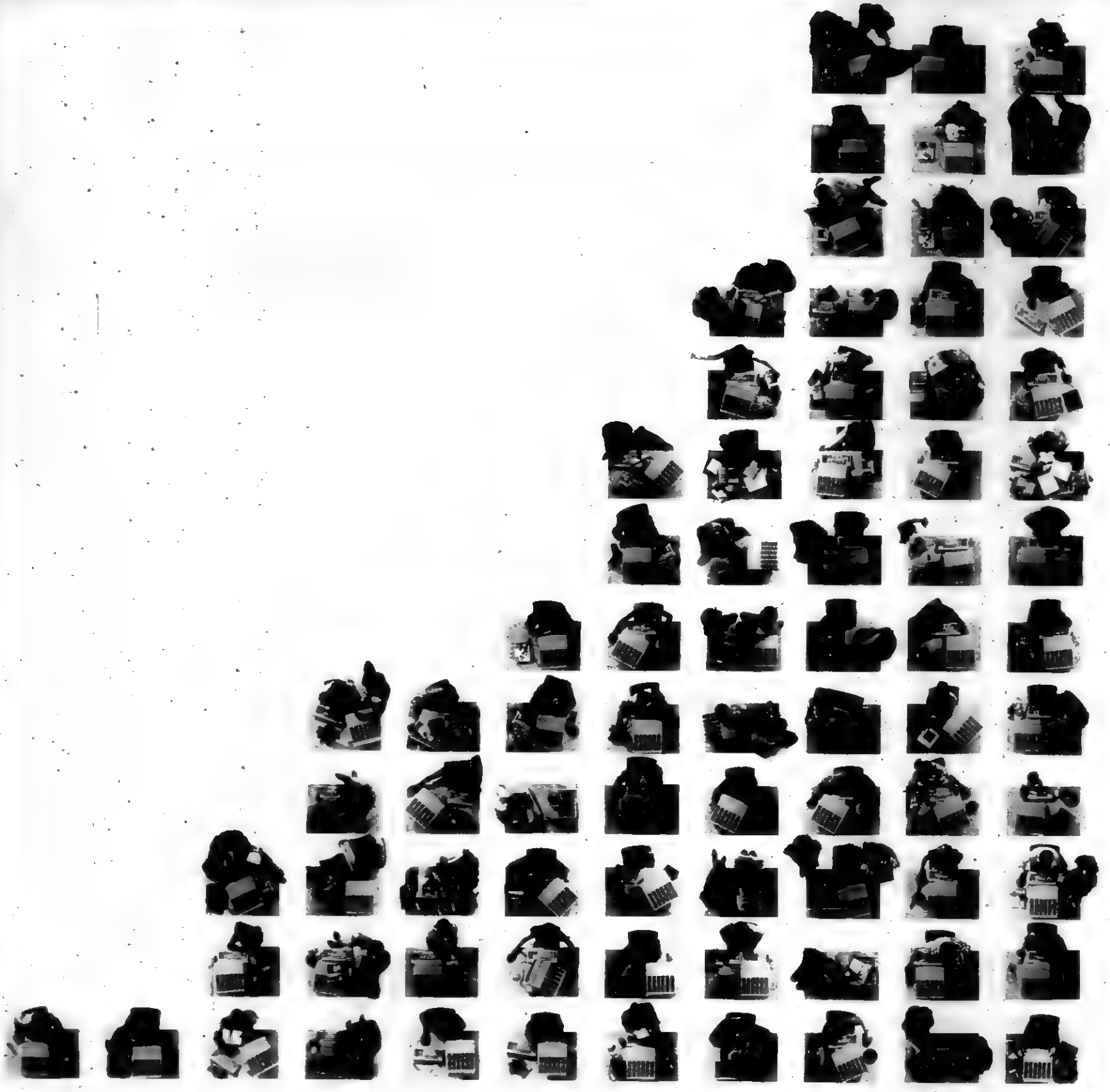
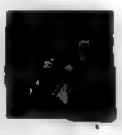


Unleash the power of your workstation and your business is bound to feel the effects.

Lotus 1-2-3 for Sun



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Lotus 1-2-3 for Sun

PRODUCT REVIEWS

Dbase upgrade worth the wait

After more than a year of shipment delays, Ashton-Tate Corp.'s Dbase IV, Version 1.1 has finally arrived. A number of features have been added to enhance its memory management and performance, and as a result, its overall operation shows a marked improvement in speed.

Dbase IV requires a minimum of 450K bytes of memory. A dynamic memory manager handles overlays better and releases more memory for application space. An optional integrated disk cache uses extended or expanded memory to cache data and overlays. More system parameters have been added to let users tune system performance.

Other improvements include conditional indexes, new language commands and removal of the limitations on user-defined functions and On commands.

For multiuser systems, a new command lets users check how long a record has been locked and who created the lock. The browse and edit screens now have access to the Organize menu, which allows users to build and select indexes as they work. The query by example (QBE) module has been improved, and printer support has been expanded. When using SQL, users can browse data tables and run reports or queries.

Dbase IV still lacks nonprogrammed multifile data entry. Users cannot enter data into more than one file at a time without writing custom programs.

Data-entry control is extensive, with a large collection of formatting templates and functions. Edit options let users specify a prompt, error message, range and validation for each field. Calculated fields can be defined, but the formula cannot reference another calculated field — a severe limitation.

The screen painter has most of the common features for boxes, lines and color control required to create attractive data entry forms. Unfortunately, screen manipulation can be awkward.

Dbase IV's query facility implements a QBE interface. Up to eight files can be related and queried by pointing to fields in a diagram. A file can be related to itself to perform a self-join. Dbase IV does not include an optimizing query engine. To perform a query, it writes a program. If an index does not exist for a linking field, one will be created. The index is created when the query is saved.

Dbase IV's report writer and label facilities let users create almost any type of output by painting the design on-screen and making menu choices. Reports can access multiple related files by using views created with the query facility. Calculated fields can be added to reports using any expression.

Dbase IV uses printer drivers and therefore supports several print styles and up to five user-specified fonts.

Dbase IV contains more than 440 commands and functions. A pseudocompiler speeds execution of operations. When an application is complete, it can be distributed with the free runtime module included in the package.

Ashton-Tate's *Dbase IV, Version 1.1*

The applications generator allows the nonprogrammer to glue all of the objects produced by the report, query and form designers into a cohesive turnkey system. Although powerful, the applications generator holds many traps. For instance, error checking is minimal.

The flaws that marred Version 1.0's generally good user interface seem to have been mostly removed, resulting in an easy-to-use and productive product.

The documentation included with Dbase IV is of high quality.

Overall, data in the Dbase IV environment is much more secure than it ever was in Dbase III due to such error-handling features as log-in security, file protection and data encryption.

Ashton-Tate offers free support weekdays from 6 a.m. to 4:30 p.m. PST. Ashton-Tate appears to have finally created a stable Dbase IV environment. The Developer's Edition comes with the template-language source code, two extra local-area network keys for multiuser program testing and a royalty-free unlimited runtime license for $1,295. The Standard Edition costs $795, and a LAN version that supports five users costs $995.

Users who need both a highly functional interactive environment and turnkey custom programs may find Dbase IV to be an attractive alternative.

Ashton-Tate Corp., 20101 Hamilton Ave., Torrance, Calif. 90509, (213) 329-8000.

Dbase IV Version 1.1

Price: $1,295

- Performance: Poor to very good
- Documentation: Very good
- Ease of learning: Very good
- Ease of use: Good
- Error handling: Good
- Support: Satisfactory to very good
- Value: Good

Powering up quick, easy presentations

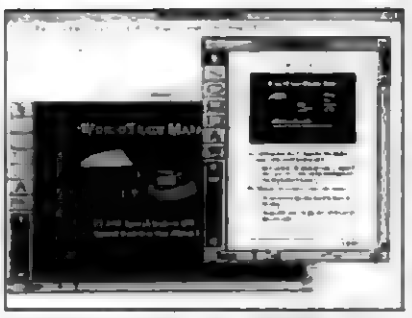
Powerpoint for Windows, Microsoft Corp.'s presentation graphics software program, focuses on the complete process of creating a presentation. It provides a consistent look to the images, organizes the presentation and produces supplementary materials such as speaker's notes and handouts.

Powerpoint's main menu works like an on-screen slide table. The images are displayed in a 35mm slide format, and they appear in what-you-see-is-what-you-get format throughout.

The program's slide master option serves as the backdrop for all successive slides. The master slide can be adorned with a company logo, presentation title or piece of clip art taken from Powerpoint's extensive library. It can be set up with a preset or custom color palette and a solid or shaded background.

The product comes with numerous presentation templates, including assortments of text charts, graphs and bullet charts.

Powerpoint can automatically produce speaker's notes for each slide. A facility for handouts allows users to print small reproductions of as many as six slides on a page and add text headers or footers.



Microsoft's *Powerpoint for Windows*

The program is solid, but it seems a bit sluggish in its screen operations compared with DOS programs. It provides basic numeric charting capabilities with few frills. Numeric charts are created in a separate program module called Powerpoint Graph. Data for the numeric charts is entered into a built-in spreadsheet. Users can edit a spreadsheet and view its linked chart simultaneously.

Powerpoint has exceptional text charting capabilities. A labeler provides quick entry of small pieces of text. For more extensive input, Powerpoint includes a simple word processor with fairly complete text editing capabilities. A spelling checker is also included.

Powerpoint does not offer direct film camera support. When a presentation has been constructed, a communications program can be used to send the file via modem to one of Genigraphics' centers for slide or photo processing.

The package comes with a comprehensive 400-page hardbound user's guide that is superbly organized and amply illustrated. About the only feature missing from the Powerpoint package is an on-line tutorial. On-screen Help is exceptional.

Microsoft offers unlimited free (but not toll-free) technical support on weekdays from 6 a.m. to 6 p.m. PST. The support staff is courteous and knowledgeable.

At $495, Powerpoint sets a new standard for making and orchestrating quick, easy and professional presentations.

Microsoft Corp., 1 Microsoft Way, Redmond, Wash. 98052, (206) 882-8080.

Microsoft Powerpoint for Windows Version 2.0

Price: $495

- Performance: Good to excellent
- Documentation: Very good
- Ease of learning: Very good
- Ease of use: Very good
- Error handling: Very good
- Support: Very good
- Value: Very good

Paradox Engine revs up programming control

Borland International's Paradox Engine is a set of C libraries that provides many of the data-handling functions of the Paradox database.

It includes libraries for Borland's Turbo C 2.0 and Microsoft Corp.'s C 5.1. Only the large memory model is supported. According to Borland, the next version, which is due out this fall, will support Microsoft's Windows 3.0, Turbo Pascal and object layers for Turbo C++ and Turbo Pascal.

The C functions in Paradox Engine provide for database creation, modification, manipulation and controlled access. The engine can be used to create standalone applications that access Paradox data files or miniprograms for integration into Paradox Application Language (PAL) programs that run under the Paradox database.

Most of Paradox Engine's functions are lower level, meaning that each one performs a fundamental operation and is usually grouped with other low-level functions to perform one higher level function. A few higher level functions that simulate features in the Paradox database's menu are also included.

Paradox Engine provides the full range of locking capabilities for use on a network. There are also functions that let users add and delete passwords as well as encrypt and decrypt data.

Paradox Engine lets users create and access the three index types available with Paradox: primary, incremental secondary and nonmaintained secondary. The engine can automatically maintain primary and incremental secondary indexes. The programmer must update nonmaintained indexes.

Paradox Engine implements five data types: numeric, money, short integer, date and character. Dates are stored as long integers, and numeric and money data types are stored as floating point. The storage of long integers places no real burden on the programmer, because Paradox Engine has functions to encode and decode dates.

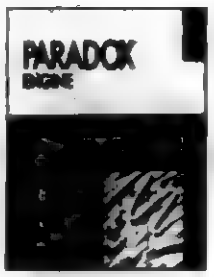
One of the main advantages of a C development tool kit over a high-level language is that it gives the user control over all the minute details of a program.

Continued on page 60

Reviews are compiled from information supplied by *Infoworld*.

Paradox

CONTINUED FROM PAGE 59



Overall, Paradox Engine provides functions in enough detail to afford a great deal of control over access to data, but it doesn't overly burden the programmer with responsibilities for less useful details. It is a fairly well-balanced set of C database functions.

Paradox Engine comes with a user manual, a quick-reference guide, C program examples for using all the available functions and a few complete sample programs. The user manual is well organized and has good examples.

Accessing data in Paradox files through C functions is so complex that it requires excellent documentation and good sample programs for users to start programming quickly.

The quick-reference guide that comes with Paradox Engine is a simple but ideal solution.

Paradox Engine is easy to use as C tool kits go. If it supported more high-level functions, it would be even easier.

Paradox Engine traps hardware errors on its own. It offers a range of error codes for various situations such as attempting to open a corrupt table.

Paradox Engine Version 1.0

Price: $495

- Performance: Good
- Documentation: Excellent
- Ease of learning: Excellent
- Ease of use: Very good
- Error handling: Excellent
- Support: Good to excellent
- Value: Excellent

The vendor offers unlimited free support via a non-toll-free line, Compuserve and facsimile. Borland also provides extended support hours, a 60-day money-back guarantee and corporate extended support plans. The support people respond quickly and accurately.

Paradox Engine, priced at $495, is so easy to use and learn that it is a must for any Paradox user who needs more power than PAL has to offer.

Borland International, 1800 Green Hills Road, Scotts Valley, Calif. 95066, (408) 438-8400.

Pastore

CONTINUED FROM PAGE 55

share leader. But to ensure this leadership for another decade, IBM should heed users' complaints. Though some of the following suggestions have been brought up in the past, they bear reiteration:

1. Price aggressively. The minor price restructuring of the past year has not had much effect on the budget-conscious. IBM should skip the namby-pamby, sporadic price cuts like the recent 3% to 8% reduction on Personal System/2 Model 25s. (Three percent? That doesn't even pay the state sales tax in most places.) To really startle buyers and change their perceptions, IBM needs a dramatic across-the-board cut — especially since Compaq just knocked about 20% off most of its product line.

2. Fill in product line. How can a company call itself a first-tier vendor when it has no practical portable or dedicated servers — with or without multiprocessors? Users may begin asking the same question unless IBM delivers a viable laptop computer, dedicated servers and a multiprocessor system this fall.

IBM has already filled a hole in the home market segment with its PS/1. But right now, its product line still looks like swiss cheese next to Compaq's.

3. Speed up or spruce up. If you're going to be late to market, at least be better once you arrive. It's asking a lot of a lumbering behemoth like IBM to beat its nimble competitors to market. Yet, wouldn't it be nice if, when the machines showed up, they had second-generation features that improved on the others?

Sadly, no one expects IBM's rumored laptop or servers to be any more innovative or exciting than what's been out there for almost a year. In contrast, Compaq's diskless network PCs were not the first such machines to arrive, but they had novel security and networking features that make them better than the rest. Take a lesson here, IBM.

4. Spit and polish. Put a little production effort — or at least some advertising effort — into restoring an image of peerless quality. Compaq has cemented that reputation among the first-tier vendors. Dell is earning it in the second tier.

5. Embrace EISA. Among those rarified individuals who give a hoot about what kind of bus their PC has, most seem to favor the Extended Industry Standard Architecture (EISA). It seems almost every PC vendor offers EISA, and users and third-party peripheral developers are starting to take notice. Meanwhile, users who have bothered to check say they find no performance advantage with IBM's rival Micro Channel Architecture (MCA) bus.

To avoid being stuck with some kind of bus albatross or white elephant, IBM should swallow its pride and offer both EISA and MCA. Other, smaller vendors have found it possible to sit on both sides of the bus fence; why can't IBM?

Pastore is a Computerworld senior writer.

T1 USERS

TRANSFER 6250 DATA AT 256KB OFF-LINE TAPE-TO-TAPE

Mitron's STD 6250 provides an efficient method for sending and receiving data anywhere in the world. STD 6250s communicate with each other and with other companies' bisynchronous terminals and computers.

The STD 6250 solves machine compatibility problems. It transfers data reliably without mailing tapes. It can communicate off-line to relieve an overworked computer.

STD 6250s transfer data at speeds up to 256KB. Double-buffering eliminates delays caused by read/write cycle times.

The STD 6250 can be leased or purchased.

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- Needs no software
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- Multiplexers
- 6250 or 1600 bpi
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- Variable size records to 32,000 bytes
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STD 6250 options:
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Since 1969, Mitron's magnetic tape systems have been used in a wide variety of data communication applications. For more information on how the Mitron STD 6250 can be used to send or receive magnetic tape data files, call 800 638-9665 (in Maryland, 301 992-7700)

MITRON
Systems Corporation
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Upgraded Clipper snips away memory limits

BY JAMES DALY
CW STAFF

LOS ANGELES, Calif. — Nantucket Corp. began shipping an update of its Clipper application development system this month featuring a revised memory management function that removes limitations on the size of DOS applications developers can create.

Clipper 5.0's Virtual Memory Management (VMM) system is designed to allow developers using personal computers to write the type of large and complex applications previously confined to mainframes and minicomputers, Nantucket President Larry Heimendinger said.

VMM consists of two software subsystems that divide memory tasks. The "segmented" virtual memory subsystem addresses up to 64M bytes of memory, while a separate object memory unit manages character and array values generated by Version 5.0 applications. The object memory subsystem also automatically reclaims memory occupied by values no longer needed.

When teamed with Clipper's dynamic overlay linking, which permits developers to build and run applications larger than available main memory, VMM allows developers to write programs with no practical memory limitations, Nantucket officials said. "Developers can concentrate on writing the best possible application without worrying about how big or complex it is," Heimendinger said.

Clipper 5.0 will sell for $795, and registered users of previous versions can upgrade for $195.

MICRO BITS

NCR resells with Pacer

NCR Corp. and **Pacer Software, Inc.** have announced a cooperative marketing agreement to resell NCR's Tower line of supermicrocomputers and Pacerlink Software.

Archive Corp. subsidiary **Ardat** and **Hewlett-Packard Co.** have agreed to use the same data compression technology — DCLZ — on their digital data storage systems.

Rasterops Corp. has signed an OEM pact with **Digital Equipment Corp.** to develop a high-resolution color display capable of combining 24-bit color graphics with on-screen television and video for DEC's family of reduced instruction set computing workstations. Initial shipment of the product is slated for the first quarter of 1991.

Fox Software, Inc. will publish a developer's directory that will include listings of Foxpro, Foxbase+ and Foxbase+/Macintosh developer, vertical applications and third-party enhancement products. The *1990-1991 Fox Software Developers Directory* will be available next month for $24.95.

A $20 rebate coupon for **Traveling Software, Inc.**'s Laplink Macintosh III will ship with every copy of **Aldus Corp.**'s Pagemaker Version 4.0. Laplink is a file transfer utility that allows Apple Computer, Inc. Macintosh computers and IBM Personal Computer compatibles to exchange files. The offer expires March 31, 1991.

Robotron, East Germany's largest computer and electronics conglomerate, has signed a distribution pact with **AST Research, Inc.** that will allow AST to expand its sales in Eastern Europe.

DG coaxes Unix users

BY SALLY CUSACK
CW STAFF

WESTBORO, Mass. — By introducing a vector processing version of the Aviion reduced instruction set computing-based system recently, Data General Corp. is hoping to lure larger numbers of systems integrators, laboratories, contractors and exploration firms into its Unix-based workstation camp.

The Model 5069 is a 32-bit single-precision, single-board system that performs up to 66 million floating-point operations per second (MFLOPS).

According to the vendor, as many as eight Model 5069s can be interconnected for a maximum of 528 MFLOPS in a single-chassis environment. The system incorporates an industry-standard VMEbus data bus and is available in configurations with 2M bytes and 8M bytes of memory, priced at $8,995 and $12,195, respectively.

The company also announced three VMEbus interfaces for connecting Aviion systems to external systems and peripherals: the Model 5089/5099 for use with Digital Equipment Corp.'s DR11-W devices; the Model 5517 for IEEE-488 connections; and the Model 5400, a general-purpose interface for high-speed parallel block transfer functions between Aviion computers and external devices.

Pricing for the interfaces ranges from $1,895 to $4,495. All of the products are available immediately.

Multimedia

FROM PAGE 55

specifications for the Context product line, including which fabrics are available for which pieces of furniture. It also contains modules that give designers different views of the product.

The planning system allows designers to plan entire offices, right down to simulating office lighting.

The minimum hardware requirement is a Macintosh II with a color monitor.

Steelcase went with the system in the fall of 1988. It contracted with Santa Fe Interactive to write and produce the information system and worked with Apple's Integrated Systems Group to develop the planning system. Eventually, the work was transferred to the Palo Alto, Calif., office of KPMG Peat Marwick. Steelcase sent several employees to KPMG to learn the development process and in July of this year brought the project in-house, for economic reasons and control.

Using its new multimedia secret weapon — based on Apple's Hypercard and Macromind, Inc.'s Director — Steelcase unveiled the new product line at the Neocon trade show in 1989. The company walked away with the best of show award.

Steelcase picked Apple because "we wanted to work with a computer that didn't feel like a computer," Greiner said.

The project has three target markets:

1) Steelcase's 450 distributorships, for use as a sales tool.

2) The architectural and design community, which specifies furniture for new offices. "Context has 500 pieces in it, and these people have very limited amounts of time to learn these products," Greiner said.

3) Customers, so that they can get a quick and easy orientation in the Context line.

Spread nationwide

Besides the dealers, the system has been installed in area offices in New York, Los Angeles, Chicago, Toronto, Atlanta, Grand Rapids, Mich., and San Francisco and will ideally be installed in all 30 of Steelcase's area offices.

Greiner said that dealers in general react cautiously to the new system. "They're still weighing whether the investment in the hardware and software is worth it for one product."

It is a good question, particularly when those with computers are generally using IBM and compatible systems. However, Greiner said that Steelcase, which would not disclose its investment in the project, is firmly committed to multimedia technology and will develop similar applications for all of its major new product lines.

Just because Steelcase developed its first project on a Macintosh platform does not mean it will stay there. Greiner said that IBM has greatly improved its multimedia efforts, and Steelcase would certainly consider moving to the IBM platform.

"It would be more convenient," Greiner said. "But the key is, where is the solution best manifested?"

For now, the answer is Apple.

Greiner also pointed out that Steelcase does not expect to replace its printed catalogs at any point in the future. Multimedia applications will simply be an additional tool.

Greiner said that work on this project has opened some eyes at Steelcase.

"It's raised our expectations of all applications," he said. "They all should be fun to use; we shouldn't have to accept boring-looking spreadsheets. We go back to IBM and [tell them that] applications should be quick, simple, easy to use and intuitive."

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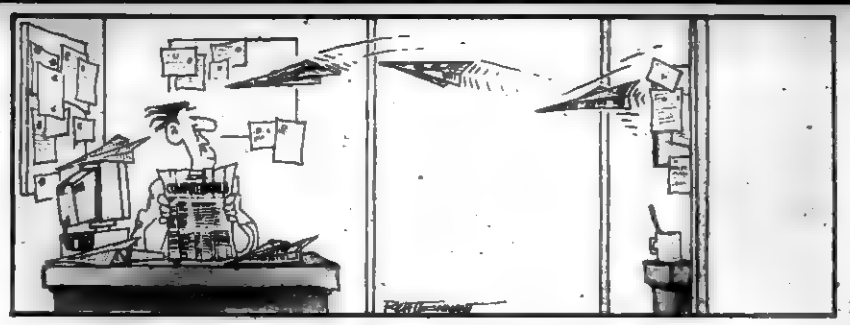

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   - 85. System Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
   - 90. Computer/Peripheral Dealer/Distr./Retailer
   - 75. User: Other _____
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COMMENTARY

Walter Ulrich

Living private E-mail lives

Electronic mail privacy issues spring to the surface every few years. A few years ago, archiving of E-mail made headlines as old IBM Professional Office System (Profs) messages played a role in the undoing of Oliver North. Recently, the Epson America and city of Colorado Springs cases have raised related questions: What level of privacy are users of business E-mail systems entitled to expect?

Messages sent between two companies via a third-party service have excellent privacy protection. First, the Electronic Communications Privacy Act of 1986 protects electronic communications in a way similar to the wiretap statutes that apply to telephone calls.

Second, it is more difficult for a wiretapper to make sense of E-mail than it is to listen to a telephone conversation. Identifying and decoding a specific electronic message from a bit stream over a busy communications line is a formidable task.

Companies that run and own their own private E-mail systems, however, must deal with issues that do not apply to E-mail service users. Among the most crucial: What privacy rights does

Continued on page 64

LANs can now talk over SNA

BY ELISABETH HORWITT
CW STAFF

Third-party vendors are stepping in to meet the needs of IBM users who want economical ways to interconnect their local-area networks to one another and to IBM hosts via the same box. IBM recently began moving to bridge the gap between its LAN and Systems Network Architecture (SNA) but at a pace slow enough to leave gaps for third parties to fill.

Two years ago, IBM took the crucial step of allowing its Network Control Program to support the PU2.1 peer-to-peer protocol, which allows devices supporting PU2.1 to communicate directly over a backbone of front-end processors without having to go through the host. LANs can talk to each other and to IBM hosts via that backbone, as long as they are equipped with a gateway that supports PU2.1.

Two vendors announced such gateways at the recent Networld '90 Dallas conference. Phaser Systems, Inc. introduced LU6.2 and PU2.1 support for its Novell, Inc. Netware SNA router. That will allow Netware LANs to use the SNA backbone to communicate directly with one another or with other PU2.1 systems such as IBM Application System/400 hosts, Phaser said. The router already supports SNA connections to IBM MVS and VM hosts.

Also at Networld '90, Harris Adacom Corp. in Dallas introduced the Strategy 9770 Intelligent Token-Ring Gateway. The product is said to provide bidirectional, PU2.1-based links between Transmission Control Protocol/Internet Protocol (TCP/IP) Ethernet networks and IBM SNA 4M/16M bit/sec. Token-Ring LANs.

The Travelers Corp. recently discovered that an OS/2 server running LAN Manager also has the PU2.1 capability to provide LAN-to-LAN connections over its front ends.

However, the insurance giant drew back from implementing this interconnectivity strategy because it wanted its users to be able to communicate via protocols other than SNA, according to a company spokesman [CW, Sept. 3].

IBM recently introduced a program that is said to encapsulate Netbios transmissions in SNA envelopes so that they can run over SNA backbones. And Mitek Systems Corp. in Carrollton, Texas, offers gateways that encapsulate TCP/IP so that it can run over SNA.

However, this method of bridging two networking environments is too slow to support any but the least demanding of LAN-to-LAN transmissions, sources said. A more direct solution would be for IBM host front ends to support other protocols besides SNA.

IBM is reportedly working on both Open Systems Interconnect (OSI) and TCP/IP support for its front-end processors. Meanwhile, NCR Comten has already implemented TCP/IP on its own IBM-compatible front-

Continued on page 65

Study says IBM connectivity limited

BY JOANIE M. WEXLER
CW STAFF

In an era in which managers see data traffic boldly venturing off its own local-area network to other networks and hosts, LANs in IBM shops are proving to be more provincial than Digital Equipment Corp. VAX-based networks, according to a recent study by Computer Intelligence (see story above).

The La Jolla, Calif.-based market research firm, which surveyed the 25,000 U.S. sites housing either a VAX minicomputer or an IBM mainframe, determined that VAX-equipped LANs are more likely to be communicating with another LAN or host than are networks connected to IBM mainframes.

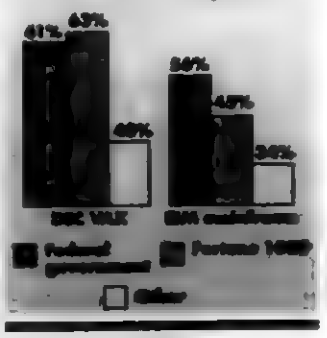
Federal government and Fortune 1,000 sites are among the largest users of LANs, and about 62% of them are on speaking terms with another LAN or host. By contrast, about 55% of the large IBM mainframe sites are communicating with other systems or networks, according to Computer Intelligence.

Bridgework

Companies with DEC VAXs are more likely than IBM mainframe sites to interconnect LANs

Percentage of sites with interconnected LANs

(Base: 7,000 DEC, 5,000 IBM)



Source: Computer Intelligence
CW Chart: Chuck Fletcher

"The installed base today somewhat reflects the historical emphasis of the vendors," explained Bruce Coughran, a communications industry analyst at Computer Intelligence. "IBM has traditionally been more hierarchical, while DEC's strategy is more peer-to-peer oriented."

The same DEC/IBM LAN interconnection relationship holds true, the study said, for other sites, including smaller companies and some universities — although university environments often mirror the heterogeneous government networking environment, Coughran said.

Cliff Worth, a senior consultant at Arthur D. Little, said, "The deterministic nature of the token-ring architecture makes it easier to predict traffic flows, so it is becoming more desirable than Ethernet for some users. But there are still a lot of IBM shops out there with isolated Token-Rings because of the traditional mainframe orientation in the IBM world."

Who was the first bank automation company to produce a computer with 486 chip technology?

Here's a hint: It's not IBM or DEC.

Videotex lets ailing travelers rest easy

ON SITE

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — It is scary enough to suddenly need hospitalization while traveling in a foreign country. But then there is the question of how to pay the hospital bill, especially when credit cards are not accepted.

One company coming to the rescue is Group Hospitalization and Medical Services, Inc. (GHMSI), an insurance conglomerate that has made arrangements with hospitals in about 67 countries to provide direct payment of hospital bills for GHMSI's 200,000 traveling customers.

However, this convenient system only works if the hospital can get immediate verification that the patient is eligible under GHMSI insurance.

GHMSI has taken the unusual approach — unusual for an American firm, at least — of adopting France's Minitel videotex system to solve this international networking problem. The result is that hospitals can get fast confirmation of eligibility, regardless of languages, time zones and holidays.

For many Americans, Minitel is too simple and too, well, European. "Our data processing people were highly skeptical," said Ruth A. McKenty, director of GHMSI Europe and Asia. Americans resist Minitel because "it's not a U.S. product with an IBM mainframe and dozens of programmers," she said.

However, GHMSI, a company with an international outlook, was familiar with Minitel in its Paris office, where the French videotex service is used mostly for making airline reservations.

After flirting with some very expensive options, GHMSI decided that a Minitel-based system would be much more cost-effective for an application that involves infrequent bursts of traffic but requires 24-hour access to the database, project manager Jacquelyn Hartley said.

The application was designed

GHMSI

and implemented by Information Systems Experts, Inc., a Washington, D.C.-based systems integrator that continues to operate the system for GHMSI. User costs include the original contract of $20,000 and a fee of $2,500 per month for continuing operations and maintenance, plus Minitel per-minute usage charges.

The videotex service, known for its graphics displays and easy-to-learn function keys, is provided by Minitel's U.S. marketing arm, Minitel Services Co. in Purchase, N.Y., which uses Infonet Corp.'s X.25 backbone network to carry the transmissions.

Hartley said that in a typical scenario, the Minitel-based system works like this:

- A traveling subscriber shows up at a foreign hospital with a GHMSI identification card. The hospital calls GHMSI's World Access, Inc. subsidiary in Washington, D.C., where a multilingual staff is on hand 24 hours a day to answer the phone.
- The World Access employee uses a Minitel terminal to look up the subscriber's record and verify the insurance coverage while the hospital is still on the phone.
- The database of eligibility records — just a small subset of the complete insurance database — runs on an Intel Corp. 80386-based microcomputer with a 150M-byte hard disk. The eligibility records from GHMSI's foreign insurance partners are updated on-line via the Minitel network or magnetic tapes.

Hartley explained that because GHMSI acts as a reinsurer for its foreign insurance partners, the system requires access to the eligibility data contained in the partners' insurance databases. Instead of duplicating the partners' entire customer databases on GHMSI mainframes, GHMSI is taking the much simpler route of loading just the essential data onto the personal computer database.

In addition, GHMSI's International Division uses Minitel for basic electronic mail communications among offices in the U.S., UK, France, Mexico and Ireland, Hartley said.

Dick Groppe, president of the International Division, said he is considering other Minitel-based information systems, including development of an executive information system that would provide managers with summaries of international financial data.

Ulrich

FROM PAGE 63

the firm have, and what privacy rights do employees have?

When a company owns or leases E-mail systems or services for its employees' use, the company has a definite right to privacy. Wiretapping or hacking by third parties is clearly illegal under a variety of privacy, computer crime and other laws. The company's electronic information is protected.

Employees, on the other hand, have no a priori right to protest the privacy of company electronic messages from their company. The company, after all, owns (or leases) the system and the messages. Therefore, the company has broad latitude in its behavior with respect to its E-mail.

An electronic message is analogous to a paper memo. Information in memos is often freely shared among workers. This kind of information sharing is essential to the smooth and effective functioning of an enterprise.

It would be a big mistake to accord electronic communications privacy restrictions different than those accorded to paper communications. One of the justifications for E-mail is that it enables faster sharing of information. It would be wrong to begin chipping away at that benefit with bureaucratic regulations or government intrusion.

Mike Cavanagh, executive director at the Electronic Mail Association located in Washington, D.C., points out that there are often situations in which we would want a colleague to retrieve information. For example, if I am away on an emergency, I would want a colleague to search for that nearly completed proposal, complete it and send it to my client before the deadline.

There are several justifiable reasons for someone in a company to access another person's electronic information:

- Routine sharing of information in the course of business.
- Suspicion of theft of trade secrets or computer crime.
- Investigation of other criminal activity, such as drug dealing, gambling and fraud.

However, companies should never allow electronic fishing expeditions. Snooping is counterproductive and in bad taste.

There are 10 million users of E-mail, and questionable practices are so infrequent that they make the news. Common sense has worked well so far, but as volumes grow, the incidence of problems will increase. Companies should establish electronic record management policies that include privacy guidelines.

E-mail privacy guidelines should do the following:

- Encourage fast and free sharing of electronic information.
- Prohibit an overzealous supervisor from electronic snooping, except under special circumstances.
- Reserve the company its proprietary rights in its electronic information.

People should use E-mail freely in the conduct of their company's business. Individuals should protect their passwords carefully and change them regularly. Above all, users should conduct themselves in the same professional and prudent manner when using E-mail as they do in other aspects of their business life.

If you suspect that electronic snooping is occurring in your company, use proper channels to inform an officer of the company. If it is permitted to continue on a routine basis, you may well question whether it is the kind of organization with which you want to be associated.

The privacy of E-mail is better than that of paper mail. An electronic message is handled by fewer people and is less subject to interception or modification. A commonsense policy on privacy will encourage responsible use of E-mail while preventing unfortunate incidents that could have embarrassing and far-reaching implications.

Ulrich is client services director for the information and telecommunications systems consulting section at Arthur D. Little, Inc. in Cambridge, Mass.

It's Olivetti.
The company that brought together ISC-Bunker Ramo.

INC delivering hybrid ISDN system

BY ELLIS BOOKER
CW STAFF

BRIDGEWATER, N.J. — Integrated Network Corp. (INC), which made a name for itself with networking gear that offers many of the digital features of the Integrated Services Digital Network (ISDN) without ISDN, recently announced its first ISDN-compatible system.

Remaining true to its history, however, INC's CM-384/PRI, which can access an ISDN Primary Rate Interface channel, is said to be the first ISDN product that can also work with 56K bit/sec. systems, specifically INC's own line of 1056 series 56K bit/sec. channel service unit/data service units.

The latest product offers access speeds from 56K bit/sec. to 768K bit/sec. in 56K or 64K bit/sec. increments and will initially support AT&T's Switched 384 service, according to INC.

"I'm not aware of another 384 switched product," said Dataquest, Inc. analyst Larry Cynar, noting that INC has pushed hard in the 56K/64K bit/sec. market and that a number of vendors are reselling INC's boxes under their own nameplates.

Initially, the CM-384 will have two ports, each capable of running from 56K bit/sec. to 384K bit/sec. The unit, which can perform automatic rate adaption when connecting to INC 56K bit/sec. devices, is also said to be able to work behind standard T1 muliplexers.

"Next year, we'll have a software upgrade making each port [compatible] with a 1.5M bit/sec. service," said INC Vice-President of Marketing Craig Bender, who plans to demonstrate the product at the Tele-Communications Association show in San Diego this week.

Bender said he expected AT&T to announce its 1.5M bit/sec. switched service by the end of 1991, once its network of 400 or so toll switches is upgraded.

Cynar noted that the value of INC's device may be nominal until and unless local exchange companies provide variable, high-speed access into long-distance services.

The CM-384 will be available in the fourth quarter at a list price of $5,995 for the rack-mount version.

US West beefs up recovery service

BY ELLIS BOOKER
CW STAFF

DENVER — Local telephone companies are beefing up their networks, adding redundant and intelligent features to make them better able to respond to outages and protect customers' critical on-line applications.

Two weeks ago, US West Communications won regulatory approval for its high-speed network recovery and restoration services. US West claims to be the first of the seven regional Bell holding companies to develop and market such services, which automatically reroute a customer's telecommunications traffic around failed network nodes.

"All the regionals have looked at this from time to time," said Thomas L. Nolle, president of CIMI Corp. in Voorhees, N.J. Nolle said he was surprised US West had entered the market first, given that the largest concentration of financial services and brokerage firms — historically the users with the most pressing need for backup services — are located in New York and Chicago, which are served by Nynex Corp. and Ameritech.

Network recovery at the local phone company level is "natural because of the acceptance of the idea of disaster recovery for private networking," and it will increase in proportion to the delivery of virtual network services using public facilities, Nolle said. But, he added, large users may be uncomfortable with the concept of a network-generated switchover.

"A lot of users feel that the only person who can switch to the backup is them," Nolle said. He added that "millisecond" backup switching on public networks, which has only been available recently with the deployment of intelligent cross-connect systems, is of dubious advantage if the customer's backup data center cannot handle millisecond switchovers.

A SHARP edge

US West's Self-Healing Alternative Route Protection (SHARP) service, an option for DS1 or DS3 customers, offers alternative routing around failed network nodes over fiber-optic facilities. The service will be deployed in five US West markets: Minneapolis-St. Paul, Denver, Seattle, Phoenix and Portland, Ore. A second service, called Self-Healing Network Services (SHNS), is for custom-built networks and provides redundant facilities through a counter-rotating fiber ring for DS3 private network customers. It is available throughout US West's territory.

SHARP will be available in a phased rollout, starting with Minneapolis-St. Paul this month and entering the other four markets by July 1991.

Pricing for SHARP can range from about $370 per month for a single T1 circuit to as much as $4,000 per month per DS3 circuit. SHNS costs from $25,000 to $46,000 per month, depending on number of nodes and locations.

To back up its claims of reliability, US West is offering a one-month credit to customers if they experience as little as one second of downtime on the redundant networks. Both tariffs were approved earlier this month by the Federal Communications Commission.

Connectivity

CONTINUED FROM PAGE 63

end processors and plans to ship OSI support for its offerings by early next year, a spokesman said.

The Minnesota legislature became a beta-test user of Comten's TCP/IP product running on a Comten front end last January. The legislature had determined that it needed more terminal-to-host throughput than was provided by its "ancient" IBM 3705 front end, according to Robert McClung, the legislature's data processing manager.

The organization upgraded to a Comten processor rather than to a larger IBM front end because it wants to eventually use TCP/IP for both LAN and micro-to-mainframe communications, McClung said. IBM does provide TCP/IP for its hosts, but the software reportedly takes up a tremendous amount of mainframe processing power, he added. In contrast, Comten's front ends provide translation from TCP/IP to SNA so that the IBM host can still talk in its native language.

If IBM front-end manufacturers are invading LAN interconnectivity vendors' territory, the router companies are striking back by turning their devices into SNA gateways. Indeed, IBM's own 3172 Interconnect Controller now links both SNA and non-SNA hosts to a variety of LANs. The vendor is considering whether the 3172 will become a LAN-to-LAN platform as well, an IBM spokesman said.

The following offerings are from the third-party arena:

- Eicon, Inc. in Montreal is offering a personal computer card that is said to support SNA, Netbios, TCP/IP, Novell, Inc.'s IPX and OSI. Eicon is working on adding Integrated Services Digital Network and frame relay links to its product.
- Proteon, Inc. in Westboro, Mass., recently introduced a bridging router that supports IBM's 16M bit/sec. Token-Ring and source routing protocols, as well as IPX, TCP/IP, Apple Computer, Inc.'s Appletalk, Digital Equipment Corp.'s Decnet and OSI.
- Cisco Systems, Inc. in Menlo Park, Calif., is offering a router that supports the same protocols as Proteon's device, as well as others.

NEW PRODUCTS

Local-area networking hardware

Tecmar, Inc. has announced a family of server-based tape backup and optical-disc subsystems for Novell, Inc. networks.

Proline is attached to a network's central file server so backup procedures can be performed without a dedicated workstation and without requiring server data to be sent across the network. Data transfer rates of 240K byte/sec. are possible using Proserve, a network management software package that functions as a Novell Value-Added Process under Netware 286 and as a Network-Loadable Module under Netware 386.

Pricing ranges from $2,595 to $8,495, depending on configuration.

Tecmar
6225 Cochran Road
Solon, Ohio 44139
(216) 349-0600

David Systems, Inc. has announced two Ethernet 10Base-T adapters designed for use in IBM Personal Computer environments.

The Ether-T PC/AT and the Ether-T MC both establish local-area network connections using ordinary telephone lines. The former model was designed for use in an 8- or 16-bit bus IBM PC XT, AT, Personal System/2 Model 30-286 or compatibles. The latter model can be used in IBM PS/2 and compatible PCs using Micro Channel Architecture.

The adapters are priced at $350 for the Ether-T PC/AT and $460 for the Ether-T MC.

David Systems
701 E. Evelyn Ave.
Sunnyvale, Calif. 94086
(408) 720-8000

Network management

Candle Corp. has introduced a VTAM monitor that complies with IBM's Systems Application Architecture (SAA) and Common User Access (CUA).

Omegamon II for VTAM enables users to analyze VTAM performance and determine if short-term network problems are caused by VTAM or other network components. It includes an SAA/CUA interface that facilitates VTAM command entries and a Netview hot key that provides easy access to IBM's Netview.

First CPU pricing ranges from $20,000 to $60,000, depending on site size.

Candle
1999 Bundy Drive
Los Angeles, Calif. 90025
(213) 207-1400

Links

Intervoice, Inc. has introduced an integrated digital version of its Robot Operator system that features full T1 support.

The system's Intervoice Vocalcard/Digital voice card provides 24-channel capacity in a single slot of an IBM Personal System/2 and is fully integrated with T1 capabilities.

The product is priced at $1,625 per channel for a T-Span of 24 channels and less than $1,000 per channel for 96 channels or 4 T-Spans.

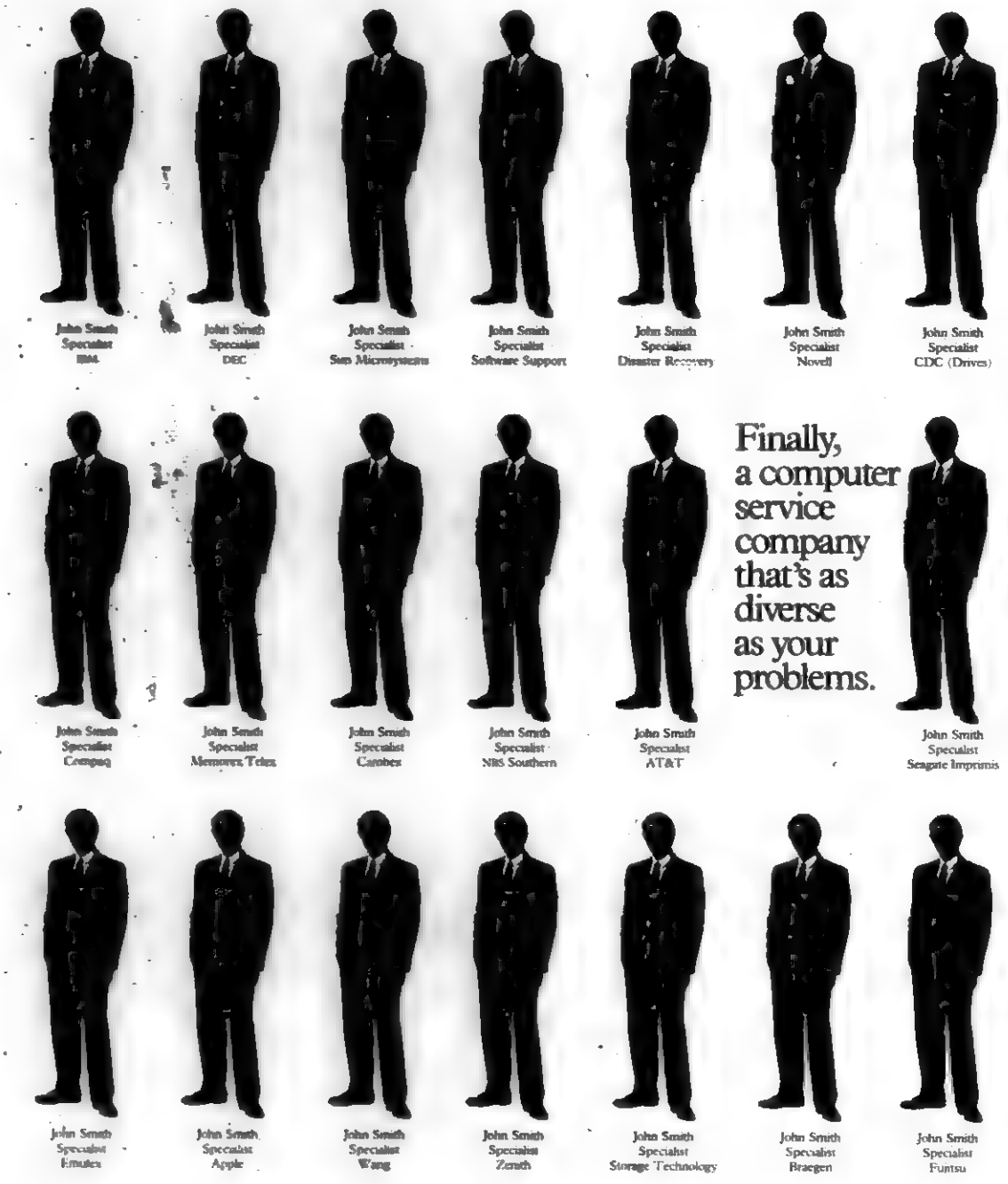
Intervoice
17811 Waterview Pkwy.
Dallas, Texas 75252
(214) 497-8720

CE Software and Solutions, Inc. has announced a communications enhancement that was added to Quickmail, its electronic mail package designed for users of Apple Computer, Inc. Macintosh systems.

Faxgate Plus was developed as a Quickmail-based gateway that enables users of local-area network mail systems to share its Backfax modems or compatibles.

Faxgate Plus requires a Macintosh Plus or higher version with 2M bytes of random-access memory, a hard drive and Quickmail Version 2.2 or higher. It is priced at $395.

CE Software and Solutions
P.O. Box 65580
1854 Fuller Road
W. Des Moines, Iowa 50265
(515) 224-1995



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MANAGER'S JOURNAL

EXECUTIVE TRACK

Tom Cash has been appointed vice-president and chief information officer at **Sara Lee Knit Products** in Winston-Salem, N.C., makers of Hanes, Stedman and Pannill clothing.

Cash previously served as director of Sara Lee Knit Products' sales, marketing and distribution systems. Before that, he was president of management consulting firm SBE Associates and vice-president of systems at Cannon Mills Co. He also spent some time at Sara Lee Corp., parent company of the Knit Products division, as a consultant.

Cash holds a bachelor's degree from Wake Forest University and a master's degree from the Georgia Institute of Technology.

.....

Dennis Connor, the former head of IS at Greyhound Lines, Inc., has been named director of MIS at **Epic Healthcare Group**, a Dallas-based firm operating 39 hospitals in 10 states.

After leaving Greyhound, where he was senior director of IS, Connor joined Epic last May as interim director of MIS. Epic is the third largest employee-owned company in the U.S., with 10,000 employees.

Connor's 20-year IS career has included positions at Ericsson, Inc., Texas Instruments, Inc., Kimberly-Clark Corp. and Electronic Data Systems Corp.

He holds a bachelor's degree in naval engineering from the U.S. Naval Academy and an MBA from Texas Tech University.

.....

Who's on the go?

Changing jobs? Promoting an assistant? Your peers want to know who is coming and going, and *Computerworld* wants to help by mentioning any IS job changes in Executive Track. When you have news about staff changes, be sure to drop a note and photo or have your public relations department write to Clinton Wilder, Senior Editor, Management, *Computerworld*, Box 9171, 375 Cochituate Road, Framingham, Mass. 01701-9171.

IS management: A campus view

Harvard professor urges students to seek firms where tech is 'a big deal'

The most far-reaching change in the world of information systems management during the next five to 10 years may be the blurring of the distinction between careers in IS and general business management. One individual with a particularly clear perspective on this issue and many others in IS is F. Warren McFarlan, the Ross Graham Walker professor at Harvard Business School.

Computerworld senior writer David Ludlum recently spoke with McFarlan on the Harvard campus in Cambridge, Mass.

Warren McFarlan: *IS managers should focus on the needs of end users*

A few years ago, there was concern that the best business school talent was heading for Wall Street at the expense of other callings. Is that still an issue, and has it affected the information technology area?

We were very concerned at the high percentage of our class that was going to Wall Street three or four years ago, and we began restricting sharply the number of people entering the school from Wall Street financial institutions. We went hard after people whom we considered did real jobs, which would be in information processing, marketing, production and sales.

Is that still a concern?

Oh, yes. We're continuing to focus on people who have an orientation in that direction.

Do many Harvard MBA graduates go into IS management positions?

My guess is it's a relatively limited number of people. Most of them are going off into marketing or production types of jobs. It might be 5% of the class or 7% of the class that would go into IS management.

Part of the reason for that, of course, is that a number of the IS management positions are filled by people coming right out of the technology side. Two years here doesn't give that kind of apprenticeship.

How much should the general manager know about information technology?

We don't waste a lot of time teaching people the intricacies of relational data architecture or the technical performance of different kinds of local-area networks because that technology tends to be very specific to a point and time. But in terms of developing an understanding of how the technology is changing organizational structures, how it's allowing new kinds of control techniques to be created, how it's improving responsiveness in the company, how it's opening up new channels of distribution, how new forms of elec-

Continued on page 72

The *wrong* way to implement an EIS

BY CLINTON WILDER
CW STAFF

Companies that don't view an executive information system (EIS) as a major development effort are in for a rude shock. That is something Mutual Benefit Life Insurance Co. found out the hard way.

The Newark, N.J.-based company is considered a leader in the use of IS to transform its business. However, during the recent Society for Information Management conference in New York, June Drewry, senior vice-president of corporate planning and systems development at Mutual Benefit, gave a refreshingly candid account of an EIS that failed.

The mistake most companies make is thinking that creating an EIS is easy, Drewry said. Installing a vendor's EIS package onto executives' personal computers is really a very small percentage of the effort — and the cost — of the project.

"If you don't think about the costs of gathering and massaging the information, the hardware and software looks great and is easy to justify," she said.

Mutual Benefit chose Comshare, Inc.'s Commander EIS two years ago and had a prototype system running by May 1989. But the system never caught on, for a variety of reasons that Drewry ticked off:

- Not enough effort was put into what data the executives wanted, how soon and in what form.

"The job of 'information provider' to the system was not a full-time job, and it should have been," Drewry said. As a result, sales information and other important financial data was only available in the EIS monthly or quarterly. "It was not very different from the data they already had," she said.

- Lack of one committed senior executive sponsor. "We've had five different sponsors, and that has been devastating," Drewry said.
- Failure to approach the EIS as a major application project with formal methodology and adequate systems programming talent. "You wouldn't bring an application to prototype and then walk away, but that's what we tend to do in EIS situations," she said.

What is in the cards for future EIS efforts at Mutual Benefit? "The CEO wants to take another shot," Drewry said, "but IS is understandably gun-shy."

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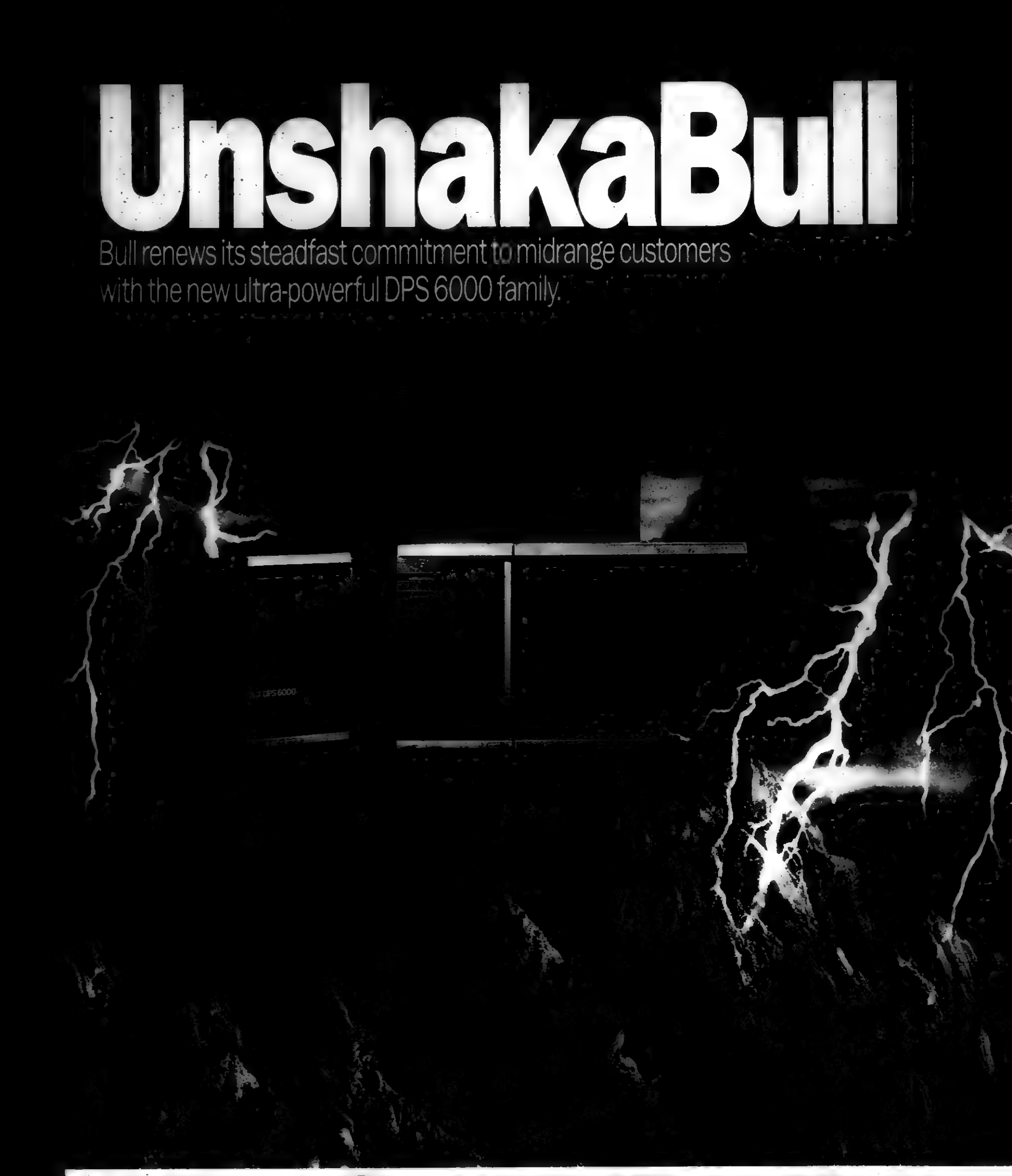

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CONTINUED FROM PAGE 69

tronic technology enable strategic alliances — those are really big things, and we have a required course in the first-year MBA program.

What are the major challenges that will be facing IS managers in the next five years?
A series of issues. The first one is the continual forging and maintenance of the partnership between them and key end-user constituencies. A second set of issues is helping to identify and work with end users to think about potential ways in which new technologies can be applied.

It's a really hard area, because traditionally that information technology function was very specialized, very remote from the rest of the organization, often working on problems other than those absolutely essential to corporate survival, and as all of those things have changed, it's put the function in incredible turmoil.

What advice do you give students interested in going into IS management?
I think we have much fewer of them that are interested in that than other schools do. There is a very strong general management orientation that our students have. Their interests as they come out are major positions of profit center and corporate leadership. It's a much smaller group that aspires to major leadership roles on staff activities like information systems. And that's just really a function of the mission of this school.

Does that mean going into IS is inconsistent with reaching a position of significant responsibility for a profit center?
I think that if we look for where the successful information systems manager will come from in the early 21st century, we will find them having had significant positions in both end-user departments as well as in the information systems function. They can enter the organization in either way. The key thing is they have to spend time on each side.

Now, look at it quite bluntly. Students coming out of Harvard Business School carry along with them a $65,000 debt. Heavily focused on their minds are career opportunities and jobs that will allow them to extinguish the debt at a satisfactory rate so they can sleep better at night.

It's not clear to me that the compensation levels in the information systems entry-level jobs are commensurate with those that can be got in marketing or certain kinds of service management activities.

Do you think companies should be providing greater incentives for people to work in information systems?
My advice to the students who are interested in working in this field is: You don't want to work in a company where it's not a big deal. Go to a place where the expenditure levels as a percent of sales are large, where there is very significant value added coming out of these kinds of things.

Are there industries you recommend?
In financial services, it's a big deal in terms of new product development, new channels of distribution. In the wholesale industry, it can provide a big competitive advantage. In aerospace there are very complex [computer-aided design and engineering] efforts.

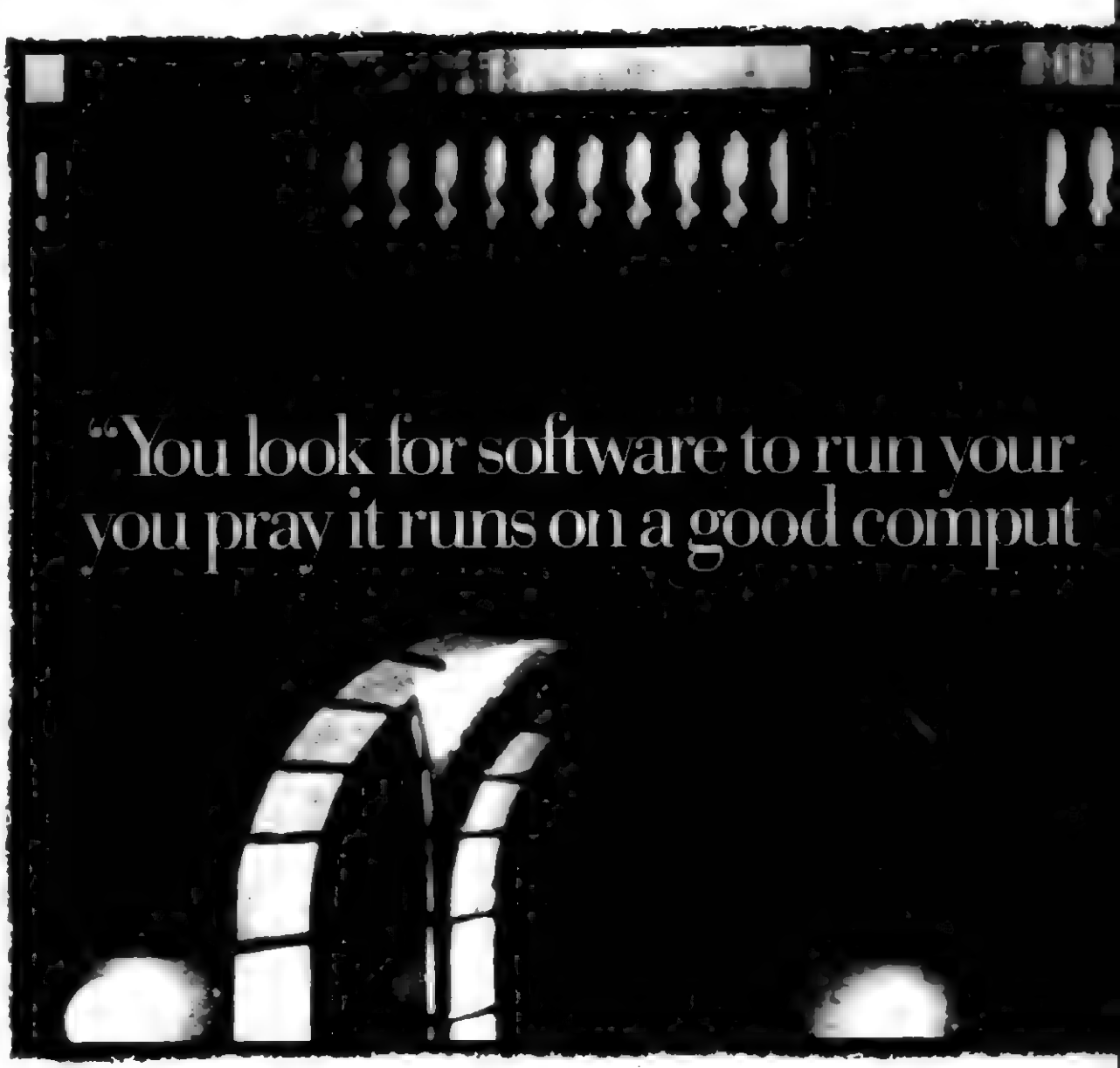
Look for places where it really is aligned against three or four things that the company has to do right to be successful. That's where the large salaries are, that's where the challenging problems are, that's where you can make a really big impact.

Do you think there'll be any changes in the prospects for IS managers to go on to top-level management?
In companies where it's a big deal. I'm a director of the Royal Trust Co. of Canada. Our chief operating officer has come out of the information systems function. He's a super high-energy person. He has total command of the technology but knows the rest of the business.

Do you think that is going to become more common in 10 years?
Yes, I think it's going to become more common because of the kinds of people who are going in and the diversity of the career path. If you want to be a general manager and you enter the information systems side, you may start as an analyst at a bank. You move on as a branch manager; you come back as manager of a large systems and programming group. You look for significant management jobs on each side as you move up in the firm.

I emphasize the word "line jobs." People who help in dealing with real customers, real problems, feel real pressure. Someone who works as a staff member gets an entirely different view of what's going on than someone who is out on the sharp edge. The people who enter the information systems function who can head large project teams and then gain insight into what it really takes to be successful — those are the ones who have the careers.

Can you assess the state of IS education at colleges and universities around the country?
It varies all over the place. We're training people for very different roles. We've got



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education for those who are going to be the doers — database architects, programmers and analysts. And then we've got education for those who are going to manage the departments that are going to be impacted. In general, the more specialized the technology, the better job we do of training people. It's easier to train people to do technical jobs than it is to think through the administrative environment within which the tasks are going to be executed.

So there's an adequate job being done in training in the technical areas?

I think the job is being done better in the technical areas than in the nontechnical. It has a lot to do with career paths — what does a typical MIS professor get trained in? He gets trained in research methodology. He gets trained in computer science. Does he get trained in all the nuances of applications development and how to make things happen in the real world? No.

Every year I go to the leading conference of information systems academics. They are different than the people I spend most of my life working with because they are *heavily* focused on the technology kind of education and they try to help people think about things in a very hands-on, how-to-make-it-happen way. They aren't very good at business policy or the broad view as to how an organization operates and how the technology can be grafted onto it.

CALENDAR

OCT. 7-13

User Groups and Associations: The Management Imperative. Chicago, Oct. 8-9 — Contact: Technovation, Toledo, Ohio (419) 537-1122.

Making CASE Work. Scottsdale, Ariz., Oct. 8-10 — Contact: CASE Research Corp., Bellevue, Wash. (206) 453-9900.

Human Factors Society Meeting. Orlando, Fla., Oct. 8-12 — Contact: Steve Marlin, HFS, Irvine, Calif. (714) 752-7866.

EDI Steps for Success. Atlanta, Oct. 9-10 — Contact: Inform, Alanta, Ga. (800) 343-5048.

CASE World. Chicago, Oct. 9-11 — Contact: Digital Consulting, Andover, Mass. (508) 470-3880.

Introduction to Reconfigurable Computer Architectures. Washington, D.C., Oct. 9-12 — Contact: George Washington University, School of Engineering and Applied Science, Washington, D.C. (202) 994-6106.

Data Administration in the 1990s. Washington, D.C., Oct. 10-12 — Contact: Performance Development Corp., Princeton, N.J. (609) 921-3770.

International ACM/SIGIR Conference on Information Retrieval. Chicago, Oct. 13-16 — Contact: Association for Computing Machinery, New York, N.Y. (212) 869-7440.

OCT. 14-20

Computer Services, Communications and Information Systems Seminar. Baltimore, Oct. 14-17 — Contact: Sarah Hess, Alex. Brown & Sons, Baltimore, Md. (301) 727-1700.

Educom '90. Atlanta, Oct. 14-17 — Contact: Educom, Princeton, N.J. (609) 520-3340.

International Users Group for Repository and AD/Cycle. Chicago, Oct. 14-17 — Contact: R/AD, Chicago, Ill. (312) 644-6610.

Retail Information Systems Conference and Exposition. St. Louis, Oct. 14-17 — Contact: NRF, New York, N.Y. (212) 244-8780.

Caller ID, Automatic Number Identification Technologies & Privacy. Washington, D.C., Oct. 15-16 — Contact: Telecommunications Reports, Conference Dept., Washington, D.C. (202) 347-2970.

Next Generation Telephone Conference. New York, Oct. 15-16 — Contact: Jupiter Communications, New York, N.Y. (212) 941-9252.

Data Entry Management Association Conference and Exposition. Las Vegas, Oct. 15-17 — Contact: DEMA, Norwalk, Conn. (800) 888-6486.

Bancon '90. Marlboro, Mass., Oct. 15-18 — Contact: Conference Management, Norwalk, Conn. (203) 852-0500.

IBM Token-Ring & 3Mb: Gateways, Bridges and Network Management. Washington, D.C., Oct. 17-19 — Contact: Kaptronic, Haworth, N.J. (201) 769-4250.

Mapping to X12 & Edifact EDI Standards. Chicago, Oct. 18-19 — Contact: EDI Group, Oak Park, Ill. (708) 848-8135.

CAD/CAM,CAE Reseller/VAR Strategy Workshops. Bedford, Mass., Oct. 20-21 — Contact: Silvia Bianchi, Darmtech, Cambridge, Mass. (617) 354-2330.

OCT. 21-27

International Congress on Advances in Nonimpact Printing Technologies: Black & White and Color. Orlando, Fla., Oct. 21-26 — Contact: The Society for Imaging Science and Technology, Springfield, Va. (703) 642-9090.

Datapro Executive Symposium. New York, Oct. 22-23 — Contact: Datapro Symposium Office, Delran, N.J. (800) 328-2776.

International Conference on Desktop Manufacturing: The Rapid Prototyping Revolution. Cambridge, Mass., Oct. 22-23 — Contact: Conference Coordinator, CAD/CIM Management Roundtable, Boston, Mass. (617) 232-6080.

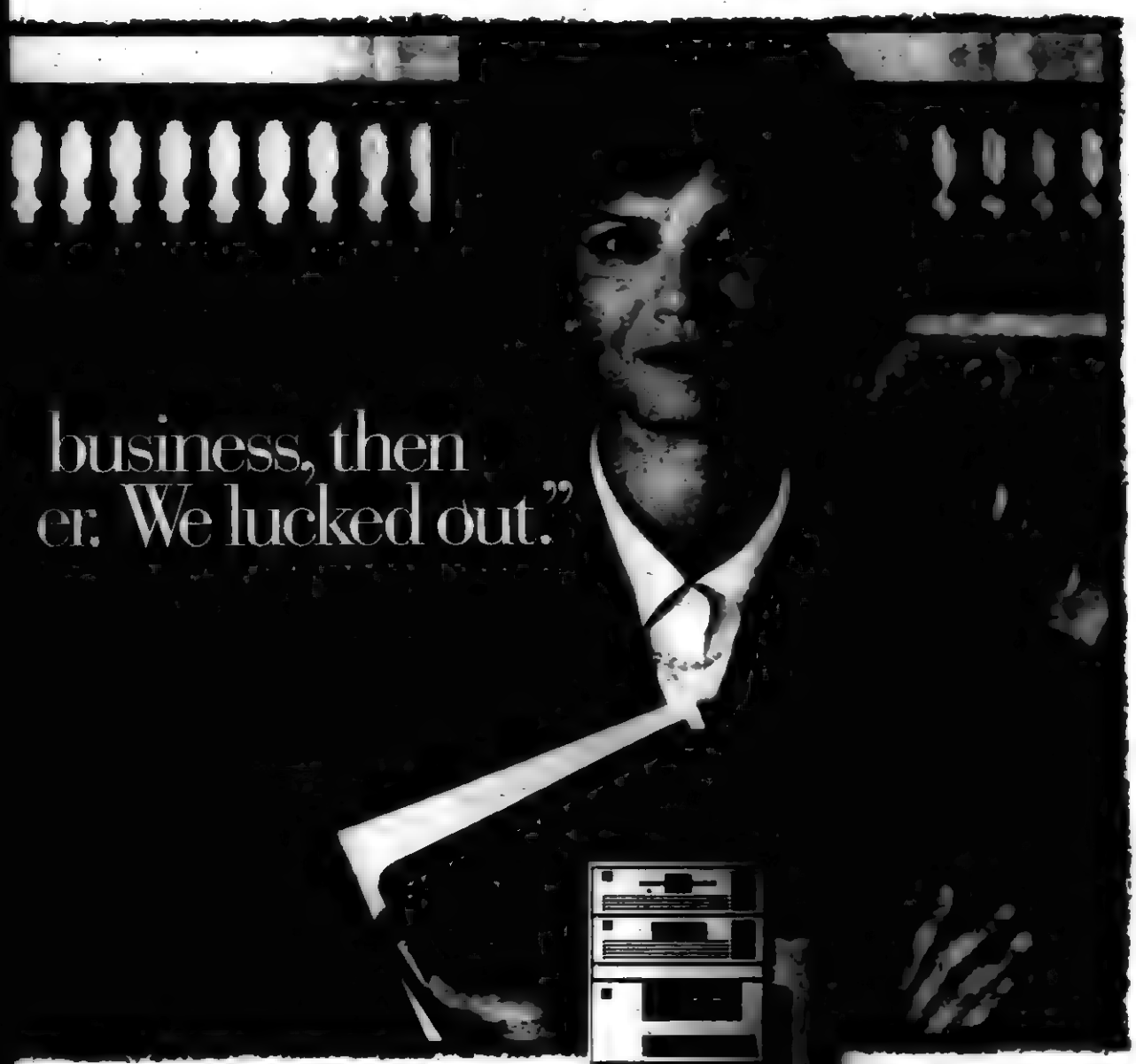
Knowledge-based Systems in Everyday Use: Increasing Productivity and Profits. San Diego, Oct. 22-23 — Contact: Donna Kacin, Decision Support Technology, Cambridge, Mass. (617) 354-6400.

The Western Canada DB2/SQL/DS Users Group Conference. Winnipeg, Man., Canada, Oct. 22-23 — Contact: Peter Barnett, Western Users Group Conference, Winnipeg, Man., Canada. (204) 946-6600.

Electronic Messaging '90. San Francisco, Oct. 22-24 — Contact: Electronic Mail Association, Arlington, Va. (703) 522-7111.

CIPS Edmonton '90, Information Technology Conference. Edmonton, Alta., Canada, Oct. 22-25 — Contact: Canadian Information Processing Society, Edmonton, Alta., Canada. (403) 488-1879.

Jerusalem Conference on Information Technology. Jerusalem, Oct. 22-25 — Contact: Tnuf, Travel and Tours, New York, N.Y. (800) 286-7908.

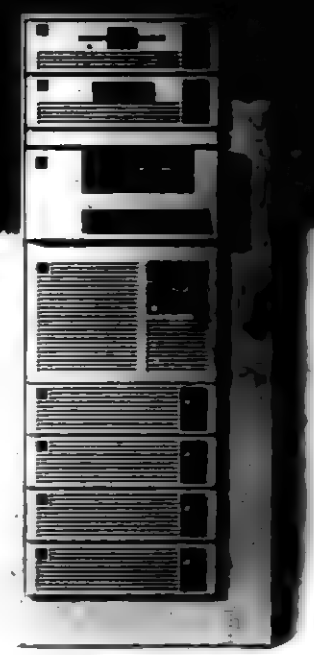


quickly their people learned, using the highly flexible tutorial system.

You might also hear about Electronic Customer Support, which lets an AS/400 diagnose its own problems and call for service automatically. Except that AS/400s don't have many problems.

Or, you could simply remember that in a major survey of midrange system owners*, the AS/400 owners said they were the happiest.

So when you're asking about software, don't forget to ask this: "Does it run on an AS/400?"



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MINICOMPUTERS:

For each buyer, a different perspective

BY ALAN RADDING

Before you purchase a minicomputer, you may first want to ask yourself what kind of minicomputer purchaser you are. According to Dudley Cooke, president of the Executive Insight Group, a systems consulting firm, there are at least five types of buyers and knowing where you and your firm fall within those categories at the time of selection can make a large difference in fit and effectiveness.

Cooke's categories of minicomputer purchasers include the following:

- Small firms, where the minicomputer is the only system.
- Departments of large firms that use a single minicomputer as a general departmental processor, forming one component of a distributed processing architecture.
- Companies that use the machine as a specialized processor for a particular application — another example of distributed processing.
- Firms involved in downsizing applications from a mainframe to a minicomputer setup using one or more minicomputers in conjunction with personal computer local-area networks.
- Organizations that use the minicomputer as a large, powerful, specialized server on a LAN.

Among the various scenarios, the actual evaluation process doesn't drastically change. Most minicomputer buyers tend to start with the application and focus only on the platforms that offer the best software packages and strongest support. They then assess their communications and compatibility requirements to ensure that the minicomputer will work effectively within the organization's overall systems framework.

What changes is the way the various purchasers need to weigh buying issues, sorting out which functionality should be emphasized and what can be downplayed.

"A general-purpose mini doesn't have to be architected differently for roles like LAN serving. But it has to be tuned a little differently," says Jim Hammons, vice-president at The Sierra Group, Inc. in Tempe, Ariz. For instance, a minicomputer used as a server should have a large amount of available cache, up to 256K bytes. An on-line transaction processing machine should offer a sufficient number of asynchronous ports.

"There will be a lot of customization of the general-purpose mini" to support the various roles, says David Card, director of systems research for mainframe and multiuser systems at International Data Corp. in Framingham, Mass.

In the small company for which the minicomputer is the only system, the machine runs a full suite of applications, including general accounting and financial jobs, office automation and specialized, industry-specific applications. The system can be as small as an IBM System/36 or entry-level Application System/400 and as large as a Data General Corp. MV/40000 or Digital Equipment Corp. VAX 6000.

From a functionality standpoint, the system needs to be designed along the lines of a mainframe with ample I/O capability, storage, bandwidth and processing power to accommodate multiple users and concurrent tasks. It also needs to have strong database management features.

On the other hand, high performance plays a distant second to reliability and overall functionality. "Ease of administration is the main consideration in this purchase decision, followed by software availability," says Thomas Nolle, president of CIMI Corp. in Voorhees, N.J. Managing the system in a small shop should not require a large technical staff, he adds.

Upgradability is another plus. "A key factor in the choice of a mini for a small company is the growth path," adds Bob Walsh, vice-president at the Boston Systems Group. "Small companies are usually growing companies, and they need a system they can grow with." Walsh recommends that the buyer look for a clear upgrade path on the minicomputer or generous expansion facilities.

The group that uses the minicomputer as a general departmental processor needs a machine that will serve the same variety of needs as the small company, from administrative functions to production.

In this case, the minicomputer must offer sophisticated communications capabilities to share data and support services with headquarters and other departmental minicomputers on the corporatewide network.

"The big issues for a department are communications and compatibility from a support standpoint," Walsh says.

Buyers in this group should avoid systems that cannot accommodate a variety of communications protocols. "The most important thing here is connectivity back to the data center. The lesson of the late 1980s is that we can't tolerate isolated pockets of computing," Nolle adds.

For the minicomputer buyer who needs a specialized processor, the application is the important factor. Hardware is selected on the basis of its ability to handle a specialized application. For instance, if the application is highly math-intensive — such as engineering or graphics — the system must be optimized for processing performance. If the system is intended for on-line customer service, the operating system needs to use English-language prompts.

While the common approach

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Radding is a free-lance writer in Newton, Mass.

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Alternate Route
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is to buy a general-purpose machine and add applications as needed, most analysts suggest that this group of purchasers buy separate minicomputers for different applications. One reason is that each application requires a different hardware configuration to perform optimally. Secondly, says Ron Cipolla, president of Kentech in Mansfield, Mass., prices on these machines have dropped, especially the smaller models, making the multiple-machine approach a cost-effective one.

"Why risk potential resource conflicts?" he asks. "Just add another machine. Each machine can be small, and the cost of the additional machine may be less than an upgrade."

Similar applications can be grouped to run on one machine. A user may run order entry and distribution on one minicomputer and purchase a separate one for manufacturing resource planning.

Companies involved in moving applications from the mainframe to a minicomputer in a LAN or wide-area network configuration will also buy more than one machine, according to Cooke. As in a departmental setup, communications capability is an all-important issue to support cooperative processing.

"This user is probably talking about client/server relationships," Nolle says. In that case, the machine needs to support a variety of communications protocols, such as those for OS/2, DOS and Unix. The mini should also provide high-performance processing and intensive I/O capabilities to handle frequent requests to the database.

Client/server functionality is also important to the fifth group of purchasers, which uses minicomputers as powerful, specialised servers on a LAN. Functions that users need to watch for are large-capacity storage, fast processing, multiple access paths, high-speed throughput, a variety of protocol support and ports for various devices.

Nolle adds two emerging uses for minicomputers: a gateway device on a network and a dedicated system management machine. In the first case, the key requirement is that the mini supports a large number of protocols and a variety of high-performance communications lines, such as T1.

As a dedicated system manager, the mini handles both network management and system administration for large distributed systems. "The key to network management is fault tolerance," Nolle says. If the network manager goes down, the system is running blind.

Minicomputers offer various levels of fault tolerance. Any machine can achieve it through disk-mirroring; however, both Tandem Computers, Inc. and Stratus Computer, Inc. specialize in fault-tolerant offerings, and DEC is now working on a full-fledged fault-tolerant machine.

No matter what type of buyer you are, price will come into play somewhere in your purchasing decision. However, where you go for budget approval is dependent on how you intend to use the machine.

When the minicomputer is the corporate processor or when a company is

Continued on page 78

Changeling

"I know one when I see one."

If you ask people how they define a minicomputer, that's what you're likely to hear. The definition used to be based on the type or number of processors, architecture or operating system, but "there is no technical definition anymore," says Michael Packer, vice-president of the information technology group at The MAC Group in Cambridge, Mass.

"Take a machine based on a single RISC processor and running Unix: Is that a minicomputer or is it a micro?" asks Brian Jeffery, managing director of International Technology Group in Los Altos, Calif.

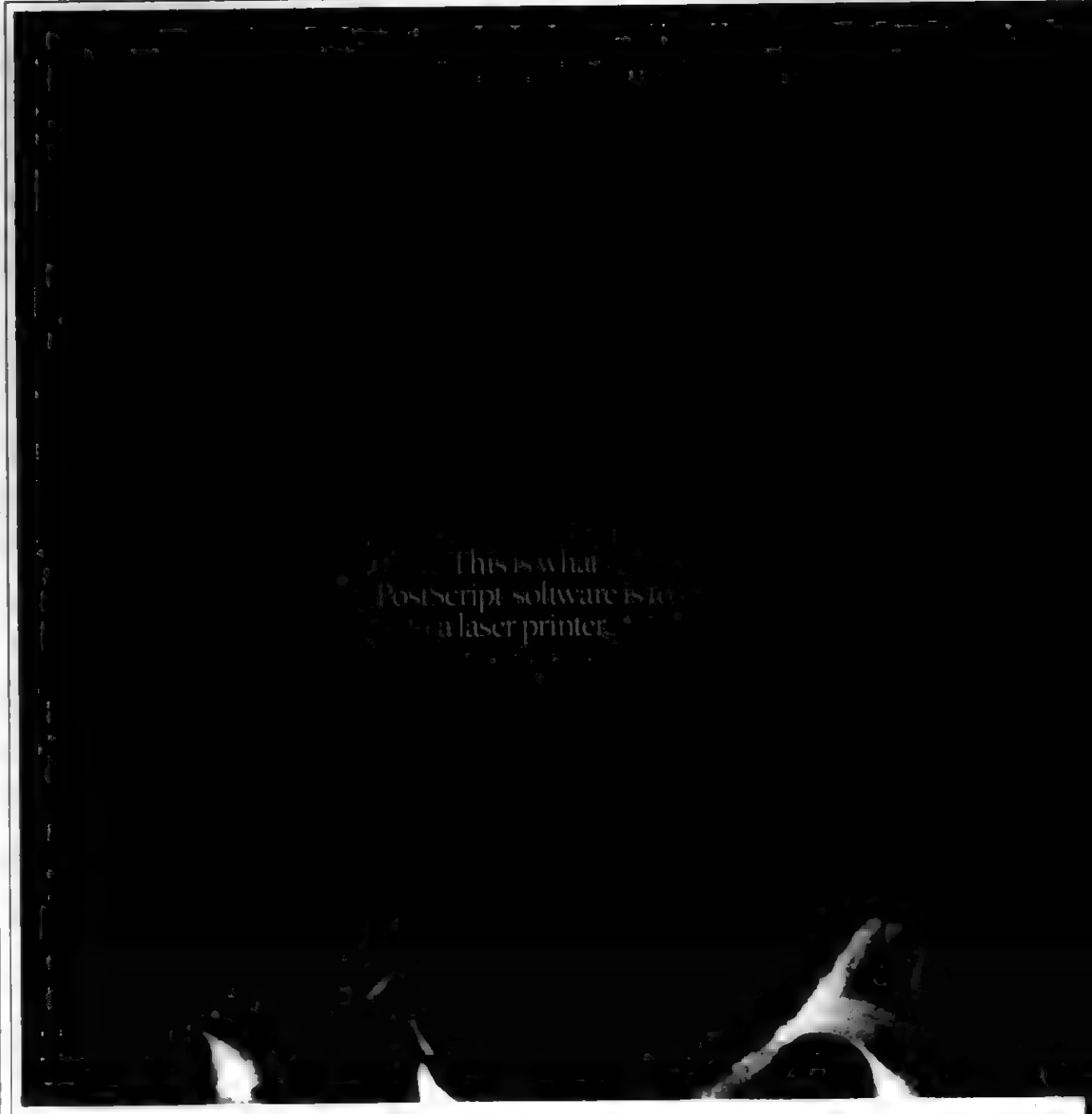
Some consultants draw the line at how multiple users are handled on each platform. Minis are designed for multiuser service, while PCs and workstations are standalone machines adopted for multiuser purposes in a LAN server environment.

Others say applications separate minicomputers from PCs. "You don't do manufacturing, distribution, transaction processing or even accounting with a PC LAN," says David Card, director of systems research at International Data Corp. in Framingham, Mass.

Maybe the historical approach is best, suggests Wayne Kernochan, senior analyst for distributed systems at The Yankee Group in Boston: "Minicomputers are what minicomputer vendors sell."

In this case, the term minicomputer covers machines that range in price from $15,000 to more than $750,000, which makes it that much more important to know what you need before you go out and buy.

ALAN RADDING



Choose the environment that matches your needs

BY ALAN RADDING

When choosing a software environment, users have two choices: proprietary and open or Unix. The best decision depends on what type of buyer you are.

Proprietary systems — including Digital Equipment Corp.'s VAX/VMS, Wang Laboratories, Inc.'s VS and IBM's OS/400 — are both the great strength and the Achilles' heel of minicomputers.

Proprietary systems are all robust, industrial-strength environments for multiuser distributed systems. Buyers intending to use minicomputers for traditional uses tend to prefer these proprietary systems because the vendors offer large libraries of applications software, relative ease of operation, simplified system management and close vendor support.

On the other hand, the proprietary systems lock users into a single platform, a situation that makes connectivity a difficult accomplishment.

For buyers who need to fit the minicomputer into a multivendor, client/server environment, Unix's portability, ease of connectivity and better price/performance outweighs the advantages of proprietary systems.

For these buyers, ease of use is less of an issue. End users in a client/server setup interface with client machines, not directly with the minicomputer in its server role. In addition, these buyers may not count on effective vendor support because they are building their own client/server systems with components from multiple vendors.

With more vendors porting applications to Unix, the open environment might even start to appeal to more traditional users. In addition, new releases of the operating system provide more of the features that users typically see in their proprietary systems.

Some experts go so far as to say that proprietary systems will eventually be superseded by Unix. "The big question is, 'Why use a [proprietary] mini?' " says Brian Jeffery, managing director of the International Technology Group in Los Altos, Calif.

"If I wrote an application for a proprietary system, the next thing I would do would be to port it to Unix," says Judith Hurwitz, vice-president at Boston-based Patricia Seybold's Office Computing Group.

Minicomputer vendors themselves acknowledge the importance of Unix by providing Unix-based products along with their proprietary lines. DEC offers Ultrix and its Decsystem, while Data General Corp. provides Aviion.

Here for the duration

Proprietary systems still beat Unix in providing a robust multiuser environment, however, and they are also stronger in terms of performance. "The proprietary systems aren't going away because they offer added value. Hewlett-Packard gets higher throughput with its proprietary operating system than with Unix," according to Jim Hammons, vice-president at The Sierra Group, Inc. located in Tempe, Ariz.

Hammons and other analysts argue that proprietary systems are here for a long time to come and that the large installed base of proprietary system users

> **"THE BIG QUESTION is, 'Why use a [proprietary] mini?' "**
>
> **BRIAN JEFFERY, INTERNATIONAL TECHNOLOGY GROUP**

— wedded to their proprietary applications — are not going to disappear overnight.

What might actually happen is that proprietary system users will want their open Unix system and their applications, too. At Knoxville Community Development Corp. (KCDC) in Knoxville, Tenn., DG's Nova minicomputer served the company well for nine years, running specialized housing authority software.

When the agency needed to upgrade to a larger, more powerful minicomputer two years ago, the agency's managers decided to leave behind the world of proprietary minicomputer software and opt for Unix. They insisted, however, on bringing its specialized housing authority applications with it.

"A key part of our request for proposals was that the vendor convert our present software to Unix," says Helen Branson, program coordinator of data processing at KCDC. The agency needed to stay in step with other government agencies that had converted to Unix, particularly the federal Department of Housing and Urban Development.

"We had so much time and money wrapped up in the existing software, and we had customized it to our needs," Branson says. "We weren't about to start reinventing the wheel." ●

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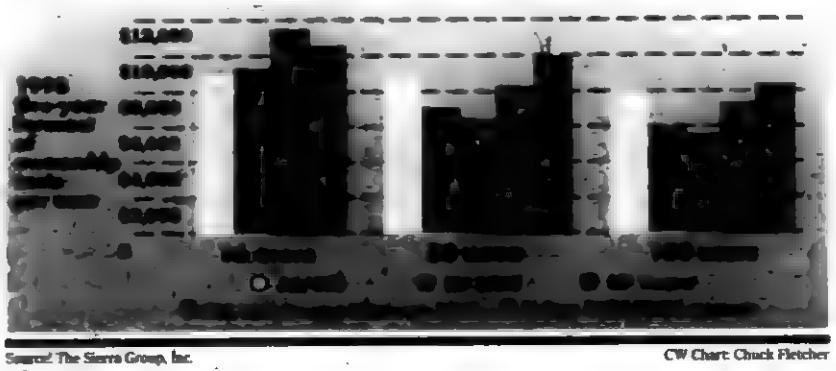
The more the merrier

As the number of users increases from 16 to 100, DEC five-year costs drop four times as much as IBM's; HP's drop three times as much as IBM's; and Unisys' two times



Source: The Sierra Group, Inc. CW Chart: Chuck Fletcher

Continued from page 76

downsizing, the purchase decision is made at the corporate level, and the money comes from the corporate budget, Nolle says. When the minicomputer is intended as a departmental machine, an application processor or a specialized server, the purchase decision and budgeting is usually at the departmental level. In general, departments prefer to lease their minicomputers, Nolle says.

While price is certainly an issue in the minicomputer evaluation, price/performance itself is less a priority than software and hardware support and service.

"There is more to price than the cost of the CPU," says David Andrews, president of Cheshire, Conn.-based ADM, Inc., a consulting firm specializing in the IBM midrange. Particularly in the first three groups, users are willing to pay more for an environment that offers packaged solutions, a strong service and support network and ease of use.

As is happening elsewhere in the computer industry, however, minicomputer prices are dropping. One factor that has influenced the decrease is competition with Unix workstations. As vendors show more flexibility in pricing, users have more leveraging power, Walsh says.

Once you've paid for your minicomputer and the box finally arrives, don't be alarmed if someone tells you that the minicomputer is dead. Just tell him it is a big workstation or — better yet — a small mainframe. In today's market, a minicomputer can pass as almost any multiuser machine, with something for almost every type of user. •

Lease factors

When the computer industry is slow, so is the computer leasing industry. But on top of the general industry slowdown, minicomputer lessees and lessors are also coping with the changes wrought by rapid technological development.

"It seems to me that the vendors are cannibalizing themselves. They bring out products so rapidly that they are pushing down the price/performance curve faster than they need to," says Tony Jeffcott, senior manager at Deloitte and Touche National Leasing Services in Edison, N.J.

This trend also seriously undercuts residual value, which is the worth of the machine when the lease terminates. For lessors, that lower value means they could lose their shirts on leases, getting stuck with products that suddenly have far less value than expected.

For lessees, the drop in value means lease costs are higher, and lease terms are shorter.

However, buyers can control residual value to some degree by choosing carefully among vendors.

DEC equipment has a strong secondary market that serves to support residual values. But the firm introduces new products with such frequency that it can also undercut residual value, says Sonny Monosson, chairman of the American Computer Group, Inc. in Boston.

The fact that Wang is not introducing much in the way of new products has a stabilizing effect on residual value, says Allan Newman, chairman of The Newman Group in Dexter, Mich.

Other vendors' minicomputers lose residual value because of the vendor's policies, such as refusal to honor a license transfer.

On the other hand, says Tom Martin, president of Computer Financial Leasing in Hackensack, N.J., "IBM holds superior market value," because the company provides extensive after-market support, and there is a large market in used IBM equipment.

ALAN RADDING

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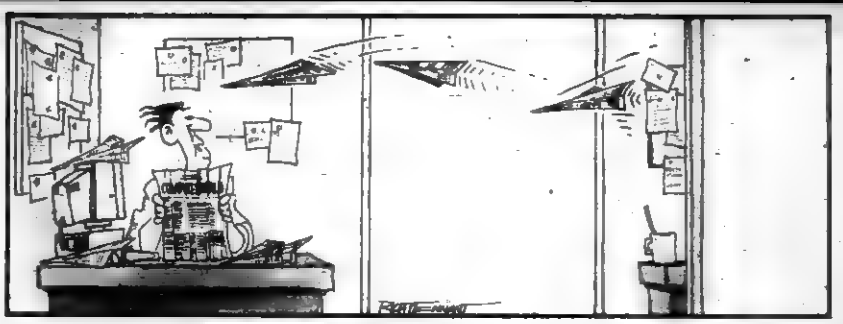

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Servers make their move on minicomputers

BY CHUCK BARNEY

An emerging class of machines is trying to prove to low-end minicomputer buyers that you don't need a spoon to stir your coffee. These machines — based on personal computer technology and configured with database management capabilities, on-line transaction processing (OLTP) and some level of fault tolerance — are making a strong move into a role where low-end minicomputers once stood strong: file serving.

According to Workgroup Technologies, Inc., these "server" machines from AT&T, Netframe, Inc., Concurrent Computer Corp. and Compaq Computer Corp. are showing a compound annual growth rate of more than 40% per year through 1993, while minicomputer placements will experience a compound annual decline of 4% per year during that same time period.

While there is no better machine than a minicomputer for some buyers, recent enhancements on servers enable them to do minicomputer-like jobs at a lower price — about $15,000 to $20,000 for an entry-level configuration.

One enhancement is processing power. Server-class PCs and workstations based on the Intel Corp. 80386 or I486 chip deliver 40 million instructions per second (MIPS) of speed, compared with five to 60 MIPS on low-end minis.

Compaq's Systempro and AT&T's Starserver are configured with more I/O buffering, faster memory access and 32-bit buses to achieve a balanced architecture targeted at the server environment.

Servers have also become stronger in fault tolerance. On Concurrent's Server, users have the option of purchasing adjustable levels of fault tolerance. An operator may decide to enable disk-mirroring or even install redundant drive controllers and processors where higher levels of fault tolerance are required.

While network management is still a weakness for this class of machine, Netframe is addressing this limitation by including a suite of network management tools on its multiprocessing machine that support hundreds of active PC users.

Minicomputers have a clear upper hand, however, in offering network management capability. They also offer better data security, more disk storage and the ability to interact with other minicomputer- and mainframe-based applications. Environments that require a high level of data security and integrity will continue to use minicomputers as file servers. ●

Barney is director of the competitive analysis service at Workgroup Technologies, Inc. in Hampton, N.H.

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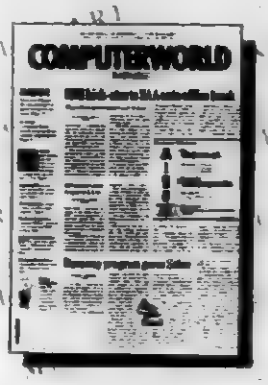

COMPUTERWORLD

The newspaper for information systems management

BUYERS' SCORECARD

Hewlett-Packard cleans up in mini sweepstakes

BY MICHAEL L. SULLIVAN-TRAINOR
CW STAFF

What's your favorite ice cream?

While many people would say strawberry is good and chocolate is fine, Heath Bar Crunch stands out as unique in its mix of ingredients.

Buyers' satisfaction with their chosen minicomputers is much the same. IBM and Digital Equipment Corp. can do the job, but Hewlett-Packard Co. has a different way of implementing capabilities that capture the fancy of many information systems managers.

Fifty users of the HP 3000 Model 925 found many ways to make their satisfaction with the product clear in this Buyers' Scorecard on minicomputers. The system captured the highest rating in 13 of 15 categories, outscoring IBM's Application System/400, DEC's VAX and AT&T's 3B2 by a full five points.

The ratings are based on survey results from 50 users of each product. Total scores are derived by multiplying the ratings each user group gave its own product by the importance factors all users assigned to the criteria.

While HP garnered its highest ratings in the categories of availability, future growth and compatibility, users also gave it very high marks in programming capability and interfacing with other vendors' systems.

"It runs like a giant PC," says Thomas Arnoldo, information services administrator at Mercy Hospital in Portland, Maine.

The system's programmability is largely the result of integration between third-party software and the HP 3000's system functions. The system also topped the category of availability of third-party applications (8.1), followed closely by IBM's AS/400 (8.0). Respondents also rated HP's system higher (8.7) than the other models on ease of computer operation.

IBM and DEC tied for second in the overall ratings despite DEC's first-place finishes in the performance and effective networking support categories. IBM came in third in all but one of the key ratings of most importance to users, but the AS/400 produced the second highest marks in seven of the remaining nine categories.

IBM placed last in compatibility with installed hardware and software — a tenth of a point behind AT&T. The AS/400 also tied with the 3B2 for last in effective networking support.

DEC was rated the lowest in price/performance categories, ringing up scores of 6.9 or less in the three criteria. HP set the pace in these areas, with scores of 7.7 or higher.

The only Unix system in the rating, AT&T's 3B2, scored last in 10 out of the 15 factors measured. The system's highest scores were in availability, compatibility and storage capacity. Its third-place ratings included efficient I/O performance, overall cost of ownership, acquisition and maintenance cost and cost per million of instructions per second.

Users rated availability and ability for future growth as most important. Third-party software and distributed processing had the lowest ratings. •

COMPUTERWORLD BUYERS' SCORECARD

Minicomputers

Total scores reflect all criteria and their user-assigned importance
Response base: 50 users per product

Product	Three highest ratings	Three lowest ratings
Hewlett-Packard Co.'s HP 3000 Model 925 SCORE 71	Availability Ability to provide future growth Compatibility with installed hardware	Networking support Acquisition & maintenance cost Support for distributed processing
IBM's AS/400 Model 60 SCORE 66	Ability to provide future growth Availability Quality of service & technical support	Support for distributed processing Acquisition & maintenance cost Cost per MIPS
Digital Equipment Corp.'s VAX 6000 Model 210 SCORE 66	Availability Overall performance Ability to provide future growth	Acquisition & maintenance cost Overall cost of ownership Cost per MIPS
AT&T's 3B2 Model 600 SCORE 62	Availability Compatibility with installed hardware Sufficient storage capacity	Availability of third-party applications Support for distributed processing Cost per MIPS

KEY RATINGS

HP tops five of six key factors by strong margins, garnering ratings of nine or close to nine out of 10 in each category. DEC edges ahead in overall performance and takes second in five other categories of high importance to users

User importance rating:

9.2 Availability

8.8 Overall performance

8.8 Quality of service & technical support

8.8 Ability to provide future growth

8.7 Compatibility with other installed hardware

8.6 Sufficient storage capacity

A CLOSER LOOK

IBM's AS/400 takes second in seven out of nine remaining categories, scoring high in memory but low in networking and distributed processing support. AT&T's 3B2, which placed fourth in most categories, captured third in five areas

User importance rating:

8.3 Sufficient memory

8.3 Efficient I/O performance

8.1 Ease of computer operation

8.1 Overall cost of ownership

8.1 Reasonable acquisition & maintenance cost

7.9 Reasonable cost per processing cycle (MIPS)

7.7 Effective networking support

7.4 Effective support for distributed processing

7.4 Availability of third-party applications

Loyalties

Would you buy the product again?

(Reasons based on most frequently stated responses)

IBM AS/400

Response base: 50

Number of respondents

Likely
The reason:
Meets our needs

HP 3000

Response base: 50

Number of respondents

Likely
The reason:
Reliability

Unlikely
The reason:
Would buy larger system

DEC VAX

Response base: 49

Number of respondents

Likely
The reason:
Meets our needs

Unlikely
The reason:
Other systems are equally good at lower price

AT&T 3B2

Response base: 50

Number of respondents

Likely
The reason:
Performance

Unlikely
The reason:
Other hardware more cost effective

"Verbatim"

What do you like best/least about this product?

(Responses are based on the most frequently stated answer)

[redacted]

Likes
Ease of use
Performance
Database capabilities

Dislikes
Compatibility with non-IBM products
Disk drive mechanical problems
Support from IBM

[redacted]

Likes
Reliability
Ease of use
Support/service/maintenance

Dislikes
Lack of applications software
Difficult operating system
Incompatible with other hardware

[redacted]

Likes
Ease of use
Expandability/upgradability
Reliability

Dislikes
Cost of hardware and software
A lot proprietary to DEC
Maintenance costs

AT&T 3B2

Likes
Reliability
Unix-based system
Service/support

Dislikes
Slow
Service/support/ maintenance
Lack of applications

Statistics

(Respondent base of 200; multiple responses allowed)

Who responded:

Manager	103
Director	51
Staff	35
Other	11

Their responsibility for minicomputers:

Evaluate or recommend vendors	173
Determine need	164
Set standards for the organization	160
Select vendors	151

Time involved with minicomputers:

Five or more years	155
Three to four years	23
One to two years	17
Less than one year	3

CW Chart: Paul Mock

METHODOLOGY

Products rated in *Computerworld*'s Buyers' Scorecard on Minicomputers were selected in the following manner: The products had to be from one of the top vendors in the proprietary or Unix segments of the minicomputer market in terms of installed base and revenue. Within that sample, they also had to be the largest capacity systems that were comparable in terms of size and features.

The sample included the top three vendors in the proprietary segment — IBM, DEC and HP — and the top three vendors in the Unix segment. However, because HP and DEC were already included on the proprietary side, only AT&T was included from the Unix group.

The survey was conducted by telephone interviewers from First Market Research in Austin, Texas, using names selected randomly from nonvendor sources. A minimum of 50 users was required for each product.

Total weighted scores were computed by multiplying the mean scores all users assigned to the importance of each criterion by the mean scores each user group gave to its own product.

RESPONDENT PROFILE

Most respondents (51%) have been using these minicomputer products for two to three years. Thirty-nine percent have worked with them for one year or less and 10.5% for more than four years.

Fifty-eight percent of the respondents use their minicomputers for accounting and billing applications, and 35% use them for order processing and inventory functions. Median company size for the group was $208 million in annual revenue. Thirty-one percent of the companies are in manufacturing; 12% in government; 10% in insurance; and the balance came from a mix of banking, financial services and consumer products and health care companies.

ACKNOWLEDGMENTS

Computerworld would like to acknowledge the assistance provided by the following individuals and organizations in the preparation of this edition of Buyers' Scorecard: Carolyn Griffin, International Data Corp.; Bob Randolph, Technology Financial Services, Inc.; Computer Intelligence; and Installed Technology International.

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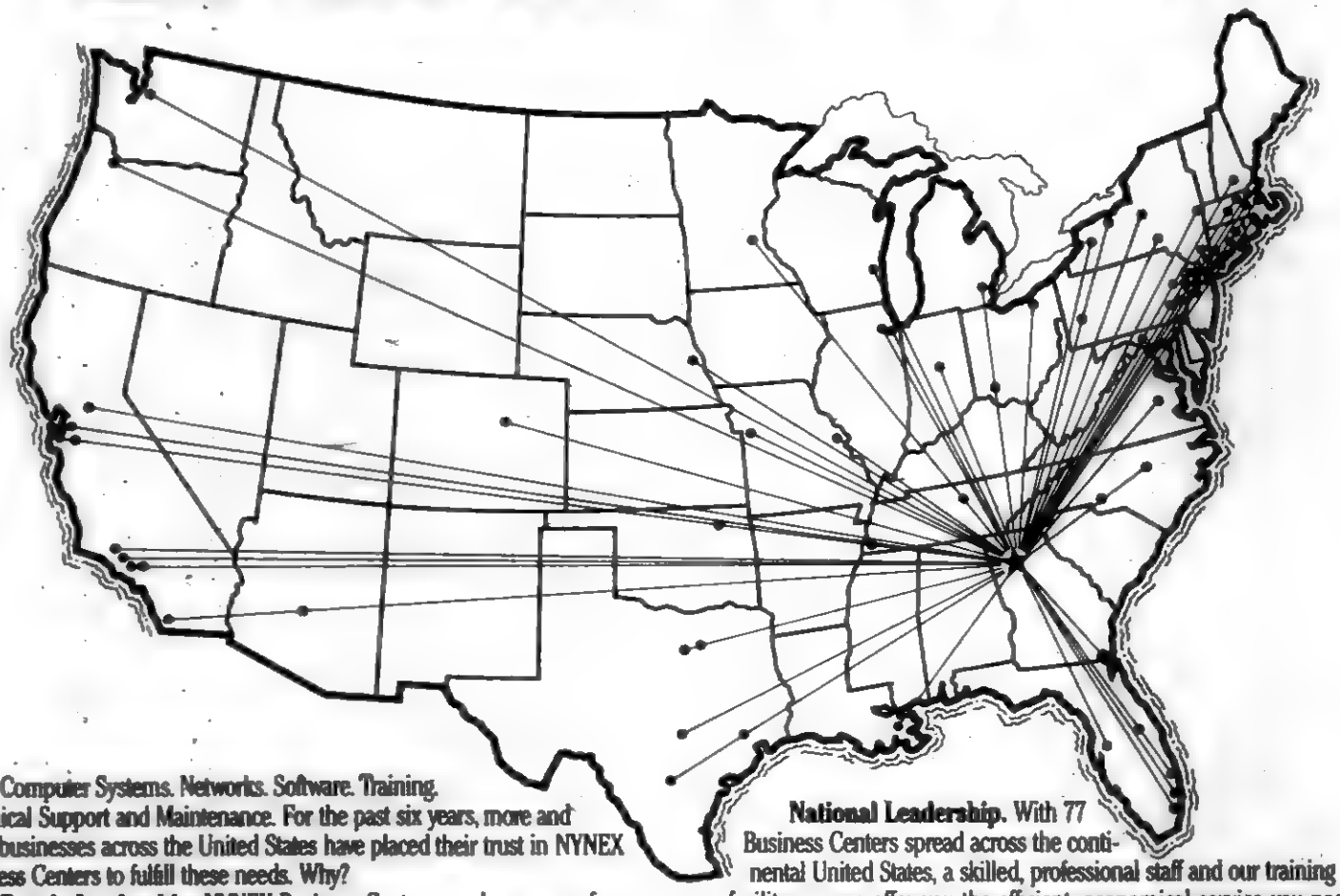

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PRODUCT SPOTLIGHT

Late-model minicomputers*

VENDOR	PRODUCT	PRIMARY MARKETS[1]	COMPARABLE SYSTEMS	MAXIMUM NUMBER OF CPUs	PERFORMANCE (MIPS)[2]	PERFORMANCE (MFLOPS)[3]	BENCHMARKS[4]	MACHINE CYCLE TIME	MEMORY RANGE/ MAXIMUM CACHE (BYTE)	DISK CAPACITY (BYTE)	DISK TRANSFER RATE (MBYTE/SEC.)	MAXIMUM NUMBER PORTS/ MAXIMUM NUMBER CHANNELS	CHANNEL SPEED (MBYTE/SEC.)	SUPPORTS PARALLEL PROCESSING OR FAULT TOLERANCE	OPERATING SYSTEMS SUPPORTED	NETWORK ARCHITECTURE SUPPORTED	DISTRIBUTION CHANNEL	BASE PRICE
AT&T [illegible]	[illegible]	DP, OLTP, [illegible]	NCR Tower 32 Model [illegible]	4	5 - 16	NP	4.6 DS (actual)	NP	4M - [illegible]	154M - 14.4G	4	[illegible]	NP	Neither	Unix System V	SNA	VAR, Direct	$19,999 - $74,999 with Model 60 Package B consisting of 32M-byte memory, 3 CPUs, 2000-byte or 5000M-byte cartridge tape drive, power supply, 1.2G-byte disk capacity
	System 7000, Models 7020, 7040, 7060, 7080EX	OLTP, DP, [illegible]	HP 9000 Series 800, DEC VAX 6000 and 8000 series, IBM ES/9000	12	14 - 140	NP	16.7 DS; 200+ DC transac. (actual)	100 nsec; RISC-based processor	16M - 512M/1M	1.2G - 48G	NP	512/NP	NP	Neither	Unix System V, BSD	SNA	VAR, Direct	$90,000 - $1,750,000 with minimum 256M-byte memory, 1 CPU
	Shamrock FT	OLTP, DP	Stratus XA2000 Models 210 - 260, Sequoia Series 200 and 300	3	11 - 15.6	NP	NP	60 nsec; RISC-based processor	16M - 64M/1M	600M - 17G	1.3	128/E	10	Fault tolerance	Unix System V	SNA	Direct	$172,000+ with minimum 16M-byte memory, 4 CPUs, tape drive, duplexed power supply, 600M-byte disk capacity
Arix Computer Corp. (408) 432-1200	System 90, Models 25, 45, 85	DP, OLTP	Sequent Symmetry, Pyramid	8	15 - 300	5.6	NP	50 nsec	8M - 416M/ 0.5M	280M - 448G	4	1.024/32	NP	Parallel processing	Unix System V.3	SNA, NFS, RFS	OEM, VAR, Direct	$52,000 - $1,000,000+ with minimum 8M-byte memory, 1 CPU, 150M-byte cartridge tape drive, power supply, 280M-byte disk capacity
Bull H.N. Information Systems, Inc. (508) 294-6200	DPS 6000, 600 family	DP, OLTP, [illegible]	IBM AS/400, DEC VAX 6000	8	3 - 19	NP	11.6 - 32.6 DC transac. (actual)	160 nsec	6M - 64M/ 768K	286M - 11.0G	1.8	300/2	13.3 or 40	Parallel processing	GCOS 6 BVS, Unix System V.3.1	SNA, OSI, DSA	OEM, VAR, Direct	$90,000 - $600,000 with minimum 16M-byte memory, 1 CPU, 1 channel, power supply
	DPS 6000, 300 family	DP, OLTP, [illegible]	IBM AS/400, DEC VAX 6000	2	0.7 - 1.7	NP	5.0 - 7.5 DC transac. (actual)	200 nsec	2M - 256M/8K	68M - 3G	1.8	40/1	4.6	Parallel processing	GCOS 6 BVS	SNA, OSI, DSA	OEM, VAR, Direct	$14,000 - $60,000 with minimum 2M-byte memory, 1 CPU, 1 channel, power supply, 68M-byte disk capacity
	DPS 6000, 400 family	DP, OLTP, [illegible]	IBM AS/400, DEC VAX 6000	8	1.7 - 3.6	NP	6.5 - 10.2 DC transac. (actual)	200 nsec	8M - 64M/64K	143M - 9.8G	1.8	100/1	13.3	Parallel processing	GCOS 6 BVS, Unix System V.3.1	SNA, OSI, DSA	OEM, VAR, Direct	$33,000 - $250,000 with minimum 8M-byte memory, 2 CPUs, 1 channel, power supply
Concurrent Computer Corp. (201) 758-7000	Series 3200, Micro 3, Micro 5, 3280E	Real-time computing, SE, OLTP, DP	DEC VAX 6000, Microvax 3800, 3900; Encore 32/2000	12	0.5 - 72	1.3	3.9 - 6.8 single processor whetstones (actual)	100 nsec	8M - 256M/ 32K	1.2G - 2,000G	1.3 - 3	1,024/96	5.5 - 120	Parallel processing	OS/32 proprietary	SNA, Decnet, NFS, TCP/IP	OEM, VAR, Direct	$55,000 - $360,000 with minimum 8M-byte memory, 1 CPU, terminal, power supply
Control Data Corp. (612) 893-8182	4680	Database management processing, SE	DEC 8800, Pyramid	1	60	24 (peak)	120,000 DS Version 1.1; 11.3 LP MFLOPS; 42.6 Specmarks (actual)	16.7 nsec	32M - 256M/ 512K	1G - 600G	1.5 - 2 for SMD; 2 - 10 for disk array	144/8	20	Neither	EPOC	SNA, Decnet, Cdcnet, TCP/IP	Direct	$145,000 - $600,000 with minimum 32M-byte memory, 1 CPU, channel, QIC-120 tape drive, power supply, 1G-byte disk capacity
	4380	Same as above	MP	1	27	10 (peak)	47,600 DS Version 1.1; 4.1 LP MFLOPS; 18.3 Specmarks (actual)	40 nsec	16M - 128M/ 128K	330M - 14G	1.5 for SCSI; 2 - 10 for disk array	16/8	3 - 20	Neither	EPOC	SNA, Decnet, Cdcnet, TCP/IP	Direct	$47,050 - $200,000 with minimum 16M-byte memory, 1 CPU, channel, QIC-120 tape drive, power supply, 330M-byte disk capacity
	4380	Same as above	MP	1	35	10 (peak)	43,000 DS Version 1.1; 3.6 LP MFLOPS; 17.8 Specmarks (actual)	40 nsec	8M - 128M/ 64K	400M - 6.3G	1.5	16/3	5	Neither	EPOC	SNA, Decnet, Cdcnet, TCP/IP	Direct	$11,720 - $78,000 with minimum 8M-byte memory, 1 CPU, SCSI channel, power supply, 400M-byte disk capacity
	Cyber 930E, 990E	SE	SGI 4D2XXS, 4D3XXS	8	16 - 224	1.6 - 24.3 double precision	16 - 234 DS Version 1.1	30 - 33 MHz	8M - 256M/ 32M	300M - 25.2G	2.1 for SCSI; 6 for IPI	56/8	24	Parallel processing	IRIX	SNA, Decnet, TCP/IP	Direct	$5,000 - $382,500 with minimum 8M-byte memory, 1 CPU, power supply
Data General Corp. (508) 366-8911	Eclipse MV/40000HA	DP, OLTP, OA, SE	DEC VAX 6000, 9000	4	14 - 54	NP	33 - 102 DC trans/sec. (estimate)	50 nsec	64M - 256M/ 64K	322M - 1,152G	2.6	4,224/7	53	Neither	AOS/VS II	Xodiac, TCP/IP, OSI	OEM, VAR, Direct	$629,000 - $1,585,000 with minimum 64M-byte memory, 1 CPU, channel, 2 power supplies
Digital Equipment Corp. (800) 344-4825	VAX 6000 Model 300	DP, OLTP, SE	HP 3000 Models 922, 932, IBM AS/400 Models 70, 45	1	8.0 VUPs[5]	NP	22 TPC/A trans/sec.; 1.87 single LP, 1.27 double LP, 15,484 DS coded, 23,900 DS inlined	30 nsec	32M - 128M/ 128K	300M - 30G	2	30/4 DSSI or 2 DSSI and 2 SDI	4 DSSI	Neither	VMS, ULTRIX	Decnet, TCP/IP	VAR, Direct	$75,000 - $300,000 with minimum 32M-byte memory, 1 CPU, DSSI channels, power supply

*All products listed became available after January 1988 or are scheduled to ship before January 1991. All listings are marketed as minicomputers; specific capabilities vary widely from machine to machine.
**MAI Basic Four, Inc. measures performance by the number of concurrent users that can be supported by a given machine. The GPX 5070 supports up to 160 users; the GPX 6070 up to 360; and the GPX 440 up to 47.
[1]Listed in descending order according to size: DP = Batch commercial data processing; SE = Scientific engineering; OLTP = On-line transaction processing; OA = Office automation.
[2]Millions of instructions per second.
[3]Full-precision millions of floating-point operations per second.
[4]Per-second performance ratings, based on the following industry-standard benchmarks: DH = Dhrystones Version 1.1, unless Version 2.1 is noted; DC = Debit/Credit (transactions based on 95% subsecond response); LP = Linpack (100 x 100 full-precision in MFLOPS); LL = Livermore Loops (harmonic mean; 11 loops); TPC/A = the first benchmark implemention of the Transaction Processing Council. Vendors supplied either actual or estimated benchmark figures.
[5]VUP = VAX units of performance, a measurement used by DEC in which one VUP = the performance of the VAX-11/780.
[6]Specifications for IBM machines were collected from numerous sources, including in-house sources; written materials supplied by the vendor and Datapro Research, a market research firm in Delran, N.J.; Technology Investment Strategies Corp., a market research firm in Framingham, Mass., and The Meridian Group and Meridian Technology Leasing Services, a leasing firm in Deerfield, Ill.
[7]NCR Corp.'s MIPS performance is based on Dhrystone Version 1.1, in which 1,757 Dhrystones = 1 MIPS.

Harris Computer Corp. sells the HCX and H series minicomputers but chose not to supply information on these machines. Interested readers should call the company directly at (800) 442-7747.

The companies included in this chart responded to a recent survey conducted by *Computerworld*. When a vendor is unable to provide specific information about its product, the abbreviation NP (not provided) is used. When a question does not apply to a vendor's product, the abbreviation NA (not applicable) is used. Further product information is available from the vendors.

PRODUCT SPOTLIGHT

VENDOR	PRODUCT	PRIMARY MARKETS[1]	COMPARABLE SYSTEMS	MAXIMUM NUMBER OF CPUs	PERFORMANCE (MIPS)[2]	PERFORMANCE (MFLOPS)[3]	BENCHMARKS[4]	MACHINE CYCLE TIME	MEMORY RANGE/ MAXIMUM CACHE (BYTE)	DISK CAPACITY (BYTE)	DISK TRANSFER RATE (MBYTE/SEC.)	MAXIMUM NUMBER PORTS/ MAXIMUM NUMBER CHANNELS	CHANNEL SPEED (MBYTE/SEC.)	SUPPORTS PARALLEL PROCESSING OR FAULT TOLERANCE	OPERATING SYSTEMS SUPPORTED	NETWORK ARCHITECTURE SUPPORTED	DISTRIBUTION CHANNEL	BASE PRICE
Digital Equipment Corp. (800) 344-4825	VAX 9000, Models 110, 310, 330, 340, 360, 390	DP, SE, OLTP	HP 3000 Model 949	6	3.8 - 22 VUPs	0.04	6,507 DS; 14 - 49.6 DC trans/sec.; 0.588 LP (actual)	60 nsec	32M - 256M/ 257K per processor	5,900G	2.8	Unlimited/992	2	Parallel processing	VMS, Ultrix, VAX ELN, VAX System V, DSM	SNA, Decnet, FDDI	OEM, VAR, Direct	$141,645 - $406,855 with minimum 32M-byte memory, 1 CPU, 2 channels, 296M-byte tape drive, power supply
	VAX 9000, Models 210, 220, 230, 240	DP, SE, OLTP	HP 3000 Model 826	4	2.8 - 11 VUPs	0.01	4,822 DS; 6 - 18.2 DC trans/sec; 0.433 LP (actual)	60 nsec	32M - 256M/ 257K per processor	5,900G	2.8	Unlimited/992	2	Parallel processing	VMS, Ultrix, VAX ELN, VAX System V, DSM	SNA, Decnet, FDDI	OEM, VAR, Direct	$106,680 - $221,865 with minimum 32M-byte memory, 1 CPU, 1 channel, 95M-byte tape drive, power supply
	VAX 9000, Models 410, 420, 430, 440, 450, 460	DP, SE, OLTP	HP 3000 Model 865, IBM AS/400 B70	6	7 - 36 VUPs	23.7 LP 1,000 x 1,000 full precision	12,900 DS; 8.6 - 33.4 DC trans/sec.; 3.6 LP (actual)	28 nsec	32M - 256M/ 128K per processor	5,900G	2.8	Unlimited/992	2	Parallel processing	VMS, Ultrix, VAX ELN, VAX System V, DSM	SNA, Decnet, FDDI	OEM, VAR, Direct	$175,300 - $960,000 with minimum 32M-byte memory, 1 CPU, 2 channels, 296M-byte tape drive, power supply
Encore Computer Corp. (800) 933-6267 (305) 797-5430	Multimax 510	DP, OLTP, SE	DEC VAX, Pyramid Mmerver, HP 9000, Sequent Symmetry	10	17 - 85	NP	12,953 DS (actual)	33 nsec	32M - 320M/NP	600M - 9.6G	1.5 - 25.5	512/7	4	Parallel processing	Unix System V	Decnet	OEM, VAR, Direct	$156,000 - $1,000,000 with minimum 32M-byte memory, 2 CPUs, 1 ENET/SCSI channel, 1 console terminal, tape drive, 600M-byte disk capacity
	Multimax 520	DP, OLTP, SE	DEC VAX, Pyramid Mmerver, HP 9000, Sequent Symmetry	20	17 - 170	NP	12,953 DS (actual)	33	32M - 640M/NP	168M - 676M	1.5 - 49.5	1,024/13	4	Parallel processing	Unix System V	Decnet	OEM, VAR, Direct	$199,000 - $4,000,000 with minimum 32M-byte memory, 2 CPUs, 1 ENET/SCSI channel, 1 console terminal, 1G-byte disk capacity
	Concept 32/2000 Models 32/2030, 32/2040, 32/2050	SE, DP	Harris 3400, 3800, Nighthawk 1280, 1400; IBM RS/6000, Concurrent micro 3 and 5	64	12	1.5	1.5 LP (estimate); 12 whetstones single precision (actual)	75 nsec	4M - 256M/No cache	300M - 1.2G	3	256/ 100+	13	Neither	MPX32	Reflective memory	OEM, Direct	$139,000 - $1,800,000 with minimum 4M-byte memory, 1 CPU, power supply
GEAC Ltd. (416) 475-0525	9000 series, Models 9542 - 9560, 9562 - 9584	OLTP, DP, OA	Stratus XA2000, Tandem CLX	8	2.5 - 10	NP	10 DC trans/sec. (actual)	100 nsec	4M - 64M/No cache	360M - 959G	2.5	744/8	13	Parallel processing, fault tolerance	GEOS proprietary	OSI	VAR, Direct	$65,000 - $360,000 with minimum 4M-byte memory, 2 CPUs, 2 channels, terminal, 4 power supplies
General Automation, Inc. (714) 778-4800	GA 680 3000, 6000	DP, OLTP	Ultimate, Adds, Prime, McDonnell Douglas	1	25	NP	NP	75 nsec	1M - 256M/ 64K	40M - 10G	4	256/NP	NP	Neither	Pick	Proprietary	VAR	$10,000 - $500,000 with minimum 4M-byte memory, 1 CPU, 8 terminals, tape drive, power supply, 95M-byte disk capacity
Hewlett-Packard Co. (800) 752-0900	HP 9000 Model 1240	Telecommunications, OLTP, DP	Tandem, Stratus	64	3 - 192	NP	250 DC trans/sec. (actual)	50 nsec	16M - 8G/16M	0.5G - 100G	NP	10,000/-96	0.5	Fault tolerance	HP-UX proprietary Unix System V.3	SNA, New Wave Computing	OEM, VAR, Direct	$299,000+ with minimum 32-M byte memory, 2 CPUs, 2 channels, 32 terminals, tape drive, 2 power supplies, 1.1G byte disk capacity
	HP 9000 Models 8065, 8135	DP, OLTP, SE, Open systems	Decsystem 5, IBM RS/6000, NCR Tower	1	7	0.7 double precision	NP	62.5 nsec	8M - 56M/64K	150M - 8000M	1.4 - 2.5	96/1	32	Neither	HP-UX	SNA, Decnet, OSI, TCP/IP	OEM, VAR, Direct	$14,900 - $19,500 with minimum 8M-byte memory, 1 CPU, cartridge tape drive, power supply, 150M- or 335M-byte disk capacity
	HP 9000 Models 822, 832	DP, OLTP, SE, Open systems	IBM RS/6000, Decsystem, Sun Sparcserver	1	11 - 15	2.1 double precision	NP	67 - 80 nsec	8M - 128M/ 128K	335M - 80G	1.4 - 2.5	160/1	32	Neither	HP-UX	SNA, Decnet, OSI, TCP/IP	OEM, VAR, Direct	$27,900 - $51,200 with minimum 8M- or 16M-byte memory, 1 CPU, terminal console, DAT tape drive, power supply, 335M-byte disk capacity
	HP 9000 Models 825S, 835S, 835SE, 845S, 845SE	OLTP, DP, SE, Open systems	IBM RS/6000, Decsystem, Sun Sparcserver	1 - 4	10 - 23	0.7 - 2.8, double precision	NP	33.3 - 80 nsec	8M - 128M/ 256K	335M - 22.44G	1.4 - 2.5	342/2	8	Neither	HP-UX	SNA, Decnet, OSI, TCP/IP	OEM, VAR, Direct	$25,500 - $130,000 with minimum 8M- to 32M-byte memory, 1 CPU, power supply
	HP 9000 Models 850S, 860S, 870S/100, 870S/200	OLTP, DP, SE, Open systems	DEC VAX 6000 and 9000, Sequent Symmetry, Pyramid Mmerver	2	14 - 95	2.1 - 26 double precision	NP	20 - 40 nsec	48M - 768M/ 1,024K	335M - 85.8G	1.4 - 2.5	800/12	8	Neither	HP-UX	SNA, Decnet, OSI, TCP/IP	OEM, VAR, Direct	$188,500 - $689,000 with minimum 48M, 96M or 128M memory, 1 or 2 CPUs, 2 channels, power supply
	HP 3000 Models 955, 960, 980/100, 980/200	OLTP, DP, Open systems	IBM AS/400 and low end 3090, DEC VAX 6000, 9000	2	NP	NP	18 or 19 - 100+ TPC/A estimates for 950, 955, 980/100, 980/200; actual for 960)	13 - 21 nsec	64M - 1G/ 1,024K per processor	670M - 868G	1.4 - 2.5	850/4	20	Neither	MPE/XL	SNA, New Wave Computing, OSI, ARPA	OEM, VAR, Direct	$240,000 - $1,850,000 with minimum 96M- or 256M-byte memory, CPU, 2 channels, power supply
	HP 3000 Models 920, 922LX, 922RX, 922, 932	OLTP, DP, Open systems	IBM AS/400, DEC VAX 3100, 4000, 3000	1	NP	NP	4.95 - 13.6 TPC/A (estimates for Model 920, actual for 922s and 932)	62.5 - 67 nsec	24M - 128M/ 128K	670M - 22G	1.4 - 2.5	240/1	20	Neither	MPE/XL	SNA, New Wave Computing, OSI, ARPA	OEM, VAR, Direct	$27,000 - $79,500 with minimum 24M- or 32M-byte memory, CPU, console terminal, tape drive, power supply, 670M- to 1.3G-byte disk capacity
	HP 3000 Models 935, 950, 949	OLTP, DP, Open systems	IBM AS/400, DEC VAX 6000	1	NP	NP	6 or 7 - 32.2 TPC/A (actual)	33 - 80 nsec	32M - 192M/ 64K	670M - 416G	1.4 - 2.5	400/2	20	Neither	MPE/XL	SNA, New Wave Computing, OSI	OEM, VAR, Direct	$70,000 - $230,000 with minimum 32M- or 64M-byte memory, CPU, 2 channels

PRODUCT SPOTLIGHT

VENDOR	PRODUCT	PRIMARY MARKETS[1]	COMPARABLE SYSTEMS	MAXIMUM NUMBER OF CPUs	PERFORMANCE (MIPS)[2]	PERFORMANCE (MFLOPS)[2]	BENCHMARKS[3]	MACHINE CYCLE TIME	MEMORY RANGE/ MAXIMUM CACHE (BYTE)	DISK CAPACITY (BYTE)	DISK TRANSFER RATE (MBYTE/SEC.)	MAXIMUM NUMBER PORTS/ MAXIMUM NUMBER CHANNELS	CHANNEL SPEED (MBYTE/SEC.)	SUPPORTS PARALLEL PROCESSING OR FAULT TOLERANCE	OPERATING SYSTEMS SUPPORTED	NETWORK ARCHITECTURE SUPPORTED	DISTRIBUTION CHANNEL	BASE PRICE
IBM[4] Contact local sales office	Enterprise System/9000 Models 320, 260	DP	NA	1	18 or 28	7	NP	NP	32M - 256M/NP	1,024M (max)	NP	NP/48	4.5	Neither	VSE/ESA, VM/ESA	SNA, TCP/IP	Direct	$1,125,600 - $1,670,600
	ES/9000 Models 150,130,120	DP	NA	1	2.0 - 5.6	NP	NP	NP	16M - 256M/NP	NP - NP	NP	NP/12	4.5	Neither	VSE/ESA, VM/ESA	SNA, TCP/IP	Direct	$70,480 - $165,600
	AS/400 Models 9406 CO4, CO6	DP	NA	NP	NP	NP	NP	NP	8M - 16M/NP	646M - 1,280M	NP	NP	NP	Neither	OS/400	SNA	Direct	NP
	AS/400 Models C10, C20, C25	DP	NA	NP	1.3	NP	NP	30 nsec	4M - 40M/NP	636M - 3,946M	1.2 - 1.25	36/NP	NP	Neither	OS/400	SNA	Direct	$34,145 - $42,970
	AS/400 Models B35, B45, B60, B80, B70	DP	NA	NP	0.87 - 3.5	NP	2.1 - 7.1 Rmip C trans./sec.	94 nsec for B35; others NP	8M - 192M/ NP	400M - 54.8G	6.7 for B35; others NP	72 ports for B35; channels and ports for others NP	NP	Neither	OS/400	SNA	Direct	$64,135+
	AS/Entry Model 9402 T10	DP	NA	NP	NP	NP	NP	NP	1M - 2M/NP	160M - 640M	NP	NP/NP	NP	NP	SSP	SNA	Direct	$11,000 - $17,300
ICL (714) 458-7282 in U.S. (06) 344-481000 in UK	DRS 6000, Level 50	Server, OLTP, DP, SE	HP 9000, IBM RS/6000	1	23	5 double precision	40,400 DS Version 2.1 (actual)	33 MHz	32M - 128M/ 128K	15G - 19G	4	384/39 cards	40 or 88	Neither	Unix System V.4	SNA, OSI, ICL IPA, TCP/IP	OEM, VAR, Direct	$140,000+ with minimum 32M-byte memory, 1 CPU, tape drive, power supply, 1.5G-byte disk capacity
	DRS 6000, Level 40	Server, OLTP, DP, SE	HP 9000, IBM RS/6000	1	17.5	3.7 double precision	30,300 DS Version 2.1 (actual)	25 MHz	16M - 112M/ 128K	760M - 19G	4	384/39 cards	40 or 88	Neither	Unix System V.4	SNA, OSI, ICL IPA, TCP/IP	OEM, VAR, Direct	$120,000+ with minimum 16M-byte memory, 1 CPU, tape drive, power supply, 760M-byte disk capacity
	DRS 400, Levels 62, 68, 78, 88	Server	NP	1	6	NP	NP	25 MHz	8M - 64M/64K	300M - 2.6G	15	80/11 cards	4	Neither	Unix System V.3.2	SNA, OSI, ICL IPA, TCP/IP	VAR, Direct	$25,000 - $41,000 with minimum 8M- or 16M-byte memory, 1 CPU, tape drive, power supply, 300M- or 660M-byte disk capacity
International Parallel Machines, Inc. (508) 988-2077	IP-1	SE, Other, DP, OLTP	DEC VAX 9000, Convex C240	33	30	10	2 LL, 0 LP (actual)	100 nsec	8M - 256G/1M	196M - 6G	10	200/200	10	Parallel processing	Unix, Ipos	Ethernet, TCP/IP	OEM, Direct	$40,000 - $3 million with minimum 4M-byte memory, 1 CPU, tape drive, power supply, 0 terminals, 19MM-byte disk capacity
MAI Basic Four, Inc. (714) 731-5100	GPX, Model 5070	OLTP, DP, SE	AT&T 3B2, Prime Series 50, IBM RS/6000 Model 530	4	NP	NP	∞	20 MHz	8M - 48M/ 128K	355M - 3.35G	1.9	256/12	NP	Neither	Bos/VX Dual Universe	Ethernet, TCP/IP	VAR, Direct	$69,000 - $300,000 with minimum 8M-byte memory, 2 CPUs, 120M-byte cartridge tape drive, power supply, 355M-byte disk capacity
	GPX, Model 6070	OLTP, DP, SE	Same as above	10	NP	NP	∞	20 MHz	16M - 96M/ 320K	670M - 11.39G	1.9	512/16	NP	Neither	Bos/VX Dual Universe	Ethernet, TCP/IP	VAR, Direct	$107,400 - $500,000 with minimum 16M-byte memory, 2 CPUs, 120M-byte cartridge tape drive, power supply, 670M-byte disk capacity
	GPX, Model 440	OLTP, DP, SE	Altos 2000, NCR Tower 32	1	NP	NP	∞	25 MHz	4M - 16M/32K	200M - 1,340M	1.6 - 1.9	64/7	NP	Neither	Bos/VX Dual Universe	Ethernet, TCP/IP	VAR, Direct	$18,360+ with minimum 4M-byte memory, 1 CPU, 120M-byte cartridge tape drive, power supply, 200M-byte disk capacity
Mips Computer Systems, Inc. (408) 720-1700	Riscomputer, Model RC 3230	DP, SE	Sun Sparcstation 1+, IBM RS/6000 Model 320	1	26	3.6	3.6 LP double-precision, 6.0 LP single precision	40 nsec	8M - 128M/ 32K	380M - 6G	5	24/2	5	Neither	Unix System V.3.2, BSD 4.3, RISC/OS 4.5	SNA, Decnet, OSI/C	OEM, VAR	$8,490 - $21,760 with minimum 8M-byte memory, 1 CPU, 120M-byte ¼-in. tape drive, 220-W power supply, 200M-byte disk capacity
	Riscomputer, Model RC 3240	DP, SE	Sun Sparcstation 330, DEC 5400, HP 9000 Model 832, IBM RS/6000 Model 530	1	26	3.1	3.1 LP (actual)	40 nsec	8M - 64M/64K	320M - 1G	10 - 23	128/1	1.2	Neither	Unix System V.3.2, BSD 4.3, RISC/OS 4.5	SNA, Decnet, OSI/C	OEM, VAR	$35,000 - $60,000 with minimum 8M-byte memory, 1 CPU, 120M-byte 1/4 in. tape drive, 400-W power supply, 320M-byte disk capacity
	Riscomputer, Model RC 3260	DP, SE	Sun Sparcserver 470, DEC 5810, HP 9000, IBM RS/6000 Model 530	1	26	3.9	3.9 LP (actual)	40 nsec	16M - 128M/ 64K	320M - 8G	10 - 23	128/2	4	Neither	Unix System V.3.2, BSD 4.3, RISC/OS 4.5	SNA, Decnet, OSI/C	OEM, VAR	$50,000 - $75,000 with minimum 16M-byte memory, 1 CPU, 120M-byte ¼-in. tape drive, 1,024-W power supply, 320M-byte disk capacity
	Riscomputer, Model RC3280	DP, SE	Sun Sparcserver 490, DEC 5810, HP 9000 Model 845, IBM RS/6000 Model 530	1	25	3.9	3.9 LP (actual)	40 nsec	16M - 128M/ 64K	320M - 2G	NP	256/4	3	Neither	Unix System V.3.2, BSD 4.3, RISC/OS 4.5	SNA, Decnet, OSI/C	OEM, VAR	$75,000 - $125,000 with minimum 16M-byte memory, 1 CPU, ¼-in. tape drive, 1,025-W power supply, 640M-byte disk capacity
	Riscomputer, Model RC 6280	DP, SE	IBM RS/6000 Model 560, Sequent 9000 series, Pyramid	1	50	12.0	120,000 DS; 9.1 LP double precision (actual)	15 nsec	32M - 256M/ 512K	640M - 1.7G	2.4	256/8	40	Neither	Unix System V.3.2, BSD 4.3, RISC/OS 4.5	SNA, Decnet, OSI/C	OEM, VAR	$150,000+ with minimum 32M-byte memory, 1 CPU, 1 channel, terminal, tape drive, 4,500-W power supply, 0GBM-byte disk capacity
Modcomp, Inc. (305) 974-1380	Tridimension-al series, Models 9720, 9730, 9735, 9740	SE	Concurrent 6300 and 6400, Encore 32/3000, Harris 3800 and 3400	1	1.7 - 2.8 whet-stone	0.22 - 0.46	5,996 - 7,676 DS Version 2.1	33 MHz	16M - 40M/64K	80M - 600M	9	2/16	3	Neither	Real/IX	Decnet, TCP/IP	OEM, VAR, Direct	$20,000 - $60,000 with minimum 8M-byte memory, 1 CPU, 150M-byte cartridge tape drive, power supply, 80M-byte disk capacity
	Tridimension-al series, Models 9230, 9250	SE	DEC VAX 600, 3400 - 3600; HP 9000 Models 825, 836; Harris 3400, 3800	3	2.8 - 4.3 whet-stone	NP	3,300 - 4,900 DS Version 2.1	80 - 180 nsec	8M - 240M/ 32K - 64K	67M - 300M	8.8	8/256	2.2	Neither	Max proprietary	TCP/IP, SNA, Maxnet	OEM, VAR, Direct	$79,000 - $114,000 with minimum 8M-byte memory, 1 CPU, power supply

VENDOR	PRODUCT	PRIMARY MARKETS[1]	COMPARABLE SYSTEMS	MAXIMUM NUMBER OF CPUs	PERFORMANCE (MIPS)[2]	PERFORMANCE (MFLOPS)[3]	BENCHMARKS[4]	MACHINE CYCLE TIME	MEMORY RANGE/ MAXIMUM CACHE (BYTE)	DISK CAPACITY (BYTE)	DISK TRANSFER RATE (MBYTE/SEC.)	MAXIMUM NUMBER PORTS/ MAXIMUM NUMBER CHANNELS	CHANNEL SPEED (MBYTE/SEC.)	SUPPORTS PARALLEL PROCESSING OR FAULT TOLERANCE	OPERATING SYSTEMS SUPPORTED	NETWORK ARCHITECTURE SUPPORTED	DISTRIBUTION CHANNEL	BASE PRICE
NCR Corp.[5] (513) 445-5075	NCR Tower, Model 32/600	Departmental processing	AT&T 3B2/600	1	5.8	NP	10,208 DS (actual)	100 - 200 nsec	4M - 32M/16K	120M - 700M	1.25 - 1.65	16/3	5	Neither	Tower Release 1.01 proprietary Unix System V.3	SNA, TCP/IP	OEM, VAR, Direct	$11,290 - $20,800 with minimum 4M-byte memory, 1 CPU, 3 channels, 150M-byte tape drive, 120M-byte disk capacity
	NCR Tower, Model 32/650	Same as above	Same as above	1	5.8	NP	10,343 DS (actual)	100 - 200 nsec	4M - 64M/16K	120M - 2.3G	1.25 - 1.65	32/7	5	Neither	Tower Release 1.01 proprietary Unix System V.3	SNA, TCP/IP	OEM, VAR, Direct	$15,050 - $83,900 with minimum 4M-byte memory, 1 CPU, 7 channels, 150M-byte tape drive, 120M-byte disk capacity
	NCR Tower, Model 32/700	Same as above	HP 9000 Model 815	1	6.8	NP	15,487 DS (actual)	66 - 132 nsec	4M - 64M/32K	120M - 2.3G	1.25 - 1.65	96/7	5	Neither	NP	SNA, TCP/IP	OEM, VAR, Direct	$23,500 - $76,000 with minimum 4M bytes of memory, 1 CPU, 7 channels, 150M-byte tape drive, 700M-byte disk capacity
	NCR Tower, Model 32/850	Same as above	Sequent S27	6	6.6	NP	11,855 DS (actual)	100 nsec	8M - 128M/ 256K	170M - 3.5G	1.21 - 1.65	256/10	40	Neither	Tower Release 2.0 proprietary Unix System V.3	SNA, TCP/IP	OEM, VAR, Direct	$59,950+ with minimum 8M-byte memory, 1 CPU, 10 channels, 150M-byte tape drive, 700M-byte disk capacity
	NCR Tower, Model 32/850	Same as above	Same as above	6	6.6	NP	11,855 DS (actual)	100 nsec	8M - 384M/ 256K	170M - 3.0G	1.21 - 1.65	512/20	40	Neither	Tower Release 2.0 proprietary Unix System V.3	SNA, TCP/IP	OEM, VAR, Direct	$81,300+ with minimum 8M-byte memory, 1 CPU, 20 channels, 150M-byte tape drive, 700M-byte disk capacity
Prime Computer, Inc. (508) 655-8000	50 series, Models 3455, 5320, 5340, 6450, 6150, 6450, 6850	DP, OLTP, SE	HP 3000, DEC VAX 6000, IBM AS/400	2	1.6 - 28	0.233 - 3.791 single precision	2,488 - 60,526 DS; 0.2 - 4.7 LP (200 x 200) BLAS (actual)	36.6 - 120 nsec	4M - 128M/ 128M	673M	2.5	512/- 32,000	5 - 24	Neither	Primos	SNA	VAR, Direct	$20,000 - $1,000,000 with minimum 4M-byte memory, 1 CPU, 32 channels, terminal, tape drive, power supply, 328M-byte disk capacity
Pyramid Technology Corp. (415) 965-7200	Mimerver series, Models MIS-12T, MIS-4, MIS-2, MIS 1/1	OLTP, DP, SE	Sequent, Symmetry, HP 9000 Model 800, DEC 5000	11	14 VUPs	0.76	15,625 DS; 200 DC; 0.76 LP (actual)	100 nsec	16M - 512M/ 12M	323M - 64G	2.46	2,000/16	11	Neither	Unix System V.3, BSD 4.3 and higher	SNA, Decnet, TCP/IP	OEM, VAR, Direct	$50,000 - 42 million with minimum 16M-byte memory, 1 CPU, 2 channels, ¼-in. tape drive, power supply, 323M-byte disk capacity
Stratus Computer, Inc. (508) 460-2000	XA2000 Continuous Processing Systems, Models 30, 75, 80, 200 - 260	OLTP	DEC VAX 6000, PT3000 and dual host Microvax; Tandem VLX and CLX	6	NP	NP	99,470 trans./hour, heavy mix; 132,130 trans./hour moderate mix (actual)	42 nsec	8M - 128M/ 128K	152M - 31.2G	2.458	440/14	4	Fault tolerance	VOS, FTX version of Unix System V.3.2, Pick	OSI	OEM, VAR, Direct	$49,800 - $1,080,000 with minimum 8M- or 32M-byte memory, 1 - 6 CPUs, 1 channel, cartridge tape drive, power supply, 152M-byte disk capacity
Sequent Computer Systems, Inc. (503) 254-0480 (800) 854-0700	Symmetry series, Models S3, S30, S27, S81	OLTP, DP, SE	DEC VAX 6000, Pyramid Mimerver	30	8 - 150	0.7 - 10.5	0.35 LP	33 MHz for S3; 20 MHz for others	8M - 384M/ 128K	150M - 44G	3	256/14	2.4	Parallel processing	Dynix, Unix System V	SNA, Decnet, TCP/IP	OEM, VAR, Direct	$29,950 - $1 million with minimum 8M-byte memory, 1 CPU, terminal, SCSI tape drive, power supply, 300M-byte disk capacity
Sequoia Systems, Inc. (508) 480-0800	Series 300	OLTP, Unix, DP, SE	Tandem Cyclone, Stratus XA2000 M2	64	8 - 150	NP	251 DC	20 MHz	16M - 20G/256K	760M - 2,000G	NP	3,000/1	80	Fault tolerance	Unix System V.3	SNA, TCP/IP	OEM, VAR, Direct	$300,000 - $1.5 million with minimum 32M-byte memory, 2 CPUs, 12 channels, 32 terminals, tape drive, eight power supplies, 1.56G-byte disk capacity
Tandem Computers, Inc. (408) 725-6000	Nonstop CLX, Models CLX 600, CLX 700	OLTP, DP	IBM AS/400, HP 3000, DEC VAX 6000	16	NP	NP	3.7 DC (actual)	91 nsec	4M/128K	300M - 209G	2	48/2	20	Both	Guardian 90	Tandem Expand, OSI	OEM, VAR, Direct	$39,750 - $405,000 with minimum 4M-byte memory, 1 CPU, 2 channels, terminal, tape drive, 2 power supplies, 300M-byte disk capacity
Unisys Corp. (215) 986-4011	U 6000 series, Model 31	Departmental processing, DP, OLTP, SE	Altos 1000, HP 9000, NCR Tower, Data General Aviion	1	5	NP	8,179 DS (actual)	50 nsec	4M - 12M/No cache	80M - NP	NP	28/1	4	Neither	Unisys version of Unix System V.3.2	SNA, Decnet, OSI	OEM, VAR, Direct	$11,500 - $35,000 with minimum 4M-byte memory, 1 CPU, channel, 150M-byte tape drive, 220-W power supply, 80M-byte disk capacity
	U 6000 series, Model 55	Departmental processing, DP, OLTP, SE	DEC 3100, IBM AS/400, HP 9000, Data General Aviion	1	10	NP	17,048 DS (actual)	30 nsec	4M - 80M/64M	168M - 4G	1.5	59/1	3.3	Neither	Unisys version of Unix System V.3.2	SNA, Decnet, OSI	OEM, VAR, Direct	$28,450 - $80,000 with minimum 4M-byte memory, 1 CPU, channel, 150M-byte tape drive, 472-W power supply, 168M-byte disk capacity
	U 6000 series, Model 60	Departmental processing, DP, LTP, SE	HP 9000, DEC 3100, IBM AS/400, NCR Tower, Data General Aviion	1	15	NP	25,000 DS (actual)	40 nsec	4M - 80M/64M	168M - 4G	1.5	59/1	3.3	Neither	Unix System V.3	SNA, Decnet, OSI	OEM, VAR, Direct	$32,400 - $90,000 with minimum 4M-byte memory, 1 CPU, channel, 150M-byte tape drive, 472-W power supply, 340M-byte disk capacity
	U 6000 series, Model 51	Departmental processing, DP, OLTP, SE	IBM AS/400, NCR Tower, HP 9000, Data General Aviion	1	8	NP	12,576 DS (actual)	40 nsec	4M - 80M/64M	168M - 4G	1.5	43/1	3.3	Neither	Unisys version of Unix System V.3.2	SNA, Decnet, OSI	OEM, VAR, Direct	$20,850 - $60,000 with minimum 4M-byte memory, 1 CPU, channel, 150M-byte tape drive, 472-W power supply, 168M-byte disk capacity
	U 6000 series, Models 70, 80	DP, OLTP, SE	Pyramid Mimerver, DEC 6000, HP 9000	20	10 - 100	0.7 - 10.5	7,300 single, 4,550 double precision FPA whetstone (actual)	20 MHz	8M - 384M/ 128K	337M - 112G	3	256/14	3	Parallel processing	Unisys version of Unix System V.3.2	SNA, Decnet, OSI, DCA	VAR, Direct	$79,900 - $1,000,000+ with minimum 8M-byte memory, 2 CPUs, 16 terminals, 150M-byte tape drive, power supply, 380M-byte disk capacity
Wang Laboratories, Inc. (800) 422-6000	VS 6000, Models 6200, 6270, 6280, 6420, 6470, 6480	DP, OLTP	IBM AS/400, Bull VP, DEC VAX 6000	1	NP	NP	10,600 DS; 6,726 US Steel (actual)	60, 90 or 120 nsec	8M - 64M/ 128K	76M - 40G	3	960/16	Up to 20	Neither	Wang VS/OS, BASIX	SNA, OSI, TCP/IP	VAR, Direct	$165,000 - $611,000 with minimum 8M- to 32M-byte memory, one CPU, channel, terminal, 2 power supplies
	VS 10000, Models 80, 70, 100	DP, OLTP, Server, OA	IBM 4381, DEC VAX	1	NP	NP	12,000 DS	44, 77 or 110 nsec	16M - 256M/ 32M	314M - 37.8G	3	960/80	33.3	Neither	VS/OS, IX/IX proprietary Unix	SNA, OSI	VAR, Direct	$525,000 - $750,000 with minimum 32M-byte memory, 1 CPU, 16 channels, 1 terminal, 2 power supplies

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MCC's research is low-key but steady

MCC

CONTINUED FROM PAGE 1

unspectacular, technical advances has also done little to alter the public perception that MCC has yet to justify its existence.

In fact, MCC's mission is to find a way for corporations to leverage long-term (four to 10 years) applied research in critical technology disciplines. In the coming global technology wars, it is to be *part* of the solution, not the whole solution, says David Gibson, a professor of management science at the University of Texas at Austin who is writing a book about MCC. But the criticisms persist. Among them are the following:

- No major breakthrough technologies have emerged from MCC.
- Consortiums in the U.S. do not work.
- Member companies do not send their best people to MCC; therefore, the best research and development is not done there.
- Some shareholder companies are unhappy with MCC and the results they are getting for their money.
- MCC has done little or nothing to slow Japan's technology juggernaut.

Ironically, no one associated with MCC ever made the alleged promise to quell the Japanese threat. Yes, MCC was formed in response to publicity about Japan's vaunted Fifth Generation Project and set out to build advanced AI tools. But William Norris, former chairman of Control Data Corp. and the catalyst behind MCC, was simply sounding an alarm that the U.S. was in danger of losing its competitive edge if companies refused to band together.

Yet, because of the timing and rhetoric surrounding MCC's birth, the consortium suffered through an infancy of misplaced perception. "The original expectations surrounding MCC were unrealizable from the word go," says Ralph Gomory, president of the Alfred P. Sloan Foundation and former senior vice-president for science at IBM. "You can't, by any stretch of the imagination, improve U.S. competitiveness with Japan with an organization of 400 people. That was a delusion from the start."

Zigy Kaluzny

Fields (left) and Dove *have different styles but the same objective for MCC*

As for the other charges, criticism of MCC tends to come in the form of blanket skepticism about consortiums from people who have not looked closely at MCC. Attempts to find detractors among the current and former shareholders turned up no one willing to speak on the record.

Critical, if not breakthrough, technology has been and is being transferred to shareholder companies in the areas of packaging, expert systems, software development and computer-aided design. Major programs in superconductivity, holographic storage, neural networks and other leading-edge technologies are under way.

"NCR's product development has been greatly influenced by technology, processes and concepts from MCC," says Roy Coons, director of applied research at NCR Corp., a founding member of the consortium.

"We don't look for a detailed return on investment analysis," adds Tom Gannon, director of technology planning and development at Digital Equipment Corp. "We ask, 'How much would it cost DEC to do it on our own? What is the leverage factor?' On MCC's CYC knowledge-base project, for example, there are seven companies paying $500,000 each, so we figure it would cost DEC five to 10 times that to do it alone. We're pleased with the results." (See story page 90.)

Coons concedes that it has taken MCC longer to produce worthwhile results than originally expected. "We lost a couple of years because we were the pioneers with the arrows in our backs," he says. "We had no one else to look to."

But skeptics in industry, academia and especially the media point to a dearth of technologies flowing out of MCC's doors and say that by now, much more should have been accomplished.

"Companies just won't send their best people to MCC. They say they want to

MCC

Advanced Micro Devices	Digital Equipment Corp.	Hughes Aircraft Co.	NCR Corp.
Andersen Consulting	Eastman Kodak Co.	Lockheed Corp.	Northern Telecom, Inc.
Bellcore	General Electric Co.	Martin Marietta Corp.	Rockwell International Corp.
The Boeing Co.	Harris Corp.	3M Co.	Westinghouse Electric Corp.
Cadence Design Systems	Hewlett-Packard Co.	Motorola, Inc.	
Control Data Corp.	Honeywell, Inc.	National Semiconductor Corp.	

Advanced Packaging Systems	DSC Communications Corp.	Magnavox Government and Industrial System	Software Engineering Institute
Allied-Signal, Inc.	*Du Pont Co.	Metropolitan Life Insurance Co.	Sun Microsystems, Inc.
*Apple Computer, Inc.	Environmental Research Institute of Michigan	The Mitre Corp.	*Tandem Computers, Inc.
AT&T	*E-Systems, Inc.	Northrop Corp.	Teradyne, Inc.
Compaq Computer Corp.	*General Dynamics Corp.	Olin Corp.	*Texas Instruments, Inc.
*Conner Peripherals, Inc.	Itasca Systems, Inc.	Polylithics	TRW, Inc.
Dover Corp.	LTV Missiles & Electronics Group		United Technologies Corp.

* *Actively funding research*

Source: MCC

CW Chart: Paul Mock

participate, but they only send second- or third-level people. For that reason, it hasn't worked," says Harvey Newquist, an AI consultant based in Scottsdale, Ariz. "The members are competitors; everyone is working to the common good until it affects the corporate bottom line," he says. "The concept just can't work."

The nearly 50 shareholders and associate members who are pouring $60 million into MCC annually don't believe that. "We've learned how to collaborate and remain intense competitors," says Frederic Schwettmann, general manager of circuit technology at Hewlett-Packard Co., an MCC shareholder.

As it heads into the 1990s, MCC is quietly poised to show its detractors that it is hardly an underachiever.

"The expectations were perhaps too high," says Grant Dove, chairman and chief executive officer of MCC. "But I'd compare our record to any other research lab in the U.S."

Dove says he believes that long-term research is given a low priority in U.S. industry today and that "that is a niche we can provide."

But as global competitive pressures intensify, U.S. companies are starting to rethink the concept of cooperative long-term research as an alternative to the do-it-yourself mentality.

"There's actually a much better attitude today toward consortia," Dove says. "When I came to MCC [in 1987], we had 25 companies; now, we have nearly 50. Texas Instruments, Inc. had passed on MCC at first; now they are in. Apple Computer, Inc. has not joined any other consortium except MCC. Companies are starting to get comfortable with the infrastructure of cooperative development."

Initially, MCC had a rigid format in which shareholders had to pay set fees for each program in which they participated, and it was an all-or-nothing proposition. In the past two years, the consortium has eased the restrictions, building in flexibility for participation by smaller companies in parts of projects rather than entire programs. A new category of membership — associate — has been established that provides access to MCC research for a $25,000 entry fee.

Members are pleased with the changes. "Grant Dove succeeded in achieving customer focus and responsiveness," Schwettmann says. "Consensus-building is a time-consuming process, but we have achieved it."

This unbundling and shifting of the membership restrictions has brought in more than 20 associate members since 1988, including Apple, TI, AT&T, Sun Microsystems, Inc. and Tandem Computers, Inc., to join the 21 shareholder firms. Shareholders such as Allied Signal Co., which left several years ago, have rejoined as associates. Even IBM is taking part in an MCC study project, although the firm says it has no plans to join MCC.

Adding another visible checkmark to MCC's plus column is the entrance of Craig Fields (see story above). Fields, a tough, no-nonsense scientist, joined MCC as president in July after being ousted, amid controversy over his views on technology research, from his job as head of the Defense Advanced Research Projects Agency. He will succeed Dove as chairman of MCC next year, and MCC watchers say they believe Fields will provide the jump-start the organization needs to power itself during the '90s.

"Fields is definitely the right guy for MCC," says Gordon Bell, chief scientist at Stardent Computer, Inc. "He is tolerant of all kinds of ideas, but he demands results."

With more than $60 million in revenue, the for-profit MCC is financially stable, according to Dove, and its membership is growing. Earlier this month, Andersen Consulting became the 22nd shareholder.

MCC has quietly transferred more than 150 technologies to its 22 shareholders while attracting a group of world-class researchers such as Doug Lenat, Laszlo Belady and Steve Redfield, all of whom prize the innovative environment. In hiring top researchers for its own staff, MCC is acknowledging the problem that it ran

Dreams of Fields

Ex-head of DARPA may be just the person to push MCC to its R&D limits

Even when offering his version of small talk — a recipe for homemade chocolate chip cookies — Craig Fields speaks in pointed, rapid-fire bursts that bespeak his intensity. Fields, 43, is the new president of MCC and will take over as chairman and CEO, replacing Grant Dove sometime next year. Making the transition from the affable, grandfatherly Dove to Fields should be more than a bit shocking for MCC's 540 troops.

But Fields may be just the man to take MCC out of the shadows and into the spotlight of U.S. research. Even though he was fired as head of DARPA after less than one year on the job, Fields is viewed as a brilliant scientist and a prize catch for MCC.

"MCC needs a dynamic and controversial new leader who can make it live up to its billing as the flagship of all consortia," says William Norris, former chairman of CDC and the catalyst behind founding MCC in 1982. "Getting Craig Fields is a super move."

Fields apparently rubbed too many Bush administration officials the wrong way with his efforts to promote targeted commercial uses of DARPA funding. Because MCC is a private, nongovernmental outfit, Fields should find the environment more suited to his aggressive, brook-no-fools style.

His initial assessment of his new employer is mixed. He says he has no problem with the technical quality of the projects, and the staff is "super." But Fields plans to give every project a critical evaluation based on the question: Is this going to give a major competitive advantage to our shareholders? "Projects should start," he says. "But they should also stop."

Fields insists that projects be better defined, with both long-term and intermediate goals. "Technology transfer needs to be better, and our schedules need to be better. We have to set up technology transfer plans up front."

Zuzy Kaluzny

Fields *will put his belief in consortiums to work*

Fields claims that he has long been a believer in consortiums and that leveraging technology investments is crucial. "I can't understand the concept that a consortium is not an American way to work," he says. "MCC is pro-competition. We're not anti-Japanese or anti-EEC. We're pro our shareholders."

The economic crisis facing high tech today only confirms Fields' belief in consortiums. "We can offer a CEO research and development at a percentage of the cost to do it alone," he says.

GLENN RIFKIN

Five distinct parts equal one synergistic whole

MCC is really four consortiums under one umbrella, and it has recently formed a fifth, called the Computer Physics Lab, to house MCC's superconductivity and optics projects. The five are as follows:

• **Advanced Computing Technology.** This group, which includes AI, human interface and neural networks, has been the most visible and probably taken the most heat. "We take the most flack for why consortia don't work," admits Deborah Pedersen, ACT's program manager. "We were the most ambitious and probably haven't focused and coordinated the effort as well as we should have."

ACT is at work on several ambitious projects such as character and symbol recognition using neural networks, natural language interfaces, an innovative Interactive Work Surface and object-oriented database design.

The most visible project, however, is Doug Lenat's CYC project. Lenat, a Stanford computer scientist, is building a vast knowledge base of millions of commonsense facts. The 10-year project, now in its sixth year, will potentially engineer the brittleness out of today's expert systems, which cannot cope with unexpected situations because of a lack of basic general knowledge.

"Learning occurs at the edge of what you know," Lenat says. "The more you know, the more you can learn. This issue has held machine learning back for 20 years." To correct this, Lenat and his team have been feeding general knowledge information into a growing database that is now halfway to completion. Lenat's ambitions are high. "Almost all software in the 21st century will be based on a platform of common sense," he says.

• **Packaging/Interconnect.** This program, which many say is the most successful of MCC's groups, has a more directed focus than ACT and has already transferred key technology to some of the shareholders.

Through the program, MCC is developing multichip modules that allow greater chip densities and higher performance while lowering fabrication costs. The goal is to create technologies necessary to produce a 10-million gate, 100-chip computer costing $1,000.

Incorporating tape automated bonding techniques and creating an innovative laser bonder, the program has already transferred high-performance interconnect technology, which DEC incorporated in its VAX 9000 mainframe product. "This is concrete work that was done at the consortium and lifted to support product development at DEC," says Tom Gannon, DEC's director of technology and planning.

• **CAD Program.** This MCC program includes the Framework Initiative, a broad-based industry effort that promotes the standardizaton of interfaces between computer-aided design tools and their supporting software.

• **The Software Technology Program.** One of MCC's original groups, the program is multilayered and working on tools to help design large, complex, distributed software systems. A potential breakthrough project involves hypertext-based processing used to capture the design rationale. The project, called The Design Journal, uses hypertext and groupware to capture the issues and processes of why a software program was designed a certain way.

• **The Computer Physics Lab.** The lab is now home to the High Temperature Superconductivity Program, which is aligned with renowned superconductivity guru Paul Chu at the University of Houston. In addition, Steve Redfield is working on the breakthrough-level Bobcat project, an optical computing design using a read/write holographic data storage subsystem that will potentially deliver access speeds three orders of magnitude faster than magnetic disk [CW, Aug. 6].

GLENN RIFKIN

On September 20, the distance between the lab and the real world got a little shorter.

Last week, the world's largest information technology services firm became part of an exceptional computer research consortium.

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Consortiums can help companies successfully leverage their R&D

For consortiums, the key to survival is leverage. Companies must be able to obtain valuable leverage in a particular research project or it isn't worth retaining membership.

Leverage is not only based on money invested but also on time to market and the end technology itself. For MCC, its innovative laser bonder is an example of leverage at work.

The laser bonder, a device that provides high-speed inner lead bonding, was created for $2.5 million at MCC. According to Phil Spletter, an assignee from Harris Corp. and the head of the laser bonder project, the technology took five years to develop.

"It was definitely faster to do the project here," Spletter says. "No single company even tried" because of the risk and expense involved. The consortium allowed the cost and risk to be spread among the 15 shareholders interested in the device for building integrated circuits.

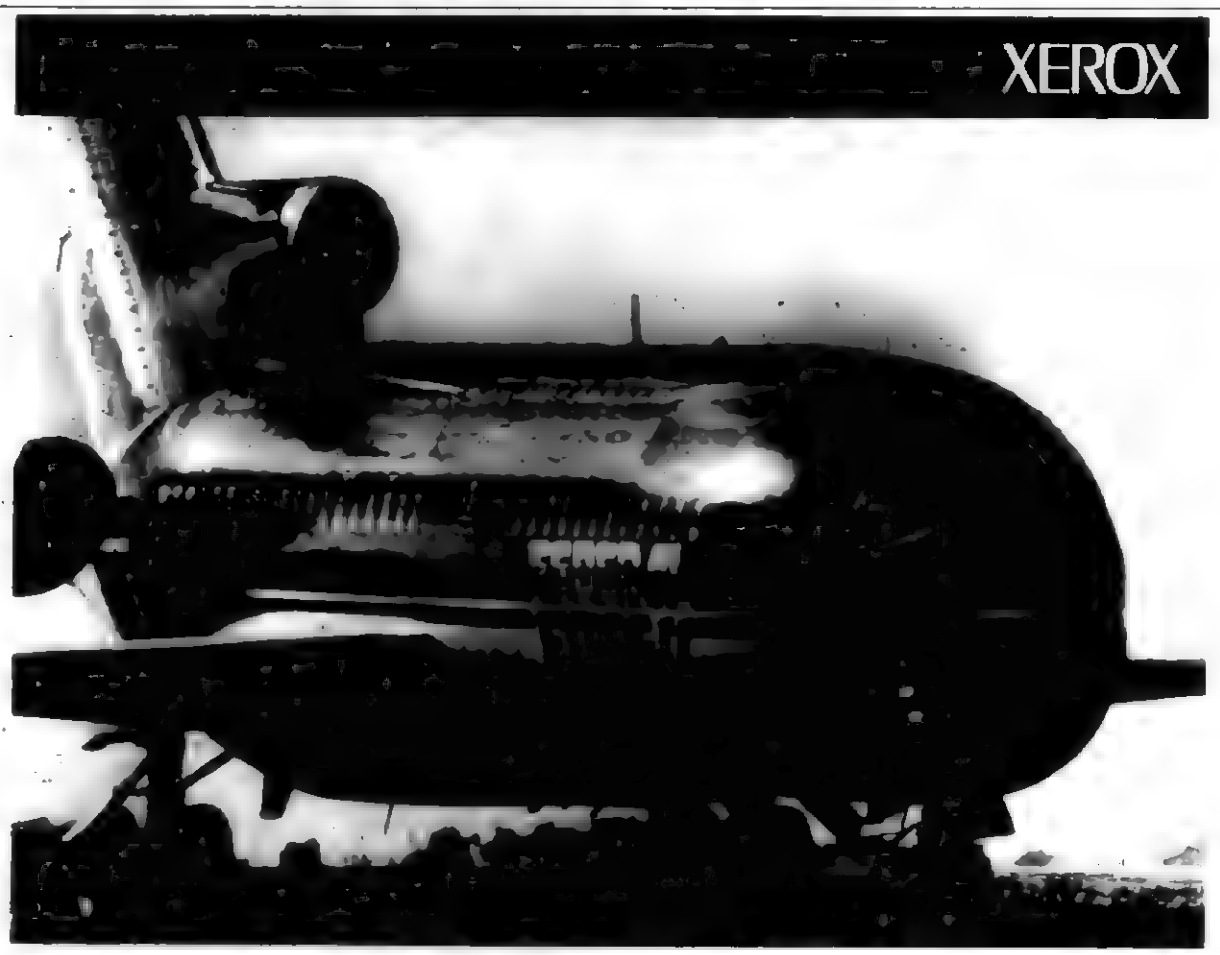
"If an individual company had started this, they probably would have given up," Spletter says. With associate members now allowed to participate, the project offers a 17-to-1 leverage factor.

The technology took three years "to get into a licensable state," Spletter says. The payoff came when MCC licensed the technology to ESI, a Portland, Ore., manufacturer.

Advanced Micro Devices, an MCC shareholder, is now serving as a beta-testing site for the new machine. Ironically, the patented technology attracted the Japanese bonding industry, which was, of course, turned away.

The laser bonder offers a breakthrough to the fundamental limitations of conventional bonding tools, averting the need for thousands of pounds of heat and pressure applied to these sensitive materials. It also allows a software program to control the device rather than manually changing dye sizes and components to bond different devices, cutting downtime from two hours to 10 minutes when changing devices.

The laser bonder won't replace conventional single-point bonding anytime soon. It is expected to impact the high end of VLSI and gate-array technology.



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into when depending on shareholders to send top people. Now only 15% of the staff members are transfers from member firms; the rest are MCC employees.

MCC suffers most of all from the lack of a single technological breakthrough that would spread glitter across the pages

Inman *says MCC has been plagued by technology transfer problems*

of the business and trade press. This may soon change, however. MCC researchers are at work on several breakthrough-level technologies (see story page 88), and parts of these have already begun to transfer to shareholders. DEC, for example, has incorporated MCC's research in at least three critical areas of product development during the past six years.

"This is a major innovation for expert systems," says DEC's Gannon, referring to Lenat's 10-year knowledge-base CYC project, which is aimed at building common sense into expert systems. "Lenat's project alone will make MCC worthwhile," Bell says.

More important than the breakthroughs is transferring new technology to members, who then turn them into products or processes. According to Bobby Ray Inman, MCC's first chairman, technology transfer was the "biggest problem" at the outset. This task was greatly underestimated.

Today, Inman says that he made a mistake by assuming "quality control" over the full-time research staff but not over the liaison types between MCC and the members. "Many of the liaisons were not first-rate and didn't command attention in their own companies," Inman says.

Though that has changed for the better, technology transfer has remained a painful process for the consortium. Shareholders such as DEC, which has a corporate culture deeply tied to outside research cooperation, have thrived at MCC. Others find more difficulty in assessing

the benefits of the consortium.

Dan Wiersma, manager of electronic products at Eastman Kodak Co., admits that staff members are not beating down his door to request transfers to MCC. Of the nearly 3,000 R&D staffers at Kodak, only three are currently at MCC. "There are both family issues and career issues for people," Weirsma says.

"What you get out of a consortium depends on how much you put into it," Inman states. "Some members have gotten a great deal out of MCC. The remainder were waiting for packages tied with ribbons and were disappointed."

Firms such as Unisys, Gould and Mostek believed they weren't getting their money's worth and pulled out (although for Unisys, the decision to leave was made when Sperry Corp., a member, merged with Burroughs Corp., a nonmember).

University of Texas' Gibson has closely followed the consortium's efforts for the past six years, and he bristles at the criticism leveled at MCC.

"Technology transfer turned out to be much more difficult than they realized. But most U.S. firms don't do a good job of technology transfer even within their own organizations. MCC should be nurtured and critically evaluated, not looked at cynically," he says.

"A quality research organization takes years to become effective," adds Alan Chynoweth, vice-president of applied research at Bellcore, itself a consortium and member of MCC. "Sometimes individualism and competitiveness can counteract the forming of effective teams. But companies have come to realize that it's not a problem to cooperate technically even if they are competing."

However, because shareholders are reluctant to reveal product development details, much of what MCC provides gets quietly incorporated into customer projects. MCC forfeits bragging rights and gets little or no credit when a product is unveiled, Fields explains.

Of course, public relations restrictions are not the cause of all MCC concerns. Some shareholders are reportedly dissatisfied with results and are thinking of leaving the consortium. The Boeing Co., for example, is said to be one such member. A spokesman indicated that the company is reconsidering its plans to remain a member but would not elaborate on the root of its dissatisfaction.

"We've lost some, but we're getting a lot of new blood as well," Fields asserts. "The members are less happy than I'd like them to be. The key is to choose the right technologies that give them an advantage in working with us."

Dove acknowledges that MCC must provide even better leverage on its projects. "I'm not happy with our leverage here; it's still too low," he says. In other words, there is never enough funding, and MCC is seeking other avenues, such as stepped-up marketing campaigns and increased government participation.

Organizational issues also remain a major concern. Managing a diverse group of more than 500 people — some full-time staff, some assignees from member companies and some resident researchers — can be somewhat daunting.

Norris *was the catalyst behind MCC*

"They have a weakness at the project manager level," says Bill Hanna, a researcher at HP's integrated circuit division who spent the last two years at MCC. "As projects grow, a project manager is needed to be the glue, the arbitrator, the vision-setter."

There is also the constant striving to upgrade the consistency of the research.

"Overall, the research has been quite spotty," says Bell, who, as DEC's vice-president of engineering in 1983, led his company into MCC. "But that's the nature of research. Researchers tend to hold the funders hostage. Craig Fields knows how to select people. He's not interested in running an old folks' home for researchers," he added.

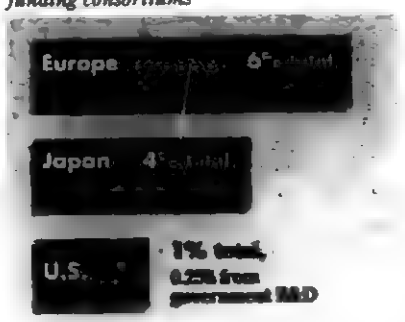
In the end, more and more companies may turn toward MCC and other consortiums simply because competitive pressure and economic realities demand it. As the stage is set for the start of the next millenium, the U.S.' frontier attitude won't fly, according to Dove.

"Without a collaborative effort in electronics and computers, the U.S. won't get it done," Dove says, referring to the global technology wars. "There's simply not enough money to go around." ●

Senior editor Amiel Kornel contributed to this report.

Consortium catch-up

Compared with Europe and Japan, the U.S. spends fewer of all research dollars on funding consortiums



Source: MCC CW Chart: Paul Mock

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NATIONAL
BRIEFS

Prime cuts revisited

In what was described by company officials as the final phase of layoffs originally announced last October, **Prime Computer, Inc.** terminated an undisclosed number of employees from its Framingham, Mass.-based manufacturing facility last week. The plant is primarily responsible for final testing and assembly work, a spokesman said. The reduction includes technicians and administrative personnel.

■

Secret of its success

Computer Task Group, Inc. has made no secret of the fact that it sees both networking and communications as pivotal and profitable technologies. Two weeks ago, the Buffalo, N.Y.-based consulting and systems integration firm put its money where its mouth is — albeit without stating exactly how much money — and bought Lowell, Mass.-based **Connolly Data Systems, Inc.** Acquiring the firm that claims to be New England's largest independent networking systems integrator will more than double Connolly Data Systems' communications staff, the company said.

More National briefs on page 96

Right to know of hazardous wastes

Environmental regulations on chemical use generating need for on-line monitoring

BY MAURA J. HARRINGTON
CW STAFF

Recently, an Oklahoma trucking company employee was sentenced to five years in prison for falsifying toxic discharge monitoring reports required by the Environmental Protection Agency (EPA).

A few months ago, a management-level employee of a reclaiming solvent company in Michigan was charged with knowingly omitting hazardous labels from toxic waste barrels — another EPA violation. That offense, coupled with other toxic waste misdemeanors, earned the employee a one-year prison sentence.

These are just two of a growing number of cases being investigated by the EPA to protect the public from corporate carelessness and the illegal disposal of hazardous wastes, as well as the government's attempt to make firms offer the public accurate records required under the Community Right-to-Know (RTK) Act.

On-line management

The amount of these records and other documents monitoring hazardous waste management required by the government every year has grown considerably in recent years. That buildup, in turn, is causing IS managers to consider maintaining and managing these records on-line in order to keep the companies they work for out of trouble, and that may mean growth for an emerging segment of the computer industry.

"The number of regulations and regulated materials has increased drastically in the past 10 years, and it will continue to grow, imposed by both the U.S. Department of Labor's Occupational Safety and Health Administration and by the EPA," said environmental analyst Richard Greenberg, of New York-based Coopers & Lybrand's Denver office.

"You may be a white-collar executive, but if you're responsible for these regulations and you break the rules, you're more likely to get caught now than you were just a few years ago," Greenberg said.

The RTK regulations require companies that use, store or emit any hazardous materials to provide complete data on these materials in the form of a material safety data sheet to any member of the community.

This federal law, passed in 1986, has prompted community and environmental interest groups and even stockholders to demand to know more information about the firms around them.

In turn, it has prompted upper management in several corporations to take a good hard look at the benefits of developing an on-line environmental tracking system, an EPA spokesman in the Boston-based New England EPA bureau said.

While the issue of implementing some sort of on-line environmental software system has been addressed by IS managers in several different industries, these real-life implementations are few and far between, even though these companies well know what must be regulated by law, according to Ronald Ratney, OSHA New England assistant regional administrator for technical support.

Continued on page 100

Bad news makes for a good market

The mounting burden of record-keeping in toxic waste management could force manufacturers such as these – culled from the environmental action group National Toxics Campaign Fund's list of alleged corporate polluters – to depend on information technology for help. That could let computer companies clean up – with profits

	Major toxic sites	Poor safety record	Toxic product line	Major toxic pollutants	Toxic emissions
American Cyanamid	☠	☠	☠	Pesticides, solvents, acids	120,300
Amoco	☠			Petrochemicals	27,100
Dow Chemical USA	☠	☠	☠	Chlorinated hydrocarbons	23,300
Du Pont	☠		☠	CFCs, chlorobenzines	223,300
Eastman Kodak	☠			Chlorinated solvents	75,800
Exxon	☠	☠		Petrochemicals	85,100
Occidental Petroleum	☠		☠	Chlorinated hydrocarbons	114,600

Source: National Toxics Campaign Fund

CW Chart: Marie Hansen

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Lotus reshaping long-term goals

BY PATRICIA KEEFE
CW STAFF

CAMBRIDGE, Mass. — Shake, rattle and roll. As its stock recently bounced up from a rock-bottom price of $15 per share, Lotus Development Corp. went on the offensive, quietly revamping its sales force and publicly detailing financial expectations for the next three to five years.

Even Chief Executive Officer Jim Manzi got in on the act, after finance Senior Vice-President Robert Schechter told attendees at a recent Montgomery Securities conference that Lotus had lowered its expectations for pretax margins during the next several years from 25% to 20%.

Claiming that the message was misinterpreted, Manzi attempted to set the record straight.

"I seem to come here only when the stock is depressed," he told attendees at a Cowen & Co. conference in Boston. "We did a few things [recently] to make sure that was the case," he quipped.

On a more serious note, Manzi said, Lotus growth will be less cyclical going forward, and return on equity will remain unchanged in the mid- to high 20s while revenue growth will remain stable at 20% to 25%. "This is not a change from where we are today or what we've been saying about the future but [is] based on growth figures the industry [and Lotus] has historically achieved," he said.

Noting that personal computer growth is slowing worldwide and that an estimated 25% to 30% of the market consists of replacement buys, he said Lotus has built these trends into its strategy. Even so, he added, the company would be "reshaping its cost structure" over the next several months.

While Lotus is feeling increasing market share pressure, Manzi said, "it is not as significant as rumor would indicate." He dismissed a "perception" that Lotus is feeling the heat with small to medium-size companies in particular. However, Lotus is making changes to "more aggressively" address this area, he conceded.

For example, Lotus sales representatives will be assigned territories, resulting in less emphasis on individual account representation. "We're putting our resources where the business potential is" — in this case, mid-tier and smaller businesses, said Bill Drummey, Lotus' former vice-president of sales.

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NATIONAL BRIEFS

Datapoint dive

The cost of restructuring worldwide operations, **Datapoint Corp.** said, was a key factor in the firm's $82.8 million net loss for its 1990 fiscal year ended July 28. The loss was close to three times the $29.2 million net loss sustained by Datapoint in fiscal 1989. Chief Executive Officer Michael Michigami, in a prepared statement, attempted to put a positive spin on the red ink gusher: The restructuring will reduce the company's future costs, he said, noting that Datapoint also reduced its debt by $26.6 million in 1990.

■

Post garde

Nothing stays avant-garde forever — including, apparently, **Avant-Garde Computing.** Acquired last February by Sunnyvale, Calif.-based systems software house **Boole & Babbage, Inc.** as part of that firm's advance on the network management market, Avant-Garde was officially renamed Boole & Babbage Network Systems earlier this month.

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Wastes

CONTINUED FROM PAGE 93

"Keeping track of all the government's rules and regulations is a problem . . . but I'd say for the most part employers are generally aware of what our rules are. We make a very special effort to educate these people," Ratney said.

Another problem is communication between IS and those in charge of keeping track of the environmental regulations, according to Douglas McIntyre, president of Hyannis, Mass.-based Software 2000, which offers environmental systems for the IBM Application System/400 platform.

"There are quite a few companies that don't have any environmental software packages, that you would expect would have full-blown systems. Some of these companies don't even have full-time environmental people," said Al Amlani, an analyst at Cambridge, Mass.-based consulting firm Arthur D. Little, Inc.

Even those companies that have state-of-the-art IS shops do not necessarily have a full-scale environmental system, Amlani said. For example, Patrick Aurrichio, an environmental engineer for IBM's Environmental Program Group in Stamford, Conn., said that while the hardware and software vendor has been involved with "hard-core environmental activity" since the early '70s, IBM does not have a corporatewide environmental tracking system, per se.

Many of the 60 manufacturing sites throughout the world manage their environmental responsibilities on their own, he said. They use both off-the-shelf products and in-house environmental software, Aurrichio said.

"There are two companywide software programs that were developed in-house that are used in all 60 sites," he added. One is the Environmental Master Plan, a site-specific waste management form. "The other is our Incident Reporting system, which is a form that is filled out by any site that has any type of environmental incident," Aurrichio said.

McIntyre's systems *run on the IBM AS/400*

"There are quite a few large companies that have bought off-the-shelf software packages that are not practical for their specific situations," Amlani said.

"It is important for IS managers to know what they need in an environmental system and either find a product that fits their needs, or develop it on their own," he added.

If shrink-wrapped alternatives are currently in scarce supply, however, computer companies are scrambling to fill the void. For instance, although many environmental software systems are PC-based, the Software 2000 environmental series is designed to run on an IBM AS/400, McIntyre said.

The system covers three areas of records that companies are required to keep track of for various government agencies: Industrial Health, Community RTK and Hazardous Materials records, all of which are designed for easy access by multiple departments within the user company, McIntyre said.

For users seeking an easier way to keep up with the thousands of environmental rules and regulations imposed by the U.S. government, Coxton, Md.-based Environmental Communications Consultants, Inc. offers Chem-Ply, a PC-based integrated database management tool designed to help users track OSHA, EPA, the Resource Conservation and Recovery Act and the Superfund Amendments Reauthorization Act legal regulatory requirements.

The database includes a regulations management module covering all OSHA and EPA regulations that is updated every month, a list of 2,700 chemicals and their regulatory requirements and an emergency trainer module in case of accident, fire or hazardous waste accidents, according to Janice Talsky, president of the consultancy.

Know exactly what you need

What might an IS manager want to consider before investing in an environmental software system? Al Amlani, an analyst at consulting firm Arthur D. Little, Inc., offered the following suggestions:

- Make sure the software program that you choose fits the needs of your company.
- Check out the supplier's know-how. Does the supplier understand your industry?
- Beware of specific PC-based off-the-shelf environmental products. While they may seem to be what you are looking for, individual software packages are often too focused for a particular user's needs.
- Look at multiple and varying software options, and make sure your choice fits the configuration of your existing system.

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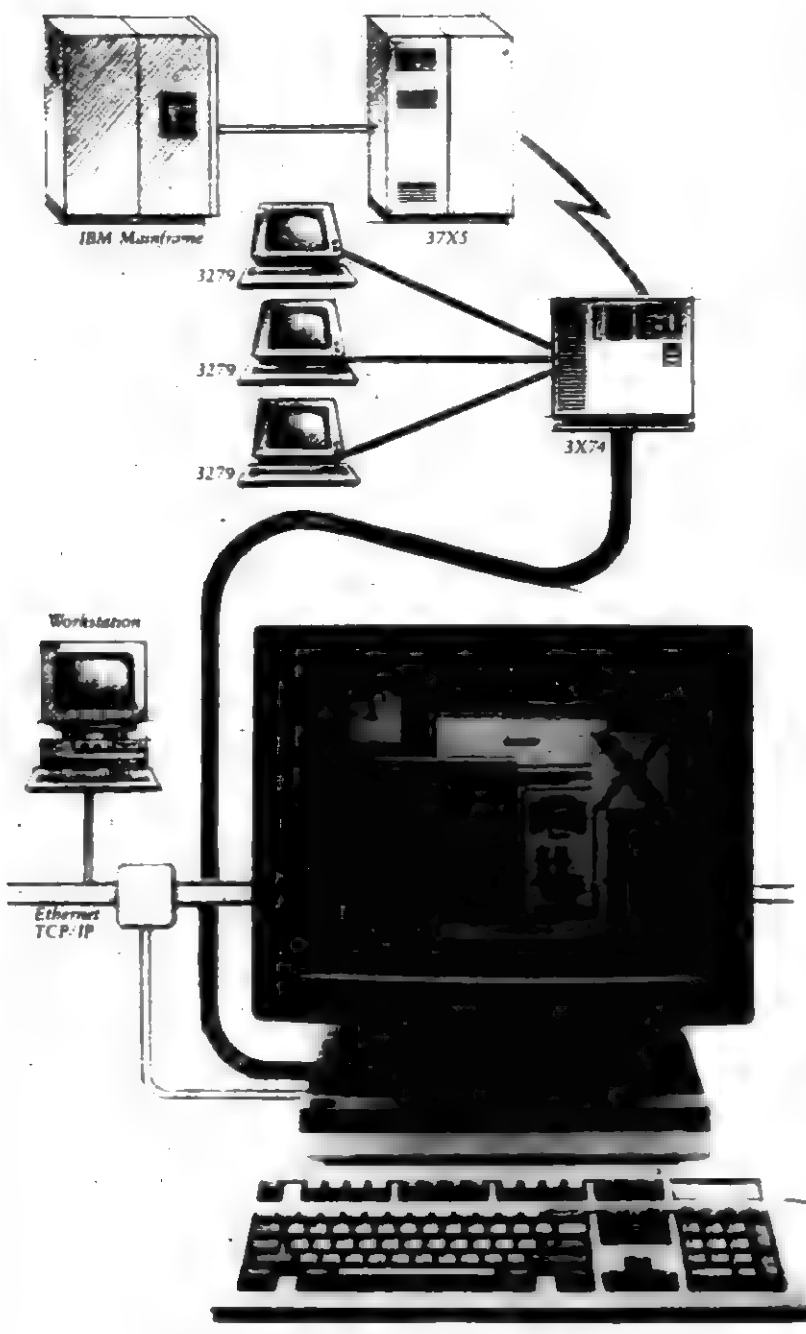

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GAO takes active tech tack

BY J. A. SAVAGE
CW STAFF

The federal government should be more like private industry in its acquisition of technology, according to the U.S. General Accounting Office (GAO). And the GAO is trying to influence government agencies in that direction with a new book of guidelines.

It was not the cost overruns of any particular agency — such as those at the Federal Aviation Administration (FAA) or the Internal Revenue Service (IRS) — that led the GAO to help guide technology acquisitions before they are actually undertaken, said Paul Bollea, a senior evaluator and an author of the booklet, "Information Technology: A Model to Help Managers Decrease Acquisition Risks."

Rather, the GAO was fueled by a desire to steer agencies in the right direction before they get mired in overwhelming projects.

For instance, the GAO has been dogging the FAA for 10 years regarding the agency's attempt to replace its obsolete systems. The project is reportedly $15 billion over its original budget and nowhere near completion.

During the last decade, an entire section of the GAO has been responsible for issuing stacks of reports to Congress on how badly the FAA is proceeding and what changes the GAO recommends. With the new booklet, the GAO hopes to circumvent such staff work in future acquisitions.

Developed from meetings with commercial executives from firms such as Merrill Lynch & Co. and Ford Motor Co., the GAO's guidelines are designed to help decrease technology acquisition risk, according to Bollea. The booklets are currently being circulated in government agencies.

One lesson the GAO learned from private industry and incorporated into its guidelines was to increase the user's importance before designing the project. "Industry leaders said that when they brought on major projects, they got users involved," Bollea said. "That way you meet users' needs first instead of the project being forced from the top down."

The guidelines also call for flexibility once a project has been defined — the lack of which has been a recurring problem with government agencies such as the FAA and the IRS, Bollea said.

For a copy of the guidelines, call the GAO at (202) 275-6241 and ask for GAO/IMTEC 8.1.6 Acquisition Model.

INTERNATIONAL BRIEFS

It ain't so, Joe

Netherlands-based **Philips Telecommunications N.V.** has denied rumors that it is looking to sell its 15% stake in a European telephone joint venture with **AT&T**. The rumor spread after a Dutch financial newspaper reported that 6% of Philips' stake would be sold to Spain's **Telefonica**, with the remaining 94% going to AT&T. Not so, Philips said.

■

Four square

As of this month, **Telecom Corp. of New Zealand Ltd.**, New Zealand's former state-owned major domestic and international telecommunications supplier, is officially in the hands of four new owners: U.S.-based **Ameritech** and **Bell Atlantic Corp.**, and New Zealand's **Richwhite Holdings Ltd.** and **Freightways Holdings Ltd.** The U.S. partners own some 90% of Telecom. As a condition of the multibillion-dollar sale to the consortium, they will reduce their stake to 49.9% during the next three years.

■

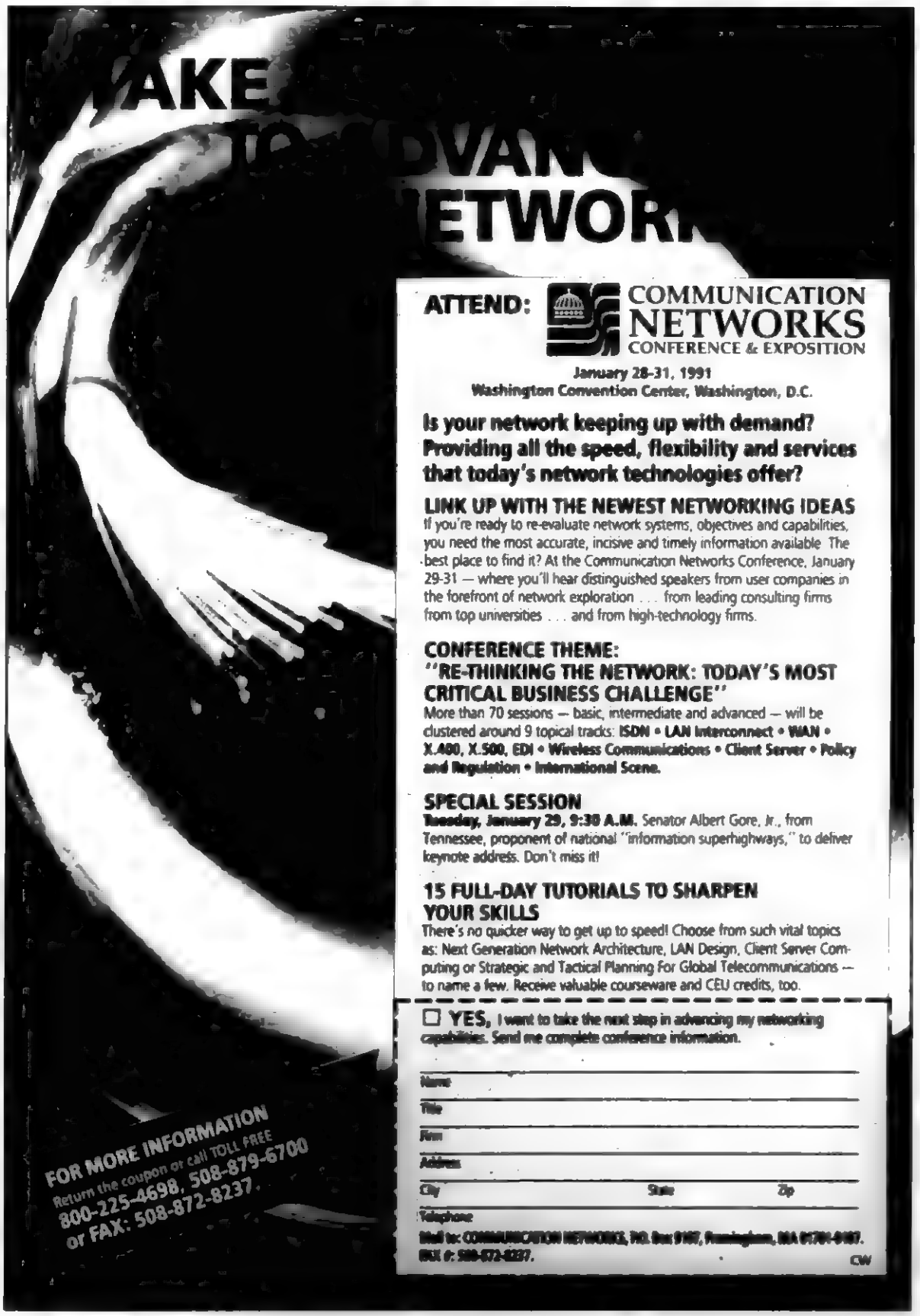
Finnish line

Information systems are no longer an exclusive large-firm preserve in Finland, said a recent study by small business association **Pienteollisuuden Keskusliitto**. During the next two years, Finnish small and medium-size firms plan to plough about 25% of their respective investment budgets into IS, with an emphasis on electronic banking, production control and warehouse management.

■

Lucky seven

The Canada Award for Business Excellence has been given for six years, but never to a software connectivity firm. However, 1990 is coming up a seven for Ottawa-based **Simware, Inc.**, which will win a medal in the invention category when the awards ceremony is held next month.



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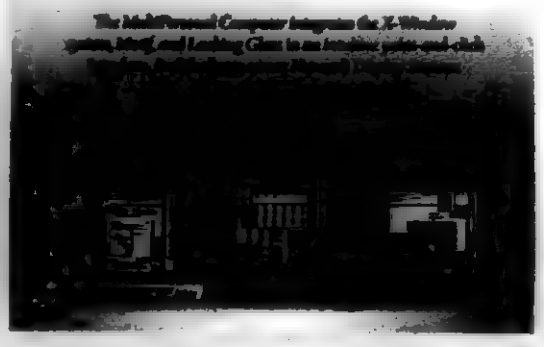

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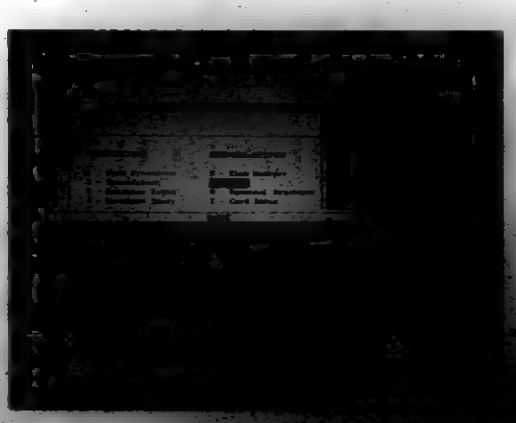

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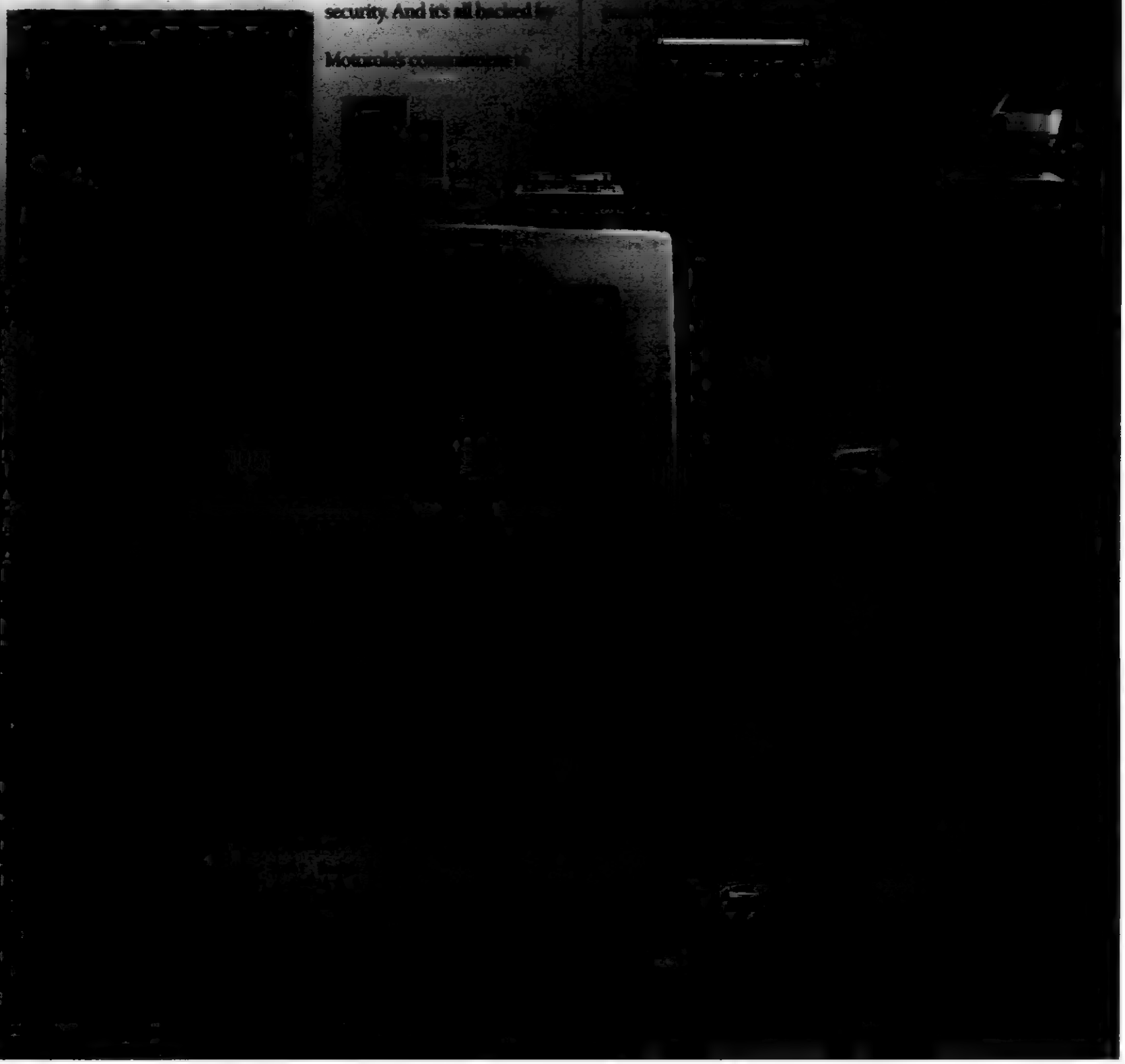

MOTOROLA
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Need for AS/400 experience boundless

BY SHERYL KAY
SPECIAL TO CW

Demand for IBM Application System/400-proficient professionals — spurred largely by conversions from IBM System/36s and System/38s — has recruiters hopping. The national installed base of AS/400s has tripled since January 1989, and many firms are feeling the impact of the placement punch.

"The AS/400's popularity happened so quickly, the demand for experienced individuals far exceeds the number in the market today," says Larry Stanczack, director at Source EDP in Chicago. In the Midwest region alone, he says, requirements for AS/400 professionals have soared 50% since the end of 1988.

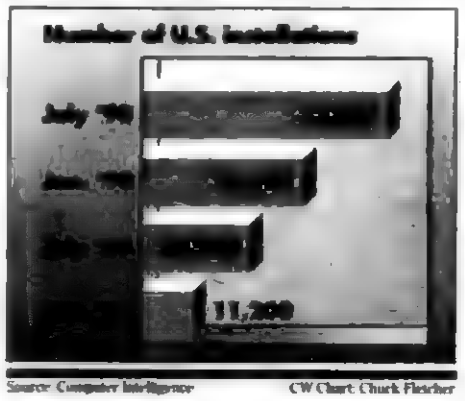
Recruiters agree that more companies are moving or contemplating a move from mainframes to midranges. While they are seeing higher conversion numbers in small to medium-size companies, larger firms are adding to the demand, too. A Coca-Cola distributing company and H.B. Fuller Co. recently converted from mainframes and are now operating multiple AS/400s, says Jim Kwapick, director of information systems recruiting at Robert Half International, Inc. in Minneapolis.

Other causes for the boom: Companies want the higher level of distributed processing and stand-alone divisional processing that the AS/400 provides. Also, the AS/400 is more flexible and boosts increased capacity, according to Stanczack. "It's the kind of machine whereby many of these small to mid-size companies can just buy the canned software, so they don't have to have the extensive in-house development effort," Kwapick says.

This is good news for those with experience. AS/400 professionals are in such demand that firms are paying highly competitive salaries. Nationally, Stanczack reports that programmer/analysts with three years of overall IS experience (two on the AS/400) may command salaries in the range of $36,000 to $40,000. For senior analysts with 10 years of experience, the salaries climb to about $45,000 to $55,000. For individuals who also have supervisory experience, salaries could reach more than $60,000, he adds.

Up, up and away

Application System/400 installations have tripled in 1½ years, boosting demand for proficient professionals



Source: Computer Intelligence — CW Chart: Chuck Fletcher

Some might think that the logical solution to satisfy the demand would be for companies to train their own staffs on the AS/400 system. However, it doesn't always work that way. "Typically, small to mid-size firms don't have sophisticated training functions. They usually have pretty small staffs, so they don't have the liberty to have any downtime for training," Kwapick says. But when employers look outside of the firm for experienced professionals, the numbers are slim. This, recruiters say, is because training for the AS/400 can get tricky.

For example, the architecture of the operating system is brand-new and is different than any of its predecessors, although it is similar to System/38s. One learning curve for System/36 people trying to move onto the AS/400 is its job control language. The AS/400 uses CL, while a System/36 requires OCL, and the differences are significant, says Chris Miller, a programmer/analyst at Concord Management Systems, Inc. in Tampa, Fla.

Anyone with a solid foundation in data processing could easily be trained on the AS/400, according to Miller. However, he suggests that interested professionals would do well to learn the RPG programming language rather than Cobol, C, Fortran or Basic because approximately 70% of AS/400 shops are using some form of RPG. "It's ironic because the RPG skills in the past didn't seem to be so marketable, but they sure are now," Kwapick says.

Miller reports, however, that "learning the AS/400 is not nearly as difficult as finding an employer who will offer to train you." Companies want AS/400 proficiency now, not three months from now, Kwapick explains.

Bob Ashman, vice-president at Baltimore-based First National Bank of Maryland, says one problem he's run into is that college students aren't getting a strong enough education in low- to midrange computers. "Upon graduation, their perception is that most jobs will be Cobol, mainframe-oriented," he says.

Those with extensive experience on the System/38 find the AS/400 easy to learn. "It looked strange to me for about one week," says systems analyst Rebecca Loesche at Reiman Publications, Inc. in Greendale, Wis. "I teamed up with one other co-worker, and after going through the manual, I had no problems."

> "LEARNING THE AS/400 is not nearly as difficult as finding an employer who will offer to train you."
>
> CHRIS MILLER
> CONCORD MANAGEMENT SYSTEMS

Loesche says that the AS/400 has provided her with a great deal of flexibility. In the past, many commands on the System/38 had to be customized specifically for her company. On the AS/400, these customized commands are already incorporated into the system. "It's very menu-driven, so it's much easier to move objects around," she says.

Although the demand will peak sooner or later, AS/400 whizzes should enjoy the boom while it lasts. "From a job placement standpoint," Kwapick concludes, "I wouldn't say it's an avalanche, but it's close."

Kay is a business consultant and free-lance writer specializing in emerging technologies and human resources.

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APPLICATIONS PROGRAM ANALYST - Position required to design, analyze, develop and implement complex computer system enhancements using specific linear programming and statistical techniques. The position involves design and analysis of mathematical or simulation techniques specific to an insurance application computer software system for life insurance products in the Korean language. The position also requires systems analysis, testing and documentation skills specific to the requirements of a life insurance system. Position requires a Bachelor of Science degree in Computer Science. Must be fluent in spoken and written Korean language, and have knowledge of the COBOL programming language. 40 hours per week, 8 a.m. to 5 p.m., compensation of $27,200.00 per year. Send resume with social security number to Indiana State Employment & Training Services, 10 N. Senate Ave., Indianapolis, Indiana 46204, Attn: W.F. Shephard. Include I.D. No. 3180528 with response.

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Intercraft offers a competitive salary and complete benefits package including medical, dental and life insurance, profit sharing and tuition reimbursement. For confidential consideration, please forward resume and salary history to:

Intercraft Industries L.P.
Human Resource Department
P.O. Box 1130
Taylor, Texas 76574
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SYSTEMS ANALYST: Develop & maintain data merge and data analysis applications. Design & develop an integrated database system using high level languages. Develop training materials for clients. Requires a Bachelor's Degree in Electrical Engineering or Computer Science, and 2 yrs. experience in the job offered. The req. 2 yrs. exp must be on mainframe computers using database system, and COBOL, ALGOL, and C. $33,000/yr., 40 hrs./wk., 8-5. Send Resume and verification of requirements to: Illinois Dept. of Employment Security, 401 S. State St.-3 South, Chicago, IL 60605. Attn: Len Bokea, Ref. #1630-B. An Employer Paid Ad.

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Analysis, design, coding, testing and documentation responsibilities in providing development, enhancement and maintenance support for varied applications such as Financial Accounting, Budget & Reporting, Customer Information, Engineering, and Materials Management applications.

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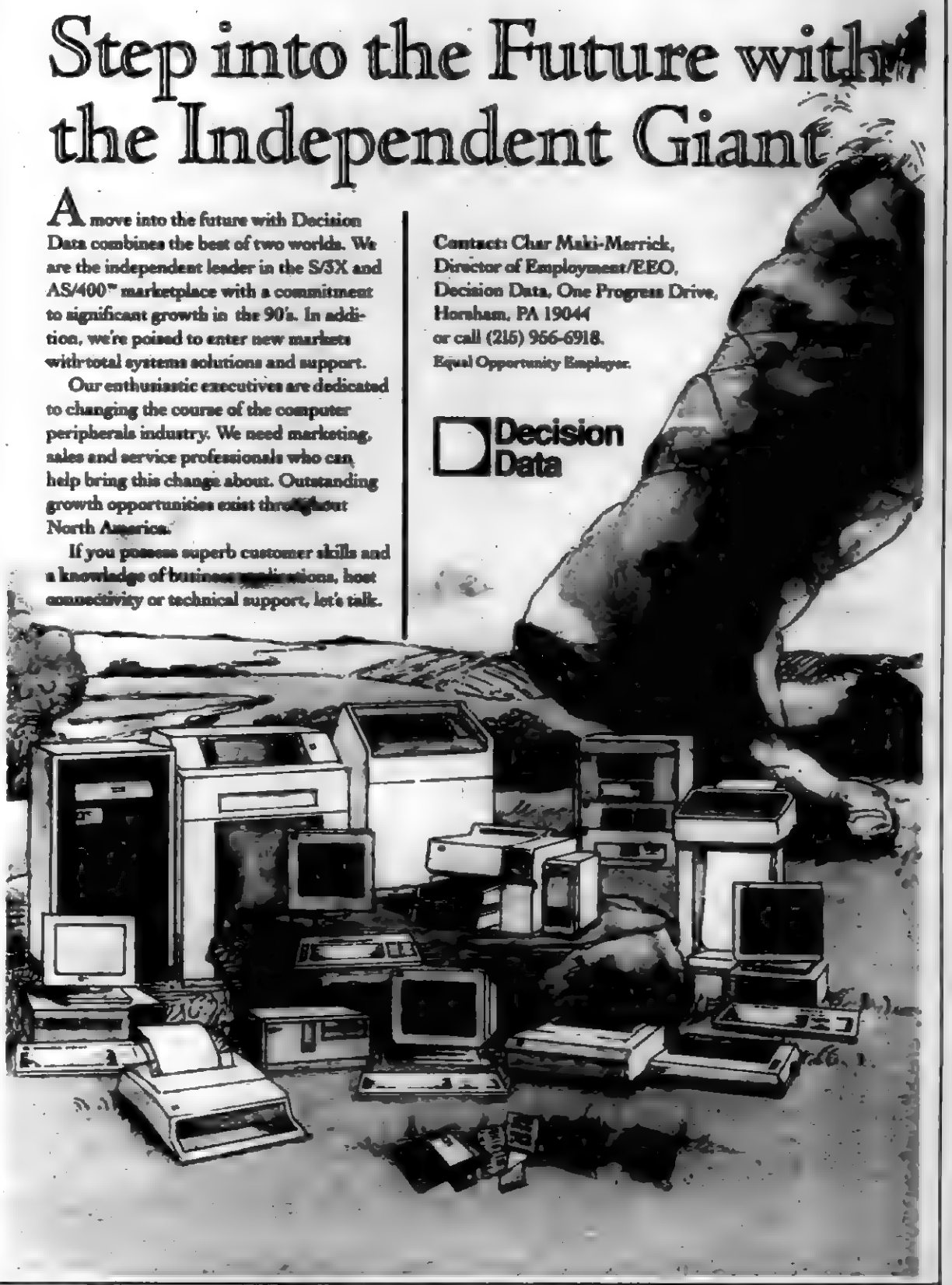

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Deluxe Data Systems, Inc. is the nation's largest third party processor of debit (EFT) transactions and also the number one vendor of high performance EFT software in domestic and international markets. We are a subsidiary of "Fortune 500", Deluxe Corporation. Continued expansion of our organization necessitates the need for talented analysts skilled in the art of product development and support.

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This position is responsible for a comprehensive software development environment using the ORACLE relational data base management system on a DEC VAX 8700 under the VMS operating system. Will manage a small team and participate directly in the software development process focused on applications such as accounting, personnel/payroll, purchasing, budget, etc. UHCL is using the principles of software engineering, DEC, WINDOWS, and CASE on DEC VAXSTATION 3100's.

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Hardware Engineer responsible for verifying the functional correctness of complex next-generation full-custom VLSI chips used in various Digital products. Initial assignment is for the memory management and primary cache/controller of a chip, but continued assignment may be on other functional areas of CPU designs. Understand complex CPU chip designs in detail, formulate verification plans, create verification tests and run them on behavioral and structural models; indentify design errors through simulation or other techniques and propose corrections; develop behavioral models to support verification work; develop tools, methods and techniques to improve the efficiency and quality of the design verification process. Will be involved in advanced development work possibly involving formal verification techniques using automatic theorem proving. Requirements are a Master's Degree in Electrical Engineering with knowledge of computer hardware design, VLSI design, logic design, design-for-testability concepts, behavioral modeling (hardware description languages), structural modeling of digital circuits and simulation methods. Knowledge of many computer architectural concepts including hierarchical memory organizations, cache memory design, pipelined processors, multiprocessor designs and memory mapping is required. Software development/programming background in both a high-level language (C, Pascal or Fortran) and assembly language is required. Knowledge of CAD tools and CAD tool graphics interfaces (for example X windows) and a background in developing CAD tools and knowledge of their application is required. Knowledge of automatic theorem proving and knowledge of VMS operating system is required. No experience necessary. Salary $37,500 per year, 40hr/week, 8:15a.m.-5:00p.m. If you are interested in and qualified for the above position, please forward two (2) copies of your resume to: J.O. #00817, Commonwealth of Massachusetts, Department of Employment & Training, Specia. Programs, First Floor, 19 Staniford Street, Boston, MA 02114.

ACP/TPF PROGRAMMER ANALYST required. Responsible for design and implementation of ACP/TPF itinerary pricing system and fare determination for over 500,000 fare seats daily. Use technical knowledge of ACP/TPF design principles to advance beyond current technology and to maintain competitive technological advantage. Act as project leader and/or technical advisor as necessary for two to four less senior analysts as required. Programming in Basic Assembler using CMS development tools and Structured Programming Macros in an ACP/TPF environment. Applicants required to have Bachelors degree or Equivalent in Computers, Math or Engineering with at least two years experience in ACP/TPF software design and Basic Assembler Coding. Experience must include at least one year working with Structured Programming Macros in an ACP/TPF environment. Annual salary will be $38,000.00 per year for a 40 hour work week. Additional salary up to $43,000.00 may be paid if education and experience warrant. Interested applicants contact the Texas Employment Commission, Fort Worth, Texas, or send resume to the Texas Employment Commission, Austin, TX 78778-0001, J.O. number 5424679. This advertisement was paid by an Equal Opportunity Employment Employer.

Senior Software Usability Specialist. By October 24 please send resume to: Employment Security Department, ES Division, Att: Job # 203736-D, Olympia, Washington 98504. Job Description: Designs usability evaluations for software products, designs and administers variety of usability tests, analyzes data collected and writes test reports for design engineers, establishes experimental research conditions for usability evaluations, utilizes MS-DOS, XENIX and Windows operating systems for data analysis. Two positions available. Requirements: M.A. in Psychology, Communications or Technical Communication. Six months' work experience in the design of experimental usability evaluations of software products using both qualitative and quantitative research methods, including data analysis using MS-DOS, XENIX or UNIX and Windowing operating systems. 20 course hours in usability evaluation. Must have proof of legal authority to work in the United States. Job location: Redmond, Washington. Salary: $37,500-40,000 per annum, depending on experience. 40 hours per week, flex time. EOE.

Temporary position available for Installation Engineer at American Airlines for period beginning November 26, 1990 and ending July 15, 1991. Duties to be: Installation of and training of programming staff on Performance Software's SYSTEL Product and Autofile's ATOP (Autofile Tour Operating Package) computer systems. Will install systems within the SABRE environment, train Systems Development personnel in area of systems utilities, operating procedures and internal structure of new product, assist staff with initial design and analyses of applications and perform data cutover to new product. Will thoroughly test both products before turning operation over to SABRE development staff. Applicants required to have four years experience in installation and training for SYSTEL and ATOP products. Monthly salary will be $3,000.00 for a 40 hour work week. Interested applicants please contact Teresa Carr, Personnel Services Representative, P.O. Box 619616 MD4138 CP4, DFW Airport, Texas 75261-9616. Phone number (817) 963-1096. An Equal Opportunity Employment Employer.

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BS in an Earth Science, Math or related field with 7 years' Intergraph technology experience including: DMRS, IGDS and GIPSIE system. Responsible for providing technical support to exploration Geologists and Cartographers in the use of Intergraph hardware/software technology. Working knowledge of upstream business a plus.

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Requires a BS in Petroleum Engineering or closely related field; MS or Ph.D. preferred. Minimum of 10-12 years' experience with at least 6-8 years related to petroleum engineering computer applications development and support. At least 2-3 years should be in direct support of large reservoir simulation software systems. Working knowledge of numerical solution techniques and advanced scientific programming. Expertise in Fortran and UNIX on large scale CRAY and IBM computers. Demonstrated leadership and ability to train others.

PRODUCTIONS OPERATIONS SOFTWARE ENGINEERS

Requires a BS in Petroleum Engineering, Computer Science or related fields; MS preferred. Minimum 8-10 years' experience related to Petroleum Engineering Computer Applications development/support. At least 4-5 years should be in direct support to producing operations application. Expertise in Fortran, ISPF, MVS/TSO and mainframe graphics or large scale IBM computers, working knowledge of workstation based applications and graphics. Support of interfaces to SCADA and remote sensing systems, CADD System and knowledge of UNIX preferred. Demonstrated leadership and ability to train others.

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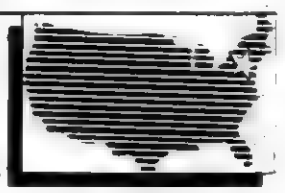

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Mountainside, NJ 07092
(800) HIRE AGS
Fax (201) 654-9794

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Multimedia offers managers multiple business solutions

BY JESSICA KEYES
SPECIAL TO CW

And you thought multimedia was just for the classroom.

Not so anymore. Multimedia — the ability to use desktop computer technology to blend basic tools such as graphics, animation, audio and video — is creeping into more places than you would imagine.

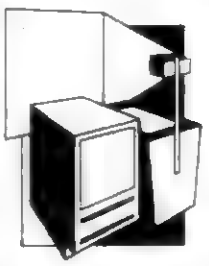
For example, in the World Financial Center in New York, multimedia kiosks are used to direct visitors around the large complex of buildings, shops and sights. These kiosks contain specialized hardware devices that permit the integration of video, graphics and audio with a touch-screen input device.

The majority of multimedia applications used to be directed toward corporate training and marketing presentations. Gradually, however, this technology has become popular with grassroots business application managers.

The financial quote service Infotechnology, Inc., which owns "Financial Network News" in New York, made a major alteration to the rather humdrum text-based quote service. Having ported the application to a more advanced workstation, the service is now able to merge live reporting from one of the financial news networks. This multimedia approach enables the stock analyst to watch the news and research stock information at the same time — on one piece of equipment.

Multimedia is not for the faint of heart. To develop a professional-quality system requires mastery of the many components. A plan to integrate video, audio, text and animation requires a development team to first master each of these separate components completely.

It is also not for the faint of wallet. A manager who follows an IBM recommendation to the letter can expect a price that runs to five digits. And there's still the cost of the video and audio recording equipment. A minimum configuration on the video side — the more expensive of the two — would be a camcorder, VCR and an editing device. If the manager finds a bargain, the recording equipment should cost no more than $2,000.



On top of all this is the animation and graphics software — sometimes called presentation software and averaging about $500 — and the multimedia software itself. Interestingly, the multimedia software may be the least expensive portion of the system, averaging $495 for the newer entries on the market, such as IBM's Audio Visual Connection.

Be forewarned: There are wide swings in prices, so research carefully. To assist the novice multimedia developer in selecting and putting together a system, the following checklist can be used to ensure that all the components are accounted for:

• **What media needs to be integrated?** The choices are many. The most common are voice, music, still image, full-motion video, graphics, text and user input. Be aware that not all multimedia tools integrate all of the media listed. Developers need to match their requirements to the multimedia tool set.

• **Where will all of these sound, video, graphics and text files be stored?** It's becoming more common today to find multimedia systems dependent on compact disc/read-only memory for access to the thousands of images necessary for creating some larger scale systems. If this is the path you've chosen to take, you must ensure that the multimedia software can access this input device.

• **Do you have the necessary audio and/or video recording equipment?** Audio recording has been around a long time and should be available to everyone in the form of a tape recorder. Make sure you have staff members available with the diction and presence necessary to carry off development of the system's audio track. The same holds true for video.

• **Do you have the proper personal computer configuration to handle the load?** It would be foolhardy to attempt multimedia on an IBM Personal Computer XT, but some of the smaller vendors let you run multimedia applications on as little as 1M byte of random-access memory. But remember, there is a correlation between hardware configuration and speed.

• **Do you have the proper animation and graphics software?** Make sure your software creates files in the format necessary for integration into the multimedia tool. Many users already have these software packages.

• **Does your staff know how to use these tools?** The manager might be faced with the problem of staff members not only having to figure out how to connect all of this equipment together — somewhat like hooking up your VCR, TV and cable box, and we all know how much fun that was — but also having to learn a cadre of new software packages.

With multimedia sinking into more organizational cracks than just training, it's best to know what you're getting into before you make long-term purchasing decisions.

Keyes is president of New Art, Inc., a management and computer consulting firm in New York.

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XT Model 086	$500	$700	$350
XT Model 089	$675	$825	$475
AT Model 099	$975	$1,375	$850
AT Model 239	$1,025	$1,325	$700
AT Model 339	$1,175	$1,400	$900
PS/2 Model 50Z	$1,550	$1,650	$1,425
PS/2 Model 60	$1,850	$2,200	$1,600
PS/2 Model 70P	$3,550	$3,700	$3,175
Compaq Portable II	$975	$1,150	$875
Portable 286	$1,275	$1,450	$1,100
SLT-286	$2,500	$2,825	$1,700
Portable 386	$3,000	$3,450	$2,950
LTE 286	$2,100	$2,525	$2,000
Deskpro 286	$1,375	$1,400	$1,200
Deskpro 386/20	$2,800	$3,100	$2,400
Apple Macintosh 512	$375	$775	$275
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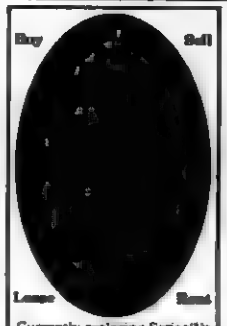

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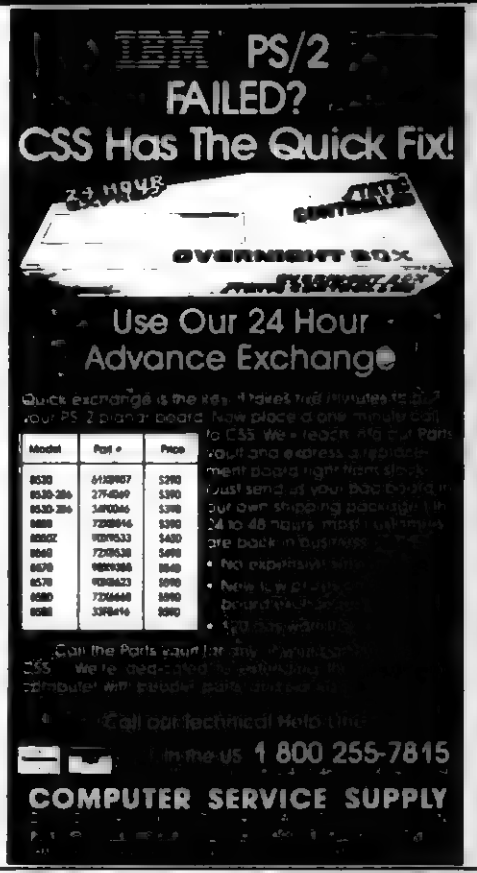

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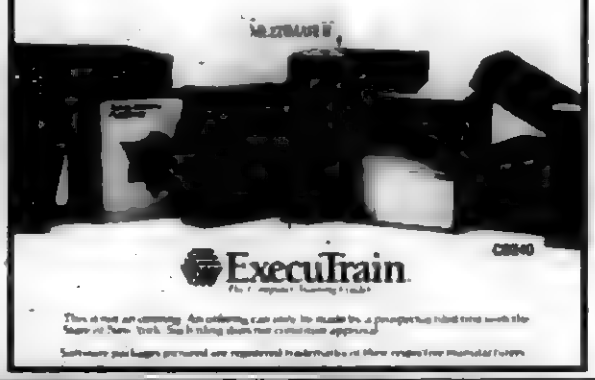

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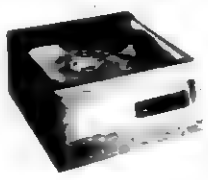

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Request for Proposal No. 1870, due Friday, October 12, 1990 at 3:30 p.m. for the acquisition of a file server, workstation, and software to complement an existing DOS-based LAN for the STATE OF MISSISSIPPI TREASURY DEPARTMENT.

Detailed specifications may be obtained from the CDPA office. The CDPA reserves the right to reject any and all bids and proposals and to waive informalities.

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Computerworld's Total Audience by Job Title	
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VPs, Assistant VPs, Treasurers, Controllers	
Financial Officers	23,119
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Directors, Managers of Operations, Planning, Administrative Services, Data Communications Network/Systems Management, Office Automation, Word Processing Directors, Managers, Supervisors	52,598
Systems Managers, Systems Analyst	79,913
Managers, Supervisors of Programming	16,419
Programmers, Methods Analysts	120,888
Engineering, Scientific R&D, Technical Management	44,558
Manufacturers' Sales Representatives, Sales & Marketing Management	29,574
Consulting Management	20,841
Medical/Legal Accounting Management, Educators, Journalists, Librarians & Students	125,016
Other	12,198
Total	612,703

*Source: Audit Bureau of Circulations Supplemental Data Report, May 25, 1987.

To place your ad, call John Corrigan, Vice President/ Classified Advertising, at **800/343-6474 (in MA, 508/879-0700).**

COMPUTERWORLD

Where all computer buyers and sellers go to market.

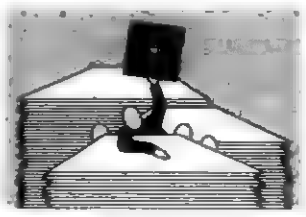
Beating the paper glut

Authoring systems can replace hard copy in many situations

BY NANCY MUELLER
SPECIAL TO CW

Computers were supposed to save us from the ever-increasing mounds of paper and lead the way to the paperless office. Instead, they've somehow increased the piles. What happened?

The many breakthroughs in computers and telecommunications technology have provided us not only with easier, quicker methods of storing information but also with the ability to access information from around the world.



Of course, information provides the building blocks for creating more information, causing an ongoing multiplying effect.

The cost of paper isn't the problem; paper is cheap. It's the cost of storage space and the labor involved: the filing, accessing and updating.

One way to put a lid on paper documentation and the expense of handling it is through nontraditional uses of computer-based training authoring systems software.

Authoring systems can be used in areas other than training. They can be used to reduce paper overload and increase staff efficiency and effectiveness.

For instance, authoring systems can be used to generate disk-based policies, procedures, guidelines and standards.

Although employing electronic policies is not a new concept, many organizations still have not taken this approach. Authoring systems can also create electronic presentations, whether instructional, informational or promotional in nature.

Nontraditional applications of authoring systems are gaining momentum in organizations as the advantages of such nontraditional uses are becoming better known.

One of the pioneer groups in using authoring systems in these ways is Informatics Group, Inc. Mike Ganci, president of Informatics, said that the use of programs such as its ACT III is expanding in nontraditional applications. "Managers are finding out that disk-based presentations are highly cost-effective ways to disseminate information, that they can be created and modified quickly and that unlike passive paper-based information, the interaction of the disk causes higher information retention," he said.

Some nontraditional users of authoring systems include the following:

- Authorware, Inc. produced a prototype interactive magazine, called *Authorware's Macworld Interactive*, for *Macworld*.
- The computer-aided publications department in the Peripheral Products Division at NCR Corp. created an on-line writer's handbook.
- Informatics developed on-line procurement procedures for IBM's Marketing and Services Communications Group.
- Metamedia Systems, Inc. produced a "point of information" system, called Infopost, for the U.S. Postal Service.
- Micro Training Associates, Inc. developed trade-show demonstrations and on-line documentation for AT&T.
- Paragon Technologies, Inc. developed both a feature-oriented product demonstration intended for mass mailings and a trade-show demonstration.

A variety of authoring systems were used in the above applications: Informatics' ACT III, Authorware's Authorware Professional, Applied Learning's The Educator, Cognetics Corp.'s Hyperties hypertext software, On-line Computer Systems, Inc.'s Oasys, Computer Teaching Corp.'s Tencore Producer and Alan Communication's Quest.

What does all this mean to information systems trainers? The basic problem they'll face is not new.

Discrepancies continue to exist between the availability of technology and the use of technology because of a lack of knowledge among potential users regarding what is available and how to effectively apply it.

Trainers familiar with authoring systems should conduct classes on how it can be used and how to get the most out of it.

They could also demonstrate how to develop disk-based policies, procedures, standards and guidelines, highlighting the many features that such software has to offer from both developer and viewer perspectives.

Think of computer-based training authoring systems as another option — another tool for developing presentations.

ONE WAY TO put a lid on paper documentation and the expense of handling it is through nontraditional uses of computer-based training authoring systems software.

Choosing a presentation method or medium is like performing a feasibility study. You must analyze your needs, develop alternative solutions, then choose the best solution for the situation, taking all relevant factors into consideration.

Organizations cannot survive in today's marketplace on tradition and rigidity, not in this era of fierce competition and rapidly advancing technology. They must anticipate and quickly respond to all types of changing environmental demands, regardless of the source, if they are to continue offering competitive products, prices and service.

Mueller is an IS technical adviser and liaison to the Graduate College, Bowling Green State University, Bowling Green, Ohio.

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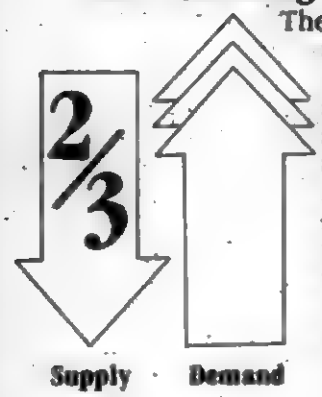
A few important tips on recruiting computer professionals

Finding computer talent isn't as easy as it used to be. In fact, there was a time when you'd just run an ad in the local newspaper and you could make a hire without waiting too long or spending too much.

But times have changed. And like so many facets of today's business, so has the effectiveness of traditional recruiting methods.

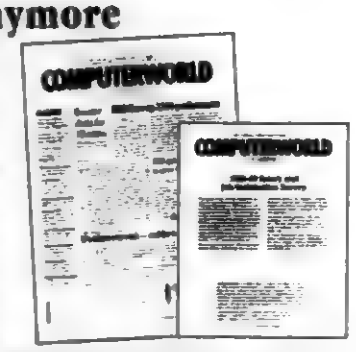
What's more, many of today's recruiters *don't use* today's most efficient methods — methods that save time and money for some widely unknown reasons.

The supply of qualified professionals isn't meeting demand



The American Council on Education reports that the number of college students choosing computer careers is down two-thirds since 1982. To make matters worse, there are more computers in today's business that require the skills of this shrinking market than ever before. And while you may never consider the company next door your competitor, it likely *is* competing for the same computer talent today. The result is a classic supply/demand problem that isn't changing for the better -and that's sure to make your recruiting tougher in the '90s.

Ads in local papers don't reach your major hiring market anymore



That's because they generally reach "active" job seekers — those who actively seek out the local newspaper to find jobs — and who a recent *Computerworld* job satisfaction survey found to represent 2 in 10 of today's computer professionals. The study also found that 7 in 10 of today's computer professionals are "passive" job seekers — those who would *consider* new job options, but likely never look for them in the local newspaper. (The remaining small percentage are "non-movers" content with long-term jobs.)

For every 10 of today's computer job seekers . . .
2 are Active
7 are Passive
1 is a Non-mover

In short, this means that your ad in today's local newspaper reaches no more than 20 percent of today's computer job seekers. What's worse, if you're not using other vehicles that reach far more job seekers, your local newspaper expenses are as inefficient as their limited audience.

More job seekers see your ad in Computerworld than in any other newspaper — Sunday, daily, or trade

That's because *Computerworld* reaches over 612,000 qualified computer professionals every week — the largest audience of its kind, and one that's rich with passive and active job seekers.

That's why more companies advertise more jobs in *Computerworld* than in any other professional newspaper. And why *Computerworld* is the *single place* where America's computer professionals *expect* to see the most jobs every week.

Computerworld gives you regional editions

A key option when you need a regional candidate and want to avoid national response and relocation. Yet if your search is national in scope, *Computerworld* can also give you more widespread national exposure than any other source.

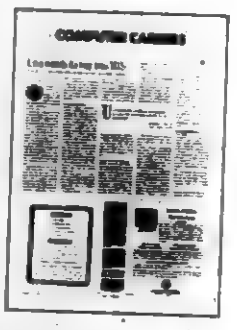
Computerworld needs just 3 working days for your ad to appear

That's comparable to most local newspapers. And why your ad can quickly appear in the next issue to start generating quality response.

Computerworld costs no more than local papers

And with a regional line rate of just $10.80, your cost-per qualified candidate reached is better than *any* newspaper - Sunday, daily or trade. Or just about any other source, for that matter.

Computerworld leads candidates to your ad



Just look at this week's Computer Careers section. You'll find a career editorial topic that will stir the interest of virtually any computer job seeker — passive *or* active. It's just one of countless reasons *Computerworld* is America's newspaper of choice on computing. No matter how much the times change.

And while times may change, some things won't. Whether you *use* computers, *make* computers, or sell products and services *for* computers, *Computerworld* is still your major source of news today. And your major source of computer professionals tomorrow.

For more recruiting tips, call John Corrigan, Vice President/Classified Advertising, at 800/343-6474 (in MA, 508/879-0700).

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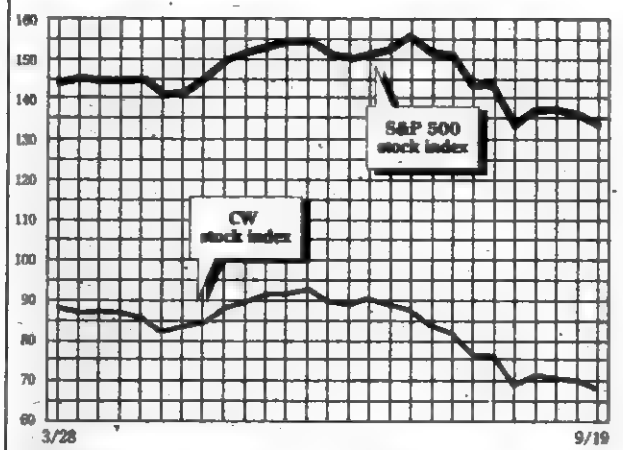
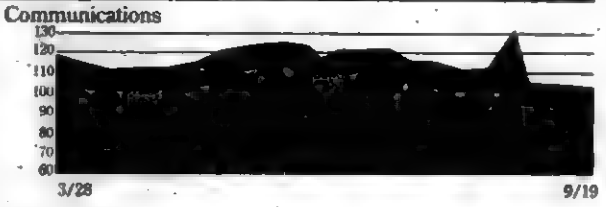
STOCK TRADING INDEX



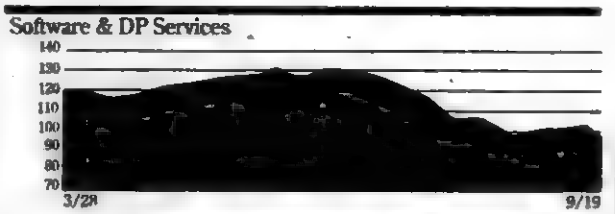
Indexes	Last Week	This Week
Communications	104.6	103.9
Computer Systems	67.8	65.7
Software & DP Services	102.4	97.8
Semiconductors	45.4	44.3
Peripherals & Subsystems	75.6	73.5
Leasing Companies	56.8	54.4
Composite Index	70.0	68.0
S&P 500 Index	136.3	133.8

Communications

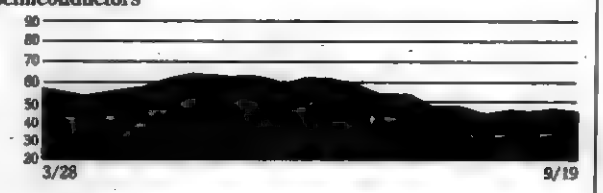


Computer Systems

Software & DP Services

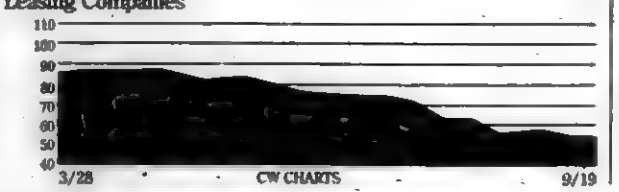


Semiconductors



Peripherals & Subsystems

Leasing Companies



Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, SEPT. 19, 1990

EXCH		52-WEEK RANGE		PRICE CLOSE SEPT. 19, 1990	WEEK NET CHNGE	WEEK PCT CHNGE

Communications and Network Services

N	AMERICAN INFO TECHS CORP	66	52	60.375	4.1	7.3
O	ANDREW CORP	26	16	18	0.0	0.0
O	ARTEL COMM CORP	10	3	3.125	0.1	4.2
N	AT&T	47	30	30.875	0.3	0.8
O	AVANTEK INC	5	2	2.563	-0.1	-2.4
N	AYDIN CORP	21	11	10.75	0.0	0.0
N	BELL ATLANTIC CORP	57	40	45.375	1.9	4.3
N	BELLSOUTH CORP	59	46	51.375	1.1	2.2
O	COMPRESSION LABS INC	15	7	13.25	0.0	0.0
O	CONTEL CORP	37	23	30	-0.4	-1.2
O	DATA SWITCH CORP	4	2	3.75	-0.1	-2.2
O	DIGITAL COMM ASSOC	27	15	15.875	0.0	0.0
O	DYNATECH CORP	20	18	15.5	-0.6	-3.9
O	FIBRONICS INTNL INC	13	5	8.625	-0.1	-1.4
O	GANDALF TECHNOLOGIES	5	2	3	0.1	4.3
N	GENERAL DATACOMM INDS	5	2	2.375	-0.1	-5.0
N	GTE CORP	36	24	25.25	-0.3	-1.0
O	INFOTRON SYS CORP	10	2	2.5	-0.3	-9.1
N	ITT CORP	64	50	50.5	-1.9	-3.6
N	M A COM INC	7	3	4.125	0.1	3.1
O	MCI COMMUNICATIONS CORP	40	21	21.875	-2.0	-8.9
O	NETWORK EQUIP TECH INC	34	5	6.375	0.9	15.9
O	NETWORK SYS CORP	16	7	8.75	-0.3	-2.8
N	NORTHERN TELECOM LTD	30	20	28.375	0.3	1.1
O	NOVELL INC	29	12	25.375	-0.1	-0.5
N	NYNEX CORP	82	66	71.75	2.5	3.6
N	PACIFIC TELESIS GROUP	52	36	41.625	0.4	0.9
A	PENRIL CORP	9	6	8.125	-0.6	-6.3
N	SCIENTIFIC ATLANTA INC	29	15	14.75	-2.3	-13.2
N	SOUTHWESTERN BELL CORP	58	47	48.75	1.1	2.4
O	3 COM CORP	19	7	7.75	-0.8	-9.8
N	U S WEST INC	41	32	34.5	-0.4	-1.1

Computer Systems

O	ALLIANT COMPUTER SYS	9	2	3.625	-0.1	-4.5
A	ALPHA MICROSYSTEMS	7	2	1.875	0.4	25.0
A	AMDAHL CORP	19	11	12.125	-0.4	-3.0
O	APPLE COMPUTER INC	50	32	32.5	-1.5	-4.4
O	AST RESH INC	28	8	10.625	0.8	3.9
N	BOLT BERANEK & NEWMAN	6	4	5.5	-0.1	-2.2
N	COMPAQ COMPUTER CORP	68	37	44.375	0.1	0.3
N	COMMODORE INTNL	12	5	5	-0.5	-9.1
O	COMPUTER AUTOMATION INC	6	0	0.282	-0.2	-43.6
N	CONTROL DATA CORP	22	11	10.625	-2.4	-18.3
N	CRAY RESH INC	51	31	34.75	-0.5	-1.4
N	DATA GEN CORP	18	5	9.75	1.3	22.7
N	DATAPOINT CORP	6	1	1	-0.3	-20.0
O	DELL COMPUTER CORP	14	5	10.875	-0.9	-7.4
N	DIGITAL EQUIP CORP	98	64	85.625	-6.0	-9.7
N	FLOATING POINT SYS INC	4	0	1.5	0.1	9.1
N	HARRIS CORP	40	24	24.625	-0.1	-0.5
N	HEWLETT PACKARD CO	52	31	33.5	-1.6	-4.6
N	HONEYWELL INC	112	73	92.125	-2.4	-2.5
N	IBM	123	99	106.375	0.5	0.5
O	INFORMATION INTL INC	15	10	10	-0.5	-4.8
O	IPL SYS INC	14	6	9.5	0.3	2.7
N	MAI BASIC FOUR INC	8	2	1.938	-0.1	-3.1
N	MATSUSHITA ELEC INDL LTD	172	117	120.75	-7.5	-5.8
O	MENTOR GRAPHICS CORP	26	11	12.5	0.0	0.0
N	NBI INC	2	0	0.172	0.0	-8.9
N	NCR CORP	72	55	58.625	-1.4	-2.3
O	PYRAMID TECHNOLOGY	34	13	16.375	-1.1	-6.8
O	SEQUENT COMP SYS INC	34	15	22.75	0.3	1.1
O	SUN MICROSYSTEM INC	37	15	29.375	1.0	3.5
O	SYMBOLICS INC	2	0	0.438	0.0	0.0
N	TANDEM COMPUTERS INC	20	11	11.5	-0.1	-1.1
N	TANDY CORP	48	28	28.125	0.4	1.5
N	ULTIMATE CORP	10	5	5	-0.4	-7.0
N	UNISYS CORP	20	7	7	-1.4	-16.4
A	WANG LABS INC	9	3	3.375	-0.3	-4.9

Software & DP Services

O	AMERICAN MGMT SYS INC	20	11	13	-0.3	-1.8
O	AMERICAN SOFTWARE INC	18	8	8.875	-0.5	-5.3
N	ANACOMP INC	6	2	2.25	-0.1	-4.3
O	ANALYSTS INTL CORP	24	12	12.25	-5.5	-30.0
O	ASHTON TATE	18	7	7.75	-0.1	-1.8
O	ASK COMPUTER SYS INC	16	7	7.625	-0.3	-3.2
N	AUTO DATA PROCESSING	63	44	47.875	-1.5	-3.0
O	AUTODESK INC	60	38	46.75	-0.8	-1.6
O	BMC SOFTWARE INC	36	14	23.75	0.1	0.5
N	BUSINESSLAND INC	14	2	2.375	-0.3	-9.5
O	COGNOS INC	10	4	7.625	0.0	0.0
N	COMPUTER ASSOC INTL INC	17	6	6	-0.6	-9.4
O	COMPUTER HORIZONS CORP	17	7	14.5	-1.5	-9.5
N	COMPUTER SCIENCES CORP	59	37	37.875	-1.9	-4.7
N	COMPUTER TASK GROUP INC	12	6	8.5	-0.5	-5.6
O	COMSHARE INC	25	16	16	-2.0	-11.1
O	CORPORATE SOFTWARE	16	8	11.5	-0.5	-4.2
N	GENERAL MTRS (CL E)	38	24	34.75	1.5	4.5
O	GOAL SYSTEMS INTL	16	10	11.25	-0.3	-2.7
O	HOGAN SYS INC	7	2	2.75	-0.5	-15.4
O	INFORMIX CORP	16	6	8.875	-1.1	-14.1
O	INTELLICORP INC	8	4	4	-0.4	-9.8
O	LEGENT CORP	32	18	20	-0.3	-1.2
O	LOTUS DEV CORP	26	14	14.75	-2.3	-13.7
O	MICROSOFT CORP	91	31	82	4.6	6.1
O	NATIONAL DATA CORP	26	9	10.375	-0.1	-1.2
O	ON LINE SOFTWARE INTL INC	11	6	6	0.0	0.0
O	ORACLE SYS CORP	166	7	7.25	-1.0	-12.1
N	RANSOPHIC SYS INC	19	10	11.375	0.0	0.0
O	PHOENIX TECHNOLOGIES INC	5	2	2.5	-0.5	-16.7
O	POLICY MGMT SYS CORP	43	26	37.75	0.5	1.3
O	PROGRAMMING & SYS INC	26	14	15.375	-0.6	-3.9
O	RELATIONAL TECH INC	10	3	9.125	0.1	1.4
N	REYNOLDS & REYNOLDS CO	27	14	14.125	-0.8	-5.0
O	SAGE SOFTWARE INC	16	8	10.125	-0.3	-2.4
O	SEI CORP	22	15	16.375	-0.6	-3.7
O	SHARED MED SYS CORP	17	12	14	-0.9	-5.9
O	SOFTWARE PUBG CORP	38	14	22	-2.0	-8.3
N	STERLING SOFTWARE INC	11	7	8.875	-0.3	-3.5
O	SUNGARD DATA SYS INC	28	15	19.25	-2.3	-12.2
O	SYSTEM CENTER INC	25	8	9.125	-0.8	-8.5
N	SYS. SOFT INC	29	16	20	-0.8	-3.8
O	WORDSTAR	2	1	1	0.3	33.3

Semiconductors

N	ADV MICRO DEVICES INC	11	5	5.75	-0.1	-2.1
N	ANALOG DEVICES INC	10	6	6.375	0.0	0.0
O	ANALOGIC CORP	11	8	9.75	0.1	1.3
O	CHIPS & TECHNOLOGIES INC	25	10	11	-0.4	-3.3
O	INTEL CORP	52	30	39.875	1.1	2.8
O	MICRON TECHNOLOGY INC	16	7	8.125	-0.9	-9.7
N	MOTOROLA INC	88	53	61	0.1	0.2
N	NATL SEMICONDUCTOR	9	4	4.75	-0.3	-5.0
N	TEXAS INSTRS INC	44	28	28.625	0.1	0.4
A	WESTERN DIGITAL CORP	15	6	7.625	-1.0	-11.6

Peripherals

O	ALLOY COMP	2	0	0.438	0.0	0.0
N	AM INTL INC	3	1	1.375	-0.3	-15.4
O	AUTO TROL TECH CORP	3	2	2.25	-0.1	-4.3
O	BANCTEC INC	24	13	18.5	-0.5	-1.6
A	COGNITRONICS CORP	6	3	4.875	0.1	2.6
O	COMMER PERIPHERALS	31	11	21.625	-0.6	-2.8
A	DATARAM CORP	22	9	11.75	-0.6	-5.1
N	EASTMAN KODAK CO	49	36	42.125	0.6	1.5
N	E M C CORP MASS	7	3	6	0.5	9.1
O	EMULEX CORP	9	4	8.5	0.8	10.6
O	EVANS & SUTHERLAND	35	18	26.25	0.3	1.0
O	ICOT CORP	2	1	0.625	-0.3	-36.8
O	INTERLEAF INC	6	3	3.125	0.0	0.0
O	IOMEGA CORP	6	3	6	0.2	3.9
O	MASSTOR SYS CORP	3	1	0.75	-0.1	-7.7
O	MAXTOR CORP	17	6	9.25	-1.1	-15.3
O	MICROPOLIS CORP	10	3	5	-0.1	-2.4
N	MINNESOTA MNG & MFG CO	91	66	79.5	0.9	1.1
O	PERSONAL COMP PRODUCTS INC	6	4	4	0.3	8.7
O	PRINTRONIX INC	15	9	9.75	0.0	0.0
N	QMS INC	21	9	12.625	-1.3	-9.0
N	QUANTUM CORP	26	9	17.375	-0.3	-1.4
O	RECOGNITION EQUIP INC	8	4	5.125	0.0	0.0
O	REXON INC	10	4	4.75	0.1	1.3
O	SEAGATE TECHNOLOGY	20	8	8.25	-0.3	-2.9
N	STORAGE TECH CORP	35	11	16.25	-2.5	-13.9
O	TANDON CORP	4	1	2	0.0	0.0
N	TEKTRONIX INC	30	12	14	-0.5	-3.4
O	TELEVIDEO SYS INC	1	0	0.281	0.0	0.0
N	XEROX CORP	67	36	37.75	-1.4	-3.5

Leasing Companies

N	CAPITAL ASSOC INTNL INC	7	1	1.25	0.1	5.3
O	COMDISCO INC	34	15	16.75	-0.8	-4.3
O	LDI CORPORATION	18	12	12.5	-0.5	-3.8
O	PHOENIX AMERN INC	5	3	3.5	0.0	0.0
O	SELECTERM INC	5	3	3.313	0.1	1.9

Fall-tering

Autumn's approach does not slow tech stocks' summer slide

Technology stocks fell faster than dry leaves off an autumn oak last week, and Digital Equipment Corp. hit the ground hard. DEC fell to 53¾ Thursday, its lowest closing price in five years, after losing 2¾ points last week.

IBM stood strong, however, raking in 3¼ points to close at 107½, making it a standout among last week's sinkers.

After deciding not to decide between the two major factions in the Unix standards debate and then announcing that its new operating system would be unavailable until 1991, Apple Computer, Inc. sagged 2¾ points to 31½.

Sellers stomped Adobe Systems, Inc. down 4¾ points to 22½. Oracle Systems Corp. continued its long, slow slide downward, easing ½ of a point to close at 7. Oracle has lost more than 49%, or 6¾ points, of its share price in the past four weeks. Other software firms also felt an early frost: Novell, Inc. slipped 1 point to 25 and Lotus Development Corp. fell 1¼ points to 14¾. Microsoft Corp. remained steady at 59¾ points after signing a software licensing agreement with IBM.

NCR Corp. said it plans to build new machines using Intel Corp. microprocessors, which boosted Intel stock up ⅜ of a point to 33. NCR tumbled, however, 1½ points by Thursday to close at 58. Motorola, Inc. declined 2¾ points to 60¾ Thursday, hovering near its 52-week low. National Semiconductor Corp. gave up ¼ of a point to 4½. Quarterly financials from the chip maker showed revenue up more than 11% from revenue for the same period a year ago.

Sun Microsystems, Inc. was a bright spot in an otherwise gloomy technology arena, edging up ⅛ of a point to 28½. Also ahead of the game was United Telecom, Inc., which gained ½ of a point to close at 25¼.

KIM S. NASH

Oracle

FROM PAGE 1

month to 25%. That will necessitate drastic cutbacks in spending to reflect the lowered expectations.

Oracle Chief Executive Officer Larry Ellison said in a prepared statement that he will sweep away two layers of sales management, "reducing the number of sales managers while increasing the number of sales representatives."

Oracle insiders, including current and former executives and employees, have described a harrowing summer in which all the rules of Oracle's win-at-all-costs marketing strategy were called into question — and no one knew who was going to lose their job next.

"The old Oracle culture said that if you were a good performer and met or exceeded your goals, you would be rewarded for a job well done," one former executive said. In general, the rewards were high pay, bonuses and traveling in high style, the former executive said. "That culture is dead."

Ellison *recentralizes company*

The 400 or more employees laid off from Oracle's 4,000-person domestic work force were, in many cases, given only two weeks' severance pay, even though some had served the firm for five years or more, sources said. The company declined to reveal severance specifics. Some employees lost their jobs based on performance reviews and others because their departments were reduced in size, company sources said.

"One difficulty is that Oracle doesn't handle transition very well," another former executive said. Among the company's top executives, "Very few are willing to stick their neck out and say, 'This is the way it is,' and go on from there." As a result, he said, the bad news continues to come in dribs and drabs rather than being presented as part of an overhaul of the company, one of the largest independent software suppliers in the world.

"What we are guilty of is doing this in real time," countered Chris Greendale, vice-president of marketing at Oracle U.S.A. "Look at how visible and upfront the company is about what it's doing."

Though concerned about Oracle's financial prospects, users seemed more concerned about future product plans — something they intend to focus on at this week's International Oracle Users Group meeting in Anaheim, Calif. "A layoff on the order of 10% doesn't worry me much at all," said Warren Capps, chairman of the Mid-Atlantic Oracle Users Group.

Of greater concern, Capps said, was the future of product development, particularly in the areas of Oracle's Version 6.0 relational database management system, which first began shipping in November 1988 but experienced an extended rollout for all platforms supported by Oracle and its SQL*Forms 3.0 report writer, which began shipping for the Digital Equipment Corp. VAX last December.

"They're still behind the times on their products because so much of their development is spread across 80 [hardware] platforms," Capps said. "They spend a tremendous amount of resources just to maintain the compatibility of new releases."

If the cutbacks threaten product enhancements, they could ignite many brushfires in the grassroots user groups, user activists said, adding that Oracle must now focus on its installed base. "It appears that research and development is safe" from the cutbacks, said Tony Ziemba, president of the New York Oracle Users Group. "But we will be checking to get a confirmation of this in Anaheim."

Oracle management has clearly been sobered by recent events. The day after the layoffs, said one senior Oracle product manager, "I sat my people down and made sure everyone on the technical staff understood what was going on." He added, "You attach so much of your self-worth to your job, and I didn't want what was happening to compromise their work."

With the stress of the layoffs rippling throughout the company, Oracle executives are promising that the free-spending days of Oracle's sales staff are over.

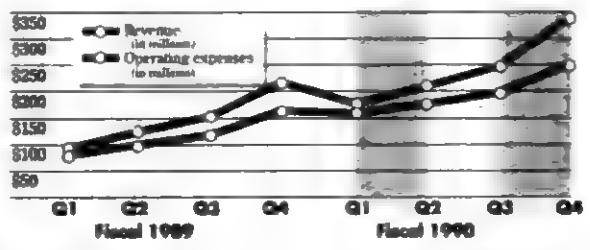
"We will focus on things that are important to our clients in a manner that won't look like we're spending money without any reason to do so," said Michael S. Fields, president of the Oracle U.S.A. sales and marketing subsidiary.

Analysts said the overall economic slowdown has lengthened Oracle's sales cycle, making it harder to close big orders so they can be stated as revenue. Compounding the phenomenon was Oracle's extremely aggressive sales stance, which may have been "eating into" future revenue for the sake of fiscal 1990's bottom line. "Until now, we were a revenue-driven organization," one senior manager said. "When we needed more money, we just went out and closed more business. But conditions have changed, and we just can't do that anymore."

There is a corporate explanation for the recent slide, which began in April with a $15 million restatement of third-quarter revenue. "The capital spending cycle is slowing down," explained Michael Musson, director of investor relations at Oracle. "In June, we had intended to build our business up as if we were going to grow at 50%. Now, it appears that 50% was way too optimistic."

Losing the race

Oracle's revenue has grown but will be eclipsed by expenses



Source: Oracle Systems Corp. CW Chart: Paul Mock

"When there was a third-quarter shortfall, they probably told themselves they would make it up in the fourth quarter," said Kenneth Burke, a vice-president of research at Alex. Brown & Sons, Inc.'s San Francisco office. "But that way, you end up with no pipeline for the first quarter, and that's probably part of what's gone on."

Two weeks ago, in the aftermath of the financial bad news, Gary Kennedy — a 10-year Oracle veteran who helped build the company — was replaced as president of Oracle U.S.A. by Fields, who had directed Oracle's U.S. field sales force. Kennedy remains with the firm, continuing to serve as chairman of the Oracle Complex Systems Corp.

Tierney *loses out in consolidation*

As a result of the consolidation, some executives have chosen to leave, saying they believe the shakeout will continue. Among them was Atam Lalchandani, a well-known Silicon Valley financial specialist who was named chief financial officer of Oracle U.S.A. in May. He had joined Oracle in March. Tom Siebel, a sales vice-president who had been close to Kennedy, took a one-year leave of absence, the company said. Sources close to both executives said they were leaving the company voluntarily.

One direct casualty of the reorganization was Peter Tierney, who was promoted from senior vice-president of product marketing to head up Oracle's intercontinental sales organization in May. Tierney, who had just started to direct the sales forces in Canada, Mexico, South America, Africa and Asia, was terminated during the consolidation of sales management, Oracle said.

Temporaries released

Although Oracle did not initially offer the information, it now appears that up to 200 more "temporary workers" also lost their jobs on Sept. 17. "We no longer have any temporary workers in the U.S., with a few exceptions," Musson said.

Oracle CFO Jeffrey Walker, who was promoted last week to a second role as executive vice-president, will oversee all financial functions in an effort to reduce spending. He joins Geoff Squire, head of worldwide sales and distribution, at the corporate executive vice-president level; both report directly to Ellison.

"There are going to be some real transition issues there," said David Bayer, a senior analyst at Montgomery Securities in San Francisco. "They've recentralized after having decentralized in May. I think Wall Street's going to look for evidence that the company has complete control over its operations and that they keep their promises with their customers about meeting product schedules in a timely fashion. Right now, there's no reason to be confident of those factors."

FCC extends reach of price caps

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — If the Federal Communications Commission is correct, actions it took last week will lead to lower prices for users of long-distance data and voice communications services. The FCC extended its system of price caps and floors, adopted for AT&T in 1989, to the interstate services of local telephone companies.

Beginning Jan. 1, the seven regional Bell operating companies and GTE Corp. must move to the price caps system; other local companies, which are smaller, also have the option to do so.

The setting of price brackets replaces rate-of-return regulation, in which prices are pegged to an allowed return on capital investment. The FCC developed price caps formulas that it said should result in lower charges to long-distance carriers for connections to local networks than would occur under the rate-of-return concept. The commission estimated that the new scheme would knock billions of dollars off bills for long-distance services over the next four years.

Price caps regulation allows prices to rise but at less than the rate of inflation. Price caps also provide sharing of earnings above certain thresholds with customers.

The commission also voted to reduce from 12% to 11¼% the maximum allowable rate of return that local telephone companies may earn on charges to long-distance carriers for local connections — a move it said will reduce those fees by $337 million in the first year.

AT&T is required to pass on to consumers all savings from reductions in local connect charges. Other long-distance companies are expected to follow AT&T's price reduction lead as a matter of competitive necessity, Richard Firestone, chief of the FCC's Common Carrier Bureau, said last week.

There is little industry agreement that the FCC's price caps formulas — which take into account inflation, productivity targets and uncontrollable costs such as tax increases and line charges — will work as intended or that telephone companies will behave as expected or be able to achieve the operating efficiencies hoped for. FCC commissioner Ervin S. Duggan called the FCC staff that developed the plan and its supporting formulas "Rube Goldberg's god-children."

Larry Blosser, an official at the 730-member, user-oriented International Communications Association, said the price caps plan should lead to more stable prices for high-speed private network services, which have tended to fluctuate widely. The FCC plan adopted special price limits for T1 and T3 services, saying they may not vary more than 5% up or down, with adjustments for changes in the price cap, each year.

This price caps plan will be in effect for four years, during which time the commission will evaluate its effectiveness and fairness.

NEWS SHORTS

AS/400 joins CIM lineup

One year after ramping up more than 50 products as part of a computer-integrated manufacturing (CIM) architecture, IBM added its midrange Application System/400 to the assembly line last week. The CIM Series/400 will fill a hole in IBM's CIM offerings, analysts said, and will position IBM against Digital Equipment Corp. in the small to midsize systems market. IBM also drew its RISC System/6000 into the CIM strategy.

NSFnet management firm founded

IBM, MCI Communications Corp. and Merit, Inc. formed a nonprofit corporation to manage and operate the federally funded National Science Foundation's NSFnet. IBM and MCI will contribute $5 million each over the course of three years to the new firm, called Advanced Network & Services, Inc. Merit, a consortium of Michigan universities, has managed the NSFnet backbone since 1988, with IBM contributing hardware and software and MCI supplying high-speed digital circuits. Allan H. Weiss will leave IBM to head the new company. He said the firm will be able to step up support for the network while taking less of a regional view. NSFnet is being upgraded to speeds of 45M bit/sec.

Businessland chops 10% of force

Businessland, Inc. is facing up and slimming down. Last week, the $1 billion microcomputer distributor announced a plan described by Chief Executive Officer David Norman as "a decisive move to make the tough decisions" needed to bring the firm's outgo into line with its income. Businessland will merge its Computer Craft retail subsidiary into the parent company, trim its worldwide work force by 10%, cut $50 million from inventory and delete a management layer from its sales organization by promoting computer industry entrepreneur Michael Poehner to senior vice-president of sales and marketing.

SPSS repackages PC version

SPSS, Inc. released SPSS/PC+ Version 4.0, a major repackaging and enhancement of its statistical software package for DOS machines. SPSS claims to have the largest share of the personal computer statistical software market. The release is in part a response to charges by competitors that SPSS is overpriced. SPSS/PC+ 4.0 has the basic module of Version 3.0 split into two modules: SPSS/PC+ Base and SPSS/PC+ Statistics. The Base module will sell for $195, with additional modules starting at $295 each. SPSS said stripping down the package is a strategic move that will draw more users to statistical software packages.

Quattro Pro updated

Borland International launched its latest attack on the spreadsheet market last week with the release of Quattro Pro Version 2.0, an updated version of its 1-year-old spreadsheet application. The new program includes enhanced problem-solving abilities as well as advanced graphics and will ship by mid-November. Borland will offer upgrades to Quattro Pro 1.0 users and owners of other high-end spreadsheets, including Lotus Development Corp.'s 1-2-3. The new program will be priced at $495, while owners of Version 1.0 can upgrade for $80.

Hyatt

FROM PAGE 1

the reservation system. In 1987, it became AT&T's largest 3B2 site, installing the Unix minicomputers in virtually all of its properties worldwide.

Last December, Biggs said, he met with AT&T and Informix Corp. and told both vendors that switching the central reservation system — which had worked under IBM's Transaction Processing Facility (TPF) operating system since 1982 — to Unix would have to be a three-way partnership.

"I told them we didn't want to bet the ranch," said Biggs, who came to Hyatt 5½ years ago after a 16-year career at Howard Johnson.

Both AT&T and Informix provided details, under nondisclosure, of pending products. AT&T outlined its System 7000, a reduced instruction set computing server aimed at OLTP settings and supplied by AT&T partner Pyramid Technology Corp. Informix revealed the specifications of Informix Online, a beefed-up version of Informix Turbo that addresses many OLTP issues, such as data integrity, on-line archiving and disk mirroring.

Hyatt has five System 7000s — three for the reservation system, one small model as a development tool and one for a sales and marketing application that supports 120 users. The company has set a goal of serving 1,500 users with the System 7000s.

The reservation system was cut over early last month. Remarkably, Hyatt elected not to run the new system in parallel with the old. "We'd benchmarked the hell out of [the 7000s]. We felt confident it would work," Biggs said.

While the application ran flawlessly in its first week, a combination hardware and software glitch crashed the system for five hours the second week.

A week of debugging located the problem, "and since then, we've made 30 minor changes to the application," Kerr said.

As if replacing an IBM mainframe with coupled Unix processors to a relational database was not ambitious enough, Hyatt also switched out its private data network the same day, replacing a dedicated Systems Network Architecture network with Transmission Control Protocol/Internet Protocol connections over 56K bit/sec. lines and Ethernets in the hotels.

Gilbert Wai, executive director of product marketing at Informix, conceded that for the classic TPF users — the nation's largest airlines — a Unix alternative is still not an option. "But I believe [Unix] is moving in that direction," he said, adding that it was not inconceivable that thousands of users could be supported in such an on-line environment.

TPF was introduced by IBM 23 years ago to the airline industry and later moved to other industries in need of TPF's 2,000 transaction/sec. rating.

Hyatt's central reservations center will link to the TPF-based computerized reservation systems (CRS) of the airlines through an interface provided by The Hotel Industry Switch Company (THISCO) in Dallas. THISCO, also a System 7000 user, is working on creating a common interface between the different airline systems and those of the hotel chains, which much now attach to each CRS separately.

IBM has little to fear from Hyatt's example, said those connected to the project and others familiar with TPF.

Hyatt was an atypical TPF site, running the system on a 4381 rather than a 3090-class mainframe. Moreover, the largest of an estimated 250 to 300 TPF licensees worldwide, among them the nation's largest banks and airlines, will not abandon their sizable investments in TPF software, programmer know-how and hardware.

While the major airlines probably will not jettison their enormous investments in TPF and IBM mainframes, they are likely to "try open systems in backdoor applications or for new, relatively small applications," said Omri Serlin at ITOM International Co. in Los Altos, Calif.

David Just

Hyatt's Kerr (left) *and Biggs lead jump to Unix*

IBM 'memory lapse' ruffles rivals

BY ROSEMARY HAMILTON
CW STAFF

An IBM mainframe memory upgrade policy officially announced earlier this month has competitors crying foul and suggesting that it penalizes users who do business with them.

Users who upgrade central storage on the 3090J model may be required to order at least one additional thermal conduction module (TCM) at a cost of $57,100 if the upgrade is "not directly ordered from IBM," according to a Sept. 5 letter.

"We are convinced that it is nothing more than a way to stop users from buying used on third-party memory," said Robert Bardagy, a senior vice-president at leasing company Comdisco, Inc. EMC Corp., which makes memory sold through Storage Technology Corp., said some customers have postponed purchases because of the added costs.

Lou Finnegan, vice-president of marketing at Cambex Corp., which sells memory upgrades, referred to the policy as a "blatant predatory practice."

These challenging comments are strongly denied by IBM. The U.S. Justice Department's 1956 consent decree expressly prohibited IBM from engaging in pricing practices that would tend to lock out competitors because of IBM's dominance.

According to an IBM spokesman, central storage is handled as a complete main memory system with two key parts: the actual memory board and a TCM to manage it. Customers pay IBM one package price, but if a customer purchases the memory upgrade from a non-IBM source, the customer is doing the upgrade on a component basis and pays for the additional TCM separately, adding $57,100 to the upgrade price.

Second-class postage paid at Framingham, Mass., and additional mailing offices.
Computerworld (ISSN 0010-4841) is published weekly, with a single combined issue for the last week in December and the first week in January by CW Publishing/Inc., 375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171.
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TRENDS

Information Systems Hiring

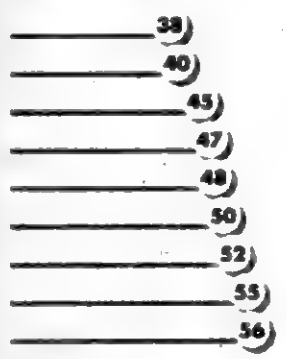
A CW survey of IS managers shows New York and Florida vacancies fill the fastest

How many working days did it take to fill your most recent vacant entry-level position?

(Average number of days)
Base: 1,005

How many working days did it take to fill your most recent vacant middle-management position?

(Average number of days)
Base: 807



How many working days did it take to fill your most recent vacant senior-level position?

(Average number of days)
Base: 697

Source: CW Salary Survey

CW Chart: Tom Monahan

NEXT WEEK

Noburo Minamisawa began designing information systems in Japan in 1953 and installed the first commercial Univac in Japan at Onoda Cement Co. in 1959. Now, still advising Onoda on IS at 72, Minamisawa has left a significant mark on both private- and public-sector computing in Japan. See Manager's Journal for a profile.

Eiji Miyazawa

As barriers to international trade fall, existing markets become saturated and new opportunities beckon from foreign soil, one lesson many firms are learning is that they can't afford to operate as independent entities. Rather, they must function as a global enterprise. Find out how IS can help multinational firms cope in Executive Report.

INSIDE LINES

No 'Made in Japan' label

Amdahl executives were piqued over questions relating its latest mainframe announcement (see story page 4) to one made earlier in the month by Fujitsu, which owns 43% of Amdahl. "I know it's a hard thing to get across, but we design, we develop, and we deliver these machines," said Amdahl President Joseph Zemke. Nevertheless, Fujitsu's recent announcement of its M-1800 high-end machine, which also has an eight-way configuration with more than 350 million instructions per second, would appear to be quite similar to Amdahl's 5995. Amdahl and Fujitsu are both "using the same bricks," explained Erika Williams, vice-president of processor product management. "However, we're using them to build different houses."

Got a problem? Just upgrade

Several users of Novell's remote print service on Netware 386 Version 3.1 loadable module (NLM) are reporting lockups, errors and outright crashes. Martin Marietta's Information Systems Division said Version 1.1 of NLM is knocking all remote Postscript serial printers off line. Novell said it is only aware of problems with Version 1.0 of NLM.

Air Force highs and lows

The U.S. Air Force is getting ready to cancel its annual worldwide microcomputer conference, slated for October in Gulf Port, Miss., according to a source. The event, which normally draws 2,000 microcomputer managers, was expected to draw only 800 this year. Blame impending budget cutbacks for the smaller than usual turnout, our source said. Meanwhile, with a personnel tracking system maxxed out because of Operation Desert Shield, the Air Force is reportedly seeking a few good men or women in the software programming business in the Washington, D.C., area to do a "quick-and-dirty job on fixing" it, said someone who claimed to have been contacted.

And a merry Christmas to all?

An almost identical version of the IBM Christmas virus that infected thousands of computers on IBM's internal mail in December 1987 has reportedly been posted on the Bitnet network. The virus puts a tree and seasonal greeting message on the screen of infected computers and is known to replicate wildly, shutting down computers. No word of any infections, however. Bitnet connects computers at more than 200 universities as well as to the Earn network in Europe, the entry point of the original virus. IBM was forced to shut down its 350,000-terminal network for nearly three days to get rid of the virus.

Stuff this in your billy-can

According to Australia-based news sources, Mips Computer Systems and Wang will formalize an agreement allowing Wang to use Mips computers as a Unix platform in New Zealand and Australia. The agreement will be the first such relationship established by the two, and Mips' Australian managing director Rob Byrne said he hopes it will extend internationally. The official word from Lowell, Mass.: "No comment."

Outsourcing, out shopping?

Times are wild and woolly in the outsourcing industry as two major vendors recently changed their business heads. At Litton Computer Services, John Cudworth has left for Affiliated Computer Services, the Dallas-based service firm headed by Mtech founder Darwin Deason; Tom Schoen has replaced Cudworth as vice-president of business development at Litton. And at Genix, President Tom Mabor is gone, replaced by Rudy Cifolelli, president of new Genix parent MCN/CSI.

New England Telephone recently informed customers that if they want to view adult entertainment on the company's videotex service, they have to sign a request for "access to the indecent services." We make no such judgments on callers trying to access our adult news hounds. Just call (800) 343-6474, and News Editor Pete Bartolik will hook you up without a declaration on your morality. Want a more hands-off approach? Fax us the dirt at (508) 875-8931, or message COMPUTERWORLD *on MCI Mail.*

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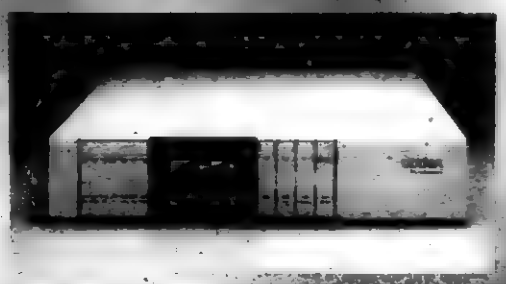

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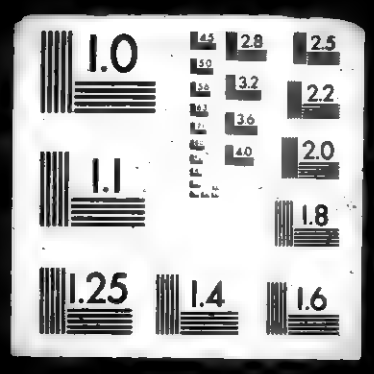
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VOL 24
ISS 40
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THE NEWSWEEKLY OF INFORMATION SYSTEMS MANAGEMENT
October 1, 1990 · Vol. XXIV · No. 40 · 136 Pages · $2/Copy · $48/Year

COMPUTERWORLD

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Oracle takes $36 million hit; red ink greater than projected, but product and service updates give users some relief. Page 4.

Deal or no deal, federal IS officials are bracing for cutbacks as the Gramm-Rudman law forces government to get serious about the budget deficit projected for the fiscal year that begins today. Page 133.

Conflict charges over an IBM mainframe purchase prompt a resignation and an investigation at the University of Wisconsin. Page 6.

At your command, telecom vendors use TCA '90 to tout on-demand high-speed data links. Page 12.

As Germany unifies, its biggest high-tech vendor, Siemens, formalizes merger with Nixdorf. Page 131.

Secure strategy is on DEC's agenda, with plans being readied for network products and services. Page 8.

Chill out your drive: IBM plans to replace all fan units on 3990 disk drives shipped between May and August. Page 29.

IBM switch repeals 3090 fee

Eases cost of adding third-party memory

BY ROSEMARY HAMILTON
CW STAFF

IBM backed off a controversial memory upgrade policy late last week and canceled a $57,100 charge it announced last month for 3090J model users who purchased memory from third-party providers.

The company reversed its position Friday afternoon, after spending considerable time explaining that it was willing to offer users options for upgrading and was not intending to restrict anyone.

"We decided it wasn't worth it," said John Henrickson, director of data systems marketing, after the fee cancellation was disclosed. "We were putting a lot of hassle into the marketplace for very little dollars. We decided to let it go."

Policy short-lived

The short-lived upgrade policy, announced Sept. 5, prompted memory product competitors to charge that IBM was trying to discourage customers from doing business with third-party providers. The controversy stemmed from an engineering change earlier this year that provided functional improvements but also eliminated the ability of J models to recognize up to 512M bytes of main memory.

The modification at issue is IBM's Engineering Change 570, which some observers said they believed was mandatory, requiring users to install an additional thermal conduction module if they later added memory beyond a 128M-byte line.

While the J models had a built-in ability to recognize and manage up to 512M bytes of main

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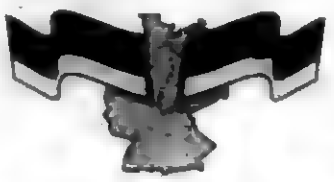
Germans hear busy signals

BY PATRICIA KEEFE
CW STAFF

When the last swig of celebratory beer has been washed down, "One Germany" will turn its attention to fixing what many see as its biggest obstacle to revitalizing the East: a tattered and aging telecommunications system that barely serves a minute percentage of the East German population.

"You can't get there from here" takes on new meaning when calling East Germany from West Germany. East Berlin may be just a hop, skip and a jump over the Wall, but as one exasperated East German official noted last week, "It is impossible to get through!"

Callers from within East German borders do not fare much better. For one thing, there are only 1.2 million telephone connections for East Germany's entire population of 17 million; 7.2 million connections are needed.



Moreover, even if every business and household was on-line, the reliability of East Germany's rapidly disintegrating analog system, which is estimated to be at least 50 years old, is tenuous at best.

"If you want data transferred within the hour, it's very risky to let your business [rely] on dial-up lines," said Helmut Gumbel, an analyst at Gartner Group Europe.

"A telex is the only safe form of communication," agreed IS consultant Reiner Michl.

Not only is there no control over when a call can be placed, but there are no leased lines, no packet-switched networks and no cellular telephone service. In addition, data transmission moves along at a slow 1,200 bit/sec. However, even though the government has a monopoly on all voice communications, it is undergoing deregulation.

This is disheartening news for

Continued on page 130

Sgt. Wendell Beppler *is assistant supervisor of the 324th Data Processing Unit. Beppler, along with 44 other data processing experts and an IBM 4341, awaits orders to ship out to Saudi Arabia*

Mobile 4341 unit called up

BY MAURA J. HARRINGTON
CW STAFF

FORT DEVENS, Mass. — Weekend warriors no longer, members of an Army Reserve data processing unit stationed here were processed for mobilization last week, expecting to ship out soon along with their mobile IBM 4341 for service in Saudi Arabia.

Mobilization procedures for "Operation Desert Shield" in the Middle East pushed the 45 members of the 324th Data Processing Army Reserve Unit through various lines last week to update wills, dog tags and identification cards; get X-rays of the teeth and jaw lines; and take care of other, more personal matters, such as full-time day care for children of single parents.

"We knew when we first signed up for the reserves that this was always a possibility . . . and our skills are needed over there," said Major John Welch, an information systems manager when wearing civilian clothes and commander of the 324th DPU — the first reserve DPU of four in the U.S. to be called up for active duty.

"The odds are, this unit is going [to Saudi Arabia], but they could end up stateside at Fort Bragg [N.C.] as a refill unit," an Army spokesman said. "They'll get their orders after Oct. 1 as to exactly where they'll be going."

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Windows 3.0 users look for that ideal fit

BY JAMES DALY
CW STAFF

Like a new snakeskin jacket that looks terrific but feels snug under the arms, Microsoft Corp.'s Windows 3.0 is drawing raves for its looks — but users say it still needs a little tailoring before it fits just right.

A perfect fit is crucial to users who already have ambitious plans for Version 3.0. "In the next five years, we want to shift all our processing from the mainframe down to desktop PCs and use Windows to access that information," said Dale Smith, a program manager at General Electric Co. in Schenectady, N.Y. "Eventually, we just want to use the mainframe as the data server."

Four months after its introduction, the graphical user interface has received an enthusiastic welcome from early buyers who appreciate the ease with which it helps them navigate the DOS world. Now those buyers would like a few alterations before they continue with their ambitious plans for corporatewide implementation.

Users contacted by *Computerworld* generally agreed that until the rough edges of Version 3.0 are smoothed out, its use will

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133 Millions of federal employees may soon be enjoying a forced holiday because of government budget cuts.

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"A soft U.S. economy cannot possibly explain a drop like that."

LARRY ELLISON
ORACLE

On his company's major woes. See story page 4.

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The Fifth Wave

"I HAVENT LOCATED THE PROBLEM YET."

EXECUTIVE BRIEFING

■ **Global competitiveness requires coordination** on a scale that cannot be achieved with isolated outposts, which makes unification and standardization of information key priorities for many companies. Telecommunications networks and information systems are the glue that holds corporate global business strategies together, but producing cohesion without strangling local initiative and creating a unified network across multiple borders can be dauntingly sticky. **Page 91.**

■ **Thousands of federal IS jobs could be on the line** as the Bush administration and Congress try to reach a budget compromise. All federal agencies anticipate unpaid furloughs for some employees. Federal IS managers are prepared for belt-tightening, but worst-case scenarios call for canceling major computer purchases and systems development plans — even shutting down noncritical applications. **Page 133.**

■ **Outmoded, unreliable and scarce,** East Germany's telecommunications system is proving a major barrier to business opportunities for U.S. and European companies. Although the two Germanys will be officially reunited this week, the Bundespost's plan to overhaul the telecommunications infrastructure will take seven years, with satellite bypass offered to Western firms in the meantime. **Page 1.**

■ **Oracle customers are not panicked** by the software firm's worse-than-expected losses, but they are concerned about how Oracle management was apparently blindsided by the financial debacle. Some attendees at the annual user group conference saw a silver lining: Management will now focus more on products and less on growth. **Page 4.**

■ **Army Reserve IS professionals** may be moving from the data centers of Massachusetts to the deserts of Saudi Arabia after President Bush called the 324th Data Processing Reserve Unit to active duty. Forty-five men and women and a mobile IBM 4381 from Fort Devens, Mass., may soon be supporting communications for Operation Desert Shield. **Page 1.**

■ **Coinciding with German reunification** is the corporate merger between West Germany's largest technology firms, Siemens and Nixdorf. Analysts give the huge new company strong odds to succeed in the rapidly growing European market. **Page 131.**

■ **A LAN support dilemma** confronts many decentralized firms. They want to push networks out to the local level, but users are notoriously lax about LAN support. It falls to IS to achieve a balance between local autonomy and some form of central oversight. **Page 45.**

■ **The key to improved IS productivity** is not always the latest fad, but an ungiamorous basic: good software logic and documentation. Using both keeps systems useful even if enhancements and redesigns are needed to keep pace with changing corporate needs. The result is that programmers and analysts are freed up for new tasks. **Page 101.**

■ **On-site this week:** A bilingual telephone voice-recognition system allows French Riviera visitors to verbally browse through a database of tourist options in Nice, France. **Page 29.** Closer to home, Papa Gino's hopes to challenge Domino's in the New England pizza delivery business with PCs in its restaurants that log and track phone-in orders. **Page 40.** Customer convenience is also the driver for the California Department of Motor Vehicles, which has installed ATM-like terminals for motorists to renew their licenses without waiting in line. **Page 39.** A voice synthesizer-equipped Wang PC helps a blind attorney in Raleigh, N.C., do his job. **Page 41.**

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Oracle stock takes stunning dive

CEO says emphasis will be on quality and support in wake of $35.9M loss

BY JEAN S. BOZMAN
CW STAFF

ANAHEIM, Calif. — Oracle Systems Corp. executives shed new light on the firm's finances last week, announcing that the company had lost $35.9 million in the 90 days ended Aug. 31 — a staggering figure that exceeded recent projections.

"There was a $45 million shortfall in product sales by Oracle U.S.A.," Chief Executive Officer Larry Ellison said Tuesday. "There was a 72% sequential drop from the fourth quarter to the first quarter, and a soft U.S. economy cannot possibly explain a drop like that."

Ellison blamed a May reorganization of the Oracle U.S.A. division, along with faulty sales projections, for the failure.

Leaders in the Oracle user community were still analyzing the new financial revelations (see chart) as they considered the impact on Oracle product development — and on information systems careers linked to Oracle software.

"My concern is that management is working in a reactionary mode and not addressing the systemic problems," said Warren Cappa, president of the Mid-Atlantic Oracle Users Group and a senior systems manager at Science Applications International Corp. in McLean, Va. "They've made strong management changes and put drastic cost-cutting measures in place. But I'm not sure that the management difficulties have been resolved enough so that new problems, such as a recession, could be easily handled."

Users questioned at the International Oracle Users Group meeting last week were largely unaware of the financial revelations. Some said they were unconcerned, but even those who anticipate tough times ahead for their vendor remained stoic. "What are you going to do when you have users to support?" one software administrator from an East Coast pharmaceuticals firm asked. "You have to go on, no matter what happens."

Even Ellison, who founded Oracle in 1977, agreed that the emphasis must now be on product quality and customer support rather than on market share.

Financial analysts, already stunned by the former highflier's precipitous stock drop — falling from a 52-week high of $28 per share to the $6 range last week — were unsure how soon the firm would recover. "It's going to take many quarters of consistent growth before I'll be convinced that they're back on track," said David Bayer, a vice-president of research at Montgomery Securities in San Francisco.

The first-ever loss for the $971 million company was far more than the $27 million projected on the basis of Oracle financial statements just two weeks ago. Since then, there has been a hiring freeze, a purchasing freeze and another restructuring of the Oracle U.S.A. division, which Ellison pinpointed as the source of the troubles.

Big changes in the works

Last week, Ellison outlined a radically changing Oracle business, one in which U.S. sales are being eclipsed by European sales at a rapid pace — with Unix products among the big sellers.

"Essentially, all our growth will come in Europe, which expanded its business by 60% last year," he said. "Our expenses are going to be reduced to correspond to a worldwide growth plan of 25%, regardless of how good the second-quarter indicators look, and they look very good."

According to Ellison, he expected a second-quarter rebound largely because of an unprecedented "overhang" of business that had not closed in the first quarter.

In an effort to spur a return to profitability, Ellison has slashed two layers of sales management [CW, Sept. 24], ordered a 10% reduction for the 4,000-person domestic work force and stopped hiring, with few exceptions. The firm took a one-time charge of $25 million to cover the costs of severance pay for the laid-off workers, build up its bad-debt reserve and cover a $4 million currency-exchange "mistake."

However, many observers said they remain unsure of the firm's growth prospects.

"It's a question of how much is enough," said Charles Phillips, a senior analyst at Soundview Financial Group, Inc. in Stamford, Conn., who was also present at the meeting. "They were planning on much higher growth, and it's hard for the people who founded this company and built it on high growth rates to accept the need to focus on profitability and quality rather than on market share."

Evaporating fortunes

Oracle's revenue from all its product lines have dropped off dramatically

ORACLE

Estimated product line revenue (in millions)

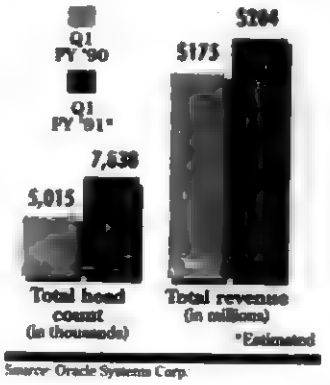
Product line	FY '90 Q1	Q2	Q3	Q4	FY '91* Q1
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
DEC VMS	$66	$59	$74	$68	$44
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Unix	$34	$58	$58	$101	$49
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

*Projected

Source: Oracle Systems Corp. CW Chart: Paul Mock

Bottom-line expenses

Slower growth has stifled Oracle's ability to fund a more than 50% increase in personnel during the past year



Source: Oracle Systems Corp.

The good news: Streamlined support

BY JEAN S. BOZMAN
CW STAFF

Although overshadowed by Oracle's financial news, significant product news was made at last week's International Oracle Users Group convention in Anaheim, Calif.

Largely in response to user complaints about long waiting times, Oracle announced that it was revamping its telephone call-in support service. Based on a voice-mail technology, Oracle Real-Time Support Services (RTSS) is programmed to route the call to the appropriate technician without stopping first at the junior-level staff members who used to provide Level 1 support, Oracle said. The service went on-line last week at no additional cost to customers, the company added.

"The new system gives customers access to our most experienced people rather than to our least experienced people," said Doug Allred, vice-president of Oracle's systems and support group. "We have also shifted our hiring to put more senior people on staff."

It is unclear how RTSS would be affected by Oracle's current hiring freeze, but the technical support staff grew from 140 technicians to 220 technicians during 1990, Allred said.

The real-time support announcement was well received at the convention, where many users complained of wait times ranging from one hour to several days before critical technical questions were answered. Some users had already tried the revamped system and found it far from perfect.

"I called several days ago, was put on hold and told they'd have to call me back," said one Silicon Valley user. "That's not much of an improvement."

Until now, complete 24-hour support was provided only for Oracle's top customers, who pay a maintenance fee equal to 22% of the cost of their Oracle relational database management system license fee.

Oracle executives also detailed some future products, including the following:

- Oracle Version 6.2, which contains fixes that allow Version 6.0 to run on Digital Equipment Corp. Vaxclusters, is due out by year's end. The original Version 6.0 software caused Vaxclusters to "thrash," Oracle executives have said, and was withdrawn from the market last year.
- Oracle Version 7.0, announced at last year's meeting, will be in alpha-test sites within Oracle by Jan. 1, according to Oracle CEO Larry Ellison. Beta-test sites should begin receiving Version 7.0, which reportedly supports transparent processing in distributed networks, shortly thereafter.
- The Oracle Toolkit for applications developers will soon support a wider variety of graphical user interfaces, said Jerry Baker, senior vice-president at Oracle's Product Division.
- SQL*Forms 3.0 for the IBM MVS operating system will be available in beta-test form next month, Oracle product managers told users. But the software is long overdue, many users said, since SQL*Forms 3.0 was shipped for the DEC VAX computer last December.

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NEWS SHORTS

Mayer fills First Boston post

First Boston Corp.'s top information systems position, vacant since Eugene Bedell took over computer-aided software engineering spin-off Seer Technologies in March, was filled last week by Charles H. Mayer, a 20-year Wall Street IS veteran. Mayer, 43, was named chief information officer and managing director. Mayer had been chief operating officer at Tech Partners, a computerized equity arbitrage trading firm. His experience includes positions at Salomon Brothers, Inc., Morgan Stanley Group, Inc., the former Lehman Brothers and consultancy Arthur Young.

Activists sue FBI

Computer Professionals for Social Responsibility (CPSR), a Palo Alto, Calif.-based group, recently filed a lawsuit seeking to force the Federal Bureau of Investigation to disclose whether it has been monitoring the computer bulletin boards of political and advocacy organizations. CPSR said it filed suit because the FBI had not responded to its August 1989 request for the records under the Freedom of Information Act. The FBI is expected to respond to the lawsuit in mid-October.

Integrator adds commercial unit

Syscrest Information Systems, Inc., a Falls Church, Va.-based systems integrator in the government market, will announce formation of a commercial systems integration division this week. The division, which promises to work with corporate IS mana...rs to implement multivendor open systems and networks, will be headed by Kathleen M. Sperl. Another company branching out into the commercial sector last week was IDC Washington, Inc., a Vienna, Va.-based market research firm that focuses on the federal government. The company changed its name to Information Strategies Group and will provide consulting and research services for users and vendors in several vertical markets.

Intel works on RISC ports

After getting a late start in the reduced instruction set computing (RISC) field, Intel Corp., with its i860 RISC processor, announced a group to help port software to its RISC architecture. Mass860 will offer verification and compatibility testing for software and joint marketing programs.

Ask/Ingres deal progresses

Ask Computer Systems, Inc. pressed its bid last week to buy Ingres Corp., despite a stockholder suit. Shareholder James Lemunyon of Florida owns 9.7% of Ask stock and seeks to stop Ask from issuing $60 million in stock to Electronic Data Systems Corp. and Hewlett-Packard Co. In other developments, the firms said the deal had cleared antitrust hurdles, and EDS announced plans to sell Ask software.

D&B adds package

Dun & Bradstreet Software announced last week that it has ported its AMAPS manufacturing resource planning system to run on IBM's Application System/400 midrange system. Prices start at $150,000. D&B is expected to announce a personal computer version of its human resources package this week. Called The Flex Resource, the product is designed to handle flexible spending account procedures. The Flex Resource is available now with prices starting at $10,000.

Met Life begins shift

Metropolitan Life Insurance Co. has begun moving some IS staff and other personnel from New York to Atlanta. About 100 people in the Investment Systems and Technology Division have already moved, according to a Met Life source, and another 200 are scheduled to make the move by February. Met Life denied published reports that said the company would move its 400 corporate IS staff members to upstate New York.

More news briefs on page 132

IBM, university pact prompts probe

BY RICHARD PASTORE
CW STAFF

MADISON, Wis. — Conflict of interest charges late last month prompted an investigation of the University of Wisconsin's recent IBM 3090 mainframe purchase and the resignation of a dean who was paid by IBM for consulting work and whose department would benefit from a proposed imaging system gift from IBM.

A state senator last month broached the possibility of an improper connection between a University of Wisconsin at Madison mainframe contract awarded to IBM and a library dean who is a paid part-time IBM consultant.

University officials initially denied any conflict of interest but two weeks ago launched an internal investigation. At the same time, Library Services Dean Kaye Gapen resigned her position, stating that conflict of interest allegations made it impossible for her to do her job effectively.

The university "admitted there was a connection between the mainframe contract and the library deal," said Sen. Lynn Adelman (D-New Berlin). University employees reportedly brought the matter before Adelman, who chairs the Senate Judiciary and Consumer Affairs Committee.

An IBM spokesman denied any relationship between the mainframe, library system and Gapen. "People are linking things that are unrelated," spokesman Mark Holcomb said. "The separate proposal brought by the university to jointly work on imaging technology is unrelated to the 3090 purchase."

Adelman contends that wording in IBM's bid for a 3090 Model 200J refers specifically to imaging technology and may have unethically influenced the awarding of the contract. The university reportedly chose IBM over competing bids by Amdahl Corp., Encore Computer Corp. and Hitachi Data Systems Corp.

Adelman has also alleged that Gapen was deeply involved in negotiations for the library system, violating state ethics codes regarding conflicts of interest.

Gapen could not be reached for comment.

Wisconsin's Sen. Adelman

Jack Duwe, the university's director of administrative data processing, said IBM discounted its mainframe bid in return for university-generated reports on imaging technology. The discount did influence the awarding of the contract, he said, but he denied that Gapen influenced the decision.

"IBM chose to include [in its mainframe bid] a substantial discount associated with the university's preparing some reports on image technology. We determined that it was a real value to the university and included that in our evaluation," Duwe said. "Kaye [Gapen] was not a player in that."

Holcomb said "software credits" for imaging reports were included in IBM's bid for the mainframe. "We wanted that software credit evaluated as part of our bid, but the two projects aren't linked," he said. The imaging reports can be generated by systems already installed at the university and do not depend on the proposed library imaging project, he said.

Holcomb also confirmed that IBM employed Gapen as a part-time consultant to speak to potential customers about library applications and imaging technology. "But nothing that IBM did in that relationship was in any way intended to influence what Dean Gapen did in her official duties," he stated.

Officials at other state universities said they operate under strict guidelines that discourage bid influencing by a vendor.

"The state is very strict about keeping a level playing field between competing vendors," said Joseph Ullman, assistant vice-president of administrative computing services at the University of Virginia. State overseers "want a fair decision based on criteria that all vendors have an opportunity to respond to."

Conflict of interest is a major area of concern at most state institutions, but university information systems officials said it is common for staff to be on the payroll of major vendors. "You can't find a school that doesn't have someone" on a supplier's payroll, said Ronald Schoenau, director of the Northeast Regional Data Center for Florida's state colleges.

Pending the outcome of the investigation, the joint IBM-university library system proposal awaits approval by the board of regents. A scheduled legislative audit of the mainframe contract is also on hold.

Switch

FROM PAGE 1

memory, the engineering change would reduce memory recognition up to 128M bytes or whatever currently existed on the system.

Third-party memory suppliers claimed the Sept. 5 policy put their products at a disadvantage [CW, Sept. 24]. If a user bought memory upgrades from IBM, the cost of the additional TCM was rolled into the upgrade price; if they went to the used or third-party market for memory, they would be charged $57,100 for the TCM.

Users have an out

Prior to the decision to terminate the TCM charge, Henrickson said last week that users were not required to install EC 570 and that if they had done so without fully understanding it, IBM would adjust their systems.

"We want to make sure our customers understand . . . and if anyone made a decision to install EC 570 prior to us being able to describe it clearly to them, we will go back and make any changes," Henrickson said. "If there's something we did that our customers didn't understand, we will go back and fix it."

Industry consultants and memory providers were surprised at that IBM declaration.

"That's apparently a departure from the earlier position that stated EC 570 was a mandatory EC," said Paul Noble, a vice-president at memory board maker EMC Corp.

When the upgrade policy was announced, IBM also reduced memory upgrade prices from approximately $6,000 per megabyte to $4,000 per megabyte. As it turns out, the third-party prices were still less than IBM's prices — even with the additional TCM cost rolled in — but the IBM policy narrowed the difference between the two.

Prior to this policy, J model users could buy additional memory from any source — IBM, leasing companies or third-party providers — without having to bring in an additional TCM.

The additional TCM was not just a change in memory pricing policy, according to Henrickson. It was required because of EC 570, which, he said, provided various functional boosts, including improvements to PR/SM, which is a capability to create logical partitions on the processor. But in providing more features for these functions, IBM had to reduce the memory management capability on this TCM.

Therefore, if a user added more memory, an additional TCM would be required to recognize and manage the added memory or perform a function that had once been built into the system.

Without this EC, a 3090J model installed prior to Sept. 5 continues to have the ability to recognize up to 512M bytes of main memory.

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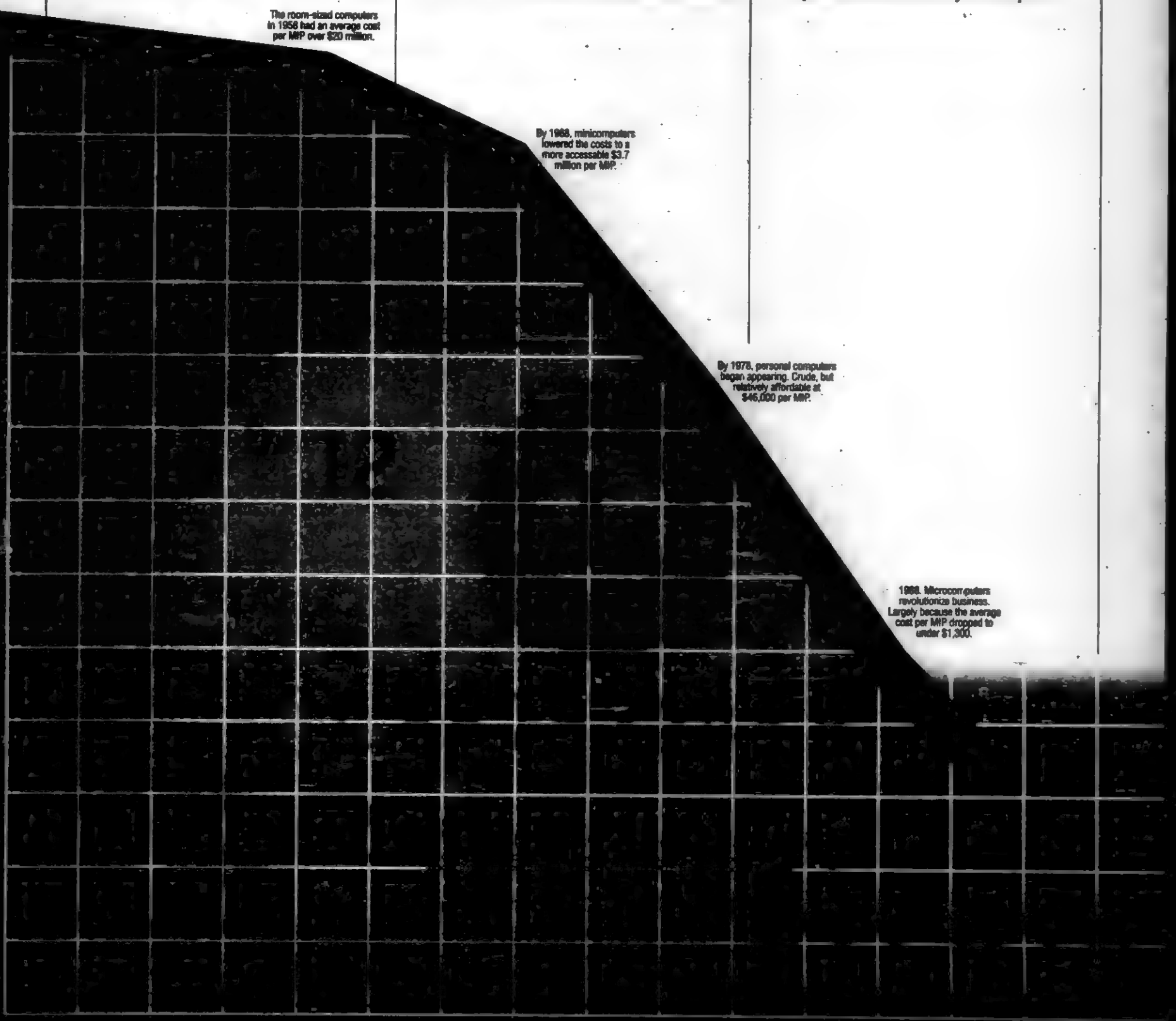

Mobile 4341

FROM PAGE 1

he added.

The 324th DPU includes 19 women and 26 men ranging from ages 18 to 58. All are from the East Coast, and most are from Massachusetts. Of those registering last week at Fort Devens, all knew their responsibilities as members of the 324th DPU.

Mobile communications units have been part of Army missions since before World War I, according to Sergeant Major James Dillon, the highest ranking enlisted man in the 324th DPU. "But this is the first time that a mobile systems unit with the automation of this caliber has been deployed on an overseas mission." Before this, Dillon said, the DPU mobile units generally consisted of people processing papers by hand or on personal computers.

"The 324th will mostly be taking care of inventory control for the staff there, including inventory supply, personnel management, financial management, medical applications and transportation management," Welch said.

While all of the soldiers in the 324th DPU are well aware of their duty and are willing to serve, real-life concerns and fears continued to race through their minds as they prepared for the worst.

"When all of this started to happen [in the Middle East], I kind of got the feeling we would be called up," said First Lieutenant Debbie Wilson, acting executive officer for the unit.

Wilson is highly regarded by her peers in the reserve unit and in her civilian life. She works as the PC coordinator at Norfolk & Dedham Mutual Fire Insurance Co. in Dedham, Mass. Wilson, 25, lives with her parents in Dedham.

"Debbie is an extremely bright and hard-working professional," said Leon Hebert, vice-president of services at Norfolk & Dedham and her boss.

"I was in the Navy Reserves during the Korean War, so I'm well aware of what's going on and what could happen. This most certainly brings the issue home," Hebert added.

Stella Johnson

Reserve Lt. Debbie Wilson *leads IS troops to firing range*

Welch, who is married to a systems analyst who works for the government, just turned 40 last month. In his civilian life, he is an independent contractor currently working at Polaroid Corp.'s Marketing Systems Division as a senior IS manager. In the reserves, he is head programmer and systems manager in the mobile unit.

"I was very surprised to hear I was called up, even though I knew it was always a possibility," said Staff Sergeant William Humber, 40, who is a systems designer for operations in the reserves and a business systems analyst as a civilian at Data General Corp.

Humber, who is married and has three children, said, "My family is pretty upset about this because I have a brother who served in Vietnam and lost his legs."

At 57, Sergeant Wendell Beppler is the oldest data processing professional in the 324th DPU. He is assistant supervisor of the unit, in charge of all hardware and software. He has three daughters and a son.

Beppler's son, 26, is also in the reserves and presently on standby for mobilization for Operation Desert Shield, Beppler said.

Chief Warrant Officer James Russell said, "It was a surprise that being called up for active duty would ever happen to me . . . I've been in the reserves for 22 years this October and have never been called up before."

Russell, 44, has been working at John Hancock Mutual Life Insurance Co. in Boston for almost 22 years. He was recently promoted to the position of program applications systems manager for the corporate payroll department there, he said.

While Russell is serving his tour, his work load will be given to two other people in the office, and his position will be held for him for at least 180 days, Russell said.

"John Hancock will be making up the difference between my Army pay and my civilian pay for at least 180 days. They have been very supportive," Russell said.

Stella Johnson

Members of *the 324th Data Processing Unit (from left to right): Staff Sergeant Sharon Kelsey, Clayton Beatty, James Russell and Sean McNiff.*

Financial strain

The difference between active-duty military pay and civilian salaries is a concern for some members of the unit. "I don't think there is a person here that won't suffer financially from this," Welch said

The 324th DPU is a direct reporting unit of the 94th U.S. Army Reserve Command, headquartered at Hanscom Air Force Base in Lexington, Mass. It is one of four mobile data processing units in the reserves (there are 12 like it in the Army worldwide) and consists of three 35-ft trailers housing an IBM 4341 mainframe running IBM's OS/MVS operating system with about a dozen IBM 3270 terminals hooked together on a network with fiber-optic cables, Russell said. It is 100% mobile and powered by multiple 100-kilowatt generators, which also control the climate in the trailers, he said.

"We're designed to go where the troops go and, if necessary, we will," Welch said.

Dillon said that the reason this DPU was called up first was because of the quality of professionals in the unit.

"It's no mistake that these particular people have been called up. The people in this unit also are a part of the high-technology belt of the country," Dillon said, adding that the reserve units that are stationed near Silicon Valley are not data processing units.

GSA grounds proposed FAA advanced system

BY J. A. SAVAGE
CW STAFF

After years of interagency disagreement over how the Federal Aviation Administration (FAA) should acquire its computers, the General Services Administration (GSA) yanked from the FAA the authority to proceed with a $1.5 billion system.

The GSA handed over procurement authority for the project, called the Computer Resources Nucleus Project (CORN) to the FAA in the mid-1980s, according to a GSA spokesman. The GSA took back that responsibility late last month after Congress' oversight agency, the General Accounting Office (GAO), and a congressional committee questioned the project.

The GAO not only questioned the project but also issued a report to Congress in May asking that the CORN contract not be awarded because the system is adequate and future growth rates were unsubstantiated.

CORN was conceived as a 10-year program to spare the FAA's centralized data services an annual request to Congress for more money for upgrades. It was designed to allow the FAA to spend its time on applications rather than on annual justification of hardware procurement.

Nearly all of the FAA's administrative work is done on a single IBM 3084 mainframe and 22 Data General Corp. MV/15000 computers running a total of 23,000 programs. The 3084 is at 86% capacity. While the FAA had planned on postponing an upgrade until the CORN contract was decided, it recently installed an IBM 3090 Model 300E mainframe, according to Leo Epperson, the division's assistant manager. He said he expects the 3090 to carry the FAA until CORN is operational.

DEC dispelling feelings of insecurity

BY MARYFRAN JOHNSON
CW STAFF

Digital Equipment Corp. confirmed last week that it will launch a range of security products and services within the next several weeks to help solve corporate security problems on networked computer systems.

According to internal DEC documents, a security architecture under development will make extensive use of encryption for confidentiality and integrity of communications. It will employ traditional secret-key encryption and public-key techniques for authentication of network users.

The framework for DEC's plan is called Distributed System Security Architecture (DSSA), and its goal to make distributed DEC systems on multivendor networks as secure as stand-alone machines.

DEC has not yet officially announced the program, and the final pieces of it will not be in place until 1992, sources said.

"In the final analysis, we believe DEC has done its homework," said Peter Schay, an analyst at Gartner Group, Inc. in Stamford, Conn.

Art McClinton, a lead scientist at Mitre Corp. in Washington, D.C., said, "Half of this [DSSA] is marketing strategy for what's already there. But there are some new products, and DEC is putting it together well."

Don Holden, a security marketing manager at DEC, told UK-based *PC Business World* last week that DEC will enlist the support of other manufacturers in developing new security products. The security architecture will support the Kerberos authentication mechanism, designed by Project Athena at MIT.

Schay explained that many of the distributed systems security products that are now on the market — such as antivirus "vaccines" and data link encryption — do not address the range of needs in secure distributed systems.

Personal computer security on a network, the analyst cautioned, "will remain limited by the inherent lack of MS-DOS system integrity."

Some users noted that while vendors may talk about distributed system security, there are no products yet approved by the National Computer Security Center in Fort Mead, Md.

At Houghton Mifflin Co. in Cambridge, Mass., the prospect of network security products holds particular appeal for John Young, director of technology.

Houghton Mifflin just finished installing a VAX 6000 Model 410 to manage its Decnet wide-area network, which encompasses the corporate IBM mainframe and Hewlett-Packard Co. minicomputers in regional offices.

"I have talked with DEC about [DSSA products] already, and I'm interested in securing the VAX part of our network," Young said. "We're pretty well secured on our IBM and HP side."

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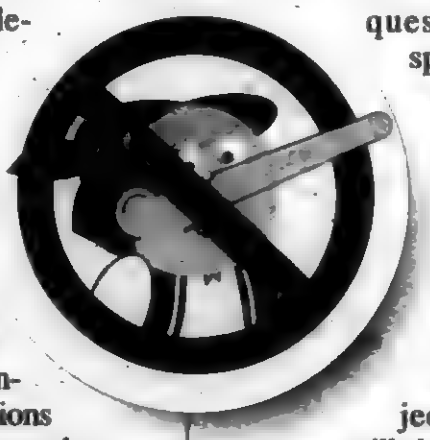

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Hitachi drives counter IBM

BY JEAN S. BOZMAN
CW STAFF

SANTA CLARA, Calif. — Hitachi Data Systems Corp. (HDS) is playing one-on-one basketball with IBM in the disk drive arena and is trying to win out over IBM's 3390. The IBM-compatible HDS 7390 disk drive line announced last week edges out IBM specifications on disk-access times and includes a high-capacity unit with 16% more capacity than the IBM 3390 Model 2, HDS claimed. However, industry analysts noted that the F model is intended for IBM 3380 K emulation, since its extra capacity would not be "recognized" by IBM systems software.

HDS announced that it would start shipping two of its three models — those that match IBM's 3390 Models 1 and 2 — this month. The HDS 7390 F, priced 7% higher than the most comparable IBM list price, is scheduled to ship in the first quarter of 1991.

HDS first described its drives in February, following IBM's Nov. 20, 1989, announcement of two 3390 models [CW, Feb. 12]. However, it was not until last week that the plug-compatible systems maker promised support for IBM's recently announced Escon fiber-optic channel feature.

Designed to be plug-compatible with the IBM 3390, the 7390 has a 10-msec average access time compared with IBM's 12-msec average access time. The basic 7390 drive uses 9-in. platters. A single 7390 cabinet can hold up to 22.7G bytes of data. While IBM also supplies 22.7G bytes per 3390 cabinet, it uses 10.8-in. platters.

Both the HDS and IBM models offer data transfer rates of 4.2M. byte/sec. Both vendors have also reduced delays caused by disk rotation, or latency, from 8.3 msec to 7.1 msec in the latest generation of drives.

One way that HDS plans to differentiate its 7390 F model from IBM's offerings is by preserving the IBM 3380 Model K's "block size," allowing migration from older 3380-type drives without reformatting. By using the HDS 7390 F model in its IBM 3380-K emulation mode, users can lay out their data in exactly the same block patterns as on older drives, HDS executives said.

Users can opt to run the 7390 F in "full-capacity mode" or in IBM 3390-compatible mode, explained Gary Holtwick, vice-president of HDS peripheral systems marketing.

The IBM 3380 has 47K bytes per track, while the IBM 3390 has more than 56K bytes per track, analysts said.

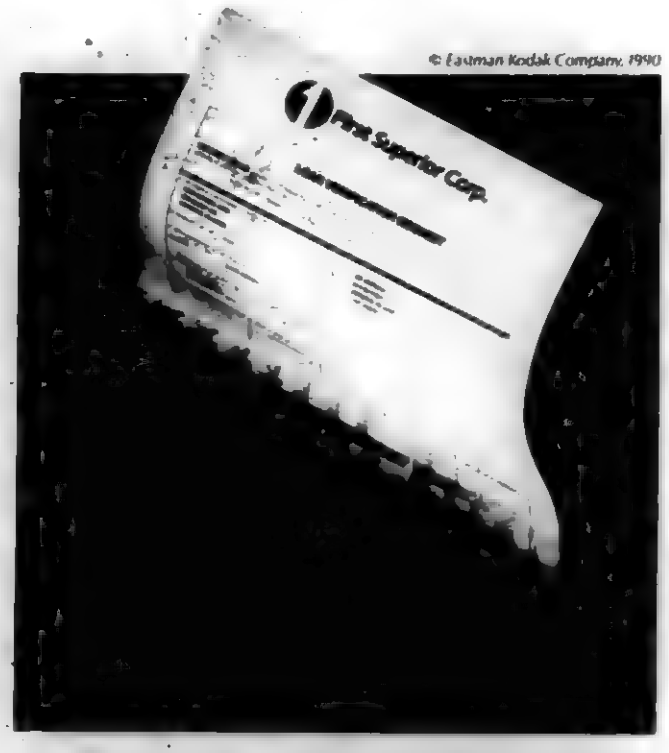
HDS is also marketing a high-capacity model called the 7390 F that provides 7% more capacity than the IBM 3390.

Unrecognizable

If it is not used to emulate an IBM 3380, the 7390's extra capacity means little to IBM mainframe users, because IBM systems software does not recognize the extra storage space in HDS' 9-in. platters. "The software expects it to look like IBM's equipment, so you have to wonder how much of that extra capacity is really going to be useful to people," said Bob Katzive, vice-president at Disk/ Trend, Inc. in Mountain View, Calif.

Industry analysts said the new HDS drives should give IBM a run for its money. "Its average seek time is less than IBM's, and it's got a [20%] smaller footprint than the equivalent IBM models," said Carl Greiner, vice-president of Gartner Group, Inc.'s storage strategies program in Stamford, Conn.

List prices for the 7390 range from $110,000 to $782,000, depending on the number of head-disk assemblies in the drive. The 7490 tape-cartridge system is priced from $117,000 to $554,000. Greiner said he expects HDS to discount its drives as much as 30% lower than the 3390's list price of $759,000.



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On-demand switched data needs faced at TCA

BY ELISABETH HORWITT
CW STAFF

SAN DIEGO — Users tired of putting up costly dedicated connections to support occasional bandwidth-hungry applications were the target of various on-demand, switched, high-speed data networking services announced here last week.

MCI Communications Corp., U.S. Sprint Communications Co. and Williams Telecommunications Group each targeted the on-demand market during announcements at the Tele-Communications Association (TCA) '90 conference here with on-demand circuit-switched data services ranging from 56K bit/sec. to 45M bit/sec. Additionally, Sprint announced a frame relay service that could provide throughput "easily an order of magnitude higher" than that of the carrier's current packet-switched offerings.

The introductions came none too soon for users who want to dial up bandwidth in chunks of 56K bit/sec. or more and pay only for the time they need that bandwidth.

"As voice and data departments get together, you see the benefits of both sides, and with voice, the benefit is dial-up connections," said Jim Williams, manager of telecommunications at Mervyn's department stores.

Williams said he envisioned the chain using "the increased flexibility and lower cost" of on-demand data connections for "shipping tapes around and for short-term file transfer with the same reliability you get with dedicated lines." He said he would like to be able to set up a 56K bit/sec. or 128K bit/sec. link "just long enough to send payroll information to the bank, get an acknowledgment they have the file and then hang up."

Ahead of the game

At McDonnell Douglas Corp., switched 64K bit/sec. and 128K bit/sec. links are already in use to support videoconferencing, said Lionel Gillerman, a network specialist at the firm and TCA's vice-president of regulatory affairs. "We'd also like the higher switched speeds for network management; it makes it easier to monitor" remote networking devices, he said.

MCI introduced the first two members of a new family of virtual private data services that promises users the ability to dial up T1 and T3 data lines with a targeted setup time of a half-second, an MCI spokesman said. Williams Telecommunications announced what it described as bandwidth-on-demand service that supports bandwidth of 56K bit/sec. up to 1.5M bit/sec. However, the service may take up to 15 minutes to actually set up a connection, a Williams Telecommunications spokesman said.

The point at which Williams Telecommunications' switched service would stop offering price breaks over its own private-line service would be between 20 and 50 hours of use per month, depending on bandwidth size and length of circuit, a vendor spokesman said.

Such a service is actually comparable to an existing AT&T reserved service that allows users to request a point-to-point connection at speeds of up to 1.5M bit/sec. within 15 minutes of when they want to make the call, according to AT&T product line manager Ralph Andreotta. AT&T recently began providing "true switched" data services with no setup time for 56K bit/sec., 64K bit/sec. and 384K bit/sec. connections, company spokesman Mitch Montagna added.

While AT&T spokesmen would not give an announcement time frame for a switched T1 service, The Yankee Group analyst Berge Ayvazian said that AT&T is due to announce such an offering by early next year.

Sprint unveiled yet another twist on switched data networking, a customer premises device that is reportedly able to enable users to dial up and amalgamate up to eight channels of its existing Switched 56 service.

The advantage of such an offering is that it can be made available quickly to users throughout Sprint's network, a company spokesman said. A possible disadvantage is the delay inherent in bringing up multiple switched 56K bit/sec. links through a user device instead of on the carrier's central office switch, according to Ayvazian. Sprint's Northern Telecom, Inc. switches do not support such switched fractional T1 services right now but will in the future, a spokesman said.

Promises pending

Also at TCA, Sprint said that it would provide "the world's first public Frame Relay Service" next year, initially in the U.S. and UK, with other countries to be added.

The carrier said that it would base its service on an enhanced version of its subsidiary Telenet's TP4900 packet switch and also sell it as a private network switch. Sprint will also provide translation between its frame relay and X.25 packet-switched offerings, allowing users to combine the two types of networks. Frame relay switches are reportedly able to support throughput of up to 2M bit/sec., compared with the 56K bit/sec. speeds that are typical of packet-switched links.

Sprint's switch will interface with the de facto frame relay standard recently announced by Stratacom, Inc., Cisco System, Inc. and Northern Telecom.

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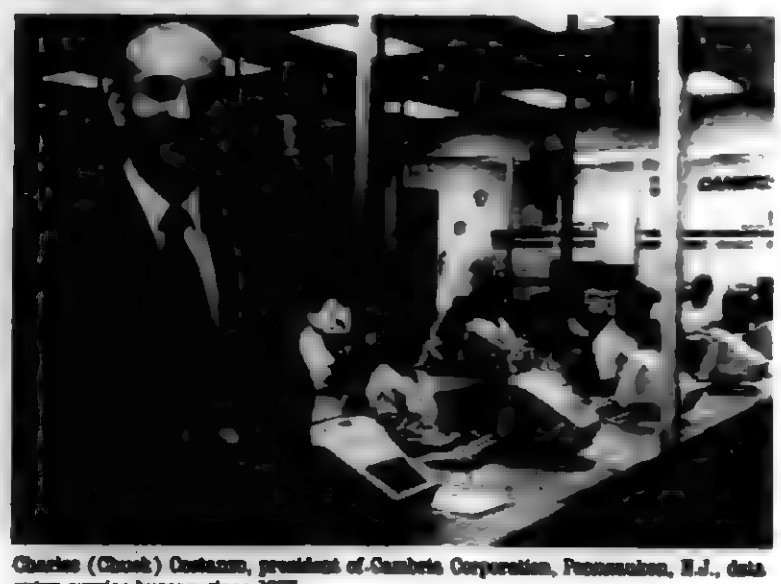

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VIKING SOFTWARE SERVICES

Global networking dominates show as suppliers vie for user attention

BY ELISABETH HORWITT
CW STAFF

SAN DIEGO — In a race to supply multinational users' every global networking need, carriers brought new alliances, product introductions and integrated management and billing to the table at last week's Tele-Communications Association '90 conference.

British Telecom led the pack on the integrated services front, announcing that it has amalgamated its U.S. and overseas value-added network offerings under a single umbrella, Global Networking Services. "We see an interest among customers for a single global networking supplier, and we intend to be that leading supplier," said BT Tymnet, Inc. project director Michael Rude.

Through its Global Networking Services strategy, British Telecom will provide customers with a single service and sales organization and a single pricing structure for value-added networking services that extend to more than 100 countries, Rude said. British Telecom has united the sales organizations of its British Telecom and Tymnet companies into a single force that sells packet switching, electronic data interchange and electronic-mail services, customer premises equipment and videoconferencing systems, he added. "Customers have so many choices; they can tell us, 'We want a link between countries A and B,' and we can come up with the best way to provide it."

Transammonia, Inc. in New York is one company that bought into British Telecom's comprehensive approach to global networking support. "One-source global networking is key," said Jay Shroads, Transammonia's director of information systems. "I used to put circuits up between Europe and Singapore" involving various foreign Postal Telephone and Telegraph (PTT) authorities, and resolving network problems involved "a lot of finger pointing and problems with time and language differences," he added.

The fact that British Telecom has its own nodes in many countries eliminated the need for X.75 gateways to PTT services, "which create performance bottlenecks," Shroads said.

AT&T announced agreements to bring its virtual private network service to four additional countries through agreements with five foreign carriers: France Telecom, RTT Belgium, Mercury Communications Ltd. in the UK, Kokusai Denshin Denwa Co. in Japan and Unitel in Canada. AT&T already has virtual private networking agreements with British Telecom and OTC in Australia.

AT&T's virtual private network service is said to provide major discounts over ordinary direct-dial overseas rates. The "next wave of features" for AT&T's virtual private network offerings overseas will include dial-up 56K bit/sec. and 64K bit/sec. data services, which will be implemented as part of AT&T's global Integrated Services Digital Network rollout, AT&T director of international business services Ray Butkus said.

AT&T has no immediate plans to bring its global network offerings under its Unified Network Management Architecture platform, Butkus said.

Also at the conference, MCI Communications Corp. announced that it will interconnect MCI Mail with E-mail services in Scandinavia via the CCITT X.400 standard. MCI had earlier announced plans to acquire international carrier OTI, Inc.

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Landmark aims for DB2 third-party market

BY ROSEMARY HAMILTON
CW STAFF

Landmark Systems Corp. is scheduled to step into the IBM DB2 utilities market this week with a performance monitoring tool that it said will soon be linked with its other monitoring facilities.

Industry observers said Landmark, an established player in the CICS monitoring market, has a good shot at the DB2 third-party arena because it is still a relatively new field with no declared winners.

"This market will eventually be a mirror image of IMS," said Paul Hessinger, a consultant at Computer Task Group in Buffalo, N.Y. "In the early days, there wasn't really a need for IMS tools, but then that market became very strong."

IBM has also just about given the go-ahead to third parties for DB2 performance monitoring. While IBM offers its own tool, it is not a very advanced product and does not seem to be getting a strategic push from IBM, analysts said.

"IBM doesn't make a big deal of [its DB2 monitor]," said Shaku Atre, partner at Atre Computer Assistance, a division of Coopers & Lybrand. "IBM is more interested in providing the engine, and it can create more momentum for DB2 if third parties are selling utilities products."

Landmark will be joining several other performance monitoring companies, including Candle Corp., Boole & Babbage, Inc. and BMC Corp. However, observers expect Landmark to zero in on its existing customer base and play up the integration between monitor tools it will provide next year.

Selling point

One beta-test site fits that profile. Don Parrott, lead software systems engineer at Bi-Lo, Inc. in Mauldin, S.C., said he did not give the other DB2 performance monitors much thought because he is currently a Landmark customer, and the idea of integrating the performance tools was a big selling point.

Parrott, who installed Landmark's DB2 tool four months ago, said the company has been using DB2 since early 1989. Recently, the Landmark tool has come in handy to pinpoint trouble spots in the DB2 development effort.

"We had one application that ran 18 hours," Parrott said. "It was beating the system to death. With [the Landmark tool], we got it down to 30 minutes."

The Monitor for DB2 will begin shipping under controlled availability this week and is slated for general availability in December. A Landmark executive said the company will then begin providing links to its two other products, a CICS monitor and an MVS monitor, early next year.

The company will provide interface screens for each of the three monitors as maintenance upgrades. The update will allow users working with one tool to move directly into another one, said Richard Horseman, a marketing manager.

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Templates save on AS/400 coding

BY MARYFRAN JOHNSON
CW STAFF

LARKSPUR, Calif. — Synon, Inc. announced its first series of financial application "templates" for the IBM Application System/400 last week, claiming the products will help users develop customized software applications more quickly and less expensively.

Application templates are essentially building blocks for developing applications at the data model level rather than at the source-code or program levels. "They're a shortcut to getting applications completed," said Christopher Herron, president of Synon, which specializes in computer-aided software engineering (CASE) tools for the AS/400.

Built on Synon/2E CASE tools, the templates provide core application functions that serve as the nucleus for a specific application. At a cost of $5,000 per module, the Synon templates for general ledger, accounts payable and accounts receivable are available immediately.

"What you've got is 80% of a finished product, and you can tweak it as you see fit to tailor it to your needs," said Andrew Mahon, an analyst at New Science Associates in Southport, Conn.

Synon is hoping to sell its template customers on its own consulting services, because only users with in-house expertise in CASE, database design and template design will be able to do the job themselves. "This is not like opening a box from Microsoft and popping it on the PC," said Larry Lipner, president of Synon Consulting, Inc., a subsidiary of Synon.

Synon also introduced its Template Implementation Assistance Service, a one-week, $7,000 program that reviews the steps a customer must take to put the templates to work.

Synon officials said the templates are the first pieces of their new applications architecture, which combines Synon CASE tools with services from its consulting subsidiary. Eventually, Synon plans to offer templates across its entire product line, company officials said.

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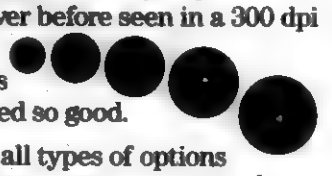

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HEWLETT PACKARD

Business as usual at ICL after sale

BY KENNETH WONG
IDG NEWS SERVICE

TOKYO — Despite Fujitsu Ltd.'s recent purchase of 80% of ICL, the British corporation will continue to operate as an independent company, according to ICL Chief Executive Officer Peter Bonfield.

"Technically speaking, ICL will be part of Fujitsu, but ICL will operate as it used to, and the management structure will remain stable," Bonfield said at a Hong Kong press conference that was part of an Asian tour designed to blunt speculation about the future direction of ICL. "The company will maintain its identity as a British publicly listed company with external shareholders."

The transaction, which will make Fujitsu the second largest computer company in the world, is expected to be completed by Nov. 30. ICL is now waiting for British government approval.

"We started looking for a partner two years ago as we planned to expand our operations in telecommunications and computers," Bonfield said. Fujitsu and ICL have been working together since 1981.

"So far, we have had no loss of business because of the merger," Bonfield claimed. Most of ICL's customers welcomed the acquisition, eyeing ICL's $1.3 billion cash reserves. "Our competitive edge has gained weight," he said.

The takeover of ICL enables Fujitsu to make inroads into the European market after 1992. According to Bonfield, ICL now has better access to Fujitsu's advanced technology in both computers and telecommunications.

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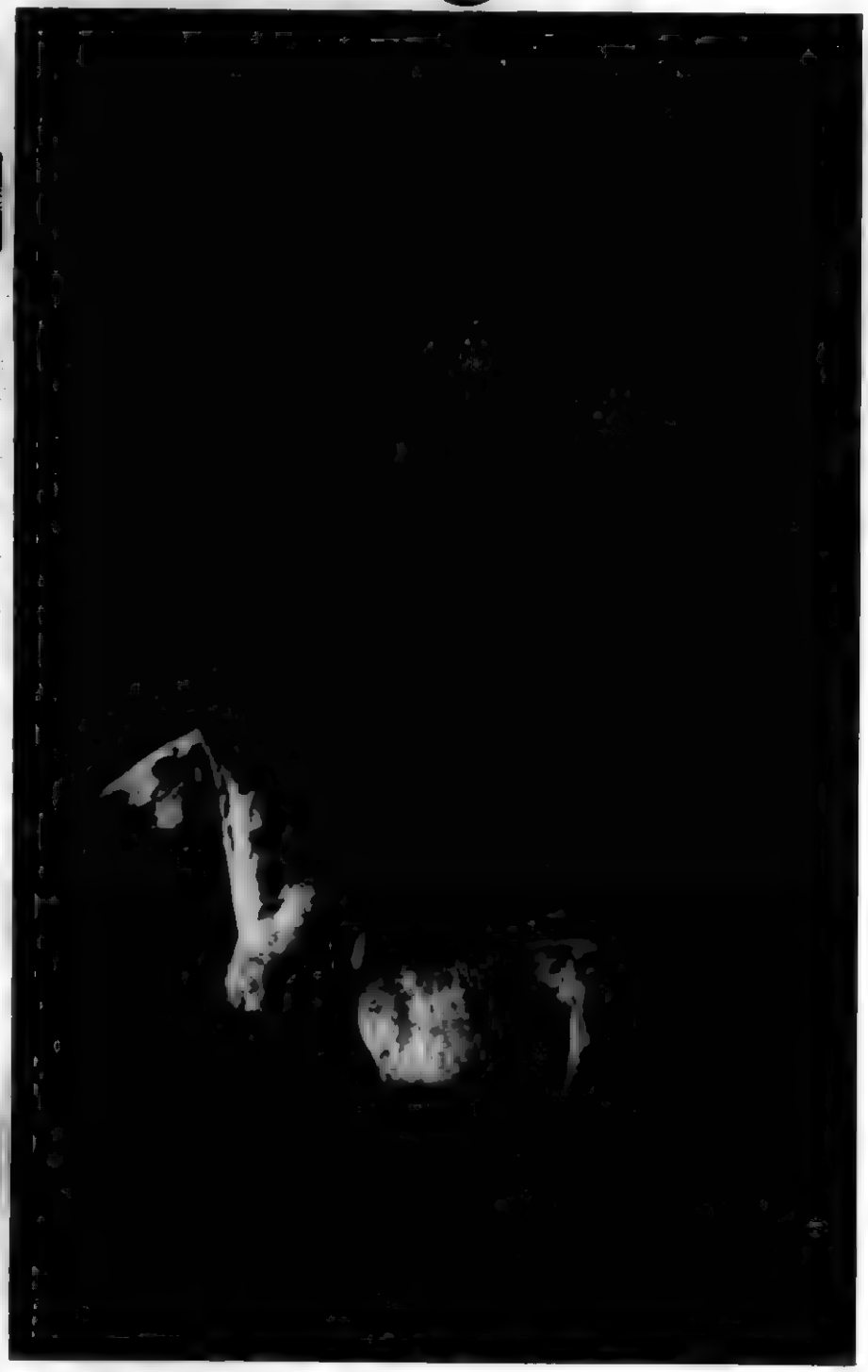

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Prodigy adds extra charges for E-mail

BY ELLIS BOOKER
CW STAFF

WHITE PLAINS, N.Y. — Flat-fee pricing for the Prodigy videotex service will not remain quite so flat for entrepreneurial users who have latched onto the venture's electronic-mail features.

Responding to excessive E-mail use from a tiny number of its clients, Prodigy Services Co. last month announced that it will end unlimited free E-mail on its videotex service sometime next year.

Since Prodigy announced its intention to end unlimited E-mail on Sept. 6, it has heard from a vocal minority of users. The firm has received about 2,000 negative letters from 700 persons, the spokesman said.

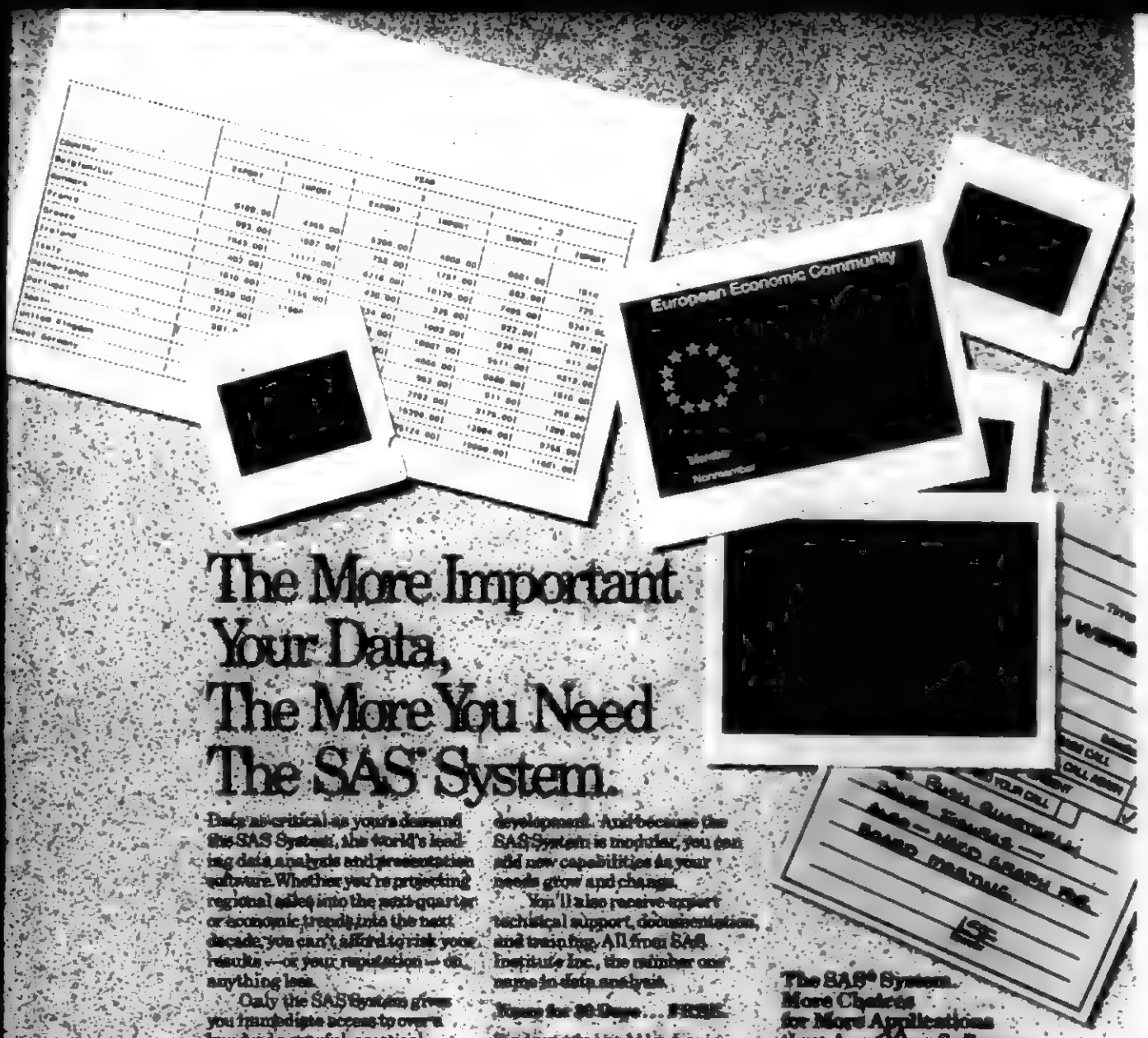
In August, 1% of Prodigy's 480,000 subscriber households sent 3.6 million messages — an average of 750 per user. The remaining customers sent fewer than 30 E-mail notes apiece that month, according to a company spokesman.

"We never in our wildest dreams thought we'd have that kind of E-mail [traffic] from such a small group of users," said the spokesman, who speculated that the traffic may represent businesses using Prodigy as an E-mail hub or for "underground" electronic bulletin boards.

Unlimited E-mail was a founding principle of Prodigy, a partnership of IBM and Sears, Roebuck and Co. that went on-line in October 1988. The service costs $12.95 per month.

The new E-mail pricing, due to go into effect sometime next year, will give all subscribers 30 free messages of any length per month. Beyond that, subscribers will pay 25 cents for E-mail notes of up to four pages in length.

Prodigy investigators discovered that one individual sent 20,000 E-mail notes during August — about 42 messages every waking hour. "We've learned what some people out there told us early on," the Prodigy spokesman said. "It's darn tough to make a business out of unlimited E-mail and a flat rate."



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ADVANCED TECHNOLOGY

Deep Thought boggles the human mind

Research garnered from chess-playing computers may eventually lead to advances in technology

BY DEREK SLATER
CW STAFF

After world chess champion Garri Kasparov handily defeated Deep Thought, a chess-playing computer, in two games last year, he declared that no computer would ever beat the best human players at the royal game.

Some researchers think otherwise. Chess-playing machines have made great strides in recent years, and it may only be a matter of time before a machine wins a world chess championship. Perhaps more valuable than a chess title, however, is the prospect of research using chess-playing computers leading to advances in factory automation, software design and other areas of computer technology.

A team of graduate students at Carnegie Mellon University in Pittsburgh began constructing Deep Thought in 1985. Engineering student Feng Hsiung Hsu built the machine's hardware. With programming by fellow students Thomas Anantharaman and Murray Campbell, Deep Thought was ready to play.

And play it has. Deep Thought weighs in with a national chess federation rating of 2552. That lofty number indicates that the machine's playing strength is on a par with the nation's elite. Master level chess players earn a 2200 rating. The average rating for casual tournament players stands at about 1600.

Tough match

"It's an interesting opponent," said British international master David Levy. Levy has served as a sort of human benchmark for measuring the progress of game-playing computers during the past 15 years. Prior to his 1989 meeting with Deep Thought, Levy won a series of matches against the world's top computers. Deep Thought, however, burned him — four games to none.

"It doesn't play subtle chess," Levy said. "It's very aggressive. It just comes at you."

Anantharaman, the project's software programmer, sees two practical applications of the team's success with Deep Thought. First, the computer is now refining its own program by using a database containing the move-by-move description of hundreds of grand master-level tournament games. Deep Thought examines the games and adjusts the numerical weights it assigns to each strategic factor according to the results. "Deep Thought is now better at improving its own evaluations than we are," Anantharaman said.

Anantharaman said expert systems can benefit from the same principle. "A robot can perform routine, well-defined tasks that humans are known to be very good at, such as housework," he said. "Let the robot learn from its own mistakes."

Second, Deep Thought illustrates "how much better custom hardware can do than general-purpose hardware" at performing specialized tasks, Anantharaman said. Money and time spent developing software for certain business or scientific applications may be better invested in dedicated machines, he said.

Dr. Hans Berliner, principal research scientist in computer science at Carnegie Mellon, offers a different perspective. Berliner is the creator of Hitech, another dedicated chess computer developed at Carnegie Mellon. Berliner said he sees great significance in the method by which the machines select their moves.

With minor modifications, both computers run "brute force" searches, examining every possible sequence of moves that could arise from the current position. Deep Thought extends this tree of possibilities as far as it can within the given time limit. It then selects the move that most forcefully leads toward an advantageous position.

Ross MacDonald

The strength of the computer lies not in its understanding but in the power of its brute force search. Under tournament time constraints, it can examine all possible positions five full moves in the future — a feat that no human could hope to duplicate.

"Search," Berliner said, "is probably the most misunderstood area of computer science." According to Berliner, a chess computer that could visualize all the way from the starting position to the end of the game would never lose. "It just needs a very limited understanding of completion: what checkmate is, what a stalemate is."

This principle can be applied to other areas of problem solving. "All this stuff humans tell each other, all these methodologies for solving problems are full of holes," Berliner said. "A brute-force search will bring out solutions that you would never see on your own."

The Carnegie Mellon team is already at work on Deep Thought's successor. The next machine will be capable of calculating an astounding one billion positions per second. By 1992, Anantharaman said, he expects to produce a machine capable of winning the world championship.

Intel tries new approach to processing

BY GARY H. ANTHES
CW STAFF

As part of a contract with the U.S. Department of Defense, Intel Corp. has shipped its first Iwarp prototype — a parallel processing system with ultrafast internal communications — to its research partner, Carnegie Mellon University. The university will use the computer to develop parallel programming tools and test its capabilities in image and signal processing applications.

Iwarp uses an approach to computing called systolic processing, in which data is pumped through an array of processors, undergoing one or more operations at each step. It achieves very high interprocessor communications speeds because it does not have to read and write intermediate results to memory but can operate on data taken directly from communications channels.

The architecture is ideal for signal- and image-processing applications in which huge quantities of data have to be processed in real time.

Iwarp is part of a program of the Defense Advanced Research Projects Agency (DARPA) to develop new architectures for high-performance, large-scale parallel computing for use in weapons systems. DARPA has structured the program to encourage dual-use technologies — those that will find commercial as well as military uses. Ken Harper, an Intel spokesman, said Iwarp has attracted the interest of several large companies that may obtain prototypes through DARPA. However, Intel has not decided whether it will offer Iwarp as a product.

An Iwarp cell is made from a single Iwarp component — consisting of a processor and communications circuits on one chip — and 18 memory chips. It delivers a peak performance of 20 million single-precision floating-point operations per second (FLOPS). Each processor supports four input and four output links, each with a bandwidth of 40M bit/sec., giving an aggregate bandwidth of 160M bit/sec. both in and out.

Harper said an automobile manufacturer is seeking an Iwarp prototype to develop a vision system for collision avoidance. The system, mounted in an automobile or truck, would employ an Iwarp cell to recognize impending danger and would override driver control, he said.

Two other companies are investigating use of Iwarp in vision applications for robotics, Harper said. Other possible commercial applications include fingerprint recognition, analysis of satellite photographs and high-definition television, he said.

Iwarp cells can be combined to produce an eight-board, 32-cell workstation with a theoretical peak speed of 640 MFLOPS, Intel said. A system with 1,024 cells and a peak performance of 20 GFLOPS could be built within existing constraints, according to the company.

The prototype shipped to Carnegie Mellon has 12 cells and supports 500K to 1.5M bytes of memory per cell. Iwarp demonstration systems support standard C and Fortran with extensions for intercell communications. Carnegie Mellon is developing parallel program generators that can convert existing serial codes into programs for parallel execution across multiple Iwarp cells.

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EDITORIAL

Full circle

Everything from world power to weather to washing machines to the economy works the same way: in cycles. The only difference is that some are more predictable and fathomable than others.

A decade ago, nearly all the attention of MIS/DP directors was riveted on technology issues. There were more than a dozen viable minicomputer companies pumping out 32- and 48-bit machines that were localizing the information landscape with their distributed data processing capabilities. Advanced programming languages were giving managers something other than Cobol to think about. Personal computers offered a radically different computing environment of the future for those who cared to think about them.

Ten years later, as the decade of the 1990s unfolds, IS chiefs and CIOs pride themselves on how little time they spend on technology matters. Bruce Rogow at Gartner Group pegs this time allotment at about three percent of the workweek of top IS executives — *three percent.*

Instead, they are focusing on more heady business issues such as melding the IS resource to the long-term goals of the company and, more importantly, using this resource to achieve those goals more effectively and efficiently than the competition.

Strategic thinking. That's what the IS brass spends most of its time doing in the current cycle. As for technology issues, these have become relegated and delegated to those lower on the IS food chain, even to the user departments.

As Rogow and others are increasingly noting, this has to change, and in some companies it is beginning to change. For a wide variety of compelling reasons, the ever-dynamic IS cycle is again moving toward technology and *relatively* away from the pure business issues that have dominated IS thought for the past couple of years.

We certainly observe this change in attitude with our own readership surveys, conducted four times each year for the past 15 years. Those surveys indicate a noticeable shift in preference for more comparative product analyses, information on emerging technologies and other tools to help sort through the welter of solutions available. The former mainstays of using IS for competitive advantage, honing information as a strategic resource and so on, are of relatively declining interest.

The good news is that the pure business acumen and skills acquired in recent years will come in handy for what will promise to be the greatest challenge of this decade: convincing corporate management to invest heavily in the exciting new platforms and architectures that are emerging during times when levels of business activity will likely be ebbing.

All cogent arguments will be grounded in a thorough understanding of precisely what these technologies will bring to bottom-line performance. Key elements of the sales pitch simply can't be left to small fish.

LETTERS TO THE EDITOR

Bias debate

Computerworld's editorial, "Glass houses" [CW, Aug. 20], appears to argue that the trade press is as honest, as objective, as responsible, etc., as the country's leading newspapers. Your argument would be much easier to swallow if you could give us a rough idea of how many "negative" stories *Computerworld* has printed about *its* advertisers and readers.

The Wall Street Journal, to name one example, routinely prints stories detailing misfeasance, malfeasance and nonfeasance in business. In some cases, it has included lengthy, detailed articles describing those activities by its advertisers.

Oddly, the only "negative" stories I recall seeing in *Computerworld* along those lines have reported on things such as companies being fined for improperly disposing of toxic waste — and those have appeared *after* the fines have become a matter of public record.

Owen K. Darrath
Brockton, Mass.

Bias debate II

Regarding your editorial that dealt with the objectivity of the computer industry trade press [CW, Aug. 20], I would characterise the trade papers by the following:

- A single-minded devotion to decentralization of computer hardware, with free publicity for such marketing inventions as "downsizing" and "open systems."
- Relentless promotion of microcomputer systems and products at the expense of all other types of technology.
- Blind acceptance of most vendor marketing claims as fact. Complex issues such as price/performance levels are oversimplified to such absurdities as MIPS ratings.

An outstanding example of the consistent bias of trade papers occurred in your front page article entitled "Fujitsu move rattles Europe" [CW, Aug. 6]. Figures presented with the article, which were corrected in a later issue, showed a very healthy European mainframe market of more than $9 billion per year, with a growth rate of 7% — nearly $1 billion — in 1989. IBM's growth in European mainframe shipments was shown as an outstanding 25% increase.

With these facts, what was the tone in the body of the article? That mainframe vendors in general, and IBM in particular, are in trouble because of downsizing and open systems. Nowhere was any evidence presented to support these points, and in any case, these subjects had nothing to do with the primary focus of the article.

If you want your publication to be truly useful to those of us in the information systems industry, I would suggest that you promote debate on this important topic — the objectivity of the trade press — and review your own editorial practices to remove the obvious bias that influences much of your coverage.

Donald Powell
Partner
Thurgur Powell Associates
Ottawa, Ont., Canada

CA-Idealist

I am writing regarding the Computer Associates International, Inc. CA-Ideal product review [CW, Aug. 27]. The poor ratings in the analysis/design, database setup and file maintenance transaction areas lead readers to view the product as an incomplete fourth-generation language solution at best and a closed architecture for enterprises seeking to implement an integrated computer-aided software engineering (CASE) environment at worst.

Criticisms noting "the absence of an integrated CASE tool," "cumbersome processes at the program code level" and documentation that was "not readable" do not reflect the experiences of our firm — a longtime user of the CA-Ideal/CA-Datacom, CA-Ideal/DB2 solutions.

The majority of CA-Ideal users we speak with are focused in another direction altogether. With the emergence of seemingly competing software architectures, the growing interest is in how to implement multiplatform, non-IBM Systems Application Architecture languages (CA '90s) in an IBM AD/Cycle framework without throwing away the investments already made in mission-critical CA-Ideal-based systems.

Steven P. Subar
Vice-President,
Sales and Marketing
MF] International
Chicago, Ill.

Computerworld *welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor In Chief,* Computerworld, *P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701. Fax number: (508) 875-8931; MCI Mail:* COMPUTERWORLD. *Please include phone number for verification.*

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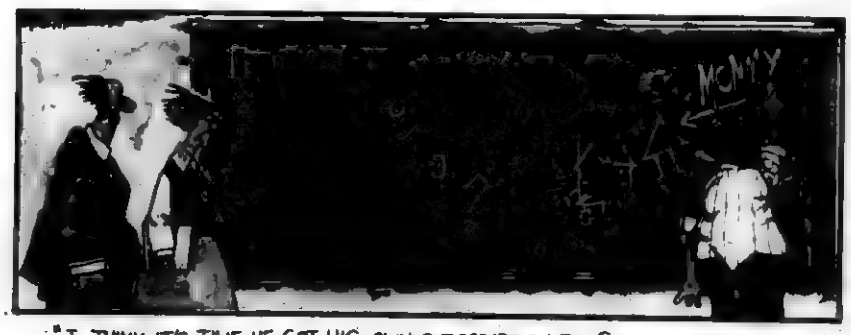

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Artificial ignorance: Not bliss

CHARLES P. LECHT

To set the scene for what is to follow, I want you to know that I think computers are wonderful and that almost every use of them provides us with some form of artificial intelligence endowment. I define AI as an augmentation of man's natural faculties of sense, recall and reason. The computer extends these beyond what is otherwise possible.

Along with the benefits we may expect from AI, I suspect that we may not escape encountering its negative counterpart, "artificial ignorance," or -AI.

-AI offers us the potential to so diminish man's natural faculties that we are deceived into believing the unbelievable, accepting the unacceptable — in general, being dumber than we really are.

For example, focusing on just one of man's senses — vision — people lived thousands of years without electronic computers, yet they reached some powerful visual conclusions. They discovered that the earth is a sphere, that nine planets circumnavigate the sun and that there are galaxies, and they estimated the size of the universe with as much certainty as anyone has been able to do since.

Before the invention of the electronic computer to aid us in mathematics, scientists invented differential and integral calculus and created trigonometry, geometry and statistics.

Sir Isaac Newton didn't have much more than paper and pencil to do the work he did in physics, yet Newtonian physics endures as an indisputable body of knowledge that describes a major part of our universe. Albert Einstein didn't use a modern electronic computer to reach his conclusions either, yet his theories endure as the definitive augmentation of Newton's universe.

In the logic arena, we'd be hard-pressed to find any invention that has surpassed those of the precomputer era. Russell and Whitehead didn't have a computer to help them; neither did Thomas Aquinas, Aristotle or his teacher, Parmenides. Yet their works increase in value as time passes. We need but cite the works of Marie Curie and Louis Pasteur to further our arguments on what the brain was able to produce in the biological world when modern electronic computers weren't around.

Today, we have modern digital computers, but we are hard-pressed to cite anyone or anything of equal stature derived from these, save a few events in space and communications technology. Not to demean the powers that modern computers offer, but we cannot escape the realization that the misuse of this power offers us the ability to create monumental blunders. This brings to mind America's most recent -AI achievement — the Hubble deep space telescope.

Bob Dalton

The cost of an entire space shuttle mission plus the cost of producing the blinded Cyclops was expended just to see what Galileo saw through his home-made telescope. Whoever issued for publication the pictures of the same heavenly bodies before and after Hubble snapped them had to be up to no good — we could not tell the difference between the two.

The Hubble blunder wouldn't have been possible without modern electronic computers. We can only conclude that it resulted from a massive augmentation of -AI by the scientists who planned the project. No human brain unaided by a computer could have erred so stupendously.

The money the Hubble trouble cost Americans may have been enough to cure cancer and acquired immune deficiency syndrome, with enough left over to shelter the country's homeless.

-AI had to be at work when the recent plethora of highly vulnerable, unusable and unneeded weapons were made in countries all over the globe. Don't get me wrong. I'm not against the creation of weapons, if for no other reason than to frighten off all the crazies that seem to abound in our computer age. But give me a break — the sight of the Stealth bomber sneaking above the non-radar of Panama is almost too much to bear.

What about the use of computers in commerce? Surely -AI was at work in the now famous Black Tuesday market crash in October 1987. A battery of systems all running the same program, augmenting the decision-making process of a legion of traders, had to at least have contributed to the cause of the implosion that made market yuppies wonder if their own brains worked anymore.

It seems as though -AI is the cause of most of the big blunders of our times, blunders that cannot be credited to individuals or even groups of individuals. You can't blame all of NASA for the Hubble fiasco, nor can you blame our mass of investors and brokers for Black Tuesday. Only a computer can screw us up on so large a scale.

Is it the fault of the humans operating the computer, regarding the computer-generated results as absolutely correct without using the old gray cells to check whether the results make sense? Of course it is! The computer is merely aiding the human brain in its inherent ignorance.

Lecht is an IDG News Service correspondent based in Tokyo.

Japanese decade gives way to European decade of '90s

JEFF ANGUS

The Japanese decade came to an end last December. Their dominance of business in the 1980s was valuable to microcomputer users. The miniaturization pioneered by Japanese electronics wizards, the constant flow of minor but cumulatively significant improvements in electronics products, their willingness to dump products at below cost — keeping computer prices in a downward spiral — were critical elements in the computer revolution. But the Japanese decade came to an end.

It wasn't because of technological shortcomings. It wasn't because of a failure of the much-vaunted megacorporation or their corporate-labor relations. It ended simply for two reasons.

First, no strategy — no matter how effective — is optimal forever because environments change. Second, through no fault of their own, the Japanese are basically outsiders in the largest economic boom to come along since the post-World War II growth in the U.S.

The '90s will be remembered as the European decade the way the '50s were the U.S.' private playground. Pundits are waxing poetic about the importance of 1992, the year most European nations will join their economies more closely through the Common Market (OECD). That is a side factor, not the key event.

The key factor was the opening up of Eastern Europe. The largest untapped per-capita consumer markets in the world are much bigger opportunities for advanced industrial products than China.

Those gross national product numbers are somewhat fuzzy, based on U.S. government numbers that the CIA recently admitted were off target, but the fact that those Eastern European consumers have considerable assets in savings is indisputable. When you hear about consumer anger in the former Warsaw Pact countries, it's because they have savings but nothing exciting to spend money on.

The unleashing of the Eastern European consumer will generate an unprecedented boom in the only economies in a position to take strong advantage of Eastern European expansion: OECD countries. It won't be the U.S., and Japan will only be a minor player. Neither country has the uncommitted liquidity to build up industrial capacity the way OECD countries do. So this windfall will accrue in OECD-based industries, and with that, their economies will grow like a bodybuilder on steroids — in every direction and without regard for aesthetics.

The European economy will sop up computers and software at the same unbelievable rate that the U.S. market did in 1983-1984. OECD companies are far less saturated with computers than their U.S. rivals, and with our market potentially flattening, the lion's share of growth will come across the Atlantic.

I think the most remarkable piece of that growth will be in portable office technology, since more companies, and therefore more people will be operating transnationally, traveling to do business with new customers across the continent.

It won't be the kind of boom computer analysts understand — a "more of the same in a different place" scenario. Europe is innately different from the U.S. and Japanese computer markets.

Former glory daze

In fact, U.S. computer industry pooh-bahs may not understand what has happened until after their European business has evaporated and their domestic business is a shrunken prune of its former self.

The European business market is in the same weight division as the U.S. and Japan but broken up into smaller groups, each with a separate spoken and written language and wildly varying cultures. Where Americans productively use technology to process words or store order forms and contact data, Europeans can make the most gains using existing technology to communicate across language and cultural boundaries.

Some vendor is going to make a bundle from word processors that translate business blather into 15 other languages, speech recognition and voice output systems that translate and pocket computers that advise on appropriate cultural behavior and track, in real time, current trade regulations in 20 countries.

The European boom is going to fuel a marked increase in artificial intelligence efforts. The last trend requires computers to work invisibly and remotely the way the telephone system currently does. It requires computers to become an extension of the telephone system, something the OECD countries are already way ahead of us in doing through integrated services digital network.

These quantum advances will come through European necessity. We will benefit economically if our industries are prescient enough to act, and we'll benefit from the trickle-down effects of the advances in AI and telephone-computer melding as European vendors peddle their revolutionary products to us.

Since the last great surprise in computing — the proliferation of PCs — seven years ago, the technology that organizations implement has changed in scale and horsepower but not in function. The '90s, the European decade, will provide the next surprise.

The computer of 1997, especially the portable computer, may be virtually unrecognizable to the user of today. Organizations that follow European technology developments most closely will be in the best position to harvest the rewards.

Angus is a manager at Paralion Computing, Inc., a manufacturer of Apple Computer, Inc. Macintosh networking hardware and software in Berkeley, Calif.

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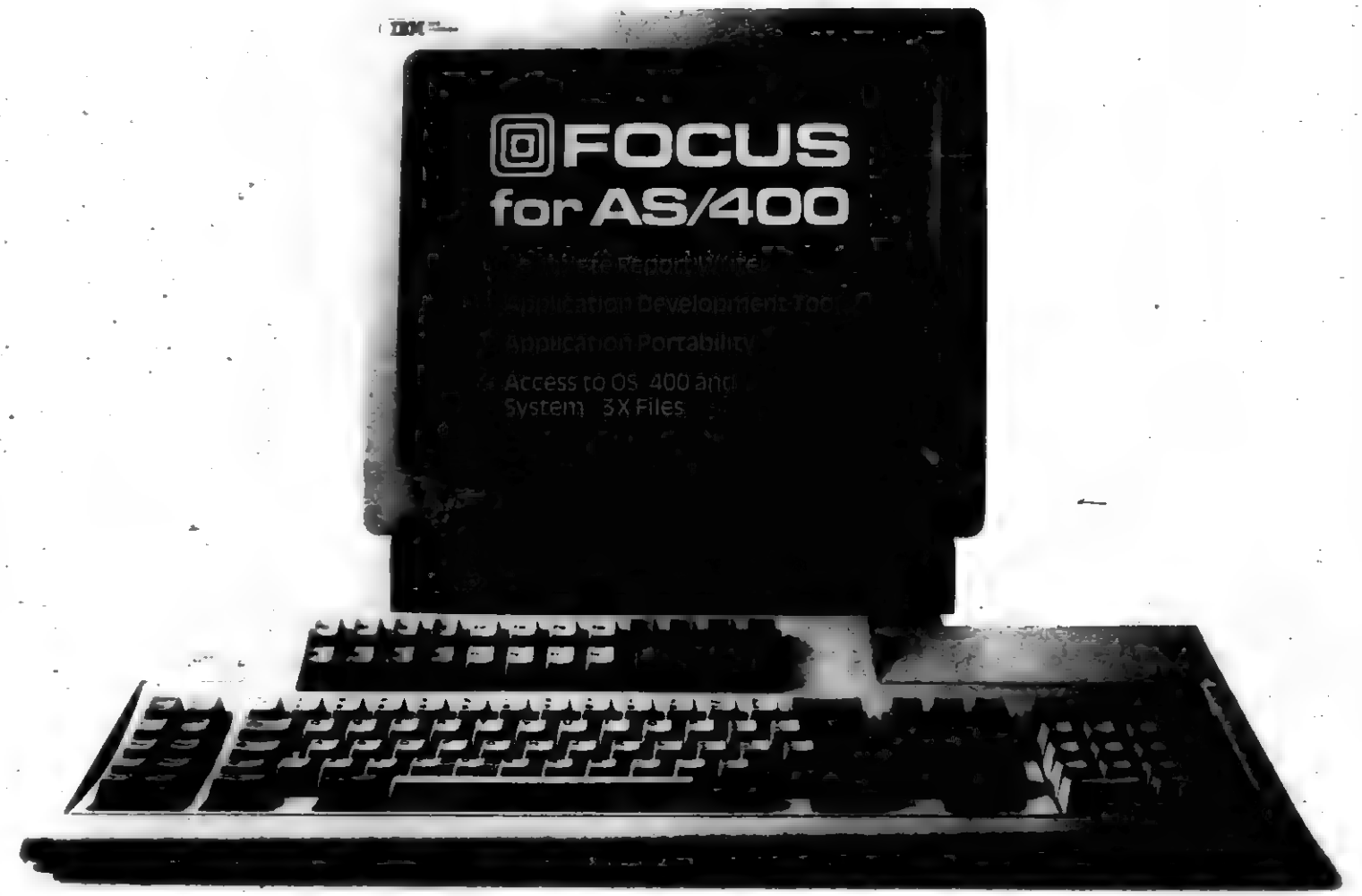

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COMMENTARY

J.A. Savage

Change vs. user loyalty

Hewlett-Packard is serious about open systems. That is clear. But whether it can parlay that commitment into a successful computer company in the next decade is certainly hazy.

Black clouds formed over analyst reports following the firm's recent financials, showing a net quarterly loss of 5%. Analysts such as Montgomery Securities' John Jones and Salomon Brothers' John Dean question HP's ability to survive the change to open systems.

If HP had started out in the late 1980s with new computers based on RISC architecture and the Unix operating system, the company would be flying like competitor Sun and to a lesser extent, Mips Computer. But HP has a curse that used to be considered a blessing — a large installed base.

Some of those longtime users — the ones with HP's proprietary operating system, MPE or even its 20-year-old real-time systems — just don't want to change. I don't blame them. They have time and capital invested in making those systems work for their own needs.

If it were up to them, HP would keep supporting those systems into eternity. HP likes those users. It does everything it can to keep them from being ticked off. Having heard from a cranky bunch of real-time operating system users at a user group conference in 1989, HP

Continued on page 36

AS/400 joins CIM's roster

IBM beefs up computer-aided manufacturing line, but is it enough?

BY ELLIS BOOKER
CW STAFF

IBM's move to bring its Application System/400 minicomputers and Risc System/6000 workstations and servers into the computer-aided manufacturing (CIM) arena may fill a hole in the company's CIM offerings and better position IBM against rival Digital Equipment Corp. in competition for small and mid-size sites, according to analysts.

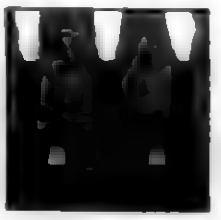
Yet some analysts complained that the delivery of the first CIM AS/400 product is nearly a year away and noted that IBM has not clearly set forth how its enterprisewide CIM solutions will include the AS/400 platform.

For example, IBM did not add support last week for its Distributed Automation Edition (DAE) to the AS/400's OS/400 operating system. DAE is a communications facility, currently available for OS/2, that supports access to data from multiple (both IBM and non-IBM) applications. An IBM spokeswoman said the CIM Series/400 will come with communications and routing services "equivalent to those provided by DAE."

"I buy them at their word that all the architectures will be coordinated ... The question is when," said Erik Keller, program director of the CIM service at Stamford, Conn.-based Gartner Group, Inc.

The AS/400 will manage the production and business applications and a shared database, while the RS/6000 will be used for design and engineering applications, and standard and hardened-for-industry versions of the Personal System/2 will sit on the plant floor.

However, Keller observed that connecting the Unix-based RS/6000 with the proprietary AS/400 could get expensive. "IBM will have to glue and patch to make that happen," he said. "It appears [users] will have to buy a Token Ring adaptor, some [Systems Network Architecture] programming protocols and one, if not two, software packages. When you start adding it up, it's not cheap."



"Needless to say, IBM has been badly hurt by DEC's midrange [products]," said Martin Pisaczalski, a senior industry analyst at The Yankee Group in Ann Arbor, Mich. Pisaczalski, said the new product may be attractive to smaller companies — ones not large enough to implement IBM's mainframe-based CIM products — and others that will want to use the AS/400 as a hub, connecting personal computers and workstations on the plant floor.

IBM introduced three CIM software solutions for the AS/400 and RS/6000 last week: the Base Edition, which includes an interface supporting data sharing with IBM's Manufacturing Accounting and Production Information Control System/Data Base; the CAD Integration Edition, which links IBM's Cadam or Catia design systems on the RS/6000 with an enterprise database on the AS/400; and the Application Edition, an electronic engineering management system that tracks changes in design and specifications through to production.

According to IBM, the CIM/400 products will be available starting in the third quarter of 1991.

IBM to replace faulty fans on some 3390 disk drives

BY ROSEMARY HAMILTON
CW STAFF

IBM is apparently not messing around when it comes to its top-of-the-line disk drives.

The company recently confirmed plans to replace all fan units on its 3390 disk drives shipped between May and August of this year.

The fans have the potential to cause system disruptions but apparently will not cause data loss. Two users who received drives during that time frame reported no fan-related problems. The situation was first reported by Technology Investment Strategies Corp. in Framingham, Mass. earlier this month, and IBM immediately confirmed it. The market research firm said the fan defect affects about 25% of the 3390 installed base of approximately 7,000 to 8,000 units.

IBM's quick and open response to the 3390 glitch may in part show its determination to put its problematic disk-drive history behind it. Its high-end 3380 drives had been plagued with faulty bearings, and the introduction of the 3390 was delayed last year because of a technical glitch.

"We are probably using a sledgehammer on a gnat here, but we can't leave any risk [of problems]," said Bill Reedy, IBM's director of storage systems marketing.

According to Reedy, the initial fan unit shipped with 3390 drives last year produced a slight hum, but it did not appear to harm the drives.

Nonetheless, IBM engineers set out to design a better fan early this year. But what was to have been a remedy ended up causing a larger problem. The new fan design had a defect that caused it to either wobble or get stuck, shutting the drive down.

Reedy said the defect did not show up when IBM tested the new fan unit before approving it for production. In August, IBM was alerted to one fan problem in the field, Reedy said, and the company immediately stopped production of the new fan unit. Within two weeks, another fan design was completed.

All new drives are currently shipping with the latest fan, Reedy said, and the new fan has neither second fan's defect nor the first fan's hum.

Reedy said the flawed fan unit has the potential to get stuck. When that happens, the disk drive's microcode senses a potential problem and shuts off access to the head disk assembly unit. Data currently being accessed is likely to get trapped.

Reedy stressed that the defect would not cause a system crash or loss of data. He said IBM is working with customers to determine when they can accommodate the repair job, which is expected to take 15 minutes.

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Voice recognition gives direct line to the Riviera

ON SITE

BY MARYFRAN JOHNSON
CW STAFF

NICE, France — *Toute La Cote d'Azur En Ligne Directe.*

That advertising slogan made its debut last spring throughout France, promising to put "all the French Riviera on direct line" with a single phone call.

What its designers say is the world's first voice-recognition information system at a tourist agency, "Com'-Azur" is both a high-tech experiment and a chic new marketing tool for the state-run Comite Regional du Tourisme in Nice.

"This is a new niche for us, a way to translate our knowledge into concrete details that our tourists can use," said Dominique Charpentier, director of the regional tourism agency. "Travelers want better information, greater freedom and speed in choosing and booking their holidays."

Based on Digital Equipment Corp. Microvax computers, the Com'Azur system allows callers speaking English or French to verbally browse through a database packed with a range of tourist options from the largest cities along the Cote d'Azur. The system logs 250 calls per day.

From a range of key word choices — sometimes the name of the city or special event — Com'Azur users can pick a hotel in Menton, rent a car in Monaco, book tickets for the opera in Nice, make reservations to dine in Antibes or check the dates for an art exhibit in Cannes.

All with a single phone call.

"The machine is only the pipe, really," Charpentier explained. "It puts the customer through to the destination."

If the caller selects a restaurant in Menton, for example, the system connects directly to the restaurant and waits in the background while the caller makes his own reservation. Then it comes back on-line to proceed with car rentals, hotel reservations and so forth.

The database is loaded with 2,000 pieces of information supplied by regional businesses, all of which can update or change their entries from their own "Minitel" terminals. France Telecomm, the public telephone company, has installed approximately 5 million Minitels free of charge.

The Cote d'Azur attracts 8.5 million tourists to southern France each year, and they pour at least $2 billion into the local economy. Yet that accounts for only 1% of worldwide tourism.

"Our problem is simple," Charpentier noted. "Destination Riviera has some very hard competition worldwide . . . The more accessible the Cote d'Azur is, the more attractive it is."

What callers do not see is the technical side of Com'Azur, which starts with Telic Alcatel 2600 E automatic switching equipment to handle the 30 phone lines, automatically dial the chosen service and indicate whether the line is busy.

Three DEC Microvax 3000s, each with 8M bytes of memory and 159M bytes of hard disk space, run the voice end of the system with Decvoice cards.

Charpentier *directs tourists*

The database, built on DEC's RDB, resides on a DEC Microvax 3400 with 28M bytes of memory and 400M bytes of disk capacity. The entire system is linked by Ethernet using Decnet and DEC-developed software.

The Com'Azur software was jointly developed by DEC and several French companies in the research science park at Sophia Antipolis — France's own Silicon Valley — located about 15 miles inland from Nice and Cannes.

In some ways, however, the system is still struggling to its feet.

The 30 leased lines cannot always handle the volume of calls, so would-be users often encounter busy signals. Other callers are put off by the mere idea of conversing with a machine.

"We need to develop the acceptance of the public," Charpentier acknowledged.

Making a profit from Com'-Azur is also something of a problem for the tourism agency.

French telecommunications regulations have effectively cut the agency out of the revenue picture thus far, with only state-owned France Telecomm reaping the income from those 250 daily calls.

"We are working on that," Charpentier said with a smile. "Our [telecommunications association] is in dialogue with the government now."

IBM vows commonality between AIX and OS/2

BY JOHANNA AMBROSIO
CW STAFF

ARLINGTON, Va. — Deciding whether to adopt Unix or OS/2 may soon become a bit less daunting. In a briefing here last week, IBM managers said they were building "common elements" to tie the two closer together.

The managers also pledged much-improved availability of the RISC System/6000 machines — the wait will be cut in half to 30 days by year's end — and said they have fixed all the major bugs that had plagued early AIX versions.

"You'll see a lot of commonality between OS/2 and AIX," said Jeff Mason, director of advanced workstations and AIX systems. "There will be common database managers, network management systems and compilers," he said. "And there will not only be commonality between AIX and OS/2 but between AIX and our other operating systems, like VM and MVS."

Mason said the choice of operating system will hinge on the user's background, training and preference. "OS/2 is for people who are moving up the Intel architecture line and want more performance. If they've invested in DOS, it makes sense to go to OS/2. But if you're coming from the Unix world, going to OS/2 might be a bit strange."

The distinction between the two "is going to blur in the longer term — people will choose one or the other, and it won't make much difference. People know what they want, and they don't agonize over the operating system decision," Mason said.

Open systems pledge

Furthermore, IBM will "demonstrate its commitment to open systems" by swapping out its current AIX kernel for the one that will be available from the Open Software Foundation, called OSF/1. "We'll do this over time when it makes sense to do it and without sacrificing any of the functionality now in AIX," said Donna Van Fleet, director of AIX systems in Austin, Texas.

IBM will also bring out an OSF/1 version for its Personal System/2 line of computers and "add functionality to allow the PS/2 to participate more as a family member with the RS/6000," Van Fleet said.

Versions of the OSF kernel will also be available for the System/370 and System/390 mainframe families, she said.

IBM managers confirmed reports that its strategies for computer-aided software engineering (CASE) in AIX and the mainframe worlds will be coming closer together. "Over time we will talk about an IBM CASE strategy, not just an AIX or AD/Cycle strategy," said Jerry Latta, applications solutions director for technical computing. Other directions for AIX include the following:

- Improved performance of the hardware and compilers with a goal of doubling performance every 12 to 18 months.
- An announcement to be made shortly about when the Nextstep interface will run on the RS/6000.
- Help screens on AIX to make it more user-friendly.
- Improved security, now at the C2 level, to go to the B1 level.
- Support for multiprocessing.
- Low-cost stand-alone RS/6000 machines.
- IBM will exceed its promise of 1,500 applications for the RS/6000 by year's end.

The managers said problems with early versions of AIX, including system crashes, have been fixed with the so-called golden version of AIX, Version 3.0, which shipped in June.

Van Fleet said problems arose with releases prior to this latest one. IBM "wanted to get the code out so our business partners would get a head start. But some didn't completely understand that this was early code, and they had different expectations," she said.

The RS/6000 is doing very well in sales, Mason said. "We're ahead of expectations and will ship more in the fourth quarter than originally planned."

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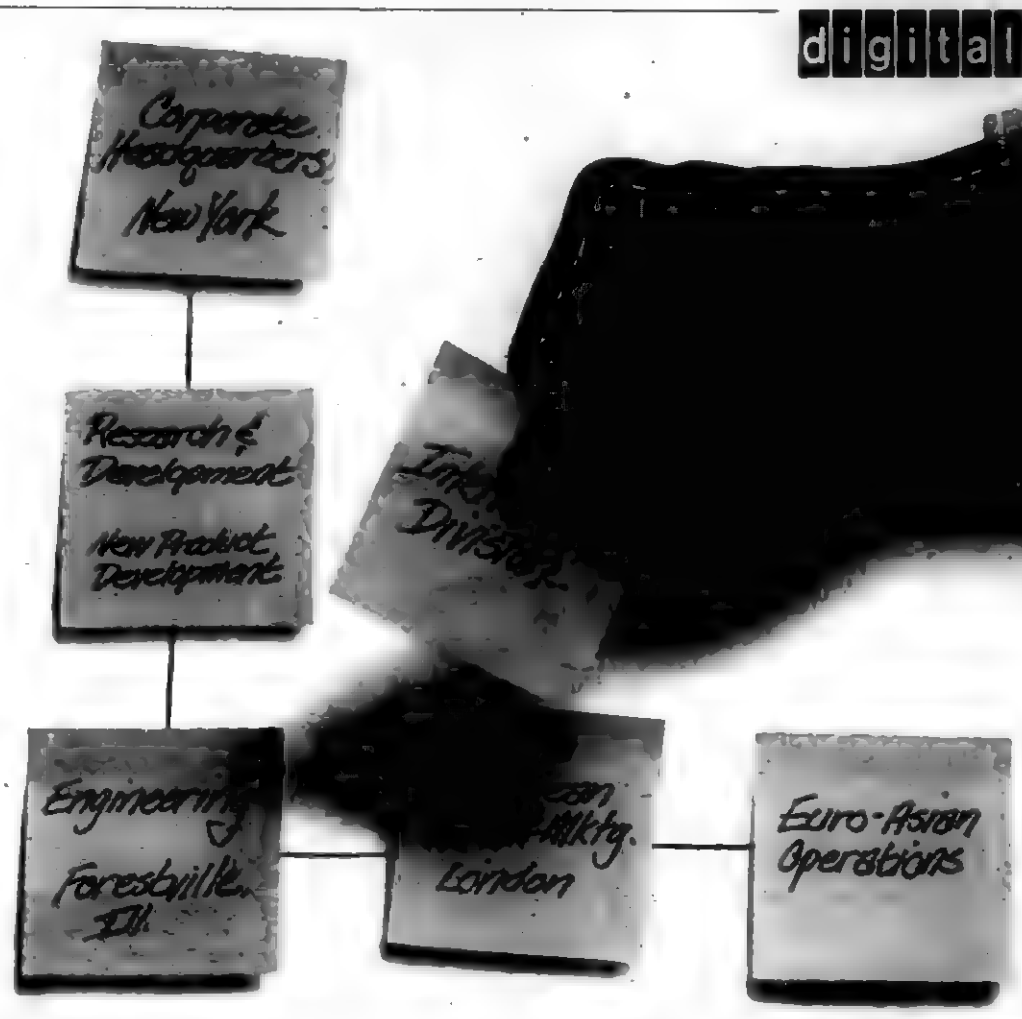

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AT&T Unix to gain enhanced security

BY JOHANNA AMBROSIO
CW STAFF

NEW YORK — AT&T's Unix System Laboratories said recently it will add security features and increased multiprocessor support to its version of Unix.

Additionally, AT&T Unix System V Release 4 will now include new file management and systems administration facilities.

Larry Dooling, president of Unix Software Laboratories, said the enhancements are consistent with Roadmap, a document issued by Unix International in January. About 12 firms are working with Unix Software Laboratories — an AT&T subsidiary that implements Unix changes recommended by the nonprofit Unix International — to deliver the System V enhancements.

"The product is on time, on track and meets the specifications without being partial to any one hardware architecture," said Peter Cunningham, president of Unix International.

The only area in which Unix Software Laboratories "could do better" is in supporting more of the industry-standard user interfaces, including OSF/Motif from the Open Software Foundation, Cunningham said. "It's quite apparent there will be three or four standard interfaces."

In the meantime, Unix security will be beefed up to adhere to the U.S. National Computer Security Center's B2 level. The first phase, the B3 level, will be delivered in the first half of 1991. In the second half of 1991, Unix Software Laboratories will make a rating kit available so users can test their applications to ensure they also conform to the B3 level.

Greater multiprocessor support will also be delivered in stages. By June 1991, a "standard" version supporting up to 16 processors will be released. It will be available for computers from Unisys Corp. and Motorola, Inc. and on Intel Corp. microprocessor-based machines.

By mid-1992, an extended version will support up to 30 processors — compared with fewer than 10 now — and user-defined interfaces and work in a B2 secure environment. Applications developed for the earlier multiprocessing version will run on the new one.

HP, Oracle sign deal

BY JEAN S. BOZMAN
CW STAFF

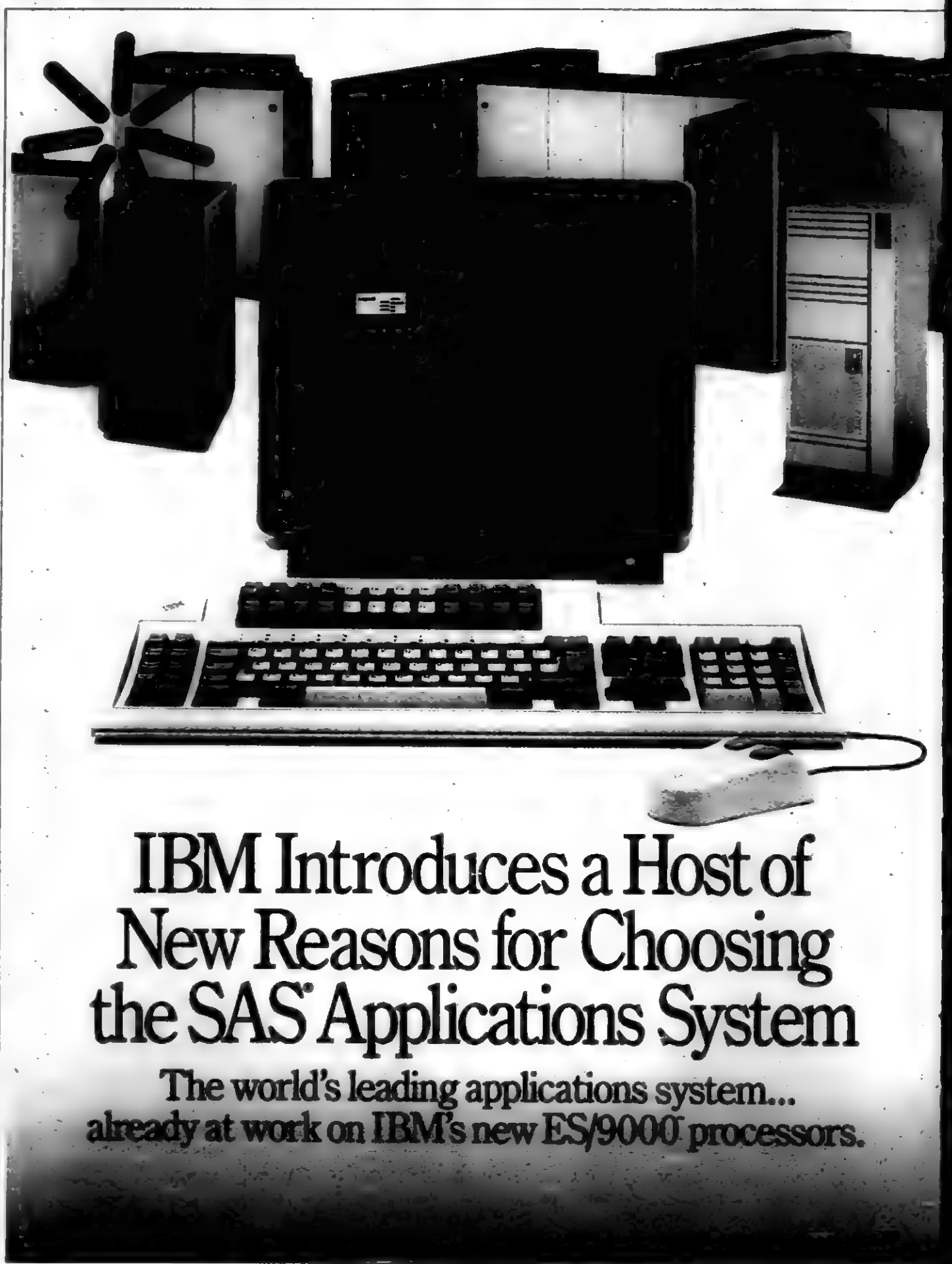
REDWOOD CITY, Calif. — Hewlett-Packard Co. agreed recently to enter into a strategic partnership with Oracle Systems Corp. just one week after announcing that it would buy 10% of Ask Computer Systems, Inc. Ask, in turn, offered to purchase Oracle competitor Ingres Corp.

HP managers said they see no conflict in supporting both the Ingres and Oracle database management systems because customers often specify which DBMS product they want to use.

"In our business situation, 40% of our users have chosen their DBMS and want to pick the hardware to run it on," said Laura Cory, marketing manager for HP's computer systems group. "We recognize that Oracle is one of the leading providers of software on Unix systems. It's clear to us that we need to be offering choices of all the leading [DBMS] products."

The move, which was announced to both companies' sales personnel during a national teleconference over HP's internal television network, will strengthen existing ties between HP and Oracle. Both sales forces are now authorized to sell each other's products.

"We really want to get down to the business of providing [applications] solutions," said Brian Owen, vice-president of Oracle's minicomputer systems group.



N.J. computer break-in raises doubts

BY JOHANNA AMBROSIO
CW STAFF

TRENTON, N.J. — The New Jersey State Legislature's information systems department is still scrambling to recover after a computer tampering incident raised some doubts about the system's security.

Seven months after some Democrats' computer files had allegedly been breached by one or more members of the Republican staff, the group that oversees the legislature's IS is trying to reassure people that the computers really are safe to use.

"We feel our system is secure," said Albert Perroni, executive director of the Office of Legislative Services, which manages the computer systems used in the New Jersey Assembly and Senate. Investigations into the incidents are being conducted by the Attorney General's office and by a joint ethics committee.

Another staff member, however, shed a bit more light on what happened. "The software we were using had a trapdoor. By the time we found out about it, it was too late," said the staff member, who requested anonymity.

No definitive information is available about the extent of the file prying. The number of files and people involved have been kept under wraps.

In the midst of the controversy are the legislature's two Wang Laboratories, Inc. VS computer systems. There were three at the time of the break-ins, but the legislature has since upgraded to two more powerful models.

The systems, which connect 120 field offices to the Trenton state house, are used for research, to track legislation and to provide public access to information.

The application involved with the break-in was a database system that some Democrats were said to be using for political work. Because a New Jersey law bars the use of state equipment for political work, some of the Democrats involved may also be facing legal action.

The scandal erupted in February, when Democrats began complaining that some of their files had been tampered with. Jeffrey Land, a GOP staff member who has been accused of illegally accessing those documents, was fired in March.

Data management staff members tracked the activity to Land, initially on a tip, Perroni said. "We ran a logger on [Land] and found he was able to access all the files in question." A logger tracks all the activity from any given terminal — which files were accessed and for how long.

Two events have combined to add new fuel to this case: Land is said to have come back to the jurisdiction and is ready to testify in return for the state's promise not to charge him with a crime.

Second, one of the state's top Republicans resigned on Sept. 7 after admitting that he lied to investigators about the incident.

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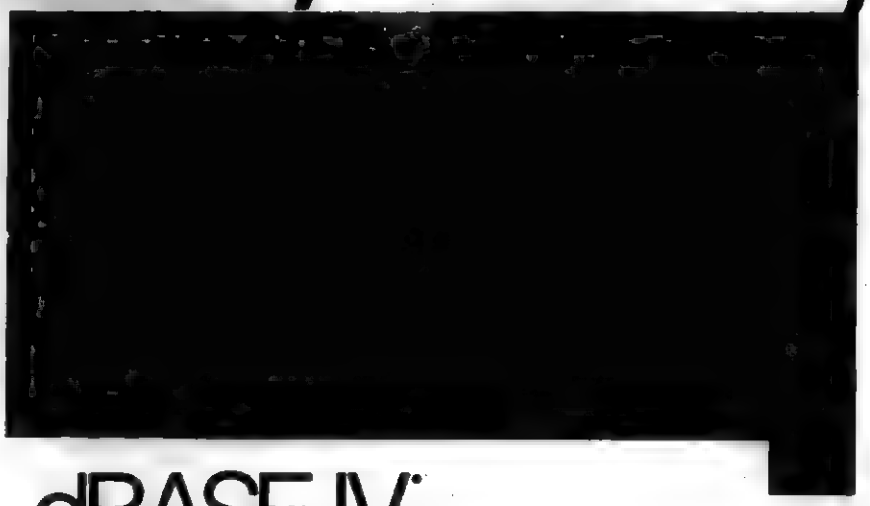

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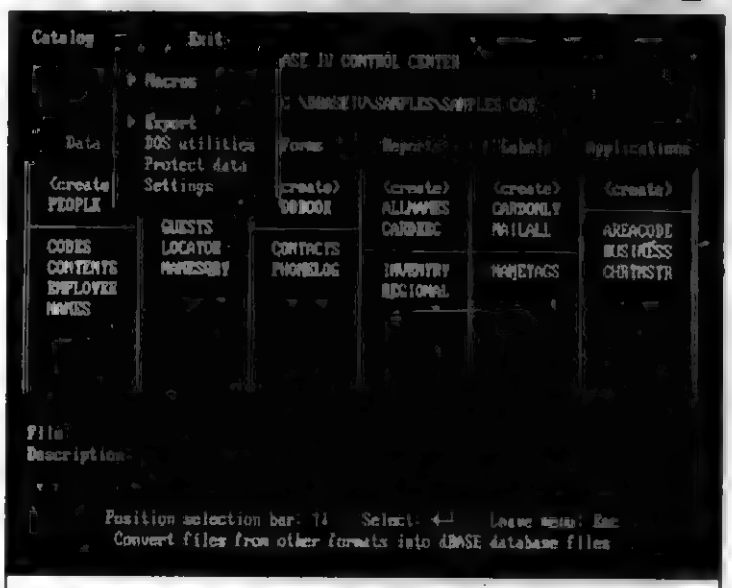

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REPORTER'S NOTEBOOK

Overcoming barriers

The User Alliance for Open Systems, formerly known as the Houston 30, began to get its act together at a two-day meeting in Warren, Mich., last month. What follows are some insights into the hopes and fears of the coalition of 45 information systems managers, which is promoting standards-based computing systems.

■

Leaders of the User Alliance said it is far too early to discuss what international standards the group will endorse, although it is clearly sympathetic to the IEEE Posix and the International Standards Organization's Open Systems Interconnect standards. They stressed that there are numerous management and "process" issues to tackle before getting technical.

Responding to persistent questions about whether the user group will back either Unix International or its rival the Open Software Foundation, spokesmen said that is the wrong question. "We want to get the process fixed so we don't have to make that decision," said Hughes Aircraft Co.'s E. W. "Bud" Huber, who was elected chairman of the User Alliance.

■

The IS managers were pleased with themselves for coming up with a mission statement that is crammed into a single sentence. The alliance's mission is "to overcome common barriers to achieving integratable business information environments."

The group also had to agree on a common definition for the term "open systems." The result is that open systems refers to "standards-based, vendor-neutral information technology products." Vendor neutrality provides interoperability and application portability among the hardware and operating systems of competing vendors, the User Alliance concluded.

■

In a draft report, the IS managers said they have a dream of systems integration that looks like this:

- Hardware and software products interoperate across enterprises and across vendors' systems.
- Applications and data are transportable.
- The environment is modular and scalable.
- Interfaces among parts of the business IS are well defined in vendor-neutral standards.
- The technology clearly supports business objectives.

"We need to integrate these islands [of technology] because the whole is greater than the sum of the parts," said Jere L. Thomas, a Humble, Texas-based consultant who was instrumental in the formation of the User Alliance.

■

The coalition, which began with a bias against creating yet another open systems consortium, found that picking one of the existing organizations to join was its most wrenching decision, according to Rick Barron of McDonnell Douglas Corp. The leading contenders were the Corporation for Open Systems (COS), X/Open Ltd., Computer-Aided Manufacturing International and the National Institute of Standards and Technology.

Each contender had its advocates, but none had a perfect fit with the User Alliance's mission. For example, COS is primarily focused on networking, and UK-based X/Open was perceived as being foreign and vendor-dominated.

In the end, the User Alliance voted to join COS after the McLean, Va.-based consortium agreed to stretch its boundaries to include user groups promoting open computing systems. Final negotiations are under way to address user fears that the User Alliance might be swallowed by the vendor-dominated COS and lose its identity. In addition, the group is trying to find a way for smaller companies that cannot afford the COS dues of $25,000 to join the User Alliance, Barron said.

■

A major goal of the User Alliance is somehow to bring down the cost of investments in open systems.

Standards-based products tend to be more expensive than proprietary systems, not to mention the difficulty of replacing the older "legacy systems," users complained.

Product costs will not come down until there is a critical mass of open systems products and users, added Michael A. Kaminski, manager of General Motors Corp.'s Manufacturing Automation Protocol program.

Furthermore, corporate executives will have to focus on the long-term, or life-cycle costs of their information systems, rather than on high up-front costs of open systems, said Don Simonton of the National Aeronautics and Space Administration's Johnson Space Center in Houston.

MITCH BETTS

RISC processor to boost AMD chip line

BY MAURA J. HARRINGTON
CW STAFF

SUNNYVALE, Calif. — Advanced Micro Devices, Inc. (AMD) last week announced a new reduced instruction set computing (RISC)-based embedded processor that analysts said should bring added power to the company's 29000 chip line and allow AMD to keep its standing in the competitive embedded chip market.

The new 40-MHz AMD 29050 chip, which is an upgrade to the company's 29000 line of RISC-based embedded processors, is expected to include a built-in floating-point coprocessor, according to a company spokesman.

Products that might use the AMD 29050 include graphics-oriented products such as scanners, graphical "smart" terminals, color laser photocopiers, laser printers and Adobe Systems, Inc. Postscript-compatible printers as well as network node controllers, the spokesman said.

Target market

"The significance is that the 29K family of processors is targeted for the embedded control market, which is sensitive to cost and space. Most embedded processor manufacturers prefer one-chip solutions," said semiconductor analyst Jack Karp, vice-president of Meta Group, Inc. in Westport, Conn.

The new one-chip combination processor and floating-point coprocessor could, indirectly, bring down end-user costs because the manufacturer's costs would be less, said semiconductor analyst Dean McCarron, vice-president of technology at Instat, Inc., based in Scottsdale, Ariz.

However, end-user costs would probably only be driven down by competition because, "When you're dealing with an embedded controller situation, [the processors] are going into large products that are volume sensitive . . . A lot of times, for these companies to make a profit, they'll use semiconductors to bring down their costs, and they may not want to pass that on to the end user," McCarron said.

Savage

FROM PAGE 27

recently announced a new version of its real-time system. Users wouldn't have to throw out all their old software.

In an effort to keep everyone happy, HP is not only refusing to get rid of any of its old architectures, but it is attempting to give those old systems a bridge to Unix. This is not easy, and it takes up a significant amount of research and development. For example, in order to change Unix to allow it to work with HP's real-time system, RTE, much work needs to be done on the open operating system in terms of interrupts (making sure that first priority gets to the top under the Unix approach to nonjudgmental multitasking) to allow Unix to function more closely to real time.

HP also has no plans to get rid of its proprietary operating system, MPE. Instead, HP engineers are figuring out a way to get Unix to run simultaneously with MPE on one platform. There will be a bit of a performance degradation on Unix applications — HP is shooting for 10% or less — but it will keep users happy with their old proprietary systems while allowing them to dabble in Unix.

A more soft-spoken bunch of users want to see HP prosper in the '90s, and they understand that the way to keep HP and perhaps their own companies afloat is to support open systems. HP doesn't get much of a chance to hear those voices, because the louder user contingent is resistant to change. The company is torn between what it knows it has to do to compete and what it thinks it has to do to keep its installed base happy.

With its dual open system/proprietary system products, it may have found a way to keep everyone happy. The question remains, can any business afford to be all things to all users?

Savage is a Computerworld West Coast senior correspondent.

NEW PRODUCTS — SOFTWARE

Applications packages

Friedman and Associates, Inc. has added an Import Tracking System to its HFA Manufacturing, Distribution and Financial software system, which was designed for IBM's Application System/400 machines.

The system provides import tracking, costing and accounting functions needed by firms that conduct business with overseas suppliers. It can reportedly track overseas shipment data such as credit letters, estimated and actual arrival dates and freight costs.

The Import Tracking System is priced between $3,000 and $6,000, depending on CPU size.
Friedman and Associates
108 Wilmot Road
Deerfield, Ill. 60015
(312) 948-7180

Philip Lieberman & Associates, Inc. has announced a menu-driven software package designed for managing employee time sheet data.

Version 3.0 of Staff Time Accounting enables users to produce four types of tracking reports that list incurred time by project, client and employee. Cost and billing amounts are included.

The software package, which runs on Digital Equipment Corp. VAX machines, is priced at $1,900.
Lieberman & Associates
1010 S. Weinbach Ave.
Evansville, Ind. 47714
(812) 479-5064

Powersoft Corp. has added two software modules to its Growthpower Manufacturing System, a materials requirements planning II information system designed for manufacturers.

Warrantyplus automates the fulfillment of complex product warranty claims, and Creditpower enables Growthpower users to expedite the collection of receivables.

Growthpower runs on Hewlett-Packard Co. 3000 series minicomputers and costs between $44,000 and $200,000. Warrantyplus is priced between $9,800 and $17,150. Creditpower ranges from $7,000 to $12,250. Prices are based on the number of users.
Powersoft
70 Blanchard Road
Burlington, Mass. 01803
(617) 229-2200

System software

Systems Center, Inc. has announced an automated systems administration package designed for IBM Application System/400s.

The AS/Center includes five menu levels: executive review, strategy directives, operations management, console supervision and operator tasks.

Several other features include a backup strategy, a structured recovery procedure, report and print management functions and a systematic method of reclaiming wasted disk space.

The product is scheduled to be released this month for a list price of $4,000 to $15,000 per processor.
Systems Center
1800 Alexander Bell Drive
Reston, Va. 22091
(703) 264-8000

COMMENTARY

Patricia Keefe

Doing the OS/2-step

Put on your dancing shoes.

Besides making public what everyone already knew, the IBM-Microsoft announcement two weeks ago proved that the dynamic duo sure knows how to waltz — around key questions.

Sure, they told us they were splitting up responsibility for OS/2 — a move, incidentally, that anyone with even half a brain could see coming a mile away. The fact that the division of labor put the development of the 32-bit OS/2 Version 2.0 in the hands of the developer most anxious to see it released is not exactly a sign of unity.

What it is, however, is assurance that the product will be completed and shipped. And both users and developers needed that.

While fine as far as it goes, this is not startling news. What many people really wanted to know were some details — particularly about the lesser parts of the announcement — concerning things both said and left unsaid. But IBM and Microsoft were not very forthcoming. One concerned OS/2 developer quipped last week that perhaps she should begin looking for something else to occupy her

Continued on page 41

Bringing up 'baby' computers no small feat

ANALYSIS

BY MICHAEL FITZGERALD
CW STAFF

You could call them baby computers, as in "slip that baby into your pocket, and let's go." But the palm-top and handheld computers that are out there bill themselves as fully featured and fully capable of doing solid work. Still, users seem to be holding these babies at arm's length, as though they are in need of having their diapers changed.

A case in point is the Poqet computer, which its makers claim is the only fully DOS-compatible member of the handheld family. September marked Poqet Computer Corp.'s first anniversary as a company with a product. The Poqet only started shipping in volume in August and met precious little user demand.

Handful of Poqets

La Jolla, Calif.-based Computer Intelligence, which surveys large corporations, showed only a handful of Poqet purchases among 7,400 sites last year and does not expect to see an upswell in the near future.

"I think there's a place for it," said Dan Ness, an analyst at Computer Intelligence. "But I still think that you're going to find a lot more people who want a more self-contained personal computer."

Poqet said it believes it is just a matter of getting the word out to corporations. The firm recently sponsored executive briefings throughout the U.S. About 100 attendees filled the room at one held in Chicago. While many remained skeptical, several people saw possibilities for their companies.

One, an executive vice-president at a major builder in downstate Illinois, wants his 250-strong force of field engineers to carry computers and complains that "they won't even touch a notebook because it's too big."

He thinks Poqet might provide the answer to his problem.

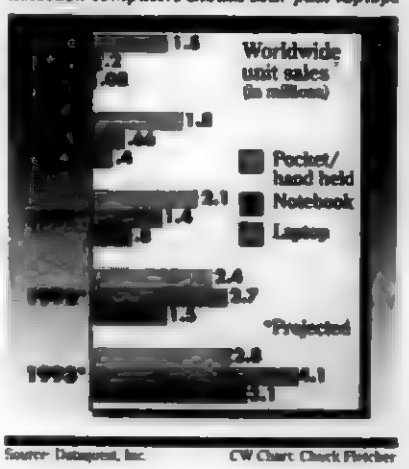
Poqet also looks to be the answer for a company in California. Robert Seat, president of Seatree Nursery, Inc. in Irvine, Calif., said recently he will buy eight to 10 Poqets as soon as the company comes out with the 1M-byte random-access memory cards that Poqet has indicated will be available in November.

Seat's company is currently using two Poqets to do inventory management. Seatree has 130,000 to 140,000 trees, from

Continued on page 40

Tiny giants

While sales of all types of battery-powered portable PCs will show growth, pocket and notebook computers should soar past laptops



Source: Dataquest, Inc. CW Chart: Chuck Fletcher

Stardent takes aim at low, high ends

BY RICHARD PASTORE
CW STAFF

NEWTON, Mass. — Stardent Computer, Inc. moved to establish itself as a full-range graphics supercomputer vendor late last month with the introduction of a significantly less expensive line as well as a new high-end system.

The Stardent 500, which retails from $30,000 to $40,000, is intended for users of low-end imaging, scientific and engineering applications who could not afford to buy Stardent's previous $80,000 entry-level systems.

"It's the first system in its price class that's got a dedicated [mathematical] vector processor built into it," said Richard Fichera, a graphics workstation and technical computing consultant based in Groton, Mass.

The low-end introduction positions Stardent as a "full-range workstation vendor instead of just a niche player at the top end," Fichera continued. Stardent needs such an entry to compete with the low-cost Personal Iris from Silicon Graphics, Inc. and the low-end RISC System/6000 workstation from IBM, among others, he noted.

The system runs Stardent's version of AT&T's Unix System V Release 3.0 and supports the company's Application Visualization System.

The 500 is powered by up to two 32-MHz reduced instruction set computing (RISC) scalar processors and two RISC vector processors. It delivers a peak performance of 64 million instructions per second (MIPS) and 96 million floating point operations per second (MFLOPS).

In image processing, the 500 can manage a minimum pixel transfer rate of 5 million pixels per second. The unit reportedly supports all application packages currently available for Stardent's 3000 series.

Stardent also unveiled its top-of-the-line Stardent 3000VS, which differs from the 500 by offering up to four RISC scalar processors and sustainable processing rates of 100 MIPS and 100 MFLOPS. The system is intended for the most complex scientific, technical and graphics applications.

Like the 500, the 3000VS models are slated to ship by the end of the year. Prices will range from $109,000 to $185,000.

Some folks think that COBOL, the language of the past, may also be the language of the future!

"Micro Focus COBOL for Presentation Manager has suddenly become the right language." . . . . . **BYTEweek, 6/19/89**

"And COBOL, the language everybody uses without admitting to it - also refuses to go gentle into the night of old technology. . . Micro Focus appears ready to bring the old-time language into the brave new world of graphical user interfaces." . . . . . **PCWeek, 6/5/89**

Micro Focus COBOL/2 Workbench Awarded 1989 Professional Solutions Award . . . . . **PC Tech Journal, 2/89**

"The COBOL/2 Workbench, available from Palo Alto based Micro Focus, Inc. is by far the most powerful and complete PC-based COBOL development and maintenance toolset. This package is the Cadillac of PC COBOL toolsets." . . . . . **System Builder Magazine, 1/89**

Micro Focus "ANIMATOR is a sparkling example of the reason why the PC-based COBOL workstation represents a quantum leap in programmer productivity." . . . . . **Database Programming & Design, 10/88**

"Could COBOL be the key to the success of OS/2?" . . **BYTEweek , 6/19/89**

Micro Focus Awarded Four Out of Four Ribbons for "Overall Value" in Readers' Choice Awards . . . . . **InformationWEEK, 4/24/89**

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License renewal goes self-serve

ON SITE

BY JAMES DALY
CW STAFF

SACRAMENTO, Calif. — For most of California's 20 million licensed drivers, a trip to the Department of Motor Vehicles (DMV) ranks right above a root canal on the personal enjoyment scale.

But that may not hold true very much longer. Beginning this month, DMV officials will help anesthetize the pains often associated with a trip to their overcrowded offices with an interactive terminal that streamlines the test-taking and fee-collecting segments of the license renewal process.

Drivers needing to renew their licenses in person can use an NCR Corp. terminal housed in a special kiosk that looks and acts like an automatic teller machine, said Gary Nishite, chief of the DMV's office of technology.

After keying in their driver's license number, applicants work with a touch-screen display that pulls up test questions stored on a laser disc within the terminal. Short videos illustrating typical traffic situations are also run, and questions pop up relating to the clip.

The terminal scores the tests, allows users to change addresses or other personal information and then collects the renewal fee using either a Visa or Mastercard — tasks previously handled by a DMV representative.

The scored answer sheet is taken to a clerk, who completes the process by administering an eye test, snapping a photo and issuing a license.

The NCR terminal is currently in pilot locations in Los Angeles, San Francisco and Sacramento, but it is expected to be widely distributed by next year to handle the 6.5 million licenses the state issues annually.

While the interactive terminal promises to speed what can often be a laborious renewal process, spokesman Bill Gengler said it is still only a half-step toward the DMV's goal: the full issuance of a license. "We still need the clerk in the process because there are important security concerns that need to be worked out," he said. "For instance, how do we know if the person taking the test is actually the one applying for the license?"

A possible solution, Gengler said, is to add a fingerprint scanner to the machine, which would then match the print with a central database containing the fingerprints of all licensees. The DMV moved in that direction recently when it inked a contract with North White Plains, N.Y.-based Fingermatrix, Inc., which will supply scanners to the DMV.

Gengler said the NCR terminal will probably never be used for first-time license applicants because important issues such as verification of age will always require human interaction.

Still, the machine's implications are broad. Nishite said the licenses could ultimately be enhanced to become standard credit cards for government business transactions such as welfare benefits processing and hunting and fishing licenses.

California DMV's *Lisa Ito tries out self-service license renewal system*

Critics find Systempro benchmarks unconvincing

BY MICHAEL FITZGERALD
CW STAFF

While Compaq Computer Corp. exulted over a recent benchmark test showing that certain configurations of its Systempro are capable of transaction performance equaling minicomputers such as Digital Equipment Corp.'s VAX 4000-class machines, those results are being met with skepticism in some quarters.

Compaq released results of a TP1 benchmark conducted by Codd and Date, Inc. in San Jose, Calif., which showed that a Systempro 486/33 with dual Intel Corp. I486 microprocessors could achieve 42 transactions/sec. when running Oracle Systems Corp.'s Oracle Server under The Santa Cruz Operation's SCO Unix with SCO MPX.

"[TP1 is] worthless — no one should ever suggest that TP1 results [have] value greater than the paper on which they are written," charged Omri Serlin, head of Itom International in Los Altos, Calif., and founder of the Transaction Processing Performance Council (TPPC). "Every vendor fixes the test results to show [results] their own way, and I would strongly recommend users to disregard them."

Serlin expressed disappointment that Oracle, one of the earliest members of the TPPC, would be using TP1 benchmarks, rather than TPC Benchmarks A and B.

Codd and Date's Tom Sawyer said that Oracle has become much more strict about its TP1 benchmarks since a controversial test released in July 1988, in which Oracle ran a test that was essentially a batch file, giving it greater performance than it would otherwise have achieved. As for the hardware, Sawyer said, the machine's performance was not in question.

The Systempro with dual I486 chips only recently became available. It is expected to retail for $95,432.

Scanner moves OCR closer to desktop

BY JIM NASH
CW STAFF

Will optical character recognition (OCR) reach the desktop? A new product, the result of a collaboration between Calera Recognitions Systems, Inc. and Microsoft Corp., could come close to putting it there.

Calera, in Santa Clara, Calif., recently introduced Scan In, an OCR macro program that teams its Wordscan OCR firmware with Microsoft's Word for Windows software. While the hardware used to scan documents remains bulky, Calera claimed to have developed software making the operation of the equipment almost a DOS utility.

Using the Scan In macro, users working on a Word for Windows file can reportedly call up a scanning command from the menu, feed in a document and incorporate that document into the original file. Previously, users either had to get out of word processing and into the Wordscan program to scan a document, or they had to use multiple sessions on Microsoft's Windows Version 3.0. The macro will be standard in all Wordscan and Wordscan Plus systems this fall. It will be free to owners of current versions of Wordscan Plus.

At the State of Delaware's public advocate office, Evan Wilner has had to work with the latter solution. As the public's representative in hearings to set rates and rules for Delaware's public utilities, Wilner said he deals with "thousands of pages of verbatim transcripts."

The testimony must be scanned, stored, indexed and retrieved — often on tight deadlines for cases involving billion-dollar corporations. He said his three-person office is likely to pick up Scan In after its scheduled October delivery. Wilner said he expects to see a 5-to-1 time savings using the macro program.

A quick utility

Jude Gartland, senior vice-president at Lehman Bros. in New York, said his firm primarily uses a Wang Laboratories, Inc. mainframe in its word processing center to handle data from printed resources. That could change, Gartland said, if the task of combining paper documents with existing files were made easier.

"It sounds as if you can now use [scanning] like a quick utility. That would be much more natural," he explained. Gartland said more word processing might be done at the desks of Lehman executives rather than in the company's word processing center if scanning were streamlined.

Walt Kasha, director of marketing at computer consulting firm Gilbert & Associates, said the macro program delivers on Microsoft's promises that Windows would give users task-oriented capabilities outside of its own line of products.

"We're finally exploiting Windows," Kasha said. Users, he explained, want to know what needs to be done, not what commands have to be used to complete their work.

Gartland agreed, saying the true advantage of the product was not so much in performing multiple tasks but in lessening the information users must know just to get their jobs done.

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PC Week
June 12, 1989

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Baby

FROM PAGE 37

four to 40 feet tall, on 300 acres of land.

"If you have a whole number of people lugging a laptop into the field and trying to use it in the field, well, laptops are fine if you have a lap, but if you don't, what do you do?" Sent asked. Still, typical corporate reactions are similar to those expressed by an executive at a government agency that is looking to replace about 1,500 laptops: "It was cute, but it really doesn't have any use in our business. I might consider one for personal use, but we tend to stay in one place for one to two weeks, so I couldn't see us wanting to purchase anything like that at this point in time."

Companies are most likely to use or want Poqets in cases such as that of Seatree Nursery, where weight and space are major concerns, analysts agreed. One handicap for Poqet may be the lack of full-sized ports and a full-sized keyboard. Poqet's keys are the same size as a regular keyboard but are closer together at the base, and even the company admits that typing speed is not likely to get much higher than 30 to 40 words per minute.

Bruce Stephen, an analyst at International Data Corp. in Framingham, Mass., thinks Poqet has a solid target in highly mobile people, but he said the difference between Poqet and even a conventional laptop has slowed acceptance by the corporate user.

Not the norm

"The challenge [Poqet] faces is that it's innovative, and it's sort of a departure from what people are used to in a notebook machine," Stephen said.

The RAM cards also present a challenge, as an entirely different and far more expensive form of media than conventional floppy disks.

Despite the new media, there are a growing number of software packages available for Poqet, including Wordperfect Corp.'s Wordperfect 5.1, Xyvision Corp.'s Xywrite III Plus, Lotus Development Corp.'s 1-2-3 Release 2.2, and Smartware by Informix Corp. External storage drives are available directly from Poqet, and Micronet Technologies, Inc. just released the Micro Docket, a docking station that gives Poqet users up to a 100M-byte hard drive plus a built-in modem. The docking station weighs about 4.2 pounds.

One East Coast insurance company that requested not to be identified said the Poqet and the Micronet docking station have meant productivity gains for its field force since it replaced Compaq Computer Corp. LTE laptops.

"[The Poqet is] light, it's compact, it doesn't detract from other things you might want to carry in your briefcase," commented an MIS manager at the company. "We get the same performance level [as from the Compaqs], and I think you get about the same speed, even though they say it has less speed."

His biggest complaint about the Poqet is its price, but he says that even at the suggested retail of $1,995, the company receives payback within 18 months.

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Papa Gino's 'to go' here to stay

Pizza chain tries home delivery again, this time with a PC-based system

ON SITE

BY RICHARD PASTORE
CW STAFF

DEDHAM, Mass. — It's Friday night. It's pouring out, but your mouth is watering for a pepperoni pizza. You're in luck — the local pizza house you've never tried has started delivering. You pick up the telephone and Papa Gino's personal computer-based delivery system wins over another new customer.

New England pizza chain Papa Gino's of America, Inc. is offering efficient delivery service in hopes of attracting new business — at least enough to pay for a 200-store rollout with hardware costs of roughly $11,000 per site.

This is not the first time Papa Gino's has tried to deliver. In 1982, the company attempted a manual order-taking system that proved too crusty. Phone operators had to manually look up prices, add up the order, figure the tax and sometimes search a map to see if the street was in the delivery zone. Mistakes were as plentiful as pizza toppings.

"It was a really time-consuming process," recalled Tony Lewis, manager of systems analysis.

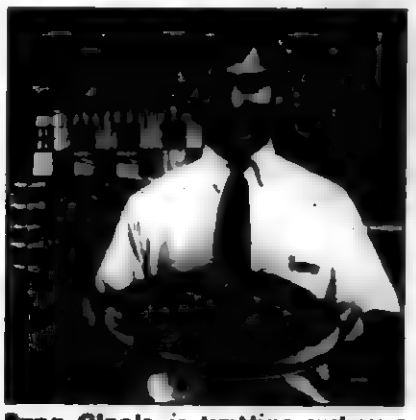
Delivery trend

The restaurant dropped delivery in 1983 and has since watched Domino's Pizza build a national reputation and gold mine with its delivery system. The trend, even among traditional sit-down and gourmet restaurants, is for more delivery. A significant minority of customers who would otherwise never frequent an establishment will patronize it if it delivers, industry observers said.

"We're noticing a lot of new customers now that we have delivery. That's new business," Lewis said. Preliminary figures from test restaurants showed an increase in business of as much as 30%.

Because it speeds up the order-taking process, a PC-powered system can handle three times as many customers as a manual one. "We hope to get at least 25% increased throughput with the PC system vs. a manual system," Lewis said.

The installation, piloted for a year and now set up in 36 stores, consists of three or four AST Research, Inc. PCs per store connected to incoming phone lines. Diskless Intel Corp. 80286-based models are tied to an 80386-based server by Novell, Inc.'s Entry Level System 1 local-area network software. The PCs send output to printers located in the kitchen and the manager's office.



Papa Gino's *is tempting customers with more than pepperoni and onions*

When a customer calls in, an employee answers and asks for the customer's phone number. If it is a repeat customer, the home-grown database software will match the number with the customer database and pull up the customer's file.

"Everything you need to know about the person, including whether their dog bites, appears on the screen," said Frank Paolino, president of The Mayflower Consulting Group, the Burlington, Mass.-based company that designed the system.

After the order taker types in the order (and the caller's name and address if he is a first-time customer), the system prints out the order for the cook and separate receipts for the delivery driver and customer.

The software also plots the destination on an on-screen city locator grid. Known as Radar because of its resemblance to airline flight-control screens, the grid helps dispatch drivers with efficiency.

With the PCs, Papa Gino's can now log in orders in under 20 seconds as opposed to two minutes. With door-to-door delivery expected in under 30 minutes, the company said, every second counts.

The system also automatically generates reports that save managers over an hour of nightly paperwork. Instead of adding up drivers' pizza deliveries in order to calculate their pay, the manager can get an instant tally from the PC. A running sales tally also eliminates the need to recalculate sales transactions each night for the daily total.

During the pilot year, the company has added some features and dropped others. Out went a bar-code reader that assigned orders to specific drivers. The wand's limited reach and the unwieldy stacks of bar-coded pizza boxes combined to make the process untenable.

In its place, the designer is adding an automatic street locator function that prints the customer's road and its connecting street. There will also be new reports, including one that tracks discount coupons.

The chain, which operates on low margins, will slowly roll out the system to the rest of its locations.

Reading with electronic eyes

Specialized software lets blind lawyer communicate with peers and PCs

ON SITE

BY SALLY CUSACK
CW STAFF

RALEIGH, N.C. — Nine years ago, when John B. DeLuca was a law student at Stanford University, he depended on hired readers and a braille transcription machine to help him research and study for exams. If he needed to generate printed material, he relied on a typewriter.

Now a lawyer at the North Carolina Employment Security Commission, DeLuca uses a Wang Laboratories, Inc. personal computer equipped with a synthesizer board and specialized software to receive and transmit audio messages throughout the department.

Super strides

"Technology has made a lot of advances since then, especially in areas like braille and artificial speech," DeLuca said, adding that the Wang product is his first experience with a PC. DeLuca has been totally blind since he was seven years old.

The Employment Security Commission employs seven attorneys in its legal department to handle contested benefit employment claims and unemployment tax issues. The department installed DeLuca's Wang PC 250 MS-DOS-based machine last spring, and there are currently several PCs in the legal department.

These desktop systems connect directly to a Wang VS 5000 minicomputer over 19.2K bit/sec. lines to access several departmental applications. The VS runs Wang's Office messaging and calendaring program, as well as several legal packages. All the machines send and receive messages from the state's IBM 3090-class mainframe over 3270 communications.

The PCs are equipped with Wang's Freestyle imaging software, and in DeLuca's case, a third-party software package is used for voice synthesis. Called Vert Plus, the program is manufactured by TSI and is a voice-to-text software package that utilizes a synthesizer board to read text as it appears on-screen.

Attorney DeLuca *relies on third-party software installed on his Wang PC to read text aloud to him*

DeLuca simply sits down at his desk, turns on his PC, and Vert Plus reads the electronic mail, memos and interoffice correspondence. The software is configured so that the user may interrupt the electronic voice at any time to reply, and as characters are typed into the system, the synthesizer reads them aloud.

DeLuca said the artificial voice provides him with information on how to log onto the system and then proceeds to read items on a menu. Once a menu has been selected, such as Wang Office Mail, the system indicates what memos have come in, which have been read and which have not.

Vert Plus complements Freestyle's voice and annotation capabilities, and the department relies on the latter for easing case load management and assigning briefs. Cases are scanned into the system with Freestyle and electronically transmitted to the chief attorney, who makes annotations and assigns briefs accordingly.

For the future, DeLuca said he plans to use the PC for document correction and information retrieval. People make certain requests on a fairly regular basis, he said.

"Now I will be able to access this information by myself," he pointed out, adding that he would perhaps feel a little more comfortable with more training on the system, "as the new PC and the constant work load are always competing with one another for time."

NEW DEALS

Zenith awarded notebook contract

Zenith Data Systems, the **Groupe Bull** subsidiary, announced that it had won the largest contract for a notebook computer yet awarded by a government agency. The U.S. Postal Service has agreed to purchase $6 million in notebook personal computers from Zenith for use by its field data collection group. The machines are Zenith's six-pound Minisport HD portables, with 20M-byte hard drives, backlit screens and 1M byte of random-access memory.

TRW, Inc.'s Customer Service Division has won a multiyear contract with **Air Products, Inc.** to provide nationwide on-site maintenance and repair services for the company's more than 3,000 microcomputer systems and peripherals. The contract requires a permanent staff of repair technicians to be based at Air Products' Trexlertown, Pa., headquarters and to cover 180 satellite locations.

Mexico City has awarded Intergraph Corp. a $1.5 million contract for expansion of the city's geographic information system (GIS). Intergraph will supply 20 Interpro workstations running the vendor's Microstation GIS environment software. The city's existing land records will be loaded into an **Oracle Systems Corp.** relational database residing on an Intergraph Interserve 3005.

Interleaf, Inc. said it has been selected to provide document management and electronic distribution technology for **Boeing Computer Services'** Product Standards Data System. The initial order is estimated at $2.5 million.

Apple shifts Hypercard

BY JAMES DALY
CW STAFF

CUPERTINO, Calif. — Apple Computer, Inc. shifted full possession and responsibility for its popular Hypercard software program over to subsidiary Claris Corp. recently, rekindling fears among third-party developers that they will not be able to compete fairly with a group so closely tied to Apple.

Developers said the inclusion of a Claris-labeled Hypercard application with each new Apple Macintosh, along with Apple's recent decision to scrap long-standing plans to turn Claris into a separate business unit, will give Claris an unfair competitive advantage.

"Each customer will be walking home with a box that is a billboard for Claris," said Heidi Roizen, president of T/Maker Co. in Mountain View, Calif. "It deprives us of fair access to the new user."

Beginning next month, Claris plans to develop, market, distribute and support Hypercard 2.0. Those shipments will mark the debut of the updated Hypercard, which was introduced in June and scheduled to ship in July but has been held up by documentation changes and final testing.

Authoring added

A Hypercard 2.0 authoring system, which is necessary for developing subprograms within Hypercard, will also be sold through Claris.

The decision to put Hypercard under Claris' wing is consistent with Apple Chief Executive Officer John Sculley's statement that software will play an important role for Apple in coming years. John Zeisler, Claris' marketing vice-president, said Hypercard will help the company "focus on turning software into strategic advantage."

Keefe

FROM PAGE 37

time. Maybe.

Journey back to last November's unity pledge. It's too bad that IBM and Microsoft didn't see fit to update that pledge with some concrete information. They have already kept users on hold for 10 months with the vaguest of promises, statements of direction or whatever you want to call it. Popping up almost a year later and saying, "Hey guys, we still wanna do it," isn't very illuminating.

Were I Novell, I'd keep pointing this out to waffling accounts. There are a fair number of Netware users rankled by Novell service and the constant reshuffling of Netware 386's features, but very few will give LAN Manager the time of day unless IBM and Microsoft get their acts together. And given Microsoft's intensified drive into the LAN market, you'd think they'd *want* to inform network decision makers.

If, after 10 months of work and study, IBM and Microsoft haven't come to a conclusion, even some semblance of an estimated delivery date, that they can share with users, well, you have to wonder A) how "committed" they really are, and B) whether any work has actually been done. Of course it has, so what is the holdup, fellas?

A second promise involves licensing the Communications Manager and Database Manager pieces of OS/2 Extended Edition. IBM's Extended Edition outsells Standard Edition. Perhaps if OEMs could license and resell the pieces that make up Extended Edition, IBM's prayers for a jump in OS/2 sales would be answered.

In November, only marketing issues seemed to be standing in the way. Two weeks ago, we were told there are technical issues.

Microsoft also promised that as of June, it would release OS/2 versions of software before the Windows version. This has gone by the wayside since the wild sales of Windows 3.0.

Also key is whether Microsoft will continue its promise to restrict the capabilities of Windows in some areas, such as file serving. Many observers are wondering whether Microsoft is free to develop Windows to the hilt, even to the point of becoming a competitor to OS/2. As both Microsoft and developers have noted, "you can do anything with software." All Microsoft will say is that they have no plans to do so "at this point in time." Whatever that means.

There's an IBM side to the Windows question. If it's true that the announcement two weeks ago was not driven by reports of a rift, then IBM has had time to think about what it will do with Windows. IBM admits users want it. It sells a few Windows-based packages. But IBM isn't ready to tell us what we want to know — will they bundle or actively remarket Windows? That's real commitment. IBM licenses a lot of stuff it never uses. So what about it?

Now, if IBM does push Windows, how will that be reconciled with Officevision's miserable support for DOS and Windows clients? How will IBM position OS/2 Lite?

Better yet, when will IBM speak?

Keefe is Computerworld's senior editor, PCs and workstations.

Intel promises Satisfaxtion

BY MAURA J. HARRINGTON
CW STAFF

Intel Corp.'s Personal Computer Enhancement Operation introduced a multifunction facsimile board for personal computers last week that is designed to allow a user to easily send a fax directly from a PC application.

The product, called Satisfaxtion, includes a 9.6K bit/sec. fax modem, a 2,400 bit/sec. Microcom Networking Protocol Class 5 (MNP-5) data modem and a gray-scale scanner port all on one board. Satisfaxtion can also be programmed to accept faxes 'without interrupting the user, according to Richard Bader, general manager of the PC Enhancement Operation.

"I think the price is very competitive, and I'm not aware of anyone with a data modem at that price. But I think the real selling point of this product is the ease of use and installation," said Judy Pirani, associate director of BIS-CAP International, a market research firm based in Norwell, Mass.

Satisfaxtion is available now and costs $499 for the AT and XT bus PC versions and $599 for the Micro Channel Architecture systems, according to Intel.

The quality of the information being sent directly from an application is better than when a fax machine is used because Satisfaxtion sends files as though they were going to a printer, thus eliminating the need for a fax machine to scan the information, which is usually where quality is lost, Bader said. Also, users can send a fax without exiting their application. A user running Microsoft Corp.'s Windows Version 3.0 can send and receive faxes in a background window while using another program, Bader added.

Quantum leap for micro disks

The new wave of midget hard drives is about to hit. Several makers, including Conner Peripherals, Inc., have 2½-in., 20M-byte hard drives, considered ideal for laptop and notebook portable computers. Now, however, the 20M-byte standard has been leapfrogged by Quantum Corp., whose powerful new 2½-in. hard disks, called Go-Drives, will offer 42M and 84M bytes of storage space.

Two Go-Drive models were announced as part of an 8-disk announcement by Quantum, a $162 million per-year maker of data storage devices located in Milpitas, Calif.

Jim Porter, president of Disk/Trend, Inc. in Mountain View, Calif., said there would be a wave of similar 2½-in. products with higher capacity at Comdex/Fall '90 next month.

"The Quantum announcement beats the pack as far as 2½-in. drives go and is the first in a wave of 40M- to 80M-byte [product announcements]," Porter said.

He added that the increase in capacity is necessary to run many current applications and that the higher capacity models would quickly dominate the market.

Sybase updates report writer

BY JEAN S. BOZMAN
CW STAFF

EMERYVILLE, Calif. — Sybase, Inc. responded to customer criticisms about its 3-year-old report writer product recently by announcing a visually oriented version, scheduled to be shipped this month.

The new Sybase Report Workbench is intended to counter products from relational database management system competitors Oracle Systems Corp. and Ingres Corp.

"Report writing capability has been one of the weaker parts of our product [line]," Sybase Executive Vice-President Bob Epstein said. "Now we feel we're in a much more solid position."

Competitive products include Oracle's SQL*Forms Version 3.0, Ingres' Report by Forms and Informix Software, Inc.'s Quickstep, all character-based report systems. Report Workbench is visually based, allowing programmers to create forms by example rather than by writing large amounts of procedural code.

For now, the what-you-see-is-what-you-get environment will be Sybase-proprietary, Sybase marketing manager Perry Mizota said. However, he said, future releases of the product will support such graphical user interfaces as the Open Software Foundation's OSF/Motif and Sun Microsystems, Inc.'s Open Look.

Suzann Larsen, a database analyst at Frame Technology Corp., in San Jose, Calif., has been using a beta-test version of Report Workbench for nearly a year. "The software lays out your reports as if it were on a piece of paper," Larsen said. "You can click on the fields and move them around on the screen. When you like the way it looks, you can use the form you've created to run the report."

The first versions of Report Workbench will run on Sun workstations and Digital Equipment Corp. VAXs. Report Workbench will be sold as part of Sybase's Data Workbench tool set, which is priced from $950 to $82,080, depending on the size of computer used.

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NEW PRODUCTS

Software applications packages

Cadam has announced a family of software products designed for users of IBM's RISC System/6000 workstations.

The Professional Cadam family consists of computer-aided design and manufacturing software packages that will reportedly allow engineers to create, visualize, analyze and document designs at their workstations.

The product will be available for RS/6000 Models 320, 520, 530 and 730. Prices range from $4,700 to $100,000, depending on configuration.

Cadam
1935 N. Buena Vista St.
Burbank, Calif. 91504
(818) 841-9470

Computervision has announced Versa-CAD/Macintosh Edition Version 3.0, a software package that enables nongraphic attributes such as part names, cost, size and description to be attached to individual drawing objects or groups of objects via a pop-up dialog box.

The product supports Apple Computer, Inc.'s 8-24GC 24-bit color graphics card and provides users with the ability to read and write Versa-CAD MS-DOS drawing files.

Versa-CAD Version 3.0 costs $2,395.

Computervision
100 Crosby Drive
Bedford, Mass. 01730
(617) 275-1800

Peripherals

Nissei Sangyo America Ltd. has announced the 14MVX multiscanning color monitor for business graphics applications.

The product can adjust to 30- or 40-kHz horizontal scan frequencies and is compatible with IBM's Video Graphics Array (VGA), Super VGA, Apple Computer, Inc.'s Macintosh II and other systems. The 14MVX monitor costs $895.

Nissei Sangyo America
800 South St.
Waltham, Mass. 02154
(800) 441-4832

HSD U.S., Inc. has introduced an 8-bit scanner designed for Apple Computer, Inc. machines that features built-in image manipulation capabilities.

The Scan-X Professional supports a maximum resolution of 1,500 dot/in. for line art and 300 dot/in. for gray-scale images.

It also recognizes 256 shades of gray and includes Scan-X DA, an Apple Macintosh desk tool that enables users to to select scanning operations from an Apple menu while continuing to work in an application.

The product is available now for $1,995.

HSD U.S.
1350 Pear Ave.
Mountain View, Calif 94043
(415) 964-1400

Development tools

Oasys, Inc. has announced Oasys 680 x 0, a software development package designed for cross, embedded or object-oriented development on IBM Personal System/2s running under OS/2.

The line of tools includes the Oasys Optimizing Cross C Compiler, Oasys Assembler/Linker/Librarian and Green Hills C++, a cross C++ compiler.

The Oasys Cross C and Green Hills C++ compilers are based on Green Hills Software, Inc.'s family of optimizing compilers.

Pricing begins at $1,125.

Oasys
230 Second Ave.
Waltham, Mass. 02154
(617) 890-7889

Board-level devices

Rasterops Corp. has announced 8- and 24-bit color graphics boards designed for use on Apple Computer, Inc. Macintosh systems.

The Rasterops 24S and 8S support Apple 13-in. or compatible color displays that feature 640- by 480-pixel resolution. Other features include hardware pan and zoom functions.

Rasterops 8S is priced at $695. Rasterops 24S is being sold as a bundled package with the Rasterops Accelerator for $1,195.

Rasterops
2500 Walsh Ave.
Santa Clara, Calif. 95051
(408) 562-4200

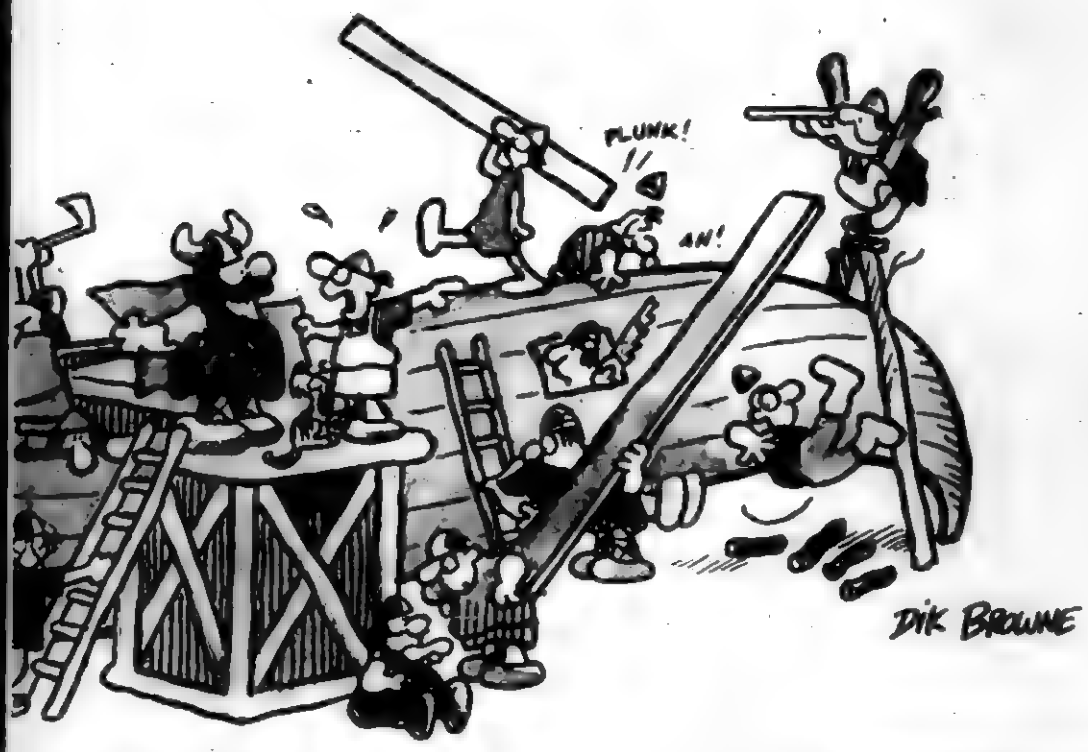
Atronics International, Inc. has introduced an Intel Corp. I486-based miniature AT-size motherboard designed for high-end applications.

The ATI-486/B measures 8½ by 13 in. and is available in 25- and 33-MHz versions. The board includes 8M bytes of built-in memory and has an optional 32K, 64K or 128K bytes of external cache. It features compatibility with multiuser versions of DOS, Xenix or Unix operating systems.

The product is priced at $3,495 for a 1M-byte unit.

Atronics International
1830 McCandless Drive
Milpitas, Calif. 95035
(408) 942-3344

6000™ family.
will seem downright primitive.



cations from more than a dozen vendors.

With every POWERstation, you can get an almost unimaginable palette of 16 million colors, which gives you 3D images so realistic, they fairly leap off the screen, with super sharp resolution of 1,280x1,024 pixels. And when it's time to call in the heavy artillery, the POWERstation 730 draws nearly one million 3D vectors per second. Like all POWERstations, it can come complete with its own graphics processor, freeing the POWER processor to rapidly create and analyze your designs. All at prices that won't sink anybody's budget.

So if you're tired of paddling upstream with yesterday's performance, call your IBM marketing representative or Business Partner to find out more about the RISC System/6000 family. For literature, call 1 800 IBM-6676, ext. 991.

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How big is your network?

"We have over 700 users worldwide on our network, with 24 servers in New York alone. 4 each in Chicago and Geneva. Plus single servers in another 12 offices. Recently we added Zaire, and we've discussed putting them in Hong Kong, Singapore, and South America."

Do you use third-party lines?

"Yes, depending on needs and economics. Mostly, it's GEIS, plus some point-to-point lease lines and dial-up facilities. Even a dedicated 56KB satellite link. And it's all totally transparent."

Why did you select VINES?

"When we started this network 5 or 6 years ago, Banyan was the only company that could satisfy our needs. Today, in my opinion, it still is."

Banyan's VINES is the only network operating system that can effortlessly grow as your company does—even on a global basis. For a further description of Continental Grain's networking challenges and solutions, write or call us at 800-828-2404 (in MA 508-836-2828).

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Bringing far-flung LANs aboard

Vendors take many tacks to link LANs with corporate headquarters

BY ELISABETH HORWITT
CW STAFF

This fall, vendors are moving in several different directions to address users' growing need to tie long-isolated local-area networks into the corporate backbone and data center structure.

Cisco Systems, Inc.'s recently introduced low-end bridge (see story page 52), for example, targets companies that want to link hundreds of "remote LANs with a few nodes to each other and to corporate headquarters over an existing Decnet or TCP/IP backbone," Cisco spokesman Edward Kozell said. "Right now, a lot of these companies are using a dial-up modem to call up a minicomputer file from a PC LAN. With a bridge, they can exchange files directly between PCs or between a PC and a mini running Novell, Inc. Netware 386, LAN to LAN."

LAN philosophy

Mervyn's, a subsidiary of Dayton Hudson Corp., "had a philosophy to integrate our LANs with the corporate data center from day one because we got into it so late and realized that we had to," said Chris Blazak, the department store chain's manager of installation service and support. Mervyn's finished a company-wide implementation of Banyan Systems, Inc. LANs approximately one year ago, he added.

The company chose Banyan precisely because it has built into its server architecture the ability for LANs to talk both to one another and to IBM corporate Systems Network Architecture (SNA) systems, Blazak said. "We knew that users want to get to the mainframe and also to applications that are just on the LAN."

Cisco plans to go after Banyan users soon, incorporating support of the LAN vendor's Virtual Networking Software into its routers next month, Kozell said.

Cisco also plans to announce a frame relay software package at this month's Interop '90 conference that will allow its routers to transmit at up to 2M bit/sec., Kozell said. This will be an important feature for users whose inter-LAN traffic has grown beyond the 64K bit/sec. limits of traditional X.25 packet-switched networks, he added. Cisco plans to demonstrate interoperability between the product and Stratacom, Inc.'s fast-packet T1 switch at Interop and to ship the offering on Nov. 1, Kozell said.

Several announcements at last week's Tele-Communications Association '90 show targeted companies that share Mervyn's internetworking needs but do not have the right capabilities built into their LANs.

Data Switch Corp. in Shelton, Conn., announced Unilan Communicator, an intelligent wiring hub that is said to provide a wide range of LAN interconnectivity capabilities in a modular architecture.

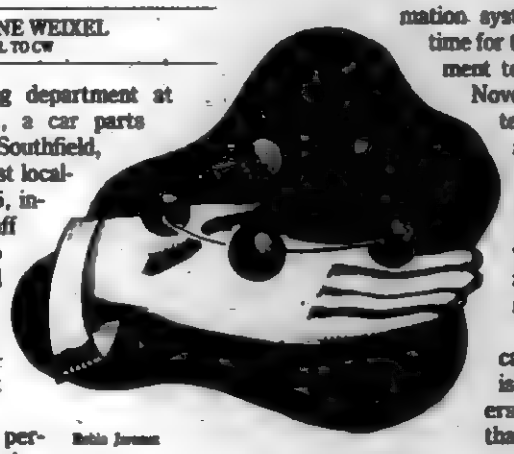
Priced from $20,000, the hub is said to provide local connections between 4M bit/sec. and 16M bit/sec. token-ring systems

Continued on page 52

FEATURE: LAN SUPPORT

Balancing autonomy with control

BY SUZANNE WEIXEL
SPECIAL TO CW



Robin Jareman

When the accounting department at Federal-Mogul Corp., a car parts supplier based in Southfield, Mich., installed its first local-area network in 1985, information services staff wanted nothing to do with it. Departmental end users either supported the LAN themselves or contracted for support from the vendor.

Five years and six personal computer LANs later, however, "we realize how integral LANs are to the company's operations; we realize that we must exert some influence over how they are installed and how they are maintained," says Tom English, the company's vice-president of information systems. When it came time for the accounting department to upgrade its original Novell, Inc. operating system, IS was ready with a list of standards, guidelines and strong opinions about exactly what type of systems the accounting department ought to use.

Federal-Mogul's case is by no means an isolated one. IS managers and consultants say that decentralized companies are in the midst of a LAN support dilemma. They recognize the need for networks and applications at the local level, where users are more in tune with what they need in order to do their jobs well, but

Continued on page 46

PC networks kinder to bottom line

BY JIM NASH
CW STAFF

Gasoline prices are up, and mortgage rates are up more often than down, but at least one thing is cheaper than it used to be.

According to a survey of 100 large companies, the cost of installing and running a local-area network made up of 40 personal computers for three years is about half that of minicomputers and mainframes.

David Ferris, president of Ferris Networks, Inc. in San Francisco, said each mini or mainframe terminal costs large companies an average of $14,300 annually for the systems' first three years of operation. In contrast, Ferris said, companies spend an average of $6,400 for each PC in a 40-machine network.

"If you are talking dollars and cents, it is cheaper to have a network," said Victor Delgadillo, LAN manager at Lillie Rubin Affiliates, Inc. Lillie Rubin Affiliates is a Miami-based chain of 82 women's apparel stores. "Our entire network cost less in dollars than the one-year maintenance contract we have for our Bull mini."

Included in his average for PC LANs, Ferris explained, were such hidden costs as salaries for users and systems administrators, communication links, maintenance and training.

Continued on page 52

Announcing the arrival of your favorite MVS text editor on OS/2!

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Existing mainframe REXX edit macros may be downloaded to run with **SPF/2** and CLIST macros may be easily converted to REXX.

SPF/2 is compatible with OS/2 Standard and Extended Editions, Versions 1.2 or later. However, Standard Edition users will not have access to macro capabilities due to the unavailability of REXX in that environment.

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SPF/2 processes keystrokes in the same manner as the OS/2 Extended Edition 3270 Emulator, including NEW-LINE, ENTER and status display indicators.

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Autonomy

CONTINUED FROM PAGE 45

users can also be notoriously lax about such LAN support staples as backup, maintenance, documentation and updates. How is IS balancing local autonomy and flexibility with some form of central oversight?

"Clearly," says Jeffrey Kaplan, a director at The Ledgeway Group in Lexington, Mass., "there has to be a mixture of centralized and decentralized support."

At Federal-Mogul, the cross-functional organization of the company had led to the decentralization of application development into individual business units. However, support, which was mainframe-oriented, had remained centralized. The need for local-level support became apparent as end users were increasingly asking their department's application developers LAN-related questions.

According to English, Federal-Mogul formed the PC Support Group, a cross-functional team that is part of the IS department. Members of the PC Support Group are distributed among the user departments along with the application developers. Now, each business unit has its own IS group on-site with at least one dedicated PC support person responsible for administering the LAN.

The distributed IS group reports to both the vice-president of IS and the president of the business unit.

According to Cheryl Bachleda, a telecommunications analyst responsible for developing a long-term plan for corporate network integration, PC Support Group representatives are on-site to troubleshoot, add users to the network and maintain printers, drives and monitors. That frees up the central IS telecommunications staff to focus on larger issues such as standards and integration.

This approach is becoming more typical, companies say. A key concern is freeing up central staff for more strategic activities. "Ideally," says Michael Hurwicz, president of MTI Group, an Eastsound, Wash.-based consulting company specializing in LANs, "every work group has at least one person assigned to it for first-level LAN support. Sometimes it is an IS person, and sometimes it is someone from that department who happens to be the most involved with the LAN or the applications run on the LAN."

In Federal-Mogul's case, it is someone from the IS side who zeros in on the end users' business needs, Bachleda says. The departments retain their autonomy, but they have someone who understands both IS and the department's points of view to help them do their planning, budgeting and purchasing.

Still, with seven different LANs and four different LAN operating systems, it is difficult to implement any kind of overall corporate support strategy, Bachleda says. But with Federal-Mogul's planned conversion to one Ethernet backbone network, IS must rely on the PC support group representative to translate the corporate network strategy into terms that the business unit can understand.

Local presence

Even in situations in which corporate IS departments control the selection and distribution of all decentralized technology, PC LAN support has drifted down to the local level. At United Parcel Service, where there are more than 300 LANs with approximately 4,500 workstations installed in over 200 sites worldwide, a multilevel hierarchy of support is used to keep the systems up and running.

According to Steven Heit, information services planning manager at UPS in Paramus, N.J., corporate standards are developed and controlled centrally to facilitate support, but given the large number of user sites, IS "cannot organize an effective centralized support structure."

For instance, Heit says, UPS has 60 delivery information offices in the U.S. where a customer can call to find out the status of a package. Each office runs a standard setup — an application and communications system, called the Trace Information Processing System (TIPS), on token-ring hardware running the Novell operating system. Typically, each LAN has between 30 and 40 workstations.

The first tier of support for each delivery information site is handled by a supervisor from that business area. The supervisor is not part of the IS staff, Heit emphasizes, but has been trained by IS to perform the day-to-day PC LAN administration tasks of adding and deleting users, controlling password protection, reporting statistics such as disk capacity and taking care of general troubleshooting.

If the supervisor encounters a problem that cannot be solved at the local level, such as a board failure, he funnels it upward to the district office technical support staff. Typically, Heit says, there is one or more IS technical support person located at each of UPS' 60 district offices. These people are responsible for supporting all the different LANs as well as other technologies that reside within their district. They are trained to diagnose hardware and software problems and to resolve the simple ones such as board replacements.

Heit says that 90% or more of all PC LAN troubleshooting is handled at the local or district level. But if there is a complex or unusual problem, such as a software malfunction, there is a dedicated LAN support staff made up of a dozen or so IS employees who act as an on-call help desk for the district support technicians.

UPS has arrived at a combination of localized and centralized support, according to Heit, with end users and IS sharing control. For instance, application updates are developed centrally, he says, so IS can be confident that every office is using the same software. On the other hand, the updates can usually be installed by the local LAN manager, so IS does not have to spend time performing a relatively simple task.

It is when the issue of shared corporate information comes into play, says Ledgeway's Kaplan, that many IS departments discover the need for centralized PC LAN support. If a department forgets to back up its LAN and loses data, it alone may suffer. However, once PC LANs start linking into a corporate network and transferring information among departments, such negligence affects the company as a whole.

For Federal-Mogul, this means reassessing its support structure once its Ethernet wide-area network is in place. With one network, the central staff will be forced to assume a more active role.

According to Bachleda, from the server out to the end user, localized support will still be provided by the distributed PC support group. However, Bachleda predicts a need for a centralized network administration team.

Central authority

There is no question in George E. Reid's mind that support must be done centrally. Reid is MIS director at Sanford C. Bernstein & Co., an investment management and Wall Street brokerage firm with approximately 400 employees spread across three buildings in New York and New Jersey. The company has 50 PCs and 250 workstations all sharing a common network.

"Basically, we tell the departments that they have to play by our rules because we have to be able to support [the network]," Reid says.

In general, end users cooperate, but there are a few renegades. One portfolio manager likes to write his own applications and integrate them with existing products on the LAN. "We try to give him latitude, but every once in a while we do bump into him," Reid says.

Reid's solution was to set certain limits that the manager must meet if he wants to remain on the network.

Imposing restrictions on users is a matter of security and data integrity. In most cases, it is just a way to keep the user files organized and consistent so that if they do have problems, IS can help them.

"A network assumes you have a group of people doing something in common," Reid says. With that in mind, IS feels justified controlling memory allocation and keeping directory structures uniform.

Still, Reid says, IS recognizes that users need some degree of independence. "We try to be as nonintrusive as possible," he says.

Weinel is a free-lance writer based in Framingham, Mass.

Andy Freeberg

Bernstein & Co's Reid: *Users "have to play by our rules."*

UPS' Heit *says central support is not possible due to a prohibitively large number of user sites*

Recruiting support

To deal with the local vs. central support issue, some companies take the hierarchy one step further. They hire an outside source such as a vendor, value-added reseller or consultant to back up the central IS support team, according to Michael Hurwicz, president of MTI Group, an Eastsound, Wash.-based consulting company that specializes in local-area networks.

Most firms that choose this route have found it difficult to assemble a central team that is large enough to keep up with the demands of the end users as well as perform the strategic network functions required of a corporate department.

Given the high personnel turnover rates as well as the rapid changes in applications and network technologies, Hurwicz says, outside sources can go a long way in taking the pressure off the backs of central network support staff.

Car parts supplier Federal-Mogul is currently involved in a trial partnership with San Jose, Calif.-based Businessland, Inc. According to Cheryl Bachleda, a telecommunications analyst at Federal-Mogul, the company is evaluating the idea of contracting with Businessland to provide specific support services in order to help its IS department in the future, when the company completes its conversion to an integrated Ethernet network.

Bachleda is not entirely sold on the idea, however. "In the past, we've had a hard time relying on vendors for support when it comes to issues involving integration," she says.

SUZANNE WEINEL

Expert panel says now is time to put brakes on deregulation

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — A panel of telecommunications experts said the U.S. stands at an important crossroad with respect to further deregulation of the industry, and several officials attending a conference here said a wrong turn now could have consequences as unpleasant as the deregulation of the savings and loan and airline industries.

Most of those speaking at a recent seminar sponsored by the Competitive Telecommunications Association (Comptel) said deregulation of AT&T has gone far enough for now. They urged the Federal Communications Commission to back away from recent proposals that would substantially free the telecommunications giant from restrictions that have existed since the breakup of the Bell System more than six years ago [CW, July 9]. "The FCC has launched regulatory clay pigeons to prematurely deregulate AT&T, and we must be ready to shoot them down," Rep. Edward J. Markey (D-Mass.) said. "AT&T is still the dominant carrier by any traditional economic measure."

Markey, who chairs the influential U.S. House of Representatives Telecommunications and Finance subcommittee, pointed to AT&T's market share — 65% of the long-distance market, which is five times that of the No. 2 provider — as evidence that it would have an unfair advantage in the marketplace were it not for inhibiting regulations.

Running on empty

However, AT&T sees its market-share glass not as two-thirds full but rather as one-third empty and falling fast. William Catucci, an AT&T corporate vice-president, pointed out that AT&T's market share has plummeted from 90% to 65% in recent years, losing 10 percentage points in 1988 alone. He said that's evidence of vigorous competition. "Somebody is misinterpreting the facts. The FCC is not. If we're dominant, what good does it do? We can't raise prices, and we can't take market share from competitors."

The FCC contends that AT&T no longer dominates its competitors in several markets, particularly in providing voice and data services to the largest, most sophisticated corporate buyers. The commission buttresses its contention by citing the steep loss of market share in that market segment and the industry-wide surplus network capacity it says prevents excessive pricing by any company.

Some now say the industry has become an oligopoly, with AT&T, MCI Communications Corp. and U.S. Sprint Communications Co. owning 95% of the market. That concentration of market power leads to higher prices overall, critics charged. "I feel that the pricing war is over in the telecommunications industry," said Norman C. Frost Jr., director of investment banking at First Boston Corp. "[Wall Street] sees non-price competition as being the dominant factor in the future."

Richard Firestone, chief of the FCC's Common Carrier Bureau, suggested that large corporate users are able to negotiate favorable prices while fostering the development of new services. "You can't just look at [overall] market share; you have to look at the customers. Do large telecommunications customers need the intervention and protection of the government? They're some of the most sophisticated buyers in the country."

Catucci acknowledged that AT&T does charge higher prices — by some 5% to 10% — but he said customers are willing to pay that premium for higher quality telecommunications services.

One FCC proposal would allow AT&T to write contracts with single users for customized services at discount prices, just as its competitors may now do. In return, the FCC would require AT&T to make terms of the contract public. Brian Moir, general counsel for the International Communications Association, objected to disclosure of single-customer offerings, saying that it might reveal proprietary user information, including information about confidential network configurations. "We need regulators to be sensitive to user concerns about network disclosure," he said.

The FCC is now considering public comments on its proposals, and it is not expected to announce its decisions or next steps until early next year. But the bet at the conference was that the commission would backpedal on at least some proposals because of the negative public comment from nearly every party except AT&T. Terry Haines, chief minority counsel for the House Telecommunications and Finance subcommittee, said the gung-ho deregulatory fervor of FCC Chairman Alfred C. Sikes is being challenged internally by other more cautious commissioners. He predicted that the FCC is moving away from "the ramming-down-the-throat approach of the past."

However, Rep. Jim Cooper (D-Tenn.) was not so sure. "Sikes' statements [about AT&T deregulation] have been so positive, so one-sided, it's unlikely he'll change his mind."

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"We like the HYDRA product line for several reasons," says Al Demerath, Director of MIS at Ansul Fire Protection. "HYDRA II saves money, it's reliable, easy-to-use and flexible."

Al Demerath is like many HYDRA II users who are using ASCII devices to enhance their 3270 network applications. They have found that the HYDRA II protocol converter is a reliable and versatile controller. HYDRA II offers superior performance without the requirement of a front end processor.

MIS, Ansul Fire Protection

Some data processing facilities use the printer emulation capabilities of HYDRA II to generate mainframe reports on inexpensive ASCII printers. Other HYDRA II users enjoy the easy but secure dial-up access that features integrated callback security. And still others find that it's simple to access local 3270 applications with HYDRA II from a personal computer or ASCII terminal.

"HYDRA II has allowed us to get users on-line while saving money," Al continues. "Instead of using costly 3270 terminals, we ... high quality async ... cost savings. ... transfer files ... our host and ..."

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...y International Business Machines.

Seeking cure for network Achilles' heel

BY JOANIE M. WEXLER
CW STAFF

With the burgeoning trend toward linking LANs into corporatewide networks, the market for integrated network management couldn't get any riper without falling off the vine. Enter Spectrum, a next-generation product introduced recently by Cabletron Systems, Inc.

The $105 million-per-year Cabletron — which six years ago consisted of 10 people selling cable out of a garage — has dared to go up against the likes of AT&T, IBM and Digital Equipment Corp. and is purporting to finally offer the user community a centralized, enterprisewide network management system.

Cabletron's artificial intelligence-based system will be one of a half-dozen packages running the Interop '90 show network next week in San Jose, Calif. It reportedly allows a user sitting at one console to view all seven communications layers of a heterogeneous network from various perspectives, such as function, topology or organization.

Business Research Group, a Newton, Mass.-based market research firm, said earlier this year that 75% of 300 large companies it surveyed plan to increase their integrated network management spending by up to 48% between 1990 and 1992.

Open to change

According to Datapro Research, Inc. in Delran, N.J., IBM's Netview enterprise manager has 10,000 licensees; Systems Center, Inc.'s Netmaster, which competes with Netview, has 700 to 1,000 installations. Datapro said that other vendor installations are negligible, leaving a large user community open to new offerings.

"This is an area in which an early player will be able to score big," agreed Walt Magnussen, a network planner at Texas A&M University in College Station who has been testing Spectrum to manage a jumble of multivendor networking equipment. He said he will probably purchase the product. "One of the things we like about Cabletron is that it is aggressive about adding new interfaces," Magnussen added.

Ray Parcell, a computer systems specialist at the Naval Mine Warfare Engineering Activity in Yorktown, Va., uses a Cabletron smart hub to connect Ethernets running over both thick and thin coaxial cables.

"Cabletron is a fairly new vendor to me, but sometimes you need a specialist [unlike full-service vendors IBM, AT&T and DEC] to serve your needs," Purcell said. "Because Cabletron doesn't sell computers, it doesn't have anything else on its mind."

Spectrum specifics

Availability: January.
Hardware: Sun Microsystems, Inc. Sparcstations. Intel Corp. 80386-based PCs, DEC workstations and IBM RISC System/6000 workstations to be phased in.
Operating system: Unix System V or Berkeley 4.2 (OSF/1 support planned).
Graphical user interface: Open Software Foundation's Motif.
Network management protocol support: Simple Network Management Protocol, 802.1B, Internet Protocol's Ping. Common Management Interface Protocol by end of summer 1991.
Recommended RAM: 16M bytes.
Price: $50,000 to $150,000.

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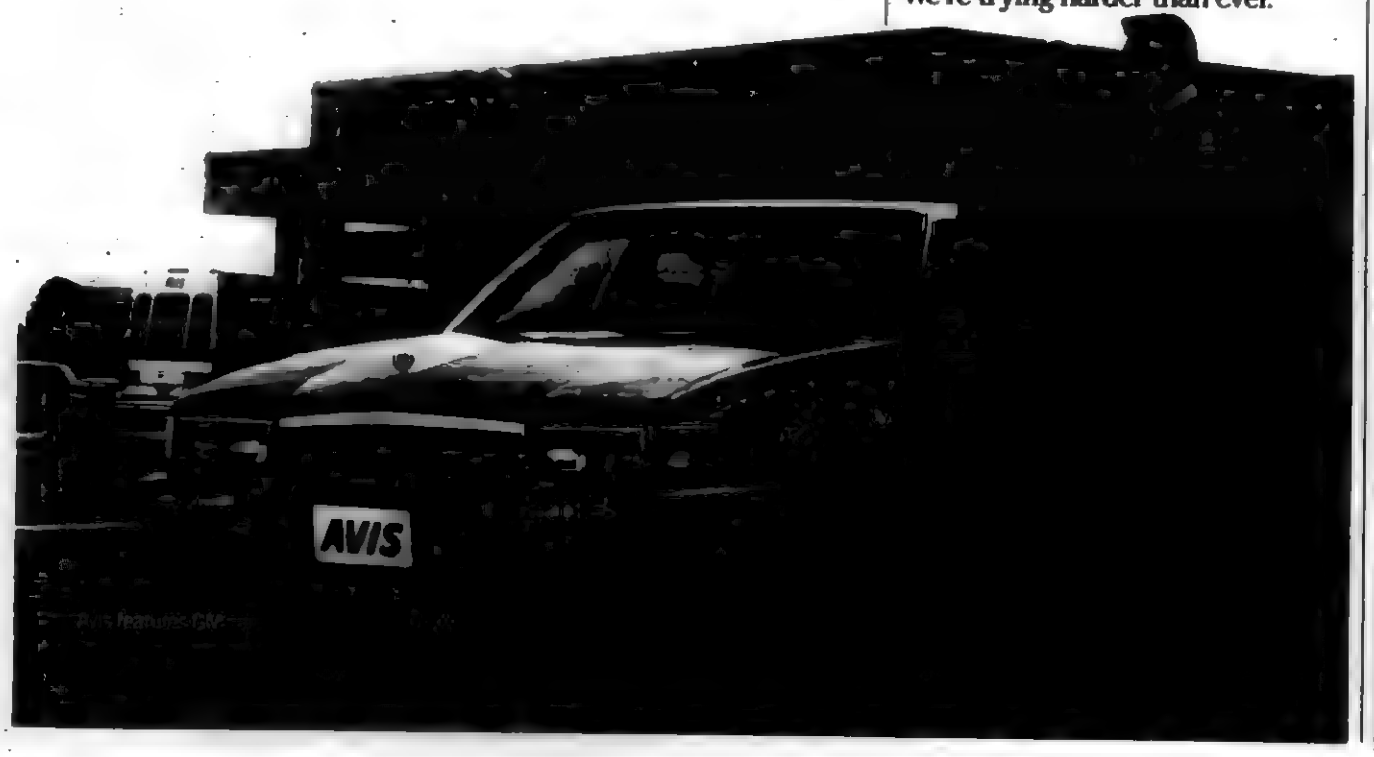

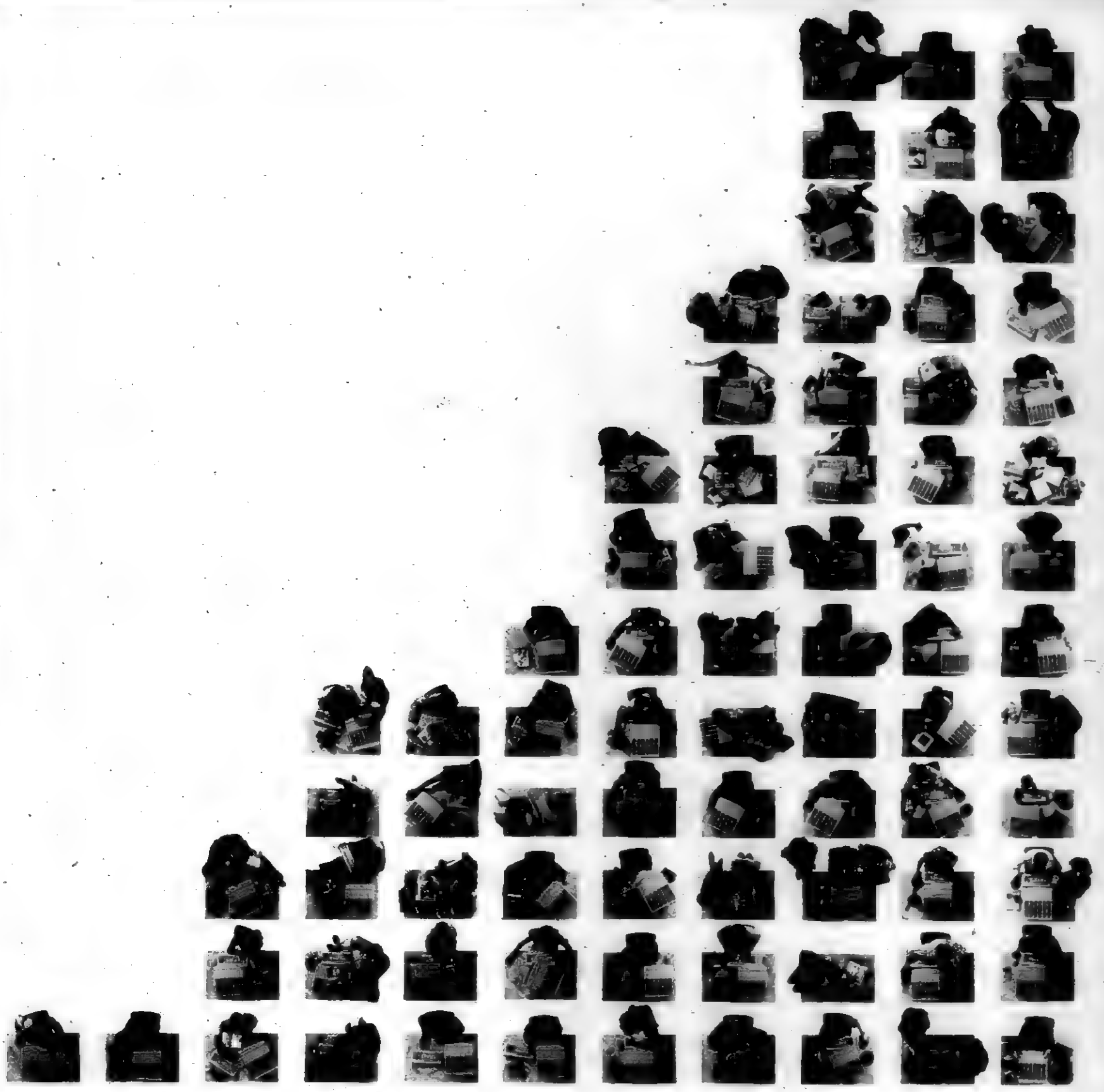

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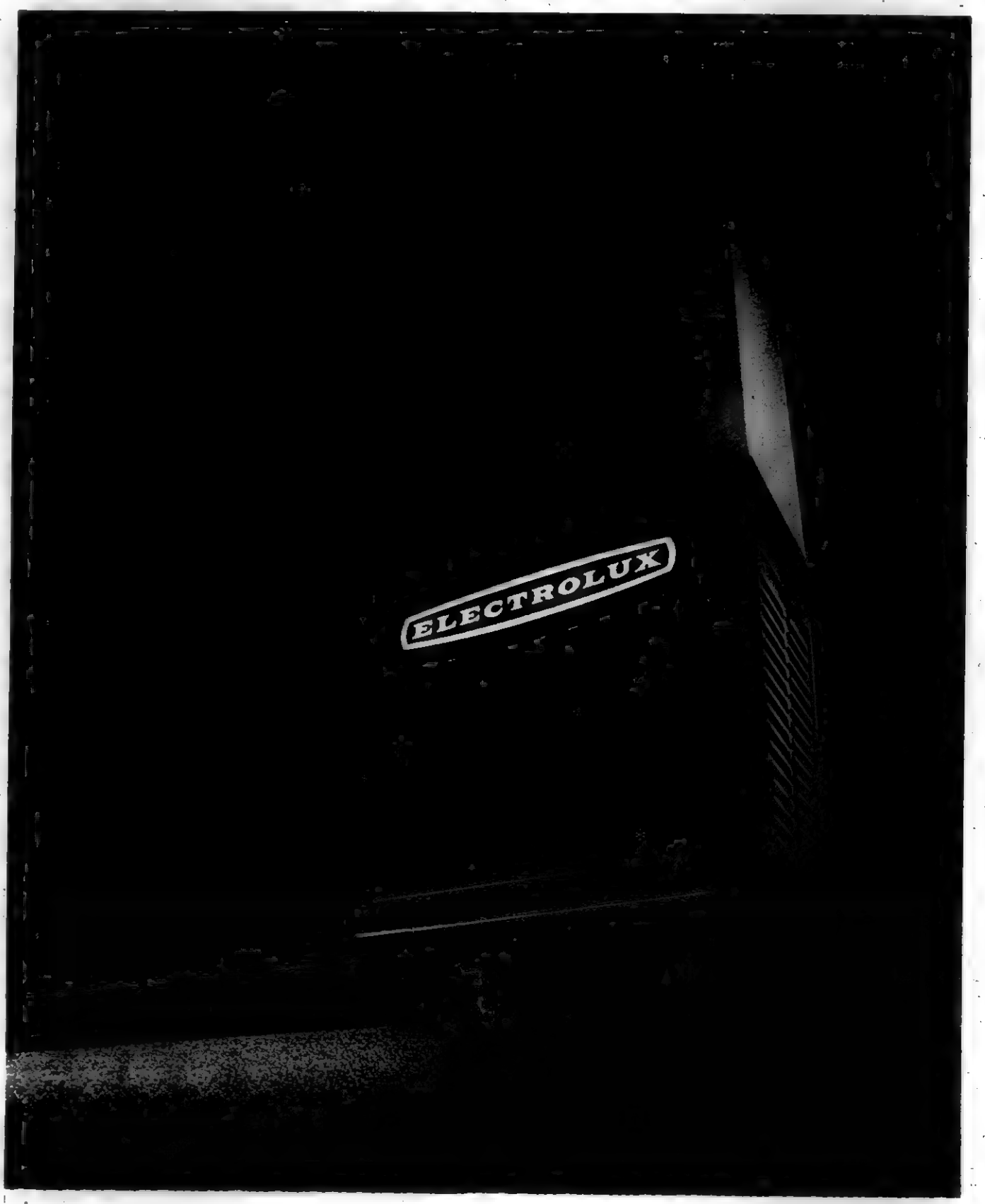

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The Past, Present, and Future of Network Computing.

LANs

FROM PAGE 45

running on shielded and unshielded twisted-pair cable, as well as fiber.

A separate Channelconnect Communicator module, starting at $18,000, can link Ethernets into the central hub or directly to a mainframe channel.

In addition, the hub is said to link LANs to T1 long-distance connections, RS-232 and V.35 devices and IBM host front ends via Data Switch's Universe matrix switch line.

By using a matrix switch to link LANs to hosts, the user gains the ability to reroute transmissions automatically to an alternate port or line when the primary connection fails, Data Switch spokesman Richard Pasqua said.

Data Switch also announced support of IBM C lists on its Totalnet network management system. This allows IBM's Netview to send commands to reconfigure or initiate testing on Universe switches, according to Pasqua.

Also at TCA, Broomfield, Colo.-based McData Corp. expanded its Linkmaster 4174 family of SNA controllers with an interconnect controller that is said to allow Ethernet users to send and receive SNA packets.

The 44R is said to support up to 160 host sessions on 32 coaxial terminals, half of which can be Digital Equipment Corp. Local Access Terminal sessions. Scheduled to ship this month, the product is priced at $11,863, with software costing an additional $3,000.

Another internetworking announcement at TCA was Micom Communications Corp.'s Marathon 5K fast-packet multiplexer, which is said to integrate data, voice, facsimile and LAN traffic over the same low-speed lines.

The Marathon 5K is said to compress the bandwidth taken up by data by up to 75% and to reduce a 64K bit/sec. voice channel to 4.8K or 9.6K bit/sec. One 19.2K bit/sec. line can handle communications from 10 terminals at 9.6K bit/sec., plus two voice lines, Micom said.

Fast-packet multiplexing is used to combine data, fax and voice transmissions over the same line with minimum delays, according to the vendor.

The base model Marathon 5K comes with six ports, one of which can be a 64K bit/sec. port.

Prices begin at under $3,000.

Linking far and near

Tyson Foods, Inc. is close to choosing McData's Linkmaster controllers as a way to integrate connections between remote sites and data center hosts for both the fast-food chain and its Holly Farms subsidiary.

Right now, Tyson's outlets use an extended Ethernet backbone to communicate with DEC VAXs at the parent company's Springdale, Ark., headquarters, according to Paul Lothian, Tyson's staff analyst. Meanwhile, Holly Farms fast-food outlets use IBM's SNA to hook up to the Tyson subsidiary's IBM 4381s and 4361s.

Amalgamating the two sets of connections makes sense, Lothian said, because the two fast-food chains often have outlets near each other and because Holly Farms sites need to access Tyson's data center as well as their own. However, DEC provided limited solutions for such integration, Lothian said.

McData's recently announced Linkmaster 4174 Model 44R provides a way for remote Holly Farms IBM terminals to send SNA packets over the Ethernet backbone to Tyson's DEC data center, Lothian said. And Holly Farms can install a Linkmaster 6100E at its own data center, which allows Tyson's DEC users to access the IBM hosts, Lothian said. "So the same backbone links our systems and their systems."

ELISABETH HORWITT

Cisco on internetwork router detour

BY JIM NASH
CW STAFF

Cisco Systems, Inc.'s new low-end internetwork router marks a departure from its previous bridge and router products. The Integrated Gateway Server (IGS) differs from its sister products in appearance, price and marketing.

IGS is a single-board, nonexpandable two-port internetwork router that supports 15 communications protocols. Cisco is marketing both a local version, which connects two Ethernet networks or two segments of an Ethernet backbone, and a remote version with an Ethernet port and a high-speed serial port.

Cisco has departed from its previous marketing strategy in its decision to license the core of IGS as a board to Synoptics Communications, Inc., Cabletron Systems, Inc. and Chipcom Corp.

No delivery dates for the licensed products have been announced. However, the first fruits of one of the alliances will be brought out at next month's Interop '90 conference, a Cisco spokesman confirmed.

Appealing packaging

IGS' in-the-box incarnation will be sold through the firm's direct sales force, along with the rest of Cisco's product line. The new router comes in a smaller, more aesthetically designed box. The local version sells for $4,995 and the remote for $5,495.

Coyne Gibson, MIS computer operations manager at Convex Computer Corp. in Richardson, Texas, said he uses Cisco routers to link 16 offices nationwide using workstations and supercomputers. Gibson said IGS surpasses Cisco's previous products by having a smaller, less obtrusive chassis. Gibson said the new chassis should help the product gain acceptance in smaller workplaces.

However, IGS' target market is large internetworks linking 100 to 200 sites, according to Bruce Byrd, product line manager at Cisco. Selling far smaller quantities of the router, Byrd said, might occur through telemarketing.

An aerospace systems analyst who declined to be identified said that his large internetwork contains 70 Cisco routers that have performed with few problems. The source also indicated that his firm would likely adopt IGS in the future given its past experience with the products.

PC networks

FROM PAGE 45

He did not include the cost of downtime for either type of system. Ferris estimated that the purchase of a $1,000 backup system could add $105 to the per-PC cost each year.

"If you are looking at the set of applications that you can run on both minis and PCs, that statement is obvious," said Todd Booth, senior software specialist at Quotron Systems, Inc. Maintenance and personnel costs often drive up the price of large systems, Booth added.

Quotron, part of Citicorp, is one of the world's largest financial information brokers. It is heavily involved with both DOS- and Unix-based networks. The firm runs a mix of 3Com Corp., Novell, Inc. and Microsoft Corp. networks.

But there are costs involved in the use of minis instead of PC LANs that will not show up in internal budgets, he cautioned. "If you are going to put really dumb terminals and really canned environments on the desk, minis are the right choice." Those setups, however, can be competitive liabilities for a company if its adversaries are automating with more versatile LANs.

There are fewer general applications used by businesses that require even a mini's brawn. The capabilities of each platform are rising in unison, Booth said. "PC LANs do what minis used to do. Minis do what mainframes used to do, and supercomputers do what nobody thought could be done."

Even the process of purchasing a mini can be more expensive, Delgadillo said. "You can't just go up the street and buy them. You have to sit down and negotiate and buy service contracts and everything."

NEW PRODUCTS

Local-area networking hardware

Emulex Corp. has announced a printer server that allows up to four parallel or serial printers to be shared on an Ethernet network.

The Performance 3000-TL is compatible with Digital Equipment Corp.'s Local Area Transport (LAT) protocol and with the Transmission Control Protocol/Internet Protocol standard. Users of LAT and TCP/IP host computers can transparently queue print jobs, and remote printers can be operated via a single coaxial connection, the vendor said.

Pricing for a basic unit starts at $2,595.

Emulex
P.O. Box 6725
3545 Harbor Blvd.
Costa Mesa, Calif. 92626
(714) 662-5600

Abletec has announced a line of file servers, local-area network stations and Ethernet boards.

The AFS/386 file server ($3,995) is a 32-bit system that features 64M bytes of random-access memory, a 64K-byte cache and full- and half-height 40M- to 650M-byte hard disk drives.

The ALS-2 Lanstation is an Intel Corp. 80286-based MS-DOS computer that is available in 12-, 16- or 20-MHz versions for $1,495. It can be expanded to accommodate OS/2 and Unix software packages.

The AE-2000 ($325) 16-bit Ethernet board features 64K bytes of dedicated buffer memory.

Abletec
4971 Fremont Blvd.
Fremont, Calif. 94538
(415)659-1544

Gateways/Bridges/Routers

Xyplex, Inc. has announced an interoperable remote bridge card that was developed as part of a strategic technical partnership with Vitalink Communications Corp.

Maxserver 6510 provides wide-area network link interoperability via the Vitalink Communications Protocol. It supports the IEEE 802.1D Spanning Tree Protocol and is compatible with Wanmanager, Vitalink's network management system.

The product began shipping last month and is priced at less than $4,000.

Xyplex
330 Codman Hill Road
Boxboro, Mass. 01719
(508) 264-9900

Remotely Possible, a remote control software package announced by Avalan Technology, Inc., enables users of personal computers attached to a Novell, Inc. local-area network to remotely control and monitor other LAN-based PCs.

The product provides users with the ability to control remote applications with a mouse. It operates over Novell's Netware topologies and requires a remote PC with 16K bytes of random-access memory.

License fees are priced from $199 to $1,299, depending on the number of users.

Avalan Technology
747 Washington St.
Holliston, Mass. 01746
(508) 429-6482

BICC Data Networks, Inc. has announced the Isolan Etherconnect System/4 (ECS/4), a multimedia intelligent hub designed for small-office local-area networks.

The ECS/4 can accommodate up to four line cards and more than 400 users. It enables networks to be managed remotely or locally without requiring a dedicated personal computer.

The system is priced at $1,595. Line and management cards are sold separately.

BICC Data Networks
1800 W. Park Drive
Westboro, Mass. 01581
(508) 898-2422

IDC WHITE PAPER

OSI: The Global Network Architecture

OSI: THE GLOBAL NETWORK ARCHITECTURE

AN IDC WHITE PAPER FOR INFORMATION SYSTEMS MANAGEMENT

INTRODUCTION

EVOLUTION TO OSI
- History of OSI
- Why OSI?
- Current Status

DEFINITIONS
- The Concept of Layering
- Transmission Services: Layer 1
- Networking Services: Layers 2, 3 and 4
- Application Services: Layers 5, 6 and 7

APPLICATIONS
- Electronic Mail
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MIGRATION STRATEGIES
- Implications for Other Networking Standards
- Replacement of and Coexistence with Proprietary Networks
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- The Move away from TCP/IP

STANDARDIZING THE STANDARD
- Multivendor Interoperability

PRESENT AND FUTURE UTILIZATION
- Current Usage
- Future Directions
- Time Line for Adoption

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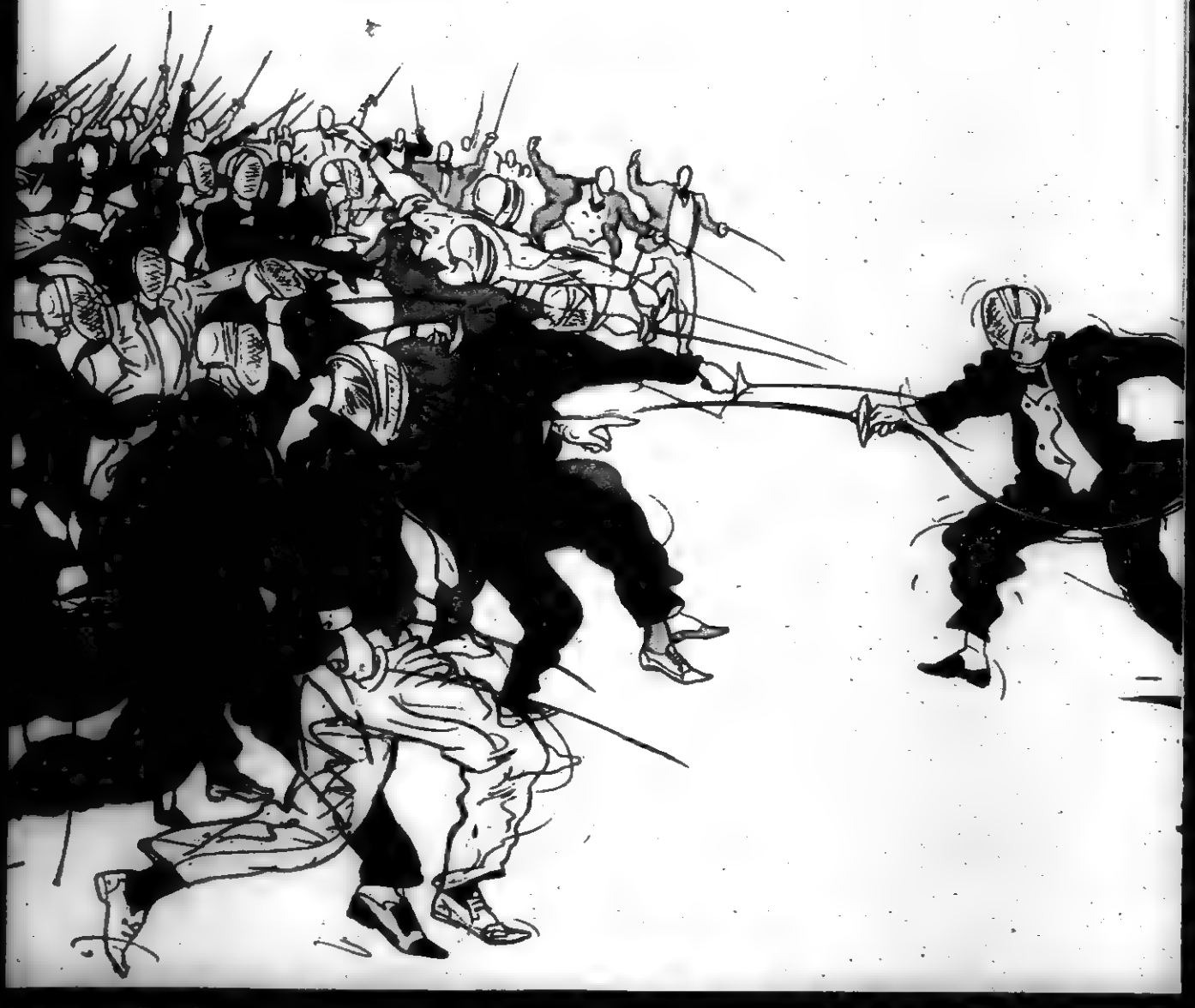
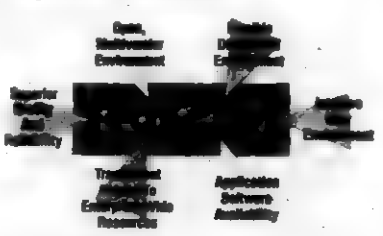


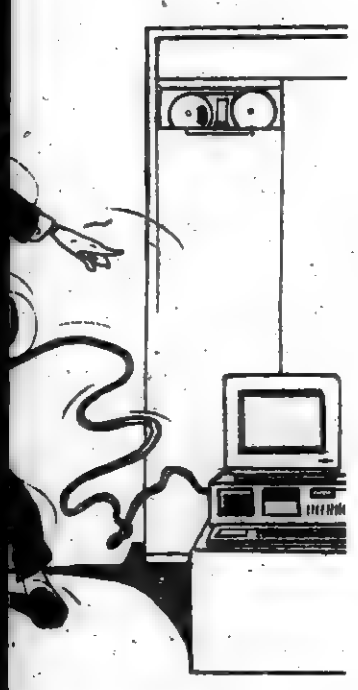
Intensifies, Information A Competitive Weapon.

Economic experts agree that the 1990s will see unprecedented competition in global markets.

Key to your company's survival in this new competitive environment will be the adoption of a new computing strategy in which information systems can truly become a competitive weapon. A strategy far more flexible and able to adapt rapidly to change than those of the past.



Open, Cooperative Computing is NCR's blueprint for such a strategy. Its openness gives you the widest possible choice of hardware and software. So you can add applications and functionality quickly.



Its client/server architecture lets you distribute computing resources more efficiently. Its intuitive graphic interface gives you transparent access to information enterprise-wide. So you can respond to customer and market needs more quickly and more effectively.

And it provides a bridge to your current information systems that preserves your present investment in systems, applications, and data.

NCR is a leader in open systems solutions. We build the most complete set of end-to-end, industry-standard products. And no one has more experience connecting multivendor environments, via SNA, OSI, and other communications methods.

Open, Cooperative Computing is a strategy that will shape the future of information systems. The time to begin implementing that future is now.

For details on how to turn your information systems into a competitive weapon, phone 1-800-CALL NCR.

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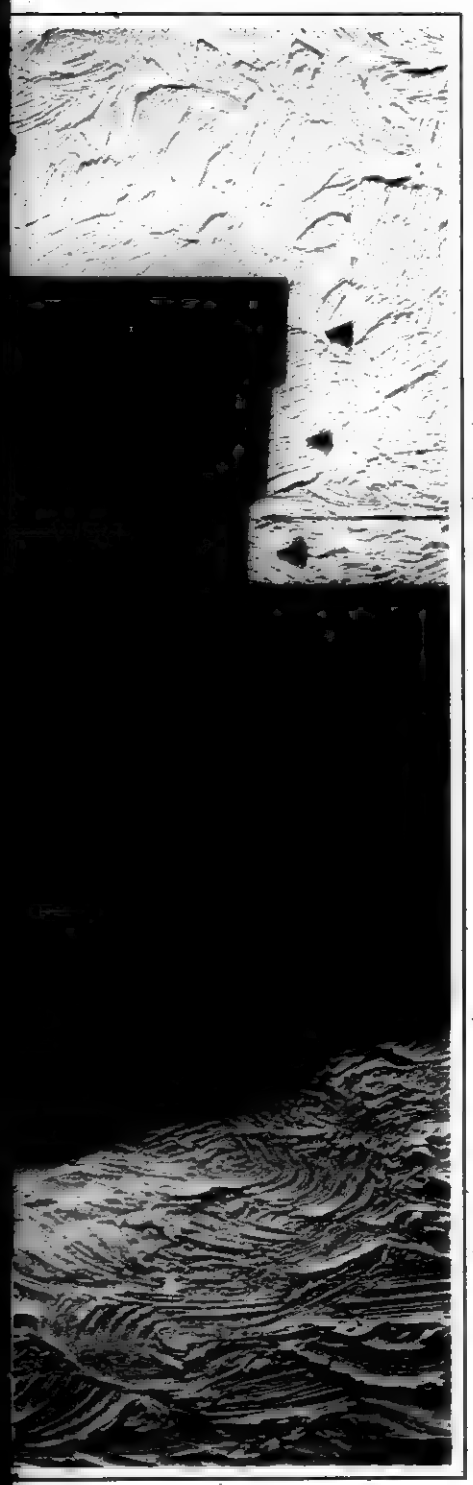


OSI

THE PAST THREE DECADES HAVE BEEN DOMINATED BY THE EXPANSION OF NEW AND NECESSARY COMPUTER ARCHITECTURES IN RESPONSE TO A DEVELOPING HIERARCHY OF USER NEEDS. DURING THE 1960s, THE BURGEONING POPULATION OF MAINFRAMES SERVICED THE INCREASING DEMANDS OF BACK-ROOM PROCESSING. DURING THE '70s, MINICOMPUTERS PROVIDED SPECIFIC APPLICATION SUPPORT FOR NONDATA PROCESSING PROFESSIONALS. THE '80s SAW PERSONAL COMPUTERS AND WORKSTATIONS SATISFY THE CRAVING FOR END-USER COMPUTING. UNFORTUNATELY FOR THOSE PEOPLE PLANNING INFORMATION SYSTEMS IN THE '90s, ALL THE INNOVATION AND CHANGE OF THE PAST 30

years have lead to a more complex, rather than a neater and cleaner, computer arena. Each new generation of hardware has survived instead of being succeeded. As a result, the networks of today must accommodate all of them - mainframes, minicomputers, PCs and workstations.

Consequently, the challenge for the '90s is not to rid ourselves of older architectures but rather to blend the new with the old in some more highly useful and manageable fashion. The '90s will undoubtedly be remembered as the decade in which computers of all kinds finally provided a whole information system that was functionally greater than the sum of its parts. The following research paper is meant to provide a general overview and status report on the progress of the Open Systems Interconnect (OSI) model for computer communications. It is not meant to be a technical journal, nor is it composed of OSI hype. Instead, it paints an optimistic, yet honest picture of the next big step in the evolution of networking computers to computers, applications to applications and, most importantly, end users to information.

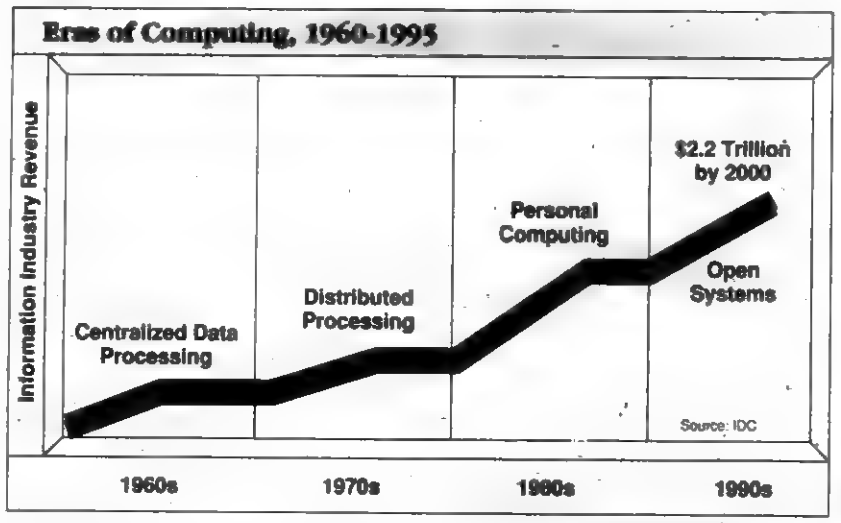
EVOLUTION TO OSI

History of OSI

It became quite apparent by the mid-1970s that computers were utilized more effectively when properly linked together. With additional advancements in distributed processing on the horizon, it became equally evident that in order to prevent users from becoming entrapped in proprietary vendor network architectures, standardization needed to take place. Since 1946, the International Standards Organization (ISO) has been involved in worldwide standards development and adoption on behalf of its almost 100 represented countries. In 1977, the ISO decided to expand its standards-setting work to include computer-to-computer communications. At that time, a formal working group was given the charter to develop the OSI Reference Model.

Why OSI?

Information systems are fraught with network architectures that are essentially closed to outsiders. In this case outsiders could be either vendors that are not already installed on the network or users that operate within a separate and different network environment. On one hand, this closed posture provides the installed vendor tremendous leverage in any system expansion. On the other hand, it severely limits the choices for users examining new hardware, operating systems and applications as well as communications and networking equipment and services.



OSI will follow in the footsteps of mainframes, minicomputers, personal computers and local-area networks as a catalyst for information industry growth.

The OSI model holds the promise of freedom from these constraints by providing a networking platform on which all vendors have an equitable chance of competing for new hardware and software systems business. In this environment, the power rests with the user community, allowing implementation decisions to be based on the best future as opposed to the installed past.

Current Status

Work has progressed over the last 12 years to the point that the primary functions of OSI are firmly adopted as international standards and are able to be actually implemented and subsequently incorporated within network architectures. Almost every major computer vendor will deliver full seven-layer OSI-based networking systems during 1990. Those vendors that significantly fall behind this schedule will face user backlash that will be difficult to overcome in the future.

For the users, these primary functions provide the base level with which to construct a networked system. Beyond these, however, there is still much work to be done. OSI network management, although having progressed nicely over the last eight years, will still require at least two more years of effort. Also, OSI application-level standards for such things as network transaction processing and distributed databases are not expected to be fully functional until 1993 at the earliest.

These caveats should not, however, discourage potential OSI implementors. Most networks currently provide users with less robust services than their corresponding offerings within OSI. Obviously, with more room to grow, OSI shows greater potential for supporting the more intense network utilization planned - and unplanned - in the future.

DEFINITIONS

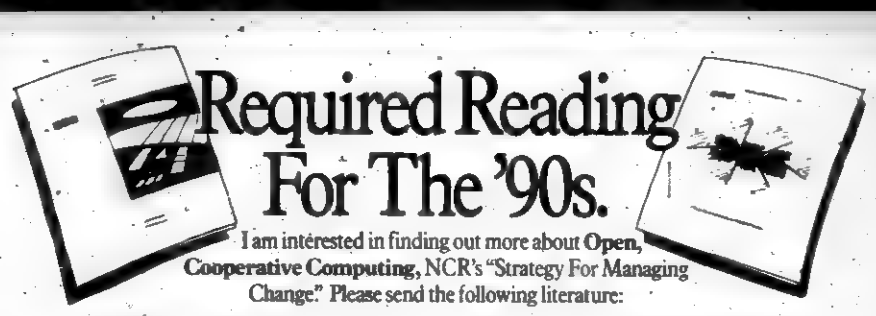
The Concept of Layering

In an attempt to deal with the constantly changing nature of standards and the products that employ them, the OSI model was based on layers. As a result of that approach, it is easier for vendors to implement the model into their products. Users, who inevitably find themselves continually upgrading their networks, will also benefit from the model's modularity and cost-effectiveness.

Layering also allows more flexible configurations with respect to not only topology but also higher performance hardware support for network services. By allocating specific network duties across each of the seven layers, users and vendors can properly balance the placement of network and end nodes.

Transmission Services: Layer 1

The OSI model is quite flexible regarding the types of transmission services it supports. Older standards such as RS-232 and V.35 are supported for use in longer distance or lower performance network environments. In the higher bandwidth ranges, OSI makes use of local-area network interface standards including IEEE's 802.3 (Ethernet), 802.5 (Token-Ring) and 802.4 (broadband) as well as the more newly adopted ANSI standard for fiber-optic LANs, the Fiber Distributed Data Interface. Work is also under way to allow such recently heralded telecommunications services as Integrated Services Digital Network to support OSI-based computer traffic.



Required Reading For The '90s.

I am interested in finding out more about **Open, Cooperative Computing,** NCR's "Strategy For Managing Change." Please send the following literature:

☐ NCR's "Networking Directions" Brochure ☐ NCR's "Open, Cooperative Computing" Brochure

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Because of its modularity, OSI can adapt to any new transmission technology. This allows users the comfort of designing computer networks and networked applications without worrying about the communications transport method. Users will be able to make these choices during implementation, just as they would when choosing between Ethernet or Token-Ring for a PC network. This eliminates the much less appealing alternative of having the vendor make these decisions during the product design and development process.

Networking Services: Layers 2, 3 and 4

Layers 2, 3 and 4 comprise the networking portions of the OSI model. They provide support for information delivery between both intermediate nodes and end nodes. An intermediate node is one which routes information in a way that allows source and destination nodes to conduct a conversation. For example, if Node A, the source node, was to transfer information through Node B in order to have it subsequently transferred to the destination, Node C, Node B would be an intermediate node because it provides a routing function for Nodes A and C.

Within the OSI model, Layer 2, or the Data Link Layer, is exercised in transferring data from Node A to Node B and then again from Node B to Node C. Routing functions take place at Layer 3, the Network Layer, which allows Node B to determine that this data transfer is actually destined for Node C. The actual source-to-destination conversation occurs at Layer 4, the Transport Layer. Node A's Transport talks directly to Node C's Transport.

This division of responsibility within OSI will allow network managers to customize OSI to the needs of their organizations. In many organizations, OSI will initially be used as a backbone network linked to local networks running non-OSI protocols. For example, Novell, Inc. will not suddenly abandon support of its proprietary Netware IPX protocol and the large installed base of IPX users simply because the OSI protocol stack becomes available. However, for better enterprisewide connectivity, these distinct PC LANs may use OSI routers to send information to other parts of the network. This would allow the OSI backbone to support other types of communications besides PC LAN exchanges.

X.25, initially specified in 1976 by the international standards body, the Consultative Committee for International Telephony and Telegraphy (CCITT), is the most widely used OSI standard in the area of networking services. It is supported through the use of private packet-switching equipment as well as through public value-added networks (VANs) such as Tymnet and Telenet.

Application Services: Layers 5, 6 and 7

These are the services most closely related to, and controlled by, end users and network applications. They are demand-driven, meaning that as users or applications need to use the network, these layers perform their appropriate duties. For example, say user 1 on Node A wanted to send a file to Node B. The file transfer application service on both Nodes A and B would be involved in a layer seven (application) conversation. Along with this conversation, layer six (presentation) processing would occur to ensure that, upon transfer, the file would be in the format appropriate for Node B. This would then allow Node B users access to the file from their own applications. Layer five (session) would involve itself in this process by coordinating resources at both ends of the transfer, acting as the mediator between the high-level application services and the networking services below.

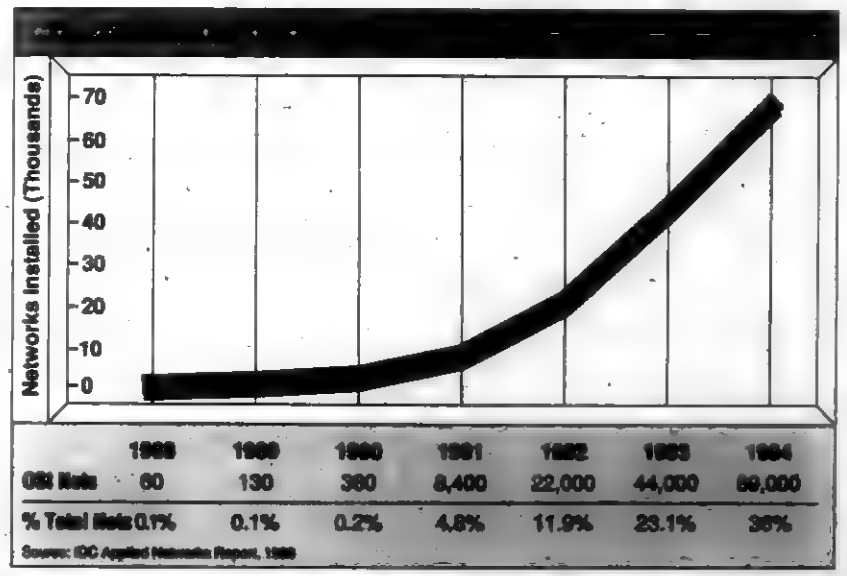
APPLICATIONS

Application suites are perhaps the most important, yet least defined, components of OSI. Designing company-specific applications for OSI networks will take IS managers quickly into uncharted waters. A number of them have been put forth.

Electronic Mail

Currently, most large organizations have installed multiple hardware platforms, which include mainframes, minicomputers, PC LANs, stand-alone PCs and other systems. Electronic mail has the potential to become the basis for common communications among these diverse computing environments. However, the reality of proprietary communications protocols, e.g., IBM's Systems Network Architecture (SNA), Digital Equipment Corp.'s Decnet and incompatible E-mail formats, such as addressing, directories and document types, make the development of a corporatewide mail system a difficult and resource-intensive challenge for IS planners. What large organizations require is a common, unifying set of specifications that allows E-mail users on one vendor's system to easily talk to other users on different systems across the corporate network.

The suite of international standard E-mail specifications is comprised of two protocols: X.400 and Office Document Architecture. X.400 enables the transfer of messages - packets of information - between users and applications. Initial work on the X.400 messaging standard has been entirely geared toward providing vendor-independent E-mail. The most important protocols within X.400 are Message Transfer Agents, which accept and transfer messages, and User Agents, which provide the E-mail interface between the end user and the mail-transfer system. X.400 can be used in several

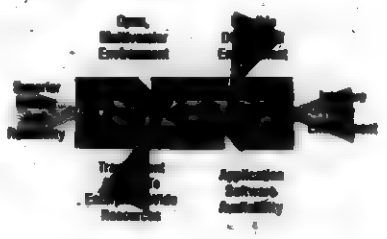


IDC predicts backbone networks based on mainframes and minicomputers will experience significant growth between 1990 and 1991. This growth will stem primarily from demand by the U.S. government and DEC offering its OSI stack to Decnet customers.

Move Your Wor
Isolation To

kgroups From Cooperation.

Most companies have computer systems that were acquired on a departmental level, often from different vendors. This practice has left islands of information—workgroups divided by function, operating system, and communications protocols—barriers more formidable than any wall.



As a result, information critical to the success of the entire enterprise may not be available on a timely basis to those who need it.

A primary goal of NCR's Open, Cooperative Computing strategy is to enable an open, multivendor environment that integrates these islands into a single enterprise-wide network. To accomplish this, we've developed a wide range of capabilities adaptable to almost any customer need.

We deliver open communications systems, network applications, and network management based on OSI standards, to help make your migration to a fully OSI-compliant network easier. And we provide current system flexibility with open communications standards like TCP/IP.

If you use SNA, NCR helps preserve your investment by a continuing commitment to superior SNA connectivity, while helping you integrate this proprietary standard with open systems.

We also support standard communication interfaces like Ethernet and Token Ring and standard operating systems like UNIX,™ OS/2,® and DOS.

Moving your workgroups from isolation to cooperation can make your organization more efficient, more competitive, a better team. For details, phone 1-800-CALL NCR.

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Open Systems Interconnect Seven-Layer Model

Layer 7 (Application)	Responsible for information transfer between two network applications. This involves such functions as security checks, identification of the two participants, availability checks, negotiating exchange mechanisms and most importantly initiating the exchanges themselves.
Layer 6 (Presentation)	Responsible for the proper formatting of information. This involves negotiating formats, transforming information into the agreed upon format and generating session requests for service.
Layer 5 (Session)	Responsible for the management of connections between cooperating applications. This involves establishing and releasing sessions, synchronizing information transfer over these sessions and mapping session-to-transport and session-to-application connections.
Layer 4 (Transport)	Responsible for managing connections between two end nodes involved in an information exchange. Primary functions include establishing and releasing end-to-end connections, controlling the size, sequence and flow of transport packets and mapping transport and network addresses.
Layer 3 (Network)	Responsible for routing information among source, intermediate and destination nodes. Primarily, routing is provided through network address processing, connection-oriented and connectionless exchange management, segmentation and blocking of network packets.
Layer 2 (Data Link)	Responsible for the reliable transfer of data frames over the physical layer. Reliability is provided through proper sequencing, error detection and recovery and flow control.
Layer 1 (Physical)	Responsible for the mechanical, electrical, functional and procedural aspects of data circuits among network nodes. Of primary importance are link activation and deactivation, fault and performance management of circuits and sequencing of bit streams.

different capacities by large organizations, including the following:

- As a common denominator between dissimilar internal mail systems. For example, X.400 could be used to transfer mail between DEC's All-In-1, IBM's Professional Office System and Wang Laboratories, Inc.'s Wang Office since each supports X.400.
- As a link for intercompany communications. X.400 can extend the reach of a proprietary internal mail system to public or other private mail systems that support X.400.
- As a link to international offices. Because of the wide support for OSI in Europe, X.400 will help extend U.S. mail systems to offices in Europe.

X.400 has been ratified as an international standard, and a new 1988 version was recently approved by the CCITT. This newer version includes support for the delivery of multiple information streams, including data, electronic data interchange (EDI) documents, image, facsimile, voice and even audio. Obviously, X.400 is destined to become far more than just an E-mail delivery system.

Office Document Architecture is the specification for revisable compound document interchange. Compound documents contain text, data, image, graphics and voice. Office Document Architecture builds on X.400's ability to act as an envelope, defining how data is sent between two users by interpreting that information.

It is a finalized international standard, but it only contains specifications for text plus limited graphic and image capabilities. It will have to be substantially enhanced to fully manage the transfer of complete compound documents before realizing its potential. Several vendors have announced plans to utilize Office Document Architecture as a basis for their compound document architectures, but IDC believes it will not receive widespread support until 1992 at the earliest.

File Transfer Access Management (FTAM)

The FTAM protocol was designed for the exchange of files among computers and users on an OSI network. Much of the work on the protocol was derived from the manufacturing environment in which the management and proper exchange of parts and inventory information became critical as companies began applying just-in-time manufacturing techniques.

General Motors Corp. not only led the Manufacturing Automation Protocol (MAP) effort in its early years but also began requiring FTAM transfer capabilities from its suppliers. Because of its acceptance as part of the MAP effort and its early adoption date, this protocol has been widely implemented by computer vendors. It is second only to X.400 in vendor product availability at the application level.

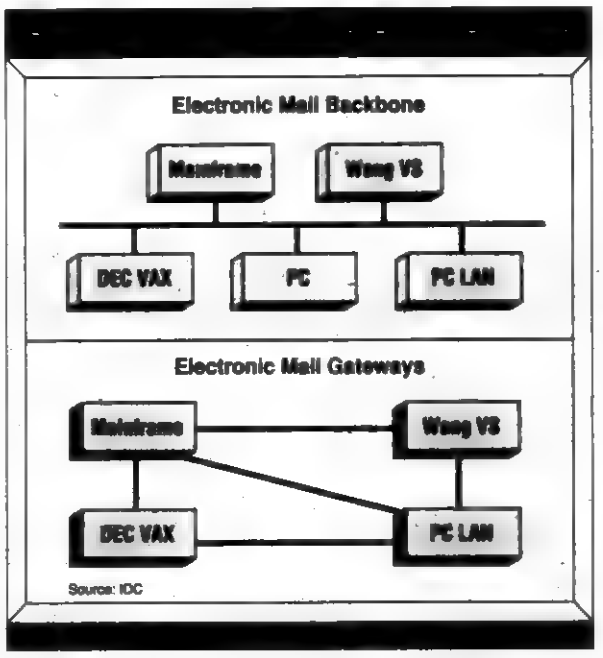
However, MAP has not achieved the same level of success as X.400 in gaining widespread user acceptance. There are a variety of reasons for this. First, while X.400 can be easily shown to solve a common problem - incompatible E-mail - FTAM requires more creativity in terms of application development. Second, users have had other options for transferring files among computers. Some, such as remote job entry emulators, are indeed old, while others, such as tape and flat text files, are simplistic, but they have gotten the job done.

Electronic Data Interchange

EDI is defined as the electronic transfer of structured data via standard messaging protocols. The most common use of EDI is the transmission of general business documents such as purchase orders or invoices between business partners. Another important EDI application is electronic funds transfer between financial institutions. EDI is an ideal application on top of OSI because OSI networks can give organizations the universal connectivity over standard communications protocols that EDI requires.

EDI also describes how the information or business document is formatted. Several EDI standards currently exist. The two internationally accepted EDI platform standards are ANSI's X.12 and EDIFACT. Platform standards act as an underlying base for application-specific, value-added communications. X.12 is developing as the preferred U.S. EDI method, while EDIFACT is the choice for international exchanges.

Other standards developed by industry organizations such as the Transportation Data Coordinating Committee will eventually migrate to X.12 and EDIFACT, using them as platforms while enhancing them with industry-specific extensions. Today, most EDI traffic is carried over proprietary network protocols. However, industry pilots are moving toward utilizing X.400 as the standard messaging and forwarding mechanism of EDI.



The use of a common backbone provides centralized gateways for the connection of incompatible E-mail networks.

Directory Services

A collaborative effort by the CCITT and the ISO, X.500 is a set of specifications that maps out the structure of a global electronic directory. The X.500 standard specifies the structure of the directory, the types of information (objects) to be stored, how entries are to be named, the manner in which the information will be accessed by users and the types of services that will be available to users. X.500 is designed to work as an extension to X.400 electronic messaging. X.400 provides user-friendly names for its standard message envelope, while X.500 provides the services to translate user names to network addresses.

X.500 will first be available from vendors during 1990. Installation of large X.400/OSI networks will drive developments in X.500. Experimental X.500 directory usage will begin in 1991, but most large organizations will not actually implement complex X.500-directed networks until 1993.

Initially, X.500 will exist as a number of isolated directories. Individual networks will utilize one or more X.500 distributed systems architectures (DSA) to provide services to intraorganizational network users. Over time, the DSAs in each network will be connected. The result will be an ever-expanding web of X.500 directories. The Directory is the name given to what will be the ultimate realization of worldwide directory services sometime in the late 1990s.

Distributed Databases

Considering that much of today's IS budgets is spent on the development, manipulation and maintenance of information databases, OSI standards for Remote Database Access will have a great impact on expenditures in this critical area. Unfortunately, user apprehension and these lagging standards constrain the development of mission-critical access to data. This is both a reflection of their complexity and of user ambivalence toward changing what is a very complex and critical part of their IS structure. As PC LAN databases, SQL servers and object-oriented systems grow in popularity, there will be an increasing demand for standardization.

INTEGRATED NETWORK MANAGEMENT

OSI Network Management Status

Comprehensive standards for network management, although having made much progress over the last few years, are still two years away from finalization, and fully conforming products are two years beyond that. Does this mean that users should hold off on implementing OSI networks until 1994? IDC believes the answer is absolutely not.

Because proposed OSI network management systems are not considered sufficiently robust, proprietary network management systems will continue to outperform OSI-based network management systems well into the foreseeable future. However, OSI network management standards are key in the realm of intra-network and intervendor network management exchanges. Here, OSI standards will outline rules for network management interactions, enabling coordinated network management without having to specify every last detail of proper network operation within any one segment of a network.

The most influential group involved with OSI network management is the OSI Network Management Forum. Comprised of almost every major vendor of computing and communications systems, this group's charter calls for it to oversee the interoperability of OSI-based network management systems. This task is no easy one. With the risk of losing users running high, vendors are delicately balancing control against open-mindedness. Too much of the former and vendors risk user loyalty; too much of the latter and they risk user reliance.

MIGRATION STRATEGIES

Most IS/communications managers in large U.S. organizations are interested in what OSI may offer them but they are very unclear on what those benefits are and how to achieve them. IDC survey data shows some movement toward OSI in IS plans. Generally, a conservative approach is dictated through 1990 and 1991, with a quickening pace for implementation beyond 1992.

Beyond 1995, OSI will be well on its way to dominating large corporate networks. X.400 especially has the potential to lead OSI into many large organizations. Even implemented without full OSI stack support, as it

Configuration	• Initialize and reinitialize network entities. • Collect and store information about all circuits, hardware and software systems within the network. • Distribute network information and systems and application software.
Fault	• Identify, classify and report problems. • Analyze network breakdowns. • Provide a resolution by directing operators and/or initiating intelligent automatic restorals.
Performance	• Monitor use of the network; plan for the aquisition and deployment of new equipment and services. • Tune network and application components.
Security	• Track information flow within the network nodes and applications. • Identify and pinpoint sources of misuse or abuse of network resources.
Accounting	• Provide for chargeback of network access and level of utilization. • Aid in properly managing networking budgets. • Quantify productivity associated with installed and planned network technologies.

can be, X.400 will stimulate demand for more complete lower level and comparable application-level services.

Implications for Other Networking Standards

OSI, although coordinating with a wide variety of technologies at the transmission-service level, serves as a replacement for almost every network architecture currently in use. SNA, Decnet, Data General Corp.'s Xodiac, Hewlett-Packard Co.'s Advancenet, NCR Corp.'s TowerNet and others all face the probability of replacement by corresponding functions specified within the OSI model. Obviously the key for these vendors and their users will be effectively moving their current proprietary schemes toward an open architecture.

The cynics among us would say that vendors will never do this. The past history of heel dragging relative to standards implementation supports this claim. However, as users have grown more powerful and as standards such as Unix, SQL, MS-DOS, Ethernet and Token-Ring have grown more widely used and appreciated, the dynamics of the situation have changed. In this environment, the vendors are being forced into delivering open systems platforms at the networking layer, in addition to operating systems, databases, user interfaces and programming tools.

Replacement of and Coexistence with Proprietary Networks

The greatest challenge for users implementing OSI networks during the next few years is the proper balancing of openness against cost and performance. Proprietary networks enjoy the leverage of a substantial installed base and years of enhancements. Fortunately for most computer vendors, network architectures have been mainly implemented in software with a certain amount of hardware assist where performance became a concern. This software orientation provides the user with a smooth upgrade path to the OSI model.

For example, DEC, by upgrading its proprietary Decnet Phase IV transport protocol to OSI Transport within Decnet/OSI Phase V, provides, in essence, a free migration to those users with up-to-date maintenance contracts. Once implemented, this new open DEC transport holds the potential of opening up the user's network to OSI-based NCR, DG, Bull H. N. Information Systems, Inc., Unisys Corp. and even IBM equipment.

Many alternatives will be offered to users over the next two years. Routers and gateways that act as go-betweens for OSI and proprietary networks will become prevalent as OSI backbones are implemented. Although possibly more resource intensive, a dual-stack approach, i.e., an architecture that offers both OSI and proprietary protocol usage side by side, will allow smoother migration for those more complex and diverse network configurations. A third alternative will have OSI protocols providing support for both OSI and proprietary applications and extensions. This alternative is the one that will eventually prove itself most useful for both vendors and users.

SNA/OSI Coexistence

The largest population of applications and users exists within IBM networks utilizing either Binary Synchronous Communications or SNA protocols. Therefore, the biggest potential migration toward OSI from a proprietary system exists within IBM's domain. The key to unlocking this potential from the current constraints of hardware and software dependencies is IBM's Systems Application Architecture (SAA) and its support for the OSI model. Scheduled for release this spring and summer on 370 architecture machines, IBM's SAA-based OSI suite will offer IBM users a break from traditional hierarchical IBM network offerings. Both OSI and SNA occupy the common communications portion of SAA, allowing users the freedom to choose between IBM-proprietary and open standards as a basis for new applications and end-user devices.

This increased IBM flexibility toward networking will lead to a more open IBM environment for users - one that will more easily allow the integration of other vendors' equipment and services. No matter how LU6.2 and PU2.1 have been sold over the past few years, the implementation of the OSI model within SAA represents the first solid move by IBM toward bringing peer-level communications capabilities into its strategic, mainstream product offerings.

The Move away from TCP/IP

Over the next few years, networks that utilize Transmission Control Protocol/Internet Protocol (TCP/IP) must be prepared for a transition to the more highly functional and longer term OSI solution. Useful in that preparation will be TCP/IP-OSI routers and gateways such as IP-to-OSI network exchanges; well-integrated application and networking services from both architectures, e.g. using File Transfer Protocol over OSI lower layers; and most importantly, painless upgrades from TCP/IP to OSI protocols.

STANDARDIZING THE STANDARD

Multivendor Interoperability

Conformance testing is critical to OSI acceptance. The tremendous benefits of OSI can only be achieved if OSI products

from a multitude of different vendors can plug and play for users. Over the course of the last two years, several standards promotion groups, specifically the Corporation for Open Systems in the U.S. and the Standards Promotion and Application Group in Europe, have developed test suites for seven-layer OSI testing. Through these test suites and at trade show demonstrations around the world, vendors have shown that multivendor OSI networking can be achieved. Testing and initial user experience have also shown that no two vendors implement OSI the same way. Users are advised to implement multivendor OSI networks only with caution and, for at least the next two years, with the expectation of expending significant time and effort. Over time, testing and experience will increase interoperability, but the goal of OSI plug and play is unlikely to be reached before the mid-1990s.

PRESENT AND FUTURE UTILIZATION

Current Usage

Current OSI utilization is best exemplified by the world's VANs. They represent many distinct operating transport networks utilizing one common standard, X.25. They offer applications services such as EDI and E-mail for intra- and intercompany communications internationally. This is accomplished in an environment that uses a mix of private and public communications and computing equipment as well as a multiplicity of service providers. Although far from perfect, VANs represent the current state of the art in large-scale OSI networking.

Within the private networking arena, full process manufacturing companies have shown the highest degree of OSI commitment. With their specialized research and development, automated manufacturing operations and well-integrated selling, administrative and service functions, they have the most urgent need for highly coordinated computing systems. Increasingly, the financial services industry has gravitated toward the use of standardized networks based on the OSI model. Its demands for higher performance intelligent workstations and networks, its need for smooth and timely international exchanges and its strong desire for vendor independence are combining to drive this industry down the OSI path.

The U.S. government, through its Government OSI Profile (Gosip) which is set for implementation this year, will be a big boost for OSI networks in the early '90s.

Future Directions

There will be two phases of OSI development. The first will be aimed at broadening the availability and use of the base-level OSI as a flexible and multivendor network system. Conformance testing and migration strategies are pivotal in this phase. The second phase will be aimed at strengthening OSI itself. In this phase, further enhancements to OSI applications and increasingly higher performance protocol stacks will become the driving forces.

Phase one will take place over the next three years. In 1989, we saw many OSI announcements and a few product introductions. This year will be the year in which almost every major vendor makes available its OSI stacks and applications. The years 1991 through 1993 will be dedicated to making sure the products of 1990 are actually able to work together within one common network.

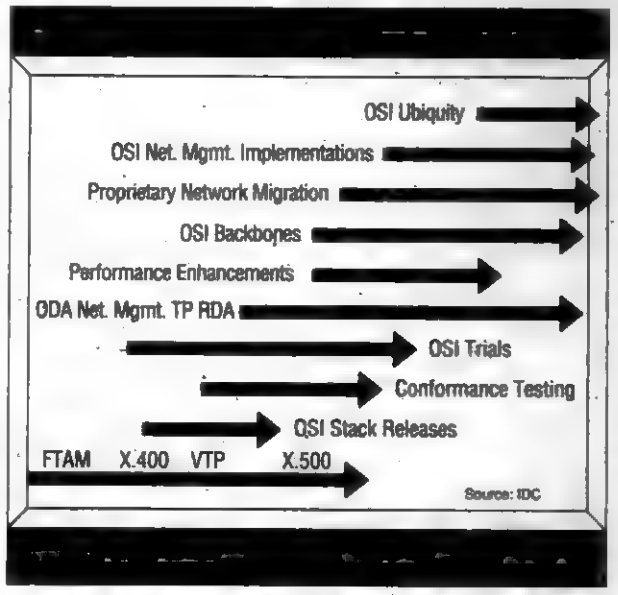
Simple OSI-based organizationwide applications such as E-mail and file transfer will become widely utilized by the end of 1993. OSI backbones, acting as coordinators for installed proprietary networks, will start to be implemented within larger organizations in this same time frame, continuing through the year 1995.

The second, more performance-oriented phase of OSI will begin in the technical/knowledge worker community - the current bastion of TCP/IP, Unix and high-powered workstations. Its requirements for intense, real-time network delivery mechanisms combined with its leading-edge networked applications will drive OSI developments starting in 1992. These phase two developments will be restricted to this select community of users until OSI proves itself a viable and workable backbone technology. Beyond 1994, performance enhancements will begin disseminating into the mainstream end-user community. At this time, demanding applications such as object-oriented databases and image processing will become the norm rather than the rarity in IS.

Time Line for Adoption

End-user organizations that abide by the "right processor for the right job" philosophy should already have firm plans in place for OSI utilization. IDC believes actual implementation for these more aggressive organizations will begin in 1991. More mainstream organizations that tend to operate rather distinct multivendor environments - NCR point of service, DEC engineering, IBM administrative, HP manufacturing - should already be planning the coordination of their networks into a unified OSI backbone. Implementation in these organizations should happen between 1993 and 1995. Further migration of these distinct networks toward OSI stacks and applications will occur between 1994 and 1996.

Organizations primarily oriented toward a single network architecture such as SNA and a minimal investment in what would be considered secondary vendors will gain little from OSI until the enhanced second phase beyond 1994. At that point, OSI networks will begin to offer significantly superior functionality when compared with traditional proprietary networks. By sticking with the older networking methods, organizations will invariably fall behind in their ability to compete on the basis of information technology.



OSI charts a steady course toward ubiquity.

The Architecture Behind the Strategy.

Open, Cooperative Computing Architecture.

NCR's Open, Cooperative Computing Architecture (OCCA) focuses on client-server relationships as the foundation for Open, Cooperative Computing.

In the client-server model, the application is split between the client and server, and data is separated from the applications. This makes maintenance of applications and data easier, and allows processing at the most effective location.

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OCCA also supports such services as exchange of electronic mail and files, and through a common set of programming interface standards, offers a universal application environment for development and run-time systems. And by supporting a uniform set of human interface services, it allows OCCA developers to provide new applications that are easier for you and your staff to learn.

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NCR's plan for open networking is designed to give you the flexibility you need by delivering standards-based systems for all levels of your organization, and the end-to-end support and service to achieve *your* strategic plan.

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NCR's strategy for Open, Cooperative Computing is to give you the flexibility you need to compete, and win, in the '90s. And we support this strategy with the architecture and service necessary to offer not just systems, but solutions.

For more information on Open, Cooperative Computing, phone 1-800-CALL NCR.

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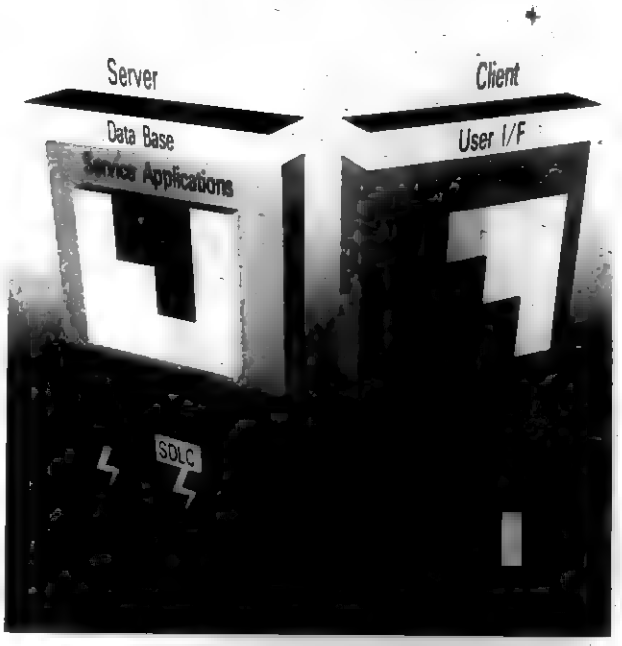
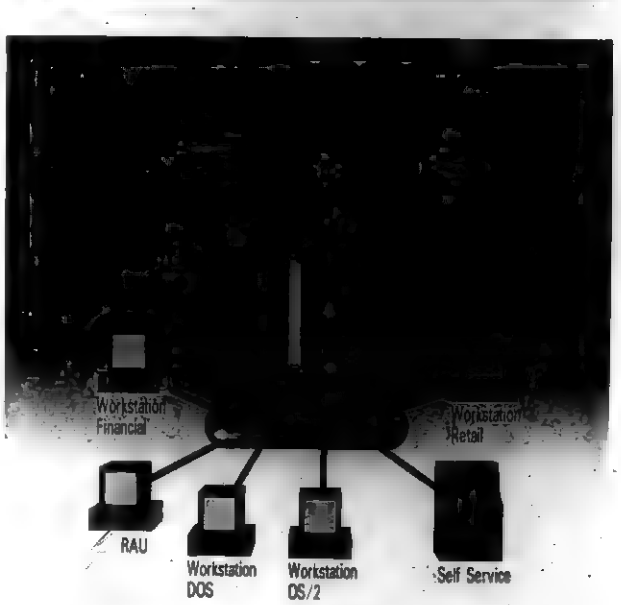




NCR

Open, Cooperative Computing.
The Strategy For Managing Change.

MANAGER'S JOURNAL

EXECUTIVE TRACK

Donald E. Rife has been promoted to director of computer services at the **Medical Center of Delaware**, a private, nonprofit hospital in New Castle, Del., that is the 16th largest health care facility in the U.S.

Rife, 36, joined the medical center in May 1988 as manager of technical support. Prior to that, he was a technical business consultant at Computer Task Group, Inc.

Rife's 13-year information systems career has included positions as systems engineer at IBM, manager of technical services at Villanova University and manager of hardware and software at Crystal Brands, Inc. He has also worked as an independent consultant. He holds a certificate in data processing.

.....

Harry Toland has been promoted to vice-president of IS at **Market Street Mortgage Co.**, a Tampa, Fla.-based retail mortgage banking company. Toland joined Market Street Mortgage in 1989 as director of IS.

Toland, who will oversee the planning and installation of a new generation of communications and information programs at Market Street Mortgage, will continue to supervise the existing IS network.

Prior to Market Street Mortgage, Toland worked in several IS positions during a 10-year career at United Technologies Corp. He also has experience in international banking and sales at RCA, Exxon Corp. and Olivetti U.S.A.

.....

Who's on the go?

Changing jobs? Promoting an assistant? Your peers want to know who is coming and going, and *Computerworld* wants to help by mentioning any IS job changes in Executive Track. When you have news about staff changes, be sure to drop a note and photo or have your public relations department write to Clinton Wilder, Senior Editor, Management, *Computerworld*, Box 9171, 375 Cochituate Road, Framingham, Mass. 01701-9171.

Founding father of Japanese IS

With little to guide him, Noburo Minamisawa helped lead Japan to the computer age

BY YASUKO YOSHIMI
SPECIAL TO CW

With clear vision and a strong faith in computer and networking technology going back almost 40 years, Noburo Minamisawa is a living witness to and pioneer from the dawn of Japan's computing era.

The 72-year-old adviser at Japan's Onoda Cement Co. has helped develop information systems for hundreds of Japanese organizations — notably the Japan Railway — while working as the IS manager at Onoda Cement.

His contributions to IS in Japan extend into government agencies, banking and manufacturing industries, but they all started with Onoda Cement's internally developed corporatewide computer network, which Minamisawa designed from scratch in 1953.

Prizewinner

In recognition of his distinguished service, he has been awarded prizes from the minister of Posts and Telecommunications in 1975 and from the prime minister in 1983.

"I did not join the company to pursue an MIS career," says Minamisawa, who shows surprising vitality for his age.

Now in his 40th year at Tokyo-based Onoda Cement, he serves as adviser and executive director at OACS Co., a spinoff company of Onoda's IS division and NTT Internet.

An IS utility joint venture with a large vendor such as NTT is fairly common business practice in Japan. Onoda Cement is the 11th largest building materials manufacturer in the world — the second largest in Japan — with revenue of $3.1 billion.

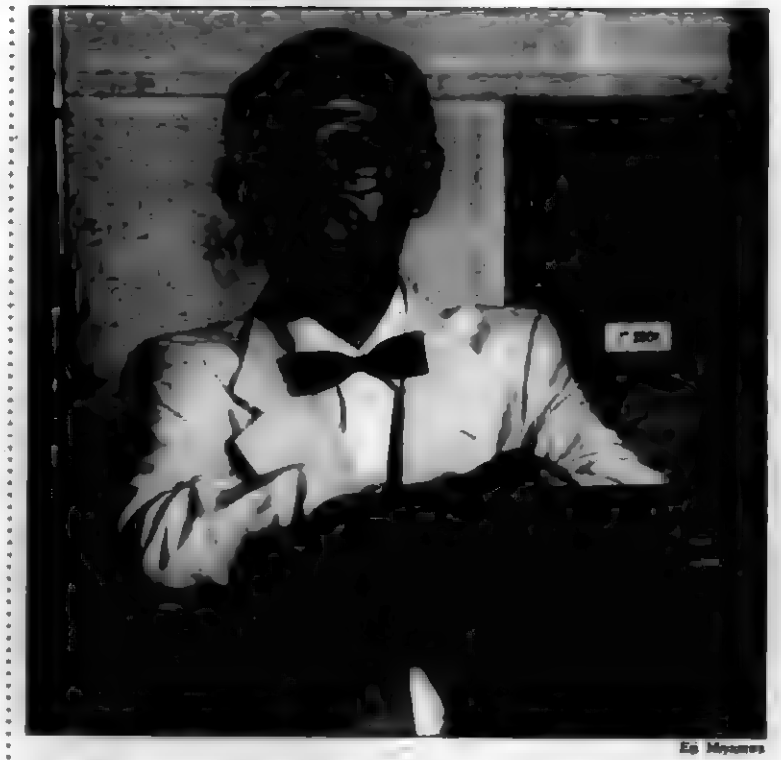
In addition, Minamisawa holds chief director positions at the Japan Computer Utility Association and the Japan Data Processing Association. Until recently, he was a professor at several colleges teaching principles of economics and IS.

One of his first big IS efforts was the Japan Railway's "Midori no Madoguchi," a nationwide ticket reservation center that linked 3,000 point-of-sale terminals at 1,600 stations. This was the first on-line, real-time system launched in Japan.

Called the MARS (Magnetic Automated Reservation System), the system began full-fledged operation in

Continued on page 70

PROFILE: Noburo Minamisawa



Eiji Miyamoto

Position: *IS manager, Onoda Cement Co.*

Achievements: *Designed Onoda Cement's corporatewide computer network in 1953; designed Japan Railway reservation system; honored by Japan's Prime Minister.*

Teenage techie is serious about his GAME

BY GARY H. ANTHES
CW STAFF

Tenth-grader John Haskins, the youngest member of the winning team in the Black Data Processing Associates' recent National Student Computer Competition, began programming at the age of six, and he's now developing his own graphics-animation programming language.

Called GAME (Graphic Animation Modulation Engine), it will support testing of animation sequences and dual-graphic editing and have the ability to merge graphics and text. In other words, it will help Haskins develop video games like the one he made recently — "a Mutant Ninja Turtle game . . . robots fighting for their master."

Not all is fanciful for Haskins, a student at Dunbar Senior High School, an inner-city school in Washington, D.C. He said he enjoys trigonometry, integral calculus and programming for applications in artificial intelligence.

"The things I take seriously are my math, my Turbo Prolog class and GAME," he said.

Haskins said he will study math or computers in college. Why math? "Math is very predictable. One plus one is always two, but with English you have things like, 'i before e except after c,' " he said.

Haskins and his team trained all summer for the national computer competition, meeting twice a week with a coach for drilling in computer technology and practicing sample problems (see story page 71).

When not in school or training for the contest, Haskins worked with several other students on a project sponsored by Joint Educational Facilities, Inc. (JEF) to develop the Artificial Intelligence Model of the Black Teenager. The knowledge-based expert system embodies the views of black teenagers on matters of sex, drugs, suicide, education and family life. JEF founder Jesse L. Bemley said he hopes the teenagers can turn the model into a commercial product.

Haskins said he does most of his programming in Pascal, which he learned in a class, and C, which he picked up on his own. "I just read a lot of books on C. It came pretty easy.

"My hobbies are playing basketball, playing video games, making video games and counting my money," Haskins said. The money is for a new computer.

Minamisawa

FROM PAGE 69

1964, the year that Tokyo hosted the summer Olympic Games. The mild-mannered Minamisawa's salary-man life at Onoda Cement began in 1950 in the accounting division. He joined the company initially to make the best of his economics major.

For 10 years before that, after graduating from a commercial high school, he managed his father's handbag business. "I was predestined to do so, due to being the oldest son in the family," Minamisawa says. It is still typical for a Japanese son to take over a family business.

During that time, however, Minamisawa prowled around his native town making a sincere effort to pass entrance exams to study mechanics at Shinshu University and economics at the prestigious University of Tokyo.

"I had books sneaked in between handbags. I was scolded when studying at the desk," Minamisawa recalls. Shigemi Oshima, general manager of the IS division at OACS, says that Minamisawa reminds him of Ninomiya Kinjiro, a legendary Japanese 'dutiful son' whose statue is seen in front of elementary schools throughout the country.

> "I STUDIED AS hard as I could, though I had no knowledge about the use of computers."
>
> NOBURO MINAMISAWA
> ONODA CEMENT CO.

After successfully completing college, Minamisawa began a typical Japanese employee "rotation," working in the accounting, materials and finance departments at Onoda. He was then assigned to the Research and Planning Division, where he was responsible for preparing management census and research reports to present at board of directors meetings.

Minamisawa's reports were full of multicolored graphs and charts made by using the new copier and camera technologies of the time. Toyoroku Ando, Onoda's president at the time, was enchanted with his reports and assigned Minamisawa to conduct a feasibility study on computerization.

He recalls Ando saying, "I understand it is unusual to work on computers in a cement production company, but can you try?" Minamisawa embraced the offer "because I was young," he says.

"Since it was mandatory, I studied as hard as I could, though I had no knowledge about the use of computers or applications of computer technology," he recalls with a smile.

Ando told Minamisawa that he had seen a picture of the Univac I in a Japanese photography magazine with a caption claiming it as the world's first mainframe for practical use. The magazine explained the number cruncher's use in the U.S. census and said it was becoming popular in the world of U.S. business.

"Ando-san had determined the need for office automation and modernization. He was anxious to install factory floor systems, or what would now be called [computer-integrated manufacturing]."

In order to link the company's 32 branches, which were spread out from the northern island of Hokkaido to the southern island of Okinawa, Minamisawa mapped out a networking structure by himself. "I had no staff working with me. A couple of years later, two employees were assigned to help me," he says. He connected 130 terminals with Onoda's Univac File Computer via private telecommunications lines.

In 1957, he published a book titled *Keiei no Automation (Automation in Management)*, which introduced his ideas of "comprehensive computerization, managerial decision-making and integrated processing methods." He acknowledges that automating the enterprise was ahead of its time.

"No scholars and researchers I consulted with inside or outside the company could understand why we should take the trouble to send payroll information, for example, from a Kyushu office

How did anyone WordPerfect

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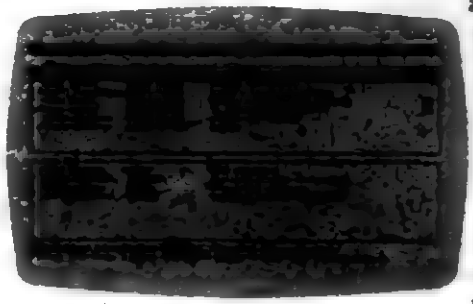

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to Tokyo and back again. They said it's odd," Minamisawa says. "I explained an electric wave can run around the globe seven times in a second, and such data transfer wouldn't take a second."

In order to implement his plan, he went to talk with Teiji Tanimura, then president of Shinko Seisaku Sho, a printer manufacturer. The firm then developed the Standard Onoda Auto-Punch Typer, a remote-control I/O encoding terminal based on specs designed by Minamisawa.

He even created a Japanese word for it — 'enkaku chohsetsu nyu-shutsu-ryoku sohchi.' No manufacturers have yet developed terminals, although they are one of the three columns indispensable in building a corporatewide computer network system besides mainframe and data transfer equipment.

"He began a tradition in the IS division. The idea is to create and customize something if it is not available off the shelf," says Junichi Uchida, managing director at OACS and one of Minamisawa's first apprentices at Onoda Cement.

In April 1959, when the Univac File Computer was installed at Onoda Cement, it was the first full-fledged number cruncher operated in the Japanese private sector.

"It's hard to believe, but it took three years from the time we ordered it," Minamisawa recalls. The first mainframe in the public sector in Japan was the IBM 704 EDPM, which began operating at the Meteorological Agency in the same year.

Minamisawa's efforts within Onoda became a signpost to help open Japan's computing era. "Ando-san told me to help develop information systems for the sake of economic development in this country," he says.

Yoshimi is a freelance writer based in Tokyo.

D.C. takes computer tourney

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — Five teenagers from Washington, D.C., public schools beat 16 other teams in the fifth annual National Student Computer Competition, held at the annual convention of the Black Data Processing Associates (BDPA).

The teams, which had trained all summer, competed by solving a problem that required analysis, programming in Basic, documentation and an oral presentation, all in the space of two hours. Separately, the teams had to answer questions about computer technology and the history of the BDPA.

For this year's problem, the winners wrote a program in Basic to analyze survey forms, determining such things as the mean income of families in a neighborhood and calculating various statistics such as the percentage of low-income families. Judges evaluated the teenagers' ability to explain and demonstrate the problem and its solution, the ability to answer questions and the program's sophistication in design, readability and report generation.

Prizewinners

Winners John Haskins, Carletha Rhones, Taylora O'Bryant, Lewis Newton and Christopher Mitchell will each receive $1,000 scholarships. Second-place winners, sponsored by the Chicago BDPA chapter, will receive $500 scholarships.

Team coach William Johnson, who had led two previous Washington, D.C., teams, said this one was the weakest in terms of experience. "But they pulled all-nighters studying. They just decided they wanted to win. I'm particularly proud of all of them," he said.

Perry W. Carter, the BDPA 1990 conference chairman, said he hopes BDPA can move toward collegiate-level contests. He will look for corporate sponsors with real problems who could get genuinely useful ideas from the contestants' approaches, he said.

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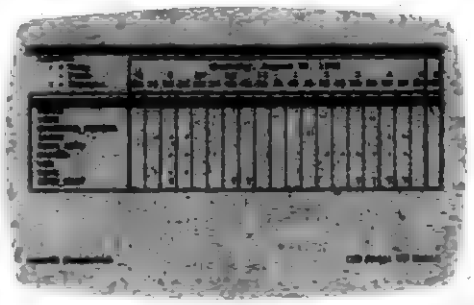
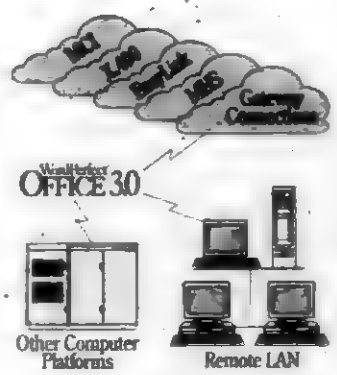


Scheduler



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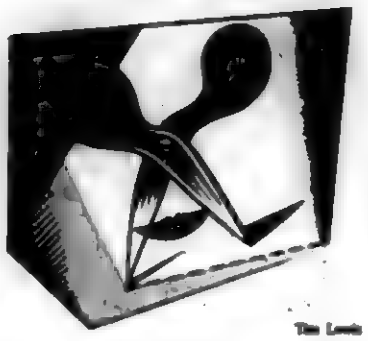


Summaries from leading scientific and management journals

"The RFR: Winning the race of technology"

By Matthew Buckman

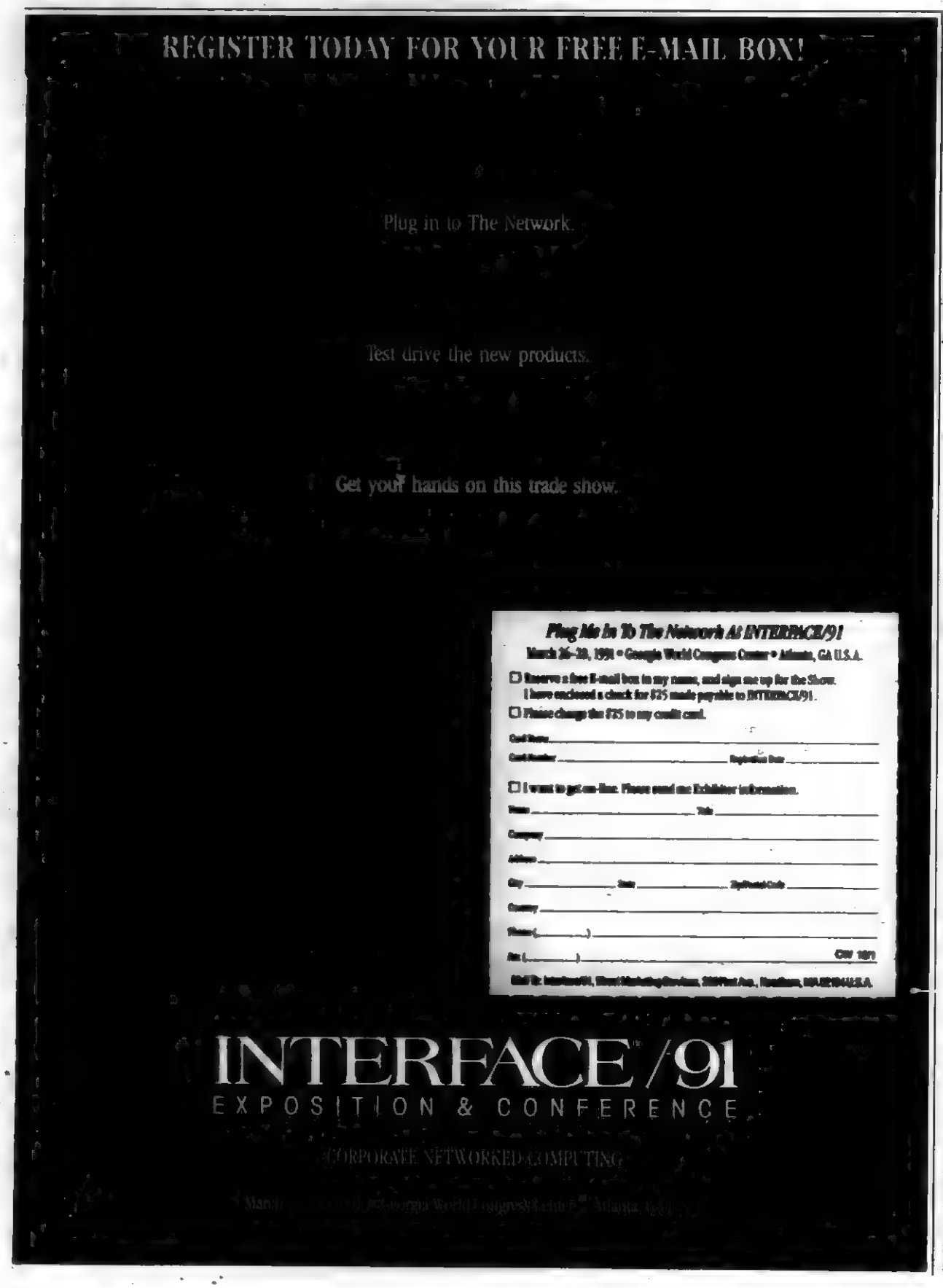
The Journal of Systems Management
September 1990

■ Requests for proposals, or RFPs, are outdated. These 100-page tomes, written by consultants and delineating such specifics as screen length, don't deal with whether any one solution meets a company's *business* needs.

The decision-making process needs to shift from one of buying cheaply to buying smartly. What information systems management needs is a request for recommendation. An RFR — which focuses on the company's needs, not system needs — requires the following criteria:

- Replies should be limited to 10 pages.
- A price to the closest $50,000 is required; if it's a small project, make it 5% to 10% of the estimated cost.
- The vendor's recommendation must include a brief systems description and details on the support the vendor can offer. It must include a list of references.
- IS management should provide the vendor with a brief description of the firm's needs.
- A due date of three or four weeks' time should be included.

With an RFR, companies can save the $50,000 to $100,000 consultants typically charge to advise them on a 100- to 200-user system.



"Aligning CIM strategies to different markets"

By Jeffrey R. Williams and Robert S. Novack

Journal of Long Range Planning
February 1990

■ Successful computer-integrated manufacturing (CIM) strategies are shaped by competitive forces beyond the shop floor, including such industry variables as costs, volume, customer wants, monopolies and stability. CIM requires managers to have a tightly focused view of how their company intends to compete.

For example, manufacturers in a rapidly changing market, characterized by short product life cycles, need to plan for the obsolescence of not only their products but of their manufacturing processes.

To reap the full benefits of CIM, companies must completely integrate the manufacturing mission with their strategic business mission — indeed, the distinction nearly disappears.

Rather than producing fast competitive results, CIM investments tend to have longer-term paybacks that in some cases approach a "bet-your-company" status.

"The neural computer"

By Herb Brody

Technology Review
August/September 1990

■ Neural networks, according to biologists, bear only a superficial likeness to the brain, yet despite this, they are being groomed for tasks that conventional computers are not equipped to handle.

Constructed of simple electronic "neurons," neural networks add together many input values and perform mathematical operations on this information to give a single output, usually all at once.

Tasks within their capabilities often involve picking out patterns. For example, to train the computer to analyze handwriting, it must be shown thousands of handwritten letters in a variety of styles. Each time, it must be told what the sample should be, eventually learning to recognize the letters on its own.

There are many areas waiting to benefit from a technology that has the ability to learn and adapt from its mistakes, among them speech recognition and telecommunications.

Organizations that have already seen the advantages of neural networks include the U.S. Postal Service, which hopes to enlist the machines in reading and sorting handwritten ZIP codes; airports, which hope to use them to screen for plastic explosives in luggage; and banks, which hope to have them evaluate mortgage loan risks.

Financial organizations such as American Express Co. and Chase Manhattan Bank N.A. have developed neural networks to help them spot patterns in financial data.

The Chase system was designed to cut the enormous cost of stolen credit cards. Chase programmed the system with data on credit-card transactions, indicating ones that turned out to be fraudulent. The neural network found certain trends; for example, it discovered that transactions most likely to be questionable involved the purchase of women's shoes for $40 to $80.

INTEGRATION STRATEGIES

When integration means insecurity

BY JON WILLIAM TOIGO and JOSEPH MAGLITTA

Are integrated systems more vulnerable to security threats? A growing number of computer security experts think so.

Take the following typical scenario, offered by Mike Heylin, an analyst at Creative Strategies Research in Santa Clara, Calif.: "A remote office gets tired of waiting for information through Federal

Express, so they go to a local PC retailer and get set up. IS provides a connection directly into the corporate mainframe."

The problem, Heylin says, is that the information systems department may be accustomed to serving local users only. The new branch users are likely to be quite unsophisticated about security issues. The result, he says, is that security for the new remote office "may not be foremost in everyone's minds."

Sound familiar? Many computer security experts say that the trend toward increased systems integration and the rise in computer crime are on a collision course — especially in small and medium-size companies that may lack sophisticated information security.

Factor in corporate downsizing, they say, and the picture worsens.

"Downsizing and integration are occurring at a time when there is a major increase in computer crime incidents in the U.S. and internationally," says Sanford Sherizen, president of Data Security Systems, a computer security firm in Natick, Mass. "At a time when there should be a tightening up of security, we are seeing a diminution of security."

Robert Campbell, president of Advanced Information Management in Woodbridge, Va., agrees that integration has complicated security.: "We spend a lot of time counseling customers about the hidden network: logical gateways and pathways that evolve because of end-user computing, integrated computing, etc. Most companies don't know where they are or that they exist and consequently have a large exposure."

Larry Ashton

The issue becomes particularly serious, experts contend, because with more of a company's information assets on-line, an intruder can do more damage than in a compartmentalized system. They fear that networks make companies much more appealing targets for hackers or viruses.

Security consultants say there are several reasons why integration poses particular problems.

The biggest reason probably has to do with how companies install integrated systems in the first place, Campbell says. "Historically, we work on integrating the systems now and worry about security later, " he says. "That needs to change."

Once systems are in place, Heylin adds, problems arise in the way that many companies operate them. "Most distributed systems are implemented and managed by a non-DP person," he notes. As a result, security consciousness tends to be low.

Many companies have been slow to pick up on the problem because security in an integrated environment requires a whole new mind-set. "Traditional system security called for you to put road guards at access points," Campbell explains. "In

Continued on page 82

Meet me at the Hilton

Hotel chain's new integrated marketing system makes meeting sales as easy as room service

INTEGRATING THE ORGANIZATION

Hilton Hotels Corp.

BY JANET MASON

John DePaul, director of sales at Hilton Hotels Corp., sits in the lounge of the Waldorf Astoria in New York with a client interested in booking a Hilton hotel for a meeting. Over tinkling ice cubes and a background of soft music, DePaul anticipates the client's questions and tells him about the hotel's strict security and ample parking facilities — the two most important hotel features for the client's upcoming meetings.

On the surface, it's a successful high-touch, low-tech meeting. But the scene depends on a new, highly integrated sales and marketing system that has taken Hilton four years and some $5 million to develop.

Before the meeting, DePaul scanned the client's file on Hilton's Answer Net system, which gave him client information from national sales offices and local accounts. He reviewed the client's five-year history with Hilton in 10 minutes and left for the meeting, knowing in advance the kind of service the client desired.

After shaking the client's hand and leaving the lounge, DePaul heads not back to his national sales office but straight upstairs to the hotel's sales office. Using a sales representative's personal computer, he sends one message to Hilton sites on the East and West coasts and Hawaii — locations that the client is considering for meetings during the next year.

DePaul leaves the Waldorf Astoria confident that Hilton salespeople in local hotels have already received his message and that — with the system's automatic report on leads — he will know of their progress within several days.

This type of expediency was impossible for Hilton — which calls itself "America's business address" — until Answer Net was completed in June. The networked system connects local, regional and national sales offices in 63 Hilton hotels and sales offices. Hilton has plans to sell Answer Net to its 235 U.S. franchises in the near future.

Alan Levenson

Hilton's Wichers: ***'In sales, speed wins'***

In the past, Hilton hotels operated as separate entities, explains Chris Wichers, project leader. The result, he says, was that "the customer would have to wait a week for information" about availability at other Hilton sites.

"Now," Wichers says proudly, "when a national salesperson talks to a customer and gets 10 meetings, 10 sets of dates and 10 locations and has two days to get the information, he can do it through Answer Net's electronic mail and lead report generation."

That's good news for Hilton. The $998 million chain, headquartered in Beverly Hills, Calif., derives nearly half of its business from meetings and corporate travel. Each year, Hilton hosts about 40 million guests.

In 1986, Hilton re-examined its sales and marketing system and

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found it lacking. That was bad news, because the hotel market at the time had a flood of new competitors. Worse, liberal tax legislation allowed any business to shelter its assets in hotel property.

The computing picture was equally grim. In place was a 10-year-old system employing hard-to-use dumb terminals in each hotel to send and receive cryptic messages from the national and regional sales offices. Local sales representatives got messages late — or not at all. And sales managers who sent leads had no way of ensuring local sales follow-up.

Starting with two New York hotels in July 1987 and one Beverly Hills location, Hilton finished rolling out the system in 62 sites this summer.

One of the major hurdles in developing Answer Net was transferring the old database into the new system and running both systems at the same time, says Elizabeth Burkhardt, director of sales management systems at Hilton's Dallas office.

While both systems resided on the same IBM 3090, the older one was written in a customized program Hilton had used during the 1970s, and Answer Net was developed in IDMS.

The solution was to transfer the old system to a new database and develop custom software that would transfer data both ways, she explains.

Employees received one week of training after the system was installed. Trainers stayed on-site the following week for additional consultation.

"We found that, regardless of age or sales experience, employees took to the computer system, especially when they found that it would help them," Wichers says. Average training time was three months, he says.

According to Hilton officials, Answer Net's advantages over the old network are many:

- **Better information.** The system provides a minimum of four pages of information — which the end user can add notes to — on each account. Besides noting each event for which the client uses the hotel, such as annual board meetings and quarterly technical forums, personal client information about spouse birthdays and favorite wines are also included.
- **Lead management.** Regional and national sales managers can now check on the progress of leads they forward to local hotels. Moreover, national and regional sales offices can receive leads and forward them to local hotels, which lets the sales staff meet customers' needs more quickly, Wichers says.
- **On-line access.** Employees no longer have to use paper files to get missing information. Regional directors can get details on sales calls via PCs, eliminating travel time and increasing speed.
- **Room tracking and messaging.** The system lets users see what rooms and meeting areas are currently in use. In addition, a salesperson can see what room the client is in and leave a computerized electronic mail message that the switchboard operator can deliver to the guest.
- **Greater access and easier use.** Answer Net lets sales reps use their own IBM Personal System/2s to log on at home or at the office. Users also get simpler commands and a menu-driven interface. "Hotel salespeople are a type-A breed," explains Gail Moore, manager of

Hilton's 'superuser'

Answer Net boss Chris Wichers came from an unusual position to spearhead an IS project: His last job was regional director of marketing for Hilton's Western and Central regions.

A self-described "superuser," Wichers had taken classes in telecommunications. "I knew enough about PCs to be dangerous," he says, "but I also knew how the system needed to be used."

Under Wichers' direction, Answer Net was designed to reflect the way sales reps do business. In real life, one salesperson might handle research and development meetings, while another does new product introductions. Answer Net, therefore, organizes client information by event.

Wichers' team consisted of approximately 25 employees, including Hilton sales and computer systems staff and employees from Compass Computer Services, a company owned jointly by Hilton and Budget Car and Truck Rental. AMR, an affiliate of American Airlines, joined Compass as a management consultant in 1989 and now manages Answer Net maintenance.

Wichers says Answer Net was started in 1986. It was completed about 150,000 work-hours later, in June.

For Wichers, there's no question the effort was worth it and that having an end user guide the project was the way to go.

Because Answer Net allows the company's 15 national sales offices to communicate readily with its 48 hotel locations, Wichers says, "salespeople who once felt they were working for a local hotel now feel that they are part of a wider company."

JANET MASON

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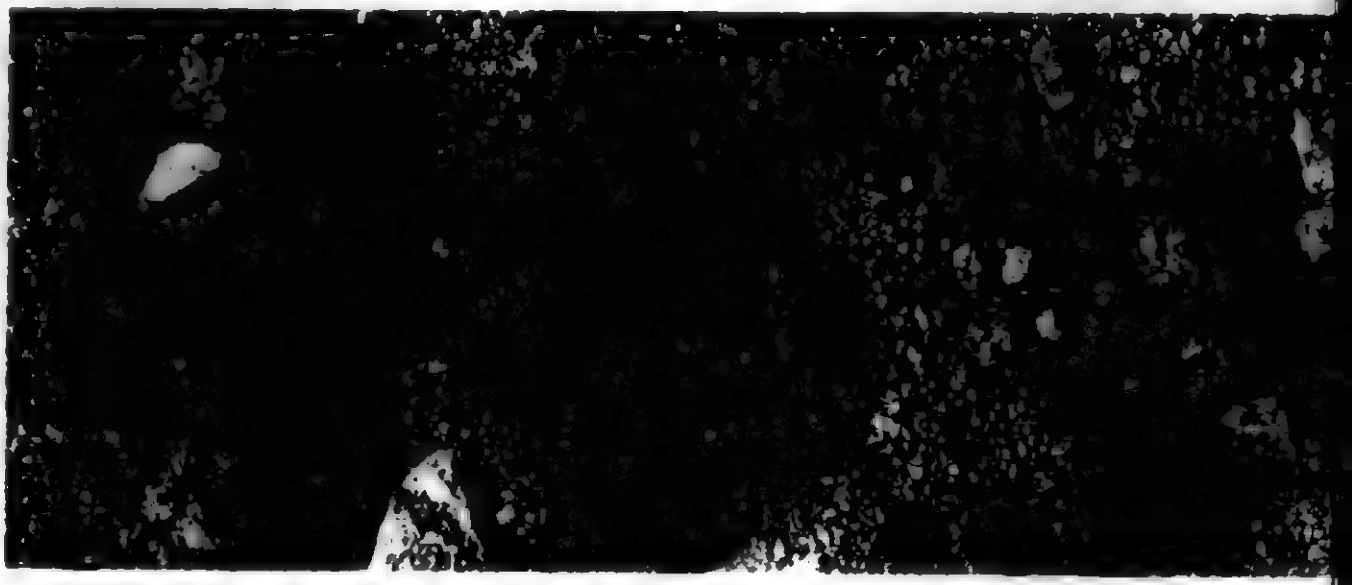

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sales management systems at Hilton's Dallas office. "They want information quickly."

"Now, salespeople no longer have to take the time to make a status report for the manager," DePaul notes. "The [lead management] function helps them meet their own goals of how many sales calls they will make in a given time period."

Burkhardt says the ability to access Hilton's reservation system, and in some cases the local hotel's property management systems, makes Hilton sales staff even more responsive.

"When salespersons want to verify whether reservations have been processed, or what the general guest room availability is, they can hot-key into the reservation system," she says.

Close-up

Organization: Hilton Hotels.
Goal: Connect local, regional and national sales offices and have them operate as an efficient whole.
Strategy: A network of PCs connected to a central mainframe at headquarters.
Payoff: Tailored client information, lead management, quick turnaround time on customer requests and access to reservation and property management systems for more informed sales pitches.

More importantly, the new system also ties into a new way of promoting Hilton hotels, officials say. "Salespersons now are coached to ask the customer what he wants out of his stay at the hotel," Wichers explains.

For instance, a client may want to use the hotel as the site for unveiling a new product to its sales force. That probably means the client has high security needs and that his people will be under an enormous amount of pressure and will need a place to unwind.

Sales more tailored to client needs have helped Hilton become more profitable, officials say. While Wichers says that figures on increases in sales leads and profits are proprietary, he claims that both "have increased substantially."

Answer Net is also cheaper than the old system, Hilton officials say. "There's a tremendous cost and time savings with co-op processing," says Jim Whitworth, an Answer Net project leader.

But the main benefit of the system is speed. "And in sales," Wichers says, "speed wins."

Ed Watkins, editor of industry trade magazine *Lodging Hospitality*, says Hilton could use a boost from Answer Net.

While the chain has always been seen as a good marketer, he says, and Hilton is among the top five most profitable hotel chains, its profits have been down lately.

Next steps

Future plans for Answer Net are already in the works. Currently, the system is being integrated with an automated function book called Delphi/Miracle, which tracks the future use of public hotel rooms, such as ballrooms, at three hotels.

Also under development is an "optimization plan" system that will be integrated with Answer Net. "This program will help a salesperson determine what they will need to charge in 1993," Burkhardt explains. "It will also help us determine our peak periods and downtimes during the year. Ultimately, it will help clients by saving them money and at the same time increase occupancy for Hilton." •

Mason is a free-lance writer living in Philadelphia.

Nuts and bolts of Answer Net

The Answer Net system stores customer information in a program written in Cobol and an IDMS database that resides on an IBM 3090 380J running MVS at Hilton's Dallas office.

The mainframe is connected via satellite transmission and telephone lines to 500 IBM PS/2 Model 50s and 70s running DOS 3.3.

The system is based on cooperative processing between the mainframe and the PCs, where the Answer Net software program resides on hard disks. The PC program requires 30M bytes of storage.

The configuration uses a second token-ring card in the file server — a PS/2 80 Model 111 — which connects the system to the proprietary property management system.

"This enables the property management system token-ring to see the whole Answer Net network as just another workstation," explains Elizabeth Burkhardt, director of sales management systems at Hilton's Dallas office.

Hilton uses Infront, an off-the-shelf interface package from Multisoft, Inc. in Lawrenceville, N.J., between the mainframe and the PCs. The system's 1,100 users typically perform 31,000 transaction/day from the PS/2s to the mainframe.

Some PCs are connected to the satellite channel via individual coaxial cables and others by Novell, Inc. token-ring networks. Each office has one printer. Attached to each local-area network is a high-speed printer.

JANET MASON

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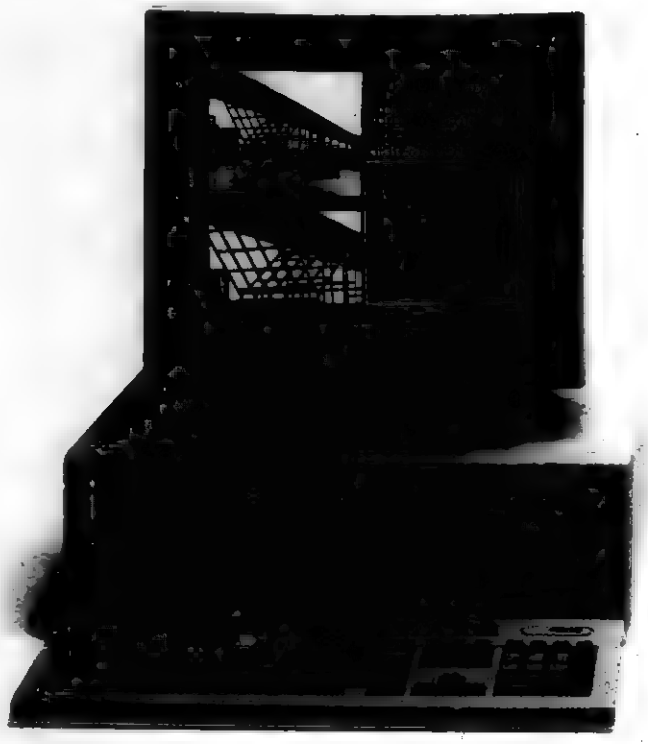

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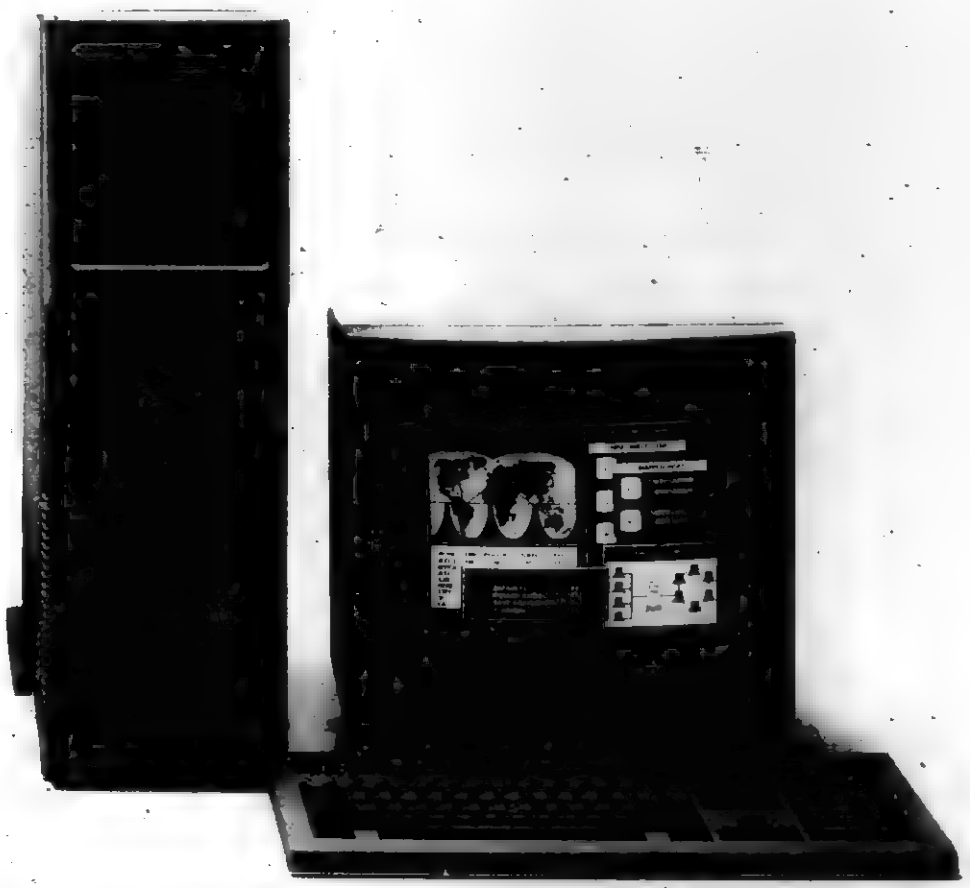

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INTERVIEW

Sharper image: EDS in the '90s

Electronic Data Systems' CEO Les Alberthal uses key acquisitions and outsourcing to gain points with IS managers

Les Alberthal, the chief executive officer at Electronic Data Systems Corp. for 46 years, is fond of telling visitors about an image survey the company commissioned two years ago. "The good news came back that we didn't have a bad image," he says. "The bad news was that we didn't have much of an image at all."

That was when EDS was still emerging from the long shadow of its dynamic founder and former chairman Ross Perot. Today, EDS casts a nearly $6 billion shadow of its own.

EDS has positioned itself to cash in on the trend toward information systems outsourcing by building a national network of data centers and acquiring a barrelful of vertical market expertise. Last month it bought Ticor Title Insurance Co. of California and a stake in Ask Computer Systems, Inc. In February, EDS bought half of Texas Air's System One airline reservations subsidiary, then turned around and signed a $4 billion contract to manage the IS functions at Eastern Airlines and Continental Airlines. It also inked recent outsourcing contracts with First Fidelity Bancorp., Westmoreland Coal and Neodata Services, Inc.

Alberthal spoke with Computerworld *Executive Editor Paul Gillin at EDS' Dallas headquarters.*

IS directors tend to have a split personality regarding EDS. They respect the fact that you can save them money, but they're reluctant to hand over their operations and strategic assets to an outsider. How do you think IS directors should regard EDS?
You've got a time now where businesses really need to consult with someone on how to [use technology acquired during the last 20 years]. What it boils down to is: What does a company have to do to get technology to accomplish something?

You've got the hardware suppliers, the consultants, the software product guys and guys like EDS all vying to say they can make technology work. All these companies are vying to find the guy in the company who will listen. The question is, is that the IS director or the CEO or the [chief financial officer] or someone else?

There will be some situations in which we'll market directly to the IS director, other situations where we'll market over his head. IBM faces that same choice. You watch IBM — as long as the IS director has enough authority to make a decision, they'll sell to him. The minute he loses, they'll be in that chairman's office.

What does the IS director need to do to make sure EDS doesn't come in over his head and put him out of a job?
Make technology work. If the problems are being solved, there's no need [for EDS to come in]. The problem is, there's a widening gap [between the technology curve and our ability to use technology]. The gap is our marketplace. The ability to educate, train and keep pace with technology is going to be more difficult than it has been . . . A CEO is saying, "I've done all this stuff and I'm still not competitive in the market."

You're still saying that the onus is on the IS director to do his job of managing technology; otherwise, EDS might be called in to do it for him.
Otherwise, the CEO has to look at alternatives. That can be across the board from changing the IS director to changing the hardware. I don't think we've got any industries today that are fat-catting it like they were 10 years ago, where they could just roll along with IS as a certain percent of the budget. That's gone.

Isn't EDS' ultimate goal to get a full-scale facilities management contract from the customer?
We are most effective when given a challenge and the authority to accomplish the task . . . We're very content to be a supplier of one piece of the overall solution, so long as we have enough ability and control to make that piece happen. I will walk away from a business deal if I can see ahead of time that there's no chance of making it succeed.

When a company hands over an entire facility to you, isn't it taking the risk that it's giving a strategic asset to somebody who has no direct interest in the success of the business?
Absolutely not. They've got more control over us than over their own employees. We have every interest [in making that customer successful]. If that customer doesn't succeed, we won't succeed. And even if, at the end of the contract, that customer decides to bring things back in-house or go somewhere else, we have to ensure that it's done smoothly and professionally. One negative relationship causes tremendous market problems for us.

One of the things the customer is getting with us is a lot of experience being a change agent. We don't have to bend to the bureaucracy of an organization. An outside company takes its orders from the CEO.

What image are you most interested in portraying to the IS director?
We can be an ally to the IS director, or we can be a threat. We don't have as a goal to put IS directors out of business. We do have a goal of utilizing technology more effectively so that our customers can be more effective.

You've said that you believe the Eastman Kodak Co. outsourcing deal with IBM was overblown. Why?
There was an image of this being a winner-take-all kind of thing. We're still in there today as we have been with Kodak for years. IBM spent a good deal of effort making sure [its deal] was publicized and advertised. I could do the same publicity stunt [with some of our customers], but it would be a waste of energy. Most executives who make a decision of that magnitude know the facts.

Would you put your two most recent acquisitions, Ticor and the equity stake in Ask, in context?
Ticor is just an extension of our efforts to expand in the insurance business. It's an area that we think is in dire need of technology to do a better job, and Ticor was a way to get into that.

Ask is different. When [General Motors Corp.] bought us, manufacturing wasn't high on our list of credentials. After the GM relationship, we not only picked up 8,000 or 9,000 data processing specialists in manufacturing, but we also had a cram course on manufacturing. Ask represents access to software products and manufacturing that we can use for all of our customer base.

We try to use acquisitions to gain people and expertise that we don't have or products or a customer base we don't have.

Do you see anything along the lines of doing a deal with a major consulting firm, like the Big Eight mergers of a couple of years ago?
We've looked at that concept. I don't believe you'll see us do that unless we can make it effective for our customers. We've looked at it from a number of angles, but we haven't gotten comfortable with it.

Can you explain the reasoning behind the equity relationship you worked out in the deal to acquire Texas Air's System One reservations system?
We spend enormous time and energy when we start working for a customer, especially if it's on a full facilities management basis. In the past, they would have said they were going to have us run their computer centers, and we would have taken over the computers and people and that [asset] would be discounted back in our pricing structure. But now, more companies look at their data processing as an asset. They want some cash up front to do other things. It's not an acquisition; it's a change in the finance mechanisms.

Is outsourcing a long-term trend or is it just getting a bubble of publicity right now?
I don't think companies see it as a flash in the pan. They see it as part of a long-term solution to effectively use technology. I see it continuing for another one to two decades at a minimum. ●

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OFF THE CUFF

Michael Seiden

Open your eyes, IS!

In many cases today, information systems consultants and systems integrators are selling dreams that can often mean nightmares for in-house IS departments.

Consultants and integrators are aware that most business managers feel they are not getting an adequate return on their IS investment. They are also aware that managers have heard about the examples of strategic IS successes: Citicorp, United Airlines, American Airlines, American Hospital Supply, Federal Express and so on. So crafty integrators sell management on the dream of using information technology to achieve competitive advantage in the marketplace.

On the other hand, internal IS departments offer managers a more mundane reality — the ability to keep existing systems running.

Not even the high prices charged by systems integration consultants can sway management caught up in its dreams. If management can be convinced it can beat the competition by using information technology, it will gladly pay the price.

In fairness, many systems integration consultants bring a lot to the table. Many consulting firms are large, world-class organizations with high-quality employees. They train staff in top-notch facilities and provide them with a full array of support tools — laptop computers, computer-aided software engineering tools and planning methodologies. Add these qualifications to the dream that systems integration consultants offer, and these outsiders present formidable competition for the internal IS department.

In fact, while the head of IS may be reporting to the chief financial officer or the vice-president of administration, the systems integration consultant is talking to the chief executive officer or the chief operating officer in most cases. They have a business relationship, not a technical relationship. By speaking to operating managers from a business perspective, systems integration consultants are seen as credible, which is often not the case with the internal IS department.

As management continues to buy into the dream, even cost becomes a secondary issue. Systems integrators are often very expensive and can sometimes exceed their budgets on company projects — without severe consequences. In contrast, internal IS budgets tend to be tightly controlled, with severe limitations on growth.

Here the nightmare begins. Management's dream state eventually begins to threaten the existence of the IS function. A serious question emerges: Can the internal IS organization survive in the company of the 1990s, or will it be replaced by outside consulting and facilities management firms? Unless the IS organization can establish its position as integral to the business structure, it runs a big danger of becoming obsolete.

So how can the internal IS organization survive against the onslaught of commercial systems integrators? The following are a few helpful, hopeful hints:

- IS departments must learn to distinguish between strategic ***advantage*** and strategic ***maintenance***. Strategic advantage means using information technology to be different from your competitors. Strategic maintenance means using information technology to reduce costs and improve productivity to keep up with the competition and stay in business.

External systems integrators may sell management on strategic advantage while actually providing strategic maintenance. If this occurs, even successful implementation efforts can lead to management dissatisfaction.

- The IS organization must be a strategic, tactical and operational partner with operating management. Business activities, measurements, controls and plans must have the involvement of IS resources from inception through implementation. If IS is nothing more than a "call me when you need me" organization, its function could just as easily be provided by an outside organization.
- A company must develop and implement sound business strategies for the IS function. IS must be managed like a business, not just a technical support organization. This will ensure that the IS function is contributing to business goals.
- A company must develop sound information technology strategies. Technology costs money and should be used only when it adds real value to the business. There is nothing wrong with concentrating on strategic maintenance systems or with IS organizations that support the business in a least-cost mode. Strategic advantage systems aren't for everyone.
- The business must always retain control of consultants, systems integrators and facilities managers. While these consultants can be useful in the right situation, their use should be planned, monitored and controlled in situations where their expertise can produce results and create real value. ●

Seiden is president of Seiden and Associates, a consulting firm in Englewood, Colo.

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Continued from page 73

integrated systems, it is possible to access logical functions or databases *without* going through logical access points. It's a real dilemma."

Things are made worse by the fact that in many organizations, security historically has been a low priority.

Finally, in many cases, senior management does not see any conflict between integration and security. All these factors make some security consultants cautious.

Fears exaggerated

How bad is security? AMR Information Services, Inc. claims that when asked to do so for a test, it has been able to break into 90% of its clients' systems.

Despite rising fears, some information security experts question whether highly integrated systems are really more vulnerable to computer crime and vandalism than centralized or limited network computer systems.

Joseph Bologna, who edits the monthly newsletter "Computer Security Digest" in Plymouth, Mich., concedes that networks are probably a little more vulnerable than mainframes.

"The weakest link theory applies — that one unsecured PC in the network can expose the entire network to embarrassment," Bologna says. However, he cautions against blowing the problem out of proportion.

A recent Creative Strategies Research report seems to back him up. The study, "Managing Microcomputers in the 1990s," discovered that only 7% of data loss came from software-related causes and viruses — an indicator of security and access problems. Most loss was because of operator error, according to the report.

Al Belisle, chairman of the Information Systems Security Committee of the American Bankers Association, is outspoken on the subject.

"I have something unique in this field: a business mentality. We have created information not to lock it up, not to encase it in concrete, but to make it available to those who need it," he says.

Belisle says integration is inevitable and the security profession will be forced to find solutions to security challenges without losing sight of the original goal.

"It is unfortunate that the whole world didn't grow up on one platform," he concludes. "But this is a country of choices. There is a real challenge to provide a secure environment but to stand in the way of integration is to stand in the way of progress."

How much security?

There is general agreement that better integrated security is needed. Views differ, though, about what constitutes effective and adequate security.

On one side are advocates of an aggressive approach. Beyond simple devices such as passwords, IDs and log-ons, they also see a use for biometrics and other more exotic devices.

Ideally, Campbell says, organizations would be able to automate security across multiple operating environments. The next phase would be to establish a security monitor with master data banks of all authorities, which would centrally manage pertinent security information.

While business-minded executives such as Belisle concur that all users should be identified and have passwords and other basic security protections, he cautions against overdoing it.

"When you have a loan officer who says that he couldn't close a loan because the system had him re-enter his password 27 times, and by that time the customer got fed up with the delay and went to another bank, management needs to look at how much security they really want," he explains.

To Ken Dehoff, managing director of the information security practice at Andersen Consulting in Chicago, good integrated security starts with organization-wide education.

"Security needs to be communicated to employees in the same way as quality," he says. "There needs to be an education program that says 'we work at this company; we do something that somebody else wants.' "

A sense of data ownership and responsibility among management and staff is a good first step, experts say.

Another solution lies in debunking myths spread by integration and open systems advocates, which Campbell says has led to misapprehensions about security.

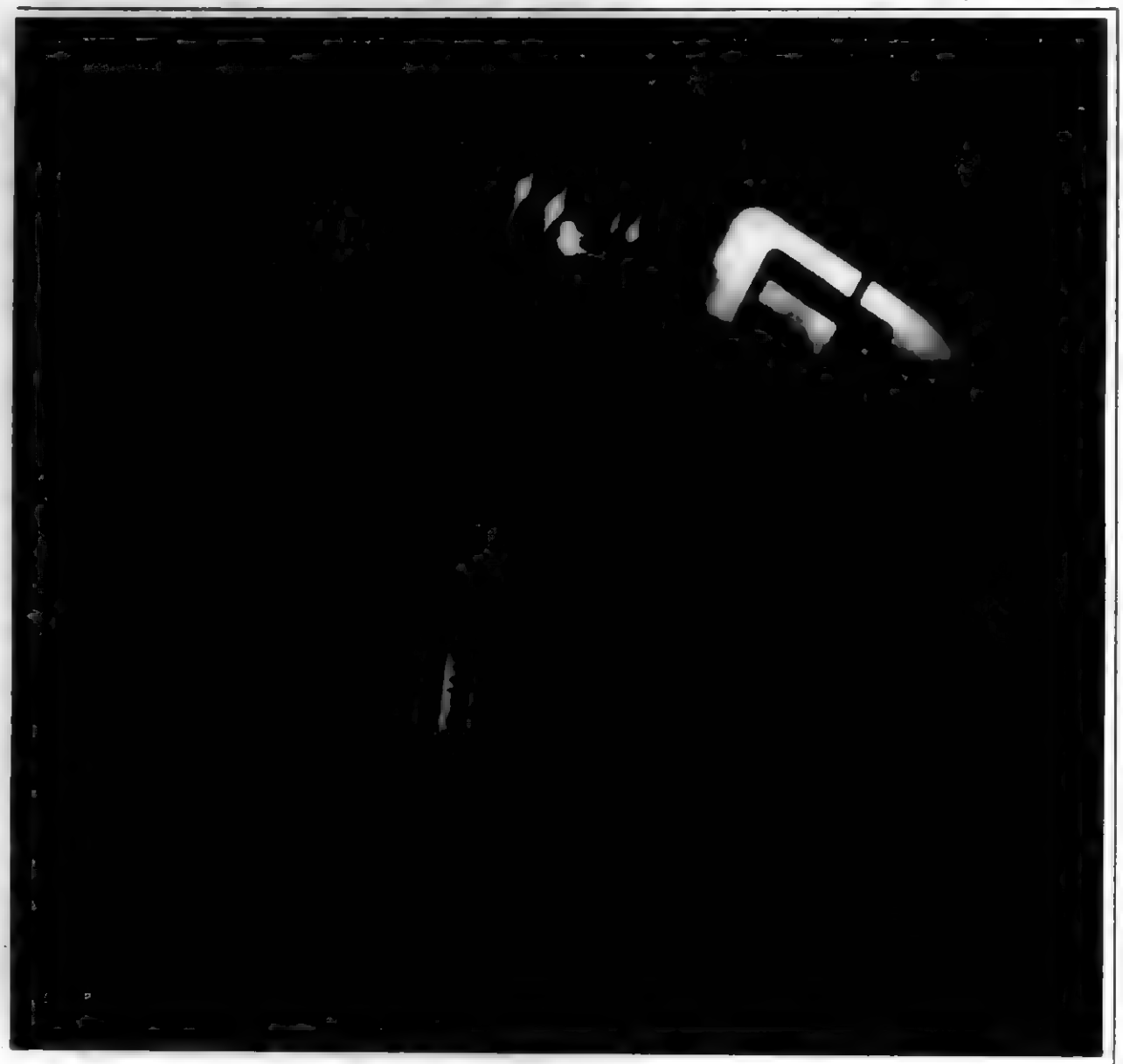
"The myth of having to lay security aside to provide openness in systems is one of the major mistakes that we were making. Fortunately, people are becoming more aware of the openness of the systems they've created."

Dehoff agrees, saying, "We have the mentality that all information should have accessibility to all employees, which opens the portholes to the mischief makers, the browsers or the Shadow Hawk guy that comes in to copy or observe what's in the corporate database."

There is no strong consensus about which security measures will be successful. "For the most part, people are still trying to come to grips with disparate environments," Campbell says.

One sign of this trend is that many larger firms are paying more attention to security architectures. Belisle says: "More and more firms seem to be realizing that it's more expensive to add the bathroom to the house after it's built, rather than integrating it into the design and taking advantage of the natural plumbing." ●

Toigo is a free-lance writer and trainer in Dunedin, Fla., who specializes in business automation subjects. Maglitta is *Computerworld*'s senior editor, in depth/integration strategies.



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THE POWER IS ON

From crude to refined

Five-year, $10 million project helps Champlin raise petrochemical quality, double output

BY KATIE CRANE

Five years ago, if you'd asked Warren Thompson if Champlin Refining and Chemicals, Inc. would be in business the following year, he would have replied with a confident "Sure." Then came the call that every business fears.

A major customer, peeved at small quality inconsistencies in its petrochemical product, issued an ultimatum: "If you don't fix things fast, we'll stop buying." The threat shook Thompson, manager of process control and computer applications at Champlin's Corpus Christi, Texas, oil refinery.

It was especially serious because Dallas-based Champlin has only about a half-dozen U.S. customers for whom it converts low-gravity, high-sulfur Venezuelan crude oil into gasoline, diesel fuel and raw materials for plastics, chemicals, synthetic fibers and fertilizer.

In this case, quality varied only a few hundredths of a percent from day to day and met specifications, but the client said even such minute fluctuations affected its plant operations. "When one of those big raw material users comes at you, it has a big impact," Thompson says.

Big impact may be an understatement. Heeding its customer's words, Champlin adopted a companywide quality program based on the quality and productivity principles of business theorist Dr. W. Edwards Deming. Thompson sums up this philosophy with one phrase: Always try to improve. The result was a $1 billion project to automate process control, thereby doubling petrochemical output at the Texas facility to 8,000 barrels per day.

A key part of the effort is a five-year, $10 million integration project that lets Champlin monitor thousands of temperatures and flows. Now, everyone from the president to a laboratory worker can access process and business information via 340 color terminals and a total of 10 Vaxstation 2000s and 3100s.

Customers seem pleased. "In the past two years we have seen significant improvement in the quality of Champlin's product," says David Krieg, a quality assurance coordinator at Dow Chemical Co. in Freeport, Texas. "The impurity levels have dropped dramatically."

In fact, the automation program has been so successful that Champlin earlier this year became the first manufacturer to win the coveted quality award from the U.S. Environmental Protection Agency (EPA). Visitors from Japan, Mexico and South Korea have toured the new automated facility, as have executives from Shell Oil Co., BP, Texaco, Inc. and Du Pont Co.

Mark Green

Champlin Refining's Thompson: ***'We believe integration is strictly a software problem'***

Such reviews bode well for Champlin, one of the 10 largest Texas oil refiners and the North American subsidiary of Petroleos de Venezuela S.A., itself the world's fifth largest oil company and owner of Citgo. Its Corpus Christi refinery can handle 160,000 barrels of Venezuelan crude oil per day and counts among its customers Monsanto Co., General Electric Co., BASF Corp. and Du Pont. But like other refiners, Champlin faces a tough, volatile market that could be helped by technology.

David Capers, vice-president of Dallas-based Solomon Associates, an international management consulting firm specializing in energy and chemical industries, agrees, saying that the refining industry in general has been slow to develop "decision information systems." While Champlin's isn't the only such system, he says, it is among the best.

Ironically, pieces of Champlin's integrated system existed a decade ago. In 1980, the firm had developed a large database, called the Process Data Communications System (PDCS), which served as a repository for the refinery's process data. The database contained all data from the entire product life cycle, from crude oil shipments to finished product.

Eventually, Champlin added data from the laboratory, tank gauging system, maintenance work orders, central requisition system, electronic mail, Mass-11 word processing and Stone Mountain Graphic Outlook spreadsheets to the database.

But the system wasn't integrated. For example, users accessing one portion of PDCS were forced to log off in order to read another section. Sometimes it took longer to gain access to an application than it did to actually use it.

Even with such a hard-to-use system, Thomson recalls, "we were content. We were on spec. We had all the data. And we showed it very prettily." However, this was not good enough for some Champlin customers. So Thomson and his group started looking for a better way.

From the start, the motto was "keep it simple." Champlin approached its software vendors asking for simple routines, not large relational databases and sophisticated SQL calls to tie individual applications together. "We believe integration is strictly a software problem," Thompson explains.

The decision to buy off-the-shelf products rather than develop the software in-house let the company concentrate on what it does best, says Thompson, adding "We're a refinery, not a software developer."

Standard and smooth

Over a 24-month period, integration went smoothly, says Charles "Chuck" Roberson, a Champlin computer applications specialist. A big reason, he says, was that Champlin decided to standardize on Digital Equipment Corp. hardware and graphics displays. And unlike other companies, Roberson adds, Champlin was not saddled with a mix-and-match installed base that forced it to start from scratch.

Eventually, systems architects came up with a detailed strategy. Process control data is handled by Honeywell TDC 2000 or 3000 process control instrumentation. The current PDCS system links six processors from DEC: a VAX 6440 as the host, plus two VAX 8350s, a Microvax 3400 and two PDP-11/73s to feed remote process control data into the main computer.

The secondary computers also provide necessary monitoring and computer control for the more than 10,000 devices throughout the refinery.

These systems form the backbone for dozens of off-the-shelf applications, including supervisory control software from Setpoint, a maintenance management package from Fluor Daniel and process engineering software from Metiere. Setpoint also provides products for process control, networking, spreadsheets and statistical control as well as the current database for PDCS.

Champlin's IS staff also integrated a variety of specialized, independent databases, according to Roberson. A bar-code sampling and scheduling system controls tests through

Continued on page 84

Close-up

Organization: Champlin Refining and Chemicals.
Goal: Integrate process control and business data to improve quality of its petrochemical products.
Strategy: Revamp a 10-year-old process information database by integrating it with on-line business data.
Payoff: Doubled petrochemical output to 8,000 barrels a day. Won several quality awards from its customers as well as the Environmental Protection Agency.

Crane is a free-lance writer based in Norwich, Vt.

Continued from page 83

Champlin's laboratory.

A new laboratory system performs statistical controls on the analysis of samples. The Oil Handling and Movements Systems (OHMS) tracks as many as 200 tanks and most pipeline meters throughout the refinery, allowing anyone in the refinery to track the status of receipts, shipments and transfers of product.

This is just the beginning, Roberson says. "We're just starting to find all the neatsy-keens we can pull together."

Big productivity boosts

All told, Thompson and his eight-member staff (up from five in 1987) spent nearly 80% of their time during the last three years automating the process control function. But there's no doubt in their minds that it's been worth it.

Thanks to the project, Champlin was able to improve quality by adding the ability to gather data easily and quickly for mandatory environmental reports and to detect any disturbances that might affect the process, explains Richard Cadmus, a 30-year veteran of the oil and gas industry who now works for DEC as an industrial marketing manager.

Payoffs from the system have been substantial, company officials say. Though Champlin won't discuss exact numbers, it says payback on its investment is in months rather than years.

There have been internal payoffs as well, according to Thompson. For instance, a laboratory worker can now process five times the industry average number of tests in an eight-hour day because of the availability and quality of data.

Control is improved, too, he adds. "We can monitor 4,000 temperatures and 5,000 flows every 10 seconds throughout the process."

Now, users can access data from any terminal, select the plant area and process unit they want to review and immediately get a real-time process diagram.

For example, when someone wants an updated analysis of a particular stream — the flow of crude oil as it's being converted into a petrochemical raw material — the user simply points a mouse at that stream and clicks. The stream's lab results are displayed in a window, while in the background, the process diagram is being updated with live process data.

If there is a maintenance problem in one unit, someone can walk to any workstation, enter the work order and pull up equipment records, cutaway drawings, maintenance history or parts lists.

Hard benefits aren't the only measure of the systems' effectiveness, Thompson adds. Since the system went on-line, the firm has won four successive quality awards from the same irked customer that challenged it to change, he says.

"What we've done is not very sophisticated at all," Thompson says. What sets Champlin apart, DEC's Cadmus adds, is that the company *started* the quality and integration process. "It is like eating an elephant," he says, "you've got to do it one bite at a time." ●

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Digital Equipment Corp.'s integration blitz continues. DEC won a $100 million contract to supply operational support systems for a German pan-European digital cellular telecommunications network.

In other news, DEC and **Ernst & Young** signed a nonexclusive service alliance agreement to pursue systems integration business in the health care industry.

The **Open Software Foundation** announced the Distributed Computing Environment. The offering was described as technologies for creating and using a distributed environment.

Software Publishing Corp. in Dallas introduced **Infoalliance**, a client/server software product that lets personal computer users on a network transparently access and manipulate data located in disparate databases. Users include companies such as **Provident Life & Accident Insurance Co.** and **Coca-Cola Information Services.**

The total market for IBM's **Systems Application Architecture** software is expected to be $3.1 billion in 1990, according to **Market Intelligence Research Corp.**, a consulting firm based in Mountain View, Calif.

Interleaf, Inc. announced a $1.5 million order from **Canadair** for publishing software, systems integration services, hardware and support. The system will be used to produce technical documentation that meets Air Transport Association specifications.

San Diego-based **Simpact Associates, Inc.** received a $1 million contract to provide wide-area networking equipment to **Contel Federal Systems.** The equipment will be used in Contel's project to modernize U.S. Air Force weather information systems worldwide.

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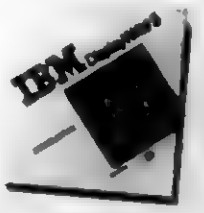

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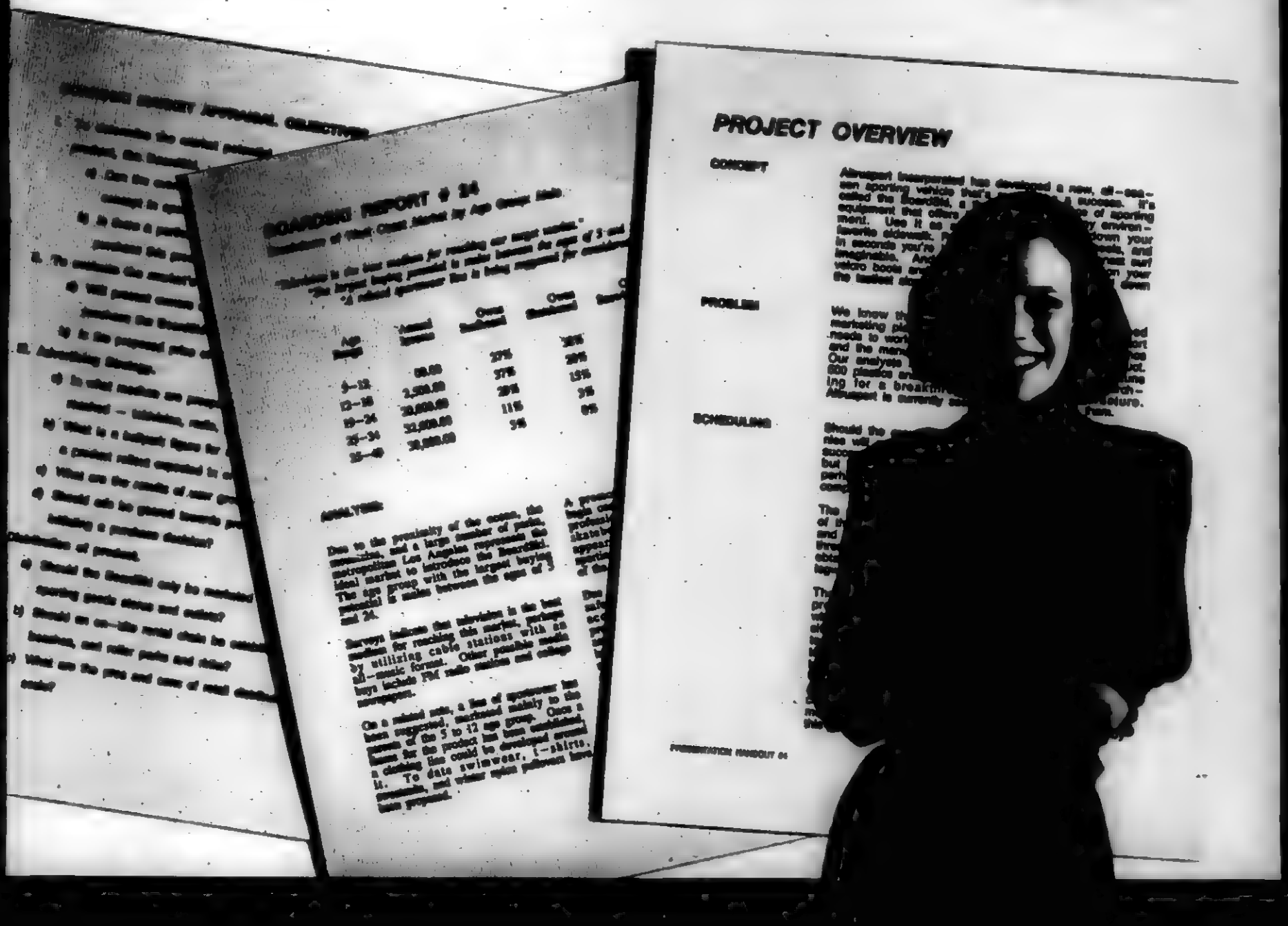

TYING IT TOGETHER

George Van Ness

The art of risk management

A recent Federal Aviation Administration systems integration project, worth about $1.5 billion over 10 years, was bid on by just one systems integrator. Why such a poor showing from the integrator ranks? Potential bidders reportedly balked at the risk involved in the project.

True, this is project planning on a grand scale. But firms of all sizes are turning to large systems integration firms to manage the risk of their projects.

Expecting the systems integrator to act as a deep-pocket partner who absorbs the financial loss if the project is late or fails is not realistic. Managing the risk together is. A firm is more likely to build quality systems by having clear goals, managing with those goals in mind, hiring the right people, creating a sense of teamwork and devising a good plan.

Many firms view systems integrators as general contractors in a construction project. The integrator is responsible for bringing together the diverse skills and components of many vendors that are necessary to build a working system.

Based on a limited understanding of what they want, user companies seek competitive bids, negotiate a tough contract and then assign a manager to hold the contractor's feet to the fire.

However, it has been shown time and time again that the contractor analogy does not apply when building systems. A construction project is about specifying and building something; a systems project is about capturing ideas, modifying people's work habits and changing the very fiber of how a company works.

People have strong feelings about how things are done and how they should be done in the future. The integrator has to help capture those objectives, develop a quality system and obtain acceptance of that system. The integrator also has to do all of this within a project framework that is frequently underestimated as to cost and duration and which may have been sold to management on unrealistic benefits to justify the high cost. It is no wonder many of these systems fail.

So how can your systems integration project be a model of success in which the risk is shared equitably? Perhaps the most important step is to discard the contractor analogy and understand that a complex systems project will require a team effort. The team should consist of an integrator, a diverse user population from a number of internal organizations and the internal IS professionals who will support the system once it is activated.

Because each of these groups has objectives that frequently conflict, the integrator and the client must establish and manage a realistic set of shared goals.

Risk-free advice

Here is some simple advice to reduce the risk for you and your integrator:

- **Pick the right integrator.** Each firm has a set of disciplines at which it is the best. Make sure there is a fit to your project and your management team's personality.
- **Establish a well-defined set of goals.** A systems project must meet the needs of the firm as well as time and budget constraints. A project leader must articulate these goals so they will be shared by all members of the team.
- **Develop and manage with realistic plans in mind.** Projects frequently fail because the plan was either superficial or detailed but not adhered to. A detailed plan is critical to success. Once the plan is complete, track progress and regularly update the plan as you learn more about the problem and the team.
- **Put the right people in the right roles on the project.** Perhaps the most important risk management tool is having the right people. They must understand their roles and what is expected of them at all times.
- **Establish and maintain a sense of teamwork at all levels of the project.** A large integration project is tough. There will be problems. Management must bring team spirit to the surface and resolve problems quickly. Most importantly, everyone must be working with the common goals of the project in view.
- **Establish a culture for quality.** Don't settle for doing things over vs. doing them right the first time. Everyone on the team must believe that. Clear expectations and good leadership are all part of this culture.
- **Constantly manage expectations at all levels of the project team.** With projects lasting one or more years, everyone can forget where they are headed. Project reviews, issue management and change control are all tools that keep everyone working toward common goals.
- **Treat others as you want to be treated.** The client has a right to high quality at a reasonable cost, and the integrator has a right to a fair profit for quality work.

It has often been said that managing risk is the uncommon use of common sense. Managing risk well can ensure a successful systems integration project. •

Van Ness is national director of information technology consulting at Coopers & Lybrand, a consultancy and systems integration firm in New York.

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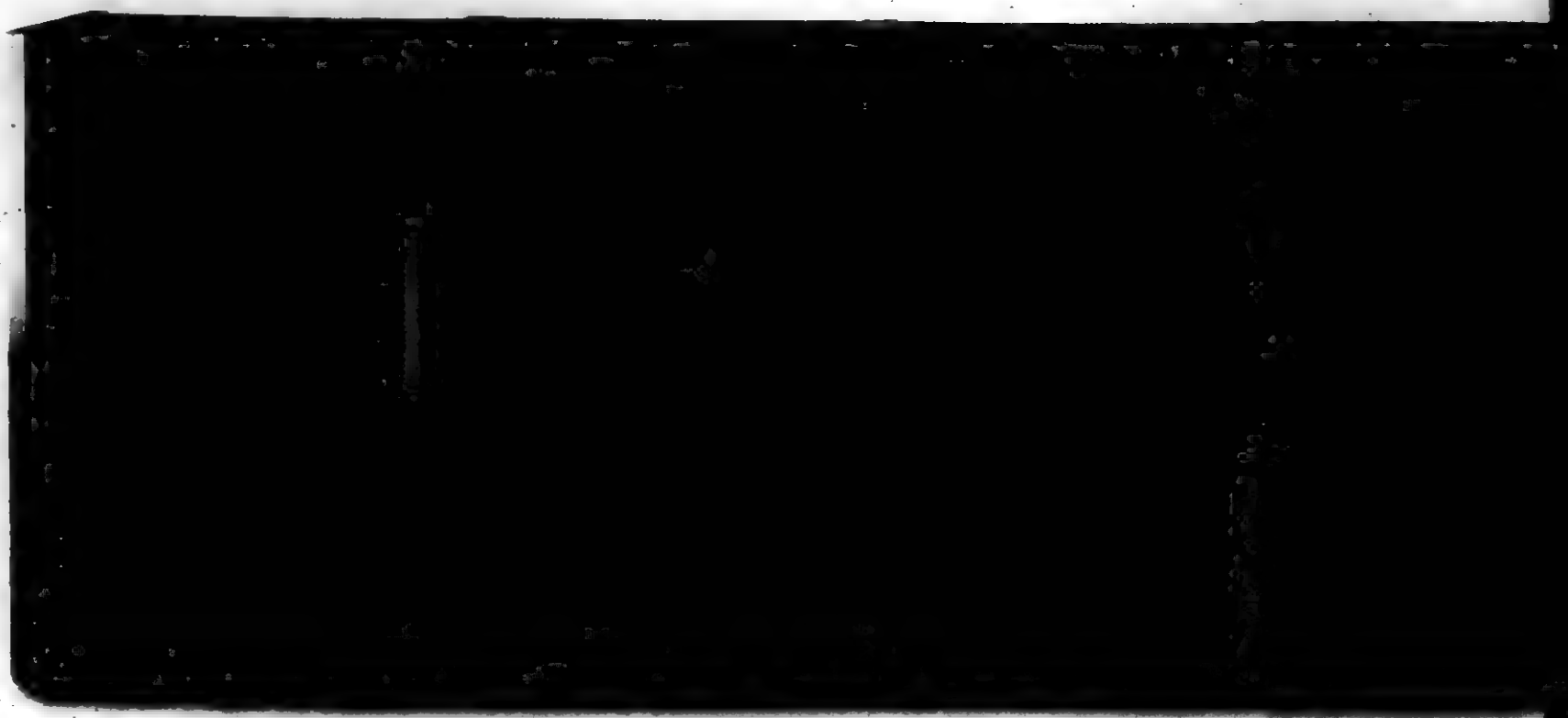

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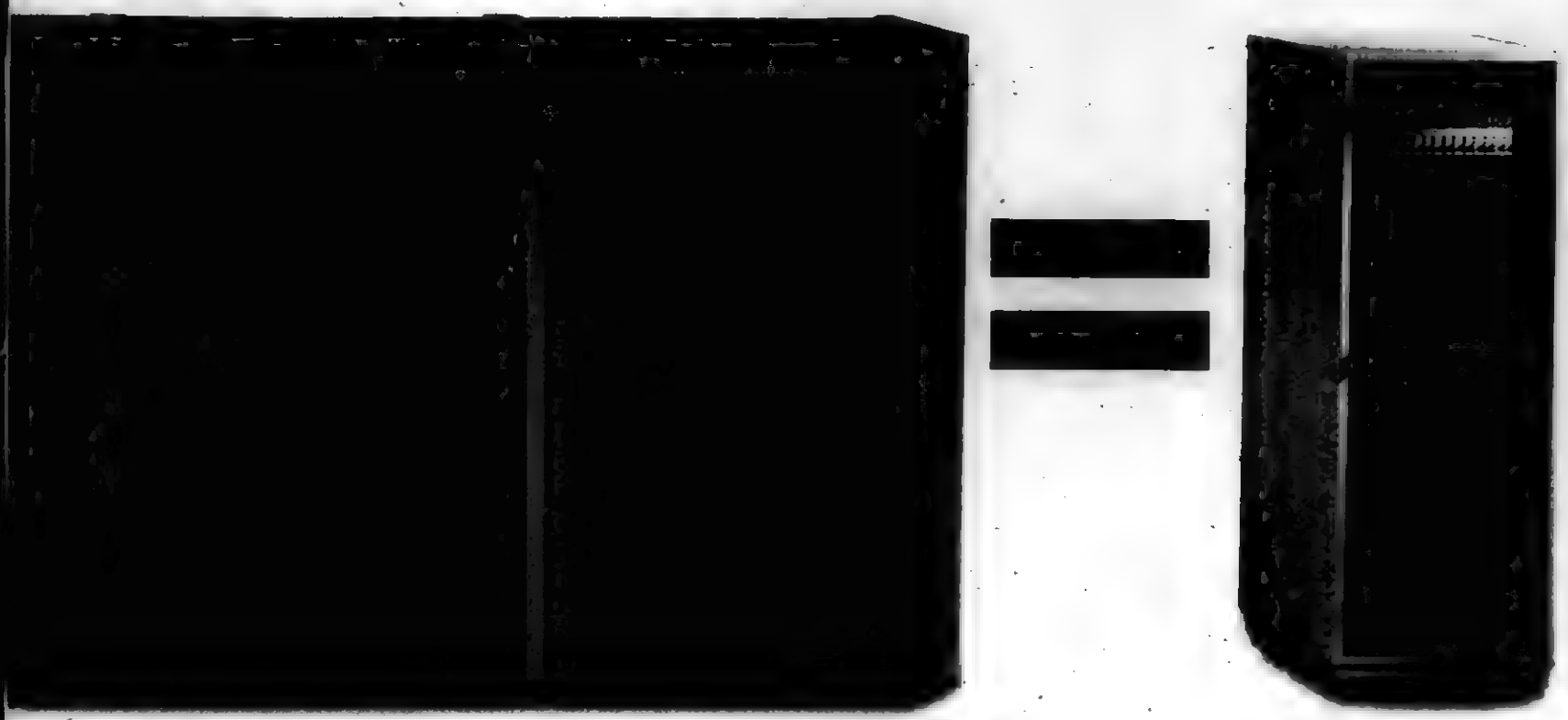

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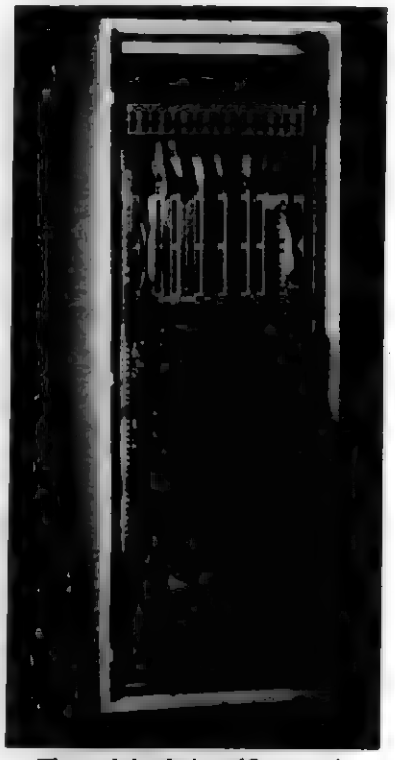

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Information must conform in a world without borders

BY JANET FIDERIO

Ask Hans Huppertz about the importance of information sharing in global corporations, and he'll tell you that it is necessary to forget most of what you learned in geography class.

"Global companies can't afford to operate as a series of independent geographic segments," says Huppertz, director of corporate information systems at Dow Chemical Corp. "They need to operate as a single global entity."

Dow makes 50% of its sales outside the U.S. and has manufacturing facilities scattered throughout Europe, Central America, South America and the Pacific Rim. While many Dow subsidiaries have their own manufacturing facilities and can react quickly to local markets, the need for corporate headquarters to coordinate and monitor activities is vital.

"We want to get the product as close to the customer's place of operation as possible," Huppertz says, "but we also need to remember the needs of our customers, and many of our customers are global customers."

Global customers, according to Huppertz, are companies such as Ford Motor Co., which may order products in Latin America, Canada, the U.S. and Europe and expect the specifications of those products to be the same no matter where they are sold. "In the past, each [facility] had its own specifications for dealing with the local customer," Huppertz says. "If you work, however, with a global customer — no matter if the customer is in Brazil or the Netherlands or the U.S. — it's the same customer, and it wants the product to be identical in terms of specifications."

To meet the challenge, Dow had to rethink its IS network. "We are now tying our computer systems closer together so we can service our global customers on a global basis," Huppertz says. "We're also trying to make information available across all functions. In the past, a lot of the data we had was captive within independent operating units."

Unification and standardization of information are becoming key priorities for many companies these days as it becomes clearer that international competitiveness requires coordination on a scale that cannot be achieved with isolated outposts.

"U.S. companies are beginning to realise they can't treat their foreign operations as 'also-rans' or 'stepchildren,'" says Susan Welch, president of Waltham, Mass.-based IMC Systems Group, Inc., a manufacturer of international trade management software. Welch is also a former import manager for Zayre Corp. Integrating these operations into corporate strategy and the corporate information flow is imperative if the companies are going to grow internationally, she says.

Information and telecommunications systems become more critical than ever when you start expanding into foreign territories, says Arthur Fairclough, director of import/export control at Unisys Corp.

Unisys opened its first overseas subsidiary in 1988, Fairclough says, but today it has overseas factories, OEM vendors and sales and service personnel in hundreds of locations, including Japan, Korea, Taiwan, the UK and France. Coordinating the activities of that many sites requires rapid communication and good information sharing, he says, and for that, "We rely totally on our systems."

Developing systems that are going to be invested with that kind of power is not just a matter of technical wizardry, however. As Bill Ledford, director of financial reporting systems at R. J. Reynolds Tobacco International, points out, international systems require a special kind of diplomacy.

R. J. Reynolds, which has manufacturing facilities in such locations as Puerto Rico, Canada, Ecuador, Germany, Korea, the Canary Islands, Malaysia and Hong Kong, uses a system called the Tobacco International Consolidation and Reporting System, or TICRS, to help management keep track of international activity.

TICRS, which incorporates electronic mail and McCormack & Dodge's General Ledger 3.0, is not only a mixture of internally developed and commercial software, according to Ledford, but also the result of a great deal of human networking between the development team and the staff members of overseas facilities. "We involved the people offshore since they were the ones who would make the thing work or not," Ledford says. "Before we put that software in, we talked to them and said 'Here's what we're thinking about doing, give us your opinion of it.'"

Ledford and his team spent much of their time demonstrating the Input/Interface package — proprietary menu-driven software that lets foreign offices request reports from company headquarters and download profit and loss information as well as balance sheet and cash flow data throughout the month to corporate headquarters. They can also use the package to create a local database and run trial balances.

"We took it out and demonstrated it to them," Ledford explains. "We couldn't even hook it up to the mainframe because we didn't have the interface for the McCormack and Dodge system ready, but we took it out and said 'Here's what it looks like, here's how it operates, what do you think? We still have time

Continued on page 93

Jon Mann

R. J. Reynolds' Ledford *says there is more to international communication than just the hardware*

Fiderio is a Gilsum, N.H.-based freelance writer.

INSIDE

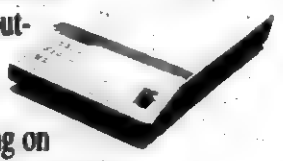
Where does the power reside?
Page 98

Weaving a global net
Page 100

NEC modems keep information moving as if your life depends on it.

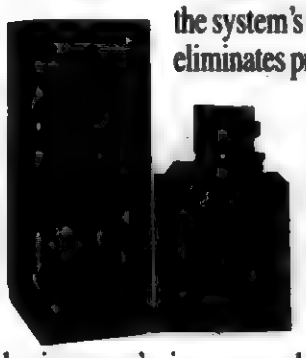
In a 911 emergency, to risk a communications breakdown is to risk a life. So if you don't want to take any chances, make sure your modem can handle the pressure in a crisis.

In Florida, NEC's I Series Intelligent Chassis System is now helping coordinate the life-saving efforts of Lake County's 911 services. The county chose the system after tests found NEC's I-Chassis modems outperformed others. And they've proved their round-the-clock reliability by being on the job there for more than a year without a single failure.



Since NEC modems are designed to rapidly and accurately transmit huge volumes of data, Lake County's 911 operators can now quickly pinpoint accident locations, provide traffic instructions, find patient medical records, and dispatch back-ups when needed. And because NEC's Dual Modem Card links 911's control center to NEC Dial-up Modems in remote locations, Lake County feels it has found the best data networking solution attainable.

Each individual I Series Chassis supports a wide variety of applications and products. These include synchronous and asynchronous operation in dial-up or leased line networks. Line speeds ranging from 300 bits/s to 56k bits/s with both analog and digital capabilities. As well as compatibility with CCITT standards such as V.32 and V.42/bis. Plus, the system's built-in flexibility eliminates product obsolescence by making it easy to add, mix, and match other chassis and data communications devices as network requirements change.



No matter what business you're in, you need a modem that can keep facts and information on the move without causing a crisis of confidence. So choose wisely. Choose NEC's I Series Intelligent Chassis System and Network Manager. For a free assessment of all your data networking needs, **call (800) 222-4NEC.**

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NEC

C&C

Continued from page 91

to change it.' "

When it came time to install the system on the IBM System/36s, 38s and Application System/400s used at 12 of the company's facilities, Ledford sent two people to each location to install the software and train the staff — one systems person and one finance person.

"We found that this worked very well," Ledford says. "As a side benefit, you get to know the people out there, and now we've got both systems and finance people who have been to these offshore locations who probably never would have gotten there any other way."

Another added benefit is that the foreign staff now has names of people at corporate headquarters whom they feel comfortable contacting when things go wrong. Having a personal contact reduces feelings of isolation. "That pays a lot of dividends, and we feel good about that," Ledford says. "We constantly get phone calls from these people. The question may have nothing at all to do with the system, but they know us so they call, and we'll scramble around here and find someone who can help them."

Dow's Huppertz *says a firm must work as a whole*

'World has to be involved'

Dow's Huppertz also makes the point that building a system on this scale takes coordination between those who provide the technology and those who will use it. "This is not the kind of thing you can do in one location and hope to roll it out to the whole world. The world has to be involved to make it successful," Huppertz says.

Dow uses project teams that consist of both users and IS staff. Project teams work closely together and are located in one building. If, for example, a module for use in a French subsidiary is being designed, a member of the French staff who understands that facility's requirements is a member of the project team. That professional resides in the U.S. during the development cycle.

"When it is time to implement the new software, these people go back to their homeland and take part in the implementation process," Huppertz says. "The biggest mistake we could make today is trying to build [systems] in the isolation of the IS department."

A major component of Dow's strategy for global information exchange is its proprietary order chain system. After almost two years of development, pilot modules are scheduled for implementation during the next two months in the U.S., Europe and Canada. When completed, the system will be able to track the status of any order worldwide, from the time it is placed to the time the order reaches its destination.

One of the benefits of such a system, Huppertz says, is that it allows the company to communicate with customers in the same product language around the globe. "If we sell a product here or on the other side of the world, we have the same product code for that product," he asserts. "You can't have different codes and different names for your product."

Smooth trafficking of orders to widely dispersed manufacturing locations and the ability to capture information about orders on inventories in standardized forms were two major objectives that led Unisys to develop its Consolidated Backlog System.

This integrated system for order management, inventory management and invoicing, which runs on four Unisys A/17s in Detroit, can be accessed by sales personnel at all of the company's sites.

If, for example, a French sales representative wishes to place an order for a mainframe system, he enters all system specifications into the central system, which then breaks the order into its component parts and sends each to the appropriate manufacturing location.

The company also relies on its own proprietary E-mail system to keep dialogue open between corporate headquarters and distant personnel. "The most important point in the international environment is communications," Fairclough says. "The better you can communicate, the more efficient your business will be. The fax machine has been a great invention. The telephone obviously helps. But in terms of the time differences and getting things understood, global E-mail is a big assist to running a business properly."

At another computer maker, Harris Corp., E-mail is both a bridge across cultures and a symbol of the kind of diversity that multinational companies must accommodate. "We have Banyan Mail, CC:Mail, Profs, HPmail, HPdesk and Vaxmail all connected via [products from] Softswitch," says Karl McCalley, vice-president of systems. Harris generates approximately one-third of its sales overseas and expects that share to jump to 50% by 1994. Manufacturing facilities in

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Stretching the law

Worldwide consortium gives small legal firms big reach

BY BARBARA WIERZBICKI

As corporations become more global in their operations, the professional services that support corporations are finding that they also need to widen their horizons.

Lex Mundi, a worldwide nonprofit membership organization founded in 1989, allows its member law firms to expand without incurring the overhead associated with maintaining foreign offices.

The key to providing effective support for clients with far-flung interests isn't in trying to learn everything yourself but rather in cultivating a network of sources who can tell you what you need to know when you need to know it, founder Steve McGarry says. McGarry handled legal matters in 60 countries during his 10-year career as in-house counsel for Houston-based NL Industries, Inc.

From its small office in Houston, Lex Mundi connects more than 105 law firms and 8,000 attorneys in nearly 200 offices worldwide. In terms of staffing and technology, the group operates on a shoestring. Administration is handled by McGarry and one secretary. They work with several personal computers, a laser printer and a facsimile machine. Still, members say the information-sharing provided by the consortium helps them immensely when their clients need answers on how to proceed in foreign parts.

The core member service is referral. The group maintains 10 databases containing the resumes of its lawyer members, noting their areas of specialization and interest. This resource, members say, expedites research to make fast local connections for clients. It also fosters the formation of far-reaching personal networks.

Recently, for example, McGarry received a query from a member in Paris asking if any Lex Mundi members were likely to be interested in forming a special committee on global transportation issues. Turning to one of the databases built around a customized version of Borland International's Paradox database management system, McGarry found the names of 250 lawyers who spend more than 90% of their time dealing with global transportation affairs.

The ability to make that kind of connection in so little time really helps to level the playing field for small law firms, says Gerard Bruyninckx, an attorney at Trenite van Doorne in Rotterdam, Netherlands. According to Bruyninckx, U.S. companies with client interests in the Netherlands have traditionally relied on large New York or Chicago law offices with established branch locations in that country. With Lex Mundi, however, he sees the possibility of more collaboration among local firms in the two countries.

Wierzbicki is a free-lance writer in Apple Valley, Minn.

National flavors in the global stew

BY SCOTT KRAMER

Just because a company operates globally does not automatically mean that it loses its national accent. According to a number of consultants who have dealt with multinational firms rooted in various countries, there are some noticeable differences in the way that multinationals handle information systems, and these differences seem connected with their geographic origins.

"If you look across Europe, you'll see information technology following the mind-set of each respective country," says Brad Power, managing associate at Index Group, Inc. in Cambridge, Mass. "For example, Germany and Sweden are great at engineering and manufacturing, so that's where they are strong in automation."

U.S.-based corporations, some consultants say, frequently tend to be faster off the mark in adopting technology and, possibly as a result, less careful about assessing environmental impact. "Americans are more inclined to go for a technological risk to give them a big advantage," says David Stringer, international practice director at Arthur D. Little, Inc.'s Information and Telecommunications Management Practice in London. "In Europe, we're not getting into that game."

Ira Magaziner, an international business consultant based in Bristol, R.I., and co-author of *The Silent War*, a book about global competition, has noted a difference in the amount of preparation devoted to business process changes related to technology implementation. "In Germany, Japan and some other countries such as Sweden," he says, "more emphasis is placed in understanding the change in work organization clearly; there is more of an emphasis on changing work flows prior to implementation. That way, they get more out of it."

Location can influence business attitudes, Power says, and there are certain differences that carry through not only into business but also into use of information systems by business.

"When it comes to systems in general, any European [company] has to work across borders," Power says. "The U.S. first thinks about the U.S., while overseas is an afterthought." Furthermore, he says, European firms are used to designing systems to accommodate country-by-country variations. U.S. firms are just learning how to do this and still tend to think of Europe as a single market. For example, if a bank in New York needs to add a foreign currency for exchange rates into a computer system, it might entail a change in the system's architecture. A similar European institution, however, would probably already have a flexible system for diverse monetary arrangements. The U.S. thinks homogeneously, while Europe takes a more open-ended, heterogeneous approach, he says.

This openness to diversity manifests itself, according to Magaziner, in Europe's eagerness to embrace open-systems. "Unix is catching on quicker in Europe than it is here in the United States," Magaziner notes. "We talk a lot about it, but we've slowed in moving toward actual adoption."

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Malaysia, Kuala Lumpur, India, Taiwan, South Korea and Ireland communicate over a dedicated network consisting of T1 lines and 56K bit/sec. lines to Europe and the Far East so that they can report their production and capacity to the home office in Melbourne, Fla.

Each facility keeps its own database, which the central office queries weekly. All facilities share a common planning formula. Manufacturing facilities report their capacity, and marketing offices report demand. All reports come into the home office in a common format. Using these reports, an integrated central planning engine combines demand and capacity forecasts to produce factory schedules and order acquisition schedules, which Harris communicates back to the field.

Few companies are staking quite as much on global networking, however, as Visa International. More than 49% of Visa's transactions were generated outside the U.S. in 1989 and, by 1993, the company expects more than 60% of a projected $700 billion in sales to be generated outside the U.S.

Power behind the drive

The engine supporting this expansionary drive is Visa's global network and sophisticated electronic transaction processing system, Visanet, which operates as a giant switch, connecting its member banks with customers worldwide.

Visanet's three data centers service five regions with more than 330 access points internationally. The data centers — in San Mateo, Calif.; McLean, Va.; and London — house IBM 3090 mainframes to handle the heavy transaction load.

At the San Mateo facility, the switching and authorization systems run on a IBM 3090, while clearing and settlement services run on an IBM 1090. Development work is done on an Amdahl Corp. machine. A 3090 in London and another 3090 in McLean fulfill more processing obligations. In September, a fourth processing center in Yokahama, Japan, will be operating using two IBM 4381s.

"Each facility is linked to a specific member base as well as being interconnected," says Michael Massey, senior vice-president of international operations

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Logistics and IS

The role that information systems play in managing complex shipping and logistics activities and in tracking the resulting import and export requirements can't be overstated.

IS, claims Susan Harris, corporate logistics manager at Intel Corp. in Santa Clara, Calif., is essential in helping her manage Intel's transportation and finished goods warehousing network. Harris is responsible for the movement of materials from the supplier to Intel's facilities, from one Intel facility to another and then from the final finished goods warehouse to the customer.

To track activities in Intel's U.S. and foreign facilities, the company is currently installing a new version of its sales and marketing system. The company plans to implement the system during the next four to five years and include a shipping module that will be used by the logistics department.

According to Harris, there's no way for organizations to get around installing integrated systems. When manufacturing, sales, purchasing, tracking and reporting systems are integrated, she says, you can respond more quickly to your customers.

"Think in terms of the fact that you're establishing a worldwide shop floor, and each of the workstations needs to be connected — just as you would do with a shop floor that's contained by four walls," Harris says.

Tracking details

Another concern of corporations that trade extensively across U.S. borders is how they can keep track of a dizzying assortment of laws and import/export requirements when moving products.

According to Arthur Fairclough, Unisys Corp.'s director of import/export control, keeping track of import requirements can be complicated and time-consuming because corporations have to comply with U.S. customs laws.

"You have to properly classify the goods for the correct payment of duty, and you have to comply with country-of-origin markings on goods and any other laws that the government happens to introduce," he says.

Fairclough and his staff use a third-party product called Import Statistics from Waltham, Mass.-based IMC Systems Group, Inc. to help them keep a corporate record of company imports with the import transaction, the duty paid and other statistics from the tip to the freight payments. Unisys also uses the package to match imports against exports for the duty drawback provision of the customs law.

JANET PIDERIO

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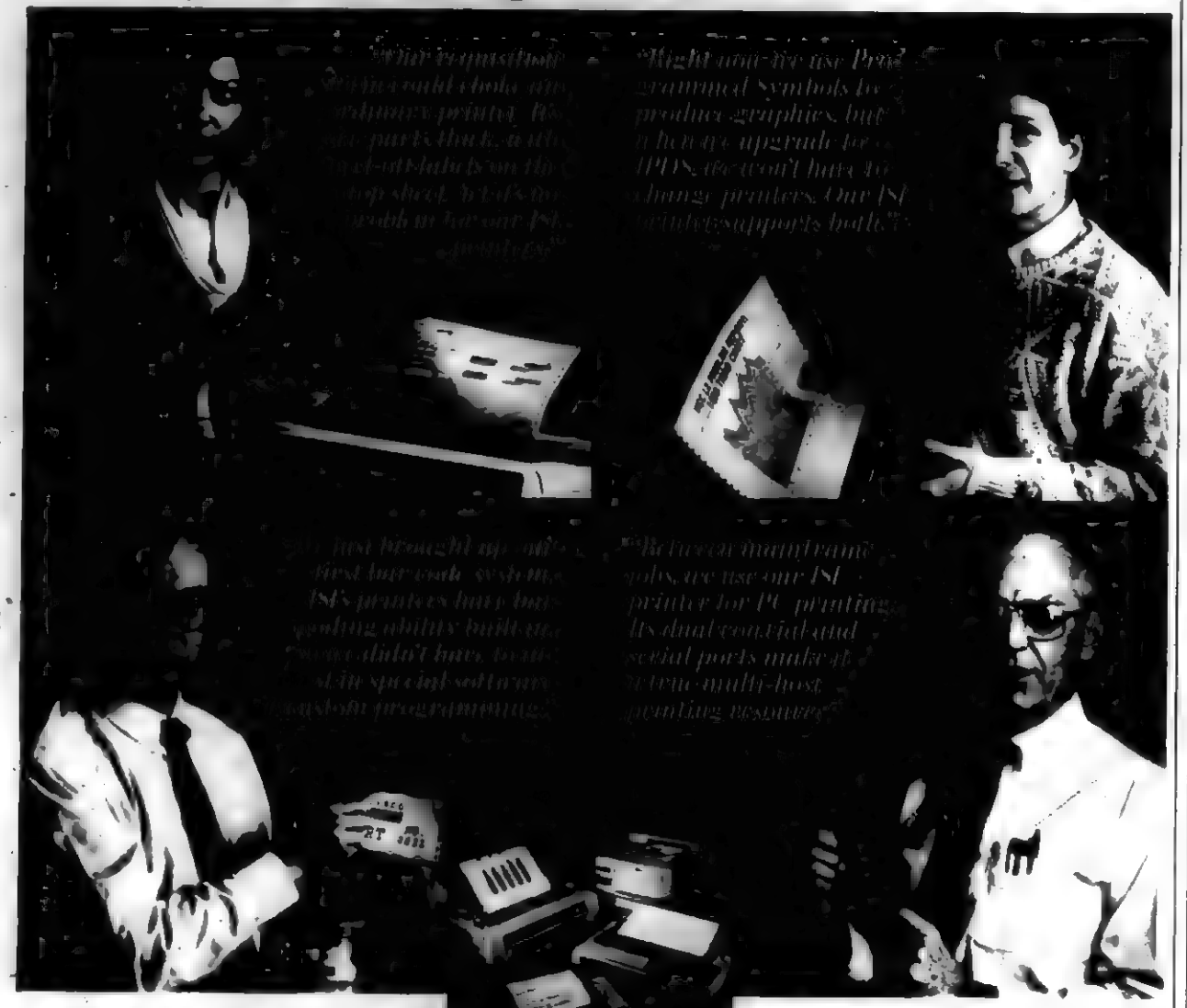

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Continued from page 94

and the person responsible for overseeing Visanet. "In other words, the center in London communicates with both the McLean facility and the San Mateo facility." When Yokahama comes up, it too will communicate with the other facilities.

Visa uses T1 circuits, which span both the Atlantic and Pacific oceans, as well as the continental U.S. "We use the local telephone companies as well for the local connects that need to be made between member institutions and our local data centers, and we also use satellite links," Massey says. While most of Visanet's connections are leased lines, the company has dial-up lines and Switched 56 service available as a backup.

The result of this massive network is that Visa headquarters gets reports of regional activity every day. "All the systems are interconnected, so, for example, when our clearing and settlement system finishes running this evening, we will know the total dollars that went through the system. Then that is totaled," Massey says. "We know how many authorization transactions went through London, how many went through the West Coast and also the dollar amount when we go to clear and settle."

This trend information is also fed into daily, weekly and monthly reports that are sent to those responsible for ongoing market trend analyses. Visanet also lets the company's development team send system enhancements and emergency changes electronically through the network to each facility. "We don't have to mail tapes to actually enhance our systems," Massey says. "The system developers can do that through the facilities here."

Easier said than done

Setting up a network outside the U.S. is not always easy.

According to Massey, establishing systems and networks in some areas of the Middle East, Latin America and Africa, where local Postal Telephone and Telegraph authorities (PTT) are not as developed, may mean longer lead times to get service.

Once established, however, those links are usually reliable. And if they're not, Massey is prepared. "Once those lines are established," he says, "they're connected to what we call our Advanced Network, and they get the same monitoring as our major trunks between carriers."

The Advanced Network is actually Network Corp.'s IDNX Network, a fully automated monitoring system that warns operators when lines drop below specifications and reroutes traffic automatically when a link goes down. "IDNX alerts the operator that he has a potential problem. But at the point that the system has determined that degradation has reached a threshold level, it automatically switches to a backup route. The operator has to do nothing," Massey says. IDNX monitors all of Visanet's links, from the long-haul T1 to the local lines provided by the Bell operating companies in the U.S. and PTTs in foreign countries.

Massey could order international lines through AT&T or other long-haul carriers, who will do all the negotiating with foreign telephone companies for him, but he says that doing it yourself is worth going the extra mile. "There are some service bureaus that say, 'Give us your orders, and we'll handle everything,' but we stay very close [to our service providers],

Harris' McCalley *knows value of linking far-flung facilities*

because what happens in the middle of the night if our folks have telephone problems?" Massey asks. "We want to make sure that there's a relationship established with the local companies so that we don't have to go through a third party."

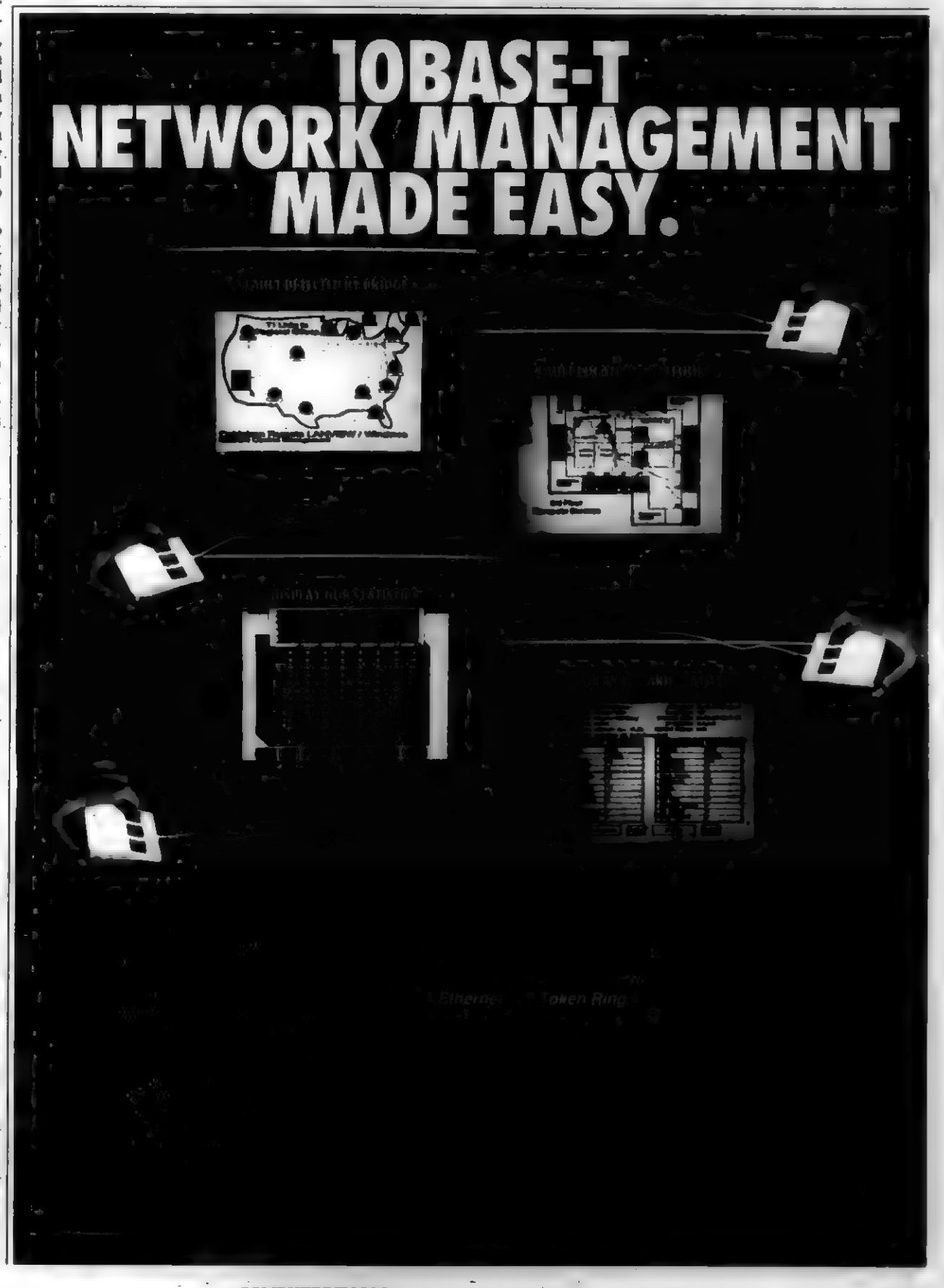
In some countries you may have a choice of vendors, and in other countries, you may be negotiating with a government-owned facility. "Regardless, you still sit down, establish a relationship," Massey says. Not only do Visa's staff members make personal contacts with foreign service providers, but they also establish service objectives that are measured each month.

"I spent a great amount of time in Japan over the last three months working with the local service providers, negotiating and understanding what they can and cannot do," Massey says. "When you come up with something that they can't perform as well as you may find in the U.S., you work to find an alternative."

Telecommunications networks and information systems are the glue that hold corporate global business strategies together.

In order for that glue to hold, the IS manager needs to be on the spot, whenever and wherever strategies are being formed or impacts are going to be felt.

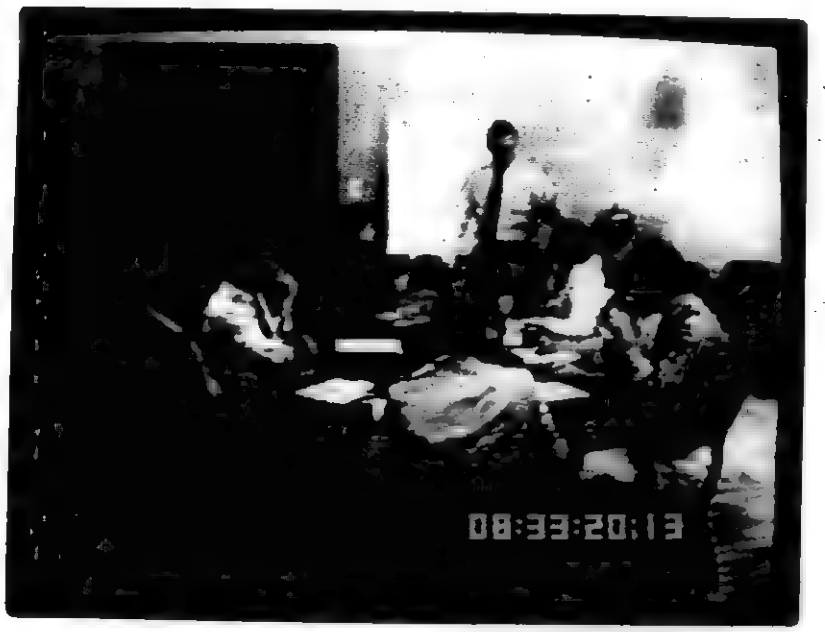
"The IS manager must be involved in developing the business strategy and the way information management and technology will support that strategy," says Donald Marchand, dean of the School of Information Studies at Syracuse University. "If it requires redefining how R&D and manufacturing interact and what technologies they use to design products, he or she has to be there right at the planning stage." ●



"My ultimate PC system? Well, for starters, it's got to be compatible with everything I've got already... so you can take a floppy from an old PC, pop it into a new one, and it will work."

"Networking PCs is a major pain. I'd like to see PCs designed to do networking without lots of configuration work... and still connect with all the networks I've already installed."

"We've got plenty of data... the challenge is to put it in the hands of decision makers in a form they can use. The perfect PC would be an ideal client to all my information systems."



"Every time I turn around, vendors change the operating system or interface. I want to be able to drop the hottest new box on my executives' desks and know their software will run."

Hidden camera reveals the se

Not long ago, we invited hundreds of IS managers to talk about their wildest desires in a personal computer system.

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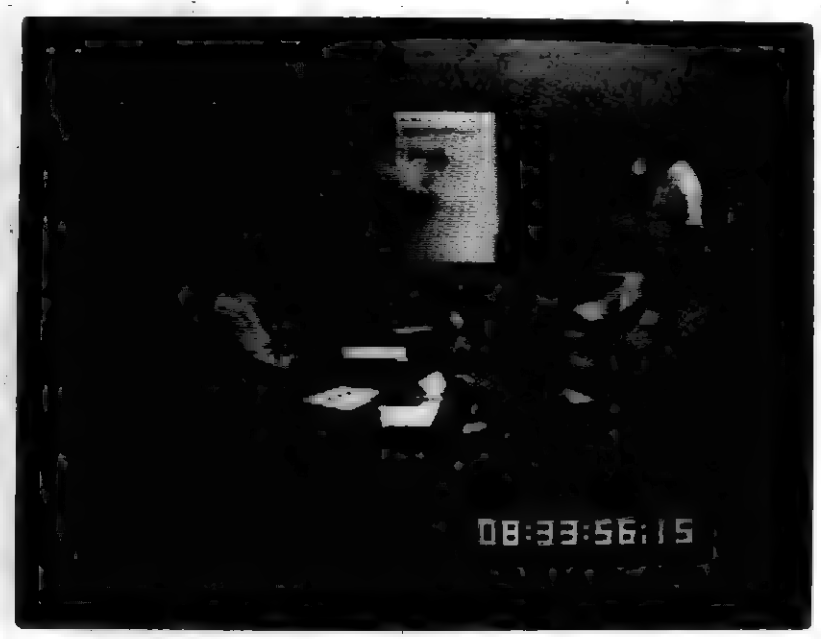
"A graphical interface is clearly important... users love 'em. But the architecture has to be designed to handle it or the performance compromise is unacceptable."

"I'd like to see more discipline from software developers. Commands should be consistent for every application... it would eliminate the cost of constantly retraining."



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"Macintosh? No kidding?"

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No set rules for systems design

BY KATHLEEN A. GOW

Many factors, including geographic origins and locations of foreign sites, influence the manner in which multinational corporations handle systems planning and acquisition.

Japanese companies, for example, tend to encourage local autonomy wherever they operate as a means of staying close to local markets, according to Christopher Bartlett, professor of business administration at Harvard Business School and author of *Managing Across Borders, the Transnational Solution*. "If you shook a Japanese manager out of sleep today, he would be mumbling 'localization,' not globalization," Bartlett says.

In other instances, multinationals allow greater latitude for local decision-making in certain areas of the world. Many, for example, give Latin American business units and subsidiaries much more local control over systems planning and aquisitions than their North American or European counterparts. There are a number of reasons why Central and South American sites are accorded this special treatment. One is that systems and communications software used in other parts of the world are either unavailable in these areas or incompatible with the local standards. Another is that stringent government regulations frequently restrict the flow of information across borders.

Phil Mint

Corning's Shrednick *doesn't rely on a single strategy*

Bartlett describes the challenge for multinational firms as being able to balance the need for local differentiation with the seemingly contrary objective of achieving integration and coordination on a worldwide basis.

Achieving this balance calls for a certain amount of flexibility in weighing the cost and efficiency advantages of centralization and standardization against the requirements of individual areas.

At Gillette Co., for example, David Lawless, assistant director of international systems, says Gillette Europe is handled very differently from Gillette Latin America. Europe has centralized planning and direction coming out of the Isleworth, UK, facility for every function, including IS. Latin America, on the other hand, looks like Europe did seven years ago: Although the region adheres to the framework of centrally developed hardware, organizational and procedural standards, there is much more local autonomy.

"Local control is useful to the degree that business requires resident systems, but it can mean higher costs and the risk of mismanagement," Lawless says.

At Stockholm-based Alfa Laval AB, local control is encouraged but within certain limits. In th early 1980s, Alfa Laval sought to counter a structure that was too cumbersome by decentralizing control of its business units, which are arranged by product area. The only requirement imposed on these units, says John Tower, corporate manager of MIS at Alfa Laval, Inc. in Park Ridge, N.J., is that they maintain systems compatibility with headquarters.

Alfa Laval uses an IBM communications network and mid-range systems that vary locally. The seven business areas use different processes and manufacturing equipment, but some systems have come out of

Gow is a free-lance writer based in Medford, Mass.

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headquarters, such as electronic mail and the in-house-developed Global Inventory File.

Corning, Inc., takes a very broad view of IS diversity. "We're opportunistic," Harvey Shrednick, vice-president of information services, says of the Corning, N.Y.-based conglomerate's approach to IS. "We share where we can and manage by prevention."

Lawless *values local control to a point*

Shrednick holds overall responsibility for corporate IS worldwide. He says Corning has not come up with a global strategy that it can use across the board. Rather, the strategy varies depending on the needs of the industry and the people involved in each unit.

In North America, IS operations are centralized and report directly to Shrednick. In Latin America and Europe, however, systems control for the consumer products groups is much more local. The central IS function provides advice and guidance, but decision-making authority for hardware and applications software rests locally. "We have chosen not to legislate what people use," Shrednick says. It is each group's responsibility to purchase equipment and software that will communicate with headquarters.

Although achieving worldwide coordination in this type of an environment is not easy, Shrednick says he stresses that individual freedom does not always lead to a choice to be different. He gives the example of a U.S. plant floor reporting system that was taken to Japan and adapted for Japanese plants, complete with a hot key between English and Japanese versions.

Managing by consensus

Many multinationals have set up international IS management groups to help achieve coordination through consensus. At Xerox Corp., for example, the Corporate Information Management (CIM) group brings together senior information managers from business units worldwide to make decisions on issues such as architectures, operating

Xerox's Campbell *sees advantages in resource sharing*

system software and primary database modules.

According to Judi Campbell, manager of strategic technology deployment at Xerox in Rochester, N.Y., the CIM group can also serve as a catalyst for resource sharing. In one instance, she says, a member — the liaison for Latin America — was able to identify an opportunity for adapting a set of systems developed for a European region to the requirements of a Mexican unit.

Bartlett says it is impossible to overemphasize the value of forums that permit face-to-face meetings. Globalization is not just to gain access to markets, he says, but also to gain information such as competitors' activities and government regulations.

"In the old role, the subsidiary served as a delivery pipeline, essentially acting as a dumb terminal," he says. "Now, they capture and transfer knowledge — not just raw data processing, but information" and, for that reason, "it is better to manage through socialization," he maintains.

Bartlett stresses that this transfer shouldn't just be between headquarters and subsidiaries but from one subsidiary to another: "That's what drives transnational innovation." ●

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INTERVIEW

Potholes on the global data highway

Infrastructures, tariffs and line availability can all present headaches to the company seeking to set up a multicountry network

Shop carefully, compare prices and be prepared to settle for less than you really want in some areas of the world. That's Arthur Solomon's advice to companies attempting to construct multicountry networks in today's tangled telecommunications environment. Solomon, who recently spoke with Computerworld staff member Stephanie McCann, is vice-president of the information and telecommunications systems section at Arthur D. Little, Inc. In addition to working in Europe, Australia, Asia and Latin America, Solomon has managed major projects in Thailand, Mexico, China and the Philippines.

Q: How much of a networking hurdle do multinational companies face as a result of differences in the technological infrastructures of various countries?

A: A private multicountry corporate network is pieced together using the tariff services of the telephone companies or communication carriers in each of the countries it spans, and it usually involves national networks and international services. Many multinational companies have sophisticated tools for configuring networks and spend a lot of time negotiating tariffs and providing for the interconnection of pieces across national boundaries. It is a time-consuming process, because the services in one country don't always perfectly match the services in another.

Q: Are there significant variations in tariffs and regulations?

A: There are great variations in tariffs and regulations and big variations in cost. A company will often choose the locations of its main data centers based on the costs of services in different countries. Locating a data center in [West] Germany is very expensive, for example, because the tariffs there are very high. So a company might decide to put its main data center in the UK, where tariffs are much lower, but put in connections to [West] Germany.

Tariffs are very different from country to country, and they are changing as various countries liberalize their telecommunications environments. The typical cost for the same length of voice-rate private line for voice or data services could be twice as much in the UK as in the U.S. and eight times as much in [West] Germany.

Arthur D. Little's Solomon *says that carrier cooperation could eventually make management of international networks easier*

Q: Are there places in which the issue isn't price but rather whether you can get a line at all?

A: Definitely. In places such as South America, Africa and many parts of Asia, telephone networks are less developed and services are hard to come by, so companies have to take what they can get in terms of circuits and quality of service.

Q: Can you give examples of infrastructural differences that exist from country to country?

A: In contrast to the U.S., where international network services are provided by a number of carriers, in most other countries there is one carrier you have to deal with.

Infrastructures are also changing in some of the larger industrialized countries. In Japan, for example, competing international services are scheduled to be introduced within the next year or so. Right now, there are competing domestic carriers but only one international service. There is also a trend toward U.S. carriers providing services beyond the U.S. In Latin America, for example, AT&T, MCI and Sprint negotiate connections from Latin America to a location in the U.S. where they place a network hub enabling the customer to communicate with other countries.

Q: Are there any small quirks that may not be immediately apparent and that can cause large headaches?

A: A company will find a lot of service differences from country to country.

You can't establish a high-speed data link between the U.S. and [West] Germany, for instance, without a terminal interface. This is because there is a mismatch in available speeds. Sixty-four kilobit circuits are not easily found in the U.S., and 56K-bit circuits do not exist in [West] Germany, so a speed conversion is needed.

Even within Europe, interfaces are necessary to make one circuit look like another. In addition, there are cost discrepancies that can make a big difference to companies. For example, the cost of an international circuit will be different depending on whether it is acquired from a U.S. carrier or the carrier in France. You can get the same 9.6K bit/sec. circuit from either AT&T International or from the French PTT, but the cost will be higher if you lease from the PTT.

Q: How do companies with multinational networks handle network management?

A: Most U.S. companies with multinational networks have network management systems in this country that deal to some degree with the links to different countries. The limitation is that the database can only collect traffic statistics on the basis of measurements made in the U.S. Traffic between two foreign locations, such as Paris and London, can't be measured. Typically, parts of the network that don't touch the U.S. have to be managed separately from one of the foreign cities involved.

Carriers are making some attempt to deal with this situation, and, in the future, international carriers will offer to provide network management on an international basis to customers. Right now, however, that situation is more of a dream than a reality.

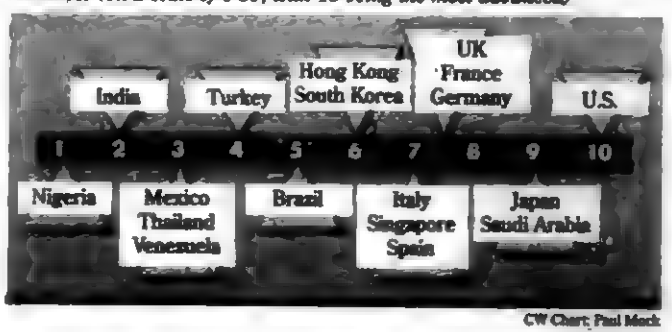
Q: Are there any developments in the wings that you expect will make the job easier?

A: Yes. Carriers in different countries are starting to cooperate with each other so they can provide a single point of contact for corporate customers.

This has been tried before with mixed success, but it is clearly a direction in which the carriers are going. There is a major effort under way among AT&T, British Telecom and Japan's Kokusai Denshin Denwa Co. to provide a single-source network option for organizations that need communications across the U.S., the UK and Japan. Also, last fall, 16 European carriers signed an agreement promising to work together toward providing a single point of contact.

States of operation

Solomon rates the following countries on their overall telecommunications readiness (on a scale of 1-10, with 10 being the most advanced)



CW Chart: Paul Mack

Write it down!

Oral histories are fine for nomadic tribes, but productive IS departments need good documentation and logic

BY CARLOS A. GUERRERO

Why do so many information systems departments encounter such poor user satisfaction? Why is the main complaint of systems analysts the difficulty of knowing what users want and need?

The truth is, both analysts and end users work very hard and very seriously to produce specifications. But in most cases, the results leave something to be desired. Each group is often dissatisfied with the job done by the other.

Worse, most systems are nearly obsolete by the implementation phase because the IS department already has a backlog of changes by the time the integration tests are performed. Even worse, most systems require so much maintenance that upkeep demands more time than the original development after just a few years.

Many analysts continue asking the age-old question: "Why wasn't I told this earlier?" This question is based on unrealistic expectations about the amount and quality of cooperation other departments can offer. It's sad, but misunderstandings will continue to occur unless IS professionals decide to accept the facts of life. That means adopting methodologies that match reality. Probably most important, yet least discussed, are methodologies that can produce good documentation at a reasonable cost.

Don't ask the user

Despite wishes to the contrary, it's impossible for users to know exactly what they want and need before the system is completed. Too many tasks need to be done, such as conceiving a new organizational model that would use a higher level of information for better business performance, helping prospective analyses, improving efficiency, reducing errors and speeding up their correction. These are not things users can do all at once with pure intellectual conceptualization.

Even if they could, there would be few benefits for users. There's a basic contradiction between the dynamic nature of corporate functions and the static architecture of computer systems. Systems are subjected to constant transformation. Managing something so dynamic requires specific strategies and very thorough, constantly updated documentation.

Documentation is the single most important thing that can help IS productivity. Good documentation keeps systems useful despite whatever enhancements and redesigns are needed to keep pace with changing corporate needs.

There's no way IS personnel can change the way the world works from their desks. The only thing for them to do is change the way they do their jobs — specifically, by trying to prevent bad scenarios from happening in the first place.

To do this, IS managers need methodologies for creating good documentation. How does the lack of attention to documentation hurt an IS department's performance? Let's see what happens with a newly developed system.

Documentation writers commit their first mistakes immediately, when the rationale for the chosen design is still fresh in everybody's minds. Left to their own inspiration to provide explanations in a narrative form, they fail to make some things sufficiently explicit simply because they seem obvious at that moment. In doing so, they forget one of the basic principles of good recording: "What seems obvious to everybody now may not seem obvious to everybody tomorrow — and perhaps to nobody."

One example of this "don't bother" attitude is the brief treatment often given to describing design idiosyncrasies caused by system integration constraints. As the other systems change, the logic of the design becomes a little more obscure, and things lose some of their raison d'etre.

Systems and program changes require someone to deliver the right products as quickly as possible. Further analysis for a possible redesign or extensive changes to the documentation are left for a future time when there is no backlog.

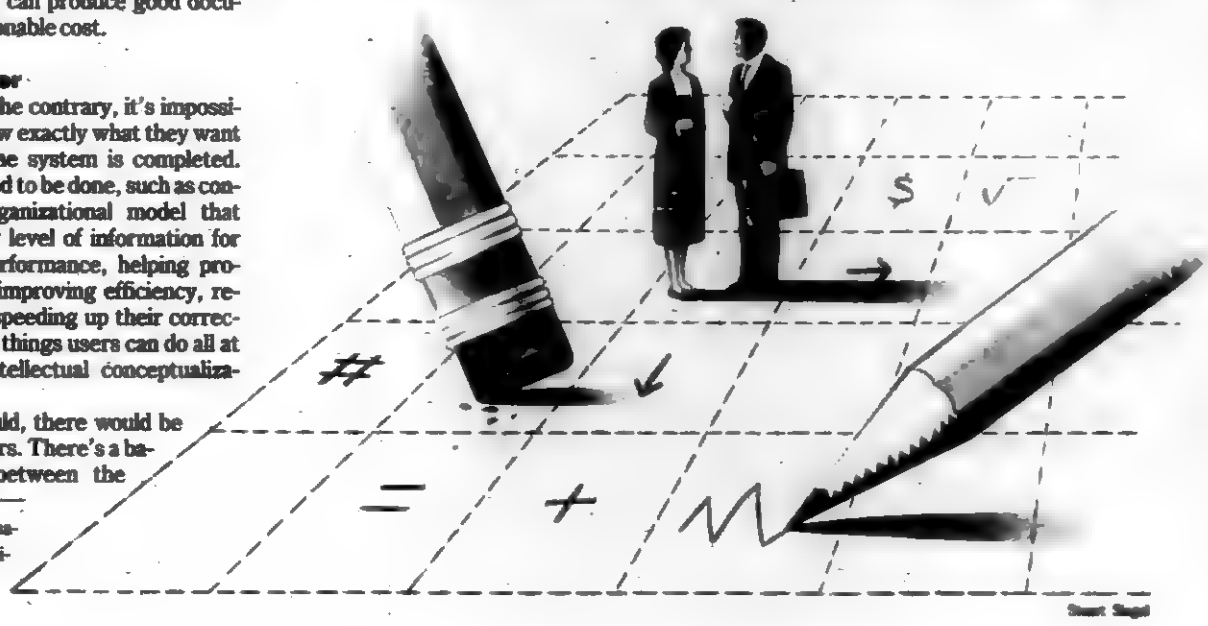
Of course, it's absurd to redesign something every time an important change is made. That would mean rewriting page after page of narrative documentation, which many managers legitimately refuse to do.

Nevertheless, the problem would be totally different if the right methodologies were used for documentation.

The price of doing it wrong

What else happens if the wrong documenting methodology is used?

The first noticeable effect is the multiplication of programs and job strings, as well as an increase in the number of times the same



Guerrero is a systems analyst with 19 years' experience based in Sharon, Mass.

- **Good methodology is key**
- **What is obvious today may not be tomorrow**
- **Quality, not quantity, is the goal**

I'm sitting in a

about my son

above our house

I told him that

hand; however,

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fly right, Dad,

for me going to

corner office on a round planet and I'm thinking and how last night he looked at the crescent moon and said, "Daddy, broken moon, broken moon." And the moon would be fixed soon by a silent and unseen the PBX that I bought for the corporation from company might not be fixed any time soon at all, who is only five said, "Dad, AT&T has a REMOTE lab in Denver set up to detect any problems that might their DEFINITY® System and fix them before they You see, Dad, a full 1/3 of the memory of a DEFINITY entirely to self-maintenance." And I told him thanks looked up at me and said, "Straighten up and because no silent and unseen hand is going to pay college."

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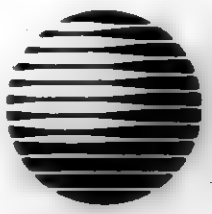

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records are accessed during every cycle. This in itself is not the main problem if you consider that the operations department is supposed to service the user community and the programming staff. Thus, because of the cost of programming, it's better to load the machine and the people.

In other words, the goal is to make things easy for the systems and programming department — even if it means increasing the work load for the computer. There's nothing wrong with this reasoning, and it's financially sound. Or is it?

Unfortunately, it's not. This approach immediately backfires by making systems and programs more and more unintelligible, maintenance more and more difficult and project management more and more complicated. People keep information to themselves, and it disappears when they leave the organization. IS then reaches its old age, which is characterized by decreasing response speed, increasing demands for more staff and diminished correspondence between systems in use and corporate needs.

The problem is also rooted in the general organization of work in the IS group. Time pressure and chronic understaffing promote a shortcut approach. This means that systems modifications are done economically; i.e., by doing what's necessary to resolve the problem at hand.

Tomorrow's problems

The deliver-strictly-what-you're-asked-for-now approach is nothing more than digging your own grave. IS executives are just as vulnerable to firings as those in other areas — and maybe more so. Maybe corporate managers are not as blind as they seem. Maybe there are inherent flaws in the way IS managers approach their metier.

There is probably nothing more distressing for chief executive officers than IS directors who cannot identify problems at their origin and thus demonstrate an apparent lack of knowledge about how their systems work. It's possible (although very unlikely) that an inquisitive CEO might want to look at the documentation. He will certainly find the experience so overwhelming that he will never want to repeat it.

Clearly, there's no need to produce a mountain of documentation that will soon be inexact, outdated and outright incomprehensible. On the other hand, somebody in IS *must* possess the necessary information.

Information exists in many cases, of course, but it is often kept in a person's mind and not documented. It is ironic that in a computer environment so much vital information is maintained in individual human memories. Every time a programmer or analyst quits, it means trouble for the organization.

Back to basics

The solution to all this lies in rationalization and systematization. The first thing to do is determine key aspects of the problem so you can concentrate on avoiding them. The most difficult thing to grasp is how things are put together — the general logic and rationale of programs, processes and systems. These are the things that allow people to think, conclude and resolve.

Discovering the big picture can be done perfectly with decision tables. In the past, managers wouldn't accept any program that was not accompanied by a flow-

IS EXECUTIVES ARE just as vulnerable to firings as those in other areas — and maybe more so. Maybe corporate managers are not as blind as they seem. Maybe there are inherent flaws in the way IS managers approach their metier.

chart. Today, no program should be accepted without decision tables.

Training in decision tables is essential for programmers; it's pure logic. Although learning a programming language takes a short number of months, acquiring good programming logic takes between two and four years or longer.

Logic is also a very difficult thing to communicate, especially if documenters use the narrative method, which requires not only a substantial amount of time but also exceptional writing skills.

Consequently, people developed tools that stress the visual form of representation, such as decision tables and high-level flowcharts, among others. By using these tools, a lot of important information can be registered fairly compactly, and by following a set of standard procedures, this documentation can be kept updated with little effort.

Whether you use Warnier diagrams, Nassi-Shneiderman diagrams or any other means of visual representation, there's an additional advantage: Updates are easy because the specific procedure for construction doesn't leave room for personal styles. Nor does it depend on a person's inspiration. It's also easier to estimate a documentation work load, which guarantees almost 100% accuracy.

The relationship between documentation and systems and programs is not only essential in the maintenance phase but is also inextricably linked to the analysis, design, programming and implementation phases.

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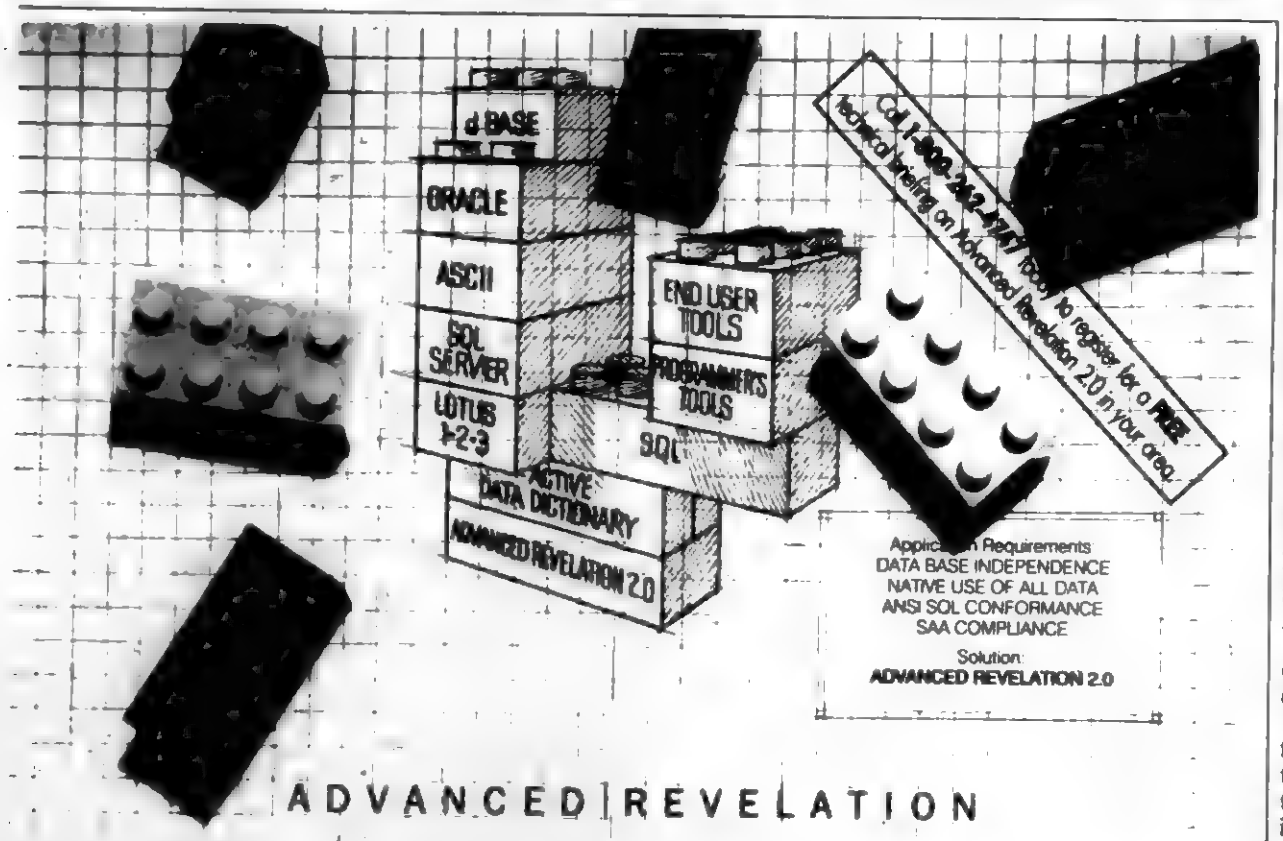

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Designated hitters

Kaypro Corp.'s new chief executive officer, Geoffrey Soule, the board of directors' choice to lead the computer company out of Chapter 11, has announced his own turnaround team. Stepping up to bat for Kaypro are industry veteran Hallock G. Davis and former financial services industry consultant Dan J. Mackie. Davis will oversee the firm's financial and legal affairs, as well as general operations.

■

High tech, low visibility

Many technology firms have much to boast about, but apparently few can claim that their wares are household names. **U.S. Landor Associates**, a marketing consulting firm, recently conducted an international consumer survey to find out which brand names were most recognized and respected. The resulting list of the Top 20 Most Powerful Brands in the U.S. included **Kodak** at No. 5 and **General Electric** at No. 12. Technology did a tad better on the the World's Top 20: **Polaroid** (20), **Panasonic** (13), **IBM** (9), **Kodak** (4), and **Sony** in the No. 2 slot — right behind Coca-Cola, Inc.

More National briefs page 111

Merger rides out storm of growth

Informix and Innovative learned the hard way that revenue boom requires control

BY JEAN S. BOZMAN
CW STAFF

MENLO PARK, Calif. — It was, essentially, a case of indigestion.

Informix Software, Inc.'s 1988 merger with Innovative Software, Inc., a Lenexa, Kan.-based firm half its size, was supposed to move the database company into the fast-paced world of personal computer software. That it did — but not without a painful year of adjustment marked by rising costs, financial losses and a 10% workforce reduction last January.

Today, with employment back at the premerger level of 1,200 workers, revenue of approximately $145 million and costs in line, Informix is back on its feet. But the dark days of 1989, when a new management team was brought in to restructure the 10-year-old firm, serve as a reminder that growth, no matter how positive, must be managed.

"We've learned a lot," Informix Chief Executive Officer Phil White said. "It's like marriage. The second time around, you're a lot smarter about how you do things."

Nevertheless, White, who still sees acquisition as the fast track to new technologies and markets, by no means rules out another one for Informix. "It takes more than two years to develop a new software product and get it out the door," he said.

The Informix/Innovative merger, which took effect in early 1988, got off to a good start, Chief Financial Officer Howard Graham said. Informix was then a $41 million software house, and Innovative had more than $20 million in annual sales. By grouping the two together, executives found that business was booming but had to be controlled.

Paul Mock

"Revenues continued to grow at 20%, but costs grew too," Graham said. "Selling more always sounds great. People say, 'It only costs us an extra dime to get that extra dollar.' But at the end of the day, there are hidden costs. At some point, you have to allow for support costs for the organization."

Double effort

By Jan. 1, 1989, it was clear that there was a duplication of effort between Innovative, which developed the Wingz graphical spreadsheet package for Apple Computer, Inc. Macintoshes, and Informix, which sells a Unix-based relational database management system, a fourth-generation language and computer-aided software engineering tools.

Informix founder and chairman of the board Roger Sippl, then CEO, decided to step aside in favor of a new senior management team. A professional recruiter found White, a former Wyse Technologies, Inc. executive with 15 years' experience at IBM. White, in turn, recruited Graham from Wyse and hired a team of senior managers who had worked at IBM, Hewlett-Packard Co., Alcatel Business Systems and ITT. Sippl spends much of his time working on software standards.

"Informix and Innovative had duplicate marketing, finance and manufacturing," White explained recently. "We were losing focus on the businesses, trying to get Informix to understand industrial-strength office automation and trying to get Innovative to understand databases."

To put things right, the very infrastructure of the company had to be shifted.

Industry analysts agreed that the firm is well positioned. However, Informix's annual growth rate of 20% to 30% is modest compared with

Continued on page 110

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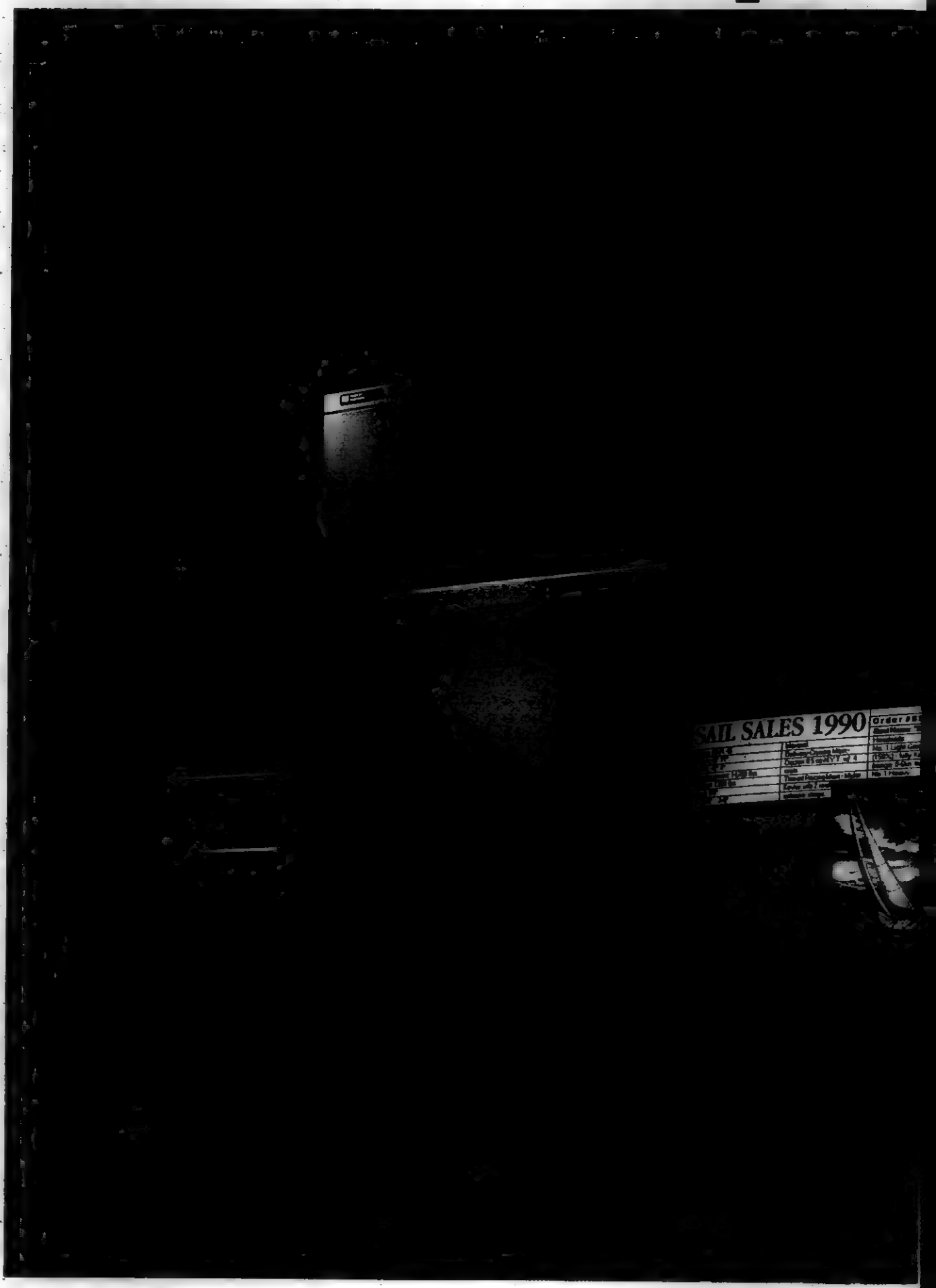

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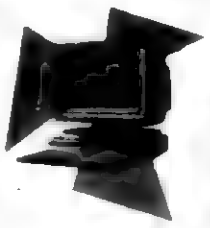
VDT makers face new liability issues

BY J. A. SAVAGE
CW STAFF

With the Swedish government announcing new limits on two types of VDT emissions and most major U.S. computer companies vowing to market low-emission VDTs in the near future, potential liability appears to be looming over manufacturers' heads.

VDT makers may be caught between an envisioned marketing opportunity for new products and their legal departments, according to one legal observer.

There has been no discussion of the industrywide cost of liability, a spokesman for the Computer and Business Equipment Manufacturers Association said. The decision by computer makers such as Sun Microsystems, Inc., Digital Equipment Corp. and Apple Computer, Inc. to develop low-emission VDTs "is a marketing decision, not a health and safety one," the spokesman said. "If customers ask for them, we'll make them."



However, Terry Mahn, a Washington, D.C., lawyer specializing in electronics issues, said that it is not quite so simple.

"If government regulates [the issue], it's one thing," Mahn said. "But if manufacturers change course in an attempt at self-regulation, a critical legal question becomes, 'What do they know? And when did they know it?' " He said that such a move on the manufacturers' part would likely become the basis for lawsuits claiming either negligence or product liability.

At this time, no studies have shown a clear link between health problems and electromagnetic emissions from VDTs. Yet concern is snowballing.

Last month, the San Francisco Board of Supervisors said there was majority backing for a bill to help limit exposure, especially to pregnant women. Late last month, Sweden announced the world's strictest government-enforced limits on emissions for VDTs. The country added extremely low frequency emissions to its list of restrictions and reiterated previously enacted bounds for very low frequency (VLF).

Sigma Designs, a Fremont, Calif.-based firm that has been marketing a VLF-limited monitor to the Swedes, plays down its low-emission marketing in the U.S. — largely because of the liability factor. "We don't want to unnecessarily alarm anyone," Sigma marketing manager Charles Waters said. "Even in Sweden, no one has proven anything conclusively."

If studies do show a correlation between health risks and VDT emission exposure — or if there becomes an overwhelming body of evidence pointing toward a correlation — VDT manufacturers could face two kinds of liabilities, Mahn said.

Easiest to prove

The easiest type of liability to prove is product liability. "Everyone in the chain of distribution is jointly and severally liable," Mahn said. On product liability counts, consumers do not have to show who is at fault. They do have to show connection between the product and health problems, he added.

Lawsuits based on product negligence would likely prove the most costly for manufacturers, Mahn said.

"Negligence is anything a reasonable person would not do, like putting something potentially harmful on the market without a warning or protection," he said.

Mahn likens the potential manufacturers' liability regarding VDTs to that which existed in the asbestos industry. If a "watershed event" — similar to the studies showing that asbestosis was caused by inhaling asbestos filaments — occurs with VDTs, "money wouldn't be any object" to the plaintiffs, he said.

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Fortune 1,000 uncertainty adding to PC slump

BY PATRICIA KEEFE
CW STAFF

An increasingly tight-fisted Fortune 1,000 is said to be the culprit behind flattening shipments of microcomputer hardware.

Although estimated at just 20% of the overall desktop market, a decreasing flow of corporate dollars has forced many vendors and resellers to lower earnings estimates, prices or both this year, prompting Wall Street to respond with hold and sell recommendations.

In early 1990, analysts predicted personal computer market growth of 8% to 12%, down from 12% to 14% the previous year. Instead, growth has plummeted as low as 5% and should stay in the single digits through 1991, according to Rick Martin, a Prudential-Bache Securities, Inc. analyst.

This has led to price cutting from the likes of Compaq Computer Corp., Dell Computer Corp., AST Research, Inc. and Everex Corp., as well as rebates from IBM. A price war is raging in the Intel Corp. 80386SX-based PC segment.

Yet while hardware stands alone, other products are rolling off the shelves. Software, peripherals and other accessories are generally doing well, according to resellers. Companies targeting home users and small and medium-size businesses — the new growth areas — are also finding success, analysts said.

The most visible and typically the most sought after sales are in the Fortune 1,000. A close look at these accounts, however, reveals a camp divided between spending bulls and bears.

The bears say the worsening economy, budgetary constraints, corporate downsizing and, in some cases, near saturation of PCs are the reasons behind their cautious approach.

"This year, there is a cost crunch on," said Dennis J. Murphy, director of corporate information management consulting and support at GTE Corp. in Stamford, Conn. Corporate downsizing has also served to stanch the flow of invoices. "Fewer people need fewer workstations," he said.

Other users have grown weary of incessant upgrade cycles and leery of committing dollars to technology that is often usurped a few months down the road.

"The budget doesn't have as much to do with it as does the 'wait and see' in terms of the new technology to be introduced shortly," said Rock Blanco, vice-president of information systems at Garber Travel Services Corp. in Boston.

Uncertainty about migration issues is another stalling mechanism. Users will soon have a choice of five platforms: Microsoft Corp.'s Windows 3.0, Unix and three as-yet unreleased environments: OS/2 2.0, OS/2 "Lite" and DOS 5.0.

"I think the confidence level is not there for two reasons," said Andrew Seybold, an analyst at Dataquest, Inc.: Users are either unsure of their next move, or they no longer believe the computer industry, he said. "The whole industry has been guilty of misrepresenting the ease-of-use factor."

Bulls, on the other hand, tend to be in the throes of automating the work force or are aggressively moving into either Windows 3.0 or OS/2.

Richard Kowal, PC manager at Lever Bros. in Englewood, Calif., attributed his accelerated purchasing this year to a new system that demands a greater number of more powerful PCs. He expects to hit PC saturation in mid-1991.

INTERNATIONAL BRIEFS

Philips in Dutch

As the dust settles over the decision of Netherlands-based **Philips N. V.** to pull out of the static random-access memory development wing of the 18-country Joint European Submicron Silicon Research program, industry experts last week voiced concern that the move could signal reorganization of the market just as it appeared to be coming together. Meanwhile, in its ongoing effort to shore up its foundering computer business, Philips has signed on to sell **Motorola, Inc.**'s RISC systems under an OEM contract.

■

The winds of price war

Is there a price war about to break out in the European personal computer market? Market researcher **Dataquest Europe** and London-based securities house **Barclays de Zoete Wedd PLC.** think so. A report issued jointly by the two firms warned that **IBM**'s Personal System/1s are selling at a premium to all the competition in the midrange sector: notably Commodore Business Machines, Inc., Ing. C. Olivetti & Co. and Tandon Corp. If IBM wants to take a learned share of the continental home computer market, PS/1 prices will have to fall, the report warned.

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- ☐ Other _____ (fill in name)

Merger

CONTINUED FROM PAGE 105

RDBMS industry leader Oracle Systems Corp., which has traditionally coped with growth rates of 50% or more. Even with its recent financial setbacks [CW, Sept. 10], Oracle is speeding past Informix in sales — and RDBMS competitor Ingres Corp. may increase its market when it merges with software vendor Ask Computer Systems, Inc. [CW, September 17]. "The people at Informix are surfing, but they're not on top of the wave," said Tom Moore, an analyst at Framingham, Mass.-based market research firm International Data Corp.

Indeed, Informix's revenue is just a fraction of $971 million Oracle's — and just a step ahead of $157 million Ingres, which is struggling to hold onto market share.

Yet Informix beats Oracle within the Unix marketplace. "In terms of the number of DBMS units shipped, and in terms of the Unix DBMSs shipped, Informix is No. 1," said Julie Rodwin, a senior analyst at Infocorp in Acton, Mass. However, she added, the value of Oracle's Unix-based DBMSs is higher than Informix's. Oracle's Unix DBMS sales totalled $155.7 million in 1989, compared with Informix's $106.2 million.

Informix's White *likens mergers to marriage*

According to some analysts, Informix's PC products and the Unix-based RDBMS and 4GL tools have not yet reached true synergy. The Wingz and Informix Turbo/Online database products weren't even linked until this year, when Wingz got an interface called Datalink. Now, Informix is going after additional PC/local-area network connections, announcing support for Novell, Inc.'s Netware 386 last month and advertising new Wingz ports to the OS/2 and MS-DOS operating systems. The firm also plans to add a graphical user interface to the popular Informix 4GL application environment.

Surfing or not, Informix's strategy is to ride the downsizing wave all the way to the beach. "People are going to keep their IBM mainframes, for the most part, as a repository for corporate data," said Jeff Bork, vice-president of marketing. "But they are adding distributed Unix servers throughout their departments and divisions."

Sitting pretty

At a time when most RDBMS vendors are struggling to bring costs in line with incoming revenue, Informix executives said they feel they have cleared that hurdle and can concentrate on future growth.

How? Where competitors emphasize a strong direct-sales force, Informix prefers to let large systems manufacturers, such as AT&T, NCR Corp. and Unisys Corp., along with some 2,000 value-added resellers (VAR), resell its RDBMS engine. By its own account, Informix has sold most of its products — its low-end Unix servers and RDBMS tools — through third-party systems integrators. By policy, Informix sales representatives are rewarded for OEM and VAR sales even if they didn't ink the deal.

Without the heavy burden of a high-priced direct sales force, Informix feels it can grow comfortably, even as some RDBMS competitors struggle to keep costs under control [CW, Sept. 3]. "We are well positioned to hang in there if the economy slows down," said Jeff Bork, Informix's vice-president of marketing. "If it picks up, we're ready for growth."

Though the indirect sales strategy is a success, Informix has paid a price in terms of visibility. "We do have a lower profile than our competitors because we use indirect channels," said Roger Sippl, Informix founder and chairman.

"We also get many fewer dollars per unit, so our revenue isn't on the order of some of our competitors." However, advertising campaigns and increased interchanges with the analyst community are designed to boost Informix's image as a provider of end-user systems, he said.

Whatever cost Informix has incurred on account of its partnering ways, Sippl said, has been outstripped by the strategy's benefits. "We're not going to change the formula," he said. "Dealing with business partners is a winning formula for the 1990s. The direct sales model is an outdated model. This new world of open systems is really a world of systems integrators more than anything else."

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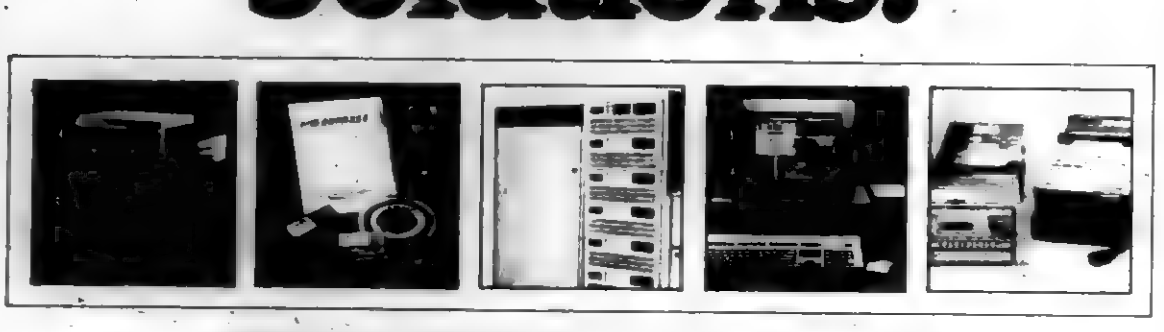

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COMMENTARY

James Daly

Of sailing ships and sales dips

You've got to hand it to Steve Jobs. On paper, his Next Computer venture sure looks great: It's got style, mystique, scads of financial backing and has boldly promised to redefine its genre.

Yeah, well, so did the Titanic.

But whereas the great luxury liner went down like a rock after bumping into a big ice cube, Next continues to ride the waves of the computer industry, its hull strengthened by its leader's idealism and more than $130 million in investment capital.

It is clear, however, that Next will need to significantly readjust its original course.

There's no doubt that Next's sleek black cube is an exciting piece of work. Heck, if I ate a doughnut each time the word "revolutionary" was spoken in this industry I'd look like Dom DeLuise, but Jobs really seems to understand the concept. The Nextstep application development environment regularly draws raves, while the machine's slick communications tools and use of the emerging Mach operating system point in exciting new directions.

Trouble is, Next is like a salmon heading upstream. While the company's recent introductions have eliminated many of the obvious shortcomings of its first computer — high price, no color, slow speed, lack of applications — it is still unclear whether the new additions will steal customers away from more established vendors.

Several factors have lined up against Next, including a slowing economy and stiff competition from firms such as Apple, Sun Microsystems and Compaq. Additionally, most large organizations have significant installed bases that they are not willing to replace. Even the normally brassy Jobs has tempered his rhetoric. "We're cautiously optimistic," he said. "We don't want to get carried away."

Instead of burning down the house, insiders say that Next will instead become a pleasant addition to the neighborhood. Analyst Jonathan Seybold said that Next will find its place as a niche player, first in the desktop publishing industry. Next also continues to be popular in schools and universities — the firm's original market.

Despite falling short of its market goals, Next has succeeded tremendously in restoring something to the PC industry that seemed to have gone the way of the dodo: an infectious sense of adventure and the belief that rules are made to be rewritten.

Sure, the industry was founded on that premise, but anyone who has ever attended one of the humorless IBM or DEC announcements knows that they look and feel more like a wake than opening night. It only takes a few stony-faced marketing managers telling you how excited they are about a new product to realize the big lie this industry lives with.

In contrast, Jobs marked the launch of his new products with a celebratory dinner that included musician Graham Nash (who's using the Next machine for his photography habit) and billionaire Ross Perot (one of the company's financial sugar daddies). Personally, anyone who can seat a veteran of Woodstock and an ultra-capitalist at the same table is all right with me — even if he isn't going to bounce the world on its ear again.

Daly is a *Computerworld* West Coast senior correspondent.

NATIONAL

BRIEFS

Big

OK, *Jeopardy!* fans, think fast: As of late last month, this company is not only a telecommunications subsidiary, but it also claims title as the largest U.S.-based purveyor of applications software to the financial services industry. Everyone who chorused "What is Nynex Information Solutions Group, Inc.?" got the right answer, now that the White Plains, N.Y.-based firm's acquisition of Stockholder Systems, Inc. has become final.

■

Supply slide theory

Large corporate users who rely on interconnected local-area networks (LAN) for their ever-more-sophisticated networking needs are heading toward a crisis that goes back to Adam — Smith, that is. Cambridge, Mass.-based Forrester Research, Inc. is finding that the current sources of supply are not equal to the big users' escalating demands. Forrester's report foresees the emergence of two new LAN distribution channels to bridge the gap: National resellers organizations and systems integrators with low cost channels.

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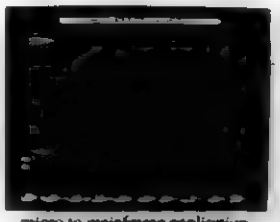

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Gleaning the most out of conferences

BY JILL VITIELLO
SPECIAL TO CW

If you're a typical information systems executive, scores of conference brochures march across your desk every week. But in this era of budget squeezing, conferences may be the first thing you cut from your list. Keep in mind, though, that short-term Band-Aids can leave long-term career scars.

IS professionals must stay on the cutting edge of technology to keep up with the competition — the No. 1 reason to justify going to industry conferences.

"People have told me that when they miss an important annual industry conference, they lose a whole year [of technical knowledge] in their business," says Dianne Winterberg, convention manager at association management firm Smith, Bucklin and Associates in Chicago.

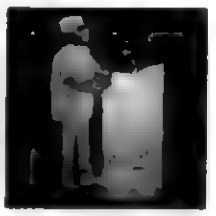
Picking and choosing

Because of the abundance of conferences offered, it's up to you to choose carefully. Weigh all of the elements, including the conference theme, the topics of the plenary and workshop sessions and the speakers who will be providing the information.

Industry experts point out that conferences today are serving highly specialized audiences. If necessary, you can call the sponsoring organization for detailed information. Keep in mind that conferences put on by trade associations or user groups are usually more diverse and less parochial than those mounted by one consulting group, vendor or manufacturer.

After you've zeroed in on a conference, you'll probably have to build a solid case to convince your boss that you should attend. First, factor in your time plus the cost of travel and conference fees. Then jot down a list of things that will not get accomplished while you're away. By acknowledging the downside, you will deflate arguments against your going. After that, follow up quickly with a list of benefits the company will gain.

"If I return from a conference with two good ideas that I can implement in my own company, I feel the expense is justified," says Rich Davis, vice-president of information services at E & J Gallo Winery in Modesto, Calif. "After all, to bring in a high-powered consultant for two or three days would cost twice as much as gathering new ideas at a conference myself."



Assuming that you've made a good case for attending the conference, how do you maximize your time while you're there? In plenary sessions, be an active listener. Take notes, jot down ideas sparked by the speaker, and list questions to ask during the open microphone session. During workshops, roll up your sleeves and take advantage of the chance to acquire new skills and training. Participate by raising controversial points and listen to your peers' opinions.

If the conference features an exhibition, you will most likely be given a floor plan of the hall. Mark it up as you would a road map. By planning a route, you'll be sure to visit every vendor that may be of interest to you and your company. Keep moving forward as if you'd scheduled appointments at each of the booths you want to see.

Prepare yourself to take advantage of standing-around time, whether it occurs during the awkward first few minutes of a cocktail reception or at scheduled coffee breaks. Study the list of attendees the night before so that you will be able to recognize at least a handful of names on the name tags. Plan to ask a simple question to break the ice. For example, introduce yourself and ask your new contact about his or her daily responsibilities. This will generate a much more interesting response than the usual, "What do you do at Consolidated?"

Besides staying current, there is another good reason to attend conferences: to build and expand your personal network of business contacts. You may not see instant results, but this kind of informal networking will prove increasingly valuable as your career moves ahead.

"Over the years, executives have told me countless times that their contacts have helped them make wise business decisions," says Sheila Hoffmeyer, vice-president of Smith Bucklin. "It's impossible to overstate the worth of a reliable network."

Davis, for example, says he relies on his network to stimulate ideas or help find creative solutions. "It's good to know I can pick up the phone and call another IS executive and quickly get a new perspective on just about any issue," he says.

Networking begins when you bring a huge stack of your business cards to a conference and give them to as many interesting people as possible. The flip side of this is for you to collect as many cards as you can. Write on the back of each card when and where you met the person and what you discussed.

Truly effective networking continues after the conference ends. Follow up with the people you've met by sending letters recapping your conversations or enclosing an article you may have discussed. Suggest meeting for lunch if you are in the same or a nearby city. Keep the dialogue open so that you can bounce ideas back and forth or ask advice at a later point.

> "IF I RETURN from a conference with two good ideas that I can implement in my own company, I feel the expense is justified."
>
> RICH DAVIS
> E & J GALLO WINERY

After the conference, share information with your boss and co-workers, which will help justify future trips to conferences. Hoffmeyer suggests preparing a training session that condenses the information you received at the conference. Winterberg encourages conference attendees to prepare a staff briefing memo on key points as well as an opinion of the event so that associates can weigh the merits of going the following year.

All in all, IS executives are sure to agree that staying ahead of the game isn't easy, but it is essential. "People who are successful in this field are not stagnant," Davis says.

Vitiello is a speech writer and free-lance journalist based in East Brunswick, N.J.

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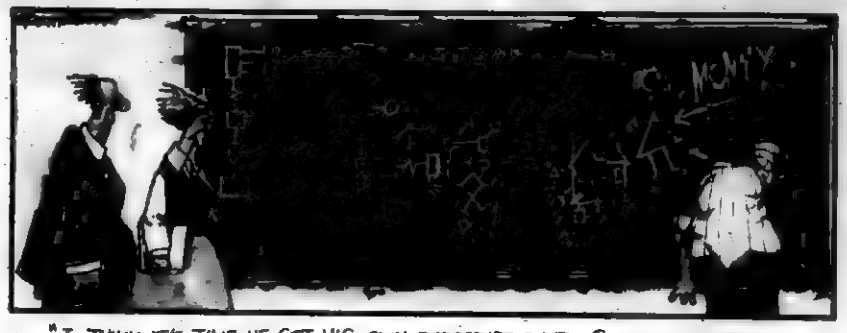

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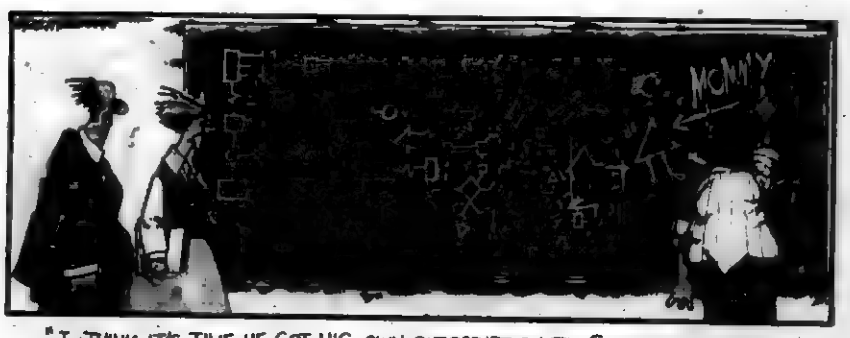

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23. Dir./Mgr. Sys. Development, Sys. Architecture
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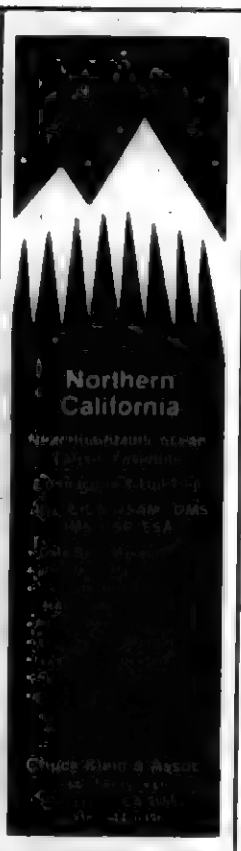

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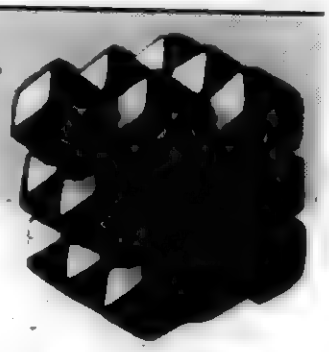

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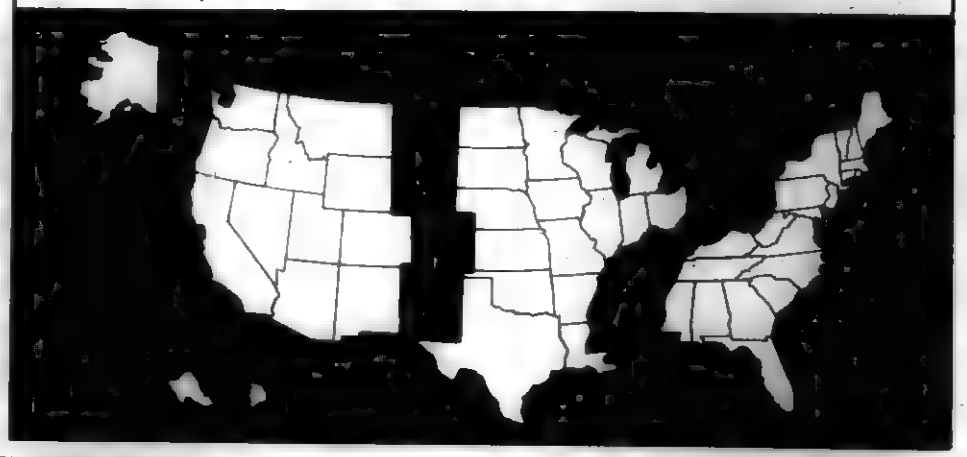

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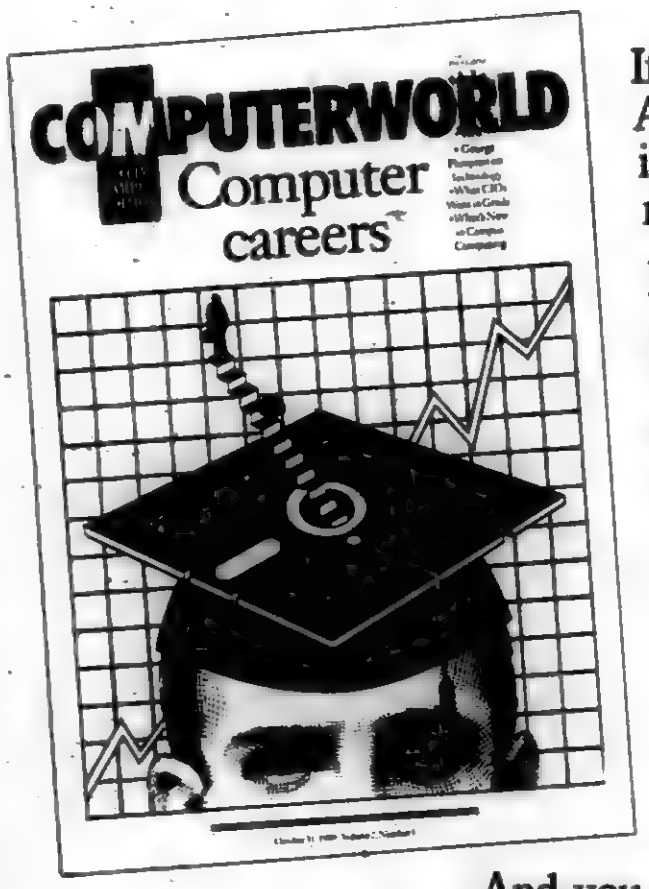

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- Experiences of recent MIS graduates in their first jobs and what helped them in school
- The MIS career ladder
- Profiles of acclaimed top level MIS executives
- The strategic advantage of computers and how they play a key role in running a company

MARKETPLACE

Even if you have a warranty, you may not have a guarantee

Editor's note: Legal Eye is a monthly series exploring legal issues in the computer industry.

BY LEE GRUENFELD
SPECIAL TO CW

Computer warranting is one of the stickiest topics in the procurement arena. Part of the problem is the general assumption that a warranty means "If it doesn't work, we will fix it." Would that life were so simple.

There are several kinds of warranties (limited, general, express and so on) that are usually accompanied by disclaimers and exclusions. Unfortunately, courts will frequently reinterpret written warranties in ways that come as a great surprise to the parties who signed the contract.

Customers are usually favored in these cases because the court often finds computer warranties to be ambiguous, unclear or "unconscionable." The theory is that the customer is the novice in the deal, and the vendor is experienced. Very often, the court will look askance at a contract interpretation that is technically correct but that really makes no sense, is blatantly unfair or is legitimately misconstrued by the customer. Two recent cases underscore this judicial inclination and contain important cautions.

Some years ago, USM Corp. contracted with Arthur D. Little to have new accounting systems designed. The written agreement referred to the system as "turnkey." The specifications that formed the basis of the agreement referred to on-line response time goals for the system. When the system failed to work to USM's satisfaction and had response times in excess of the contracted goals, Arthur D. Little's efforts were halted, and USM finished the system on its own, ultimately replacing the hardware that ADL had supplied as part of the "turnkey" agreement.

USM sued Arthur D. Little, lost, and then appealed. The U.S. Court of Appeals reversed the lower court decision and ruled in favor of USM, the customer. The court's reasoning contains important lessons for anyone dealing with computer system warranties.

First, the court placed great emphasis on the word "turnkey," going so far as to say that use of this term created an express warranty that made Arthur D. Little responsible for the performance of the system.

As in other recent cases, "turnkey" is loaded with risk for any vendor who uses it, since the courts are taking it to mean a system that is completely finished and fully operational and that requires virtually no maintenance.

Second, Arthur D. Little had warranted that the system would be "free of defects in design." While the lower court interpreted this to mean that the design *document* would be error-free, the appeals court saw that this made no sense and applied the provision to the functioning system. More importantly, the court extended this interpretation to apply to the response time performance, realizing that there was an implicit promise to achieve the stated response time goals.

A critical point is that there are many ways in which a vendor can create a warranty without specifically stating that it *is* a warranty or even intending it to be one. Agreeing on a set of specifications, a set of design goals or a particular format can all be interpreted as an implied warranty. Only exclusions need to be extremely specific.

Finally, there is a long-standing tradition that general disclaimers do not apply to express warranties. If there is a warranty specifically stated, it stands as written. The USM case reaffirmed this tradition.

The second case, while not computer-related, could affect information systems. General Motors Corp. is currently being sued for knowingly selling defective diesel engines between 1981 and 1985. While the defects generally did not appear until after the expiration of the warranty periods, the suit alleges that GM knew about the defects and therefore breached an *implied* warranty.

The trial court initially granted GM's motion to dismiss the case since its written warranty was technically valid. However, an appeals court reversed the decision, saying it may be possible to show at trial that the warranty limitation was invalid because it was "unconscionable" of GM to limit the warranty in light of GM's knowledge of the defect. The U.S. Supreme Court refused GM's request to review the appeals court's decision, so the case is going to trial.

The impact on the licensing of computers and software is evident. If a vendor has knowledge of defects that it does not specifically disclaim at the time of sale, general warranty limitations — including the time limit — might not apply.

There is now an avenue to pursue if a customer has reason to believe the vendor was aware of a problem at the time of sale even if the warranty has technically expired.

Gruenfeld, a management consulting partner in the Los Angeles office of Deloitte & Touche, specializes in computer-related legal matters.

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Buy/Sell/Lease

The BoCoEx index on used computers

Closing prices report for the week ending September 21, 1990

	Closing price	Recent high	Recent low
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XT Model 086	$500	$700	$350
XT Model 089	$675	$825	$475
AT Model 099	$900	$1,075	$850
AT Model 239	$975	$1,025	$700
AT Model 339	$1,025	$1,300	$900
PS/2 Model 30-286	$1,250	$1,300	$1,125
PS/2 Model 60	$1,600	$2,000	$1,600
PS/2 Model 70P	$3,375	$3,400	$3,175
Compaq Portable II	$975	$1,150	$875
Portable 286	$1,275	$1,450	$1,100
SLT-286	$2,500	$2,825	$1,700
Portable 386	$3,000	$3,450	$2,950
LTE 286	$2,100	$2,525	$2,000
Deskpro 286	$1,375	$1,400	$1,200
Deskpro 386/20	$2,800	$3,100	$2,400
Apple Macintosh 512	$375	$775	$275
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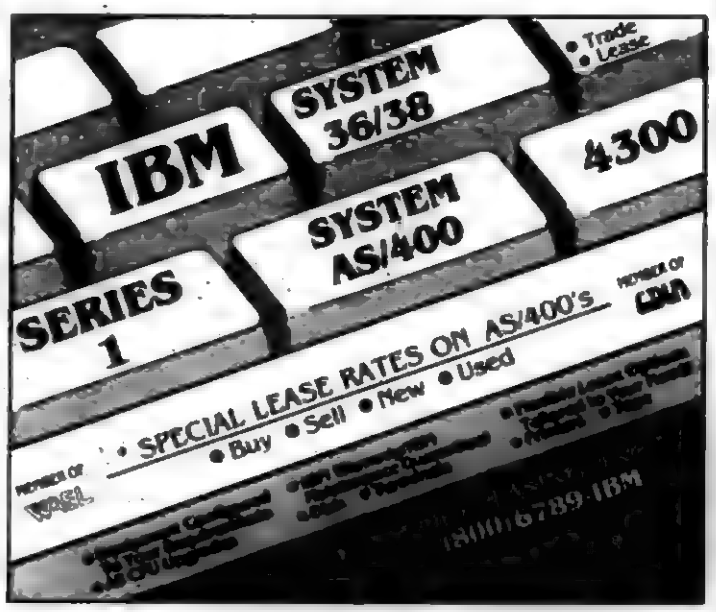

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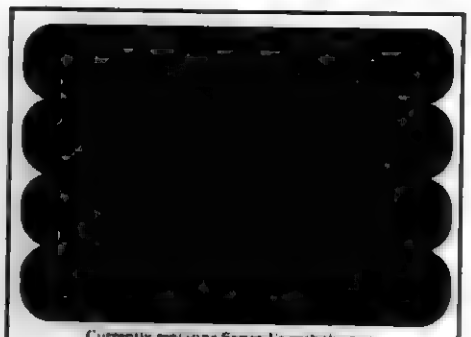
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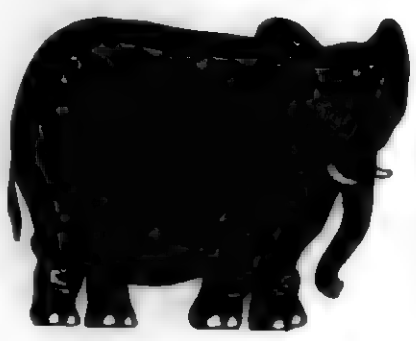

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* Source: STAT Resources Profile of Computerworld Subscribers, November 1987.

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Request for Proposal No. 1873, due Thursday, October 25, 1990 at 3:30 p.m. for the acquisition of correctional simulation-modeling software for projecting prison and parole populations for the MISSISSIPPI DEPARTMENT OR CORRECTIONS.

Request for Proposal No. 1875, due Thursday, October 18, 1990 at 3:30 p.m. for the acquisition of two MUX cluster controllers and 25 ASCII terminals to attach to UNISYS 3000/65 minicomputers for the MISSISSIPPI DEPARTMENT OF CORRECTIONS.

Request for Proposal No. 1874, due Thursday, October 25, 1990 at 3:30 p.m. for the acquisition of services for the development of a computer-assisted, instructional delivery system for the MISSISSIPPI DEPARTMENT OF ENERGY AND TRANSPORTATION.

Request for Proposal No. 1876, due Tuesday, October 30, 1990 at 3:30 p.m. for the acquisition of a production turnover/change management software package to run in an IBM 3090 MVS/ESA environment and compatible with the PANVALET source library management system for the State Computer Center of the MISSISSIPPI CENTRAL DATA PROCESSING AUTHORITY.

Request for Proposal No. 1877, due Thursday, October 25, 1990 at 3:30 p.m. for the acquisition of necessary hardware, software, installation services, training and technical support for the establishment of a local area network for MERIDIAN COMMUNITY COLLEGE.

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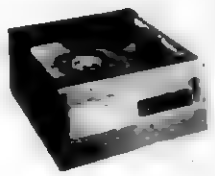

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Secrets of my success

Trainers considering self-employment must take precautions

BY LOU RUSSELL
SPECIAL TO CW

"All serious daring starts from within."
—Eudora Welty

I remember how I viewed training consultants: as glamorous, intelligent, worldly individuals who taught somewhere wonderful and different each week and made tons of money. I compare that concept to the life I actually lead — a challenging, exciting life, but one more likely to be led in Bismark, N.D., in February than in San Diego, and with a cash flow that is unpredictable.

People at conferences I attend are constantly asking me the secret of making it as an independent training consultant, just as I asked people before I took the plunge. All in all, it is well worth the daring, so I'd like to share a few secrets with people who are considering the move.

Goal digger

Optimism is the first trap to look out for. Individuals who have a knack for stand-up instruction on a particular technical topic often hit the street with no plan or strategy. Yet the most important aspect of consulting is setting goals and then building a strategy to meet those goals.

Although this may seem a little upsetting to those who had hoped to lose the bureaucratic, management-by-objectives paperwork that buried them while working for someone else, these new goals are different because they are your own. Once these goals are established, a strategy can be built to move toward them.

A lack of goals leads to a training consultant who tries to sell everything. This person is not sure where the money is and is trying to walk the fence, contracting to do any training that comes along. However, any business expert will tell you that although your product line should be flexible, you should have a specific vertical market in mind.

In consulting, this means that you pick your area of expertise, get really good at it, and stay up to date. There is also the danger that you will spread yourself too thin and not do anything well. Consultants are selling themselves, and one bad contact can sometimes be enough to ruin you.

Lead us not . . .

Overhead is another temptation. Most people buy all the things that they equate with success — a fancy office, a nice desk, a new computer system or two, lots of software, fancy stationery and business cards. These things add pressure and force independent trainers to settle for contracts for financial reasons that may not move their companies in the direction they want to be going. Before saddling yourself with monthly expenses, try working at home, and grow into the large facilities when you need them.

Something else that amazes me is the number of people who leave financially secure jobs without any customers committed. Don't get me wrong. I am not encouraging you to take customers from your old employer; most conflict-of-interest clauses eliminate that possibility.

However, you certainly can be making contacts on your own time so that when the big break comes along, you have some assurance that your product line is going to sell. If you do not have the time to put in extra hours building your clientele before you quit, you do not have time to be in business for yourself.

Weakly news

Those of us who shine with technical and presentation skills are usually somewhat weak on marketing. This was the most difficult thing for me to learn. At one time, I would rather have taught a seminar to a million students than call one stranger on the phone.

Consequently, you need to get some background in marketing before you start a consulting firm. This can come in the form of books, professional organizations, training seminars or even other consultants. Things such as direct mail, telemarketing and advertising are foreign to most technical people but critical to the success of a consulting company.

I recommend that most people contract or hire to fill the marketing and advertising needs. Although it is good to try to learn things, and there is no substitute for being involved, it can be a serious mistake to try and do all your work yourself.

Grow with the flow

So, let's assume that things are flowing right along, and you are traveling to *almost* glamorous places and even making a good living. The next pitfall — laziness — sneaks up on you just when you think you have everything under control. The training consultant becomes so comfortable in his expertise that he stops working at staying current. Consultants, more than anyone else, need to keep their skill level at the leading edge.

The only way to do this is to drop out at least once a year and work on a project applying the skills you teach. One of the last things an instructor leaves time for is instruction for himself. Choose technical journals that are best for your topic and review them continually. Sooner or later, an out-of-date training consultant is going to be badly embarrassed in front of a substantial client.

Consulting is a fascinating field. You have to love hotel pizza at 10:30 p.m., and you have to be able to look good even though your suitcases went to a different city than you did. The up side is that you get to meet fascinating people and become involved in situations that cause you to learn and grow every day.

Russell is a training analyst at Russell Martin & Associates in Fishers, Ind.

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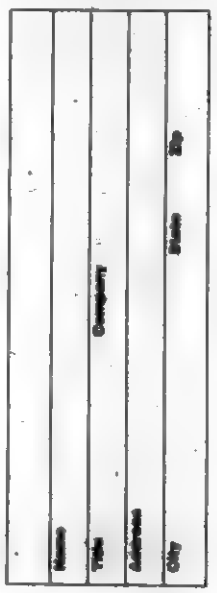

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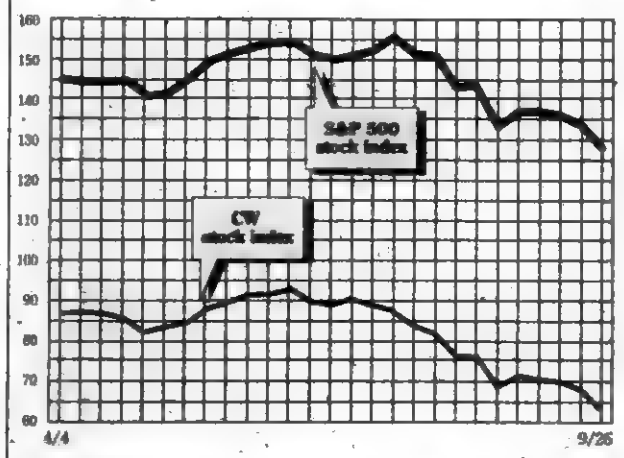

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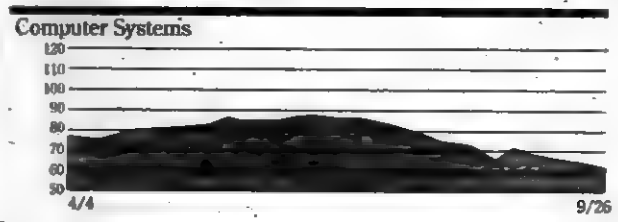
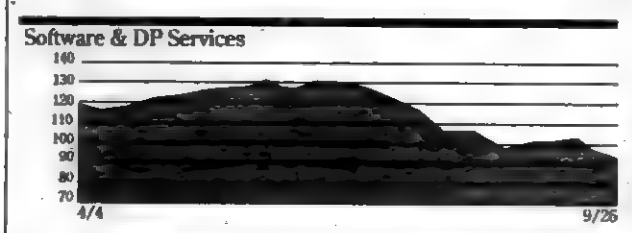
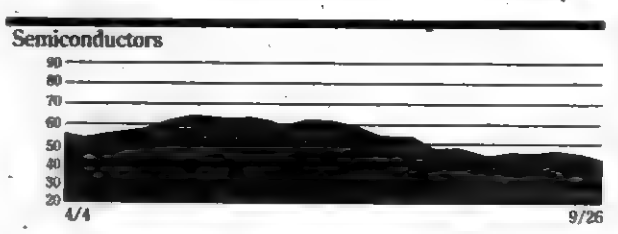
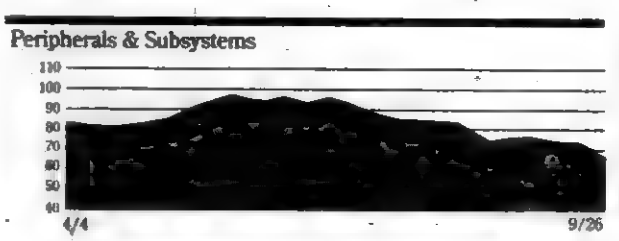
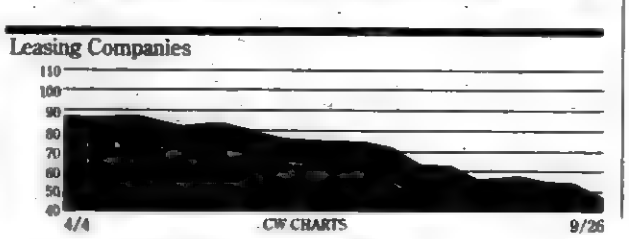
Communications	103.9	101.3
Computer Systems	65.7	62.2
Software & DP Services	97.8	91.7
Semiconductors	44.3	41.9
Peripherals & Subsystems	73.5	67.9
Leasing Companies	54.4	48.7
Composite Index	68.0	63.7
S&P 500 Index	133.8	128.9











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CLOSING PRICES WEDNESDAY, SEPT. 26, 1990

EXCH		PRICE 52-WEEK RANGE		CLOSE SEPT. 26, 1990	WEEK NET CHNGE	WEEK PCT CHNGE
Communications and Network Services						
N	AMERICAN INFO TECHS CORP	98	83	98.75	-0.8	-1.0
NQ	ANDREW CORP	28	16	17.75	-0.3	-1.4
NQ	ARTEL COMM CORP	10	3	2.75	-0.4	-12.0
N	AT&T	47	30	31.5	0.6	2.0
NQ	AVANTEK INC	6	2	2.563	0.0	0.0
NQ	AYDIN CORP	21	11	10.75	0.0	0.0
N	BELL ATLANTIC CORP	57	40	49	0.6	1.4
N	BELLSOUTH CORP	59	49	51.625	0.3	0.5
NQ	COMPRESSION LABS INC	16	7	13.125	-0.1	-0.9
NQ	CONTEL CORP	37	33	35.875	0.9	2.9
NQ	DATA SWITCH CORP	4	2	3.25	-0.5	-13.3
NQ	DIGITAL COMM ASSOC	27	18	19.25	-0.6	-3.0
NQ	DYNATECH CORP	20	14	13.75	-1.6	-11.3
NQ	FIBRONICS INTNL INC	13	6	7.625	-1.0	-11.6
NQ	GANDALF TECHNOLOGIES	6	2	2.813	-0.2	-6.2
NQ	GENERAL DATACOMM INDS	6	2	2.375	0.0	0.0
N	GTE CORP	36	24	26.125	0.9	3.5
NQ	INFOTRON SYS CORP	10	3	2.125	-0.4	-15.0
N	ITT CORP	64	47	48.625	-3.9	-7.7
N	M/A COM INC	7	3	4.625	0.5	12.1
NQ	MCI COMMUNICATIONS CORP	49	30	32	0.1	0.4
NQ	NETWORK EQUIP TECH INC	34	5	6.125	-0.3	-3.9
NQ	NETWORK SYS CORP	15	7	9	0.3	2.9
NQ	NORTHERN TELECOM LTD	30	21	22.625	-0.8	-3.2
NQ	NOVELL INC	29	12	23.25	-1.1	-4.3
N	NYNEX CORP	92	68	69.5	-2.3	-3.1
N	PACIFIC TELESIS GROUP	52	36	43.25	1.6	3.9
A	PENRIL CORP	9	5	6	-0.1	-2.0
N	SCIENTIFIC ATLANTA INC	29	13	13.625	-1.1	-7.8
N	SOUTHWESTERN BELL CORP	65	47	50.625	1.9	3.8
NQ	3 COM CORP	19	7	7	-0.6	-8.7
N	U S WEST INC	41	32	33.75	-0.8	-2.2
Computer Systems						
Q	ALLIANT COMPUTER SYS	9	2	2.8	-0.1	-4.8
NQ	ALPHA MICROSYSTEMS	7	2	1.75	-0.1	-8.7
AQ	AMDAHL CORP	19	11	11	-1.1	-9.3
NQ	APPLE COMPUTER INC	50	28	29.75	-2.8	-8.5
NQ	AST RESH INC	26	6	17.625	-2.0	-10.2
NQ	BOLT BERANEK & NEWMAN	8	4	4.875	-0.6	-11.4
NQ	COMPAQ COMPUTER CORP	68	37	40.5	-3.9	-8.7
NQ	COMMODORE INTNL	12	6	6	0.0	0.0
NQ	COMPUTER AUTOMATION INC	6	0	0.5	0.2	77.3
NQ	CONTROL DATA CORP	22	10	10	-0.6	-5.9
NQ	CRAY RESH INC	51	29	29	-5.8	-16.5
NQ	DATA GEN CORP	16	6	6.25	-1.5	-22.2
NQ	DATAPOINT CORP	6	1	0.875	-0.1	-12.5
NQ	DELL COMPUTER CORP	14	5	9.625	-1.3	-11.5
NQ	DIGITAL EQUIP CORP	96	50	51	-4.6	-8.3
NQ	FLOATING POINT SYS INC	4	0	1.625	0.1	8.3
NQ	HARRIS CORP	40	21	21	-3.6	-14.7
N	HEWLETT PACKARD CO	92	30	30.5	-3.0	-9.0
N	HONEYWELL INC	112	73	83.625	-8.5	-9.2
N	IBM	123	93	105.375	-3.0	-2.8
NQ	INFORMATION INTL INC	15	9	9.125	-0.9	-8.8
NQ	IPL SYS INC	14	5	9.25	-0.3	-2.6
NQ	MAI BASIC FOUR INC	6	2	1.625	-0.3	-16.2
N	MATSUSHITA ELEC INDL LTD	172	116	116	-4.8	-3.9
NQ	MENTOR GRAPHICS CORP	26	11	12.25	-0.3	-2.0
NQ	NBI INC	2	0	0.141	0.0	-18.0
N	NCR CORP	72	56	55.375	-3.3	-5.5
NQ	PYRAMID TECHNOLOGY	36	13	18	-0.4	-2.0
NQ	SEQUENT COMP SYS INC	34	18	20	-2.8	-12.1
NQ	SUN MICROSYSTEM INC	37	15	27.75	-1.8	-6.3
NQ	SYMBOLICS INC	2	0	0.313	-0.1	-28.5
N	TANDEM COMPUTERS INC	30	10	10.875	-0.6	-5.4
N	TANDY CORP	48	25	24.875	-1.3	-4.8
N	ULTIMATE CORP	10	4	4	-1.0	-20.0
N	UNISYS CORP	20	7	7	0.0	0.0
A	WANG LABS INC	6	3	3	-0.4	-11.1
Software & DP Services						
Q	AMERICAN MGMT SYS INC	30	11	12.5	-0.5	-3.8
Q	AMERICAN SOFTWARE INC	18	8	7.875	-1.0	-11.3
N	ANACOMP INC	6	2	2	-0.3	-11.1
Q	ANALYSTS INTL CORP	24	10	11	-1.3	-10.2
Q	ASHTON TATE	18	6	9.25	-1.5	-19.4
Q	ASK COMPUTER SYS INC	10	7	7.125	-0.5	-6.6
N	AUTO DATA PROCESSING	60	44	46.625	0.8	1.8
Q	AUTODESK INC	53	33	42.25	-3.5	-7.7
Q	BMC SOFTWARE INC	30	14	23.25	-0.5	-2.1
N	BUSINESSLAND INC	14	2	2	-0.4	-15.8
Q	COGNOS INC	16	4	7	-0.6	-8.2
N	COMPUTER ASSOC INTL INC	17	4	5.625	-0.4	-6.3
Q	COMPUTER HORIZONS CORP	17	7	11.75	-2.6	-19.0
N	COMPUTER SCIENCES CORP	59	37	37.75	-0.1	-0.3
N	COMPUTER TASK GROUP INC	12	8	8.5	0.0	0.0
Q	COMSHARE INC	25	14	16	0.0	0.0
Q	CORPORATE SOFTWARE	16	8	9.5	-2.0	-17.4
N	GENERAL MTRS (CLS E)	36	24	32.875	-1.9	-5.4
Q	GOAL SYSTEMS INTL	18	10	10	-1.3	-11.1
Q	HOGAN SYS INC	7	2	2.75	0.0	0.0
Q	INFORMIX CORP	10	5	5.5	-0.4	-6.4
Q	INTELLICORP INC	6	3	3.5	-0.5	-12.5
Q	LEGENT CORP	22	18	19	-1.0	-5.0
Q	LOTUS DEV CORP	39	14	15.625	0.9	5.9
Q	MICROSOFT CORP	81	33	60.25	-1.8	-2.8
Q	NATIONAL DATA CORP	35	8	9.875	-0.5	-4.8
N	ON LINE SOFTWARE INTL INC	11	6	5.875	-0.1	-2.1
Q	ORACLE SYS CORP	188	6	6.25	-1.0	-13.8
N	PANSOPHIC SYS INC	19	10	10	-1.4	-12.1
Q	PHOENIX TECHNOLOGIES INC	5	2	2.375	-0.1	-5.0
N	POLICY MGMT SYS CORP	43	30	35.625	-2.1	-5.6
Q	PROGRAMMING & SYS INC	25	14	15.5	0.1	0.8
Q	RELATIONAL TECH INC	10	3	8.375	-0.8	-8.2
N	REYNOLDS & REYNOLDS CO	27	13	13	-1.1	-8.0
Q	SAGE SOFTWARE INC	16	8	9.125	-1.0	-9.9
Q	SEI CORP	22	15	15	-1.4	-8.4
Q	SHARED MED SYS CORP	17	12	16.25	2.3	16.1
Q	SOFTWARE PUBG CORP	28	14	21.25	-0.8	-3.4
N	STERLING SOFTWARE INC	11	6	6	-0.8	-12.7
Q	SUNGARD DATA SYS INC	26	15	15.75	-0.5	-3.1
N	SYSTEM CENTER INC	25	8	6	-2.1	-26.2
N	SYS. SOFT INC	23	14	16.75	-3.3	-16.3
Q	WORDSTAR	2	1	0.938	-0.1	-8.2
Semiconductors						
N	ADV MICRO DEVICES INC	11	5	5.375	-0.4	-6.5
N	ANALOG DEVICES INC	10	6	6.125	-0.3	-3.9
Q	ANALOGIC CORP	11	6	9.375	-0.4	-3.8
Q	CHIPS & TECHNOLOGIES INC	28	10	10.125	-0.9	-8.0
Q	INTEL CORP	52	30	32.75	-1.1	-3.3
Q	MICRON TECHNOLOGY INC	16	7	8.5	0.4	4.8
N	MOTOROLA INC	68	53	60.625	-0.4	-0.6
N	NATL SEMICONDUCTOR	9	4	4.125	-0.6	-13.2
N	TEXAS INSTRS INC	44	29	29.625	-2.0	-7.0
A	WESTERN DIGITAL CORP	15	6	6.125	-1.5	-19.7
Peripherals						
Q	ALLOY COMP	2	0	0.5	0.1	14.2
N	AM INTL INC	6	1	1.25	-0.1	-8.1
Q	AUTO TROL TECH CORP	5	2	1.75	-0.5	-22.2
Q	BANCTEC INC	24	15	13	-2.5	-16.1
A	COGNITRONICS CORP	6	3	4.375	-0.5	-10.3
Q	CONNER PERIPHERALS	31	11	17.5	-4.1	-19.1
A	DATARAM CORP	22	8	10.063	-1.7	-14.4
N	EASTMAN KODAK CO	48	36	38.125	-3.0	-7.1
N	E M C CORP MASS	7	3	6.375	0.4	6.3
Q	EMULEX CORP	9	4	6.5	0.0	0.0
Q	EVANS & SUTHERLAND	35	16	22.5	-2.8	-10.9
Q	ICOT CORP	2	1	0.857	0.0	5.1
Q	INTERLEAF INC	8	3	2.875	-0.3	-9.0
Q	IOMEGA CORP	6	3	4.438	-0.8	-11.2
Q	MASSTOR SYS CORP	3	1	0.563	-0.2	-24.8
Q	MAXTOR CORP	17	6	6	-0.3	-4.8
Q	MICROPOLIS CORP	10	3	5	0.0	0.0
N	MINNESOTA MNG & MFG CO	91	68	78	-1.5	-1.9
Q	PERSONAL COMP PRODUCTS INC	5	4	3.813	-0.2	-4.7
Q	PRINTRONIX INC	15	9	9.5	-0.3	-3.8
N	QMS INC	21	9	10.75	-1.8	-14.9
Q	QUANTUM CORP	29	9	17.125	-0.3	-1.4
Q	RECOGNITION EQUIP INC	8	4	5	-0.1	-2.4
Q	REXON INC	10	4	4.625	-0.1	-2.6
Q	SEAGATE TECHNOLOGY	20	6	6.875	-1.4	-16.7
N	STORAGE TECH CORP	35	12	12.625	-2.6	-16.2
Q	TANDON CORP	4	1	1.563	-0.4	-21.9
N	TEKTRONIX INC	30	12	13.75	-0.3	-1.8
Q	TELEVIDEO SYS INC	1	0	0.25	0.0	-11.0
N	XEROX CORP	67	22	22.625	-5.1	-12.8
Leasing Companies						
N	CAPITAL ASSOC INTNL INC	7	1	1	-0.3	-30.0
N	COMDISCO INC	24	15	15.125	-1.6	-9.7
Q	LDI CORPORATION	18	12	11.75	-0.8	-6.0
N	PHOENIX AMERN INC	5	3	3.25	-0.3	-7.1
Q	SELECTERM INC	9	3	2.875	-0.4	-19.2

EXCH: N—NEW YORK; A—AMERICAN; Q—NATIONAL

Care bears

Economic concerns keep tech stocks on a downward trend

When the worry meter soars, stock prices sink. As the Dow Jones industrial average and other economic indicators spiraled further downward, "to sell or not to sell" was not a question over which investors labored long last week. Several technology firms hit new lows, including Amdahl Corp., which dropped 1⅝ points last week to close Thursday at 10¼.

Data General Corp. and Digital Equipment Corp. also sank to new depths. DEC was down 1⅜ points to 51 by Thursday, while DG closed at 4⅜, down 1⅛ points for the week.

The makers of big machines were not lonely at the bottom. National Semiconductor Corp. fell ½ a point to close Thursday at a new low of 4⅛, and LSI Logic, Inc. found its way to a new low of 5⅜ after losing ⅛ of a point.

Other losers were Apple Computer, Inc., which slid 3¼ points to 28⅛, Sun Microsystems, Inc., which lost 2¾ points to 25⅝, and IBM, which fell 2⅝ points to 104⅜.

The hardware arena may have been hit hard, but software did not escape unscathed. Oracle Systems Corp. officially issued its first quarter financials midweek, showing negative numbers in the net income column despite revenue gains. Oracle shares fell 1⅜ points to 5⅜ in response. Both Microsoft Corp. and Ashton-Tate Corp. slipped 1¼ points to 59¼ and 5⅜, respectively. Novell, Inc. slid ¼ of a point to 23¼.

Although some software issues were down, Borland International broke away from the pack and soared 1⅛ points to close Thursday at 18⅛. Also on the upswing was Computer Associates International, Inc., which gained ⅛ of a point to close at 5½. Lotus Development Corp. edged up ¼ of a point to 15¼.

Elsewhere, Conner Peripherals, Inc. took a 4⅛-point step backward to 16⅛.

KIM S. NASH

Info systems uber Deutschland

West German firms look to IS for an edge in the race to grab market share

BY PATRICIA KEEFE
CW STAFF

BERLIN — There's no rest for the weary. This week's reunification will turn loose a Germany with an attention span split between the old and the new. Over the next 18 months, Germany will be forced to divide its resources between rushing what was East Germany into the 20th century and gearing up to compete in the no-holds-barred 1992 opening of the European Common Market.

While West German companies are under pressure to implement technology that will ensure a competitive edge in a liberated international sphere, many are also contemplating expansion into a market estimated to be anywhere from 10 to 20 years behind the West technologically. German analysts and other observers seem convinced that information technology will prove a critical factor in achieving success at both ends of the spectrum.

Information systems will be "absolutely key" to resolving these problems and keeping Germany in top competitive form, said Helmut Gumbel, director of technical support at Gartner Group Europe in Munich, West Germany. "Any expansion into the East will have to be done hand-in-hand with information systems," agreed Patrick L. Springer, director of industry services at a division of Computer Task Group.

That may increase the prominence, if not the budgets, of IS departments in many West German corporations. "That's because this has got to be done very quickly," pointed out Ivan Kalman, president of Kalman Consulting in Neu-Isenburg, West Germany. This is particularly true for the banking industry, where market share is the goal for 1992. "Whoever is able to corner that market quickest will dominate it," Kalman explained.

Springer, who did some research for a number of West German firms looking to expand in the East, added, "We found the infrastructure in East Germany was so dissimilar and so outdated that literally there is nothing there to buy from the standpoint of an IS system." In short, IS will have to build from the ground up, even if the company buys an existing enterprise. Many East German firms relied on a government-run centralized data processing service that has since disintegrated.

Starting from scratch carries an unexpected bonus. Many West German firms plan to replicate their sites in the East, typically with older equipment they already own. This in turn may provide the excuse West German sites need to move aggressively into updating their shops. Analysts and users said it is already happening. "The secondhand market is flourishing here," Kalman said. This movement is expected to pump up hardware sales in Germany.

However, there is the danger that IS management will be diverted from implementing long-term strategic projects. "There is no question [that will happen]," said Kirtland Mead, a vice-president at the London branch of consulting firm Index Group, Inc.

Just how heavily IS departments will be affected depends greatly on two factors: the business and the extent to which it relies on automation and the company's strategy for exploiting the newly freed East German market and its work force.

Most Germans warned against expecting an explosion of activity in the Eastern sector, suggesting it may take up to two years before Western businesses move seriously into the East. "You see, it will not all happen with a big bang on Oct. 3," noted a spokesman for BMW in Munich.

German businesses are already tempering their euphoria when it comes to tapping the market potential of their cousins in the East. Cost-conscious outfits may opt to service and supply the East from the safety of their amortized Western facilities, Mead said.

True, many Germans will say it is their duty to repatriate the East — the West German constitution actually requires the pursuit of reunification — but they are not blind to the obstacles barring the door. These obstacles are many, and in some cases, mighty:

- A virtually inoperative telephone system (see story this page).
- A technological and internal infrastructure on par with the Third World.
- Uncertainty about property rights issues.
- A population described by one analyst as socialized since birth not to be productive, ignorant of the profit motive and well-educated in nearly every aspect except computers.
- Severe pollution.

Through the wall

Looking through the yawning hole that was once the Berlin Wall, German businesses and their IS shops cannot help but see both opportunities and nightmares unfolding before their eyes.

Overnight, reunification has transformed East Germany from the best of the worst — that is, Eastern Bloc countries — to the worst of the best, or the West, said Frank Daubeck, a consultant and president of Communications Network Architects, Inc. in Washington, D.C., who has traveled extensively in Europe.

Noting that Daimler-Benz AG plans to modernize an "old-fashioned" tool parts factory, a spokeswoman said that the company was still researching the issue and that it was too early to assess its affect on the IS department.

Besides the computer and software vendors, the more adventurous companies are those providing basic services, such as banking and insurance, and government agencies. The possible transfer of the German capital from Bonn to Berlin, for example, would result in a massive relocation of computer equipment between the two cities if Berlin succeeds in convincing government agencies to transfer facilities as well.

Banking giant Deutschesbank said it expects to spend $500 million to open 250 branches in the East. It has already opened some branches, enticing skilled employees to move East with higher pay and housing allowances. Electronic data will be moved across the border in one of two ways: either via "sneaker" or "rubber" net, or by bouncing it off satellite links to very small-aperture terminals in the West, Gumbel said.

As for software, Hans Schlegel, president of Biel, Switzerland-based SAP International, recently suggested that, "East Germans can leapfrog over the last 15 years of software development" by purchasing off-the-shelf software.

"They are desperate not only for computer equipment but for a kind of embedded knowledge in software," said Esther Dyson, editor of the "Release 1.0" newsletter. Of particular value to Eastern Europe, she said, is software capable of managing business procedures.

It will be necessary to bring East Germany technologically up to speed as quickly as possible, so analysts said they expect a boom in shrink-wrapped software sales and the installation of local-area networks.

The maturation of LAN technology will give East Germany the advantage of skipping a couple of steps in the computerization life cycle.

In addition, West German IS shops have tended to take more of a systems approach to solving their problems as opposed to the islands of computing still found in the U.S., said Guy Daniello, president and chief executive officer at Datamedia Corp. in Nashua, N.H.

East meets West

East Germany's economy is dwarfed by West Germany's

	West Germany	East Germany
Population	62.2M	16.6M
Gross National Product	$1,190.4B	$191.1B
Imports from U.S.	$20.3B	$138.7M
Exports to U.S.	$24.8B	$83.9M

Source: U.S. Dept. of Commerce — CW Chart: Chuck Fletcher

Germans

FROM PAGE 1

Western enterprises seeking to expand their operations into the virgin East. It is especially troublesome for heavily automated operations such as the data-intensive banking, insurance and retail sectors (see story this page).

Not surprisingly, overhauling East Germany's telecommunications infrastructure is a top priority — both for business and the government.

Quick on the draw, Deutsche Bundespost, the West German government monopoly that operates and controls both the telephone and postal services, has already outlined Telecom 2000, a glass-fiber-studded, seven-year reconstruction plan.

"When we are done, the East German telephone network will be the most modern in the world," said Michael Behr, a spokesman at Bundesposte's Telecom Regional Directory.

In the meantime, Bundespost is offering Western businesses the option of bypassing the East German telephone system in favor of satellite communications.

Bayerische Vereinbanke Group, which plans to open 21 branches in the East, will be relying on that option, a spokesman said.

Primarily targeted at data transmission, Behr said that those users who have to wait longer than a short period for a telephone connection in East Germany will have use of the satellite for voice transmission as well. "This is extraordinary for Germany," he said.

Under Telekom 2000, Bundespost will replace the East German postal and telecommunications services with a 35-billion deutsche mark digital telephone network and a data and mobile radio network estimated to cost another 20 billion marks. The cellular system is scheduled to be installed by the end of 1991.

Over the next seven years, additional connections are slated to be provided: 100,000 in 1990, including 30,000 digital channels by the third quarter; 300,000 in 1991; 500,000 in 1992; 800,000 in 1993; and a total of 5.5 million from 1994 to 1997. A mix of coaxial and fiber-optic cable will be used; glass fiber cable is slated for Berlin.

Space race

The poor quality of East Germany's telephone system forces communications agency Deutsche Bundespost to install satellite networks for data and voice transmission

Source: Deutsche Bundespost — CW Chart: Marie Haines

A long way to go

East Germany's technological infrastructure at a glance:

- **A 1970s data processing infrastructure standardized on 1960s-era IBM 360 mainframes. As of January 1990, there were an estimated 400 mainframes with processing power that together totaled only 600 MIPS.**
- **Centralized approach to data processing.**
- **An estimated 100,000 personal computers, comprising a mix of Intel Corp. and knockoff chip-based 8088s, 80286s and a few 80386s running MS-DOS and MS-DOS clones.**
- **Limited applications; no applications development tools or fourth-generation languages.**
- **Antiquated analog telephone systems dating back to at least the 1940s.**
- **Data transmission speed limited to 1,200 bit/sec.**

Computer firms set to unite

Siemens and Nixdorf combined effort has good shot at world-class clout

BY NELL MARGOLIS
CW STAFF

Given half a chance, almost all merging companies would claim that their union is a world-shaking event. In the case of West Germany's Siemens AG and Nixdorf AG, it may be.

Today, Siemens, the 145-year-old Munich, West Germany-based electronics giant, formally weds Nixdorf, the entrepreneurial computer firm based in Paderborn, West Germany, whose 30-year skyrocket crashed in a sea of red ink in the quickly shifting computer market of the past several years. The former competitors join to become Siemens Nixdorf Informationssysteme AG: a firm with combined worth estimated at $61.1 billion and a range of product offerings that blanket the information technology territory.

The company hopes to leverage its newly combined clout into world-class player status by the end of the decade. Most analysts said they believe the firm can do it.

Siemens' Decker: *Reunification a surprise*

"This is the one European player that stands to make it," said Martin Hingley, an analyst at International Data Corp./Europe.

In both the corporate and geographical sense of the phrase, "this is a particularly well-placed company," said Gordon Muir-Carby, an analyst at Muir-Carby Boettkjaer Ltd. Both the Nixdorf acquisition — a triple play in which Siemens removed an aggressive competitor, expanded its own might and emerged a hero by saving a popular but foundering company from virtually certain failure — and Siemens' early moves into the emerging East German market "were particularly well thought-out," Muir-Carby said.

The merger occurs on the dawn of unification for the two Germanys after a 45-year schism (see story page 130). Siemens has wasted no time in making clear its commitment to the unification effort. In June, the firm announced plans to invest some $600 million in East Germany during the next several years, funding technology projects that could open up 25,000 to 30,000 jobs.

The coincidence of the two events is staggering, even to Siemens executives. "If you had asked me six months ago if [unification] could happen, I would have said, 'Not so fast,' " said Hans Decker, chief executive officer of New York-based Siemens Corp., the firm's approximately $4 billion U.S. subsidiary. "If you had asked me a year ago, I would have said 'never.' "

Analysts pointed to a panoply of recent moves as signs that both firms arrived at merger point in maximal fighting trim for taking on the world market: Nixdorf's recent 3,500-person work force reduction, for instance, and Siemens' decentralization and subsequent spate of acquisitions and alliances (see story below).

In addition, they said, the company will be able to draw on a wealth of advantages, including the following:

- Wealth itself. Siemens logged $848 million in profit on worldwide sales of $33 billion last year, and analysts said they expect to see growth when the firm announces its numbers for the 1990 fiscal year ended yesterday.
- A huge work force, in the 350,000-person ballpark.
- A particularly broad earnings base, spanning a spectrum of technologies from medical to automotive to nuclear. The spread could serve to cushion the firm's computer-related endeavors from the shocks suffered by any one industrial sector, noted Estela Piscope, an analyst at BHF Securities in New York.

This is a luxury not shared by major U.S. technology market players — even those as relatively diverse as IBM — whose financial fortunes rise and fall with the worldwide computer industry, and it puts Siemens on a more competitive footing with the similarly organized Japanese giants.

None of this is to say that Siemens has a clear path to the front ranks of the world technology industry. One barrier that could prove hard to overcome, some analysts said, are the company's bureaucratic and patriotic roots.

"This is a *very* nationalistic corporation with too much of its overall business based in Germany," Hingley said. "When Siemens bought Nixdorf, one of the advantages it claimed was that Nixdorf was more international than Siemens. That's true — but that's not saying much." Although the rich possibilities of postunification expansion mitigate this weakness in Siemens' global strategy, he said, it remains a potential problem.

Economic gridlock in the U.S. and signs of an impending slowdown in Europe as well will not roll back for Siemens Nixdorf, and the further the firm ventures into the global fray, the more cutthroat the competition it faces will be.

Moreover, Hingley noted, despite protestations by executives from both sides, questions remain as to whether the supercorporate Siemens and the freewheeling Nixdorf will be able to make the match work.

Tenuous rank

The Siemens-Nixdorf merger ranks the firm second in estimated West Europe computer sales, although DEC is rapidly catching up

Siemens	$5,441	5%	$5,713
(Nixdorf)	$2,830	1%	$2,870

Source: International Data Corp. CW Chart: Chuck Fletcher

Time will tell in Siemens, Nixdorf merger

When Siemens and Nixdorf announced their impending union last winter, two questions sounded from the user community:

- Will customer support erode as Siemens and Nixdorf, widely viewed as icons of bureaucracy and entrepreneurialism, respectively, engage in a struggle for corporate dominance?
- Which of whose product offerings will survive? Not surprisingly, concern centered on the smaller, newer, financially impaired Nixdorf as the probable loser in a battle of wills.

The questions are still there, and despite protestations of good faith from executives in both camps, the frustrating answer is that only time will tell. In the hours before the merger vested, however, most appeared willing to just reserve judgment.

"Sure, we've talked about the merger, but it's no big deal," said Devera Clayton, operations supervisor at Dresser Industries, Inc. in Houston. Nixdorf's Targon is Dresser's data processing platform. "I don't think [the merger] will really affect us very much," Clayton said.

Charles Mitchell, vice-president of information services at Nordstrom, Inc., said that he has seen an effect — "and so far, it's been nothing but positive." The 61-store Seattle-based department store chain bought Nixdorf point-of-sale systems on an eight-store experimental basis two years ago, Mitchell said. Nixdorf is now in 25 Nordstrom locations and counting.

"One of the reasons Nixdorf got the nod was its people and its customer orientation," Mitchell said. "The problems over the past couple of years clouded whether that would continue." The impending Siemens acquisition, he said, "seems to have given [Nixdorf] the confidence that they needed to continue as they were."

Siemens' Holler *feels good about merger*

Other users voiced variations on Clayton's and Mitchell's themes. Albert Holler, chief executive officer at Burlington, Mass.-based Siemens Nixdorf Information Systems, Inc., said their optimism will prove justified. "Our objectives are the same [as they were before the merger]: to address quite distinct niche markets with complete solutions instead of just hardware and to get, if anything, closer to the customer."

It might not be that easy. Hans Decker, chief executive officer of Siemens Corp., the holding company for Siemens' U.S. operations, echoed Holler's assurances that all major product lines of both companies would be continued and supported, as the firm moves toward a co-developed line of products to which all customers will be offered affordable and easy migration paths. However, he implied, Nixdorf-style TLC is no sure thing. "If cost were not a factor, extreme customization would survive."

NELL MARGOLIS

Siemens shopping its way to the top

Siemens' claims to have cast off a century's worth of bureaucratic chains in search of 1990s-style global dynamism have roused a rare degree of credibility — largely because the company has put a rare amount of money — and action — where its mouth is.

In the past two years, Siemens — anything but a power shopper before 1989 — has been on an acquisition and alliance binge:

- 1988 — Siemens acquired certain divisions of telecommunications vendor Rolm Co. from IBM; Siemens and IBM also teamed up on a Rolm distribution company.
- 1988 — Siemens bought Bendix Electronics Group from Allied Signal Corp. for a reported $250 million.
- 1989 — Siemens joined with General Electric Co.'s British subsidiary to mount a successful hostile takeover of UK-based electronics and telecommunications provider Plessey Co.
- 1989 — Siemens acquired a majority of the stock of France-based computer vendor IN2 S.A.
- 1989 — Siemens and Framatome S.A. in France entered a joint marketing agreement to sell water pressure-driven nuclear reactors.
- 1990 — Siemens acquired a controlling stake in Nixdorf.
- 1990 — Siemens and IBM teamed up again, this time to co-develop a 64M-bit chip — by a large margin, the densest memory chip yet promised by the manufacturer.

Both companies reported last week that the project is on track. Production is targeted at mid-1995.

NELL MARGOLIS

NEWS SHORTS

Merger reports quashed

Rumors were flying last week about a possible merger between two Massachusetts-based midrange computer vendors. According to unidentified sources cited in news reports, Wang Laboratories, Inc. in Lowell, and Data General Corp. in Westboro were considering a merger. Christopher W. Mines, an analyst at Cowen & Co. in Boston, noted that although both companies are in "dire straits" and may be willing to consider any and all options, it seems highly unlikely that they would want to "muck up the works by combining forces." DG issued a statement saying there was no truth to the report. Wang said it does not comment on rumors.

Microsoft will unite applications

Microsoft Corp. will announce today the availability of The Microsoft Office for Windows, a packaging of its three most popular business applications for use under the Windows Version 3.0 graphical environment. The bundling includes the Excel spreadsheet as well as the Microsoft Word word processor and its Powerpoint presentation graphics program. The product is available immediately and costs $995.

NEC to use Stratus technology

Stratus Computer, Inc. announced an agreement last week giving NEC Corp. nonexclusive rights to sell Stratus' Unix-based fault-tolerant computers on a worldwide basis. The agreement allows NEC to sell Stratus' upcoming reduced instruction set computing (RISC) workstations, scheduled to debut in the fall of 1991. The RISC machines will run Stratus' FTX version of AT&T Unix System V but will carry an NEC label.

Software firm outsources

Group 1 Software, Inc., a Greenbelt, Md.-based vendor of software for the direct marketing industry and volume mailers, has signed an outsourcing contract with Computer Network Systems, Inc. in Washington, D.C. Under the "multiyear, multimillion dollar" deal, the contractor will provide a nationwide network and data center for the development, maintenance and distribution of Group 1's software products.

Researchers merge

The prestigious National Research Council, based in Washington, D.C., merged two of its high-tech research boards last week to form the Computer Science and Telecommunications Board. The panel, chaired by Joseph F. Traub at Columbia University, is studying such issues as the competitiveness of the U.S. computer industry and computer security.

Visa revamping global network

Visa International, Inc. has begun a worldwide restructuring of its processing technology and network architecture to support increased transaction volume and new services. The revamped network will include four "Supercenters," containing IBM 3090 mainframes linked by a T1 backbone. In addition, a rewrite of the company's core business software aims to expand services into payment markets now dominated by cash and check transactions, including the fast-food, travel and health care industries. The new architecture is expected to save Visa member companies up to $1 billion during the next decade.

Racal Interlan beefs up smart hub

Adding a new dimension to the smart hub approach to corporate cabling, Racal Interlan, Inc. has announced an integrated local-area network platform that includes a built-in asynchronous terminal server that speaks both Digital Equipment Corp.'s Local Area Transport terminal server protocol and the widespread Transmission Control Protocol/Internet Protocol. The hub also reportedly supports 10Base-T (Ethernet LANs running over unshielded twisted-pair wiring) and Simple Network Management Protocol, a de facto network management standard, and the vendor said token-ring support is in the works.

CA relents on CA-7 scheduler support

BY JOHANNA AMBROSIO
CW STAFF

GARDEN CITY, N.Y. — Computer Associates International, Inc. has apparently given in to users' demands to continue support for an older version of its CA-7 scheduling product.

The issue concerns Version 2.83 of CA-7, which was introduced in January 1988. Version 2.9, introduced in April 1989, is the most current version of the product. However, about half of the CA-7 user base is still using Version 2.83.

According to letters that CA reportedly began mailing to users several months ago, the company said it was dropping support for the older version in early September. The date was then moved to early this month. However, because users complained to CA at the systems software users group meeting in August, support has now been extended to at least March 30, 1991.

Mark Wasilko, CA's senior vice-president of marketing, acknowledged the letters' existence but insisted they were intended only to "clarify" CA's support stance for Version 2.83. Furthermore, he said, "We will always support 2.83, just like we support any other product. As of now, it's stabilized, and we are no longer enhancing it. But the support is there."

However, at least one user said that support for 2.83 was forthcoming only after a series of meetings he had with CA managers.

Sean Blessing, systems designer at Cigna Corp.'s operations group in Windsor, Conn., said that support is "very important" to him. "We never upgraded to 2.9 because it didn't have any value for us," Blessing said. "We've been waiting for Version 3.0 and now that's been delayed until next year. So it's very important to us that they continue to support 2.83, and now, we've got that support."

Delays, delays

Users said that Version 3.0, originally promised for general availability by the end of this month, is now slated to be delivered in the first quarter of next year. "CA was still looking for beta-test sites for 3.0 at the user group meeting," Blessing said, "so I doubt it will come out anytime soon."

Wasilko said that Version 3.0 is on schedule for the first quarter, as promised by the company in a position paper last year.

Some users said the change of status for 2.83 is not really of concern. "My experience with CA is that even if you're not current, they will still support you," said Deidrich Towne, a technical analyst at Niagara Mohawk Power Corp. in Syracuse, N.Y., which is still using Version 2.83. "They may not have a fix for you right away, but they'll answer your questions."

Another problem with Version 2.83 is that it exists in two flavors, basic and full — a leftover from the days when Uccel sold the product before CA acquired it. "CA wants everyone to upgrade to the full product, and users are saying they want CA to make that upgrade a little less painful," said Craig Besand, supervisor of change management at Blue Cross/Blue Shield of Missouri in St. Louis.

However, Wasilko said, CA is charging "basic" 2.83 users $15,000 to upgrade to the full version. "They're entirely different products," Wasilko said. The full version includes features such as dynamic work-load balancing and cross-CPU scheduling, he added.

Some users said the major bugs in Version 2.9 appear to have been fixed. Besand credited CA with working "real hard with us to help solve the problems." He said he would "think a lot harder about being a beta-test site next time."

Windows

FROM PAGE 1

remain limited. "It needs to be cleaned up a lot more before it breaks out into our whole organization," one systems manager said.

The primary complaint is systems overhead. Use Version 3.0 with an Intel Corp. 80386-based personal computer and about 4M bytes of random-access memory or you are wasting your time, users said. "We've tried [Windows] with some of our 286s; you can bring it up but that's about all," Smith said. "It ends up doing so much memory swapping to the disk that the performance [of Windows] becomes unacceptable."

While 386-based PCs are becoming prevalent, many firms have stockpiles of older machines that still provide everyday computational needs. As a result, the sluggish performance Version 3.0 provides on these machines has limited it in some places to leading-edge users.

Operational quirks have also proved irksome. "Every once in a while, we'll get an application that just freezes up, usually during multitasking or when we're switching between applications," a systems analyst said.

Another request: a wider array of applications optimized for the Windows environment. Software developers said their efforts have been slow because of the complexity of the new program. "Developing for Windows 3.0 is a whole new ball game," said Marc Matoza, a senior product manager at Ashton-Tate Corp., which is working on a version of its Dbase database application.

Seeking software

Matoza added that a rich software selection could take a while, probably a year to 18 months. A software program can typically be created in six months to a year.

Despite the quibbles, Version 3.0 is already winning popularity contests among the estimated 50 million DOS users worldwide. Redmond, Wash.-based Microsoft said it has shipped more than 800,000 copies of the application, although this figure includes all units shipped to resellers and does not specify whether the packages are in users' hands or languishing on store shelves.

Especially enthusiastic are those ready to scrap Windows 2.0. "The difference between 2.0 and 3.0 is like night and day," said Laura Hill, vice-president of product management at Information Science, Inc. "It's got better icon presentation, better color and a cleaner look all around."

Hills said her firm will "absolutely" move all their in-house business applications to the 3.0 environment. Currently, Version 3.0 gets a workout in the company's applications development laboratories, where it is widely used in the development of human resources software packages that the Montvale, N.J.-based firm later remarkets.

The splashier presentation has sparked some Unix users to quicken their transition to DOS. "Before [Windows 3.0], I would have needed to be dragged into the DOS world kicking and screaming; I didn't want to learn DOS commands," said Ralph Redfern, a senior technician at AT&T in Denver. "The Windows point-and-click approach is exactly what we need to ease the transition [from Unix]."

The clean and crisp appearance of Version 3.0 has also led some users to defer their buying plans for OS/2, a graphics-filled operating system co-developed by IBM and Microsoft that was originally intended to replace DOS. "Windows 3.0 will be our substitute for going to OS/2," said a director of corporate information in Atlanta.

Trouble is, if such feelings become widespread, it could sour the Microsoft-IBM friendship. Most observers already say that Windows 3.0 will greatly help DOS' longevity because it contains many of the features that were supposed to make OS/2 such a draw.

Budget squeeze on for Fed's IS

BY GARY ANTHES and MITCH BETTS
CW STAFF

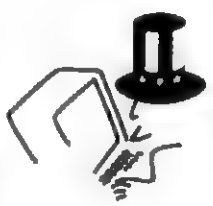
WASHINGTON, D.C. — Plans for furloughing more than 1 million federal employees — including thousands of information systems workers — were on the line this past weekend as the Bush administration and congressional Democrats edged closer to an agreement on the federal budget for the fiscal year beginning today.

Regardless of a last-minute compromise, federal IS managers still face significant budget cutbacks because any settlement between the budget negotiators is certain to include tens of billions of dollars in spending cuts for the coming year.

Lawmakers agreed to meet in a session Sunday to pass a stopgap bill that would provide funds until Oct. 20, but President Bush earlier promised to veto such a measure in the absence of an acceptable compromise.

With no temporary funding bill or action to delay implementation of the Gramm-Rudman-Hollings deficit reduction law, at least $85 billion would have to be trimmed from an estimated $149 billion federal deficit for the fiscal year. Federal agencies said their first response to budget cuts ranging from 32% will be to send employees home for unpaid furloughs.

Some federal officials have braced themselves for scenarios in which major computer buys are canceled, critical systems projects are put on hold and computers running noncritical applications are shut down.



Even if the White House and Capitol Hill are able to come to terms, federal IS managers are preparing to tighten their belts: "No matter what agreement is reached, there will be cuts. It will not be business as usual," said Joseph J. Leo, deputy administrator for management at the Food and Nutrition Service of the U.S. Department of Agriculture, where 100,000 employees recently received notices of looming furloughs.

Each agency has come up with its own plan for dealing with the funds freeze that Gramm-Rudman requires. The U.S. Department of Commerce would furlough employees for one day within the first 12 days of October but would stagger the furloughs among the work force to ensure that "critical operations" continue, according to Reed Phillips, director of information resources management.

However, the U.S. Department of Housing and Urban Development (HUD) had plans to shut down the entire agency on particular days. Not only would HUD-operated data centers close on those days, but all computer contractors would also be expected to halt their HUD work, said Donald C. Demitros, director of information policies and systems.

"We'll be OK for the first 15 days, but after that we're going to have to take some drastic measures," such as unplugging equipment, said Conrad M. Newsom, director of the Agriculture Department's computer center in Kansas City, Mo.

If the freeze or sequester lasted longer than 15 days, the data center would have to eliminate one of its three shifts and discontinue use of one of its mainframes in order to reduce hardware and software maintenance costs, Newsom said. The center is one of two that handles processing for the $13 billion food stamp program.

"About 80% of the cost in a major computer center is fixed costs. Only about 20% represents personnel costs. So we could actually get rid of all our people, and we wouldn't even make a dent" in meeting the 32% budget cut, Newsom said.

An official at the Office of Management and Budget (OMB), who asked not to be named, said computer acquisitions and contractor services will get a double whammy as a result of budget cuts or sequesters, because agencies will shift funds from those activities to personnel accounts to minimize layoffs, a shifting technically prohibited by the Gramm-Rudman law. "There will be a lot of that kind of game-playing going on," the official said.

"Regardless of whether there is a sequester, there won't be much money around [for IS] next year," the OMB official added.

In July, the Bush administration released scenarios detailing what could happen in the event of a $100 billion sequester. Among its predictions, OMB said that badly needed systems upgrades at the Internal Revenue Service, Social Security Administration, Federal Aviation Administration and National Weather Service would be canceled or deferred.

Leo said IS officials are probably facing a 10% budget cut even if a deal is struck between Congress and the administration. One result will be that IS officials will postpone computer buys, letting mainframes get closer to capacity before ordering the next system and tweaking the systems to be more efficient. Data centers will also reduce the number of shifts while allowing the turnaround time for batch jobs to increase accordingly, he said.

But Marina Young, president of Information Strategies Group, was less pessimistic. She said spending on IS in the federal government will rise 11% — 7% discounted for inflation — in the fiscal year beginning today. That is based on agencies' own spending projections, an assumption of a brief sequester, if any, and the expectation of a significant tax increase. "After a brief disruption, it will be business as usual," Young said.

Price drop gives X terminals wider appeal to users

BY JOANIE M. WEXLER
CW STAFF

With X terminal vendors butting heads on a playing field that spawned last month's rollout of the first under-$1,000 offering, firms in certain computing environments are finding the products gaining in their cost-cutting appeal.

Analysts predict a shakeout in the overcrowded X terminal market, which has seen dramatic price drops and feature enhancements during the last three years. Firms seeking a combination of centralized processing, workstation ergonomics and X Window System make up the niche, but users and analysts said performance considerations must also factor into cost-per-station evaluations.

Because X terminals do not do local processing, firms considering them should enjoy some surplus of network computing power and run applications that do not require constant processing. Otherwise, they will have to buy additional computing power, which jacks up the per-seat cost.

Also, users and analysts warned, would-be customers should test the products running their own applications to determine performance benchmarks for themselves because vendor performance claims — which are based on a unit of measurement known as an "X stone" — are too general to be meaningful in a firm's unique environment.

X terminals are specifically designed to run X Window, a networking protocol that allows a computer or intelligent terminal to access multiple hosts on a network and display data and applications simultaneously in separate windows on one screen. Currently used mainly in technical applications, the terminals will creep into the commercial marketplace by the end of 1991, according to research firm International Data Corp. in Framingham, Mass.

Recent developments in the X terminal market include the introduction of a $995 monochrome terminal from Visual Technology, Inc.; catch-up color display rollouts from Visual Technology and Human Designed Systems, Inc. (HDS) to compete with market leader Networked Computing Devices, Inc. and the major vendors offering X terminals; and a four-year warranty from HDS.

Major player Digital Equipment Corp. also recently replaced its VT1000, which came with a feeble 1M byte of random-access memory, with its 2M-byte VT1200 and is offering VT1000 users free upgrades. The 1M-byte product "sat around for months gathering dust" at the Dana-Farber Cancer Institute in Boston, according to director of scientific computing Gerald Siddons, because "a 1M-byte terminal is incapable of doing anything."

Siddons, who plans to install about 15 X terminals, said his organization's cost trade-off will be in maintenance savings, compared with what it would have to spend for a Sun Microsystems, Inc. diskless workstation evaluated as an alternative.

"It's easier and cheaper to keep an X terminal running scattered across many networks," he said. The terminals wind up being "less than half the cost of a full-blown workstation" with disk drive.

Louis McDonald, manager of the workstation support group at Aerospace Corp. in El Segundo, Calif., which recently installed three HDS X terminals, said, "We're on a limited budget, and not everybody who likes the look and feel of a workstation needs a CPU on his desk."

Princeton University has found Networked Computing Devices' X terminals to be cost-effective for people using workstations for windowing who mainly want to log onto Princeton's DEC VAX minicomputer, said Stephen Beck, acting systems manager: "For the price, it made sense from a systems administration point of view to use X terminals."

Robert Linden, senior development project engineer at Fischer & Porter Co. in Warminster, Pa., added, "Installing workstations is a tedious business, while the X terminals are brought up right out of the box."

Stephen Auditore, president of X Business Group, a Fremont, Calif., research and consulting firm, said, "The cost of the terminal is not only the cost of the seat, but also how many more [millions of instructions per second] you need on your network to support the X terminals if you don't already have them."

X marks the spot

X Window System display shipments are projected to grow rapidly

Source: International Data Corp. CW Chart: Chuck Fletcher

Second-class postage paid at Framingham, Mass., and additional mailing offices.
Computerworld (ISSN 0010-4841) is published weekly, with a single combined issue for the last week in December and the first week in January by CW Publishing/Inc., 375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171.
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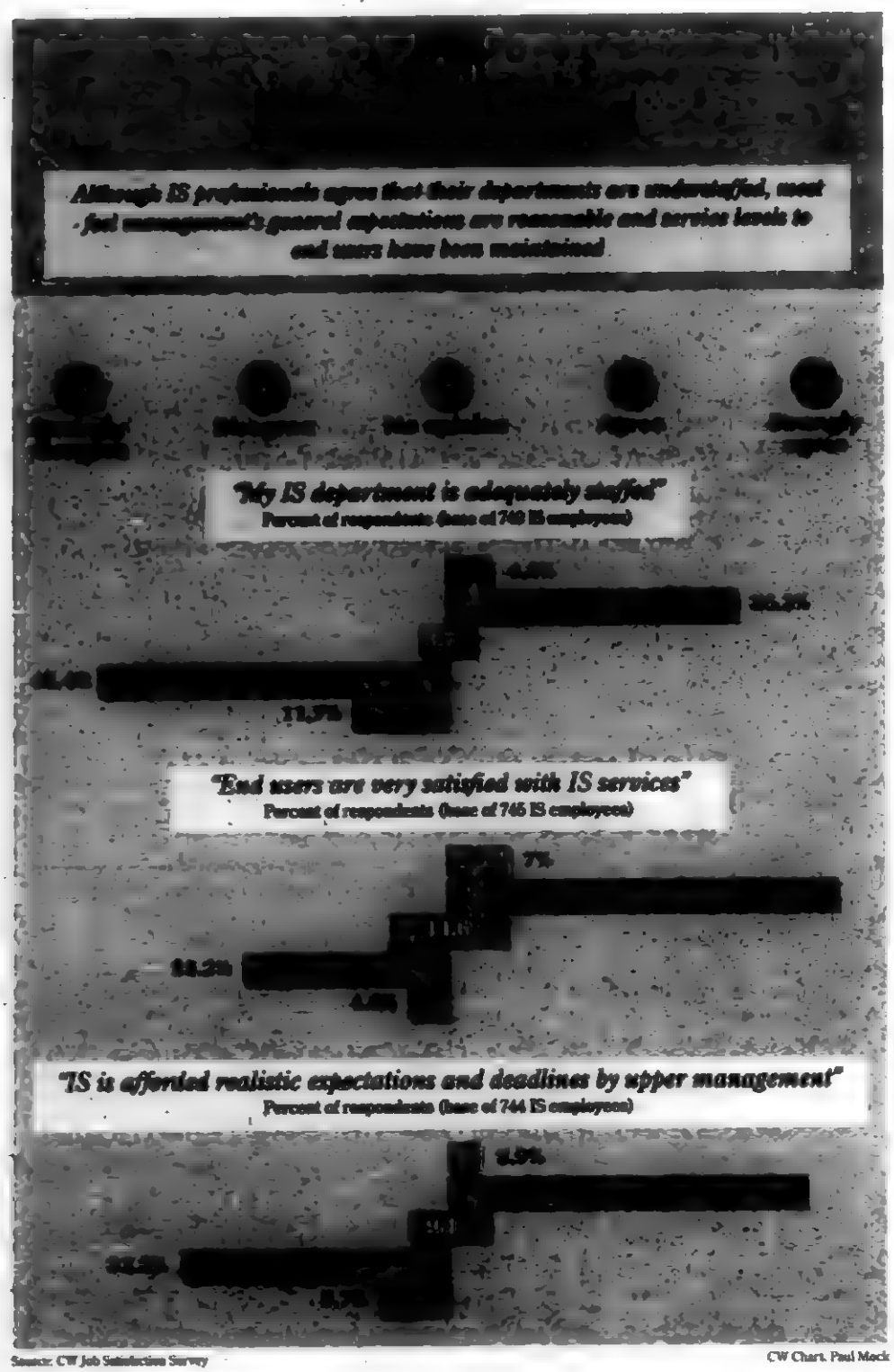

Source: CW Job Satisfaction Survey

CW Chart: Paul Mock

NEXT WEEK

Sears, Roebuck and Co. is Technology Central, according to **Robert Ferkenhoff**, vice-president of information systems for the retail giant's merchandise group. A six-year plan to revamp virtually all systems is now taking effect — with the goal of reversing the group's declining market share. See a progress report in Manager's Journal.

David Joel

Four hardware architectures. Six operating systems. Has IBM become too splintered? In the 1960s, binary compatibility helped make IBM. In the 1990s, lack of it could spell big trouble. Consolidating operating systems and architectures while focusing on reduced instruction set computing technology is necessary. For an overview, see In Depth.

INSIDE LINES

Another architecture to build on

Unisys is expected today to disclose details of the Unisys Architecture, a 10-year plan integrating its diverse computing platforms around open software architectures for enterprisewide computing. By no means will Unisys abandon its proprietary A series and 2200 series mainframes, according to customers and analysts who have been briefed on the announcements. Instead, Unisys will position the large systems as "information hubs" and increasingly integrate them through the use of common hardware and software, notably fourth-generation languages. The announcement is for Unisys what Systems Application Architecture was for IBM, sources said, with a major difference being an open systems push.

HP's Young not so young anymore

Presiding over Hewlett-Packard in the wake of its poor financial showing and difficulties in keeping Apollo users must be formidable. Insistent rumors of CEO John Young's departure are rife. A task force has convened regarding his successor, but the firm says it's no more than the usual policy as Young inches toward retirement age (he's 58). Young has been a strong political presence chairing many outside organizations but has admittedly left management to his divisional officers. Financial analysts say stronger leadership would have a better chance of getting HP through tough economic times.

Sculley looks to play Japanese card

Apple head John Sculley is hinting that a Japanese "connection" will play a big role in Apple's push toward miniaturization. Sculley won't name names, but a deal could be in the works with Sony, which supplies monitors for the Macintosh. Apple insiders have also confirmed they are talking with Japanese firms about the possibility of building a portable computer.

What a demo!

Oracle's electronic mail package, put to work at last week's Oracle user conference in Anaheim, Calif., as a messaging system, failed to live up to its high-speed billing. After many hours of intensive key-pounding by thousands of attendees, screens froze, and the system crashed. The same thing happened at the 1989 user group meeting in Dallas. After much tinkering, the system, which was powered by Sequent's Balance S 81 processors, was restarted. Then a brief and apologetic electronic note flashed onto users' screens: "We experienced an overload during peak periods when we had 250 concurrent users and were processing about 100,000 transactions per hour. To resolve this overload, we have tuned the database I/Os so that they are spread more evenly across our disks."

Networking breaks out all over

A cab driver tells a story of driving a systems troubleshooter to administer to an ailing Tele-Communications Association '90 network demonstration at the U.S. Sprint booth. The troubleshooter apparently told the driver that he "knew what the problem was," and he'd be back in 10 minutes. Not too surprisingly, the guy did not show up for two hours. Moral of the story: There is no such thing as a simple glitch in a network demonstration.

DEC's latest at the gate

Some customers and industry analysts are convinced that the announcement of the Decsystem 5500 is imminent. The newest member of the RISC Decsystems is reportedly the deskside machine DEC promised last April when it announced a slew of new reduced instruction set computing (RISC) machines. The Decsystem 5500 reportedly runs at 28 million instructions per second, costs somewhere around $50,000 and will be the first RISC machine from DEC that supports DSSI drives.

IBM's memory upgrade policy (see story page 1) confused us and memory board competitors and, at times, seemed to have IBM spokesmen tongue-tied. If you implemented infamous Engineering Change 570, pass on the experience to your peers through us. Contact News Editor Pete Bartolik at (800) 343-6474 or message COMPUTERWORLD *on MCI Mail. We also have a fax for the facts at (508) 875-8931.*

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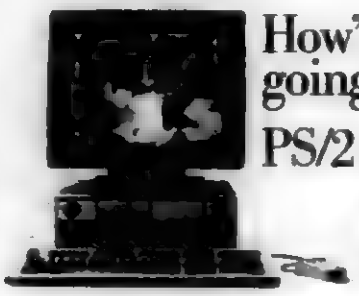

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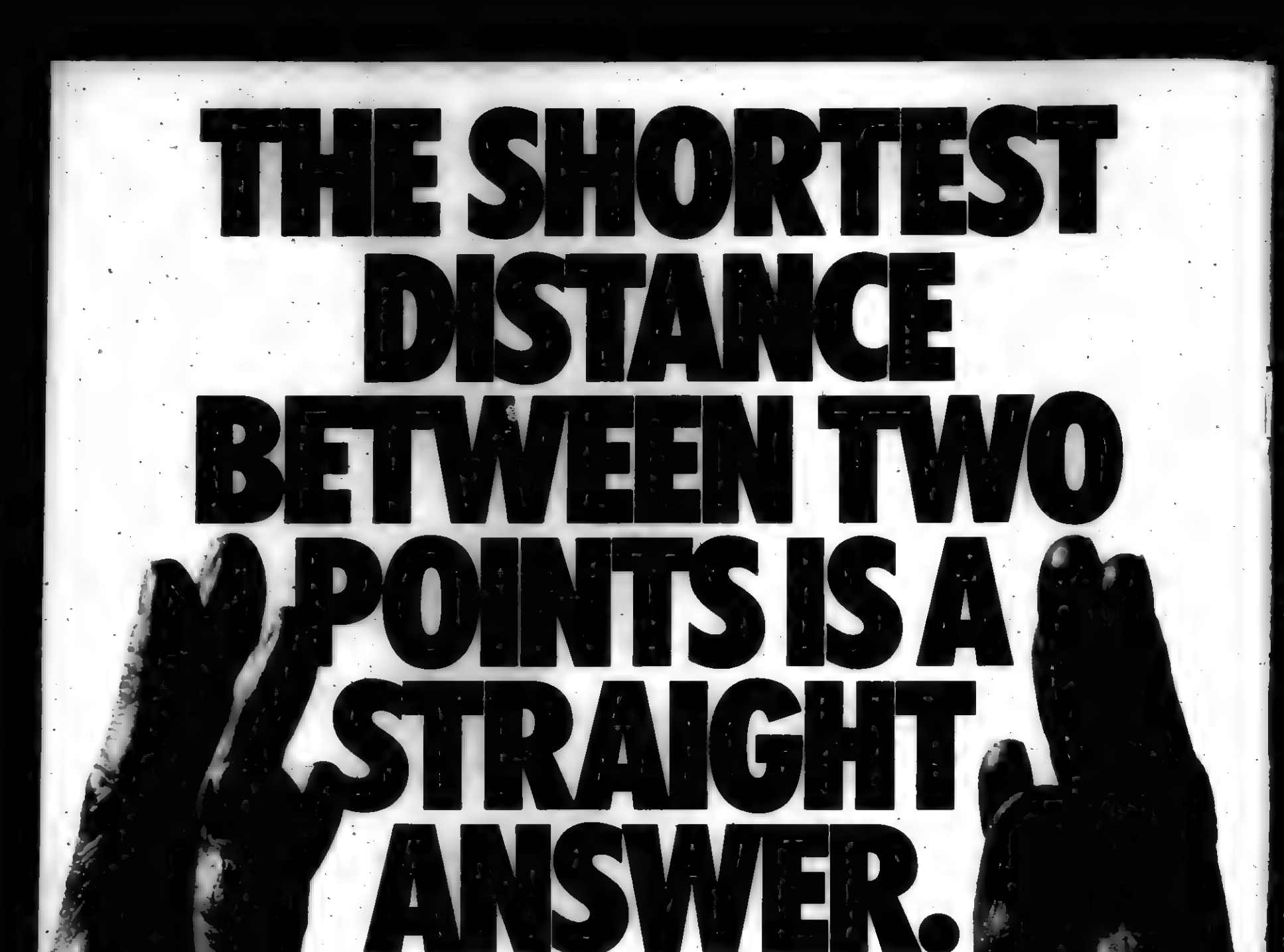

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VOL 24
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COMPUTERWORLD

INSIDE

In Depth — Is it time for IBM to get it together? Page 97.

Product Spotlight — Tough times call for sophisticated performance management strategies. Page 81.

Desperately seeking growth, Hewlett-Packard unveiled a major reorganization that raises questions about the future of CEO John Young, who will now share his post. Page 133.

Facing financial woes, Unisys goes open with plans to adapt its proprietary systems to Unix and non-proprietary networking standards. Page 6.

Printer wars? Xerox changes its printer profile with a high-priced multifunction machine as IBM replaces its 15-year-old printing system. Page 133.

Bottleneck busters

In user ratings of MVS performance monitors, Omegamon users gave the product the highest score for isolating bottlenecks. However, The Monitor topped the overall ratings

See Buyers' Scorecard, page 90

Product	Score
Response base: 50 users per product	
Candle Corp.'s Omegamon	74.8
Landmark Systems Corp.'s The Monitor	73.9
Boole and Babbage, Inc.'s Resolve Plus	66.8
IBM's RMF Monitor 2	50.7

CW Chart: Doreen St. John

Competitive advantage fleeting

BY MICHAEL L. SULLIVAN-TRAINOR and JOSEPH MAGLITTA
CW STAFF

Is the notion of using information systems for competitive advantage dead?

No way, according to a recent poll of top IS executives in *Computerworld Premier 100* companies. But in today's business climate, respondents said, you're lucky to keep that advantage for more than 12 to 18 months.

Overall, nearly three-quarters of IS executives in the *Premier 100*, the annual survey of top technology users, said their organizations have implemented information systems during the last year solely to get ahead of the competition. "Companies are leapfrogging each other," said Thomas Kiernan, president of AMR Corp.'s Sabre Computer Services Division. "Technology gives companies the ability to catch up promptly."

With higher hopes pinned to technology, it is no surprise that 53 of the *Premier 100* IS executives received increases in their 1990 IS budgets. Most banks, chemical companies and petroleum and financial services firms polled enjoyed budget increases: IS spending by banks and chemical companies rose 8%, financial services 7.5% and petroleum firms 5%, based on medians for the groups.

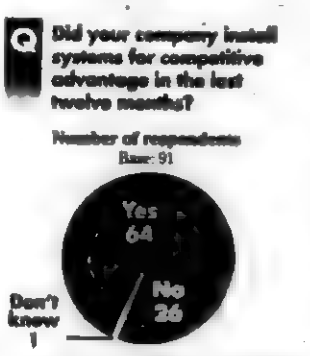
Firms in banking, financial services, manufacturing and aerospace were the biggest advocates of using technology for competitive gain. More than three-quarters of the companies in each of those groups said they implemented "strategic" systems during the past 12 months.

One notable shift among respondents concerned the focus of strategic systems. In the past, external or customer applications were presumed to be the best use of technology. Now, many say that the biggest

Continued on page 4

Competitive necessity

The vast majority of IS executives in Premier 100 companies implemented systems to attain competitive advantages



CW Chart: Paul Mack

Price tag hindering slow-burning Notes

BY PATRICIA KEEFE
CW STAFF

Lotus Development Corp. is still taking notes a year later when it comes to its most promising and most pricey offering, Notes — groupware communications software for creating and accessing shared information using personal computers and local- and wide-area networks.

With a few notable exceptions, such as Manufacturers Hanover Trust Corp., Reuters International and Price Waterhouse, that are actively cheerleading for the product, the bulk of the user community is taking its time studying Notes.

Lotus said 39 accounts have purchased Notes, but the firm said it expects to have 100 by year's end.

Regardless, users and analysts predicted sales might be higher if only Lotus would take a more flexible approach to packaging and price.

Some users claimed to suffer from sticker shock. The initial Notes investment is $62,500 per 200 users; volume discounts are available. "My management's attitude was that it was pretty steeply priced," said Brian Illari, vice-president at Citibank NA.

For other interested users, price is and is not an issue. On the one hand, IS managers are used to paying millions for mainframes and hundreds of thousands of dollars for related software.

But there is a cultural and political infrastructure that supports that kind of purchase, one unprecedented at the desktop. "The work group is traditionally headed up by an individual without the budget Lotus is asking

Continued on page 132

New VAXs to pack big power surge

Memory needs could cause sticker shock

BY MARYFRAN JOHNSON
CW STAFF

In a significant departure from previous upgrades within its VAX 6000 minicomputer line, Digital Equipment Corp. will announce new models during the week of Oct. 22 that will require 128M-byte memory boards and a revamped backplane to drive vastly improved performance.

DEC will also be busy later this month with a slew of announcements (see story page 8), including the Oct. 16 unveiling of a six-processor minicomputer based on Intel Corp.'s I486 chip and running The Santa Cruz Operation's SCO MPX Unix.

The VAX 6000 Model 500s, 40% to 50% more powerful than the present top-of-the-line minis, "will be sharply more expensive than previous upgrades," said Chris Christiansen, an analyst at Meta Group, Inc. in Westport, Conn.

They will also require the newest version of the operating system, VMS 5.4, several customers and analysts confirmed.

"This upgrade will require major changes. The [Model 500s] are nothing like the 6300s

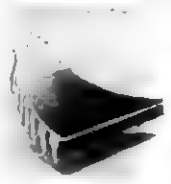
Continued on page 8

Lack of Unix unity blurs RISC future

BY J. A. SAVAGE
CW STAFF

Reduced instruction set computing systems in the 1980s have been rather like Japanese sports cars — fast, inexpensive and, from the exterior, often indistinguishable.

In the 1990s, RISC will be even faster and less expensive. RISC products will span the range from compact in the high-end personal computer range to Cadillac in the mainframe range. By the mid-1990s, several RISC engines will be tied together in one computer, revving the power up to that of next year's high-est-end mainframes.



While all that price/performance is appealing, the promise of open systems — in which a user could pick an engine from one dealer, peripherals from another, interior from a third and make it all go — is still years away.

With one exception, all vendors' RISC architectures use a Unix operating system. But RISC vendors, despite all their lip service about open systems, cannot agree on one version of Unix. While they all said they will follow a standard whenever it is issued, most appear resistant to homogenization of their applications to make them portable across hardware, as they have sunk many engineering hours into tuning Unix for their particular RISC architecture.

For instance, Michael Mahon, manager of processor architectures at Hewlett-Packard Co., said that in the future, software will be developed neutral to the vendors' architecture and will be recompiled on-site to fit the particular

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6 Wanting the best of both systems architectures, **Unisys** introduces an integration plan that makes the most of open and proprietary systems.

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Quotable

"I have the feeling they don't have the power to do this with their cash problems . . . they flat don't have the manpower."

WOODY WOODWARD
CALMAT CO.

Reacting to Unisys' strategy announcements. See story page 6.

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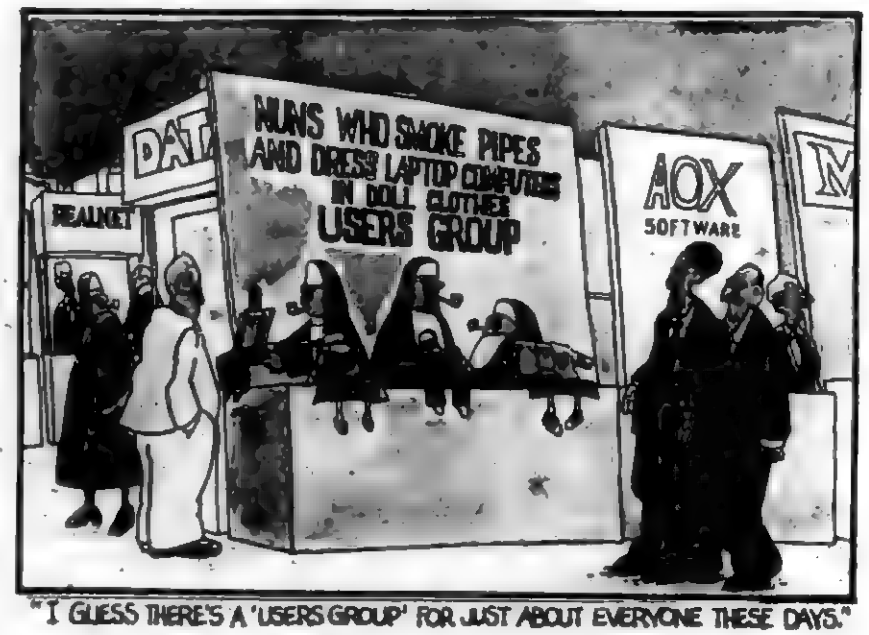

"I GUESS THERE'S A 'USERS GROUP' FOR JUST ABOUT EVERYONE THESE DAYS."

EXECUTIVE BRIEFING

■ **Competitive advantage for IS** increasingly comes from re-engineering internal processes, say a majority of the 100 most effective users of IS. *Computerworld*'s third annual ranking of the *Premier 100* found that most companies still believe in strategic systems but are focusing on improving internal functions and empowering users. They also believe the window for competitive advantage is much more narrow than it used to be. **Page 1 and supplement.**

■ **The effectiveness of RISC architecture is hampered** by the lack of common Unix standards among vendors. Despite dazzling price/performance breakthroughs, systems administration hassles are a big problem for IS departments trying to make different versions of Unix consistent. IS hopes may rest on future software from Patriot Partners, the new IBM joint venture with Metaphor, to smooth out Unix differences. **Pages 1 and 131.**

■ **Sears' retail business was an IS pioneer** in its industry, but many of its leading-edge systems have grown old. IS chief Robert Ferkenhoff is attempting to spur a corporate turnaround with a reorganized department and revamped applications. **Page 67.**

■ **The federal government is about to move forward** on a $1.9 billion effort to develop a high-power, high-speed computer network. The plan has been stalled by differences between two rival Senate bills, but a compromise is reportedly at hand. **Page 8.**

■ **Unisys unveiled its architecture plans for the '90s,** exemplifying the fine line vendors are walking between open and proprietary systems. Meanwhile, Unisys stock fell after Moody's downgraded the firm's debt and preferred stock. **Page 6.**

■ **50-MHz PCs based on the Intel 1486 chip** may appear as early as Comdex/Fall. Everex and three other vendors are expected to display systems running at 50 MHz. **Page 4.**

■ **CD-ROM applications still have a way to go as** mainstream business tools, attendees at CD-ROM Expo in Boston said. Too often, they added, applications are merely repackaged databases or books. **Page 10.**

■ **Short-term thinking in IS** is preventing many companies from moving ahead with strategic technologies such as migration to OSI. Long-term, hard-to-quantify benefits are a very tough sell to top management, especially in a time of recession threats and the Middle East crisis. **Page 59.**

■ **Performance management tools are becoming more popular** for analyzing resource-intensive applications, scheduling jobs efficiently and otherwise eking all the power out of current systems. Nonetheless, experts say most large firms are just now getting into true capacity management. **Page 81.**

■ **On-site this week:** A mainframe spreadsheet helps National Semiconductor coordinate manufacturing plans with sales results. **Page 45.** Cincinnati-based Gibson Greetings arms its account reps with PCs to give retailers information that can increase store sales. **Page 47.** The American Stock Exchange scraps fault-tolerant systems for lower-cost DEC platforms. **Page 31.** A DG-based on-line system monitors air quality for Connecticut's Department of Environmental Protection. **Page 34.** Lincoln National Insurance in Fort Wayne, Ind., gains office productivity with systems tailored to 70% of its workers — the mainstream users. **Page 38.** Community Memory in Berkeley, Calif., runs an electronic bulletin board for citizens to exchange information on terminals in public places — including bars and Laundromats. **Page 60.**

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Everex set to show 50-MHz PC

BY MICHAEL FITZGERALD
CW STAFF

Even though Intel Corp.'s release of its 50-MHz I486 chip will not come until sometime in 1991, power users may still find an I486-based machine running at 50 MHz under the Christmas tree this year.

Everex Systems, Inc. is one of at least four hardware vendors that are expected to display an I486-based machine running at 50 MHz at Comdex/Fall '90 in November, sources said. Sources inside Everex confirmed the report, although Everex had no official comment.

The speed increase comes from a technology twist called Icecap, or integrated circuit environmental control, made by Velox Computer Technology, Inc., a Santa Clara, Calif.-based start-up. Icecap uses solid-state technology to cool the chip down to zero degrees Celsius and keep it from overheating at the higher clock speeds.

Mel Snyder, president of Velox, confirmed that Everex has purchased several lots of Icecaps and said that other buyers include IBM, Intel, Digital Equipment Corp., Compaq Computer Corp., Dell Computer Corp. and Commodore Business Machines, Inc., as well as a number of systems integrators. He refused to confirm whether any of these vendors would display machines using Icecap at Comdex.

Snyder said he expects machines based on Icecap technology to make it to market before year's end. Everex's Stephen Dougherty, manager of performance testing at the Fremont, Calif.-based firm, said Everex was not likely to be among them.

Icecap *cools chip to 0° Celsius to prevent overheating*

"We've run the thing for weeks at a time, and it gives high performance, but we don't have a way to absolutely confirm that it will be fine running at that speed," Dougherty said. While the firm believes it unlikely that users would suffer problems such as incorrect calculations while using the device, he said, "until Intel has said it can operate at that range of temperature, we don't know for sure."

An Intel spokeswoman said that Intel was familiar with the Velox technology but was not working with the firm. She also warned that Intel considers it a bad idea to use chips in ways that have not been specified by Intel.

Dougherty said that Everex was likely to use Icecap to help it design next-generation systems in advance of Intel's delivery of faster chip prototypes.

Competitive

FROM PAGE 1

payoff comes from deploying strategic systems *inside* the organization.

"Today the most strategic use for information technology is to improve internal processes," said Linda George, director of corporate information services at Gencorp. "It's a way for us to be more corporately effective."

A few examples follow:

- Gencorp has taken steps toward re-engineering various cost centers in the firm with an eye toward leveraging information technology, she said.
- At Paine Webber Group, IS has concentrated on simplifying and consolidating internal information feeds to traders, said Robert Beonnoche, director of MIS.
- MCI Communications Corp. reduced double planning and double billing and trimmed staff by two-thirds after integrating a network and data center operations at an Ohio facility.
- FMC Corp. finished the first phase of an IBM 3090-based procurement tracking system that will completely automate the firm's purchasing.

Once the technology is in place, executives said, advantage springs from maximizing it.

"Anybody can buy the technology," said William Friel, executive vice-president at The Prudential Insurance Co. of America. "Success comes from continually developing and improving user skill sets."

Technology provides a shorter window of advantage, and it keeps newcomers out of the business.

Well-deployed technology poses "a very significant barrier to entry" for new firms in an industry, said Anish Mathai, vice-president at Bankers Trust Co.

The survey polled 92 of the 100 most effective users of IS ranked in the 1990 *Computerworld Premier 100*. The annual ranking examines Fortune 500 services and industrial firms and their IS operations (see special supplement with this issue).

Respondents to the survey included 16 financial services firms, 12 aerospace firms, 11 banks, 10 utilities and nine firms each in chemicals, manufacturing and petroleum. Fewer than nine firms from the diversified services, industrial and automotive, food and pharmaceuticals, retail and transportation categories were surveyed, so their responses were not factored into the industry statistics.

Re-engineering popularity

Financial services organizations lead Premier 100 companies in re-engineering processes to reap the benefits of technology

Q Did your company redesign or re-engineer business processes?

A

Total	Number of respondents (base: 92)
Yes	77
No	13
Don't know	2

Top four industries	Number of companies	
Financial services (base of 16 companies)	Yes	14
Banking (base of 11 companies)	Yes	10
	No	1
Aerospace (base of 12 companies)	Yes	8
	No	3
	Don't know	1
Utilities (base of 10 companies)	Yes	9
	No	1

CW Chart: Paul Mock

Premier concerns

While *Premier 100* firms share common concerns about remaining competitive, each industry faces a different set of IS challenges and concerns. The following are brief summaries for each industry surveyed:

Aerospace. The greatest challenge facing IS executives at top aerospace firms is technological change and integration. Defense budget cutbacks and competition run a close second.

Banking. All 11 banking IS executives polled said their industry will become more competitive during the next year. Three-quarters also feel increased scrutiny from top management.

Changing the size of IS is one solution being explored by many banks. Nine of the 11 banks surveyed said they merged or consolidated data centers during the past year.

Chemicals. Acquiring and integrating the latest technology will be big concerns for chemical firms in 1991, according to the nine chemical companies among the *Premier 100*.

Financial Services. When it comes to re-engineering business processes, financial firms are the most aggressive. All 16 financial services executives said they have re-engineered business processes to take advantage of information technology over the past year.

Manufacturing. Top IS executives in manufacturing agreed with peers in other industries that technological change and integration are among the biggest challenges they face.

Petroleum. The single greatest challenge facing their companies, petroleum executives said, is balancing domestic oil and gas exploration and production with the overseas market. They said the IS mission over the next year will be to improve products and services while keeping costs down.

Utilities. Chief concerns are the strategic use of IS as well as personnel issues such as hiring and training.

CORRECTION

Readers may have been surprised to read that the youthful-looking Les Alberthal, chairman and chief executive officer of Electronic Data Systems Corp., has been at his company's helm for 46 years [CW, Oct. 1]. In fact, Alberthal is 46 years old and has been EDS' CEO since 1986.

In the chart accompanying the story "Bringing up 'baby' computers no small feat" [CW, Oct. 1], the sales projections were reversed for pocket and laptop computers. The correct numbers for laptops range from 1.5 million in 1989 to 2.8 million in 1993, while pocket or handheld computers range from 80,000 to 3.1 million during that time frame.

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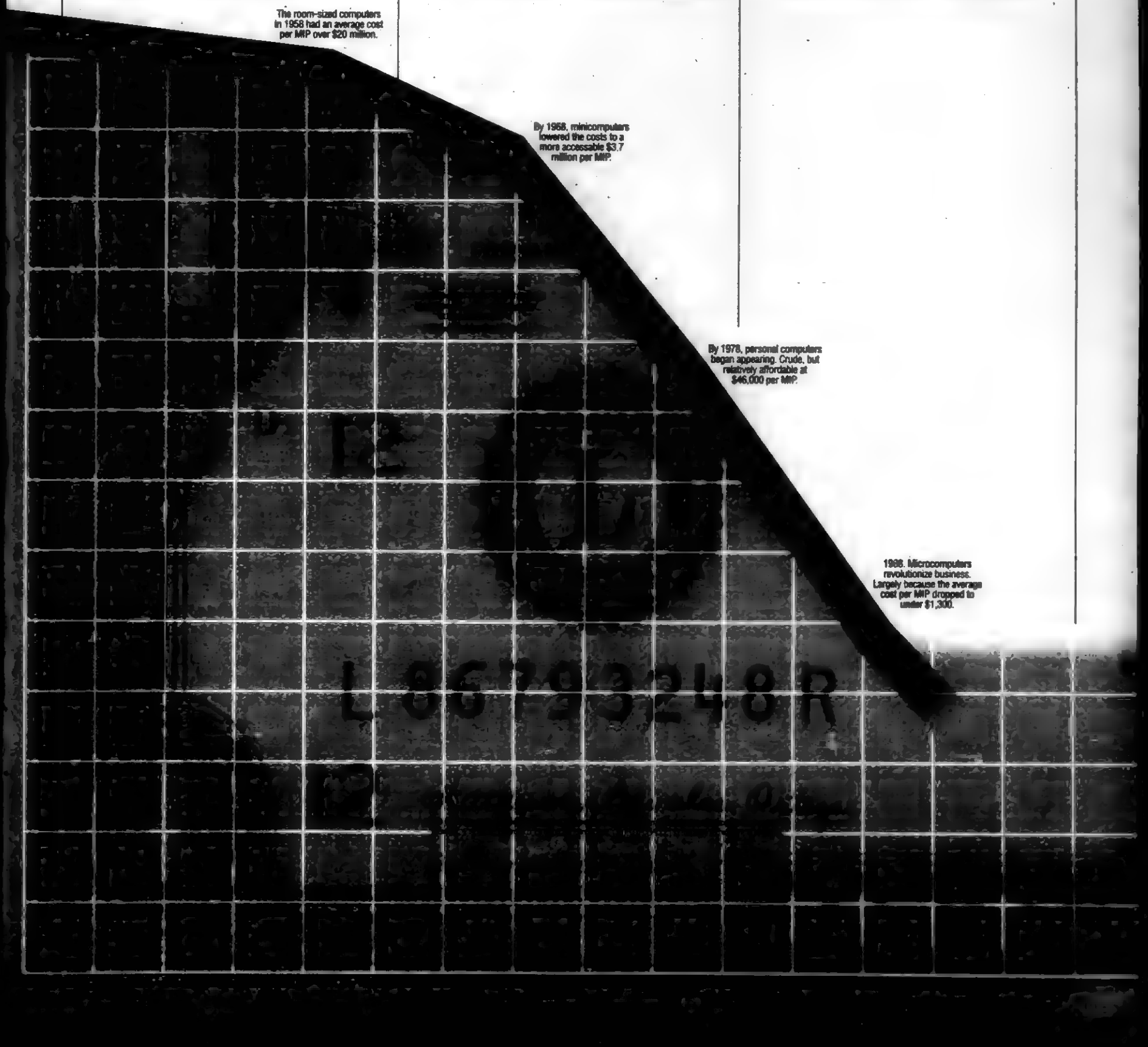


Unisys to tie its lines together

BY ELLIS BOOKER
CW STAFF

NEW YORK — Walking a tightrope between open and proprietary architectures, Unisys Corp. outlined a plan last week for coordinating its disparate product lines and delivering the enterprisewide network computing it said customers will demand in the 1990s.

The Unisys Architecture calls for integrating rather than abandoning Unisys' various proprietary platforms.

The "glue" in the architecture, which will connect different Unisys machines to one another as well as to systems from other computer makers, will be a combination of open and de facto industry standards, particularly network interfaces. Other key elements are Unisys' own software tools, notably its third-generation application programming interfaces and fourth-generation computer-aided software engineering offerings.

Some observers said this mixed-bag approach to openness, providing access to a proprietary world through an open systems window, makes sense for Unisys, which lacks the clout of IBM or Digital Equipment Corp. to set forth an architecture largely built on its own agenda. Unisys, they said, wants to balance its competing needs of protecting existing customers' investments, joining the open systems wave and making new sales to customers looking for multivendor solutions.

Sarah Leen

CEO Unruh *keys on customer protection*

Unisys Chief Executive Officer James A. Unruh last week explicitly stated the goal of protecting the company's current customers.

"From our customers' point of view," he said, "[this architecture] helps them plan for the future, building on the systems and investments they have today."

Unruh also attempted to distinguish the Unisys architecture from the enterprisewide computing schemes of its competitors.

Unlike IBM's Systems Application Architecture (SAA), he said, "we're bringing standards to the proprietary systems . . ."

"What's new is they are saying they're going to make proprietary iron play in the open systems environment," said George Lindamood, Unisys watcher at Gartner Group, Inc. Nevertheless, Lindamood said he was unsure whether there are many differences in the capabilities of the Unisys, DEC and IBM architectures.

John Rymer, senior editor of "Unix and the Office," a monthly report from Seybold's Office Computing Group in Boston, was more upbeat.

"As an architecture, Unisys has actually done a pretty good job," he said. "SAA doesn't know about Unix, which is still in a separate world. With [the Unisys Architecture], Unix is part of the architecture."

Michael Goulde, vice-president of research at Boston-based Open Systems Advisors, Inc., said the commitment to X/Open standards and a common applications environment "could be a strong selling point, particularly in Europe."

However, Goulde noted that enhancements on top of standard platforms, particularly in the case of software applications, are vital for winning customers.

However, at least one of those customers said he felt the new architecture had come too late and doubted that financially strapped Unisys would be able to afford the initiative.

"The new architecture is fine," said Woody Woodward, director of information systems at Calmat Co., a mining concern in Los Angeles. "But I have the feeling they don't have the power to do this with their cash problems . . . they flat don't have the manpower."

Indeed, Calmat, a Unisys V series and A series user, has already begun hunting for a new software provider and is entertaining the idea of moving off the Unisys platforms entirely.

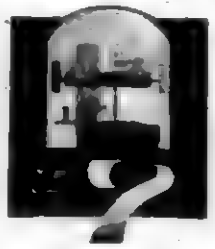
Jerry Weinstein, director of corporate MIS at General Instrument Corp. in Lyndhurst, N.J., said that he and many of his counterparts in the Unisys user committee are very concerned about the company's financial statements and that the phrase "ripe for acquisition" comes up frequently.

However, other customers said they believe Unisys will see its way out of its financial troubles. "The financial [difficulties] are short term," said George Germann, national director of MIS at Ernst & Young in Lyndhurst, N.J., who noted that Unisys is not alone among struggling U.S. computer vendors.

Moody's casts dubious eye on Unisys fortunes

BY ELLIS BOOKER
CW STAFF

Moody's Investor Service downgraded its ratings on Unisys Corp.'s debt and preferred stock last week, saying the company's "prospects for significant, sustainable profit are low."



The rating change, coming at a time when Unisys has been striving to reduce its debt, stung company officials and caused Unisys stock to lose nearly a quarter of its value last week.

The event is the third major financial shock for Unisys in as many weeks. Two weeks ago, Unisys informed its investors that it would suspend its 25-cents-per-share quarterly dividend as part of an accelerated effort to cut its debt. The company has repeatedly said that it wants to cut $600 million to $800 million of its debt this year and a similar amount next year.

The company also said it anticipated a loss in the third quarter but a profit in the fourth quarter. This was not unexpected. As early as April, Chief Executive Officer James Unruh was projecting that the company would probably see a slow third quarter but a gain in the fourth quarter. Ominously, Unisys officials last week seemed to back away from earlier predictions that the company would be profitable for the year.

In a scheduled, companywide videoconference last week, Unruh reportedly described the company's condition as "bleak" but said it would pull through with additional belt-tightening. In answer to a question from the audience, he said that massive layoffs were not planned.

"We're disappointed with the rating change," said a Unisys spokesman, who said the company feels it has made inroads against its debt load.

Unisys stock was trading at 3⅝ points late last week, down from a March high of 17. Unisys, which said it expects sales of approximately $10 billion this year, now has a market value of $580 million, a condition that some observers speculated might make the company ripe for acquisition.

2200, A series get systems refresher

BY ELLIS BOOKER
CW STAFF

Some tangible pieces of Unisys Corp.'s new architecture were announced last week, starting with new versions of the operating systems for its A series and 2200 series mainframes. Both systems will include components of the Open Systems Interconnect (OSI) model.

Unisys also expanded the reach of its development environments — key parts of its cross-platform integration strategy — by announcing that its fourth-generation languages (4GL), Mapper and Ally, will be available on AT&T 3B2 and NCR Corp. Tower systems.

Earlier this year, Unisys announced a port of both 4GLs to Sun Microsystems, Inc. Scalable Processor Architecture platforms. The company's development systems — Ally, Mapper and Linc — will be condensed into one environment in 1991, officials said last week.

More open than ever

Some of the most aggressive commitments to open standards are part of the networking sector of the five-component Unisys architecture. For network transport, for instance, Unisys said it will use Fiber Distributed Data Interface, backbone T3/Synchronous Optical Networks for voice, image, voice and data integration and broadband Integrated Services Digital Networks for voice and data integration.

Likewise, for network management, Unisys said communications within its Systems Management Service (SMS) will use the OSI reference model and rely on the OSI Common Management Information Protocol. This means that SMS will support third-party, OSI-compliant network management products such as AT&T's Accumaster Integrator, Unisys said.

Unisys also said it plans to demonstrate distributed computing using Mapper at this week's Interop '90 conference in San Jose, Calif.

For the end-user interface component of the architecture, Unisys rallied behind Microsoft Corp.'s and IBM's OS/2 Presentation Manager, although it said its end-user interface will also include drivers for Motif, Microsoft's Windows, X Window System and future windowing graphical user interfaces. The application programming interface will use the X/Open Portability Guide for high-level languages, data management, operating systems, networking and data communications and user interfaces.

John Rymer, editor of "Unix and the Office," a report from Seybold's Office Computing Group in Boston, said the architecture's support for multivendor environments and its push for open standards reflects "Unisys' awareness that they have to take the crumbs off the table and rebuild their business."

Tiered structure

The Unisys architecture will cover three tiers of hardware: workstations/work groups, servers and information hubs. The hub, represented by the Unisys A series and 1100/2200 series mainframes, are the top of the hierarchy and are clearly positioned for on-line transaction processing and other processor-intensive, mission-critical duties.

The architecture is composed of five sets of services: Systems Connectivity Services (SCS), Distributed Systems Services (DSS), Information Management Services (IMS), Applications and Information Services (A&IS) and Systems Management Services (SMS). SCS and DSS are the networking subsystem of the architecture; IMS and A&IS are the applications subsystem, and SMS is the management and repository subsystem.

Within each service are three "classes" of capabilities, stretching from open systems interfaces and protocols to proprietary methods pushed by Unisys or its competitors.

The "open" class includes, for example, the OSI model for networking and the X Window System model for user interfaces. The "premium" class includes both Unisys proprietary products like its Mapper and Ally fourth-generation languages or "value-added" extensions to the open system capabilities. The "complementary" class includes non-Unisys de facto standards such as IBM's Systems Network Architecture that will be supported by the architecture in order to connect Unisys hardware or software in multivendor settings.

Intel chip, card aim at portable PCs

BY JIM NASH
and MICHAEL FITZGERALD
CW STAFF

Intel Corp. this week is expected to unveil both its 80386SL chip and its first memory card. The personal computer components will have an almost immediate impact on portable and perhaps even desktop computers.

Sources close to the company have said the 386SL will have the same power-management capabilities currently available only in twin chip sets, at a price below Intel's 80386SX chip. It is expected to be announced Oct. 15 but could be unveiled as early as today, when Intel will introduce its Flash Memory Card. The card is a solid-state replacement for floppy disks.

The announcements could put Intel in a solid leadership position in the laptop and smaller computer market, the fastest growing piece of the PC pie.

As described by one analyst, who asked to remain anonymous, the 386SL is a low-power 386 chip designed for the laptop, operating at anywhere from one watt to an undisclosed full-power setting with numerous sleep modes.

Other sources, both in and outside Intel, have confirmed that it will feature a 386 microprocessor kernel, a small cache memory, a cache memory controller chip and peripheral logic chips. Contrary to previous media reports, the chip will not sport a 80387SX math coprocessor or an IBM Video Graphics Array-compatible graphics chip, according to a company source who requested anonymity.

Gathering microprocessors off a computer's motherboard and placing them on a single chip will eventually shrink computer sizes and could cut their prices. Because the chip combines the system support logic, it uses less power, making it ideal for use in notebook computers.

Pricing the 386SL below Intel's 386SX chip may make the 80286 obsolete, one analyst pointed out. He said the 386SL is designed generically enough to replace 286 chips in production today.

The new chip addresses Intel's mandate to increase the number of microprocessors and transistors on each chip. Intel is one of several chip makers reputed to be working on similar chips.

The Flash Memory Card, which is about the same size as a credit card, comes in 1M- and 4M-byte versions. Intel is releasing a Flash Memory Card developer's tool kit for notebook computer makers who purchase Intel chips.

A number of companies are rumored to be readying notebook or palm-top systems that use the card's media for Comdex/Fall '90 next month. Among them are Atari Corp., AST Research, Inc., Dell Computer Corp., Nippon Electronic Corp. and Toshiba America Information Systems.

Apple boasts of Mac attack

BY JIM NASH
and JAMES DALY
CW STAFF

Apple Computer, Inc. executives last week outlined an aggressive five-year battle plan with which they hope to recapture the firm's eroding market share.

The Cupertino, Calif.-based company plans to start the offensive next Monday with the introduction of three new systems, including a long-awaited entry-level model — the Macintosh Classic — listing for $999. The product launch will be followed up with a $40 million advertising campaign.

Since 1987, Apple has seen its portion of the personal computer market slip from nearly 15% to just 10%, according to Dataquest, Inc., a San Jose, Calif.-based research firm.

Apple Chairman John Sculley said no sacred cows will be spared in order to restore the company to its former glory. "We're going to make some significant changes," Sculley said.

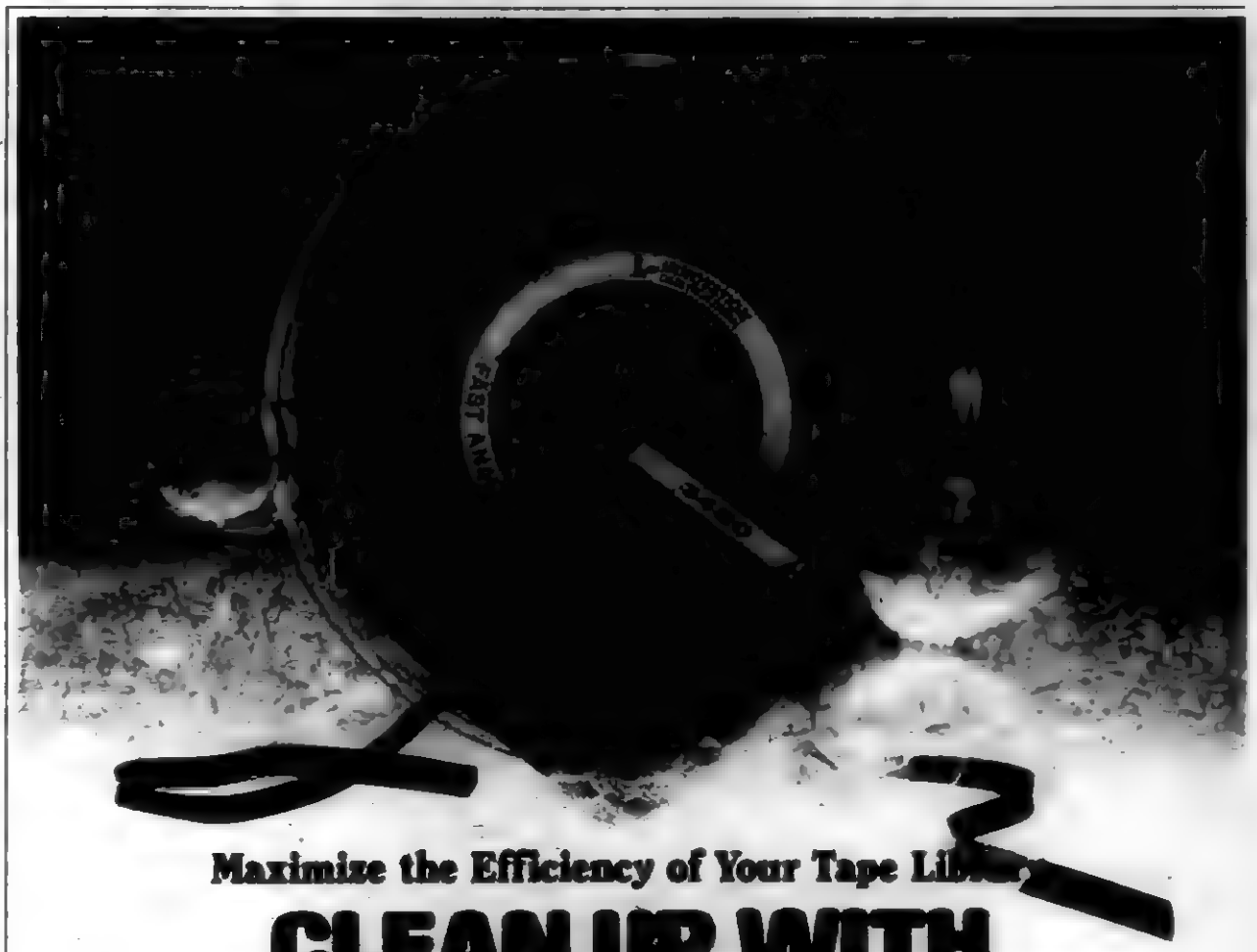
The first tradition to fall may be Apple's gross profit margin, which has been among the highest in the industry. Last year, its profit margin was 54%. Sculley said Apple will accept smaller profit margins as long as it gains market share.

However, analyst Bruce Lupatkin at Hambrecht & Quist, Inc. in San Francisco said he expects to see margins drop no more than "a couple of percentage points" during the next few quarters.

Some analysts warned that Apple's foreseen turnaround may be beyond its grasp. "You can't lose market share over a sustained period and then suddenly dig it up overnight," said Charles Rothchild, an analyst at the Jersey City, N.J., offices of Pershing & Co.

Apple has also become mired in a series of internal reorganizations, executive resignations and shifting marketing strategies during the past few years.

Both Sculley and Chief Operating Officer Michael Spindler said the company is considering moves never before taken at Apple, including the licensing of its technology to other firms. Although neither executive would comment on reports that Apple is working with Sony Corp. for this purpose, Spindler said that Apple's relationship with the Japanese electronics giant is "intensifying."



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NEWS SHORTS

Met Life will flee Manhattan

Metropolitan Life Insurance Co.'s information systems director, Daniel Cavanagh, has confirmed that his company is looking at moving its New York data center elsewhere. "It will happen in weeks or months," he said. "We're close." Met Life is looking at sites in upstate New York and in neighboring New Jersey to reduce costs and to be able to do such things as add an uninterruptible power supply and a more up-to-date cooling system, he said.

Color 'luggable' from Toshiba

Toshiba America Information Systems announced what may be the first portable computer with an IBM Video Graphics Array color display to be made commercially available to U.S. buyers. The Toshiba T5200C will retail for $9,499 and is scheduled to hit the market next month. Essentially, the T5200C is a desktop machine in an 18.7-pound package. Based on Intel Corp.'s 80386SX chip, it runs at 20 MHz, comes with a 200M-byte hard drive and features 640- by 480-pixel resolution, with up to 16 colors displayed at one time. The machine is not battery powered.

Burlington Northern names CIO

As of last week, Fort Worth, Texas-based Burlington Northern Railroad — No. 4 in the Fortune 500 railway transit category — has a new top IS position and the man to fill it. Former Nolan, Norton and Co. consultant Robert Hanson came on board as Burlington Northern's first executive vice-president and chief information officer; he will also be the first to run the railroad's IS operations out of the Fort Worth headquarters. Former Vice-President of IS Brock T. Strom becomes a senior vice-president, reporting to Hanson from the IS services department in St. Paul, Minn.

Cray unveils supermini

Cray Research, Inc. officially entered the minisupercomputer market last week by unveiling the Cray XMS system at the semiannual Cray User Group conference in Austin, Texas. The system is scheduled to be available for customer deliveries next month. The 64-bit XMS, which runs the company's Unicos operating system, has a peak vector performance of 36 million floating-point operations per second (MFLOPS) and a peak scalar performance of 18 MFLOPS. It has one central processing unit and is available with 32M, 64M or 128M bytes of memory, the company said. Cray Research is also developing a Cray Y-MP-compatible supermini, slated for delivery in the second half of 1991.

Fiat buys Prime workstations

The Fiat Group, which is headquartered in Italy and is the parent company of the well-known automobile manufacturer, has signed an agreement with Computervision, a Prime Computer, Inc. company, for the purchase of 400 of Computervision's Cadds4X workstations during the next 12 months. The workstations will be used to automate the different phases of the design process, including conceptual modeling, design and drafting. Fiat Auto, Prime Computer Italy and Computervision U.S.A. have also agreed to undertake joint development of new design and drafting software within the Cadds4X environment. Computervision has an installed base of more than 150,000 worldwide.

DEC to rename Lanworks

Digital Equipment Corp. has decided to change the name of Lanworks rather than risk delaying shipments of the personal computer integration product while it engages in a lengthy legal battle. A Maryland-based company named Lanworks, Inc. challenged DEC's use, and a federal judge has issued a preliminary injunction to stop DEC from using the name in several states. The first Lanworks product began shipping on time last month; a new name has yet to be chosen.

More news shorts on page 132

NREN legislation gains new life

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — After months of languishing and weeks in a dispute with a rival bill, pending legislation that would establish a five-year, $1.9 billion federal high-performance computer and communications program is about to move forward, sources said late last week.

The program, originally spelled out in a bill sponsored by Sen. Albert Gore Jr. (D-Tenn.), would sponsor the development of a National Research and Education Network (NREN) with bandwidth in the billions of bits per second and large-scale parallel computers operating at trillions of operations per second. It also calls for the establishment of nationally distributed libraries of software and data and stepped-up funding for basic research and education.

The bill, crafted by the U.S. Senate Commerce Committee in 1989, gives primary funding and responsibility for the NREN to the National Science Foundation (NSF), which has already begun beefing up its giant NSFnet by boosting the capacity of its backbone to 45M bit/sec.

However, this year, a rival bill sponsored by Sen. J. Bennett Johnston (D-La.) and the Senate Energy Committee appeared, earmarking NREN funds and responsibility for the U.S. Department of Energy. A battle for ownership of the project ensued between the senators and their committees.

What to do?

The Energy Department, faced with budget cuts for several reasons, including the decreased importance of its nuclear weapons programs, was looking for new things to do and new ways to pay for them, government sources said. "The federal energy labs are desperately looking for a new mission," one Senate staff member said last week.

Presently, an agreement between the rival committees is near, and a compromise bill is likely to be approved by both camps this week, a staff aide involved in the negotiations said.

The aide said that the new bill will give responsibility for building the network to an interagency "federal network council" made up of officials from the NSF, the National Aeronautics and Space Administration and the Departments of Energy, Defense and Commerce. NSFnet would be the likely base for NREN, he said.

The new bill may be attached as an amendment to another Senate bill, but in any case, it must be approved by both houses of Congress.

VAX

FROM PAGE 1

and 6400s," agreed Barry Willman, an analyst at Sanford Bernstein Co. in New York. Across the Atlantic, DEC's European operations last week began slashing prices by 26% to 35% on existing 6000s, said Karlyn Kilroy, an analyst at Technology Investment Strategies Corp. in Framingham, Mass. The same scenario will undoubtedly repeat itself in the U.S., she added.

Willman said anticipation of the new machine's fall debut created a "significant air pocket" in sales of the present high-end VAX 6000s.

At prices ranging from $300,000 to $1 million, the Model 500s will not — at first blush — look much more expensive than their predecessor 400s. But if DEC holds true to previous memory prices of more than $1,000 per megabyte, the new 128M-byte memory board required on the Model 500s could give some users pause.

The maximum memory on a Model 400 now is 256M bytes, but only in 32M-byte increments, which take up several slots on the machine's backplane. "By quadrupling the amount of memory on a board [for the Model 500], DEC is reducing the slots their customers have to devote to memory," Christiansen said. The maximum memory the Model 500s will be able to hold is 512M bytes.

"I've got a meaning bunch this upgrade is not going to be real cheap," said Kevin Obermann, network manager for the engineering department at Lawrence Livermore Laboratories in Livermore, Calif.

"If we have to buy all new memory, that would be another consideration on upgrading. I'm shocked," said Scot Shepherd, a system administrator at Chaparral Steel Co. in Midlothian, Texas. "But I look at a memory upgrade like a CPU upgrade. If you need it, you need it."

Chaparral is in the final stages of automating its main headquarters and three steel mills under all-DEC systems, developing applications on Smartstar's fourth-generation language for DEC's RDB database. "We're considering the new 6000s against a VAX 9000 [mainframe] right now," Shepherd said.

At performance ratings that reportedly run as high as 60 million instructions per second (MIPS), the high-end Model 500s will indeed encroach upon the low end of the VAX mainframe's power. Yet analysts and customers contacted last week seemed convinced that a possible cannibalization of low-end VAX 9000s, which start at around 40 MIPS, would not be a significant issue for DEC.

The most important technical changes in the Model 500s include a newly enhanced XMI bus supporting at least twice the data throughput of its predecessor and availability of a fully duplexed Computer Interconnect Interface, rather than the single interconnect interface now available on the VAX 6000s.

The combination of the XMI bus and duplexed Computer Interconnect Interface should alleviate previous system bottlenecks.

Facts on VAX, etc.

DEC will be announcing several significant additions to its product line, including the following:

- Six new models at the top end of the VAX 6000 line, Models 510 through 560. Priced at roughly $300,000 to $900,000 and ranging in power from 13 MIPS to 70 MIPS, these new minicomputers will nibble into the lower range of VAX 9000 mainframe processing power.
- A new symmetrical multiprocessing machine based on six Intel Corp. 1486 chips and targeted at small and medium-size businesses. The DEC/Intel box, to be announced Oct. 16, will run the SCO MPX version of Unix System V from The Santa Cruz Operation.
- A new line of reduced instruction set computing (RISC) servers based on chips from Mips Computer Systems, Inc. The 28-MIPS Decsystem 5500, which is scheduled to be introduced Oct. 31 at Unix Expo in New York, will replace the Decsystem 5400 and 5800 lines.
- A new Vaxstation intended to shore up the price/performance gap between DEC's VAX/VMS workstations and its RISC workstations. It will join the Vaxstation 3100 family at the top of that line.

MARYFRAN JOHNSON

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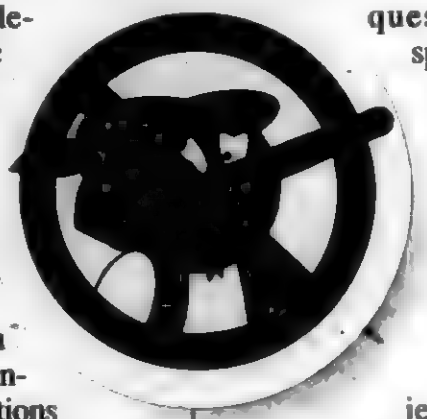

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Users still dissatisfied with current CD-ROM offerings

BY RICHARD PASTORE
CW STAFF

BOSTON — Compact disc/read-only memory (CD-ROM) technology still seems haunted by its image as an overly complicated alternative to books. As evidence, one of the highest-profile announcements at the CD-ROM Expo here last week was Time Magazine's current-events almanac on CD.

Some business users complained that CD-ROM technology and applications have not yet satisfied their needs. At an Expo conference on productivity, the consensus among attendees and speakers was that all too often, CD-ROM offerings are merely repackaged books, databases and software.

"Where is the value added?" asked one insurance industry information systems staff member, noting that productivity is probably decreased by putting something such as a dictionary on CD. Unless the CD platter is already in the drive and booted, it is usually faster to grab the book and look up your word, he contended.

Expo-goer Edward Hill was searching for technology that would help his hospital integrate a CD-ROM-based *Physician's Desk Reference* with patient databases running off a mainframe.

Hill, assistant vice-president of IS at Winchester Hospital in Winchester, Mass., did not find what he was looking for.

"The technology's getting there, but it's not there yet," he said.

"CD-ROM is not the best answer for everything," added Gian Argentati, manager of corporate engineering standards at Ingersoll-Rand Co. in Phillipsburg, N.J. "It's best for storage and retrieval of static data, which does not have to be changed much."

Ingersoll-Rand ships out parts catalogs on CDs to its 50 divisions around the world. Argentati said CD-ROM is the right technology for this job because of the company's desire for more secure data integrity.

Despite what seemed to be a general lack of enthusiasm among Expo attendees, not all of the products unveiled at the show were repackaged magazines or databases.

In the software arena, Dataware Technologies, Inc. announced that its CD Author publishing system is now available for Sun Microsystems, Inc.'s Scalable Processor Architecture-based workstations and Digital Equipment Corp.'s VAX family.

The releases are designed for corporate customers who wish to continue developing applications in-house on personal computers while having DEC or Sun systems read and index the data, the Cambridge, Mass.-based company said.

Windows-compatible

A number of companies ported their CD-ROM software to Microsoft Corp.'s Windows 3.0 environment. Knowledgeset Corp. in Mountain View, Calif., released a Windows version of its Graphic Knowledge Retrieval System, which uses hypertext links to quickly navigate through data. Scheduled to ship in the first quarter of 1991, the product is priced at $75.

Meridian Data, Inc. unveiled Windows CD, a CD-ROM publishing system for the Windows 3.0 environment. A streamlined version of the firm's VR Publisher 5.0, it features the software, CD-ROM drive and tape drive necessary to organize and output data for CD-ROM. The system is slated to ship next month at a price of $18,195.

In addition to the publishing software, Meridian also unveiled a unit that will write the data onto blank compact discs, eliminating the need to use outside mastering facilities. VRS Professional supports DOS, Windows 3.0 and the Apple Computer, Inc. Macintosh environment and is expected to ship the first of next month. It costs $36,000, including publishing software.

On the hardware front, On-line Computer Systems, Inc. in Germantown, Md., introduced a turnkey CD-ROM package for Novell, Inc. Advanced Netware 286 networks.

Composed of small computer systems interface CD-ROM drives, controllers and software, the system connects directly to a dedicated file server or external bridge running Netware Version 2.1 or higher. IBM Personal Computer AT-style single-drive packages sell for $3,495, and four-drive versions list for $5,795. IBM Micro Channel Architecture versions cost $100 more.

For the record, the Time Magazine CD-ROM Almanac includes the full text from 1989 *Time* issues and major news items dating back to 1923 — a total of nearly 5,000 articles. The CD also packs illustrations, a current-events quiz and an almanac-style facts-and-figures compendium. The release, intended for educational institutions and libraries, is slated to ship in two weeks at a price of $195.

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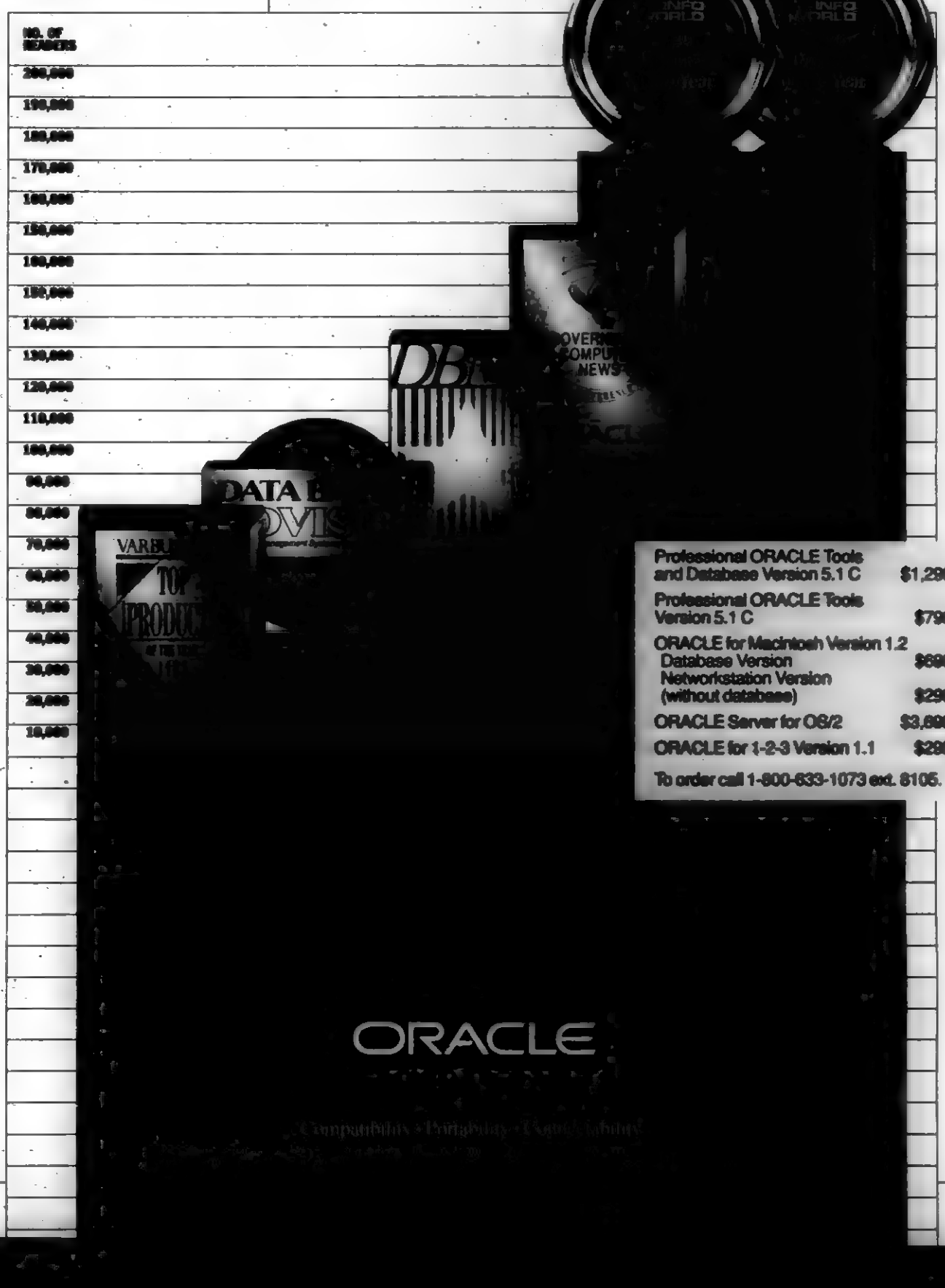

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MCA allies form consortium

BY MICHAEL FITZGERALD
CW STAFF

IBM may be admitting that there are cracks in the foundation of its Micro Channel Architecture (MCA).

IBM, along with Intel Corp., NEC Technologies, Inc., NCR Corp., Ing. C. Olivetti & Co. and several other vendors, will announce on Wednesday the formation of the Micro Channel Developers Association (MCDA), a group designed with the purpose of improving the flow of information on MCA between IBM and its licensees.

Analysts said IBM's decision to participate in the licensee-driven vendor group indicates that it may be worried about mounting support for MCA rival Extended Industry Standard Architecture (EISA).

While MCA-based systems have outsold those using the competitive bus, EISA vendors are expected to gain market share rapidly during the next three years. Nevertheless, Industry Standard Architecture machines using the IBM Personal Computer AT bus continue to outsell both architectures combined by a wide margin.

The projected loss of market share is what has IBM worried, analysts said.

"It sounds like IBM has decided they'll lose significant market share if they don't make [MCA] more open. At this point, it's about one year too late," said Robert Charlton, a high-end PC analyst at Dataquest, Inc., a market research firm in San Jose, Calif.

Charlton added that if IBM were to make MCA more open by lessening its stiff licensing structure, the association could go a long way toward altering perceptions about the proprietary nature of MCA. An IBM spokesman said the company felt MCA was an open architecture already and saw no need to change its licensing arrangements.

Not all analysts viewed the announcement as a concession by IBM that MCA was failing.

"IBM is doing such a good job in the PC business right now — they're taking a lot of share on the desktop, have an incredibly aggressive pricing strategy and [are] supporting dealers better than ever before — that I think they're just trying to build their momentum [through the MCDA]," said David Korus, computer systems analyst at Kidder, Peabody & Co.

Officially, the MCDA will serve as a clearinghouse of information about MCA, according to an IBM spokeswoman.

Members of the group said they hoped to be able to get products out the door faster and influence IBM on the direction of MCA.

Representatives of 14 member companies will form the MCDA's executive committee.

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Retix aims to unseat TCP/IP

BY JOANIE M. WEXLER
CW STAFF

SANTA MONICA, Calif. — A ray of light may have seeped through the Open Systems Interconnect (OSI) fog last week when Retix announced software aimed at usurping the widespread Transmission Control Protocol/Internet Protocol (TCP/IP).

Retix claimed its products outshine most implementations of TCP/IP on both memory requirements and performance. The company will demonstrate OSI LAN Transport for DOS and OSI LAN Transport for OS/2 — which are targeted at hardware vendors for integration into computer equipment — this week at the Interop '90 show in San Jose, Calif.

OSI's large memory requirements and speed inefficiencies have traditionally been perceived as two of the many barriers to OSI acceptance. Retix cited test results of 8M bit/sec. throughput for the DOS version and 4.8M bit/sec. for the OS/2 version on Intel Corp. 80386-based Ethernet local-area networks, depending on which LAN adapter card is used. The DOS version reportedly uses 56K bytes of personal computer-resident memory, compared with the up to 128K-byte requirements in existing OSI transport implementations.

Edwin Riddle, head of communications and network systems at the NASA Langley Research Center in Hampton, Va., said the announcement could be good news for government agencies, which must support OSI standards in new procurements.

"Our big OSI concern has been a lack of an equivalent protocol to TCP/IP for interoperating among different vendors' equipment," he commented. "Right now, we get 1M to 2M bytes of throughput with our TCP/IP implementation if we're lucky, and our TCP package uses over 100K [bytes] of memory."

Riddle operates several Ethernet networks running FTP Software, Inc.'s fairly robust TCP/IP for DOS and OS/2 implementations. "I would have some serious questions about Retix's throughput benchmarks," Riddle acknowledged, "but I'd sure like to try the products."

New and old OSI applications, as well as DOS and OS/2 applications, can run on top of Retix's software, which is slated for availability next month.

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Network General enhances error-seeking analyzer

BY ELISABETH HORWITT
CW STAFF

MENLO PARK, Calif. — Local-area network users' demands for an ever-larger piece of the corporate backbone may be on the verge of colliding with an increasingly profit-conscious top management. That's the scenario Network General Corp. hopes to take advantage of with last week's introduction of an enhanced version of its Sniffer product that is said to pinpoint glitches, bottlenecks and bandwidth-hogging applications across LAN-to-WAN connections.

The need for such a device is embryonic but growing rapidly, according to Vertical Systems Group. Out of 1,750 companies surveyed by the Dedham, Mass.-based research firm, 59% said that LAN traffic would take up more than 25% of their WAN bandwidth by 1994.

The WAN/Synchronous Sniffer Analyzer is based on Network General's Sniffer LAN diagnostic tool, so users can employ a common set of commands and screens to analyze the same wide range of high-level network protocols on either LANs or LAN-to-WAN connections, Network General Chief Executive Officer Harry Saal said.

For example, WAN Sniffer can figure out which LAN device, application or network protocol is generating an unwarranted amount of LAN-to-WAN traffic, Saal said.

One boon to the budget-conscious is the product's ability to identify the exact source of network slowdowns, often enabling network managers to boost response time without adding expensive bandwidth, Saal said.

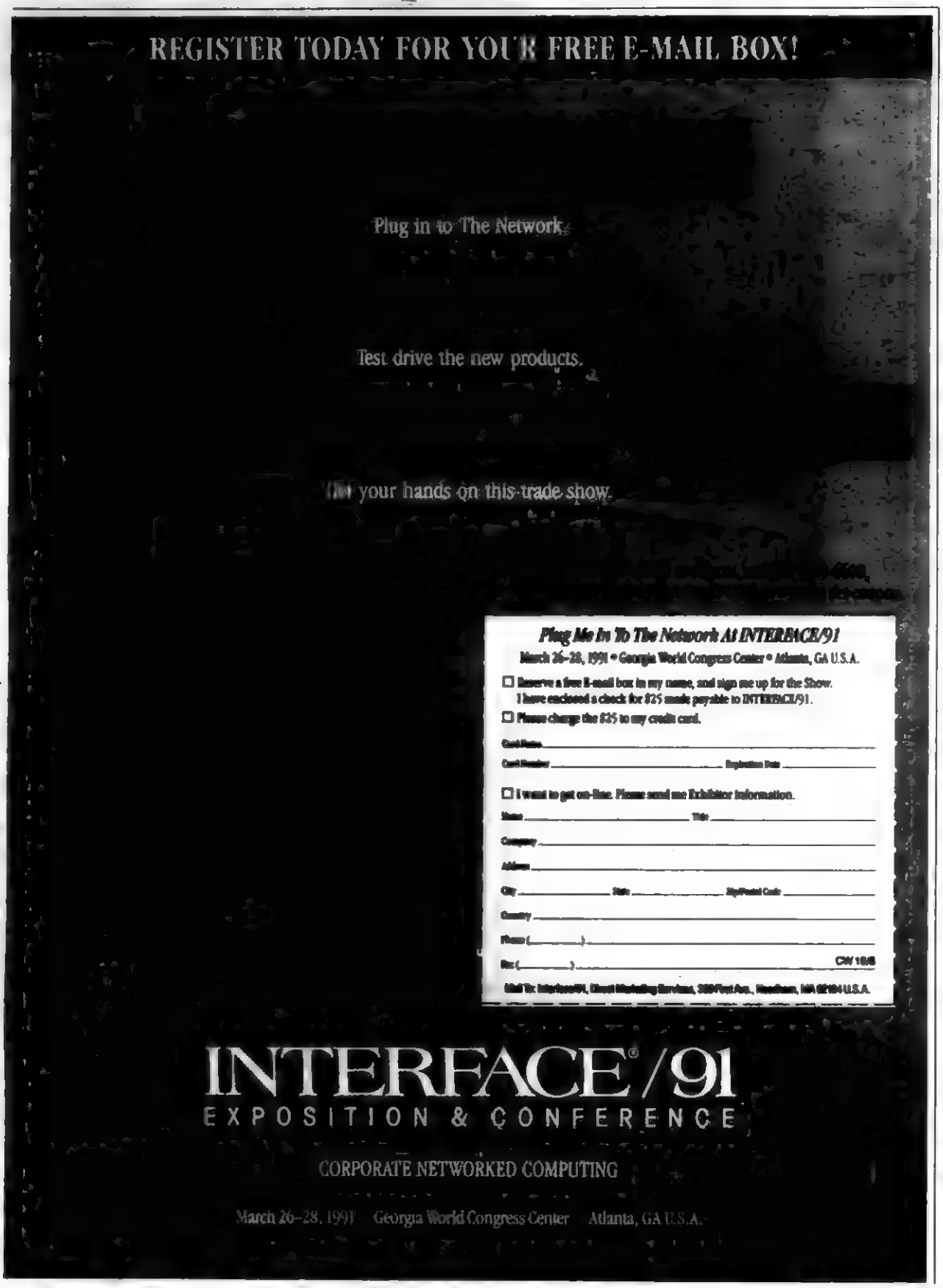
"Having something like Sniffer is very important to locate degradation or errors if they do happen to creep in," said Robin Layland, a manager of IBM Systems Network Architecture (SNA) software engineering at The Travelers Corp. Bridges and routers have primitive error correction at best, Layland said, adding, "If they encounter an error or confusion, they throw [the offending packets] away and assume that someone will ask for a resend."

With its ability to trace bandwidth use to individual users and applications, Sniffer could provide the industry with a much-needed LAN-to-WAN chargeback system, said Ken McGee, program director at Stamford, Conn.-based research firm Gartner Group, Inc.

Chargeback is of increasing importance to companies that are "turning to outsourcing because their telecommunications expenses are out of control," he added.

WAN Sniffer analyzes traffic traveling over links of up to 64K bit/sec. Support for 1.5M bit/sec. T1 links is planned for a future release, Saal said.

Available immediately, a dual-topology LAN/WAN Sniffer Analyzer is priced at $21,750, with a WAN upgrade to an existing LAN Sniffer costing $5,500.



HP opens up net software to Sun

BY J. A. SAVAGE
CW STAFF

Staying true to its promise of "open" open systems, Hewlett-Packard Co. said it will offer its 10-month-old network management software package for rival Sun Microsystems, Inc.'s Unix workstations as well as its own Apollo Division computers.

HP also said it is considering porting the product to IBM's and The Santa Cruz Operation's versions of Unix.

Trying to establish the product specifications as standard for Unix, HP submitted its framework to the Open Software Foundation for approval late last month. The submission was cosigned by IBM.

The product, the Openview Network Management Server, allows a network or systems administrator to track CPU and memory use throughout a heterogeneous network. In addition to the basic Unix product, the new version encapsulates applications so they can be initiated remotely and allows even-status communications between MS-DOS-based servers and Unix servers. It also supports Microsoft Corp.'s Windows Version 3.0.

Users of the Apollo DN 10000 can take advantage of Openview if they implement the latest version of the Apollo Domain operating system, Version 10.3, according to Duncan Campbell, marketing manager at HP's Network Division.

Openview has run on HP's Unix-based 9000 series since the beginning of the year. A DOS version of the product has been available since 1988.

"HP is trying to convince people not to bother with system software and concentrate on value-added specific applications," said James Herman, an analyst at Northeast Consulting Resource, Inc.

Sun also has a network management product, Sparcserver Manager. While it is also Unix-based, it is bundled to work only on Sun products. "Sun can't lose," Herman said. "People will either use Sun's network manager or their platform."

The unbundled HP network manager costs $7,000 for a user license.

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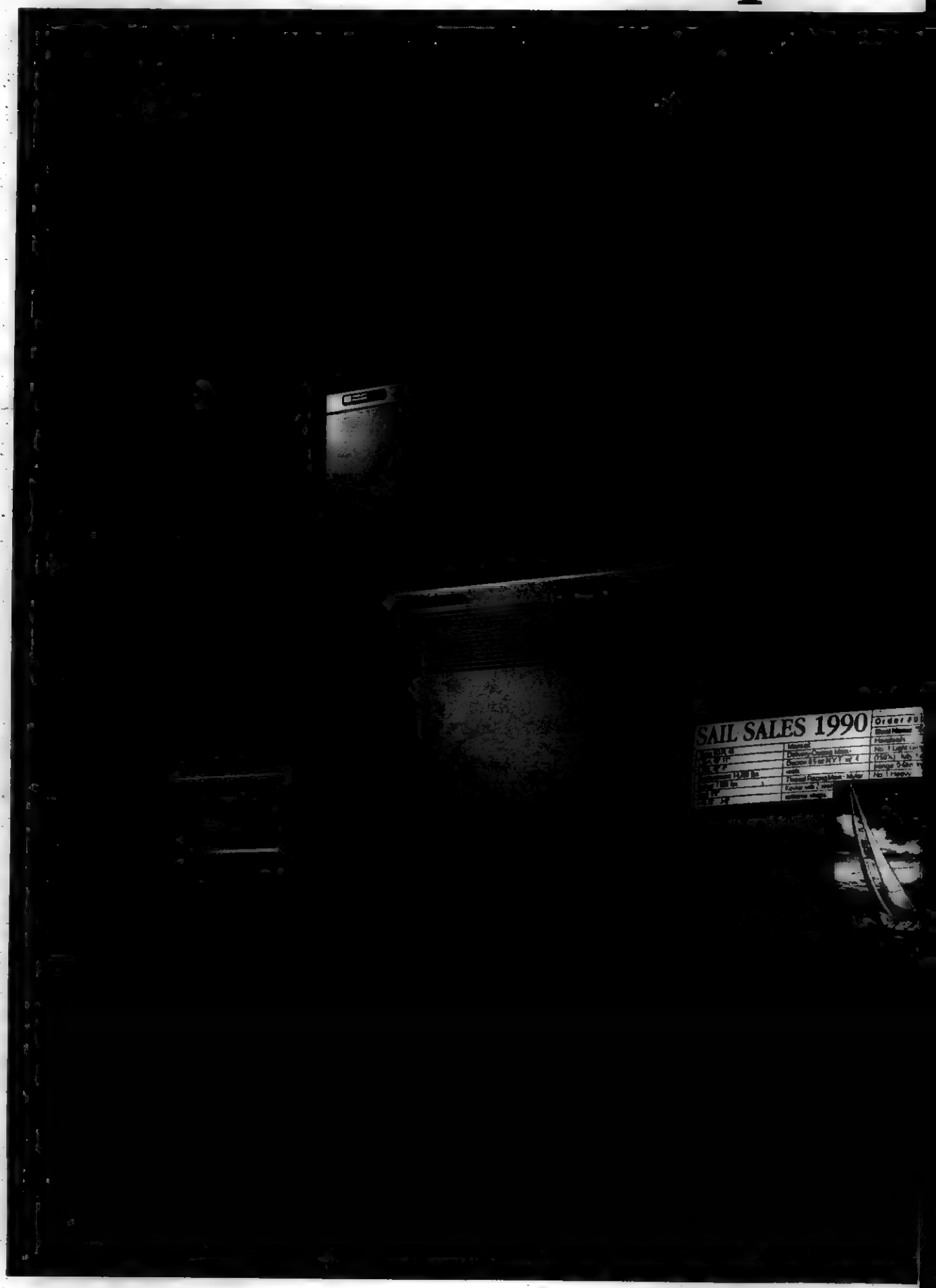

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San Francisco businesses decry VDT proposal

BY J. A. SAVAGE
CW STAFF

SAN FRANCISCO — In the first public hearing concerning San Francisco's proposed VDT legislation, small businesses said it could put them out of business and large businesses said it could cost them more than $30 million per firm.

The legislation, backed by a majority of San Francisco supervisors, would mandate adjustable tables and chairs for businesses with more than 15 VDT workers. It would require nonglare screens for workers, at their request, and a minimum of five feet of space between the back of a VDT and the next worker, among other provisions.

Two of the more controversial portions of the bill — requiring that management give pregnant workers alternative work if requested and promotion of eye examinations — were dropped from the package "due to the potential for legal challenges," said supervisor Angela Alioto, chairwoman of the City Service Committee (San Francisco city and county share jurisdictions). The city attorney's office feared that the state and federal governments preempted the city and county in those areas and that it would be overturned, as was a similar measure in Suffolk County, N.Y., on that technicality.

THE OVERALL economic state of affairs in the U.S. is seen as the largest single factor contributing to the drop-off.

The legislation was drafted by a coalition of unions, including Service Employees International, the Communications Workers of America and the Newspaper Guild. It faces opposition from the Small Business Advisory Committee and some of San Francisco's largest corporations, such as the Bank of America.

"It would cost $14 million for equipment and training, mostly due to retrofitting 6,000 workstations," said John Cammidge, vice-president of employee relations at Bank of America. He said it would cost at least another $30 million to implement the "five feet" rule.

Robert Harrison, director at the Occupational Medicine Clinic at the University of California, San Francisco, said the measure would save money when compared with the cost of treating worker injuries. He calculated the cost of treatment for one year at $3,120 and the cost of retrofitting one workstation at $1,135.

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NPUG, Prime seek cause of declining rolls

BY SALLY CUSACK
CW STAFF

NATICK, Mass. — Alarmed by a 20% decrease in membership for the 1989-1990 year, the National Prime Users Group (NPUG) Membership Committee, in conjunction with Prime Computer, Inc. in Natick, Mass., is surveying its members via a mass mailing to uncover the reasons behind declining renewals and enrollments.

The overall economic state of affairs in the U.S. is seen as the largest single factor contributing to the drop-off, said Peggy A. Long, western regional representative for NPUG.

Referring to last year's annual NPUG convention, which was held in Orlando, Fla., Long said that "six weeks out we had the highest registration we ever had, and three weeks before the conference we had the lowest numbers we've had in five years."

Members tended to lock into the discounted early-registration rates; numbers reflecting those signing on at later, full price fees were significantly smaller.

Belt-tightening barrier

Long and the convention staff put out a series of random calls to the user community to pinpoint the problem, and the majority of users responded that their companies were not inclined to pay for the trip and expenses last year.

With many companies tightening belts and budgets, this did not come as a big surprise to the NPUG organizers. According to Roland K. Kittredge, senior manager of marketing support at Prime and a NPUG board member, NPUG's membership is on an individual, as opposed to corporate, basis. Estimating that there are currently 2,000 members worldwide, Kittredge cautioned against placing too much significance on the recorded numbers, as "many individuals in organizations share the information provided to the NPUG member."

In preparation for next year's meeting in San Antonio, Texas, Long is working to step up publicity for the group and hopes to reach more third-party software developers and new users who may be unaware that such an organization is available to them.

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ADVANCED TECHNOLOGY

Optical processing: Smooth-flowing traffic

Data transmitted by light instead of electrical impulses holds significant promise for a freed-up data highway

BY JAMES DALY
CW STAFF

To fully appreciate the concept of optical computing, which uses pulses of light instead of currents of electricity to carry information, it may be necessary to climb into a helicopter.

Imagine for a minute that you're hovering above Manhattan. It is rush hour, and the bridges radiating from The Big Apple are crammed with cars anxious to escape the crowded isle. Because they can only hold so much traffic, however, commuting is a painfully slow process.

Consider how much easier the ride would be if 100 more bridges were built or if each bridge was a thousand lanes wide. A team of researchers at AT&T's Bell Laboratories has done just that and applied it to the field of high-performance computing.

"We've got the ability to open up the data highway tremendously," said Tod Sizer, a member of the technical staff of Bell Laboratories' Optical Computing Research Department in Holmdel, N.J.

Light beams can be programmed to move through the air without dispersing, Sizer said, and pass through each other without interference. An optical computer could send millions of signals to the smallest of switches without a single physical connection.

Earlier this year, the Bell Laboratories team announced what it describes as the first digital optical processor, which department head Alan Huang called a key breakthrough toward realizing its goal of producing a full optical computer within the next two decades.

No bottlenecks

What has excited researchers of photonics is that optical-based systems quickly eliminate computing's classic speed conundrums: Too much information is trying to get to the same place at the same time.

Until now, the typical method of getting computers to run faster was by packing more chips into the system design. But that produced unwanted baggage: Heat increases proportionally to the number of chips crowded into a small area, and the electromagnetic fields emanating from the chips can scramble information on an abutting chip.

Electricity must also travel along a wire. If the wires are not isolated, they can garble information on a nearby wire.

Optical computing meets these restrictions head-on. An optical computer would require far less power than an electron-based computer. Also, a computer tapping into the speed of a photon — the basic particle of light — would only be limited by the rules of physics.

Although the concept of optical computing has been kicked around for more than 20 years, the obstacles to producing a machine based on those principles are formidable. "Unfortunately, one of light's greatest strengths is also its greatest weaknesses," said John Caulfield, director of the Center for Applied Physics at the University of Alabama in Huntsville.

Because light beams don't interact, they cannot flip the on-off switches that govern when and where data flows. AT&T researchers tamed that problem in January when they announced Symmetric Self-Electro-optic Effect Devices (S-SEEDS), which handle photons the same way silicon handles electrons. S-SEEDS work as light lenses that control the amount of light passing between processors by opening and closing according to the intensity of the light.

But the S-SEED technology is still in its rudimentary phase. As a result, "Optical computing will never replace electron-based computing, because you've always got to bring electrons into the game at the switch level," Caulfield added.

While photonics has filtered into the computer industry — fiber-optic cabling and optical storage discs have been around for years — an optical-based system could rewrite the rules of high-performance computing. AT&T scientists hope that an optical computer can operate at several hundred million cycles per second, giving it the potential to be 1,000 times as powerful as a Cray supercomputer.

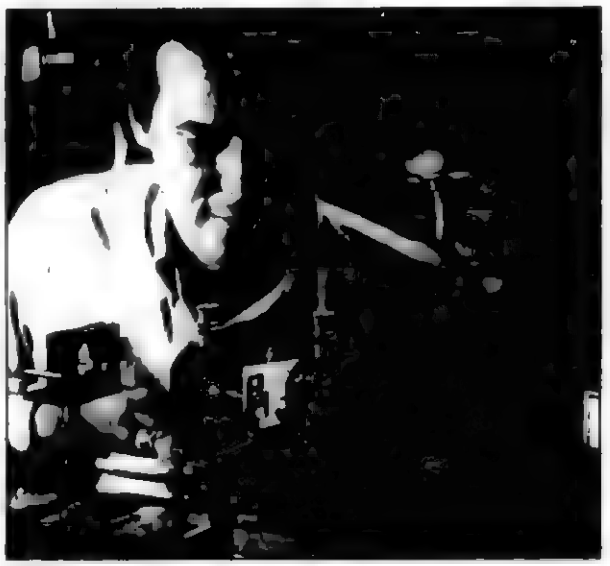
Although it seems improbable that optical-based systems will take over the desktop anytime soon, they are already actively targeted at computationally intensive applications in seismic exploration and geophysics.

Another early use, Sizer said, will come at phone company switching stations, which typically route millions of calls daily. The Pentagon is also interested because optical computers would be more secure.

The repercussions of optical computing, however, could work their way into the home as well as outer space. For example, the higher capacity of optical lines could permit firms to offer such data-intensive services as pay-per-view home television, sporting thousands of titles.

Elements of optical computing are also likely to spin off into the machines we use every day. An early target: PC data bus architectures, which serve as the traffic cop for data passing around the machine and which often account for performance slowdowns.

Optical computing continues to draw enthusiasts. "We all hold beliefs that we hold strongly but just can't absolutely prove at this moment," Caulfield said. "Optical computing is one of my beliefs."



AT&T researchers *David Miller (left) and Jill Henry work on a chip designed for optical computing*

Fishing around with virtual computing

BY MARYFRAN JOHNSON
CW STAFF

Imagine that the machine on your desktop was capable of changing identities on command — one minute an IBM Personal Computer, the next minute an Apple Macintosh.

Impossible, right? Those processor chips with their myriad functions were etched into silicon back at the factory. That's why they call it hardware.

Well, swing off the logic gate into the abstract world of virtual computers, where the boundaries of software encroach on hardware's territory, and the rules of the game can be changed.

"The idea behind a virtual computer is basically taking the notion of software to its logical extreme," said Brian Silverman, director of research at Logo Computer Systems, Inc. in Montreal. Silverman is the author of Phantom Fish Tank, a $30 recreational software package that allows users to design a two-dimensional virtual computer on their PC screen and then watch it in action.

The screen of Phantom Fish Tank is divided into 1,600 tiny cells or squares — cellular automata — that represent the logic gates on a silicon chip. Each cell is in either an "input" or "output" state and by following a few simple rules can change its state (and color) with each tick of the computer clock.

The whimsical name of the program, which runs on IBM Personal Computers, PC-compatibles and Apple Computer, Inc. IIs, refers to the strange undulating patterns made by the cellular automata as they move around the screen.

A fuzzy line

That imaginary PC-to-Macintosh quick-change act described above is one way Silverman explains what virtual computing may one day accomplish.

"That hardware/software boundary could be pushed back a little," he said. "The stuff people think of as hardware could itself be implemented in software."

Another way to think about the possibilities of virtual computing is to picture the grid of a silicon chip as a city map, with roads and intersections etched in concrete. "Now imagine that instead of something solid, you could make it in more reshapeable materials," he explained. "When you graphically changed the map, you would change the function or direction of the road."

The Phantom Fish Tank is more a "proof of concept" than a serious demonstration of virtual computing, Silverman emphasized, and practical uses for virtual computers are at least a decade away.

Still, the game seems to appeal to a diverse collection of users. The software designer remembers one particular day when two teachers told him how useful they found Phantom Fish Tank in their philosophy discussions with their classes. "What grade do you teach?" he asked them.

"Graduate school," the first teacher said.

"Third grade," the other replied.

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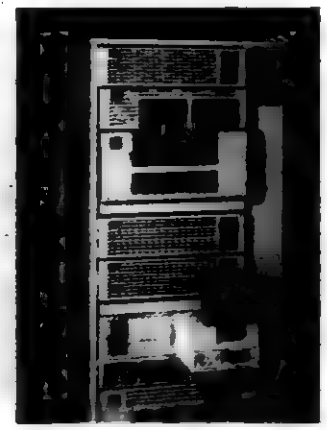

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EDITORIAL

Playing to win

"GONE ARE THE days when information systems could hide in the back office, sheltered from the turbulent winds of corporate change."

Those words appropriately open this year's *Computerworld Premier 100* — our tribute to the most effective users of information technology in the U.S. As much as anything else, what our high-performance IS leaders hold in common are the willingness and ability to enmesh their organizations into the very fabric of corporate competitive strategies.

Today, those strategies are as diverse as the challenges facing the firms, challenges that are fostering some downright desperate situations:

- The threat of war in the Middle East has hammered Wall Street, where big investment houses have never fully recovered from the crash of three years ago.
- The economy's painfully slow slide to a near-zero growth state is sending consumers to the spending sidelines, putting many big retailers into a tailspin.
- The greatest swindle in history — the savings and loan scandal — has paired with a federal deficit of sinful proportions to prompt a proposal for the biggest-ever tax increase in the U.S., further shaking the economy.
- Global competition has driven the U.S. from leadership in virtually every industrial sector except defense-related products — and computers.

Yet through it all, some firms rise above an increasingly dicey situation, seeming to fire on all cylinders no matter what the conditions are.

The *Premier 100* firms continue to invest in information technology, with most companies reporting healthy increases in IS spending for mission-critical technology. As most of the IS managers in the *Premier 100* also said they are under closer scrutiny from senior management than ever before, clearly this group is doing a spectacular sales job to gain the financial support it needs.

At the same time, 70% of the group either has consolidated data centers or will do so shortly to contain costs.

A majority has moved to the hybrid centralized/decentralized IS structure that the futurists of five years ago envisioned. That keeps the IS groups closer to the action and flexible while at the same time maintaining systems security and compatibility.

Finally, virtually all the *Premier 100* companies continue to invest heavily in network solutions and, perhaps most importantly, in human capital through training programs.

So it is by no accident, stroke of luck or "help" from the government that the companies of this year's *Premier 100* are making such effective use of information technology. That is fortunate for them because, as our lead article concludes, "All the ups and downs of life at the top of IS evidenced by the *Computerworld Premier 100* show the battle scars of the 1990s. And to think it's only the beginning of the decade."

LETTERS TO THE EDITOR

Skilled and ready

Your recent In Depth look at the changing work force [CW, Sept. 17] was interesting, but you seem to have missed two important points. The words "degreed" and "skilled" are not synonymous. There are many skilled workers out there who are being overlooked because they have talent and experience but no piece of paper to make them acceptable to personnel departments.

A college education has always been expensive, and many people have not been able to afford it or have had other commitments such as a family or the military. This does not make them unworthy, stupid, unprofessional or second-class citizens. They deserve consideration.

In addition, while companies are forming partnerships with colleges and high schools, they are failing to provide training to the workers they already have. Then, when things get tight, these people are discarded because they no longer have current skills.

If companies are really concerned about the perceived shortage of skilled labor, they should address their own contributions to it.

D. L. Richards
Systems Programmer
Montclair, Calif.

Not blaming IBM

I commend you on your coverage at the 29th annual National Convention of the American Council of the Blind, "Blind IS managers defy career odds," [CW, July 9].

However, I'm concerned about a passage in "Inside Lines," on page 126 that reads, "Computer users at the American Council of the Blind in Denver last week were angry that IBM's new graphical user interface strategy leaves them stranded."

While the quote that follows is accurate, that sentence is not. The American Council of the Blind does not blame IBM for the graphical user interface environment. While we are concerned about the importance of accessibility to the graphical environment, we did not express anger toward IBM or any other company in the computer industry.

We view the graphical environment as progress that is here to stay. We applaud IBM and other corporate efforts to help blind and visually impaired Americans find new ways of accessing the environment and thereby broadening and maintaining their employment horizons.

LeRoy F. Saunders
President
American Council of the Blind
Washington, D.C.

OOPS!

Your publication of "The scoop on OOPS" [CW, Sept. 17] does a disservice to your readers.

While the article starts out by claiming that it will tell you what you need to know about object-oriented programming systems, the author's notes seem to have become mixed up with another article about object-oriented databases.

Object-oriented databases are an important component of OOPS, particularly within the management information systems world, but are by no means the most important.

The "big idea is simple," but it is not that "repetitive programming code should be written only once." Instead, the big idea is that OOPS is about modeling the real world and reducing the so-called semantic gap between users and developers.

To say that OOPS "is a descendant of Unix" because C++ is an extension of C is an error of significant proportions. C is a fairly recent player on the object-oriented language scene and represents the retrofitting of a procedural language with object-oriented extensions.

In the side box titled "Object-oriented guide," the author claims that "not much productivity increase will be seen in the first few years until a library of objects and object modules is built." This is contrary to our experience.

With modestly experienced programmers working in a Parcplace Systems Smalltalk environment and employing the appropriate tools and disciplines, we have seen immediate and significant productivity improvements.

Reuse of existing designs and code will increase these improvements as we accumulate developed applications to reuse from.

Charles M. Durrett
Plant Automation Division
Electronic Data Systems
Troy, Mich.

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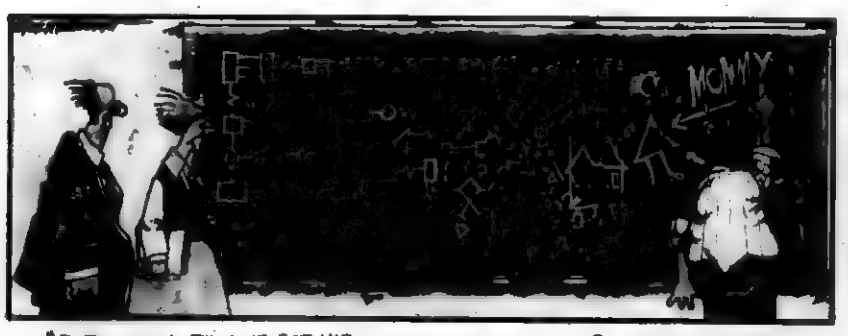

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Can technology effectively replace human teachers?

GLENN RIFKIN

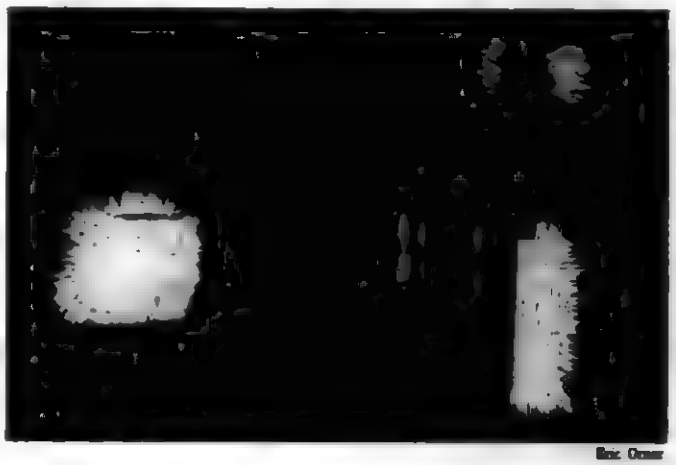
When I went to school, the most elaborate piece of technology ever seen in the classroom was a movie projector. The teacher would flick off the lights, hit the projector switch and hope that the antiquated 16mm machine would whir and click its way through some boring film about Guatemala without breaking down.

No more. Technology has hit America's schools in a big way. We've all heard about the computer literacy of the next generation, but maybe we haven't realized just how widespread this thing has become.

There are an estimated 3.3 million computers in U.S. classrooms. Personal computers are now used for instruction in 98% of U.S. school districts, according to a survey by the Wirthlin Group in McLean, Va.

This is a fairly amazing statistic when you think that these computers were really not available to the public until 1982 — more amazing when you realize that user interfaces simple enough for a child to use are no more than five years old.

The critical question, however, is whether these technical marvels are simply shoring up an increasingly bleak picture in America's classrooms or are actually producing brighter, better educated students. This question rises beyond K-12 all the way to the college campus.



Eric Orner

Definable benefits?

Is the computer nothing more than an elaborate teaching aid? What evidence do we have, now that a generation of students has been exposed to computers in school, that we are turning out better graduates?

If the '80s were any indication, the sad answer to that question is: not much. Scholastic Aptitude Test scores have steadily declined during the past decade, despite access to computers by precollegiate students.

Interest in critical disciplines such as math and science — areas in which computers should have the most impact — has also continued a dramatic decline. There simply seems to be no hard evidence that computer use has produced better students.

At Dartmouth College, for example, personal computers are required for incoming freshmen. Thus every student on campus has an Apple Macintosh in his dorm room. A Dartmouth professor noted that while students now turn in papers that are clean, readable and without spelling errors, the content of papers is of no higher quality than in precomputer days.

Perhaps it is unrealistic to expect that computers, in and of themselves, are capable of having such a dramatic impact. A computer, after all, is no more or less effective than the person operating it. It is a machine — a tool that, despite great advances in technology, cannot think. As anyone with a PC knows, the technology can be friendly, but not all that friendly.

Teachers, for example, are forced to climb the learning curve along with their students, and many continue to be intimidated by technology. It is tough, if not impossible, to use a teaching tool with which you are uncomfortable.

Older students without a penchant for programming or exploring on their own the often complicated application software packages available will be at a loss to get real value from a computer in the classroom — or anywhere else, for that matter. Students, teachers and parents expecting miracles from the fact that computers are now in the schools are bound to be disappointed.

This is not to say that computers can't be effective in the classroom. In the Wirthlin study, 82% of the teachers surveyed said they believe that using computers increased their students' motivation for learning.

Early school-age children are benefitting from such programs as IBM's Write to Read program, in which 5-year-olds can use computers to write any word they can say. IBM launched Write to Read in 1984 and claims that students in the program are outscoring comparison groups in writing and reading.

IBM correctly points out that computers help provide the kind of one-on-one learning environment that a single teacher cannot offer in a classroom setting. Certainly, in substandard inner-city schools, these aids are invaluable.

Irreplaceable

In an era when the teaching profession has been shamefully devalued, computers may indeed be a salvation in providing remedial skills to young children. However, it is folly to believe that a PC can ever replace a dedicated, talented teacher in a classroom.

The biggest fear of this seemingly positive trend is that computers will become substitute teachers — better than the wide-eyed, confused subs we used as targets of paper airplanes and spitballs, but far worse than a real live professional.

Only a Luddite would openly scorn the use of PCs in the classroom; their potential as teaching tools, especially with advances in such technologies as artifical intelligence, is unlimited.

But the education crisis in America needs more than an infusion of technology. It needs a reprioritization of social values — values that have slipped shamefully and require more than bits and bytes to repair.

Rifkin is a *Computerworld* features editor.

LEWIS PERELMAN

One of the most dangerous myths that is threatening the U.S. economy is the ritual incantation, "Technology will never replace the classroom teacher." The truth is, it already has. By paying lip service to this myth, the computer and telecommunications industries are squandering their most lucrative growth opportunity. Worse, they are undermining efforts to retool America's work force in a way that harms the nation's most disadvantaged people.

Information technology is at least as capable of displacing and transforming labor requirements in education as in any other business; the academic bureaucracy has simply not allowed it to do so in most schools. However, research and practical experience have demonstrated technology's potential in areas of the learning enterprise outside the control of the "educrats."

One firm recently showed me a new computer program it plans to market in 1991 that can teach students of any age to read English up to any level of proficiency — without the aid of a human teacher. Another firm is using laptops to deliver basic education in New York to 1,800 welfare mothers and their children — over the telephone. In the Oklahoma panhandle, public schools are cutting teacher positions and using the payroll savings to help pay for a fiber-optic network that allows students 100 miles apart to take the same teacher's class via two-way interactive video.

In higher education, National Technologic University is an electronic graduate school with no campus or full-time faculty that nevertheless provides continuing engineering education to more than 3,000 students all over the U.S.

These are not unique examples. Over two decades of research shows that computer-based instruction produces at least 30% more learning in 40% less time at 30% less cost, compared with traditional classroom teaching. A research survey published in a leading education journal found at least 125 technologies and methods that proved to more than double the productivity of teaching, yielding at least twice as much learning for each unit of labor time or other cost.

Computer vendors, unless they've been living on Mars, cannot claim ignorance of the classroom teacher's rapid obsolescence. Former IBMer Jack Bowsher published a book last year recounting the five-year effort he led to modernize IBM's $2 billion-per-year employee education system by replacing most classroom courses with instruction delivered by computers and telecommunications.

Unisys' training director is planning to convert at least two-thirds of the company's classroom instructional programs to such "telematic" methods. In general, employers are spending at least 300 times more on computer-based instruction than are public schools.

There are more than 45 million personal computers in use in the U.S. today, compared with virtually none a decade ago. This means perhaps 60 million people or more learned how to use PCs, and almost none of this crucial learning took place in schools. It was delivered by vendors, manuals, tutorial software, videos, hot lines, user groups, books, magazines, help systems, trial-and-error and lots of schmoozing. Many parents and teachers will testify that kids have often led adults in climbing up the PC learning curve.

Some $370 billion will be spent on U.S. schools and colleges this year. About one-third of that amount — more than $100 billion — will be wasted by the failure to employ the most productive off-the-shelf technology for teaching and learning. When other kinds of education are included, learning is about a $400 billion to $600 billion business in the U.S. — the biggest information industry and the most technologically backward sector of the economy.

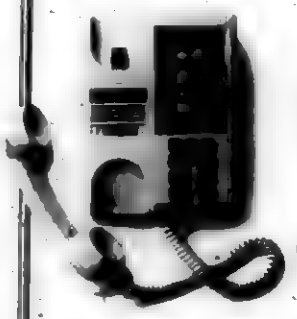
This is the greatest business opportunity since Rockefeller struck oil. Yet most computer and telecommunications firms are bending over backward to blow it, mainly because of raw fear of the political conflict that must come with challenging an entrenched establishment. Ironically, the same firms are seeing their global competitiveness undercut by the festering ignorance of the U.S. work force. Talk about shooting yourself in the foot!

COMPUTER-BASED instruction produces at least 30% more learning in 40% less time at 30% less cost, compared with traditional classroom teaching.

The U.S.' mostly government-owned, operated and subsidized schools and colleges are this country's collective farms. They are declining for the same economic reason the whole Soviet empire has collapsed: lack of market incentive for productivity and, hence, for technological innovation. Instead of brown-nosing educrats and dumping equipment on schools, the computer industry should be supporting the political movement to restructure education by introducing choice and competition to public education; accounting for student learning, not just attendance; and shifting education budget priorities from labor to technology.

The computer industry's continued failure to support such political action will not only shortchange stockholders but also hurt the U.S.' most disadvantaged people. The well-off will get access to high-tech learning regardless of public policy — through the workplace, the home and other private sources. Only the poor and minorities will be stuck in the knowledge ghetto of the public school's 11th century technology.

Perelman is director of Project Learning 2001 at the Hudson Institute in Alexandria, Va.



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10:06 P.M. We're sorry, room service is now closed. You can place a breakfast order by pressing 3. "I'd like two eggs, over easy, with bacon. Make sure the bacon's crispy. Toast, lightly buttered. Freshly-squeezed orange juice. And coffee, black. To room 235 at 6:15 A.M." *6:00 A.M.* Good morning.

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"John? Ted again. Don't forget to bring the revised contract to the meeting.

Still don't know what room we're in." *7:00A.M.* To record your

own personal greeting, press 7. [redacted] "I just went down for a quick

workout. I'll be back in a few minutes.

Leave your [redacted] message at the sound of the beep."

7:20A.M. You received one new voice message.

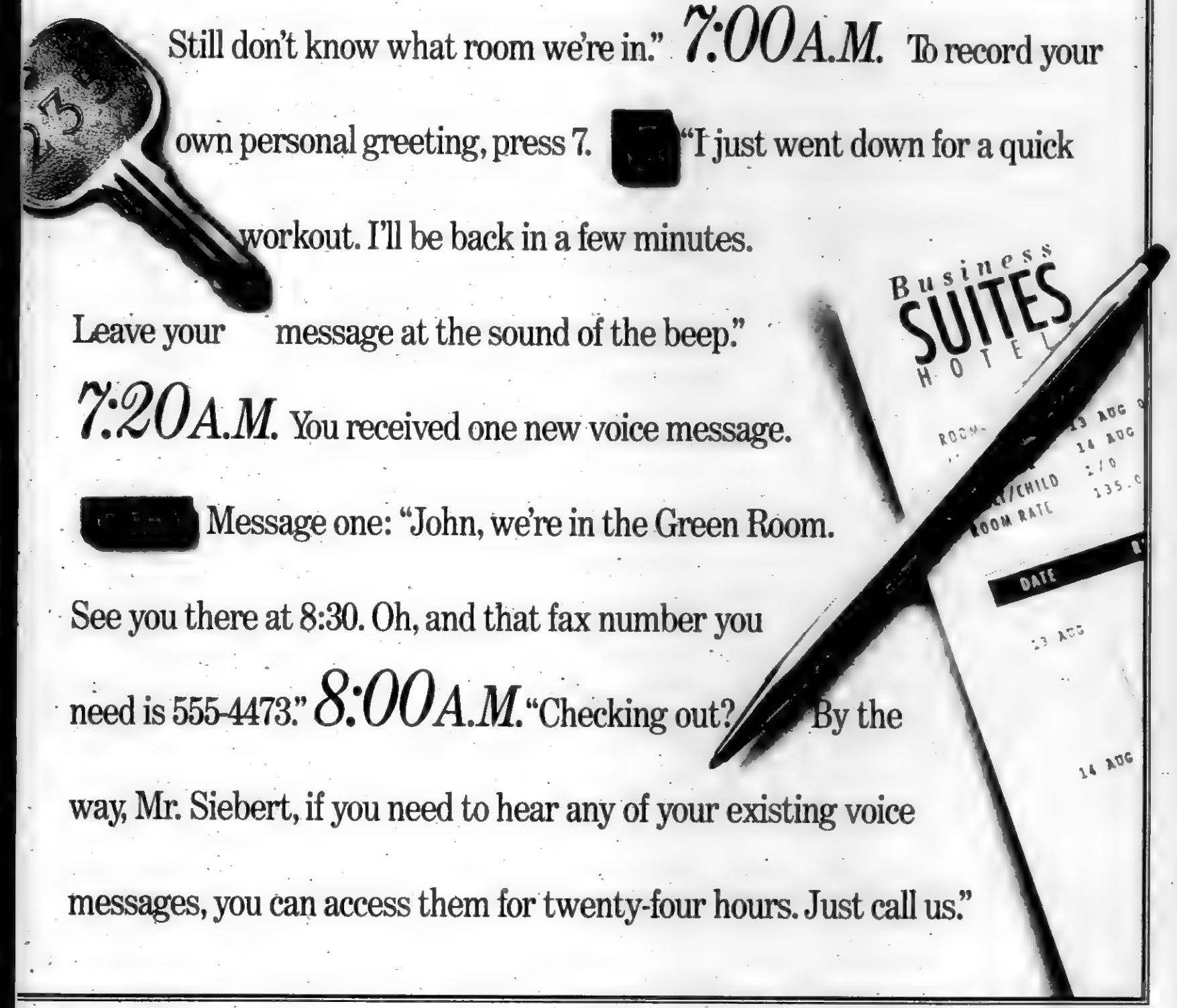
[redacted] Message one: "John, we're in the Green Room.

See you there at 8:30. Oh, and that fax number you

need is 555-4473." *8:00A.M.* "Checking out? [redacted] By the

way, Mr. Siebert, if you need to hear any of your existing voice

messages, you can access them for twenty-four hours. Just call us."



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Let's take a look at what makes SQL/DS Version 3 the best DBMS for users of the VM and VSE operating systems.

Standards

In addition to the high performance and robust features that serious database applications require, SQL/DS has three features that are essential to implementing the most important information architecture of this decade—distributed computing. These features work together to provide an excellent environment for implementing distributed applications.

The first feature is SQL/DS's adherence to international standards for SQL as expressed by the American National Standards Institute (ANSI), the International Standards Organization (ISO) and the Federal Information Processing Standard (FIPS) 127.1. FIPS has created a test suite so vendors can measure how close they come to the SQL specification. Version 3 Release 2 of SQL/DS easily passes this test. SQL/DS even provides a "FIPS flagger" program to help users identify SQL statements failing to comply with the FIPS standard.

The second important feature is SQL/DS's participation in SAA connectivity using Advanced Program to Program Communication (APPC). This communication standard simplifies building cooperative processing applications with SQL/DS. In particular, APPC makes it easy to use SQL/DS as a database server in client server applications. In this style of distributed computing, the DBMS provides intelligent access to the data for client applications running on remote computers. These remote computers can be other mainframes, but more and more they are PCs with a graphical user interface such as OS/2 Presentation Manager.™

Not only do IBM's applications such as QMF use SQL/DS as a server, but third-party products are being used as front ends to SQL/DS to build applications. Independent software vendors are also attracted by the large installed base of SQL/DS users.

Distributed Data Bases

The third feature needed for effective distributed processing is support for distributed databases: the ability to access data at multiple sites, including locally, in a transparent fashion. One benefit of a distributed database is that local data can be retrieved without any network activity, thus reducing communications costs when compared with a centralized database at a single remote site. Another potential advantage is that each database node can be appropriately sized to the amount of data, the complexity of user requirements and the number of users. As the system grows, added demand can be met more easily than with a centralized system, by making smaller changes to existing nodes or by adding new nodes to the network.

SQL/DS's "remote unit of work" capability delivers these benefits by allowing a collection of database operations (called a unit of work) to retrieve and update data at a remote site. Future releases of SQL/DS will add support for "distributed unit of work," which allows a single unit of work to access data at multiple sites simultaneously.

Connectivity

Because companies often rely on a variety of operating environments, IBM is committed to extending distributed database functionality. Currently, remote data can be shared among VM SQL/DS databases, and IBM has announced data sharing between VM SQL/DS and DB2 databases. VSE Guest Sharing, using VM TSAF, provides access to local or remote VM SQL/DS databases to VSE users and applications running under VM. IBM intends to add interoperability with AIX,® OS/2 and OS/400 applications and databases as well.

SQL/DS delivers the three keys to implementing distributed processing—SQL standards, SAA connectivity and distributed databases. If you need to solve tough data management problems in a VM or VSE environment, SQL/DS is the obvious choice. Get in on the secret.

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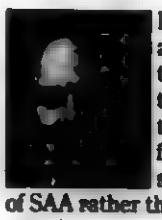
COMMENTARY

Jerrold M. Grochow

Defining SAA terms



Recent articles about IBM's Systems Application Architecture have focused on the shortcomings of SAA rather than on what SAA compliance has to offer. So what does SAA compliance mean, and who is providing it? Will IBM tell you? If not, who will?

Let's start with a definition. Complying with SAA means the following:

- Using the languages and interfaces defined in the SAA Common Programming Interface.
- Developing user interfaces that follow the Common User Access (CUA) definition.
- Using architectural techniques to design your application program for cooperative processing.
- Using one or more of the included operating environments.
- Using communications mechanisms specified in SAA Common Communications Support.

SAA compliance, however, is not an all or nothing proposition. The answer to the question, "How much compliance is enough?" depends on who is asking the question. It also depends on who is listening to the answer. In fact, the entire

Continued on page 39

DEC's Ultrix strategy falls flat

Observers see failure to differentiate Ultrix from other Unix offerings

ANALYSIS

BY MAURA J. HARRINGTON
CW STAFF

In an effort to gain acceptance by the commercial Unix market, Digital Equipment Corp. has been aggressively selling Ultrix, its Unix-based operating system, as an "open systems" product that can run on several different platforms.

However, analysts concurred that although DEC's Ultrix product has shown overall improvement, the 6-month-old strategy to gain more of a share of the commercial Unix market has been unsuccessful for two reasons.

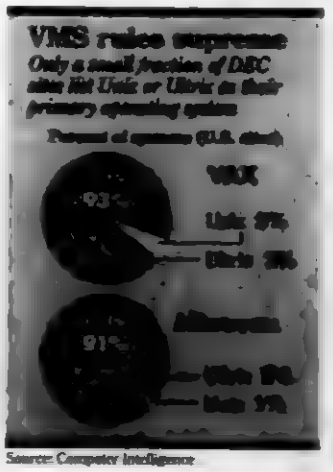
First, while Ultrix Version 4.0 now offers many of the same features other Unix platforms do, it has no outstanding features to differentiate the product. Second, it is ranked second to DEC's VMS operating system by the chairman and founder himself, Ken Olsen.

Unique streak

"The biggest problem DEC is faced with is the need to differentiate its Ultrix product from other Unix offerings," said Terry Shannon, an analyst at International Data Corp., based in Framingham, Mass.

DEC has attempted to convince users that Ultrix is a viable and competitive Unix product because it has more than 1,000 applications from independent software vendors and features that are accepted by the Open Software Foundation standards organization. Yet users are not listening very hard, according to analyst David Wu at S.G. Warburg & Co., an investment firm in New York.

"DEC has not been successful with its Ultrix product line, partly because when you have the founder of the company saying VMS is the best thing on the market, it's very hard to sell Ultrix — especially as an open system," Wu said.



Source: Computer Intelligence

Wayne Kernochan, an analyst in the Distributed Systems

Continued on page 36

Index, Ernst & Young join CASE bandwagon

BY ROSEMARY HAMILTON
CW STAFF

Those computer-aided software engineering (CASE) announcements just keep on coming.

Index Technology Corp. recently made its first move beyond the front-end design stage of CASE with the introduction of a re-engineering tool for Cobol systems.

Meanwhile, Ernst & Young is gearing up for its first move into the CASE market. It is scheduled to announce a consulting and methodology package called the Navigator Systems Series this week.

Index's XL/Recover is designed to review Cobol applications and provide help in both cleaning them up and bringing their data into an application development environment. The goal is to align existing programs with new ones so they can operate under the same structures and guidelines. The tool scans programs and then loads data and design information into the repository of Excelerator, Index's front-end software design tool. It also produces analysis reports of the programs so a user can pinpoint trouble spots.

One early user of XL/Recover is using the tool on a project that will merge applications from two operations into one. The U.S. division of Bertelsmann, a German media company, is creating one set of applications for both its book club and record club operations, which had functioned separately. This calls for both writing new programs when necessary and saving whatever software possible.

"We can see what already exists and what can be reused," said Everett Penn, a senior consultant at the U.S. division of Bertelsmann. "It also helps us identify what we don't have."

Information engineering

The Ernst & Young offering actually contains no CASE tools. The company has put together a package based on the information engineering methodology, which provides on-line guidelines, documentation and consulting services for software development. It is designed to support any product based on the information engineering methodology.

Ernst & Young has ties to Knowledgeware, Inc., which sells the Information Engineering Workbench. The Arthur Young portion of this accounting and consulting firm (the result of the merger of Arthur Young and Ernst & Whinney) provided start-up money for Knowledgeware, and Ernst & Young currently serves as a reseller of the Knowledgeware product overseas. But company officials insist that they will not promote Knowledgeware's product as the exclusive tool for the Navigator Systems series.

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Fault-tolerance out, DEC in at the Amex

ON SITE

BY JOHANNA AMBROSIO
CW STAFF

At the American Stock Exchange, Inc., "buy low, sell high" is more than the age-old adage about how to play the market. The philosophy also applies to how information systems staffers are revamping the exchange's computer architecture.

The exchange is getting rid of its high-cost Stratus Computer, Inc. and Tandem Computers, Inc. systems and is bringing in relatively low-cost Digital Equipment Corp. machines instead.

"Why pay extra for fault tolerance?" said John Diesem, senior vice-president at the exchange. "Our sense is that fault tolerance provides you protection against the thing least likely to fail — the processing unit. The mean time between failures for mainframe hardware is extremely high, yet you're paying a premium for fault tolerance."

Diesem *updates Amex*

Diesem and his team handle all the systems on the exchange's trading floor. He is also working with the Securities Industry Automation Co. (SIAC) to develop and implement the new architecture. SIAC, which is owned by the American and New York stock exchanges, houses, maintains and programs the host computers used by both exchanges.

The overall goal, Diesem said, is to bring the exchange's architecture up to date to quickly respond to changing business needs. The exchange is, for example, exploring around-the-clock trading and recently received regulatory permission to offer new options for investors to bet on the direction of the Japanese stock market. The new computers will allow the exchange to handle these requests with much more flexibility, he said.

With the current systems, applications for routing orders, storing orders and reporting on completed orders are stored on a different host computer. The last computer in the chain is linked to the terminals and personal computers used by brokers on the exchange floor.

"Our current architecture is monolithic," Diesem said. "Each is very valuable and contains its own data. But if you lose any one because a communications line goes down . . . the whole chain goes down — all the way to the floor."

Instead of having hosts with huge applications, smaller machines will pinch-hit for each other in case of failure. The new computers will house the same applications, but the software will be broken down into small, easier-to-maintain modules that will run on specific machines.

That way, when the exchange adds a new product, only the application on a server, for example, may need to be rewritten. "The way things are now, we have to do major surgery on the big systems if we want to change anything," Diesem said.

At the top of the revamped architecture will be two DEC 6420s to house the Open Order File, which is a record of all the orders to buy or sell stock. Mirrored data sets will run the VMS operating system. Next will be multiple Decservers, also running VMS, to house specific applications. The final level will consist of terminals and Unix-based workstations on the trading floor. The computers will be connected via Ethernet.

Diesem said he could not specify when the swapping out would be complete. However, he said, "A lot of this will start to come together in '91."

Is there room for minis in client/server world?

ANALYSIS

BY SALLY CUSACK
CW STAFF

The client/server competition is heating up again, pitting midrange computer vendors against workstation companies and workstation companies against personal computer manufacturers. But exactly how or where does the traditional minicomputer fit into the world of the client/server computing environment?

Current data indicates that minicomputers are holding their ground, particularly in larger information systems shops. The Business Research Group (BRG) in Newton, Mass., recently surveyed 750 Fortune 1,000 companies and found that midrange computers are perceived as viable servers among that resource-rich community.

"The midrange market will definitely provide a place where companies can develop major client/server applications on that platform," said William Bluestein, an analyst at Forrester Research, Inc. in Cambridge, Mass.

According to Kevin O'Neill, vice-president of research at BRG, many of the sites surveyed indicated that a client/server strategy is simply one component of the larger issue of network integration.

"These companies want to retain the value of the systems they already have, and this results in better utilization of all types of computers," he noted.

The study also indicated that two-thirds of the sites were either using client/server functions or planning to implement them within the next 18 months.

Pete Johnson, manager of Texaco, Inc.'s Scientific Systems Management Unit in Houston, said the lines become "blurry" when defining the differences between high-end workstations and midrange computers. Texaco relies on a Cray Research, Inc. X-MP 2/16 to process compute-intensive data and uses a mix of Sun Microsystems, Inc. servers, IBM RISC System/6000s and Digital Equipment Corp. Microvax 3100s to process smaller data sets in an interactive environment. The company also services a sizeable PC community.

One thing that is very clear is that every midrange vendor — including IBM, DEC, Hewlett-Packard Co., Sun, Data General Corp., Wang Laboratories, Inc., Prime Computer, Inc. and Groupe Bull — has repositioned its product line to function in a client/server environment.

Adding value

Ultimately, their success will be determined by how and where they can add value, said Jim Hammons, an analyst at The Sierra Group, Inc. in Tempe, Ariz.

"They can't just relabel these systems, and the added value doesn't necessarily have to be in hardware. It can be in software and applications," Hammons said. He cites the Decstation 4000's extra I/O performance and HP's implementation of the New Wave environment on HP 3000 servers as examples of value-added systems.

While Bob Craig, IS manager at Genarra Sportswear, Inc. in Seattle, is not currently taking advantage of HP's New Wave technology, the company is using an HP 3000 Series 950 in a server capacity. The 950 communicates with two Novell, Inc. local-area networks, the company's distribution center and a facility in Hong Kong. When the computer was purchased in 1989, the intent was not to use it as a server. "It was just an evolutionary type of thing that brought us to that point," Craig said.

Many large-scale users plan to reconfigure their minis as servers as the necessary software becomes available or as individual corporate needs change. According to BRG, 29% of those sites currently implementing a client/server strategy are using mainframes, while 30% are using minis.

Jack Crawford, vice-president of information management at Hartford Insurance Group, a longtime Wang shop, said he is waiting for Wang to take Pace, its relational database management system, into a cooperative environment in a client/server-based architecture.

"It's a software-driven decision," Crawford said. Gerry Paul, vice-president of systems and communications at Wang, confirmed that the Pace version is being developed, but he would not specify a delivery date.

According to Bluestein, as the Unix operating system gains momentum, it better positions itself in the server world. "That's one of the reasons we feel companies like Sun will compete quite successfully as client/server providers," Bluestein said. "DEC will be there too, depending on how long it will take them to deliver an Ultrix-based server."

"The real issue for us is the software, not the hardware," Johnson said. "The three words around here are Unix, networking and X Windows." Johnson's staff is busy writing code in Unix to "X Window into" the PC environment, and he hypothesizes that someday the company will have a file server, database server and a local server all within the same network.

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Going on-line helps Connecticut manage environmental concerns

ON SITE

BY SALLY CUSACK
CW STAFF

HARTFORD, Conn. — Data center employees and engineers at Connecticut's Department of Environmental Protection (DEP) are busy these days creating and maintaining an on-line Environmental Information System for use by the department's Bureau of Air Management.

Air quality control within the unit is a round-the-clock job. The unit is responsible for 30 remote sites that continually monitor the level of air pollutants. It also serves in a watchdog capacity for several in-state facilities by constantly evaluating factory emissions and the quality of air.

"These sites will eventually have systems that will automatically dial into our computer if there is a problem," said Richard J. Soj, senior technical systems analyst at the DEP. "We are working on a system that will allow our computer to interrogate their CPUs for data, if indeed that becomes necessary."

Depending on the reported results, such as if a pollutant reaches an alarming level, "they will send a computerized file here telling us that this is the problem, here is the level, and we determine then what, if any, action should be taken," Soj said.

The department currently has three bureaus dedicated to monitoring air, water and waste pollutants, and all three rely on Data General Corp. MV systems to process information and applications. The DEP is also responsible for issuing permits and maintaining historical data on facilities and incidents that fall under its jurisdiction.

The new Environmental Information System consists of a set of integrated software components designed to run on the Air Compliance Unit's DG MV/10000 and MV/15000 and MV/20000 minicomputer systems. The computers are linked together via DG's Xodiac networking system, and all are running DG's AOS/VS operating system. The system project is being developed in-house.

Describing the application as an evolutionary, ongoing development effort, Soj and his staff have divided the software into three major components: administrative, comprising newly established registration and permit fee programs and a purchase request/budget operations system; air quality, which includes data acquisition and air quality data handling subsystems; and the technical component, with 13 subsystems, including programs for complaint tracking, inspection tracking and the continuous emissions monitoring subsystem. There are also subsystems for toxic air pollutant retrieval and enforcement control.

The Environmental Information System was written using a suite of programs and applications from SAS Institute, Inc., a Cary, N.C.-based software corporation. Known for its statistical programs, the SAS product line has expanded to include sophisticated graphics, data handling and data management systems.

IF A POLLUTANT reaches an alarming level, "they will send a computerized file here telling us that this is the problem . . . and we determine then what, if any, action should be taken."

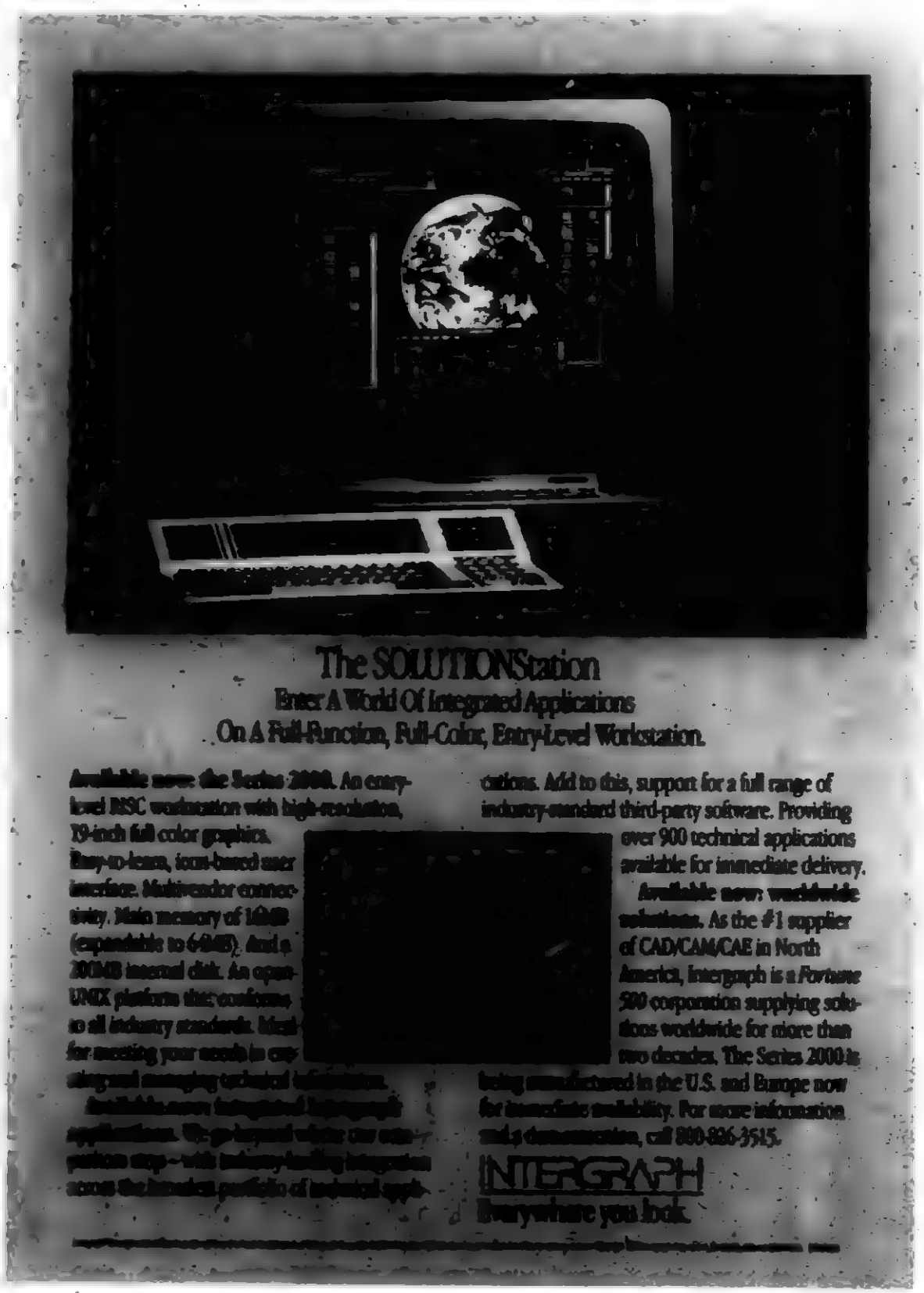
RICHARD J. SOJ
CONNECTICUT DEP

The Bureau of Air Management is implementing several of these systems to construct the environmental software. A unique feature of the product, Soj said, is its ability to merge all files and subsystems.

"The SAS program allows us, in five or six statements, to merge data sets and produce a report," he said, adding that the ability to produce timely reports is a requisite for any government agency. "All systems have been assigned a unique identifier such as client, sequence, town, and premise number, which allows bureau engineers to create any number of data files containing specifically requested information from any combination of subsystems." All data storage, management and analysis is done by the SAS system, Soj said.

Most of the 128 staff members are engineers and technicians, the people responsible for designing, implementing and maintaining the software project. The system will be expanded as needs dictate, Soj said, and the department is currently writing an interrogation and polling software program to be used in continuous emissions monitoring.

The DEP is also investigating the possibility of arming inspectors with laptops for on-line data entry and on-site testing. Soj said the department has a DG Aviion workstation that "we are planning to use for GIS applications."



How Long Will You Have To Wait For VSE/ESA Software Solutions?

Sybase lessens mainframe load

BY JEAN S. BOZMAN
CW STAFF

EMERYVILLE, Calif. — Users of Sybase, Inc.'s new IBM mainframe connectivity products said they are using the software to gain real-time updates from IBM hosts rather than batch updates, which typically occur overnight.

The latest generation of Sybase mainframe products provides connections through IBM's LU6.2 protocol to IBM's CICS teleprocessing monitor. The result can truly be called cooperative processing — a system in which the personal computer local-area network takes some of the heavy number crunching away from the IBM mainframe, beta-test site users said.

"IBM's VSAM is an efficient file structure," noted Dave Alessandro, a project manager at Textron Financial Corp. in Providence, R.I. "But you're losing [mainframe] cycles accessing the VSAM files. Now we're bringing the host data down to the LAN and moving toward eliminating duplication of functions." Sybase's products are slated to ship to new customers by year's end.

Textron developers are working on a pilot project that would take data from IBM's VSAM and DB2, residing on Textron's IBM 3090 mainframe in Irvine, Calif., and place it on a PC LAN running under Microsoft Corp.'s LAN Manager. Textron is using Sybase's Open Server for CICS to access MVS applications and the Sybase Open Gateway to provide SQL access to DB2 data. An IBM RT running AIX acts as the gateway on the PC LAN. However, the workstations are IBM Personal System/2s or clones running OS/2.

Taking time out

True distributed processing will not follow immediately, Alessandro said. "We don't want to jump into a truly distributed application until we can get a feel for this technology."

The beta-test site users said Sybase had solved both connectivity and communications problems with its IBM-compatible software. "You can have an application that thinks it's talking to the Sybase Open Server, and the Sybase software will take on the job of turning a Sybase task into a DB2 task," said Jim Stoddard, senior vice-president for strategic systems at Fidelity Investments in Boston.

Fidelity plans to continue to do much of its high-speed transaction processing on the IBM host, while presenting the results to users on desktop machines. "Most other DBMS products want you to move all of your data into their database," Stoddard said. "Sybase is saying that you can move part of your application into Sybase, then go through the [Sybase] Open Server so that you won't have to change your older, host-based applications."

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Ultrix

CONTINUED FROM PAGE 29

Division at Boston-based The Yankee Group, agreed. "Ultrix has, in some ways, always been a product that was looked at as secondary to [DEC's] VMS operating system," Kernochan said.

While DEC's Ultrix marketing director, Joe Menard, acknowledged that VMS is the dominant system DEC ships today, he said, "We're seeing a lot of VMS customers moving to Ultrix since we started shipping last April."

However, Kernochan said that Ultrix's growth remains stunted because it is being pulled in too many directions.

In addition to DEC's internal forces pulling Ultrix toward its proprietary platform, it is also being pulled toward becoming an OSF standard, because of its Motif user interface, and toward Unix International, because of the organization's security requirements and popular kernel.

However, because of an industry dispute between Unix International and the OSF, each organization uses a different user interface.

Tying them together

"We can't be bothered with multiple user interfaces . . . and that has been a sore spot for the people around here, because ideally, we'd like to run all of our applications under one common user interface, and right now we can't," said Ultrix user Jim D'Aquino at the Union Bank of Switzerland Securities, Inc.

D'Aquino, who is upgrading to Ultrix Version 4.0, said that the bank's most popular spreadsheet, Lotus Development Corp.'s 1-2-3, doesn't run on Ultrix.

"We've raised hell about that to DEC, but it's sort of fallen on deaf ears," D'Aquino said, adding that 1-2-3 does, however, run under the VMS platform, and DEC said it will not be marketing an Ultrix version for another six to 12 months.

Despite the ongoing standards issue, Wu said DEC is being held back from becoming a serious player in the Unix world for other reasons as well. "I don't think DEC's salespeople really understand Unix . . . their sales staff isn't that good, and their marketing strategy isn't good either," Wu said.

Menard disagreed, claiming that DEC spent "a considerable amount of time and money in training the sales staff."

"If you look a few years back, we basically sold Unix to those who wanted it, but we didn't go out of our way. Now we are going after the Unix market agressively," Menard said.

Now, That Didn't Take Long Did It.

COMPUTER ASSOCIATES *News*

COMPUTER ASSOCIATES INTERNATIONAL, INC.
711 Stewart Avenue Garden City, NY 11530-4787
Telephone (516) 227-3300 Telex 981393 FAX (516) 227-3937

Contact: Chris Maynard
Corporate Communications
(516) 227-3300, Ext. 7129

ALL COMPUTER ASSOCIATES VSE SOFTWARE SUPPORTS IBM VSE/ESA

Garden City, New York -- September 5, 1990 -- COMPUTER ASSOCIATES INTERNATIONAL, INC. announced today complete support for IBM's recently announced VSE/ESA Operating System concurrent with its general availability. Computer Associates, the acknowledged experts in VSE technology, has been committed to the VSE operating system since the company was founded in 1976. With over 20,000 VSE software product licenses worldwide, Computer Associates is the leading independent vendor of VSE software today. A list of the products supporting VSE/ESA follows:

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CA-ACF2
CA-TOPSECRET
CA-JARS
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CA-LOOK
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CA-DATACOM/VSAM Transparency
CA-DATACOM/DL1 Transparency
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CA-DATAQUERY
CA-DB: STAR
CA-IDMS/DB
CA-IDMS/DC
CA-IDMS/DDS
CA-IDMS DEVELOPER
CA-IDMS DBA
CA-ESCAPE
CA-eMAIL
CA-ETC
CA-ADS
CA-ADS/GENERATOR
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CA-DATAMACS/II
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COMPUTER ASSOCIATES

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Lincoln finds systems success designing for 70% of its users

ON SITE

BY MICHAEL FITZGERALD
CW STAFF

FORT WAYNE, Ind. — At Lincoln National Corp., the nation's seventh-largest insurance holding company, 11 years of automating its offices have turned the information systems staff into proponents of the 70% solution.

Lincoln has seen its Office Productivity Network (OPN) — installed in 1979 and expanded throughout the years — grow to support more than 6,000 users, far outstripping its original expectations of 500 to 1,000. Even the custodial department is hooked into OPN, which now has its own network of 10 of Lincoln's 20 Prime Computer, Inc. systems, including 6450 and 6650 minicomputers.

The company has come to be used as a test lab of sorts for Lincoln National Information Services, Inc. (LNIS), a Lincoln subsidiary created in 1983, both because there was not much competition at the time, and because selling the system helps cover development costs.

For example, Lincoln will serve as a test ground for LNIS' latest upgrade, a major revision of OPN that emulates a graphical user interface on the dumb terminal system, providing windowing and pull-down menus. LNIS expects to have this fully implemented within the company by sometime in 1991.

Secrets of success

Lincoln has learned how to make a system user-friendly by setting its sights on a 70% success standard. "We found that only about 15% of the knowledge workers in the office would ever really master any of the products," such as spreadsheets or desktop publishing packages, said James Tunis, who helped start OPN and has run LNIS since the subsidiary was created in 1983. "At the other end, there's another 15% that we call the Luddites, who are just never going to touch anything."

That leaves about 70% of the people, who are what Tunis calls "technology indifferent." These people, Tunis said, will use technology when "it'll do the job for them; they don't have to read a manual or go to a class; and when they need it 10 minutes from now, they can get it."

Tunis said most software ignores the needs of these users, who are the bulk of the corporation: "It has to be PHD [Push Here, Dummy] or something that really gets them going easily without having to dig through a manual."

For instance, Lincoln has created a desktop publishing package it has called OPN:Style. The package automatically prepares text in a variety of formats. Tunis said it has eliminated the "ransom note" school of design — the use of too many fonts and type sizes in one document — and cut the costs of hardware, desktop publishing software and training.

The initial incentives for creating the OPN came from Chief Executive Officer Ian Rolland's desire to reduce paper flow and advance end-user computing. Rolland's continued support and use — he even has a terminal at home — and that of other top executives has helped the system succeed. Primarily, though, users drive the success of OPN.

Executives credit the system with making a qualitative change in the way the company does business. For instance, since the law department installed OPN, it has been able to handle 30% more cases with 8% (two employees) fewer staff. Internal surveys showed that workers with OPN rate themselves from 12% to more than 20% more efficient than without it.

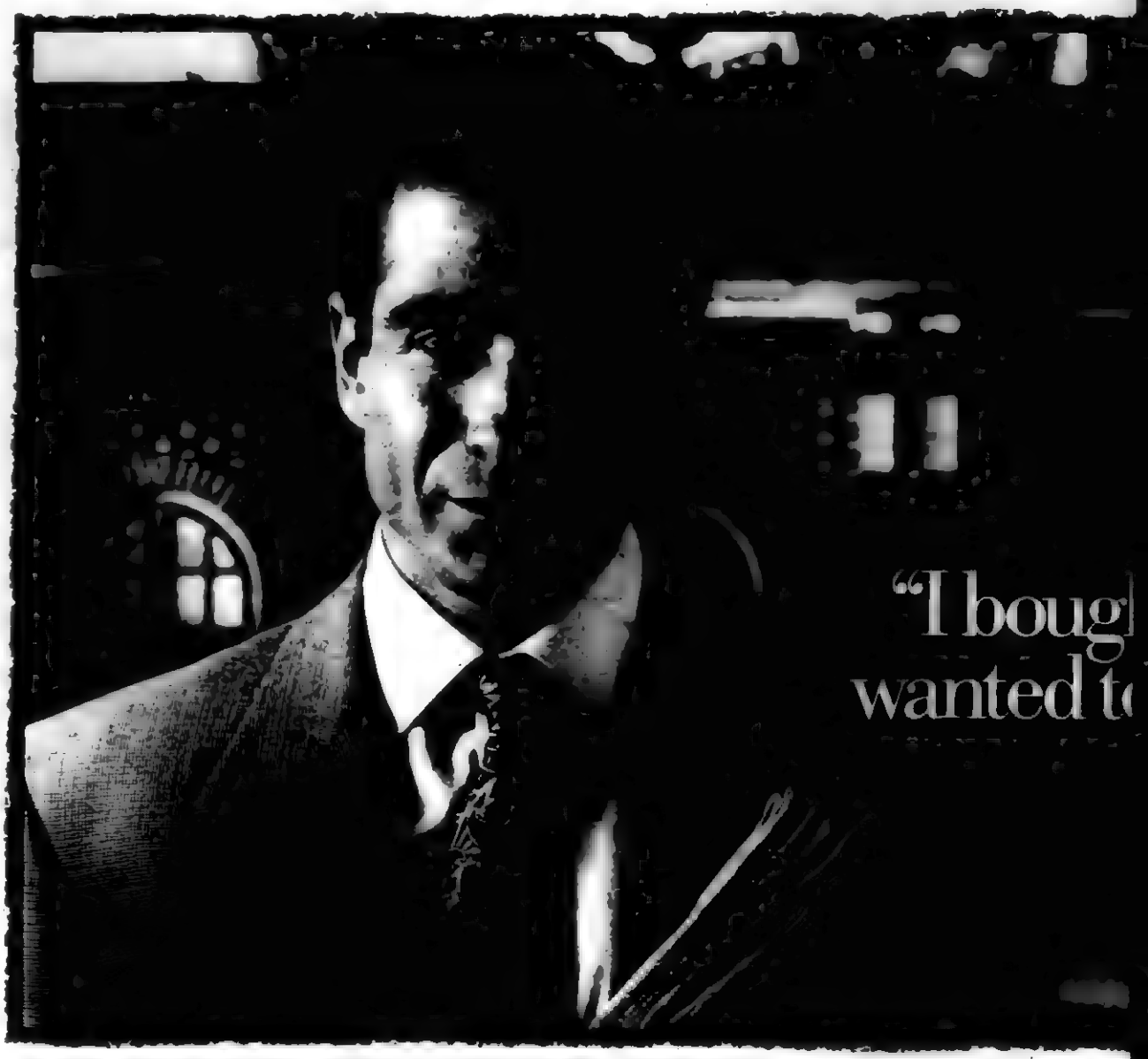
Electronic mail is the main selling point for OPN within Lincoln, but users generally find its document management abilities attractive as well. The system, for instance, will automatically arrange meetings. It also keeps records of where E-mail goes, so users can tell whether requests have been passed on to other employees, which can help prevent bottlenecks.

Tunis *wants 70% success*

Lincoln wants to make the system broader. Among current projects are creating modules that will do purchase orders electronically as well as bringing optical character recognition and imaging technologies into OPN.

LNIS recently implemented an IBM RISC System/6000 version of the system for a customer but has no plans to move off of the Primes internally — at least not until the Unix world "grows up" with more powerful machines, Tunis said. He said he does favor Unix over OS/2 for a multiuser, multitasking environment.

Tunis said that using the proprietary Prime system with terminals is inexpensive and much easier to connect to than a client/server environment.



The IBM AS/400 advantage:

Buying a computer system for your whole company isn't something you want to do twice. If nothing else, that could mean you did it wrong the first time. Which would be painful.

So remember this: in a major survey of midrange system owners*, the ones who'd bought IBM AS/400s said they were the happiest. And by a wide margin. Here are four reasons why:

1. *Applications.* The AS/400™ runs thousands of proven applications, designed to help all kinds of businesses solve their kinds of problems. And we keep track of AS/400 software at IBM's National Solution Center, along with customer references. So it's easy to find your kind of software, plus someone else who's already using it.

2. *Growth.* The AS/400 is designed for expansion, which means you never have to buy more system than you need right then. As you grow, it can grow with you—from a few users to hundreds. And if you already have PCs, they won't

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Grochow

CONTINUED FROM PAGE 29

issue of compliance may need to be treated on several different levels, from concepts down to specific rules and standards.

Software vendors play a very important role in implementing IBM's SAA strategy. Forward-thinking software vendors are already moving toward common user interfaces across multiple applications and common software across multiple platforms. The support and compliance of vendors has added legitimacy to IBM's strategic direction and to pursuing improved productivity and quality via better software architecture."

It is important to remember the following:

- Vendors will all claim SAA compliance — some long before they actually have it.
- There will be fairly wide variations in how different vendors interpret "complying with CUA."
- Cooperative processing will begin with workstation front ends to previously existing mainframe applications; distributed databases will be in second or third releases.
- Non-SAA languages will be phased out slowly since few, if any, vendors will rewrite older software until they really must.

How can you tell if software is SAA-compliant? IBM publishes a "Guide for Evaluating Applications" to help you in verifying SAA compliance. This manual supplies a checklist of the major components of SAA. Anyone developing software can check off those features of the SAA definition that are used in their applications.

Like most checklists, this provides only a superficial view of how the application is implemented. It does not show what non-SAA software or standards are also used, nor does it indicate how much of an application uses the standard. If one set of queries uses SQL, but the rest of the application is written in assembler, does that make it SAA-compliant (i.e., allow you to check the box)?

IBM is leaving it up to software vendors and developers to determine if and how specific software conforms to SAA. This puts a significant burden on software developers and users to understand the issues underlying compliance and insist on it when it is important.

IBM is also publishing a catalog of current and announced products that comply with SAA. The first edition of this catalog will include applications that support SAA as to application structure, environment and CUA.

Future versions of the catalog are likely to require adherence to CPI and CCS components of SAA as well.

Listing in the SAA catalog permits a vendor to specify "registered in IBM's SAA catalog" in advertising and on the products themselves. However, only the vendor makes the judgment as to whether a product follows SAA guidelines in a particular area. IBM reviews requests for catalog listings but not the actual software and presumably catches only blatant misrepresentations.

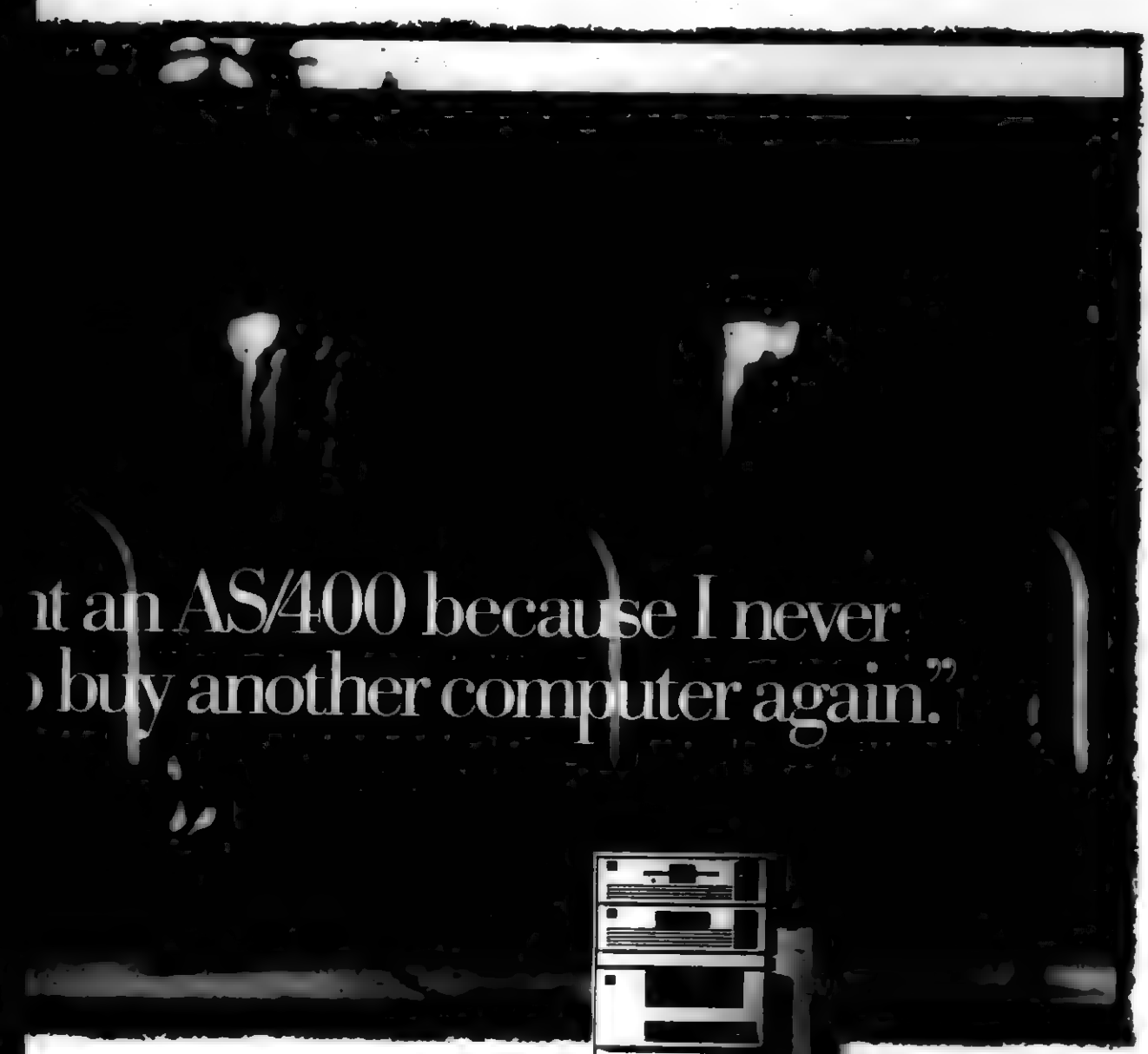
If IBM takes a generally passive role in enforcing SAA compliance, does this mean that SAA will devolve into chaos? Probably not.

What SAA is really about is productivity and quality. It is less an issue of strict compliance with rules and standards for their own sake than an issue of what we can expect as a result of complying with them.

Underlying the whole SAA approach is a belief that productivity of developers and users will improve when we use standard approaches to implementing systems and delivering their functions. There is also the belief that the quality of our work, measured in every way from number of errors to customer satisfaction, will improve from the use of these same standards. As SAA demonstrates its ability to create these improvements, the marketplace will police the level of SAA conformance.

We are all in this together — IBM, other hardware manufacturers, independent software vendors and computer user organizations — so the more we can agree on a set of standards that all can use, the more we will all come out winners.

Grochow is vice-president of the Corporate Technology Group at American Management Systems, Inc. in Arlington, Va.



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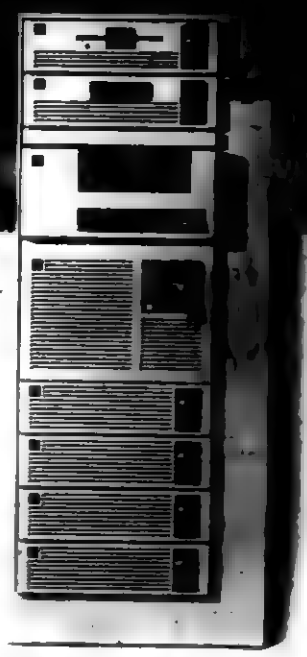

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IBM

NEW DEALS

TRW to supply Amoco imaging

Amoco Oil Co. has chosen **TRW Financial Systems, Inc.** of Berkeley, Calif., to supply Amoco's customer service center with an advanced document image processing system. The Customer Service Image System, which will process customer correspondence and provide on-line access to statements, is the second phase of a project begun in 1989.

Digital Equipment Corp. will install a $2.7 million campuswide information network at **Oakland University** in suburban Detroit. Two DEC VAX 6000s will be used for academic computing; a reduced instruction set computing-based Decsystem 5810 is earmarked for research studies; and 70 DEC workstations and personal computers will be installed in the PC laboratory and campus library.

NEW PRODUCTS — SOFTWARE

Applications packages

DK Systems, Inc. has announced a Wang Laboratories, Inc. VS-based on-line user support and call tracking system.

DK Help Desk is a Wang Laboratories, Inc. PACE application that can be used as a stand-alone unit or with DK Inventory Manager, a hardware- and software-equipped tracking system. The product allows multiple-response entries to be made against particular Help Desk calls.

The product is priced at $5,000 for a stand-alone version and $2,500 when purchased as an integrated package with DK Inventory Manager.

DK Systems
1455 N. Sandburg Terrace
Chicago, Ill. 60610
(312) 943-7744

IMSL, Inc. has introduced Exponent Graphics System, a software package designed to meet the programming demands of scientists and engineers who solve problems with Fortran.

The product provides three levels of functionality: low-level subroutines, advanced subroutines and applications-level routines.

The product runs on Sun Microsystems, Inc. 3 and 4 systems, Digital Equipment Corp. VAX 9000, 5400, 5800 and Decstation machines. Prices range from $1,500 to $15,000, depending on type of platform.

IMSL
2500 Permian Tower
2500 City West Blvd.
Houston, Texas 77042
(713) 782-6060

Utilities

R.R. Software, Inc. has announced that Pastran, its Pascal-to-Ada translator, has been made available for Digital Equipment Corp. VAX platforms.

The product will directly translate DEC Pascal to Ada with up to 95% efficiency, the vendor said. Pricing is based on the numbers of Pascal lines to be translated in increments of 50,000. Up to 250,000 lines cost $10,000 per increment; more than 250,000 lines cost $5,000 per increment.

R.R. Software
P.O. Box 1512
Madison, Wisc. 53701
(800) 722-3248

Beacon Software International, a division of Interleave Technology, Inc., has announced the CICS Connection, an IBM mainframe software product designed to extend the file-sharing ability of VSAM.

The product enables users of multiple on-line and batch programs to update the same VSAM files simultaneously without compromising any data. It features automatic field-level journaling of updates, which enables users to back out changes from VSAM files while they remain on-line, the vendor said.

CICS Connection runs on IBM mainframes under MVS/SP, MVS/XA, MVS/ESA or CICS Version 1.6.1 or higher. It is priced at $45,000 per site.

Beacon Software
50 Milk St.
Boston, Mass. 02109
(617) 482-1778

Main Frame Software Products Corp. has announced Release 4.0 of Help/Key, an IBM Systems Application Architecture/Common User Access-compliant help system designed for users of VSE and MVS CICS systems.

The product supports IBM's DB2 and IMS and includes an automatic scanning feature that searches single- or multiple-page screens.

Perpetual license fees range from $9,900 to $13,900.

Main Frame Software Products
135 Glen Road
Wellesley, Mass. 02181
(617) 239-0288

System software

Highland Research, Inc. has announced Release 1.2 of Critique VTAM, its VTAM performance management software package.

The product can be used to monitor VTAM areas such as configuration, storage, application, session, routing and I/O. It can also be used to find VTAM problems before users do and then isolate the cause of these errors, the vendor said.

Pricing ranges from $9,000 to $25,000, depending on CPU size.

Highland Research
120 Summit Pkwy.
Birmingham, Ala. 35209
(205) 942-6590

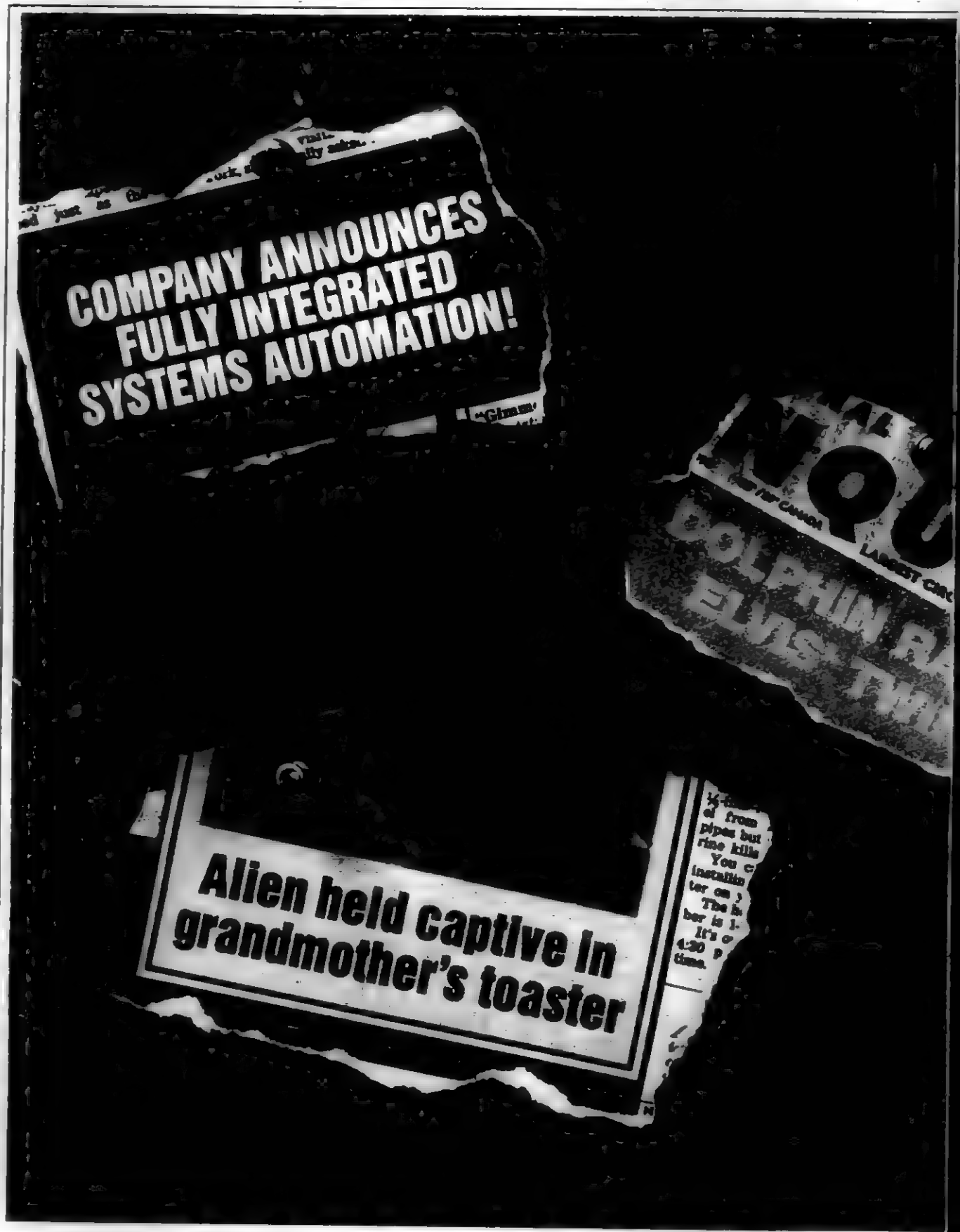
Compilers

Data General Corp. has announced a native-code compiler designed for Aviion reduced instruction set computing-based servers and workstations.

The GNU C++ compiler is based on AT&T C++ Version 2.0. GNU C++ is a component of the GNU software platform from the Free Software Foundation.

A package that comprises GNU C++, a GNU debugger known as GDB and AT&T 2.0 C++ libraries is priced at $1,595.

Data General
3400 Computer Drive
Westboro, Mass. 01580
(508) 898-4051



NEW PRODUCTS — HARDWARE

I/O devices

Everex Systems, Inc. has announced an Intel Corp. I486-based file server that includes 32M bytes of 32-bit memory.

Stepserver 486/33 was designed to accommodate several users on a Novell, Inc. network. It operates at 16.5-MHz I/O bus speed and includes an intelligent small computer systems interface controller. The product is priced at $13,498.

Everex Systems
48431 Milmont Drive
Fremont, Calif. 94538
(415) 498-1111

Human Designed Systems, Inc. has announced a second generation of its Viewstation series of X Window System terminals.

The Viewstation Plus series of terminals is reportedly equipped with as much as 10M bytes of memory and features screen sizes ranging from 14 to 21 in. The terminals also feature 256-color, grey-scale or monochrome display capabilities.

Pricing ranges from $1,999 to $5,999, depending on type of model.

Human Designed Systems
421E Fehelely Drive
King of Prussia, Pa. 19406
(215) 277-8300

Oce Graphics USA, Inc. has introduced two 406 by 406 dot/in. raster plotters designed to produce maximum monochrome outputs of 1 in./sec. on paper or film.

Models G9844 and G9845 of the Oce G9800 series of direct imaging plotters include a 20M-byte hard drive and a 3½-in. floppy disk drive.

Model G9844 ($20,990) produces D-size architectural plots in approximately 30 sec., and Model G9845 ($23,990) produces E-size architectural outputs in about 45 sec., the vendor said.

Oce Graphics USA
P.O. Box 7169
385 Ravendale Drive
Mountain View, Calif. 94039
(415) 964-7900

Oce Graphics' ***G9800 raster plotters***

Processors

Tektronix, Inc. has introduced a reduced instruction set computing-based multiprocessing server designed for visualization applications.

The XD88/700 can operate as a file or compute server in heterogeneous environments. It features scalable computer architecture and consists of two basic configurations: the XD88/720 ($62,000), which features a dual-processor, 25-MHz Motorola, Inc. 88100 processor rated at 67 million instructions per second (MIPS), and the quad-processor XD88/740 ($102,000), which delivers 120 MIPS.

Tektronix
P.O. Box 1000
Wilsonville Industrial Park
Wilsonville, Ore. 97070
(503) 685-2838

Power supplies

Current Technology, Inc. has announced its Plus series of power protection products for retail, point-of-sale and other small system environments.

The series was designed to protect point-of-sale registers, scanners, teller terminals, personal computers, facsimile machines and photocopiers from power surges, lightning and line noise. Surges are filtered before they reach any equipment, thereby preventing errors, avoiding the loss of data and obviating the need for system reboots, the vendor said.

Other features include noise suppression of more than 35 dB and 20,000-amp surge capability. The series of products are priced at $169 each.

Current Technology
1400 S. Sherman
Richardson, Texas 75081
(214) 238-5300

Data storage

Unisys Corp. has announced a cache disk storage subsystem for its 1100/2200 line of mainframe computers.

The M9740 supports 16M to 64M bytes of cache memory and features a disk storage capacity of 32G bytes. It supports industry-standard Block Multiplexer Channel or Unisys Word Channel I/O. The product is equipped with a dual-control unit that supports four separate mainframe host interfaces and can also be configured to accommodate up to eight host interfaces, the vendor said.

The product is priced at $275,707 or $762,355, depending on configuration.

Unisys
P.O. Box 500
Blue Bell, Pa. 19424
(215) 986-5367

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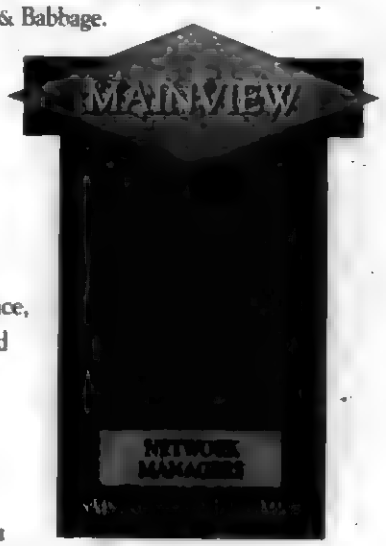

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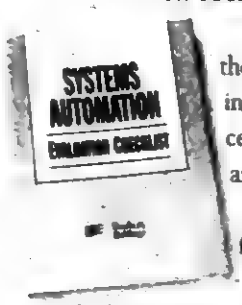

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Hannover, Germany, 1990: European experts judging at CeBIT, the world's largest computer exposition, give their top design award to the Wyse PC Model 3225.

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COMMENTARY

J.A. Savage

Open Look, closed mind

Sun executives like to trip over the word Motif, pretending that their tongues are tied when it comes to the opposing product to Sun's Open Look graphical user interface.

Motif, supported by the Open Software Foundation, apparently represents more to Sun than mere competition. It represents The Old Entrenched Big Boys (and, presumably, Big Girls) in the computer industry — everything that Sun loves to hate.

Sun has resisted Motif, although other vendors, notably IBM, HP and DEC, have embraced it. Instead, Sun continues to insist its Open Look will become the graphical interface standard.

The Open Look graphical user interface was designed by Sun with the help of AT&T and Xerox. Motif was largely developed by HP and is supported by IBM and DEC. Motif is based on Presentation Manager and OS/2 but will also work with Unix. Open Look is solely for Unix.

"It's not a question of backing down on Motif," Sun marketing executive Ed Zander says. "Our fundamental problem is with DEC and IBM, the forces

Continued on page 48

Dbase users cautiously content

BY JAMES DALY
CW STAFF

Early assessors of Ashton-Tate Corp.'s Dbase IV Version 1.1 database software package give it a thumbs up but say they will keep one eye on the offerings of the up-and-coming vendors who slipped into the vacuum after an earlier, buggier version of Dbase damaged Ashton-Tate's profits and reputation.

"They did exactly the right thing with this fix, and I'd like to see them stay ahead of the game, but I'm keeping my options open," said Pat Adams, president of DB Unlimited, a consulting firm in Brooklyn, N.Y. "My loyalty is to my business and my clients, not to any particular company."

Longtime Ashton-Tate users generally hung tough with the company throughout the ordeal, which began nearly two years ago. Dbase IV Version 1.0 was a failure of monumental proportions because of a faulty memory management program that caused the application to crash spontaneously.

In late July, the Torrance, Calif.-based company pulled the curtain back on Dbase IV Version 1.1. In the interim, however, some users headed over to products such as Fox Software, Inc.'s Foxbase or stayed with Ashton-Tate's preceding generation, Dbase III Plus.

Competitors said the Version 1.0 debacle rewrote some of the rules in the database market. "Before the problems with 1.0, people were less willing to sign on with the smaller companies," said Michael Gardner, vice-president of research and development at Wordtech Systems, Inc. in Orinda, Calif. "But that's changed in the past 18 months."

Those who stuck with Ashton-Tate said Version 1.1 is much quicker and more reliable than 1.0 but could still use some sprucing up. Barbs were directed toward Version 1.1's menuing system, which one user described as "pretty bare-bones." The major complaint: Users need to write a lot of code to create elaborate menus.

Jack Bradford, a systems supervisor at the Minnesota Department of Natural Resources in Minneapolis, was able to work around the bugs in Version 1.0 but said he would still like more windowing and mouse support.

Continued on page 47

FEATURE: PC PURCHASING CONTROL

PC buying power: Who has it?

BY RICHARD PASTORE
CW STAFF

"This is the PC I want. Just sign the check, and I'll go get it." End users may wish it was that simple to obtain new personal computers, but such orders typically fall on deaf information systems ears.

Despite the purported trend to distribute IS responsibilities to end users, few IS groups seem to be relinquishing control over PC purchases. Indeed, some IS departments have only recently wrested control from end users, ringing down the curtain on what they called an unmanageable menagerie of motley machines too confusing and costly to maintain.

"What I inherited here two years ago was very difficult to control,"

says Claude Rankin, manager of MIS at the New York office of Deloitte Touche. It was a multivendor free-for-all, Rankin says of the users' former buying patterns.

He has since instituted a steering committee made up of key partners of the firm and himself. At least once a year, this group gathers to evaluate and predict users' hardware needs.

"We look at the historical events of the past 12 months and how we've been doing," Rankin says. If the committee identifies a need for more processing power, it will set aside a percentage of the budget for PC upgrade purchases, and those purchases can only be placed with vendors appearing on Rankin's approved brand list.

"It makes it possible to have greater control over your inven-

Continued on page 49

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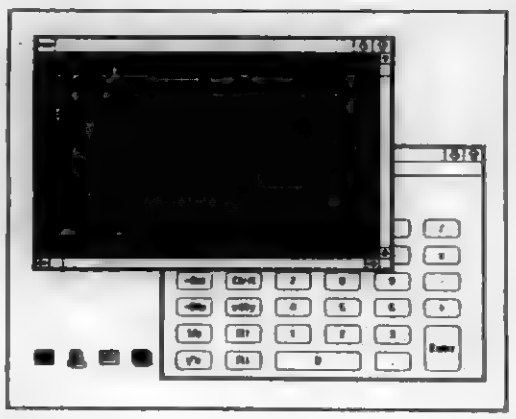

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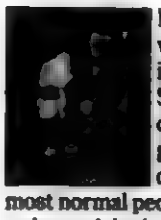
COMMENTARY

Douglas Barney

A handle on multimedia



Do you know what a gen lock is? How about SMPTE time code or a single-frame recorder? If, like most normal people, you haven't a clue and don't give a hoot, then you are far from ready for multimedia.

Bored with the drudgery of spreadsheets and fed up with fonts, it seems that most people today think they want multimedia. Its sheer hype has taken care of that. But all that fun masks an important fact: True multimedia creation is complex and difficult. It assumes all the complexity of the individual components — sound, video, graphics and animation — and adds the difficulties of blending these elements into a cohesive whole. That doesn't sound like fun, and managing it all may be worse.

Clearly, an information systems group that is up to its ears downsizing and chipping away at applications backlogs has no time to explore the wonders of desktop video and perfect the fine arts of rotoscoping and motion blurring that make animations effective. Most people in IS have no idea what any of this weird stuff is. Should IS start animating, digitizing video and syncing sound? Of course not. That requires artistic talent, creativity and technical expertise.

Despite the daunting complexity, IS should not sit idly by while the multimedia jugger-

Continued on page 46

Right at the user's fingertips

National Semi's 1-2-3 link to host databases automates analysis

ON SITE

BY PATRICIA KEEFE
CW STAFF

SANTA CLARA, Calif. — A mainframe-based spreadsheet initially designed for National Semiconductor Corp.'s Asia Pacific Operations is expected to enable users companywide to automate what was once an inflexible, manual system of comparing sales and manufacturing data.

Previously, this data was available only in canned, paper reports for manual side-by-side comparisons. Consequently, it was very difficult for the Singapore-based division to quickly massage the data, never mind compare it or view it from various angles. The canned approach also led to the production of unnecessary reports that left users with mountains of data to sift through.

"They wanted to be able to have graphics and manipulation of data on-line, at their fingertips," said Katharine Nickey, an information center end-user support staffer.

Along with her supervisor, Judy Armstrong, Nickey has built and is still beta testing a mainframe-based database. The Manufacturing Data Base (MDB) system is currently being tested by a handful of users in the Asia Pacific subsidiary.

Free time

According to the Asia Pacific staff, the MDB system will free up time that was dedicated to the weekly summarizing process and the feeding of results into an electronic mail system.

Because the paper-based reports were fed with data from four mainframe-based databases, it would seem only natural for National Semi, which was already a heavy user of Lotus Development Corp.'s 1-2-3 spreadsheet across numerous platforms, to turn to the IBM mainframe version, 1-2-3/M. After all, 1-2-3 threads its way through the chip maker's facilities on personal computers — both DOS- and OS/2-based — Digital Equipment Corp. VAXs, Unix hosts and MVS mainframes. "We can put a file on any platform and without any conversion, it works just fine," Nickey said.

Yet at first, Nickey's team considered a mainframe database built around Information Builder's Focus-based applications.

While Focus does play a large part in extracting information and building reports, which are then pulled into Lotus spreadsheets, Nickey's team decided it wanted a more flexible user interface than Focus could provide.

"We had such a wide user base of Lotus that [we knew] the interface would be comfortable and familiar to someone on a mainframe," Nickey said. Users can also continue to rely upon Lotus commands rather than learn the Focus language.

Also aiding the comfort factor was 1-2-3/M's Worksheet Window Perspective Mode, which allows users to split the screen to view two or three different reports simultaneously.

In the end, Nickey's team built a custom-developed 1-2-3/M menu that allows users to choose reports and pull data directly into 1-2-3 spreadsheets for analysis and manipulation on-line.

The MDB system extracts data from cascading databases.

Andy Freeberg

1-2-3/M *gave Nickey flexibility*

At the top of the pyramid are four mainframe-based databases created from Information Builder's Focus language. The host hardware is NAS 9080s running IBM's VM operating system and related software.

"Using linking commands from within VM's CMS program, we're extracting data out of corporate databases and then creating smaller databases, which contain the information we really use," Nickey explained. At that point, Focus programs extract the information necessary to produce the requested reports, which can be output to Lotus PRN files. Each PRN file, totaling as many as a few hundred, provides a different view of the raw data.

Those reports are fed into 1-2-3/M, where they become accessible to a range of desktops, including ASCII terminals, graphics terminals and PCs.

From here, users can execute a macro that taps into templates that provide predetermined views of the data or different views of the same report. There is a template file for each PRN file. This allows users to massage the information on-line and produce a report that meets their needs.

A macro menu presents users with a choice of seven different types of performance measurements. Once a selection is made, they are presented with other choices, such as data by locale, customer or product line.

"Each time they choose one, a spreadsheet is loaded into workstation memory, although it's really still on the mainframe. Then they can go in and choose the report they want," Nickey said.

Each choice loads more spreadsheets into memory — up to 256 sheets.

"You can page back and forth looking at the reports using function keys, download files to the PC, graph the information and print it out," she added.

Unless it is copied to the A disk, all this data disappears from memory when the user logs off.

Group accounts will provide access to a 1-2-3/M file server, from which data and reports can be viewed and customized.

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Barney

CONTINUED FROM PAGE 45

naut moves past. Those in IS should strive to understand the basics of multimedia; otherwise, these systems can get as out of hand as the early days of corporate personal computers.

As is often the case, it will be up to IS to deflate the hype that says multimedia is for everyone and will simply drop from the sky onto millions of desks. That's nice for firms trying to sell expensive hardware, but it ain't how it's going to happen.

IS will pull in the reins a bit and define what this technology will be used for, as well as who will implement and support it. These are questions that hawkers of multimedia have utterly failed to answer. In doing so, IS will fulfill its lesser but more important uses — you know, real things like training and corporate presentations, those sorts of things.

One thing the vendors generally fail to tell users is that there are different types of multimedia. There are multimedia applications that a user simply runs. These are the kiosks seen at airports or the compact disc/read-only memory applications bought in the store.

This is the easy part. All you need is a machine powerful enough to support the application, and click and go. Although they are called interactive, these systems are relatively passive and are a no-brainer to implement; one just buys it.

On the other side is the creation process, a far more difficult endeavor that is over most people's heads. A big creation opportunity concerns presentations. Who wouldn't like to command an array of video, sound, and animation and boom them all at rapt audiences? What IS executive wouldn't want to give the firm's chief executive officer that capability?

Then there is ad hoc multimedia, in which the user can, on the spur of the moment, pull elements of multimedia into his computer to demonstrate a point or simply for fun. We are a long way from the point at which this will be easy.

The latter two forms of multimedia can require great expertise. For example, the act of bringing video into a computer system involves immense complications. Manipulating it and making it part of a larger presentation is even more difficult. That's why people go to school to learn video production.

So far, no one is asking the tough questions. Who is going to manage multimedia? Will it be IS, PC managers, end users or people outside of the corporations such as service bureaus and graphics/video firms? If it is people within the corporation, how will they come to grips with this new technology?

Also, who plans to use multimedia? Do they have the required computer knowledge, access to artistic talent and understanding of specific multimedia hardware and software products? What exactly are their expectations, and why exactly do they want to do it?

I expect these will be the organizational questions IS will grapple with in the coming years.

There are also specific questions one should ask of overexcited multimedia vendors — things such as: how many peripherals are available and how much do they cost? What about file standards for graphics, animation and sound? What about support software such as titling, graphics, animation, image processing, sound and, most importantly, multimedia authoring?

Can the software intercommunicate to trigger synchronization actions? Are the hardware and operating system up to the task of multiple computing- and memory-intensive applications? And who is going to support what?

Oh, by the way: A gen lock syncs a video signal to that of a computer. An SMPTE time code helps sync video to audio, and a single-frame recorder does just that, record single frames to video. Now that we've got that straight . . .

Barney is editor in chief of Amiga World.

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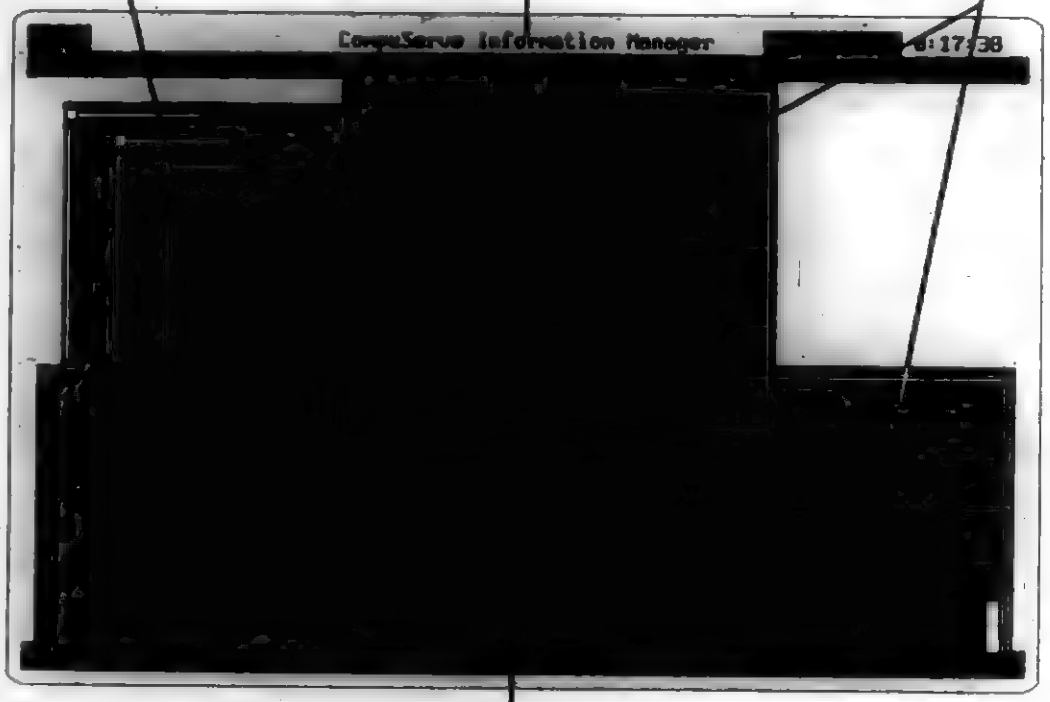

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MICRO BITS

Dbase IV server under testing

Ashton-Tate Corp. began beta-testing the long-awaited server edition of its Dbase IV front-end database recently but still hedged on a final release date. The Torrance, Calif.-based firm said it will implement a "phased strategy" of incremental releases and asked impatient users to sit tight. "We waited for too long to bring our Dbase IV Version 1.1 and don't want that to happen again," Vice-President Dave Proctor said. The company also announced Framework XE, an integrated package of seven commonly used business applications that will retail for $149.

The **U.S. Customs Department** recently seized some Intel Corp. 80386SX- and 1486-based computers made by **Dolch Computer Systems** that were to be exported to New Zealand-based wholesaler **Dove Electronics.** The shipment was halted on the grounds that it held strategic equipment not cleared for export to New Zealand. "We were told we weren't on the list of [Coordinating Committee for Multilateral Export Controls] countries, whatever that is. Subsequently, we've had to fill in a five-page form and confess we aren't going to give the computers to the 'commies,' " Dove marketing manager Carlton Duston said.

Sales pitch has punch with PC proof

ON SITE

BY RICHARD PASTORE
CW STAFF

CINCINNATI — Retailers are not likely to change their store layout or product mix based on some salesman's hunch. They want proof that changes will pay off in higher sales volumes. Gibson Greetings, Inc., one of the nation's largest greeting card and party goods suppliers, will use a personal computer network to arm its account reps with the proof the retailers need.

The goal of the system is to compile a database of meticulous notes on every location that sells Gibson products — what the sales numbers and turnover rates are, what the particular product mix is, where the items are located in the store, what products are adjacent and what the typical customer profile is. With this information in customized reports, account reps can fine-tune their accounts to maximize sales.

"It's one more tool for our salespeople to go in there with and sell against the competition," said Scott Morgan, head of stock control planning. One example of bringing the data to bear: An account rep walks into one of his stores and shows the proprietor sales figures for a similar store. That second store is selling 31% more party favors than this one because, as the diagram shows, the items are located next to the gift wrap instead of the pet food, as is the case in the first store.

Rick Dieringer

Gibson's Morgan *(left) and Martin see more sales in the cards*

"That's a very powerful selling feature to a retail chain; they become very interested in talking with you," said Robert Martin, manager of business systems.

The application rests on two components: Microrim, Inc.'s R:Base database software and Autodesk, Inc.'s Autocad. The account data resides in an R:Base database with capacity for 20,000 accounts running on a Compaq Computer Corp. Deskpro 386E server. Account data is ported to a second Deskpro, where Autocad automatically renders drawings of that specific store's layout.

Two other end-user nodes will be added to the system in the next two months on a Novell, Inc. Netware 286 token-ring network. By year's end, this small network will be linked to a separate corporatewide network served by a Compaq Systempro. At that point, field reps will be able to dial into the system to access account records and drawings and manipulate data for "what-if" analyses.

The payoff for the system, six months in the planning and execution, will come in increased sales and product turnover. Once up and running, it will be a matter of weeks before the $75,000 application payout is recouped, Morgan estimated. "If we can match consumer needs to product mix, we'll maximize satisfaction for the customer, revenues for the retailers and sales for Gibson," Morgan said.

Gibson also needs the system to keep pace with its larger rivals — Hallmark Cards, Inc. and American Greetings Corp. — which have already automated stock control planning, according to Morgan.

Previously, Gibson did its analyses manually. "Sales management had to pull the numbers to analyze them," Morgan said. "They'd come up with pretty much the same analysis, but this allows us to do it at a much greater speed."

The database will also be used by other departments hooked to the corporate network at headquarters here. Marketing can use the demographic data to hone its promotional efforts. Product management will have a better grasp on what sells best in what locations. Even the department that assembles and ships store display shelves can use the data to forecast supply needs, Morgan said.

Though the hardware and programming were relatively cheap to implement, assembling the reams of account data was a major undertaking and is still only 75% to 80% complete. Previously, account-specific information was outdated or simply unavailable, Morgan said.

"The entire sales force had to take time away from selling to document exactly what was in every account," Morgan noted. Because of the time spent on the project and its high profile, "the database had better work — there's a lot of high expectations for it."

Dbase

CONTINUED FROM PAGE 43

future releases. Bradford is also anxious to see the release of Version 1.1's long-awaited Professional Compiler, which recently went into beta testing but is not expected to be available until next year.

Some users said Ashton-Tate tried to add too much too fast with Version 1.0. "They threw in everything but the kitchen sink, so we expected some problems," said Paul Von Fange, a senior analyst at 3M Co. "What I didn't like was the way they handled the fixes — it took far too long." Others understood the painfully slow development process. "I work with government, and I understand bureaucracy," said Bill Campbell, systems manager at South Carolina Water Resources in Columbia, S.C.

Ashton-Tate officials said it took longer than expected to ship Version 1.1 because of an extensive beta-test period that was designed to clear up possible early problems.

By the end of the testing program, Ashton-Tate had enlisted the support of more than 2,700 beta-test sites around the world and tested the program more than 5 million times prior to its release, said Joe Budge, Dbase product development manager.

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Caching controller can speed disk-intensive applications

BY RICHARD PASTORE
CW STAFF

As more vendors realize that personal computer performance hinges on disk access as well as CPU speeds, users are seeing an increasing number of disk-optimizing rollouts — from small computer systems interface (SCSI) controllers to disk arrays. Last week, Perceptive Solutions, Inc. expanded the list with enhancements to its disk caching controller.

The Hyperstore 1600, unveiled in February, is a disk controller card with its own 16-bit microprocessor, resident cache and optional daughterboards. The controller can reportedly transfer data at up to 4M byte/sec. vs. less than 1M byte/sec. for standard disk controllers.

The speed comes from the cache, which can be as large as 20M bytes. Data in the cache is retrieved with an access time of .8 msec. The card predicts and controls what data goes into the cache by continually analyzing data use based on 14 sets of criteria.

In one usage example, the controller helped compress a 14-hour stretch of processing into two hours at H&H Production Management Corp., an oil and gas operating and consulting firm in Pittsburgh.

Before generating distribution checks for its oil well investors, H&H used to spend a week processing well invoices and production data in 14-hour overnight runs. With the controller card installed in its Intel Corp. 80386-based 20-MHz clone, the company has reduced the 14-hour runs to a couple of hours and achieved a more timely check distribution schedule, according to H&H President Terry Holt.

Among last week's enhancements to the product is an operating system upgrade that enables concurrent writes to the disk while the controller receives data and manages cache memory.

The vendor also announced a new daughterboard specifically designed to support IDE hard drives. As many as four daughterboards can be stacked on the Hyperstore standard IBM AT-style card, providing simultaneous support for enhanced small device interface, SCSI, IDE and other drive types. With the card's support, users can mix most drive types within a single PC, the firm said.

The controller is intended primarily for multiuser or server machines engaged in disk-intensive applications such as network file serving, image and voice processing, accounting, desktop publishing and engineering.

The $900 card and $275 to $400 daughterboards are available to corporations direct from Dallas-based Perceptive Solutions, Inc. A drive-specific controller card intended for stand-alone PCs and costing about half the price of the 1600 will be unveiled at Comdex/Fall '90 next month, according to the company.

Sun announces 'dumb' printer

MOUNTAIN VIEW, Calif. — Sun Microsystems, Inc.'s new laser printer uses the power of the workstation instead of putting a processor in the printer itself.

The Sparcprinter, announced recently along with its unbundled software, Newsprint, will work coupled with a Sun workstation or with another host on a network, according to the company. However, the printer does use an extra 4M bytes of memory.

"We recommend a 12M-byte Sparcstation," said Wayne Rosing, vice-president of desktop systems and graphics at Sun.

The printer is slated to be available next month for $2,695. The printer operates at 12 distinct pages per minute. Newsprint software alone will cost $495.

The software package will also work with other types of printers, including nonlaser types such as those made by Hewlett-Packard Co. and Seiko, Inc.

Savage

CONTINUED FROM PAGE 43

that would like to stop the move to customer freedom [in open systems]."

Zander argues that OSF will do whatever it can to thwart Sun. "If we did black, OSF would do red."

In the last year, OSF rejected not only Open Look as a standard but also Sun's basis for Network File System, according to Zander. Unlike Open Look, Sun's NFS is used in many vendors' products. NFS, a means to move data among different platforms over a network, may be less contentious than a graphical user interface and thus has been easier for other vendors to adopt.

While Zander says that Sun pays attention to product volume in the marketplace as creating de facto standards, not standards blessed by OSF, it looks like the company has drawn a line in its sandbox at Motif. Zander refuses to say whether Sun will adopt Motif if there are enough users out there to make it not only the OSF-blessed standard but also the de facto standard. He acknowledges, however that Sun's independent software vendors are "bitching" at Sun because they'd like to write to only one standard.

Robert Duncan, chief executive officer at Sparc International, an independent organization that includes Sun, other Scalable Processor Architecture hardware vendors and independent software vendors, says that his members do not want to make the effort for a separate Open Look port, either. Even worse, that group, dedicated to spreading Sun's Sparc architecture in any way possible, refuses to endorse Open Look. For the record, neither does it endorse Motif.

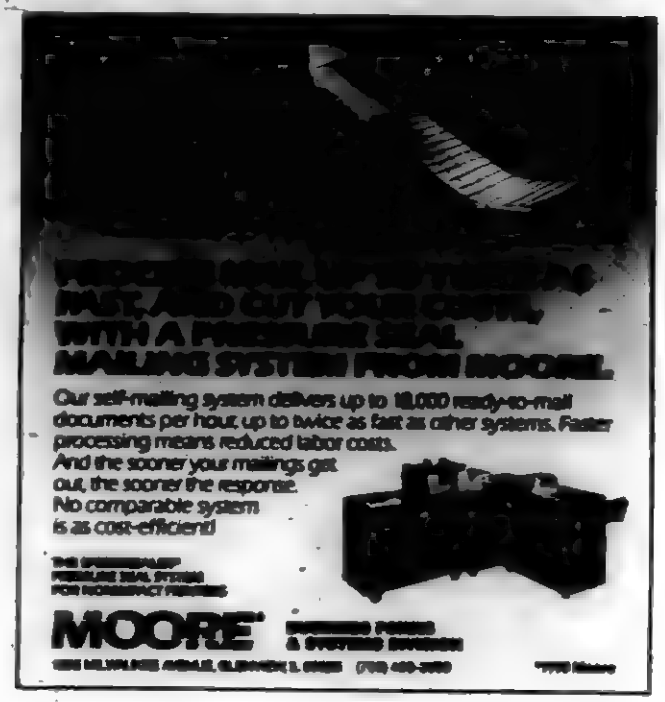
Zander has nothing to say about HP, the OSF member that submitted the underpinnings for the Motif standard, but blasts IBM and DEC because they don't have their hearts in the open standards issue, preferring to lock people into proprietary systems. "Do those companies have their best interests in open systems?" Zander asks, swearing that "Sun will live and die by open standards."

Living and dying is one thing firms do, sometimes on very short notice when the market passes them by. Not that any demise of Open Look will kill Sun, but if management is pinning that much on its success, it does make Sun look inflexible in a market that requires flexibility.

Anecdotal information passed on from analysts says that Sun has been losing accounts because of its insistence on Open Look, because major users want the same graphical user interface on all their heterogeneous equipment.

I can't say which is actually the better interface. Each has its adherents, and standards are not always based on the best technology. But if Motif is as prevalent as it seems, then Sun just might want to back off on its stubborn resistance in trade for more sales. This isn't ideology; this is simple capitalism.

Savage is a *Computerworld* West Coast senior correspondent.



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Introducing a new
concept in software
with a name
that says it all. . .

What's in a name?

Plenty. Especially when the name is the SAS System...the most popular applications system in the world. Over the years, it has come to symbolize reliability, power, and productivity.

The NEW SAS® System

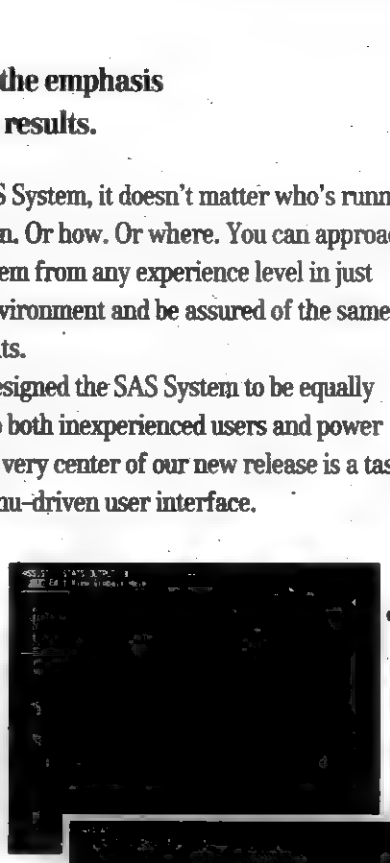
The world's #1 applications system

And now the SAS System means even more. It means you have the flexibility to choose software from an *applications* point-of-view instead of a hardware point-of-view. It means you can master the four key data-driven tasks — data access, management, analysis, and presentation — through a single software system. It means you can extend applications to more computer users, regardless of experience level. And it means you'll be the beneficiary, not the victim, of emerging computing technologies.

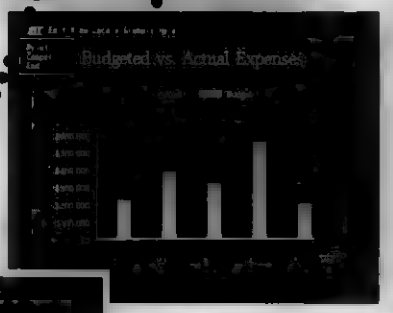
We've put the emphasis on the end results.

With the SAS System, it doesn't matter who's running an application. Or how. Or where. You can approach the SAS System from any experience level in just about any environment and be assured of the same reliable results.

We've designed the SAS System to be equally responsive to both inexperienced users and power users. At the very center of our new release is a task-oriented, menu-driven user interface.



It's never been easier to access, manage, analyze, or present data. You can even build your own executive information systems.



The menus, powered by keywords, make it even easier to run the SAS System's most widely used applications. Without having to know a word of syntax, users can access a data base... read in data... perform analyses ranging from simple statistics to specialized applications such as forecasting, project management, and quality improvement... and generate a variety of reports and graphs.

If you're approaching the SAS System from an applications development viewpoint, you'll find all the capabilities you'd ever expect in a powerful and productive programming environment. And then some.

There's a command-driven interface especially for systems analysts, applications developers, MIS personnel, and the Information Center staff.

From this interactive windowing environment, you can use the SAS System's English-like commands to build applications in a fraction of the time. And you can customize any application any way you choose by adding user-friendly menus and fill-in-the-blank screens.

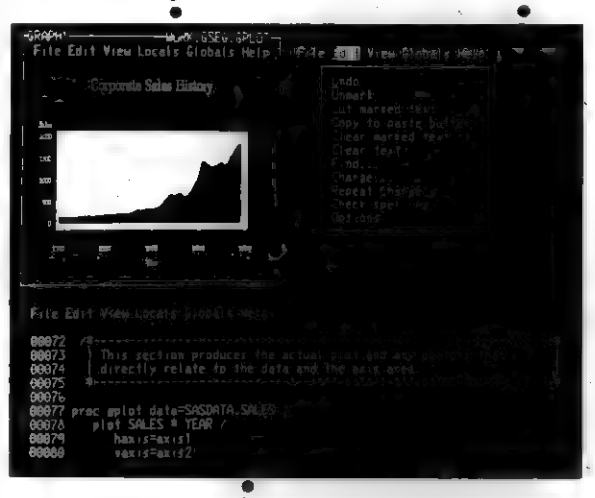
We've made sure you'll never get boxed in.

While the industry struggles to define a common operating environment, the SAS System eliminates the need for one.

Our exclusive MultiVendor Architecture™ gives you the power to decide where a particular application belongs — in the data center, at the departmental level, on the desktop, or a combination of all three. The SAS System, and the work you do, is portable across the entire range of computing environments.

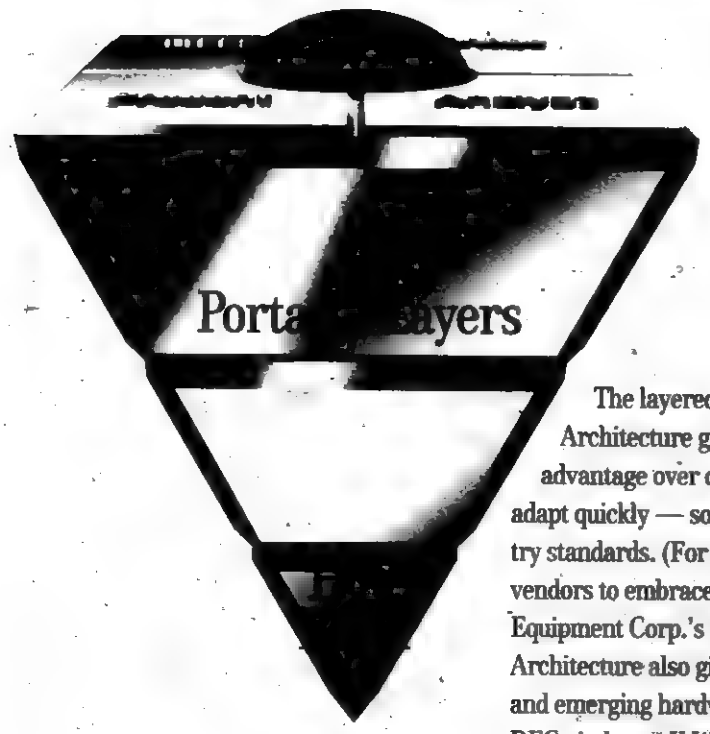
A dynamic programming interface lets you customize your development environment. As your program takes shape, so do the results.

Monitor programs as they execute. Pull-down menus make editing, file management, and other essential programming tasks easy.



Directly access and manipulate the SAS System's English-like command language.

SiliconGraphics
The 3D Computer Company
Business Partner
Authorized Cooperative Software Supplier
sun microsystems
Catalyst Advantage Program



The layered approach of our MultiVendor Architecture gives the SAS System a unique advantage over other software. The SAS System can adapt quickly — sometimes instantly — to new industry standards. (For instance, we were among the first vendors to embrace both IBM Corp.'s SAA and Digital Equipment Corp.'s NAS in one system.) MultiVendor Architecture also gives you the freedom to exploit new and emerging hardware technologies — such as DECwindows,™ X Windows, Presentation Manager,™ and other native windowing interfaces — without worrying about your existing inventory of applications.

With the SAS System, you'll always have state-of-the-art software for state-of-the-art equipment. You'll never again be boxed in to a particular hardware platform.

And that's a promise.

SAS software lets you stay on the leading edge of such new technologies as native windowing.

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Premier Solution Provider

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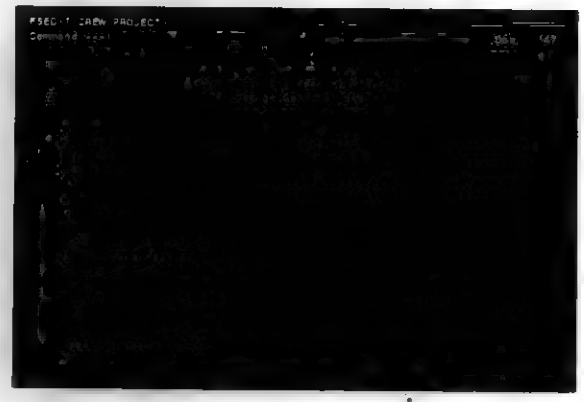
We've given you total control in four strategic areas.

There are four data-driven tasks common to all your computing applications. We've designed the SAS System with these tasks in mind.

The first task is to identify and *access* the data you need. With the SAS System, you'll find direct and transparent interfaces between your applications and the most popular data base management systems such as DB2, SQL/DS,™ ORACLE,® Rdb/VMS,™ Lotus 1-2-3,® dBASE,® and SYSTEM 2000.® You can get your hands on data without having to know data base terminology, and without sacrificing data base security. What's more, the SAS System's support of SQL™ gives programmers a standard language for data query. The SAS System can also be used to access raw data files in any format — even files with messy or missing data.

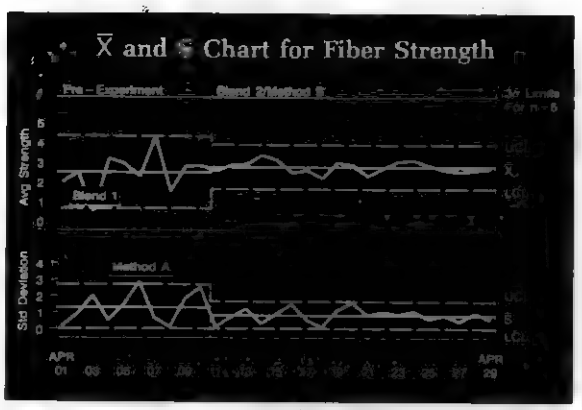
But getting data from place to place is just part of the challenge. Data *management* is also key, and the SAS System responds with efficient ways to enter new data... edit and query data files... and manipulate your data. You can even merge data from totally different kinds of files. And your inexperienced users can enter their data through customized fill-in-the-blank screens that look exactly like your business forms.



Users can take a conversational approach to data entry using fill-in-the-blank screens.

Turning data into meaningful information has always been a hallmark of the SAS System. And now you'll find more ways to *analyze* data than ever before... everything from descriptive statistics to advanced multivariate techniques. You'll also find specialized tools for virtually any kind of business need: planning, forecasting, electronic spreadsheets, operations research, decision support, and more. Plus the most sophisticated methods for statistical quality improvement and experimental design.

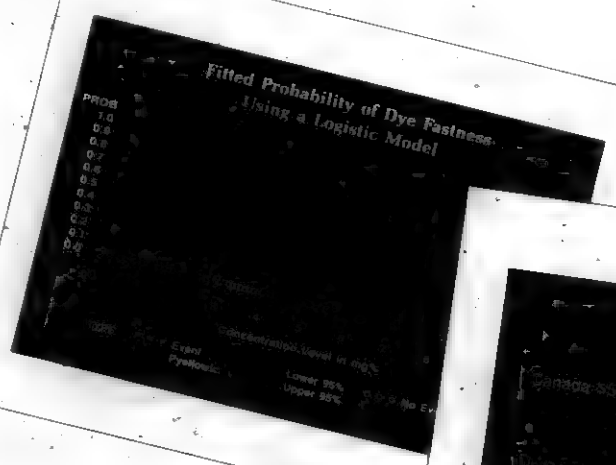
And once you have analyzed your data, the SAS System makes it easy to get the attention you, and your data, deserve. Our data *presentation* capabilities are unsurpassed — from simple printed lists to spectacular full-color graphics. Here's just a sample:

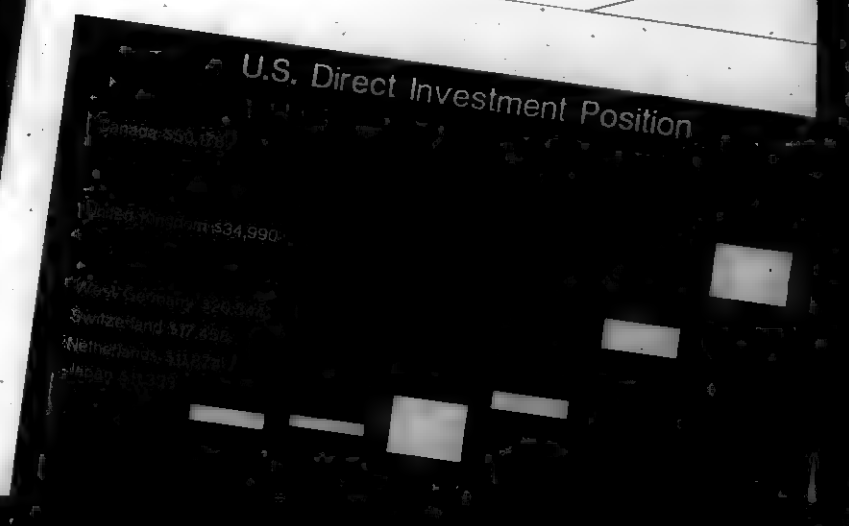


You can rely on one software to handle all your analytical needs.

Quarterly Investment Returns

	Total by Fund Type			
	QUARTER1	QUARTER2	QUARTER3	QUARTER4
Aggressive Growth	$13,916.00	$10,135.00	$20,073.00	$16,454.00
Bond	$13,277.00	$16,561.00	$33,390.00	$21,279.00
Capital Accumulation	$12,291.00	$9,422.00	$26,222.00	$20,166.00
Cash Management	$15,278.00	$12,093.00	$26,116.00	$19,798.00
Government Securities	$12,982.00	$11,570.00	$24,694.00	$14,645.00
Growth	$7,633.00	$10,892.00	$13,196.00	$18,265.00
High Yield	$11,870.00	$13,895.00	$24,121.00	$8,511.00
Tax Exempt	$14,925.00	$14,757.00	$23,934.00	$8,511.00
TOTAL RETURNS	$102,367.00	$99,315.00	$211,846.00	$139,719.00





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Buying power

CONTINUED FROM PAGE 43

tory," Rankin says. "Instead of having 50 different types of PCs and clones to maintain, we have perhaps three or four."

Without standards and tight purchasing controls, IS would indeed be overwhelmed by the mix of machinery that would otherwise wind up in user departments, analysts say. "In all the muddle, it's a wonder that anybody keeps stuff running, let alone successfully analyzes and upgrades," says Paul Zagaeski, an analyst at The Yankee Group in Boston.

One would expect many end users to begrudge IS' control. "The ones that use [the PCs] should be the ones that decide what people get," says Betty McDonnell, manager of word processing at Houston-based insurance firm Burke-Daniels Co.

McDonnell says she would like more control over purchasing decisions. For example, she would have preferred dedicated word processors over the PCs chosen for her department's network.

Despite user complaints, Deloitte Touche's accounting competitor Coopers & Lybrand also tightened the reigns on PC procurement. "When I came aboard here, we had a hodgepodge of equipment," says Stephen Rood, manager of microcomputer technology. "It's hard to administer a very broad, sweeping base."

Today, a technology committee at the New York accounting firm reviews user upgrade requests. IS staffers sit down with users and evaluate such things as graphics and storage requirements for applications, users' communications needs and even weight considerations for laptop PC requests. "We then put together a package of what the hardware and software will be from a two-page list of approved products," Rood says.

Given the local nature of the user base, the evaluation usually takes only a day or two, Rood says. The net benefits are cheaper maintenance and significantly fewer hardware and software compatibility snafus.

The New York City Transit Authority recently established a PC Technical Advisory Committee to oversee and bring some measure of control to its PC proliferation. Made up of representatives from the user departments and central IS, the group is charged with setting hardware standards. For example, the committee recently determined that only desktop machines based on the Intel Corp. 80386SX processor or higher would be acceptable for purchase. It also came up with a list of approved vendors.

By limiting vendors, the authority is hoping to arrange volume purchase discounts with the vendors, says Robert Cucinotta, the committee's chairman.

IS managers say that setting PC purchase standards undermines, in a way, the mandate to serve the user. "You take away their freedom," Rood says. "If someone is hung up about using AST computers and you tell them no, that's not providing the kind of friendly end-user environment that you should be providing."

Even so, IS has dug in its heels at many firms. Aerospace contractor Martin Marietta Corp. runs a tight ship. Users "can't come in and say, 'We want product XYZ,' " says Steven Birgfeld, manager of the IS department's product evaluation center for microcomputers and local-area networks.

Instead, users must file a formal request for evaluation with the IS product evaluation center at each division location. IS staff members prioritize the requests and conduct evaluations, studying users' specific application requirements and coming up with a suggested system configuration. The process is lengthy. A user could wait three to six months from the time of request until the new system arrives, Birgfeld says.

Some users complain about the delay, Birgfeld says, but he contends that 80% comply with the standards process. Perhaps users acquiesce because the alternative is worse than the wait. "If they don't [comply], they must understand that they're going to be somewhat on their own with maintenance," Birgfeld says.

Leave it to the users

Not everyone is taking such an autocratic line. The IS folks at Armco Advanced Materials Corp. set product standards, but they leave the needs evaluations up to the users.

"I'm not going to argue with somebody's vice-president about what they ought or ought not to have," says Tom Lutz, chief information officer at the Butler, Pa.-based steel maker. The justification for a new PC takes place within the user department, and Lutz is content to leave it there.

"We're here to facilitate, not to be a barrier," he says. The lag time between a PC purchase request and its installation on the user's desk is about two weeks.

Helping the user decide for himself and facilitating purchases is also the guiding philosophy at Florida Power & Light Co., an investor-owned utility based in Miami. "We've published guidelines but put the responsibility on operating department management," says William Wallace, manager of user access services. Florida Power's central IS group does review the purchase justification, "but we think people are using good business judgment."

PC pointers

William Wallace, manager of user access services at Florida Power & Light Co., may not control end-user procurement practices with a heavy hand, but he does have the following PC evaluation tips for end-user managers:

- **Make sure you know the old PC's repair history.**
- **Be aware of the old PC's functionality compared with user needs.**
- **Have a clear understanding of the potential productivity gains to be had from a faster processor.**
- **Take into account new applications demands.**

RICHARD PASTORE

Apollo blasted by users over system security glitches

BY J. A. SAVAGE
CW STAFF

Hewlett-Packard Co.'s Apollo Division recently got a dressing-down from more than 70 users over the way it has and has not handled complaints on its operating system security and over support in general.

An open letter to the company complained that "Apollo users have formed the impression that Apollo support has become the poor relation within HP." More specifically, they complained that users have "difficulties in finding out what bugs are known and what patches are available" and that there are "long delays in delivery of software and hardware."

In a response from HP, the company acknowledged knowing of the "need to dramatically improve the flow of information regarding known software problems and relevant patches."

HP made a pledge that beginning in February 1991, it will publish a monthly defect status report.

Another facet of the letter to HP was a discussion of the security of Apollo's Domain operating system. Details of the problems were deliberately omitted from the open letter to keep hackers from discovering them. HP responded that users have found those security glitches to be helpful and problematic and that it will develop a technique to make them optional.

Users contacted by *Computerworld* who had not signed the open letter knew the security issues well, but they have found them to be to their advantage.

"There are a number of loopholes where users can get root privileges," said David Krowitz, systems manager of the Earth Atmosphere and Planetary Science department at MIT. "I use them."

Krowitz and others said they would like to be able to discuss security problems among users but pointed to an inherent paradox in the idea — there is no secure way of doing so and leaving the discussion open.

Lotus trumpets marketing tool for Macintosh

BY PATRICIA KEEFE
CW STAFF

CAMBRIDGE, Mass. — Lotus Development Corp. last week began shipping Lotus Marketplace, a compact disc/read-only memory (CD-ROM) marketing tool for Apple Computer, Inc. Macintosh users, which is also the only Lotus offering for the Macintosh today.

Lotus is on the verge of moving 1-2-3 for the Macintosh into beta testing; the product will not ship in 1990, a spokeswoman said.

Meanwhile, Lotus has two goals for Marketplace, which maintains data on 7 million U.S. businesses.

The spreadsheet maker claimed the application is unusual among desktop software because it provides users with a measurable return on investment.

To back up that claim, Lotus assembled nine users, including one who said he earned $20,000 in new revenue from the first list he created.

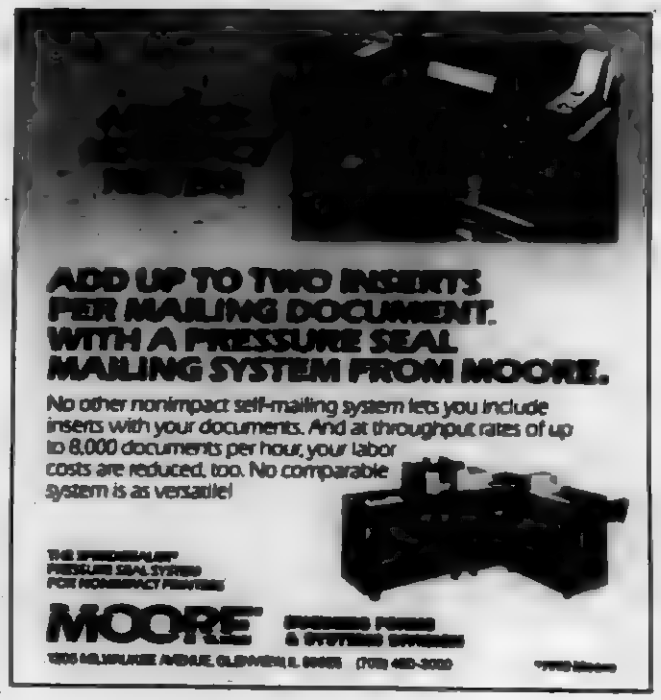
Atlanta-based accountants Collins & Collins C.P.A.s said that Marketplace has saved it "hundreds" in advertising dollars by weeding out unlikely candidates.

"With Marketplace, I can create a mailing list in minutes, instead of days," said Guy Merenda, president of Wedgemere Associates in Winchester, Mass.

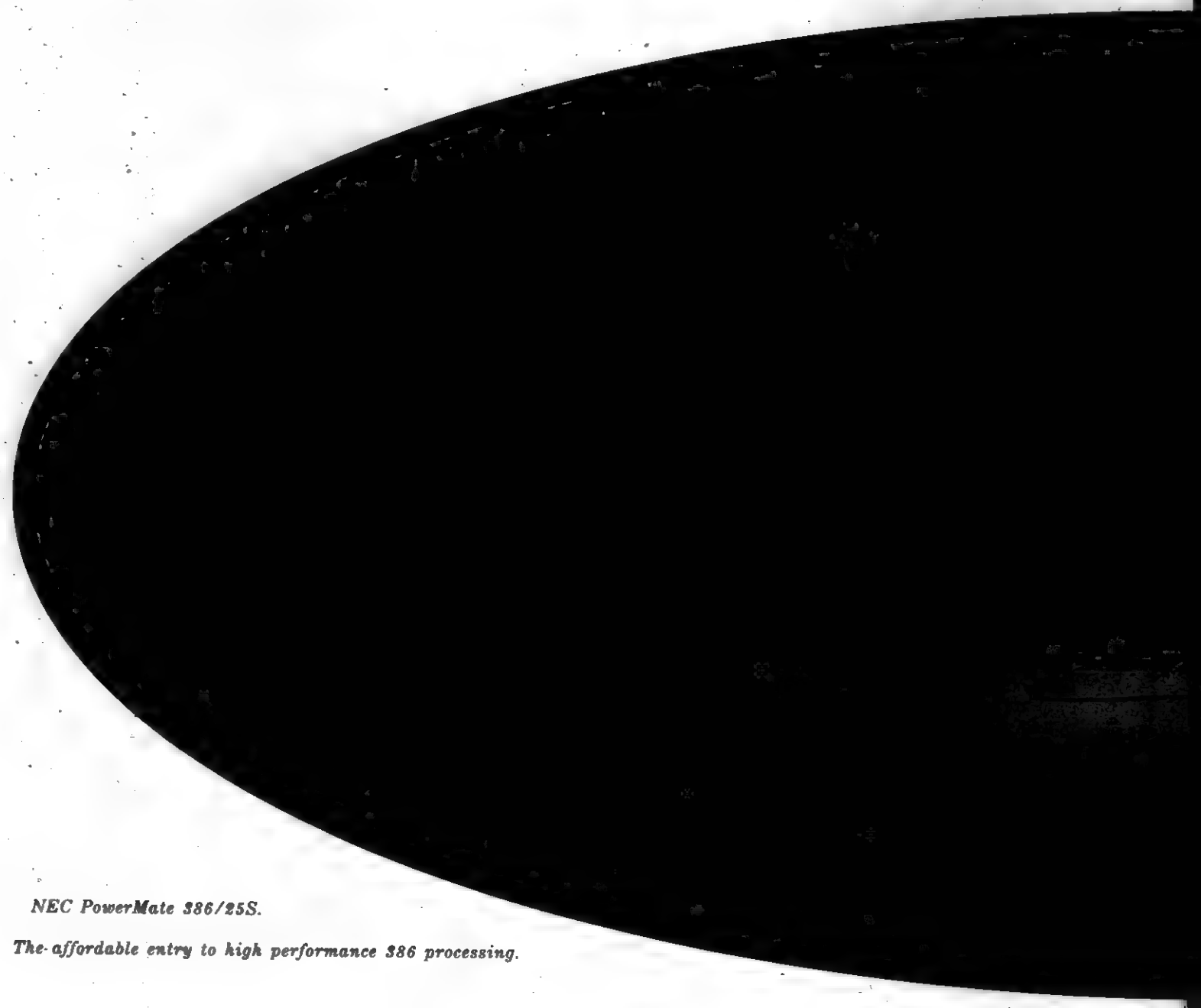
Frank Ingari, vice-president of Lotus' Emerging Markets Business Group, also predicted that Marketplace might be able to help serve as a publicity vehicle for driving sales of CD-ROM drives.

However, the emphasis remains on return on investment and productivity. "When you sell someone a spreadsheet or word processor, it's hard to look them in the eye and say 'If you use this for three hours, you'll either make or save money,' " Ingari conceded.

"With Marketplace, we're finding customers are calling us up and saying that they are making money within an hour," he claimed.



How to make the work go fas



NEC PowerMate 386/25S.

The affordable entry to high performance 386 processing.

For advanced applications like CAD/CAM, presentation graphics or financial modeling, you can't go wrong with the PowerMate® 386™/25S. For far less than comparable 386 systems, you get 25MHz speed, 2MB

C&C
Computers and Communications

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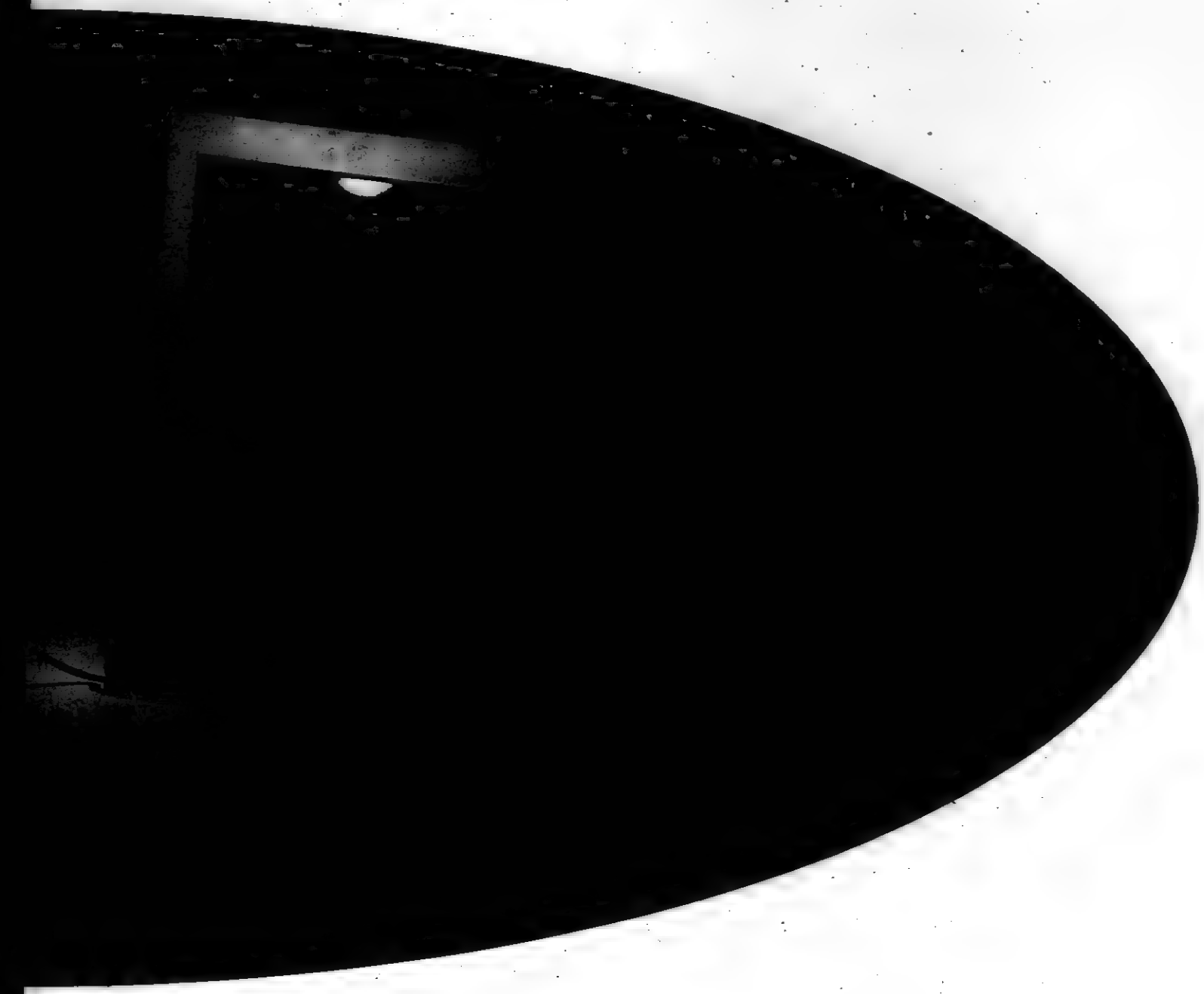


of RAM (easily expandable to 16MB via SIM modules) and a 32K memory cache. You also get something you can't get from anyone else at any price: NEC. For more information call 1-800-NEC-INFO.

NEC

NEW PRODUCTS

Systems

Sharp Digital Information Products, Inc. has announced an image processor that includes very large-scale integration chips that mimic human vision recognition patterns and support various personal computer-based imaging applications at speeds of 700 million instructions per second.

The product is available as a board-level subsystem or an application development system. The Core Board IV-80-CB is priced at $3,000. An IBM Personal Computer AT-based IV-80-IP development system costs $28,500.

Sharp
16841 Armstrong Ave.
Irvine, Calif. 92714
(714) 261-6224

Cumulus Corp. has announced a small-footprint personal computer that can be configured with a monochrome or color monitor, a floppy or hard disk drive and a 16- or 20-MHz Intel Corp. 80386SX processor.

The GLC/CO includes Microsoft Corp.'s DOS Version 4.01, Windows 3.0 and Works software packages; 1M byte of random-access memory; and a 16-bit Industry Standard Architecture bus with four expansion slots.

Pricing ranges from $1,195 to $1,895, depending on configuration.

Cumulus
23500 Mercantile Road
Cleveland, Ohio 44122
(216) 464-2211

Advanced Logic Research, Inc. has announced the SX Powerflex Model 40, a 16-MHz Intel Corp. 80386SX-based personal computer.

The system includes 1M byte of random-access memory, a 1.44M-byte 3½-in. floppy disk drive, one serial port, one parallel port and a 101-key keyboard. The product is priced at $1,495.

The company also announced that its Powerflex Model 1 and Model 40 are now available at reduced prices of $995 and $1,295, respectively.

Advanced Logic Research
9401 Jeronimo
Irvine, Calif. 92718
(714) 581-6770

Earth Computer Technologies, a division of Alloy Computer Products, Inc., has added an Intel Corp. 80386SX-based diskless personal computer to its Earthstation line of diskless PCs.

Earthstation III consists of an IBM Personal Computer AT-style 101-key keyboard, a network interface and multimode IBM Video Graphics Array-compatible video adapter.

The product is available in 16- or 20-MHz models, which are priced at $1,695 and $2,195, respectively.

Alloy Computer Products
165 Forest St.
Marlboro, Mass. 01752
(508) 481-8500

American Mitac Corp. has introduced a computer system designed to serve as a stand-alone workstation or as a local-area network file server.

The Mitac 3070G is a 33-MHz Intel Corp. 80386-based small-footprint desktop computer that features 128K bytes of cache memory. The system uses a proprietary 32-bit slot for 4M bytes of random-access memory but can be configured to accommodate a maximum of 16M bytes of RAM.

A basic configuration is priced at $4,995.

American Mitac
410 E. Plumeria Drive
San Jose, Calif. 95134
(408) 432-1160

Software applications packages

Applied Information Systems, Inc. has announced a spreadsheet software package designed for engineers and scientists who require computation levels greater than those of standard financial spreadsheets.

Xess runs under the Open Software Foundation's Motif on Unix and Digital Equipment Corp. VAX/VMS workstations. It features built-in scientific and engineering functions and all standard spreadsheet financial functions.

The program is available at an introductory price of $495 per workstation until its mid-October scheduled shipping date.

Applied Information Systems
500 Eastowne Drive
Chapel Hill, N.C. 27514
(800) 654-2596

HNC has announced a software package designed for IBM Personal Computer ATs or compatibles running Microsoft Corp.'s Windows Version 3.0. Explorenet 3000 acts as neural network software that enables users of Windows 3.0 to use an icon-based environment to develop applications without requiring any programming. The product is priced at $1,495.

HNC
5501 Oberlin Drive
San Diego, Calif. 92121
(619) 546-8877

Strategic Mapping, Inc. has announced Version 4.5 of Atlas Mapmaker, a software package that enables users of Apple

Continued on page 56

Call the Xerox Uptime Team at 1-800-622-0076.

You have the tool right on your desk. And now you have the number for the most comprehensive, multi-faceted network support system available today. In fact, Xerox is the recognized leader in quality network support. And today, there are over 3,500 members of the Xerox Uptime Team dedicated to helping you to avoid costly downtime.

It doesn't matter if you have two PCs or two thousand, freestanding or networked, mixed-system PCs in a campus environment, or in offices nationwide, Xerox PC/Network Services can offer you superior technological service and network support. In fact, since Xerox can offer you on-site capability in 95% of the country, your network system is covered.

The Xerox Uptime Team can set up an in-house service center in your own facility, staffed with dedicated network support technicians who will take full responsibility for all your network service and network support needs, including network design, installation, moves and changes. The Uptime Team can service just about any brand of hardware, software or network system. Because of our close relationship with original equipment manufacturers (OEMs), we always have firsthand information about new technologies and advancements.

Our Xerox network service professionals guarantee the quality of their work and total customer satisfaction. Xerox PC/NS offers flexible and customized system management and information tracking.

So the next time you have a network problem, from design to service, call the Xerox Uptime Team at 1-800-622-0076.

Xerox PC/NS
The Uptime Team

The planning report is stuck in accounting.

Sales data are still out in the field.

Inventory figures are stored at 1200 different sites.

The competition is on our heels.

Now tell me why our computers can't work together.

Integrated information from to give you control by giving

It is a comprehensive

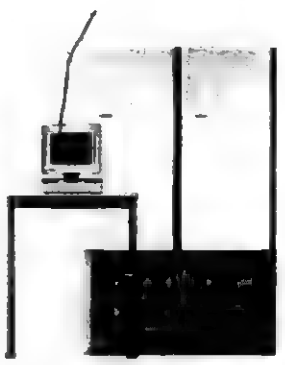
so broad you're free to integrate information

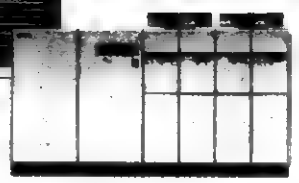
It is a truly open initiative

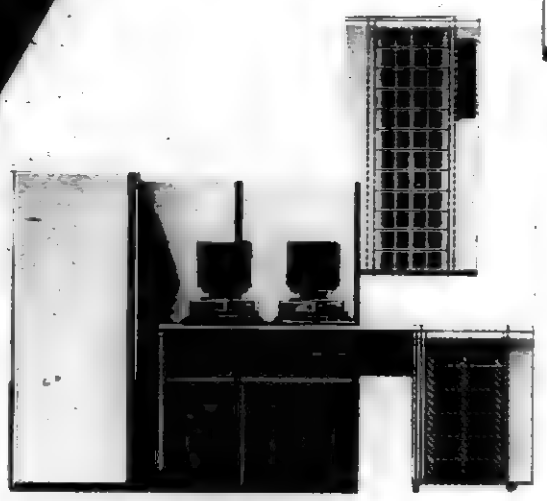
so you're free to integrate Unisys

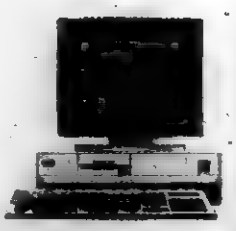
It is a standards-based

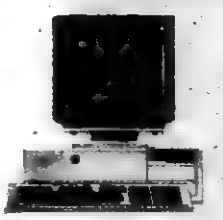
so flexible you're free to protect past investments

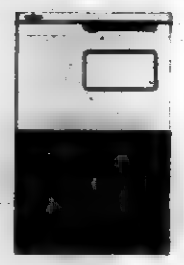












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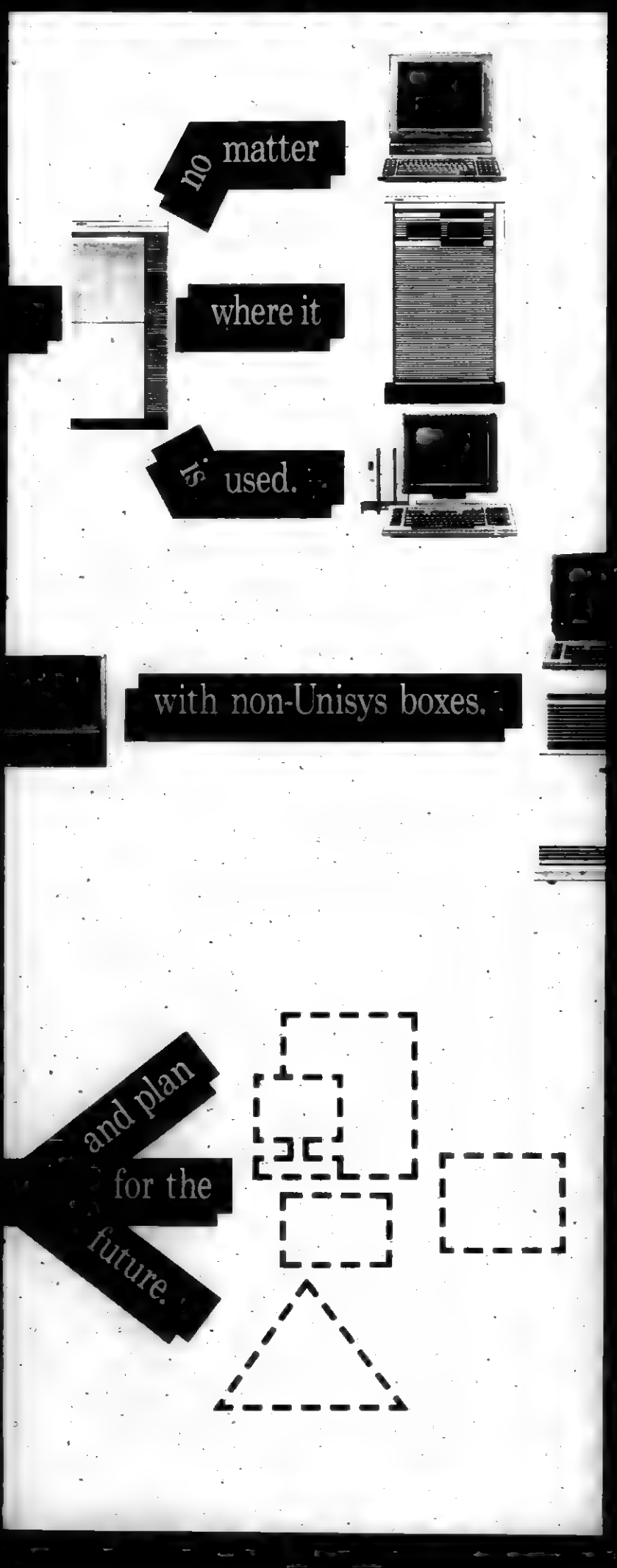

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Many of the systems and software products to start you down this road are here today. Many are yet to come.

Our goal is clear: to give you the greatest freedom of choice in a multi-vendor environment. The freedom to integrate what you have with what you need. The freedom to stay competitive. So call 1-800-448-1424, ext. 48. And see how good freedom can be.

We make it happen

Continued from page 52

Computer, Inc. Macintosh systems to link maps to databases or spreadsheet files and publish maps that indicate geographic relationships between data.

The product runs on Macintosh 512K, Plus, SE and II series machines and is priced at $495. Registered users of Version 4.0 can upgrade their systems for $95.

Strategic Mapping
4030 Moorpark Ave.
San Jose, Calif. 95117
(408) 985-7400

Time/Design, Inc. has announced Timebase, a personal information manager software package designed for users of personal computers.

The product allows users to schedule, prioritize and delegate multiple activities and includes a DOS gate that enables users to move directly to other programs.

Timebase is priced at $195.

Time/Design
11835 W. Olympic Blvd.
Los Angeles, Calif. 90064
(213) 312-0288

Cadworks, Inc. has begun shipping Release 107 of Drawbase, a software package designed for computer-aided design database applications.

The product features support for Phar Lap Software, Inc.'s Phar Lap 386/DOS-Extender and includes an application programming interface that allows users to load and execute externally developed application programs.

System requirements include an Intel Corp. 80286-, 80386- or 1486-based computer equipped with a math coprocessor and 3M bytes of extended random-access memory.

Pricing ranges from $1,995 to $5,495, depending on the type of model.

Cadworks
222 Third St.
Cambridge, Mass. 02142
(617) 868-6003

Software utilities

Advanced Software, Inc. has announced a software utility designed to allow users of Apple Computer, Inc. Macintosh systems to store an unlimited amount of names and addresses and up to 14 pages of notes with each address.

Intouch Version 1.0 includes features such as fast searching, extensive telephone dialing options, envelope label printing and previewing and immediate copying of addresses to and from other applications.

The product is priced at $70.

Advanced Software
1095 E. Dunne Ave.
Sunnyvale, Calif. 94086
(408) 733-0745

Frame Technology Corp. has announced a software program designed to seamlessly integrate Lotus Development Corp.'s 1-2-3 spreadsheet data with Framemaker Version 2.1, its publishing software package for producing business and technical documents.

The Unifit for Spreadsheets package is part of the Frame Partners Program, an agreement among Frame, Lotus and Unifit Co. It runs on Sun Microsystems, Inc.'s Sun-3 and Sparcstation, Digital Equipment Corp.'s VAX 5000 and Ultrix systems and IBM's RISC System/6000 workstations.

A single-node license costs approximately $380.

Frame Technology
1010 Rincon Circle
San Jose, Calif. 95131
(408) 433-3311

Trend Micro Devices has announced the PC-cillin Virus Immune System, an anti-virus system that uses hardware and software components to protect systems from all known computer viruses.

The product includes a hardware immunizer that includes nonvolatile enhanced erasable programmable read-only memory that safeguards boot sector data and partition records, the vendor said.

A terminate-and-stay-resident filter program features three levels of virus protection: detection, prevention and quarantine. The product costs $139.

Trend Micro Devices
2421 W. 205th St.
Torrance, Calif. 90501
(800) 228-5651

Macintosh products

Ventura Software, Inc. has announced a version of its desktop publishing software package designed for Apple Computer, Inc. Macintosh environments.

Ventura Publisher Macintosh Edition includes a spell checker, movable dialog boxes, 300 on-line Help menus and file import and export capabilities. System requirements include a Macintosh Plus, SE, SE/30, II series or portable with 2M bytes of random-access memory.

The product is priced at $795.

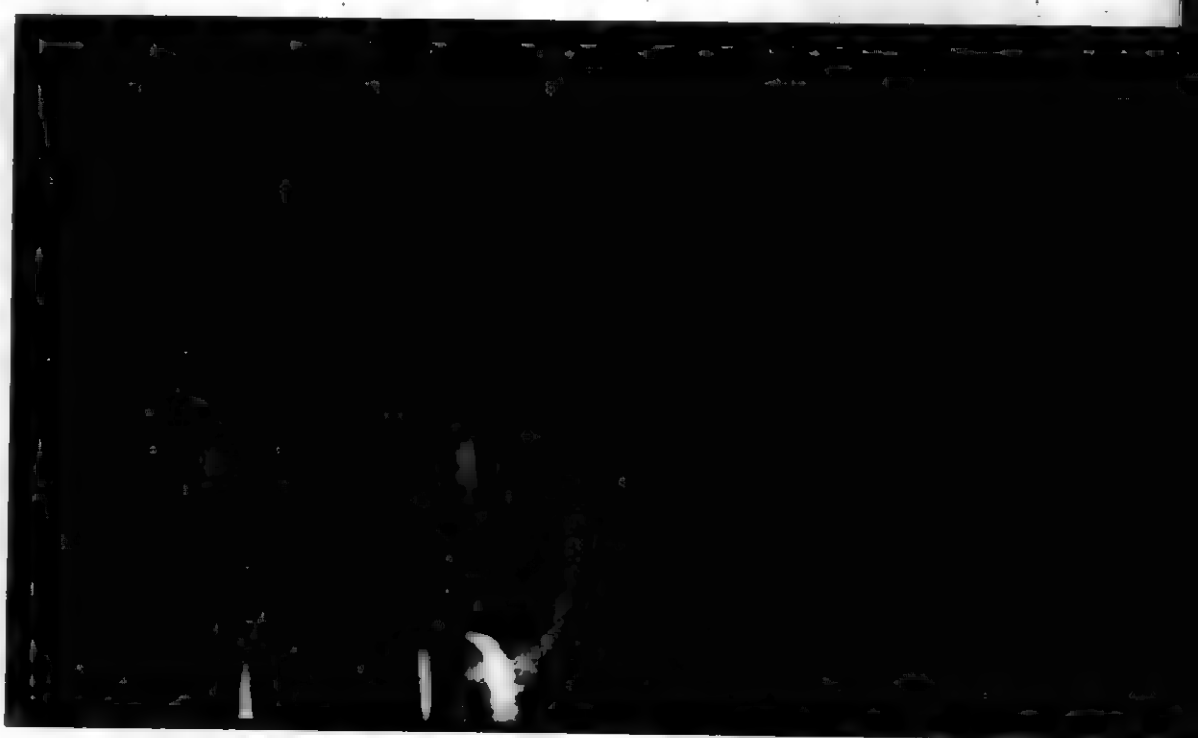
Ventura Software
15175 Innovation Drive
San Diego, Calif. 92128
(800) 822-8221

Data storage

Micron Technology, Inc. has announced a 2M-byte single-socket memory module designed for Compaq Computer Corp. Deskpro 386/33, 486/25 and Systempro computers.

The Ascend dynamic random-access memory expansion module uses a 32-bit data path and attaches to a system's current memory board to increase memory to 16M bytes or more, depending on the

PLATINUM Takes The



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Micron Technology
2805 E. Columbia Road
Boise, Idaho 83706
(208) 383-4000

Mass Optical Storage Technologies, Inc. (MOST) has introduced a rewritable optical disc drive that uses removable 3½-in. media.

The RMD-5100-S, part of the MOST RMD series, features entry-level formatted capacities of up to 128M bytes on ANSI-standard 3½-in. rewritable optical disc cartridges. Its average seek time is rated at 35 msec, and a short scan/seek function allows data within a 128-track band to be accessed in less than 9 msec, according to the vendor.

The RMD-5100-S is scheduled to be released next month. It is priced at $2,425 in single OEM quantities.

MOST
11205 Knott Ave.
Cypress, Calif. 90630
(714) 898-9400

Priam Systems Corp. has announced a line of 200M-byte full-height 3½-in. disk drives that are equipped with an adapter card for Intel Corp. 80286-, 80386- and I486-based IBM Personal Computer ATs and compatibles.

The ID200L series includes three models: the ID200L-IC ($1,551), the ID200L-IF ($1,531) and the ID200L-I ($1,500). All the drives were designed to provide access with a 15-msec seek time and to operate with a 50,000-hour mean time-between-failure rate, the vendor said. The drives are IBM BIOS-compatible and support bus speeds of up to 16 MHz.

Priam Systems
1140 Ringwood Court
San Jose, Calif. 95131
(408) 954-8680

Peripherals

Microtouch Systems, Inc. has announced an integrated, flat-panel display module designed for use in industrial or hostile environments.

The EI Touch Monitor features an electroluminescent display that is compatible with IBM's Enhanced Graphics Adapter and a capacitive touch screen that enables users to make contact with the sensor through thin layers of dirt, moisture or other material that builds up on the screen, the vendor said.

A single unit is priced at $1,995.

Microtouch Systems
55 Jonspin Road
Wilmington, Mass. 01887
(508) 694-9900

Curtis Manufacturing Co. has introduced a track ball that features plug-in ADB compatibility and optomechanical engineering.

The Curtis MVP Mouse includes three click command buttons that are wrapped around the top two-thirds of the track ball. A custom control panel enables users to assign dozens of commands to the three command buttons and select preset tracking or double-click speeds.

The product is priced at $150 and includes a one-year warranty.

Curtis Manufacturing
30 Fitzgerald Drive
Jaffrey, N.H. 03452
(603) 532-4123

Radius, Inc. has announced that Version 1.1 of its Radius PC software package is included free with its 19- and 21-in. Two Page Display Systems.

The software package includes drivers for Microsoft Corp.'s Windows Version 3.0, Wordperfect Corp.'s Wordperfect Version 5.1 and Version 10 of Autodesk, Inc.'s Autocad. The Two Page Display Systems (TPD/19 and TPD/21) enable users to view an entire document without reducing or scrolling, the vendor said.

Model TPD/19 has a list price of $1,395, and Model TPD/21 costs $1,795.

Radius
1710 Fortune Drive
San Jose, Calif. 95131
(408) 434-1010

Alpha Technologies, Inc. has announced a 300-VA standby power supply designed for personal computers.

The Alpha 300 produces a sine wave form that is compatible with computer and peripheral loads and provides electronic overload and short-circuit protection. It includes intelligent local-area network interface options for networked environments.

The product is priced at $419.

Alpha Technologies
3767 Alpha Way
Bellingham, Wash. 98226
(206) 647-2360

Training

Fliptrack Learning Systems, Inc. has released an audio course that highlights the more complex features of Lotus Development Corp.'s 1-2-3 Release 3.0.

Advanced Training for Lotus' 1-2-3 Release 3.0 describes 1-2-3 functions such as linking multiple worksheets, viewing multiple worksheets on-screen and creating macros and other macro uses.

The product includes four audiocassette-based lessons, a data disk and a reference guide. It runs on IBM Personal Computer XTs, ATs and compatibles and is priced at $119.

Fliptrack Learning Systems
999 Main St.
Glen Ellyn, Ill. 60137
(800) 222-3547

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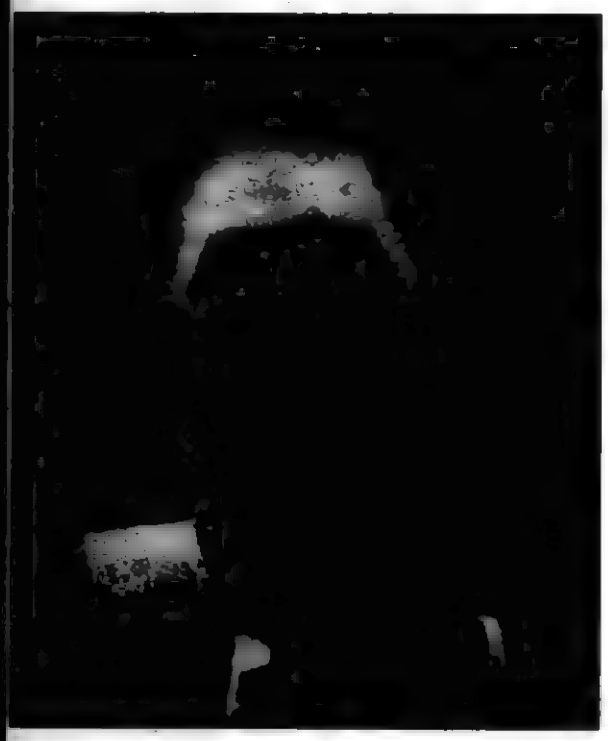

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From an interview with Eric Dickstein of Continental Grain.

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How big is your network?

"We have over 700 users worldwide on our network, with 24 servers in New York alone. 4 each in Chicago and Geneva. Plus single servers in another 12 offices. Recently we added Zaire, and we've discussed putting them in Hong Kong, Singapore, and South America."

Do you use third-party lines?

"Yes, depending on needs and economics. Mostly, it's GEIS, plus some point-to-point lease lines and dial-up facilities. Even a dedicated 56KB satellite link. And it's all totally transparent."

Why did you select VINES?

"When we started this network 5 or 6 years ago, Banyan was the only company that could satisfy our needs. Today, in my opinion, it still is."

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COMMENTARY

Elisabeth Horwitt

Bottom-line bugaboos

I happen to agree with the financial gurus and political pundits who blame many of our country's current woes on short-term thinking. Politicians' horizons are limited to the next election, so they go for the inexpensive, Band-Aid solution and leave it up to their successors to solve those little leftover problems — such as the federal budget deficit and the disappearing ozone layer.

Similarly, business managers have to please their stockholders with quarterly profits, so they are leery of major investments that do not bring quick returns. As a result, our factories become outmoded and we get skunked by overseas competition.

The above phenomenon has been cropping up more and more in corporate information systems budget planning sessions, with dire results.

I recently asked Jere Thomas, a founder of the Houston 30 — now the User Alliance for Open Systems — why Open Systems Interconnect (OSI) is taking so long to take off. His reply: Users still haven't given vendors a clear signal that they want products based on the networking standard.

"There are no bad guys here," Thomas emphasized. Rather, there are a lot of companies whose investments in technology must answer to bottom-line-oriented investors. Un-

Continued on page 64

OSI management still lacking

Lack of test suite hinders creation of multivendor network management

BY ELISABETH HORWITT
CW STAFF

SAN DIEGO — Open Systems Interconnect Network Management Forum members had little to show in the way of product conformance — let alone multivendor interoperability — at last month's Tele-Communications Association '90 conference.

The second in a series of Network Management Showcases, which the Forum has scheduled for major communications shows during the next year, saw approximately 25 Forum members on the floor but little in the way of network management products that adhere to the Forum's specifications, published last June. This was no surprise, since the Forum's test suite for ensuring such compliance is not due out until December.

"It's too soon. We have a map of our members on the floor but no interoperability," said Keith Willets, chairman of the board of trustees of the Forum.

"The purpose of the early showcases is to steer users to member booths to get a preview of and information about vendors' OSI network management plans," said Jim Warner, the Forum's Communications director.

British Telecom PLC did demonstrate how its Concert network management platform will use OSI to manage various British Telecom global network offerings, as well as an Ungermann-Bass, Inc. local-area network. However, the demonstrated OSI links will not be fully Forum-compliant until they are tested — and the test suite is slated for release by year's end, a Forum spokesman said.

The Forum, which currently has more than 100 vendor members worldwide, is "a good, organized effort, but products are not in the mainstream yet," said Jim Williams, telecommunications manager at the Mervyn's department store chain. Mervyn's, which currently uses IBM's Netview, would like to use OSI rather than IBM's LU6.2 protocol as a way to hook up other vendors' networks to the network management platform, Williams said, because OSI has broader vendor support.

IBM has for some time indicated that it will provide native support of OSI protocols in Netview, "which will mean you can issue a 'get' command from Netview, for example, rather than going through a gateway to translate Netview to OSI commands," IBM spokesman Bob Anderson said. IBM has also implemented OSI network management protocols as a way for its LAN Manager and LAN Station Manager to communicate, according to IBM programmer

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National gigabit net security under fire

ANALYSIS

BY GARY H. ANTHES
CW STAFF

The National Research and Education Network (NREN), also known as the gigabit net and invariably described as a data superhighway, may turn out to be a road with no traffic cops and a highway with no guardrails, critics charge.

A wide range of computer and communications experts in and out of the federal government say that planning for NREN is proceeding with too little thought being given to issues of security and privacy.

However, a number of equally qualified observers scoff at that assertion, saying that security and privacy safeguards belong on the host systems that attach to networks, not on the networks themselves. They point out that in the notorious Internet worm incident of almost two years ago, it was host operating system flaws that admitted the rogue program, while Internet efficiently passed bits precisely as intended.

Both camps seemed to agree on one point: Not enough attention is being paid to security as a whole, with network and computer center managers focusing most of their attention on just making their systems work in an environment of presumed, but not assured, geniality.

At a recent meeting of the Computer Systems Security and Privacy Advisory Board of the National Institute of Standards and Technology (NIST), the board criticised a bill sponsored by U.S. Sen. Albert Gore Jr. (D-Tenn.) that would establish a $1.9 billion program in high-performance computing and communications. The board said that the bill failed to adequately address security and privacy on the NREN, whose development would be partially funded by the bill.

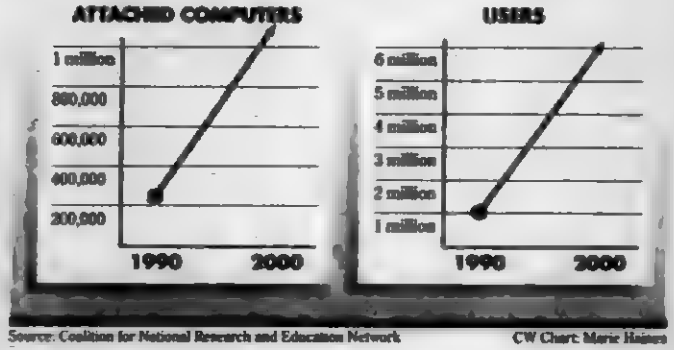
Even defenders of the pending legislation acknowledged that more attention could be paid to these topics, not only for the NREN but for its existing predecessors, the National Science Foundation's network (NSFnet) and other components of the Internet, the global collage of networks used mostly by the research and education communities.

"Security is hard to address because no one knows what to expect," said a Senate staff member who worked on the bill.

Continued on page 63

Sky high

The number of users of NREN and the networks tied to it could total 6 million by the year 2000



Source: Coalition for National Research and Education Network — CW Chart: Marie Haines

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Nonprofit firm seeks to create low-cost network

ON SITE

BY J. A. SAVAGE
CW STAFF

BERKELEY, Calif. — Considered by many to be the first electronic bulletin board in the U.S., the Community Memory Project, Inc., a nonprofit communications organization, is implementing a client/server architecture to move into the 1990s.

Community Memory was founded in 1977 by Lee Felsenstein, a free-speech activist and an inventor of the Osborne Computer Corp. personal computer. The organization put four terminals out for public access at retail stores and community centers in 1984. There were forums to speak one's mind, check the city council's agenda, find toxic hot spots in the neighborhood and locate used cars and housing.

In 1988, the Berkeley Co-op food centers went out of business, and with them went two of the most popular terminals. Community Memory then shut down the project while the organization worked on new software. Ten terminals were reinstalled earlier this year in a wider range of public places, including bars and laundromats.

Community Memory had a head start on the new architecture because it has always been on a Unix-based system. However, as an early Unix user, it was saddled with expensive hardware that it could not afford to keep. "We were using a computer from now-defunct Plexus Computers, Inc. that cost $30,000 with dumb terminals," said Terry Beynart, Community Memory's treasurer.

Upgrades were expensive because they had to be bought from the manufacturer instead of on the open market. For example, 1M byte of memory cost about $3,000 when comparable prices on the open market were $700 to $800, according to Carl Farrington, president of the organization. It also carried an expensive maintenance contract, Farrington said.

Cost was a detriment not only to the organization's treasury, but also to its moral foundations. An underlying purpose of the group, which has a staff of five, is to create a low-cost system that other community groups can use to increase communications within their organizations or between the organizations and the public.

The group now has a $10,000 Intel Corp. 80386-based IBM Personal Computer clone running AT&T Unix System V, as well as diskless clones that cost about $300 each, Beynart said.

While Community Memory may have been one step ahead of many corporations by running Unix, it still had to rewrite its software for a client/server model. Despite the fact that it took the tiny organization four years to develop the software, Farrington said, the client/server model is "much more efficient." He said the Unix server functions are suited to the operating system. Functions such as I/O and database management are handled on the server, while the PCs manage screens. On its old host/dumb terminal model, the Unix-based computer had to do everything.

Community Memory wrote its own networking protocol based on the physical configuration of a local-area network. "Instead of terminals scattered around an office, they're scattered around the city," Farrington said. "A wide-area network would have worked but would have been expensive, and part of our design goal was to be low cost."

Speed limits

To cut costs, data transfer speed was limited to 2,400 bit/sec., running over leased lines. The system employs a packet-switched network through limited-distance modems to increase efficiency. According to Farrington, the organization's software could also work on a LAN.

In hopes of licensing its new system to other "struggling nonprofits," Community Memory wrote its system in object-oriented code. It can be licensed on a sliding scale that begins at $200 and is based on the licensee's size, ability to pay and other more esoteric reasons such as how interested the organization is in the new project. "When we aggressively license it, it will be much more systematic," Farrington said. It has one licensee so far — San Francisco State University. Three more organizations are currently negotiating with Community Memory.

Community Memory is still trying to identify and solve problems, not in its system but in the way it can be used. The organization is grappling with a marketing problem: how to encourage people to use this kind of communications as well as what its most valuable use can be — questions not addressed in a traditional networking environment.

The new system was launched with a $94,830 grant from the Telecommunications Education Trust, which is managed by the California Public Utilities Commission. The trust was set up in the wake of the breakup of AT&T to fund groups that would discuss the role of public utilities in society.

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From the day of its introduction, UDS' V.32 modem has gathered honors from leading computer publications and other industry watchers!

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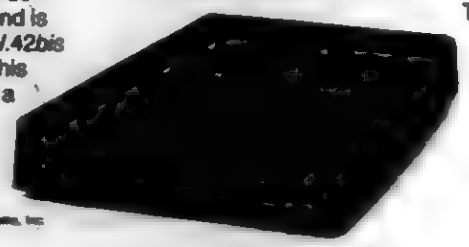
For accurate communication over worst-case lines, the unit incorporates V.42 LAP-M and MNP 4 error control functions. A full complement of on-board test functions is included, and eight LEDs provide easy monitoring of the unit's operation and built-in diagnostic features.

Get acquainted with the latest winner in the UDS V.32 family. For technical details and quantity pricing, contact UDS, 5000 Bradford Drive, Huntsville, AL 35805-1993. Telephone 205/430-8000; FAX 205/430-8926.



UDS
MOTOROLA

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Simpler pricing strategy may give LAN Manager edge over Netware

BY JIM NASH
CW STAFF

Now that Microsoft Corp. has both feet in the personal computer-based local-area network market, resellers are re-examining LAN pricing strategies.

They are comparing Microsoft's three-tiered network prices with LAN leader Novell, Inc.'s Byzantine price schedule. Some see a distinct advantage to Microsoft's keep-it-simple premise, especially for information systems managers who are trying to simplify all aspects of buying and operating a LAN.

David Vinzant, president and founder of Vinzant, Inc. in Portage, Ind., said Microsoft could score points with some customers who want a "clearer and easier" price schedule.

Microsoft is suggesting a retail price of $995 for documentation and code for five users and $995 for each additional 10 users. Code for an unlimited number of users is priced at $5,495. Packages at each level contain identical features.

Novell's Netware, on the other hand, is acknowledged even by company Executive Vice-President Darrell Miller to be confusing. In a recent interview, Miller said he regularly reviews prices with an eye toward simplification but has yet to come up with a better solution.

The Provo, Utah-based company has several versions of Netware, each designed and priced for specific network sizes. Beyond that, users can buy applications called network-loadable modules (NLM) that do not operate universally with all Netware packages.

However, Vinzant said, many IS administrators are not looking at price tags or overall price strategies when they buy their networks. "It's an issue of product maturity," he explained. Novell has been in the LAN market longer and has developed distinct products for different needs, Vinzant added. Many of his customers, he said, accept that those products will have differing prices.

Richard Close, president of Soma Training, Inc. in New York, agreed but cited "politics and features" as the deciding factor for most IS departments.

"If a company's got a strong IBM installed base, they are likely to go with LAN Manager," Close said. He said cost would almost always lose to long-range investment protection.

Vinzant said Novell's structure may be a pattern for the future. "I'd be curious to see if in two years LAN Manager is only one product" with the present three-tiered pricing strategy.

Some Netware users and resellers at a recent users conference saw the reverse. They wondered if Netware 386 would follow Microsoft by being molded into a universal core on which all other Netware options could hang.

For example, system fault tolerance, an option currently available only on large-scale Netware packages, could be an option for small offices that require redundant systems. Critics of that idea say it would increase user confusion and make older product versions obsolete.

"That might be a theoretical solution but not a practical one," Vinzant said. "Right now, the user buys one box, and it's got everything you need. You can get NLMs, but that's not the norm." For example, there would be more confusion on users' parts if they needed multiple installation cards to boot up a system, he said.

Non Sequitur

As the originator of one of the earliest, but commercially unsuccessful, database management products, Community Memory rewrote its software so other community groups on a shoestring budget could use the technology.

Community Memory Software is a far cry from Sequitur, the organization's earlier database management system software package. Sequitur was one of the first general database management products available but had little success in garnering market share.

"Community Memory wanted to make a million dollars on [Sequitur] to fund the nonprofit side of the project," said Terry Beynart, the organization's treasurer. However, after premiering at Comdex in 1981, it sold only about 100 copies for Unix and 1,000 copies for IBM Personal Computers, according to Community Memory President Carl Farrington.

For the new community-oriented database, Community Memory scaled down its database management system from the Sequitur product. "Sequitur was designed as a general-purpose database," Farrington said. The new system is geared for ease of use in a text base, where a user can navigate by using key words.

J.A. SAVAGE

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BIT BLAST

British Telecom to resell ACC bridge/routers

British Telecom has formed a partnership with **Advanced Computer Communications** to resell and support ACC's bridge/routers. ACC's products will reportedly provide local- to wide-area connectivity to British Telecom's T-Net IN2000 local-area networks across both X.25 packet-switching networks and private circuits.

A networking factory-floor interface between **Digital Equipment Corp.** VAX minicomputers and **Siemens Automation Group** plant-floor devices has been developed to allow DEC VMS applications to communicate with applications running on remote Siemens manufacturing equipment over Ethernet local-area networks. The product, dubbed Decoup/VMS, will reportedly be available this month from DEC.

Nynex Corp. has announced a safeguard to personal privacy issues revolving around caller-identification services, which allow the phone number of an incoming call to be displayed at the receiving site. The regional Bell holding company said that its **New England Telephone Co.** subsidiary will provide callers with a free, per-call blocking feature in areas where the caller ID service is available. The service, slated for initial availability in Vermont this month, will allow a caller to activate a code to prevent the passage of his phone number to the calling destination.

Proteon, Inc. is taking creative measures to fuel the competitive fires in the network adapter card arena by announcing a lifetime warranty for its 4M/16M bit/sec. token-ring boards. The warranty, which applies to all three versions of Proteon's board — Extended Industry Standard Architecture, Micro Channel Architecture and IBM Personal Computer AT — guarantees that adapter failures will be repaired or replaced throughout the life cycle of the adapter. There is a $10 fee to customers who want to sign up for the warranty.

Banyan Systems, Inc. has designed a version of its Virtual Networking Software (Vines) network operating system to support symmetric multiprocessors. Symmetrical multiprocessing allows multiple processors in a server to perform tasks on a first come, first served basis to improve processing time. The new Vines version is compatible with Banyan's Intel Corp.-based 80286, 80386 and I486 single-processor platforms and will support Compaq Computer Corp.'s Systempro server with either two 80386 CPUs, two I486 CPUs or one of each.

OSI

CONTINUED FROM PAGE 59

Jeff Ferla.

IBM and BT are now working on a peer-to-peer link between BT's Concert and IBM's Netview, based on the OSI Common Management Information Services and Common Management Information Protocol, a Forum spokesman said. Products are due out by the end of next year, he added.

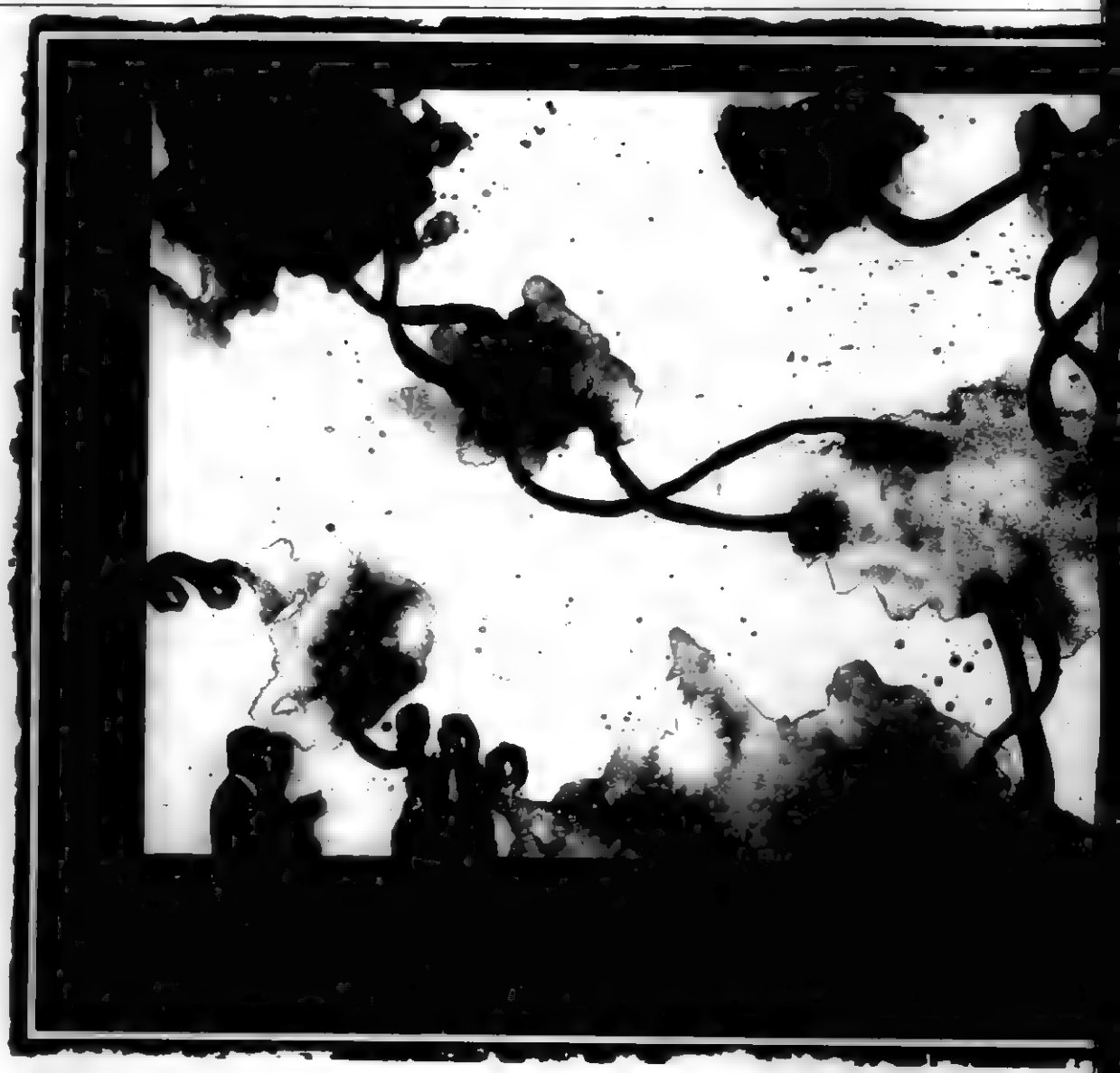
IBM is also scheduled to take part in Forum OSI interoperability demonstrations as part of the showcase, but while the demonstrations do point to future products, they give no indication of the time frame for commercial release, said Bob Smith, IBM's director of network management alliances in communications systems.

AT&T plans by the second half of 1991 to provide Forum-compliant interfaces for its Accumaster network management platform and for some of the "elements" that manage its various network offerings, such as Accunet Information Manager, said company spokesman Don Keller. However, AT&T will continue to support its existing Network Management Protocol interface as well as an alarm interface now supported by several third-party vendors, Keller said.

Forum members are likely to initially use the Forum specifications to manage their own as well as business partners' disparate products, Warner said. Interoperability between business rivals may take longer, "which could be a problem if the first three vendors to achieve compliance are all long-distance carriers," he added.

The Forum's OSI network management interoperability showcase series should begin to take off at the Communications Network '91 conference in Washington, D.C., in late January, Forum sources said. "Once large companies begin rolling out products, and there will be a number at each show, the showcase will grow exponentially because vendors that do not take part will become conspicuous by their absence," Warner said.

The Forum protocols released last June allow systems to exchange network management information and perform fault management, Willets said. The next phase will expand the base of managed objects and provide protocols for performance and path management, as well as end-to-end fault isolation, he added.



"That reminds me, now that we've managed to network everything, who's going to manage our network?"

Deciding on how to manage a network with different devices, systems and architectures can be an abstract proposition for any company.

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Security

CONTINUED FROM PAGE 59

"Quite frankly, we haven't put the resources in it yet," he added.

Regardless of one's view on the state of security, neither the issues nor the stakes are trivial. Traffic on NSFnet is growing at 20% per month. Internet connects 250,000 computers on 5,000 interconnected networks supporting more than 1 million users in 35 countries.

Lack of funds is also a problem. Federal agencies are working with the private sector to upgrade NSFnet to 45M bit/sec., and small pilot projects are getting under way to prove the feasibility of a successor intended to work at more than 1G bit/sec., but the project badly needs the funding that passage of the Gore bill would likely bring.

The NIST is required to develop standards for computer security for unclassified systems but has not received the funding it needs. "We need something out of NIST today, or we'll have to retrofit it later," said NIST advisory board member William Colvin.

"Security is not one of the higher priorities [in the NREN pilot projects]," agreed Charles Brownstein, acting head of the NSF's information sciences programs. However, he said, security is not being ignored, and he cautioned against legislative attempts to ensure security: "You don't want [the government] to come in and put a lock on your machine."

A computer security specialist at the U.S. Department of Defense said that security must be addressed at both the network and host levels. The source said that host security does not help if you are using the network for remote log-on.

While some bemoan a perceived lack of attention to network security, much is being done behind the scenes by a low-profile group called the Internet Activities Board (IAB). IAB-sponsored groups are developing standards, policies and technical approaches to improving privacy and security on the Internet. Work is being done in areas from user awareness to improved password selection to more secure routing protocols.

One group is extending the Simple Network Management Protocol so that network commands can be authenticated. Another group is field-testing privacy-enhanced electronic mail so that Internet users will soon be able to send E-mail that is protected by public key cryptography.

According to Steve Crocker, an area security director at the Internet Engineering Task Force, attention to Internet security has increased significantly since the intrusion of the so-called Morris worm. "There's more going on than many people know about, but it's not enough," he said.

Rocky road

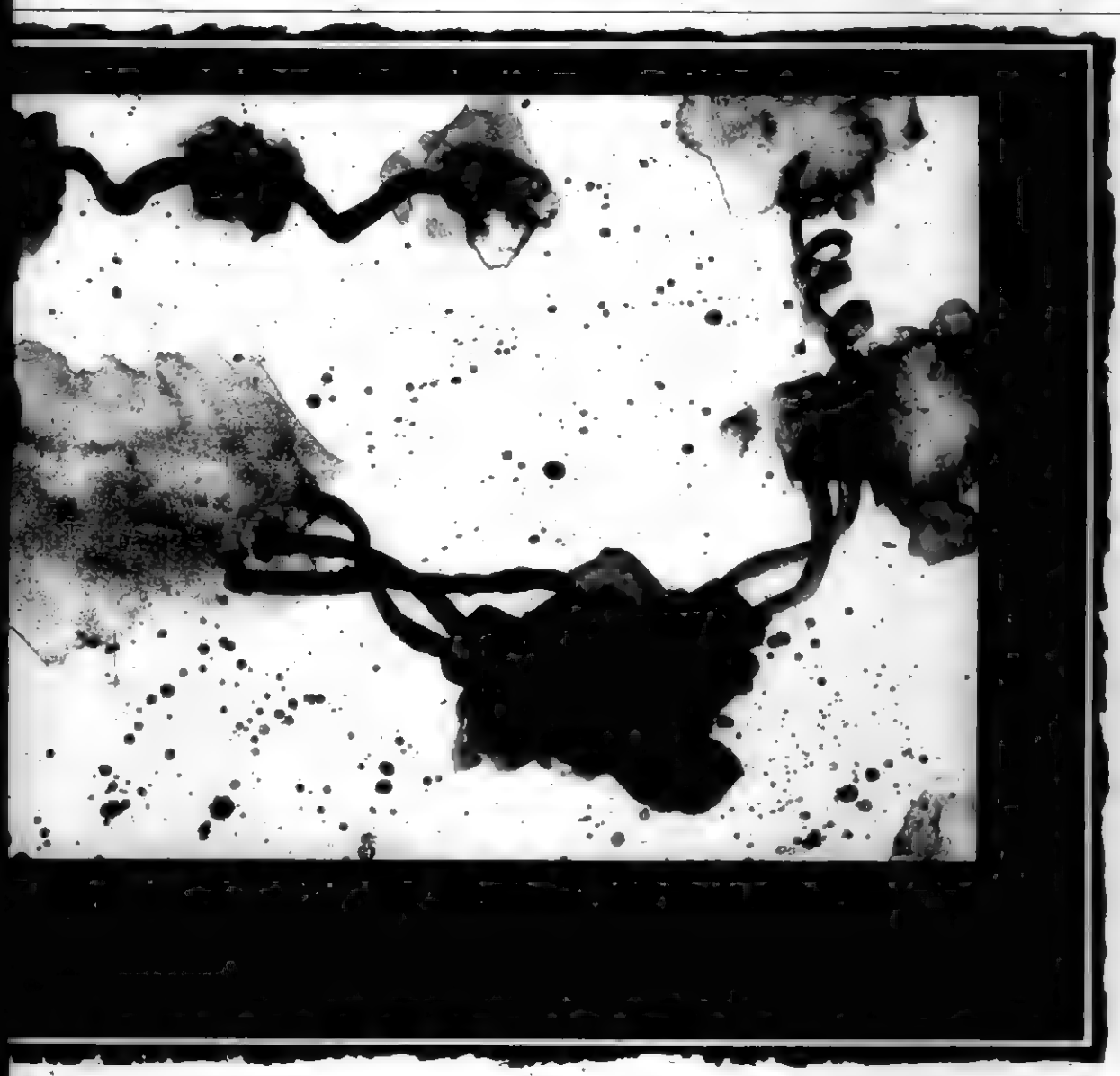
Under the rubric of security lie many thorny policies and legal issues, and they are typically overlooked by the technicians whose main goal is to prevent network and host intrusions, said Lance J. Hoffman, a computer security specialist and professor at George Washington University.

Hoffman asked, "Should access to the network be universal? How about foreign access and access from hostile countries? Who should be the gatekeepers? What rules should apply and who should make them? Should users be presumed to be trustworthy until proven otherwise? Is a network manager who erroneously denies service to a suspected wrongdoer liable for damages? Who's liable if transmission errors cause damage?"

Hoffman's list goes on and on, and he said very little attention is being paid to these questions. "Internet management focuses on implementation, not information management policy," he said.

So while the technicians implement elegant solutions to security problems, the results may have to be undone when a consensus emerges on policy matters. "NREN is a lightning rod for policy issues quite beyond its capability to deal with [them]," Hoffman added.

GARY H. ANTHES



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Bull package gives PCs more access

BY SALLY CUSACK
CW STAFF

BILLERICA, Mass. — A software package designed to give users of IBM Personal Computer and compatibles access to multivendor, multiarchitecture systems has been announced by Bull HN Information Systems, Inc.

Called VIP-Plus, the package permits PC users to support multiple sessions and transfer files to either a single host computer or a number of hosts via a wide range of terminals and supports multiple host sessions across Ethernet local-area networks. Emulations are provided for Bull, Digital Equipment Corp. and Unix-based host systems, while connections to IBM Systems Network Architecture (SNA) hosts are initiated via 3Com Corp. CS1/SNA gateways.

File transfer capabilities are provided via Kermit and ASCII-text editor methods, and the menu-driven package permits communications via asynchronous and synchronous lines. Multisession LAN communications are possible using XNS protocols, the company said.

The package is produced in Australia as part of a continuing initiative by Bull to manufacture computer products in Australia for export around the world.

According to Joe Keady, Bull's director of export sales, Bull is investing a certain percentage of Bull sales and revenue back into Australian research and development projects in an effort to satisfy the needs of the local market.

"We have a number of products that fit this profile," said Keady, referencing a hardware smart card reader that can be embedded into PCs or LANs and a PC Video Card that allows a television to double as a PC monitor as a result of the Australian/Bull contract agreement. The PC Video Card, which was entirely designed and developed in Australia, will soon be available in the U.S., the company said.

VIP-Plus is available immediately. Prices start at $400 and vary depending on network size.

Horwitt

CONTINUED FROM PAGE 59

fortunately, the benefits of OSI migration are both long-term and hard to quantify, falling into such vague categories as "more effective sharing of information within and between work groups." In contrast, the cost of corporatewide OSI conversion has an immediate negative impact on the IS budget.

Other advanced technologies are losing momentum because corporate managers have a bad case of bottom-line fidgets. At a conference last year, Bill Gaze, who was then a Merrill Lynch telecommunications executive, said that integrated multivendor network management platforms are hard to sell to corporate higher-ups because the benefits of such systems are so very hard to quantify. Ironically, Gaze has since left Merrill Lynch in the wake of a "cost-cutting" outsourcing deal that gutted the firm's telecommunications department.

The idea of moving applications from mainframes down to LANs is another area that both attracts and frightens conservative IS managers. It's pretty easy to pinpoint potential payback areas such as lower-cost CPU power and maintenance, but a lot of companies are holding off on the move because the LAN server and operating system industry is in such flux right now.

An investment company's vice-president of IS recently described to me the contortions he is going through to come up with the most cost-effective platform on which to downsize various workgroup applications. "All I ask is that you don't make it seem like we're overspending," he pleaded at the end of the interview.

With the economy on the slide, IS conservativism is bound to increase before the pendulum starts swinging in the other direction. "The Middle East crisis has created a climate of uncertainty which has put a lot of user projects on hold," says Tom Nolle at CIMI Corp. "People aren't doing strategic telecommunications planning anymore; they are being reactive, not proactive."

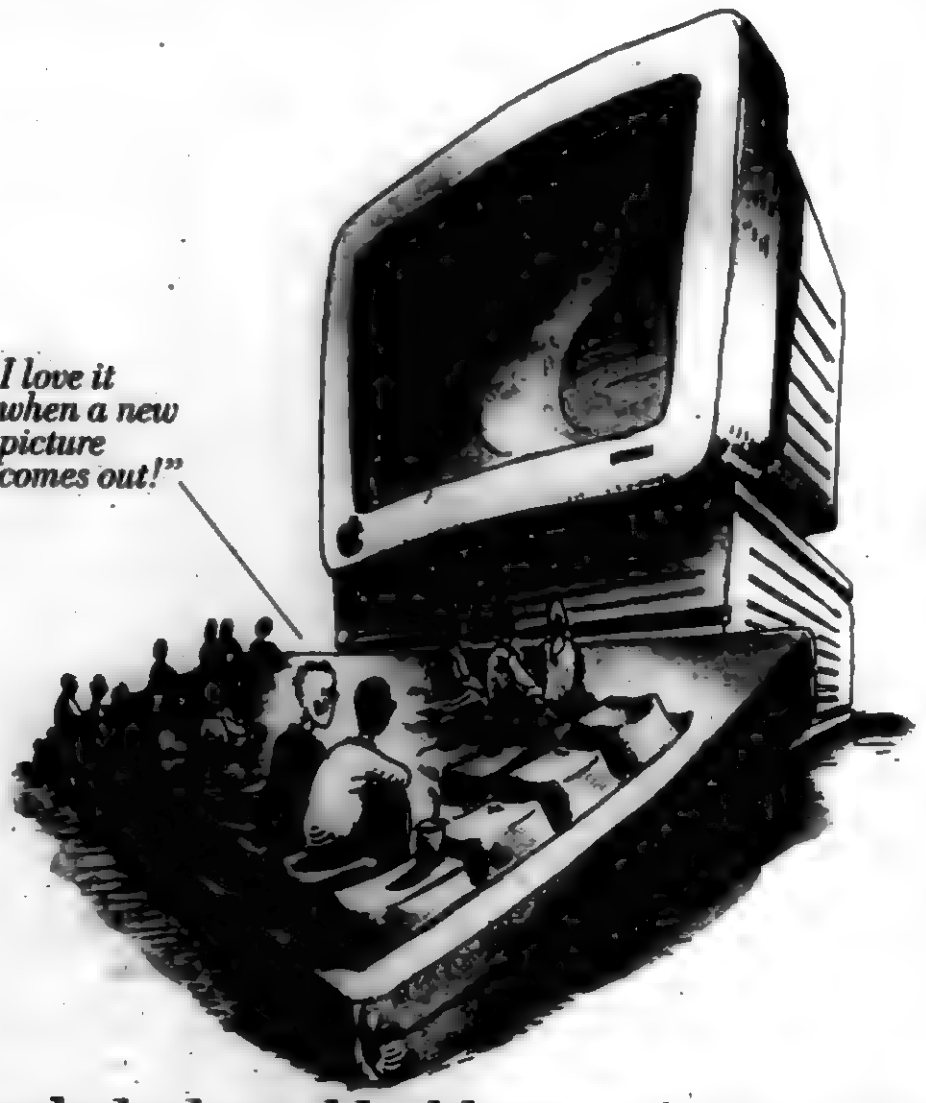
This translates into a widespread user reluctance to invest in what will eventually be the next generation of network technology. Users will express interest in the latest buzzwords because "someone told them it's good, and anyone who is anyone in the industry is doing it," Nolle says.

Some 75% of respondents to a recent CIMI survey expressed interest in offerings such as fast-packet and integrated network management. However, few had come up with any concrete plans for implementing these technologies within the next 18 months, Nolle says.

Of course, it's risky now to commit your company's long-term networking strategy to emerging technologies that could fall by the wayside in the next year or two. Making no decision at all, however, puts your firm at the mercy of more technologically aggressive rivals.

"We're creating our own equivalent of the budget deficit," Nolle says, "piling up a burden of shortsighted decisions instead of long-term strategy — borrowing against the capital of successful information integration."

Horwitt is Computerworld's senior editor, networking.



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NEW PRODUCTS

Gateways, bridges, routers

Synoptics Communications, Inc. has announced that it has incorporated remote bridging features into its Lattisnet intelligent concentrator product line.

The Lattisnet Model 3356 Remote Ethernet Bridge has been integrated as a module into the Lattisnet System 3000 intelligent wiring hub to interconnect geographically dispersed Ethernet local-area networks over wide-area links, including T1.

The product is priced between $11,800 and $14,600, depending on the type of serial lines used.

Synoptics
501 E. Middlefield Road
Mountain View, Calif. 94043
(415) 960-1100

Lantana Technology, Inc. has introduced a line of token-ring bridges, repeaters and multistation access units (MAU) that interconnect microcomputers, minicomputers and mainframes.

The Cypress/B7404 ($4,995) and Cypress/B7412 ($5,995) token-ring bridges are source-routing devices that connect network rings to departmental rings. The Cypress/M8228 ($595) and Cypress/M8228D ($695) MAUs support 4M- and 16M-bit/sec. token-ring LANs.

The Cypress/R8218 ($795) and Cypress/R8218D ($845) repeaters connect two segments of a token-ring network while filtering, boosting and retiming network signals.

Lantana Technology
4393 Viewridge Ave.
San Diego, Calif. 92123
(619) 565-6400

Racal Interlan, Inc. has announced a stand-alone gateway server designed to link Novell, Inc. Netware-based machines with Transmission Control Protocol/Internet Protocol (TCP/IP) hosts.

The TCP Server for Netware allows bidirectional transfers of TCP client and server applications. Client applications can be downloaded to a Netware DOS or OS/2 machine without a need for any additional configurations or installations, the vendor said.

The product is priced at $5,995.

Racal Interlan
155 Swanson Road
Boxboro, Mass. 01719
(508) 263-9929

Network management

International Business Software, Inc. has announced a suite of real-time administration tools designed for Apple Computer, Inc. Macintosh networks.

Netcontrol provides network administrators with data pertaining to the status of each piece of hardware in the network and to all the software in the Macintosh systems.

The product is scheduled to be available next month, the company said. It is priced at $249 per administrator for a single zone and $649 per administrator for multiple zones.

International Business Software
1270 Oakmead Pkwy.
Sunnyvale, Calif. 94086
(408) 522-8000

Synoptics Communications, Inc. has announced a Simple Network Management Protocol-based network management applications package designed for small to midsize networks.

The Lattisnet Basic Ethernet Network Management package is a DOS-based management application that provides physical layer monitoring and control of Lattisnet Ethernet networks.

The product runs on IBM Personal Computer AT and Micro Channel Architecture-based PCs. It is scheduled to be available in early December and is priced at $2,295.

Synoptics Communications
501 E. Middlefield Road
Mountain View, Calif. 94043
(415) 960-1100

Certus International Corp. has announced Version 2.0 of its Certus and Certus LAN systems management software.

The product provides virus protection and detection, disaster recovery, system security and usage monitoring features. A boot lock feature enables PC managers to restrict access to a hard drive after booting from any device other than drive C, the vendor said. A scanning module (Certus VS) checks for more than 100 known viruses in random-access memory and on disk.

The product costs $189, the company said.

Certus International
13110 Shaker Sq.
Cleveland, Ohio 44120
(216) 752-8181

Modems

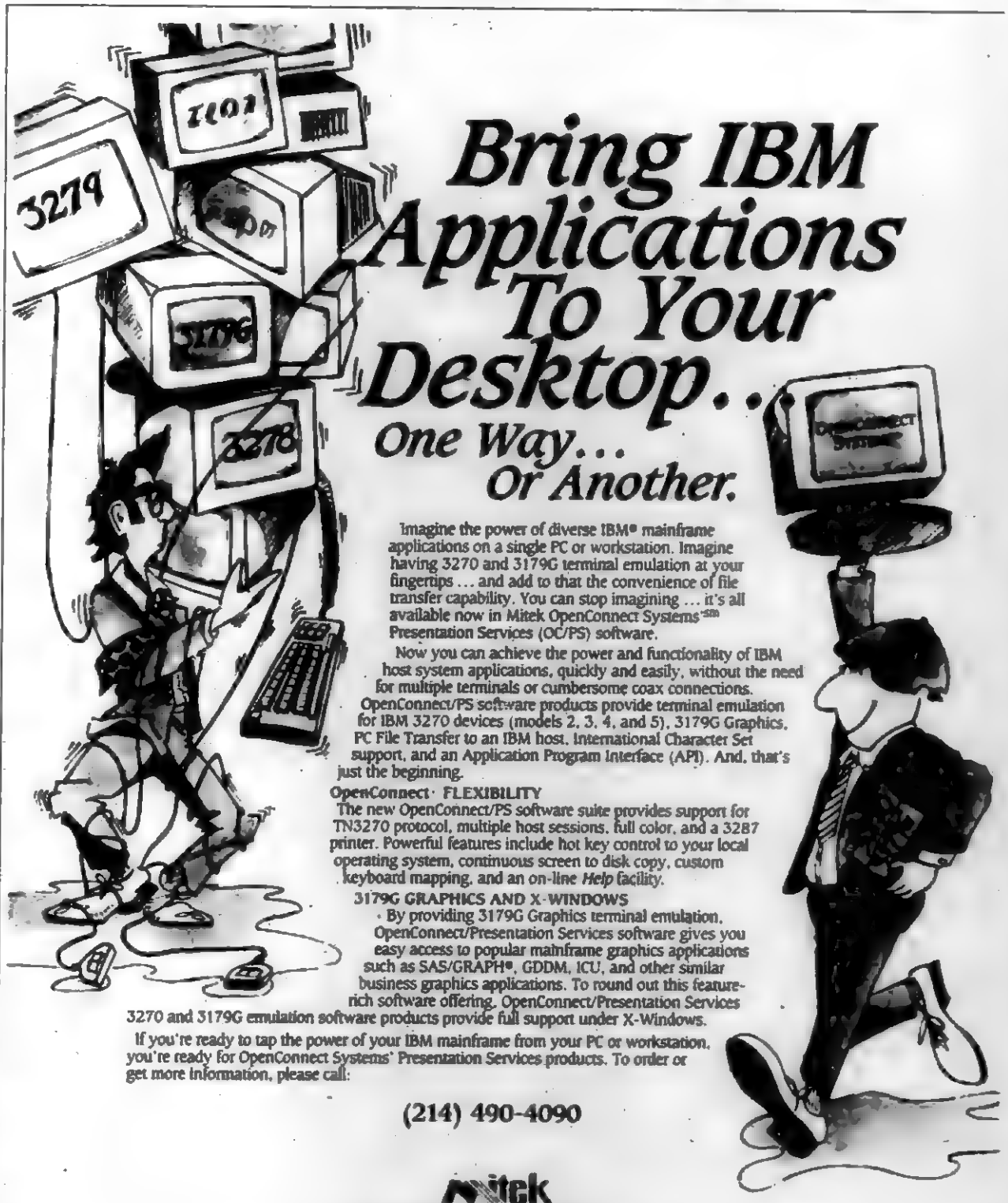
Microcom, Inc. has announced a CCITT V.32 modem that features support for V.42 and V.42 bis.

The QX/432hs can transfer data at maximum speeds of 38.4K bit/sec. It provides two methods of data compression: Microcom Networking Protocol 5 and V.42 bis.

Automatic logon procedures, password connection security and remote access features are also included.

The product costs $1,099.

Microcom
500 River Ridge Drive
Norwood, Mass. 02062
(617) 551-1000



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MANAGER'S JOURNAL

EXECUTIVE TRACK

Della Kennelly has been appointed director of information systems at **All America Termite and Pest Control, Inc.**, an Orlando, Fla.-based pest-control firm operating in five states with $30 million in sales and 600 employees.

Kennelly has more than 10 years of IS management experience, which includes seven years at the Suntrust Corp. She has also worked as an independent data processing consultant.

Kennelly holds a bachelor's degree in mathematics from Florida Atlantic University and a master's degree in mathematics from Clemson University, as well as an MBA from the University of Central Florida.

.....

Irene W. Sherk has been named to the position of assistant director of the Tax Systems Division of IS management at the **U.S. Internal Revenue Service** (IRS) in Washington, D.C.

Sherk assists the division's director in planning and developing computer processing for the IRS tax administration system.

Sherk was most recently the project director for two major tax system modernization efforts at the IRS.

She previously served as a senior executive advisor at Ameritech as part of the President's Commission on Executive Exchange program.

She holds a bachelor's degree in mathematics from Pennsylvania State University.

.....

Who's on the go?

Changing jobs? Promoting an assistant? Your peers want to know who is coming and going, and *Computerworld* wants to help by mentioning any IS job changes in Executive Track. When you have news about staff changes, be sure to drop a note and photo or have your public relations department write to Clinton Wilder, Senior Editor, Management, *Computerworld*, Box 9171, 375 Cochituate Road, Framingham, Mass. 01701-9171.

'When?' is now at Sears

Retail giant is working to regain its leading-edge competitive advantage

BY MICHAEL FITZGERALD
CW STAFF

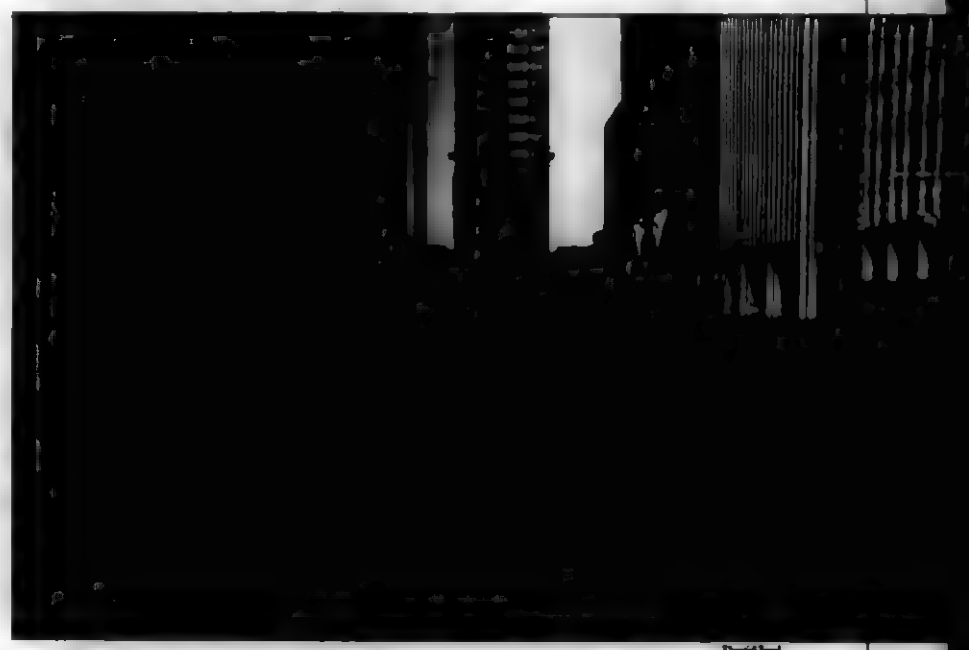
"When?" challenges the sign on the door of Robert Ferkenhoff's office on the 42nd floor of the Sears Tower in downtown Chicago. The sign was put on the doors of all the top officers at the Sears Merchandise Group during Sears, Roebuck and Co.'s restructuring in 1989 to push executives to meet the new business plans.

Ferkenhoff, vice-president of information services and quality development for the Merchandise Group, keeps the sign on the door. The question still applies, particularly now that a 6-year-old plan to revamp almost all of Sears' retail systems is taking effect. For the past two years, major systems that handle distribution, billing, product ordering, store layout and other essential business functions have been rolling into place.

"You cannot separate information technology from our business — it touches everybody and it touches every aspect of our business," Ferkenhoff says.

Sears was once considered a leading-edge user of technology in retailing, but the gray-templed retail giant found itself with aging systems that were, Ferkenhoff says, "a competitive disadvantage." Ferkenhoff, who started at Sears in 1964 as a management trainee and worked his way up to national retail manager, joined the systems side in 1982 and was named to his current post in February 1989.

His challenge is formidable; IS must help reverse shrinking profit margins and a bloated corporate structure that analyst Richard Nelson of Duff & Phelps, Inc. says will have to be cut by $1 billion before the company can again become competitive. Sears' retail business, once larger than the next four U.S. retailers combined, is now about the same size as both K Mart Corp. and Wal-Mart Stores, Inc. Profit margins are razor-thin; the Merchandise Group earned just $72 million on $14.72 billion in revenue in the six months ended Sept. 30.



David Joel

Sears' Ferkenhoff *has led an extensive reorganization of IS*

However, Sears is investing tremendous amounts of money in technology: Ferkenhoff oversees a budget that amounts to 1% of the Merchandise Group's annual revenue of $30 billion, or approximately $300 million. He has also done an extensive reorganization of IS, chopping bureaucracy and dispersing resources to improve responsiveness to business needs.

This particular period is one of the most active in Sears's IS history, as a number of large new systems have been implemented in the past two years. One of the systems, a Merchandise Assortment Planning System (MAPS), this year won the first Retail Innovation Technology Award from *Chain Store Age Executive* magazine and Digital Equipment Corp.

Technology use "is going to differentiate people" in the retail industry, Ferkenhoff says. "We've heard that

Continued on page 71

Inland Steel's Howard tests his mettle

BY CLINTON WILDER
CW STAFF

Bill Howard said he was ready for new challenges. Now he's got them.

Appointed vice-president of information technology at Inland Steel Industries, Inc. five weeks ago [CW, Sept. 3], Howard's charter is to oversee and coordinate all information systems and communications for a $4 billion company in one of the most brutally competitive industries in the world. The 55-year-old Howard cannot wait to get started.

"I see a lot of opportunity to leverage systems, especially on the distribution side," Howard said, referring to Inland's extensive business distributing steel products made by other manufacturers. "Maximizing inventory turns can contribute significantly to Inland's profits and competitiveness. That's the opportunity and the challenge, but it's not easy."

One of the many prominent IS executives to change companies in the last few years, Howard left the Bechtel Group, Inc. in San Francisco after 18 years, departing the Bay Area for Inland Steel's headquarters in the heart of Chicago's Loop.

Inland Steel's Howard

As with many of his industry colleagues who have switched jobs, Howard was offered a newly created chief information officer-level position, reporting directly to Inland Steel Chairman Frank W. Luerssen.

Howard will seek to implement technology links, such as electronic data interchange, between Inland's Ryerson Steel and Toll Metals distribution businesses and the manufacturing sides. "To the greatest extent possible, we should have common systems and one Inland way of doing business," he said.

The IS heads in each business unit, however, will continue to report to the business unit heads. "Recentralization is not the thing to do," he said.

Inland Steel's IS budget for this year was about $70 million, and despite the creation of Howard's job, that will not change very much.

"I'm here to give a corporate view of where money is being spent and how to prioritize it," he said. "I wasn't asked to come in and spend more money."

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COMMENTARY

Al Smith

No measure, no change

To hear most IS executives talk about increasing productivity, you would think they were trying to discover perfect love. It is so desirable, emotional (if I don't make my deadline, I can kiss it all goodbye), intangible, indescribable . . . and unattainable.

Like love, many look for productivity in all the wrong places — such as computer-aided software engineering (CASE) technology, re-engineering and outsourcing — without looking in their own backyards. Before any of these solutions can work, you need to have a way to measure your current productivity level. Otherwise, how will you know if your CASE and re-engineering tools are working?

Consider these two friends of mine:

• Bob, a highway contractor, was building a portion of interstate roadway. When I asked him to evaluate the work, he told me that they were laying asphalt at a rate of two miles per day, had 15 miles left to go and would finish the job five days ahead of schedule.

LESS THAN 5% of all IS shops have any type of productivity measurement program at all!

• John, a project manager at a large IS shop, was developing an on-line financial system. His assessment of the project was that it was 80% complete, just starting the systems test and "looked good" to meet their promised delivery date.

Is it any wonder that the users in John's company are dissatisfied with the productivity of the shop? John's staff is working very hard, but he can't say if the job will be done in two weeks because he doesn't know how productive his team is.

John's users do not understand what software production entails, and, based on past projects, they don't feel confident in his ability to deliver on time — and justifiably so. Bob, on the other hand, has metrics to gauge his productivity.

If you decide to try a CASE tool on a project to see if it makes you more productive, start by measuring the productivity you achieved on a similar project in the past that did not use CASE. In other words, if you want to run a four-minute mile, it helps to know how long it takes.

Historically, by creating a productivity metric, we are not breaking new ground in IS. Yet less than 5% of all IS shops have any type of productivity measurement program at all!

Our profession has gone in search of the right metric before. In the 1950s and 1960s, when second- and third-generation languages appeared, we measured the output of programmers in lines of code. In the early 1970s, when life-cycle methodologies appeared and we had consistent project task plans, we used "percent complete" as a measure of productivity. In the mid-1970s, Ken Kolence of Boole & Babbage fame devised a measurement "science" called Software Physics — an idea before its time. None of these programs caught on, however.

Productivity in systems development is measured in terms of what is produced per unit of labor resource expended per day. The more progressive organizations are using function points per day as a productivity measure. When trying to decide whether lines of code per day or function points per day is the right approach for your shop, don't spend too much time on the pros and cons of each approach. The important thing is to pick one approach and implement it consistently.

Remember that your primary objective is to measure your productivity so you can implement change in your organization. Comparing your performance to other organizations or to "industry averages" is of secondary importance.

I have been in many large IS shops and have overheard the arguments on lines of code versus function points and the excuses for why they can't use either — or measure productivity at all, for that matter. These excuses are mostly bureaucratic in nature, contain very little substance and are tolerated because these organizations are so big that they think they don't have to become more productive.

Rubbish! In our contemporary business climate, businesses must be competitive in order to survive. The theme of all the current outsourcing conferences is to do more with less — that sounds like productivity to me!

My friend the contractor needed to be competitive to stay in business, so he determined the correct metric for his purposes and uses it to stay competitive. We in the IS community must do the same.

A metric productivity method won't necessarily bring you perfect love from your users, but it can make your shop sexy in the sense that it will be more productive, competitive and desirable. And the results will be . . . measurable!

Smith is executive vice-president at Bell Atlantic Systems Integration Corp. in Arlington, Va.

Announcing The Last Thing Our Competition Wants To Hear:

Sears

CONTINUED FROM PAGE 67

type of language for a long time, but normally not in terms of the retail industry. It's really becoming a competitive issue in retailing."

By rights, Sears should be easily winning the technology wars. The company claims to be the first retailer to have electronic point-of-sale systems, the first to do electronic data interchange (EDI) transactions and the first with inventory management systems, among other things.

But this has its disadvantages, as Ferkenhoff is quick to point out, particularly with 854 full-line stores, some of which were built more than 50 years ago.

"Systems, just like facilities, grow old," he says. "If you look at the Sears portfolio today, we've got new systems and great systems and old systems. It's a challenge of reinvesting."

The current thrust at Sears Merchandise IS is making systems cross-functional. As part of its effort to make EDI a condition for doing business with Sears [CW, July 16], Sears has developed internal systems that are almost completely seamless across functions, a move Ferkenhoff considers essential to the company's future.

Any Sears executive "can go anywhere [in the company] and access their electronic mail, review past trip reports, bring up performance data — we really have just about any piece of information available to anybody, anywhere," Ferkenhoff says.

Sears' Distribution Operating System (DOS), which Ferkenhoff says is "probably the biggest single systems project the company has ever undertaken," will integrate Sears's approximately 100 distribution sites with all of the in-store point-of-sale systems.

The system will replace all of the functions, automated and otherwise, currently in place to manage the entire movement of goods throughout Sears. DOS will, among other things, allow Sears planners to gauge what is selling and what is not and plan order schedules.

The Sears Apparel Merchandising System (SAMS) has been brought up fully live throughout all of Sears' apparel departments. SAMS allows Sears' apparel buyers and planners to do virtually everything related to their job on on-line terminals connected to a mainframe: the fashion plan, buying and replenishment of goods, and performance reports. It also delivers weekend sales reports first thing Monday morning.

Old Fashion-ed system displaced

SAMS replaced Sears' former Fashion system, which Ferkenhoff offered as an example of old technology that had become a liability for the company. Fashion was based on a system more than 20 years old. SAMS was brought in on a division-by-division basis, starting in mid-1989, and was totally live by the beginning of 1990.

At Sears, in accordance with Ferkenhoff's philosophy, the business side owns the systems it uses — no system is put in place without a business rationale, and any system that gets designed is designed by the department in question.

> "SYSTEMS, JUST like facilities, grow old. If you look at the Sears portfolio today, we've got new systems and great systems and old systems."
>
> ROBERT FERKENHOFF
> SEARS MERCHANDISE GROUP

IS also has to come up with new ways to do things. EDI is an application of fundamental technology; Sears Merchandise is also pushing into other realms such as expert systems. Its first expert system was for handling arcane import rules; others since installed include one used by the credit department to automatically determine whether Sears credit card customers should receive credit on a purchase that exceeds their official buying limits.

Sears is also investigating outfitting its field service and repair groups with portable computers that use radio frequency wireless modems. These allow the user to dial into a host machine without being connected to a telephone jack.

Ferkenhoff has radically restructured the 500-strong IS department during his tenure, a move several IS employees said was long overdue. One of his first acts was to break up the large administrative groups that made up Sears Merchandise IS into units aligned one-to-one with their business customers.

Ferkenhoff also made the manager the single point of contact for the end user. Where the IS department heads once were responsible only for in-house development and mainframe work, now they are expected to be a total partner, providing reviews of applications packages, in-house development, end-user computing — whatever the business partner needs to get the job done.

Ferkenhoff backs up his words: At review time, the business side participates, providing Ferkenhoff with feedback on how well IS supports their needs and partners with them.

"My people know that their business is not the systems business, it's the catalog business, or the retail business," Ferkenhoff says. "I tell people in the business these aren't my people; they're your people, your resources."

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BOOK REVIEW

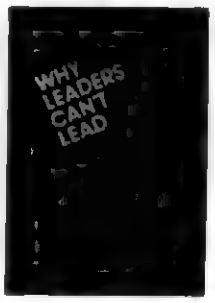
Leaving behind the Machiavellian strategy of leadership

WHY LEADERS CAN'T LEAD: THE UNCONSCIOUS CONSPIRACY CONTINUES
By Warren Bennis
Jossey-Bass Publishers

Machiavelli would have had a fit.

As you might recall, the 15th-century strategist articulated a recipe for leadership that called for deceit and manipulation. (Wall Street mavens of the '80s probably slept with copies of Machiavelli's treatises under their pillows.)

Warren Bennis offers us a different formula. In his book, he presents would-be leaders with a humanistic alternative to Machiavelli's approach. For information systems professionals searching for a way to influence the direction of their organizations, Bennis can serve as a guide.



In *Why Leaders Can't Lead*, Bennis expands on a work by the same title he published in 1972. As the University of Southern California professor writes in his preface, the new book is more than a revision. It adds accounts of leadership debacles of the past decade as well as the results of his research.

Bennis sketches a dire picture of the country's "long slide from true leadership." The successive layers of the country's current moral crisis are peeled away like the skin of an onion. "America has never been less interested in achievement and more interested in success," Bennis writes. "At the moment, we not only cannot agree on what the public good is, we show no inclination to pursue it."

The failure of leadership arises from an "unconscious conspiracy" in which we all play unwitting roles. We impede those in charge from carrying out their duties and dissuade those individuals who might otherwise seek positions of power.

In general, Bennis rakes the '80s over the coals of his scathing analysis. He sees Ronald Reagan, Ivan Boesky and Oliver North as the country's gifts to itself in a decade that prized selfishness and despised generosity and ethical conduct.

He turns back to the '60s for a clue to how things went awry. "In America," he writes, "the 1960s were and still are the future, because we never really got there." By the mid-1970s, notions of civic responsibility had yielded to traditional North American demands for individualism and autonomy.

"Never before have individuals wanted and been able to seize so much power unto themselves," Bennis writes, "and never before have they had so many tools to ensure their autonomy."

By the time we get to the book's final section, we hungrily await Bennis' recipe for leadership. How can we foster the qualities necessary to lead us out of the desert?

Shamed by our search for a quick fix, however, we realize that complex problems defy simple solutions. The men and women Bennis is looking for are hard to come by. True leaders, Bennis writes, are people who lead fully integrated lives in which their professional and personal activities "fit seamlessly and harmoniously together." They fulfill their visions of excellence through "the application of passion, energy and focus."

To succeed, Bennis tells us, leaders must communicate a compelling vision of their institution's future.

True tales

Bennis' narrative is at its most powerful when he anchors his reflections in real-life anecdotes, such as the story of Charles Johnson, the overworked university president who died under suspicious circumstances, or Robert McNamara, the Lyndon B. Johnson defense secretary who, sublimating his own moral convictions, oversaw the escalation of the Vietnam War.

Unfortunately, Bennis sometimes trivializes his message by resorting to tried and worn platitudes. For every overused sophism, however, Bennis offers us dozens of profound truths that serve as beacons in an era abandoned to the darkness of an ethical void.

So what is the lesson for the IS professional in all of this? Bennis suggests the answer: "We have more information now than we can use, and less knowledge and understanding than we need. Indeed, we seem to collect information because we have the ability to do so, but we are so busy collecting it that we haven't devised means of using it."

Technology always gallops in advance of society's ability to exploit it most creatively. Since social consensus is slow to forge, IS executives can take the lead in helping their organizations plan for change. IS leaders who want to make a difference in their organizations must make sense out of the information glut they have helped foster. This is where they can bring their visions, integrity and sense of social responsibility to bear.

AMIEL KORNEL

Kornel is a former *Computerworld* features senior editor and is enrolled in MIT's Sloan School of Management.

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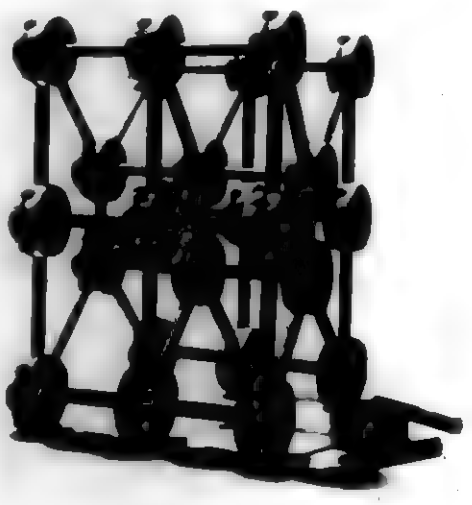

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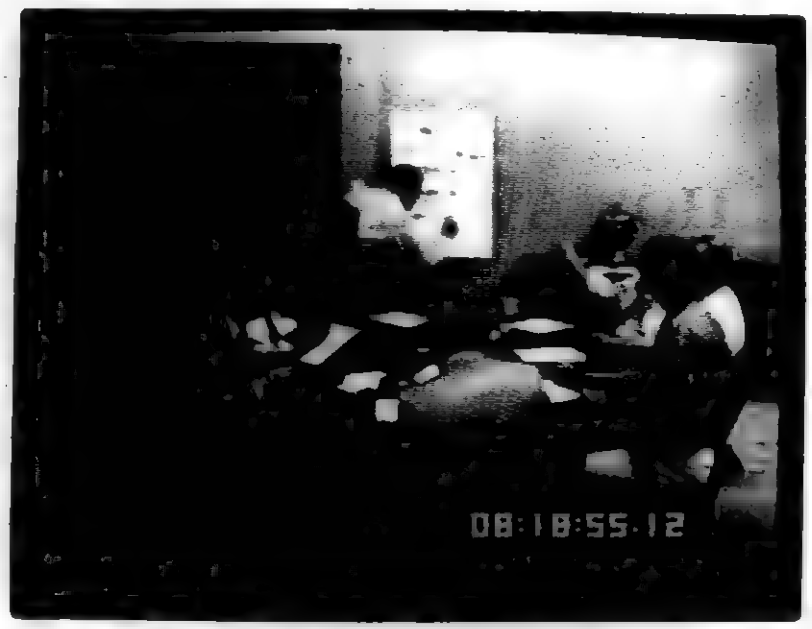
"Networking PCs is a major pain. I'd like to see PCs designed to do networking without lots of configuration work… and still connect with all the networks I've already installed."



"We've got plenty of data… the challenge is to put it in the hands of decision makers in a form they can use. The perfect PC would be an ideal client to all my information systems."

"Every time I turn around, vendors change the operating system or interface. I want to be able to drop the hottest new box on my executives' desks and know their software will run."

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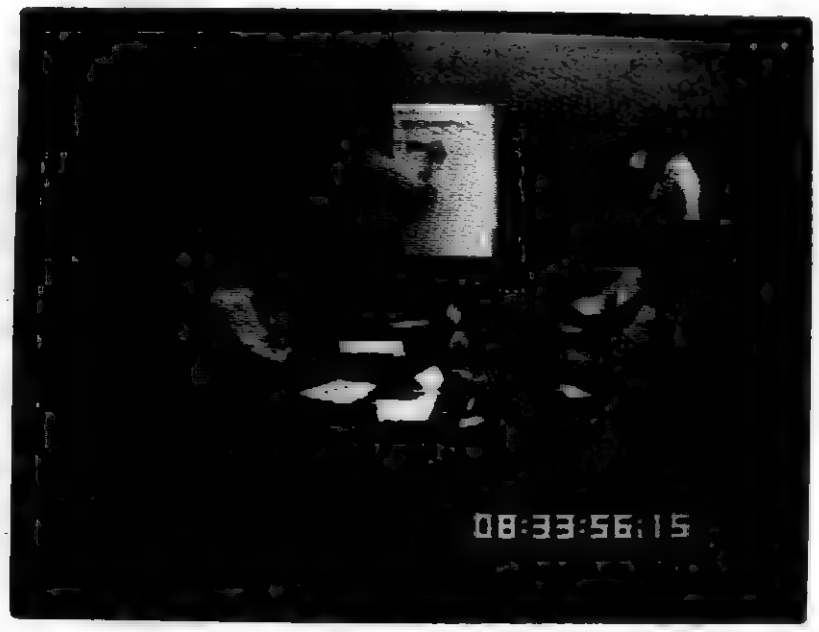
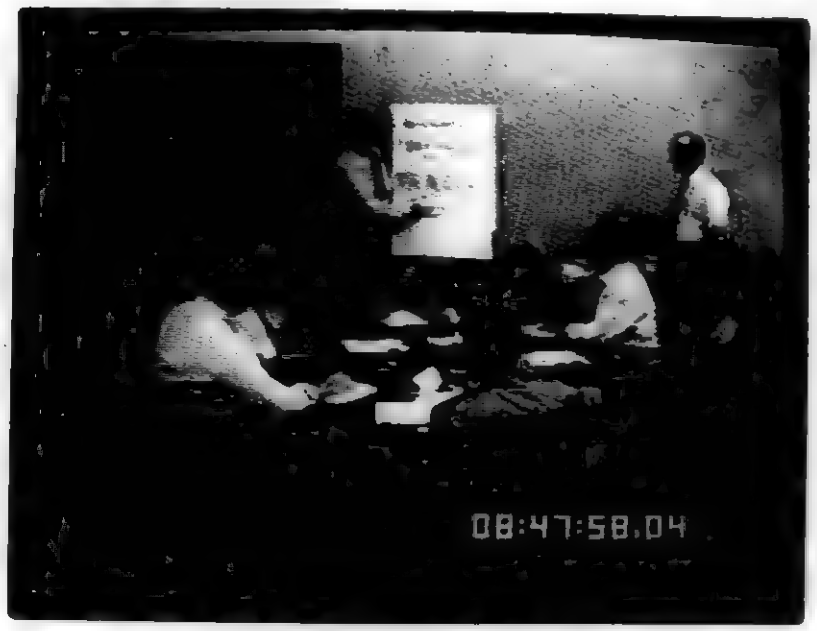
"A graphical interface is clearly important... users love 'em. But the architecture has to be designed to handle it or the performance compromise is unacceptable."

"I'd like to see more discipline from software developers. Commands should be consistent for every application... it would eliminate the cost of constantly retraining."



"My company's needs go way beyond off-the-shelf software. I need serious development tools my existing programming staff can use to develop custom apps quickly and easily."



"Macintosh? No kidding?"

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CALENDAR

Better management of complex computer systems and consideration of their impact on users and society will be the focus of the Association for Computing Machinery's (ACM) 1990 Conference on Critical Issues. The event is limited to 300 attendees and will be held Nov. 6-7 at the Hyatt Regency Crystal City in Arlington, Va.

The conference will bring together leading information systems thinkers from the areas of business, science, government and academia. Scheduled speakers include Shoshana Zuboff of Harvard University, Robert Benjamin and Jay Forrester of MIT, Rod Leddy of Mobil Oil Corp. and Edward Chevers of the NASA Johnson Space Flight Center.

For more information, contact Jim Adams, ACM, New York, N.Y. (212) 869-7440.

OCT. 14-20

IBM Token-Ring & SNA: Gateways, Bridges and Network Management. Washington, D.C., Oct. 17-19 — Contact: Kaptronic, Howarth, N.J. (201) 769-4250.

Mapping to X12 & Edifact EDI Standards. Chicago, Oct. 18-19 — Contact: EDI Group, Oak Park, Ill. (708) 848-0135.

CAD/CAM, CAE Reseller/VAR Strategy Workshops. Bedford, Mass., Oct. 20-21 — Contact: Silvio Bianchi, Duratech, Cambridge, Mass. (617) 354-2339.

OCT. 21-27

Association for Computing Machinery's Object-Oriented Programming Systems, Languages and Applications Conference. Ottawa, Oct. 21-25 — Contact: Karen Kouri, OOPSLA, Ottawa, Ont., Canada (613) 723-1495.

RAMIS '90 Roundtable. Nashville, Oct. 21-25 — Contact: RAMIS Registrar, Newark, N.J. (201) 585-6758.

International Congress on Advances in Nonimpact Printing Technologies: Black & White and Color. Orlando, Fla., Oct. 21-26 — Contact: The Society for Imaging Science and Technology, Springfield, Va. (703) 642-9090.

Achieving Lights-Out Data Centers. Boston, Oct. 22-23 — Contact: Richard Giaquinto, Institute for International Research, New York, N.Y. (800) 345-8016.

Datapro Executive Symposium. New York, Oct. 22-23 — Contact: Datapro Symposium Office, Delran, N.J. (800) 328-2776.

International Conference on Desktop Manufacturing: The Rapid Prototyping Revolution. Cambridge, Mass., Oct. 22-23 — Contact: Conference Coordinator, CAD/CIM Management Roundtable, Boston, Mass. (617) 232-8080.

Knowledge-based Systems in Everyday Use: Increasing Productivity and Profits. San Diego, Oct. 22-23 — Contact: Donna Kacin, Decision Support Technology, Cambridge, Mass. (617) 354-6400.

MIS Strategic Planning for Corporate Success Conference. New York, Oct. 22-23 — Contact: Computer Economics, Carlsbad, Calif. (619) 438-7457.

The Western Canada DB2/SQL/DS Users Group Conference. Winnipeg, Man., Canada, Oct. 22-23 — Contact: Peter Barnett, Wescan Users Group Conference, Winnipeg, Man., Canada (204) 946-6800.

Disaster Recovery Conference/Exhibit. Atlantic City, Oct. 22-24 — Contact: DVDRJEG, Cherry Hill, N.J. (609) 778-5702.

Electronic Messaging '90: Beyond Interpersonal Correspondence. San Francisco, Oct. 22-24 — Contact: Electronic Mail Association, Arlington, Va. (703) 522-7111.

LANs: Applications, Design and Systems. Irvine, Calif., Oct. 22-24 — Contact: Program Office at UCI Extension, Irvine, Calif. (714) 856-7774.

North American Information System Security Symposium. Toronto, Oct. 22-24 — Contact: Heidi Spry, Datapro Canada, Scarborough, Ont., Canada (416) 298-1177.

CIPS Edmonton '90, Information Technology Conference. Edmonton, Alta., Canada, Oct. 22-25 — Contact: Canadian Information Processing Society, Edmonton, Alta., Canada (403) 488-1879.

Jerusalem Conference on Information Technology. Jerusalem, Oct. 22-25 — Contact: Tzell, Travel and Tours, New York, N.Y. (800) 288-7908.

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Hammer Forum '90. Cambridge, Mass., Oct. 29-31 — Contact: Hammer and Co., Cambridge, Mass. (617) 354-5555.

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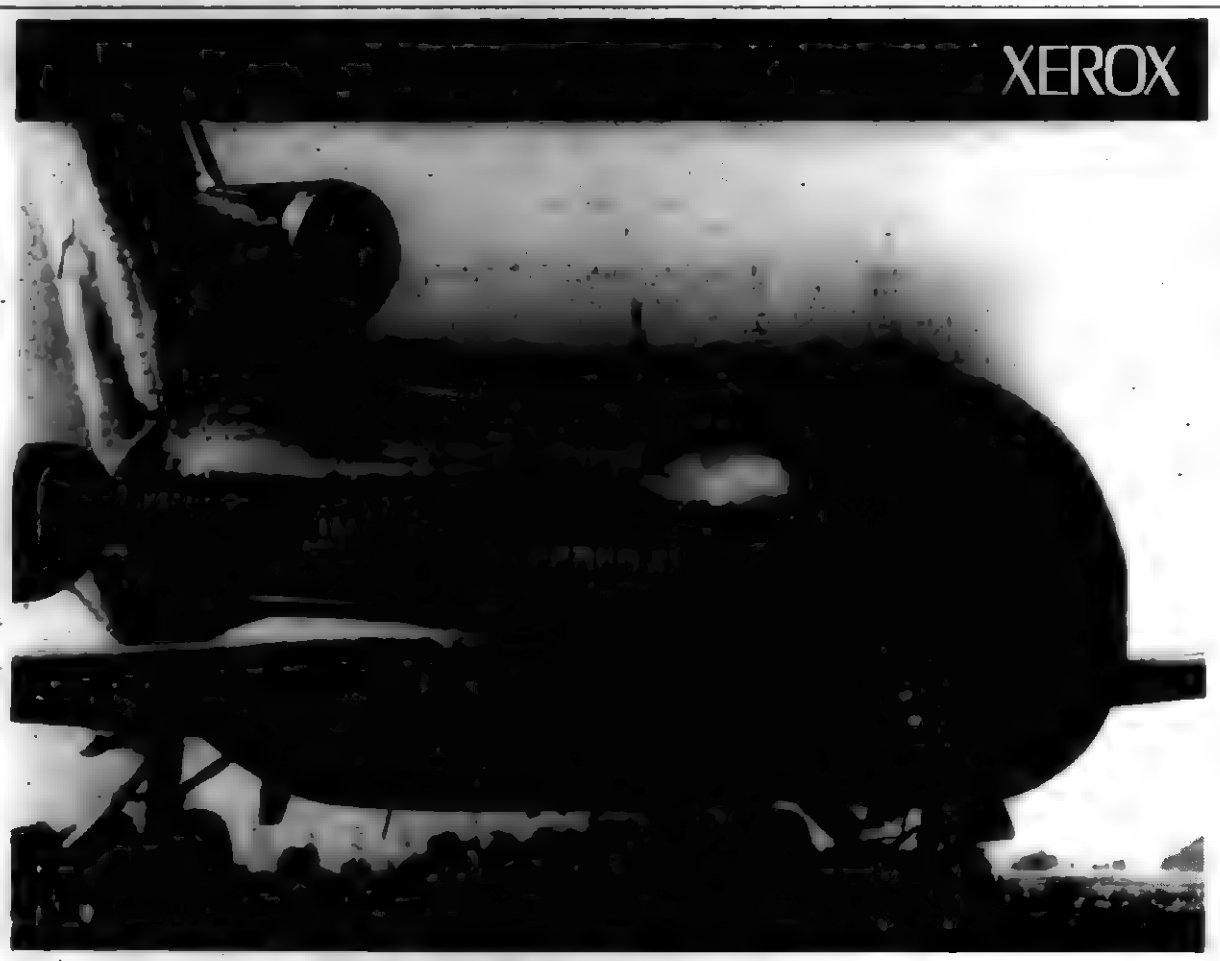
Pacific Northwest Software Quality Conference. Portland, Ore., Oct. 29-31 — Contact: Terri Moore, Pacific Agenda, Portland, Ore. (503) 223-8633.

IBM Midrange Computer Users Group. Cincinnati, Oct. 29-Nov. 2 — Contact: Common, Chicago, Ill. (312) 644-6610.



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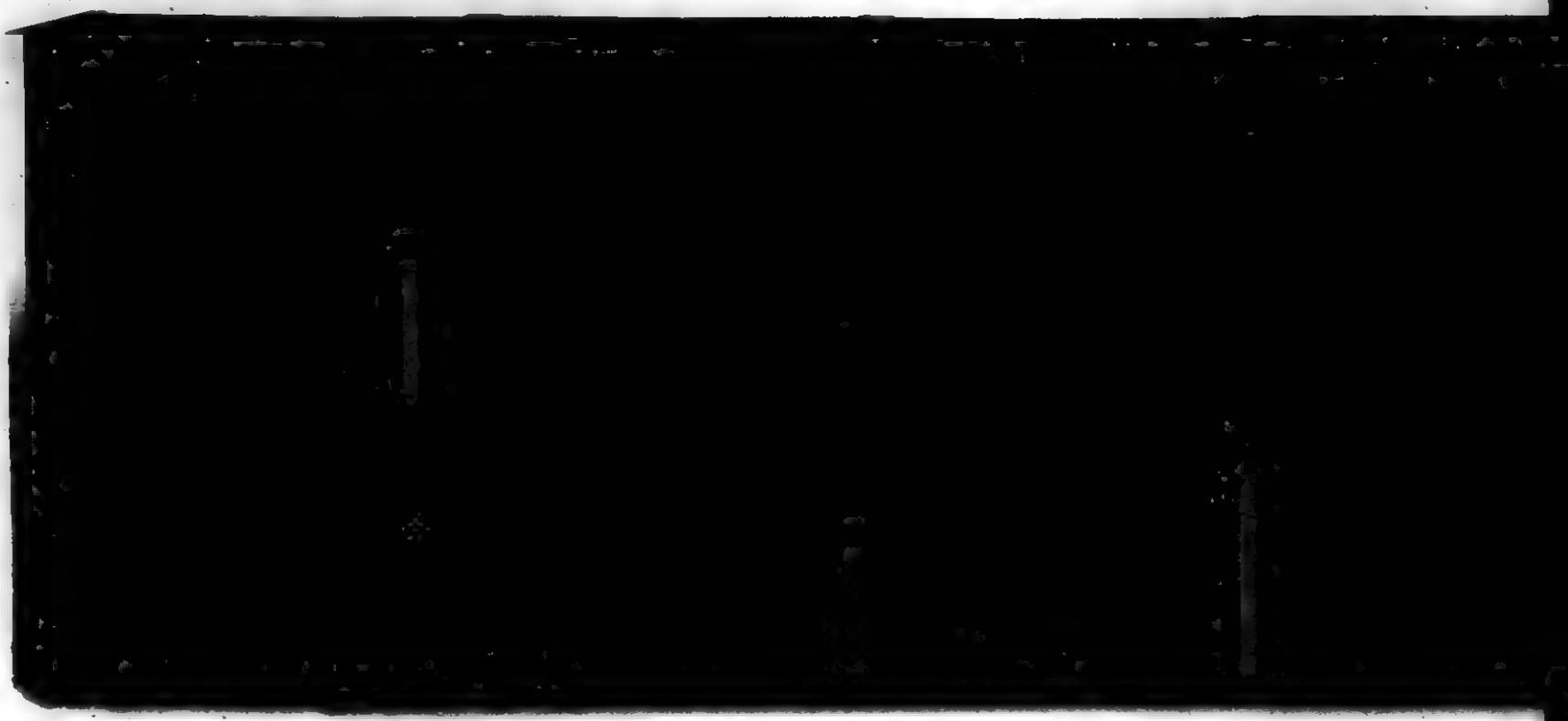

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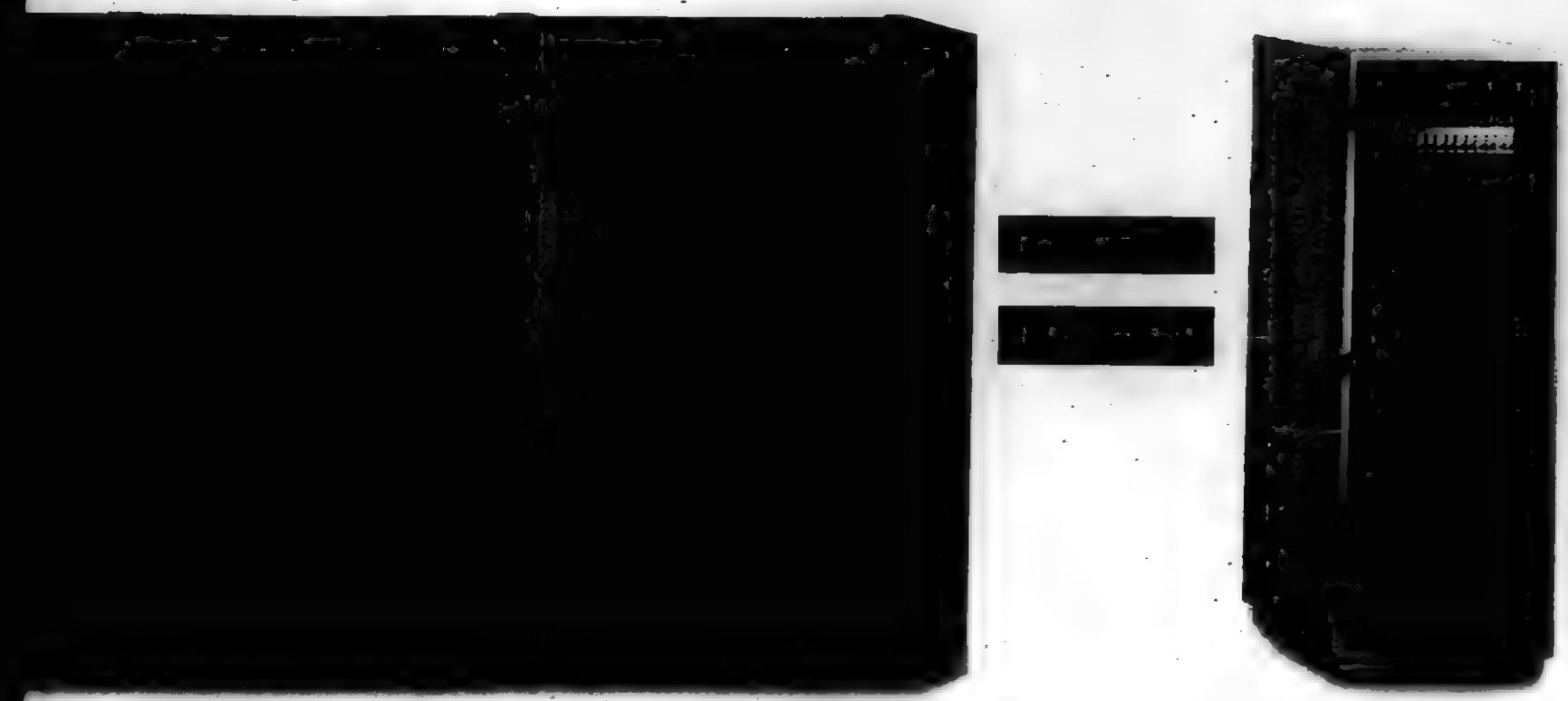

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PERFORMANCE MANAGEMENT AND OPTIMIZATION

Getting the most out of what you've got

BY STAN KOLODZIEJ

Information systems departments are learning a lesson in life: "making do." The days of buying new hardware at the first sign of a system slowdown are over. A declining economy, new system architectures and an effort to "buy strategically" have all played a role in slowing down purchasing plans.

"Controlling IS expenses in a recessionary period is definitely a mandate right now," says Gerard Becker, vice-president of the IBM utility information service at Bankers Trust Co. in New York.

This emphasis on cost containment doesn't mean that IS is off the hook regarding business expectations. Strategic support is still expected but with a smaller price tag. For this reason, "making do" is not such an easy job. It requires IS departments to wring all the power they possibly can out of their current system setup as well as plan their future acquisitions carefully.

To meet corporate demands in tougher economic times and better support changing business strategies, IS departments in larger corporations are realizing that they need to place more emphasis on capacity management, says Alan Howard, vice-president of operations at Applied Computer Research, Inc., a capacity management research firm in Phoenix.

Companies currently involved in capacity management are a rare breed, according to Howard, who says the function is primarily the preserve of large corporations — ones that use an IBM 4381 machine or larger.

"There are few companies doing capacity planning of any kind — perhaps 25% of the marketplace," Howard says. "Of those, only a small percentage are doing any sort of integrated, well-thought-out capacity management."

Capacity management is an umbrella term that includes two smaller components: performance management and capacity planning. While performance management is concerned with the short-term activities necessary to keep daily machine operations acceptable to users, capacity planning deals with strategic planning activities that ensure system resources will be adequate to support the needs of the customer base.

The reason people are slow to move toward capacity management, Howard says, is that it involves two things they don't like to deal with: change and money.

"Capacity management and planning entail some organizational changes, and they also mean an economic commitment," he says. "Those are two things that MIS — already very busy — might not have the strength to deal with."

Some companies, because of economic or organizational pressures, have already been pushed into paying closer attention to future capacity needs, as well as optimizing performance on their current systems. Others can learn from these examples.

During the early 1980s, General Public Utility Service Corp. (GPU) in Reading, Pa., was on a six-year IS resource tear, notching direct-access storage device (DASD) and CPU annual compound growth rates of about 50%, according to Douglas Howe, who was then manager of performance analysis and capacity planning.

But in 1986 the buying spree came to a screeching halt at the holding firm, which provides data processing services to its subsidiaries. "TSO end-user growth exploded during [the early 1980s]," Howe explains, "and so did large-scale application development. Utilities were in a growth mode. Then, in mid-1986, the downturn in the economy caused us to switch quickly into a cost-containment phase."

GPU's IS department never saw it coming. Senior management put the IS brakes on hard and with little warning. Expenditures went one way, while user demand — still in growth mode — went the other.

Howe says he and others at GPU were ill-prepared to deal with the crisis. They had their share of performance management tools but were weak in the planning area. Until then, capacity planning was simple: You just bought more equipment.

"There was a period of hand-wringing and pain," says Howe, who is now manager of cogeneration at GPU affiliate Jersey Central Power & Light in Morristown, N.J. "We were used to growth under liberal circumstances, and now we had to deal with growth under strained conditions. We had to emphasize longer term planning, and we needed a model to help us."

Lack of role models

When GPU went looking for such models, there were none to be found in the marketplace. Instead, the company used its own ingenuity and an existing methodology borrowed from the electric utility industry. This model dealt with conservation and load management — not of IS resources but of energy use.

"We took the [energy] methodology, which deals with peak-load shaving and adapted it

Continued on page 83

Kolodziej is a free-lance writer in Lexington, Mass.

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Product Guide
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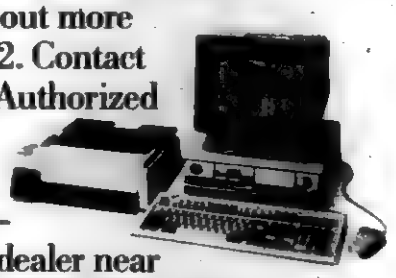

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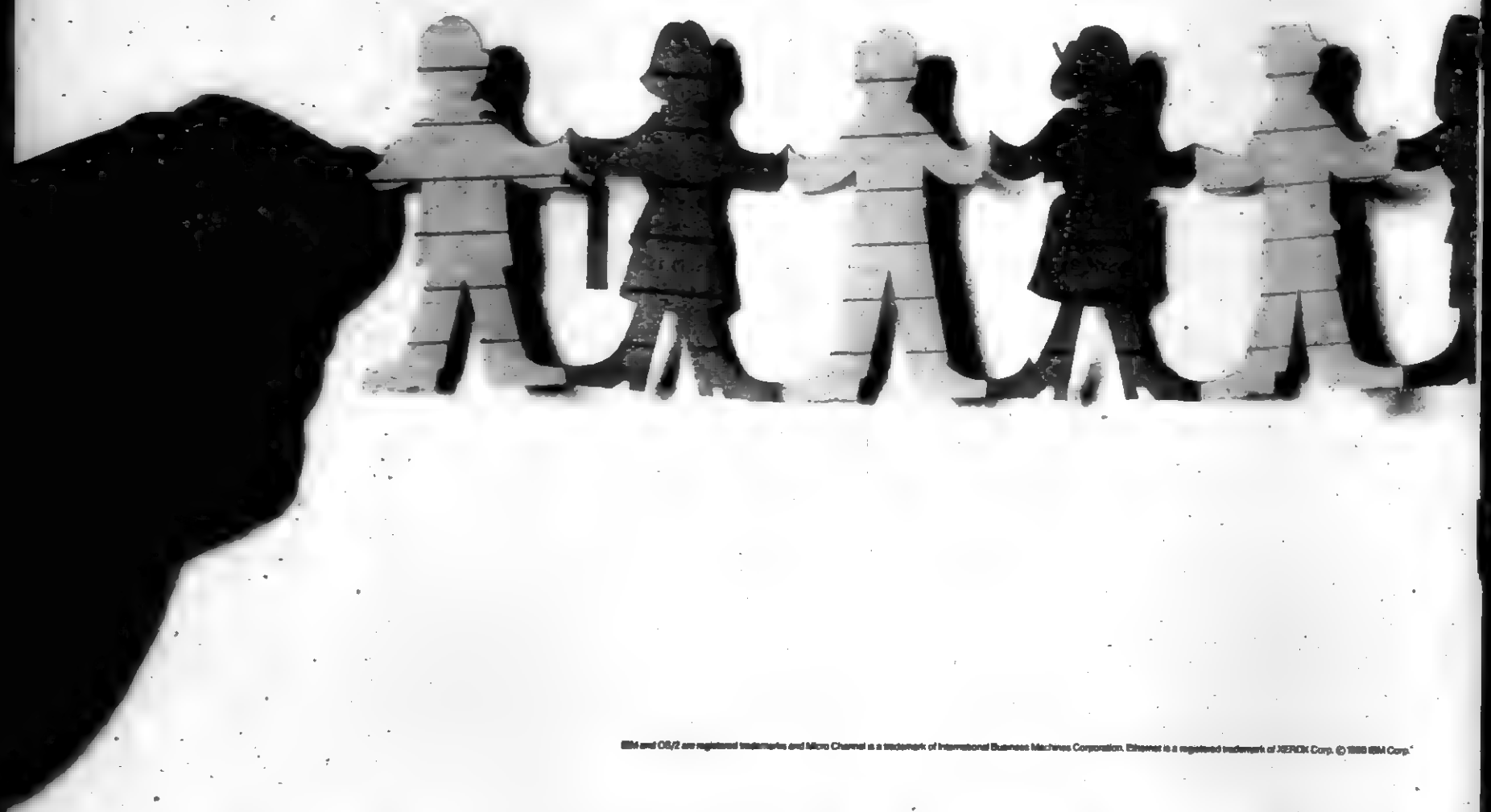

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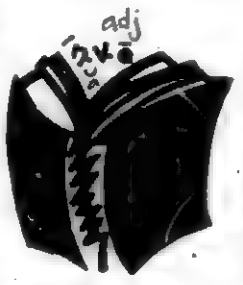
Wide-angle view

As in many areas of the computer industry, capacity management suffers from a lack of standards. In this case, it's nonstandard terminology. Different meanings for words don't have any profound impact — until you try to communicate.



The three umbrella terms commonly used in this field are defined below by the editors of the newsletter "Capacity Management Review" and the "IS Capacity Management Handbook." Both publications are produced by the Institute for Computer Capacity Management in Milpitas, Calif.

Performance management: The short-term or tactical activities necessary to keep daily machine operations acceptable to customers. This primarily includes the following functions:
- Monitoring, analysis and tuning of the operating system, subsystems and hardware.
- Service-level agreement monitoring.
- Chargeback administration.
- Benchmark activities.
- Data collection and maintenance.

Performance management also includes many activities that support capacity planning.

Capacity planning: The long-term or strategic planning activities necessary to ensure system resources will be adequate to support the customer base. This primarily includes the following:
- Quantification of past and present computing activities.
- Work-load characterization and forecasting.
- Prognostication of business plans.
- Sizing of new applications.
- Development of capacity forecasts and alternative plans.
- Modeling.
- Service-level negotiation.
- Acquisition recommendations.

Capacity management: The functions necessary to ensure adequate data processing support are provided at a reasonable cost. They include both performance management and capacity planning functions.

Continued from page 81

to our IS situation," Howe explains. In IS terms, peak-load shaving meant asking users to reschedule some of their data processing work from the peak throughput hours of 9 a.m. to 11 a.m. and 1 p.m. to 3 p.m. They then developed time-of-use billing programs to track savings accrued by the rescheduling.

GPU found this process necessary because most job scheduling programs on the market track larger applications, such as payroll, that run on a regular basis. Many GPU users were used to requesting smaller, more irregular jobs at the last minute. These more unpredictable requests were eating through computer resources.

While this solved the immediate problem of reserving capacity and day-to-day performance management, Howe says, capacity planning at GPU is still not as extensive as it could be. GPU does have some homegrown applications that can grab performance statistics and do some capacity modeling, however.

Capacity planning efforts are being steered away from mainframes and toward personal computers, as the company starts to off-load some processing and application development onto smaller machines in a local-area network configuration.

"Network management is now one of the top planning considerations at GPU," Howe says.

Curb spending

The economic downturn — as well as a change in Bankers Trust's business strategy from commercial/retail to global markets — put pressure on the bank's IS department to flatten its expense growth curve in the late 1980s, Becker says.

The department decided in December 1988 that the best way to slow expense growth was to consolidate its two production data centers and one check processing facility into one large production site and a remotely run development center that also serves as a disaster recovery site.

The merge was completed about one year later. Thanks to the move, Becker estimates, the expense curve has slowed to the tune of $50 million over a period of 10 years. While he did need to upgrade an IBM 3090 Model 400 E to a J model, Becker says the consolidation slowed down purchasing and put the company on a "strategic leverage path."

"NETWORK management is now one of the top planning considerations at GPU."

DOUGLAS HOWE
GPU

Such savings could not have been reaped were it not for a change in the way the bank approaches performance management. A simple way to sum up that change, Becker says, is to call it "proactive" rather than "reactive."

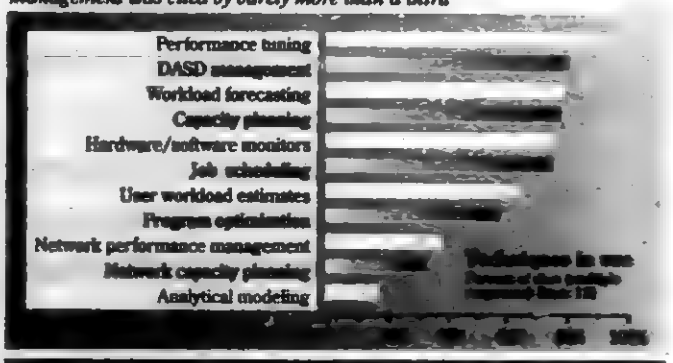
Performance management became an issue was right before moving the stand-alone check processing facility into a shared environment in the production center. "It was extremely important to maintain a high degree of [system] availability as well as a reasonable level of performance," Becker says.

The issues didn't change much once the merger was

Continued on page 85

Tools and techniques

Whereas almost all of the sites surveyed say they tune performance, network management was cited by barely more than a third



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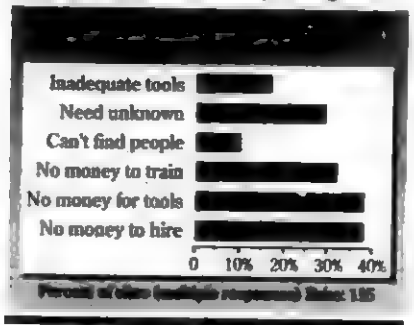
complete. "When the data centers were two distinct sites, they were smaller, and it was easier to maintain a reasonable level of performance," Becker says. "Because of the size of the new production facility, we have to make sure we stay on top of performance levels of the system."

None of this entailed purchasing new and exotic tools, however. Instead, the operators dug deeper into the existing tools.

"We had been using tools like Omegamon to half their capabilities," Becker says. "Quite honestly, [the consolidation] forced my operations staff to get closer to [performance management] products and understand what they can do for them. We were discovering new facilities all along the way, such as understanding all the levels of channel utilization to see where jobs are backed up."

What's stopping you?

In nearly one-third of the large and medium-size sites surveyed, management does not recognize the need for capacity management



Source: Institute for Computer Capacity Management

CW Chart: Doreen St. John

In the larger consolidated site, for instance, Becker has an infrastructure in place that consists of two parts. First, operators no longer wait for a slowdown to occur; rather, they check the system via Omegamon at peak stress levels to deter bottlenecks. Secondly, alert levels are set at a higher tolerance so that problems are triggered earlier in the process.

The bank also uses IBM's Service Level Reporter and homegrown tools developed with SAS Institute, Inc.'s SAS programming language to produce reports on a daily, weekly and monthly basis.

"We use Omegamon to look at channel utilization during peak on-line processing," Becker explains. "On a daily basis, we use Service Level Reporter to look at trends on channel, CPU and memory to better understand that when you're approaching certain thresholds, you can preempt any kind of adverse event from happening."

Tuning, testing and modeling in the VM environment is made difficult by a lack of tools, Becker says. When he needed to merge the check processing system with the production facility, the bank used Smart, a VM modeling package from IBM that it was pilot-testing.

"We didn't find it to be nearly as user-friendly or robust as Omegamon MVS," Becker says. The bank is currently evaluating Candle's recent release of Omegamon VM.

For the near future, Becker says he is looking into tools such as automated console operators. The bank is evaluating Candle's AF/Operator as well as Outbound's message-handling system, Votek.

Becker is also becoming interested in modeling tools such as BGS Systems, Inc.'s Best/1 in order to move beyond performance management to more forecasting functions.

"I WAS TOLD I needed to provide quality service yet operate within some high utilization levels."

MIKE DELVECCHIO
TRAVELERS

"We're looking at forecast tools now, but we're not sophisticated enough to take full advantage of them yet," Becker says. "By early '91, we'll be ready."

Start doing

Most firms find that they hit a wall in terms of how much the products can help them. At some point, they find, you have to turn from products to process.

At The Travelers Corp. in Hartford, Conn., Mike Delvecchio, technical director of data processing, was given the task of taking CPU utilization from the 70% range to 85%.

"I was told I needed to provide quality service yet operate within some high utilization levels," Delvecchio says. "The way to do that is not straightforward." First, he says, you need to understand what is critical for the optimization process. "You can look at any one

Continued on page 88

Close-up

Within the capacity planning and performance management functions, the Institute for Computer Capacity Management also defines subfunctions:

- **Performance monitoring and analysis.** To track computing activity, collect data in a performance database and analyze the data to identify bottlenecks, operating problems or problem applications.
- **Performance tuning.** To adjust operating parameters for the operating system and subsystems, balance work loads and adjust hardware configuration.
- **Work-load characterization.** To classify the total work load into a set of classes so that the resource consumption of each class can be more accurately predicted.
- **Work-load forecasting.** To combine existing work-load resource requirement data with the estimation of new work loads to predict future work-load demand.
- **DASD management.** To monitor, analyze and tune disk-storage devices through DASD configuration parameters, data set placement and manipulation and hardware configuration.
- **Modeling.** To analyze the impact of a variable on a system through diacrete event simulation or analytical methods.
- **Job accounting and charge-back.** To track resource use by customer classification, compute rates and bill customers.
- **Software performance engineering.** To address performance and capacity issues early in the application development phase.
- **Service-level management.** To negotiate and document an agreement between IS customers and IS, relative to the service that will be provided. To subsequently monitor and report service relative to the agreement.
- **Management reporting.** To formulate and distribute graphic, tabular and written reports to various levels of management covering issues relating to performance and capacity.

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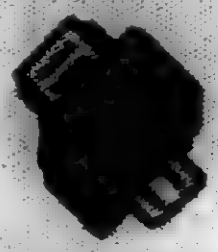

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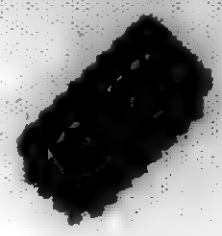

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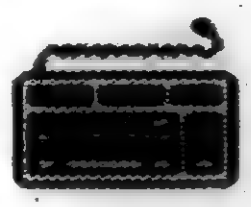
International



Keyboards

Now, all it takes is and you're

It's only fair to warn you that exposure to new Microsoft® Windows™ version 3.0 has been linked to obsessive and habitual usage. Why?

Because with a simple click of the mouse users can connect to the network, even access and manage network resources. All without cumbersome keyboard commands.

Which means users are now able to share data. Not frustration.

While in the interest of time, the Windows 3.0 graphical user interface was designed to be easy to learn. And use. Neophytes, not to mention troglodytes, will be up and running in no time. With virtually no training.

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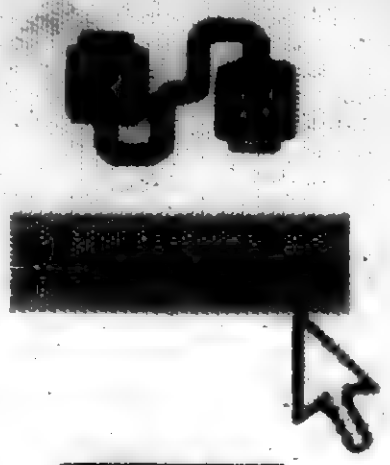
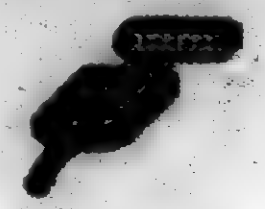


Desktop



Ports

Fonts

a point and click hooked.

And since Windows 3.0 has a modular setup program, a single copy now memorizes every user configuration on the network. Which means, so to speak, one size fits all.

Furthermore, Windows 3.0 has redefined its relationship with IBM® 3270 emulation programs. Users can now download corporate data and easily share it with Windows applications. Something we have come to call peaceful coexistence.

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Continued from page 85

transaction as being a combination of CPU, I/O and memory use." You optimize the important ones, he says.

Delvecchio used degradation analysis tools such as Best/1; Strobe from Programart in Cambridge, Mass., and Omegamon. Best/1 parses a job into its component parts, telling the operator which I/Os are critical to response time.

Strobe was used for highly detailed degradation analyses of on-line and batch applications. The tool looks at the life of a job for a specified time interval and reads out where time is being spent — for example, where memory is being executed, which data sets are in I/O and how much CPU time is being used and where.

Delvecchio and his staff went from site to site, working with programmers to determine which applications were causing delays and where. He used Omegamon as well as programs written in-house that scan output from Legent Corp.'s Mix database to check for trends and anomalies.

The end result was not only an increase in CPU utilization, Delvecchio says, but also savings in deferring machine acquisitions.

He emphasizes, however, not just the tools but the plan behind them. "Tools are immaterial without theory," he says. "If you look at what really makes sense from a throughput perspective, you've got to define the set of processes that describes the most critical computer job type."

In his current search for performance management tools in a distributed LAN-based environment — such as degradation analyzers, remote communication vehicles and other problem detection and repair mechanisms — Delvecchio is coming up empty-handed.

"Distributed technology and computing is mission-critical for us," Delvecchio says, "but it looks like a lot of the distributed performance management work is going to be handled internally until vendors come out with the tools."

Others who have been there and back agree that while tools are important, the way you use them is equally so. "Performance and tuning is both an art and a science," Becker says. "The science piece is the logic and the programmers. The art is the creativity around it that makes the system hum." •

ASK THE VENDOR

We have network applications that require 56K bit/sec. throughput. We have only 19.2K bit/sec. circuits installed, however, and 56K bit/sec. digital is cost-prohibitive and in some cases unavailable. Can you suggest a way for us to get around this problem?

Gregg Swenson
Data Networks and Technical Services Manager
Hewlett-Packard Co.
Palo Alto, Calif.

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For a single-port application, the XA-1 will provide four times the throughput over your 19.2K bit/sec. analog circuit.

With more than 76K bit/sec. available, you may want to run your application at 64K bit/sec. or greater, depending on the capabilities of your equipment.

We have several hundred libraries that could benefit from decreased I/O activity. However, many of these libraries are often compressed and subject to member updates such as link edits.

If we use MVS/ESA Library Lookaside (LLA) and Virtual Lookaside Facility, our operators will have to immediately issue LLA refresh commands after each update on all systems using the library, which would increase manual operations.

Also, because our users are constantly creating, deleting, renaming and moving their libraries, keeping LLA's parameter list current would be quite cumbersome.

Bill Nicholson
Senior Systems Engineer
National Westminster Bank, USA
Melville, N.Y.

LEGENT CORP.: Our direct-access storage device performance optimizers — PMO and Quick-Fetch — allow users to eliminate nearly all directory search and program loading I/O activity against your libraries without operator intervention.

Following updates, the products automatically refresh their in-storage copies of the modified directories and load modules on all systems in your information network.

The products also automatically begin managing libraries that are currently busy. In many data centers, PMO and Quick-Fetch are handling hundreds of libraries, enhancing MVS performance by eliminating more than 90% of the associated I/O activity.

Pansophic Salutes 10 Productive Companies That Make The Difficult Look Simple

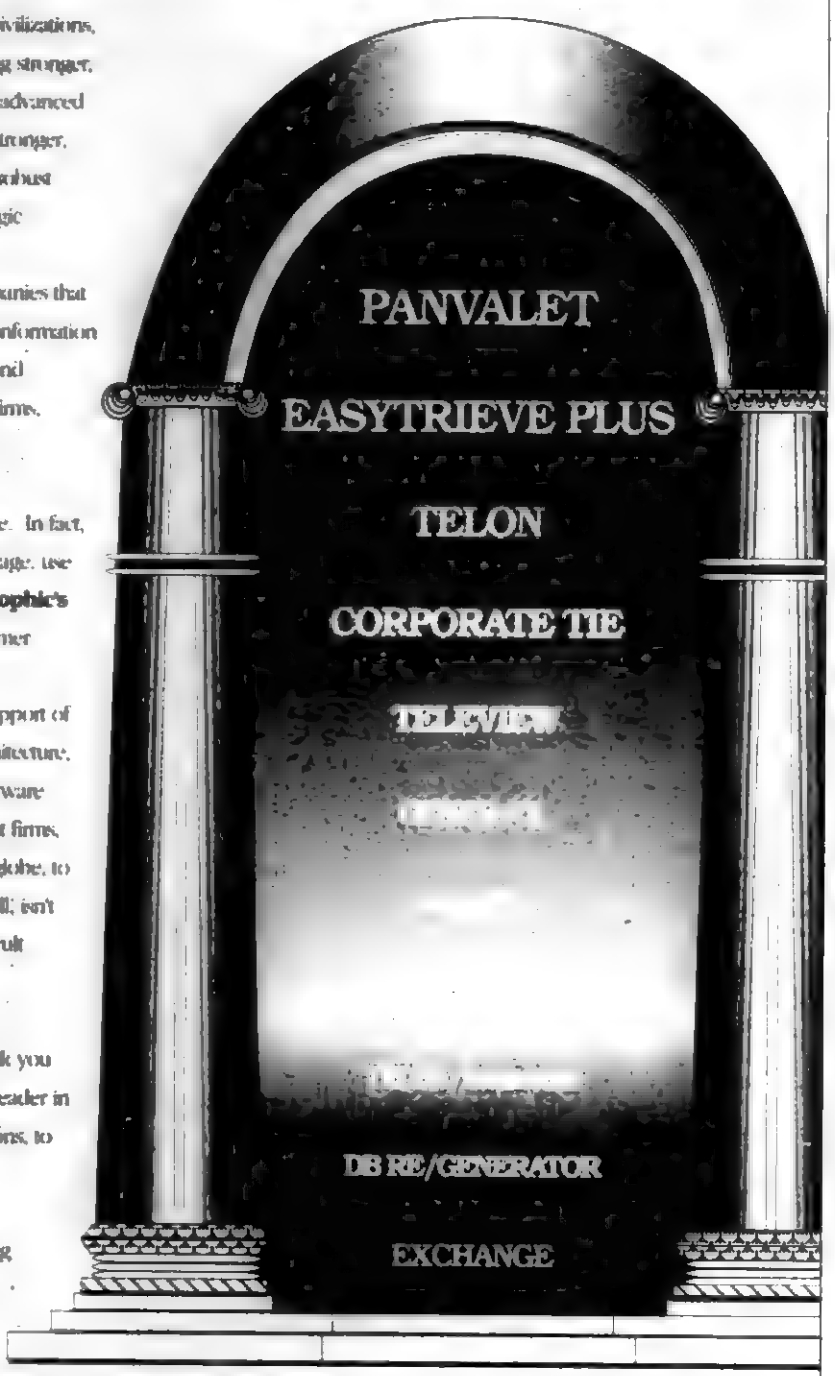
The arch, built by advanced civilizations, offered a breakthrough in erecting stronger, longer-lasting structures. Today, advanced MIS professionals are designing stronger, longer-lasting systems providing robust support for mission-critical, strategic applications.

Computerworld lists ten companies that have built efficient management information systems, increasing productivity and improving quality. Of these ten firms, eight have chosen Pansophic for information retrieval, application development and control software. In fact, these eight organizations, on average, use at least **six products from Pansophic's** suite of industry leading programmer productivity tools.

Yes, 8 of 10! Through our support of IBM's AD Cycle and its open architecture, Pansophic's integrated system software solutions have enabled these eight firms, and thousands more around the globe, to become more productive. After all, isn't productivity just "making the difficult look simple?"

Pansophic Systems salutes the Computerworld 10. We also thank you for choosing Pansophic, a world leader in providing systems software solutions, to help you achieve your goals.

Find out how these firms use Pansophic's productivity-enhancing solutions to improve their MIS operations. Call us today.



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AT&T 80

What does an indestructible 800 service mean to your business? It means more calls will go through. By fortifying all six essential steps in the call process, only AT&T can offer just that.

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The first step is making sure your calls always have access to the AT&T Network. That's why we're building 800 only access lines. So in high-traffic areas 800 calls can ride on access lines that are separate from the regular lines, and the regular lines are always available as a backup. And that's just the beginning.

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Before an 800 call can be switched across the network, information about it must be analyzed and processed. To help this step go flawlessly, we are now adding an entirely separate signalling network called the Alternate Signalling Transfer Network (ASTN). Operating on completely different software and protocols, ASTN can take over for the primary network. At any time.

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Now the 800 number must be translated into a regular phone number. The information needed for this translation is contained in duplicate databases, which are backed up by other databases located in different geographical sites.

And for added protection, we will be providing an alternate database for those numbers critical to your business. And it will be completely independent of the primary one. So you know your call is well on its way.

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0 Service

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BUYERS' SCORECARD

The Monitor eases into first for MVS tracking

BY MICHAEL L. SULLIVAN-TRAINOR
CW STAFF

When it comes to software, what a product does is often secondary to how it does it. This is especially true in performance monitoring, where collecting operating system information is only half the battle. The rest is making the data useful.

This reality is reflected in the fact that four of the six product measures ranked highest in importance by respondents to *Computerworld*'s Buyers' Scorecard on real-time MVS performance monitors highlight ease-of-access and ease-of-use issues.

So it is that a product such as Candle Corp.'s Omegamon, which is the market leader in performance monitoring, can achieve the highest score for buyer satisfaction in what users say is the the most important information collection area and the most important of all criteria — the ability to isolate bottlenecks — and still miss the top slot.

Responses from 50 users of each of the following products were included in the survey. Each user group rated only its own products: Candle's Omegamon for MVS, Landmark Systems Corp.'s The Monitor for MVS, Boole and Babbage, Inc.'s Resolve Plus and IBM's RMF Monitor 2.

Landmark's The Monitor received the highest score overall based on gaining the best marks in areas that reflect how useful the information is to the organization. These include effective on-line real-time reporting and overall ease of use. In addition, Landmark topped key information collection categories such as measuring service levels and resource use. Landmark also scored the highest in affordability.

Boole and Babbage's Resolve Plus placed second — only 1.8 points behind. Omegamon's tally placed it four points below the leader. IBM's RMF 2 came in a distant fourth, a full 12 points behind The Monitor.

The Monitor was the first product to offer ease-of-use features such as "point and shoot," which allows users to select any field to get more detailed information without knowing the precise field data.

Candle has recently upgraded Omegamon to include the point-and-shoot feature. Users who responded to the survey include a mixture of those using new and old versions. Resolve Plus made a strong showing across the board. In addition to tying with Omegamon in providing accurate CPU data, it was rated first in report generation and data extraction. It also garnered high ratings for integration with other Boole and Babbage products.

RMF 2 placed last in all but two of the 16 areas surveyed, reflecting users' concerns about the difficulty in using the product to generate the information they require. However, it did edge ahead of Omegamon in the cost category and placed second before The Monitor in integration with capacity planning software.

Total scores were derived by multiplying the ratings each user group gave its own product by the importance factors all users assigned to each of the 16 criterion. (See methodology next page.) •

COMPUTERWORLD BUYERS' SCORECARD

Real-time MVS performance monitors

Total scores reflect all criteria and their user-assigned importance
Response base: 50 users per product

Product	Three highest ratings	Three lowest ratings
Landmark Systems Corp.'s The Monitor for MVS SCORE 58.5	Overall ease of use On-line real-time reporting Accuracy of CPU data	Integrating with other monitors Integrating with capacity planning software Interfacing to other software
Boole and Babbage, Inc.'s Resolve Plus SCORE 56.7	Accuracy of CPU data On-line real-time reporting Service and support	Integrating with other monitors Interfacing to other software Ability to measure service levels
Candle Corp.'s Omegamon for MVS SCORE 54.1	On-line real-time reporting Accuracy of CPU data Isolating bottlenecks	Integrating with capacity planning software Integrating with other monitors Acquisition and maintenance costs
IBM's Resource Management Facility (RMF) Monitor 2 SCORE 45.9	Service and support Accuracy of CPU data Monitoring resource use	Effective Help facilities Flexible user interface Integrating with other monitors

KEY RATINGS

Landmark's The Monitor achieves the highest score on four out of six key ratings. Candle's Omegamon edges ahead in the most important factor – isolating bottlenecks. Boole and Babbage's Resolve Plus ties with Omegamon for first in providing accurate CPU data

User importance rating

8.9 Ability to isolate bottlenecks

Omegamon	8.4
The Monitor	8.3
Resolve Plus	7.5
RMF	5.7

8.8 Accuracy of CPU data

Resolve Plus	8.5
Omegamon	8.5
The Monitor	8.4
RMF	7.6

8.7 Quality of service & technical support

The Monitor	8.3
Resolve Plus	8.2
Omegamon	8.2
RMF	7.8

8.6 Effective on-line real-time reporting

The Monitor	8.7
Omegamon	8.6
Resolve Plus	8.3
RMF	6.2

8.3 Ability to monitor resource use

The Monitor	8.4
Omegamon	8.3
Resolve Plus	8.0
RMF	6.8

8.1 Overall ease of use

The Monitor	8.7
Resolve Plus	8.2
Omegamon	7.2
RMF	5.6

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A CLOSER LOOK

Boole and Babbage and Landmark split the remaining categories with Resolve Plus showing strength in reporting capabilities and integration and The Monitor winning price, user access and interfacing categories. Candle and IBM battle for third with Omegamon taking most of the third-place rankings

User importance rating

7.9 Usefulness of reports

Resolve Plus	7.5
The Monitor	7.4
Omegamon	6.9
RMF	6.7

7.7 Reasonable acquisition and maintenance costs

The Monitor	8.2
Resolve Plus	7.2
RMF	6.1
Omegamon	5.9

7.5 Ability to measure service levels

The Monitor	7.8
Omegamon	7.5
Resolve Plus	6.7
RMF	5.7

7.3 Flexible user interface

The Monitor	7.8
Resolve Plus	7.3
Omegamon	7.0
RMF	4.9

7.2 Effective Help facilities

The Monitor	8.2
Resolve Plus	7.2
Omegamon	6.9
RMF	4.7

7.1 Ease of report generation

Resolve Plus	7.1
The Monitor	6.8
Omegamon	6.3
RMF	6.2

7.1 Data extraction capabilities

Resolve Plus	7.6
The Monitor	7.2
Omegamon	6.0
RMF	5.8

6.4 Integration with capacity planning software

Resolve Plus	6.9
RMF	6.3
The Monitor	5.9
Omegamon	5.2

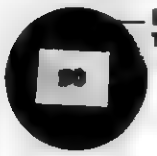
5.8 Effectiveness of interfaces to other software

The Monitor	6.6
Resolve Plus	6.5
Omegamon	6.2
RMF	5.1

Loyalties

Would you buy the product again?
(Reasons based on most frequently stated responses)

The Monitor — Response base: 50



Number of respondents

Likely — 90
The reason: Ease of use

Unlikely — 6
The reason: Better products are available

Resolve Plus — Response base: 49

Likely — 43
The reason: It meets our needs

Unlikely — 6
The reason: Not as user friendly as it could be

Omegamon — Response base: 50

Likely — 44
The reason: Good product

Unlikely — 6
The reason: Difficult to use

RMF — Response base: 50

Number of respondents

Likely — 41
The reason: Provides data we need

Unlikely — 9
The reason: Difficult to use

Verbatim

What do you like best/least about this product?
(Responses are based on the most frequently stated answer)

The Monitor

Likes
- Ease of use
- Good price, low overhead price
- Menu-driven user interface

Dislikes
- Report writing feature delayed
- Expanded batch reporting not delivered
- Lack of connectivity to other products

Resolve Plus

Likes
- Ease of use
- On-line reporting capabilities
- Good for identifying and fixing problems

Dislikes
- Documentation and manual
- Slow to keep current
- Interface to other capacity planning products

Omegamon

Likes
- Determines source of bottlenecks and lockups
- Provides comprehensive picture of what's going on
- Pinpoints problems quickly in real time

Dislikes
- Lack of ease of use
- It's a technician's tool
- Tough learning curve

RMF

Likes
- Support from IBM
- Provides broad base of data
- Reliable

Dislikes
- Not user-friendly
- Lack of flexibility
- Documentation and manuals

Vital statistics

(Response base of 200; multiple responses allowed)

Who responded:

Operations Manager	134
IS Manager	64
Other	2

Length of time using these products:

Less than one year	52
Two to three years	47
Four to five years	25
More than five years	76

Operating system used:

MVS	26
MVS/XA	108
MVS/ESA	79

CW Charts: Paul Mock

METHODOLOGY

Products rated in *Computerworld*'s Buyers' Scorecard on real-time MVS performance monitors were selected on the basis of vendors' installed base and revenue shares within that market segment.

The survey was conducted by telephone interviewers at First Market Research located in Austin, Texas. A minimum of 50 users was required for each product. Results tabulation was conducted by IDG Research Services in Framingham, Mass.

Total weighted scores were computed by multiplying the mean scores all users assigned to the importance of each criterion by the mean scores each user group gave to its own product.

RESPONDENT PROFILE

Survey respondents use the following equipment: large-scale 3090, 32%; medium-scale 3090, 17%; small-scale 3090, 11%; large 308X, 8%; medium 308X, 6%; small 308X, 1%; large Amdahl Corp. mainframe, 6%; medium Amdahl, 2%; large Hitachi Data Systems Corp., 2%; medium HDS, 2%.

Fifty percent of the respondents also say they use other performance software from the same vendor. According to three-quarters of the 200 respondents, their use of the performance monitors has enabled their organization to make changes to improve equipment use. The 25% who did not make changes gave the following reasons: The monitor is difficult to use; the package is used for problem determination rather than planning; other software is used to address usage issues.

Fifty-seven percent of the respondents say that monitoring is very important to their business. Thirty-eight percent say it is somewhat important, and 4% say it is not very important.

Twenty-two percent of the companies surveyed have annual revenues in excess of $1 billion. Sixteen percent of the companies are in the manufacturing industry, 13% are insurance companies, and 11% are government agencies.

ACKNOWLEDGMENTS

Computerworld would like to acknowledge the assistance provided by the following individuals and organizations in the preparation of this edition of Buyers' Scorecard: Tom Bell, Rivendal Consultants, Inc; Chuck Hopf, Hopf Consultants; Alan Howard, Applied Computer Research; Computer Intelligence; and Installed Technology International.

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A little bit of knowledge isn't that hard to come by

BY MARY LOU ROBERTS

Expert systems — or at least knowledge-based techniques — are cropping up in the plans or products of almost every developer of performance management or capacity planning tools.

This trend is likely to continue as hardware and software configurations become more diverse and complex and processing speeds increase. In fact, some observers say that expert systems may well hold the only answer to effective performance management on future systems.

"For computer operations and management, problem solving and decision-making will become automated just as surely as production lines will," says Bernie Domanski, president of Domanski Sciences, a consulting firm in Freehold, N.J.

While only a small number of products today conform to a strict definition of expert systems (see story page 93), many users say they have already saved manpower and money using current tools.

James Hayes, senior systems programmer at Huntington National Bank in Columbus, Ohio, has used Boole & Babbage, Inc.'s DASD Advisor for about two years. "It's worth somewhere from one part-time to one full-time DASD expert to us that we couldn't afford to hire."

The DASD Advisor I/O subsystem performance manager is one of the few true expert systems-based products on the market, incorporating technology from Aion Corp. The product does performance analysis and planning in direct-access storage device (DASD) environments. When it detects problems with I/O, it interprets the problem, poses an explanation and suggests a response.

"Anyone can do data collection; it's how you use and interpret the data that's the hard part," Hayes says. While a human interpretation of data is subjective and possibly inconsistent, DASD Advisor allows the company to measure improvements on a consistent basis.

Roberts is a free-lance writer in Glenside, Pa.

According to Hayes, the bank is preparing to install Boole & Babbage's new DASD Impact Advisor, a modeling component that will let the company look ahead to see the full impact of the changes it plans to make in its I/O configuration.

"Before, our decisions were often wrong and frequently degraded some applications. Now we will be able to make changes with 90% assurance that the changes will be the right ones," Hayes says. The bank is also looking forward to Boole & Babbage's DB2 Advisor and MVS Advisor.

BGS Systems, Inc.'s Best/1-MVS is a knowledge-based — but not true expert system — tool that does perform in those two environments. A recent release of a modeler — called Calibration Consultant — is also rule-based and aids in modeling and calibrating IBM MVS work loads. Calibration Consultant interactively presents the user with a methodology for completing the modeling steps and offers prioritized suggested approaches.

Michael Doyle, senior capacity analyst at Purdue University in West Lafayette, Ind., says the tool has been a big time-saver. "This is a good tool for someone like me who doesn't do modeling very often because it's easy to forget what the right steps are," he says. During the modeling process, he adds, "If you pursue one option and you don't like the results, you can quickly back out of it and try another."

BGS Systems is expected to announce the Best/1-DASD Consultant later this year. This product is expected to provide reporting, tuning and modeling at the device, data set and work-load levels.

Los Angeles-based Candle Corp. plans to incorporate true expert systems technology into its Omegamon product line late this year with AF/Performer.

AF/Performer will initially focus on solving 10 common performance problems, ranging from MVS cross-system reserve lockouts to IBM CICS high CPU use to DB2 thread lockouts. It complies completely with the recent IBM announcements, according to Robert Sackett, product manager at Candle.

The next stage, Sackett says, is for the product to monitor service levels. "If the user isn't meeting response time requirements, we'll be able to tell why."

According to Robert Berry, a research scientist at IBM's Thomas J. Watson Research Center in Yorktown Heights, N.Y., IBM is doing a significant amount of prototyping in using expert systems for performance tuning. The recently announced IBM Performance Analysis Facility/VM, a reporting tool that incorporates statistical techniques for detection and diagnosis of performance problems, is a sample of the tools IBM is expected to announce.

Other vendors offering knowledge-based tools include the following:

- Goal Systems International, Inc. in Columbus, Ohio, markets the Explore family of products, which monitors performance of MVS, VSE and VM systems; Insight for DB2, which manages the performance of DB2 systems; and CICS/Express, which tunes internal aspects of CICS to achieve optimum response time.
- Computer Associates International, Inc. in Garden City, N.Y., offers CA-Mindover, an expert technology-based system that conducts performance and capacity management in the MVS environment and the CA-ISS/Three capacity management system.
- Legent Corp. is planning to build expert systems technology from AI Corp. into Netspy Assistant, a technical support tool for its Netspy product. •

Price guide

• BGS	Best/1-MVS	Modular pricing $14,000 to $72,000
• Boole & Babbage	DASD Advisor	Tiered pricing $18,750 to $30,940
• Candle	AF/Performer	Tiered pricing $20,000 to $60,000
• Goal Systems	Explore MVS	$16,000 to $24,700
	Explore VSE	$16,000
	Explore VM	$10,200 to $15,600
	Insight DB2	$10,800 to $35,000
	CICS/Express	$25,000 to $39,000
• Legent	Netspy	$13,860+
• CA	CA-Mindover	Tiered pricing $26,000 to $71,000
	CA-ISS/Three	$36,800

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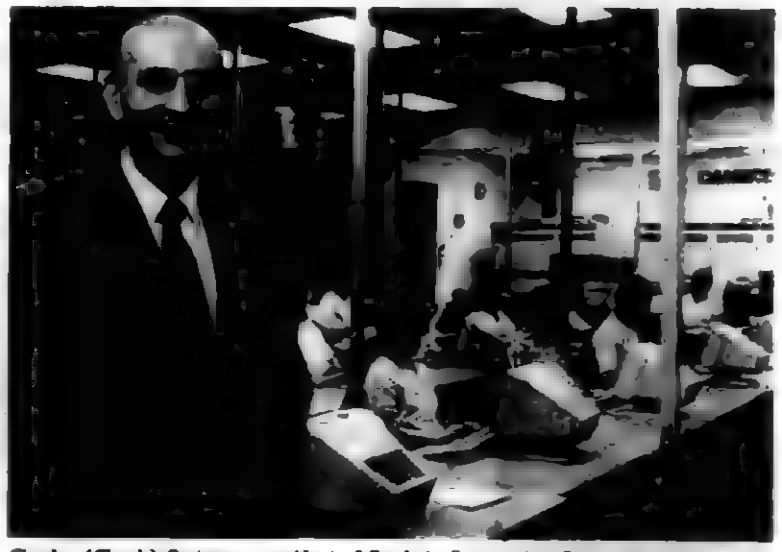

Charles (Chuck) Costanzo, president of Cambria Corporation, Pennsauken, N.J., data entry service bureau since 1973.

Viking Data Entry (VDE) software gives Cambria fast formatting, statistical information on productivity, and data validation/verification routines. More than that, it means quick, accurate turn-around on peak workloads for Cambria's many Fortune 200 clients.

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VIKING SOFTWARE SERVICES

Where expert systems help and hurt

What's the difference between having knowledge and being an "expert"? In the sphere of information systems, there's a major one.

According to Robert Berry, a research scientist at IBM's Thomas J. Watson Research Center in Yorktown Heights, N.Y., a true expert system product meets the following three requirements:

- It must incorporate a knowledge base that encodes expert knowledge, or rules, and is separable from the processing function.
- It must include an inference engine that coordinates the application of knowledge-based information.
- Its system memory must contain problem data used for inter-rule communications.

Most vendors' performance management tools do not meet these criteria. The question is, do they have to in order to deliver a useful tool?

The vendors say no. "You can implement expert systems-type technology without the use of an inference engine and have an excellent product," says Robert Sackett, product manager at Los Angeles-based Candle Corp. "If you can analyze a problem, devise a solution, implement the solution and validate the results, then you have a knowledge-based system."

Other industry observers agree that there are advantages to not incorporating an expert system shell in a performance management product. "Expert systems are not known for their speed," says Bernie Domanski, president of Domanski Sciences, a consulting firm in Freehold, N.J. "The interpretation of performance measurement data in real time could take a prohibitive amount of time, nullifying the usefulness of the system."

This use of system resources may account for the fact that true expert systems are more often applied to capacity planning and modeling tools than to real-time performance management.

"Model calibration and configuration capacity planning . . . are longer-term issues than performance management, which tends to be a more pressured 'fire fighting' type of situation," Berry says.

Slow to move

Even proponents of expert systems acknowledge that users are reluctant to turn the real-time performance tuning of their systems over to automated tools. No matter how much these systems may become capable of doing, users are likely to insist, at least for a while, on holding onto direct control of performance changes.

"What expert systems will do in the near term is intelligent analysis of the data — not turning the knobs," Domanski says. "People are new to the idea of having the systems tune themselves. They first want to understand how it works."

The issue of user acceptance may be more than just lack of faith and understanding in the tools. "In the real world," Berry says, "the people who do the performance analysis are not necessarily the people who have the authority to change the system. For now, it makes more sense to automate some portions of the process and then let the tool serve as an aid for letting people solve the rest."

Looking ahead, observers say that many of the "expert" capabilities for real-time performance management will eventually be built right into the operating systems by the hardware vendors themselves.

This is already beginning to happen on IBM's recently announced ESA/390 operating system, which includes many built-in expert performance techniques.

"Mainframe vendors will also begin to build knowledge bases into their front ends," according to Domanski. "It's going to be a true interactive Help facility rather than a more static one like we see today." ●

MARY LOU ROBERTS

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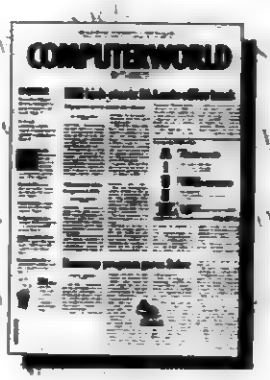

COMPUTERWORLD

The newspaper for information systems management

Few tools capture full network picture

BY ALLEN G. TAYLOR

When an organization wires personal computers and workstations into a local-area network configuration, the last thing it expects is slower access and response times. Finding and fixing bottlenecks on a network isn't easy, however; the job is at least an order of magnitude more complex than doing the same on stand-alone machines.

The biggest problem is that no one tool gives you a window into the entire network. For a complete overview and analysis of network activity — especially in large LAN or wide-area network configurations — you need to think more in terms of a crowd.

"Local-area network management and optimization are very much an art rather than a science because you are dealing with multivendor environments," says Cheryl Currid at Coca-Cola Foods in Houston. "There is no one tool that can tell you everything."

There are tools that can tell you "almost everything," however, depending on the level of detail you require.

If your network supports fewer than 100 users and doesn't perform network-intensive tasks such as database retrievals, software-only performance monitors may be sufficient for your needs.

Typically priced at only a few hundred dollars, these monitors provide a less-detailed analysis than hardware/software protocol analyzers. They monitor network resources, collect statistical node and traffic information, run connectivity requests and provide a picture of the internet.

This information sufficiently resolves most problems on small networks and can also be valuable on larger networks in combination with other tools.

Most of the software-only packages are designed to run under Novell, Inc.'s Netware, currently the most popular PC network operating environment.

One of the most capable products in this class is Cheyenne Software's Monitrix, which was introduced a year ago. The package provides a graphical display of network topology and everything connected to it, including bridges, servers and workstations, while continuously monitoring network resources.

Monitrix is a value-added process (VAP), meaning that it follows Netware specifications to run continuously in the background during network operation. As a result, it is not necessary to dedicate a workstation to the monitoring and statistics-gathering functions.

Monitrix Release 2.0, just introduced this year, adds artificial intelligence functionality that goes beyond problem analysis to suggesting solutions. The package costs $795 for a configuration that supports up to four servers.

Fresh Technology in Gilbert, Ariz., has started shipping Netvision, a network analysis tool with a different emphasis from that of Monitrix. At $495, it provides the budget-conscious network administrator with a detailed view of CPU, cache and disk efficiency in both graphical and spreadsheet form. As a VAP, it can also run as a background function to gather long-term statistics.

There are fewer software-only performance monitors for the Unix environment. In addition, tools that run on workstations under VMS or Unix tend to be more expensive than comparable tools that run under Netware on PCs.

One that just came out seven months ago is Santa Clara, Calif.-based Aim Technology, Inc.'s Aim Network File Manager (NFM), which runs on Sun Microsystems, Inc. workstations. Priced at $6,500, NFM monitors file-server throughput, diagnoses topology-related problems and manages the use of disk storage.

Tool combinations

Generally, tools that include hardware extract more detailed information from the network but for a higher price than their software-only counterparts.

Software-only tools have network adapters designed to filter out faulty data packets, thus losing valuable diagnostic information. With a hardware/software combination tool, the adapters capture that faulty data and thus provide a better picture of the network.

These products can also alert the administrator to undesirable trends before they affect performance. The administrator can then act to prevent a system slowdown without users being aware that anything is out of the ordinary.

Representative of the combination hardware/software products running under Unix is FNMP-based Lance from Micro Technology in Anaheim, Calif., which has been available for about eight months.

A single Lance/Tap card can be plugged into a PC and then hooked up to a LAN segment to gather and report on detailed activity data. It also provides general information about the network as a whole. When additional Lance/Tap monitors are installed on other network segments, the administrator can gain a detailed view of activity on the entire network through a single console.

Lance is geographically unlimited in its ability to monitor: It sees through bridges, routers and T1 multiplexers to give the network administrator a picture of the entire internetwork.

The software component — Lance/NMS — is priced at $15,000, and each Lance/Tap card costs $3,500 in quantity purchases.

Another network manager for Unix-based T1 networks is the Digital Link Network Management System (DLMS) from Digital Link Corp. in Sunnyvale, Calif.

Using boards installed in workstations, the DLMS retrieves performance data and error reports and runs diagnostic tests from a central control site. A database contains the network configuration, historical performance data and alarm conditions. A basic DLMS software package, priced at $17,600, can handle up to 10 T1 links.

There is as much diversity in the DOS, OS/2 and Netware worlds as in Unix. Novell's Lanalyzer products — which serve as both protocol analyzers and network monitors — are available for Ethernet and Token-Ring networks.

The first Lanalyzer was introduced four years ago. The latest release includes an application test suite, an on-line troubleshooting guide and a Help system.

The Help system not only guides the administrator in running the tests but also helps him interpret the results and suggests possible actions to take. A Lanalyzer kit consists of software and a network interface card that plugs into any IBM Personal Computer AT on the network. The kit costs $9,980 for Ethernet or Token-Ring versions.

Network General Corp. in Menlo Park, Calif., manufactures the Sniffer family of network analyzers, which supports more network hardware platforms than any other vendor.

The company also supplies a wide array of protocol interpreters, including IBM's Systems Network Architecture, Netbios, OS/2 LAN Manager, Netware, XNS/MS-Net, Transmission Control Protocol/Internet Protocol, Sun's Network File System, ISO, Simple Network Management Protocol, Digital Equipment Corp.'s Decnet, Banyan Systems, Inc.'s Virtual Networking Software, Apple Computer, Inc.'s Appletalk and X Window System.

Sniffer consists of a PC specifically configured for network analysis and all associated software. It ranges from $16,750 to $24,000 for a base model.

Network General recently introduced a 16M/4M bit/sec. Token-Ring Sniffer analyzer ($18,750) that is based on the IBM Personal System/2 Model 70. •

Taylor is a lecturer, writer and systems consultant in Westminster, Calif.

Detail work

For inexpensive, "quick-fix" views of network performance, there is also a variety of add-on utilities that fix their sights on specific aspects of network performance.

For $179, Fresh Technology's Fresh Utilities reports on such things as bindery information, drive use and file server active user groups.

TXD from Thomas Conrad monitors LAN performance, alerts the administrator to problems and suggests a solution. The product costs $195.

TXD is slightly more than a year old, and, like most of the products in this category, is able to see through bridges to segments of the network other than the one on which it is running.

Other entries in this arena include Fry Computer Systems' Fry Utilities at $495 and Emulation Technologies' Net Companion at $349.

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or by FAX to the attention of Jo Ann Rice at CTC's headquarters in Buffalo, NY 716-887-7468.
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Job scheduling tools

VENDOR	PRODUCT	HARDWARE ENVIRONMENT	OPERATING SYSTEMS SUPPORTED	JOB SCHEDULING FUNCTIONS PERFORMED	POTENTIAL PROBLEMS FOR WHICH WARNINGS ARE ISSUED	ACTUAL PROBLEMS FOR WHICH OPERATORS ARE ALERTED	ERROR HANDLING FUNCTIONS	TYPES OF OVERRIDE COMMANDS	ALLOWS ONE-TIME SCHEDULING CHANGES	REPORTING CAPABILITIES	INTERFACES WITH ON-LINE SYSTEMS	COMMAND OR MENU DRIVEN	LANGUAGE USED FOR COMMANDS	SECURITY PACKAGE COMPATIBILITIES	PRICE RANGE
Advanced Systems Concepts, Inc. (760) 602-1311	Plus	IBM AS/400, System/38	OS/400, CPF	Cancel, create dependencies, generate future schedules, schedule by time	None	Incomplete and unperformed jobs	Logged	None	Yes	Distribution, on-line job status, history of jobs run	No	Menu	NA	None, uses OS security	$300-$2,400
Allen Systems Group, Inc. (800) 780-2727 (813) 263-6700	Jobnet	IBM mainframes and compatibles	MVS/SP, MVS/XA	All	None	Incomplete and unperformed jobs	WTO message	Hold, release	Yes	On-line job status, history of jobs run	No	Menu	NA	None, internal security	$11,800-$16,900 for CPU license; $28,400-$40,500 for site license
Altai Software (817) 640-6811	Zeke, The Scheduler	IBM mainframes and compatibles	MVS/SP, MVS/XA, MVS/ESA, VSE/SP	All, plus check condition codes	Scheduling conflicts, dormant jobs, overload	Unperformed, late and held jobs	Reported, logged, automatic job restart	Change schedule, JCL or prerequisites	Yes	Distribution, on-line job status, pre- and post-process reports, history of jobs run, forecasting of production requirements	Yes	Either	Proprietary	ACF2, RACF, Top Secret	$17,500-$56,500
Carlisle Systems Group (512) 744-6118	Ivan-Submit	NCR V8000 and V9000 series	VRX, VRX/E	Create dependencies and multiple job queues, generate future schedules, hold jobs, schedule jobs by time and event	None	Incomplete and unperformed jobs, activity errors	Reported, logged	Any commands that would otherwise be issued automatically	No	On-line job status, pre- and post-process reports, history of jobs run, chargeback	Yes	Command	English-like	None, relies on text editor security	$3,500
Carolian Systems International, Inc. (416) 673-0000	Emperor	HP 3000	MPE/V, MPE/XL	All, plus dynamic scheduling	None	Incomplete and unperformed jobs	Reported, logged, automatic job restart	Any commands that would otherwise be issued automatically	No	On-line status, history of jobs run, post-process reports	No	Command	Proprietary	None, internal security	$2,000-$12,000
Chestnut Data Systems, Inc. (215) 567-0807	CDS/Acorn	HP 3000	MPE V, MPE/XL	Cancel and hold, create dependencies, generate future schedules, schedule by time	Dormant jobs	Incomplete jobs	Reported, logged	Stop, run	Yes	On-line job status, pre-process reports, forecasting of production requirements	No	Menu	NA	CDS/Sec Review	$2,800-$3,400
Computer Associates International, Inc. (516) 227-3300	CA-Scheduler	IBM mainframes and compatibles	MVS, VM, VSE	Cancel and hold, create dependencies, generate future schedules, schedule by time and event	None	Aborts	Reported, trapped, logged, automatic job restart, user notification	Change schedule	No	On-line job status, pre- and post-process reports, history of jobs run, forecasting of production requirements	No	Either	English-like	ACF2, Top Secret	$6,000 - $180,000
	CA-7	IBM mainframes and compatibles	MVS/XA, MVS/ESA	All, plus simulate future work load, real-time work load balancing	Scheduling conflicts, dormant jobs, overload	Late jobs	Reported, trapped, logged, automatic job restart	Date, time or JCL changes	Yes	On-line job status, pre- and post-process reports, history of jobs run, forecasting of production requirements, simulation	No	Either	English-like	ACF2, RACF, Top Secret	$41,250 - $180,000
Cybermation, Inc. (416) 479-4611	Execution Scheduling Processor (ESP)	IBM 370 and compatibles	MVS, MVS/XA, MVS/ESA	Cancel and hold, create dependencies, generate future schedules, schedule by time and event, allow ad hoc changes, resource-based scheduling	Scheduling conflicts, overload	Incomplete, unperformed or late jobs, JCL errors, system messages, condition code failure	Reported, trapped, logged, recovery procedure run	Any operator and scheduling commands	Yes	On-line job status, history of jobs run, job queue, forecasting of production requirements, simulation modeling, exception and late job reports	No	Either	English-like	ACF2, RACF, Top Secret	$42,000 - $70,000
Digital Equipment Corp. (508) 486-6642	Decscheduler for VMS	DEC VAX	VMS	Cancel and hold, create dependencies, generate future schedules, schedule by time and event	Scheduling conflicts, dormant jobs, overload, expected runtime exceeded	Incomplete and unperformed jobs, user-defined problems	Reported, logged, automatic job restart	Any operating system and scheduling commands	Yes	Distribution, on-line job status, pre- and post-process reports, history of jobs run	No	Either	DCL	Any VMS-compatible package	$1,797-$66,700
EDP Systems, Inc. (904) 575-0179	A S Exec	Unisys A series machines	MCP versions 3.7-3.9	Cancel and hold, create dependencies, generate future schedules, schedule by time or event	Overload	Incomplete jobs	Trapped, automatic job restart	Run jobs out of schedule, hold and remove jobs	Yes	Distribution, on-line job status, pre- and post-process reports, history of jobs run	Yes	Menu	NA	EDP's Infoguard and internal security	$8,300 - $25,000
	LIONL/Job Flow	Unisys V series machines	MCP versions 3.7-3.9	All	Scheduling conflicts, dormant jobs, overload	Incomplete jobs	Reported, trapped, logged, automatic job restart	Parameter changes, minor schedule modifications	Yes	Distribution, history of jobs run, post-process reports	Yes	Either	Unisys Operator Control Language	Internal security	$17,000 - $32,000, includes scheduling, console automation, tape management modules
Goal Systems International, Inc. (800) 829-8000	Jobtrac	IBM 4300, 3000 series, NAS, Amdahl	MVS/SP, MVS/XA, MVS/ESA	Cancel and hold, create dependencies, generate future schedules, schedule by time and event	Scheduling conflicts	Aborts, reruns, JCL and catalog errors, condition code violations	Reported, trapped, logged	Add, delete, purge, hold, adjust forward and backward	Yes	On-line job status, pre- and post-process reports, history of jobs run, job queues	Yes	Either	ISPF	ACF2, Alert, RACF, Top Secret	$40,000 - $80,000
	FAQS/FCS for VSE	IBM mainframes and compatibles	VSE/SP version 2 and higher	All, plus manual dependencies	Scheduling conflicts, dormant, aborted and waiting jobs	Incomplete, unperformed, late and waiting jobs	Reported, logged	On-demand scheduling, override data or JCL, restart job	Yes	On-line job status, pre- and post-process reports, history of jobs run, job queue, chargeback, audit trails	Yes	Either	SKEX	Alert/VSE, internal security	$8,000 - $12,000
Glosser Software (800) 634-0102	Scheduler	Wang VS	Wang OS 6.43 - 7.30	Cancel and hold, create multiple job queues, generate future schedules, schedule by time or event	Dormant jobs	Incomplete jobs	Logged	Activate, deactivate jobs	Yes	History of jobs run, job queue	No	Menu	NA	None, internal security	$300 - $960
Help Systems, Inc. (612) 933-0609	Robot	IBM AS/400, System/38	OS/400, CPF	All	None	Incomplete jobs	Reported, trapped, logged	Start and hold job, send sent run, run jobs missed due to shutdown	Yes	Distribution, on-line job status, pre- and post-process reports, history of jobs run, chargeback	Yes	Menu	NA	IBM None, uses OS security	$1,790-$4,575
ISA Solutions (800) 462-6361 (708) 677-3530	ISA/Task Master	DEC VAX	VAX/VMS Version 4.7 and higher	All, plus resource-based scheduling	None	Incomplete or unperformed jobs	Reported, logged	Hold, release, start	Yes	On-line job status, pre- and post-process reports, history of jobs run	No	Either	DCL	Internal security	$1,295-$9,000
ISK, Inc. (212) 837-0330	Schedule V3.3	DEC VAX	VMS	All	None	None	Trapped	Edit, force status changes	No	On-line job status	No	Command	DCL	None	$1,300-$10,225

[1] "All" refers to the following features: cancel and hold jobs, create dependencies and multiple job queues, generate future schedules, schedule jobs by time and/or event.
[2] "All" refers to the following features: distribution, on-line job status, pre- and post-process reports, history of jobs run, job queue, forecasting of production requirements and chargeback.
[3] European readers should call Boole & Babbage, Inc. in Brussels, West Germany at 32-2-725-2432.

The companies included in this chart responded to a recent survey conducted by *Computerworld*. When a vendor is unable to provide specific information about its product, the abbreviation NP (not provided) is used. When a question does not apply to a vendor's product, the abbreviation NA (not applicable) is used. Further product information is available from the vendors.

VENDOR	PRODUCT	HARDWARE ENVIRONMENT	OPERATING SYSTEMS SUPPORTED	JOB SCHEDULING FUNCTIONS PERFORMED	POTENTIAL PROBLEMS FOR WHICH WARNINGS ARE ISSUED	ACTUAL PROBLEMS FOR WHICH OPERATORS ARE ALERTED	ERROR HANDLING FUNCTIONS	TYPES OF OVERRIDE COMMANDS	ALLOWS ONE-TIME SCHEDULING CHANGES	REPORTING CAPABILITIES	INTERFACES WITH ON-LINE SYSTEMS	COMMAND OR MENU DRIVEN	LANGUAGE USED FOR COMMANDS	SECURITY PACKAGE COMPATIBILITIES	PRICE RANGE
Avan Technology Corp. (919) 872-5577	JES-Job Scheduling and Control System	DEC VAX	VMS	Cancel, create dependencies, generate schedules, hold, schedule by time and event	None	Incomplete jobs	Reported, trapped, logged, automatic job restart	Hold	Yes	On-line job status, pre-process reports, history of jobs run, job queue, post-process reports	No	Menu	NA	None, internal security	$4,000-$15,000
Informed Management Environment, Inc. (800) 447-4687 (713) 880-4630	Operations Environment	IBM AS/400	OS/400	All, plus user reminders	Dormant jobs	Incomplete and unperformed jobs, activity errors	Reported, trapped, logged, user-defined responses	None	No	Distribution, on-line job status, pre- and post-process reports, history of jobs run, forecasting of production requirements	No	Menu	NA	None, uses OS security	$5,000-$12,000
Hamilton Corp. (303) 940-6500	JobMaster	IBM 370, 4381, 3080, 3090	MVS/SP, MVS/XA, MVS/ESA	All, plus monitor and schedule started tasks, resolve data set contentions	Scheduling conflicts, dormant jobs	Incomplete and unperformed jobs, missed task requirements and real-time status for delays	Reported, trapped, logged, automatic job restart, real-time status for delays	Paused caused and completed, hold, release	Yes	On-line job status, pre- and post-process reports, history of jobs run, forecasting of production requirements, user reporting	Yes	Menu	NA	ACF2, RACF, Top Secret	$20,000-$40,000
Mainline Management Systems, Inc. (314) 532-7960	Integra-Scheduler	IBM mainframes and compatibles	MVS/SP, MVS/XA, MVS/ESA	All, plus start job after appropriate data set is available or after unscheduled job is complete, rerun, check condition codes	Scheduling conflicts, dormant jobs, overload	Incomplete, unperformed and late jobs, condition code failures	Reported, trapped, logged, automatic job restart or rerun	Adjust clock, schedule changes, manual job submission	Yes	API	Yes	Menu	NA	ACF2, RACF, Top Secret	$30,000-$60,000
Mesa Software Development, Inc. (800) 635-1500	Command Plus Scheduler	DEC VAX	VMS	All	Scheduling conflicts, dormant jobs, overload	Incomplete and unperformed jobs	Reported, trapped, logged, automatic job restart	Parameter changes	Yes	Distribution, on-line job status, pre- and post-process reports, forecasting of production requirements, chargeback	No	Menu	NA	None, uses OS security	$2,500-$21,000
Netec International, Inc. (214) 343-9744	Auto Operations Extension Facility	IBM mainframes and compatibles	MVS, JES2, JES3	Cancel, hold, create dependences and multiple job queues, schedule by time or event	None	User-defined problems, including abends, allocation failures, incomplete jobs	Logged	Hold, cancel, release	Yes	On-line job status	Yes	Command	REXX-like	None, uses OS security	$3,000 - $11,000
Operations Control Systems (415) 680-4150	Express	HP 3000, models XE-7X, SE	MPE, MPE-XL	All, plus job queue management, standard list analysis, network support	Scheduling conflicts, dormant jobs, overload	Incomplete and unperformed jobs, abnormal job completion status	Reported, trapped, logged, restart sequence	Change, cancel, stop, add, override	Yes	All, plus tape, disk and printer usage, audit trails	Yes	Command	User-defined and MPE-like interface	OCS/Private, HP Security Monitor	$10,000+
Pinnacle Systems, Inc. (800) 323-7335	Mastermind - The Operations Expert	IBM AS/400, System/38	OS/400, CPF	All, plus automatic recovery	Scheduling conflicts, dormant and late jobs	Incomplete, unperformed and held jobs	Reported, trapped, logged, automatic job restart, other jobs executed based on error found	Schedule dependencies, recovery and other parameters	Yes	Distribution, on-line job status, pre- and post-process reports, history of jobs run, forecasting of production requirements, schedule documentation	No	Either	Standard OS/400 and CPF commands	None, uses OS security	$2,500 - $10,000
Pinnacle Systems, Inc. (800) 727-1800	The Daily Planit	Unisys 1100, 2200	Exec 8	All, plus start unscheduled jobs	Scheduling conflicts, dormant jobs, overload, facility requirements problems, uncatalogued files	Incomplete, unperformed, late and dependent jobs, time constraints, conflicts	Reported, trapped, logged, automatic job restart	Add unscheduled jobs, override dependencies	Yes	All	Yes	Either	SSG, Cobol, DPS, Tip	Unisys Sentry, Simm, TSS	$28,000-$31,000
Software and Management Associates (713) 864-8232	The Scheduler	Unisys 1100, 2200, System 80	OS 1100, OS 3	All, plus schedule for multiple computers	scheduling conflicts, dormant jobs, overload, machine time allocation by user or department	Incomplete and unperformed jobs, insufficient resources	Reported, logged, automatic job restart, recovery job automatically executed	Temporary suspension of the product, user-defined commands	Yes	API	Yes	Either	English-like	None, uses security in Unisys DPS and TIP and internal security features	$10,000-$65,000
Software Business Applications, Inc. (703) 860-0600	VSEJator	Wang VS	VS 6.43 and higher	Create dependencies, schedule by time and event	None	Incomplete jobs	Reported	None	No	On-line job status, post-process reports	No	Menu	NA	None, uses OS security	$300
Software Partners/32, Inc. (508) 897-0400	Jobsys	DEC VAX	VMS	Cancel, create dependences, generate future schedules, hold, schedule by time	None	Incomplete and unperformed jobs, completion status	Reported, automatic job restart if system goes down	Override scheduling	No	History of jobs run	No	Either	DCL	Any VMS-compatible packages	$2,500-$10,000
Star Tech Software (212) 643-0050	Auto-Sequoia	IBM 370	VSE, VM	Cancel and hold, create dependencies, schedule by time or event	None	None	Reported, automatic job restart	None	No	On-line job status	Yes	Menu	NA	ACF2, RACF, Top Secret	$4,500-$8,500
Systems Center, Inc. (703) 264-8080	VMBatch/ VMSchedule	IBM, Amdahl mainframes	VM/SP, VM/HPO, VM/XA Version 2.1	All	Dormant jobs	Incomplete jobs	Reported, trapped, logged, automatic job restart	None	Yes	On-line job status, history of jobs run, chargeback	Yes	Either	Internal command language	ACF2, RACF, VM Secure	$7,000-$46,500
Tandem Computers, Inc. (408) 285-6000	Network Plus	Tandem Himalaya Cyclone, VLX, CLX	Guardian 90	All	None	None	Reported, trapped, logged, automatic job restart	Change dependencies and schedules, start and stop job	Yes	On-line job status	Yes	Either	Tandem TACL and INFROC	Tandem Safeguard	$2,000-$5,500 initial license fee, plus $130-$610 per month
Tekel Systems, Inc. (312) 455-8756	Fiber	Datapoint machines	DOS, ISIS	All	None	Missing files	Reported, job stopped	Hold, change parameters	No	On-line job status, history of jobs run	No	Command	Database	None, uses OS security	$2,000
The AS/400 Group (800) 228-4400 (800) 475-8722	Light Out/400	IBM AS/400, System/38	OS/400, CPF, SNA	All	Overload	Incomplete and unperformed jobs	Reported, logged	Hold, change schedule and JCL	Yes	All, plus report shell to allow mapping to other reporting packages	Yes	Either	RPG/400	None, uses OS security	$1,495-$3,495
Time Software Corp. (800) 833-8463 (714) 991-0460	Control-M	IBM mainframes and compatibles	MVS, MVS/XA, MVS/ESA	All, plus schedules based on resource requirements, file availability, CICS status	Scheduling conflicts, dormant and late jobs, overload or condition codes, abends, JCL errors, uncatalogued conditions	Incomplete and unperformed jobs	Reported, trapped, logged, automatic job restart, audit trail	Hold and free jobs, change schedule, suspend processing	Yes	Distribution, on-line job status, pre- and post-process reports, history of jobs run, forecasting of production requirements, JCL checking, tape pull list, job and resource simulation	Yes	Menu	NA	ACF2, RACF, Top Secret	$29,000 - $59,000
Unison Software (408) 245-2660	BOSSPak	HP 3000	MPE/V, MPE/XL	All, plus control multiple CPUs	Scheduling conflicts, dormant jobs, overload, missed by deadline	Incomplete and unperformed jobs	Reported, logged, automatic job restart	Cancel, status, release	Yes	Any that run on Hewlett-Packard machines	Yes	Either	Proprietary MPE-like	All	$7,500-$40,000
Unitech Software, Inc. (703) 264-3201	Uquene	Unix machines	Unix and variations	Cancel and hold, create multiple job queues, schedule by time	None	Incomplete and unperformed jobs	Reported, logged, automatic job restart	Change schedule, redirect jobs to different printer	Yes	On-line job status, pre- and post-process reports, history of jobs run, chargeback	No	Either	C	Unitech's Unesure	$1,000-$4,000

Get it together, IBM

A once-unified Big Blue must consolidate its operating systems and architectures to thrive past the 1990s

BY JOHN CHISHOLM

It's time for IBM to rediscover its roots. What catapulted IBM to greatness in the mid-1960s was its discovery and implementation in the System/360 of a single, scalable architecture offering binary compatibility across a family of processors. Not only was this IBM's supreme intellectual and business achievement — and it is extremely rare for a single achievement to be both — but it also broadly defined the strategies that all other successful computer suppliers have followed since then.

Last month, IBM celebrated more than 25 years of the System/360 and System/370 by announcing the System/390. The System/390 provides common operating systems and architecture *within* the Enterprise System/9000 line, which covers the entire range of the former System/370 (9370, 438x, 3090) and more. But the System/390 does not provide object code (binary) compatibility *across* IBM product lines.

Over the years, System 360 and OS/360 have given way to four major hardware architectures, six major operating systems and countless minor platforms and operating systems for IBM to enhance, support and maintain. With this proliferation, IBM has not only forfeited binary compatibility but has created a beast with a monstrous appetite. Incompatible operating systems and architectures require tremendous duplicate resources for hardware engineering, software development, manufacturing, product testing, customer service and support, sales and administration.

Sustaining these operating systems and architectures will be IBM's downfall in the 1990s unless the problem is quickly addressed. To use its resources most effectively and halt its declining worldwide market share, IBM must rationalize and consolidate its disparate operating systems and architectures.

Limits of SAA

Systems Application Architecture (SAA) was a step in the right direction. SAA provides common applications programming interfaces, as well as user interfaces and connectivity among many IBM systems. But SAA does not eliminate the need for IBM to enhance and maintain MVS, VM/370, OS/2 Extended Edition and OS/400; the non-SAA operating systems VSE/370, System/88 OS, System/88 Unix, System/36 SSP and DPPX; or the three versions of AIX that run on the Personal System/2, RISC System/6000 and System/370. Nor can SAA provide binary compatibility across the System/370 (9370/3090), Application System/400, RS/6000 and PS/2.

Admittedly, the source-code compatibility that SAA provides helps programmers develop common applications for the PS/2, AS/400 or 9370/3090. However, these applications represent a fraction of IBM's total market, given the largely nonoverlapping markets of the three families. SAA is an incremental application-layer solution, and fundamental systems-level surgery is required.

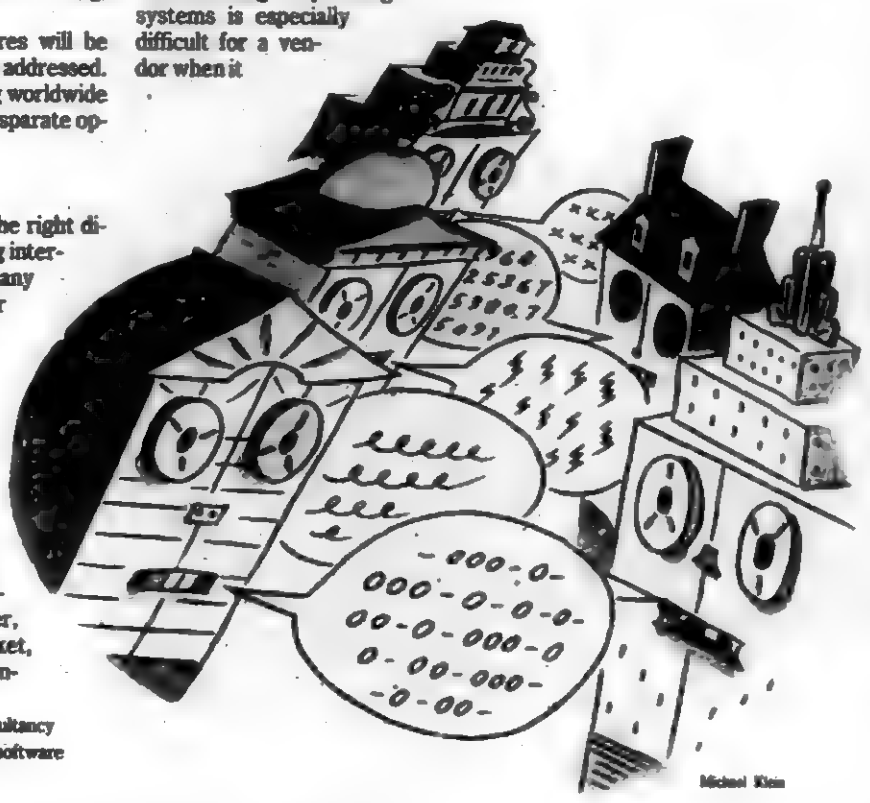
OS evolution

Operating systems, like people, look more similar with age. Given enough time, all operating systems support batch processing, timesharing and networking, offer facilities for backup, recovery and security and provide the availability and throughput needed for high-volume on-line transaction processing. IBM's VM/370, Digital Equipment Corp.'s VMS and Hewlett-Packard Co.'s MPE all currently offer similar functionality. If IBM's operating systems continue to evolve as they have for the last 10 years, by the year 2000 they will also be essentially equivalent — not compatible but with virtually identical feature sets.

That means duplicate effort. IBM, DEC and HP have separately announced that VM, VMS and MPE will be made Posix-compliant. Tactically, these moves are sound: They open the federal systems market, which requires Posix compliance, to these proprietary operating systems.

But as a result, IBM, DEC and HP each have *two* operating systems to adapt to Posix: each company's proprietary operating system and its Unix product. Posix compliance is not very demanding today, but it will become more so over time, increasing the duplicate effort required at each company.

Consolidating operating systems is especially difficult for a vendor when it



Michael Klein

Chisholm is president of John Chisholm Co. in Menlo Park, Calif., a consultancy that specializes in marketing strategy for computer manufacturers and software suppliers.

- **Loss of binary compatibility hurts everyone**
- **From laptops to mainframes, too many voices**
- **RISC System could be standard in 2000**

means moving from a proprietary operating system to Unix. Because customers using proprietary systems have higher barriers to switching vendors than those using Unix, systems with proprietary operating systems and large installed bases typically have higher margins than Unix systems.

For the vendor, the "locally optimal" strategy is to continue investing in the proprietary system. But proprietary customer pools eventually dry up as users develop new applications on open systems with superior price/performance. Usually, the pools dry up rather abruptly, as we saw with Wang Laboratories, Inc.'s VSOS and Data General Corp.'s AOS/VS and now with DEC's VMS.

To avoid local optimization, vendors have to suboptimize — accept lower returns — while operating systems and architectures are consolidated. When a well-executed consolidation is complete, returns will be higher than they would have been had the vendor continued on the locally optimal path. For example, despite HP's recent sluggish financial performance, its results are almost certainly stronger than they would have been if MPE and HP-UX had not been consolidated onto one architecture four years ago.

Goals for architecture

An architecture's purpose is to allow hardware implementations with favorable price/performance, scalability and reliability. Multiple architectures are costly and unnecessary for a vendor to be competitive in both commercial and technical computing, as DEC and Sun Microsystems, Inc. have shown. Multiple architectures increase the costs of hardware and software development, maintenance, support and manufacturing. They preclude economies of scale from common subsystems, memory, peripherals and system-level testing. For customers, they preclude binary compatibility. Customers enjoy binary compatibility within architectures — not across them.

In rediscovering the single hardware architecture, IBM can take a cue from Sun. Sun's Sparc embodies two elements appropriate for the 1990s: First, Sparc is a RISC architecture, with RISC's favorable price/performance, scalability and ease of implementation; second, Sparc is licensed to other vendors, allowing binary compatibility across multiple vendors' systems.

DEC and Apple Computer, Inc. have enjoyed the fruits of essentially single architectures for several years — VAX and Macintosh, respectively — but the market shares of both of these systems are now either flat or declining, in part because they lack these two elements that Sparc embodies.

Strategic planning

To determine how IBM should consolidate its operating systems and architectures, it is first necessary to decide where IBM should be in the long term — say, in the year 2000. It's easy to conclude that AIX (and possibly MVS) are the only current IBM operating systems on which the company should still be doing development in 2000. Demand for Unix will rise gradually, continuously and incessantly over the coming decade and beyond. AIX, if allowed to track Unix industry standards closely, should enjoy the same growth. MVS systems contribute heavily to IBM revenue and profit today and will continue to do so for many years, given the momentum created by their large applications base.

Nonetheless, demand for MVS systems will no doubt reach its peak and begin to decline within this coming decade, probably quite suddenly, just as we have seen for nearly every other proprietary system. Porting a proprietary operating system to RISC will extend the life of a proprietary operating system, as HP has demonstrated by porting MPE to its Precision Architecture. This is an option to be explored for MVS as well.

The RS/6000 is the IBM architecture with the most favorable price/performance, scalability and ease of implementation. Along these dimensions, the AS/400, PS/2 and 370 pale in comparison. Of the architectures IBM currently offers, the RS/6000, encompassing both single and multiple processors, is the one whose descendants are the best choice to underlie IBM's offerings in the coming century.

How to do it?

Now let's get down to the nitty-gritty: How specifically should IBM consolidate its many product lines to either AIX or MVS on RS/6000 platforms? Every system must have a migration path that meets three requirements.

First, the path must be easy to follow, or customers either will not move or will defect to competitors. Second, the path must be attractive, offering incentives such as improved performance, price/performance or functionality. Making the migrations easy and attractive will be costly for IBM, but the cost has a finite life — not quite a one-shot expense, but more like a half-decade expense — unlike the cost of maintaining multiple operating systems and platforms, which goes on indefinitely.

Third, because many customers will not need or choose to migrate right away, existing systems must be enhanced for several years after migration paths are available. This means that IBM should begin offering and refining migration paths to customers sooner rather than later.

A migration path can consolidate architectures, operating systems or both. *Architectures* are consolidated by moving an *operating system* to a new architecture

Continued on page 100

Getting it together: Architectures

Moving operating systems to consolidate architectures *can* be done. Two examples show how operating systems can be moved, even if — like MVS — they were *not* designed to be portable.

Hewlett-Packard — Four years ago, Hewlett-Packard Co. moved Multiprogramming Executive (MPE), which was formerly only available on the 16-bit complex instruction set computing (CISC) HP 3000 platform, to HP's 32-bit Precision Architecture Reduced Instruction Set Computing (PA-RISC) system. This event was a major industry milestone. To this day, MPE is still the only proprietary operating system with any significant installed base (45,000 units) that has been ported to RISC.

Today, the MPE-based HP 3000 and the HP-UX-based HP 9000 use identical PA-RISC platforms except for machine identification chips and I/O cards. HP enjoys tremendous economies between the two families in hardware engineering, manufacturing and software development. HP-UX and MPE are source code-compatible for C, Fortran and Pascal.

Migration of MPE users from CISC to RISC is facilitated by three factors: implementation of a 32-bit version of MPE on PA-RISC, availability of a 16-bit version of MPE through emulation of the 16-bit CISC instruction set on PA-RISC and application source-code compatibility between native and emulation modes.

Together, these three features allow existing CISC MPE applications to run on the RISC platform without recompiling. They also allow applications to be recompiled and run in native mode with few or no modifications when required for higher performance.

CISC and RISC systems also share common network services and may coexist on the same network. The migration and consolidation have been very successful. The original CISC platform for the HP 3000 has now been phased out except for the low-end HP Micro 3000 family. Eventually, even the low end will move to RISC.

Of course, sustaining HP-UX and MPE, both 16- and 32-bit versions, is not as efficient as sustaining only a single Unix variant. Before the year 2000, HP will no doubt offer a migration path from MPE to HP-UX. In the meantime, HP is differentiating the two operating systems by positioning MPE for on-line transaction processing (OLTP). Over the next few years, this distinction will also fall by the wayside as Unix gains the ability to handle OLTP as effectively as any proprietary operating system.

IBM — On a smaller scale, two years ago IBM ported the 8100 Distributed Processing Programming Executive (DPPX) operating system to the 9370. This was beneficial for both 8100 customers and IBM.

Customers now enjoy a growth path with much more performance and many more configuration options; IBM now has to enhance, maintain and manufacture one fewer hardware architecture. Of course, a better target DPPX platform than the IBM 9370 would have been the RS/6000, but in 1986 when this project began, the RS/6000 was not available.

JOHN CHISHOLM

Getting it together: Operating systems

Both IBM and Microsoft Corp. recently have shown that it's possible to consolidate operating systems and live to tell about it.

IBM — IBM developed OS/400 on the Application System/400 to serve as a migration path for both System/36 and System/38 users. OS/400 is a superset of the System/38's operating system, CPF, so the AS/400 is able to run most System/38 application binaries as is. Today, the AS/400 has effectively replaced the System/38.

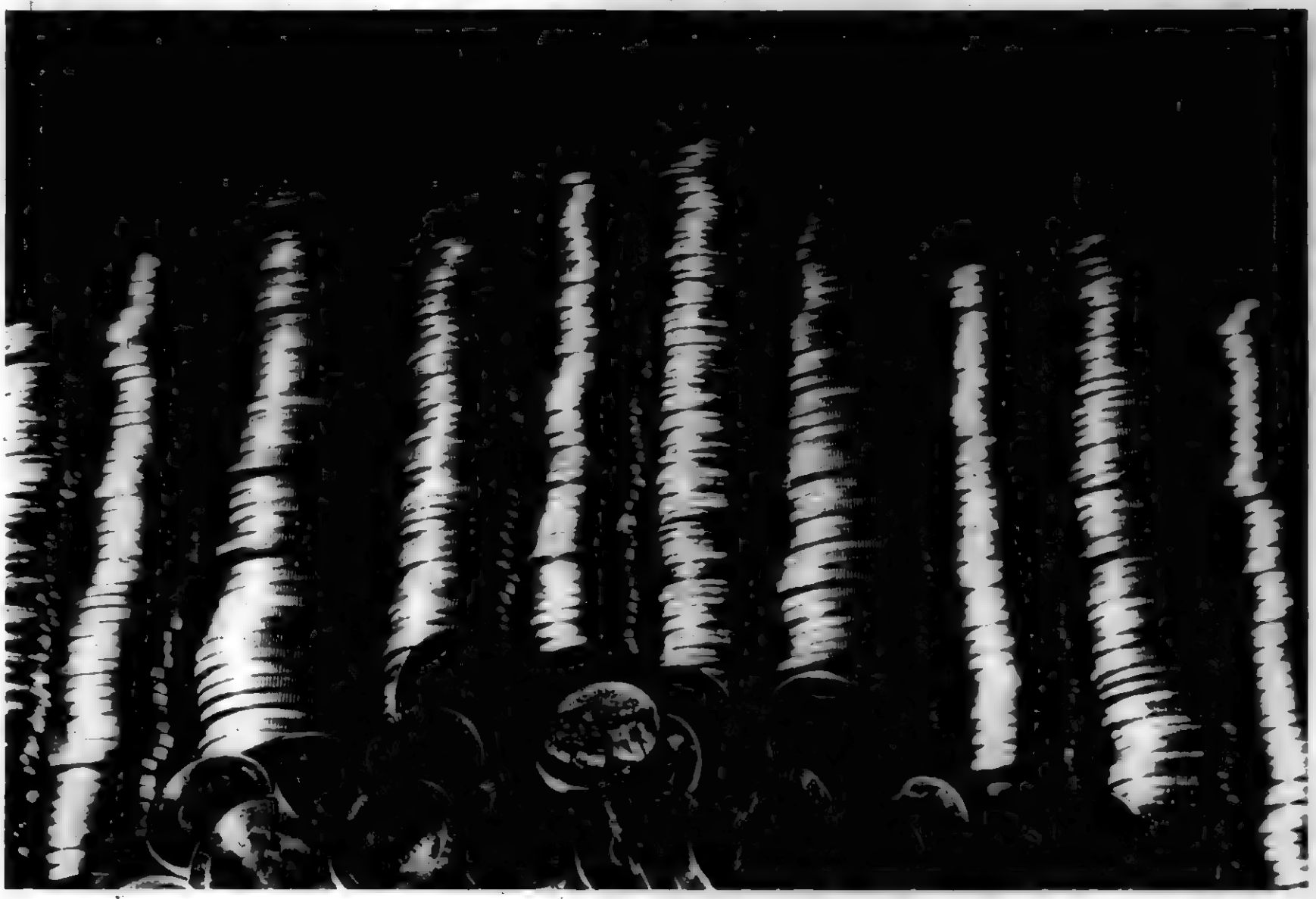
The path for the System/36 is not as smooth. OS/400 is substantially different from the System/36's operating system, SSP. IBM provides a System/36 emulation mode on the AS/400, allowing System/36 binaries to run without recompiling, but performance is slow. Many users have no choice but to rewrite applications for native mode — a major conversion effort — for better performance.

As a result of the difficult conversion and higher prices of AS/400s, only a small fraction of the 250,000 System/36s worldwide have upgraded to AS/400s. This is expensive for IBM both tactically and strategically: The company risks System/36 customers switching to low-cost, Unix-based multiuser microcomputers and bears the ongoing expense of supporting SSP and manufacturing the System/36.

IBM's response to these concerns is right on target; the company says it will improve the performance of the AS/400s System/36 emulation mode and will introduce lower cost AS/400 models.

Microsoft — Microsoft has announced plans to make Windows Version 3.0 and OS/2 Version 2.0 (or later) binary-compatible — a brilliant move. Microsoft's purpose is *not* to consolidate the two operating systems — Windows and OS/2 will coexist for a long time — but to facilitate market acceptance of OS/2, which has been slow. This represents a perfect example of a company exploiting its existing strengths (the Windows applications base) in order to build a new business (OS/2). In effect, Windows 3.0 becomes an entry-level version of OS/2.

JOHN CHISHOLM



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and phasing out the old one. An *operating system* is "moved" by either porting it as is or reimplementing it to exploit features of the new architecture. Optionally, the new architecture may emulate the old, allowing binaries of the old architecture and operating system to run on the new architecture without recompiling. Operating systems are consolidated by moving *applications* to a new operating system and phasing out the old one. Operating system consolidation requires either recompiling applications, modifying source code and then recompiling, or neither of the above if the architectures are the same.

The type of migration path chosen for each system depends on strategic and technical considerations. Moving an operating system to a new architecture will make migration easier for the customer than forcing him to convert applications to a new operating system. This may be the better approach if the operating system customer base is large, still growing and strategic; or if the operating system customer base is stable and the operating system is stable, requires no further development and porting it is straightforward. However, if applications can be easily converted, that may be the better approach.

A scenario for IBM

All of these methods have been widely used in the industry (see story page 98).

IBM could follow many consolidation strategies for its four architectures and six major operating systems. Detailed technical assessments will influence the final decision. Nonetheless, one hypothetical, aggressive scenario could do the job (see story page 101).

At a minimum, a strategy must cut through the tactical jockeying among product groups, such as "protecting" the AS/400 from the RS/6000 or vice versa. This scenario shows only the migration of operating systems and platforms, not the broadening of the RISC family to include supermini- and mainframe-class systems, which presumably would take place concurrently.

Imagine the power of IBM building, supporting and selling a single binary-compatible line, from laptops to mainframes, based on successors to AIX and the RS/6000. The company would be a juggernaut that would make both Thomas J. Watsons proud. However, if it is not done very soon, consolidation will be useless. Who would suggest porting Wang's VSOS or Data General's AOS/VS to RISC today?

A final vision

By the year 2000, an industry-wide shakeout will be well under way on binary compatibility. There will probably be room for no more than three or four binary standards. One will no doubt be successors to the Intel Corp. 80X86 chip family. Another will probably be successors to Sparc, which is off to a strong start in executing its multivendor compatibility strategy. A third candidate is Mips Computer Systems, Inc., if Mips can get its many licensees (i.e., Pyramid, DEC, Silicon Graphics) to agree on a single binary-compatible standard. A fourth candidate is IBM's RISC System.

Beyond consolidating its own product lines onto the RISC System, IBM can do two things to help establish the RISC System as a standard. First, IBM should offer the RISC System architecture for licensing, as HP has licensed its Precision Architecture to Hitachi and Samsung, so that binary-compatible RISC Systems are possible from multiple vendors.

Second, IBM should make AIX compatible with AT&T's Unix System V, Release 4 and OSF/1. System V, Release 4 already has too much momentum for any vendor who aspires to be a Unix leader to ignore.

IBM may feel that these two moves are unnecessary and that its backing alone should be sufficient to ensure widespread market acceptance of RISC. That would be risky thinking and pointless: In this, the open systems decade, no single vendor need go it alone. RISC has the potential to provide an *industry-wide* binary standard. There will be no other kind in the year 2000. ●

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A modest proposal

Nine steps to a streamlined IBM

There are many ways for IBM to consolidate its four architectures and six major operating systems. This scenario shows only the migration of operating systems and platforms, not the broadening of the RISC system family to include supermini and mainframe systems, which would presumably take place concurrently.

Step 1 — *Offer OS/2 on the RISC System/6000 as well as on the Personal System/2.* Consolidating PS/2 and RS/6000 is not an objective: Intel Corp. microprocessor-based PS/2s will long survive to run MS-DOS. But Microsoft Corp. has announced plans to move OS/2 to RISC platforms, so OS/2 on RS/6000s seems likely early on (although the first platform may well be the Intel I860 rather than the RS/6000). **1992**

Step 2 — *Move OS/400 to RS/6000; phase out System/36 platforms.* OS/400 includes some unique features, such as its built-in relational database. It will be hard to migrate these applications to a new operating system, so we have moved OS/400 intact to the RS/6000 as an interim step. Software emulation of the Application System/400 will be required to facilitate migration. This would allow RS/6000 systems to replace System/36s, System/38s and AS/400s. **1992**

Step 3 — *Migrate VSE applications to AIX; phase out VSE.* **1993**

Step 4 — *Make AIX binary-compatible with OS/2 on the RS/6000.* **1994**

Step 5 — *Migrate VM applications to AIX; phase out VSE.* **1994**

Step 6 — *Migrate OS/400 applications to AIX; phase out VM.* The applications of three IBM operating systems are migrated to AIX, with those of the least strategic operating system, VSE, migrating first. Systems Application Architecture-AIX commonality will facilitate migration of VM and OS/400 applications to AIX.

Making AIX binary-compatible with OS/2 would bring the then large base of OS/2 and X Window System productivity applications (e.g., spreadsheets, word processing, graphics) to AIX on the RS/6000. **1995**

Step 7 — *Move MVS to RS/6000; offer choice of System/370 or RS/6000 platforms for MVS.* The guts of this or any other scenario is moving MVS to the RS/6000 architecture — a Herculean investment and effort. Any of the several possible approaches would depend on recent and forthcoming advances in computer-aided software engineering and design automation to be practicable.

First, the architecture could be pure RS/6000, a superset of RS/6000 or a custom architecture using RISC techniques. Second, MVS could be ported as is or reimplemented to exploit the RS/6000 architecture. Reimplementing, an even larger job than porting, has the potential to bring advanced new functionality to MVS. Third, System/370 emulation mode could be done purely in software or with the aid of hardware assists. **1996**

Step 8 — *Phase out System/370 architecture platforms.* **2000**

Step 9 — *Migrate MVS applications to AIX; phase out new sales of MVS.* Eventually, follow-ons to RS/6000 systems will surpass follow-ons to System/370s in every aspect: millions of instructions per second, I/O throughput, price/performance, expandability, reliability and availability. As this happens, demand for MVS will naturally shift away from System/370s to RS/6000 systems. And finally, to avoid having to duplicate development between MVS and AIX, IBM will offer an MVS migration path to AIX. **2005**

JOHN CHISHOLM

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Defense

Zenith Data Systems gained an unexpected ally recently in its defense against patent infringement charges brought by **Texas Instruments, Inc.**: California inventor Gilbert Hyatt, who was awarded a patent on the microprocessor said to have spurred the rise of the microcomputer. Hyatt's patent attorney said his client will show the court that his own work predates the patents that TI said Zenith infringed on.

■

Default

Tinton Falls, N.J.-based real-time computer maker **Concurrent Computer Corp.** announced last week that it was unable to meet the September interest and principal payments on its senior bank debt. According to recently appointed Chief Executive Officer Denis Brown, the company, bank and shareholders agree that corporate and capital changes are called for. The question that remains to be answered is whether the firm's financiers will agree to give Concurrent the breathing space to finish drafting and begin implementing a new business plan.

More briefs on page 107

Sequoia rebounds with a vengeance

CEO Fusco has brought vendor back from death's door with 56% rise in revenue

BY MARYFRAN JOHNSON
CW STAFF

In an industry where one failure can be fatal, Marlboro, Mass.-based Sequoia Systems, Inc. has returned from the grave's edge with something akin to a healthy glow.

Strutting out revenue for fiscal 1990 that soared 56% over the previous year's to $48.6 million, the Unix-based fault-tolerant computer vendor has fortified itself this past year with big-name business alliances with Hewlett-Packard Co., Samsung Electronics Co. Ltd. and Raytheon Corp.

"The only thing we have to fear is shooting ourselves in the foot," said Gabriel Fusco, the beefy, gravelly-voiced chairman and chief executive officer who pulled Sequoia back from the brink three years ago.

Sequoia has doubled its manufacturing capacity, raised $20 million in cash, moved to new headquarters to accommodate a work force of some 250 employees and successfully ushered out its Series 300 systems — six weeks ahead of schedule.

Seth Resnick

Sequoia's Fusco *hung on to the faltering firm, dragged it back into the fray*

Fortune 500 league?

A slew of new software announcements, which the firm is poised to make within a few months, will ratchet up its potential to win Fortune 500 accounts, company officials claimed.

"Clearly, Sequoia went from living to zombie to living again, and very few companies have done that," said Peter Kastner, an analyst at Aberdeen Group in Boston. "But Sequoia is leaping for the brass ring from on top of a house of cards."

Kastner was referring to the fact that much of Sequoia's recent success is tied to OEM relationships with 10% stakeholder HP, which has exclusive rights to sell Sequoia boxes in the telecommunications marketplace, and The Ultimate Corp., which has a lock on selling Sequoia systems in the Pick commercial marketplace. Yet another OEM relationship with Samsung gives that company exclusive rights to sell Sequoia systems in South Korea.

Fusco argued that these business partnerships give Sequoia the kind of international reach and marketing cachet it could never attain on its own.

The alliance with HP gave Sequoia access to HP's highly regarded reduced instruction set computing technology and brought in a much needed capital infusion of $5.8 million — HP's purchase price for 10% of the company. Part of the deal also required HP to buy 22 systems for resale under its own label; HP has more than doubled that commitment already, Fusco said.

"I would characterise our relationship [with HP] as a marriage, whereas OEM relationships are only affairs," he said. "What we have is an eight-year partnership with a lot of room for innovation."

The OEM relationship with Samsung is also enhanced by the two companies' plan to build the Series 40, a kind of little-brother machine to Sequoia's main line.

"If they're able to pull off a coup with Samsung and produce a system that retails for under $100,000 and supports 100 or more users, it could be a significant challenge to a lot of other vendors in the industry," observed Robert Kidd, an analyst at Dataquest, Inc. in San Jose, Calif.

"Sequoia's lifeline today is attached to other vendors, although looking at

Continued on page 110

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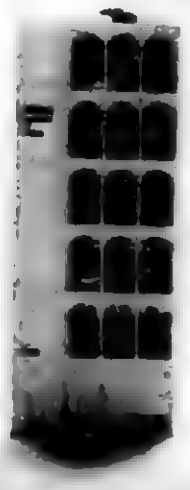

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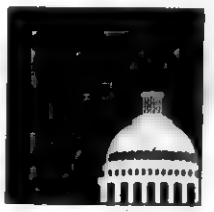
Software developers climb onto assessment bandwagon

BY GARY H. ANTHES
CW STAFF

PITTSBURGH — The Software Engineering Institute (SEI) at Carnegie Mellon University is about to certify nine companies to administer its software development assessment method. Officials at SEI and the companies said the assessments are increasingly in demand and are viewed by the companies as a competitive advantage, particularly when bidding on federal government jobs.

The companies to be licensed are American Management Systems, Inc., Arthur D. Little, Inc., Booz, Allen & Hamilton, Inc., Contel Corp., Dayton Aerospace Associates, Inc., Digital Equipment Corp., Pragma Systems Corp. and Technology Applications, Inc. Also on the list is the Software Productivity Consortium (SPC), an organization to which a blue-ribbon list of technology firms contributes talent. Teams at the firms will be trained to conduct formal assessments of the software practices of client companies and will be licensed to issue ratings according to a process-maturity scale developed by the SEI.

While it has conducted some assessments itself, the SEI lacks the staff to handle the burgeoning requests now coming in at the rate of two to three per week, said Betty Deimel, a staff member of SEI's Technology Transition Program. Teams from the nine companies will be ready to offer assessment services by the end of the year, she said.



The SEI is funded by the U.S. Department of Defense (DOD). The assessment program was established as a way to transfer software engineering technology developed under DOD sponsorship to the U.S. defense industry. However, Deimel and others said the increasing complexity of systems and the skyrocketing cost of software development are spurring interest in assessment methodologies among nondefense companies as well.

The SEI method is centered around a five-day site visit during which vendor/client teams assess the software practices of the client through a series of structured discussions. At the conclusion of the assessment, an overall process-maturity rating is assigned, and recommendations for improvements are detailed (see story below). Depending on contractual agreements, the licensed vendor may or may not assist in implementing the improvements, Deimel said.

The intent is to assess the organiza-

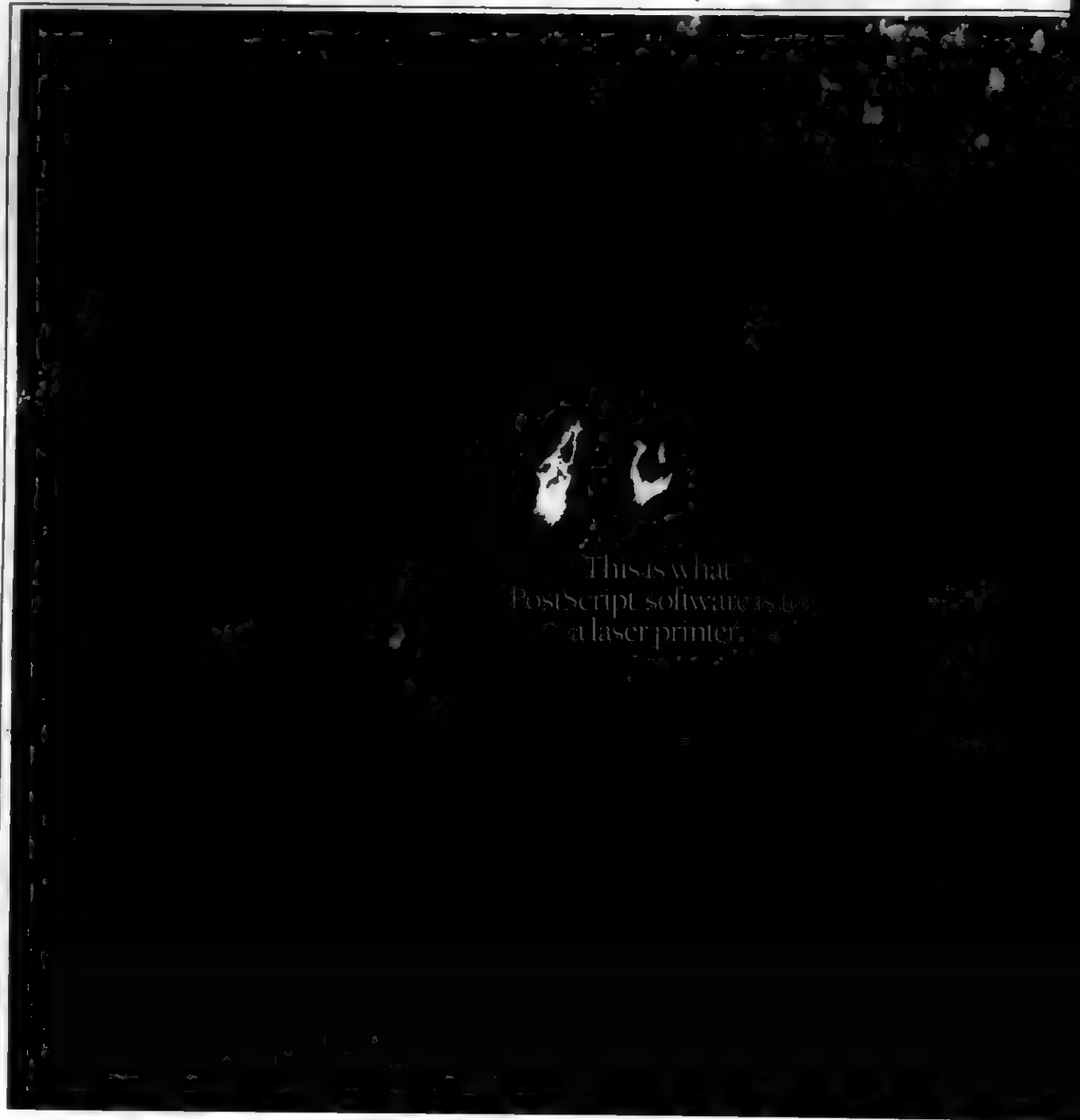
Rating maturity

The SEI's Software Process Assessment method assigns one of five maturity levels to software developers:

- **Level 1** — Initial process. The process is ad hoc, sometimes chaotic. There is no management mechanism to ensure that formalized procedures and project plans are used. In a crisis, controls are abandoned and people just work harder at coding and testing. There is little senior management involvement.
- **Level 2** — Repeatable process. Through experience, the organization has mastered projects of particular types but stumbles on new challenges. New technologies may do more harm than good by upsetting the base of experience on which past successes have been built. Growth is slow and painful, and organizational changes can be highly disruptive.
- **Level 3** — Defined process. The organization has established a group to focus exclusively on improving the software development process. An array of development tools and methods is in place, but there is no way to quantitatively measure the effectiveness of each step in the development process.
- **Level 4** — Managed process. Methods are in place to measure the cost and quality, or benefit, of each activity. For example, what is the cost and benefit of error detection and correction? The data is costly to gather and maintain.
- **Level 5** — Automated gathering of process-measurement data. The data is used to prevent problems and improve efficiency.

Of 113 project assessments conducted or observed by the SEI so far, 85% fell into level 1, 14% were at level 2, 1% were at level 3, and none were at levels 4 or 5.

GARY ANTHES



tion's practices as a whole, not to critique particular projects, Deimel said. However, she added, several projects are normally examined during the assessment.

Greg Friedman, a spokesman at Herndon, Va.-based SPC, which is sponsored by 14 aerospace and defense firms, said the SPC will have four trained teams, each expected to be employed full-time doing assessments. He said a typical engagement should cost the client less than $75,000.

According to Friedman, some SPC member companies have asked for assessments themselves, and all hope to benefit from the program by learning more about software engineering practices in the industry.

Federal agencies are encouraging bidders to go through some kind of standardized assessment, Friedman said, and some agencies have conducted vendor assessments themselves as part of the proposal-evaluation process.

Friedman added that some agencies may also favor companies having a high rating, although the emphasis should be placed on the firm's ongoing program to improve its software engineering practices.

Publicizing results

Results of the assessments remain confidential, but Deimel acknowledged that some companies seeking a competitive advantage may publish the results.

"I'd say that if you have level 3 practices in place, you'd want to publicize that," Deimel said. However, of the 113 project assessments conducted or observed by SEI so far, 99% of them fell into level 1 or level 2, she said (see story page 106).

"We see a market to design, tailor, install and support software processes for clients," said Judah Mogilensky, director of technology marketing at Contel. "A software process assessment . . . would be a first step in identifying a client's process needs."

Ron Willis, chief scientist for software engineering technology at Hughes Aircraft Co., said Hughes was so happy with the results of its 1987 SEI-assisted assessment that it went through a reassessment this year. In the first round, it was noted that Hughes collected process data on a project-by-project basis but did not have a way to integrate the data from multiple projects. The company earned a "strong level 2," Willis said.

By the time the reassessment occurred, Hughes had put in place an automated system for capturing and maintaining the process data, allowing cross-project performance comparisons and statistical analyses for the organization as a whole. A "high level 3" was earned this time in a process that Willis said cost Hughes $45,000 in internal labor and other expenses.

"I'm really sold on it because it's mobilizing the U.S. to improve," Willis said. "The process-maturity concept and the pressure by [DOD] to use process maturity are mobilizing us."

NATIONAL BRIEFS

Where's Bob?

Somebody check the betting pool. Almost three months to the day since announcing that he was leaving **3Com Corp.**, the company he founded, Bob Metcalfe is back in the biz. A recurring question in networking circles since he left has been when the agitator/inventor would re-enter computing. Last week, **IBM** said that Metcalfe would advise it on its quest to build standards-based advanced applications system software.

■

Index down

Tighter margins and lower expectations dogged an upper-CASE market player last week as Cambridge, Mass.-based **Index Technology Corp.** said it expects to report an approximately $500,000 loss for the quarter ended Sept. 30. Index Chief Executive Officer Richard Carpenter laid the impending loss at the door of the high cost of aggressive product development: Two new products recently came out the door, and two more products are coming soon. Revenue for the company, he said, should be up about 15% over revenue reported for last year's fall quarter.

■

Full Cleveland

High-tech public relations firm **Winston and Winston** may have traded in its Texas home base, but it still knows how to take the bull by the horns. Native Buckeye Staters Martin and Judith Winston have pledged a year's worth of self-funding to a campaign to persuade technology companies to follow their example and relocate to Cleveland. The Winstons insisted that their move was impelled by business logistics, not nostalgia; Cleveland's kit of advantages for tech firms, they said, includes a wealth of available commercial support services and tax authorities who share their zeal for luring companies to the region.

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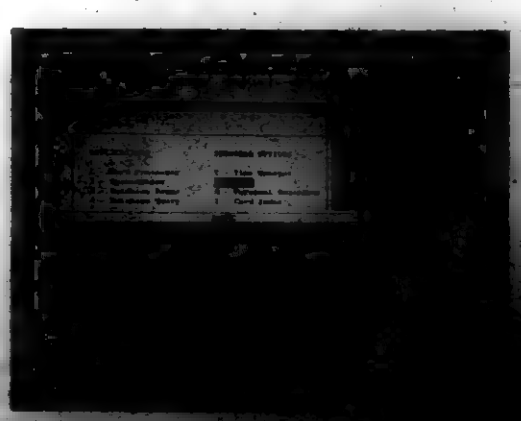

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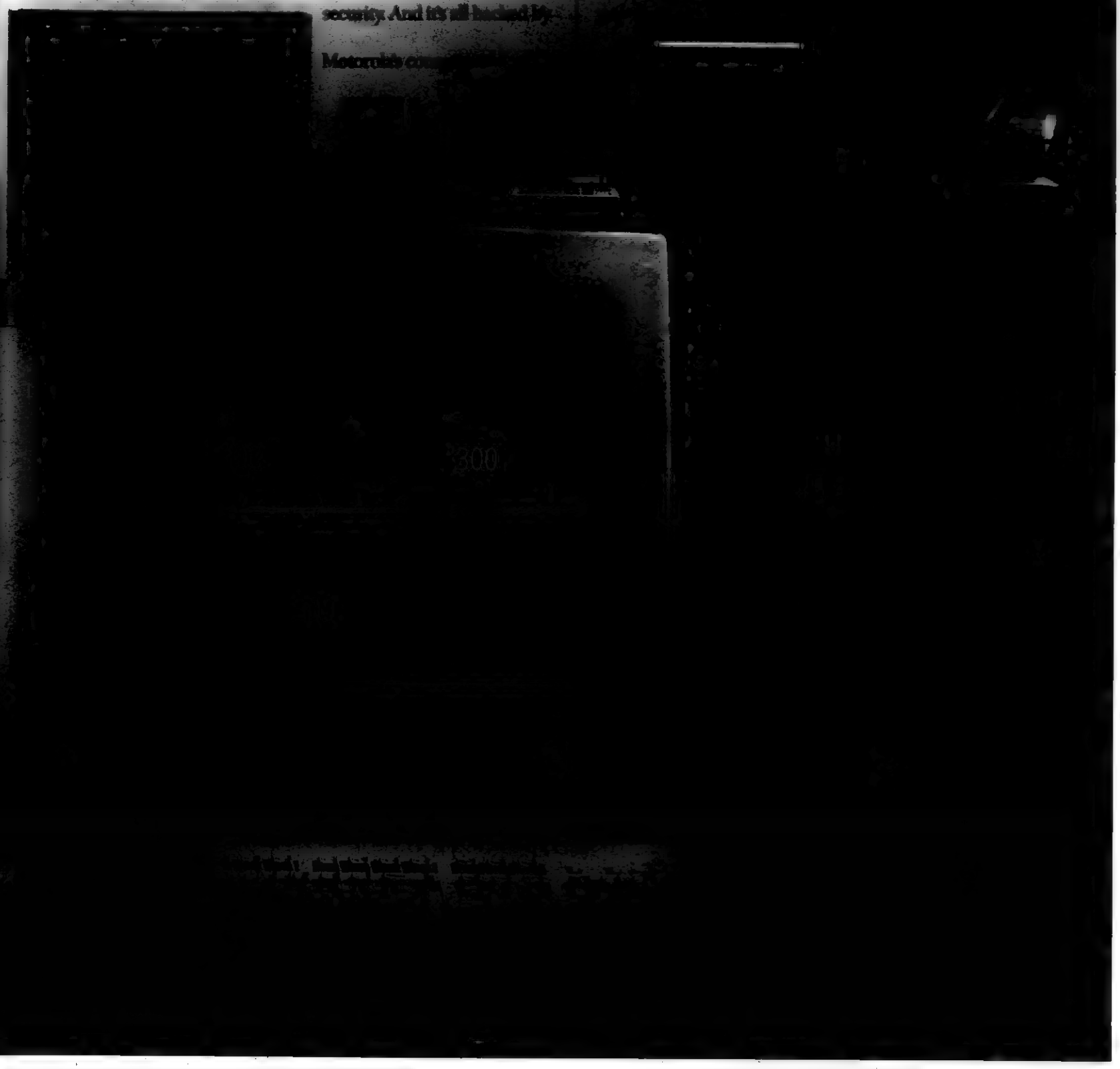

MOTOROLA
Computer Group

Sequoia

CONTINUED FROM PAGE 105

any small company today, that's hardly a unique situation," added John Dunkle, an analyst at Workgroup Technologies in Hampton, N.H. "What Sequoia is doing is using those current agreements to leverage additional sales, then taking those earnings and reinvesting in the business to develop their own products."

Analysts tend to give the lion's share of Sequoia's comeback credit to Fusco. The 26-year IBM veteran spent four years managing Iomega Corp., which makes data storage devices, before joining the fault-tolerant computer vendor in 1987.

As a start-up in 1981, Sequoia staked a claim in what was then a backwater niche of Unix-based fault-tolerant systems. Its first beta-test shipment was in 1984, but software problems bogged down commercial shipments for three years.

When Fusco arrived at the moribund Sequoia, the company was out of cash, unable to get its Series 200 systems out the door and paring its work force down to a historic low of 53 employees.

"A lot of small companies talk about [doing] what he managed to do," Kidd said. "And that's getting decent financing and lining up people to give them clout and distribution channels and a hell of a lot of credibility."

Fusco volleys that credit right back to his own management team and employees. "I benefitted from all those years of effort and an awful lot of money spent on designing our basic architecture," he insisted. "I got to build the company rather than shrink it."

New contestants

These days, Sequoia's niche is a bustling place with new Unix competition from Tandem Computers, Inc. and Stratus Computer, Inc., the two biggest names in fault-tolerant computers. "The big vendors are going after OLTP, and general competition is high," Kidd noted. "Does any small company, fault-tolerant or not, have the staying power to hold out? That's the real question."

Despite showy growth over the past year, Wall Street continues to cast a cold eye on Sequoia. Its stock price recently hit 6⅛ points, the lowest price since the company went public last March.

Still, there are signs of a thaw. Thomas Rooney, an industry analyst at Donaldson, Lufkin and Jenrette, initiated coverage of Sequoia last July with the observation that its stock was undervalued. Rooney noted how growth in Sequoia's target on-line transaction processing (OLTP) markets — financial services, telecommunications, manufacturing/distribution and federal government contracts — is anticipated to run "in excess of 40% over the next three years."

Sequoia is also keeping one foot in the still lucrative defense market. Raytheon Corp. is using Sequoia's multiprocessor and fault-tolerant technology to develop space-borne applications. The revenue potential there, Fusco said, will come in royalties and cross-licensing agreements.

"We've been through the time when we had to convince people it was worth the risk to buy us," he said. "We can't forget what we've been and where we want to go."

That is the kind of attitude some analysts believe may leave Sequoia standing among the survivors on the OLTP battlefield of the 1990s.

"I would bet that Sequoia will be successful because they know who they are," Dunkle said. "They're reinvesting in their own technology, and they haven't burned any of their past customers. That shows their dedication to the market long term."

Back on the competitive cutting edge

Sequoia builds multiprocessor, crash-proof computers running either its own version of the Unix operating system or Pick, an industry-standard operating system with thousands of commercial applications and 2.5 million devotees.

Sequoia machines range in price from $480,000 to $3 million and are optimized for high-performance on-line transaction processing.

However, since its prices run 25% to 30% higher than those of competing Unix vendors, Sequoia faces tough price/performance competition from parallel computing vendors such as Sequent Computer Systems, Inc. and Pyramid Technology Corp.

The average Sequoia sale runs about $750,000, and the machine is often used in environments with enormous databases, sprawling terminal networks and high transaction volumes.

Contractors Grumman Corp. and Raytheon Corp. bought Sequoia systems to relay missile tracking information and interpret surveillance data. GTE Hawaiian Telephone uses a Sequoia system for network management and support, and Bell Atlantic Co. uses one to deliver call-forwarding services.

MARYFRAN JOHNSON

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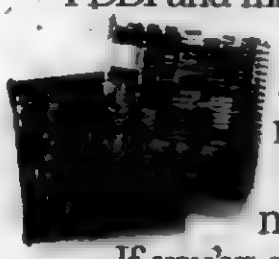

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COMMENTARY

Jim Nash

Earthquakes, user stakes

In relation to the number of square miles affected by an earthquake, the epicenter is very small — just two opposing pieces of rock grating together till one gives way.

So it is in the business world and, in particular, the world of LANs. There, the long-silent rift between Microsoft and Novell is widening, causing rumblings that could, and maybe should, prove disconcerting to users waiting to enjoy Novell/Microsoft intermanageability.

At the center of the tension is a single and relatively minor point of contention. It appears that a contract dispute worth $500,000 is all that keeps the two networking firms from cooperating with each other long enough to make their operating systems intermanageable. Intermanageability would greatly simplify the task of running multivendor networks.

Of course, more than petty accounting points are aggravating the situation, but Novell CEO Ray Noorda said he could work closely with Microsoft if only the dispute were settled. Microsoft refused to comment on the matter at all.

At issue is money that Provo, Utah-based Novell claims is owed it by Microsoft for work done by Novell's most recent acquisition, Excelan.

Back in 1988, Excelan — not yet within the Novell fold — was writing TCP/IP for Microsoft's LAN Manager network operating system. As part of that contract, Excelan had to license certain Microsoft code rights. According to Excelan's former president, Kanwal Rekhi, Excelan had paid $500,000 — of a total of $2 million — to Microsoft for royalties and code rights by the time the Novell acquisition made the Microsoft/Excelan project moot.

Rekhi, who is now executive vice-president of product development at Novell, said that Microsoft was enraged after hear that Novell was going to merge with Excelan in 1989. He said that despite a trek he and Noorda made to Microsoft's corporate headquarters in Redmond, Wash., to unruffle feathers, Microsoft took back its equipment and code before the merger was signed.

"Now they refuse to refund our money," Rekhi said. "When we went up there, we were ready to provide interoperability between Netware and LAN Manager and help market the solution, but they were adamant about not helping us at all."

I'm not talking deprivation on either side of the spat, however. Novell's net revenue reached $422 million last fiscal year. And reports are that Microsoft CEO Bill Gates recently bought a Porache worth an estimated $600,000.

Is anyone, in fact, doing without? Yes — the users, for whom interoperability is still in the promise stage.

These firms have it in their power to resolve their differences quickly and get on with their efforts to move the networking industry forward through interoperation. The earthquake released by allowing up to 85% of the market to manage their systems without a hitch would be far-reaching, all right. It's hard to believe, however, that it would be seen as a disaster by the hordes of IS managers suddenly riding herd over a less redundant, less chaotic environment.

Nash is a *Computerworld* West Coast bureau correspondent.

INTERNATIONAL

BRIEFS

China beachhead

Hewlett-Packard Co. and China's **Ministry of Machinery and Electronics Industry** have teamed up in what is said to be the first China-based joint venture aimed at manufacturing workstations. Called **Huapu Information Technology Co.**, the Shanghai-based co-venture company — HP's second on Chinese soil — will assemble and deliver to the Chinese domestic market the latest in HP workstations: the HP Apollo 9000 series.

■

Picking up the pace

Japan-based **Kubota Corp.**'s Santa Clara, Calif.-based subsidiary, **Kubota Pacific Computer, Inc.** (KPC), went into full gear late last month, manufacturing graphics supercomputer products for Kubota partner **Stardent Computer, Inc.** The new 55,000-sq-ft plant has picked up some 90 former Stardent employees and development of several product lines whose continuation was otherwise questionable because of Stardent's summer decision to centralize its formerly bicoastal headquarters in Newton, Mass. Not only is KPC up and running, it is also hiring: The firm said that it expects to add 50 to 100 engineers and manufacturing personnel by year's end.

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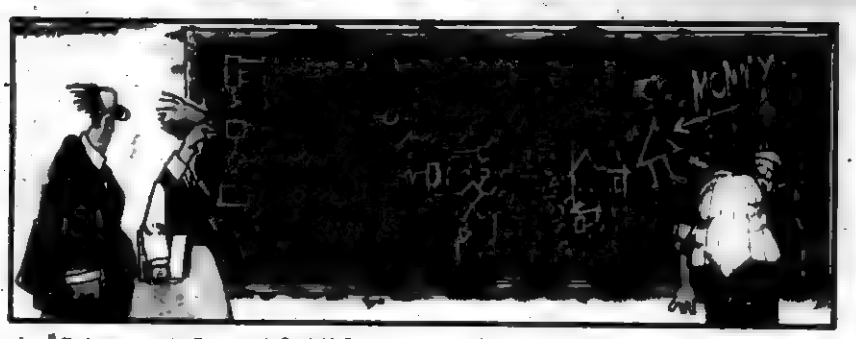

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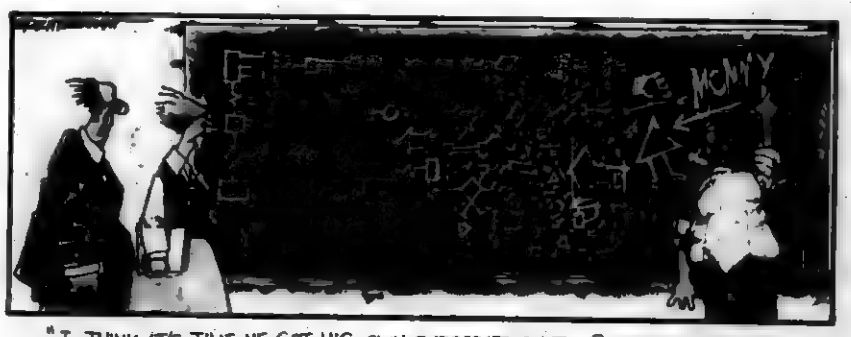

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Lowdown on making consultant grade

BY JANET RUHL
SPECIAL TO CW

It's not easy for an outsider to walk into a company, build instant trust and tell managers why they're doing something wrong and how they can fix it. There's no denying it, though: Consultants provide an evaluative eye that in-house staff simply can't match. But just what does it take to make it as a consultant these days?

A group of consultants who have practiced for at least 10 years offer some answers. Most of them, who now handle everything from management consulting to writing and supporting vertical applications packages, began their consulting careers as contract programmers. Their first contracts were usually with companies at which they'd previously worked as employees. Innocent and convenient as it sounds, this is the first consulting pitfall. Often, the consultants agreed, they relied too heavily on their first client.

Jeffrey Sachs, president of Alembic Computer Services, Inc. in Mesa, Ariz., indicates that it was scary to be dependent on one customer when he first began to consult. "After the first year, I promised myself I would never, ever find myself with all my eggs in one basket," Sachs says. Sachs, who has been consulting for 11 years, has kept his resolution: His firm supports 75 active accounts.

Few of the consultants still work in the same hardware and software environments they mastered as employees, but several of them continue to concentrate on application areas that they had learned on the job. Bob Upham, president of Kendall Holt, Inc. in New York, supports this idea. While the technical skills he brought with him were important in getting started, he now relies extensively on the skills in business analysis, project management, project life-cycle methodology and personnel management that he learned as an employee prior to consulting.

Like most of the consultants interviewed, Upham says that his biggest surprise about consulting is "the amount of work involved in maintaining the business." Successful consulting, he says, requires a lot of interaction with accountants, lawyers and bankers, as well as constant networking with other business people.

As their businesses have grown, many consultants have moved from selling their own services to managing the work of employees. After 13 years, Sachs says, he began to burn out on technical work. As a solution, he says, he "started hiring kids who were thrilled with the challenge of writing a program." This allowed him to concentrate on analysis and design, dealing with clients and monitoring the financial state of his firm.

Satis-factors

The consultants who seem to be the most satisfied with their careers are those who have either followed a pattern similar to what Sachs describes or devoted some of their energies to developing and marketing software as well as services.

Y. Alan Griver, a partner in Flash Creative Management, Inc. in Teaneck, N.J., says that while he loves the consulting side of his business, he realized that "having a somewhat static part of the business bringing in cash can help ease the pressure on the consulting side." Griver says that the money software products bring in makes it possible for him to pick and choose the interesting consulting jobs.

For those who have not diversified their consulting practices, burnout becomes a very real threat. Eric Poole, who for the last 12 years has run RKT Technologies, Inc. in Windham, N.H., observes that "there aren't many people who make it past a decade."

A major source of frustration for a consultant is the need to keep up with ever-changing technologies. Stephen Kent, a partner at Mid-Michigan Computer Consultants, Inc. in Bay City, Mich., sums up the prevalent attitude: "I hate having to learn something new every week, but I do it anyway." Over the course of his 11 years as a consultant, Kent has at different times concentrated on Honeywell, Inc. systems and developing software for Datapoint Corp. systems. Now, as an IBM business partner, he works mainly on IBM midrange systems and personal computer software.

Even those who have been successful building consulting careers around specialized niches must keep an eye on emerging and competing technologies. Austin, Texas-based database consultant Jim Hoffman, who has worked with SAS Institute, Inc.'s System 2000 databases for the past 12 years, has taken care to cross-train on two other database products: Computer Corporation of America's Model 204 and Oracle Systems Corp.'s Oracle.

Consultants must remain flexible and show a willingness to play many roles in response to changing client needs. Jeff Jacobs, president of Consart Systems, Inc. in Manhattan Beach, Calif., and an independent consultant for 17 years, reports that within a short period of time, he found himself doing hands-on programming in LISP as well as planning enterprisewide deployment of systems for a major oil company.

Marketing value

All of the consultants agree that the need to market themselves to clients never goes away. John Thompson, president of Logic Consultants, Inc. in St. Louis, who has been consulting for 20 years and whose company employs 24 people, sums it up. Although he admits that "marketing is not one of my favorite things," he pursues a marketing strategy that relies on a combination of limited advertising, referrals from previous clients and contacts made through his active participation in professional organizations.

According to Hoffman, building a relationship with a vendor can be an effective way to find clients. Guy Scharf, president of Software Architects, Inc. in Mountain View, Calif., says that the nature of the consulting business is often "feast or famine." Consultants may have more customers than they can support one month yet find themselves idle the next.

When the consultants were asked what the incentive was in working 70 to 80 hours per week, Sachs summed it up best: "Independence can be addictive."

Ruhl is a consultant and programmer in Connecticut and author of The Programmer's Survival Guide: Career Strategies for Computer Professionals.

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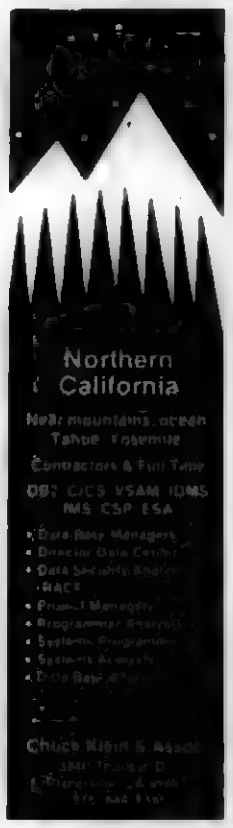

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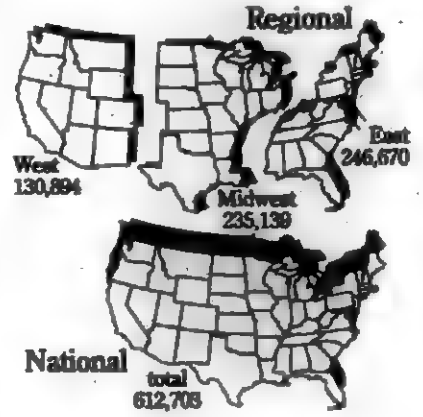

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Senior Software Engineer: Apply extensive and diverse knowledge of software engineering principles and practices in broad area of assignments in software support products department, including customer and field support, developing tools and utility programs using C in UNIX and MS-DOS environments, testing software, reviewing manuals and documentation, and interfacing with vendors. M.S. degree in Computer Science required; will accept completion of all coursework. Must have two years of experience in development of C compiler drivers and C libraries for RISC architectures; enhancement and maintenance of architectural simulators for RISC architectures; maintenance of development support tools for embedded systems; and a working familiarity with UNIX SCCS tools. Two years of experience in job offered or two years of experience in software compiler development required. Hours are 9 a.m. to 6 p.m., 40 hours weekly, at an annual salary of $43,500. Apply at the Texas Employment Commission, or send resume to the Texas Employment Commission, TEC Building, Austin, Texas 78778, Job Order #5757908. Ad Paid by an Equal Opportunity Employer.

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Job Industry	of Computerworld's Audience ...
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Computer Manufacturer	79,521
large-scale computers	37,110
medium-scale computers	45,938
small-scale computers	33,851
personal computers	47,758
technical workstations	24,889
Software Vendor	130,589
for large-scale systems	57,561
for medium-scale	74,967
for small-scale systems	61,274
for personal computers	76,767
for technical workstations	26,379
Non-CPU Computer Products Manufacturer	38,984
VAR/dealer/retailer	27,557
DP Service Bureau/contract DP Services	53,077
Consulting/planning	86,677
Manufacturer (not computers)	168,664
Insurance	52,910
Healthcare	64,729
Banking/financial Services	97,953
Government - federal/state/local	110,399
Business Service (except DP)	40,108
Communications Systems	26,913
Public Utilities	54,364
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Education	125,104

SOURCE: Stoll Survey of Computerworld's Audience, May 1989.

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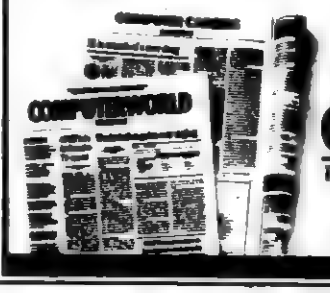

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EOE

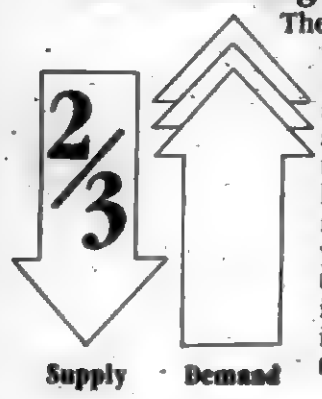
A few important tips on recruiting computer professionals

Finding computer talent isn't as easy as it used to be. In fact, there was a time when you'd just run an ad in the local newspaper and you could make a hire without waiting too long or spending too much.

But times have changed. And like so many facets of today's business, so has the effectiveness of traditional recruiting methods.

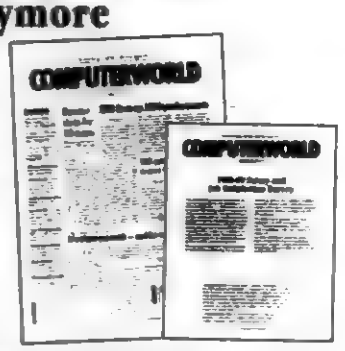
What's more, many of today's recruiters *don't use* today's most efficient methods — methods that save time and money for some widely unknown reasons.

The supply of qualified professionals isn't meeting demand



The American Council on Education reports that the number of college students choosing computer careers is down two-thirds since 1982. To make matters worse, there are more computers in today's business that require the skills of this shrinking market than ever before. And while you may never consider the company next door your competitor, it likely *is* competing for the same computer talent today. The result is a classic supply/demand problem that isn't changing for the better -and that's sure to make your recruiting tougher in the '90s.

Ads in local papers don't reach your major hiring market anymore



That's because they generally reach "active" job seekers — those who actively seek out the local newspaper to find jobs — and who a recent *Computerworld* job satisfaction survey found to represent 2 in 10 of today's computer professionals. The study also found that 7 in 10 of today's computer professionals are "passive" job seekers — those who would *consider* new job options, but likely never look for them in the local newspaper. (The remaining small percentage are "non-movers" content with long-term jobs.)

For every 10 of today's computer job seekers . . .
2 are Active
7 are Passive
1 is a Non-mover

In short, this means that your ad in today's local newspaper reaches no more than 20 percent of today's computer job seekers. What's worse, if you're not using other vehicles that reach far more job seekers, your local newspaper expenses are as inefficient as their limited audience.

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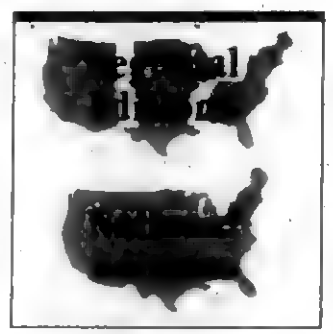

A key option when you need a regional candidate and want to avoid national response and relocation. Yet if your search is national in scope, *Computerworld* can also give you more widespread national exposure than any other source.

Computerworld needs just 3 working days for your ad to appear

That's comparable to most local newspapers. And why your ad can quickly appear in the next issue to start generating quality response.

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And while times may change, some things won't. Whether you *use* computers, *make* computers, or sell products and services *for* computers, *Computerworld* is still your major source of news today. And your major source of computer professionals tomorrow.

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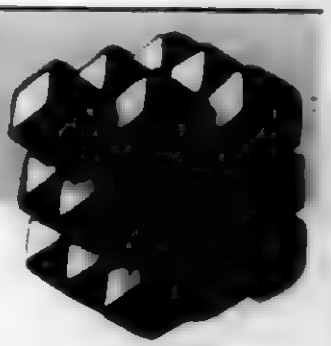

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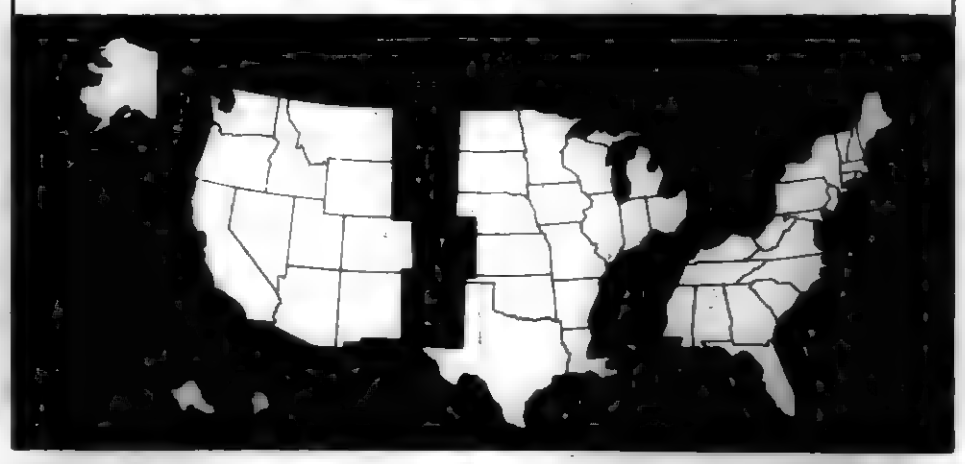

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MARKETPLACE

Neural networks can't think, but they can learn — almost

BY JESSICA KEYES
SPECIAL TO CW

While no technology can exactly simulate the process of human thinking, neural networks are putting on a good show. They can make sense of patterns in handwriting and speech and can even "learn" from their mistakes. They can be "taught" rather than programmed and can handle jobs that conventional software usually can't.

A neural network is a program or algorithm that learns through repetition. Neural networks are not programmed. They simulate a network of hundreds of parallel-processing interconnected units shooting messages to one another at a rapid-fire pace. A neural network receives input and then responds, which can give the impression that it is actually thinking and solving a problem.

While neural networks are not replacing conventional software, they're beginning to absorb tough jobs not handled well by other tools. Some examples of tasks that neurals networks are performing:

• A neural network handwriting recognition package has been developed at Texas-based Bank-Tec, a financial service institution that develops and sells check processing systems for banks. The Bank-Tek neural network can reportedly save banks hundreds of thousands of dollars each year by reading and approving the handwritten numerals that appear on the face of each check.

• American Express Co. is using neural networks to evaluate credit risks. This application, called credit scoring, is popular with financial institutions because it can assess a credit application's worthiness based on previous examples entered into the neural network.

• The Chase Manhattan Bank NA in New York is fighting credit-card fraud by using a neural network to sift through hundreds of thousands of credit-card transactions each day and flag possibly fraudulent transactions.

• John W. Loofbourrow Associates, Inc. in New York used a $995 neural network package runing on an IBM Personal Computer to develop a system that forecasts Standard & Poor's Corp.'s 500 index.

Before you jump into a major neural network purchase, however, there are several points you should keep in mind:

Know what you're getting into. Neural networks are highly complex. Before you embark on a large-scale project, a little research and development is warranted. Neural networks don't work like conventional technology; they don't even work like expert systems, their closest artificial intelligence cousin. Educate your staff so they can fully understand the workings of neural networks. Probably the best way to do this is to buy an inexpensive package to use as an entry-level training and exploratory tool.

Software vs. hardware. Neural networks can be purchased either as hardware or software with a variation in price that spans from as little as $100 to as much as $75,000. While the first commercially available neural networks were add-in boards, software packages are much more popular with commercial users because they're less expensive and can be used on PCs. If you need more processing power than your PC can supply, a high-power plug-in board can be purchased.

Hardware neural networks are mainly used in research and science institutes. Special analog circuits can speed processing time, allowing the network to handle large, complex projects.

If you choose to go the software route, make sure that the package you choose hooks into your standard database files. If your database is an Ashton-Tate Corp. Dbase file, make sure that your neural network software can access Dbase. If it can't, make sure it can at least access a standard ASCII or Unix file.

Implementing a neural network can be frustrating. Neural networks need loads of data entered at the beginning, so allow time for that. Also, make sure that you choose a task in which the data can be obtained from a source that's already automated.

Auditing is not an automatic feature. One major drawback to using this technology is that there is no way to trace how a neural network arrives at its conclusions. There are many applications that require an audit trail for legal and other regulatory considerations. However, help may soon be on the way. One company has announced the availability of such a function, derived from the patents of a Northeastern University professor. This function forces the network to develop a set of "If . . . then" rules that can be used for auditing purposes. When selecting a neural network, ask the vendor if this function is available.

Training, support and documentation. While several of the neural network vendors offer excellent training, many don't offer any at all. In those cases, the information systems manager might have to buy training services from a training vendor or consultant. Levels of support vary according to the amount spent on the software. The minimum that should be accepted, regardless of the price paid for the software, is telephone support.

Keyes is president of New Art, Inc., a management and computer consulting firm in New York.

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AT Model 099	$900	$1,075	$850
AT Model 239	$975	$1,025	$700
AT Model 339	$1,025	$1,300	$900
PS/2 Model 30-286	$1,250	$1,300	$1,125
PS/2 Model 60	$1,500	$1,800	$1,400
PS/2 Model 70P	$3,375	$3,400	$3,175
Compaq Portable II	$975	$1,050	$875
Portable 286	$1,275	$1,450	$1,100
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Portable 386	$2,700	$3,000	$2,500
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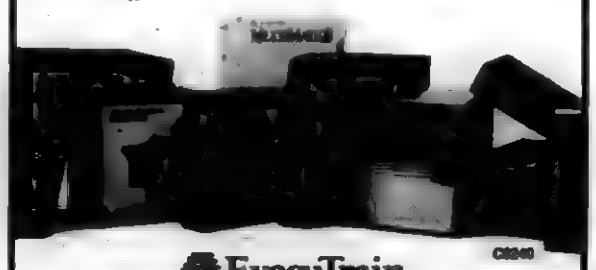

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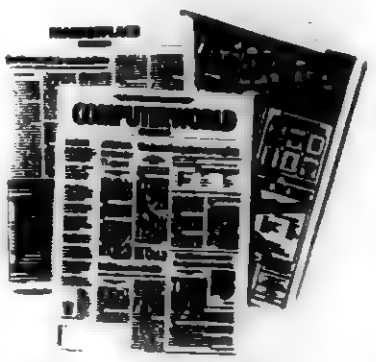

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Networking is a critical weapon that seasoned professionals should be able to brandish artfully. Unfortunately, it's something that few of us do well instinctively. There just aren't any formal training classes on how to develop long-lasting, productive contacts with colleagues. Fortunately, an IS manager can be a big help in teaching his staff some basic networking techniques and demonstrating the long-term benefits.

Networking is not directing, delegating or reporting; it is sharing, teaching and helping. Contact-grooming will extend your staff members' professional identities beyond the boundaries of their company and their own experience. And it certainly can't hurt them to have these contacts when the time comes for them to circulate their resumes.

From a manager's point of view, networking serves as a sort of postgraduate professional seminar. When people on your staff get to the point where they have taken all the formal training required to do their jobs well, they still need the stimulation of new ideas. They need the opportunity to share their knowledge and experience with others. By learning how to network, they get a form of "training." Your staff will appreciate the ability to move beyond their immediate job responsibilities and distinguish themselves as professionals in their field.

Leading the way

When was the last time you suggested to anyone in your department that he ask the advice of a colleague from another department? Another company? Another city? Encourage your staff right away to take these first steps. Over time, they'll see the benefits: Networking can give them an opportunity to share information, advice, feedback and support.

For example, a programmer may call someone in his network for advice on a puzzling technical problem, to get input about a career move or to talk over a critical issue with someone who understands his job and is not a stakeholder in the outcome. On the flip side, he can pass along information that will benefit a colleague in some way or let her know that he's given her name to someone else who would like to connect with her.

Possibly without them realizing it, your staff members already have many opportunities to network: with other IS professionals, clients or user groups in the same company; with colleagues from other companies they have had contact with in special projects and professional organizations; and with people from classes or conferences.

Urge your staff to take advantage of these opportunities to network. Those who are less timid might begin a connection with someone by introducing themselves at a class, conference or professional meeting; others might prefer initiating a written connection.

Another avenue is for an employee to call someone whose name has been passed along to him. If he is reluctant at first, remind him that most people enjoy being contacted as an expert or to discuss common interests.

The best networkers are those who go out of their way to pass along information or assistance to others. They always return phone calls, and they are active in keeping the energy moving. Remember, what goes out seems to come back multiplied — and not necessarily from the same contacts.

Even if you are not a natural networker, set a good example — network yourself; make it known in your group that you don't consider resources limited to people in your own group or company.

Networking nuggets

The next time you are tempted to deny an out-of-town class to someone on your staff because of the expense, consider the value of the networking opportunities. Networking with classmates adds a depth to the learning experience that can be missing from large in-house classes. Participants will return not only with technical knowledge but also with the experiences and opinions of others, which they can draw on later. It can't hurt you or your department to know how other companies solve related problems.

> **THE BEST NETWORKERS are those who go out of their way to pass along information or assistance to others.**

Networking is an unstructured, open-ended, intangible activity. Because of this, you won't find Networking 101 listed in a course booklet for professional development. IS managers, however, *can* play a big part in passing along techniques that can benefit their staffs and departments.

Redkey is an independent instructor, consultant and writer and author of The Technical Instructor's Handbook: From Techie to Teacher.

?

What training issues would you like to see covered? Call Cathy Duffy, associate editor at *Computerworld*, at (800) 343-6474 or fax at (508) 875-8931.

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— Alec Gindis
President
Spectrum Concepts, Inc.

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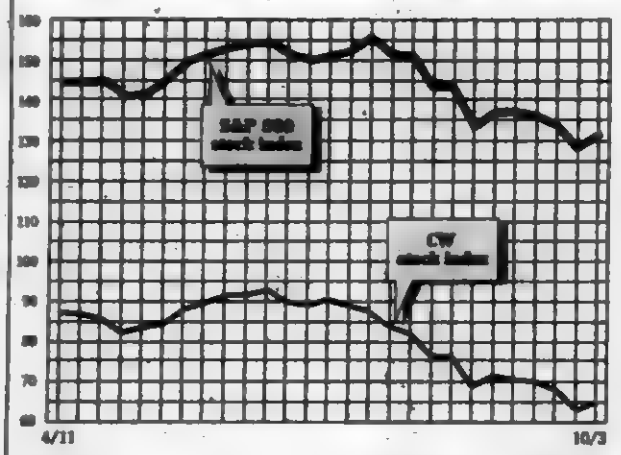

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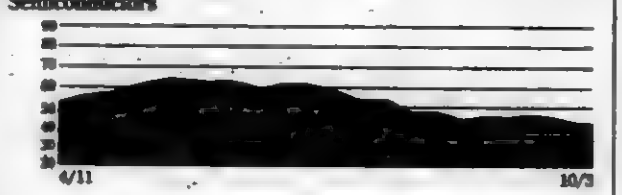

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EXCH		52-WEEK HIGH	52-WEEK LOW	PRICE CLOSE OCT. 3, 1990	WEEK NET CHANGE	WEEK PCT CHANGE
Communications and Network Services						
N	AMERICAN INFO TECHS CORP	68	53	62	2.3	3.8
Q	ANDREW CORP	28	16	17.75	0.0	0.0
Q	ARTEL COMM CORP	10	2	2.375	-0.4	-13.6
N	AT&T	47	30	31.5	0.0	0.0
Q	ARANTEN INC	8	2	2	-0.6	-22.0
N	AYDIN CORP	21	11	10.75	0.0	0.0
N	BELL ATLANTIC CORP	57	40	48	2.0	4.3
N	BELLSOUTH CORP	69	48	52.25	0.6	1.2
Q	COMPRESSION LABS INC	18	7	15.375	2.3	17.1
Q	COMTEL CORP	37	23	32.75	1.9	6.1
Q	DATA SWITCH CORP	4	2	3.125	-0.1	-3.8
Q	DIGITAL COMM ASSOC	27	14	15	-0.3	-1.6
Q	DYNATECH CORP	20	13	12.5	-1.3	-9.1
Q	FIBRONICS INTNL INC	19	5	6.5	-1.1	-14.8
Q	GANDALF TECHNOLOGIES	6	2	2	-0.6	-28.9
Q	GENERAL DATACOMM INDS	6	2	2.5	0.1	5.3
N	GTE CORP	36	24	27.5	1.4	5.3
Q	INFOTRON SYS CORP	10	2	2	-0.1	-5.9
N	ITT CORP	64	44	46.625	0.0	0.0
N	M A COM INC	7	3	4.375	-0.3	-6.4
N	MCI COMMUNICATIONS CORP	40	30	33.125	1.1	3.5
N	NETWORK EQUIP TECH INC	34	5	6.625	0.5	8.2
Q	NETWORK SYS CORP	18	7	9.125	0.1	1.4
N	NORTHERN TELECOM LTD	30	21	24.125	1.5	6.6
Q	NOVELL INC	29	12	25.25	0.0	0.0
N	NYNEX CORP	82	68	71.625	2.1	3.1
N	PACIFIC TELESIS GROUP	52	36	42.875	-0.4	-0.9
A	PENRIL CORP	9	5	6.125	0.1	2.1
N	SCIENTIFIC ATLANTA INC	29	13	14.25	0.8	4.6
N	SOUTHWESTERN BELL CORP	65	47	53.625	3.0	5.9
Q	3 COM CORP	19	7	7.75	0.8	10.7
N	US WEST INC	41	32	35.25	1.5	4.4
Computer Systems						
Q	ALLIANT COMPUTER SYS	8	2	2	-0.5	-20.0
Q	ALPHA MICROSYSTEMS	7	1	1.375	-0.4	-21.4
A	AMDAHL CORP	19	10	11.125	0.1	1.1
Q	APPLE COMPUTER INC	50	27	27	-2.8	-9.2
Q	AST RESH INC	26	8	17.5	-0.1	-0.7
N	BOLT BERANEK & NEWMAN	6	4	5	0.1	2.6
N	COMPAQ COMPUTER CORP	68	37	41.625	1.1	2.8
Q	COMMODORE INTNL	12	5	5.375	0.4	7.5
Q	COMPUTER AUTOMATION INC	6	0	1.188	0.7	137.6
N	CONTROL DATA CORP	22	9	9.25	-0.8	-7.5
N	CRAY RESH INC	51	27	27.5	-1.5	-5.2
N	DATA GEN CORP	18	8	4.875	-0.4	-7.1
N	DATAPOINT CORP	8	1	0.938	0.1	7.2
Q	DELL COMPUTER CORP	14	6	9.875	0.3	2.6
N	DIGITAL EQUIP CORP	95	50	52.5	1.5	2.9
N	FLOATING POINT SYS INC	4	0	1.625	0.0	0.0
N	HARRIS CORP	40	17	18.75	-2.3	-10.7
N	HEWLETT PACKARD CO	52	29	31	0.5	1.8
N	HONEYWELL INC	112	73	82	-1.6	-1.9
N	IBM	123	93	107.375	2.0	1.9
Q	INFORMATION INTL INC	15	9	9.25	0.1	1.4
N	IPL SYS INC	14	5	9	-0.3	-2.7
N	MAI BASIC FOUR INC	8	2	1.75	0.1	7.7
N	MATSUSHITA ELEC INDL LTD	172	116	137.5	21.5	18.5
Q	MENTOR GRAPHICS CORP	26	10	10.5	-1.8	-14.3
N	NBI INC	2	0	0.188	0.0	33.3
N	NCR CORP	72	54	58.5	3.1	5.6
Q	PYRAMID TECHNOLOGY	38	14	16.625	-1.4	-7.8
Q	SEQUENT COMP SYS INC	34	13	14.25	-5.8	-28.8
Q	SUN MICROSYSTEM INC	37	15	19.5	-8.3	-29.7
Q	SYMBOLICS INC	2	0	0.25	-0.1	-32.1
N	TANDEM COMPUTERS INC	30	10	11.125	0.3	2.3
N	TANDY CORP	48	24	29.125	0.3	1.0
N	ULTIMATE CORP	10	3	3.25	-0.8	-18.8
N	UNISYS CORP	20	2	4	-3.0	-42.9
A	WANG LABS INC	6	3	3.125	0.1	4.2
Software & DP Services						
Q	AMERICAN MGMT SYS INC	20	11	13.625	1.1	9.0
Q	AMERICAN SOFTWARE INC	10	8	8	0.1	1.6
N	ANACOMP INC	5	2	1.875	-0.1	-4.3
Q	ANALYSTS INTL CORP	24	10	10.5	-0.5	-4.5
Q	ASHTON TATE	15	5	5.25	-1.0	-16.0
Q	ASK COMPUTER SYS INC	10	8	8.375	-0.8	-10.5
N	AUTO DATA PROCESSING	60	44	48.25	-0.4	-0.8
Q	AUTODESK INC	60	33	37	-5.3	-12.4
N	BMC SOFTWARE INC	30	18	22.75	-0.5	-2.2
N	BUSINESS LAND INC	12	2	2.125	0.1	6.3
Q	COGNOS INC	10	4	6.75	-0.3	-3.6
N	COMPUTER ASSOC INTL INC	17	4	4.875	-0.8	-13.3
Q	COMPUTER HORIZONS CORP	17	7	11.25	-0.5	-4.3
N	COMPUTER SCIENCES CORP	59	37	40.125	2.4	6.3
N	COMPUTER TASK GROUP INC	12	8	9.5	1.0	11.8
Q	COMSHARE INC	28	14	16.5	0.5	3.1
Q	CORPORATE SOFTWARE	16	8	9	-0.5	-5.3
N	GENERAL MTRS (CL E)	38	24	33.75	0.9	2.7
Q	GOAL SYSTEMS INTL	16	10	10.25	0.3	2.5
Q	MORAN SYS INC	7	2	2.75	0.0	0.0
Q	INFORMIX CORP	16	5	4.75	-0.8	-13.6
Q	INTELLICORP INC	6	3	3.375	-0.1	-3.6
Q	LEGENT CORP	32	17	18.875	-0.1	-0.7
Q	LOTUS DEV CORP	39	14	16.75	1.1	7.2
Q	MICROSOFT CORP	81	34	65.75	5.5	9.1
Q	NATIONAL DATA CORP	35	8	9.5	-0.4	-3.8
N	ON LINE SOFTWARE INTL INC	11	5	5.375	-0.5	-8.5
Q	ORACLE SYS CORP	188	5	5.625	-0.6	-10.0
N	PANSOPHIC SYS INC	19	10	10.25	0.3	2.5
Q	PHOENIX TECHNOLOGIES INC	5	2	2.125	-0.3	-10.5
N	POLICY MGMT SYS CORP	43	20	35.125	0.5	1.4
Q	PROGRAMMING & SYS INC	25	12	13.25	-2.3	-14.5
Q	RELATIONAL TECH INC	10	3	8.875	0.5	6.0
N	REYNOLDS & REYNOLDS CO	27	13	14.5	1.5	11.5
Q	SAGE SOFTWARE INC	16	8	9.875	0.8	8.2
Q	SEI CORP	22	15	15.5	0.5	3.3
Q	SHARED MED SYS CORP	17	12	15.75	-0.5	-3.1
Q	SOFTWARE PUBS CORP	28	14	15.75	-5.5	-25.9
N	STERLING SOFTWARE INC	11	6	5.75	-0.3	-4.2
Q	SUNGARD DATA SYS INC	28	15	18.5	0.8	4.8
N	SYSTEM CENTER INC	25	6	9.25	3.3	54.2
N	SYS. SOFT INC	29	14	15.75	-1.0	-6.0
Q	WONDERTAN	2	1	0.813	-0.1	-13.3
Semiconductors						
N	ADV MICRO DEVICES INC	11	5	5	-0.4	-7.0
N	ANALOG DEVICES INC	10	6	6.25	0.1	2.0
Q	ANALOGIC CORP	11	8	9.375	0.0	0.0
Q	CHIPS & TECHNOLOGIES INC	26	8	8.5	-1.8	-18.0
Q	INTEL CORP	52	30	33.25	0.5	1.5
Q	MICRON TECHNOLOGY INC	16	7	8	-0.5	-5.9
N	MOTOROLA INC	68	53	64	3.4	5.6
N	NATL SEMICONDUCTOR	9	4	3.875	-0.3	-6.1
N	TEXAS INSTRS INC	44	26	28.75	0.1	0.5
A	WESTERN DIGITAL CORP	15	5	8.25	0.1	2.0
Peripherals						
Q	ALLOY COMP	2	0	0.469	0.0	-6.2
N	AM INTL INC	6	1	1.375	0.1	10.0
Q	AUTO TROL TECH CORP	9	2	2.25	0.5	28.6
Q	BANCTEC INC	24	13	12.75	-0.3	-1.9
A	COGNITRONICS CORP	8	3	8	0.8	14.3
Q	CONNER PERIPHERALS	31	11	17	-0.5	-2.9
A	DATARAM CORP	22	8	10.375	0.3	3.1
N	EASTMAN KODAK CO	49	36	37.25	-1.9	-4.8
N	E M C CORP MASS	7	3	6.125	-0.3	-3.8
Q	EMULEX CORP	9	4	6.375	-0.1	-1.9
Q	EVANS & SUTHERLAND	35	18	21.5	-1.0	-4.4
Q	ICOT CORP	2	1	0.563	-0.1	-14.3
Q	INTERLEAF INC	8	3	3.375	0.5	17.4
Q	IOMEGA CORP	6	3	4.563	0.1	2.8
Q	MASSTOR SYS CORP	3	1	0.563	0.0	0.0
Q	MAXTOR CORP	17	9	5.75	-0.3	-4.2
Q	MICROPOLIS CORP	10	3	5.25	0.3	5.0
N	MINNESOTA MNG & MFG CO	91	68	78.25	0.3	0.3
Q	PERSONAL COMP PRODUCTS INC	6	4	3.813	0.0	0.0
Q	PRINTRONIX INC	15	9	10.25	0.8	7.9
N	QMS INC	21	9	11.625	0.9	8.1
Q	QUANTUM CORP	26	9	16.5	-0.6	-3.6
N	RECOGNITION EQUIP INC	8	4	5.125	0.1	2.5
N	REXON INC	10	4	4.875	0.3	5.4
Q	SEAGATE TECHNOLOGY	20	9	8.625	-0.3	-3.6
N	STORAGE TECH CORP	35	12	12.75	-0.9	-6.4
Q	TANDON CORP	4	1	1.813	0.2	16.0
N	TEKTRONIX INC	18	12	14.875	1.1	8.2
Q	TELEVIDEO SYS INC	1	0	0.25	0.0	0.0
N	XEROX CORP	67	32	34.875	2.3	6.9
Leasing Companies						
N	CAPITAL ASSOC INTNL INC	7	1	1.063	0.1	6.3
N	COMDISCO INC	34	15	16.875	1.8	11.6
Q	LDI CORPORATION	16	11	11.25	-0.5	-4.3
Q	PHOENIX AMERN INC	5	3	4.5	1.3	30.5
Q	SELECTERM INC	6	3	3.813	-0.4	15.2

EXCH: N—NEW YORK; A—AMERICAN; Q—NATIONAL

Loop d'loop

Tech stocks take a ride that leaves many in the doldrums

Technology stocks roller-coastered up and down last week, leaving some firms derailed at new lows and others chugging ahead by Thursday's close. Hewlett-Packard Co. was among those left feeling queasy at the end of the ride, having lost 4¼ points last week to close Thursday at 29¼. HP could have shared the motion sickness pills with Autodesk, Inc., which also plunged 4¼ points, closing at 37¾.

Financial troubles and analyst grumbles caused Unisys Corp. to stumble 1⅝ points last week to close Thursday at 3⅞, just a breath away from a new low. Digital Equipment Corp. slid 1⅛ points to 50⅛, hovering just above its low mark set two weeks ago. IBM was one of the few gainers in the hardware sector, shooting up 1⅞ points to 107⅜.

With a few exceptions, software makers withstood the herky-jerky Wall Street ride and came out grinning. Adobe Systems, Inc. gained 1¾ points to 20¾. Lotus Development Corp. surged 1½ points to 17, while Microsoft Corp. rose 1⅛ points to 64⅛.

However, Software Toolworks, Inc. pitched and rolled, then pitched once more, finally sinking 2 points to 4⅝. Oracle Systems Corp. continued to lag, losing ½ a point to close at 6.

Traders did not take kindly to news of a possible legal battle between Intel Corp. and Advanced Micro Devices, Inc. (AMD) over rights to the 80386 chip. AMD lost ¼ of a point and sunk to a new low of 4⅛, while Intel declined by 1 point to 32¼. Other semiconductor makers also suffered: Motorola, Inc. tumbled 2½ points to 60½, and National Semiconductor Corp. slid ⅛ of a notch to 3¼, a new low.

Cray Research, Inc. sold its Y-MP supercomputer to a Japanese company, then investors sold Cray stock, sending it down 1¾ points to 26¼, a new low.

KIM S. NASH

RISC

FROM PAGE 1

computer. Users are not exactly thrilled with this vision of the future. First, the idea of using RISC is to lower costs, including the costs of informations systems staffing. Second, with no unified Unix, there is no cohesive central management available.

"We found the fact that there are different Unixes out there to be a tremendous disadvantage," said Gerald Siddons, who is director of scientific computing at the division of biostatistics and epidemiology at the Dana-Farber Cancer Institute in Boston. "Even if only 10% of the code is machine-specific, that's still a lot of work."

The lack of a unified Unix is creating havoc in systems administration. "Our biggest concern about the differences in Unix is not from a user's view, because that's getting cleaned up, but in systems administration," said Tom Hein, manager of technical support at John Deere Insurance Co. in Moline, Ill. "There's a significant difference between Unixes."

"They're looking for a standard way to manage what they buy," said John Jones, an analyst at Montgomery Securities in San Francisco. "It's a management headache."

Only in the last few months have two vendors, Sun Microsystems, Inc. and HP, announced management software for their RISC systems. However, it comes bundled with their hardware, thus limiting the open systems aspect.

Despite the chaos of operating system differences and lack of management tools, RISC hardware forges ahead.

RISC vendors have dribbled their first-generation products into the market over the last four years. Now that they're in the marketplace, most said they expect to double the speed of their RISC processors in the next year.

RISC's leaps in price/performance will continue in 1990. Many vendors said they will have uniprocessors that provide more than 50 million instructions per second, or MIPS (see chart). Longer-term plans for increasing price/performance center on multiprocessing.

"In the long run, they'll get more price/performance from multiple CPUs than from the shrinking geometry on a chip," said Kim Shanely, secretary of the benchmarking group System Performance Evaluation Cooperative (SPEC).

While vendors have different methods of implementing processors under the umbrella of RISC, they appear to have little to differentiate themselves in future generations outside of marketing.

As a buyer, which model is best for you? Analysts said to ignore the minor differences in vendors' claims and take one for a test drive — benchmark it on the application you expect to use.

The major players (HP's Apollo Division, IBM, Intel Corp., Intergraph Corp., Mips Computer Systems, Inc., Silicon Graphics, Inc. and Sun) all claim that certain engineering features in their implementations of RISC offer distinct advantages to users.

However, instead of wading through technical claims, users and analysts, such as Don Tapscott, vice-president of Boston-based DMR Group, Inc., suggested that potential buyers should find out whether a certain vendor's architecture is right for them by running benchmarks themselves for the necessary applications.

Trial and error

After studying more than 100 Unix users, most of whom are Unix RISC users, Tapacott said that all those engineering differences matter little. "There are important differences in terms of price/performance," he said, recommending that users simply benchmark applications that they plan to use. "You'll find out fast enough which is best for you."

This attitude points out the future prominence of SPEC and other benchmarking organizations such as Neal Nelson's Business Benchmark and the Transaction Processing Council.

SPEC released its first suite of benchmarking results in April. Users can either subscribe to the organization's newsletter and check potential hardware for aggregate performance on about a dozen applications or benchmark their own computers through tapes that are available from the Fremont, Calif.-based organization.

However, users such as Hein said that until benchmarks are more thorough, even the second generation of RISC computers should be tested on applications.

"In the PC world, you eventually believe what you read. The Unix world is not quite that easy," he said. Specmarks (the results of SPEC's testing), he said, may eventually make buyers comfortable, but because the organization has only technical application benchmarks, it still is not widely usable.

Software

Until there is a unified Unix, if there ever will be one, applications present the biggest obstacle to both users and vendors.

As RISC architecture insinuates itself into the commercial world, users would rather buy shrink-wrapped software. John Mercer, pagination project coordinator at *The Houston Chronicle*, said that he buys shrink-wrapped applications whenever possible for the company's Sun workstations. "We won't get into something that calls for [recompilation] unless we have to," he said.

Jones agrees: "The reality is once you're out of the engineering side of an organization, we're all a bunch of dummies," and recompiling is out of the question.

Vendors have further divided the issue. Instead of making Unix more alike, they have been avidly pursuing independent software vendors, often offering them money to port applications to their particular flavor of Unix. Until there is a unified Unix, these deals have been the only way for vendors to get applications for their hardware, but it has the effect of entrenching the separate flavors of Unix.

Sun and Mips — and to a lesser extent Motorola, Inc. and the rest — have programs that entice third-party software developers. Those who have been in the RISC arena longest have the biggest portfolio of applications. The rest admitted they are at a disadvantage. "What hurts us is that it takes longer to get applications going," said Jeff Nutt, marketing manager for Motorola's RISC line.

Applications key

It is no surprise that RISC and its attendant Unix operating system are limited by software applications, despite the monumental efforts by vendors to get more applications to the market.

One future remedy could be that when the architecture gets to the point where it has MIPS to burn, some of those MIPS will be burned up camouflaging the differences in flavors of the operating system and automatically tuning it to the hardware. Vendors said they see it as a possibility but would rather see those MIPS used for software to differentiate their own RISC systems from the rest, rather then bring them together.

"Camouflaging the operating system through another level of software is an unproven idea," said Phil Gerskovich, manager of Scalable Processor Architecture alliances at Sun. Bill Keating, director of corporate technology marketing at Sun, added, "As [RISC] has more power, those MIPS will be used for more functionality first."

The next generation

Most RISC vendors say they plan to double the speed and performance of their processors during the next year

Product	Availability	MIPS	Spec marks	Clock speed
HP	1990	50	N/A	48 MHz
Sun	1991	80	66	40 MHz
Intergraph	1991	48	N/A	50 MHz
Mips	1991	40	35.2	N/A
Motorola	1991	72	N/A	50 MHz
IBM	1991	70	58	50 MHz
Intel	1991	50	41	50 MHz

CW Chart: Paul Mack

RISC CPUs to yield enhanced price/performance in 1991

BY J. A. SAVAGE
CW STAFF

In the 1991 batch of reduced instruction set computing (RISC) processors, vendors will get their nudge in price and performance in two ways. Increasing clock speed, all agreed, is most easily done. Second, most vendors are experimenting with some form of increasing the number of instructions per clock cycle.

In the current generation, a 33-MHz clock speed did not just roll off the fabrication line. It was first achieved by hand-picking chips tested at higher rates, according to John Mashey, vice-president of systems technology at Mips Computer Systems, Inc.

To reach 50 MHz, where most vendors said they will be by next year, engineers are fine-tuning the circuits on the chips. "You find one path takes longer than the others, so you rearrange it to make it shorter," Mashey said.

Additionally, this next batch of RISC CPUs will gain performance in board layout. By putting cache on the CPU substrate, "it will look more like a chip than a circuit board," he said.

Trying to cram more instructions through the processor for each clock cycle is a bit more tricky, according to vendors. They are attempting two methods to accelerate the instruction. One is to widen the instructions pathway so that two instructions can be sent at once, side by side. The other is to stagger the instructions so that several can be sent for each clock cycle.

However, the ability to leverage the clock speed and instruction paths appears limited to the 1991 generation. The price/performance kick after that will most easily be achieved by stringing processors together, the vendors said.

Patriot dreams

As the Open Software Foundation and Unix International creep toward some version of a unified Unix operating system, one new company may obviate the need for their efforts and users' need to recompile applications to match hardware with each vendor's version of Unix.

IBM and Metaphor Computer Systems, Inc. recently announced a new business called Patriot Partners. Its aim is to shield software developers from the different flavors of Unix by writing a layer of code between each flavor of Unix and general applications.

If successful, the business would not only ease the headache of software developers having to tune applications for each version of Unix, but by wiping out the differences between Unix software packages, it would also make software applications more plentiful, as any created for a particular version would then run on all versions.

Users of reduced instruction set computing (RISC) architecture may not be inherently tied to Unix as an operating system. Microsoft Corp. plans a "portable OS/2" operating system, which could be used on a RISC platform in the next few years.

Although the company announced OS/2 for RISC plans, it is not pushing the product. "It's primarily for [Intel Corp.'s] X86 [processor line] platforms," said Pat Bellamah, OS/2 marketing manager at Microsoft.

Microsoft has not said which vendor's RISC architecture it will port to first, as each has to be specially tuned, but it has said that the product will support multiprocessor RISC architecture.

J.A. SAVAGE

NEWS SHORTS

Huge outsourcing pacts inked

Sun Refining and Marketing Co. finalized its 10-year, $200 million outsourcing contract with Andersen Consulting last week. The previously announced deal [CW, Aug. 6] calls for Andersen to acquire Sun's Dallas data center and hire 66 Sun operations employees. In a separate processing services announcement, the U.S. Environmental Protection Agency (EPA) extended its 13-year-old relationship with Computer Sciences Corp. and announced a five-year, $347 million contract for computer and telecommunications services to the EPA.

Antivirus organization seeks input

The National Institute of Standards and Technology (NIST), an agency of the U.S. Department of Commerce, said last week that it is considering the establishment of a government/industry consortium to combat computer viruses and similar threats. The NIST is soliciting industry comment on the idea and asked that organizations interested in the consortium contact Dennis Steinauer at NIST, Room A216 Technology Bldg., Gaithersburg, Md. 20899. (301) 975-3359.

Groups look to extend chip pact

The Computer Systems Policy Project and the Semiconductor Industry Association, groups whose goals have not always coincided, said they sent a letter last week to President Bush stating a unified position on matters related to U.S./Japanese trade. The groups said they want: the U.S. and Japan to extend an agreement on open markets and dumping, due to expire next July, for five years; the U.S. to boost its share of the Japanese semiconductor market from 13% to at least 20% by the end of 1992, one year later than had earlier been demanded; in light of recent successes, the government to reduce its role in antidumping matters; and the U.S. to remove the price floors set for sale of dynamic random-access memory chips and erasable programmable read-only memory chips in the U.S. by Japanese suppliers.

Microsoft releases driver library

Microsoft Corp. has announced the Microsoft Supplemental Driver Library (SDL), a collection of device drivers for printers, video displays, pointing devices and other peripherals that run under Windows 3.0. The library supports approximately 126 hardware peripherals, including a variety of Hewlett-Packard Co. Laserjet printers. The SDL, which can be freely copied and distributed among licensed Windows users within a company, will be available at no charge with a variety of distribution options and can be downloaded from such on-line services as Microsoft Online, Compuserve and Genie. SDL can also be ordered by calling (800) 426-9400.

Mac/IBM connections unveiled

Apple Computer, Inc. Macintosh users needing a connection to IBM System/34s, System/36s, System/38s or Application System/400 machines can look to two new Macintosh midrange products from Andrew Network Products in Austin, Texas. The first is Netaccess, an Appletalk gateway that connects Macintoshes to the IBM midrange and costs $3,995. The other is Mactwin, priced from $995 to $1,095, which offers the features of Netaccess for point-to-point networking and includes a card for the Macintosh's internal expansion slot.

Cabletron enters FDDI market

Cabletron Systems, Inc. said it plans to unveil a $19,995 Ethernet-to-Fiber Distributed Data Interface (FDDI) bridging module for its Multimedia Access Center (MMAC) at this week's Interop '90 show in San Jose, Calif. The MMAC is an intelligent wiring center that allows users to link disparate local-area networks running over various media in a star configuration, a popular strategy these days because it simplifies network management. The FDDI support joins Cabletron modules supporting Ethernet over thin and thick coaxial cable and unshielded twisted-pair, as well as token-rings running over fiber, and shielded and unshielded twisted-pair.

Notes

FROM PAGE 1

for," said John Donkle, a consultant at Workgroup Technologies.

There's an incompatibility between Lotus' desire to position Notes as a strategic corporatewide environment and users who expect Notes will prove its worth but still want a starter pack.

"If you really believe Notes is worth it, then the product should be its own best salesman," insisted Russ Baris, assistant director of pharmaceuticals systems at Pfizer Pharmaceuticals in New York. Baris' colleague and Notes fan Todd Greeno, who is a systems manager, agreed. "The major issue we have is that most corporations tend to start small, using the success of a pilot to sell it to management."

"Notes [requires] a substantial investment, and it's also difficult to explain to people," added Glen Jurmann, a section manager for the Office Technology Group at Baxter Healthcare Corp. in Deerfield, Ill.

Also difficult to say is how the product will fit into the organization, Greeno said, adding that he cannot find that out unless he tests it.

Another issue raised by Baris is one of centralized vs. decentralized purchasing. In his view — and Lotus seems to agree — Lotus is targeting information systems managers who purchase enterprisewide systems, rather than the department-level managers who purchase desktop software. "It forces us to find different sponsors than the ones who were interested in making the initial investment."

"We are targeting the IS manager or above level — even people often not in the IS chain of command," agreed Brownell Chalstrom, director of business development at Lotus' Communications Systems Group. Price Waterhouse, for example, purchased 10,000 packages, while Electronic Data Systems Corp. in Germany recently bought about 1,400 to start.

Chalstrom claimed that two other Pfizer employees in another group appear ready to make a purchase. "If you just toss Notes into an organization, it doesn't go anywhere," he said.

Lotus' Rokoff *says training will be key to Notes' success*

Yet Texaco, Inc., innovative Notes supporter Brad Jackson sold chunks of one Notes package to various work groups. Out of these pockets of success, he predicts a jump in Notes sales next year. "I was very disappointed in [Lotus'] 'IT czar' approach," he said.

Chalstrom maintained that for qualified prospects, Lotus "will work out arrangements where the customers can do whatever they have to do to convince themselves" that Notes works. He claimed that every customer who has taken advantage of this program has ended up buying Notes. Lotus is working very closely with the "several dozen customers we do have now."

Baris said his Notes sales team has offered what it considers to be creative arrangements, "but it comes down to the issue of if you don't make the $62,500 minimum purchase after a certain period, they'll yank out [what you've got]. And that will leave some users committing to Notes in the lurch."

Closing the window

David Marshak, an analyst at Patricia Seybold's Office Computing Group, said he believes that if this issue keeps Notes from getting onto the "right" person's desk for long enough, that will provide an opportunity for a pending ground swell of related tools in the conference communications and text database areas. "There are great risks in the approach that Lotus is taking," said Marshak, who is also a Notes supporter.

"We have always said that we intend to go into wider distribution, and I guarantee you that a year from now, the sales strategy you see today won't be the only one," Chalstrom said.

There are other issues. Jurmann finds Notes impressive but has technical concerns. It's unclear how Notes will fit into Baxter's Systems Network Architecture. He'll have to junk or update his Intel Corp. 8088- and 8086-based computers, and along with some Texaco employees, he wants calendaring. Lotus needs to correct a problem with replicating servers — one update can wipe out another, according to Paul Norris, a Gartner Group, Inc. analyst — and provide Notes application programming interfaces for developers.

Solving the marketing puzzle

From the start, Lotus has pondered aloud how to properly market Notes, possibly the most sophisticated, if not complex, groupware product available today. These issues still need to be worked out (see story page 1), yet where Notes has gained a foothold, it has won big. Even the hesitant offer kudos.

Most users say Notes goes well beyond basic groupware. It integrates multidimensional electronic mail, computer conferencing and text and data management into an enterprisewide system. Notes saves time and expense by letting users communicate without any direct contact via electronic "nonmeetings," said Brad Jackson, a Notes enthusiast at Texaco, Inc. It also serves as an applications platform.

Lotus is moving quickly to turn enthusiasm into sales — doubling the Notes sales force and translating the program into French and German.

Two major components of Notes' success will be training and support, said June Rokoff, vice-president of Lotus' Communications and Information Services Group.

"Clients are asking not just, 'How do I use this?' but, 'How do I explain to the organization why we'd want to do something like this?' "

Her approach is to put a few of the clients' key business applications on Notes and then talk with users about them.

Lotus is not geared to support small users of Notes, she said. "If they haven't made the mental leap, then we aren't ready to support them." Rokoff said she would like to do "smaller things" someday with Notes, but that will require a "distribution mechanism." Meanwhile, Notes users are asked to make a "people commitment" to the product, she said.

The Notes Alliance Program provides users with support specific to their vertical markets. The still-emerging Consulting Services Group may focus on helping clients deploy, integrate and target Notes, Vice-President Frank Moss said. His consulting services group can also offer unique customization skills and help users change the way in which they work, Moss said.

PATRICIA KEEFE

Analysts: HP reorg puts Young on hot seat

BY J.A. SAVAGE
and NELL MARGOLIS
CW STAFF

PALO ALTO, Calif. — Capping persistent rumors that Hewlett-Packard Co. Chief Executive Officer John Young's days are numbered, the company late last week said his job, if not his title, will be shared for an unspecified period of time with Chief Operating Officer Dean Morton.

In addition to shared management, the company is streamlining its computer-oriented units by combining them into two separate divisions. One division will include networking, workstations and systems; the other will be made up of personal computers and peripherals.

"We'll be sharing the management of the company, as a whole, more broadly than before," Morton said of his new duties with Young. Morton added that his views in running the company are not "substantially different" from those of Young.

Analysts who have been predicting that Young is leaving the company see it differently. "They're effectively taking two executives who have been perceived as warring and stuck them in the same room," said John Jones, an analyst at Montgomery Securities in San Francisco. Other analysts have expressed concern in the last few weeks that the company is too decentralized and needs a stronger central CEO.

While most analysts saw the creation of the jointly occupied "Office of the Chief Executive" as signaling that Young is on his way out, "What it does not necessarily mean, however, is that Dean Morton is in," said Bob Herwick, an analyst at Hambrecht and Quist, Inc. in San Francisco.

"There are basically two scenarios," he said. "Scenario one: Dean [Morton] cuts it and becomes the new CEO. Scenario two: Dean [Morton] doesn't cut it, and he's on his way out. In true Hewlett-Packard fashion, they're going to do this thing evolutionarily."

Plan for the future

Morton denied that he will inherit the office, as both he and Young are 58 years old: "Clearly, we have to plan for [retirement] and position others to help the organization move along." Young has been at HP's helm since 1978.

An HP spokeswoman denied that the move was at the behest of the board of directors, as several analysts have indicated. However, Hambrecht's Herwick claimed the reorganization "was driven by [HP co-founder] David Packard," whom, he said, is "displeased with Young's performance." Packard was not available for comment.

Morton said that the regrouping is an attempt to "flatten the organization and increase the amount of accountability among business units." He added that HP's computer business has been increasing in its complexity, particularly with HP's commitment to open systems. The reorganization will give the divisions a "clearer sense of how they fit" into HP's business plan, according to Morton.

Not much user concern

The general sense among users contacted regarding HP's reorganization is that the move is designed to appease Wall Street more than anything else and therefore will have little impact on customers.

One user, who asked to remain anonymous, said the change in management is really no change at all. "John Young was always making a presentation or speech somewhere. I felt that Dean [Morton] had charge of the day-to-day operations anyway."

"HP has improved over the last few years," said John Robinson, director of corporate information systems at Cox Enterprises, Inc. based in Atlanta. "I had no problem in the way the organization was run under John Young."

"I'm more interested in what the new lineup will be," said Isaac Blake, technical support coordinator for the city of Tempe, Ariz. "The rest is HP's business as long as there's a continuity of service and the user doesn't end up on the short end of the stick."

IBM makes good on several previous printer promises

BY JEAN S. BOZMAN
CW STAFF

BOULDER, Colo. — IBM upgraded its top-down approach to enterprisewide printing last week, replacing a 15-year-old system with a model that fulfills several promises made during recent years and retaining the IBM mainframe as the hub for centralized output.

The IBM 3900, priced at $289,000, is intended as a central-site continuous-feed printer, IBM product managers said. Large firms use the 3900's predecessor, the IBM 3800, to print telephone and utility bills, direct-mail advertising and large documents. The 3900 is scheduled to ship in the second quarter of 1991.

Coupled with Advanced Function Printing (AFP) Release 2.0 software, the IBM 3900 plays a role in the production of enterprisewide documents. The AFP Release 2.0 software allows users to format documents, assign page numbers and handle data compression. It also supports IBM's Print Services facility for MVS, VM and DOS/VSE hosts, supporting the merger of data, text and images.

The Xerox Docutech Production Publisher, which was also announced last week, is not a replacement for the Xerox 9790, a data center printer that will continue to compete with the IBM 3800 and 3900. However, analysts said, Docutech represents a bottom-up approach to printing because it collects information from downstream workstations and local-area networks.

"IBM is putting forward the [Systems Application Architecture] view of distributed processing," said Brandon Nordin, an analyst at BIS CAP International, Inc. in Norwell, Mass. "But in a small company that uses [personal computers] and Apple Macintoshes and Digital Equipment Corp. VAXs as network servers, you wouldn't have access to those centralized IBM printers."

Acting through the network, IBM's AFP supports "distributed printing," in which host-generated documents can be printed at different locations. "The mainframe acts as a central storage device and as a mediating device that controls print access," Nordin said. "This gives an IS manager the ability to distribute print jobs, to bring some printers down for maintenance while others are running or to reallocate the work load if one site has a power failure."

The IBM 3900 prints 229 pages per minute, using continuous rolls of fanfold paper. As such, it serves as an upgrade for the estimated 10,000 slower IBM 3800s deployed worldwide.

Xerox unveils multitalented printer

BY JOHANNA AMBROSIO
CW STAFF

NEW YORK — Is it a scanner that also copies or a printer that also scans? Actually, it is both.

Xerox Corp. unveiled what analysts are calling one of the first "hydra" products: a combination printer, scanner and copier that produces offset-quality documents and booklets. The machine, first in the Docutech Publishing Series, is aimed at electronic publishing applications in large companies.

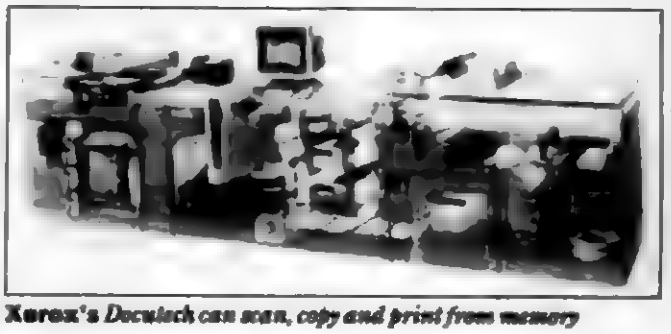
Although observers were impressed with Docutech's technology, some questioned Xerox's ability to sell such a complex machine and wondered whether the product will erode sales of the firm's high-end printers and copiers.

Xerox executives were not shy about hyping the machine. "This is a big day for Xerox and for the industry," said Paul Allaire, president and chief executive officer of Xerox.

Docutech's big advantage, executives said, is its ability to digitally scan and store images in the unit's memory. Users can then request prints or copies to be made from memory. A computer monitor allows machine operators to manipulate images to enlarge or reduce certain items or to change their placement on the document.

The machine can also accept input from a floppy disk. It scans up to 23 documents per minute at a resolution of 600 dot/in. and can print up to 135 copies per minute on regular-size paper. It also handles 58 prints per minute on 11- by 17-in. paper. Docutech costs $220,000.

A networked version will be available next year. This will allow users to create a document at their workstations and send it electronically to Docutech to print. Xerox is working with partners to allow third-party publishing, local-area networks and word processing software to work with Docutech. These partners include Aldus Corp., Interleaf, Inc., Novell, Inc. and Wordperfect Corp.



Xerox's ***Docutech can scan, copy and print from memory***

Over time, Xerox executives said, the networked version will work with many different types of personal computers, workstations and communications protocols.

Docutech was beta-tested at 28 sites, including World Bank in Washington, D.C. "It works; it does everything they say it does," said Charles Salagiver, senior production control clerk. However, the bank has not yet purchased a unit because "we're taking a step back to see what it can do for us."

Indeed, some observers wondered who will buy the Docutech — information systems departments, print shop supervisors or department managers. Xerox has said it will sell into all three places, but "they have not been successful in their past attempts to talk to MIS people," said Joel Levy, managing consultant at Goldstein Golub Kessler & Co. in New York. "I think it will be a successful product; I just wonder how successful it will be."

Angele Boyd, manager of printer research at International Data Corp. in Framingham, Mass., said that Docutech may hurt some of Xerox's high-end copier sales.

Midwest correspondent Michael Fitzgerald contributed to this article.

Second-class postage paid at Framingham, Mass., and additional mailing offices.
Computerworld (ISSN 0010-4841) is published weekly, with a single combined issue for the last week in December and the first week in January by CW Publishing/Inc., 375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171.
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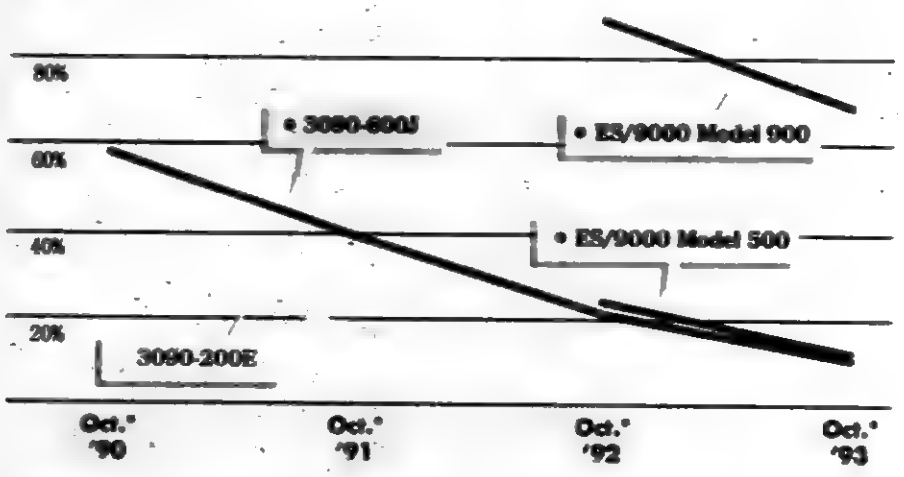
TRENDS

IBM mainframes

Estimates of residual values show that high-end ES/9000s will hold their value best

Model	List price (in millions)	Residual value (in thousands) Current used price	Oct.* '91	Oct.* '92	Oct.* '93
[illegible]	$4.8	$1,320	$868	$458	$193
[illegible]	$10.2	$3,690	$2,335	$1,344	$541
[illegible]	$13.2	$7,700	$5,105	$2,787	$1,438
[illegible]	$4.4	[illegible]	–	[illegible]	$527
[illegible]	$11.1	[illegible]	–	[illegible]	$1,517
[illegible]	$22.8	[illegible]	–	[illegible]	$15,693

Used value as a percentage of list price



*Projected

Source: Computer Economics, Inc., Carlsbad, Calif.

CW Chart: Paul Mock

INSIDE LINES

Windows 3.0 redux

Look for the next version of Microsoft's Windows graphical interface to appear in the first half of next year. Microsoft insiders say Windows 3.1 will include a better interface, improved network support, multimedia extensions and Microsoft's and Apple's collaborative Truetype scalable-font technology built in. Microsoft engineers are reportedly also working on a version of Windows that will recognise handwriting.

Where does this leave OS/2?

Still confused over the "extension" of the IBM/Microsoft development agreement that placed OS/2 squarely as an IBM responsibility? Microsoft head Bill Gates isn't. "In terms of volume, Windows has won, and it's important for us to enhance that," he said during last week's Seybold Publishing Conference. "In terms of the mainstream, Windows is it." That must leave IBM downstream — or perhaps downwind?

Coincidental tourists?

Four vice-presidents have recently resigned from Data General to "pursue other business interests," a company spokesman said. Departing from the Westboro, Mass.-based headquarters are: John Kavazanjian, vice-president of the PC and terminal business unit; Fred Cochrane, vice-president of product engineering; Thomas Palka, vice-president of U.S. sales; and Robert Tway, divisional vice-president of eastern operations, a position that reports to Palka.

Must be that Pepsi training

No one batted an eye last week when Apple CEO John Sculley described one of his company's new commercials as "based on a true story, not one of those truths we had to create." Maybe Sculley's been watching too many playbacks of Apple's award-ing-winning commercial takeoff on George Orwell's acclaimed novel *1984*.

This is only a test

Novell's network naming service for Netware 386 Version 3.1 is on again. At last report, the Provo, Utah-based firm was giving beta-test sites its remote management software to test in place of the naming service. That has switched, and one beta tester installed the naming service on a production server and watched it zap every password and scramble log-ons.

Does your phone bill make you sick?

1st Defense Anti-Viral Systems in Broadview Heights, Ohio, said it has discovered a virus designed to run up a telephone bill on a PC with a modem. The company said the new virus, dubbed the Telecomm Virus or V92, was unearthed by a couple of Texans who, as luck would have it, had copies of 1st Defense's antivirus software. A cynical virus tracker we know can't help wondering if there is a connection.

Brave new world

Microsoft is very serious about multimedia, company product manager Cornelius Willis said at last week's CD-ROM Expo in Boston. The firm is committing $12 million this year to development of systems software and support of both in-house and independent "titles" (don't call them applications). Also, the multimedia "extensions" planned for the next version of Windows will include search functions, which may place vendors offering text search/retrieval software in the position of having to choose between toeing the Microsoft line or risking the market moving out from under their feet.

While Microsoft and others are looking ahead to multimedia-compatible PCs that require IBM VGA-compatible graphics, some are worrying that the hype attending future technology is going to distract the attention of users who have to deal with older systems and deter them from purchasing more pedestrian compact disc/read-only memory offerings. At CD-ROM Expo, most developer attention was devoted to multimedia and other forward-looking technologies with arcane acronyms like DVI, CD-ROM XA and CD-I. Does that mean they're ignoring the need to let the user world catch up or that basic CD-ROM just won't cut it? You tell us. Contact News Editor Pete Bartolik at (800) 343-6474 or message us at COMPUTERWORLD on MCI Mail.

NEXT WEEK

Howard Ory is a lot of things — a physician, an epidemiologist, a birth control expert and an articulate talk show guest. However, the director of information resources at the Centers for Disease Control in Atlanta is definitely *not* your typical information systems director. Find out more about him in a Manager's Journal profile.

Alan Shaw/Gibson

Cyberspace, according to science fiction/cyberpunk writer William Gibson, is already here. Or there. In a new essay, Gibson explains that technology has generated a new territory: "a Wyoming writhing in some eerie interstice between concept and silicon." In Depth also has an excerpt from Gibson's forthcoming book, *The Difference Engine*.

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NAS. The pe
for an impe

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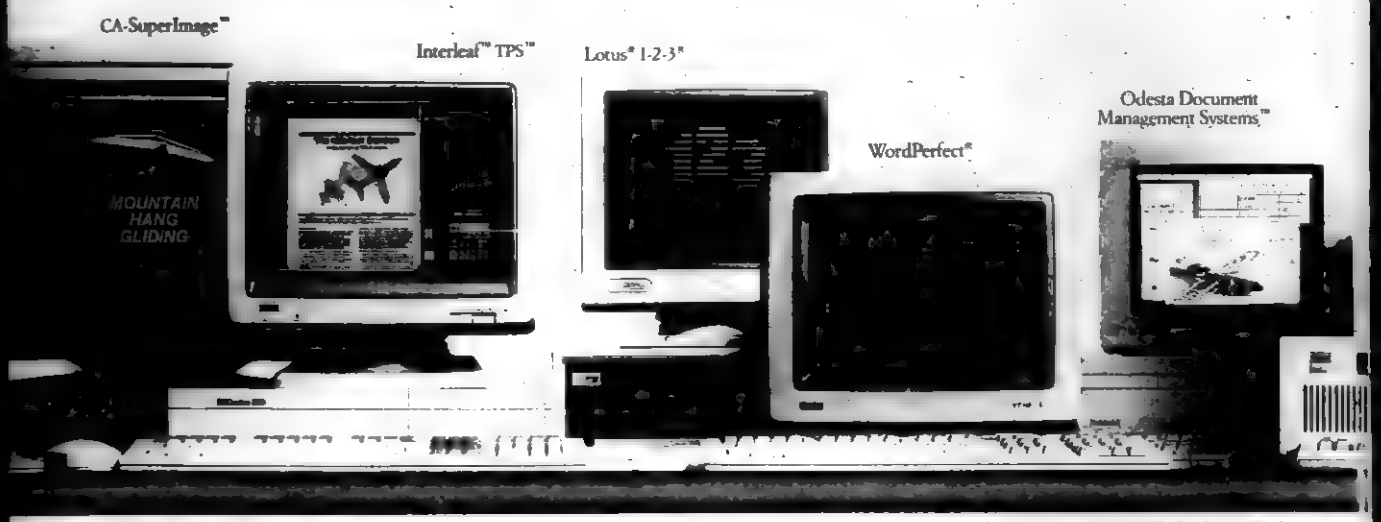

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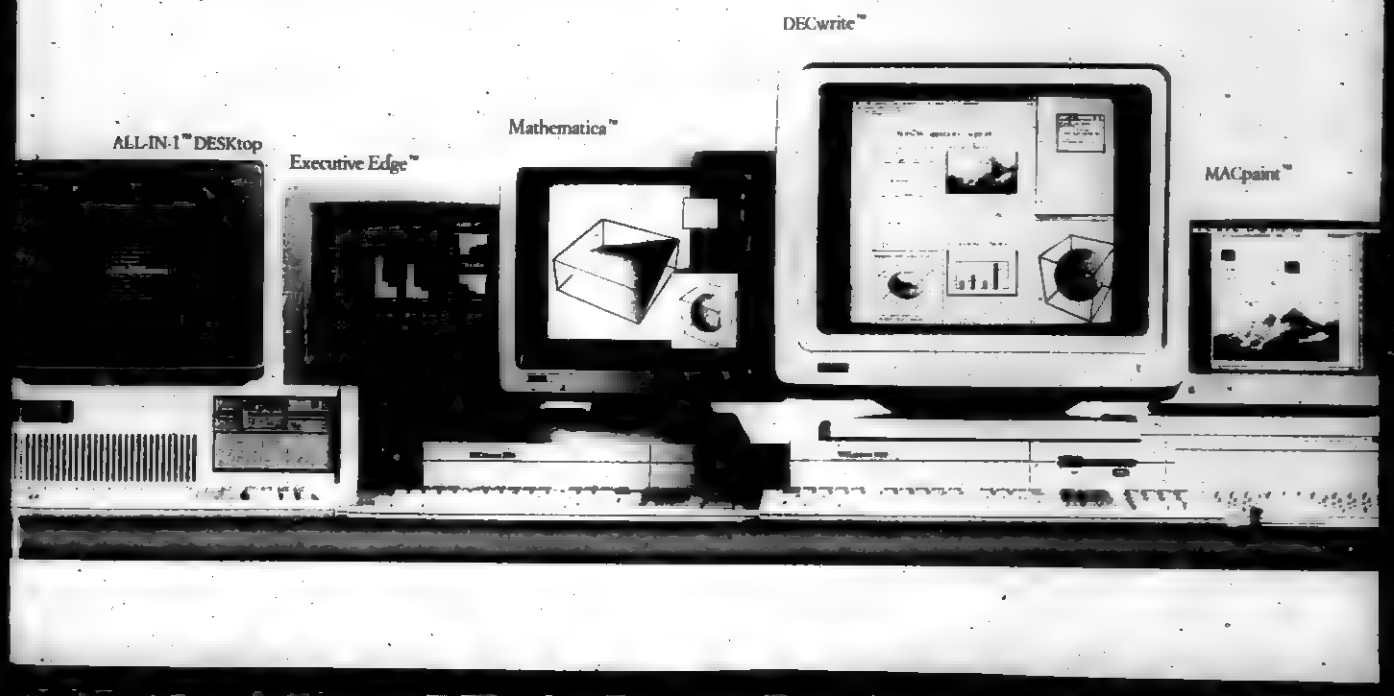

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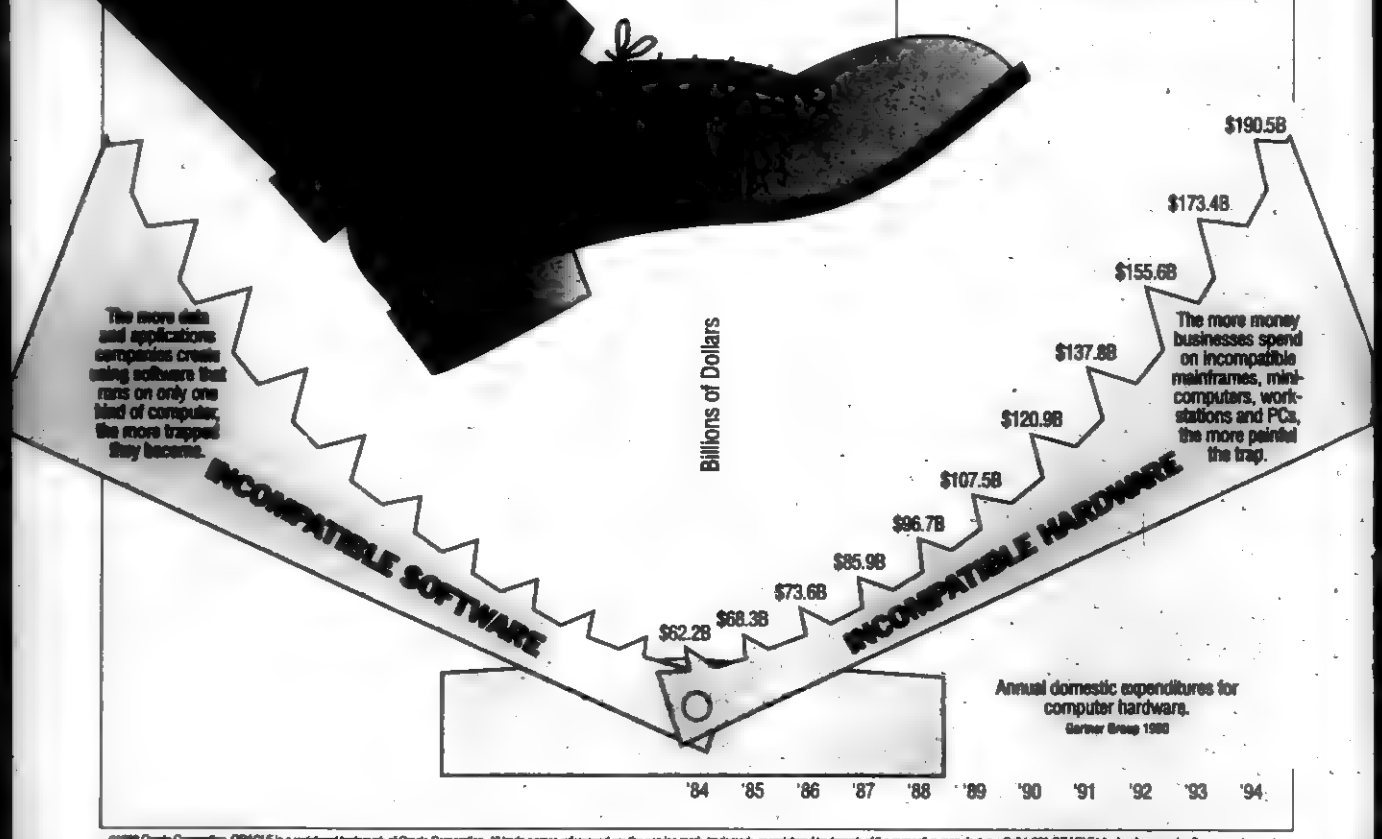

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Cover
Sculpture: P.M. Designs
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More Than Money

Stephen Sherman

The 1990 Premier 100 Team: *(From left) Joseph Maglitta, Derek Slater, Nancy Kowal, Michael Sullivan-Trainor, Kelly Dwyer and Joyce Chutchian*

Money alone, nearly anyone can tell you, will not buy happiness and friends. Nor success using information technology.

It's true that a company needs to spend money on information technology often just to stay competitive. But to be considered "effective," organizations also need to *make* money over the long haul. That's why the *Computerworld Premier 100* is not simply a roster of big spenders.

Besides being tied to IS spending, our rankings are based on five other carefully selected criteria, including long- and short-term profitability. We also look at the market value of the major systems to determine whether a company is using current technology. Investments in people are as important as investments in hardware, so our ranking also includes percentages of budget for staff and training. Technology access via PCs and terminals is also vital to company effectiveness, so another ratio covers this dimension.

The *Computerworld Premier 100* is actually two lists in one: an overall ranking of IS effectiveness across all industries, and separate rankings of the Top 10 in each industry.

This ranking system is used by companies as a measure of the value of their IS organizations. Each year, we get hundreds of reprint requests from firms wondering how *they* are doing.

More than six months of research and editorial work went into this year's *Computerworld Premier 100* issue. With job hopping at the top levels of IS still common, our staff had to make thousands of calls to track down IS chiefs at 500 corporations. Hundreds of hours of intense analysis went into verifying and calculating the survey data.

We extend congratulations to the winners, appreciation to the participating companies and an invitation to see how America's best put information technology to effective use.

Joseph Maglitta

Michael Sullivan-Trainor

Michael Sullivan-Trainor
Senior Editors

Top IS Users Soar Above Tough Times

BY MICHAEL SULLIVAN-TRAINOR

AND JOSEPH MAGLITTA

Gone are the days when information systems could hide in the back office, sheltered from the turbulent winds of corporate change. As technology plays a greater role in determining company success, information systems professionals are facing the same challenges as their peers in other front-line departments.

Nothing illustrates this shift more clearly than *Computerworld*'s *1990 Premier 100* rankings. Each of the qualifying companies exemplifies the new role of IS.

Now, rather than focusing only on the latest IBM announcement, *Premier 100* executives are grappling with the various challenges of their industries. Financial services firms such as Paine Webber, Inc. are struggling with Wall Street's woes. Defense contractors such as General Dynamics Corp. are anticipating large reductions in their government business. Retailers such as Sears, Roebuck and Co. are battling reduced consumer spending. All the companies on the list are battening down for the looming recession.

However, the biggest factor that causes these companies to rise above various business booby traps is their continued commitment to IS — despite corporate performance dips and anxiety about the future. Not coincidentally, faith in IS corresponds closely to a company's ability to remain profitable despite tough times.

For example, **MCI Communications Corp.** — the only company to rank in the *Premier 100* Top 10 three years in a row — repeats its first-place ranking in 1990 with a 61% increase in profitability from 1988 to 1989 and a 40% increase in its IS budget (from $285 million to $400 million). These achievements are the products of continued victories in the organization's competitive battles with its long-distance service rivals as well as expansion and strategic alliances.

FMC Corp. rockets to second place this year with a $110 million IS budget (an increase of 10%) and significant investments in new equipment. For example, IS spending in the company's agricultural

Illustration by Robert Crawford

100

chemicals group has increased 200% in the past three years. During that time, three plants were upgraded on the industrial chemicals side of the business, along with investments in computer systems for sales and marketing. At the same time, the company's profitability increased 21% from 1988 to 1989. All these events occurred at a time of aggressive competition in the chemicals industry and threatened defense cutbacks, which could affect half the company's business.

American Airlines and its parent, **AMR Corp.**, continue to wing along atop the transportation industry. The company reduced its billion-dollar IS spending by less than 1%, while maintaining its commitment to Sabre and planning a major downscaling of the massive computer reservation system. Profit for AMR was also down 5%, contributing to its slippage in rank to fourth overall.

Other companies continue to be committed to technology despite profit problems — a tribute to the IS executive's ability to support the technology program in difficult weather. **Sears** vaulted to 12th place in 1990 on the strength of a 20% budget increase and profit growth of 3.8%. Yet the $54 billion giant is struggling in 1990, and cost-reduction pressure is mounting. Nevertheless, a strong management commitment to technology continues and may help pull the company back into the limelight.

Bankers Trust New York Corp. is riding a roller-coaster earnings cycle. The volatility of South American loans made it No. 1 in profit growth in 1988 and dealt the company a loss in 1989. However, the bank's commitment to IS remains unswerving. Such support has allowed the company to build a pioneering architecture that supports global operations at a time when other companies are struggling to reach beyond their current systems to support a worldwide market.

INDUSTRY RANKINGS
Average point totals for vertical industries

Industry	Average
Transportation	26,891
Banking	26,465
Utilities	26,452
Chemicals	26,143
Aerospace	26,088
Diversified Services	25,948
Petroleum and Mining	25,913
Industrial and Automotive	25,796
Retail	25,517
Financial Services	25,486
Consumer Products	25,398
Equipment and Materials	25,292
Pharmaceuticals and Food	25,262

Overall, the *Premier 100* Top 10 increased spending by an average of 8%, or 5.4% of their total revenue, down 0.2% from last year's Top 10. Investments in current computer systems increased by an average of 6%, but the ratio to revenue actually decreased by 0.2%. Investments in personnel also decreased by an average of 5%, and training expenditures remained about even. The growth area is personal computers and terminals, which increased by an average of 12%.

As significant as the statistics are, the way that these investments are applied make the difference between *Premier 100* winners and the rest of the pack. One key ingredient to a recipe for IS effectiveness is the ability to carry out a unified vision of where technology integrates with business requirements. For the top companies, this statement is more than motherhood and apple pie: It is the way they do their jobs.

For example, MCI succeeds because its IS investments are intrinsic to the development and growth of its network — the single most important element in the company's arsenal. Savvy marketing and key strategic relationships would falter without a solid systems infrastructure to back them up.

American Airlines is likewise guided by such single-minded vision. Sabre is the focus of the company's attention, and IS is responsible for making it work and making it work well.

A unified sense of where technology should be applied and how to apply it permeates the atmosphere of IS operations at FMC, 3M Co. and Caterpillar, Inc. as well.

As important as insight into systems applications are the tools to carry out the functions. Leading-edge technologies or ways to revitalize old applications are vital to carrying out the promise of IS. All of the top companies employ current technology to get the job done. But some stand out

THIS SEASON, CORPORATIONS WANT A LEAN, MEAN IS MACHINE

Leaner, more supple and closer to the action is how firms want their IS organizations, IS executives say.

Rather than centralize or decentralize, executives report that their organizations are crafting new, hybrid structures combining both forms. In fact, a survey of companies reveals that more than half (56) are now operating "mixed" IS organizations. Another 24 retain centralized structures, while 12 are fully decentralized.

Proponents of mixed structures include the following: FMC Corp., General Dynamics Corp., Abbott Laboratories, ALCOA and Pacific Mutual Life Insurance Co. Centralization is favored by Paine Webber, Inc., The Travelers Corp. and Signet Banking Corp., to name a few. Among the larger decentralized companies are American Express Co., Gencorp, Inc. and United Technologies Corp.

According to IS managers, the new hybrid structures let organizations take advantage of local access to technology while still providing overall guidance for systems efforts from the central organization.

An important related development is the fast-growing popularity of data center consolidation as a cost-cutting measure. All told, 43 of the companies report that they have merged or consolidated data centers over the last year — thanks to better and more efficient technology. Another 27 expect to do so in the coming year.

Typical among consolidators is Edwin Sherin, senior vice-president of IS at Primerica Corp., who reports: "We will continue to implement a data center consolidation effort which will yield significant expense savings."

Ameritech reports data center consolidations from 14 to four over a five-year period.

Consolidation is especially popular among aerospace firms, which are also restructuring and downsizing in anticipation of federal defense budget cutbacks.

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more than others.

Merck and Co.'s Albert Cinorre, vice-president of computer resources, oversees an IS budget of $185 million. Traditionally a major Wang Laboratories, Inc. shop, Merck has turned to the latest IBM systems to speed drug development, particularly in the area of molecular modeling.

Such investments in the latest systems must be tempered today with a keen awareness of budget contraints. Cost efficiency is a major theme among the most effective users of IS. At **FMC**, for example, no processor is bought before its time. The systems are purchased at the beginning of their cycle below peak costs and are jettisoned before their value expires. But more than that, the latest 3090 or direct-access storage device will not cross the threshold of the organization's computer center without a proven business requirement for the system.

The IS group at **Caterpillar** is also adamant that technology usage match business requirements. This emphasis coincides with a management direction that ties investments to the total business rather than a single task. For example, Caterpillar is engaged in a five-year project called "Plant With a Future" that will revamp the company's 32 facilities worldwide by 1992 through the use of the latest systems.

Other companies emphasize process and integration with the company culture as subtler ways to fashion effective IS organizations. **General Dynamics** focuses on total quality management, where less than 100% quality is unacceptable. Such concentration speeds application development by involving more user participation and embeds the philosophy of doing it right the first time into the organization's culture.

Likewise, 3M is a company that lives by innovating. Its manufacturing process is marked by continual enhancement and reinvention of its products. IS at 3M is the life-support system, making innovation possible through speeding idea development to later process stages and using standards to guarantee uniformity throughout the world.

Last but still key is an emphasis on the people who run the IS operations. Companies such as **Paine Webber** and **Union Texas Petroleum Holdings, Inc.** empower those involved in IS — both users and technical specialists — by giving them control over their work and exposure to both technical and business requirements. In fact, Paine Webber recently fired 71 outside consultants and entrusted their projects to internal staff to cut costs and to show faith in the staff at the same time.

The *Premier 100* also tells the story of companies that, despite strong efforts, find it difficult to keep up with the highfliers in the choppy IS stratosphere. Though they are still effective IS operations, the companies are finding that business circumstances are taking their toll. Among these are **Baxter International, Inc.**, which fell from the lofty position of eighth overall and No. 1 in manufacturing last year to 50th this year because of significant downsizing and restructuring, leading to a $50 million reduction in the IS budget. Michael Heschel, Baxter's well-known IS chief, moved over to head IS at Security Pacific Corp.

Modest increases in spending and profit at **Dow Chemical Co.**, another industry winner last year, caused it to be passed by other fast-rising companies. The company relocated five spots lower on the list, with continued data center consolidations as the major activity.

Lockheed Corp. toppled down on the list because of a large reduction in profit accompanied by changes caused by a restructuring of the aeronautical group, shutting down operations in California and consolidating in Georgia.

Northrop Corp. also fell lower on the list with a 23% budget cut as part of consolidations and streamlining. This cut was accompanied by a large drop in profits.

Other companies, such as **Northeast Utilities**, which captured the top rank overall in 1988, simply failed to keep up with the pack. Modest budget and value increases of less than 2% and personal computer and terminals boosts of less than 10% coupled with a 10% profit drop caused the company to fall further down the list.

All the ups and downs of life at the top of IS evidenced by the *Computerworld Premier 100* show the battle scars of the 1990s. And to think it's only the beginning of the decade. □

HIGHEST TRAINING RATIOS

Percentage of IS budget spent on training

Corporation	Percent
3M Co.	7.2
FMC Corp.	7.0
The Travelers Corp.	7.0
Union Carbide	7.0
MCI Communications Corp.	6.0
Merck and Co.	6.0
Becton, Dickinson and Co.	5.4
Northeast Utilities	5.2
Sears, Roebuck and Co.	5.2

BIGGEST PC USERS

Top 10 PC to employee ratios

Corporation	PCs: employee
The Mutual Life Insurance Co. of New York	1.58 : 1
MCI Communications Corp.	1.55 : 1
US West	1.50 : 1
AMR Corp.	1.29 : 1
Bankamerica Corp.	1.29 : 1
Signet Banking Corp.	1.25 : 1
Louisiana Land and Exploration Co.	1.21 : 1
The Travelers Corp.	1.15 : 1
Oryx Energy Co.	1.10 : 1
Union Texas Petroleum Holding Co.	.95 : 1

SPENDING HIGHS AND LOWS

Largest IS budget

Corporation	1990 IS Budget (millions)	Overall rank
AMR Corp.	1,214	4
Boeing Co.	1,164	49
Sears, Roebuck and Co.	990	12
Ameritech Applied Technology	880	23
American Express Co.*	874	11

Smallest IS budget

Corporation	1990 IS Budget (millions)	Overall rank
Louisiana Land & Exploration Co.*	7	86
The Penn Central Corp.*	15	75
Jostens, Inc.*	16	100
Freeport-McMoran, Inc.	17	70
Union Texas Petroleum Holdings, Inc.	18	5

*Budgets are based on *Computerworld* estimates.

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PREMIER 100

Survey:

HIGH PRESSURE, HIGH STAKES

BY MICHAEL SULLIVAN-TRAINOR
AND JOSEPH MAGLITTA

More pressure. More money. More business focus. The new reality is unmistakable: Information technology has become a much higher-stakes game.

Top information systems executives say their companies are counting on information technology more than ever to shore up and even expand their businesses. Any doubts about the passing of the sheltered, glass-house days of data processing are dead as an IBM 360. To be in IS today means to be in business. Big business.

That's the clear message from the first-ever poll of *Computerworld Premier 100* firms. The telephone survey was conducted by First Market Research in Boston, between Aug. 27 and Sept. 12. Respondents were 92 top information executives in *Premier 100* companies.

Of course, life in a faster lane has its pluses: Despite a choking national economy, most IS managers say their budgets have *increased* this year. Nearly six in 10 got hikes that averaged a healthy 17.2% for 1990.

"[IS spending] is like a wheel," says William Friel, an executive vice-president at The Prudential Insurance Co. "We are consistently driving down the unit cost of computing, but we are investing more to deliver more applications supporting the business thrust."

Q During the past year, do you believe that the degree of scrutiny by top management and shareholders has increased, decreased or stayed about the same?

A

Increased	70
Stayed the same	21
Decreased	0

Number of respondents (Base: 91)

Only about one in 10 IS budgets took a cut. The average decrease was 15.8%.

The extra cash comes at a price, however. Companies sinking more money into information technology want more payback for their dollar. The result is that IS managers are feeling more top managers breathing down their necks. Nearly three-quarters say they are more closely scrutinized by top management and stockholders than they were a year ago.

"We have had moderate budget increases, but every increase is tied to specific projects that are expected to save the company big bucks," says Alfred Caponiti, director of data and database administration at Bell Atlantic Corp.

This reality, among others, has led three-quarters of the respondents to set up programs to measure the value or effectiveness of information technology. Results, however, have been mixed: More than half rated their program only "somewhat successful."

With more responsibility also comes more worry, executives say. What keeps top IS managers awake at 3 a.m.? Increasingly, it's the same

Q In your opinion, what will be the biggest challenges facing your IS department in the coming year?

A

Top four answers

Improving products and services and keeping costs down	30
Implementing new systems and staying current with technology	25
Integration of systems and data	15
Finding qualified people and developing skills	7

Number of respondents (Base: 92)

issues that keep their business counterparts awake: the need to make profitable, competitive products; handling technological change and integration; worldwide recession; and disenchanted customers.

"Because of the competitiveness within the banking industry, everyone is taking a tighter look at the bottom line," says Bob Sevacko, manager of data center operations at Wells Fargo and Co.

Predictably, most IS executives in every industry say they expect competition to get tougher during the next year.

Many IS executives' worlds are also getting bigger — and fast. Nearly half say their IS organizations expanded abroad or began offering systems support outside the U.S. during the past year. Their confidence level is high; the majority think U.S. companies are more effective users of information technology than Japanese or European firms, especially the latter.

Yet despite a new, strong business focus, IS executives haven't forgotten that their big weapon is still technology. Imaging systems in particular are seen as having the "most critical" value for competitive success during the next five years, followed closely by local-area networks and computer-aided software engineering (CASE) tools. Interestingly, media darlings such as workstations, distributed processing and Integrated Services Digital Network ranked at the bottom of the list.

Faith in technology remains high. A full 98% say that advanced or leading-edge technology is critical or important to their competitive survival. "Local and long-distance telephone services are extremely competitive now," says Derek Bailey, manager of systems and operations at United Telecommunications. "Without the advantage in clarity that our fiber-optic technology gives us, we would not be able to compete."

Q How important is advanced or leading-edge technology to staying competitive in your industry?

A

Critical	24
Very important	47
Somewhat important	20
Not very important	1

Number of respondents (Base: 92)

Indeed, the idea of using information technology to get a leg up on the competition is far from dead. During the last 12 months, two-thirds of the respondents installed an information system with the express purpose of providing competitive advantage.

REDESIGN TREND

Premier 100 companies are not merely throwing dollars at technology, though. Most recognize a clear need to fundamentally change the way they do business. To this end, a whopping four-fifths say they have redesigned or re-engineered a key business process to take advantage of information technology. The trend is expected to continue.

Nearly three-quarters have looked into outsourcing. Half say they will outsource all or part of their operations within the next 12 months.

For example, the refining and marketing branch at Sun Co. has signed a letter of intent to outsource its data operations. "We are getting rid of surplus computing power and building space. The end result is significant savings," says Edward Parrish, director of IS.

In the executives' own companies, sales and marketing are hot spots demanding attention, followed by manufacturing and customer service.

Faced with both technical and business challenges, how do top IS managers plan to survive the next few years? Most executives say good technology planning and integration are key. Also required, they say, is a strong top management buy-in and extra attention to staffing and training.

"The people you hire are extremely important," says Karen French, manager of programming at Ingersoll-Rand Corp. "Without strong commitment from management, we take a few steps backward and become a file server-type operation, instead of an integrated part of business planning."

Q What is the single biggest challenge now facing your industry?

A

Top four answers

Technological change and integration	21
Providing profitable and competitive products	20
Expense control and low-cost production	10
Worldwide recession and global situation	7

Number of respondents (Base: 92)

Q Has your company's IS budget increased, decreased or stayed the same during the past year?

A

Increased	53
Stayed the same	21
Decreased	15

Number of respondents (Base: 89)

Their advice for rising IS stars? Besides learning the business, IS executives say to focus on keeping technically current and acquiring good people skills.

In the long term, some IS executives foresee that the blurring between technology and business will eventually extend deeper into company ranks.

"If you look at the decade ahead — especially the end of the decade — I think it will become very difficult to distinguish the programmer from the business person," says Jim Gottardi, manager of IS at Phillips Petroleum.

"The distinction we see today will blur. CASE technology, for example, may ultimately allow a fairly nontechnical person with limited [or no] knowledge of programming languages to develop a working application," he says. □

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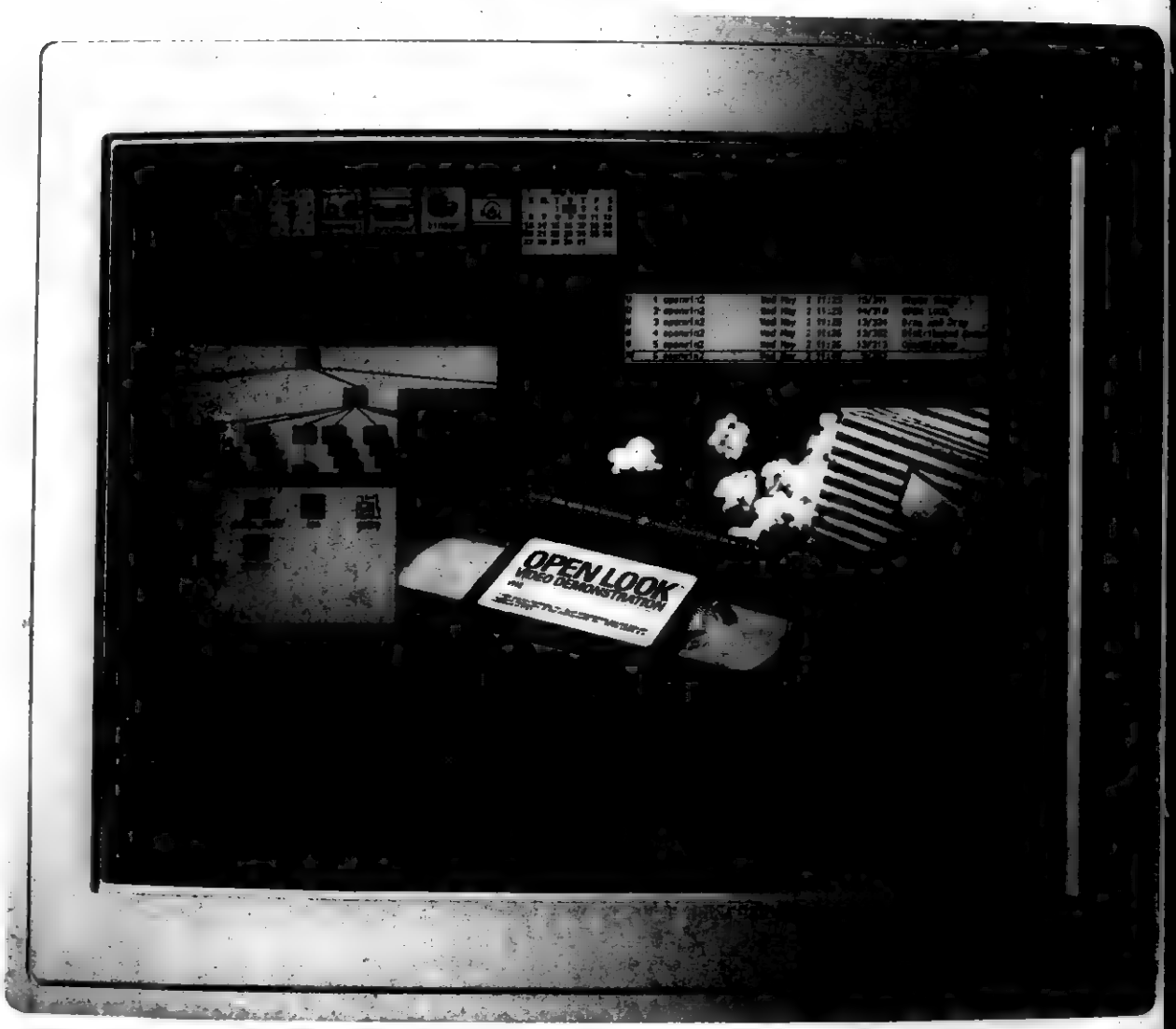

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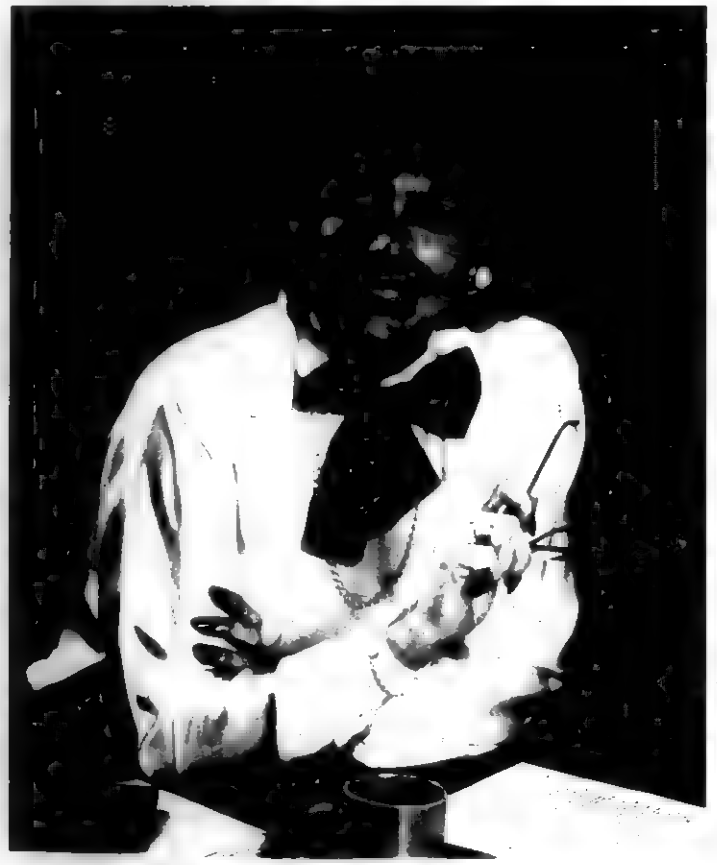

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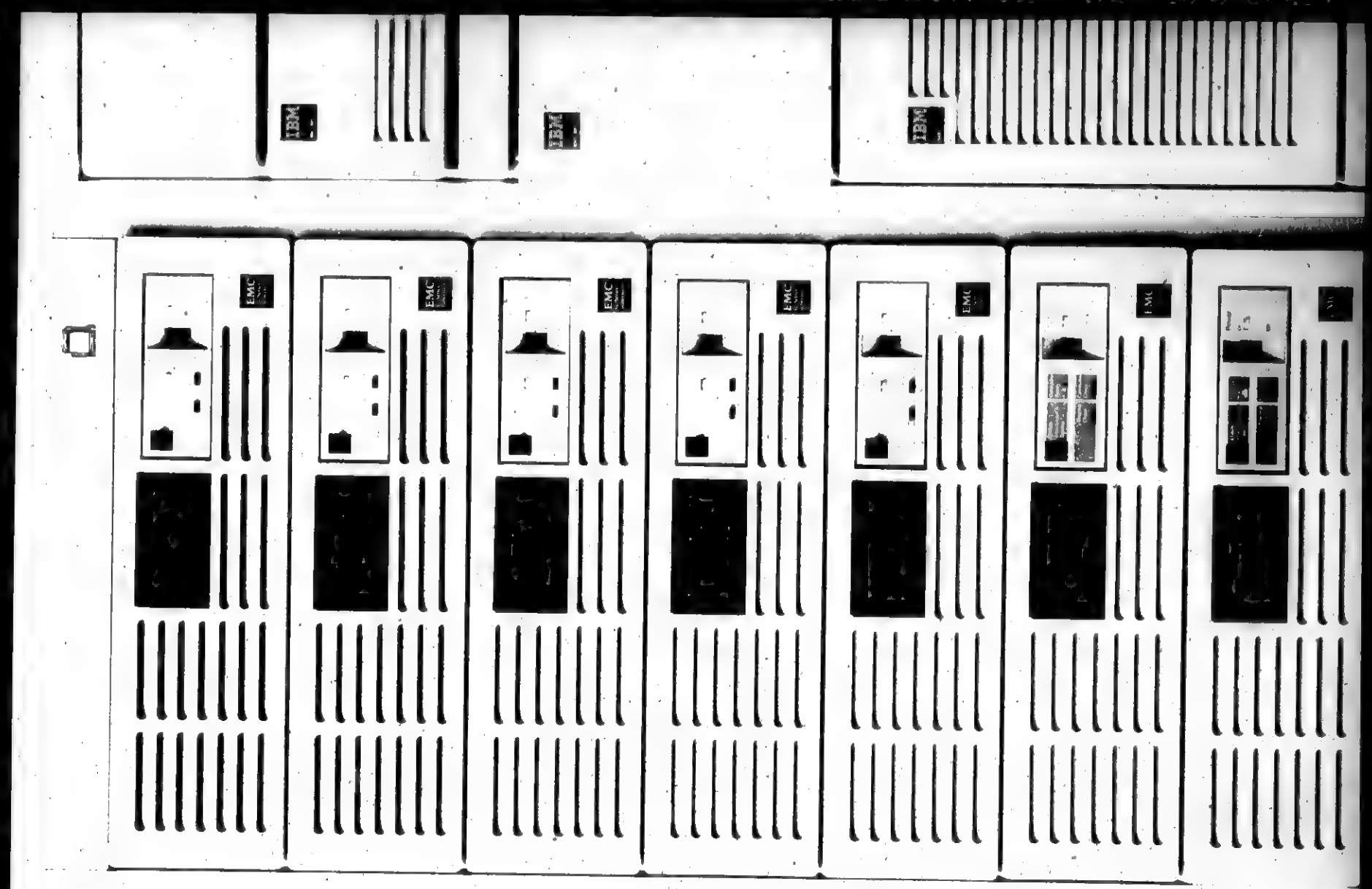
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GUIDE TO TABLES

HOW WE RANK THE PREMIER 100

TARGET GROUP
To qualify for Computerworld's Premier 100, a company must be publicly traded, U.S.-based and in the top half of its vertical industry group as listed in the annual "Fortune Industrial 500" or "Fortune Service 500". Only parent companies are ranked; subsidiaries are considered under parent company affiliations. Firms that make the majority of their revenue from the sale of information systems and related products are not included in the ranking.

DATA GATHERING
Premier 100 companies are ranked based on data gathered in an extensive survey that involves mail surveys followed by telephone interviews. Data is collected from the chief information systems executive in the organization. In a limited number of cases where the company does not supply data, Computerworld generates estimates based on market research and other sources. All estimates are confirmed prior to rank calculation.

RANK CALCULATION
Overall scores are based on the sum of point totals of six criteria: 1) IS budget 2) five-year profit average 3) current market value of major processors 4) percentage of budget spent on staff 5) percentage of budget spent on training and 6) ratio of personal computers and terminals to total employees. Each criterion is calculated separately for all firms in the target group. Point totals, which are weighted according to their relative importance, are then combined, yielding a final score.

IS BUDGET
The IS budget is measured as a percentage of total revenue. This levels the field, so that the largest firms, which are able to invest significantly more in IS, do not dominate the ranking.

To account for differences in spending levels between industries, a company's budget/revenue percentage is then compared with the average for IS spending as a percentage of revenue for that company's industry.

For example, a bank's percentage is compared with an industry average spending percentage of more than 4%, while a retailer's percentage is compared with an average percentage of 1%. The firms that achieve the greatest difference between their percentage and the average for their industry receive the most points. This is weighted by a factor of 30.

PROFIT AVERAGE
The ranking employs a rolling, five-year profit average. In the 1990 edition, profits for '85,'86,'87,'88 and '89 were considered. The companies with the largest average growth in profits received the most points, weighted by a factor of 15.

PROCESSOR VALUE
The value of major processors, specifically mainframes and minicomputers, is calculated based on what the systems would be worth if they were sold on the market today. This figure is then divided by total revenue so that large firms do not automatically gain more points. The percentage of value to revenue is weighted by a factor of 15.

STAFF AND TRAINING
Calculations for staff and training are based on amounts for those items compared with the IS budget. Fewer points are given for a larger percentage spent on staff. More points are given for a larger percentage spent on training. Points for staff percentages are weighted by a factor of 10. Training points are weighted by a factor of 15.

PCS AND TERMINALS
The total numbers of PCs and terminals are added together and then divided by the total number of employees to obtain this ratio. Points for the ratio are weighted by a factor of 15.

DEFINITIONS

CHART TYPES
Following this page is the main chart listing data for those companies that qualified for the Top 100 ranking. Each vertical industry section also contains a chart that lists data for the Top 10 companies in specific industries, regardless of whether they qualified for the Top 100.

IS BUDGET
Figures represent 1990 totals for corporatewide capital and operating budgets for information systems and services. Expenditures for staff, hardware, software and data communications are included. Not included are telecommunications costs or spending on information technology by departments other than IS.

1989 PROFIT
Profits used in the ranking are after taxes and after extraordinary credits or charges. Profit for mutual insurance companies is based on net gain from operations, and revenue is based on premium and annuity income plus net investment income.

MARKET VALUE
Figures are totals for the current market value for all major processors, including supercomputers, mainframes and minicomputers. They reflect the dollar value of the systems if they were sold on the market today, regardless of whether the company owns or leases the systems.

OTHER STATISTICS
Training figures include in-house and off-site costs. Staff figures include salary, benefits and travel. The total number of personal computers and terminals include brokerage systems, travel agent systems and retailing systems in all user departments and IS. Revenue for banks includes interest income plus other operating income.

FOOTNOTES
++ on the main chart indicates the following: Bankers Trust — reflects accounting for a loss in Latin American loan reserves; Bell Atlantic — reflects extraordinary charges of $75.7 million for a change in accounting method and $244.8 million for restructuring and other charges; FMC Corp. and Carter Hawley Hale Stores, Inc. — reflects extraordinary charges of at least 10%.

The 100 Most Effective Users of Information Systems

Overall rank	1989 rank	Company IS executive	Industry	Industry rank	Total score	IS budget (millions)
1	1	**MCI Communications Corp.** Allan Ditchfield, Senior VP	utilities	1	28,530	$400
2	—	**FMC Corp.*** Dan W. Irwin, VP	chemicals	1	28,450	$110
3	4	**Bankers Trust New York Corp.** Carmine Vona, Executive VP	banking	1	28,200	$400
4	3	**AMR Corp.** Max D. Hopper, Senior VP	transportation	1	28,100	$1,214
5	19	**Union Texas Petroleum Holdings, Inc.** Richard L. White, Director	petroleum	1	27,905	$18
6	6	**General Dynamics Corp.** Asaph H. Hall, VP	aerospace	1	27,855	$585
7	48	**Paine Webber, Inc.*** Robert McKinney, CIO	financial services	1	27,755	$200
8	15	**Norwest Corp.** Brian Phillips, Executive VP	banking	2	27,710	$133
9	5	**Banc One Corp.** Dave Von Lear, President, Services Corp.	banking	3	27,565	$235
10	13	**Gencorp, Inc.*** Linda George, Director	aerospace	2	27,525	$40
11	44	**The Dun & Bradstreet Corp.** Michael S. Field, President, IS	diversified services	1	27,465	$750
12	—	**Sears, Roebuck and Co.** Charles A. Carlson, President, Technology Services	retailing	1	27,390	$990
13	10	**Gillette Co.*** Herbert W. Moller, VP	consumer products	1	27,375	$112
14	—	**Chicago & North Western Transportation Co.*** Ed Lillig, VP	transportation	2	27,250	$42
15	74	**Signet Banking Corp.** Floyd Griggs, Executive VP	banking	4	27,210	$57
16	11	**Martin Marietta Corp.** Raymond S. Wiltshire, VP	aerospace	3	27,150	$291
17	7	**Security Pacific Corp.** Mike Heschel, Chairman and CEO, Automation Co.	banking	5	27,105	$431
18	—	**United Telecommunications, Inc.*** Art Krause, Executive VP	utilities	2	27,060	$138
19	—	**Comerstates Financial Corp.** Robert Gilmore, Executive VP	banking	6	27,055	$71
20	16	**The Dow Chemical Co.** Dave Butler, Director	chemicals	2	27,050	$347
21	2	**GTE Corp.*** Joseph Rasmussen, Director	utilities	3	27,000	$750
22	14	**Bell Atlantic Corp.** Joe Ambrozy, VP	utilities	4	26,930	$709
23	—	**Ameritech Applied Technologies** Henry Kozik, Manager	utilities	5	26,895	$880
24	—	**Allied-Signal, Inc.*** Donald Fleming, Director	aerospace	4	26,880	$372
25	—	**Air Products and Chemicals, Inc.** Peter Mather, VP	chemicals	3	26,685	$46
		Medians for all Premier 100 companies			25,635	$158

* Estimates are from *Computerworld* sources, not the company ↔See footnotes, page 17

IS budget as % of revenue	Processor market value (millions)	Market value as % of revenue	Total IS staff	% of IS budget for staff	% of IS budget for training	Total PCs and terminals	PCs/terminals: employees	'89 profit (millions)
6.15%	$226	3.48%	1,700	43%	6%	29,500	1.55 : 1	$529
3.18%	$35	1.01%	NA	37%	7%	7,200	.74 : 1	$136
5.48%	$75	1.03%	1,535	37%	1%	9,000	.65 : 1	$(980)++
11.46%	$97	0.92%	4,000	26%	1%	124,000	1.29 : 1	$455
1.55%	$18	1.55%	96	44%	1%	1,800	.95 : 1	$173
5.82%	$250	2.49%	5,950	42%	2%	28,000	.29 : 1	$293
6.84%	$12	0.41%	NA	49%	2%	10,357	.80 : 1	$139
4.54%	$49	1.67%	890	32%	2%	15,500	.84 : 1	$237
7.34%	$40	1.25%	1,100	30%	5%	14,000	.58 : 1	$363
2%	$15	0.75%	NA	36%	5%	8,700	.58 : 1	$210
17%	$150	3.47%	12,000	45%	3%	50,000	.71 : 1	$586
1.84%	$613	1.14%	6,500	39%	5%	332,350	.75 : 1	$1,509
2.93%	$85	2.23%	NA	50%	5%	8,500	.28 : 1	$285
4.34%	$11	1.09%	NA	39%	2%	4,598	.61 : 1	$(21)
4.18%	$18	1.31%	683	43%	3%	7,107	1.25 : 1	$123
5.02%	$62	1.07%	2,505	35%	2%	20,100	.44 : 1	$307
4.3%	$125	1.25%	6,500	46%	1%	31,000	.75 : 1	$741
1.83%	$75	0.99%	NA	39%	4%	38,636	.93 : 1	$343
5.26%	$17	1.26%	710	43%	1%	10,000	.83 : 1	$240
1.97%	$100	0.57%	1,900	34%	5%	32,000	.52 : 1	$2,486
4.3%	$140	0.8%	NA	37%	5%	90,000	.57 : 1	$1,417
6.19%	$416	3.63%	3,400	34%	4%	66,000	.83 : 1	$1,070++
8.62%	$115	1.13%	4,700	45%	4%	65,000	.86 : 1	$1,238
3.09%	$159	1.32%	NA	47%	3%	33,543	.31 : 1	$528
2.29%	$5	0.24%	368	42%	1%	5,180	.49 : 1	$289
2.71%	$45.5	0.93%	1,800	41%	3%	13,735	.55 : 1	$299

The 100 Most Effective Users of Information Systems

Overall rank	1989 rank	Company IS executive	Industry	Industry rank	Total score	IS budget (millions)
26	25	**American Express Co.** Roy Lowrence, VP, Corporate	financial services	2	26,675	$874
27	30	**US West** Winston Wade, VP	utilities	6	26,645	$263
28	46	**Federal Express Corp.** Ron Ponder, Senior VP	transportation	3	26,625	$234
29	21	**Southwestern Bell Corp.** Donald A. Reeb, Manager	utilities	7	26,610	$294
30	24	**3M Co.** Donald Siegfried, Executive Director	manufacturing	1	26,540	$469
31	11	**Atlantic Richfield Co.** John Coman, Manager	petroleum	2	26,465	$237
32	—	**Oryx Energy Co.** W.M. Fore, Director	petroleum	3	26,455	$27
33	—	**Phillips Petroleum Co.** P.J. Gottardi, Manager	petroleum	4	26,440	$160
34	—	**Pacific Mutual Life Insurance Co.*** William A. Roberts, VP	financial services	3	26,420	$57
35	69	**Caterpillar, Inc.** Dale Fieldcamp, Director	industrial	1	26,405	$300
36	—	**Salomon, Inc.*** John Golonte, VP	financial services	4	26,395	$335
37	32	**Monsanto Co.** Leonard A. Cohn, VP	chemicals	4	26,365	$190
38	57	**Merck & Co.** Albert C. Cinorre, VP	pharmaceuticals	1	26,310	$185
39	9	**Contel Corp.*** Chuck Acheff, Acting Director	utilities	8	26,305	$150
40	—	**Bankamerica Corp.** Martin Stein, Executive VP	banking	7	26,300	$497
41	20	**Grumman Corp.** Daniel Larkin, VP	aerospace	5	26,055	$241
42	31	**Polaroid Corp.** Al Hyland, Director	consumer products	2	26,015	$62
43	17	**The Timken Co.*** Neil Siebenhar, Director	industrial	2	25,910	$37
44	—	**General Re Corp.*** Steve Raye, VP	financial services	5	25,855	$87
45	28	**Northeast Utilities** Tad O. Dixon, VP	utilities	9	25,835	$73
46	—	**The B.F. Goodrich Co.*** Matthew J. Battista, VP	chemicals	5	25,805	$53
47	—	**Centerior Energy Corp.** Joseph Stricker, Director	utilities	10	25,755	$30
48	58	**The Mead Corp.*** John Langenbahn, VP	manufacturing	2	25,725	$53
49	67	**The Boeing Co.** Donna Milkov, President, Computer Services	aerospace	6	25,715	$1,164
50	8	**Baxter International, Inc.** Bob Kretz, VP	manufacturing	3	25,645	$200

* Estimates are from *Computerworld* sources, not the company

IS budget as % of revenue	Processor market value (millions)	Market value as % of revenue	Total IS staff	% of IS budget for staff	% of IS budget for training	Total PCs and terminals	PCs/terminals: employees	'89 profit (millions)
3.49%	$436	1.74%	7,000	23%	5%	70,000	.67 : 1	$1,157
2.71%	$288	2.97%	4,500	52%	5%	105,000	1.50 : 1	$1,111
3.34%	$74	1.06%	2,008	46%	2%	30,000	.34 : 1	$413
3.36%	$257	2.94%	2,900	54%	1%	61,700	.93 : 1	$1,093
3.72%	$167	1.33%	2,726	48%	7%	42,200	.49 : 1	$1,310
1.41%	$40	0.24%	1,500	50%	2%	15,000	.55 : 1	$1,953
2.23%	$16	1.33%	122	33%	3%	3,200	1.10 : 1	$124
1.28%	$35	0.28%	1,182	45%	3%	13,470	.60 : 1	$219
2.88%	$19	0.96%	NA	47%	2%	1,900	.55 : 1	$28
2.7%	$200	1.8%	2,500	40%	5%	25,000	.41 : 1	$497
3.72%	$33	0.37%	NA	26%	1%	6,105	.69 : 1	$470
2.19%	$142	1.63%	1,200	38%	4%	15,000	.36 : 1	$679
2.8%	$110	1.67%	1,000	50%	6%	11,000	.32 : 1	$1,500
4.81%	$25	0.8%	NA	38%	5%	5,000	.23 : 1	$207
4.36%	$132	1.16%	5,000	52%	2%	73,000	1.29 : 1	$1,103
6.69%	$69	1.92%	2,100	44%	3%	16,200	.58 : 1	$67
3.27%	$35	1.84%	475	40%	2%	5,000	.45 : 1	$145
2.41%	$19	1.24%	NA	35%	5%	5,110	.30 : 1	$55
3.14%	$11	0.38%	NA	43%	4%	1,920	.81 : 1	$599
3.3%	$117	5.3%	456	38%	5%	5,033	.60 : 1	$203
2.11%	$8	0.32%	NA	42%	4%	4,959	.42 : 1	$172
1.29%	$22	0.95%	276	40%	1%	4,952	.55 : 1	$277
1.14%	$25	0.54%	NA	61%	5%	18,273	.84 : 1	$216
5.74%	$160	0.79%	8,788	53%	2%	91,964	.56 : 1	$675
2.7%	$65	0.88%	1,100	30%	1%	25,000	.42 : 1	$446

The 100 Most Effective Users of Information Systems

Overall rank	1989 rank	Company IS executive	Industry	Industry rank	Total score	IS budget (millions)
51	12	**Northrop Corp.** W. Richard Howard, VP	aerospace	7	25,625	$290
52	—	**Rohm & Haas Co.*** William H. Groetzinger, Director	chemicals	6	25,620	$53
53	—	**Massachusetts Mutual Life Insurance Co.** Susan Magee, Senior VP	financial services	6	25,615	$75
54	—	**New York Life Insurance Co.** Thomas Pettibone, Senior VP	financial services	7	25,600	$156
55	—	**CSX Corp.** Jack Cooper, President, CSX Technology	transportation	4	25,590	$220
56	—	**Wells Fargo & Co.*** Elizabeth Evans, Director	banking	8	25,575	$206
57	—	**The Prudential Insurance Co. of America** William D. Friel, Executive VP	financial services	8	25,550	$818
58	—	**Primerica Corp.** Ed Sherin, Senior VP	financial services	9	25,480	$183
59	34	**United Technologies Corp.** John Hammit, VP	aerospace	8	25,475	$847
60	—	**The Pittston Co.*** Leon Selfe, Manager	industrial	3	25,470	$66
61	56	**Ingersoll-Rand Co.** George Tabback, Manager	industrial	4	25,400	$80
62	—	**Union Carbide Corp.** Ted Smith, Manager	chemicals	7	25,380	$700
63	—	**Metropolitan Life Insurance Co.** Daniel Cavanough, Senior VP	financial services	10	25,320	$433
64	—	**TRW, Inc.*** Don Logan, VP	manufacturing	4	25,315	$85
65	29	**McDonnell Douglas Corp.** Ernie Ridenhour, VP	aerospace	9	25,310	$755
66	38	**Textron, Inc.** Cecil Lubbert, VP	aerospace	10	25,285	$252
67	—	**Quantum Chemical Corp.*** John Stooky, VP	chemicals	8	25,245	$69
68	60	**Mobil Corp.** Peter VanZyl, General Manager	petroleum	5	25,180	$740
69	42	**Rockwell International Corp.** J.F. Sutter, VP	aerospace	11	25,170	$492
70	77	**Freeport-McMoran, Inc.** Ron Landry, Director	petroleum	6	25,150	$17
71	—	**The Travelers Corp.** Lawrence A. Bacon, Senior VP	financial services	11	25,140	$342
72	36	**McGraw-Hill, Inc.*** John Dobies, Senior VP	consumer products	3	25,135	$132
73	—	**Amax, Inc.** Joseph Rosio, Director	manufacturing	5	25,055	$30
74	23	**AT&T*** W.E. Ost, VP	utilities	11	25,040	$637
75	—	**The Penn Central Corp.*** John McDonald, Manager	manufacturing	6	25,035	$15

* Estimates are from *Computerworld* sources, not the company

IS budget as % of revenue	Processor market value (millions)	Market value as % of revenue	Total IS staff	% of IS budget for staff	% of IS budget for training	Total PCs and terminals	PCs/terminals: employees	'89 profit (millions)
5.53%	$125	2.38%	2,600	45%	5%	22,500	.59 : 1	$(81)
2%	$31	1.16%	NA	47%	2%	12,063	.92 : 1	$176
1.5%	$19	0.38%	935	61%	2%	6,000	.60 : 1	$124
1.02%	$131	0.86%	1,100	35%	2%	10,000	.55 : 1	$1,452
4.15%	$81	1.53%	1,003	39%	.05%	12,328	.31 : 1	$770
3.65%	$30	0.53%	NA	43%	3%	16,663	.85 : 1	$601
1.9%	$125	0.29%	6,425	47%	1%	65,200	.65 : 1	$743
3.22%	$24	0.42%	1,015	42%	3%	15,625	.65 : 1	$289
4.28%	$92	0.47%	4,260	46%	1%	35,918	.19 : 1	$701
4.04%	$11	0.65%	NA	39%	2%	4,914	.34 : 1	$4
2.32%	$30	0.87%	800	35%	1%	18,000	.57 : 1	$210
8.01%	$64	0.73%	500	35%	7%	5,000	.11 : 1	$1,269
1.92%	$41	0.18%	2,840	34%	2%	35,882	.72 : 1	$300
1.15%	$70	0.94%	NA	40%	5%	40,607	.55 : 1	$263
5.17%	$245	1.68%	5,600	47%	3%	70,000	.55 : 1	$219
3.39%	$61	0.82%	1,800	40%	1%	24,000	.44 : 1	$259
2.62%	$21	0.8%	NA	42%	4%	5,538	.55 : 1	$247
1.32%	$180	0.32%	3,800	34%	[redacted]	40,000	.59 : 1	$1,800
3.94%	$180	1.44%	2,867	32%	4%	45,000	.41 : 1	$735
0.86%	$10	0.51%	115	25%	4%	1,008	.27 : 1	$150
1.8%	$114	0.6%	3,230	39%	7%	40,285	1.15 : 1	$455
7.38%	$75	4.19%	NA	41%	3%	6,824	.47 : 1	$48
0.77%	$8	0.19%	275	40%	1%	10,000	.50 : 1	$360
1.75%	$400	1.1%	NA	37%	5%	94,555	.33 : 1	$2,697
0.82%	$10	0.55%	NA	43%	3%	6,538	.43 : 1	$174

The 100 Most Effective Users of Information Systems

Overall rank	1989 rank	Company IS executive	Industry	Industry rank	Total score	IS budget (millions)
76	68	**J.P. Morgan & Co., Inc.** Ralph Mastrangelo, Senior VP	banking	9	25,030	$382
77	18	**Lockheed Corp.** Dean Allen, VP	aerospace	12	25,005	$425
78	—	**Sun Co.** Edward Parrish, Director	petroleum	7	24,980	$80
79	22	**Abbott Laboratories** Kenneth Farmer, VP	pharmaceuticals	2	24,975	$145
80	—	**Ambase Corp.*** Anthony Graffeo, Senior VP	financial services	12	24,965	$94
81	81	**National City Corp.*** Harold B. Todd, Executive VP	banking	10	24,935	$104
82	94	**Duke Power Co.** George Stubbins, VP	utilities	12	24,820	$72
83	54	**Becton, Dickinson & Co.** Hank Willin, Director	manufacturing	7	24,785	$46
84	—	**Mutual Benefit Life Insurance Co.*** Charles McCaig, Senior VP	financial services	13	24,765	$48
85	—	**Xerox Corp.** Patricia C. Barron, VP	manufacturing	8	24,740	$400
86	—	**Louisiana Land & Exploration Co.*** Nick Wood, Director	petroleum	8	24,735	$7
87	—	**Carter Hawley Hale Stores, Inc.*** Paul Burrows, VP	retailing	2	24,725	$42
88	—	**Colgate-Palmolive Co.*** Bruce Johnson, VP	consumer products	4	24,715	$77
89	—	**Aluminum Co. of America*** W.G. Nichols, Director	manufacturing	9	24,705	$104
90	—	**Vulkl, Inc.*** Michael A. Snetzer, President	chemicals	9	24,685	$47
91	—	**Inland Steel Industries, Inc.** H. William Howard, VP	manufacturing	10	24,655	$70
92	—	**Eli Lilly and Co.*** Lee Gery, Director	pharmaceuticals	3	24,505	$39
93	—	**Merrill Lynch & Co.** DuWayne Peterson, Executive VP	financial services	14	24,475	$800
94	—	**The Mutual Life Insurance Co. of New York*** Gordon Duff, VP	financial services	15	24,470	$100
95	55	**J.C. Penney Co.** Dave Evans, VP	retailing	3	24,435	$201
96	—	**Exxon Corp.*** Alberto Gudo, VP	petroleum	9	24,430	$121
97	71	**Shawmut National Corp.*** Jay Roston, Senior VP	banking	11	24,425	$136
98	47	**Northwestern Mutual Life Insurance Co.** Edward A. Flitz, VP	financial services	16	24,420	$52
99	—	**The Aetna Life & Casualty Co.*** John D. Loewenberg, Senior VP	financial services	17	24,375	$500
100	—	**Jostens, Inc.*** Jack Yarbrough, Corporate Director	consumer products	5	24,365	$16

* Estimates are from *Computerworld* sources, not the company

IS budget as % of revenue	Processor market value (millions)	Market value as % of revenue	Total IS staff	% of IS budget for staff	% of IS budget for training	Total PCs and terminals	PCs/terminals: employees	'89 profit (millions)
3.49%	$60	0.55%	1,800	47%	1%	11,500	.82 : 1	$725
4.3%	$225	2.27%	3,500	40%	5%	41,000	.50 : 1	$2
1.04%	$7	0.09%	425	45%	.08%	5,600	.34 : 1	$85
2.69%	$60	1.11%	1,450	52%	1%	15,000	.35 : 1	$860
2.67%	$32	0.91%	NA	43%	4%	6,644	.71 : 1	$96
4.08%	$34	1.33%	NA	36%	5%	6,418	.44 : 1	$263
1.98%	$42	1.15%	750	35%	4%	10,400	.54 : 1	$520
2.56%	$22	1.21%	487	54%	5%	7,381	.39 : 1	$169
1.25%	$7	0.19%	NA	41%	3%	4,285	.92 : 1	$44
2.27%	$200	1.2%	3,000	37%	1%	43,000	.43 : 1	$704
0.98%	$5	0.67%	NA	38%	3%	846	1.21 : 1	$44
1.51%	$20	0.72%	NA	36%	5%	13,394	.36 : 1	$14
1.5%	$24	0.47%	NA	44%	2%	5,950	.25 : 1	$200
0.93%	$32	0.29%	NA	43%	3%	16,617	.27 : 1	$945
1.97%	$24	1.01%	NA	42%	4%	2,051	.12 : 1	$103
1.69%	$11	0.27%	420	30%	.1%	5,400	.27 : 1	$241
0.93%	$16	0.38%	NA	45%	5%	24,995	.89 : 1	$940
7.06%	$100	0.88%	3,500	40%	3%	17,000	.41 : 1	$(213)
2.61%	$32	0.84%	NA	47%	2%	7,025	1.58 : 1	$12
1.23%	$125	0.76%	1,824	38%	1%	89,000	.45 : 1	$802
1.23%	$31	0.31%	NA	39%	4%	3,468	.55 : 1	$226
6.01%	$15	0.66%	NA	42%	.4%	11,302	.88 : 1	$(129)
0.82%	$15	0.24%	464	64%	1%	6,194	.60 : 1	$372
2.54%	$93	0.47%	NA	38%	2%	25,000	.56 : 1	$300
2.3%	$2	0.27%	NA	41%	1%	1,000	.12 : 1	$54

MCI: Making the Most of a Delivery Network

Katherine Lambert

MCI's Ditchfield *successfully juggles business and technological concerns*

BY AMY BERNSTEIN

When you ask MCI Communications Corp.'s technology guru Allan Ditchfield when he thinks the company will overtake archrival AT&T, he doesn't laugh, he ponders. Then he replies: "Our compounded growth rate is about 20% a year. Just draw the curve."

He's only half-kidding. If MCI is due for a large dose of humility, the company is not likely to have to swallow hard anytime soon. MCI's hubris is justified so far by its dazzling performance. The company is among the best in the world when it comes to applying technology to solve customer problems, build strategic alliances and seize market opportunities.

MCI wins not only the No. 1 spot in its industry in the *Computerworld Premier 100* for the second consecutive year, but it also ranks No. 1 in the overall survey.

To fully appreciate precisely what MCI does so well, you should first know how well the nation's second largest long-distance telephone company is doing.

Consider these figures: Revenue for 1990 will reach $7.9 billion, a 21% jump over 1989, capping four steady years of growth in earnings and profitability. Operating margins lead the industry at approximately 16% vs. AT&T's 12% to 13%. Average revenue per employee ($355,000) is the highest in the industry. Return on equity leads the industry at 32%. And billable calls increased 40% in 1989.

What statistics cannot convey is how MCI achieves this level of performance year after year in the highly competitive $55 billion long-distance telephone and communications business.

The company views its network as a delivery system for the transaction services and applications that customers demand. The network is not just a highway for applications to ride along but also a platform MCI uses to develop and deliver customized services.

In this context, no single service — neither the highly touted Portfolio electronic billing system nor the Vision package being offered to small businesses — is the star of the MCI show. The real star is the company's ability to deploy computer power where and when it is needed to meet specific customer demands faster than anyone else.

"We understand how important it is to make our infrastructure flexible enough to move from market to market," says Ditchfield, senior vice-president responsible for companywide engineering and information systems operations.

Indeed, according to The Yankee Group, a Boston-based industry research firm, MCI may have the largest mainframe-based distributed process-

ing network of all the long-distance companies.

Of the $1.2 billion that MCI will invest in network enhancements in 1990, much will be spent on improving and expanding the hardware and software platforms designed to deliver real-time services to customers.

Ditchfield is the architect of MCI's transaction processing strategy, which he calls "process integration." With process integration, the network is the integrated delivery mechanism for all customer services, from customized billing to customer-controlled maintenance.

"If you've got the right funnel to implement the right customer ideas," Ditchfield says, "then and only then are you free to create services that ultimately lead to increased revenue and market share."

Process integration also leads to significant operating economies. For example, at MCI's North Royalton, Ohio, integrated network control and data center, the ability to switch intelligent network and IBM 3090 mainframe platforms together — rather than plan, build and run switch facilities and data centers separately — requires two-thirds fewer staff.

In essence, "we've collapsed functions and groups so that MIS and engineering are together, thereby reducing double-planning and double-billing," says James Zucco, MCI's vice-president of product development.

"We'll see MCI move increasingly from offering commodity transmission services to high-value transactions that customers can utilize on a usage-sensitive basis," says Berge Ayvazian, a vice-president at The Yankee Group. K Mart Corp., the nation's second largest retailer, is one customer benefiting from this custom-tailored approach. K Mart uses MCI's Vnet (a large private network) to link 3,400 K Mart and Waldenbook, Inc. stores, distribution centers and offices across the country.

Naturally, there has to be a cloud or two in MCI's silver lining. Ironically, because the company has focused on developing its IS capabilities over the past few years, MCI has not kept pace with the all-digital revolution. Thus, MCI is the only leading long-distance carrier to invest as much as $1.1 billion this coming year to transform its telephone network, resulting in a third-quarter writedown of about $500 million.

What makes MCI IS so effective?

- Network is used to develop and deliver customer services.
- Technology acquisition through mergers.
- Strong use of strategic partners such as Visa.
- IS closely allied with network engineering.

While its relationships with other companies will help minimize the time and investment required for the conversion, it is likely that some of MCI's creative energies will be siphoned off into this effort.

Ironically, MCI could find itself the victim of success. As the company becomes more aggressive in the transaction processing arena, it may have trouble linking up with strategic partners to leverage its capabilities.

According to Ayvazian, companies such as J.C. Penney Co., which operates substantial credit-clearing networks, will begin asking, "Is MCI my carrier or my competitor?" MCI will be forced to draw clear strategic boundaries separating its networked transaction processing from others. □

BERNSTEIN HEADS GAVROCHE ASSOCIATES, A COMMUNICATIONS CONSULTING FIRM IN BALTIMORE.

Utilities

Industry rank	Company Location Total employees	Overall rank	Total score	1989 profits (millions)	Estimated IS budget (millions)	Total PCs and terminals
1	**MCI Communications Corp.** Washington, D.C. 19,000	1	28,530	$529	$400	29,580
2	**United Telecom, Inc.*** Kansas City, MO 41,359	18	27,060	$363	$138	38,636
3	**GTE Corp.*** Stamford, CT 158,500	21	27,000	$1,417	$750	90,000
4	**Bell Atlantic Corp.** Philadelphia, PA 79,100	XX	26,930	$1,070	$709	66,000
5	**Ameritech Applied Technologies** Chicago, IL 75,900	XX	26,895	$1,230	$800	65,000
6	**US West, Inc.** Englewood, CO 70,200	27	26,645	$1,111	$263	105,000
7	**Southwestern Bell Corp.** St. Louis, MO 66,200	29	26,610	$1,093	$294	61,700
8	**Contel Corp.*** Atlanta, GA 21,800	XX	26,305	$287	$150	5,000
9	**Northeast Utilities** Hartford, CT 8,400	45	25,835	$203	$73	5,033
10	**Centerior Energy Corp.** Cleveland, OH 9,000	47	25,755	$277	$30	4,952
	Medians for industry Top 10	XX	26,770	$800	$279	50,168

Companies are ranked by industry according to CW 100 Index. *Estimates are from *Computerworld* sources, not the company.

FMC Mixes Crisp Efficiency With Latest Technology

BY MICHAEL SULLIVAN-TRAINOR

David Joel

FMC's Irwin *keeps an eye on technological advances and bottom lines*

Even though his company has extensive business in the Middle East, FMC Corp. Vice-President Dan W. Irwin has more pressing concerns than Iraq's invasion of Kuwait.

As vice-president of technology, manufacturing and information services, Irwin is charged with ensuring that FMC's IS operations are run as cost effectively as possible while still taking advantage of the latest technology when it fits company needs.

The combination of an aggressive technology evaluation strategy and the cost efficiency policy is paying off for the $3.4 billion company, which ranks second in the *Computerworld Premier 100* and is No. 1 in the chemical industry. A diversified company, FMC is a market leader in segments of the chemical, defense and gold-mining industries.

The company's recent investments in technology, combined with an ability to get the most out of its information systems for solid business performance, caused FMC to skyrocket nearly to the top of the 1990 list.

For example, IS spending in the Agricultural Chemicals Group has increased 200% over the past three years, according to John Lowry, manager of the group's information resources. In addition, three plants were upgraded on the industrial chemicals side of the business, along with investments in computer systems for sales and marketing.

"Things are very strong for the company," says J. Jeffrey Cianci, an analyst at Bear Stearns & Co. in New York. "Their earnings are growing each year despite a slowdown in business. They have solid management."

FMC's capital spending in the industrial chemical business is expected to show dividends this year, he adds, and the Middle East conflict will bolster the company's defense business despite future U.S. spending cuts.

"Their spending is heavier than competitors in chemicals, but they have a strong cash flow so they don't have to borrow to expand," Cianci says.

The availability of funds to invest in plants and technology does not mean that FMC is willing to throw its money around, however. This is particularly true in Irwin's IS op-

eration. "We look very closely at the value of our applications and assess the alternatives. We reduce everything we can to some kind of number," he says.

The key to FMC's IS strategy is flexibility at the corporate level, combined with a culture that emphasizes efficiency foremost. "We will do our computing operations only where it makes the most sense, and that is driven by the nature of the application," Irwin says. "In addition, we strive for very high levels of service at the best cost you can get."

As a practical matter, the emphasis on service weighs more heavily in the use of hardware than software. While the company has an aggressive leading-edge strategy — moving to state-of-the-art equipment when it makes sense for the company — no system is allowed to waste processing cycles for the sake of staying current.

For example, at the company's Dallas data center, which does the majority of processing for five business units, including the chemical operations, the unit cost of CPU use has decreased 50% since 1986, while use itself has increased 300%. These efficiencies are made possible by investments in the latest IBM mainframes.

NEW APPLICATIONS RESEARCH

On the software side, the company is pursuing a different type of advanced strategy. With computer-aided design and manufacturing devices a key element in chemical modeling and defense equipment design, FMC is running engineering applications at the National Center for Supercomputing Applications in Champagne-Urbana, Ill. The research is designed to determine how to make supercomputers more effective in supporting three-dimensional computer-aided image modeling.

While laying down ground rules such as cost efficiency, FMC's corporate IS group tries to remain open to the diverse needs of IS groups in the various business units. "Each unit has its own style that is influenced by the management. You'll find a different flavor of ice cream in Philadelphia [where the chemical operations are located] than here. The units have a great deal of autonomy, and we try and develop consultative relationships between our corporate staff and the line organization," Irwin says.

What makes FMC IS so effective?

- **Rigorous cost-effectiveness measures.**
- **Aggressive investments in efficient technology.**
- **Flexible standards dictated by corporate IS.**
- **Understanding of the diversified nature of business.**

Customer information is currently the focus of investments in Lowry's group. The IS staff there is upgrading its front-end customer applications from a batch system to a relational database using Oracle Systems Corp.'s Oracle on a Digital Equipment Corp. VAX platform. The project, which is being conducted by the Dallas data center, is unusual in a primarily IBM environment, but it is the solution that best suits the unit's needs. It is also one of the first on-line applications to use DEC's XI packet-switched network over a Systems Network Architecture backbone.

Ground-breaking projects are not unusual at FMC, where the industrial chemical division operates a state-of-the-art order-entry and inventory system that provides automatic freight rating of chemical products. "It's the Cadillac of the industry," Lowry says.

SULLIVAN-TRAINOR IS A COMPUTERWORLD SENIOR EDITOR, FEATURES.

Chemicals

Industry rank	Company Location Total employees	Overall rank	Total score	1989 profits (millions)	Estimated IS budget (millions)	Total PCs and terminals
1	**FMC Corp.*** Chicago, IL 24,110	2	28,450	$136	$110	7,200
2	**The Dow Chemical Co.** Midland, MI 62,100	20	27,050	$2,486	$347	32,000
3	**Air Products & Chemicals, Inc.** Allentown, PA 10,500	25	26,685	$289	$46	5,180
4	**Monsanto Co.** St. Louis, MO 42,179	37	26,365	$679	$190	15,000
5	**The B.F. Goodrich Co.*** Akron, OH 11,892	46	25,805	$172	$53	4,959
6	**Rohm & Haas Co.*** Philadelphia, PA 13,132	52	25,620	$176	$53	12,063
7	**Union Carbide Corp.** Danbury, CT 45,987	62	25,380	$1,269	$700	5,000
8	**Quantum Chemical Corp.*** New York, NY 10,000	87	25,245	$247	$69	5,538
9	**Vulcan, Inc.*** Dallas, TX 16,500	90	24,685	$103	$47	2,851
10	**Du Pont Co.*** Wilmington, DE 145,787	117	23,930	$2,480	$1,050	36,909
Medians for industry Top 10		**49**	**25,713**	**$268**	**$90**	**6,369**

Companies are ranked by industry according to CW 100 Index. *Estimates are from *Computerworld* sources, not the company.

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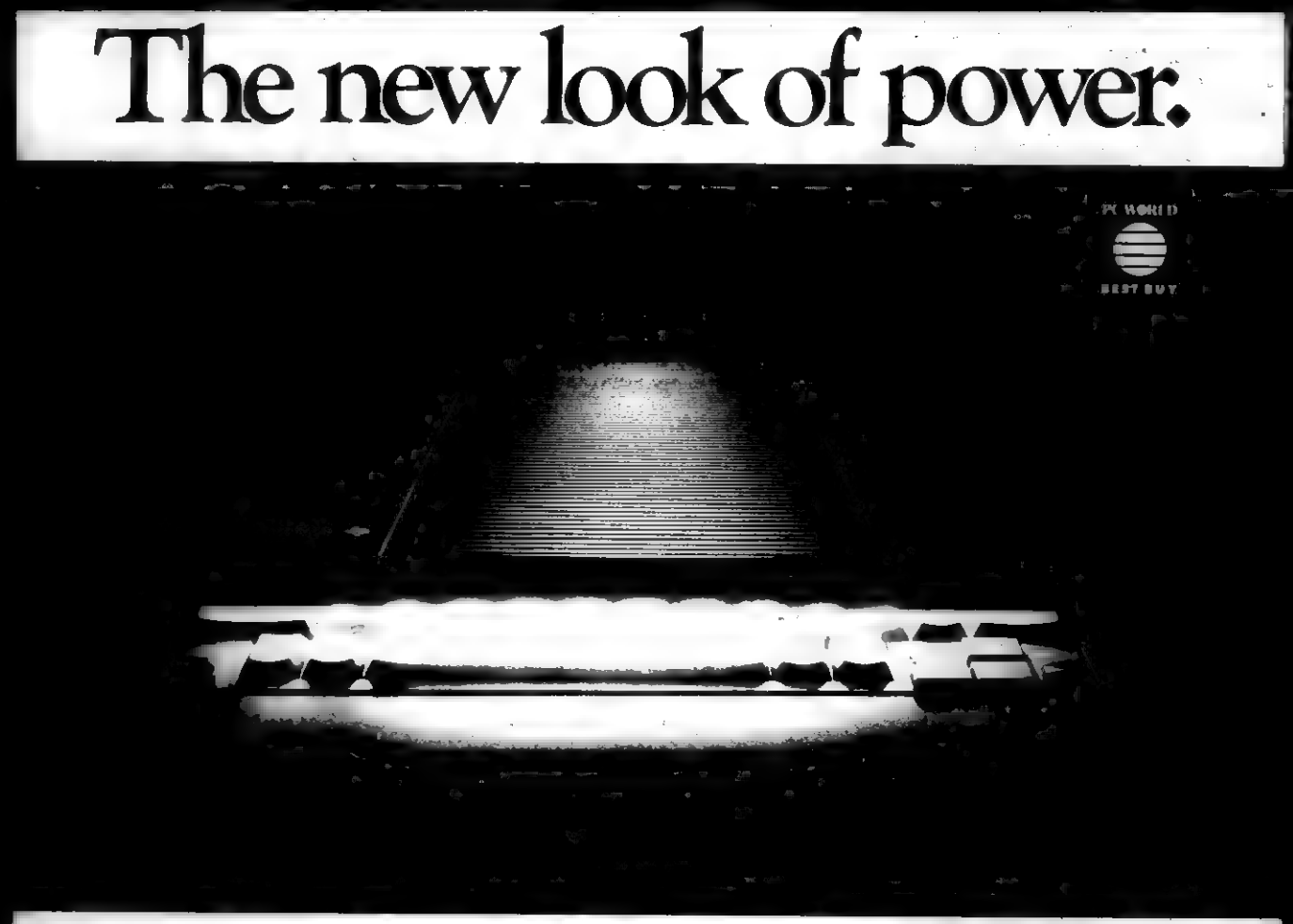

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Bankers Trust Architects a Global Plan

Flexibility lets IS react to both markets and technology

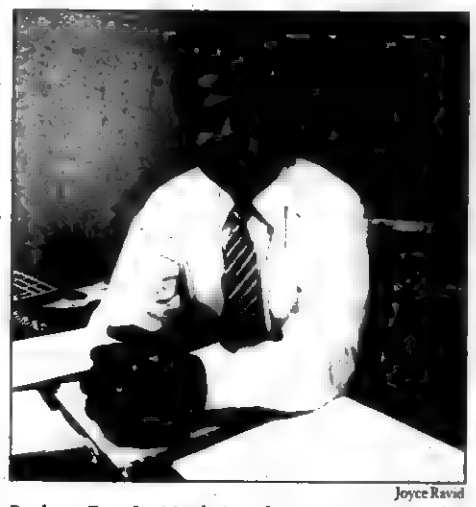
BY SALLY CUSACK

While many information systems organizations are only now awakening to the need to see their companies as worldwide operations, Bankers Trust Co. began its preparations for a global IS support system five years ago.

In 1985, Carmine Vona, executive vice-president and chief technologist at the firm, devised a flexible technology architecture that would support long-term global business needs. The strategy calls for regenerating the architecture itself as the market changes and technology progresses.

Today, Vona's vision has paid handsome dividends: Bankers Trust has built a worldwide systems infrastructure that permits real-time operation around the globe from branches in the U.S., Europe and the Far East.

Getting a global head start has helped Bankers Trust become one of the most effective users of information systems and No. 1 among banks listed in the *Computerworld Premier 100* for the second consecutive year. Bank officials say that vision is definitely long-term.



Joyce Ravid

Bankers Trust's *Mathai seeks continuous, evolutionary changes in systems architecture*

"The entire thrust of the architecture is evolutionary," explains Anish Mathai, a Bankers Trust vice-president and technical architect. "There never will be a finished product. It will grow as computer technology grows."

For example, the firm recently installed 250 Digital Equipment Corp. Vaxstations in its offices in London to access trading floor applications. The systems access an Ultrix-based equity system also used by its Tokyo operation.

Founded in 1903 as a trust company and becoming a commercial bank in 1917, Bankers Trust sold its retail banking network in the early 1980s to redirect its resources toward wholesale banking. The forces behind that change, then-Chairman Alfred Brittain III and future Chairman Charles S. Sanford Jr., devoutly believed that restructuring was the way to remain competitive in the industry. The company abandoned its traditional management hierarchy to embrace a philosophy of integration and cooperation within a horizontal framework.

Currently focusing its businesses on major corporations, financial institutions, governments and select individuals, the bank is organized into two principal units; Financial Services, which incorporates the lending, intermediary, advisory and trading capabilities of the firm, and Profitco, comprised of the bank's trust, investment management, securities processing, cash management and private banking businesses. Corporate debt underwriting power is exercised by an affiliate, BT Securities Corp.

The success of Bankers Trust merchant banking strategy has been demonstrated by the bank's strong earnings performance. Net income increased from $114 million in 1979 to $620 million in 1989. The figures, which exclude special provisions for South American loan losses in 1987 and 1989, reveal that BT is one of the most profitable major banks in the U.S. based on return equity in excess of 16% for each of the last 10 years.

With the sale of the bank's retail branch network, the company now operates three private banking centers in New York; Miami; West Palm Beach, Fla.; Chicago; Los Angeles; and San Francisco. The bank also maintains representative offices and subsidiaries in major offices throughout the U.S. and has an international network of branches, representative offices and subsidiaries

Continued on page 34

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Continued from page 31

in more than 35 countries.

To accommodate the bank's structural changes and prepare for long-term needs, Bankers Trust's IS organization initiated Vona's architecture project. At the time, a handful of skeptics at the firm opposed the plan because they feared that an architectural approach would become a money pit.

Today, Vona can say "I told you so" to his critics. In fact, Vona says, instead of costing money, the right IS architecture, properly implemented, actually saves money. As proof, he points out that the bank spends far less on IS than some of its major competitors while achieving much larger gains.

The architecture's foundation is rooted in a strong central management structure — almost paradoxical, given the company's pioneering efforts in decentralization.

What makes Bankers Trust IS so effective?

- **Well-defined business and IS strategy.**
- **Freedom in software applications development.**
- **Flexibility to implement new technologies.**
- **Tightly controlled buying process.**

A decentralization pioneer, Bankers Trust is organized into more than 20 decentralized, self-managed business units, each with its own IS support center. Despite this independence, a strong, centralized IS group also remains. Senior IS executives are known as "information architects."

Each division is part of an individual technology center, which must use IBM or DEC hardware and operating systems while adhering to the CCITT X.25 protocol for communications standards. However, maintaining uniformity is not always easy.

Mathai explains, "Sometimes we have to sacrifice local advantages for global advantages . . . and corporate strategy. This can be a major hurdle. It's an ongoing process, and local people always want to be the one exception."

Software is a different story. Although the central IS group has full veto power over every project and purchase, the group rarely intervenes in applications decisions. For example, a new equity application — the first using Ultrix — was developed entirely in-house to meet the requirements of the division.

Banking

Industry rank	Company Location Total employees	Overall rank	Total score	1989 profits (millions)	Estimated IS budget (millions)	Total PCs and terminals
1	**Bankers Trust N.Y. Corp.** New York, NY 13,000	3	28,200	($980)	$400	9,000
2	**Norwest Corp.** Minneapolis, MN 18,485	8	27,710	$237	$133	15,500
3	**Banc One Corp.** Columbus, OH 24,000	9	27,565	$363	$235	14,000
4	**Signet Banking Corp.** Richmond, VA 5,700	15	27,210	$123	$57	7,107
5	**Security Pacific Corp.** Los Angeles, CA 41,100	17	27,105	$741	$431	31,000
6	**Corestates Financial Corp.** Philadelphia, PA 12,000	19	27,055	$240	$71	10,000
7	**Bankamerica Corp.** San Francisco, CA 56,428	40	26,300	$1,103	$497	73,000
8	**Wells Fargo & Co.*** San Francisco, CA 19,600	56	25,575	$601	$206	16,663
9	**J.P. Morgan & Co.** New York, NY 14,000	76	25,030	$725	$382	11,500
10	**National City Corp.*** Cleveland, OH 14,680	81	24,935	$263	$104	6,418
Medians for Industry Top 10		**18**	**27,080**	**$313**	**$221**	**12,750**

Companies are ranked by industry according to CW 100 Index. *Estimates are from *Computerworld* sources, not the company.

EVER CHANGING WORLD

While bankers trust got a head start in globalization, it knows the world is not standing still. Looking ahead, Vona sees work on the horizon. One possibility is for a universal stock market in 10 or 15 years, above and beyond the foreign exchange.

Fortunately, he says, the bank's evolutionary architecture will let the company take advantage of new markets and technologies as they become available. This will let the bank keep pace with the world's financial direction by building systems that track risks and operate across all markets.

The goal? "Optimize technology as it appears," Vona says. As an example, he says he foresees that by 1995, desktop devices will provide "phenomenal" computing power. "We must be ready to integrate applications, discipline and tasks into these tools."

Vona predicts that employees will soon have the capacity to double and even triple their productivity. To that end, the architecture at Bankers Trust will evolve to develop software and infrastructures that bring technology "to their fingertips and keep us at the forefront of the industry."

Meanwhile, current events continue to test the strength of Bankers Trust's IS capabilities. For example, the August blackout that shut down numerous systems in Manhattan did not hurt Bankers Trust. "We experienced no problems, not even a split second. We are one of a very few that can say that," Vona says. □

CUSACK IS A COMPUTERWORLD STAFF WRITER

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AMR Hones Sabre to Sharpen Competitive Edge

BY CONNIE WINKLER

After creating what is perhaps the most successful strategic information system to provide a true competitive advantage, AMR Corp. is breaking the mold.

The company is doing the unthinkable — carving up its near-legendary innovation, the Sabre computerized reservation system (CRS).

By gradually breaking off chunks of computing from the monstrous mainframe-based Sabre system, AMR — parent of American Airlines — is hoping to reap further advantages from its strategic applications. "We're trying to get ourselves prepared to take advantage of new technologies, which may represent better opportunities," says Thomas J. Kiernan, president of AMR's Sabre Computer Services Division at the Dallas/Fort Worth airport.

Indeed, Max Hopper, AMR's IS superstar, placed an article called "Rattling Sabre — New Ways to Compete on Information" in the May/June 1990 issue of the *Harvard Business Review* proclaiming Sabre's renovation. "While it is more dangerous than ever to ignore the power of information technology, it is more dangerous still to believe that, on its own, an information system can provide an enduring business advantage," Hopper wrote. "The old models no longer apply."

How well the new strategy will work for American Airlines remains to be seen. The back-to-technology push for AMR comes at a time when the airline and industry is caught between a rock and a hard place, as some analysts describe it.

AMR, along with all domestic airlines, faces crazy fuel prices, declining passenger loads and squeezed profits. And AMR, considered one of the strongest in the airline group, recently had its debt rating downgraded by Standard & Poor's Corp.

"The kind of business environment we are in is when Sabre and computerized reservation systems really earn what's put into them," says Edward J. Starkman, who follows the airline industry for Paine Webber, Inc. in New York. "When pricing is difficult and passenger loads are soft, you squeeze everything you can [from the CRS]."

The catch-22 to the new strategy, however, is that it's the old mainframe-based Sabre that has carried AMR successfully in the past and has helped AMR, for the second year, take top place in the transportation industry and fourth place overall in *Computerworld*'s *Premier 100*. Sabre accounts for about 85% of American Airlines' earnings.

Sean Wolenski

AMR's Kiernan: *Like changing the wheels on a moving tractor trailer*

As long as American Airlines maintains control of Sabre processing, Starkman says he is not concerned about distributing the giant system. "It makes me more antsy to have everything in a bunker in Tulsa, as opposed to distributing it," he says.

AMR could not carve up Sabre until it unlaced the IBM operating system holding it together. During the past year, AMR spent 230 to 240 man-years swapping over to IBM's TPF 3.1 operating system. "It was analogous to changing the wheels on a tractor trailer while the truck was speeding along," Kiernan says.

One processing chunk AMR has already broken off the mainframe is crew planning — scheduling 8,000 pilots and 16,000 flight attendants. The application now runs on a Mips Computer Systems, Inc. processor and workstations, with the basic flight schedule data downloaded from the Sabre system.

LOOKING INWARD

AMR is also rethinking its internal computing needs, notably with the Interaact system. The aim of Interaact is to provide computing power to every knowledge worker at AMR.

With Interaact, Kiernan says, the various AMR IS groups are focusing on information sharing and providing users with the tools they need.

Beginning in August 1989, AMR put Interaact MS-DOS personal computers on about 1,400 desks in the Fort Worth headquarters and Los Angeles offices. However, the Interaact systems from AT&T, Tandy Corp. and IBM didn't provide the ease of use or Sabre response time users demanded.

"Quite frankly," Kiernan acknowledges, "we got too interested in rolling out the technology and getting users to change how they did work."

IS went back to the drawing board to "clean up the product" and focus on departments' and individuals' needs.

After the Sabre group reviewed users' needs for strong Sabre access, the Interaact Sabre emulation program was rewritten and enhanced.

"We've been on track since March," Kiernan says. "There's an absolute commitment to training [by all parties] and to looking at how people do their jobs."

While AMR is decentralizing its computing, it is centralizing its communications infrastructure on a global basis. Again, the decision is for cost and price/performance reasons.

What makes AMR IS so effective?

- Industry-leading computer reservation system.
- Willingness to improve on success.
- Moving computing power to end users.
- Clear understanding of where IS fits into the business.

Currently, AMR runs three separate networks: an older, 6-bit one for Sabre; an IBM Systems Network Architecture network for internal business; and the new X.25 configuration.

"The single X.25 network will improve reliability and reduce costs, most simply by eliminating the other two networks," Kiernan says.

AMR seems to be opening itself up to the new possibilities of technology, especially to provide better customer service. Besides a baggage bar-coding system, AMR is considering multimedia systems, compact disc/read-only memory and PCs that would store maintenance manuals or sales information and presentations for travel agents. □

WINKLER IS A NEW YORK-BASED WRITER AND CONSULTANT COVERING MANAGEMENT TECHNOLOGY

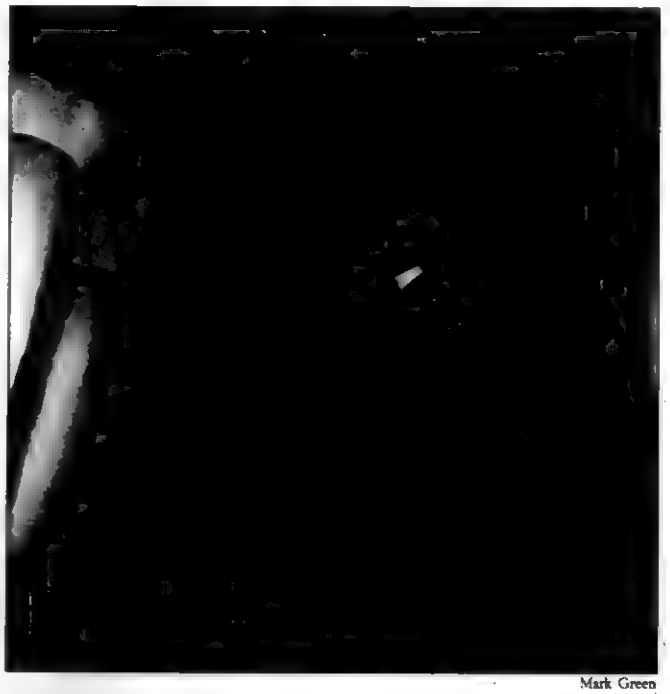
Transportation

Industry rank	Company Location Total employees	Overall rank	Total score	1989 profits (millions)	Estimated IS budget (millions)	Total PCs and terminals
1	**AMR Corp.** Dallas, TX 95,800	4	28,100	$455	$1,214	124,000
2	**Chicago & North Western Co.*** Chicago, IL 7,562	14	27,250	($21)	$42	4,590
3	**Federal Express Corp.** Memphis, TN 87,000	28	26,625	$413	$234	30,000
4	**CSX Corp.** Jacksonville, FL 40,056	55	25,590	$770	$220	12,328
5	**American President Companies** Oakland, CA 4,396	105	24,245	$11	$95	4,300
6	**Continental Airlines Holdings, Inc.** Houston, TX 68,000	112	24,055	($886)	$300	130,000
7	**Delta Air Lines, Inc.*** Atlanta, GA 58,784	147	23,530	$461	$168	35,786
8	**United Air Lines, Inc.** Chicago, IL 71,000	183	23,010	$324	$306	19,000
9	**United Parcel Service*** Greenwich, CT 237,700	263	21,905	$693	$425	11,286
10	**NWA, Inc.*** St. Paul, MN 39,323	294	21,465	$355	$133	9,981
	Medians for industry Top 10	109	24,150	$384	$227	15,664

Companies are ranked by industry according to CW 100 Index. *Estimates are from *Computerworld* sources, not the company.

Building Systems From the Bottom Up

BY CLINTON WILDER



Mark Green

IS director White: *'We don't form a committee . . . and sit around.'*

Delegating responsibility to users is a big part of how Union Texas Petroleum's IS department does business

Some say that in order to strengthen information systems management, you have to give power away to business managers. At Union Texas Petroleum Holdings, Inc. in Houston, director of MIS Richard L. White says he believes that philosophy is a big reason why his company was ranked as the most effective user of IS in the petroleum industry for the second straight year.

For most of the major applications in the works at Union Texas, White has given project responsibility to a manager in the department that will use the application. In addition, an attempt to create a data model for Union Texas' global enterprise is primarily a project for users, not "data administrators" in IS.

"We tried in 1984 and 1985 to do it the way all the gurus said to do it — top down," White says. "That doesn't work in this organization. The people who use the data must define it."

Union Texas is one of the world's largest independent oil and natural gas producers, meaning it does no refining or "downstream" selling of its products to consumers. White says he believes that the company's sharp focus gives it an edge over much larger and more diversified competitors, and he tries to bring a similar focus to IS.

"If something is obvious, we don't form a committee of 25 and sit around deciding what to do," he says. "Decisions are made very quickly."

And with strong participation by users, systems are developed at a pretty good clip as well. The first phase of an IBM 3090 and DB2-based procurement tracking system that will completely automate the firm's purchasing was implemented ahead of schedule in August, less than two years after the specification process began.

White is almost zealous in keeping the IS focus on business rather than technology. Not that Union Texas doesn't use state-of-the-art technology in specific strategic areas, such as Landmark Graphics, Inc. software for seismic exploration or four new Sun Microsystems, Inc. Sparcstations for a new geo-

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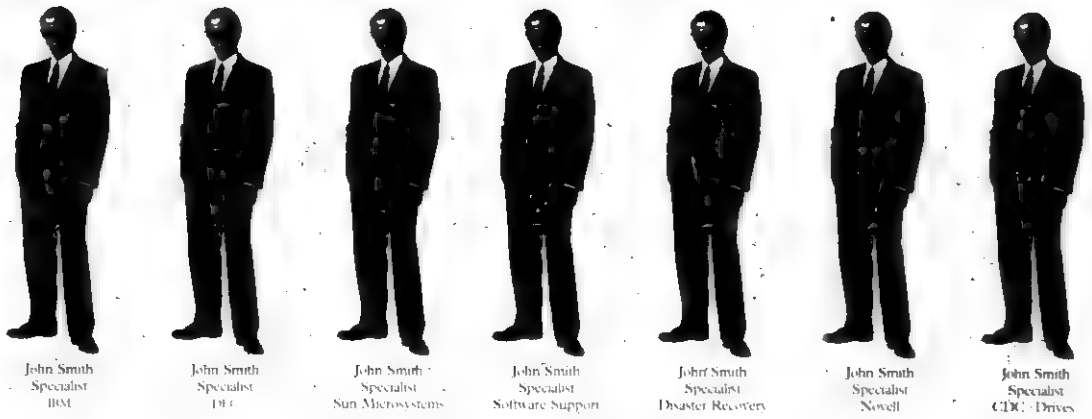

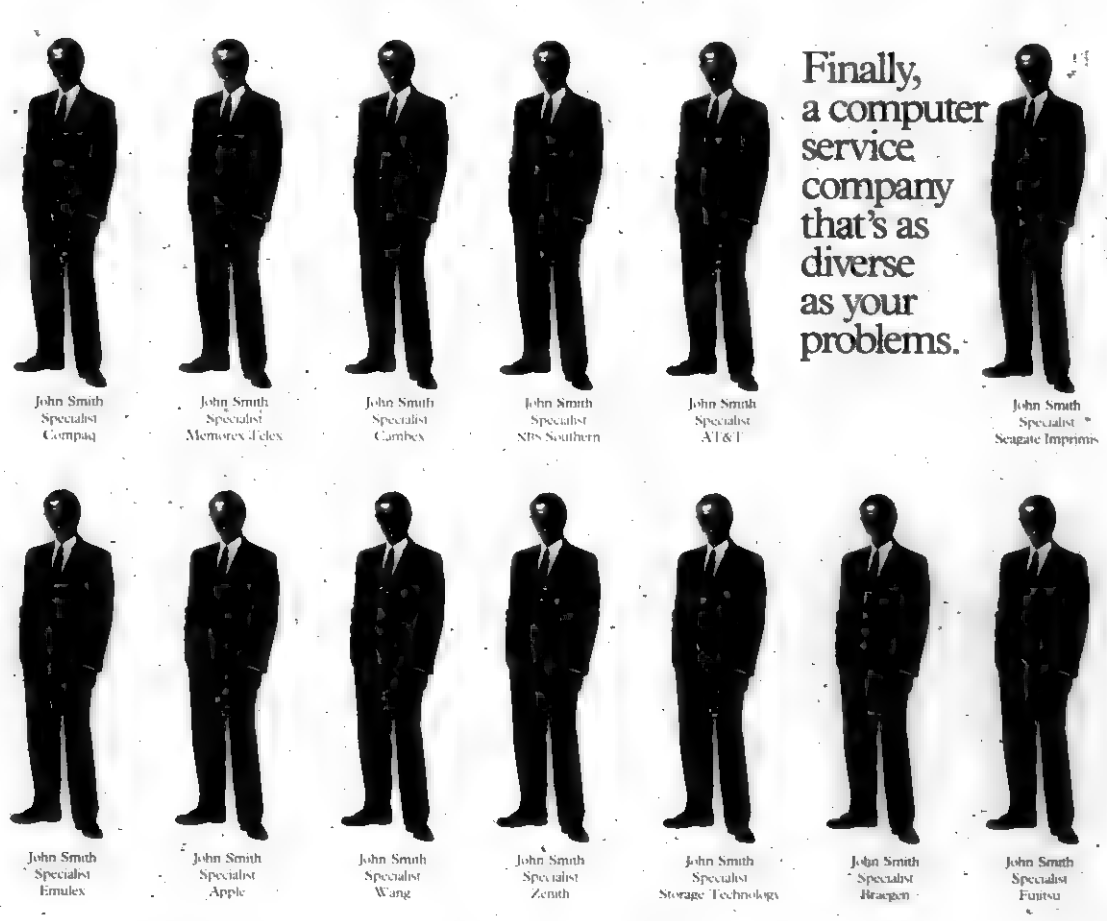

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Continued from page 38

logical/geophysical system.

However, you won't find any computer-aided software engineering tools in use here, although they are being studied; White says that client involvement is more important than new development tools. And don't ask him for the Sparcstation model numbers, because he won't know off the top of his head.

On the other hand, he and his department do understand, for example, the information needs of natural gas engineers who use 90 personal computers in Union Texas' operations in Karachi, Pakistan.

"We don't try to be all things to all people," he says. "If a petrophysicist finds a great piece of software, our job is not to go out and find a better one — it's to help him."

A good example of that philosophy is rigorous change control in systems development. Any proposed deviation from the development plan must be approved by both White and the user department manager responsible for the system. "Analysts may tell you that their changes will only take one day, but nothing only takes a day," he says. Among the systems projects under way at Union Texas are the following major applications:

- Procurement tracking system. Undertaken in response to an internal audit that dictated better controls on purchasing, the system will automate a previously cumbersome purchase order system that involved much rekeying of data and manual checking. The system will also give managers immediate access to vendor credit information to allow them to make better purchasing decisions.
- Joint interest billing system. Complex joint ventures play a big part in Union Texas' $1.16 billion business. A 37.81% interest in a joint venture supplying natural gas to an Indonesian gas plant is but one of dozens around the world. A rejuvenated billing system is intended to give Union Texas' joint venture partners more precise billing information so they will pay bills faster and improve Union Texas' cash flow. The upgraded system will also feature better integration with other functions, such as accounts payable and materials transfer.
- Journal voucher entry system. A new system will bring 48 new PCs to accounting department employees for on-line entry, eliminating many "three- to six-floor elevator rides" to carry documents to the data entry department. The new PCs were cost-justified on the basis of eliminating several data entry jobs.

Whether Union Texas can make it three straight years as a *Computerworld Premier 100* industry leader in IS, however, may be out of White's hands. Last spring, Union Texas owners Kohlberg Kravis Roberts & Co. and Allied-Signal, Inc. announced that the company is up for sale. That in itself gave IS a new responsibility: supporting a "data room" where prospective buyers from around the world can examine data on everything from oil rigs to shale deposits to employee benefits.

The sale of Union Texas may be announced before the end of the year, but with the exception of 1991 budgets, life in IS is proceeding as normal. "Our people still take a lot of pride in their systems and in meeting their schedules," White says. "No one's pulling their horns in." □

What makes Union Texas IS so effective?

- **User department managers responsible for new systems specs and project management.**
- **Rigorous change control in systems development.**
- **IS staffed at or below previous year's level.**
- **Quarterly meeting of MIS Operating Committee approves IS spending above $50,000.**

Petroleum

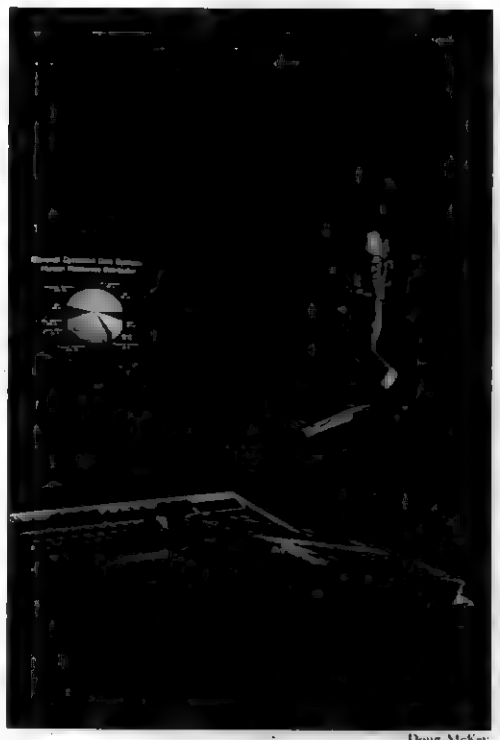
Industry rank	Company Location Total employees	Overall rank	Total score	1989 profits (millions)	Estimated IS budget (millions)	Total PCs and terminals
1	**Union Texas Petroleum, Inc.** Houston, TX 1,900	5	27,905	$173	$18	1,800
2	**Atlantic Richfield Co.** Los Angeles, CA 27,200	31	26,465	$1,953	$237	15,000
3	**Oryx Energy Co.** Dallas, TX 2,920	32	26,455	$124	$27	3,200
4	**Phillips Petroleum Co.** Bartlesville, OK 22,310	33	26,440	$219	$160	13,470
5	**Mobil Corp.** New York, NY 67,900	68	25,180	$1,800	$740	40,000
6	**Freeport McMoRan, Inc.** New Orleans, LA 3,700	70	25,150	$150	$17	1,000
7	**Sun Co., Inc.** Radnor, PA 16,500	78	24,980	$85	$80	5,600
8	**Louisiana Land & Exploration*** New Orleans, LA 700	86	24,735	$44	$7	846
9	**Enron Corp.*** Houston, TX 6,296	96	24,430	$226	$121	3,468
10	**Shell Petroleum, Inc.*** Houston, TX 31,338	122	23,875	$1,405	$200	21,376
Medians for Industry Top 10		**69**	**25,165**	**$196**	**$101**	**4,534**

Companies are ranked by industry according to CW 100 Index. *Estimates are from *Computerworld* sources, not the company.

WILDER IS COMPUTERWORLD'S SENIOR EDITOR, MANAGEMENT.

99% Perfect Not Enough for General Dynamics

Systems steer the quest for flawless quality control at aerospace firm



Doug McKay

General Dynamics' Hall *demands top quality*

BY MITCH BETTS

It seems like such a small difference, the one between 99% and 100% quality. But for General Dynamics Corp. and other devotees of the Total Quality Management (TQM) philosophy, it is a very big difference indeed.

Consider, for example, that 99% quality control at the U.S. Postal Service would mean the loss of 17,000 letters per hour. At the nation's hospitals, it would mean 30,000 newborn babies accidentally dropped each year.

At St. Louis-based General Dynamics, the nation's No. 2 defense contractor, TQM means building tank hatches with a 100% seal and building information systems that *exactly* meet the requirements of the business units. As a general rule, it means making continuous process improvements to ensure that things are done right the first time.

No one claims that General Dynamics has reached perfection in any area, but the very fact that it tries so hard may help to explain why it ranks as the top aerospace company in the *Computerworld Premier 100* for the second straight year.

"We are heavily into TQM ... trying to compare how we're operating vs. the best practices in the information systems field," says Asaph "Ace" H. Hall, corporate vice-president and general manager of the Data Systems Division.

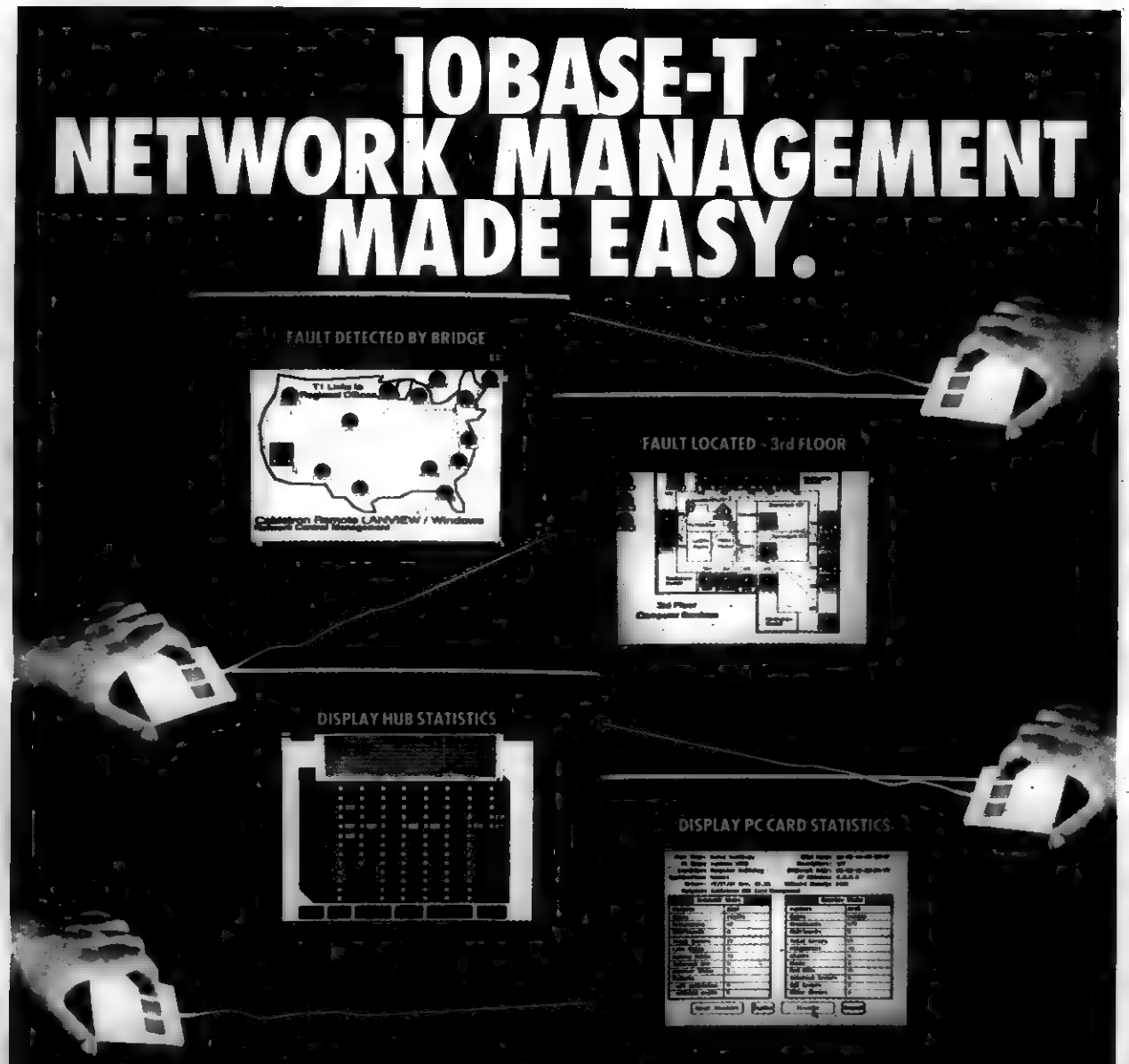
For Hall, the beauty of TQM is that it calls for the involvement of all employees in the relentless pursuit of quality and customer satisfaction. "I'm convinced there's a lot of gold there, because people get very excited when they're empowered to go out and find better ways to do things," he says.

Within the Data Systems Division, for example, one of the five "critical process teams" is focusing on the process of defining user requirements for applications software — and the team leader is a user. The goals are to find out what users *really* want out of a system and define those specifications faster, according to Larry Feuerstein, the division's vice-president of planning and quality assurance.

By improving the quality of the requirements-definition phase, General Dynamics hopes to avoid those situations in which the system has to be reworked because "you didn't get clear indications from the user or you weren't talking to the real user and you find out at the first review that you didn't really understand the requirement," Feuerstein says.

Continued on page 43

10BASE-T NETWORK MANAGEMENT MADE EASY.



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Continued from page 41

The Data Systems Division is also heavily involved in the quality-improvement projects at the other business divisions. A few years ago, Hall says, "somebody would have thrown a requirement over the wall and told us to code a system to do this. Now we help them improve the process before they even consider how to automate it." The key, he adds, is getting IS staff members included in the project team at the outset.

The biggest change at the IS unit over the last few years, Hall says, it that "we have moved even more toward the business orientation — having a direct relationship with the business of General Dynamics — as opposed to being as technology-driven as we may have been in the past."

The big problem is that the business of General Dynamics is headed for some hard times now that the Cold War is over and lawmakers are preparing to slash the defense budget. Wall Street analysts say they expect the firm's earnings, which were about $7 per share in the past two years, to fall to $6.54 per share or lower this year.

As unseemly as it sounds, the only good news for the arms maker is that protracted turmoil in the Middle East may boost its foreign sales of M-1 tanks and F-16 fighters, as well as curb Congress' appetite for military budget cuts, according to analyst Paul H. Nisbet at Prudential-Bache Securities, Inc.

Nevertheless, General Dynamics has announced layoffs of 1,500 to 2,000 workers through 1991, and analysts say it will have to continue to "tighten up and buckle down."

The Data Systems Division is consequently busy trying to streamline operations and cut spending to stay "in sync" with the business units. "Over the next three to five years, we're looking at something like a one-third reduction in our IS business, strictly as a result of what's happening in the aerospace business," Hall says.

General Dynamics is looking at some outsourcing options — it has already handed its wide-area network to AT&T under an $18 million Tariff 12 contract — but prefers to use outsourcing only for selected pieces of its IS operation. "We are not in the Kodak mode here of giving everything away," Hall says, referring to the full-scale outsourcing initiative at Eastman Kodak Co.

To outsiders, General Dynamics is best known for its accomplishments in factory automation, particularly at its plants in Fort Worth, Texas, and San Diego. At the Forth Worth facility, for instance, robots handle complex drilling tasks, apply sealant and install the correct rivets to assemble the F-16 aircraft.

What makes General Dynamics IS so effective?

- **Clearly stated IS management vision.**
- **Strong commitment to IS quality program.**
- **Strong user role in defining applications.**
- **Advanced factory-automation applications.**

"I've seen their paperless factory in San Diego and that seems like quite an advanced application," adds Richard Howard, the top IS executive at Northrop Corp. But technology aside, Howard says that General Dynamics' real strength is having a clearly stated vision for IS management.

Describing that vision, Feuerstein stresses that the Data Systems Division is run strictly as a service business, not as a "technical wonderland" or a collection of fragmented programs. "The customers are the other divisions of the company, so we work on things that are directly linked to the satisfaction of our division customers," he says. □

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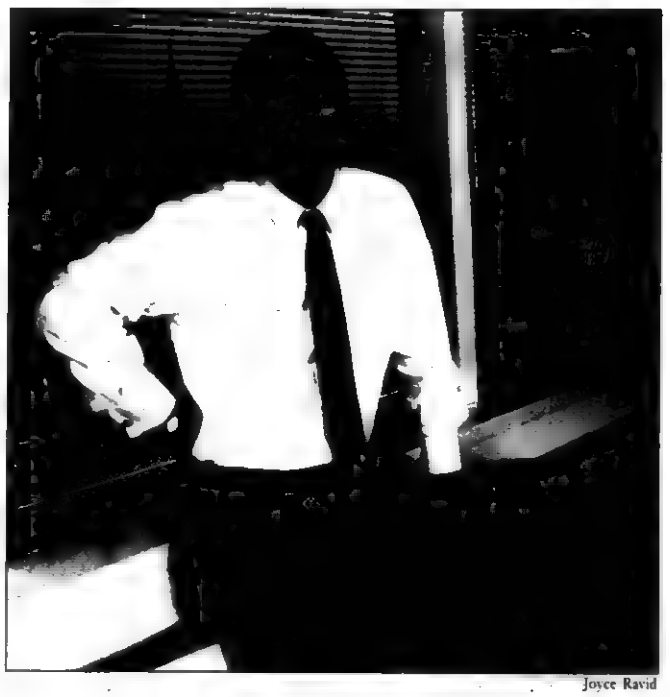
Aerospace

Industry rank	Company Location Total employees	Overall rank	Total score	1989 profits (millions)	Estimated IS budget (millions)	Total PCs and terminals
1	**General Dynamics Corp.** St. Louis, MO 95,000	6	27,855	$293	$585	28,000
2	**Gencorp, Inc.*** Fairlawn, OH 15,100	10	27,525	$210	$40	8,700
3	**Martin Marietta Corp.** Bethesda, MD 46,200	16	27,150	$307	$291	20,100
4	**Allied-Signal, Inc.*** Morristown, NJ 107,100	24	26,880	$528	$372	33,543
5	**Grumman Corp.** Bethpage, NY 28,000	41	26,055	$67	$241	16,200
6	**The Boeing Co.** Seattle, WA 164,500	49	25,715	$675	$1,164	91,964
7	**Northrop Corp.** Los Angeles, CA 38,000	51	25,625	($81)	$290	22,500
8	**United Technologies Corp.** Hartford, CT 190,400	59	25,475	$701	$847	35,918
9	**McDonnell Douglas Corp.** St. Louis, MO 127,000	63	25,310	$219	$755	70,000
10	**Textron, Inc.** Providence, RI 54,600	66	25,285	$259	$252	24,000
Medians for industry Top 10		**45**	**25,885**	**$276**	**$332**	**26,000**

Companies are ranked by industry according to CW 100 Index. *Estimates are from *Computerworld* sources, not the companies.



Joyce Ravid

Benmosche *says employee contributions and interest keep Paine Webber in fighting shape*

Strong Focus on People Powers Paine Webber

BY AMIEL KORNEL

On a clear day, staff members working up a sweat at Paine Webber, Inc.'s corporate health club have a panoramic view of downtown Manhattan. Wall Street's glass and steel peaks across the Hudson River are a constant reminder that they — and their company — need to stay in fighting shape.

These days, competing on Wall Street can challenge even the toughest players. To keep in the game, Paine Webber has whipped its information services unit into a trim, agile team. While information technology is highly valued at the company, the stock brokerage places a premium on what it considers its most valuable corporate asset — its employees.

"When you empower your people and make them feel they can contribute more to the organization, they produce more and you earn more," says Robert Benmosche, director of operations and systems.

Under the guidance of 46-year-old Benmosche, Paine Webber has implemented a number of measures that have helped keep information systems staff people motivated, highly skilled and loyal. This is no small feat in an industry renowned for its high employee turnover and fast-paced technological changes.

One of the world's largest securities brokerages, Paine Webber saw net earnings rise 4.8% to $25.4 million during the first six months of 1990, compared with the same period in 1989. Half-year revenue rose 11% to $1 billion.

As a result of the company's innovative management of its people, operational costs have shrunk while satisfaction with corporate IS services has grown.

The most visible such effort came during a cost-cutting measure in 1988, when the company moved its IS and operations facilities from the frenetic streets of downtown

Manhattan to slower-paced and lower-priced Wehawken, N.J.

The transfer across the Hudson was controversial at the time. Wall Street firms generally prefer keeping their technological nerve centers close to the action, and management feared a backlash from employees disgruntled with the move. Shareholders were not sure whether to cast a sympathetic eye, either: According to company financial statements, setting up and transferring to the new facilities cost about $50 million.

No one seems to doubt the wisdom of the move today, however. The new operations and systems facilities rent costs a third less than office space in Manhattan, Benmosche says. Also, the recent Manhattan power outage that shut down IS shops at many Wall Street firms for several days, forcing them to scramble to backup sites, made Paine Webber's move across the Hudson seem almost prescient.

Perhaps most importantly, the overwhelming majority of the stock brokerage's operations and systems staff have stayed with the company, Benmosche says. Eighty percent of the 740 IS people working for the company before the move are still with Paine Webber today, he says. Of the 20% that left, half did not need to be replaced thanks to improved efficiencies and productivity at the new site.

How did the company manage to hold onto its staff in spite of the upheaval invariably caused by a move?

The conveniences of the modern, spacious facilities, complete with health club, have helped preserve and even boost staff morale, according to Benmosche. The secret, however, seems to lie in a number of programs designed to afford employees continued training and high job mobility. "When you are ... committed to the people and their development," Benmosche says, "that tends to reduce turnover."

Benmosche, who worked as human resources chief at Chase Manhattan Bank NA, among his many previous professional incarnations, conducted an attitude survey among Paine Webber's IS staff in January 1989. He found that people believed that the firm did not offer them adequate career paths. "They said, 'We're not learning enough about the basic business, and we're not growing,'" according to Benmosche.

What makes Paine Webber IS so effective?

- Minimal employee turnover.
- Policy of 'empowering' employees.
- Strategic relationships with major vendors.
- Move to distributed processing.
- Cost efficiency the No. 1 priority.

Many staff members also demonstrated a surprising lack of knowledge about the firm's business. "They didn't understand how to solve problems; they only knew how to do their work," he says.

As a result, the company started a four-day course teaching employees the ins and outs of the brokerage business. It included field trips through the company as well as to the floor of the New York Stock Exchange.

Benmosche and his recently appointed chief information officer, Robert McKinney, have a mandate from Chairman and Chief Executive Officer Donald Marron to stay on top of the latest product offerings. No less than the company's survival is at stake.

"If you look at the last 20 years on Wall Street," Benmosche notes, "those who didn't keep pace with the technology and the efficiencies [it offered] were gobbled up by someone else." □

KORNEL IS A COMPUTERWORLD SENIOR EDITOR, FEATURES.

Financial Services

Industry rank	Company Location Total employees	Overall rank	Total score	1989 profits (millions)	Estimated IS budget (millions)	Total PCs and terminals
1	**Paine Webber, Inc.*** New York, NY 12,900	7	27,755	$52	$200	10,357
2	**American Express Co.** New York, NY 105,000	26	26,675	$1,157	$874	70,000
3	**Pacific Mutual Life Ins. Co.*** Newport Beach, CA 3,471	31	26,420	$28	$57	1,900
4	**Salomon, Inc.*** New York, NY 8,900	36	26,395	$470	$335	6,105
5	**General Re Corp.*** Stamford, CT 2,379	44	25,855	$599	$87	1,920
6	**Mass. Mutual Life Ins. Co.** Springfield, MA 10,000	53	25,615	$124	$75	6,000
7	**New York Life Ins. Co.** New York, NY 18,200	54	25,600	$1,452	$156	10,000
8	**The Prudential Ins. Co.** Newark, NJ 100,209	57	25,550	$743	$818	65,200
9	**Primerica Corp.** New York, NY 24,000	58	25,400	$289	$183	15,625
10	**Metropolitan Life Ins. Co.** New York, NY 46,000	63	25,320	$300	$433	35,882
Medians for Industry Top 10		**51**	**25,735**	**$385**	**$192**	**10,179**

Companies are ranked by industry according to CW 100 Index. *Estimates are from *Computerworld* sources, not the company.

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Centralized, Revitalized IS Brings Sears into the '90s

Bigger, leaner Sears uses 'insourcing' to downsize and shake competition

BY JOSEPH MAGLITTA

Ask the average shopper about Sears, Roebuck and Co., and you'll hear of power tools, refrigerators, lawn mowers and chunky catalogs. True, the $54 billion company is still the country's largest retailer. But Sears has changed.

For the past decade, Sears has bounced through a dizzying series of corporate maneuvers and refocusing that would give most information systems departments a bad case of the heebie-jeebies. Yet Sears' IS has not only survived these megachanges, it has evolved and *prospered*.

Today, the Chicago-based giant is aggressively using information technology to help shake off a dowdy retail image and propel it past a pack of fierce competitors and into the 1990s.

"We are technical enablers," says Charles A. Carlson, president of Sears Technology Services, Inc. (STS), the company's 1-year-old technology arm. STS both supports and drives company consolidation and integration efforts using a simple, back-to-basics approach: "Provide the best possible service at the lowest price."

Several steps taken during the last 18 months — including a major IS reorganization, data center consolidation, heavy network and electronic data interchange (EDI) spending and "insourcing" — have helped make Sears a sharper user of information technology. Already, these moves have helped the company keep pace with its fast-moving businesses and have rocketed Sears to the top of the retail industry ranking in the 1990 *Computerworld Premier 100*.

Analysts say that the savvy use of technology could be just the ticket needed to continue growth of the many diversifications undertaken by Sears during the 1980s. Hounded by hungry retailers such as J.C. Penney Co., Wal-Mart Stores, Inc., The Limited, Inc. and others, Sears expanded into financial services (Dean Witter Financial Services, Inc.), real estate (Coldwell Banker), credit (Discover card) and on-line services (Prodigy Services Co.), while expanding its Allstate Insurance Co. arm. The granddaddy of retailing also opened 779 smaller specialty shops, specializing in everything from eyeglasses to paint to computers.

While Sears is heavily computerized — it is said to be IBM's largest customer and owns the world's biggest Systems Network Architecture network — it has historically been unable to parlay the investment into any real strategic advantage, says Walter F. Loeb, a New York retail analyst and veteran Sears watcher.

David Joel

Sears' Carlson: IS *is helping Sears change the way it does business*

But recent downsizing and centralization have helped transform Sears into a more focused, effective user of information technology, Carlson says.

With profit up 3.8% to $1.5 billion in 1989, Sears is spending a whopping $950 million this year on information processing and networking, up 20% from the previous year. Much of that amount will go

toward expanding and integrating Sears' vast network of some 250,000 personal computers and terminals.

"We've focused heavily on building a solid, total information processing network and architecture," Carlson explains. "We want this network to be seamless."

Neither is Sears afraid to rattle the glass house. In January 1989, top management dissolved divisional IS operations and formed STS, the centralized IS unit. Headed by Carlson, STS handles IS and communications for all of Sears except Allstate, which receives only network support.

Carlson explains that "the goal was to free up the business units so that they could concentrate on business applications and not worry about *where* they were going to run and *how* they were going to run." Divisions now do their own applications development; STS gives consulting, procurement and implementation help as needed.

What makes Sears IS so effective?

- Insourcing centralizes IS; business units handle application development.
- Consolidated data centers save millions.
- Strong corporate commitment to IS, as shown by $950 million budget.
- Aggressive EDI program requiring its 5,000 suppliers to participate.

Another facet if the new IS strategy is what Sears calls insourcing. The centralized group, Carlson says, is an information utility. Users are charged for networking, processing and consulting services.

In another move aimed at cutting costs and centralizing power, Sears condensed its 10 scattered data centers into three "supercenters" located in Dallas; Columbus, Ohio; and Schaumburg, Ill. Carlson says the 16-month project, which was completed this spring, has already saved "millions" in operating costs and salaries.

Yet despite the cutbacks, Sears hasn't ignored new technology. The company is currently using or testing several advanced technologies, including radio frequency terminals in its service vans, expert systems, compact disc/read-only memory, IBM's Officevision, imaging in its catalog operations and video conferencing at nearly 800 sites, according to Dirk Van Alystyne, a Sears senior communications specialist and IS strategist.

Moreover, Sears is pursuing EDI in what Carlson describes as "a very big way." Early this year, Sears announced that its 5,000 suppliers would be required to transact business exclusively via EDI. All of its suppliers will be using EDI by 1992, he says.

To encourage use by small vendors, Sears provides a free EDI software package, free training and discounted IBM Personal System/1 computers. Suppliers can get started for as little as $1,000. So far, about 1,000 suppliers are using some form of EDI.

These new technology initiatives appear to be paying off. User chargeback costs have dropped during the last two years, Carlson says. Effective computerization has trimmed per-transaction costs for the Discover card to 5 cents below the industry average, he says. Annual handling expenses are $10 per account less than those of competitors, he adds.

Analysts say that it's too early to tell if technology will propel Sears into the 21st century. But the potential for new products and services is huge, says Edward A. Weller, a retail analyst at Montgomery Securities in San Francisco. With Sears' massive network and customer files, "the cross-indexing possibilities are endless," he says.

The company has also hired Harvard Business School guru Michael Porter to examine its IS operations and is considering an advanced point-of-sale system. □

MAGLITTA IS A COMPUTERWORLD SENIOR EDITOR, FEATURES.

Retailing

Industry rank	Company Location Total employees	Overall rank	Total score	1989 profits (millions)	Estimated IS budget (millions)	Total PCs and terminals
1	**Sears, Roebuck and Co.** Chicago, IL 444,400	12	27,390	$1,509	$990	332,350
2	**Carter Hawley Hale Stores, Inc.*** Anaheim, CA 37,000	87	24,725	$14	$42	13,394
3	**J. C. Penney Co.** Dallas, TX 198,000	95	24,435	$802	$201	89,000
4	**The Vons Companies** El Monte, CA 35,000	138	23,645	($10)	$46	5,500
5	**Melville Corp.** Harrison, NY 97,000	268	21,815	$679	$111	4,400
6	**The Limited, Inc.*** Columbus, OH 63,000	273	21,785	$347	$43	4,011
7	**Food Lion, Inc.*** Salisbury, NC 40,736	282	21,665	$140	$40	3,868
8	**Price Co.*** San Diego, CA 12,545	295	21,455	$117	$43	782
9	**Toys R Us, Inc.*** Rochelle Park, NJ 28,039	301	21,375	$321	$42	3,818
10	**Walgreen Co.*** Deerfield, IL 50,000	346	20,785	$154	$52	6,089
Medians for industry Top 10		**271**	**21,800**	**$238**	**$45**	**4,950**

Companies are ranked by industry according to CW 100 Index. *Estimates are from *Computerworld* sources, not the company.

Key to D&B: Mastering Information Volume

Dun & Bradstreet boosts sales with investment in IS

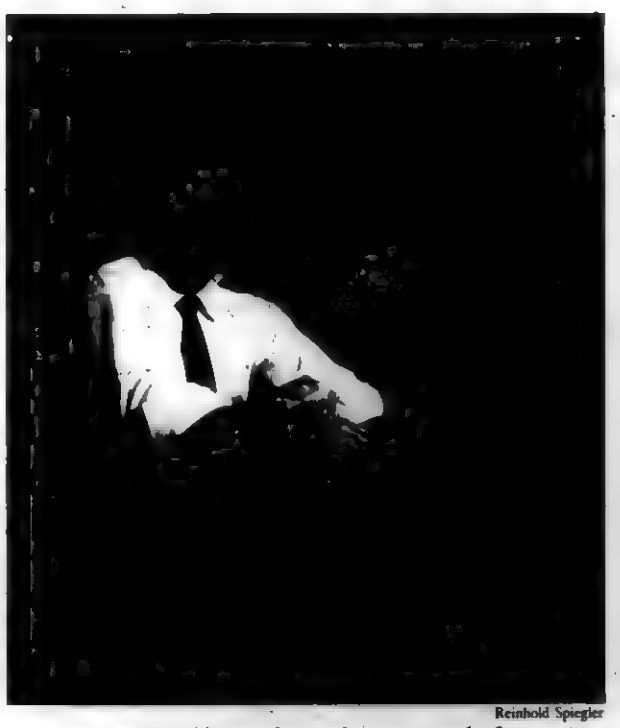
BY JIM NASH

Few companies deal with the quantity or range of data mastered by The Dun & Bradstreet Corp.'s information systems staff. In fact, at D&B, the database *is* the business. To this end, the firm maintains files containing hundreds of data elements on about 10 million to 12 million U.S. companies. Every day, approximately 100,000 file inquiries from customer service representatives and clients are logged.

The information D&B must track "is far bigger than any relational database constructed today," says Michael Field, president of the diversified service company's Business Information Group.

For this reason, the company requires a commensurately large IS investment: $750 million (about 17%) of $4.3 billion in 1990 sales. This investment was swelled in 1990 by the acquisition of Management Science America, Inc. in Atlanta, one of the largest general-ledger software vendors.

However, management is willing to spend the money to fuel continued growth and little wonder: In 1989, D&B profits jumped 17.5% to $56.4 million. The combination of effective investment in IS and solid business performance helped rank D&B at the top of its industry group and No. 11 overall in the 1990 *Computerworld Premier 100*.



Reinhold Spiegler

Dun & Bradstreet's Field: *Switching to low-cost PC platforms*

The company segments its operations six ways: risk management, directory, marketing and financial information services as well as business services and its in-house Corporate Resource Group.

Each D&B division depends on large amounts of business and consumer data. Donnelley Directory compiles and publishes Yellow Pages directories. D&B Business Credit Services provides credit reports on more than 9 million businesses. Moody's Investors Service, Inc. rates corporate and government bonds. Nielsen Marketing Research measures point-of-sale success and television advertising's audience.

With all the services, D&B seeks to tame the overwhelming wave of spending data that its technology can now collect. Businesses have a twofold use for D&B's data: They turn to it when trying to buy or sell products from other firms — or the firms themselves. They also use it to better understand consumers and sell to them. With Moody's Investors Service, for example, consumers can better understand companies, at least for investment purposes.

As providing information services using database technology moves closer to becoming a commodity market, D&B faces new challenges to its leadership

Continued on page 51

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Continued from page 49

position. To increase product development and customer use of its information services, D&B is in the midst of a multiyear effort to make its files available on lower-cost, more accessible personal computer platforms. Accomplishing this task to satisfy 70,000 employees and millions of customers is, to say the least, a difficult undertaking.

As the man charged with this megamission, Field — who is also corporate vice-president of consumer IS — has been working to remove mainframes from mainstream tasks, reserving them for roles as large database servers. This goes for both sides of D&B's house: the traditional business-to-business information side and the newer consumer-oriented side. After six years of playing the downsizing theme, Field is only now hearing the chorus sing along. That chorus is composed of managers in 26 decentralized divisions, each of which is autonomous.

Field's efforts are helping provide the platforms for D&B's latest products. Industry sources point to People Meter, the new data collection system used by D&B subsidiary Nielsen Marketing (formerly A.C. Nielsen). People Meter uses a wireless television remote control to replace the diaries previously used by volunteer TV watchers to record viewing habits.

On one hand, People Meter records viewing habits more faithfully. Viewers who watched "Three's Company" but logged a public-television documentary largely lost the fudge factor. On the other hand, recalcitrant subjects and technophobes skewed results by not using the device or by keying incorrect data. The resulting information seemed to indicate that fewer people were watching television.

The problems with the way the results were achieved and the fact that the findings were "contrary to what [advertising] companies wanted to hear," one analyst says, cost D&B a chunk of its reputation as an accurate data gatherer.

Undaunted by such criticism, D&B is working on a new product, says independent marketing and sales information consultant Bill Purcell in Palos Verdes, Calif. The new product works passively, using image recognition to record who is watching which program, Purcell says.

Critics and fans agree, however, that D&B does not wait for mistakes to improve on its products. Several analysts cited products under development at Nielsen Marketing that offer virtually up-to-the-minute sales figures at grocery and drug stores nationwide.

What makes D&B IS so effective?

- Pioneer in information services market.
- Long-term commitment to accessible information technology.
- Proven ability to learn from mistakes.
- Close link between technology and the business.

One such product, called Store*Link, would connect the ubiquitous laser scanners at store checkout counters to data collection systems, says John Costello, president of Nielsen. Corporate mainframes would collate the data into profiles prepared by D&B's customers.

"Store*Link could be a dramatic improvement in scanning technology," Purcell says. "All scanner data in general has acted as an abacus, counting one more can of Coke sold."

Programs such as Store*Link exhibit the technological goals Field is striving to achieve. They use an integrated database sporting an easy-to-use interface and offer personalized client services. "They show the level of investment [that companies] are willing to make," Purcell says. □

NASH IS A COMPUTERWORLD WEST COAST BUREAU CORRESPONDENT.

Diversified Services

Industry rank	Company Location Total employees	Overall rank	Total score	1989 profits (millions)	Estimated IS budget (millions)	Total PCs and terminals
1	**The Dun & Bradstreet Corp.** New York, NY 70,000	11	27,465	$586	$750	50,000
2	**The Hertz Corp.** Park Ridge, NJ 30,000	116	23,940	$188	$94	8,300
3	**Dow Jones & Co.** New York, NY 9,818	118	23,925	$317	$17	7,540
4	**Paramount Communications, Inc.*** New York, NY 11,800	156	23,390	$1,465	$64	5,379
5	**Alco Standard Corp.*** Wayne, PA 17,700	157	23,385	$171	$92	3,673
6	**ARA Group, Inc.*** Philadelphia, PA 125,000	200	22,755	$39	$93	2,815
7	**CBS, Inc.** New York, NY 7,000	203	22,735	$150	$36	2,500
8	**American Financial Corp.*** Cincinnati, OH 53,000	211	22,630	$3	$146	5,657
9	**Capital Cities/ABC, Inc.*** New York, NY 19,860	222	22,525	$486	$63	6,421
10	**Humana, Inc.*** Louisville, KY 55,100	226	22,450	$256	$72	8,941
Medians for industry Top 10		179	23,070	$214	$82	6,039

Companies are ranked by industry according to CW 100 Index. *Estimates are from *Computerworld* sources, not the company.

Gillette Information Systems Stays Close to the Business

BY JOANNE KELLEHER

Seth Resnick

Gillette's Moller *(left) and Standish re-examine basic assumptions*

Gillette Co., having survived to the venerable age of 89, has learned that sometimes it *does* make sense to reinvent the wheel.

The most visible new wheel the firm has created lately is the hot-selling Sensor razor, which the investment firm Morgan Stanley Group, Inc. estimates will account for $210 million in sales of razors and blades by the end of 1990. Introduced simultaneously in 19 countries across North America and Europe last January, Sensor embodies many of the business objectives that drive Gillette and its information systems organization.

The silver and black razor is based on a spring-mounted design unique in the annals of beard-removal technology. Ten designers collaborated on the project, using Prime Computer, Inc.'s Calma three-dimensional computer-aided design software running on Digital Equipment Corp. VAX 11/785-connected workstations.

Although the razor was in development for years, a marketing decision regarding the look of the product turned the last 18 months before introduction into an intricately choreographed race against the clock. While the product design team pushed for a more attractive and higher tech look for the product, 50 other designers monitored their progress and translated the new specifications into new factory machines.

Gillette took on a major manufacturing challenge with the Sensor, its first razor introduction in 10 years. Because almost all of the 230 component parts and processes were different from those used by any of the company's other razor products, a completely new production line had to be devised, virtually in parallel with the evolution of the design.

The need for fast turnaround and design flexibility was particularly dramatic with the Sensor introduction but, according to Herbert Moller, corporate vice-president and director of IS, these requirements are becoming much more pronounced in all phases of business.

For that reason, he says, the overriding priority for IS throughout the organization is to synchronize its pace with the accelerating tempo of business.

"The thrust of a lot of our activities," Moller says, "is to help compress planning cycles. That means designing applications in such an elegant way that you are able to change what you did yesterday with relative ease."

There is no template for the kind of

applications that Moller is talking about. As Ted Standish, director of IS for the Gillette North Atlantic Group observes, "We used to design applications by going to the person doing a job and asking him how he did it. That doesn't work anymore because the way a job has been done in the past may not be the way we want it done in the future. Basically, we've stopped hard coding organizational assumptions into programs."

Re-examination of basic assumptions has been an almost continuous process at Gillette ever since its major restructuring 2½ years ago. One of the results of that restructuring was the creation of the North Atlantic Group to treat the U.S., Canada and Europe as a single market for shaving and personal care products. Translating that idea of market unity into operational cohesion has meant subjecting the data definitions and data-producing systems in use across the two continents to close and ongoing scrutiny.

"If you are going to treat these areas as an integrated market," Standish says, "then clearly you need to get common information. The critical part of the process is determining how difficult it is to get common information using existing systems. The answer to that is the key to deciding where standardization is necessary."

Gillette's European IS groups decided to standardize on IBM's System/38 as a common hardware platform in 1984. Since then, the seven major European centers have moved steadily in the direction of full software and administrative compatibility — a goal that Derek Munson, MIS manager at Gillette in Europe, recently estimated will be reached in 1992.

With European operations well on their way toward smooth exchange of management information, Standish says, the next step is to figure out where and how to merge information flow throughout the entire North Atlantic region.

Top priorities include figuring out how to make information on finished-goods inventories in Europe and North America available in combined form on a daily basis and devising a means of retrieving sales information for the top accounts across geographic boundaries.

One vehicle for advancing this type of informational coordination is a professional advisory board, which was created this year. The board, Moller explains, consists of IS managers from the various business units as well as a number of key staffers from the corporate IS group. The board's purpose is to help maintain the delicate balance between functional decentralization of IS and the need for coordinated information handling.

What makes Gillette IS so effective?

- **IS keeps pace with fast business.**
- **Technological integration of North American and European markets.**
- **Professional advisory board coordinates decentralization.**

The corporate IS group headed by Moller operates a central data center providing processing and programming services to the shaving and personal care and stationery products businesses. It also has responsibility for policy decisions about IS infrastructure and technology standards across the company. Rather than trying to make such decisions by fiat, however, Moller has chosen to operate in more of a participatory mode, soliciting suggestions from the board on matters such as the selection of new technology areas for investigation. □

KELLEHER IS A COMPUTERWORLD FEATURES EDITOR.

Consumer Products

Industry rank	Company Location Total employees	Overall rank	Total score	1989 profits (millions)	Estimated IS budget (millions)	Total PCs and terminals
1	**Gillette Co.*** Boston, MA 30,000	13	27,375	$285	$112	8,500
2	**Polaroid Corp.** Cambridge, MA 11,000	82	26,015	$145	$62	5,000
3	**McGraw-Hill, Inc.*** New York, NY 14,461	72	25,135	$48	$132	6,824
4	**Colgate-Palmolive Co.*** New York, NY 24,700	88	24,715	$280	$77	5,950
5	**Jostens, Inc.*** Minneapolis, MN 8,264	100	24,365	$54	$16	1,852
6	**Eastman Kodak Co.*** Rochester, NY 137,750	169	23,135	$529	$282	40,914
7	**Knight-Ridder, Inc.*** Miami, FL 21,000	175	23,095	$247	$39	8,291
8	**Avon Products, Inc.*** New York, NY 34,500	192	22,865	$55	$36	5,909
9	**Harcourt Brace Jovanovich, Inc.*** Orlando, FL 15,000	220	22,545	$72	$35	1,800
10	**Unilever U.S., Inc.*** New York, NY 30,567	223	22,495	$139	$22	8,562
Medians for industry Top 10		**135**	**23,750**	**$142**	**$51**	**6,387**

Companies are ranked by industry according to CW 100 Index. *Estimates are from *Computerworld* sources, not the company.

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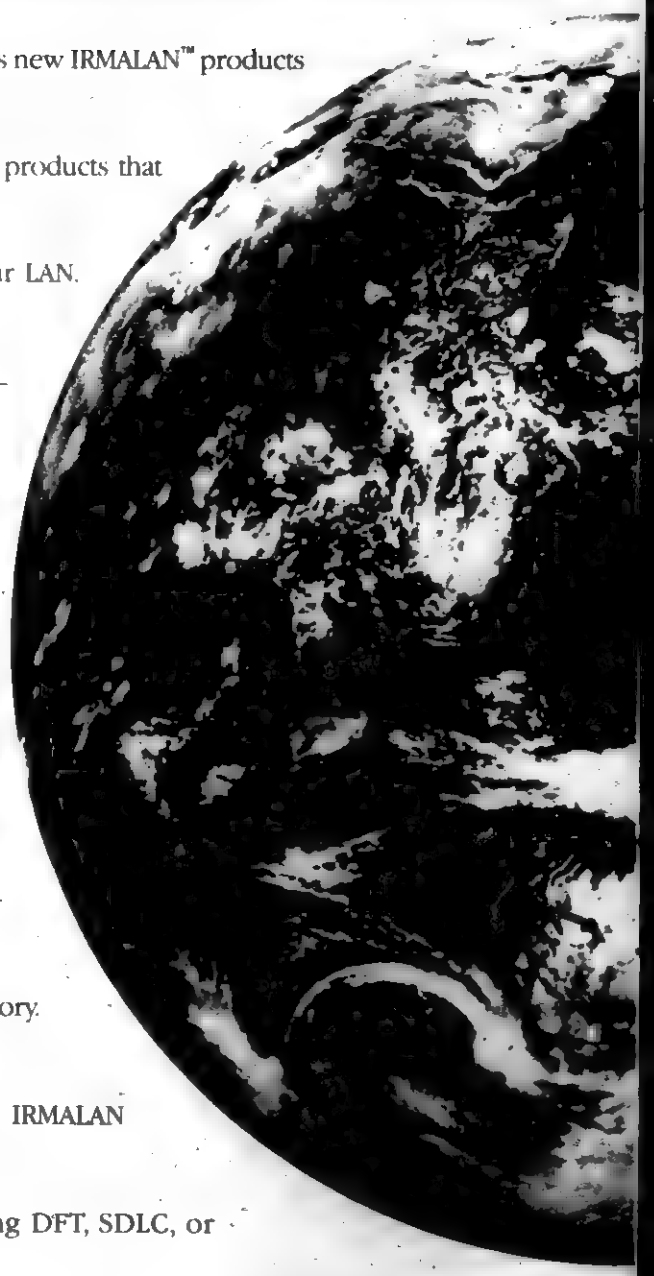

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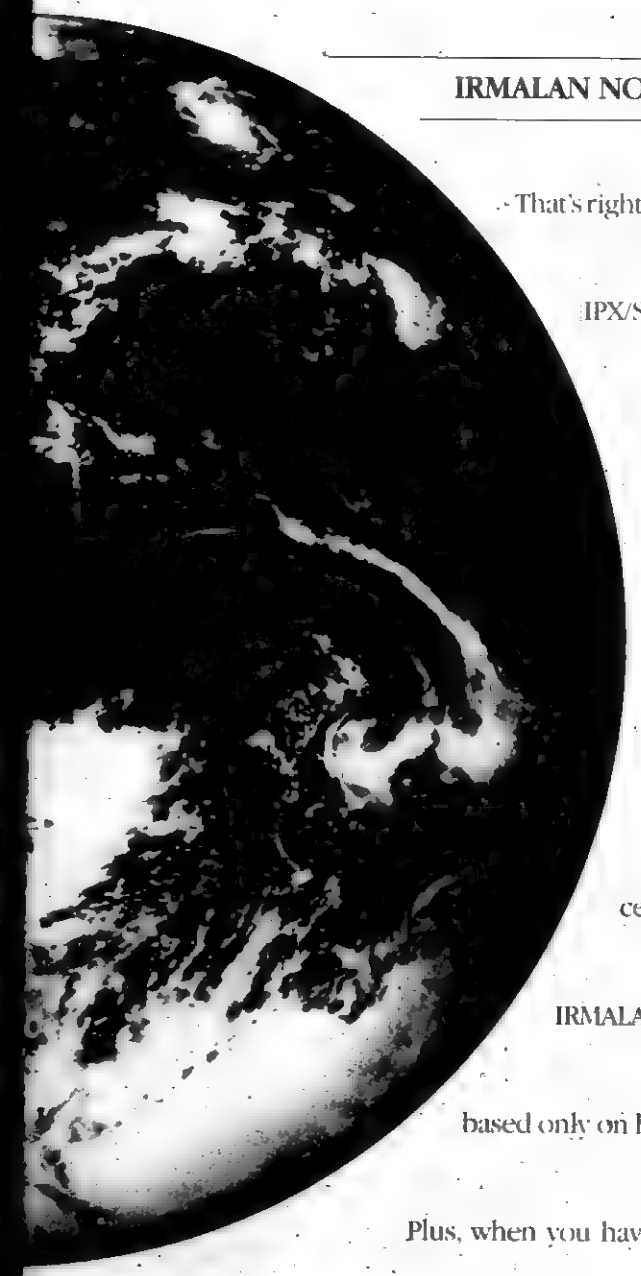

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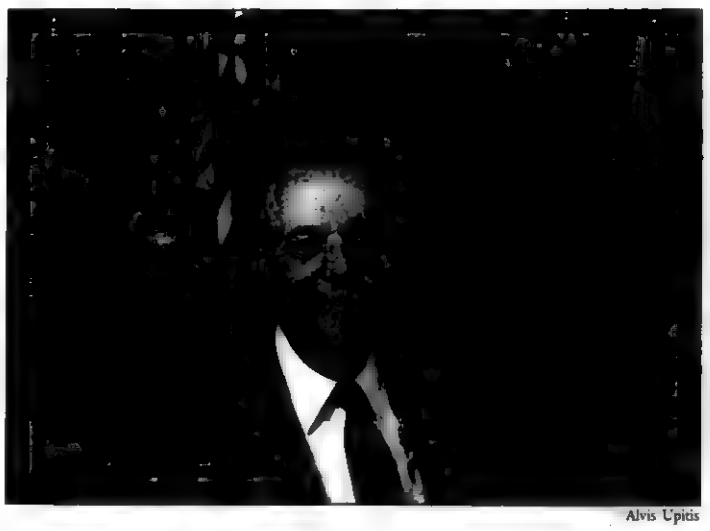
3M's Kuhrmeyer: *We do strategic planning throughout the company*



Alvis Upitis

Sticking With Innovation

3M uses systems to adapt to changing customer needs

BY ALAN J. RYAN

AND MICHAEL SULLIVAN-TRAINOR

The only sticky situations tolerated at 3M Co. are those involving consumers using Scotch Tape or Post-it Notes or workers adhering to the company's policy of innovation.

Thanks to the strategic use of information systems at the Minnesota Mining & Manufacturing Corp., troublesome situations with customers are rare. For example, when ordering any of its more than 60,000 diverse products — such as software diskettes, Bufpuf skin care products, tape products, paint stripper, Scotchgard fabric protector, sandpaper, medical diagnostic equipment and masking tape — from any division worldwide, the customer is always identified by the same ID number. It makes life easier for the customer and for 3M.

Computerized IDs are just one way in which 3M is using systems to help meet its business needs and one reason why 3M has been named to the *Computerworld Premier 100* list as the most effective user of information systems in manufacturing.

"One of the key tenets to 3M's success is its ability to adapt to meet new and different customer needs," says Theresa M. Gusman, an analyst at Salomon Brothers, Inc. With a presence in more than 50 countries worldwide, 3M is doing just fine, she says.

Sales for the St. Paul, Minn.-based manufacturing giant were $126 billion last year, and earnings amounted to just over 10% of that figure. Projected 1990 earnings for the corporation, which got its start as a mining company, are $13.4 billion. Last year, 3M passed the $1 billion mark in export sales, according to published reports.

"They tend to hold leadership positions in their markets, and in most cases, they dominate the markets," Gusman says. Much of that success is because they keep on top of the needs of the ultimate customer — the consumer.

The primary reason 3M's IS operation is effective is because of its strong adherence to standards and its ability to anticipate the requirements of the innovative corporate culture. This is not an easy task in a company that pumps out, on the average, 200 new products annually.

"All through the company we do strategic planning,"

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says Carl A. Kuhrmeyer, vice-president of administration and the company's highest ranking IS official. "The company expects each unit to innovate and come up with new ideas," he says.

That's where IS fits in. "We provide the infrastructure. We facilitate the business units' abilities to carry out their ideas," Kuhrmeyer says. "An operating division may not realize it needs a global database today," he adds, "but they may need one two years from today because of new products they are planning. We start developing that now and anticipate their needs."

3M is organized along product lines into 60 different business units. IS support for these units ranges from a large central organization, which reports to Kuhrmeyer, to IS groups and individuals that report to the business unit executives. All told, the company has 87,000 employees, 2,700 of whom work in IS.

'We work very closely with the operating groups so that we know what's coming," Kuhrmeyer says.

Operating under Kuhrmeyer is Donald H. Siegfried, staff vice-president of IS and data processing. Siegfried's group, based in St. Paul, tells 3M buyers of systems from all around the country that the preferred vendors include IBM, Digital Equipment Corp. and Hewlett-Packard Co.

However, divisions and user departments — there are 175 3M factories in the U.S. alone — are free to make their own choices if they feel there is a real need to go with a nonpreferred vendor or product. The company encourages that kind of innovation.

For instance, Unix had been in use on some manufacturing floors for 18 months before it got support from the central IS operation. The manufacturing people wanted the systems and put them in.

In fact, IS operates much like the rest of the company with respect to innovation — new ideas will be encouraged and implemented no matter where they originate. "It's a way of life," Kuhrmeyer says.

For example, if a division develops a new application or process, the central group will adopt it without having to take it over, he adds. However, there is also a strong emphasis on standards within a single product line. "A plant in Germany will use comparable systems to one in the U.S. to ensure the same quality, cost and delivery," Kuhrmeyer says.

What makes 3M Corp. IS so effective?

- Fanatical dedication to innovation and flexibility
- Adherence to IS standards to ensure consistent product quality
- Emphasis on strategic planning to anticipate future needs
- Longevity of top management

Siegfried, who has been at 3M for nearly 40 years and is one of many long-term employees, is working with a 1990 IS budget of $469 million. An additional $100 million will be spent on end-user activities other than personal computers and telephone equipment, according to Darril Wegscheid, manager of IS and data processing information planning. Of that money, nearly half will be spent on personnel, including salary, benefits, travel and training costs.

Longevity in the management ranks — all of the top managers have been with the company for 25 years or more — helps 3M carry out its ambitious agenda, says Kuhrmeyer, who has been with the company for 39 years. "We can do some of the things we do," he says, "because we trust each other completely." □

RYAN IS COMPUTERWORLD'S SENIOR WRITER, FEATURES.

Manufacturing

Industry rank	Company Location Total employees	Overall rank	Total score	1989 profits (millions)	Estimated IS budget (millions)	Total PCs and terminals
1	**3M Co.** St. Paul, MN 86,600	30	26,540	$1,310	$469	42,200
2	**The Mead Corp.*** Dayton, OH 21,800	48	25,725	$216	$53	18,273
3	**Baxter International, Inc.** Deerfield, IL 60,000	50	25,645	$446	$200	25,000
4	**TRW, Inc.*** Cleveland, OH 74,300	64	25,315	$263	$85	40,607
5	**Amax, Inc.** New York, NY 20,000	73	25,055	$360	$30	10,000
6	**The Penn Central Corp.*** Cincinnati, OH 15,100	75	25,035	$174	$15	6,538
7	**Becton, Dickinson & Co.** Franklin Lakes, NJ 18,800	83	24,785	$169	$46	7,383
8	**Xerox Corp.** Stamford, CT 99,000	85	24,740	$704	$400	43,000
9	**Aluminum Co. of America*** Pittsburgh, PA 60,660	89	24,705	$945	$104	16,617
10	**Inland Steel Industries, Inc.** Chicago, IL 20,000	91	24,655	$241	$70	5,400
Medians for industry Top 10		**74**	**25,045**	**$312**	**$78**	**17,445**

Companies are ranked by industry according to CW 100 Index. *Estimates are from *Computerworld* sources, not the company.

IS Helps 'Cat' Stay on its Feet

BY MICHAEL FITZGERALD

Heavy industry giant uses systems to keep its balance during tough times

In a decade that was tough on heavy industry, Caterpillar, Inc., known by many simply as Cat, held its position as the world's top maker of heavy equipment. The $11.1 billion company is No. 1 or No. 2 in each of its dozen or so markets, ranging from tractors to front-end loaders, pipe-layers and various engines. And the company has actually gained market share in its major lines of business.

With information systems playing a strong role in that kind of success record, it's no surprise that the Peoria, Ill., company ranks No. 1 in the *Computerworld Premier 100* industrial class and is one of only four industrials in the overall ranking.

Caterpillar's IS strategy is vital to maintaining its leadership position. "We make sure that the company always has a competitive advantage from the use and flow of information," says Dale Fieldcamp, director of computer IS at Caterpillar.

Fieldcamp, 62, has worked at Caterpillar for 40 years in departments ranging from parts distribution to finance and accounting. He has worked in IS for the past 10 years, six years as director. His broad background in the business helps give users "a feeling of confidence" that their interests are being served by IS.

His philosophy? "The users should always feel that it's their project, their objectives and their goals, and it's not an 'IS project,' " Fieldcamp says.

That approach squares with what Fieldcamp sees as a fundamental shift over the last few years in systems projects in general. "The process is now geared more toward the total business, where before it was geared more toward the task at hand," he says.

Fieldcamp credits Caterpillar's top executives with helping spread technology throughout the organization. "Management recognizes the importance of information technology. That's been a major factor in our success."

In this case, crediting management is more than simply good politics, Wall Street analysts say. Caterpillar goes into a project having done "much deeper soul-searching" than its competitors, says Karen Ubelhart, a first vice-president at Shearson Lehman Hutton, Inc.

Take, for example, the company's $2.3 billion, 5-year-old "Plant With A Future" project designed to revamp the 32 facilities that Caterpillar operates worldwide by 1992. "Companies are always upgrading their factory floors," Ubelhart says, "but Cat just sat down with a clean sheet of paper and, instead of doing an evolutionary change, is making a major change in the way they make their products."

Caterpillar is one of the most vertically integrated companies in the industry, which "puts a greater demand on [information] systems," says Tobias Levkovich, capital goods/machinery analyst at Smith Barney, Harris Upham & Co. One result, he says, is that "you've got to control your entire manufacturing process from steel producing to the end of the assembly line."

This puts added pressure on IS, which has to be involved in the new design criteria for equipment as well as design of the manufacturing floor.

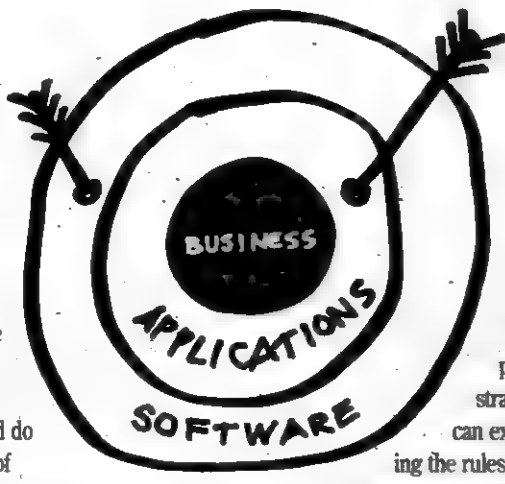
The extreme vertical integration makes Caterpil-

Continued on page 60

Caterpillar, Inc.

Caterpillar, Inc. keeps rolling along

As long as the aim of CASE vendors is better software, they'll be off-target.



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Continued from page 58

lar a highly capital-intensive company, which means the huge investment in the Plant With A Future project is a genuine commitment to complete change.

"Caterpillar has been extremely centralized, which was a way of managing the demand that they have," says Jennifer Cole, industrial goods analyst at A.G. Edwards and Sons, Inc. Cole says she approves of Caterpillar's extensive and ongoing reorganization.

"I think they're doing the right things with the Plant With A Future program and the reorganization of the management structure," she says. "They have reorganized the manufacturing from centralized to decentralized functions. Each area will be profit centers, whereas each individual division didn't have a good sense of where money was coming from before."

What makes Caterpillar IS so effective?

- **$2.3 billion plant of the future project.**
- **Vision of seamless worldwide network.**
- **Emphasis on technological change.**
- **Extensive use of advanced telecommunications.**

Fieldcamp also sees it as another management challenge for IS:

"They're setting up profit centers; we have to get them all the information they need to run their businesses in a new way. We have to be sure we're developing those and making it available to them."

Fieldcamp says this extreme vertical integration, plus the effort to decentralize, pulls the IS department in different directions.

"We try to minimize the centralization and to keep it as distributed as is practical. But in a highly integrated operation like ours, we have to recognize that some core corporate items must be centralized," he says.

Thirteen of Caterpillar's 17 divisions are "profit centers" that sell directly to the public. The other four are internal service divisions. Fieldcamp's group is part of the Corporate Services Division, headed up by Vice-President Charles E. Rager. Other branches within the division include marketing support services and computer-integrated manufacturing. The company now has about 300 product lines (services not included), as opposed to approximately 150 lines a decade ago.

Caterpillar has plants in 10 countries, 217 dealers worldwide and 22 distribution sites in 10 countries. Systems in use range from Unix-based workstations in engineering to IBM machines on the corporate side and Digital Equipment Corp. systems on the shopfloors.

With design engineers in Illinois, Japan, Belgium and Brazil working on the same products, for instance, Fieldcamp must find ways to allow these engineers to work together.

One way is through heavy emphasis on advanced telecommunications. Caterpillar bought a satellite four years ago with the goal of allowing its engineers to work on the same image simultaneously and see their colleagues' changes as they are made.

Fieldcamp estimates that this kind of seamless image sending is probably another three or four years away. In the meantime, the satellite has enabled Caterpillar to get service and marketing information to its dealers faster than ever before.

"We sell products throughout the world, and you need a communications network that will reach dealers regardless of how remote they are, and reach them in a timely fashion so they're up to date on equipment and how to service the equipment," Fieldcamp says.

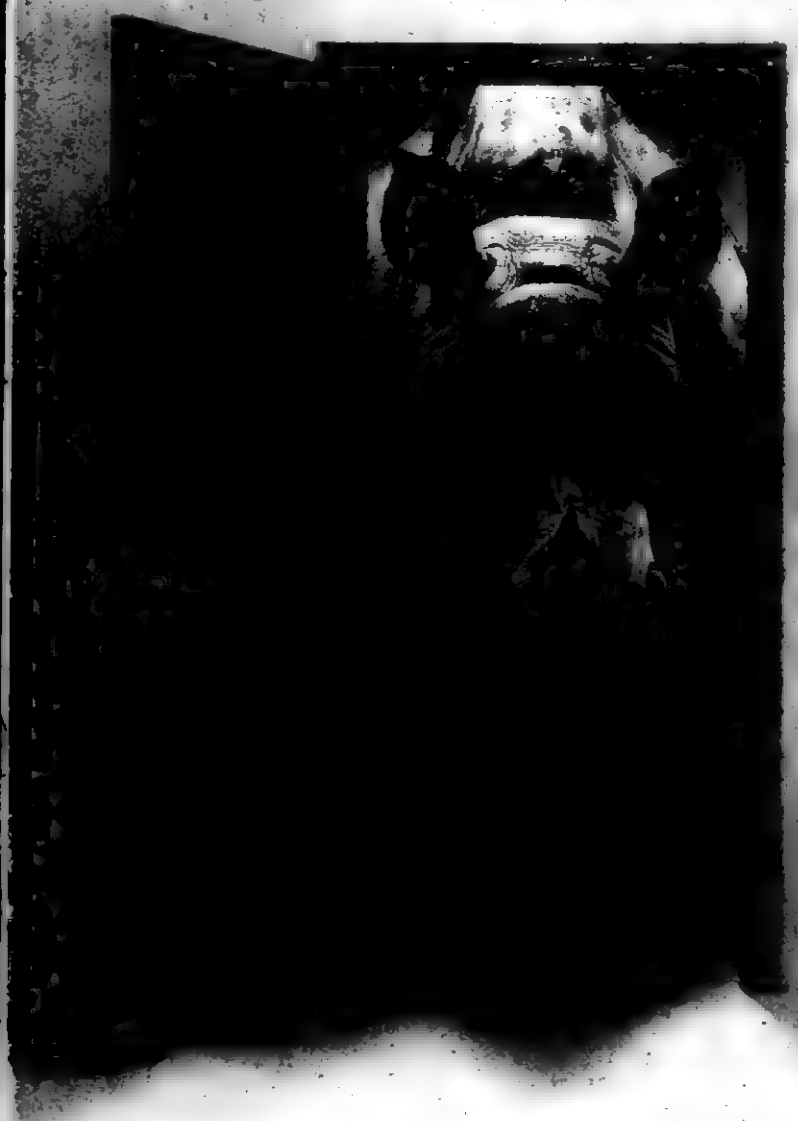
It's all part of keeping Caterpillar moving. As Fieldcamp says, "business needs drive the use of technology." And at Cat, that means a big payload. □

FITZGERALD IS A COMPUTERWORLD MIDWEST BUREAU CORRESPONDENT.

Industrial

Industry rank	Company Location Total employees	Overall rank	Total score	1989 profits (millions)	Estimated IS budget (millions)	Total PCs and terminals
1	**Caterpillar, Inc.** Peoria, IL 60,409	35	26,405	$497	$300	25,000
2	**The Timken Co.*** Canton, OH 17,248	43	25,910	$55	$37	5,110
3	**The Pittston Co.*** Greenwich, CT 14,500	60	25,470	$4	$66	4,914
4	**Ingersoll-Rand Co.** Woodcliff Lake, NJ 31,623	61	25,400	$210	$80	18,000
5	**Dresser Industries, Inc.*** Dallas, TX 31,400	104	24,295	$170	$106	9,420
6	**Harnischfeger Industries, Inc.*** Milwaukee, WI 12,000	135	23,675	$71	$20	3,538
7	**Masco Industries, Inc.*** Taylor, MI 14,300	170	23,135	$57	$35	1,981
8	**Trinity Industries, Inc.*** Dallas, TX 9,560	194	22,835	$30	$13	362
9	**Paccar, Inc.*** Bellevue, WA 13,077	201	22,740	$242	$50	3,769
10	**Parker Hannifin Corp.** Cleveland, OH 31,000	212	22,620	$124	$49	8,600
Medians for industry Top 10		**120**	**23,985**	**$98**	**$50**	**5,012**

Companies are ranked by industry according to CW 100 Index. *Estimates are from *Computerworld* sources, not the company.



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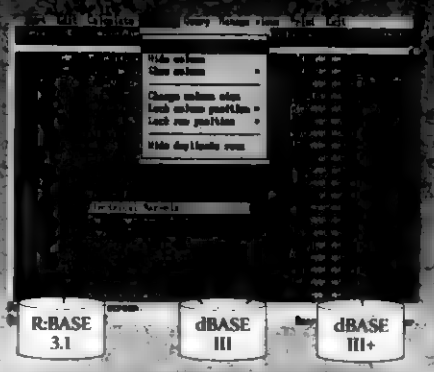

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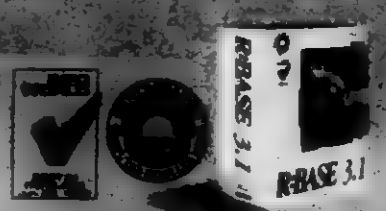

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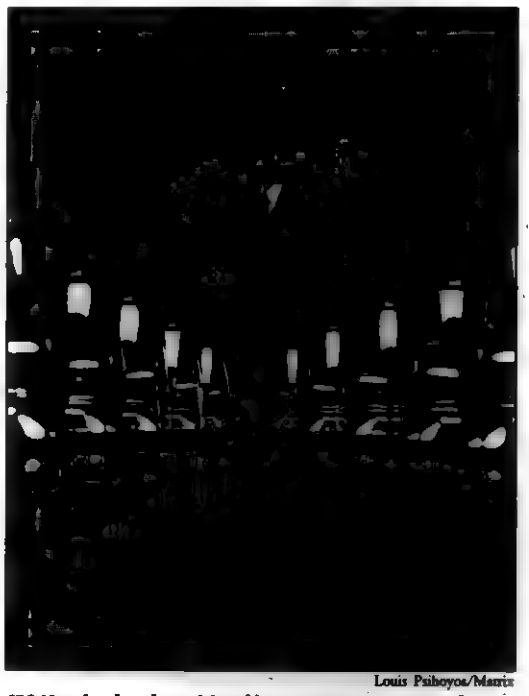
Tight Lips, Laptops and Supers Help Merck Shine

BY GLENN RIFKIN



Louis Psihoyos/Matrix

CEO Vagelos *heads up Merck's management council*

Information systems excellence might be one of the best-kept secrets about Merck & Co., a potent force in the tight-lipped drug industry and arguably the most highly regarded corporation in the U.S.

In 1986, Merck passed none other than IBM to finish atop *Fortune*'s list of America's most admired corporations and has held that spot ever since. It now adds another honor: most effective user of IS in the pharmaceuticals market.

You'd hardly know it. Albert Cinorre, Merck's vice-president of computer resources, refuses to discuss Merck's IS operations and has instructed his staff to do the same.

Although he won't talk to the press, Cinorre did acknowledge in an internal company publication that Merck considers itself a technology leader in the industry. In fact, without Merck's major commitment to computing, Cinorre added, "we'd probably be out of business."

Cinorre oversees an IS budget of $185 million and a staff of 1,000 IS professionals in Merck facilities around the world. According to information provided by Merck, the company has 11,000 personal computers and terminals and spends 50% of its IS budget on personnel costs such as salaries, training, benefits and travel.

The company, formerly a major Wang Laboratories, Inc. shop, has turned to IBM during the past three years. Most of its $110 million worth of equipment is from IBM, and according to a Merck spokeswoman, the new corporate headquarters in White House Station, N.J., will use state-of-the-art IBM systems. Merck plans to move in 1992.

The pharmaceuticals industry is intensely competitive and is thus secretive about product development. A successful new drug introduction is the result of years of exhaustive research, clinical trials, government approvals and marketing plans. Mevacor, for example, a critical cholesterol-reducing drug, took Merck 10 years to develop. Being first to market can mean hundreds of millions of dollars in revenue to a company. So it's little surprise that sharing tips on how to get that edge is verboten.

Merck also gets to market better than anyone else. According to *Fortune*, Merck has introduced a remarkable 10 major drugs since 1981, each accounting for at least $100 million in sales annually.

Computers play a critical role in drug development, particularly in the areas of molecular modeling and crystallography. Merck recently installed a high-end IBM 3090 with supercomputer speed in its Merck, Sharp & Dohme Research Lab.

Merck scientists were finding it difficult to get computer time on the old

system to model and analyze results of design and testing. The new system allows Merck scientists to run programs in seconds that once took 30 minutes or longer on older workstations.

Merck hopes the new system will make possible such research projects as designing molecules to adhere to receptors or binding sites in the body. Finding these molecules often means testing hundreds of compounds, using computer simulation to find the one that fits. Once the molecules are found, chemists can theoretically synthesize them and find new ways to combat cancer and other diseases.

Merck, Sharp & Dohme's sales force — the largest in the Merck empire — pioneered the use of portable PCs back in the mid-1980s and is now spreading laptop technology even further. By the end of 1991, all 2,700 sales representatives will be using laptops on customer calls.

By giving its 100 hospital sales representatives computers five years ago, Merck earned a reputation as a technology-driven company, and that image has spread. The company says PCs allow sales representatives to make on-the-spot projections and analyses that would previously have taken weeks. For example, a software program for Merck's injectible antibiotic Primaxin can make 24,000 comparisons of the microbiological spectrum of 28 antimicrobial agents so that physicians and prospective customers can see just how many diseases the drug can treat.

Merck is using laptops and conventional PCs in training and sales support across the entire corporation. Internally developed software programs are giving Merck a competitive advantage in every facet of sales, including plan routing, order tracking, customer profiles and internal communications.

For the past several years, Merck has been investing heavily in robotics and intelligent vision systems to improve its quality control and manufacturing processes.

Merck has its own advanced technology group, which is at work on developing a low-cost seeing machine. William Pater, senior director of IS management, oversees the group.

The firm has also targeted expert systems and voice recognition as critical technologies for use in its research-intensive environment. It installed its first voice recognition system in 1987 at its Hybridoma lab in West Point, Pa.

Merck's IS group did pioneering work in creating the pharmaceutical industry's first computer-controlled processing facilities. The company implemented an MRP II system at its West Point facility as well.

Merck's business strategy is steered by a management council headed by President and Chief Executive Officer Roy Vagelos. The council, which meets monthly, is made up of 22 senior-level executives; each division is represented. Cinorre and his Computer Resources Group are part of a corporate division that oversees the activities of all other divisions. Cinorre himself reports to council member Stanley Fidelman, senior vice-president of engineering and technology. □

What makes Merck IS so effective?

- Strong investment in IS personnel.
- Savvy use of IBM 3090 for drug development.
- Widespread use of portable PCs for sales force.
- Exploration of advanced technologies, including robotics, intelligent vision.

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Pharmaceuticals

Industry rank	Company Location Total employees	Overall rank	Total score	1989 profits (millions)	Estimated IS budget (millions)	Total PCs and terminals
1	**Merck & Co.** Rahway, NJ 34,000	38	26,310	$1,500	$185	11,000
2	**Abbott Laboratories** Abbott Park, IL 43,000	79	24,975	$860	$145	15,000
3	**Eli Lilly and Co.*** Indianapolis, IN 28,200	92	24,505	$940	$39	24,995
4	**Central Soya Co.** Ft. Wayne, IN 3,474	113	24,005	$15	$23	741
5	**Johnson & Johnson** New Brunswick, NJ 81,300	132	23,705	$1,082	$212	14,958
6	**Whitman Corp.** Chicago, IL 25,000	153	23,425	$372	$40	2,400
7	**Pfizer, Inc.** New York, NY 40,000	159	23,370	$681	$175	11,000
8	**Warner-Lambert Co.*** Morris Plains, NJ 33,000	167	23,190	$413	$41	6,488
9	**Schering-Plough Corp.*** Madison, NJ 21,300	188	22,915	$471	$38	5,162
10	**Coca-Cola Enterprises, Inc.*** Atlanta, GA 20,000	190	22,895	$1,724	$41	3,885
Medians for industry Top 10		**143**	**23,565**	**$771**	**$41**	**8,744**

Companies are ranked by industry according to CW 100 Index. *Estimates are from *Computerworld* sources, not the company.

THE PREMIER 100

COMPANY, RANK

Ambase Corp., **80**
AMR Corp., **4**
AT&T, **74**
Abbott Laboratories, **78**
Aetna Life & Casualty Co., **99**
Air Products & Chemicals, Inc., **25**
Allied-Signal, Inc., **24**
Aluminum Co. of America, **89**
Amax, Inc., **73**
American Express Co., **26**
Ameritech Applied Technologies, **23**
Atlantic Richfield Co., **31**
Banc One Corp., **9**
Bankamerica Corp., **40**
Bankers Trust New York Corp., **3**
Baxter International, Inc., **50**
Becton, Dickinson & Co., **83**
Bell Atlantic Corp., **22**
The Boeing Co., **49**
CSX Corp., **55**
Carter Hawley Hale Stores, Inc., **87**
Caterpillar, Inc., **35**
Centerior Energy Corp., **47**
Chicago & North Western Trans. **14**
Colgate-Palmolive Co., **88**
Contel Corp., **39**
Corestates Financial Corp., **19**
The Dow Chemical Co., **20**
Duke Power Co., **82**
The Dun & Bradstreet Corp., **11**
Eli Lilly and Co., **92**
Enron Corp., **96**
FMC Corp., **2**
Federal Express Corp., **28**
Freeport McMoran, Inc., **70**
GTE Corp., **21**
Gencorp, Inc., **10**
General Dynamics Corp., **6**
General RE Corp., **81**
Gillette Co., **13**
The B.F. Goodrich Co., **46**
Grumman Corp., **41**
Ingersoll-Rand Co., **61**
Inland Steel Industries, Inc., **91**
J.C. Penney Co., **95**
J.P. Morgan & Co., **76**
Jostens, Inc., **100**
Lockheed Corp., **77**
Louisiana Land & Exploration Co., **86**
MCI Communications Corp., **1**
Martin Marietta Corp., **16**
Massachussetts Mutual Life Ins., **53**
McDonnell Douglas Corp., **65**
McGraw-Hill, Inc., **72**
The Mead Corp., **48**
Merck & Co., **38**
Merrill Lynch & Co., **93**
Metropolitan Life Ins. Co., **63**
Mobil Corp., **68**
Monsanto Co., **37**
Mutual Benefit Life Ins. Co., **84**
The Mutual Life Ins. Co., **94**
National City Corp., **81**
New York Life Ins. Co., **54**
Northeast Utilities, **45**
Northrop Corp., **51**
Northwestern Mutual Life Ins., **98**
Norwest Corp., **8**
Oryx Energy Co., **32**
Pacific Mutual Life Ins. Co., **34**
Paine Webber, Inc., **7**
The Penn Central Corp., **75**
Phillips Petroleum Co., **33**
The Pittston Co., **60**
Polaroid Corp., **67**
Primerica Corp., **58**
The Prudential Ins. Co. of America, **57**
Quantum Chemical Corp., **67**
Rockwell International Corp., **69**
Rohm & Haas Co., **52**
Salomon, Inc., **36**
Sears, Roebuck and Co., **12**
Security Pacific Corp., **17**
Shawmut National Corp., **97**
Signet Banking Corp., **15**
Southwestern Bell Corp., **29**
Sun Co., **78**
TRW, Inc., **64**
Textron, Inc., **66**
The Timken Co., **43**
The Travelers Corp., **71**
3M Co., **30**
US West, **27**
Union Carbide Corp., **62**
Union Texas Petroleum Holdings **5**
United Technologies Corp., **59**
United Telecommunications, Inc., **18**
Valhi, Inc., **90**
Wells Fargo & Co., **56**
Xerox Corp., **85**

HOW TO EVALUATE YOUR COMPANY

Companies that wish to compare their use of information systems with the *Computerworld Premier 100* can request a worksheet to evaluate their ranking. During the past two years, companies have found the worksheet to be a useful measure of their industry standing.

Actual *Premier 100* rankings are based on a system that considers each firm's score in relation to the figures for all companies surveyed (see methodology page 17). For this reason, the worksheet calculations will not represent exact scores. However, ranges provided in the worksheet will allow companies to approximate their total scores.

To obtain a worksheet, contact Michael L. Sullivan-Trainor, Senior Editor, *Computerworld*, 375 Cochituate Road, Framingham, Mass. 01701. Telephone: (800) 343-6474 or (508) 879-0700, Ext. 229.

ACKNOWLEGEMENTS

We would like to thank the following people for providing assistance with the 1990 *Premier 100*: Focus Research; Susan Hancock, Hancock Consulting; Dr. Stephen Parkoff, Coopers & Lybrand; Marty Redden, Association Research; and Bob Tasker, IDC. Thanks also to those who helped develop our criteria: Tom Johnson, Nolan Norton & Co.; Tom Davenport, Index Group; and Mike Webber, Diebold Group.

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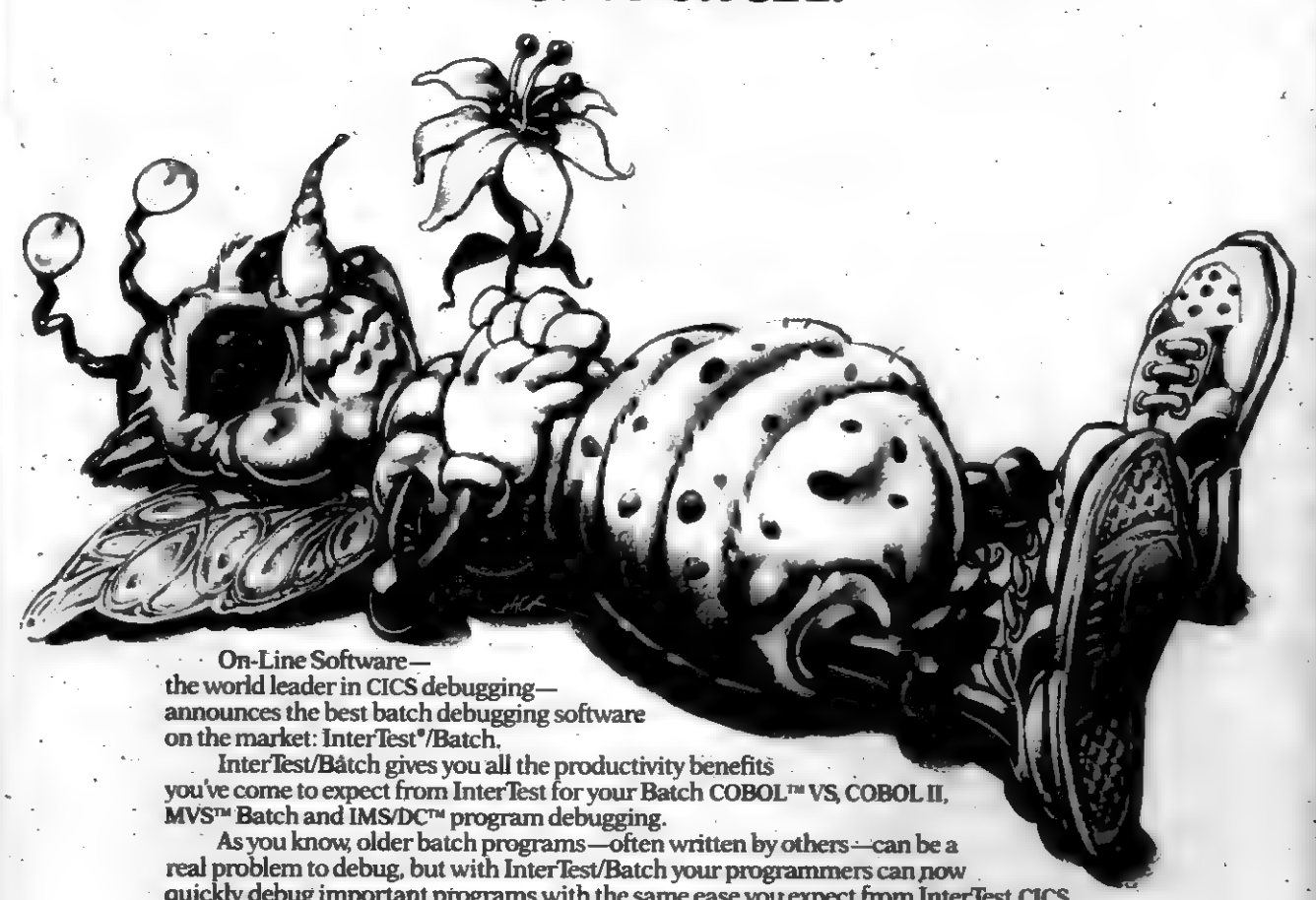

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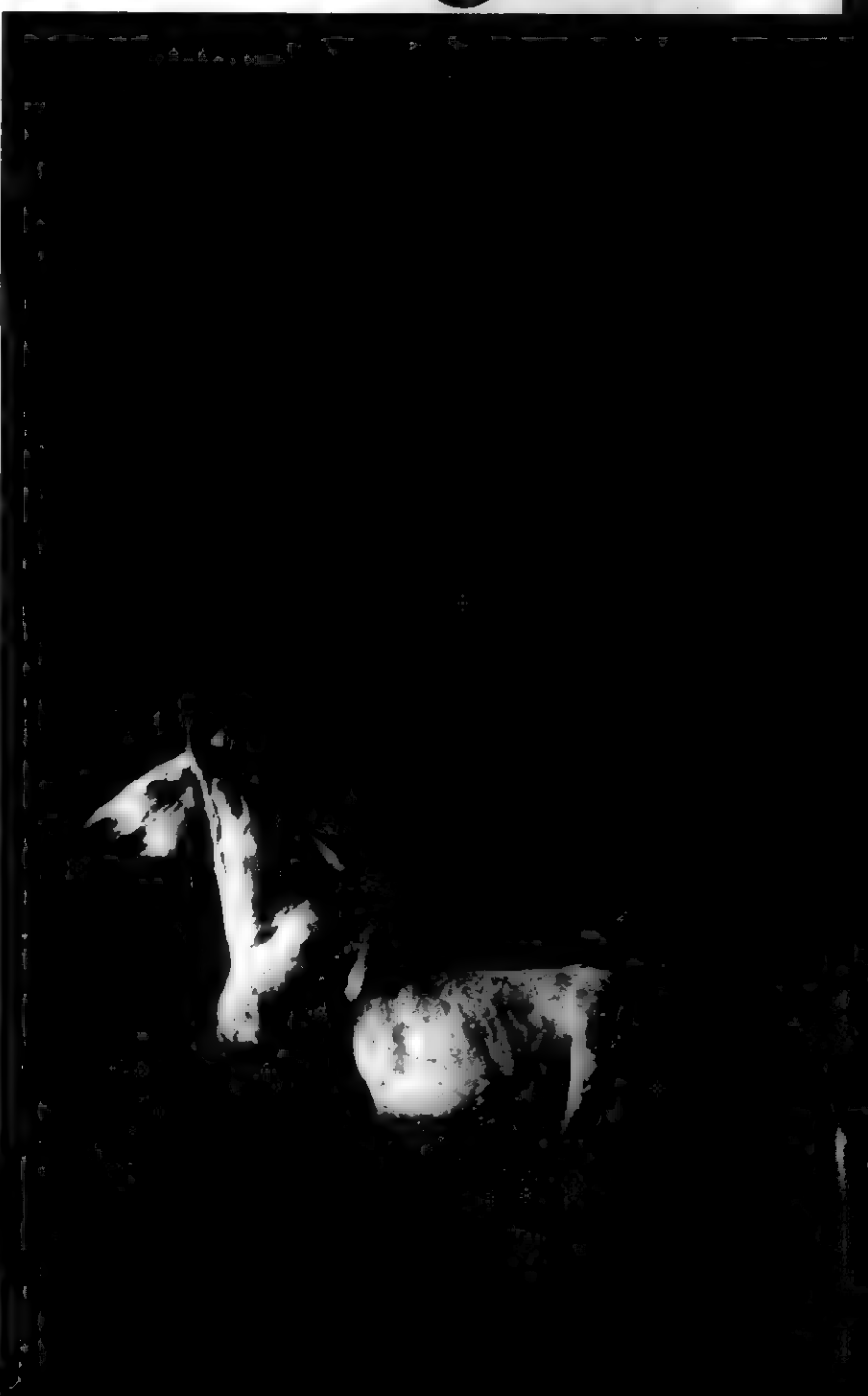

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NEWS RELEASE

INTEGRAL ANNOUNCES TRADE-IN PROGRAM FOR MSA AND M&D CLIENTS

Uncertainty Created By Dun&Bradstreet Acquisition Prompts Special Integral Financial and Human Resource Program

Walnut Creek, CA — In response to overwhelming requests from within the newly combined MSA and M&D client base, Integral today announced a financial and human resource software trade-in program designed to provide organizations with proven, stable and enduring business solutions.

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The program originated in response to strong and rapidly growing concern among the D&B Software client base over questions of product continuation, commitment to support, and overall D&B Software company strategy and technology direction. In recent coverage of the D&B Software user conference, COMPUTERWORLD noted that **"many left the conference skeptical and confused about how the company will 'bridge' the redundant applications software lines it has acquired."**

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VOL 24
ISS 42
OC 15 1990

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THE NEWSWEEKLY OF INFORMATION SYSTEMS MANAGEMENT
October 15, 1990 · Vol. XXIV · No. 42 · 144 Pages · $2/Copy · $48/Year

COMPUTERWORLD

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IBM, Federal Express awarded prestigious Baldrige quality management prizes. Page 10.

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Trade show interest slides for *Computerworld* readers who were surveyed on current and future attendance plans. Page 4.

EDS push through IS doors builds up multibillion-dollar 'juggernaut.' Page 113.

Software AG unwraps multiplatform distributed applications strategy. Page 140.

Intel 'double-crossed' AMD, arbitrator rules; fate of 80386 transfer rights remains undecided. Page 141.

Compaq to lead 'lite' brigade

BY RICHARD PASTORE
CW STAFF

NEW YORK — When Compaq Computer Corp. unveils its next-generation LTE notebook-size computer today, it will open the floodgates for a deluge of me-too competitors and price wars, observers said. The LTE 386S/20 will set a de facto standard and may prove a tough act for even Compaq to follow, some analysts noted.

An Intel Corp. 80386SX-based, IBM Video Graphics Array-compatible machine has long been anticipated as the next evolutionary step for notebook-class personal computers. Optimized to run more sophisticated software, such as Microsoft Corp.'s Windows 3.0, the Compaq system matches the minimum desktop specifications being set at most medium-size and large businesses.

The LTE 386S, scheduled to ship this month, promises to improve on the weaknesses of its predecessors. Instead of a stunted screen, Compaq has incorporated a full-size, 9-in. diagonal display that is "edgelit" rather than backlit. Full-fingered users may be happy to find that the unit's keys are not cramped, but rather standard-spaced. Compaq has also added 4K bytes of disk cache and the options of an internal modem and compact disc/read-only memory adapter, among others.

Perhaps more importantly, all LTE model cases will now be made of a more durable plastic, a Compaq spokesman said. Cracks in LTE and LTE 286 cases have resulted in a 30% to 40% rejection rate in some areas, according to Peter O'Connor, president of Laptop Expositions in New York. Owners of older LTE models will receive a lifetime case warranty for free replacement.

Continued on page 141

Upscale laptop
Compaq's latest laptop PC will feature more memory, advanced graphics and a more powerful CPU than the LTE 286

	LTE 386S/20	LTE 286
Processor	20-MHz Intel 80386SX	12-MHz 80286
Memory	2M to 10M bytes	640K to 2.6M bytes
Hard disk	30M or 60M bytes	20M or 40M bytes
Display	VGA, 16 gray shades	CGA, 4 gray shades
Weight	7.5 pounds	6.7 pounds
Base price	$6,499	$3,499

Source: Compaq Computer Corp. CW Chart: Marie Haines

Apple paring Mac costs

Move seen as key to regaining lost market share

BY JAMES DALY
CW STAFF

CUPERTINO, Calif. — Beginning today, millions of people can potentially do something with an Apple Computer, Inc. Macintosh that they were unable or unwilling to do before — own one.

Apple begins its long-awaited move to become a supplier of inexpensive personal computers today with the unveiling of three Macintosh PCs designed to regain the low-end market share that has been slowly eaten away by inexpensive IBM Personal Computer-compatible clones.

While the trio is expected to reinforce Apple's strong presence in the home and education markets, analysts said it may also accelerate Apple's expansion into the corporate world — the traditional domain of DOS-based clones.

"When it came to price, Apple always entered the world of big business with one strike against them," said Benny Lorenzo, an analyst at San Francisco-based research firm Volpe, Covington and Welty.

Apple customers said they are hungry for the new machines. "This is long overdue; we're anxious for them," said Rick Christjansen, manager of automation support at the Manville Technical Center in Denver. Christjansen said he is particularly eager to purchase the Macintosh SI because its internal Nubus expansion slot will facilitate network hookup.

Leading the rollouts at the firm's Fremont, Calif., manufacturing facility will be the

Continued on page 6

Software clan to patrol hype

BY NELL MARGOLIS
CW STAFF

BOSTON — Executives from more than a dozen software companies convened last week to declare open season on dubious marketing and accounting practices that they see as threatening their industry's credibility — and credit.

The fledgling Software Business Practices Council said it wants to stop sky-high marketing hype, vaporware announcements, misleading advertising and "creative accounting" by software vendors.

While the group includes such notable members as Ashton-Tate Corp., Digital Equipment Corp. and Lotus Development Corp., the software industry's biggest players have so far failed to join, and observers said they doubt the council can make much of an impact without them.

The council's two-pronged plan is to get the word out that "straight-shooting software vendor" is not an oxymoron and

Continued on page 8

Quake threat still haunts data sites

BY JEAN S. BOZMAN
CW STAFF

SAN FRANCISCO — One year ago this week, the San Francisco region reeled in the wake of a major earthquake that measured 7.1 on the Richter scale. It took many information systems shops days to recover from the Oct. 17, 1989, quake, and for a few sites, the path back to normalcy took months. The passage of a year has softened the memory of those painful 30 seconds when 62 people lost their lives amid the rubble of buildings and highways, but it does not appear to have caused computer operations to pack up and leave.

With a commitment born of San Francisco's history of rising above natural catastrophe — including the April 1906 earthquake and fire — area firms are still reviewing backup procedures and signing up for hot-site recovery services.

But San Francisco IS managers admitted last week to a certain fatalism about future quakes. Shaklee Corp.'s data center moved across San Francisco Bay into an earthquake-resistant building in Hayward, Calif., a few months before the quake. "We haven't done much more since then to prepare for the next one," said Hugh Bradley, director of MIS at the San Francisco-based firm.

Some shops protect themselves by having dual data centers. "We're continuing to revise our plans," said John Parady, executive vice-president of technology services at the Pacific Stock Exchange, which has computerized trading floors in San Francisco and Los Angeles. "If we should ever lose the San Francisco data center, we could stay up and running in Los Angeles. But we've tightened up on a few things, like having redundant data in both centers." After the

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"If NCR makes this work, they'll be No. 2 in no time, and IBM better watch out."

DICK REDDECLIFF
SARASOTA COUNTY

On NCR's cooperative processing strategy. See story page 130.

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The Fifth Wave

"WE HARDLY GET ANY COMPLAINTS FROM USERS ANYMORE. THINK IT'S BECAUSE WE HIRED A TROGLODYTE TO RUN THE DEPARTMENT?"

EXECUTIVE BRIEFING

■ **The thrill is gone from trade shows.** A *Computerworld* survey of information systems managers reveals that they are cutting back on spending during a blah economy and that they have pared attendance at trade shows. Fifty-three percent of the managers surveyed say they are attending fewer shows than they were two years ago. While show organizers claim that attendance is up, IS folks say they are more interested in educational conferences. **Page 4.**

■ **Market research is nothing new**, and, as the Edsel showed the people at Ford three decades ago, market research is not perfect. What *is* relatively new, however, is the use of computer-based systems to uncover opportunities that are buried amid the massive amounts of facts and figures collected in conjunction with a new product launch. Some companies have success stories to relate. **Page 93.**

■ **Well-known and respected IS exec Gary J. Biddle** died recently of an apparent heart attack. Biddle, 52, had worked since his teens at American Standard, rising to the position of vice-president of IS technology. His peers call him a "lovely guy and real gentleman." **Page 4.**

■ **The aftershocks may be gone but the memories live on** one year after the Northern California earthquake of 1989. IS executives say they learned some lessons from the quake: not only how to tie down bouncing disk drives but also how to deal with the human element of a disaster. **Page 1.**

■ **There may be a multiplatform distributed database** in IBM users' future, but the wait just seems to grow. IBM executives indicated that current plans call for a late 1991 announcement of a shipment date. **Page 29.**

■ **IS professionals aren't counting on banking careers** these days. With layoffs and cutbacks smacking the nation's largest banks, executives are forced to rethink their strategies. The fortunate ones are those with highly specialized skills; the less fortunate ones are those with "plain vanilla" mainframe backgrounds. **Page 120.**

■ **The old days of easy cabling decisions** are gone. Standards once dictated what you used: coaxial for Ethernet and shielded twisted-pair for token-ring. Today, managers are dealing with multiple choices involving numerous types of cables. The upside is that decision-makers have more flexibility. The downside is that decision-makers must make more decisions. **Page 73.**

■ **Police thyself** is what the software industry may be telling its members. Representatives of a dozen software vendors last week acknowledged that the industry has had its problems with things such as vaporware, marketing hype and creative accounting practices. The vendors plan to set up ethical guidelines for the industry to follow. **Page 1.**

■ **Politics is a fact of life** in organizations. An IS manager offers some tips based on his experiences on how you can learn to play the game. **Page 135.**

■ **On-site this week:** It may have been good as far as paper-based systems go, but it was still paper. A major plumbing supplies distributor, Ferguson Enterprises, is working on the replacement of its longtime manual system with a Pick-based computer system. **Page 33.** Expert systems that draw data down from IBM AS/400s to PCs are a key ingredient for Mrs. Fields Cookies. **Page 45.** "Why wait?" seems to be the theme at Stanford University, where management decided not to let vendors choose which protocols should be used for high-speed networking. The university is evaluating Switched Multimegabit Data Service as a means to provide 45M bit/sec. communications among researchers, academicians and scientists. **Page 78.**

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Gary Biddle was outsourcing pioneer

BY CLINTON WILDER
CW STAFF

American Standard, Inc.'s Gary J. Biddle, an information systems executive with a reputation for translating innovative thinking into action, died suddenly late last month at the age of 52.

Biddle, vice-president of IS technology at American Standard, died of an apparent heart attack in his sleep Sept. 26 during a business trip to the UK. Widely regarded as a pioneer of the current outsourcing trend, Biddle was in high demand as a conference speaker and spent a lot of time sharing his ideas.

"He was a lovely guy and a real gentleman, and I'm really very personally shocked and saddened by his loss," said Raymond Perry, corporate vice-president of IS at Avon Products, Inc. in Rye, N.Y. Avon chose to eschew the outsourcing route that American Standard embraced, but Perry credited Biddle with sparking the idea for data center consolidation that saves Avon $3 million per year.

"I had lunch with Gary last year to discuss that, and I now call it the $3 million lunch," Perry said. "I give him an awful lot of credit for getting our whole train of thought going. I'm sure American Standard is grateful to him for what he did there, but Avon owes him a debt of gratitude, too."

Joseph Burgos

Biddle practiced *what he preached*

Biddle was a lifelong American Standard employee, first employed there at age 18. He moved to data processing in 1973 and rose steadily through the ranks.

Biddle's career at the New York-based plumbing and transportation products firm was jeopardized by the hostile takeover bid of Black & Decker, Inc. in 1988. However, American Standard successfully fended off the bid with a leveraged management buyout, and Biddle stayed on as a major shareholder and executive.

The buyout debt forced him to look at technology costs differently, and he chose to outsource IS operations to Genix Corp. in 1988, well before outsourcing became a household name in IS. In a *Computerworld* profile early last year, Biddle predicted that outsourcing would become a major trend [CW, April 17, 1989].

Biddle "shocked IS managers into rethinking not only their mission but also their value-enhancing capacities to their enterprise," said Henry Pfendt, director of information technology services at Eastman Kodak Co.

"Above all, he practiced what he preached," Pfendt added. "That will be his lasting legacy."

Pfendt's sentiments were echoed by Anthony DiRomualdo, an associate director at The Diebold Group, Inc. who worked closely with Biddle. The consulting firm adopted many of Biddle's ideas about measuring return on IS investment.

"A lot of people talk about those concepts, but successfully implementing them is another matter," DiRomualdo said. "American Standard was the only firm I knew that really did. Gary was a model in my mind of what an IS executive should be."

"The community of IS has lost a great spokesman," said John Imlay, chairman of Dun & Bradstreet Software and a vendor to American Standard. "I was just forming my customer council, and he was the first name on it. I'm in shock. All of us will miss him, particularly me."

Trade shows losing appeal for cost-conscious IS execs

BY JOANIE M. WEXLER
CW STAFF

Computer trade shows appear to be fizzling — not sizzling — for the information systems manager, according to *Computerworld* readers, who say that today's dismal economic climate is forcing them to maintain a judicious grip on their corporate wallets.

Over 150 IS professionals recently surveyed by *Computerworld* reported that their exhibition-floor activity is waning, despite sponsor claims that attendance numbers are on an upward spiral.

According to the survey respondents, 53% are attending fewer shows than they were two years ago, and all respondents interviewed in a telephone follow-up acknowledged that they have no formal budget for show attendance.

"These are not boom economic times," said Roxolana Poluchowicz, manager of computing facilities at Stone Container Corp. in Chicago. "There is a value to shows in that it is convenient to be exposed to new products and technology all in one spot. But is that something we can live without by getting the same information less expensively? Yes."

David Long, director of IS at Hotsy Corp., a cleaning-machine manufacturer in Denver, added, "You can't get into a lot of detail at a show, so you're going to have to do more research anyway."

Consistent with their recent trade show behavior, 52% of the respondents also reported that their plans for the coming year call for decreased trade show attendance — both for themselves and their staffs.

IS professionals, however, seem to be holding in higher esteem the educational conferences often offered in conjunction with trade shows. Thirty-four percent of the survey respondents said they will attend more conferences and fewer trade shows, compared with 1.5% who said they will attend more trade shows and fewer conferences.

One network computing event, Interop '90, held last week in San Jose, Calif., did report a larger number of IS managers in its attendance profile. Niche shows, such as PC Expo and Networld '90, however, survive "because they're geared to specialists," according to Ralph Ianuzzi, president of Bruno Blenheim, Inc., which sponsors both PC Expo and Networld.

Interop President Dan Lynch said that he still sees a majority of engineers in attendance. "But these specialists are starting to have their managers in tow. They're guiding them to the booths and saying, 'See, it works — now will you sign the purchase order?' " Lynch commented.

The top ranked event in terms of usefulness was trade-show giant Comdex/Fall '90, with an anticipated 120,000 attendees at its upcoming event in November, compared with its 118,000 head count in 1989. Comdex was cited by 23% of survey respondents as relevant to their jobs; PC Expo (14%) and Decworld (10%) were runners-up, followed by Info, Networld and local trade shows (4% each).

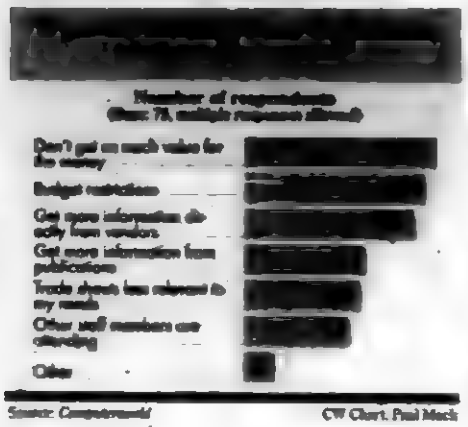
However, 18% of the respondents specifically replied "none" or "haven't attended any" to the usefulness question.

"I'm looking for applicability to my business environment," said Ron Landry, director of MIS at Freeport McMoran, Inc. in New Orleans. "Just to show a product that works has no meaning unless I can interpret how it can be applied to us."

One IS manager at a large law firm, who asked not to be identified, attributed the discrepancy between the survey and show sponsor numbers to increased attendance by end users. "As general-purpose users become increasingly aware of technology, they're going to demand more," he said, "and this will become a disjointed approach to corporate strategy."

Money, money

Cash problems and lack of show value are the top reasons users cited for skipping trade shows



Source: Computerworld — CW Chart: Paul Mock

CORRECTION

Microsoft Corp.'s Windows 3.0 Supplemental Driver Library (SDL) may be downloaded at no charge from on-line services such as Microsoft Online, Compuserve and Genie. There is a $20 fee, however, if the SDL is obtained on disk from Microsoft.

A product listing in the PCs & Workstations section of *Computerworld* [Sept. 17] said that Inner Media, Inc.'s Wideangle Desktop Expansion program was "designed to expand OS/2 Presentation Manager applications further than the confines of a single personal computer screen." The product actually expands a user's OS/2 Presentation Manager desktop rather than OS/2 Presentation Manager applications themselves.

In the *Computerworld Premier 100* supplement, 3M Co.'s revenue was incorrectly reported. The company's sales were approximately $12 billion for 1989, and profits were $1.3 billion. In addition, Leon Selfe's position was incorrectly listed in the main chart; he is manager of data processing at Pittston Coal Group, Inc., a subsidiary of The Pittston Co.

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PC aids Nynex whistle-blower

BY PATRICIA KEEFE
CW STAFF

WASHINGTON, D.C. — Much as David took on Goliath, attorney Scott Rafferty is knocking the stuffing out of telecommunications giant and former employer Nynex Corp. armed with little more than a PC and a handful of utilities.

Rafferty's efforts, coupled with testimony from other whistle-blowers, have cost Nynex millions of dollars, said Keith Gordon, assistant attorney general for New York State.

"Time after time, I've outtechnologied Nynex, the supposedly high-tech company," Rafferty said gleefully last week. "It's been very effective," agreed Gordon, adding that computer technology "made us far more capable of litigating our case effectively."

One reason technology has proven to be such an "equalizer" is Rafferty's estimate that most law firms are 10 years behind the computer wave.

Despite the fact that Nynex has spent $7 million fighting two suits involving Rafferty or his testimony, "they keep getting tripped up because of little things like Symphony 1.1," Rafferty said.

For example, two years ago, Nynex's high-powered legal team, army of paralegals and eight huge boxes of court documents were no match for his Toshiba Corp. 1000 laptop and Lotus Development Corp.'s Symphony. In August, at a hearing on the New York Telephone Co. rate case, Rafferty claimed he was able to keep Nynex witnesses on the straight and narrow by coupling Lotus' Magellan with a lone IBM Portable 386 whose 60M-byte hard disk was crammed with thousands of pages of deposition testimony.

Magellan 2.0 enabled the team to index various items and highlight key pages of testimony. The ability to intimidate witnesses by instantly calling up past testimony also saved a lot of time, Gordon said.

Perhaps Rafferty's most innovative application involved Peter Norton Computing, Inc.'s Norton Utilities, which was used to examine electronic mail records. Under court order, Nynex had included as part of 30,000 pages of hard-copy documentation a 500-page index to 50,000 electronic messages. Rafferty discovered that he had copies of only some of the messages.

Nynex uses Digital Equipment Corp.'s VAX-based E-mail system, which backs up new messages by overwriting old ones. Norton Utilities enabled Rafferty to retrieve pieces of older, underlying messages bit by bit. "He was able to obtain extremely damaging records that have played an enormous part in his private case against Nynex," Gordon said.

So critical was this evidence that Nynex charged Rafferty with theft and got a magistrate to enjoin him from even talking about the information he had unearthed. A U.S. Court of Appeals reversed that order, citing First Amendment rights.

Once upon a time, Rafferty was on Nynex's side. For seven months in 1986, he was vice-president of the Telecommunications Consulting Division at Nynex subsidiary Telco Research Corp. He was fired in November 1986 after asking Nynex officials whether plans for the consulting division overstepped a government waiver allowing it to sell and service software, Gordon confirmed.

The regional holding company, which owns New York Telephone and New England Telephone Co., among other ventures, has good reason to rue the day it fired Rafferty.

Working with the New York Attorney General's office, several federal agencies and a loose coalition of other Nynex whistle-blowers, Rafferty has figured prominently in a raft of administrative and civil proceedings filed against Nynex this year.

Symphonic suit

Whistle-blower Scott Rafferty's testimony has had a major impact on New York State's rate case against Nynex, according to Keith Gordon, an assistant attorney general for New York State.

One of the issues in the rate case concerned a group of suppliers involved in "highly irregular social activities" — that is, providing some Nynex executives with prostitutes and liquor.

Nynex's "so-called" investigation did an analysis of the amount of business these suppliers had with Nynex, beginning with the year before Nynex executives attended the parties, Gordon said.

This analysis produced about 40 pages of data, each page describing the volume of business for each of the suppliers during the period of a year. "Nowhere were there side-by-side comparisons of all the suppliers," Gordon said.

After receiving the document, Rafferty put Lotus' Symphony 1.1 to work. He put all the suppliers, their volume of business and the number of years involved into one spreadsheet. He then calculated a rated average of their growth and was able to demonstrate that those suppliers involved in the illicit parties experienced on average a 67% growth rate, compared with a 4% rate for suppliers who did not participate. "It literally proved to be a bombshell," Gordon claimed.

This evidence was not only put to use in state proceedings that are still ongoing, but it also helped to convince the New York State Public Utilities Commission to order a further investigation into the level of business done by these suppliers.

PATRICIA KEEFE

Apple

FROM PAGE 1

Macintosh Classic, a Motorola, Inc. 68000-based machine that resembles the Macintosh Plus and SE it replaces, which are being removed from Apple's price lists.

The 8-MHz Classic, which will run about 25% faster than the Plus, is structurally similar to the SE, but Apple hopes to snare new clients with the dramatic price differential. A Classic with one floppy drive will sell for $999 — compared with $1,799 for a similarly configured Plus — and $1,499 with a 40M-byte hard disk, compared with $3,498 for a similar SE setup.

The Macintosh LC will become Apple's lowest priced color system. It will use a Motorola, Inc. 16-MHz 68020 chip, making it about twice as fast as the SE, and is shaped like a small pizza box. A model with 2M bytes of random-access memory and a 40M-byte hard disk will sell for $2,499. The LC will be available in limited quantities through the end of the year with full availability expected in January, Apple officials said.

Rounding out the introductions will be the Macintosh IISI, a 20-MHz Motorola, Inc. 68030-based machine that is approximately five times faster than the SE. The SI will also offer standard sound input and become the lowest priced Macintosh to let users work under A/UX, Apple's implementation of the Unix operating system. A version with 2M bytes of RAM and a 40M-byte hard disk will sell for $3,769, while a model with 5M bytes of RAM and 80M-byte drive will cost $4,569.

Apple will supplement the unveilings with the rollout of three monitors: a 12-in. monochrome monitor for $299, a 12-in. red-green-blue color monitor priced at $599 and a 13-in. high-resolution color monitor for $999.

Apple officials said they were able to keep the price of the new models down by redesigning system components ranging from the logic board to the plastic used in the computer casing, thus trimming manufacturing costs.

At a recent briefing, Chief Executive Officer John Sculley also said the machines' low cost resulted from Apple's new belief that its traditionally high profit margins may fall victim to the company's quest to recapture market share. Since 1987, Apple has seen its portion of the $67 billion PC market shrink from nearly 15% to just 10%, according to Dataquest, Inc., a San Jose, Calif.-based research firm.

Some analysts, however, said Apple has been too laggard in getting the products to market. "Apple is way behind the curve [with the new PCs], and that's going to hurt," said Jim Poyner, an analyst at William K. Woodruff & Co., a research firm in Dallas.

Apple officials said the delay was a result of the system revamp, which, unlike earlier Macintosh releases, was not a simple reworking of previous specifications.

Mac attack

Apple is moving to shore up market share with systems priced more competitively with PC-compatibles

Apple machines

- **Macintosh Classic**
  - 1M byte RAM/floppy $999
  - 2M byte RAM/40M-byte hard drive ... $1,499
  - 8-MHz Motorola 68000
  - Available Oct. 15
- **Macintosh LC**
  - 2M byte RAM/40M-byte hard drive ... $2,499
  - 12" RGB color monitor $599
  - 16-MHz 68020
  - Limited quantity available until end of year. Full availability in January
- **Macintosh IISI**
  - 2M byte RAM/40M-byte hard drive ... $3,769
  - 5M byte RAM/80M-byte hard drive ... $4,569
  - 12" RGB color monitor $999
  - Keyboard $129
  - 20-MHz 68030
  - Sound input standard
  - Available Oct. 15

Source: Apple Computer, Inc. CW Chart: Paul Mock

RISC-based Macs said to be on Apple's drawing board

BY JAMES DALY
and MAURA J. HARRINGTON
CW STAFF

CUPERTINO, Calif. — Apple Computer, Inc. is reportedly working to integrate Motorola, Inc.'s reduced instruction set computing (RISC) microprocessor technology into its popular Macintosh personal computer line by as early as next year.

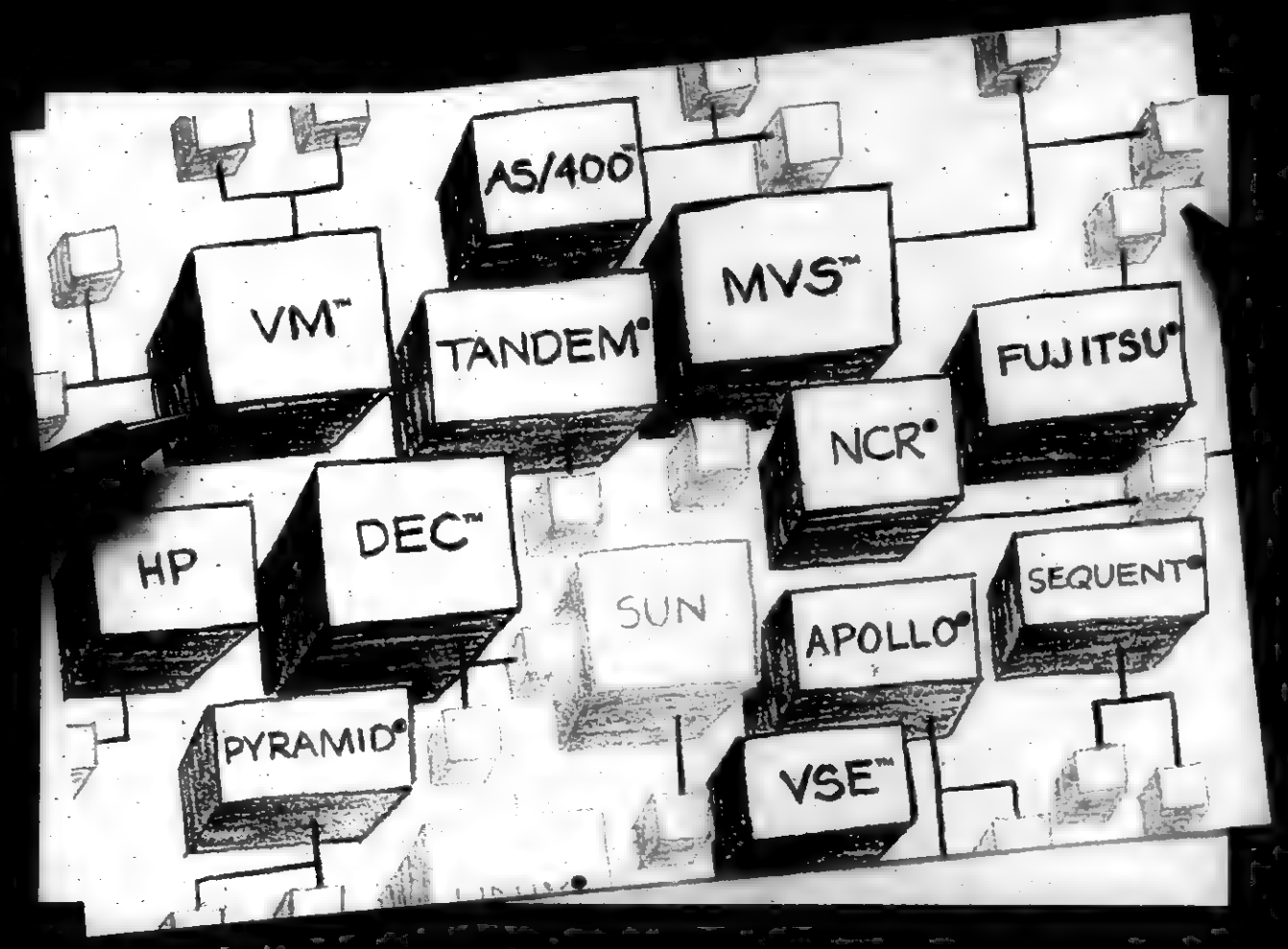
Apple insiders said they are exploring designs that would produce a Macintosh powered by a RISC chip, which is streamlined to operate significantly faster than standard chips and is commonly used in workstations. "There are a lot of intriguing possibilities there," said one Apple employee.

The move could be advantageous to both firms. Motorola, which is primarily known for its 68000 line of processors that forms the computational engines of the Macintosh series, has so far stalled in drumming up widespread interest in its current RISC offering, the 88000. Apple, meanwhile, is feeling the heat from workstation makers such as Sun Microsystems, Inc., Hewlett-Packard Co. and Digital Equipment Corp., which already use RISC technology and have targeted the price of their machines at the heart of the Macintosh line.

At last week's Microprocessor Forum technical conference in Burlingame, Calif., Motorola described plans to introduce a second-generation RISC chip, due out next year. Dubbed the 88110, the microprocessor is expected to contain over 1.4 million transistors and combine the CPU, cache memory and memory management sections on a single chip.

Motorola system architect Keith Diefendorff said the chip will be capable of running between three and five times faster than its current RISC chips, or between 50 million instructions per second (MIPS) and 85 MIPS.

The only hitch to the introduction of RISC technology into the Macintosh line is that it would require some software development finesse to get applications that work on the older machines to work on the new ones. Because a RISC machine would not be binary-compatible with the remainder of Apple's complex instruction set computing-based Macintosh line, a software emulator would need to be included with the new machine in order to run older applications.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NEWS SHORTS

Tandem in hiring freeze

Tandem Computers, Inc. conceded last week that it has had a hiring freeze in place since Sept. 10, although management had announced the freeze only to Tandem employees. In commenting on its fourth quarter, ended Sept. 30, the firm said it still anticipates a quarter of record revenue, if not stellar earnings. "We've been controlling capital expenditures and discretionary spending since last year" while also restricting employee travel and limiting equipment purchases, a Tandem spokeswoman said. "Now, [Chief Executive Officer] Jimmy [Treybig] is saying that we'll extend those controls into 1991, for as long as it makes good business sense to do so."

HP late with multiprocessor

Hewlett-Packard Co. said last week that its dual-processor Unix-based computer, rated at about 95 million instructions per second, has been delayed for up to six months. Originally scheduled for release in December 1990, the system was not delayed because of problems with adjusting the operating system to multiprocessing — identified as an inherent problem with Unix. Instead, a spokesman for HP said that there were just not enough engineers to get the product out on time.

Navy maneuver risky, GAO says

The U.S. General Accounting Office (GAO) said the U.S. Navy is buying computer gear for use in submarine-patrol aircraft before testing is completed, coding software before the design is approved and using a model of one of the system's processors for testing that is not a valid representation of the real processor. The Navy is following that risky approach, the GAO said, because it believes that further delays in the project will cause it to miss fixed-price contract deadlines, boosting costs.

Egghead settles stockholder suit

Egghead Discount Software has agreed to an out-of-court settlement of $2.9 million in a shareholder lawsuit. The class-action suit, filed in July 1989, alleged that Egghead misstated its initial public offering and subsequent public filings. A separate Securities and Exchange Commission probe has also been launched. Egghead did not acknowledge any wrongdoing.

Volkswagen signs network contract

Scientific-Atlanta, Inc. and Volkswagen of America, Inc. subsidiary V-Crest Systems, Inc. announced last week their strategic alliance to provide satellite links between auto dealers and their manufacturers. V-Crest develops and markets computer-based dealership management services. The two firms also signed a $12 million contract for Scientific-Atlanta to provide a very small-aperture terminal network linking Volkswagen and Audi dealers to their headquarters or data center.

MCDA consortium finalized

As expected, IBM and 13 other firms formed the Micro Channel Developers Association last week. The MCDA was formed to help the more than 800 developers of Micro Channel Architecture products get to market faster, with less chance that they will fail to meet MCDA specifications. The 13 other companies, all members of the MCDA's executive committee along with IBM, include AOX, Inc., Apricot Computers Ltd., Chips & Technologies, Inc., Cumulus Corp., Core International, Intel Corp., the National Software Testing Laboratories, NCR Corp., NEC Technologies, Inc., Ing. C. Olivetti & Co. S.p.A., Reply Corp., Siemens Nixdorf AG, and Western Digital Corp.

Northern Telecom claims win

Northern Telecom, Inc. announced a five-year agreement to provide up to $50 million worth of CCITT X.25 packet switches to SITA, the global telecommunications carrier for the air transport industry. More than 300 Northern DPN-100 switching nodes will form a backbone for the Mega Transport Network, which will serve SITA's 400-plus member companies.

More shorts on page 140

Prime faces hefty antitrust fine

BY SALLY CUSACK
CW STAFF

DETROIT — A federal jury in Detroit last week awarded an independent computer maintenance company a potential $25.3 million in an antitrust verdict against Natick, Mass.-based Prime Computer, Inc.

Virtual Maintenance, Inc. in Michigan alleged that Prime had unfairly excluded it from doing business with Prime customers via a "tying arrangement" whereby Prime mandates higher PDGS computer-aided design and manufacturing (CAD/CAM) software upgrade license fees for any customer who does not also purchase Prime's hardware maintenance service on the proprietary line of Prime 50 series minicomputers.

Virtual filed charges in 1989, stemming from the company's inability to penetrate the maintenance market for Prime computers running PDGS in three states — Ohio, Michigan and Indiana.

The case is similar to one that Hewlett-Packard Co. lost to Hypoint Technology, Inc. earlier this year in Cleveland. There are reported to be six other such cases pending against computer vendors in U.S. federal courts.

According to Joe Gavaghan, a spokesman for Prime, the computer manufacturer views its 50 series hardware and software as a complete, proprietary package that should be maintained as such to ensure proper support and maximum performance for the user.

Unfair practices

The jury found that Prime's practice unfairly excluded independent firms and subsequently awarded $8.4 million to Virtual — an amount that can be tripled under antitrust law.

"We feel confident we will get this decision reversed on appeal," Gavaghan said. "The policies in question are legal and have been in effect since Prime was founded in 1972."

Prime receives approximately one-third of its total revenue from computer services. Ronald S. Katz, a San Francisco lawyer and one of the attorneys representing Virtual, stated that this verdict, coupled with the recent HP litigation, " . . . sends a message to computer manufacturers that juries strongly disapprove of the methods that they have been using to foreclose competition."

Katz also serves as general counsel for the National Computer Service Network, the largest organization of independent computer maintenance companies in this country.

Virtual is in the business of maintaining computer hardware. In the three states where it operates, it has reportedly garnered more than 50% of the market for the maintenance of MAI/Basic Four, Inc. computers and Lundy terminals.

Software

FROM PAGE 1

to make good that word by pledging to uphold ethical guidelines with regard to marketing and accounting.

"Customers are angry, and, perhaps worse, they're confused," said Cognos, Inc. President Jeffrey Papows, who spearheaded the group. "When nobody can trust anybody, everybody suffers."

"The problem they're taking on is a pervasive one," said Kevin Carmody, IS director at The MacNeal-Schwendler Corp. in Los Angeles — itself a software company. "Frustration begins to grow when you've heard so many pie-in-the-sky promises that bear no relation to what the company's really doing that you begin to get the distinct feeling that marketing guys and R&D guys don't talk to each other."

Founding members, which include Hewlett-Packard Co., Sybase, Inc., Ross Systems, Ingres Corp., Banyan Systems, Inc., Interleaf, Inc. and Price Waterhouse, among others, conceded that the absence of any method of policing firms' compliance with the guidelines is a possible weak flank in their agenda. Nevertheless, they noted, the group is not entirely toothless: Several members said that they would, however reluctantly, expose to the press a member who violates the group's principles.

Industry analysts and software users applauded the council's efforts to instigate debate and to clean their own house. But they also raised questions about its chances for success.

A major issue is the absence of such big vendors as IBM, Computer Associates International, Inc., Microsoft Corp. and Oracle Systems Corp. from the membership roster. Papows said he has talked with representatives from all of those companies and only Oracle has declined to join. CA aided in forming the council but backed off when IBM put a decision on hold.

A voluntary self-policing effort only works when all of the potential violators take the pledge, said Robert Therrien, an analyst at Paine Webber, Inc. "There's always going to be some rogue who says 'to hell with the rules, we want to win,' " he said. "As soon as that happens, there go the rules."

> "THERE'S ALWAYS going to be some rogue who says 'to hell with the rules, we want to win.' As soon as that happens, there go the rules."
>
> ROBERT THERRIEN
> PAINE WEBBER

Bryan Shepherd, executive vice-president of marketing at CA, agreed. "What the council is seeking to do is to create an even playing field," he said. "Unfortunately, the world isn't even."

"What the council is doing is important," Therrien added. "But I don't think it's up to them alone. It's also up to the press to report responsibly and Wall Street to act sensibly and users to get smart."

Carmody also said he doubted that the frustration can be cured by well-intentioned vendors. "Marketing hype is the way of the world," he said. "Customers have to learn to ask the right questions."

While learning, he said, customers are likely to stick to the familiar. "If you've got six vendors and you suspect five of them might be lying to you — maybe all six — go with one that's been around for a long time and has at least a reasonable reputation for honest dealings," he said.

Shepherd said CA endorses the principles embodied in the council's white paper. "However, the fact that IBM isn't a member concerns us very much," he said. "How can we in full conscience pledge not to preannounce products when our biggest competitor has not done so?" When IBM announces a product or a capability, Shepherd said, "our customers don't ask us whether it's premature — they ask us, 'What are you going to do about it?' and we have to respond."

Both Shepherd and Dun & Bradstreet Software Chief Executive Officer John Imlay said they would take the council more seriously if it was folded into a larger, more established group, such as the software industry association, Adapso.

Papows said he ruled out working through Adapso initially because it would be too difficult to get the 750-member organization to act quickly on the ethics proposals. "We're intent on working with Adapso, but I want to have something to take to them," he said. "There's been a lot of action just in the last 72 hours."

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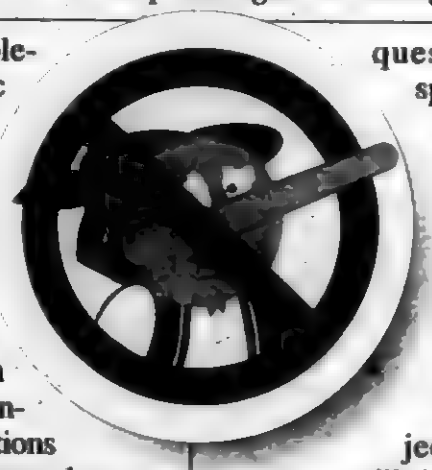

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Federal quality prize awarded to IBM division

BY NELL MARGOLIS
CW STAFF

ARMONK, N.Y. — The world's premier computer company last week won the nation's premier quality award.

"Total quality management" exhibited by its Rochester, Minn., operations, home of the Application System/400, powered IBM into the winner's circle for the U.S. federal government's 1990 Malcolm Baldrige National Quality award — a gold medal that, since its establishment in 1987, has zoomed into public prominence as U.S. industry's rough equivalent to the Nobel Prize.

Sharing the honors with IBM this year were Federal Express Co., General Motors Corp. and Houston-based Wallace Co., a family-owned pipe and valve manufacturer that scored in the small business category.

While IBM is the only computer firm that will take home a trophy from next month's awards ceremony, Federal Express' appearance as the Baldrige award's first winner in the services category is also a victory for the information systems community. The Memphis-based delivery service's use of IS to garner some 40% of its worldwide market is approaching legend status [CW, July 2].

Established under federal statute in August 1987 and named for Secretary of Commerce Malcolm Baldrige, who was killed in a rodeo accident a month earlier, the Baldrige award seeks to promote quality awareness and achievement in U.S. companies, said John Makulowich, quality program public affairs official at the Washington, D.C.-based National Institute of Standards and Technology, which manages the award.

While approximately 90 companies completed applications in 1990 — more than twice the number of firms that competed in the award's maiden year — some 100,000 sent in for the application: a document containing qualification guidelines that add up to a virtual user's manual on how to inculcate quality.

IBM Rochester, in fact, used it that way in 1989. For the past two years, an IBM spokesman said, all aspects of work at Rochester have been guided and measured by the Baldrige qualifications, consciously chosen by the company as the ideal rules for its game plan.

The results, he said, include the AS/400's development cycle, which takes half the time of its predecessor's, and two years' worth of increasingly defect-free products and satisfied customers.

"As proud and happy as we are, we regard the Baldrige award as a promising signpost rather than an end in itself," said IBM Chairman John Akers in a prepared statement. "The work only begins here."

Akers saluted Rochester general manager Larry Osterwise and the approximately 8,000 Rochester employees for their award-winning effort.

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Benchmark executable file size	104,713 bytes (2.6 times smaller)	282,288 bytes	282,288 bytes
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IBM announces disk array plan

BY ROSEMARY HAMILTON
CW STAFF

IBM edged toward the disk array arena last week by announcing a joint development deal with Maximum Strategies Corp.

The two companies plan to develop a disk array subsystem for engineering and scientific computing that uses a very high-speed interface standard called the High-Performance Parallel Interface, which clocks in at rates of up to 200M byte/sec.

However, IBM would not say when a real product may result from this effort.

"We don't know what will really happen," said Chris Wood, IBM manager of commercial analysis for the Storage Systems Product Division. "There may never be a product. It might flop."

Nonetheless, this first step shows that IBM has its eye on disk arrays and will likely go after this emerging business that so many other system and subsystem companies have targeted, analysts said.

Disk arrays and the redundant arrays of inexpensive disks (RAID) concept are the hot new topics in storage. Last month, EMC Corp. claimed to be the first to market when it introduced a subsystem that is an initial implementation of the RAID concept. Storage Technology Corp. has long been hinting that it will soon introduce an advanced RAID device, which is known in the industry by its code name, Iceberg. Meanwhile, most other systems vendors, including Amdahl Corp. and Hitachi Data Systems Corp., confirmed that they are researching this technology.

In simple terms, disk arrays or RAID devices could offer less costly fault-tolerant subsystems to replace traditional disk drives. The products would use strings of smaller disks and complex storage management techniques to provide performance of today's disk drives.

IBM has previously acknowledged research efforts and pointed out that it holds one of the first patents on disk array technology. The deal with Maximum Strategies, which is based in San Jose, Calif., is focused on a device that would be suited for numeric-intensive operations, Wood said.

100 100

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Cleveland — Sep 6*g* Sep 7*d*
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OR Portland — Sep 11*cg* Oct 23*fg*
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Successful demo reassures users awaiting cheaper FDDI

BY JOANIE M. WEXLER
CW STAFF

SAN JOSE, Calif. — One year ago, the Interop show's Fiber Distributed Data Interface (FDDI) demonstration consisted of 12 vendors merely establishing connections among their equipment. Last week's edition showed 37 suppliers actually passing and managing data.

The progress is a reassuring sign for companies eyeing the high-speed fiber-based local-area network and hoping that the refrains of "we'll see the prices drop soon" come true.

Loral Aerospace, Inc. in Houston is currently running an FDDI backbone trial to interconnect LANs in six buildings. Bill Chalupnik, a senior research and development engineer, said seeing the Interop demo relieved his concerns, because his own FDDI interoperability testing — involving equipment from Cabletron Systems, Inc., Cisco Systems, Inc. and Proteon, Inc. — has not gone as smoothly.

"We've had a few problems, and it helps to see a successful demonstration," Chalupnik said. He added that his firm installed fiber cabling a year ago because it needed FDDI's 100M bit/sec. speeds, "but the cost and the development of the technology have slowed down our efforts."

The final component of the FDDI standard, Station Management, was approved by the American National Standards Institute (ANSI) in April, and many users and vendors were waiting for that before committing to products.

The average per-connection cost of FDDI today is generally considered to be about $11,000, although recent announcements from Digital Equipment Corp and Timeplex, Inc. have listed prices of about $8,000 per port for stations with a single attachment to a concentrator, which links to both of FDDI's dual, counter-rotating rings.

However, this is still a hefty investment for users accustomed to $200 Ethernet adapter card price tags. A report by Forrester Research, Inc. last spring predicted the per-connection price of FDDI will fall to $2,000 — but not until 1994.

Another Interop '90 attendee tapping his foot waiting for the hefty FDDI component costs to fall was Charles Benjamin, communications manager at the Northeast Regional Data Center of the University of Florida. Benjamin said he would like to move some of his Ethernets and token-rings, which serve as both backbones and LANs, to FDDI.

"The cost is holding us back," he said. "We'll go to an FDDI backbone first because bridging into individual buildings from a fiber backbone costs a lot less than a lot of direct attachments to individual FDDI LANs."

Pre-Interop rumors that several workstation vendors would be unveiling inexpensive direct-attach FDDI adapter cards were partially fulfilled — depending on a user's definition of "cheap." Silicon Graphics, Inc. introduced a dual-attachment card that interfaces the workstation directly to both rings without the need for a concentrator.

> "WE'VE HAD A few problems [with FDDI interoperability], and it helps to see a successful demonstration."
>
> BILL CHALUPNIK
> LORAL AEROSPACE

Silicon Graphics' $11,000 price tag is less expensive than the cost of Sun Microsystems, Inc.'s 1-year-old, $12,500 board or Hewlett-Packard Co.'s Apollo Division's $20,000 board, which is still in beta testing.

Dave Perro, a Silicon Graphics product manager, said that in two years, connection costs should drop significantly because of 600% reductions in the cost of a pair of fiber transceivers and plummeting FDDI chip set prices. He added that if the proposals for running 100M bit/sec. speeds over twisted-pair wiring — currently on the table for ANSI's FDDI committee meeting this week in Fort Lauderdale, Fla. — catch on, the cheaper twisted-pair alternative could provide the competition needed to spur FDDI vendors to lower their prices.

In the meantime, hub products introduced by Synernetics, Inc. ($19,900) and Fibronics International, Inc. ($30,000), which multiplex Ethernet LANs running in parallel at their full 10M bit/sec. speeds onto FDDI backbones, may tide users over until prices fall. The bridgelike products give existing Ethernet users access to FDDI with no change to the workstation for about $2,000 to $2,500 per port.

Michael Howard, president of Infonetics Research, Inc. in San Jose, agreed that the prices will drop "soon." He added that this year's Interop show should spur attendees to consider FDDI technology more seriously, because "this is the best test of FDDI applications to date."

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X/Open expands user input

BY JEAN S. BOZMAN
CW STAFF

SAN JOSE, Calif. — X/Open Consortium Ltd. has decided to bring end users a bit closer to the specifications process. Last week, X/Open announced a new "open" policy to go along with its "open systems" approach to the marketplace.

Working through user councils and product reviews, the policy will directly involve end users from the initial requirements stage up until the final specifications of an X/Open standard.

The move, announced at last week's Interop '90 show here, is the latest step in X/Open's call for user input. Two user conferences, one held in Montreal in 1989 and one last May in Luxembourg, provided some precedent for the increased user role. X/Open works toward interoperability and open systems standards, often involving Unix systems.

Doug Michels, executive vice-president at The Santa Cruz Operation (SCO), a vendor of Unix-based desktop software, said more user involvement should nudge the X/Open process along. "So far, X/Open's outreach to users has been a three-day, once-a-year event," Michels said last week. "It's the right kind of thing to do, but those user conferences haven't been as detailed as I would have liked them to be."

There has also been a two-year lag in the X/Open product cycle. X/Open's XPG 3 standard was announced in 1988 and given to vendors in 1989 but not shipped to end users until 1990.

"The way X/Open has worked [before] has been by developing specifications in closed working groups and then presenting them to the world," said Mike Lambert, vice-president and chief technical officer at X/Open. "We were building up [user] expectations before the platforms were even stabilized."

Vendor strength alone will not make the XPG 3 — or the forthcoming XPG 4, expected out in 1992 — catch on, industry analysts said. X/Open members include AT&T, IBM, Digital Equipment Corp., Fujitsu Ltd., Hitachi Ltd., Unisys Corp. and Sun Microsystems, Inc.

"It's one thing to have an operating system that is compliant with a standard," said Judith Hurwitz of Patricia Seybold's Office Computing Group in Boston. "But you're really talking to yourself if you don't have applications that are compliant or have users that write applications that are compliant."

Users already involved in the X/Open users' councils said last week that they are pleased with the change in policy. "We're talking to them about how our existing systems can be made to interoperate," said Tim Cutler, manager of information systems at Eastman Kodak Co.'s Kodak Park. "That doesn't mean that users are necessarily going to go on a spree of switching vendors, but it does mean we're going to base our purchase of computer products on the vendors' compliance with open systems."

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Banyan unplugs network server

BY JOANIE M. WEXLER
CW STAFF

WESTBORO, Mass. — Shifting its marketing gears yet again, Banyan Systems, Inc. has decided to abort an 18-month, behind-the-scenes effort to develop a reduced instruction set computing-based, fault-tolerant network server — a move that will pare down the company's hardware staff by 40 people during the next nine months.

Banyan originally got into the server business "by default" to accommodate its Virtual Networking Software (Vines) network operating system, which distracted the company from its primary mission of providing networking software and confused the industry about the firm's strengths, according to Senior Vice-President James E. Allchin.

He added that the firm plans to pump the cash it saves from the abandoned development effort into porting Vines to hardware platforms other than Banyan's own CNS servers and the 40 additional platforms that are currently certified as Vines servers.

The company said it intends to expand Vines support across additional vendors' Intel Corp. 80286-, 80386- and I486-based computers, as well as Compaq Computer Corp.'s Systempro machines and clones.

CNS support pledged

However, Allchin said that Banyan would continue to produce, enhance and support its CNS line, although the company "will not step up its speed" if and when faster microprocessors begin to hit the market. "We'll provide hardware support for five years after the final CNS server ships," he said.

Allchin noted that four years ago, server sales accounted for 80% of the firm's revenue, a figure that has since dropped to one-third of Banyan's $100 million-per-year revenue.

"We're a strategic software company," he said. "Let's face it — the margins are better in software."

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HEWLETT PACKARD

Hitachi and Motorola settle patent infringement dispute

The two firms agree to jointly withdraw pending court cases

BY MAURA J. HARRINGTON
CW STAFF

Making good on a promise made last June to reach an agreement, Japan's Hitachi Ltd. and Schaumburg, Ill.-based Motorola, Inc. reached a settlement on all of their outstanding intellectual property disputes regarding Hitachi's H/8 and H/16 microcontrollers and Motorola's 68030 and 88000 family of microprocessors.

Motorola issued a statement last week stating that it will jointly file a motion before the U.S. Court of Appeals for the Federal Circuit and the U.S. District Court for the Western District of Texas (the Austin Division) requesting the withdrawal of all pending cases involving the two companies' microcontroller and microprocessor disputes.

While neither company would comment on the specifics of the settlement, Michael Slater, editor and publisher of "The Microprocessor Report" said the settlement will probably not have any impact on users.

However, according to Slater, "Motorola achieved [its] goal in crippling Hitachi's marketing efforts of its H8 until it could get fairly close to coming out with a competitive product."

In his comment, Slater was referring to a decision made last March by Judge Lucius D. Bunton III of the U.S. District Court for the Western District of Texas in which he ruled that Hitachi's H8/532 microcontroller infringes on Motorola's patents.

Network General pulls Watchdog

BY JIM NASH
CW STAFF

MENLO PARK, Calif. — Network General Corp. is smarting after discovering that network technology can overshoot user needs.

Even as it announced enhancements to Sniffer, its high-end local-area network analyzer late last month, Network General pulled Watchdog, a low-end LAN monitor, off reseller shelves. Harry Saal, president and chief executive officer at Network General, said he had misjudged the network sophistication of companies with smaller LANs.

By week's end, the error had cost Network General significantly: Its stock bottomed out at $4.50 per share before rising again this week. While some of the slide can be attributed to a bear market, company sources acknowledged that the firm's decision played a significant part in the slide.

Greg Scott, computing services manager at Oregon State University's business school, said he gave Watchdog a four-day tryout and found it lacking. He complained about the device's front end.

"It had a really clunky user interface," Scott said. "In this day and age, it's a crime to be writing front ends that are so hard to use." He explained that overly structured layering slowed him down as he used Watchdog. Scott suggested that it should support Microsoft Corp.'s Windows and mouse applications.

Network General sought to expand its single product line earlier this year with Watchdog. Instead, it will end up spending at least $200,000 to buy back stock from resellers and defer production of new monitor software.

Watchdog off guard

Saal said that effective this month, the company will market Watchdog solely through manufacturers' representatives, along with the Sniffer analyzer. Watchdog, priced at $1,995, was targeted at companies with medium-size homogeneous networks as well as large multi-LAN corporations needing a monitor on individual networks.

Some companies at both ends of that spectrum will be hit by the retreat from resellers. The U.S. Geological Survey (USGS) has thousands of networked workstations, according to USGS computer engineer Richard Jenson. However, its Menlo Park site purchased three Watchdogs to monitor three key LANs. Jenson also purchased Network General's Watchmaster, a Watchdog-dedicated console, at the same time.

Network General has said it will put production of the console on hold to satisfy the monitoring demands of larger companies that do not need the console. Jenson said he has been forced to buy software and load it onto a workstation to take Watchmaster's place.

John Rohal, an analyst at Arthur D. Little, Inc., said he sensed confusion in the market and among users after seeing Network General's demonstration at Networld '90 Dallas.

"There was a barrage of messages about what users should want from Watchdog," Rohal said.

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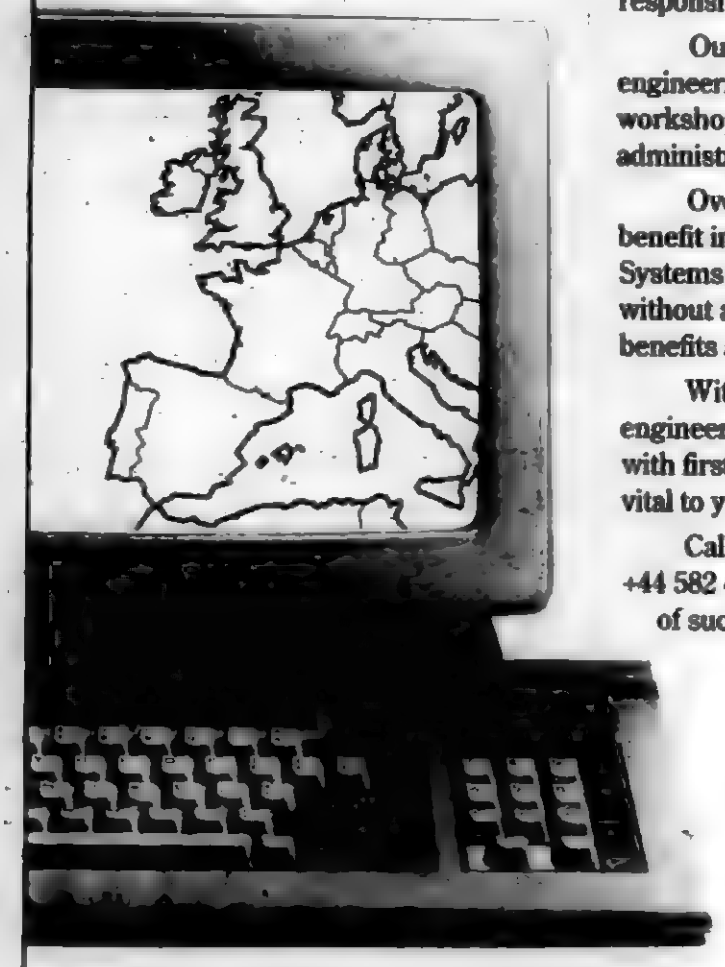

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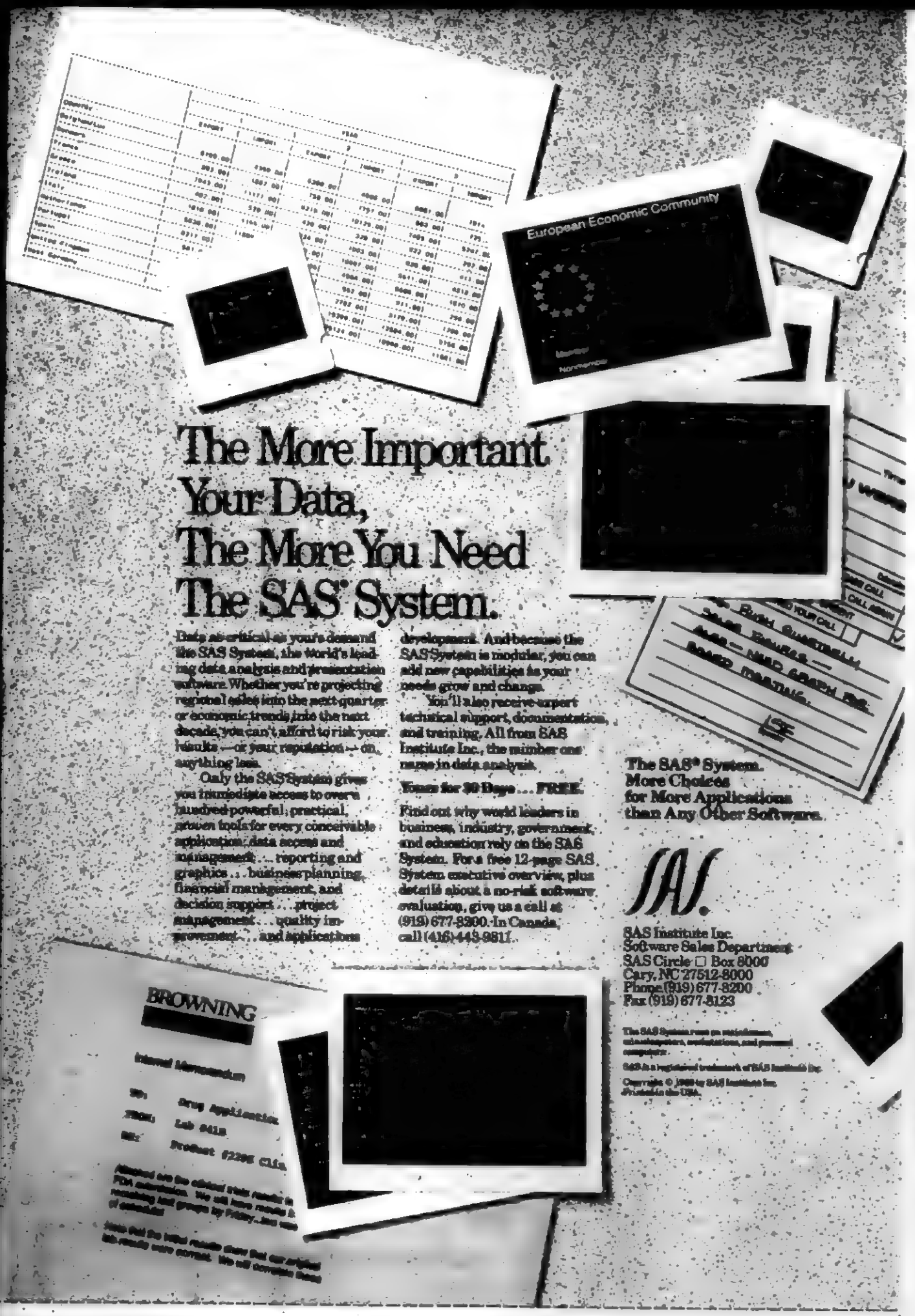

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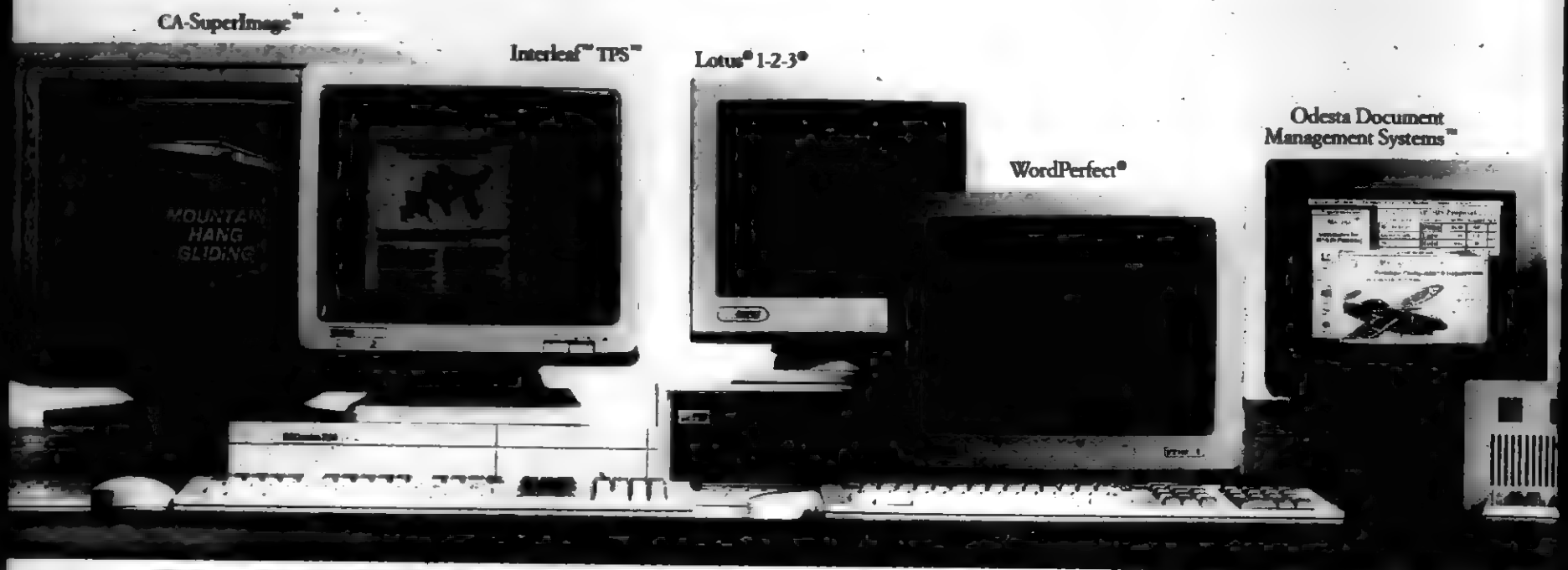

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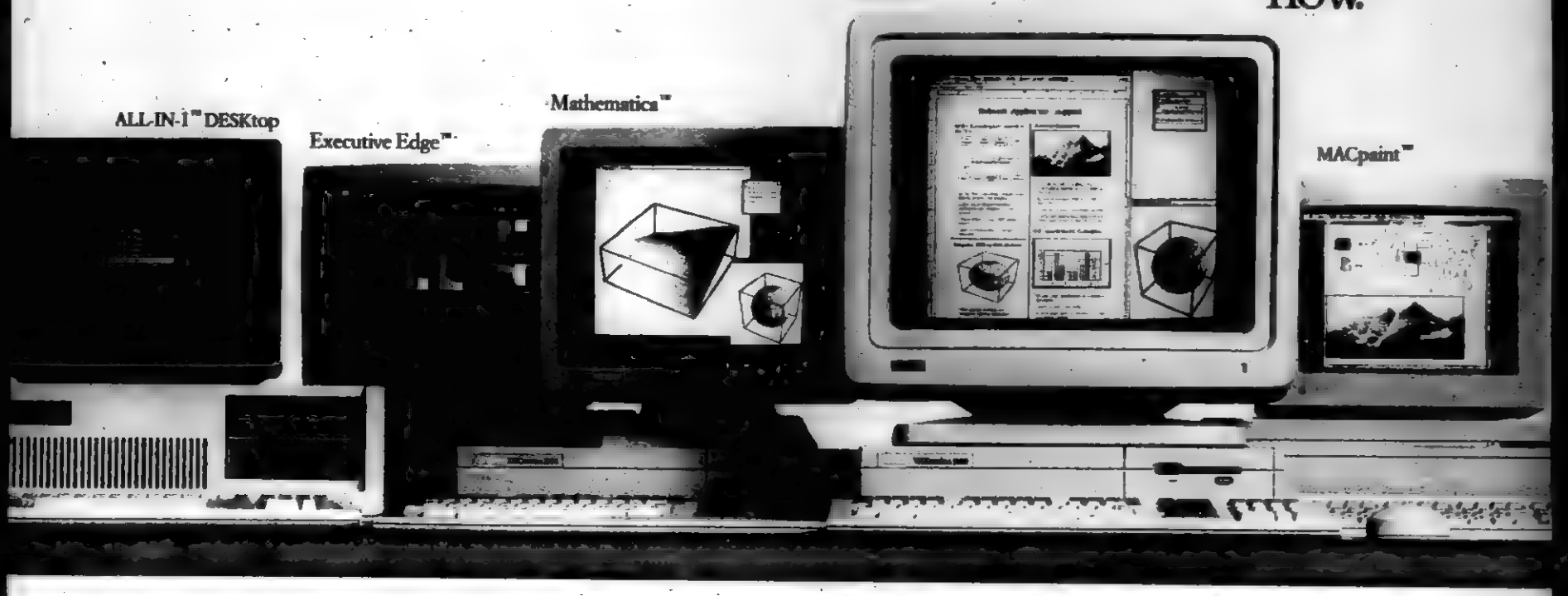

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TECH TALK

Fast fiber splices

■ GTE Fiber Optic Products said recently it has a new fiber-optic splice available that will revolutionize the way fiber-optic cables are linked. Called the Fastomeric splice, the new product uses no adhesive or special tools for assembly, a major advance in fiber-optic splices, the company said. The splice is created simply by inserting prepared optical fibers into each end of the splice and snapping into place end caps marked with a fiber-cleave gauge.

LAN without wires

■ NCR Corp. said recently that it is the first major vendor to introduce a high-speed wireless local-area network interface card. Called the NCR Wave LAN, it transmits data at 2M bit/sec., more than nine times faster than any other wireless LAN now available, NCR said. The card is also compatible with Novell, Inc.'s Netware and features spread spectrum frequency technology, which features highly reliable and secure data transmission without interference or interception. The Wave LAN has a suggested retail price of $1,390 for the Network Interface Card, including Novell drivers and an omnidirectional antenna. An optional Data Encryption Standard feature sells for $90.

LCD patent in focus

■ In Focus Systems, Inc. said last week that it was awarded a patent for a high-resolution — 1,280 by 1,024 pixels or greater — monochrome LCD. Prior attempts of LCD makers to design high-resolution LCDs were hindered by inadequate refresh rates. In Focus solved the problem by stacking two 1,280- by 512-pixel LCD panels, using a process called interdigitating. Each panel contains alternating rows of active and inactive pixels that are staggered so that each active row aligns with an inactive row. Interdigitating the panels reduces the number of rows that must be refreshed by a panel.

Packing some sense into computers

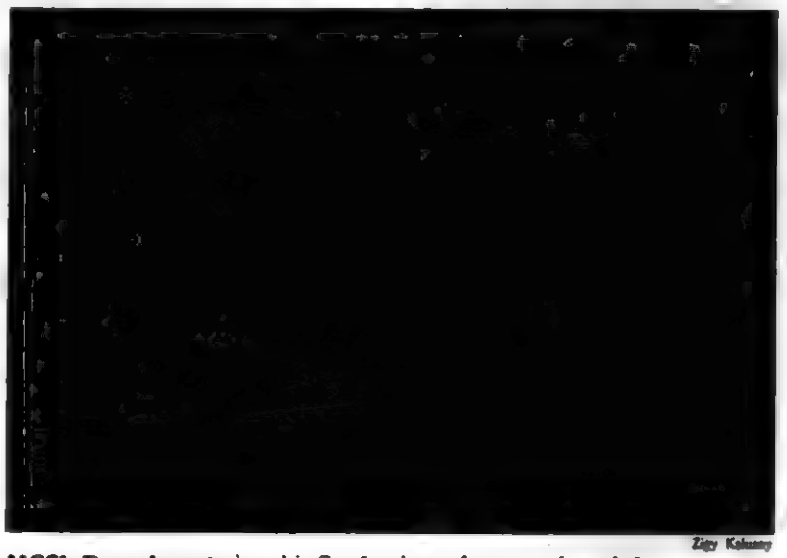
MCC works on a knowledge base of the things everybody — but machines — knows

BY GLENN RIFKIN
CW STAFF

When the film *2001: A Space Odyssey* appeared in 1969, it sent people's expectations of intelligent computers to a new and vastly higher level. HAL could not only compute, but could reason, conceive mischief and react to its environment with intelligence and cunning.

Since then, people have waited in great anticipation for computers to achieve a similar level of intelligence. Unfortunately, the great expectations for artificial intelligence have been tempered by the harsh reality that there are no shortcuts to building intelligence into machines.

In 1984, a young Stanford University-educated computer scientist, Doug Lenat, decided to manually construct a knowledge base for computers that would build common sense into software. Such concepts as "animals live for a single, solid interval of time" or "nothing can be in two places at once" are simply not available in machine knowledge. Lenat reasoned that computers needed access to general knowledge — knowledge that was so obvious that the encyclopedia omitted it — before these machines could approach useful intelligence.



Ziggy Kaluzny

MCC's Doug Lenat *views his Cyc database of common knowledge*

What's missing?

"We're driven constantly by examples of what is not there rather than what is there," Lenat said from his office at Microelectronics and Computer Technology Corp. (MCC). "People fall back on general knowledge, but computer programs can't do that; they don't learn very well on their own. In fact, all avenues are closed to software today."

With that in mind, Lenat came to MCC and embarked on a 10-year project he called Cyc (from en-*cyc*-lopedia). The goal is to create a single, intelligent system whose knowledge base contains tens of millions of facts, beliefs, categories, relations and problem-solving methods that define our reality. Six years into the enormous effort, Lenat claims to be more than halfway to his goal and says that Cyc, which began with about a 10% chance of success, is now at a 60% or 70% chance of achieving its objective.

"Almost all software in the 21st century will be based on a platform of common sense," Lenat predicted. "It will be unthinkable to write a program not based on common sense."

Lenat and his team of researchers scan newspapers and magazines daily, along with scores of books and pamphlets seeking examples of what is not there — that is, the information that the writer assumed the reader knew. Armed with these countless bits of facts and assumptions, the Cyc team has developed a language (CycL) and a structure for the knowledge base.

Current expert systems, made up of a knowledge base and an inference engine, are brittle, Lenat said. They are unable to cope with unexpected situations, thus rendering most of the usable intelligence out of them. Cyc incorporates an ever-expanding knowledge base along with 25 inference engines. "Learning occurs at the edge of what you know; the more you know, the more you can learn," Lenat said. "This fact has held back machine learning for 20 years."

The painstaking task of manually embedding facts into Cyc will certainly take the project until 1995 and likely beyond. "Perhaps the hardest truth to face — one that AI has been trying to wriggle out of for 34 years — is that there's probably no elegant, effortless way to obtain that immense knowlege base," Lenat stated in a mid-project report. "Rather, the bulk of the effort must — at least initially — be manual entry of assertion after assertion."

The Cyc project exists with the financial assistance of companies such as Digital Equipment Corp., Apple Computer, Inc., Bellcore, Harris Corp., Eastman Kodak Co. and NCR Corp., all members of the MCC consortium. Each contribute $500,000 annually to the project, freeing Lenat from the pressures he would face in an academic environment. "This project was impossible to do in academia in the '80s," Lenat said. "No single company, not even one like DEC, would fund a multimillion-dollar project with a 10% chance of success."

At MCC, Lenat has had the luxury to spend what he terms "two person centuries" to create Cyc.

The first fruits of the labor are already transferring to MCC's shareholders. Bellcore is working on a customer adviser assistant that would give one of its member companies, US West, on-line advice for solving customer problems. DEC is developing its Sizer expert system based on Cyc.

John McDermott, head of DEC's AI research group, said customers often want to handle complex, specialized tasks and have difficulty determining the size of the system they are going to need. Because of the specialized nature of the problem, a customer cannot buy the solution off the shelf, so they now require a DEC sales representative to come in and spend several months analyzing the system's requirements.

Sizer will incorporate a large knowledge base with both specialized and commonsense information. It will allow a DEC salesman to make a qualified sizing estimate in minutes rather than months based on the parameters of the customer's needs. "A knowledge base will have gaps, so we need a system with common sense, one that can reason by analogy," McDermott said. "Cyc is a good tool for building up such a knowledge base."

Self-adjusting

Eventually, Lenat expects Cyc to be able to program new information into itself automatically. Even today, the computer system on which Cyc is built spends each evening analyzing and "contemplating" the information it received that day. When complete, Cyc will contain 5 billion bytes of information — 10,000 times larger than a typical expert system today.

Most importantly, Lenat's work is considered "breakthrough" level technology. Gordon Bell, creator of the DEC VAX and currently chief scientist at Stardent Computer, Inc., said that Cyc "could provide the U.S. with a competitive advantage in the global marketplace. It could make MCC worthwhile all by itself."

Added DEC's McDermott: "Cyc is definitely a breakthrough project. Doug has defined the right way to go about using large amounts of knowledge. Just the fact that he is doing it is critical. Somebody has to."

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EDITORIAL

Distant thunder

WHEN YOU CONSIDER that 75% of those who will be in the work force in the year 2000 are already in the work force, it is clear why we all should be concerned with what that work force will look like. After all, most of us will still be a part of it, perhaps holding professional managerial positions, too.

In the information systems area, the current thinking is that the demand for skilled professionals will outstrip the supply by a substantial margin, not only here but in Japan and Western Europe as well.

In the U.S., the facts are these: The overall labor force will grow only 1.2% per year in the 1990s — more than twice as slowly as the growth rate of the 1970s. The labor force in Japan and Europe will actually decline.

Fully 80% of the meager labor-force growth in the U.S will be composed of immigrants, minorities and women. Only 45% of the labor force in the year 2000 will be white males, whose numbers have dominated IS employment.

Meanwhile, on the education front, the number of college freshmen planning computer-related majors is less than half of what it was just eight years ago. Half of the MIS doctoral candidates in the U.S. are foreign students, who increasingly are returning to their native lands on completing their education.

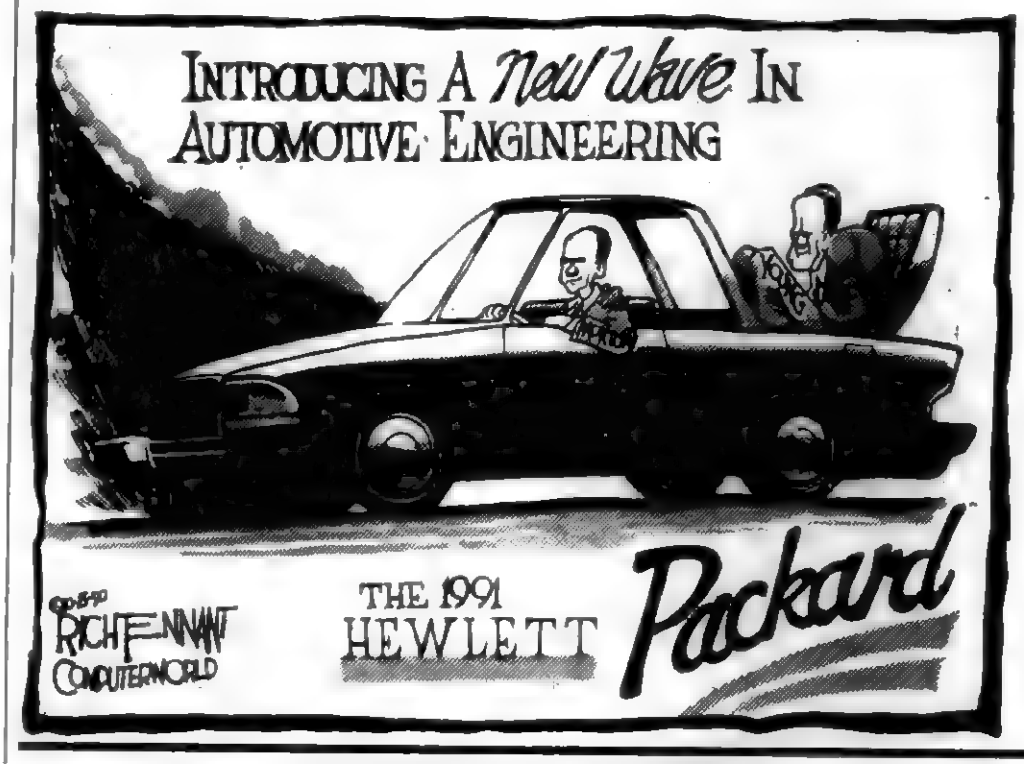
As a nation of government institutions and private companies, how are we responding to this looming crisis?

On the local level, our public schools are in turmoil. One 18-year-old in five is illiterate — *one in five*. Last year, a sample of 13-year-olds from the U.S. finished dead last in math, ninth in science and 11th in homework when measured against children from 11 other countries. Our kids finished first in one category — television viewing — by watching five hours or more of TV daily.

On the national level, the number of federally funded fellowships and traineeships fell from 60,000 in 1970 to less than 13,000 in 1986. In the last 10 years, the value of Pell grants, the major federal assistance program for undergraduates, has been cut in half. Measured in real dollars, the education budget of President Bush — the avowed education president — is smaller than President Reagan's budget of 1989.

If the threat of a shortage of IS labor isn't enough to scare you, consider what the beginnings of worker shortages are doing in Japan. According to Coopers & Lybrand's Tokyo office, new IS hires are demanding up to $16,000 *more* than existing staff, and wage increases among some IS titles are running at 20% per year.

As the federal government, several state governments and local communities across the land struggle with the worst fiscal crunch in memory, we must not lose sight of the future and that part of our destiny we still control. We must move beyond the rhetoric of politics and realize the tremendous stake we all have in facing a national crisis before it becomes a total national disgrace.



LETTERS TO THE EDITOR

DBMS downsizing

The real problem facing relational database management system vendors is that many prospects who used to be willing to pay $500,000 for a departmental computer and $50,000 for a RDBMS are deciding to buy a $5,000 personal computer and a $500 RDBMS instead. Some of them are the same prospects who concluded that buying a $5 million mainframe computer and a $500,000 RDBMS didn't make sense a few years ago when they could buy a departmental computer and RDBMS for a tenth the cost.

Just think: Customers of RDBMS vendors can buy a PC-based RDBMS for a hundredth of the cost of a departmental computer version. This represents quite a problem for any vendor, particularly when a company's overhead structure is geared to much larger, individual sales. Sales can slow down faster than expenses can be cut. It's like a plane in a deadly spiral. It's no fun, and there is no painless solution.

John J. Cullinane
President
The Cullinane Group, Inc.
Cambridge, Mass.

Language barrier

I read with interest the article "Beware the dark side of 4GLs" [CW, Aug. 27].

As a systems programmer who has installed and supported many vendors' fourth-generation language (4GL) offerings, I would like to add an additional caveat. In my experience, procedural languages, such as Cobol, Fortran and others, have ANSI standard versions at their cores. 4GLs, on the other hand, have only their individual vendor standards behind them.

I have found that each new release of many of the 4GLs currently available includes a thick stack of PTFs that needs to be applied to the new version if you want things such as field justification or translation to behave in the same way it did before the upgrade. In many shops that I have been in, this has led to the need to choose between applying the PTF and thereby neutralizing some gee-whiz new function or patching every 4GL application program in the system so that it will work according to the "new standard."

This has led to the decision in some shops to use 4GLs only for prototyping and quick-and-dirty applications. "Real" production applications are written in CICS, Cobol or some other "standard" language.

I think that it is unfortunate that vendors can't maintain upward compatibility, because 4GLs have many benefits and strengths.

Gregory A. Randis
Systems Programmer
Inglewood, Calif.

Name calling

I am writing for all the systems programmers who seem to have fallen through a large crack in your "Annual Salary Survey" [CW, Sept. 3]. Maybe you at *Computerworld* believe that those who call themselves systems analysts are really systems programmers undergoing analysis so they demand lower salaries. What exactly is an "operating systems programmer?" Do they work on OS systems? Haven't you heard about MVS? What about VSE?

I recently attended a "technical" third-party software vendor's educational course. When the 50 attendees listed their job titles, 45 called themselves "systems analysts," and all listed their duties as "technical" as opposed to "end user." I was the only "systems programmer" listed. Yet, when I asked a simple question on VSAM share options, the instructors and students demurred. They would "get back to me later on that one." I realized these were not the bits-and-bytes people I thought they were.

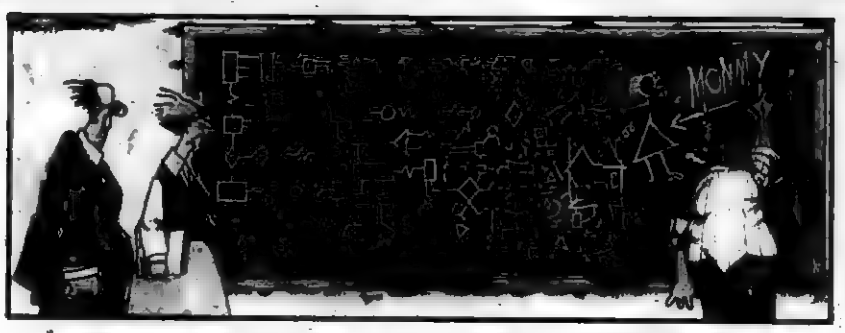
Where were your definitions of the job categories for the benefit of the nontechnical *Computerworld* reader? You may be assured that some of the job titles listed overlap, are ambiguous or generally cause confusion to the unindoctrinated.

We systems programmers are not systems analysts, although we seem to have been dumped in with them. Perhaps the systems analysts were the only ones not too busy to respond to your survey.

Those who can, do. Those who can't would probably like a nice job at *Computerworld* as a data processing specialist.

David L. Gallinson
Corporate Supervisor of Systems
Benjamin Moore & Co.
Montvale, N.J.

Computerworld welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor In Chief, Computerworld, *P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701. Fax number: (508) 875-8931; MCI Mail:* COMPUTERWORLD. *Please include phone number for verification.*



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60. Government - State/Federal/Local
65. Communications Systems/Public Utilities/ Transportation
70. Mining/Construction/Petroleum/Refining/Agric.
80. Manufacturer of Computers, Computer-Related Systems or Peripherals
85. System Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
90. Computer/Peripheral Dealer/Distr./Retailer
75. User: Other _____
95. Vendor: Other _____
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19. Chief Information Officer/Vice President/Asst. VP IS/MIS/DP Management
21. Dir./Mgr. MIS Services, Information Center
22. Dir./Mgr. Tech. Planning, Adm. Svcs., Data Comm. Network Sys. Mgt.; Dir./Mgr. PC Resources
23. Dir./Mgr. Sys. Development, Sys. Architecture
31. Mgrs., Supvr. of Programming, Software Dev.
32. Programmers, Software Developers
80. Sys. Integrators/VARs/Consulting Mgt.
OTHER COMPANY MANAGEMENT
11. President, Owner/Partner, General Mgr.
12. Vice President, Asst. VP
13. Treasurer, Controller, Financial Officer
41. Engineering, Scientific, R&D, Tech. Mgt.
51. Sales & Mktg. Management
OTHER PROFESSIONALS
70. Medical, Legal, Accounting Mgt.
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A. Mainframes/Supermins
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D. Communications Systems
E. Local Area Networks
F. No Computer Involvement

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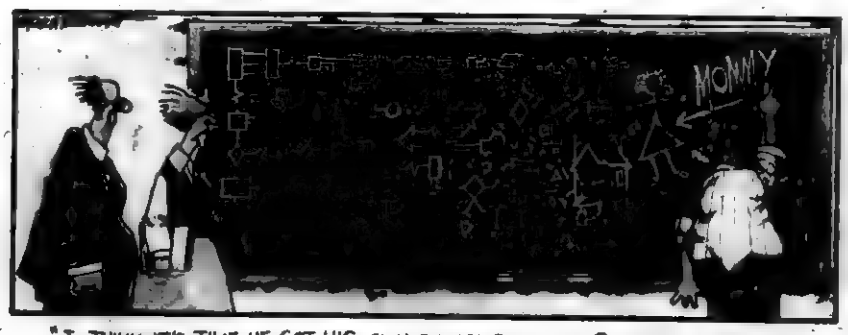

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80. Manufacturer of Computers, Computer-Related Systems or Peripherals
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22. Dir./Mgr. Tech. Planning, Adm. Svcs., Data Comm. Network Sys. Mgt.; Dir./Mgr. PC Resources
23. Dir./Mgr. Sys. Development, Sys. Architecture
31. Mgrs., Supvr. of Programming, Software Dev.
32. Programmers, Software Developers
80. Sys. Integrators/VARs/Consulting Mgt.
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12. Vice President, Asst. VP
13. Treasurer, Controller, Financial Officer
41. Engineering, Scientific, R&D, Tech. Mgt.
51. Sales & Mktg. Management
OTHER PROFESSIONALS
70. Medical, Legal, Accounting Mgt.
90. Educator, Journalists, Librarians, Students
98. Others _____
(Please specify)

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A whole new ball game

CLINTON WILDER

The Oakland Athletics' Tony LaRussa is considered a member of the "new breed" of baseball manager. Instead of the traditional hard-knock experience of years in *Bull Durham*-type minor league towns, LaRussa possesses a law degree. He has broken the mold of the tobacco-chewing, go-get-'em-boys dugout denizen with a reputation for intelligence, preparedness and an insatiable appetite for strategic information.

He is also the best manager in baseball today and will be leading his As into their third straight World Series tomorrow night.

In the IS world, a new breed of successful manager is also emerging — younger, more business-savvy and increasingly aware of the forces far from the data center that shape a company's success or failure. These new managers may have backgrounds in consulting, marketing, finance, manufacturing or strategic planning. Increasingly, many of them are women.

Like a newly appointed baseball manager, they usually arrive with a mandate for change. The old ways of managing IS — the things that made a company successful in the past — don't work anymore. The options of downsizing, decentralizing and outsourcing, anathema to some tradition-bound IS shops, are high on the agenda of the new manager. Not necessarily to implement but certainly to consider.

Although LaRussa is the best example of the new breed of baseball manager, he is not alone. Look among baseball's most successful teams, and more often than not, you'll see this new type of manager: young, intense, perhaps less colorful than the crusty skipper of old but also more cerebral.

Both division-winning National League managers, Pittsburgh's Jim Leyland and Cincinnati's Lou Piniella (in his first season with the team), are also examples. Current White Sox manager Jeff Torborg, a favorite to win Manager of the Year honors for leading a team of young unknowns to baseball's third-best record, is another good example.

Appropriately, too, these managers are themselves computer-literate. LaRussa, Torborg, the Texas Rangers' Bobby Valentine and others are noted for their use of PC databases to analyze pitching matchups, pinch-hitting decisions, placement of fielders and scores of other strategic factors that can turn losses into wins.

It doesn't always work — baseball PC pioneer Davey Johnson was fired as the New York Mets' manager this year — but it does exemplify an innovative approach to the Grand Ol' Game.

Minoter Aucio

This is not to say that every company needs new blood in IS management. In baseball, there are several highly successful old-line, old-school managers: Tommy Lasorda in Los Angeles, Roger Craig in San Francisco, Joe Morgan in Boston, Sparky Anderson in Detroit. Their style continues to work well in their respective organizations, and major-league baseball franchises can be as different from each other in corporate culture as Apple is from IBM.

IS management is becoming like baseball management in another way: job security. A losing record, or a failed systems project, is not always the reason for a firing — clashing with the established corporate culture can also do it. New York Yankees managers have an even shorter job life expectancy than CIOs.

And how about dealing with the skills shortage? Top-notch pitchers and catchers are becoming as scarce as crack global network managers or C++ programming whizzes. Of course, big bucks are important in attracting them — but so is having a stable organization and a manager with a reputation for treating "players" with respect while getting top performances out of them. Just ask Rickey Henderson to compare the Oakland clubhouse atmosphere with the one he left behind in the Bronx.

Like many a successful IS manager, LaRussa has the benefit of working for perhaps the most progressive organization in baseball today. Harvard-educated Oakland general manager Sandy Alderson has engineered a dramatic turnaround of the team's fortunes both on and off the field — a strong high-level executive sponsor if there ever was one. I wouldn't be surprised if he uses a PC, too. On the other end of the spectrum, there is (or was) George Steinbrenner.

More than any other professional sport, baseball thrives on the use of information for competitive advantage. Sure there's no substitute for talent; if a Roger Clemens or Dave Stewart is "on," all the right strategy in the world isn't going to come close to beating him.

But consistently having the right batter at the plate or throwing the right pitch in a game-deciding situation will separate the successful teams from the also-rans.

In baseball, as in business, the manager who uses the best data to make the most effective decisions will come out on top in the long run. And the new breed, in baseball and IS, is proving that to be truer than ever in the '90s.

In fact, that's why they're called *managers*.

Wilder is *Computerworld*'s senior editor, management and a former sportswriter.

Aspiring managers: Don't flatten any ducks

MICHAEL COHN

If you are an information systems manager, skip this article. Please flip to another page. Catch up on Systems & Software. Go ahead and peruse the Careers section.

Only nonmanagers should read on. I'm quite serious about this. Yet I suspect a few managers are still sticking with this piece.

Stop reading it! You won't be interested! It's a very technical discussion about denormalizing relational tables.

There, that should have scared them off. Now for the rest of us . . . have you ever wondered why those folks are managers while we remain aspiring nonmanagers?

It's got nothing to do with experience or talent or marrying the chief financial officer's overweight cousin. However, if the CFO's overweight cousin is available, a couple of dates might not be a bad idea.

What really matters in crawling your way up the management ladder is learning to speak management lingo.

Don't waste your time with buzzwords and acronyms. Don't try to sound intelligent; people will expect you to code something.

If you want to *be* in management, you have to *sound* like management.

Now don't get worked up about this. Don't fork over 40 grand for an MBA. I've saved you all that pain and suffering by listing below the hottest management phrases bouncing around the boardroom today.

Memorize them! Of course, they're not as exciting as "Stop the presses!" or "Is there a doctor in the house?" but you'll knock the socks off the chief information officer at the next big meeting.

Come to think of it, I did once get to yell, "Is there a doctor in the house?" in a crowded restaurant. Three people came running . . . they were lawyers.

- **Let's take that off-line.** If you want to be an IS manager, keep this phrase in your arsenal. It comes in particularly handy when you've just come up with this great idea, called a meeting about this great idea, told everyone about this great idea and then someone brings up a point that makes you look like an idiot.
- **Get everyone on board.** In IS, it doesn't matter if your idea is good or bad. As long as "everyone's on board," you really can't get into trouble, but when everyone's not on board, it's a bad thing.

Some folks are busy getting their feet wet. Some are in hot water. Still others are in over their heads. These guys are probably not on board. Some people get on board who you really wish were overboard. Most often, people miss the boat altogether.

- **What's the bottom line?** You hear this a lot when a meeting has run over by 10 minutes. IS managers are too sophisticated to say, "Get to the point, Chuck," or "Put a lid on it, Chuck." Instead, they say, "What's the bottom line?" Then you and Chuck and everybody else hurry off to the cafeteria before they stop serving frozen yogurt.
- **I hate to say "I told you so."** In management lingo, this means the same thing as "I told you so."
- **I'm just playing devil's advocate.** IS managers are not allowed to argue with people and call them funny names. That's considered unprofessional. But if you first say, "Look I'm just playing devil's advocate," then you can use any funny names you want.

To be on the safe side, only play devil's advocate with people a lot smaller than you.

- **The best-case scenario.** IS managers talk about this all the time, especially when they're trying to get you to work on something.
- **The worst-case scenario.** IS managers talk about this all the time, especially after you've started working on something.
- **Let's not reinvent the wheel.** IS managers are ready with this when they're asked to do a bunch of work. It's the same as saying, "We did that before, let's not do it again."

Of course, it's also the same as saying, "We did that before, and boy did we screw it up." IS managers hope no one can tell the difference.

IS MANAGERS ARE too sophisticated to say, "Get to the point, Chuck," or "Put a lid on it, Chuck." Instead, they say, "What's the bottom line?" Then you and Chuck and everybody else hurry off to the cafeteria before they stop serving frozen yogurt.

- **First thing in the morning.** This phrase describes how IS managers tackle all of the tough problems that come up just before bowling league.
- **Ducks in a row.** Don't be confused by this phrase. IS managers don't really chase ducks around the office trying to get them in a straight line. Nowadays, you can go out and buy them that way.

When IS managers are about to go live with a really big system, this is the way they get ready.

- **Rubber meets the road.** This is when IS managers find out if they were ready. Usually, when the rubber meets the road, it flattens all their ducks.

Cohn is trying to be a computer salesman in Atlanta.

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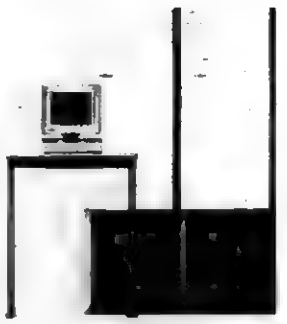

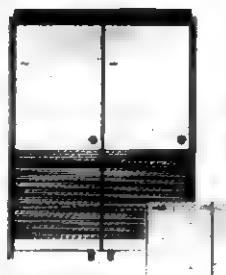

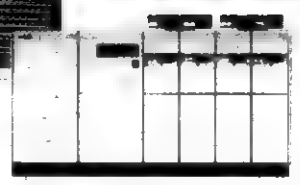

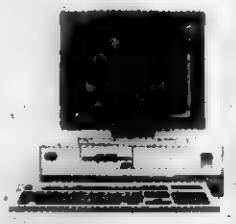

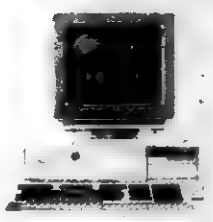

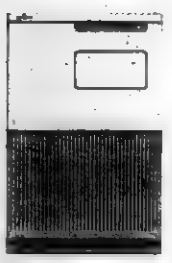

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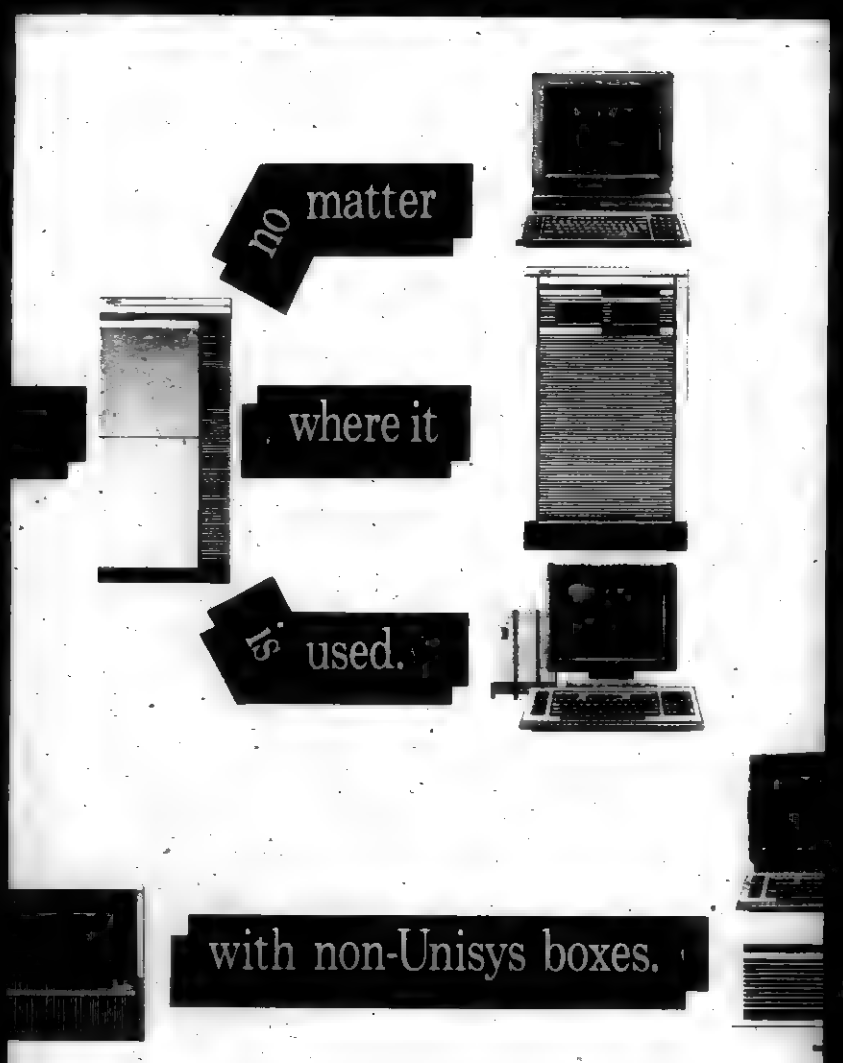

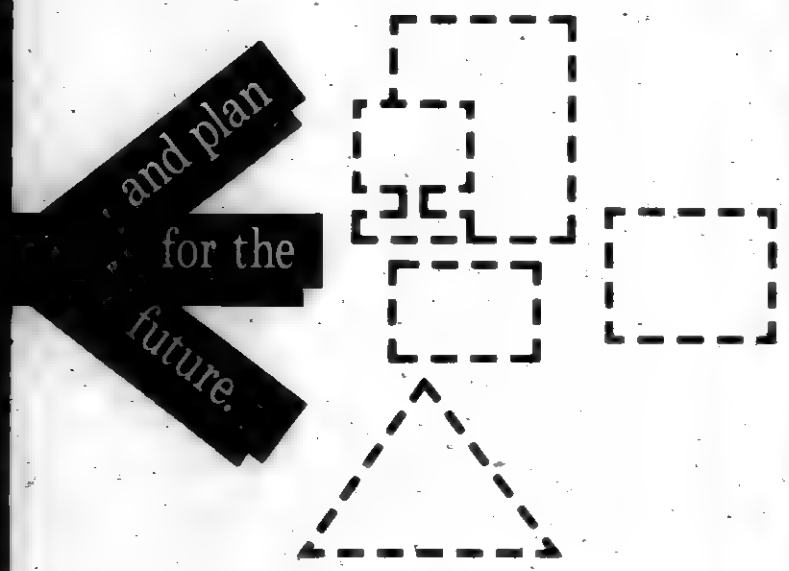

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COMMENTARY

Maryfran Johnson

The one to watch

IBM is turning its gigantic gaze on a technology that IS folks ignore at their peril: geographic information systems, or GIS.

Starting out years ago as the mainframe-oriented province of government engineers and scientists, oil companies and natural resource managers, GIS is the catch-all term for the hardware, software and services involved in gathering and managing geographic or spatial data.

Today, GIS applications run on powerful graphics workstations and high-end personal computers. They can be as basic as a database of ZIP codes or street addresses or as complex as satellite imagery or digitized maps of major cities.

"I would tell MIS managers that if they haven't seen GIS yet, it's not a matter of *if* they will but *when* they will," said Glenn Montgomery, president of GIS Research in Englewood, Colo. "IBM is really pouring jet fuel into this."

Since 1988, IBM has been focusing greater resources on developing GIS applications and is only now recovering from its reputation of indifference to the field. The computer giant cemented new business alliances with leading GIS vendors such as the Environmental Systems Research Institute, TYDAC Technologies and Geovision, Inc. This year, IBM opened an additional six GIS Solutions Centers in the U.S., bringing the

Continued on page 36

IBM restates it has a way to go

Users left to wonder when multiplatform distributed databases will ship

BY ROSEMARY HAMILTON
CW STAFF

IBM recently dropped another hint that the reality of a full-blown distributed database environment is years away.

Larry Morgan, a senior programmer at IBM's Santa Teresa Laboratory in San Jose, Calif., said in an interview recently that the OS/2 and OS/400 capabilities will be available "around the time frame" that the distributed mainframe database capabilities begin shipping.

The problem is, no one knows when that will be. In September, when IBM announced the DB2-to-SQL/DS distributed feature, it announced no shipping date. Instead, it said it would announce an availability date before September 1991.

Nonetheless, Morgan's schedule gives a slight boost to the OS/2 and OS/400 platforms, both of which have been on the sidelines of most recent IBM distributed database developments.

While IBM has had both SQL/DS-to-SQL/DS and DB2-to-DB2 capabilities on the market for more than a year, it had announced nothing specific for OS/400.

Earlier this year, it announced an OS/2-to-OS/2 feature but still had not specified when it would connect the workstation platform to the bigger databases.

Blame it on the database

George Zagelow, director of architecture and standards at the Santa Teresa lab, said that OS/400 developments have been slow because the database was the least up-to-date of the four Systems Application Architecture (SAA) databases on IBM SQL standards.

"SQL/400 had the biggest hurdle to jump," Zagelow said. "They are still pulling hard, and they have products coming."

Morgan said IBM is prepared to announce like-to-like and any-to-any capabilities for the OS/400 platform and links to host database systems for OS/2 in the time frame he indicated.

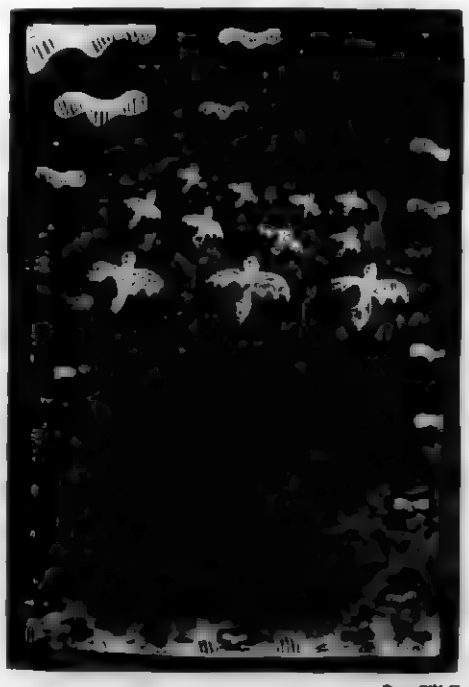
The like-to-like capability is the easier technical challenge and gives one database access to other like databases. Currently, some users are exploring the DB2-to-DB2 capability, which allows them limited access among DB2 databases.

The any-to-any feature is a more complex goal. It will eventually provide a so-called seamless SAA database environment. The idea is to allow a user in one of the four SAA databases to request and receive data that resides in any of the other SAA databases. The user need never know where the data actually resides.

FEATURE: USER/VENDOR RELATIONS

Will CDC customers take flight?

BY BARBARA DEPOMPA
SPECIAL TO CW



Pras O'Neill

The 1980s were no picnic for Control Data Corp. as the company struggled to consolidate after years of overdiversification. The 1990s may not be any easier as the Minneapolis-based firm tries to calm a customer base made skittish by uncertainty about both the company's future and the sluggish U.S. economy.

Because CDC has consolidated, sold off or discontinued many of its businesses, there is concern among customers about the long-term viability of CDC products, such as its Cyber mainframes and the aging, proprietary NOS/VE operating system, according to Charles Casale, an analyst at Boston-based Aberdeen Group and a CDC veteran.

CDC is countering this concern with a plan to migrate its current Cyber mainframe customers to a Unix-based hardware platform by the mid-1990s, according to Jim Ousley, president of CDC's Computer Products Division. In keeping with the computer industry's growing standards push, CDC has unveiled systems developed by Mips Computer Systems, Inc. that feature reduced instruction set computing-based Unix processing.

The company has also targeted future developments at the scientific/engineering arena and foreign markets, lessening its head-on competition against IBM in the general commercial computer market, Ousley says.

Most users say they are waiting CDC out because of the investment they have in the firm's technologies.

"We have a huge investment in applications that were developed in-house on the Cyber systems," says Arnold Acedo, manager of computer services at the Garrett Engine Division of Allied Signal Aerospace in Phoenix.

Garrett Engine plans to maintain its current roster of two Cyber 990s, a

Continued on page 34

BIM Spotlight

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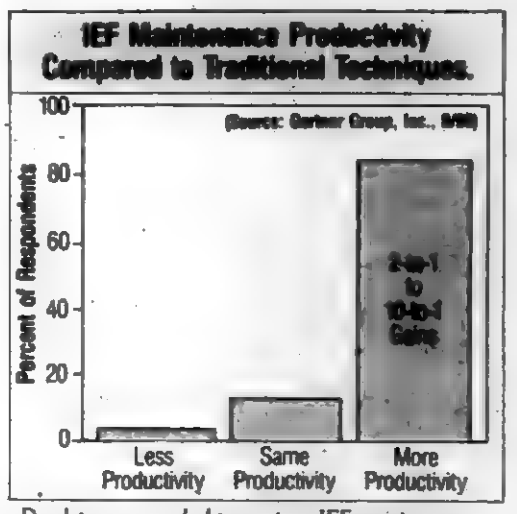
The quality of IEF-developed systems is remarkable. In recent CASE research by The Gartner Group, application developers were asked to report the number of abends they had experienced. (An "abend" is a system failure or "lock-up" caused by code defects.) *IEF developers reported zero defects—not one abend had occurred in IEF-generated code.*

Maintenance productivity gains of up to 10-to-1.

In this same study, developers were asked to compare IEF maintenance productivity with their former methods. Of those responding, *more than 80 percent had experienced gains of from 2-to-1 to 10-to-1.* (See chart.)

Specifications always match the executing application.

With the IEF, application changes are made to diagrams, not code. So, for the life of your system, specifications will always match the executing application. The Gartner Group research showed that *all* IEF users who reported making application changes made *all* changes at the diagram level.



Developers were asked to compare IEF maintenance to former methods. Of those responding, more than 80% reported productivity gains of from 2-to-1 to 10-to-1.

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With our new OS/2 toolset, you can develop mainframe applications, from analysis through automatic code generation, on your PC. Then, using the IEF's TP monitor simulator and the diagram-level testing feature, you can also test these mainframe applications without ever leaving the PC.

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Of course, our technical support, consultancy, training courses, satellite seminars, and other informational assistance will continue apace. We also offer re-engineering and template services. This full-service support will remain an integral part of the IEF product.

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In a 911 emergency, to risk a communications breakdown is to risk a life. So if you don't want to take any chances, make sure your modem can handle the pressure in a crisis.

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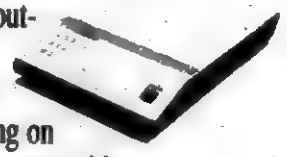
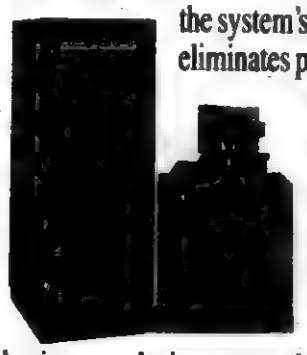


Since NEC modems are designed to rapidly and accurately transmit huge volumes of data, Lake County's 911 operators can now quickly pinpoint accident locations, provide traffic instructions, find patient medical records, and dispatch back-ups when needed. And because NEC's Dual Modem Card links 911's control center to NEC Dial-up Modems in remote locations, Lake County feels it has found the best data networking solution attainable.

Each individual I Series Chassis supports a wide variety of applications and products. These include synchronous and asynchronous operation in dial-up or leased line networks. Line speeds ranging from 300 bits/s to 56k bits/s with both analog and digital capabilities. As well as compatibility with CCITT standards such as V.32 and V.42/bis. Plus, the system's built-in flexibility eliminates product obsolescence by making it easy to add, mix, and match other chassis and data communications devices as network requirements change.



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NEC

Paper age ends as supplier picks Pick

ON SITE

BY GARY H. ANTHES
CW STAFF

NEWPORT NEWS, Va. — Ferguson Enterprises, Inc., the largest distributor of plumbing and heating supplies in the U.S., has in six short years propelled its information processing technology from the 19th century directly toward the 21st.

The $600 million company is completing a cutover to the largest Sequoia Systems, Inc. installation and the largest Pick operating system environment in the world as part of a $5.8 million fault-tolerant system supporting 2,000 users in 19 states.

In 1984, the $200 million firm had no computer systems and was proud of it, said Thomas M. Ward Jr., manager of information systems: "We were probably the largest nonautomated firm in the U.S. Our manual systems were second to none. They even told you where to put a staple on a document."

However, getting the staple in the right place could only carry the company so far, and success of the manual systems required meticulous training that became increasingly difficult to provide in the rapidly growing company, Ward said. Ferguson began sending its inventory management work to a computer service bureau.

Take it in-house

That first step away from paper proved short-lived. Almost immediately, Ferguson realized that its customer service goals were incompatible with the slow turnaround offered by the service bureau's batch processing. An in-house system, resisted for so long, seemed the only answer.

Late in 1984, Ferguson turned to Wilton, Conn.-based Ultimate Data Systems, buying the source code to Supply House Information System (Shims), a package that included order entry, inventory management, purchasing, billing and accounting. Ferguson also bought 12 Honeywell minicomputers running the Pick operating system, for which Shims was written.

The plumbing supply wholesaler spent the next four years setting up six regional data centers supporting 176 sites in the South and Midwest.

"We thought that would be the end, that we'd stop there," Ward said. But the company wanted to be able to do inter-regional inquiries so that parts not in stock in one area could be quickly provided from another.

Also, Ward's staff was spending an inordinate amount of time supporting the multiple-machine environment and the duplicate software, and the minis were running out of steam as the 120 users per machine originally forecast mushroomed to more than 300.

Ward *overcame resistance to automation*

In 1989, Ferguson began looking for a centralized system. The company considered systems from Hewlett-Packard Co., Prime Computer, Inc., Encore Computer Corp. and Sequoia. According to Ward, only Sequoia had his "dream of dreams" — a single machine with high availability running native Pick.

Ward acknowledged that the relative obscurity of Sequoia made Ferguson's management nervous, but a recent agreement by HP to market Sequoia computers gave Sequoia credibility. Ward said he was also impressed by the results of benchmarks, crafted by Ferguson, that showed better than linear improvements in performance as more processors were added to a Sequoia box.

Ferguson is shutting down its regional centers at the rate of one a month now, and Ward expects to have completed the conversion by December. So far, no serious problems have been encountered, he said.

According to Ward, Ferguson greatly underestimated the changes that had to be made to the off-the-shelf software package it bought to run its business, and the Basic programs were completely rewritten by Ferguson. But Pick, whose use was originally mandated by the choice of the package, proved a blessing in disguise, he said.

"I'm in love with it. I'm convinced that one of the reasons our efforts have been so successful is because of Pick," Ward said. "One of the reasons we're at the forefront of our industry is because of our ability to bring out applications quickly. I've never seen an application environment as rich or as easy to use."

But Pick has its drawbacks, Ward acknowledged: "It's a very nonstandard operating system. If you want to talk to the outside world, you pay a penalty. And it's harder to find Pick-trained people, although Pick is not hard to learn."

Ferguson's Sequoia Series 300 Model 364 has 16 Motorola, Inc. 68030 processors, 256M bytes of memory — shadowed by another 256M — and 17.3G of mirrored disks. Ward said Ferguson may eventually do a field upgrade to 68040 processors, boosting capacity to support 4,000 users, which Ferguson could have in about five years.

Shipper taps Unix for transaction processing

BY ELLIS BOOKER
CW STAFF

AKRON, Ohio — The number of firms migrating to Unix for their on-line transaction processing (OLTP) needs increased by one this month with the addition of the Roberts Express shipping company.

By next June, Roberts hopes to have moved a Cobol application for tracking its truck fleet from two Wang Laboratories, Inc. hosts to a multiprocessor Sequent Computer Systems, Inc. computer running Ingres Corp.'s fourth-generation OLTP database.

Roberts' MIS manager, Joe Greulich, acknowledged that he found the open systems solution a hard sell at first.

"If you said 'Unix' to me, I'd say 'university,' " said Greulich, who joined the specialty carrier 1½ years ago.

However, Greulich is now a true believer, convinced that Unix and a relational database will be up to the job. He had better be. The MIS manager revealed that 30% of his pay is tied to response time and availability of the company's information systems.

A subsidiary of Roadway Services, Inc. in Akron, Roberts had revenue of more than $75 million last year. A Wang shop since 1983, it now has two of Wang's biggest platforms — a VS 10000 and a VS 7310 — which together support about 200 users at any given time. The hosts also support all of Roberts' back-office business functions.

Greulich *made open systems switch*

Customer service and operations agents connected to the two VS minicomputers handle more than 100,000 inbound telephone calls per month. The application today runs at approximately 25 to 30 transaction/sec. and is growing.

The OLTP application involves tracking Roberts' fleet of about 1,200 trucks, each of which is equipped with two-way mobile satellite terminals. Every hour, the units report back to the home office in Akron on each vehicle's location, accurate to within 300 yards.

A development system using a two-processor Sequent S81 is currently installed, and another 10-processor, 50 million instruction per second S81 machine will be arriving in the spring to be utilized as the production host.

Chicago-based Ameritech Information Systems, Inc. is acting as the systems integrator for the project. A spokesman at the Ameritech subsidiary said the 18-month contract is by far the most significant OLTP engagement it has ever been involved in.

Although Wang told Greulich that its high-end machines would not directly run Unix, the company has proposed using Roberts' decommissioned hosts to run an imaging system that will be tied to the OLTP application, according to Greulich.

"We're interested in that, and we're looking," Greulich said, adding that he has been very pleased with Wang's service and support.

"Users who need connectivity software for remote access...should investigate MUST Software's NOMAD."—Richard Finkelstein, DBMS, 11/89

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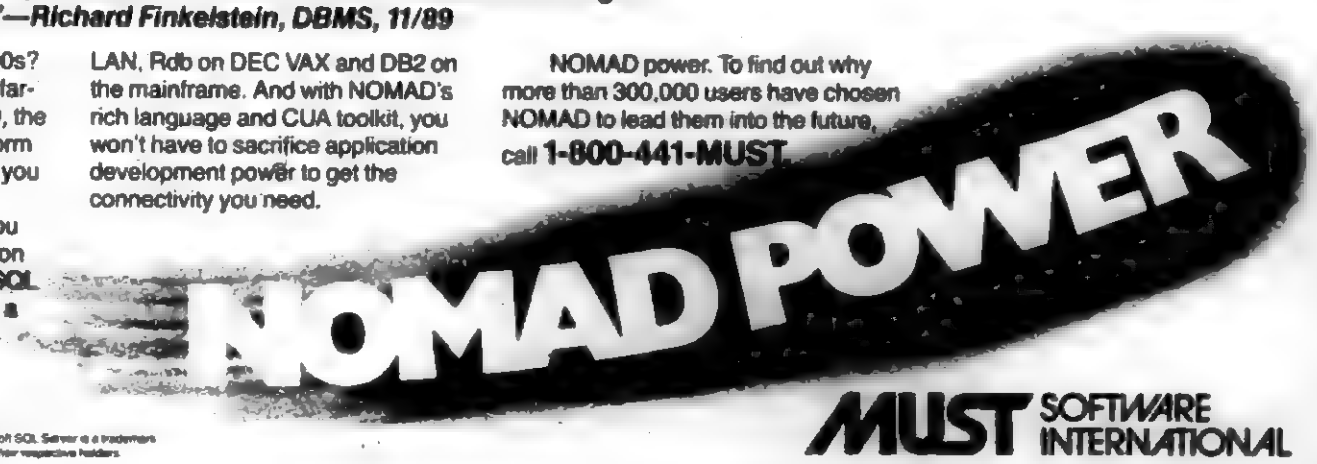

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CDC

FROM PAGE 29

Cyber 930 and a Cyber 830. However, the company is hedging its bets and has also purchased a Digital Equipment Corp. VAX. Acedo is concerned about the lack of third-party applications available for Cyber mainframes. "The reason we bought the DEC VAX," Acedo says, "is because more applications are available for it than for the CDC processors."

Whether CDC will emerge victorious in its chosen market niches is still in question. Analysts claim that the proprietary NOS/VE operating environment for the Cyber mainframe series is more than 10 years old and has not been enhanced to keep up with competitive advances, such as mainframe partitioning, hyperspace and IBM's AD/Cycle.

Taking into account this lack of a major overhaul of NOS in a decade, "combined with the company's newfound Unix commitment, I don't think they will be in the proprietary mainframe business for the long haul," says Frederick Withington, an independent consultant in New York.

Ousley disagrees, claiming that CDC will continue to upgrade the Cyber systems' proprietary software to protect its customers' investment in software applications. He underscores the company's dedication to maintaining NOS/VE by citing the $365 million, 11-year contract it won with the Army Corps of Engineers for up to 98 Cybers. CDC was awarded the contract over the likes of Electronic Data Systems Corp, the company says.

As of July 1990, eight Army Corps sites have been pilot-tested using the Cyber systems in a networked environment. The systems will be used for a mix of database management, office automation and engineering/scientific applications, according to Ken Calabrese, program administrator within the Army's information systems department handling the Corps of Engineers.

Over the long haul

However, such moves haven't alleviated customer concerns. With the lack of third-party software development, "we are definitely worried about CDC's long-term commitment to its proprietary Cyber systems," says Walter McRae, interim director of university computing and network services at the University of Georgia's Advanced Computational Methods Center in Athens, Ga.

The university currently has one Cyber 960 mainframe and a Cyber vector facility tool for high-performance vector processing. However, both systems have become obsolete for the university's needs.

The university is looking into Unix in the form of a CDC/Mips system as a future platform for its computer services. "The ability to continue to run Cyber's NOS environment and the value-added services, including data center management and communications facilities, that CDC claims it will incorporate into its Unix-based system make them attractive to us," McRae says.

However, he adds, "We have not ruled out looking at other vendors' products."

Ousley says he wants to stem any such thoughts of jumping ship by guaranteeing that the transition from NOS to Unix will be as painless as possible. "We will probably offer a compatibility box and other options to help customers continue to benefit from their current NOS/VE investment," he says.

Until the new systems are ready for delivery, however, all CDC can do is keep trying to win back users' confidence and gain market share. Some of the big wins that CDC has claimed so far include a $32 million sale to the Soviet Union following Soviet President Mikhail Gorbachev's visit to corporate headquarters last summer. The Soviet Union will purchase a variety of equipment and services, including six Cyber 960 mainframes, in order to improve nuclear plant safety within the country.

Gorbachev's visit has since been followed by a visit from Alexander Dubcek, chairman of the Federal Assembly of Czechoslovakia. While no contract has yet been signed, Ousley says he hopes to sell Unix-based workstations for computer-aided design applications in that country.

Thailand's Ministry of the Interior is also planning to stick with CDC systems. A Cyber mainframe is being used to keep track of the population of Thailand. According to Surachai Srisaracam, director of the Central Population Database Center for Thailand's Ministry of the Interior, the system is used to process passports and maintain photo information and monthly statistics on population as well as systems for tax collection, social security, military manpower and criminal investigations.

CDC sees the ever-growing global marketplace as one of its greatest market opportunities. Rather than competing against IBM head on, CDC says it will continue to go after sales in its target markets in the U.S. and pursue more sales in the Soviet Union and other overseas markets opened to foreign trade.

Ousley maintains that CDC has an edge in sales to the Eastern Bloc because of its successful sales efforts there so far.

Depompa is a free-lance writer based in Upper Marlboro, Md.

Revenue shrunk — and so did CDC

CDC pruned at least 12 subsidiaries in the '80s, including ETA Systems, its supercomputer business, and Imprimis, a disk drive operation sold to Seagate Technologies, Inc. The majority of CDC's consolidation occurred between 1986 and 1990, shrinking the company's total revenue from about $3.7 billion in 1985 to an expected $2 billion in 1990.

Ironically, despite greatly reduced revenue, 1990 may be the first year that the slimmed-down CDC achieves a significant profitability level since 1983, when it reported $161.7 million in profits. Analysts currently estimate that CDC is likely to report between $40 million and $60 million in profits for 1990.

Even the Computer Products Group (CPG), the single largest unit of CDC today, has been revamped. According to Jim Ousley, the unit's president, CDC has consolidated CPG to better focus that division's attention on its target markets: primarily scientific and engineering applications and users with large technically-oriented databases — what Ousley refers to as "technical information management."

BARBARA DEPOMPA

Sputtering earnings

CDC has had two profitable years – '87 and '88 – in the last five

CONTROL DATA

	Revenue	Net earnings
1985	$3,680	($568)*
1986	$3,347	($265)
1987	$3,367	$19.3
1988	$3,628	$1.7
1989	$2,935	($680)

*Parentheses indicate a loss

Source: Control Data Corp. CW Chart: Paul Mock

Amdahl whips latest release into Unix shape

BY JEAN S. BOZMAN
CW STAFF

SUNNYVALE, Calif. — Amdahl Corp. has brought UTS, its mainframe version of Unix, in line with prevailing Unix industry standards, industry analysts said. Release 2.1, announced in September, is compliant with Unix System V Version 3.1, and Release 2.0 will be phased out by October 1991, Amdahl said.

Analysts said they believe the change was prompted, in part, by a burgeoning market for Unix products in Europe and in the U.S. government. "The demand for mainframe Unix is coming from behind the [computer room's] glass wall," said Rikki Kirzner, senior analyst at Dataquest, Inc. in San Jose, Calif.

Acting as a corporate anchor for Unix applications, UTS will continue to run on IBM-compatible MVS and VM machines.

Using IBM's PR/SM or the older Amdahl Multiple Domain Facility (MDF), UTS sites can divide their IBM mainframe memory into multiple IBM-compatible or UTS/Unix-compatible regions. Worldwide, some 200 licenses have been sold in UTS' 10-year history, but Amdahl hopes to gain new sites with UTS Release 2.1, analysts said.

Major enhancements in UTS 2.1 include an increase in file size from 2G bytes to 6 terabytes, improved security features and an ability to share data with IBM's MVS and VM operating systems. "We've built a channel-to-channel connection to [IBM's] [Systems Network Architecture]," said Tom Littauer, manager of UTS product marketing. Sequential I/O rates have been boosted from a sustained rate of 300K byte/sec. to 1.7M byte/sec., Littauer said. Monthly license fees for UTS 2.1 range from $4,000 to $25,000, depending on the size of the mainframe that runs the software.

At the same time, Amdahl announced two new front-end processors, the 4655 Models 100 and 200, priced from $85,000 to $384,000, depending on configuration. The new processors are designed to collect data from Unix and X.25 networks for presentation to the mainframe UTS facility. As Robert Kidd, an analyst at Dataquest, explained, "The main point here is that the more homogeneous your network is from the start, the easier it will be to manage."

Apollo users push open Unix

BY J. A. SAVAGE
CW STAFF

SAN DIEGO — The biggest concern for users of Hewlett-Packard Co.'s Apollo workstation line is over the future of its Unix operating system, Domain OS, according to users who attended the Adus Apollo user group conference recently.

Since the merger of Apollo and HP in April 1989, users have been waiting and watching to see what will happen with HP's promise to merge its own version of Unix with Domain. Users lobbied Apollo to take Domain past HP's own HP-UX version of Unix and into the Open Software Foundation (OSF) standard, across the product line.

Before the conference, HP had said it would migrate Domain to OSF, but not across its entire workstation line. After hearing from its users, the company still would not commit to providing a new Unix-OSF kernel for all its computers.

"We don't have unlimited money to do all the options that [users] want," said Bill Kelly, manager of software marketing for Apollo. He said the company would add a layer of software on top of the old operating system instead of replacing it to bring it more closely toward open Unix.

HP representatives told the group that the company is attempting to put Domain OS functionality in its OSF version of Unix so that "Domain users will go there naturally," said Doug Eltoft, president of Adus.

However, they will have to cut over to OSF in the next few years, according to David Galbincea, senior consultant at Genicos Technologies in Medina, Ohio. "The next versions of Domain will incorporate the best of OSF as far as file systems," he said. In the mid-1990s, however, users will have to consider switching out of Domain to OSF, Galbincea said.

Apollo users were accustomed to "being taken care of" before Apollo was bought by HP in April 1989, Eltoft said.

At the conference, users were still grappling with the change. Eltoft added that there is a fine line for HP — either catering to its customers or competing in the marketplace.

"IBM plans obsolescence. Sun arbitrarily drops lines. Apollo users are used to running code between the oldest machines and the newest," he said. "They're deluding themselves about the real world; it's very cutthroat."

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Johnson

FROM PAGE 29

total to 15 worldwide.

In addition, IBM's Worldwide Opportunity Council, a group of executives who scope out what customers are clamoring for, recently tagged GIS as one of the Top 20 applications to pursue in the '90s.

"I believe GIS is going to be a utility like word processing or spreadsheets," said Alison Libshitz, a manager at IBM's GIS Solutions Center in Houston.

An insurance firm might use a GIS to coordinate policyholder addresses with floodplain data, ensuring that flyers for flood insurance get to the right households. Hotels and department stores could use GIS information to pinpoint the most profitable locations for new branches

IBM's WORLDWIDE Opportunity Council . . . recently tagged GIS as one of the Top 20 applications to pursue in the '90s.

or to sharpen an advertising campaign.

"Call Before You Dig" systems from telephone companies often rely on a GIS to keep track of their cabling. Federal Express also uses a GIS to determine the best delivery routes.

Many major corporations are already converts, Montgomery noted. "Virtually every one of the Fortune 500 has a major project under way in GIS," said Montgomery, who is also president of Utility Graphics Consultants, the largest GIS consulting firm. "A lot of these projects start out in the engineering department, with MIS asked to assist, not to direct or lead."

The majority of Utility Graphics' clients consider their GIS databases as enterprisewide concerns, he added.

GIS enthusiasts like to compare the relative obscurity of their field today with the status held a decade ago by computer-aided design and engineering systems.

When industry analysts talk about the growth of the GIS business, they tend to burble a bit, using words like "explosive," "robust" and "phenomenal."

Worldwide sales of hardware, software and services from GIS vendors topped $612 million in 1989, growing a healthy 16% over the previous year, according to Daratech, a market research firm in Cambridge, Mass. Counting only software, GIS sales worldwide expanded by 45% from 1988 to 1989, hitting $223 million in revenue last year.

The first wave of GIS interest happened far from corporate boardrooms in local governments, utilities and state natural resource departments — Smokey Bear stuff, such as forest management.

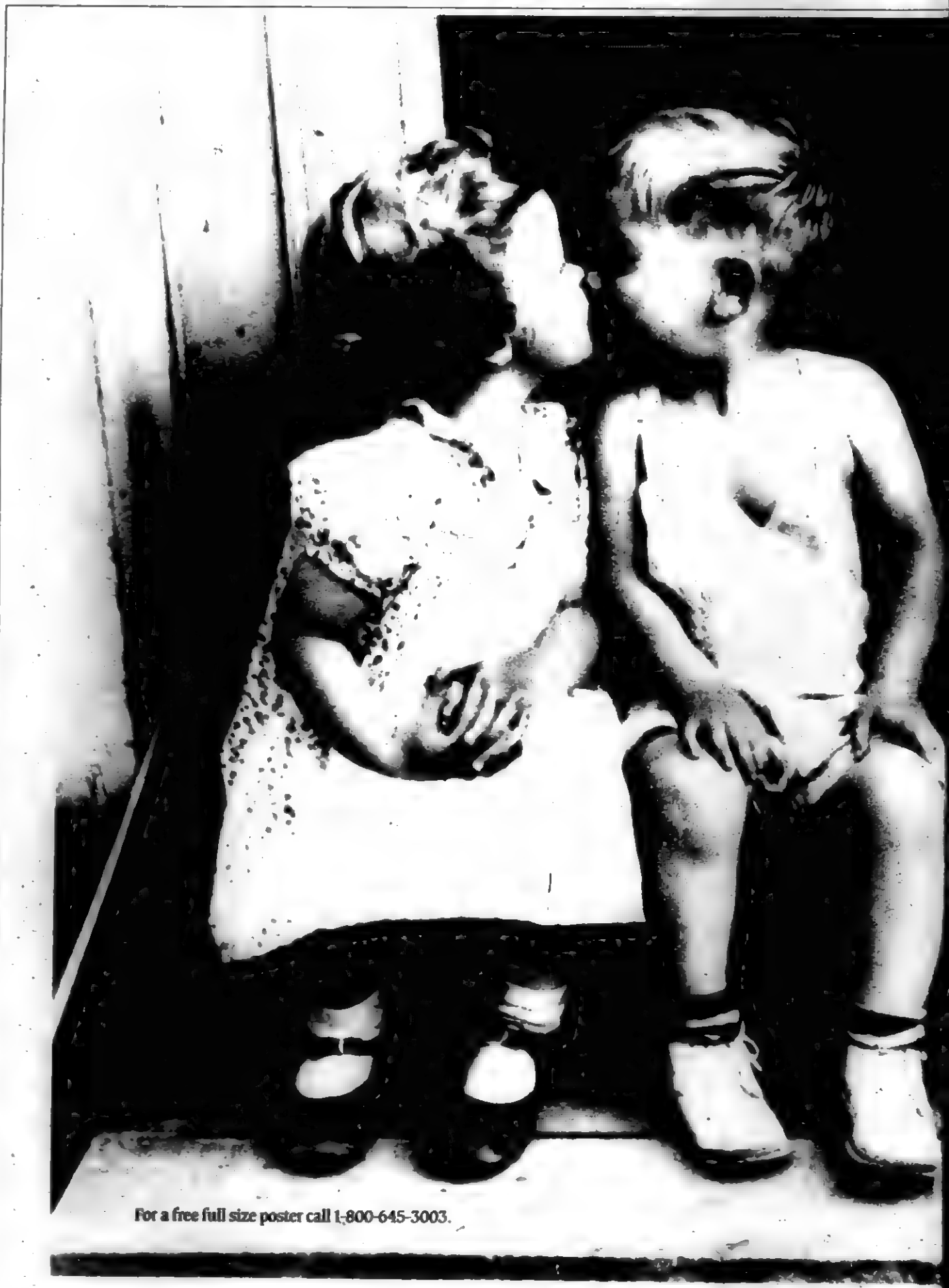
Then came the interest from the military and intelligence communities, the airlines and transporation companies as well as the mapmakers such as Rand McNally. Today, there are at least 120 hardware and software vendors servicing GIS, and another 350 data conversion companies turning paper files into digitized data.

The growth of GIS stems from several factors. Graphics workstations got better, more powerful and cheaper. Commercial and government-made databases of digitized geographic information became more accessible. Scanning technologies improved. Cities, counties and states began sharing their databases rather than reinventing a very expensive wheel.

The future holds some distinctly MIS-like challenges for GIS, however.

For one thing, there is a burgeoning need for standards. For another, the use of computer technology in capturing the data far exceeds traditional methods of managing it (sound familiar?), and businesses will want to incorporate other types of imagery — scanned drawings, photos or documents — into those geographical databases.

Johnson is a *Computerworld* senior editor, systems and software.



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TI sets its CASE sights on broad target

BY MARYFRAN JOHNSON
CW STAFF

Aiming beyond the Big Blue horizon, Texas Instruments, Inc. will move its premier computer-aided software engineering (CASE) tools outside the IBM mainframe environment and into multivendor corporate information systems shops.

Earlier this month, TI announced marketing and development agreements with Digital Equipment Corp. and Tandem Computers, Inc. that will bear fruit gradually, as TI's Information Engineering Facility (IEF) CASE tools are ported first to its own TI1500 Unix, DEC's VAX/VMS and Fujitsu's Unix.

The initial products are scheduled to be available in March 1991, and TI will announce prices in January.

"The idea is to develop an application using IEF on one platform and then send it to the target platform," said Mike Watters, vice-president of TI's advanced information management division.

The alliance with Tandem will eventually allow users to develop and run on-line transaction processing applications independent of a specific computer or operating system, said James Treybig, president of Tandem.

The IEF products for Tandem computers will roll out more slowly, however. The first phase, in late 1991, will require IBM's OS/2 and MVS operating systems. By 1992, users will be able to develop on OS/2 and Tandem Nonstop systems independent of MVS.

"It's not that TI is shifting focus. They're broadening focus," said John Dunkle, an analyst at Workgroup Technologies in Hampton, N.H. "They're clearly moving more into the midrange in recognition of the fact that as people move to distributed environments, the midrange becomes pivotal for applications development."

Lubrizol Corp. in Wickliffe, Ohio, has been a beta-test site for IEF running under VAX/VMS. The CASE tools were used to generate code on an OS/2 workstation, and the application now runs under both IBM MVS and VAX/VMS.

"The value of the product to us is its full life-cycle integration," said Georgio Sorani, MIS director at the chemical manufacturer. "We can take it from design to construction, and the integration really pays off."

Sorani said the applications under development at Lubrizol — in-house research systems — have been superior in quality to what IS could accomplish with a mixed bag of CASE tools or traditional third-generation languages.

"There were three things important to us: platform independence, fully integrated tools and the ability to do as much development as possible on intelligent workstations," Sorani said.

While TI has announced support for IBM's Systems Application Architecture strategy and AD/Cycle repository for CASE tools, analysts said this alliance with DEC and Tandem may enable all three companies to effectively compete with AD/Cycle.

"Users should be cautious in that TI will be marketing quite heavily before the products are actually available — like every company in this industry does," said Frank Michnoff, a research analyst at Meta Group, Inc. in Westport, Conn. "But while cross-platform technology like this is still quite immature, a lot of companies are beginning to examine it."

> "WHILE cross-platform technology like this is still quite immature, a lot of companies are beginning to examine it."
>
> FRANK MICHNOFF
> META GROUP, INC.

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A Comparison Chart of the Major Cooperative Processing Software Products:

FUNCTIONS:	SUPER-LINK®	Easy™	Mozart™	Arbiter®	IBM's HLLAPI™	IBM'S APPC™
Networking Standards Supported						
Peer-to-Peer Processing	✓			✓		✓
Existing terminal-based systems	✓	✓	✓		✓	
Mixed Peer-to-Peer and existing systems	✓					
Application integrity/Software Distribution	✓		▬			
SAA/CUA interface compatibility	✓	✓	▬			
Workstation Environments Supported						
PC/DOS	✓	✓	✓	✓	✓	✓
OS/2	✓	✓	✓	✓	✓	✓
PC/DOS to OS/2 application compatibility	✓		?			
LAN Server for shared applications and data	✓		?			
Multiple transaction servers on a LAN	✓					
Development Environment Comparison						
Object orientation	✓	▬				
Dictionary and documentation	✓					
Panel/Form painter for creation/maintenance	✓	✓	▬			
3270 screen capture: picture and attributes	✓					
CASE/Application Generation	✓	✓				
Intelligent (language-sensitive) editor	✓					
System and user-defined reusable code templates	✓					
Integrated compile/test/debug	✓	✓				
Execution time source debugging	✓	▬				
All development tools for DOS available in DOS	✓		✓			
Objects Supported						
CUA display images	✓	✓				
CUA dialog within display object	✓					
Validation within display object	✓					
Help processing	✓					
Error processing	✓					
Text window interactions	✓	▬				
Business graphics	✓	✓				
3270 definition	✓					
Interactions with 3270	✓					
Interactions with Peer-to-Peer	✓					
"Logon" Scripts	✓					
Application integrity/Software Distribution	✓					
Local Data Access						
Indexed files	✓		✓			
dBase	✓		✓			
Flat Files (random access)	✓					
Flat Files (sequential access)	✓	✓	✓			
Multiple read/write to files on LAN Servers	✓					
High Level Functions Directly Available in the Language						
Field-level context sensitive help	✓		✓			
Optional user learning mode	✓					
Display and selection from:						
Indexed files	✓		✓			
Sequential files	✓	✓	✓			
In-memory lists	✓	✓	✓			
Menu display and selection	✓		✓			
Determining 3270 screen identification	✓		✓			
Read/write to 3270 in a single command	✓					
Read/write to 3270 one field at a time	✓	✓	✓			
Determine dynamic 3270 attribute changes	✓					
Embedded user assistance (pop-up selection lists)	✓					
Data editing/validation:						
Data type/mask checking	✓		✓			
Single range/limit check	✓		✓			
Field/data driven range/limit check	✓					
Date formatting/validation	✓		✓			
Validation against local and LAN files	✓					
Required fields	✓		✓			
"Must Fill" fields	✓					
Zero not valid fields	✓		✓			
Peer to Peer Host Environments Supported						
MVS-CICS	✓			✓		✓
MVS-IDMS/DC	✓					
MVS/TSO	✓					
DOS/VSE-CICS	✓			✓		
VM/CMS	✓			✓		✓
DEC VAX/VMS	✓					
Software Distribution Host Environments Supported						
MVS-CICS	✓		✓			
MVS-IDMS/DC	✓					
MVS/TSO	✓					
DOS/VSE-CICS	✓					
VM/CMS	✓					
DEC VAX/VMS	✓					

Every effort to present an accurate chart has been made, however no guarantee can be made (1/2/90). Super-Link® is a registered trademark of Multi Soft, Inc. Lawrenceville, NJ. Mozart™ is a trademark of Aspen Research. Easy™ is a trademark of Interactive Images, Inc. Arbiter® is a registered trademark of Tangram Systems.

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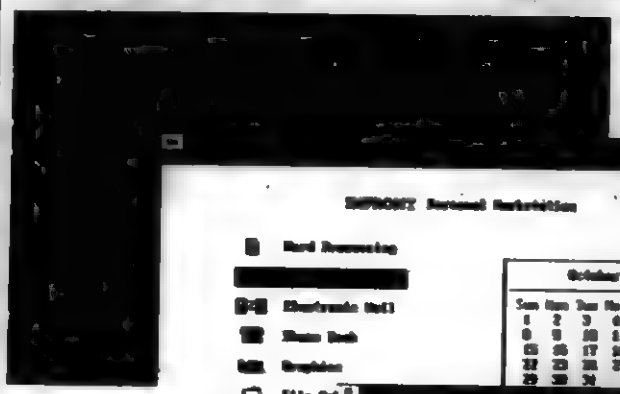

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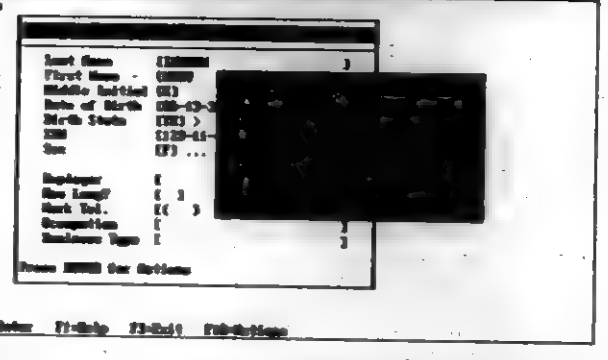

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NEW PRODUCTS — SOFTWARE

System software

Braintree Technology, Inc. has announced Version 1.8 of Auditor, a Digital Equipment Corp. VAX/VMS security investigator and auditing software package.

The product enables system managers to identify and correct security breaches in VMS systems. It can be used to review system authorization files and report on accounts that have gone unused for days, the vendor said.

Auditor Version 1.8 requires VMS Version 5 or higher and is available for free to current Auditor users. First CPU licenses range from $500 to $15,000, depending on CPU size.

Braintree Technology
600 Cordwainer Drive
Norwell, Mass. 02061
(617) 982-0200

Rocket Software, Inc. has announced the latest version of its resource monitor and administration facility, designed for IBM's Query Management Facility operating with IBM's DB2 database management system.

Rocket/QMF Version 1.1 can actively monitor QMF sessions and control resource usage according to parameters established by systems administrators. It also includes a scheduling facility that enables administrators to define specific resource limits for using QMF during peak and off-peak hours, the vendor said.

Pricing ranges from $8,700 to $13,600, depending on CPU size.

Rocket Software
161 Worcester Road
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(508) 875-4321

Database management systems

Programart has released Strobe DB2 Feature, an IBM DB2 application product designed to be used during all phases of an application's life cycle.

The product provides a full picture of a DB2 application's resource in an address space and identifies the Data Base Request modules and SQL statements that cause CPU consumption in DB2 service routines.

Pricing begins at $16,900. Current Strobe users can obtain the new release free.

Programart
1280 Massachusetts Ave.
Cambridge, Mass. 02138
(617) 661-3020

Cognos Corp. has announced that its Powerhouse Starbase relational database management system is now available for users of Hewlett-Packard Co.'s HP MPE/XL systems.

Starbase, part of the Cognos Powerhouse application development environment, provides a second-generation RDBMS for users of HP MPE/XL systems. It allows applictions developed for HP MPE/XL to operate immediately by sharing and accessing data in HP Turbo Image, KSAM or HP MPE files.

Pricing ranges from $15,000 to $100,000, depending on configuration.

Cognos
67 S. Bedford St.
Burlington, Mass. 01803
(800) 426-4667

Languages

Must Software International, a division of U3S International Ltd., has announced that its Nomad relational fourth-generation language is available for IBM's Enterprise System/9000 family of processors.

The product can be used with IBM's DB2 relational database for application development and reporting tasks. Its cooperative processing features allow users to split application functions among IBM mainframes, Digital Equipment Corp. VAX machines and IBM Personal Computers, the vendor said.

Pricing ranges from $10,000 to $235,000, depending on CPU size.

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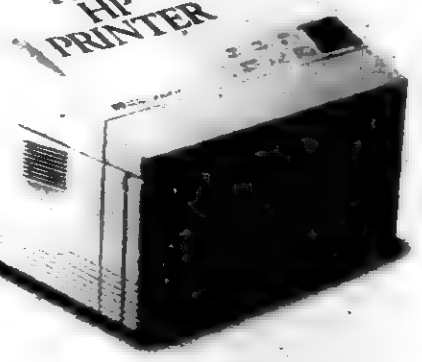

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COMMENTARY

Efrem G. Mallach

OS/2's gap? Salesmanship

The standard arguments for why OS/2 isn't selling usually focus on product issues. Maybe it doesn't offer any more than Windows 3.0. Maybe it's as complicated as Unix without the maturity. Maybe it's a poor copy of today's, or tomorrow's, Apple Macintosh.

Perhaps the real reason is how the product is sold. We can learn something about selling products from the acknowledged masters of the art — the automobile folks.

When Honda entered the U.S. luxury car market, it didn't let existing Honda dealers sell the new cars. Instead, it set up a totally separate network of Acura dealerships. Auto industry gurus predicted disaster. Today, Honda's move is recognized by many in the auto industry as a stroke of genius.

Separate distribution channels are necessary, as Honda recognized, because the selling process differs for different kinds of cars. The products may differ, but the way people buy them — and, consequently, the way the selling process must work — are quite different.

Today's desktop computer market suffers from the same myopia that auto experts once

Continued on page 52

Mainframe treatment for PCs

ANALYSIS

BY RICHARD PASTORE
CW STAFF

The trend to connect personal computer-based networks to mainframe-style peripherals has extended to centralized laser printers. Recent announcements from Eastman Kodak Co. and Xerox Corp. will give users of $2,000 PCs direct access to $250,000 printers. But while those high-speed machines seem ideal for megavolume jobs, some analysts say they may be overkill for the typical PC network.

Announced last month and available now, the $250,000 Adobe Systems, Inc. Postscript-compatible Kodak Lionheart system prints at 10 times the rate of the average desktop laser machine. It also offers finishing capabilities such as stapling and two-sided printing.

The system's intended host platforms are IBM, Apple Computer, Inc., Digital Equipment Corp. and Sun Microsystems, Inc. workstations linked by Ethernet, IBM's Token-Ring or Apple's Appletalk.

Kodak said it hopes to fill a need for centralized printing and act as a complement to distributed desktop printers. While smaller printers will take care of short jobs or "proof" copies, Lionheart will best handle multiple copies of lengthy and high-volume documents, a spokesman said.

King of the desktop

Hewlett-Packard's Laserjet III, one of the most popular desktop laser printers, is a pussycat compared with Kodak's Lionheart

	Laserjet III	Lionheart
Print speed	8 page/min.	92 page/min.
Memory	1M byte	18M bytes
Number of bit-mapped fonts	14	200
Price	$2,395	$250,000

CW Chart: Marie Haines

Earlier this month, Kodak's copier competitor, Xerox, announced the first in its own new series of printers, the Docutech Publishing Series [CW, Oct. 8]. Xerox said it plans for the $220,000, 136 page/min. printer to connect directly to networks by next year.

PC networks are increasingly connecting directly to centralized peripherals, such as system storage units, which were once exclusive to mainframes and minicomputers. Benefits include a tighter link between end user's software and the peripheral.

An intervening mainframe renders the PC software-to-central printer connection "tenuous at best," said Brandon Nordin, an analyst at BIS CAP International, Inc. With a direct connection, users will reap all the feature advantages of their soft-

Continued on page 53

Laptops make big splash in Japan

BY MICHAEL FITZGERALD
CW STAFF

The day of the desktop computer may be coming to an end, at least in Japan.

Japanese factories shipped more laptop computers than they did desktop personal computers between April and June, according to a report from the Japan Electronic Industry Development Association (JEIDA). Portables, which made up 51% of the market during the period, have never before outshipped desktop production in Japan.

A slight disclaimer, though: The figures included machines made for export. While JEIDA's figures showed that Japanese computer factories shipped 327,000 laptops, compared with 317,000 desktop machines, desktops outshipped portables in Japan itself by a margin of 268,000 to 216,000. Laptops thus held some 44% of the Japanese market.

Observers say that the fast-paced development of better, lighter portables as well as cultural concerns, such as desks that are two-thirds the size of American desks, make laptops a natural for both Japanese corporations and consumers.

Space is so tight in some Japanese corporations that workers joke that PCs should be called walkstations, not workstations, said Jack Plimpton, president of Japan Entry, a Boxford, Mass., firm that helps U.S. high-tech firms enter Japanese markets. Plimpton said that in many firms, PCs sit in a segregated area of the office, along with copiers and other large machines, rather than on employees' cramped desks.

Laptops also work well in the home market. Plimpton pointed out that portable word processors outsell laptops in Japan and said that he thinks that laptops and notebooks will begin to take a significant share of that market.

Pricing that is competitive with desktop machines and a kind of high-tech snobbery also contribute to higher sales, according to Bruce Stephen, an analyst at International Data Corp. in Framingham, Mass. Notebooks "are all the rage among young executives in Japan," Stephen said.

Most analysts expect that the U.S., with a PC market 10 times the size of Japan's, will continue to be a bastion of desktop sales. But even here, laptops will encroach on desktop market shares. Dataquest, Inc., a market research firm based in San Jose, Calif., projected that portables — mainly laptops and notebooks — will garner 40% of the U.S. market by 1993.

Analysts also report that U.S. portable makers have virtually no market presence in Japan and would need to significantly rework their machines to handle the Japanese language.

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Cooking with expert systems

ON SITE

BY MICHAEL FITZGERALD
CW STAFF

PARK CITY, Utah — "Good cookie!" is what you might say after biting into one of Mrs. Fields' offerings. "Smart cookie" might also apply, because Mrs. Fields Cookies, Inc. has used information technology since the day it baked its first batch 13 years ago and has developed a reputation for excellent use of innovative software.

Although its host systems have traditionally been from IBM, Mrs. Fields is no chip-off-the-old-block user of information technology. The company relies heavily on expert systems running under both the Application System/400 platform and DOS to manage its six-country chain of 650 company-owned stores.

Mrs. Fields uses two AS/400 Model 60s linked via token-ring and in-store, stand-alone personal computers largely based on the Intel Corp. 8088 chip. The stores are linked to the host by Xcellenet Corp. communications software.

This is a far cry from the early days at Mrs. Fields, when the company installed an ancestor of the facsimile machine called a Quim in its first few stores. Even then, information technology was used to meet the company motto: Retail happens daily. Data was sent back over the system each day and was then entered into a Radio Shack Corp. TRS-80 running Visicalc, the first spreadsheet.

Mrs. Fields' motto of retailing remains the starting point for developing computer systems.

"You need to build systems that report daily so you can really see what's going on and so that you can manage daily," said Paul Quinn, president of ROI, the Fields software group, which was recently organized as a separate affiliate by Mrs. Fields Cookies [CW, Sept. 17].

After the TRS-80s, Mrs. Fields bought an IBM Series/1, which offered a Touch-Tone data entry interface, so the stores could call in information via the telephone. But store managers found the system frustrating, because mistakes in data entry were difficult to correct.

So the company created an interface based around PCs, allowing store managers to see the data they entered on screen. Moving to PCs "was like opening floodgates," Quinn said, "because then the imagination went wild and said, 'What are all the other things we can do with that PC?' "

Quinn, who joined the company in 1984 and helped implement the PCs, then started to develop the company's first expert system to help solve its difficulty in effectively scheduling labor.

Mrs. Fields decided to build its own expert systems after examining and rejecting available commercial expert system shells. The decision has paid off as each of its five expert systems has paid for itself within six months.

The firm developed its own inference engine and its own knowledge base for the labor scheduling system and has installed it chainwide. Since it was fully implemented, the system has shaved 4% off company labor costs, adding the savings to its bottom line.

Waste not, want not

Mrs. Fields, like most fast-food chains, also faced production planning issues. Local managers had to have just enough cookies to meet demand with a minimum of waste. For this key function, the company had initially set broad production guidelines based on total store sales each day.

It decided to guide production for each store through a stand-alone PC-based expert system that has rules set up to gear production to each store's typical traffic flow. The system, also installed chainwide, has resulted in a savings of 6% of daily sales.

Another expert system is used to hire new store employees. The system develops a profile of each candidate, compares it with the desired employee profile and reports the results to the store manager.

The time benefits have been significant: Whereas month-end profit and loss analysis used to take two to three people at least two days, now only two hours are required.

The systems have given Mrs. Fields some unexpected benefits.

"Our training program changed radically after we put the expert systems in," Quinn said. "We weren't investing training dollars into managers on how to create a schedule and how to do a production plan, because they really didn't need to know. All they needed to know was push the button, and it's going to recommend something."

Mrs. Fields has realized significant cost savings from this, because the fast-food industry can generate employee turnover as high as 400% per year.

Another benefit surfaced when the company's controller left in June 1990. Thanks to one of the expert systems, much of his expertise stayed behind.

Despite kinks in Notes, most like what they see

BY PATRICIA KEEFE
CW STAFF

Lotus Development Corp.'s Notes groupware application has its problems, but it also holds a great deal of promise, according to users and analysts who have spent the last year intently studying the fledgling environment.

As observed last week [CW, Oct. 8], complaints about the way Notes is packaged — a flat entry price point of $62,500 for 200 nodes — has not dampened enthusiasm for the concept.

However, because even the most die-hard Notes fans have difficulty articulating exactly what Notes is — why it is more than just a bunch of office automation capabilities strung together and how it differs from integrated packages — it tends to fall into the "seeing-is-believing" category.

Recognizing that, Lotus has referred a host of users to Price Waterhouse, where they can see the application in action. Lotus is also hoping that partnerships with systems integrators specializing in vertical markets will provide users with further examples of how Notes can serve their organizations.

June Rokoff, vice-president of communications and the information services group, talks about getting clients to understand how they can interact with Notes and each other, be it in work groups, product development or in following an idea across the country.

Transformation tech

For example, she said, client applications can range from sharing corporate telephone books on-line to keeping track of events related to the company's business to on-line dialogues and conferences, which is how Chemical Bank uses it. Young & Rubicam, Inc., an advertising agency, uses Notes to manage client relationships, as does Price Waterhouse and the consulting services group at Lotus. Picking up on a theme brought forth by Price Waterhouse, Rokoff talks about "transformational technology."

"I see professionals throughout the company not tied to any location, in an electronic sense, [due to Notes]," said Brad Jackson, a senior consultant in Texaco, Inc.'s information technology department.

"Notes has the property that once you begin to use it, you begin to work in a very different way," said Frank Moss, vice-president of the consulting services group at Lotus. As an example, he cited his own use of Notes. Moss said he was accustomed to tracking projects using paper. But now that Lotus has all its projects on-line, Moss finds himself involved in fewer face-to-face meetings. "I make decisions now based on different information than I used to," he said.

Rokoff and Moss talk about Note's ability to change the way people work, a claim backed up by Notes users. As such, it is necessary to go out organizationally, Rokoff said, to make sure users see Notes and buy into it.

Once they do, according to Sheldon Laube, director of information technology at Price Waterhouse, they often need no prodding to move their group's applications onto Notes. In many cases at Laube's organization, users with limited technical skills have even begun to write applications for Notes. "It's incredible," he said.

David Marshak, an analyst at Patricia Seybold's Office Computing Group, agreed: "One of the things that excites those working with Notes is the ability to rapidly prototype applications; it's an easy platform to customize with." Among his clients, the applications being built on Notes tend to be those that deal with information essential to the client's line of business applications.

It is for these reasons that some observers said Lotus should concentrate on seeding any interested accounts with Notes rather than wrestling with users determined to pilot it.

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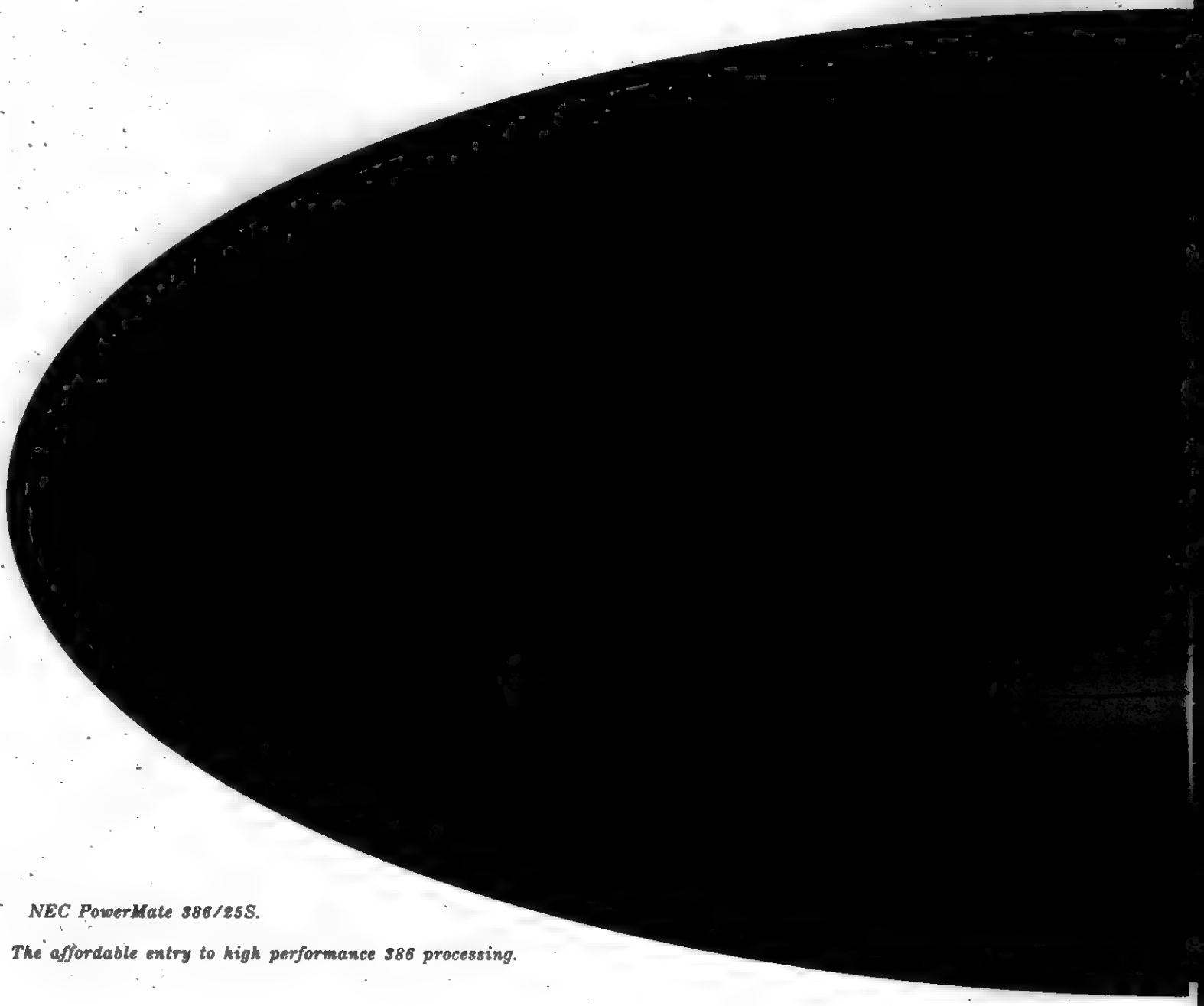

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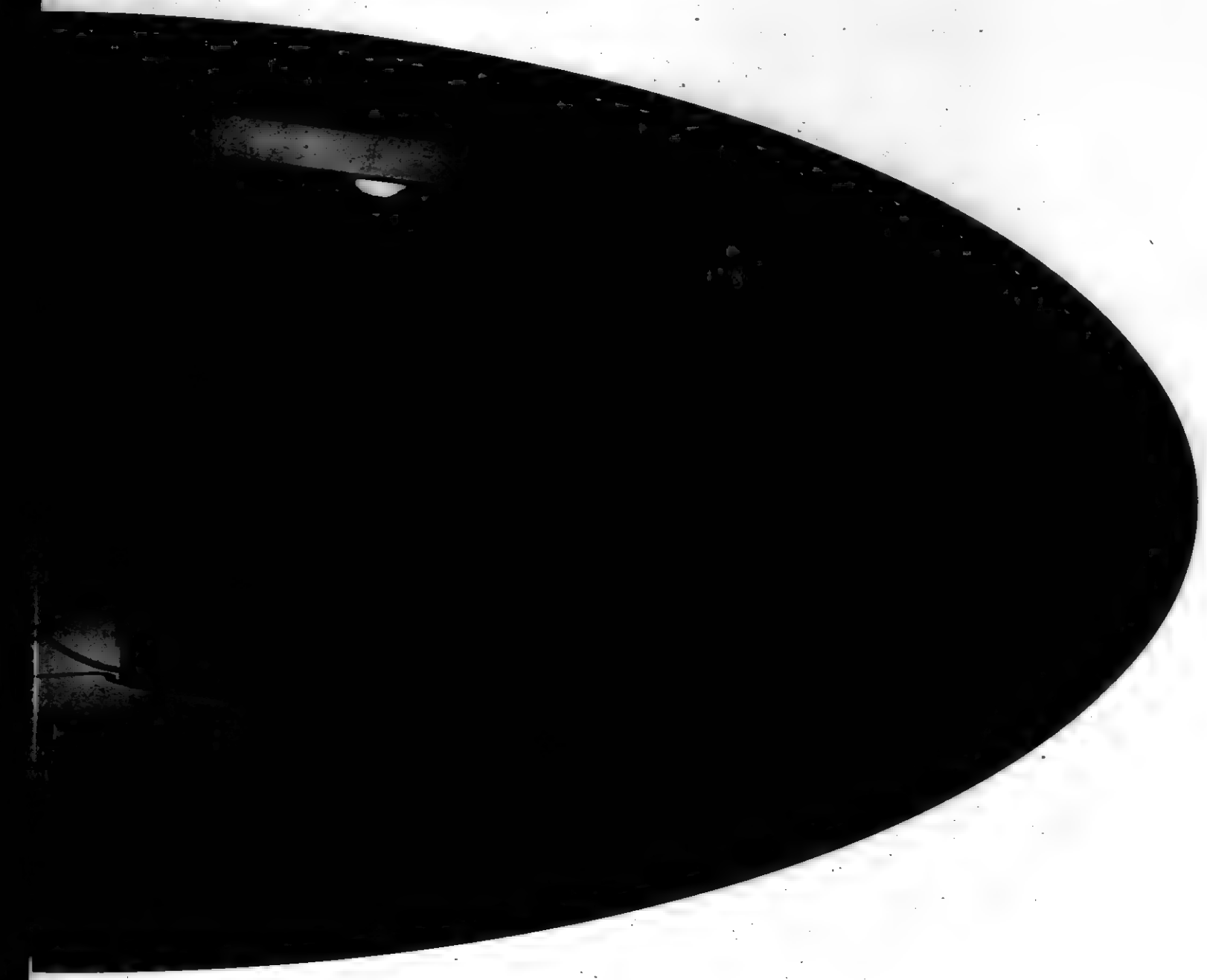

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Postscript challenger fades

Microsoft's page description language not expected until mid-1991

BY JAMES DALY
CW STAFF

SAN JOSE, Calif. — The tornado that ripped through last year's Seybold Publishing Conference generated scarcely a breeze at this month's fete as Microsoft Corp. Chief Executive Officer Bill Gates conceded that his once-ballyhooed challenger to Adobe Systems, Inc.'s entrenched Postscript page description language could remain a paper tiger until the middle of next year.

Gates said that the first general availability of Microsoft's and Apple Computer, Inc.'s collaborative Trueimage page description language and Truetype font technology will come with shipments of OS/2, Windows and Apple's System 7.0 in the first half of 1991. Early OEM versions of Trueimage were delivered last week, he added.

Last September, Gates and Apple CEO John Sculley jointly announced that they were developing their own Postscript alternative, a move that stunned Apple's longtime partner Adobe. Apple was an early investor in Adobe and the biggest customer of Postscript, a popular application that is often credited with launching the desktop publishing explosion that in turn made a fortune for Apple.

Within hours of the announcement, a visibly angered Adobe CEO John Warnock parried the move, announcing that he would "open up" Postscript by publishing its technical specifications.

Warnock has fought hard to combat Gates' charge that Postscript has become outdated.

"There's a myth that standards and innovation are mutually exclusive, when often just the opposite is true," Warnock said during the four-day Seybold conference earlier this month.

Fire under Adobe

As a result, Mountain View, Calif.-based Adobe has moved fast to shore up the defenses of its cash cow. In June, the company held a developers' conference for Postscript Level 2, which is slated to be available in the first half of 1991.

Warnock said the new package will beef up text and graphics functions as well as adding data compression capabilities and an improved memory management device.

Observers said that Truetype and Trueimage will face a difficult battle for the hearts and dollars of users.

Jonathan Seybold, an analyst at Malibu, Calif.-based Seybold Seminars, said it is likely that users faced with competing products will stay with the old familiar offering. "Postscript is a central fact of life to many, many people, and it'll be very difficult to change that," he said.

Gates acknowledged that both Trueimage and Truetype may eventually garner only a small market share, but he said that "both are sure to keep the market competitive in areas of price."

In other show news, C-Cube Microsystems, Inc. unveiled a pair of image compression add-in boards for Apple's Macintosh and IBM's Personal Computer AT and compatibles.

The Compression Master and Compression Master PC take advantage of JPEG image compression technology, which compacts bulky image files so they can be more easily stored and moved. The products cost $995 each.

Quark, Inc. announced that it will target several future development efforts toward IBM's line of PCs and workstations. Its first entry into the market will be to adapt its Quarkxpress/PC electronic publishing software to the IBM Personal System/2. That package is expected next year.

In addition, Digital Equipment Corp. and Adobe announced that they will work together to develop a unified approach to editable document interchange. The companies' work will be based on DEC's NAS Compound Document Architecture and Adobe's Postscript.

Zenith Data hops on PC price-cutting bandwagon

BY MICHAEL FITZGERALD
CW STAFF

MT. PROSPECT, Ill. — Zenith Data Systems recently cut suggested retail prices across the board on its desktop personal computers. The announcement means that the company has cut prices on its entire line of PCs within the last month.

The cuts implemented earlier this month, although worldwide, do not affect pricing of PCs based on the Micro Channel Architecture sold by Zenith's parent, Groupe Bull, in European markets.

The latest reductions ranged from an $1,800, 13% cut in the price of the Z-386/33E Model 320 to a $100, 3.7% drop in price for the Z-286 LP Plus Model 40 (now $2,599).

Zenith saved its steepest reduction for its Z-386SX Model 1, dropping the price from $2,999 to $2.299, a 23.3% cut. It also lowered prices by 18.9% on its best-selling desktop machine, the Z-386SX Model 40, dropping the price of that machine to under $3,000.

Despite the latest pricing moves, Zenith's top-of-the-line, Intel Corp. 80386-based 33-MHz machines — the Z-386/33 E Models 150 and 320 — remained priced at more than $10,000, with the Model 150 priced at $10,599 and the Model 320 at $11,999.

A Zenith spokesman called the price cuts a "business decision" for Zenith. The reductions follow recent broad cuts by other PC makers, including Compaq Computer Corp.

"It sounds like they just brought their prices more into line with what the market is accepting as price points," commented Steve Hess, executive vice-president at Creative Strategies, Inc., a Santa Clara, Calif.-based market research company.

"You can speculate that they may be doing this in anticipation of a softer market, because Zenith could probably have justified keeping their prices where they were, but now they're at a competitive price point," Hess said.

Rookies gaining ground on PC software superstars

BY RICHARD PASTORE
CW STAFF

For years, the microcomputer software market has been dominated by just a few packages: Lotus Development Corp.'s 1-2-3, Wordperfect Corp.'s Wordperfect and Ashton-Tate Corp.'s Dbase. Though the market leaders are holding fast to their massive installed base, upstarts are beginning to gain significant ground, according to recent buying-pattern surveys.

Wordperfect and 1-2-3 continued to lead the pack in sales at the 14,678 U.S. sites with 500 or more employees surveyed by Computer Intelligence in La Jolla, Calif. A key to their ongoing success is corporate buying inertia, said Dan Ness, personal computer analyst at Computer Intelligence. Cost factors associated with training, installation and support encourage the status quo and discourage software experimentation at larger firms, he added.

But two packages from Borland International are making sales strides, thanks to lowered defenses at Ashton-Tate and Lotus. Because both Lotus and Ashton-Tate have experienced major delays in releasing new products, Borland's Quattro Pro and Paradox have been able to slip in and make their presence felt, Ness said.

While 1-2-3's three-month average sales have tailed off by 5% since March, Quattro Pro has gained a couple of percentage points, according to surveyed firms. Paradox has doubled its 12-month average sales since June 1989, while Dbase IV has remained flat.

Also coming on like gangbusters is Microsoft Corp.'s Windows operating environment and Microsoft Word word processing package, which have gained five and six sales percentage points since March, respectively.

Coupled with Microsoft's Excel, the country's largest PC software house has logged a 12% gain in average sales from March through July, the survey showed. Analysts predicted continued growth for Microsoft, with sales in the $1.5 billion range next year.

Rounding out the list of the Top 15 hottest-selling software packages this summer in descending order were the following: Wordperfect; 1-2-3 Release 2.2; Microsoft Word; Quattro Pro; Excel; Software Publishing Corp.'s Harvard Graphics; Windows 3.0; 1-2-3 Release 3.0; Central Point Software, Inc.'s PC Tools; Ashton-Tate's Multimate, Dbase III and Dbase IV; Datastorm Technologies' Procomm; Symantec Corp.'s Q&A; and Fifth Generation Systems, Inc.'s Fastback.

Forward progress

Penetration of PC applications software packages into U.S. sites with 500 or more employees

Lotus' 1-2-3	69%
Wordperfect's Wordperfect	63%
SPC's Harvard Graphics	39%
Aldus' Pagemaker	36%
Microsoft's Windows	33%
Microsoft's Excel	26%
Microsoft's Word	26%
Autodesk's Autocad	26%
Wordtax's Wordstar	24%
IBM's Displaywrite	20%
Xerox's Ventura	19%
Lotus' Symphony	19%
Ashton-Tate's Multimate	18%
Lotus' Freelance+	15%
Borland's Quattro, Quattro Pro	13%

Source: Computer Intelligence
CW Chart: Marie Haines

COST FACTORS associated with training, installation and support encourage the status quo and discourage software experimentation at larger firms.

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CONTINUED FROM PAGE 41

had. Microcomputer distribution channels evolved during the 1980s for a particular class of system having certain general characteristics and, therefore, certain appropriate selling processes. Those channels are no longer the only answer — or, for OS/2, even a correct one. OS/2 promoters are making a big mistake by trying to force the product through channels that were designed for something quite different.

Consider retail computer stores. Since they began, they have focused on relatively simple systems — typically, single-user systems designed to do one user-visible thing at a time. It doesn't take a great deal of time to demonstrate their value; hence, the selling process is relatively short, and competition is often based on price, with margins correspondingly low. Even direct sales to large corporate users follow this pattern.

Now enter OS/2, stage left, as the purported replacement for MS-DOS. It calls for more hardware, but that's a transitory problem, not a fundamental issue. Today's MS-DOS calls for far more hardware than CP/M did, but nobody complains. Ditto for a Mac with less than 1M byte being next to useless — and make that 2M bytes next year.

If people really wanted OS/2, they'd pay for the hardware. The key reason people aren't buying OS/2 is that existing desktop computer distribution channels can't sell it.

OS/2 is a fundamentally different beast from MS-DOS. OS/2 has all the modules, all the interfaces and all the complexity of VMS a few releases back. The only thing it does not have in common with the VMS of 1985 or so is a six- or seven-figure price tag for the hardware. That difference is not enough to change the nature of the selling process.

Also, the channels through which most desktop micros move have never succeeded in selling Unix-based systems or anything else of comparable software complexity. Hardware cost is not the reason. The same stores that can't move a $5,000 Unix box or OS/2 system routinely sell $10,000-plus Macintosh IICIs and IBM Personal System/2 Model 70s.

No, a key reason is their inability to deal with an extended sales cycle based largely on future potential. If I buy MS-DOS to run accounts receivable, I can see the relevance of every major MS-DOS feature to that accounts receivable job. If I look at OS/2, I am told, "You can run MS-DOS A/R now, and you'll get lots more good stuff later." What good stuff, and what will it do for me? "I don't know," the sales rep says, "and what's more, I don't care, and I'm not going to waste my valuable time trying to find out when I could be selling more MS-DOS systems."

This ability to sell future benefits — not benefits of future products, but future benefits of today's products — has been the large-system salesperson's stock-in-trade for years. IBM is known for conducting detailed studies of users' long-term needs. That's what it takes to sell complex systems, and that's what existing microcomputer distribution channels can't or won't do.

A look at the few folks who *are* buying OS/2 bears out the same lesson. As a group, they tend to be large organizations whose staffs have both technical and business savvy and whose planning horizon is longer than a year. If they see reasons to buy OS/2, there must be some pretty good ones. If other people don't see the same reasons, either their needs are consistently different — which is not plausible — or something is wrong with the way they are being approached.

Those who want OS/2 to take off must create sales channels that will enable it to do so. The sooner Microsoft and its colleagues learn the Acura lesson — assuming they really do want OS/2 to take off — the sooner they will get results.

Mallach is a faculty member at the University of Lowell in Lowell, Mass., and a consultant to users and vendors.

Computervision upgrades CADDS

BEDFORD, Mass. — Computervision, a Prime Computer, Inc. company, recently expanded its CADDS 4X mechanical computer-aided design and manufacturing (CAD/CAM) software line by unveiling a version of its CAD/CAM/CAE package designed to accelerate each phase of the engineering process — from functional design and design modeling through engineering analysis and documentation to manufacturing engineering.

Components offered in Release 6.0 reportedly include a solids editing tool to simplify the changing of solid models developed in CADDS 4X; an assembly design program to accelerate the design of large mechanical assemblies; thermal analysis software to aid engineers in assessing heat transfer problems; and easier machining of complex parts.

A CADDS Raster component is also available that allows users to view, edit and store raster-based images of their paper-based engineering documents in the CADDS environment. Pricing for the individual components ranges from $8,500 to $15,000, with the GCN solids editing tool provided to current Solidesign II users as part of the Release 6.0 upgrade.

SALLY CUSACK

Wyse sets the standard in terminals again.
And again. And again. And again.

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DG plants feet firmly on I486 ground

BY SALLY CUSACK
CW STAFF

WESTBORO, Mass. — Data General Corp. officially stepped into the Intel Corp. I486-based ring this month, trumpeting a high-end, 25-MHz personal computer system.

"This is their opportunity to solidify themselves in the 486/Unix side of the server world," said Paul Zagaeski, a senior analyst at The Yankee Group. He estimated that 75% of all I486-based machines are purchased for use in a server capacity.

According to DG, the Dasher/486-25 is directed at sophisticated users looking for high performance and upward expansion options and provides a suitable platform for multiuser Unix applications and Novell, Inc. Netware networks.

The base system, priced at $7,995, provides 4M bytes of memory on a 32-bit controller, a dual-floppy disk controller, an IBM Personal Computer AT-compatible keyboard, a 16-bit Video Graphics Array controller card and eight expansion slots.

For memory above 16M bytes, another memory controller can be added to bring the total system memory up to 32M bytes. The system accommodates up to five half-height 5¼-in. drives, the firm said, which allows the user to combine multiple hard disks for fault-redundant Novell networking with tape backups and on-line storage of 1G byte.

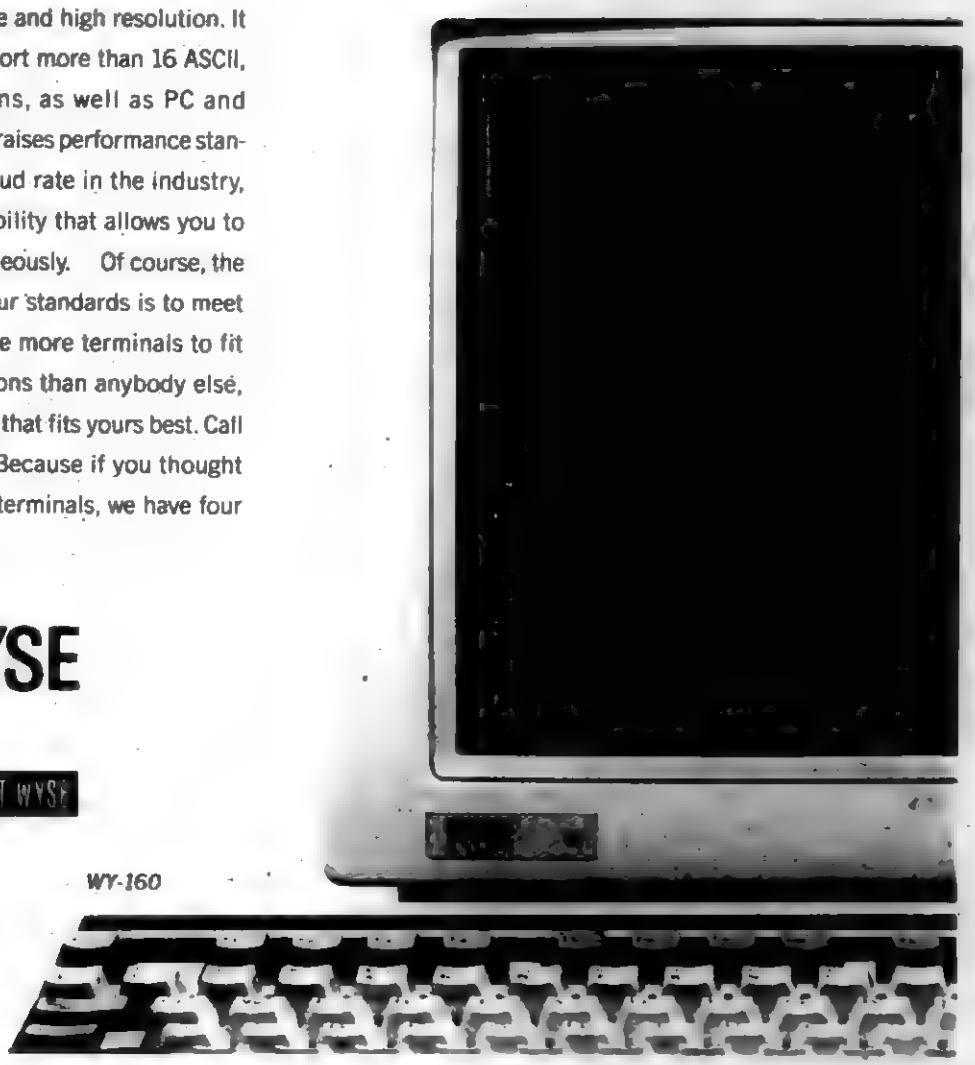
The Dasher/486-25 is available immediately and includes a one-year warranty with a toll-free telephone support center, overnight express shipment of replacement parts and telephone or on-site assistance. The system ships with MS-DOS Version 4.01, QEMM-386 and menu-driven user diagnostics.

Wyse became the number one manufacturer of general purpose terminals by repeatedly redefining the state of the art in terminal design. Not just in one category, but across the board. And with the four terminals that make up our fourth generation, we've done it again. Each one represents the ultimate achievement in its class. Our WY-150 sets the standard for alphanumeric monochrome terminals. The WY-370 brings unprecedented functionality in color. And the WY-185 is the most advanced DEC-compatible. Our newest entry, the WY-160, offers a combination of features found in no other monochrome terminal. It lives up to Wyse's well-known ergonomic standards, with its full-screen overscan, fast refresh rate and high resolution. It has the flexibility to support more than 16 ASCII, ANSI and PC emulations, as well as PC and Tektronix graphics. And it raises performance standards with the fastest baud rate in the industry, plus a dual-session capability that allows you to access two hosts simultaneously. Of course, the reason we keep raising our standards is to meet yours. And since we make more terminals to fit more system configurations than anybody else, we're sure to have the one that fits yours best. Call us at 1-800-438-9973. Because if you thought you'd seen everything in terminals, we have four reasons to look again.

THE WORLD IS GETTING WYSE

WYSE

800 GET WYSE



WY-160

Mainframe

CONTINUED FROM PAGE 41

ware, including what-you-see-is-what-you-get capabilities, he said.

Other benefits include eliminating the need to translate software and reducing drain on the mainframe, analysts said.

Yet a trend toward distribution may hamper user acceptance of centralized printing. "Decentralization is what's happening with printers all over the place," said Michael Peterson, president of Peripheral Strategies in Santa Barbara, Calif. "The lower the cost goes, the sooner we're going to get to one per office."

A centralized printing source runs counter to users' desire for local control of their output, added Gabriel Kasperek, president of network consulting firm Kazcom, Inc. in Park Ridge, Ill. "The issue is who's going to gain power over it."

Similar concerns were voiced about who will manage the Xerox system. "If this [machine] is outside the purview of information systems, then who manages it?" asked John Dunkle, vice-president at Workgroup Technologies, Inc. "Especially given the networking and integration issues, that could be a problem."

The size and cost of such systems may also be out of whack for most PC network installations. "That's a lot to bite into for a typical company running LANs," Kasperek said.

Kodak said Lionheart would be economically sound for organizations with a printing need of 500,000 pages per month. The average desktop laser unit manages 1,000 to 2,000 pages per month.

"The markets where that [volume capacity] would be viable would be very selective," said John Hoper, president of printer consultancy Omnimark in Dallas.

Printing shops, publishing houses, insurance and brokerage firms and some banks may have the volumes to use such a system, Hoper said.

Senior West Coast Editor Jean Bozman contributed to this report.

MICRO BITS

Free 1-2-3 with Powermate PCs

Lotus Development Corp. and **NEC Technologies, Inc.** are offering a coupon until Dec. 31 for a free copy of Lotus' 1-2-3 Release 3.1 to buyers of NEC's 386SX, 386 and 486 Powermate personal computers. Purchasers also get a free copy of **Microsoft Corp.**'s Windows 3.0

Computerland Corp. has standardized on **Da Vinci**'s Da Vinci E-mail throughout its corporate offices and 750 outlets, after evaluating half a dozen other electronic mail packages. Da Vinci will replace a mainframe-based E-mail application.

The **U.S. Defense Electronics Supply Center** has awarded a $12.1 million contract for dual-drive compact disc/read-only memory units to **Sony Corporation of America.** The defense group will use the external drives in combination with IBM Personal Computer compatibles for office automation applications and to store and access parts catalogs and federal stock numbers.

Eight Top Databa
Out On dBAS

ADAM GREEN
President, Adam Green Seminars, Le...gton, MA:

"It's significantly faster in some very important areas, especially in the fancy, attractive user interface. It's a very stable product, very reliable. I can safely recommend it."

PAT ADAMS
President, DB Unlimited, Brooklyn, NY:

"With standardization on the dBASE IV language, we have our database standard, which makes life easier for me, for my clients, and every other dBASE user. It's a solid, reliable product that performs the same way every time."

BOB DAVIES
President, SBT, Sausalito, CA:

"Memory utilization is much better than either dBASE III PLUS or dBASE IV version 1.0—a very substantial improvement. This means we are able to run our products, which require lots of memory and the need for a network, in a dBASE IV 1.1 environment."

SCOTT ROBERTSON
President, Champion Business Systems, Golden, CO:

"We think that it's solid. We think it's reliable. We think it's an excellent foundation for future development. The great thing about dBASE IV is that it has a flexible language and a good user interface. With dBASE IV version 1.1, end-users can take the product and tailor it so it fits their exact needs."

After running their own extensive tests, these independent experts have come to some very favorable conclusions on dBASE IV® version 1.1. We think you will, too.

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se Experts Speak
E IV Version 1.1.

TONY LIMA
Author of "Inside dBASE IV," President, Pacific Systems Design Workshop Inc., San Carlos, CA:

"Version 1.1 should dominate the market. Its added features make it the best development environment available for PC database products. None of the other products have the power and ease of the dBASE IV Control Center."

HOMER BRANCH
Programmer Analyst, Chevron CEPS, New Orleans, LA:

"I'm using version 1.1 to develop applications right now. It's much easier to use than either dBASE III PLUS or 1.0. Because of the Control Center, version 1.1 allows my users to do queries and get their reports without calling me."

RICHARD BRENNER
President, Westar Systems, Colorado Springs, CO:

"I'm now taking on some major consulting jobs that I wouldn't do before dBASE IV and its multiuser capabilities. I'm excited about the way they've gone through and enhanced just about every one of the new features within the program and the programming language."

SAM GILL
President, DataWiz International, Foster City, CA:

"dBASE IV version 1.1 is significantly faster. Memory management has really been improved. We can now load and run a system very comfortably in 640K bytes. Features like the form, report and application generators allow us to cut down development time."

Call 1-800-437-4329, ext. 1403, for more information. Better yet, call 1-800-2ASHTON for an immediate upgrade.

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NEW PRODUCTS

Systems

Grid Systems Corp. has introduced an IBM Personal Computer-compatible laptop that features a built-in pointing device.

The Gridcase 1550-SX includes a proprietary pointing device in its battery-powered Gridcase that enables users to fully utilize the features of Microsoft Corp.'s Windows 3.0. A standard unit includes a 20-MHz Intel Corp. 80386SX processor, a 60M-byte hard disk drive and Windows 3.0.

A standard configuration costs $6,295, and a version with a 120M-byte hard drive is priced at $6,995.

Grid Systems
47211 Lakeview Blvd.
Fremont, Calif. 94538
(415) 656-4700

Samsung Information Systems America, Inc. has announced a portable computer that provides users with all the features of a desktop system.

The S3600 includes an Intel Corp. 80286 microprocessor, 1M byte of random-access memory and a 3½-in. 1.44M-byte floppy-disk drive.

A backlit Video Graphics Array screen yields 16 levels of gray at a 640- by 480-pixel resolution. Traveling Software, Inc.'s Laplink III software package is included free with the S3600 until Dec. 15, the vendor said.

The product is priced at $140.

Samsung
3655 N. First St.
San Jose, Calif. 95134
(800) 446-0262

Software applications packages

Macromind, Inc. has announced a software tool for integrating video with graphics, animation, text and sound when producing videotapes or video presentations on Apple Computer, Inc. Macintosh systems.

Macromind Mediamaker includes a print-to-tape feature that enables users to create videotapes for distributing their presentations. System requirements include a Macintosh Plus, II, SE, SE/30 or portable running Apple's System 6.05 or higher. A hard disk, 1M byte of memory (for black-and-white applications) and 7M bytes (for color applications) are also needed.

The product is scheduled to be released in the fourth quarter for $495.

Macromind
410 Townsend
San Francisco, Calif. 94107
(415) 442-0200

Prentice Hall Professional Software Corp. has introduced a knowledge-based personal computer financial analysis software product designed to help accounting firms analyze clients' financial and operating data.

Answers enables users to accept financial data from more than 70 different accounting packages, as well as from packages such as Lotus Development Corp.'s 1-2-3. System requirements include an IBM Personal Computer AT, Personal System/2 or compatible equipped with 640K bytes of memory and DOS Version 3.0 or higher. It is priced at $595 for a single-user version and $1,495 for unlimited use at one location.

Prentice Hall
2400 Lake Park Drive
Atlanta, Ga. 30339
(404) 432-1996

Training

Strategic Management Group, Inc. has announced an interactive self-study program designed to help users understand financial terminology, financial reports, profitability and other financial training applications.

The product combines a four-part workbook, case studies, exercise review questions and a computer-based business simulation. It runs on an IBM Personal Computer AT or XT, Personal System/2 or compatible and requires PC-DOS Version 2.0 or higher, 512K bytes of random-access memory, two disk drives or a hard drive.

The product is available for $300, the vendor said.

SMG
3624 Market St.
University Science Center
Philadelphia, Pa. 19104
(215) 387-4000

Board-level devices

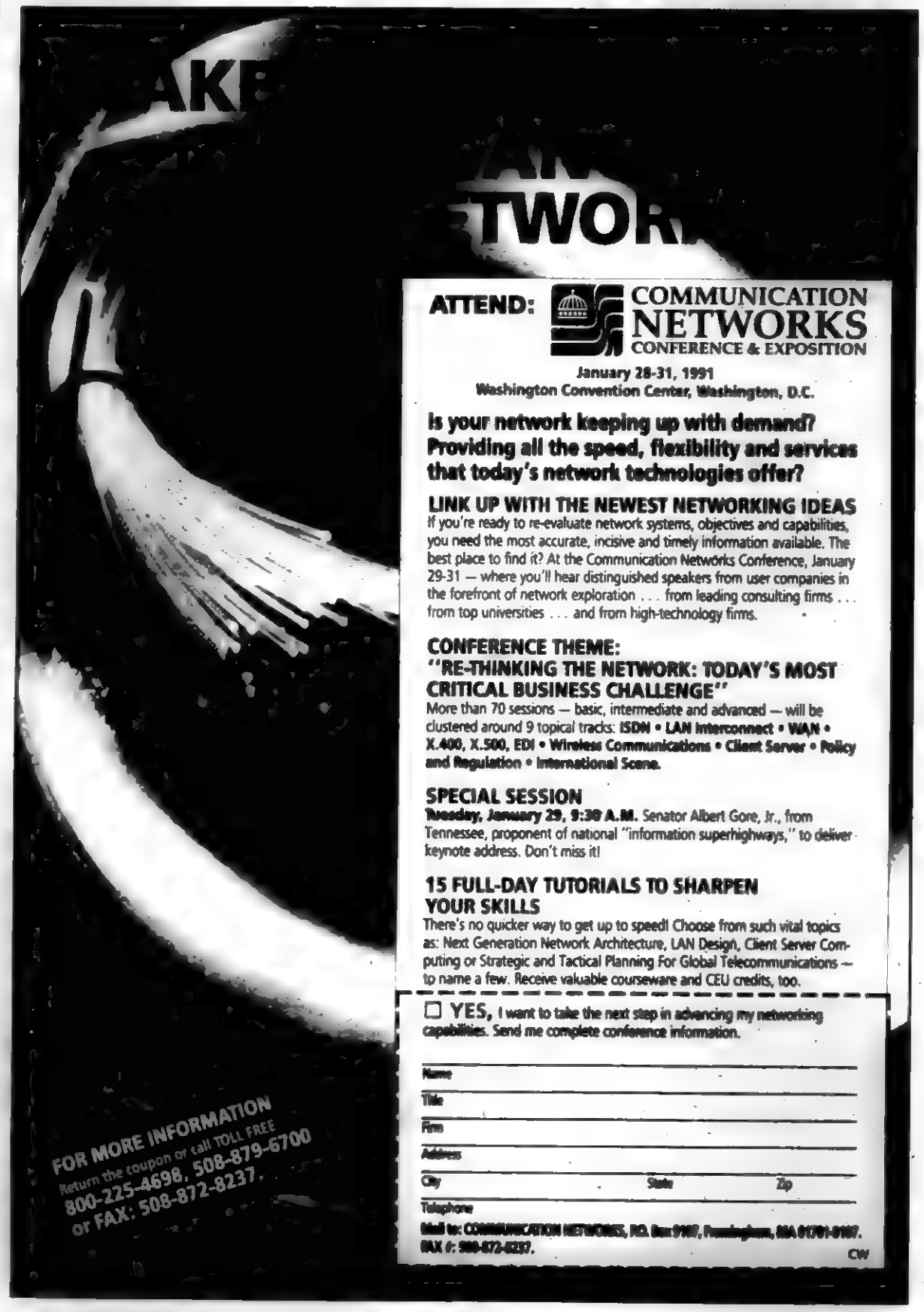
Ariel Corp. has announced two digital signal processing coprocessor cards designed for Sun Microsystems, Inc.'s Sparcstation 1+, Sparcstation IPC and Sbus-compatible computers.

The S-56 and S-56X single-slot Sbus boards are based on the Motorola, Inc. DSP56001 chip and are reported to operate at 13.5 million instructions per second.

The cards also feature up to 192K bytes of zero-wait-state memory and a digital signal processing port with a maximum synchronous transfer rate of 6.75M bit/sec., the vendor said.

The S-56 and the S-56X boards are priced at $2,495 and $2,995, respectively.

Ariel
433 River Road
Highland Park, N.J. 08904
(201) 249-2900



IDC WHITE PAPER

The Pick System Environment

EXECUTIVE SUMMARY

In this day of hostile takeovers and faceless corporations, it is refreshing to come upon a privately held company still based on the vision of its founder. Indeed, 25 years after he converted his dream to reality, Dick Pick remains the guiding light behind Pick Systems. A lot of promising companies have come and gone in that time, but Pick persists.

Not only does the company persist, but it prospers. Building upon its innovation of the early days, the Pick environment has expanded to embrace today's technology. No longer just an operating system, Pick has reached out to the information systems world by developing a relational database management system. This has made it a player in the UNIX and MS-DOS worlds.

Ease of access and use distinguish the Pick environment. The way various levels are presented lends itself to a logical understanding by users, allowing them to navigate through these levels without the aid of programmers. This ability to view data without concern for how the database management system software has to handle fields, records, files and strings makes Pick a powerful query and information retrieval model. Advanced Pick enhances ease of access and use by making it even easier for end users to browse through data.

Despite its innovative past and aggressive plans for the future, Pick is still competing in a hostile world. The Pick environment has a host of strengths to see it through. Its original design, the single vision of Dick Pick and its application base of over 3,000 products place it in a strong competitive position. However, Pick must contend with threats such as its limited marketing, hostile advances from larger database companies and the possibility, however remote, of an outside acquisition.

If the company parrys these threats, IDC believes it is poised to thrive in the '90s.

THE PICK SYSTEM ENVIRONMENT

AN IDC WHITE PAPER FOR INFORMATION SYSTEMS MANAGEMENT

THE HISTORY OF PICK

The Six Goals of Pick

KEY SUCCESSES IN THE PICK DESIGN

The Pick Data Model
The Correlative Concept
The Data Dictionary
The Pick File System

THE PICK FILE SYSTEM

The System Level
The Account Level
The Dictionary Level
The Data File Level

THE PICK ENVIRONMENT TODAY

Movement to Industry-Standard Operating Systems
Pick and MS-DOS
Adding DBMS and Applications to the Operating System Mix
Advanced Pick

PICK IN THE '90s

PICK WEAKNESSES

PICK OPPORTUNITIES

THREATS TO PICK

PICK STRENGTHS

SUMMARY

PICK

THERE ARE PRODUCTS THAT ARE CONSIDERED CLASSICS DUE TO AGELESS DESIGN AND CONTINUING FUNCTION. WORDSTAR, 1-2-3 AND THE VAX ARE AMONG THEM. WITH SUCH PRODUCTS, THE PASSAGE OF TIME ONLY SERVES TO REINFORCE THE CORRECTNESS OF THE EARLY VISION, THE UTILITY OF THE INITIAL DESIGN. THE PICK SYSTEM BELONGS ON THIS LOFTY LIST OF INFORMATION INDUSTRY CLASSICS. ■ ALTHOUGH IT HAS DEVELOPED INTO AN APPLICATIONS-BASED DATABASE MANAGEMENT SYSTEM (DBMS), PICK WAS THE FIRST OPEN OPERATING SYSTEM FOR GENERAL BUSINESS USAGE. IT TOOK A DIFFERENT TACK FROM ITS CONTEMPORARY COMPETITOR; UNIX. PICK WAS ORIGINALLY ORIENTED TOWARD BUSINESS APPLICATIONS WHEREAS UNIX WAS USED FOR SOFTWARE DEVELOPMENT. ■ IN ITS INITIAL IMPLEMENTATIONS, THE PICK ENVIRONMENT WAS DEVELOPED ON

minicomputer-level products for small–and medium-sized businesses. It was first implemented on Microdata systems, but moved to a large number of additional platforms in the late '70s.

The key to its design was the multi-user BASIC environment with its reporting capability and query access. These traits allowed the casual business user, who was not a computer professional but needed information, to run his business. This orientation toward the information content in the data files was a unique feature to Pick in its early days.

If you are talking about Pick Systems–the name of the company –you have to talk about Dick Pick himself. Although Dick Pick and Don Nelson were instrumental in the early design of the system, Dick Pick provided the single vision and driving force behind the Pick environment. His single-minded focus enabled Pick to weather many storms and changing trends in the industry.

Pick has endured because concepts thought of as leading edge in the '90s were implemented by Pick in the '70s. Features such as information access, global data dictionaries, end-user programming and application portability are not news to Pick users, who have enjoyed them for 20 years.

This IDC White Paper provides the reader with a clear statement of the genesis, current capabilities and outlook for the Pick environment. Although some that are short-sighted might dismiss Pick from their plans, the utility and function of this open computing environment demand more than cursory examination.

1965 Dick Pick and Don Nelson start work on GIRLS for TRW.

1969 Pick and Nelson deliver their software to the Army.

1972 Pick incorporates Richard Pick & Associates.

1973 First commercial introduction of Pick occurs on Microdata 1600.

1976 Dick Pick splits with Microdata.

1977 Ultimate Corp. becomes second licensee.

1981 Pick system implemented on IBM Series/1.

1984 Pick system released for IBM PC XT.

1985 Pick system released for IBM PC AT.

1988 One millionth Pick user, and implementation for IBM RT PC.

1989 Pick announces availability of Pick data base for UNIX.

1990 Pick ships Advanced Pick on AT&T UNIX, IBM AIX and SCO/UNIX platforms.

Pick's distinction as an industry classic dates back to its 1965 origins.

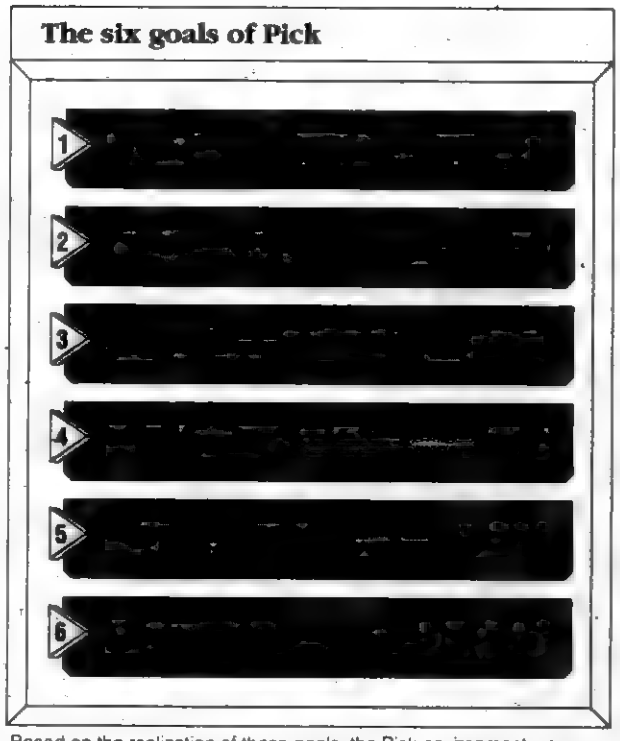
THE HISTORY OF PICK

The factors that influenced the development of the Pick system are not in the same mold as those that shaped

thousands of other engineering projects. As we shall see, the Pick System is an outgrowth of business requirements, not technology problems.

The precursor to this unique environment was described uniquely by the U.S. Army in 1965, as the "Generalized Information Retrieval Language and System," or GIRLS for short. The name was subsequently changed to "General Information Management." Used as an information retrieval tool, its first business application was tracking parts for the Army's Cheyenne helicopter project. At this point, its name was changed again to Integrated Technical Data System (ITDS).

After the completion of this project, Dick Pick continued to refine the concepts found in ITDS and explore the possibilities for its use in the commercial processing environment. As a result of this 1972 work, in 1973, the environment was ported to the Microdata 1600 processor with limited success, as the 1600 achieved only a 7% market share in the small computer market.



Based on the realization of these goals, the Pick environment was a forerunner of systems to follow it by 20 years.

The Six Goals of Pick

Given the successes with the Army, and the burgeoning market at the time for minicomputer products, Dick Pick founded Pick and Associates in 1972. The new company's immediate goal was to continue development on the Microdata 800 that was originally started on its predecessor, the Microdata 1600.

The new company had six primary goals:

- Provide a highly productive development environment
- Provide a highly productive end-user environment
- Reduce keystrokes for non-expert computer users
- Simplify the organization of the data
- Use minimal system resources
- Provide hardware portability.

Although IDC readily admits that advances in processor and system technology have enhanced the ability of vendors in general to deliver performance, it is the fulfillment of these underlying six points that makes for the timelessness of the Pick design and its appeal to users.

Between 1973 and 1977, when the Microdata systems were achieving their limited success in the market, Microdata had what amounted to a monopoly on Pick. However, in 1977 there was a falling out between the two, which became an opportunity for Pick to support other systems.

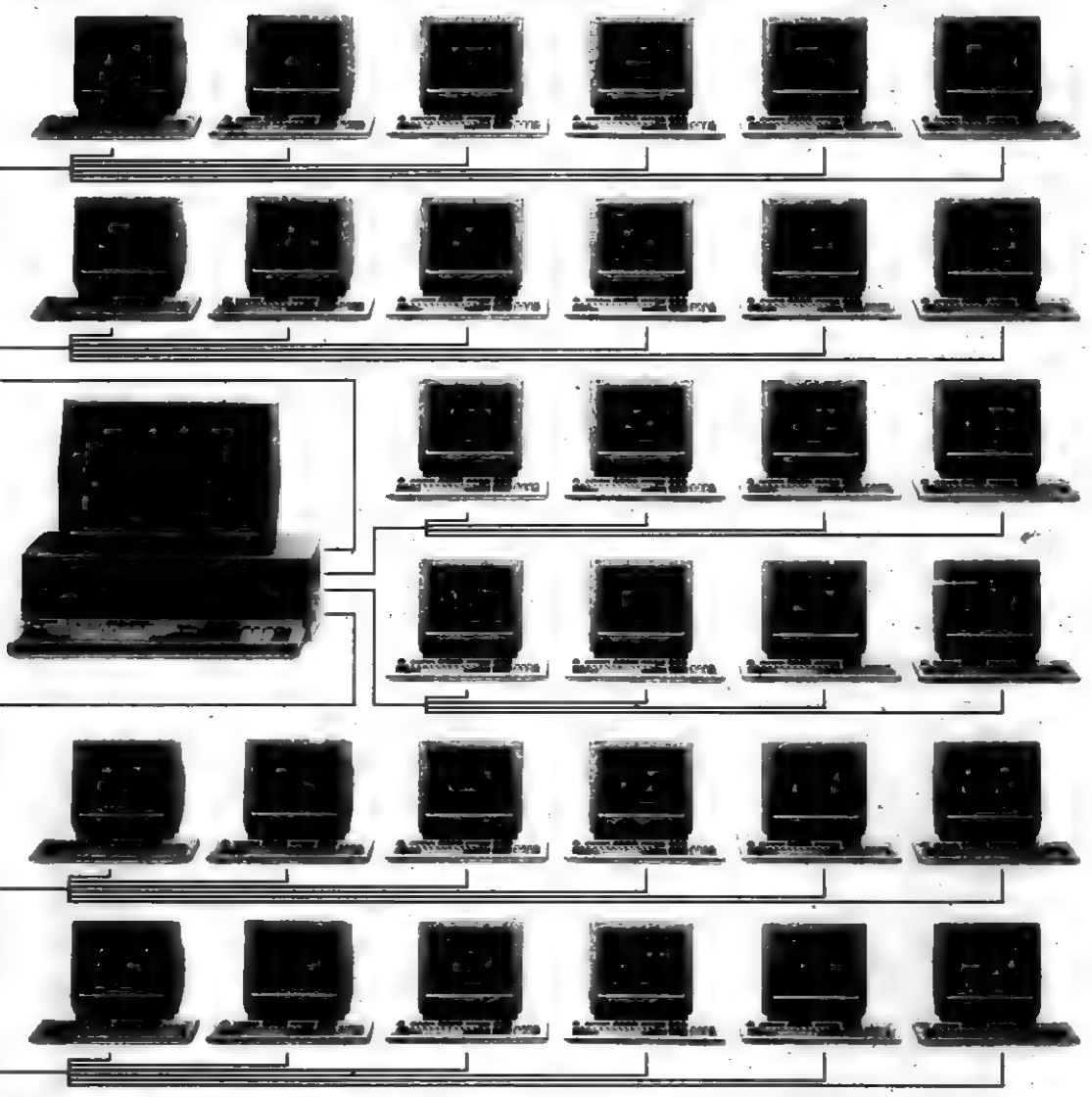
During 1978 and 1979, new licensees such as Intertechnique, Ultimate Corp. and ADDS paid fees reported to be over $1 million for their ports. However, the distinction of the first port went to the Honeywell Level 6 minicomputer, which achieved this milestone in the form of a product made by its licensee, Ultimate. Porting efforts really heated up in 1981 and 1982 when the IBM Series/1 and 43XX, and models from Pertec, SMI and Altos were all added to the base of Pick-capable systems.

Despite Pick's limited success at the time, clones were springing up. In 1977, a company called Devcom started developing a product that eventually became the Prime Computer, Inc. "Information" series. In 1982, the Pick-based Revelation system from Cosmos came to market for MS-DOS and the MS-DOS-oriented retail market. Finally, in 1985 VMark Software developed a Pick derivative to run under UNIX. All of these products had some incompatibilities with Pick, but all embodied the same heritage of usability, information access and efficiency.

Currently, sales of hardware using the Pick environment approaches $2 billion a year and there are three million users, all of whom are taking advantage of one of the most consistently useful environments for users with business problems.

KEY SUCCESSES IN THE PICK DESIGN

Calling Pick a classic in an industry where there are so few implies the company has realized some incredibly



How To Keep Your PC Working After Thirtysomething.

Try connecting more than 30 busy PC users on a LAN and you'll turn grey before your time. Even your thirtysomething operators will start sprouting a few grey hairs before they're able to get any real work done.

Put them on a Pick System and they'll be up and running in no time at all. As many as 33 users sharing a common database application and accomplishing multiple tasks with the trouble-free ease, power and speed only a true multiuser relational database system can deliver.

You don't even need PC's. A single PC/386 will drive 32 low-cost terminals (or PC's for that matter) just fine. With much faster speed and response time than other comparable multiuser database management systems. And Pick is specifically designed as a multiuser business applications system that is easy to use, update and modify as your business needs grow.

No matter how many users you need, the Pick System grows with you. The same Pick application can run on most major computer hardware ranging from PC's, to mid-range minicomputers, RISC-based systems and fault-tolerant mainframes.

There's no other relational database system more cost-effective and efficient for developing, maintaining and supporting multiuser applications. Call Pick Systems for the story the LAN people won't tell you until you turn grey before your time.

PICK® PC SYSTEMS

Pick Systems, 1691 Browning, Irvine, CA 92714 (714) 261-7425
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prescient design achievements. From IDC's perspective, the four most important of these are:

- The Pick data model
- The correlative database
- The data dictionary concept
- The Pick file system

Each of these building blocks is critical to the timeless viability of the Pick design. They enable Pick users to have capabilities today that the trade press "predicts" will be on the horizon tomorrow. They all underlie Pick's philosophy that the goal of the information system is to readily provide information. It is clear that the Pick environment was designed with that as its highest priority.

The Data Model

The Pick data model is one of the most elegant characteristics of the entire design. As is evident from the Pick data model chart, it is designed to avoid the issue of the single purpose "fields and values" that is common in so many other products. Within a Pick file there are items, values and attributes. The beauty of the system lies in the fact that values can be items, and attributes can also be files. This leads to a truly relational environment where the view of the information can be tilted to whatever axis of entry specific users may have.

In addition, the presentation of the information is done in a layered fashion allowing users to see levels of information. As can be seen from the Pick layering effect chart, in this environment, a query can start at one level and then proceed through the data to greater levels of specificity. As the chart shows, the presentation of the information lends itself to a logical understanding by users of the relationships as they navigate through the data. This is done based on their own logic, not a programmer's.

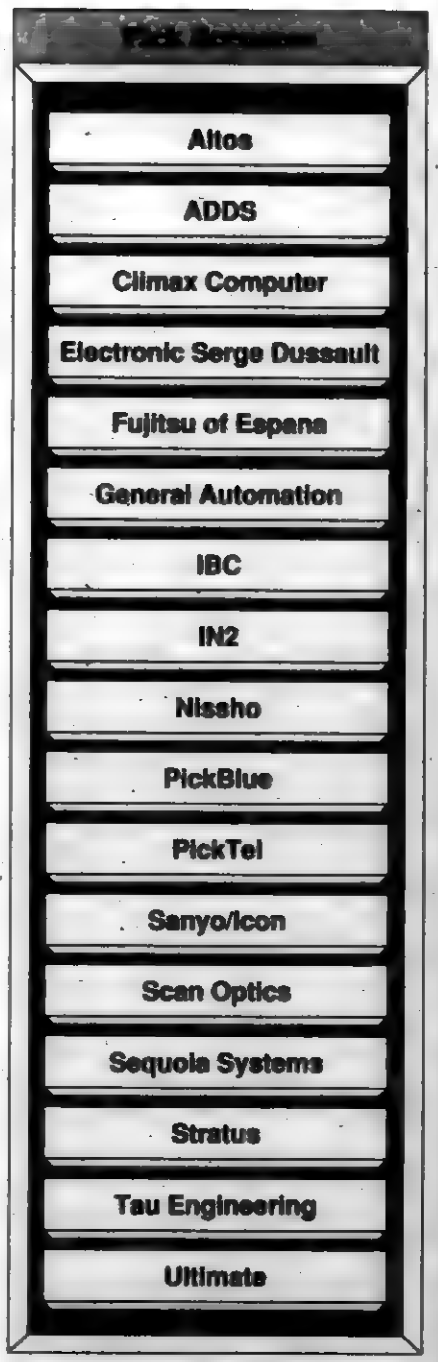
This ability to go up and down through the base of information without worrying about how the DBMS software has to handle fields, records, files and strings constitutes a powerful query and information retrieval model. This is the basis of the "correlative" concept. IDC has found that this concept's flexibility in letting users structure what they perceive to be elemental relationships is very beneficial and productive.

The Correlative Database

This second design aspect is best described by a term that is unique to the Pick environment, correlative. It describes a fundamentally different approach to applications and queries from that taken by relational systems, and has significant merit. The correlative is essentially a comprehensive way to report on information in the database without the need for understanding specific relationships and dependencies of data. This is accomplished via the rules and paradigms that are inherent in the master data dictionary of all Pick systems.

An additional difference between the relational and correlative query is the bidirectional capability that is found in the Pick correlatives. In the majority of competing databases the relationships and queries are typically handled in a unidirectional fashion. While it is possible to have two distinct pieces of data, fields or records relate in two directions, this is typically accomplished via a circular logic route, not a single path with two directions.

Pick's ability to do this transparently not only simplifies the process for users, it results in better efficiency. This capa-



What started out as a trickle with the first commercial port to Microdata in 1973 snowballed by the end of the decade. Now, Pick has established a working relationship with both AT&T and IBM through the formation of Pick subsidiaries, PickTel and PickBlue.

bility makes the correlative an extremely powerful vehicle for query and report generation.

As will be evident in the next section, the presence of the master dictionary and its rule set mitigates the "correct-query-syntax/incorrect-results" phenomenon that occurs in other environments.

The Data Dictionary

One of the vogue concepts among the information system cognoscenti is "global data dictionary". It describes an environment where all information contained within a given system is listed, along with necessary conditions, in a master data dictionary. Many large IBM users pursue the realization of this concept today as if it were the Holy Grail.

Here again is where the initial GIRLS specification, which provided the foundation of the data dictionary, proves its timelessness. In this dictionary, every file and attribute is recorded along with key relative information.

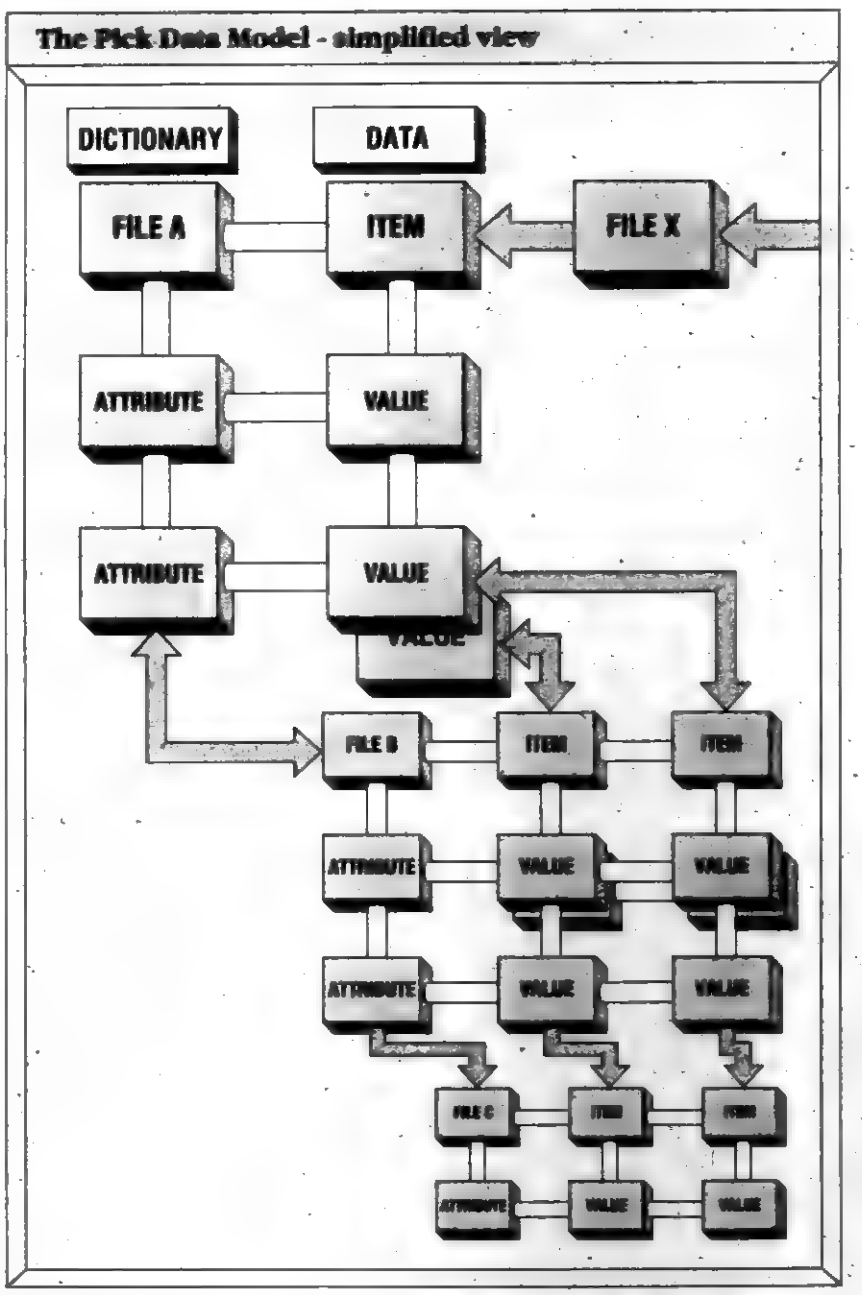
Invoked upon logon, the data dictionary allows Pick reports and queries to be organized simply. The availability and location of information is made comprehensible to users who are no longer required to become experts in data structures.

The ability to move beyond the issue of finding information and into using it is essential not only to Pick users. For instance, one of the key tenets of IBM's Systems Application Architecture strategy is the eventual development of a comprehensive data dictionary. It will be a triumph for IBM if it can replicate the ease of use achieved by Pick.

In the design of the Pick file system, the dictionary is the interface between the user and the data files. This relationship manifests itself in the processing speed and organization found in Pick application systems.

THE PICK FILE SYSTEM

The Pick DBMS is comprised of four key elements: The system level, the account level, the dictionary level and the data file level. A discussion of each follows.



The beauty of the Pick Data Model lies in its relational characteristics which provide users with a flexible view of data.

The System Level

The system level handles many of the system's administrative duties. Every time there is an end-user request, it is called to determine if the inquiry is valid in light of the privileges allowed to that account. The system level operates in conjunction with the next level, the account level.

The Account Level

The account level's main function is to record and provide to the system level the details about each valid user account. The information maintained includes file restrictions, allowed access methods, security information and the number or type of commands that are permitted by that particular user account. The centralization of these tasks and their inherent function within the overall system increase the ease of security and account/user control.

The Dictionary Level

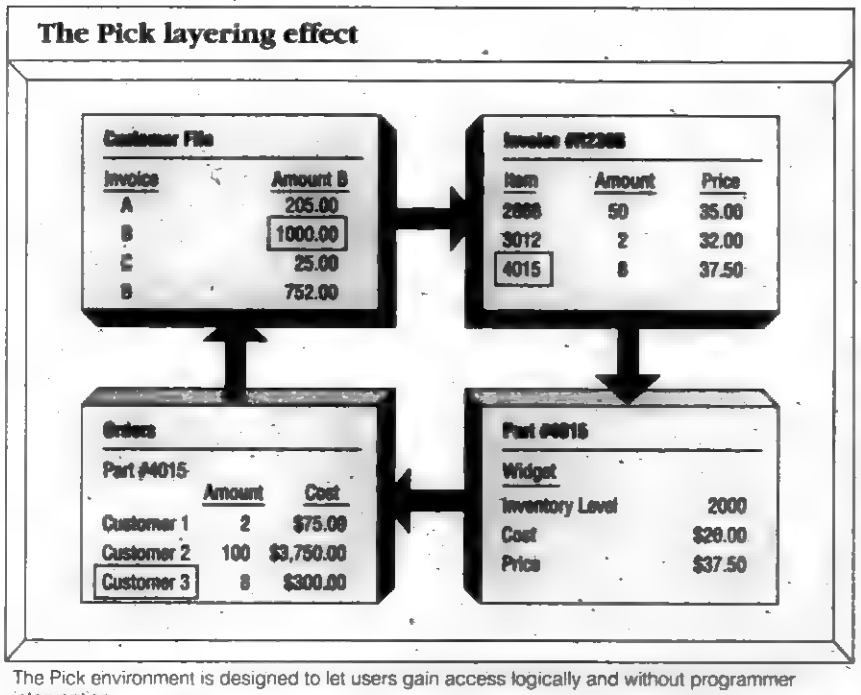
The dictionary level is described thoroughly in the preceding section. It is important to remember that this level is the actual point at which the user interfaces with the system.

The Data File Level

The data file level in the Pick environment is not notably different from many other DBMS systems in which files comprise the lowest level.

It is significant that within this four-part structure there is a dependent relationship between the four elements. This integration simplifies system use. There is, however, one caveat to consider. Pick does not presently allow for the substitution of third-party products to replace any of the four levels described here. This can be a problem for users who wish to use a PC front end or a different query tool.

The Pick layering effect



The Pick environment is designed to let users gain access logically and without programmer intervention.

THE PICK ENVIRONMENT TODAY

As would be expected from any 25-year-old product, there have been a number of changes to the initial Pick implementation. These key changes are:

- The movement to industry-standard operating systems, especially UNIX and MD-DOS
- Pick's movement away from being an operating system vendor to becoming a DBMS and applications supplier
- Advanced Pick and the introduction of system-wide automatic, ad hoc updating.

Movement to Industry-Standard Operating Systems

For years, the press and analysts chronicled the competition between Pick and UNIX as warfare. In that war, the goal was to conquer the minicomputer market. Pick was armed with its applications and commercial appeal, while UNIX fired back with its availability and the C language. Now the battles are largely over and the two combatants are realizing a peace dividend in the postwar years. Some Pick licensees will continue to use the entire Pick operating system and database, but it is no longer necessary.

This is because the Pick database and its applications are now portable to UNIX and other industry-standard operating systems. While UNIX integration is the primary thrust today, IDC believes MS-DOS and OS/2 will also be targeted.

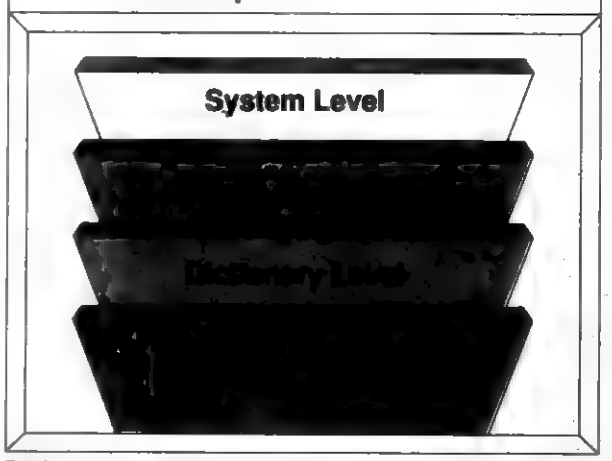
Implementing Pick on UNIX is a straightforward procedure. Seemlessly combined, they are two highly complementary products, with each having strengths that counter the other's weaknesses. Most notably, Pick has a strong application base and is easy to use, while UNIX has strong communi-

cation capabilities and development tools.

Pick's application base of over 3,000 products is composed of both vertical-industry and generic offerings, with vertical-industry comprising the vast majority. On the vertical-industry side, there are products such as ACT II, a mail-order house software product from Rigden, Inc., Cacos, a cargo control system from CRS Systems and Distributors INFO FLO, a wholesale distribution package from Interactive, Inc.

Generic products include CompuSheet+, a spreadsheet product from Via Systems, Inc., The Works, a word processing program from Jet Software, Inc. and Accu/PlotII, a graphics product from AccuSoft Enterprises.

The Pick File System



The Pick file system appears to be hierarchical, but the Pick dictionaries (data which describes data, or meta data) make it global.

Pick and MS-DOS

The benefits to MS-DOS can be be extensive for smaller companies or workgroups that want more function than they can get from today's rudimentary DOS software, but lack the financial resources to acquire that function.

The Pick DBMS combined with MS-DOS on PCs provides a migration path for many smaller firms or workgroups in larger companies that are at the difficult stage of outgrowing their current PC systems.

Adding DBMS and Applications to the Operating Systems Mix

The biggest misconception regarding Pick is that it is only an operating system. Even though this statement was valid in the past, it is no longer true as Pick moves into the '90s.

Just as it is a misconception to think of Pick as only an operating system, it is an underestimation to ignore Pick as the foundation for its 3,000-plus database applications that are built, debugged, tested and maintained.

Database technology is not new to Pick. The initial goal of the product design was to build the "Data Management System." However, the technology of the time required that an operating system component also be built in order to deliver a fully functioning system.

Times have changed dramatically. The effects of integrating Pick with industry-standard operating systems like UNIX, MS-DOS and OS/2 eliminate many objections to Pick as a database, and elevate the Pick environment to a more competitive position. Of course UNIX and MS-DOS have also benefited from their newfound Pick compatibility.

IDC believes that many new customers will be attracted to Pick's appealing database and application features. Large companies may spearhead this movement. One of their biggest challenges is providing server-level implementations of data sets for ad hoc query and reporting functions. While UNIX is clearly becoming more capable in that area, its coupling with a truly end-user-oriented tool such as the Pick DBMS will solve many application problems that would otherwise go unresolved.

Advanced Pick

The ongoing development of Pick has lead to a number of enhanced versions. Despite this evolution, however, the environment's first monumental change is embodied in Advanced Pick. This change can be divided into three areas:

- Improvements in the actual system
- Improvements for programmers and developers
- Improvements for end users.

The improvements in Advanced Pick at the system level include transaction logging, secondary indexing and B-Tree capabilities. The goal in these changes is to add features for some of the more demanding environments, as well as to improve Pick performance in on-line transaction processing applications.

Improvements for programmers come primarily in the form of tools to improve the efficiency of the development effort and to reduce program code size. The most important of these, in IDC's opinion, is the ability to update data across the critical master dictionary without programming. Another important advance is the inclusion of an input/output processor to eliminate the need to write long system function calls.

For end users, the benefits are most easily seen in the browsing of data:

Advanced Pick allows users to step or browse through data via whatever route strikes their fancy. In addition, font and proportional spacing support have been added, allowing Pick systems to incorporate some of the desktop processing features desirable to end users.

PICK IN THE '90S

Calling Pick an industry classic is eminently justifiable. But how long can it maintain this lofty status in an industry that thrives on change? IDC believes there will be an increasingly important role for Pick. Some database technologists may disagree, but the need for information access and usability by the more than 50 million regular computer users in the U.S. is a strong force.

In order to fairly consider how Pick Systems and the Pick environment might look five or six years from now, IDC believes that a "Weaknesses, Opportunities, Threats and Strengths Analysis" is in order.

PICK WEAKNESSES

The weaknesses of the Pick environment fall into two disparate categories: the inherent weaknesses of the system and the lack of publicity leading to misconceptions about the company. They are by no means fatal; in fact, the Pick environment could continue successfully and even grow in it's present state. Nonetheless, there are these problems to consider:

Lack of Fortune 1000 Impact

The Pick environment has been a success in the small-business segment of the market that, unfortunately, draws little attention. Despite the size, growth and utility of small-business solutions, they are generally ignored by many high-powered movers and shakers. Pick has to improve its image and impact in larger sites. One way to do this is by aligning itself with UNIX.

Lack of Communication Capabilities

The issue that was not foreseen in the initial design of Pick was communication. Pick is inherently a standalone system. The addition of UNIX partially mitigates this problem, but how Pick will integrate into a truly distributed DBMS environment is still a looming question. Again, its newfound affiliation with UNIX may help.

Limited Programming Tools

Despite the large amount of function provided in the Pick development environment today, there is still room for more. With the rest of the world moving toward C, Pick must add to its own Basic programming language offering. Also, there may be some issues at the graphic user interface (GUI) level. Pick does presently support GUI, but the inclusion of Native X or Windows/PM calls might be required in the future. The addition of Advanced Program-to-Program Capabilities would help.

Poor Performance in Floating Point

While it is certainly no secret that the Pick environment was designed to deal with textual or string-related business data processing, the pressure for expanded quantitative, computational facilities is being felt. IDC's user surveys have found that the performance issue is not going away. The pressure may get turned up even more by the

UNIX/Pick strengths and weaknesses

	Strengths	Weaknesses
Pick	Application base	Communications
	Ease of use	Programming tools
	Stability	Trained developers: numbers
	Single vision	Floating Point
	Data dictionary	Fortune 1000 penetration

	Strengths	Weaknesses
UNIX	Development tools	Ease of use
	Communications	Application base
	Technical/Floating Point	Version warfare
	GUIs	Multiple visions
	Horizontal applications	Vertical business applications

Once rivals; UNIX and Pick now complement each other, a development that bodes well for Pick's commercial fortunes.

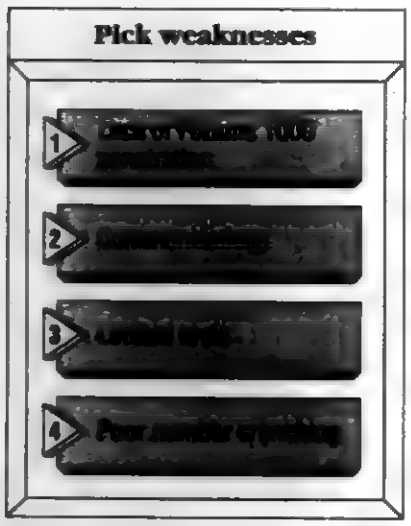
inclusion of more complex budget and numerical calculations as new business applications strain the present Pick system.

PICK OPPORTUNITIES

The movement to UNIX and the break with some of the historical emphasis on Pick being only an operating system have positioned Pick in a strong marketing position. While the firm is not cultivating "unplowed fields" untrodden by the competition, IDC believes there are still substantial opportunities. They include:

Small Business Upgrades

Although the small business segment of the market has its drawbacks, it also has its advantages. The trade press and analysts may think there is no market outside the Fortune 1000, but IDC has found that the small business market is comparable in size to its Fortune 1000 counterpart. IDC estimates that as many as 750,000 of these small establishments are outgrowing their standalone PC systems. Pick is very well positioned to make major sales gains in this segment.



While Pick's lack of visibility among Fortune 1000 companies is countered by a strong presence among smaller firms, its lack of communication capabilities makes it reliant on systems such as UNIX and MS-DOS.

The UNIX Business Database

Although there are a number of UNIX database products that are selling very well, all of them tend to be high-end products with limited application catalogs. The Pick system is a very different product from those of Oracle, Ingres, or Informix. For those customers who are more business- than technology-oriented, Pick is likely to have a strong appeal.

PickBlue and PickTel

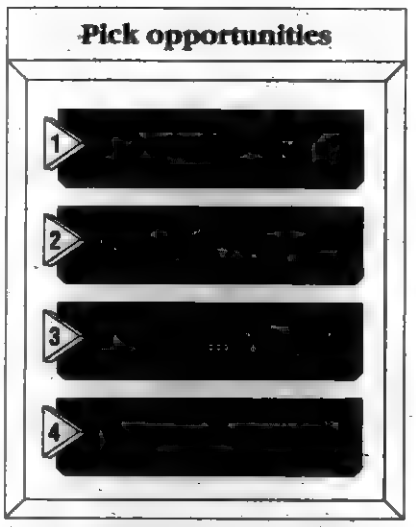
These two Pick subsidiaries are charged, respectively, with optimizing Pick's presence with IBM and AT&T. These alliances are structured in a manner to more effectively generate business than engineering exchanges. The IBM RS 6000 implementation, in particular, appears to give Pick a broad market, with little in the way of established competition.

Increasing Customer Attention to Information Access

The Pick environment clearly provides access to information contained in the database with minimal programming and maximum organization. Microsoft's big thrust, its "Information at your fingertips" concept, is similar. As actual applications that require user access to information grow, Pick has a large opportunity to play an important role.

THREATS TO PICK

As with any other player in the information industry, Pick is subject to menace from within and without. The threats it should be most immediately concerned with include:



Pick is betting its future on links to small businesses, UNIX, IBM, AT&T, and the need for user-friendly information access.

Limited Marketing

In an industry where making the loudest possible noise has become a key selling requirement, Pick clearly is not shouting. It does not help that the word "Pick" does not show up in many of the licensees' marketing materials. The decision by more aggressive companies to bury Pick under a ton of marketing fodder is clearly a concern. Pick must respond by aggressively promoting its existence and its quality. This means spending money.

Slow UNIX Acceptance

Pick's increasing reliance on the UNIX connection closely ties its fortunes to those of UNIX. If UNIX stumbles in its march toward universal acceptance, Pick will also feel the pain. IDC expects that Pick license sales will continue to grow based on Pick as a standalone entity, but the largest long-term growth will come if UNIX succeeds. What can Pick do to help ensure that success? Unfortunately, very little. However, it has

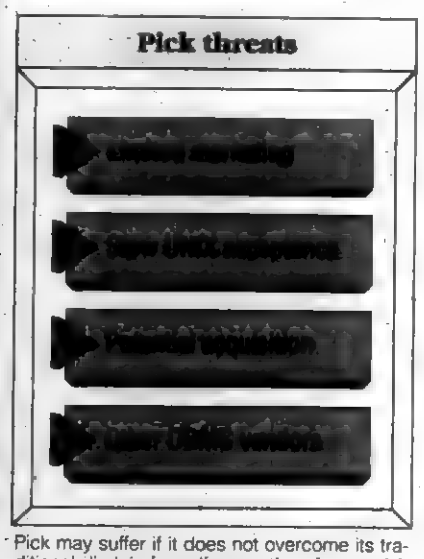
joined UNIX International and that can only help.

Acquisition of Pick

With revenues of around $25 million annually,the privately-held Pick is not attractive to would-be suitors based on its financial prospects. However, if the company were bought – and it is definitely not for sale – the delicate formula that has guided it since its inception could be irretrievably altered for the worse. Of course, a well-managed acquisition could also be a great benefit.

The Large Database Suppliers

Clearly companies such as Oracle, Microsoft, Sybase, Ashton-Tate and even IBM have not yet considered Pick a threat to their sales or market share. If there were a change of mind and some of these powerful DBMS vendors attacked Pick in the marketplace, Pick could have serious problems—problems it has never before faced. It would be in a stronger position to ward off the behemoths if it increases its revenues.



Pick may suffer if it does not overcome its traditional disdain for self promotion. An acquisition could also change the company for the worse, as could increased competition from the large DBMS vendors.

PICK STRENGTHS

There are many things that are right with Pick, or the environment would not have grown and prospered for so long. These strengths are the key to continued future growth:

The Pick Design

The fundamental design, specified 25 years ago, is as appropriate today as it was in 1965. The concepts of information access and data dictionaries are the building blocks that other systems are just now trying to add.

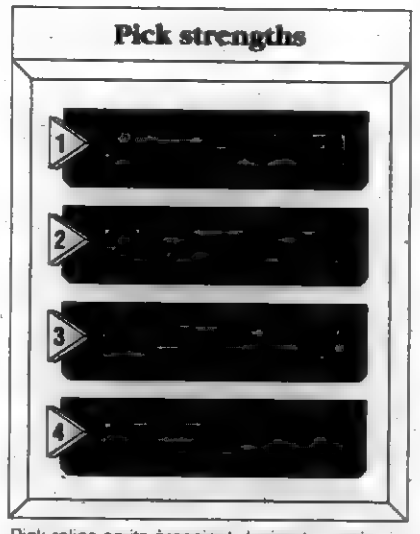
Single Vision

Time after time, IDC has seen that the most effective, efficient and timely designs are controlled and managed by either a single individual or a very small group. In the Pick case, it is accurate to say Advanced Pick represents 25 years of vision by Dick Pick. Because of his stewardship, the company maintains a clear goal and a definite direction. All these pieces add up to a competitive advantage.

System Efficiency

Somehow, the incredible efficiency of the Pick environment seems to be ignored. With OS/2 requiring 4M bytes of memory per user, Windows needing 2M bytes and Apple's Multifinder also consuming 2M bytes, it is amazing to see this elegant multi-user system supporting 65 on-line users with only 16M bytes. For smaller environments, Pick can run up to 10 users on a 640K byte, 286-based machine.

While little is made of the fact that Pick will run under configurations not seen since the late '70s, IDC believes customers who prefer to buy less hardware will be attracted to the Pick solution.



Pick relies on its prescient design to survive in today's competitive information industry environment.

Application Base

Even though many of the Pick applications are vertically oriented for smaller firms, there are others that are universally useful. It is important to realize most of these applications have been around long enough to be fully tested and debugged. IDC believes this is the kind of mature technology that users feel most comfortable with.

SUMMARY

In summary, the Pick environment is one of a handful of products that can be considered a classic in its design. Due to its many strengths, it is better positioned today than ever before. It is especially well positioned to take advantage of UNIX and other non-proprietary systems.

The fact that Pick is end-user oriented, and is designed to solve information needs outside the realm of programmers is its strongest edge. As the industry has become computer-rich and information-poor, the need for the Pick environment has grown exponentially.

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COMMENTARY

Norman Weizer

Waiting time for wireless

These days, it seems that every time we turn around, we hear or read something about a new wireless data communications technology that will revolutionize the world. Inside of a building, outside of a building, these new technologies are growing like crazy. It's easy to feel like we're missing a good bet if we don't jump right onto the bandwagon and get some form of wireless technology installed in our data networks.

But are we really missing a bet? What does this technology really bring to the party that good old copper wire, or good new optical fiber, doesn't provide? Let's sit back and take a hard look at some of these new technologies.

We have had wireless data communications systems for many years. Paging networks, two-way radio networks and special mobile radio networks are familiar (even too familiar) to many of us. These networks have been used for alerting, dispatching and status monitoring applications.

The networks are good for these applications but generally too costly and too slow to be practical for casual use by portable workstation users who need to pass significant amounts of information between their workstation and home base.

Continued on page 75

Options cloud cabling picture

ANALYSIS

BY JOANIE M. WEXLER
CW STAFF

In the "old" days of local-area networking, corporate cabling decisions were pretty straightforward. If you ran Ethernet, you installed coaxial cable. If you ran token-ring, you installed shielded twisted-pair. That is what the standards dictated.

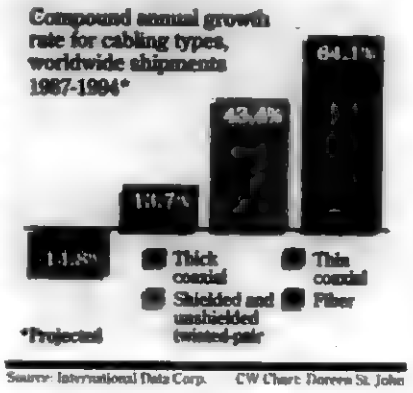
But now that savvy engineers have figured out how to make LANs operate reliably over a variety of media, vendor companies have presented users with a double-edged sword: a broader array of networking choices accompanied by the onus of new decision-making dilemmas.

"Many of our big clients are coming to us confused about whether they should pull fiber, twisted-pair or coax," remarked Todd Dagres, director of communications at The Yankee Group, a research and consulting firm in Boston. "It's an important decision, because when you consider per-user computing costs, cabling is right up there. And you can easily make a choice that is good for the short term but cramps your style later."

Cabling alternatives are running amok. Late last month, the 10Base-T standard that allows 10M bit/sec. Ethernet LANs to operate over unshielded twisted-pair was formally ratified. 10Base-T is unseating new installations of both thin coaxial cable and the more cumbersome thick coaxial cable — other standard media for Ethernet — as a cost-effective option (see chart).

Oh, what a tangled web . . .

The use of fiber-optic cabling is expected to show strong growth, while the demand for thick coaxial goes into the red



Source: International Data Corp. CW Chart: Doreen St. John

In the token-ring arena, it was only a year ago that Proteon, Inc. introduced a technology for running 16M bit/sec. LANs over unshielded twisted-pair wiring — a feat token-ring pioneer IBM insisted could not be done because of reliability problems with the medium.

FDDI lightning

Today, not only are there 16M bit/sec. token-rings cruising along over telephone wire, but there are also efforts under way for running the comparatively lightning-fast 100M bit/sec. speeds of Fiber Distributed Data Interface (FDDI) — which specifies glass fiber-optic cable — over the medium, as well as for running the high data rates over plastic fiber. Plastic fiber is a less expensive alternative to glass but poses some distance limitations and can lose transmitting power as it ages.

The controversial 100M bit/sec. media proposals will be presented this week at the American National Standards Institute FDDI committee meeting in Fort Lauderdale, Fla. Some industry pundits argue that FDDI alternatives can bring better performance to users less expensively. Others counter that there are too many trade-offs in using the substitute media and that implementing even more standards will fractionalize FDDI volume and keep prices elevated.

One user interested in high speeds over copper is Ray Parcell, computer systems specialist at the Naval Mine Warfare Engineering Activity in Yorktown,

Continued on page 78

Pitney-Bowes scores $30M pact with Ardis

BY MICHAEL FITZGERALD
CW STAFF

Pitney-Bowes, Inc. has agreed to a $30 million, five-year contract with Ardis, the IBM-Motorola, Inc. radio network joint venture.

Under the terms of the deal, Pitney-Bowes will outfit its field engineers with Ardis machines. Ardis will provide equipment, systems integration and communications software. The contract was approved by Pitney-Bowes' board of directors but has not been signed because the two companies are working out the final details, according to a source close to the negotiations.

The contract, which is a "fait accompli," according to Alan Reiter, executive editor of the "Mobile Data Report" in Washington, D.C., will be the largest confirmed contract Ardis has achieved other than its role as provider of systems to IBM.

United Parcel Service is the only other confirmed client of the joint venture, although several companies are developing or testing the Ardis system. In May, UPS signed an agreement to use Ardis technology, but UPS views Ardis as an interim solution while it develops its own 220-MHz network based on proprietary customized machines.

Pitney-Bowes systems officials did not return calls regarding the project, but there will be a representative speaking on Ardis technology at the Wireless Computing Conference on Oct. 28. Ardis officials had no comment on the deal.

Joseph Baylock, an analyst at Gartner Group, Inc. in Stamford, Conn., said the Pitney-Bowes contract would help validate the Ardis concept of radio-controlled communications technology.

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MACRO INTERFACE TO REXX

SPF/2 includes 75 ISREDIT commands that interface with IBM's REXX. You may use these to write your own commands in REXX and, if you wish, assign them to the 48 programmable function keys.

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SPF/2 is compatible with OS/2 Standard and Extended Editions, Versions 1.2 or later. However, Standard Edition users will not have access to macro capabilities due to the unavailability of REXX in that environment.

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SPF/2 processes keystrokes in the same manner as the OS/2 Extended Edition 3270 Emulator, including NEW-LINE, ENTER and status display indicators.

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Netware users fight printer problems

BY JIM NASH
CW STAFF

For some information systems managers, Novell, Inc.'s print service has offered only three options: go slow, disappear and crash.

Several users of Novell's print service software who gathered at last month's Networld '90 show griped about a variety of problems with the print applications. The leader of a large Novell users group said he knows of "three or four" IS departments waiting for Novell to solve a number of print server problems.

The print server software sells as a Netware-loadable module (NLM) on a file server, as a Netware 286 value-added process application and as an executable application to create a dedicated DOS print server.

John Riffle, technical service representative for Martin Marietta's Information Systems Division in Orlando, Fla., said the NLM print service has proved unreliable in tandem with remote Digital Equipment Corp. postscript serial printers.

Riffle is one of several users complaining that the network print software has not been thoroughly tested. He said Martin Marietta's printing trouble began last February when he upgraded some Netware 386 packages from Version 3.0 to Version 3.1, which contained Version 1.0 of the NLM print services.

"We tried to bring up 16 postscript serial printers attached to different personal computers using Novell's remote print Netware-loadable module [Version 1.0], but the printers were getting knocked completely off-line."

Although he has yet to determine if it is related, Riffle said there have also been instances when rebooting a local PC attached to a printer has caused the file server to crash.

Martin Marietta technician Jim Pelletier said printing jobs queued on a local printer are sometimes deleted when another job is sent from the local PC.

"There are at least two other sites at Martin Marietta" having similar headaches, Riffle said. Users report no problems if printers are hung off a file server or if parallel Hewlett-Packard Co. printers are substituted for the serial printers, he said.

Other users had almost the opposite experience. Users at Lockheed Corp. subsidiary Lockheed Sanders, Inc. in Nashua, N.H., reported that the print service on Version 3.0 was "pretty unstable," according to Lockheed Sanders networking strategist Glenn Fund. Fund said the print service periodically would run very slowly or lock up file servers. His answer was to upgrade, and he said the network has yet to lock up since installing Netware Version 3.1.

Riffle's first attempted solution to the printing problems was a full retreat. He said he tried to downgrade to Version 3.0 but found that Version 3.1 overwrites the previous operating system, stranding him at Version 3.1. The predicament was partially solved only when he ran Novell's print service as an executable program on a dedicated print server.

A Novell spokesman acknowledged "some problems" with Version 1.0 of the NLM print service occurring a year ago but attributed them to configuration mistakes by users. The Provo, Utah-based company also acknowledged errors with its Pserver value-added process application, which caused system crashes in Netware Version 2.15C. Novell has recommended that users reconfigure the value-added process as an executable file.

Version 1.2 of the print service, which is currently available, addresses NLM problems, according to the spokesman. Pelletier said he disagrees. He said he talked with Novell technicians and was told that they had never tested NLM print services with DEC's LN03 postscript serial printer.

"We were told by Novell engineers that the printer problem is one of their top 10 problems to solve," he said.

NEW DEALS

GEIS inks banking pact

General Electric Information Services said that Chemical Bank in New York has purchased its BPS*Central System, a mainframe software system that reportedly will allow the bank to process electronic payments for clients who are implementing electronic data interchange with their trading partners.

GTE Spacenet Corp. has inked a $5.7 million contract with Silo, Inc., a consumer electronics retailer, for a nationwide data communications network consisting of very small-aperture terminals installed at Silo's 215 stores. The vendor will also reportedly provide operations and maintenance support.

Technology for

Now, bankers, nuclear physicists, athletes, students and scores more can walk right into a virtual shopping mall of information. How? The answer is an exciting new on-line gateway service called NYNEX INFO-LOOK,* developed by our Science & Technology Center.

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Weizer

CONTINUED FROM PAGE 73

However, a new breed of networks target the above type of communication, including the IBM-Motorola Ardis and the Mobitex network from RAM Mobile Data, Inc.

In addition, cellular telephone networks are increasingly carrying facsimile and data communications. Motorola is even proposing a new data network that will be supported by a fleet of satellites for around-the-world coverage.

Companies are already bringing out such devices as battery-powered fax models, which can operate in an automobile, and battery-powered mobile modems that are designed to work with cellular networks.

The cellular networks bring flexibility in the connection of portable PCs and fax machines to corporate computing resources. A cellular phone system allows you to drive your car and communicate using your PC and your fax machine at the same time.

The new data networks such as Ardis and the Mobitex network promise reliable data communications even when the terminal is in a relatively well-shielded building.

They also feature a nationwide computer communications network that allows them to deliver information to a terminal in just about any major population center in the U.S.

All of this sounds great. The vendors are predicting markets for this type of mobile data system in the range of $1 billion to $2 billion dollars per year during the next three to five years. Almost daily, equipment suppliers are bringing out new mobile faxes and special modems that can operate over mobile networks.

But is there a fly in this mobile ointment? Actually, there are two flies. They are called the speed (bandwidth) fly and the standards fly, and they sometimes cooperate to muck up the works.

Mobile telephone and radio communications are more difficult than plain old telephone service communications, in which a signal doesn't fade like a mobile signal can. Telephone systems don't have to handle instantaneous handoff of signals from one transmitter to another like a mobile system does. Mobile systems also have their own methods of multiplexing and compressing signals.

What does that mean to you? First you can't just take my old modem, tie it to a battery and expect to use it in a mobile application. It takes a special modem using a special protocol. Plus, you need another identical modem at the fixed end of the wire to undo what the special mobile modem did.

Now standards get into the act. No one has developed a standard for this special protocol. Therefore, all of the interested modem manufacturers are going their own way, and nobody understands anybody else.

And, just to make life interesting, the cellular network operators are in the process of switching from analog to digital networks to fit more users into the system. For reasons that are too esoteric to go into here, the new digital networks will be less adapted to data communications than the current analog networks are.

The new digital communications networks like Ardis and Mobitex don't run into the standards problem; they control their own standards.

However, they run into speed problems. Our communications experts say that the maximum effective throughput on these networks is only about 600 bit/sec. once error correction and overhead bits have been taken care of. That's only one quarter of what your 2,400 bit/sec. modem can provide and one-sixteenth of what your fax can do when it's going full tilt.

So what do you do? I suggest that unless you have some real business needs, which you can justify on a hard-dollar payback basis, sit on the sidelines and watch the fun for a while. The problems will be ironed out eventually. In the meantime, the donnybrook will be fun to watch.

Weizer is a senior consultant at Arthur D. Little, Inc. in Cambridge, Mass.

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GLOBAL BITS

Networking East Germany

General Electric Information Services (GEIS) has installed a network node in East Berlin and plans to install network nodes in three other cities in Eastern Germany before the end of 1990. The nodes will allow users to gain access to GEIS' value-added network services, such as eletronic mail and electronic data interchange, via a local telephone call.

Newbridge Networks, Inc. has completed the installation of an international network for **Towers, Perrin, Forster & Crosby, Inc.** The network supports communications among the New York-based international consulting firm's remote branches and from overseas sites to the corporate data center in Philadelphia.

Sprint International has signed an agreement with **CPRM**, the international telecommunications operating entity in Portugal, to explore joint provision of services between Portugal, North and South America and Africa. The two firms will also discuss installing a trans-Atlantic fiber-optic submarine cable.

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T h e U s u a l L i m i t s D o n ' t A p p l y.™

CW10/A

E-mail spurs new privacy debate

BY JIM NASH
CW STAFF

Information systems managers have found themselves in the middle of a renewed debate: Do employees have any right to privacy at their desks?

Increasingly, network administrators must help corporations ride the fence between legitimate employee oversight and intimidating scrutiny. Whereas in the past, companies argued desk and telephone privacy rights, the new focus is on electronic mail.

"It's ludicrous to separate E-mail [privacy] from the desk and the file cabinets," said Mike Cavanagh, executive director of the Electronic Mail Association in Arlington, Va. It is the same issue, Cavanagh said, just updated.

In the glare of a class-action lawsuit filed this summer against Epson America, Inc. alleging wholesale interception of employees' E-mail, companies are taking a new look at privacy. Resulting draft policies highlight ambivalent feelings about workplace privacy.

The Epson case illustrates how differently management and labor view privacy. Alana Shoars, former E-mail coordinator at the Torrance, Calif.-based company, has alleged that her supervisor was printing reams of E-mail without employees' knowledge. Shoars has charged that she was fired Jan. 25 for questioning the appropriateness of E-mail taps. She is part of the class-action suit.

A spokesman for Epson has said that the firm dismissed Shoars for "gross misconduct and insubordination" [CW, Aug. 13]. Epson denied wide-scale interception but later stated that it "could not guarantee the privacy of documents and messages" stored anywhere in the company.

That statement puts Epson among the majority of companies, according to Cavanagh, that have formally stated that privacy rights take a back seat to the corporate duty to run a successful business.

Ken Rogers

Shoars *challenged Epson's privacy policy*

Pacific Bell in San Francisco has a similar privacy policy, defining E-mail as "the property of the company and to be used for business use only, unless prior permission is given from a supervisor."

Warner Brothers, the film and video division of Time Warner, Inc., has taken a stronger privacy stance. The Burbank, Calif.-based company hired Shoars as E-mail coordinator in August, about seven months after Epson fired her.

Bill Cotter, director of international data processing and domestic office systems at Warner, said Shoars' name came up in a discussion about E-mail privacy among IS managers. Cotter said he interviewed her and found "that she had the interconnectivity and E-mail experience that is absolutely necessary for this job." Also, he explained, her privacy philosophy matched Warner's.

Two months later, he said, he is impressed with her work in implementing Warner's strict E-mail policy: "If it's not addressed to you, it's not yours."

No random checks

Employees are told not to conduct personal business on company time or equipment, but no random checks by IS — for compliance or systems maintenance — are allowed, Cotter said: "If you don't have people's confidence, what's the purpose of having an IS department?" He added that employees need to feel their system is free of excessive scrutiny before using it fully.

Epson and Warner "are at the extremes of a bell-shaped curve," said Walter Ulrich, an analyst who follows E-mail issues for consulting firm Arthur D. Little, Inc. "Most companies' [privacy] policies are de facto, not written, but most executives won't go on routine electronic fishing expeditions," he said.

Steve York, a member of the Aerospace Industry Association's E-mail committee, said the matter has made for hot debates lately. York is also manager of information exchange technologies for Hughes Aircraft Co.

He said Hughes is in the process of writing a privacy policy, one built at least partly on the committee's findings. York said that reading portions of some messages is unavoidable with Hughes' 25,000-employee, multivendor environment. However, aside from troubleshooting, he said, messages are confidential.

Stanford explores 45M bit/sec. net standard

ON SITE

BY ELISABETH HORWITT
CW STAFF

PALO ALTO, Calif. — While most users are letting the networking industry decide which high-speed networking protocols will be widely used this decade, Stanford University has already begun evaluating Switched Multimegabit Data Service (SMDS) as a possible way for its researchers, academics and scientists to collaborate over distance at 45M bit/sec.

Stanford began installing SMDS nodes on campus last summer. Last week, it participated with Pacific Bell in an SMDS demonstration at Interop '90 in San Jose, Calif. Also, on Nov. 15, the university and Pacific Bell will initiate a six-month commercial trial of an SMDS network that will handle such bandwidth-hungry applications as transfer of medical images and earth resources mapping.

If the California Public Utilities Commission approves, the trial will extend beyond Stanford to "the outside world," including the U.S. Geological Survey and a hospital, said Frank Liu, a technical staff member at Pacific Bell.

In addition, Stanford plans to communicate over SMDS links with other members of the Bay Area Regional Research Network (Barrnet).

Stanford's Yundt *sees need for 45M bit/sec.*

"We are in the learning stage at this juncture," said William Yundt, the university's director of network and communications systems.

"We have a reasonable understanding of the pros," such as being able to share high-speed line costs with other users, he said. "We see a need for those speeds in the near term."

In an SMDS network, a central office is the hub of a multisite, and often multiorganization, network. As with a packet-switched network, customer premises equipment packetizes data and equips each packet with an address so that the carrier can route it to the right destination. Unlike packet switching, however, SMDS networks can handle up to 45M bit/sec. and share the same carrier fiber-optic lines and equipment as voice and other types of transmissions, Liu said.

An SMDS network allows multiple customers to share the cost of high-speed connections and pay according to use.

For 1.5M bit/sec. T1 connections, customers can use ordinary copper wiring to the closest carrier site; however, a fiber link will be needed to customer premises that want the higher 45M bit/sec. T3 speeds.

High-speed users

SMDS networks target users who need to communicate in intense, high-speed bursts with a large number of geographically distributed sites. Sites that communicate regularly over high-speed lines can use the traditional point-to-point T1 or T3 connection, Yundt pointed out.

Doctors who want to access records and images, such as CAT scans, from a number of local hospitals would be one type of user that could benefit from SMDS, Liu said.

The technology also puts control of the network in the carrier's hands, which is an advantage to organizations that do not want to own and manage their own networks, Liu said.

In the initial stage of the pilot, which begins next month, Stanford researchers will access multimegabit medical images from computers at the university's medical center, Yundt said. Because it is hard to ensure that files that large arrive intact across a shared, switched network, the university is evaluating the SMDS capability of "segregating" bandwidth on the network, Yundt said. This would potentially guarantee reliable delivery over a path that is separate from the rest of the "shared network," he added.

While the initial pilot will use 1.5M bit/sec. SMDS links, Stanford is more interested in the 45M bit/sec. version, which will be pilot-tested by the university beginning next year, Yundt said. "We already have an extensive network of T1 links," he explained.

Pacific Bell and other regional carriers hope to introduce SMDS in late 1991 to 1992, Liu said.

SMDS was initially conceived as a metropolitan-area networking protocol, but the local carriers now hope to extend its reach nationwide with the help of long-distance carriers, Liu said.

Cabling

FROM PAGE 73

Va. "High-speed twisted-pair is coming into our future because I'm buying 18 workstations," he said. "The only way I have to get at them is to run an extension to my backbone [thick coaxial] or use my existing twisted-pair."

Adding to the tangle of cabling choices are emerging advances in wireless LAN technology, such as NCR Corp.'s announcement last month of a $1,390 wireless LAN interface card for Novell, Inc. Netware networks.

The pot of cabling spaghetti can be boiled down, at least to one general rule of thumb, according to cabling analysts: When in doubt, install fiber in the backbone and twisted-pair to the desktop. Fiber has bandwidth potential into the gigabytes as well as complete immunity to electromagnetic interference, making it the most reliable medium available. Unshielded twisted-pair is already installed to most desktops.

Tom Nolle, president of CIMI Corp., a consulting firm in Voorhees, N.J., pointed out that "coax and fiber can't run through existing telephone channels. My personal feeling is that you run unshielded twisted-pair wherever you have individual workstations operating at 16M bit/sec. speeds or under. Wherever you're not running that, you run fiber."

"We're using fiber in our backbone, but not to our workstations yet," said Jack Sprague, consulting systems analyst at Frito-Lay, Inc. (see related story next page). Frito-Lay is running IBM's Type 2 cabling — which contains a pair of shielded twisted-pair and a pair of unshielded twisted-pair — to its individual desktop computers.

Smith, Kline, Beecham Consumer Brands in Pittsburgh invested $500,000 in IBM Type 2 cabling four years ago "when the fiber option was not yet available," said Richard Podgurski, director of information services. "We've considered fiber, but the investment in IBM's cabling scheme is already there."

Nolle commented, "Any company pulling cable today that doesn't anticipate a need for fiber in the future is making a mistake that it will pay dearly for someday."

NEW PRODUCTS

The following is a summary of some of the products announced at the Telecommunications Association convention in San Diego last month:

British Telecom, Inc.'s Videocodec VC 2100 coder/decoder provides enhanced picture quality at transmission speeds of 56K, 1.544M or 2.048M bit/sec. The product complies with the CCITT H.261 international standard for videoconferencing, the vendor said. It is available for $44,500.

British Telecom
2560 N. First St.
San Jose, Calif. 95161
(408) 922-0250

Bytex Corp. introduced a product designed to provide network managers with an additional safeguard against localized physical disasters.

The Disaster Protection Switching System enables network managers to transfer control of distributed access units from a disabled primary network switch to a backup switch at a disaster recovery site.

The product is priced between $16,000 and $20,000 for a 1,000-port configuration.

Bytex
120 Turnpike Road
Southboro, Mass. 01772
(508) 480-0840

Infotron Systems Corp.'s Streamline 2510, a multiprotocol X.25 packet assembler/disassembler, line concentrator and X.25 Level 2 switch, includes 32 full-duplex synchronous and asynchronous ports that can be configured independently for any allowable protocol. It can also operate simultaneously with other protocols, the vendor said.

A four-port version costs $5,000, according to the company.

Infotron
Cherry Hill Industrial Center
Cherry Hill, N.J. 08003
(800) 926-9600

Micom Communications Corp.'s Marathon series of data, voice and network servers were designed to integrate data, voice, facsimile or local-area network traffic over low-speed leased lines, the vendor said.

A 5K bit/sec. model combines four different technologies — data compression, speech compression, fax demodulation and fast-packet multiplexing — to reduce the amount of bandwidth that is necessary for data, voice or fax transmissions that run over leased lines, according to the vendor.

Pricing for a 5K bit/sec. model equipped with six ports begins at less than $3,000.

Micom Communications
4100 Los Angeles Ave.
Simi Valley, Calif. 93063
(805) 583-8600

Rad Data Communications, Inc.'s Trimlink-800 can multiplex eight synchronous input channels at rates of 19.2K bit/sec. onto two mutually redundant, 19.2K bit/sec. composite links.

The eight-channel synchronous data compressor includes dual-aggregate links that support the V.32 standard and feature a compression ratio of greater than 4-to-1. A two-link unit is priced at $7,000.

The company also unveiled two CSU/DSUs designed for use with fractional T1 services: the FCD-1M ($1,500) and FCD-1X ($2,000).

Both models enable a synchronous data channel to be connected over a public T1 network without requiring a T1 multiplexer. While connected to T1 networks, the users have to pay only for the amount of bandwidth required, according to the vendor.

Rad Data Communications
151 W. Passaic St.
Rochelle Park, N.J. 07662
(201) 587-8822

Hub help

The intelligent wiring center concept will ease Frito-Lay, Inc.'s expansion from seven to 47 sites next year, said Jack Sprague, consulting systems analyst. Proliferating advances in intelligent wiring center technology will play an important role in the transition, he said.

Intelligent wiring centers — or smart hubs — allow users to connect nodes on a local-area network or interconnect LANs running over different media in a star configuration, which makes network management simpler. Recent developments in hub technology include terminal server support in Racal Interlan's INX5000, FDDI support in Cabletron Systems, Inc.'s Multi Media Access Center, 16M bit/sec. fiber support in Proteon's Series 70 and Synoptics Communications, Inc.'s integration of an Ethernet router into its Lattisnet hub.

In addition, Synernetics, Inc. introduced the Lanplex 5000, which operates many Ethernet LAN segments in parallel and multiplexes them onto an FDDI backbone.

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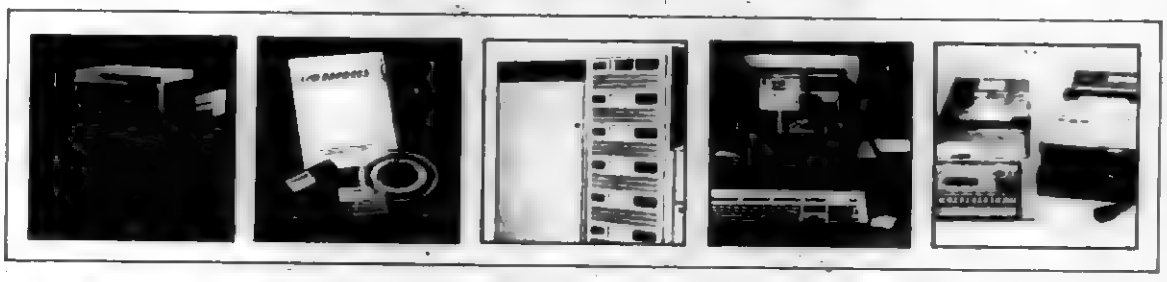

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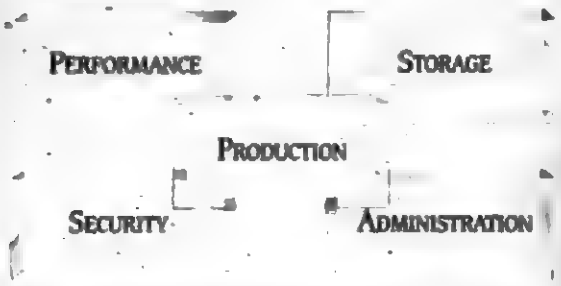

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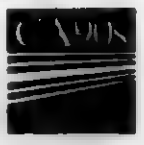

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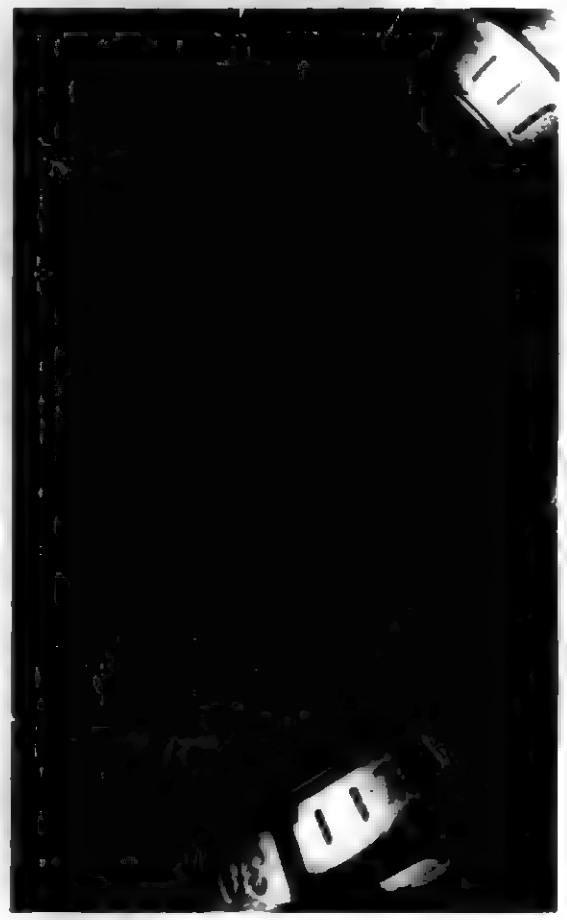

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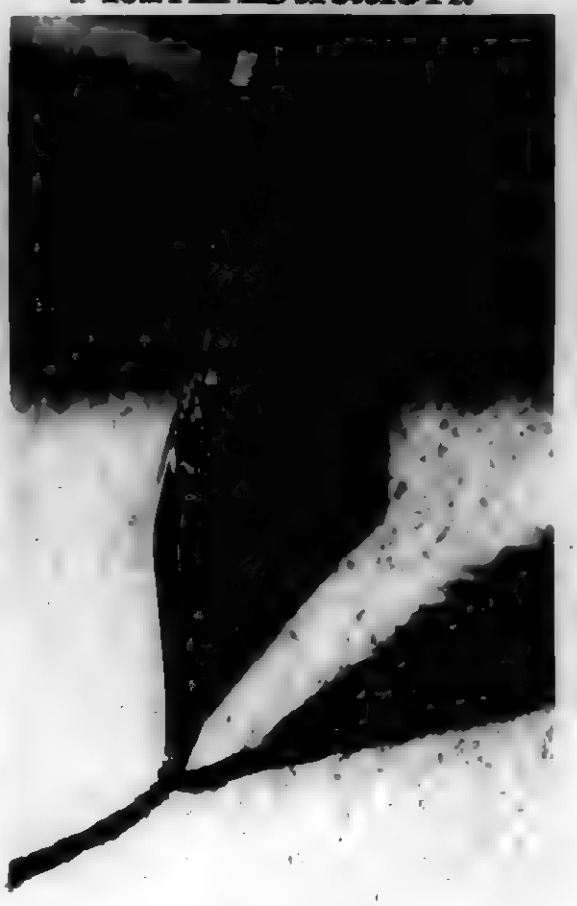

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MANAGER'S JOURNAL

EXECUTIVE TRACK

Peter Kenyon has joined **Silicon Graphics, Inc.** in Mountain View, Calif., as vice-president of information services, reporting to Ken Coleman, senior vice-president of administration.

Kenyon, 46, was most recently president of Pactel Meridian Systems, a partnership between units of Pacific Telesis Group and Northern Telecom, Inc. Kenyon joined Northern Telecom in 1982 and has held positions in finance, information services and general management. His last position there was vice-president and general manager of the Meridian Terminals Division. Kenyon holds a degree in finance from Liverpool College of Commerce.

Share, Inc., the Chicago-based association of users of large IBM systems, recently announced its board of directors for 1990 to 1992.

Sandy Moy of the University of Washington was named president, **John A. Chapman** of Amoco Corp. was named vice-president, **John H. Bevis** of the University of Florida's Northeast Regional Data Center was elected secretary and **Lois Hoyer** of Northern Trust Bank was named treasurer.

New directors are **Anne Calouri**, U.S. Army Systems Software Center; **Bill Choate**, Emory University; **Cynthia Combs**, United Services Automobile Association; **Tom Rupsis**, John Hopkins Applied Physics Lab; and **David C. Thewlis**, Kaiser Permanente Medical Care Program.

Who's on the go?

Changing jobs? Promoting an assistant? Your peers want to know who is coming and going, and *Computerworld* wants to help by mentioning any IS job changes in Executive Track. When you have news about staff changes, be sure to drop a note and photo or have your public relations department write to Clinton Wilder, Senior Editor, Management, *Computerworld*, Box 9171, 375 Cochituate Road, Framingham, Mass. 01701-9171.

'Mad scientist' turned IS chief

Howard Ory revitalized sleepy IS group at Centers for Disease Control

BY JOSEPH MAGLITTA
CW STAFF

He's a physician and epidemiologist who wears flannel shirts one day and his white Navy captain's uniform the next. He likes to tape cartoons to his office door, jokingly describes himself as a "scientist gone mad," has appeared on *Good Morning America* and has been interviewed by *Cosmopolitan* magazine.

Howard Ory is not your average information systems director.

Yet here is Ory, a noted authority on birth control, in charge of all computing and telecommunications at the Centers for Disease Control (CDC), the Atlanta-based federal agency charged with public health education and disease prevention in the U.S.

In just five years, Ory, a self-described "sophisticated end user" working at his first computer job, has transformed a sleepy IS shop into a modern, dynamic organization that is admired on Capitol Hill as a model of government computing. CDC's new on-line information system, called Wonder, has drawn congressional praise and was a finalist in this year's *Computerworld Smithsonian Awards*.

As director of CDC's Information Resources Management Office (IRMO), the mustachioed 46-year-old acts as a liaison between CDC's 6,000 users and 200 IS employees and contractors from his office in the outskirts of Atlanta.

A witty and articulate speaker, Ory — whose only formal IS education consists of a couple of in-house programming courses — is probably CDC's most active technology evangelist.

PROFILE: Howard Ory

Position: *Director of information resources management, Centers for Disease Control*
Achievements: *Transformed an ineffective IS shop into one now described as a model of government computing*

"Howard is uniquely qualified to head up IRMO," said Glenda Cowart, CDC's director of program support and Ory's boss. "He carries a lot of respect at CDC because of his personal accomplishments."

So how does one go from being a physician and research scientist to becoming IS chief at one of the government's most visible agencies?

"I learned to compute as soon as I came to CDC," Ory recalls. "I was involved in analyzing large data sets. After doing those on a card sorter, I figured there had to be a better way."

Ory, a native of Worcester, Mass., began as a epidemiological researcher at CDC headquarters in 1971. For 14 years, he continued his work exploring the medical side-effects of birth control pills, rising through the ranks to become an assistant program director.

To popularize his research, Ory did interviews on television shows such as *Good Morning America* and *The CBS Morning News* and national magazines such as *Cosmopolitan*, *Redbook* and *McCall's*. During this time, his work with computers was largely limited to using SAS Institute, Inc. software for data analysis.

Then, in 1984, Ory's career took an unexpected turn. Former CDC director James Mason ordered a business study to help the agency find ways to

Continued on page 84

Is automation turning managers into clerks?

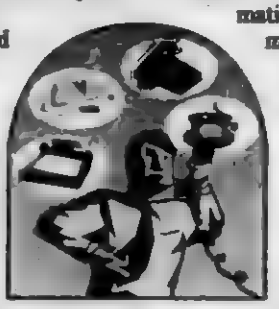
BY SALLY CUSACK
CW STAFF

Are managers actually spending *more* time performing clerical tasks now than they did before office automation? An economist at the Georgia Institute of Technology said they are — because secretaries and support personnel are being replaced by office automation technology.

"By and large, computers are not a good substitute for secretaries," said Peter G. Sassone, a technical economist at Georgia Tech's School of Economics in Atlanta.

Sassone noted that while computers can make substantial contributions to clerical efficiency, there are many tasks they are not equipped to handle.

"Secretaries do a wide variety of tasks, from sorting mail to making travel arrangements, and if a secretary is eliminated by office automation, the aforementioned tasks often fall to the managers themselves — not a productive way for professionals to spend their time," Sassone said.



Using a special method for analyzing work profiles, Sassone studied 1,563 employees in 77 offices in four Fortune 50 companies.

The study of 184 middle-level managers found that they devoted 16% of the work week to administrative support tasks, including filing, making copies and typing. Sassone said he suspects that the findings do not reflect the activities of top-level executives, who are more likely to work with a large support staff. "We were looking at the broad middle of these companies, where most of the payroll dollars are spent," he said.

Sassone stressed that office automation is basically a complementary, not substitute, technology for the workplace. Substituting technology for people is not always effective, he cautioned.

So what is his advice to corporate America? "Be wary of 'substitutional' strategy — people saying things like 'we can reduce the staff by half,' " he said. "Instead, be ready to use technology to enable people to make the maximum professional contribution."

Ory

CONTINUED FROM PAGE 83

more effectively use information technology. Ory found himself on the committee performing the study.

"My boss at the time said, 'I don't want to do it — you do it,' " Ory recalls. "So I went off to the woods for three months."

Among the group's recommendations was for IS to be headed by a CDC researcher. As the only researcher on the committee, Ory was chosen as the founding head of IRMO. His first step was to unite scattered IBM and Wang Laboratories, Inc. resources with telecommunications and to set a new direction for IS.

"It was a classic old-line [data processing] shop," Ory explains. "The head was an engineer. By and large, the people in it were more interested in the computer for the computer's sake rather than for the user's sake."

Ory quickly learned a lesson that has become the cornerstone of his management approach: Surround yourself with the best available technical talent. "If you've got a handicap, if you don't know something, you've got to bring someone in like a Seeing Eye dog," he says.

He started by signing on luminaries from the old IS staff, who then helped pick out other "keepers." Former mainframe wizard Jerry Sanders became chief of the information technology branch, software guru Jerry Gentry became assistant director of research and development, and John Davis, a 28-year veteran, became assistant director of technical operations.

By 1987, thanks to hirings, firings, promotions and retirements, the IS department had a new look. Today, fewer than two dozen employees remain from the old IS staff of approximately 100.

Some of Ory's management team members have backgrounds as eclectic as his own. For example, Joseph Reed, head of applications development, was a physics professor who had spent eight years at a major accounting firm. Andy Freed, a driving force behind the Wonder system, is a physician.

After nearly six years on the job, Ory said he is convinced that a nontechnical person can effectively lead IS. Instead of worrying about every detail, Ory says he is free to think about the larger issues of using information technology to enhance the organization's mission.

"My job is to enunciate the vision and somehow encourage [staff members] to buy into that vision and keep them in the same direction," he says.

Ory's methods seem to work. During the last few years, his team has transformed an IBM 3090 200E mainframe, Cobol and 3270 terminal environment into a modern cooperative processing network with various local-area networks and shared databases.

More than 95% of CDC's knowledge workers have personal computers on their desks, and some 2,000 voice-mail users send nearly one million messages per year.

"Howard is visionary, creative and incredibly energetic for someone at this point of his career," says Jim Seligman, IRMO's deputy director. "He's built a good crew that we can trust universally."

Taking a hands-off approach sometimes means that Ory must spend time sorting out conflicts among technical staff members.

"There's always a lot of constructive conflict going on. My job is to referee that and to make sure that the conflict is always constructive," he says.

> "I'M AN OUTSIDER, but that's a tremendous advantage . . . After five years of delivering product after product, there's some sense that I listen harder to what the scientists want."
>
> HOWARD ORY
> CENTERS FOR DISEASE CONTROL

Despite these occasional rocky moments, Ory sticks by his approach: "Delegate cleanly; trust them. Once you agree on the vision, it's their job to deliver it. It's not my job to stand over their shoulder."

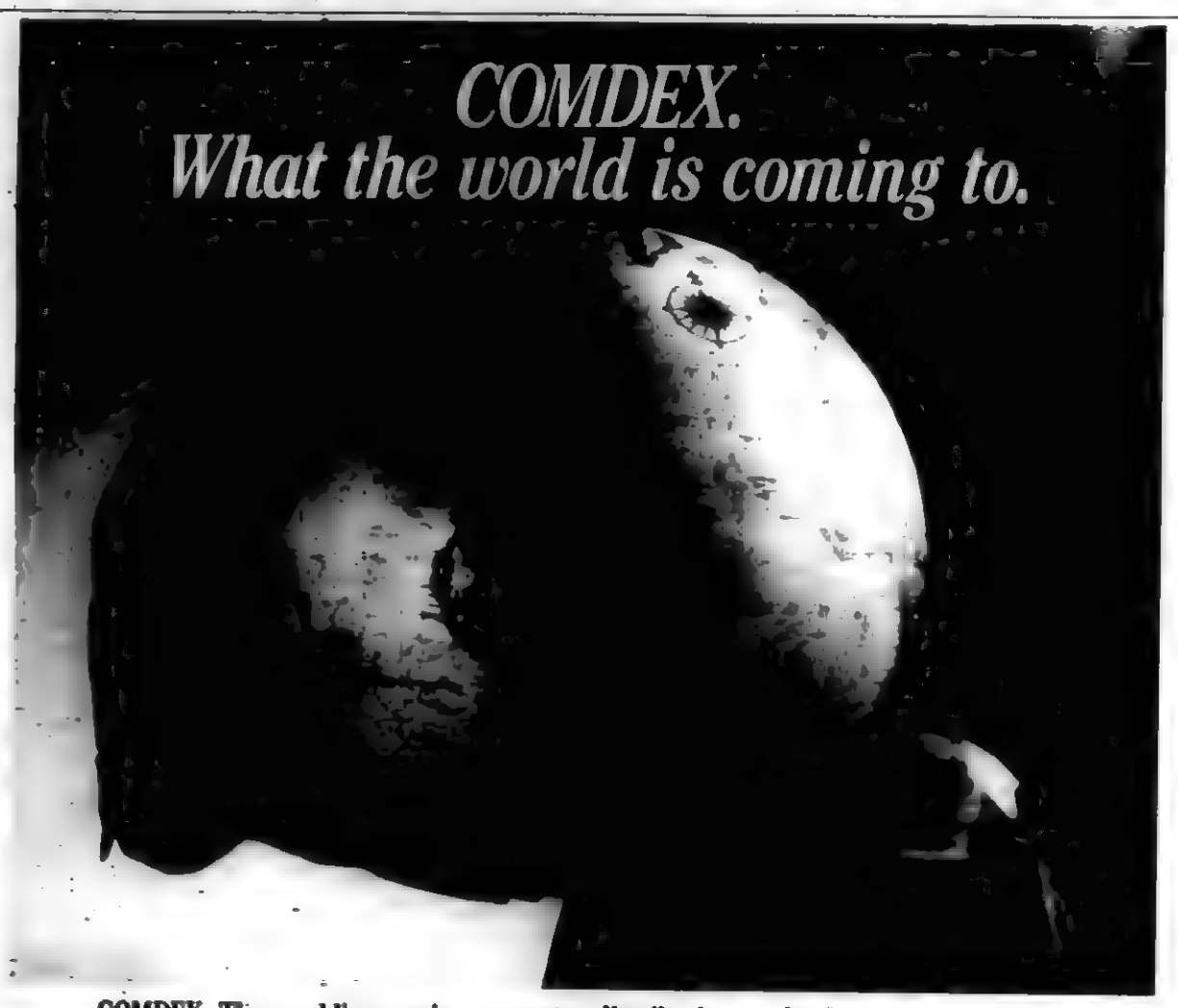
Despite his new duties, Ory still manages to work on birth control research and occasionally dons the white uniform of the U.S. Public Health Service. Still, his big focus is on fostering technology growth.

After five years, does Ory consider himself an IS professional? "I'm an outsider," he says, "but that's a tremendous advantage. The problem with the old DP shop was that the scientists didn't trust them, didn't trust that they'd get what they wanted from them. After five years of delivering product after product, there's some sense that I listen harder to what the scientists want."

Through it all, Ory tries to keep things light. The cartoons taped to his office door are a constant reminder not to get too heavy. "That's something my wife, who is a psychotherapist, taught me," Ory says. "If you don't use humor, you intimidate people."

Laughing, he adds, "Probably by now, I've been in the job long enough that they don't trust me either. But I'm working for the people I'm supposed to be helping."

Does coming from an end-user background in itself bring greater credibility? "At least they don't dismiss me out of hand," he laughs. "They think I'm just a scientist gone mad."



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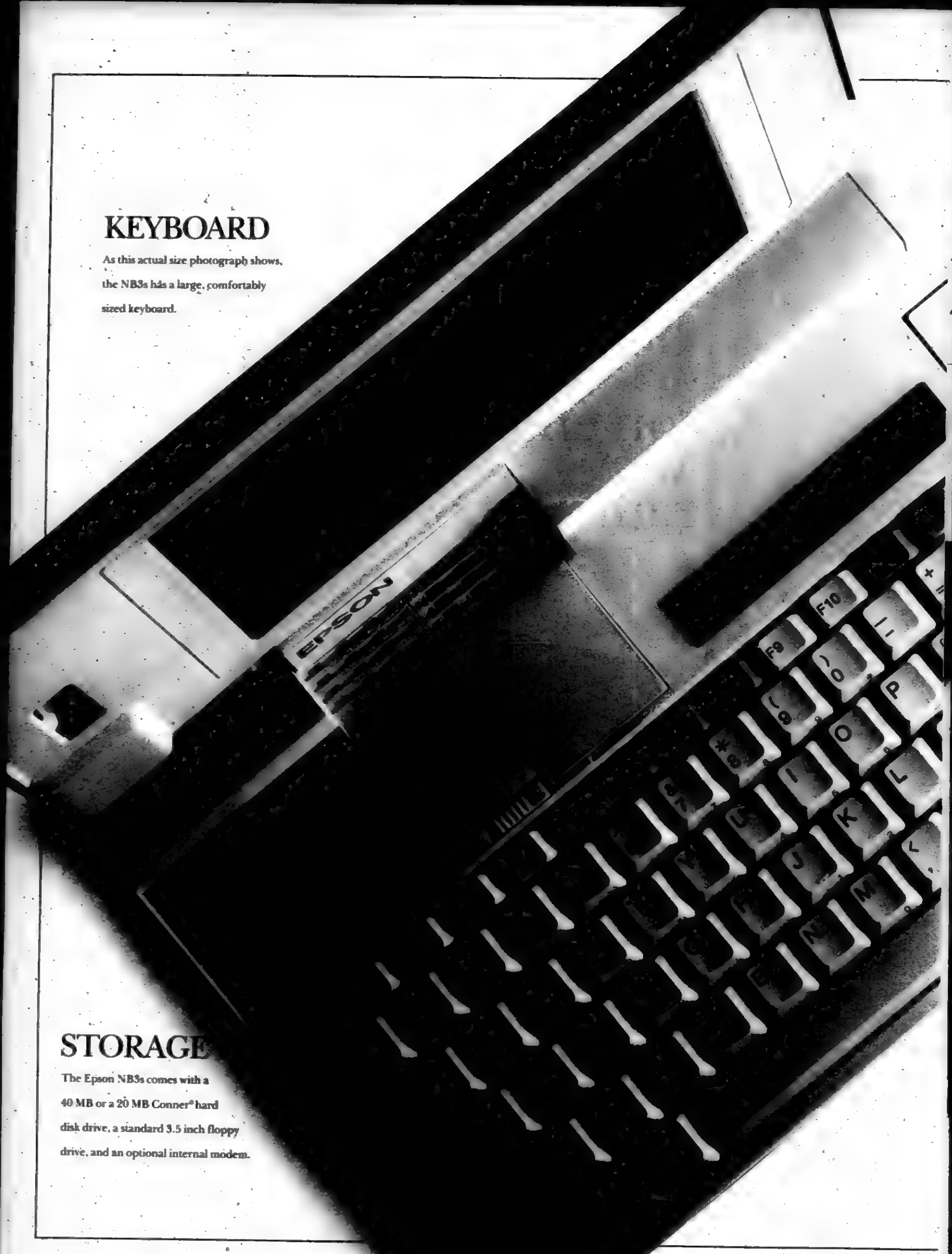
CW 10/15

In designing the new 386SX notebook, Epson engineers had to weigh a lot of options.

KEYBOARD

As this actual size photograph shows, the NB3s has a large, comfortably sized keyboard.

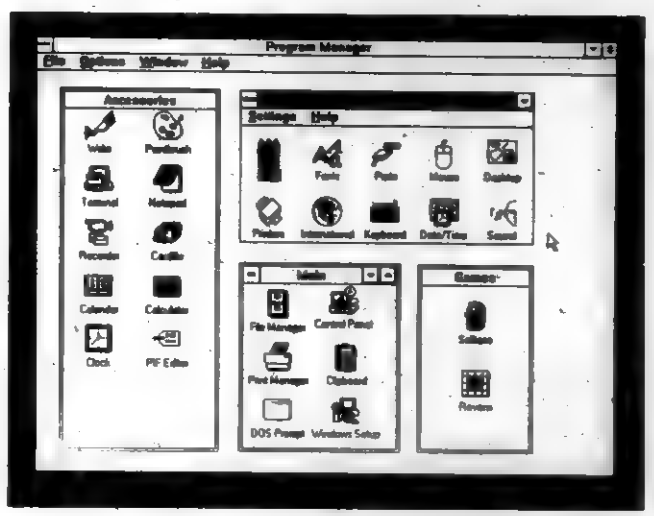


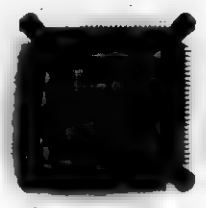
STORAGE

The Epson NB3s comes with a 40 MB or a 20 MB Conner® hard disk drive, a standard 3.5 inch floppy drive, and an optional internal modem.

VGA

The large backlit, 640 x 480 resolution LCD screen includes 16 gray scales for sharp black-on-white VGA graphics.





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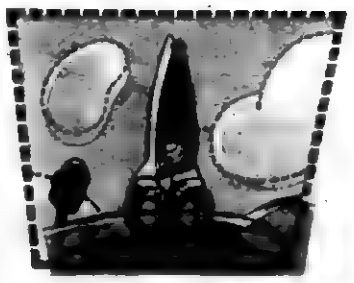

Tim Lewis

Summaries from leading scientific and management journals

"Information partnerships — Shared data, shared scale"

By Benn R. Konsynski and F. Warren McFarlan

Harvard Business Review
September-October 1990

■ Developments in data communications, storage and retrieval have facilitated the exchange of information between companies. As a result, businesses can join forces *without* merging more easily than ever before. Diversification becomes possible while maintaining corporate focus on a core line of business.

Information partnerships can facilitate joint marketing and the development of new channels of distribution for services. By sharing investments in hardware and software, companies can reduce their financial and technical risk.

There are four types of information partnerships: joint marketing, such as IBM and Sears, Roebuck and Co.'s Prodigy effort; intra-industry efforts, such as the value-added network tying together many U.S. insurance firms; customer-supplier partnerships, such as the information systems network linking Baxter Healthcare to its clients; and vendor-driven relationships, such as the electronic data interchange network set up by General Electric Information Services.

What are the keys to building such successful "information partnerships?" To start, senior management at participating companies must share a common vision of the partnership's goals, or the partnership will come to a halt. Other success factors include the need to bring reciprocal skills in information technologies to the deal and to make sure interconnecting hardware and software is technically feasible. Some coordination of technical and business policies will also be necessary in order to ensure that information can be packaged and shared in ways that are mutually beneficial to all partners. — Amiel Kornel

"Evaluating alternative computer acquisition strategies"

By David Ameen

Journal of Systems Management
September 1990

■ There is plenty of advice on how to select the right hardware but very little professional literature on choosing the least costly way to acquire that hardware. Leasing, renting, purchasing and third-party leasing plans are the four major acquisition options, but each one has its advantages and disadvantages.

For example, an outright purchase requires a large initial capital outlay but is less expensive in the long run, assuming that the hardware is kept for several years.

A cost-benefit analysis of various acquisition strategies requires the IS manager to establish financial objectives and identify relevant assumptions, such as the cost of capital, the economic life of the equipment and its salvage value. Then these variables are plugged into a cash-flow equation to produce a ranking of the acquisition plans.

Because some of the assumptions used in the equation require predictions of future technology and economic conditions, IS managers should conduct a sensitivity analysis to see how much the results would change under different circumstances. — Mitch Betts

"Groupware in practice: An interpretation of work experience"

By Christine Bullen and John Bennett

MIT Center for Information Systems Research
Working paper, March 1990

■ Corporate interest in groupware, software intended to enhance the productivity of organizations through the use of electronic mail, centralized scheduling and other functions, is increasing.

Before such a product is implemented, management should be careful to understand the following:

- People report most value from tools that parallel their nonelectronic activities, so it follows that E-mail is the most widely used groupware function.
- Users must feel that the benefit outweighs their effort in learning to use and using the system. Calendaring systems are often considered too clumsy and difficult to use to be worth maintaining.
- Groupware intervenes at both a technological and social level. It introduces changes both in the methods used by a group and in the interactions of the group.
- Work processes may need to be redesigned to function more smoothly with the new technology. — Chris Lindquist

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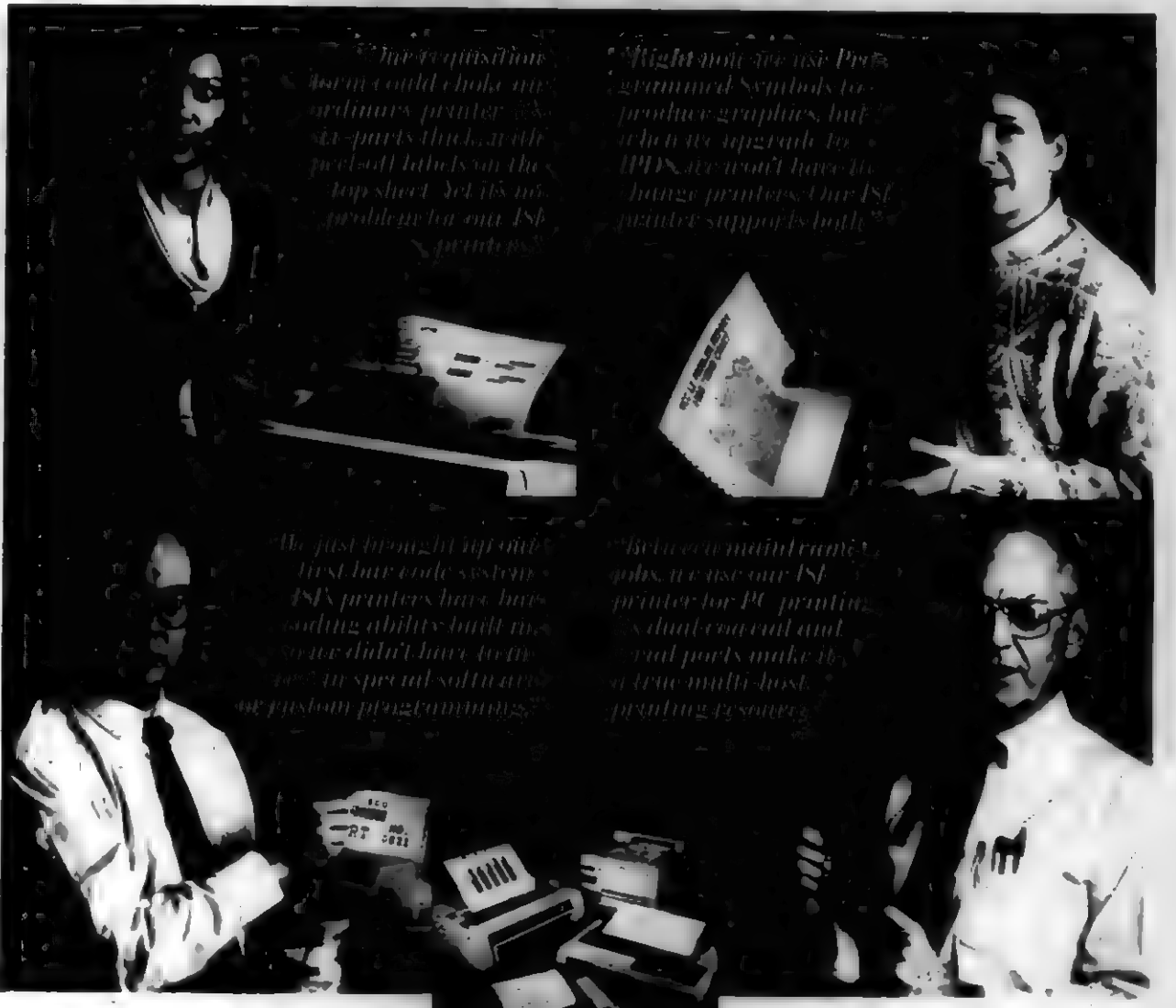

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Tips for smooth software sailing

BY JEAN S. BOZMAN
CW STAFF

SAN FRANCISCO — In software development, it's best to look before you leap.

James Wetherbe, a University of Minnesota professor who runs the school's MIS Research Center, said he believes that managers of software projects often do not allow themselves enough time to analyze their objectives, dooming their software development efforts. The goals of zero-defect software, simplified maintenance and flexibility can only be reached by those who have taken the time to reflect, Wetherbe maintains.

"You get the vision, and then you realize you can't get there from here," Wetherbe told some 50 systems development professionals attending a recent Association for Systems Management seminar here.

Beyond technology, software managers must learn to orchestrate their project staff, much as a coach assigns players in a game of pickup basketball, Wetherbe said. Some team members are better suited to interview end users about software requirements, while others are better at coding or keeping the project on track and on time.

To detect errors or bugs in the code, extensive testing is in order. "Your feedback loops have to move both backwards and forwards so that errors get detected before your system ever affects the customer," Wetherbe said. "By installing a total-quality program, you can determine whether a problem is coming from the software code or from an ill-conceived invoice that you're trying to automate."

End users will be happiest if goals are kept within reach. Cross-functional joint application design groups can often isolate key systems parameters.

"Prototyping generates excitement," Wetherbe said. "It brings reality to the concept behind the system. Even though you have to make it clear that the prototype is just that — it's not a completed system — the client can see where you're going."

If they are seeking quality, software managers should try to pilot their projects, just as airline pilots guide their aircraft through crowded skies, Wetherbe said. Their software programs should "fly" as well as jumbo jets do — with only a few mishaps among the millions of lines of code (or passenger miles, as the case may be).

"If you have the same error rate as the airport's luggage-handling facility," Wetherbe said, "you know you're not doing everything right."

MANAGEMENT BRIEFS

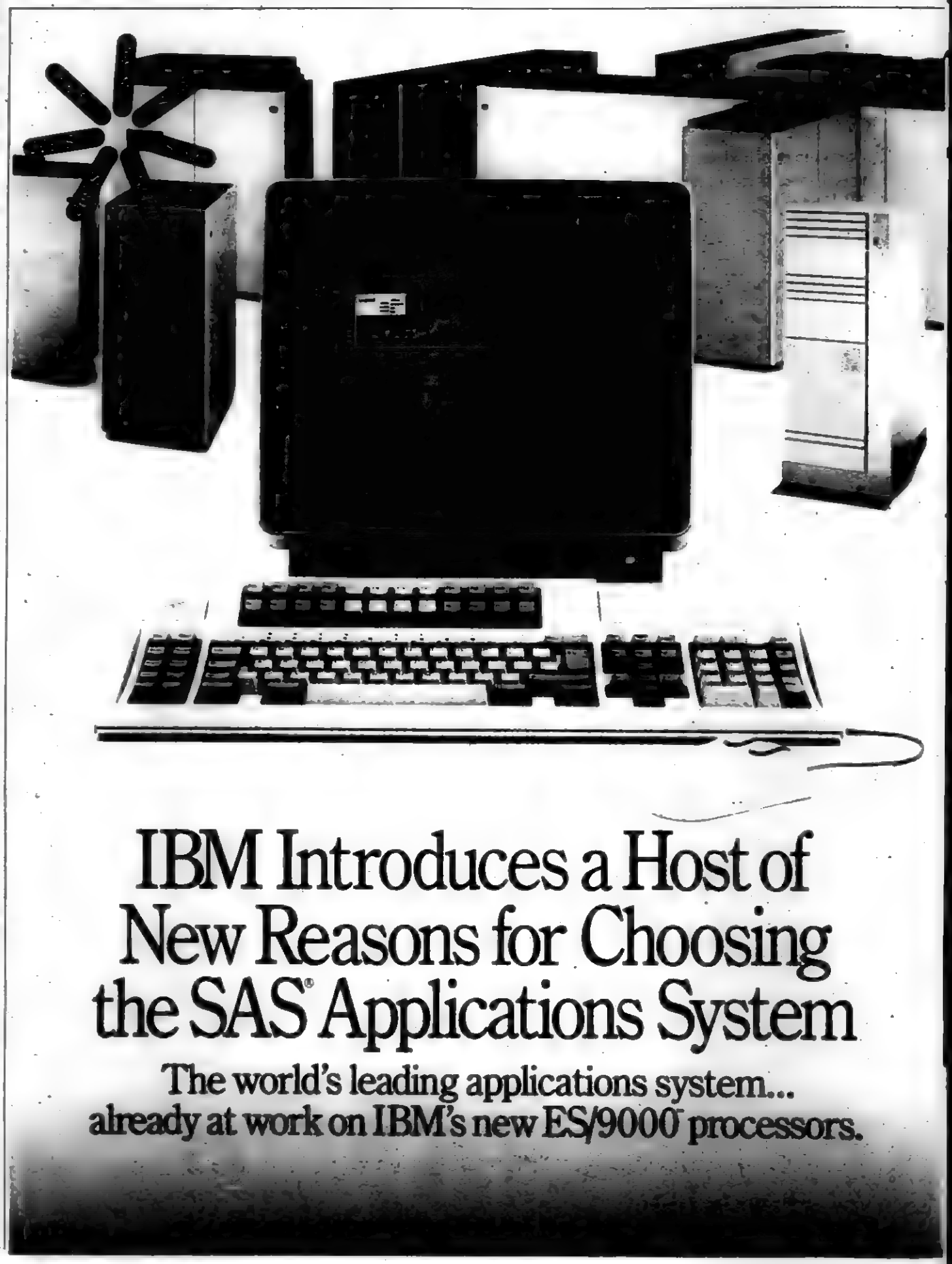
IUA adds on to its rolls

Former Cullinet Software, Inc. and Applied Data Research, Inc. (ADR) database users are now united in the same organization. **The IDMS User Association (IUA)** recently approved the addition of **Complete Applied Data Research Environment (CADRE)** into its international organization.

Both former companies and their product lines are now part of Computer Associates International, Inc. ADR users will be included in the IUA's annual user conference, IUA '91, slated to be held in Salt Lake City on April 14-18, 1991.

Uniforum, the international association of Unix users, awarded its first $10,000 research grants to two graduate students studying computer science and management science.

The winners were Kevin R. Fall, a Ph.D. candidate in computer science and engineering at the University of California at San Diego, and Basil A. Sherlund, who is pursuing a master's degree in computer science at Wayne State University in Detroit.



CALENDAR

OCT. 28 - NOV. 3

CIO Information Strategies Conference. Palm Springs, Calif., Oct. 28-30 — Contact: Lori Cardarelli, CIO Magazine, Framingham, Mass. (508) 872-8200.

Talon International Users Conference. Orlando, Fla., Oct. 28-31 — Contact: Anthony J. Paoni, Pansophic Systems, Lisle, Ill. (800) 344-8573.

Knowledge-Based Systems in Everyday Use: Increasing Productivity Profits. Chicago, Oct. 29-30 — Contact: Dorina Kacin, Decision Support Technology, Cambridge, Mass. (617) 354-6400.

The Hammer Re-Engineering Conference. Cambridge, Mass., Oct. 29-31 — Contact: Hammer and Co., Cambridge, Mass. (617) 354-5555.

Electronic Data Interchange for Government: New Approaches to Information Collection and Dissemination. Washington, D.C., Oct. 30-Nov. 2 — Contact: USPDI, Silver Springs, Md. (202) 445-4400.

Unicom '90. Washington, D.C., Oct. 31-Nov. 2 — Contact: North American Telecommunications Association, Washington, D.C. (202) 296-9800.

Unix Expo '90. New York, Oct. 31-Nov. 2 — Contact: National Exhibitions, New York, N.Y. (212) 391-9111.

Evaluating CASE Tools. Atlanta, Nov. 1-2 — Contact: Digital Consulting, Andover, Mass. (508) 470-3880.

NOV. 4 - 10

Adapso Management Conference. Phoenix, Nov. 4-7 — Contact: Adapso Education Department, Arlington, Va. (703) 284-5355.

Decision Support and Executive Information Systems: A Managerial Perspective. Cambridge, Mass., Nov. 5-6 — Contact: Decision Support Technology, Boston, Mass. (617) 482-3586.

Successful Implementation of Imaging Technology. Boston, Nov. 5-6 — Contact: KPMG Peat Marwick Executive Education Registrar, Montvale, N.J. (800) 762-3932.

CASE: The Next Generation. Washington, D.C., Nov. 5-7 — Contact: Digital Consulting, Andover, Mass. (508) 470-3880.

ISDN Week. London, Nov. 5-9 — Contact: IGI Europe, London, England (011) 41 81 6915111

Association for Computing Machinery Conference. Arlington, Va., Nov. 6-7 — Contact: Jim Adams, ACM, New York, N.Y. (212) 869-7440.

Messaging '90. New York, Nov. 6-8 — Contact: Information Publishing Corp., Houston, Texas (713) 974-6637.

Digital Dealers Association Annual Meeting. Tucson, Ariz., Nov. 6-9 — Contact: DDA Administrative Office, Chelsea, Mich. (313) 475-8333.

Computer, Office Systems & Services Conference. Houston, Nov. 7-8 — Contact: Show America Management, Houston, Texas (713) 890-0397.

Design Engineering Show and Conference. Atlanta, Nov. 7-9 — Contact: Design/South, Stamford, Conn. (203) 964-0000.

GE Information Services Business Communications Users Group Meeting. Orlando, Fla., Nov. 7-9 — Contact: Wendy Herman, GE Information Services, Rockville, Md. (301) 340-4977.

GIS/LIS. Anaheim, Calif., Nov. 7-10 — Contact: GIS/LIS, Bethesda, Md. (301) 493-0200.

Expo Comm China '90. Beijing, China, Nov. 8-13 — Contact: Ron Akins, Krause & Associates, Bethesda, Md. (301) 986-7800.

Southeastern Small College Computing Conference. Hickory, N.C., Nov. 9-10 — Contact: Dr. Frank Cheatham, Campbellsville College, Campbellsville, Ky. (502) 465-8158.

NOV. 11 - 17

Share 75.5. Fort Worth, Texas, Nov. 11-14 — Contact: Share, Chicago, Ill. (312) 644-6610.

Computer-Canada Fall Toronto, Nov. 12-14 — Contact: U.S. Department of Commerce, Office of Canada, Washington, D.C. (202) 377-3718.

Autofact '90. Detroit, Nov. 12-15 — Contact: SME, Dearborn, Mich. (313) 271-0777.

Comdex/Fall '90. Las Vegas, Nov. 12-16 — Contact: The Interface Group, Needham, Mass. (617) 449-6600.

Supercomputing '90. New York, Nov. 12-16 — Contact: Malvin Kalos, Cornell Theory Center, Cornell University, Ithaca, N.Y. (607) 255-7157.

Hawaii's Governor's Symposium on High Technology: Making Strategic and Technical Alliances for East-West Software Development and Trade. Lihue, Kauai, Hawaii, Nov. 13-15 — Contact: High Technology Development Corp., Mililani, Hawaii (808) 625-5293.

Wescon/90. Anaheim, Calif., Nov. 13-15 — Contact: Wescon/90, Los Angeles, Calif. (213) 215-3976.

National Conference and Exposition on Electronic Image Management in Government. Washington, D.C., Nov. 13-16 — Contact: Conference Manager, USPDI, Silver Springs, Md. (301) 445-4400.

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Marketers dig for openings in a blizzard of raw data

BY BARBARA FRANCETT

Without information technology, Mauna La'i guava drink wouldn't be on your supermarket shelf today. A minor tragedy? Not to Ocean Spray Cranberries, Inc., its maker. Mauna La'i carved out a piece of new territory for Ocean Spray — tropical juice drinks — and provided an important new source of revenue. It was an opportunity that the firm nearly missed.

Initial test market results for the product were not promising, says John Tarsa, operations manager of information services, a marketing support group at the Lakeville, Mass., firm. Indications were that the product would not meet sales objectives. Ordinarily, Tarsa says, that would have meant the product would never see mass distribution. In this case, however, the company decided to go a step further and recheck the product's prospects through an electronic test market service run by Chicago-based Information Resources, Inc. (IRI). This further analysis "showed that the depth of repeat purchases would make up for the lack of volume in the trial," Tarsa says.

Based on the findings, Mauna La'i was launched. "It's been very successful, but if we had been using only traditional methods," Tarsa says, "it would have been killed."

Since that time, Ocean Spray has supplemented its traditional market analysis tools with two systems from IRI — a decision support tool called Dataserver and an expert system for pattern analysis called Coverstory.

All market researchers know that new markets and new products are key to maintaining and expanding market share. Increasingly, what they are also discovering is that information systems can help them to uncover hidden opportunities amid the masses of facts and figures routinely collected about both new and existing products.

Reinhold Spiegler

Nyce (left) and Nash *say Cadbury's IS and marketing departments work hand-in-hand to get the most from database resources*

At Cadbury Beverages, Inc., the Stamford, Conn.-based maker of Canada Dry and Hires carbonated beverages as well as Mott's applesauce, IS works closely with market researchers to filter actionable information from massive data flows. "It's a team effort," says Joe Nash, vice-president of MIS.

Support from IS for the market research group, however, is limited by design. "We provide hardware support and communications support, but we're not involved in software and database maintenance. We do provide shipment information to the syndicated services," Nash says. "We complement each other."

Two of the primary tools used to filter data are the same ones now in use at Ocean Spray.

Most of the data at Cadbury Beverages comes from Universal Product Code, or scanner, data gleaned at grocery stores and sold by syndicated services. "Data sets at the UPC level are huge. Without an electronic interface, this data is almost impossible to use," says Jim Nyce, vice-president of marketing coordination and research.

Cadbury obtains scanner data from IRI's Infoscan service and from A. C. Nielsen Co.'s Scantrack. Both syndicated services sell data by categories as well as summary-level information covering sales trends, pricing and approximate market shares for all product categories.

In the quest for opportunities to extend product lines or launch new products, Nyce combs through this scanner data, using Dataserver for a first-cut examination and then Coverstory for more refined analysis.

The search process typically starts in familiar territory. "First, we look for opportunities in our own product categories ... subcategories of products that perform better than average," Nyce says.

Sometimes, however, interesting outcroppings appear in unexplored areas. When that happens, the next step is usually to pull up additional information from one of the syndicated services and subject it to intensive analysis in hopes of identifying potential buyers. This type of analysis led to an addition to Cadbury Beverages' Holland House line of cooking wines.

What the firm discovered when it began looking into the marinade category, Nyce recalls, was a growing area without a significant national presence. "There were a number of small regional brands but no national brands, so there wasn't much competition," he says.

For Cadbury, demographic information on potential purchasers, in combination with data on product sales and competition, was enough to convince the firm to move ahead. Sometimes, however, companies want a more qualitative picture of potential purchasers.

For this closer look, they turn to a different category of databases — ones that go beyond location, age, number of children and education level — to address lifestyle factors such as kinds of books read, television viewing choices and vacation preferences. These databases categorize consumers by lifestyle into profiles called "clusters" — enabling market researchers to better target their efforts.

One such product is currently being used by The Buick Motor Division of General Motors Corp. in Flint, Mich., in conjunction with its owner records database. Prizm, a market segmentation database packaged on compact disc/read-only memory from Claritas Corp., defines U.S. neighborhoods by ZIP code

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Francett is a free-lance writer based in Bloomfield, N.J.

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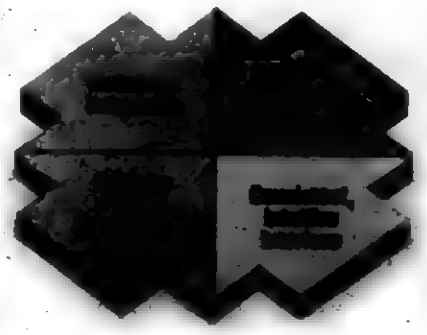

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according to 40 cluster types, with such names as Furs and Station Wagons, Black Enterprise and Shotguns and Pickups.

Prizm can be customized through the embedding of other categorization systems, databases and surveys. For example, the version Buick uses contains Arbitron Ratings Co.'s defined areas of dominant influence (ADI) for TV viewership. "We can run owner records and know what ZIP codes fall into ADI markets," says Paula Tarvenia, associate administrator in market research at Buick. "We can go into an ADI market, pull it apart and take a more microscopic look at it by ZIP code, census tract or block group for new opportunities. It's a nice way to find out who our customers are and how they fit into various lifestyles in relationship to each of our car lines."

Tarvenia's group uses Compass, a personal computer-based software system from Claritas, to analyze Prizm data and integrate it with company-collected data on existing customers. "It helps us get more into the consumer's mind," Tarvenia says. "For instance, Buick Reattas are very upscale two-seaters. People who buy them are on the go, they read a lot, they're into financial activities. A Buick Century, on the other hand, is not so upscale. Their buyers have a different lifestyle. We need to understand that."

At Perpetual Savings Bank in Washington, D.C., Tim Evans, director of marketing services, uses both Prizm and another segmentation system designed specifically for the banking and financial industry. This database, The Customer Information System (CIS) from Harte Hanks Data Technologies, runs on a mainframe at Harte Hanks and is accessed and analyzed using a PC software program called PCIS.

Downloaded information from CIS can also be imported into Claritas' PC-based Compass system for combination with Prizm data via a menu-driven interface developed by the two vendors at the bank's request. CIS gives Perpetual Savings a clustered view of its customers by common address. Prizm adds the lifestyle component. When the two are combined, Evans says, the result is a more insightful profile of current customers.

Campbell's Nelson *says modeling gives a good guess*

Tailored fit

In addition to better targeting of existing offerings, the bank uses the information gleaned from these systems to tailor products and services. "For example, last year, savings accounts were losing deposits," Evans says. "When we surveyed customers, we saw that they were opening money market accounts. So we developed a special money market account and targeted it to those people. Within a year, we brought in $200 million in deposits."

But the most dramatic use of segmentation data, according to Evans, is in site selection for new bank branches. "Clustering identifies market areas where we want to put in new branches," he says.

Finding new customers for existing products is crucial to business health, but launching new products is equally vital. Introducing a new brand is risky business: It's more expensive than merely extending an existing line, and it charts unknown territory. The potential for failure is great — as are the potential rewards.

"The road to success is new products — not line extensions, new flavors or new packaging," says Steve Rubinow, director of decision support services at Quaker Oats Co. in Chicago. "New product development requires creative processing."

At many firms, creativity gets an assist from sophisticated modeling systems that combine consumer surveys and complex algorithms that help to clarify the go or no-go decision.

At Campbell Soup Co. in Camden, N.J., where 30% to 40% of sales volume is typically derived from new products, a modeling system called Estimating Sales Potential (ESP) from NPD Group, Inc. is used to estimate the potential market for new products. "By and large," says Dick Nelson, a director of market research services, the preliminary estimates yielded by models are "pretty accurate."

New products that Campbell has successfully launched after running them through the model gauntlet include Le Menu Light Style Dinners, introduced in 1986, and Souper Combos, microwaveable soup and sandwich combinations introduced in 1988.

The modeling procedures used by systems such as ESP are considered so secret that clients such as Campbell provide information to the vendors, who then run the models and provide the results. The service is expensive. For ESP, the cost is $50,000 to $100,000 for food and household products and $75,000 to $150,000 for drug products. Costs for another popular system, Bases from The Bases Group, range from $15,000 to $150,000 for one model run and related services.

Quaker Oats' Rubinow *says success takes big, bold steps*

Higher costs for failure

The alternatives, however, can be even more costly in terms of both investment and image. "If a product dies in public, it's an embarrassment," notes Ed Russell, who also serves as a director of market research services at Campbell. "Only R&D is risked inside."

Still, Russell notes that the sophisticated external modeling systems are too expensive to tap more than once per product, which still leaves a gap in terms of ongoing feasibility research. That's why he is developing data for a model of his own, using a Lotus Development Corp. 1-2-3 spreadsheet and his Intel Corp. 80386-based PC. "It's a simple and straightforward design to use distribution and sales numbers from syndicated data to make Year-1 projections," he says. Although Russell's model won't be as sophisticated as ESP and Bases, it will be a valuable adjunct to those options. "We can run it early and often," he says.

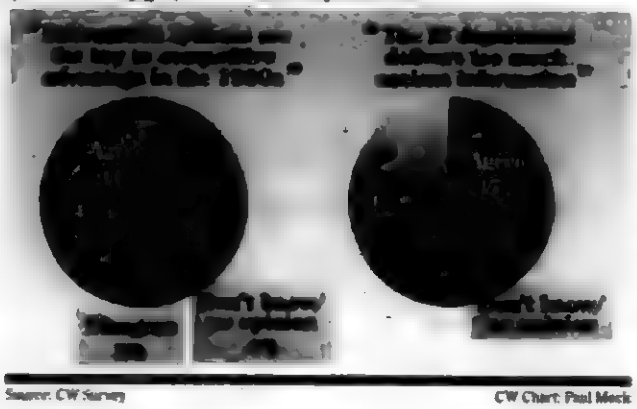
Baby-food maker Gerber Products Co. in Fremont, Mich., uses Bases to identify potential new hits and misses. New product development at Gerber is a systematic process, says Joaquin Pericas, director of market research. "From perhaps 10 to 15 new product ideas, we'll narrow our focus to three or four. Then we develop prototypes and do product-use tests," he explains.

Bases uses both a sophisticated algorithm and many inputs to gauge consumer response to a proposed new product. First, a test simulation is done. The proposed product is sampled by 500 consumers. "Those who say they would buy the product get sent home to use it for 10 days," Pericas explains.

All the consumers' responses are fed into the modeling systems, as are concept

Unsure if what they need is what they get

Sales and marketing managers say they believe that information systems are vital to their companies' strategies, but many are not sure if the data they get from IS is entirely relevant



Source: CW Survey — CW Chart: Paul Mock

Facts don't replace instincts

Before the advent of information systems to help analyze and screen vast amounts of data, market researchers depended on a blend of customer knowledge, surveys, intuition and old-fashioned "people sense" to forecast which products consumers would crave next. Even the most advanced hardware and software cannot fully supplant those skills.

As market researchers attest, divining the heart of the American consumer is still a very "soft" science indeed. Knowing when to stop looking at the numbers and start listening to instinct is crucial.

"Market research is a soft process," says Steve Rubinow at Quaker Oats Co. "It's very hard to put rules around it and systematize it."

And there will come a point when it pays to stop trying. "This is not an exact science," echoes Paula Tarvenia at Buick. "A lot of intuition goes into the mix."

"We spend a lot on consumer research. We don't want to lose touch with individual consumers through computers," says Ed Russell at Campbell Soup Co. "The more technology there is, the more people yearn for human contact and the more it's necessary from a business point of view."

Once in touch with consumer trends, fathoming consumer thinking is still mind-boggling. "I don't care how much data you have in front of you, people aren't logical," says Tim Evans at Perpetual Savings Bank. "We've got savings accounts that offer 8% interest, and people still put their money in 5¼% passbook accounts. The more I know, the less logic I see."

Don't count on logic

The problem is that when it comes to customer needs and wants, A plus B rarely equals C. "Increasingly, the study of yesterday and today doesn't reveal the actuality of tomorrow," says Graham Denton, chief executive officer at Product Initiatives, a Toronto-based new products consultancy. "Analysis doesn't reveal what will be successful because in most markets, there is a high degree of fragmentation and competition. The challenge must be approached by more innovative thinking," he says.

This is where many market researchers — replete with data — fall down, Denton claims. "Most market researchers, especially North Americans, are bean counters and trend plotters. They tend to be linear thinkers," he says.

The solution? Information systems married to creativity. "Knowledge serves as the foundation for the creative process, which means looking at the data in different ways," Denton says. "There are new ways of interpreting data, but you need to know enough about your market to know whether an idea is good or not."

Where, then, should market researchers draw the line between their use of IS and the creative process? "Where you have enough information to come up with a good creative idea," Denton advises. But, he cautions, even this approach isn't foolproof. Beware of the idea that hinges on changes in consumer behavior or attitude. "No good idea, however creative, will change how people behave or think."

BARBARA FRANCETT

and usage measurements as well as marketing plan inputs such as distribution levels and promotion spending.

The model projects such fundamental information as Year-1 sales as well as concept and product diagnostics. "If the product didn't perform well, [the model] tells us why. We can pinpoint where the problems are — if the color's too dark or the texture's too soft," Pericas says.

The firm also makes use of Nielsen data, although only in hard copy at the moment. Planning is under way for an online link that would give marketers terminal access to point-of-sale data.

At Gerber and many other firms, the relationship between IS and market research is friendly but limited.

"When we look at a new system, IS will be involved in the initial stages of introduction," Pericas says. IS makes the recommendations for hardware and software. "They'll come out with a proposal. Once the system is running, we do the rest."

John Hancock's Vanecko *sees vendors playing a big role*

But according to John Kraley, Gerber's MIS director, marketing will be seeing more of IS before long. "We have an excellent working relationship with the marketing groups, and we have plans to further automate them," he says. For example, a project is now in the feasibility stage for designing and populating databases to be accessed by Metaphor, an icon-driven marketing analysis package from Metaphor Computer Systems, which runs on top of IBM's DB2 relational database.

Although the IS department at Campbell helps load the syndicated databases obtained from vendors such as IRI and Nielsen and aids in tasks such as local-area network installation, the market research group creates and maintains its test, sales analysis and historical databases itself, looking to its vendors for programming expertise, Nelson says.

James Vanecko, director of consumer marketing at John Hancock Financial Services in Boston, also sees vendors filling most of marketing's needs. "Product marketers look for specialized vendors that do what they do well," he says. "Internal IS are operations people. Traditional approaches are not appropriate."

Using PCs, marketers at John Hancock download information from the corporate customer database, which is monitored by IS, into Harte Hanke's PCIS, which allows them to do English-language queries on the data. Geodemographic information is blended with customer information via a PCIS interface with Equifax Marketing Decision Systems' Infomart system. The integrated approach allows marketers to better analyze the features and benefits of new products, Vanecko says.

Get it together

Integration is, however, one area where, at most firms, IS has plenty of room to expand its involvement with marketing systems. Integration of internal and external data resources is the next major push for many forward-thinking companies.

"We work closely with IS, but it depends upon what we're doing," Cadbury Beverages' Nyce says. "One of our challenges is that the systems and data we use are out of house. The big issue right now is when or if to bring them in-house."

At Ocean Spray, Tarsa is even more definitive about the need for integration. "The next step in leveraging all the data at our disposal is to integrate the information in our databases," he says. That process has already begun, with the integration of grocery store sales data, picked up by IRI's Infoscan, and shipment data.

Quaker Oats' Rubinow, who reports to the vice-president of IS, is moving ahead with an IS plan designed to give marketing the broadest picture. "We're trying to incorporate external and internal data sources with other factors," he says.

"The spokes of the wheel are marketing, financial, sales, manufacturing and logistics," he continues. "Marketing includes external data, such as scanner, demographic, consumer, advertising and promotion data. All come from various sources, and there are integration issues we need to match up."

The combination of internal and external databases will present Rubinow with many different file formats and data languages. "That's the biggest problem," he says. "We have to understand each barrier." As a result, the project will evolve slowly, one area at a time, Rubinow says, and then they'll link them up.

At Gerber, Pericas says a closer working relationship between IS and marketing is possible. "The oppportunities are tremendous," he says. "But you need people with technical capability and marketing skills. That's why the two don't mix more often. MIS tends to be very technical. They need to see the broader picture. And marketing needs to better articulate what it needs." ●

Keeping your head above water with AI and supercomputers

Data proliferation is both a blessing and a curse in the minds of many marketing professionals, for whom the fear of drowning is a common sensation. "There's so much data you can't keep up with it," Campbell Soup Co.'s Ed Russell says. "We have more analysts, but we're just as far behind. It just multiplies."

New approaches and new technologies are emerging, however, which may serve as water wings for the data-inundated, helping marketers to channel their search and analysis efforts more effectively and crunch information more efficiently.

Benn Konsynski, a visiting professor at Harvard Business School in Cambridge, Mass., sees embedded artificial intelligence as the key to effective "environmental scanning." By identifying and monitoring key indicators such as advertising initiatives, buyer conditions and affinity products, companies can stay a step or two ahead of market conditions, Konsynski says.

However, there is a catch. An adaptive and sophisticated search mechanism is needed to pinpoint those kinds of market changes and that, Konsynski says, probably means AI. "More and more, AI is being incorporated into these systems. The key is to minimize false positives and negatives," he says.

A related approach, "data refining," is gathering adherents among some far-seeing firms, says John Clippinger, director of the multimedia text technical group at Coopers & Lybrand's Advanced Technology Group in Boston. This approach weds data from internal databases as well as internal and external systems to better identify market opportunities.

To consolidate these enormous, often untidy databases and relate their information, some companies will soon be using very high-performance supercomputers, such as those provided by Cambridge, Mass.-based Thinking Machines Corp., Clippinger says. "This is becoming more and more feasible now. The computing power is available as is the storage capacity."

That fact has not escaped the notice of Thinking Machines, which is currently experimenting with software capable of improvisational grouping of customer records. "If you predefine market segments, most computers are pretty efficient at deciding which bucket to put them into," says Jim Bailey, director of marketing.

But more accurate profiles might be created by the ability to tell the computer to find categories without prior criteria. "First, it will randomly pair records and decide if they're similar," Bailey says. "Gradually, larger and larger groupings will evolve."

BARBARA FRANCETT

Baseline: The census

The common denominator for the demographic and segmentation systems that market researchers consider so essential for targeting new markets and new product opportunities is none other than the national census. By all accounts, the standard of the decennial Census of Population and Housing will rise to even loftier heights over the next decade as information of unprecedented breadth and depth emerges from the 1990 count.

"All data starts with the census. It's the only true national base of information," says Eric Cohen, director of the Marketing Information Products Division at CACI Marketing Services in Fairfax, Va. CACI provides demographic information in a variety of formats — such as age by income, age by sex, in a housing profile, in an Hispanic profile — including a clustering system called the Automated Classification of Residential Neighborhoods, or Acorn. Acorn uses 49 variables to group people into 44 homogeneous groups.

Beginning next year, 1990 census data — including the long-awaited summary tape files — will be delivered during the following three years, Cohen says.

"The [summary tape files] are the 'good stuff,' such as age, income, housing and education," he explains. The tape files offer greater subject detail than that found in the printed reports the government offers. The first summary tapes, which will be released on a state-by-state basis, are expected to be available to the public by mid-1991. For the first time, census information will be available on CD-ROM as well as computer tapes.

Market researchers can also look forward to using updated files from the Census Bureau's Topologically Integrated Geographical Encoding and Referencing, or Tiger, System, a digital map-based file containing detailed geographical data from which the bureau produces maps of the U.S.

"This is exciting because it's never existed before," Cohen says. "It takes every geographic area boundary and digitally encodes it onto tape."

Tiger is a breakthrough, Cohen says. "Everybody will be working with the same information. It breaks the country down much more minutely than ever before. The entire country will be broken down into blocks, the smallest areas for which data is produced, whereas in the 1980 census, large rural areas were unblocked. This means the data can be used to target customers more accurately."

BARBARA FRANCETT

Pump up the volume

Sales and marketing executives say their departments' need for IS services will grow during the next two years

Source: CW Survey CW Chart: Paul Mach

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Cutting back costly shelf tests

Marketers add systems to repertoire to help reduce time, costs

BY SUSAN KERR

Jello-O Pudding Pops looked like a winner of a product when Michael Duffy and his fellow managers at General Foods Co. first ran a computer simulation to test its potential. But there was no way the company was going to release the product without first getting confirmation from actual test marketing. "We didn't trust the numbers, so we also did test marketing," Duffy says, who today is a marketing manager at A. C. Nielsen Co. in Northbrook, Ill.

What General Foods used to come up with its initial projection on Pudding Pops was a simulation program from Hendry Corp. The program ran on a mainframe and combined a mathematical theory of marketing with what Duffy calls "concept of market structure."

The firm tried to build a hierarchical model similar to an organization chart. The tricky part, Duffy says, was trying to use equations based on assumptions to describe the market. In part, this entailed making assumptions about product preferences and then trying to quantify and represent the changeability of those preferences and what factors, such as coupon offers, were most likely to effect a change.

As it turned out, full-blown test marketing of Pudding Pops confirmed the outcome of the simulation — the frozen dessert had all the earmarks of a hit.

This kind of on-target analysis of product prospects is making computers a much more integral part of major marketing decisions at large consumer-goods companies. Even so, Duffy says, few companies are ready to entrust information systems with the full weight of a product introduction decision. It's a question of confidence, he explains: "There's nothing there that I can really sink my teeth into as to why [the numbers] are right. I can believe it when I talk to 350 people, and they tell me why they like a product."

> "THE OLD DAYS of running a test market in Peoria for a year are over."
>
> JOHN D. C. LITTLE
> MIT

Nevertheless, computer-driven modeling and simulation is taking on greater importance as time becomes an increasingly precious commodity.

Changes in the marketplace and in the distribution chain have brought a greater emphasis on speed and efficiency in product testing. Life cycles of products are shortening because competitors are becoming increasingly adept at copying successful ideas. An adjunct to this is that being first in the market traditionally translates into better sales than the me-too products.

"The old days of running a test market in Peoria for a year are over," says John D. C. Little, a professor at MIT's Sloan School of Management in Cambridge, Mass. "In the year it would take [to run a test market], competitors would put on a crash program and start a rollout of their own."

From art to science

Some technology-driven services have emerged in the last decade that claim to make test marketing a more precise science, capable of producing better and faster answers.

One is a service called Behaviorscan, run by Chicago-based Information Resources, Inc. (IRI). IRI has carefully profiled approximately 3,500 participants in each of six small cities and given them identification cards. These cards are scanned

Continued on page 104

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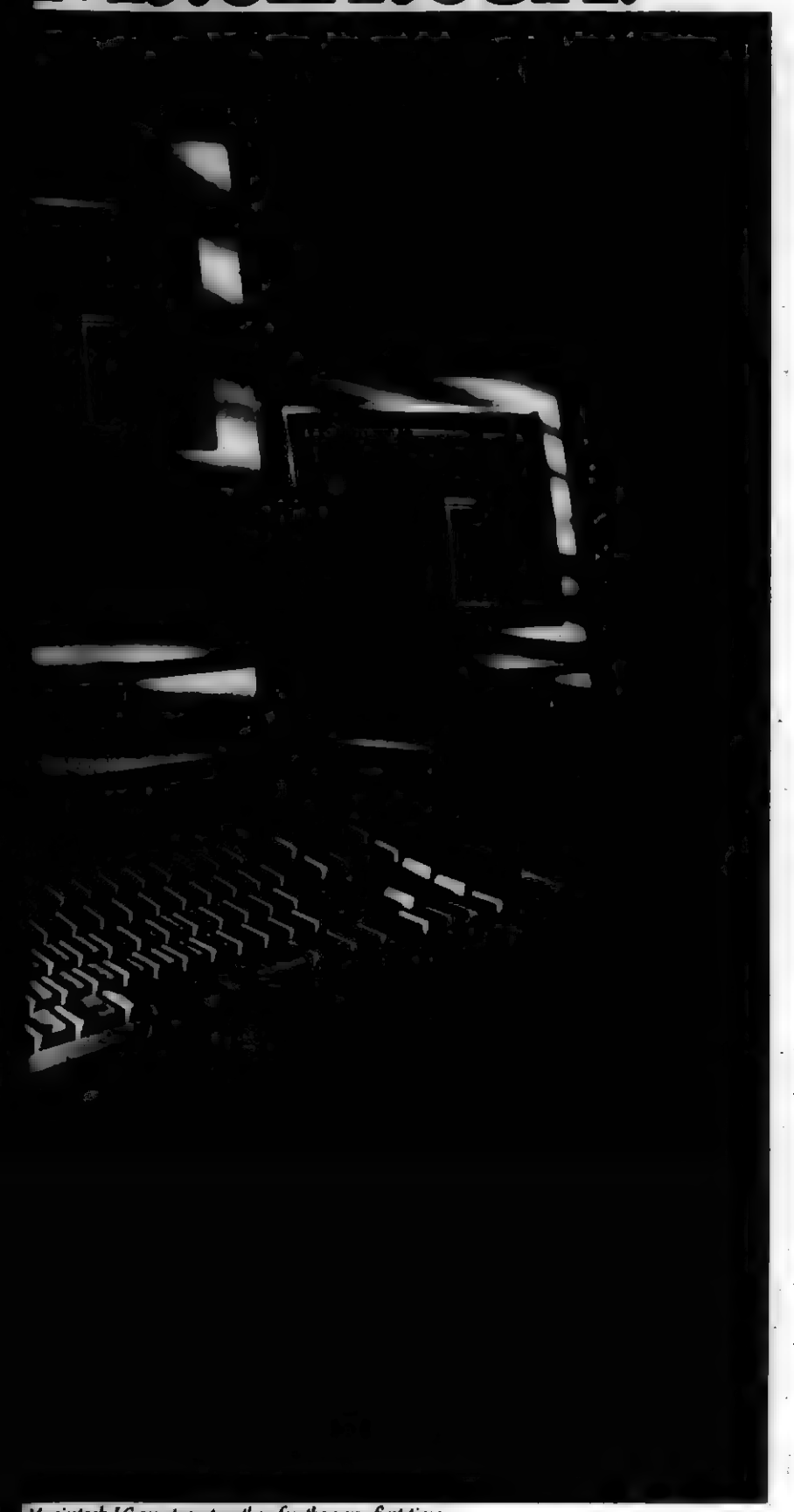

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Marketing is sold, but not satisfied

BY CAROL A. COULTAS

When it comes to information systems, marketing directors make savvy, demanding consumers.

"We've got to find some way to slice and dice the tremendous amount of information out there," says Michael Patrick, senior manager of market analysis at S. C. Johnson and Son, Inc., the makers of Johnson Wax products, in Racine, Wis. "The ideal system would allow us to do the filtering of information and then to format and graph it in such a way that our marketing decisions are made obvious."

James McCarter, director of marketing at Freedom Forge Corp., a steel company in Burnham, Pa., has his own ideas about an ideal system — born mostly out of frustration with his current data retrieval system, which he says is inflexible and not user-friendly.

"I hate it," he says. "If someone were to ask me what our sales are like in the Chicago area, I would have to go in and start sorting data from the Chicago area. It could be done, but it would take a lot of time to do it."

Tailor to fit

Although James Morgan, senior vice-president of planning at Philip Morris U.S.A. in New York, says that he's very satisfied with his company's current marketing information system, the variety of software capabilities can seem daunting. "It's well presented," he explains, "but when you deal with sales figures, there are 87 different ways to present the data. That's a living experiment. We just keep tweaking the system."

Tailoring information systems to marketing needs, which are both very specific and very changeable, is an ongoing challenge — but one that is key in maintaining a competitive edge, according to marketing executives.

Philip Morris' Morgan *considers marketing a 'living experiment'*

McCarter, for example, notes that his company is making improvements in systems for forecasting and reporting a major goal for 1991, particularly in the sales and marketing departments. "We're getting our customer files better organized," McCarter says. "Right now, forecasting is a little like Johnny Carson playing Carnac. Once we're better organized, we expect a higher degree of accuracy."

Patrick envisions a system that would allow S. C. Johnson to track not only its own products but also those of competitors or potential competitors. To illustrate his point, he uses a hypothetical situation in which his company makes razor blades but wants a system that provides data on men's skin treatment products — shave creams, colognes and hand and body lotions.

"Some categories, such as hand and body lotions, may be growing at a higher rate than others," Patrick explains. "And we'd want to look at segments within those categories, such as dry skin products. There may be an opportunity to supply a product of our own that meets a consumer need."

McCarter also believes that having access to information about his firm's competitors would provide Freedom Forge with an important edge in the marketplace.

"If you have information that shows a competitor's customer gets a product in eight weeks, and your lead time is 12 weeks for the same product, that's a pretty valuable piece of information," he says.

At K Mart Corp., information about competitors is integrated with demographics to help form a basis for making marketing decisions, according to Ron Gellish, general manager for corporate research and planning at the Troy, Mich.-based retailer.

"We maintain a database of our competitors' information so we can identify where our competitors are opening and closing units," Gellish says. "We use that information to analyze the impact on our business."

Gellish acknowledges that K Mart's information system is already fairly comprehensive but says that it still doesn't provide one particularly useful marketing tool — the actual demographics of the firm's customer; that is, who bought what item and at what price.

"We can look at a demographic area and see that within a five-mile radius around a certain store, the population is 90% white and 10% black and get an income profile and the number of kids," he explains. "But it's a leap of faith to say those are the people who are bringing all those widgets through the registers."

Joyce Rudd

S. C. Johnson's Patrick *needs a way to prioritize and segment market data*

Gellish notes that a retailer such as Sears, Roebuck and Co. can get that sort of information by analyzing customers' department credit-card use. Lacking its own credit card, K Mart relies instead on demographics and external market research companies such as A. C. Nielsen Co.

"If Nielsen says, according to its database, K Mart has 10% of the market for records, tapes and compact discs, then we'll look at our own sales data and see if there are areas where we fall below or far above the market," Gellish explains.

Nielsen is also providing information in hard copy from thousands of household "panels" who keep diaries to record purchasing patterns. K Mart is exploring the possibility of establishing an electronic linkup with the Nielsen panels to make that information more accessible.

They see the edge

Although marketing managers are not always perfectly satisfied with the information systems in place to support them, they don't underestimate what computer technology has done and can do to advance their companies' marketing efforts.

Several marketing directors contacted by *Computerworld* refused to discuss their use of IS, saying they were fearful of revealing strategies to their competitors.

Furthermore, in a *Computerworld* survey conducted earlier this year, 85% of the managers in user departments — including sales and marketing — agreed that information systems are the key to competitive advantage in the 1990s. •

Coultas is a free-lance writer in South Harpswell, Maine.

Continued from page 100

at each grocery store visit, thus supplying IRI with an accurate list of purchases. IRI has run 20 to 25 tests in each Behaviorscan market. More than half have been new product tests.

Part of Behaviorscan's appeal is its ability to monitor each participating family's cable television viewership and direct different advertisements at individual homes. IRI then shows the affect of different marketing strategies for new products.

A test using Behaviorscan costs anywhere from $50,000 to $300,000, not including advertising, according to Bob Bregenzer, an IRI senior vice-president.

Scanner strategy

Recently, Nielsen embarked on a different technology strategy by providing 15,000 households across the country with their own handheld scanners. After returning from a shopping trip, a household member scans all the Universal Product Codes of purchased items. Once every few weeks, he calls up Nielsen and downloads the scanner information by phone lines to Nielsen's IBM mainframe. As part of their total test marketing strategy, this gives manufacturers a more geographically dispersed picture of what types of people buy particular products.

Mall interviews have long been a staple of market research and a fast means of getting some reliable information on product potential without resorting to an actual shelf test. Here, too, computers are beginning to play a bigger role. Mall testing typically works by having researchers go into selected shopping arcades and ask several hundred people what product characteristics they'd like or show them real products and get their views. In some cases, shoppers are sent home to use the new item and are called later for their opinions.

Answers gathered by researchers always eventually wind up being fed into a computer for analysis. What's new is that personal computers are now being placed on-site at the malls. This summer, The Bases Group in Cincinnati started equipping its interviewers with PCs. Previously, paper responses were shipped to Bases and keypunched, according to operations vice-president Christine Adams. Now, project time has been cut in half by having either the disks mailed or data downloaded via modem to Digital Equipment Corp. VAXs. Adams adds, "We believe we'll save significant money once [the systems are] up and running." The savings should come from reducing or eliminating printing costs, shipping costs and the double checking of numbers, she says.

Duffy *says computers helped Pudding Pops lick the market*

Consumer responses

Another approach tried by some companies is to allow the consumers to key in their own computer responses. Several marketers say they believe this approach is less fruitful, however, because interviewers are more adept at flushing out good information from respondents.

Interactive PC graphics will soon allow manufacturers to test concepts more easily without the product in hand, says Rashi Glazer, assistant professor at the University of California at Berkeley's Walter A. Haas School of Business. In another year, he predicts, potential consumers will be shown computer-based images of products from which they can pick out features they like. This would save companies the time and money of making real mock-ups or prototypes.

In the meantime, others are working on different ways to attack statistical modeling. Little, for example, is reassembling old test data to answer questions such as: If the price were different, would the product do better? Using data models collected over three years on the buying habits of specific households, he is constructing models that will attempt to help predict the best way to introduce products in the future.

Test marketing, in the sense of controlled introductions of products in selected and measurable markets, will probably never be totally replaced. As Glazer notes, "The cost of being wrong is so much more expensive than test marketing."

There is, however, little doubt that in the future, computers will have a bigger say — not only in what gets to store shelves, but also what products should be subjected to good old-fashioned test marketing. •

Kerr is a free-lance writer in Los Altos, Calif.

IBM's most popular secret.

SQL/DS

ALTHOUGH SQL/DS IS installed on over 7,500 computers, some people think of it as IBM's "other DBMS" and as a junior partner to DB2.™

In fact SQL/DS, like DB2, OS/2® Extended Edition Database Manager and OS/400® Database Manager, is a critical part of SAA™ and an outstanding relational database management system in its own right. Introduced in 1981 for VSE and in 1983 for VM, SQL/DS was the first commercial relational DBMS for IBM mainframes. Over the years, it has matured through three major versions. Consequently, SQL/DS has the industrial-strength features and high performance that have led numerous businesses—including manufacturers, newspapers, shipbuilders, hospitals and universities—to run their mission-critical applications with it. These customers have applications with large transaction volumes, or large databases having tables of over 70 million rows and hundreds of views, or thousands of users.

Let's take a look at what makes SQL/DS Version 3 the best DBMS for users of the VM and VSE operating systems.

Standards

In addition to the high performance and robust features that serious database applications require, SQL/DS has three features that are essential to implementing the most important information architecture of this decade—distributed computing. These features work together to provide an excellent environment for implementing distributed applications.

The first feature is SQL/DS's adherence to international standards for SQL as expressed by the American National Standards Institute (ANSI), the International Standards Organization (ISO) and the Federal Information Processing Standard (FIPS) 127.1. FIPS has created a test suite so vendors can measure how close they come to the SQL specification. Version 3 Release 2 of SQL/DS easily passes this test. SQL/DS even provides a "FIPS flagger" program to help users identify SQL statements failing to comply with the FIPS standard.

The second important feature is SQL/DS's participation in SAA connectivity using Advanced Program to Program Communication (APPC). This communication standard simplifies building cooperative processing applications with SQL/DS. In particular, APPC makes it easy to use SQL/DS as a database server in client server applications. In this style of distributed computing, the DBMS provides intelligent access to the data for client applications running on remote computers. These remote computers can be other mainframes, but more and more they are PCs with a graphical user interface such as OS/2 Presentation Manager.™

Not only do IBM's applications such as QMF use SQL/DS as a server, but third-party products are being used as front ends to SQL/DS to build applications. Independent software vendors are also attracted by the large installed base of SQL/DS users.

Distributed Data Bases

The third feature needed for effective distributed processing is support for distributed databases: the ability to access data at multiple sites, including locally, in a transparent fashion. One benefit of a distributed database is that local data can be retrieved without any network activity, thus reducing communications costs when compared with a centralized database at a single remote site. Another potential advantage is that each database node can be appropriately sized to the amount of data, the complexity of user requirements and the number of users. As the system grows, added demand can be met more easily than with a centralized system, by making smaller changes to existing nodes or by adding new nodes to the network.

SQL/DS's "remote unit of work" capability delivers these benefits by allowing a collection of database operations (called a unit of work) to retrieve and update data at a remote site. Future releases of SQL/DS will add support for "distributed unit of work," which allows a single unit of work to access data at multiple sites simultaneously.

Connectivity

Because companies often rely on a variety of operating environments, IBM is committed to extending distributed database functionality. Currently, remote data can be shared among VM SQL/DS databases, and IBM has announced data sharing between VM SQL/DS and DB2 databases. VSE Guest Sharing, using VM TSAF, provides access to local or remote VM SQL/DS databases to VSE users and applications running under VM. IBM intends to add interoperability with AIX,® OS/2 and OS/400 applications and databases as well.

SQL/DS delivers the three keys to implementing distributed processing—SQL standards, SAA connectivity and distributed databases. If you need to solve tough data management problems in a VM or VSE environment, SQL/DS is the obvious choice. Get in on the secret.

IBM

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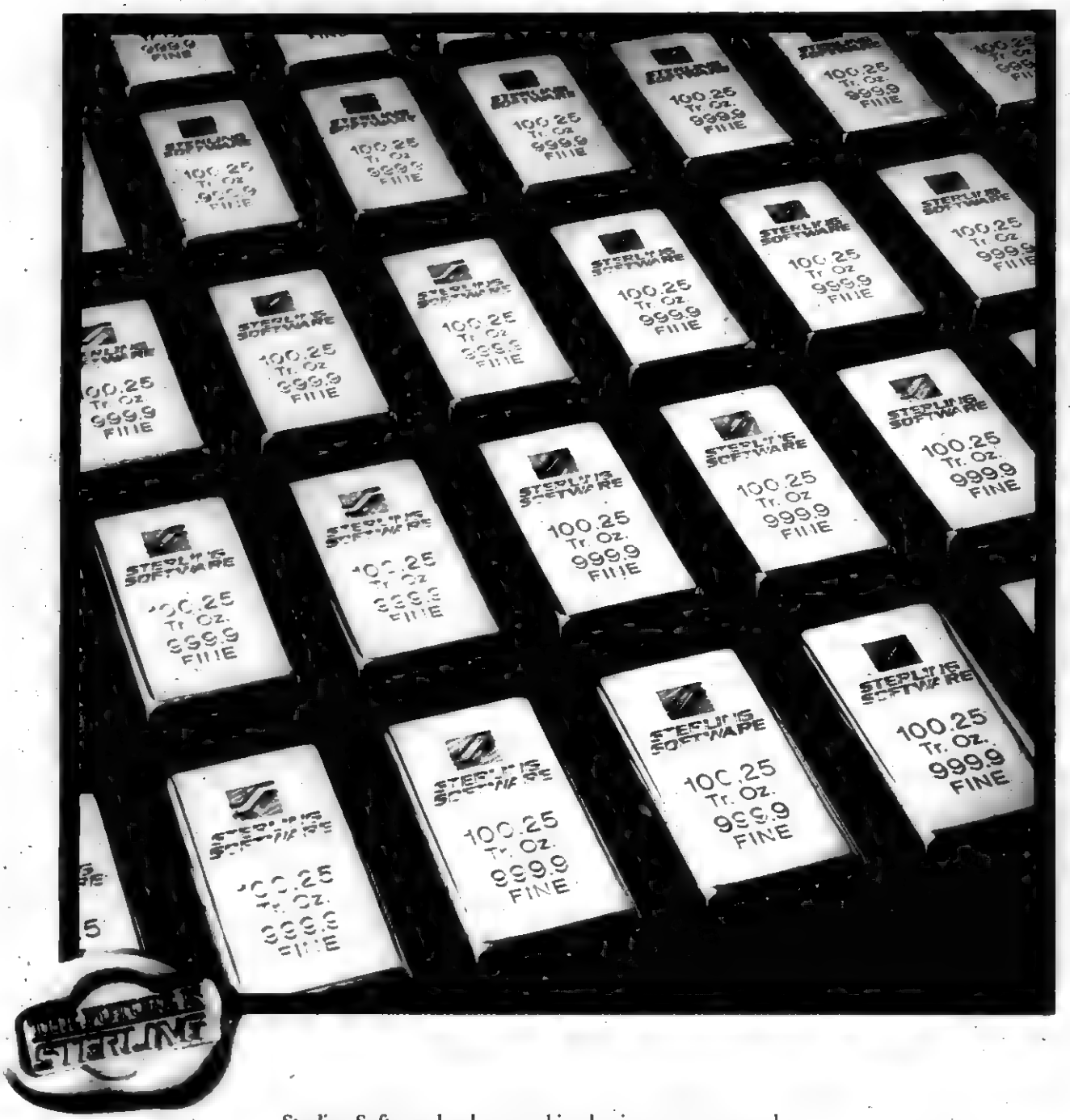

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Cyberspace '90

Sci-fi writer William Gibson explores the final frontier: Information

BY WILLIAM GIBSON

Bob Calvin

I was born in 1948, in the late dawn of the Information Age. I knew environments in which there were no televisions. My childhood was strongly colored by rampant technological optimism and a concomitant undertone of abiding dread. The two poles of the mass imagination were a glittering futuropolis, slick as Johnson's Wax, and the shadows of the nuclear wasteland. I was constantly told by various authorities that the atom would change everything. (Somewhat later, if less officially, I was told the same thing about LSD.)

I saw the world then — much as I see it now — as the ultimate science-fiction scenario. But the science fiction I grew up with was about technology as its makers would have had us receive it. The future would arrive on a stainless platter, probably of Scandinavian design, to be instantly and obediently taken up by Americans of my generation to be, it went without saying, applied to the purpose for which its manufacturers had intended it.

The science fiction I grew up with was seldom about garbage. Nor was it often about the messy and fascinating uses the human animal finds for the things that arrive daily from the uncounted factories of a world that sometimes fancies itself post-industrial. But the stainless platter is gone, replaced by a stream of cardboard-backed bubble-packs. There is no particular end in sight, and the street, home to the messy human animal, persists in finding its own uses for things. (We have it on reliable authority that Colombia's cocaine barons employ expert systems to route the global flood of their product.)

My own science fiction has tended to be about garbage, the refuse of industrial society. We swim, after all (and sometimes sink) in a sea of the stuff. We also swim, some of us, in largely uncharted seas of information, sustaining the very monsters of my bread and butter: the outlaw hacker and the great big corporation. When I wrote *Neuromancer* in 1983, "hacker" had not yet acquired its current freight of negative value. Hackers were obsessive, superbright boffins who delighted in worming their way as far into the texture of the emerging data matrix as possible. In fact, they were sometimes the very same techie folk heroes who brainstormed the personal computer into being, and a few of them even managed to become Great (or at least Pretty) Big Corporations in the process. To hack, in the original sense, was not bad; to hack was to *be there*.

Be where? Cyberspace. Not the neural-jacked fantasy purveyed in those paperbacks of mine. Rather, in the altogether more crucial version of the concept as currently championed by John Perry Barlow, Mitch Kapor and the Electronic Frontier Foundation: The totality of information existing in the matrix *right now*. Because cyberspace, as I've been muttering for years, is already here. Or rather, we are already there and have been for some time.

> I SAW THE WORLD then — much as I see it now — as the ultimate science-fiction scenario.

This is difficult for some of us to see, likely because we're more used to technologies that open pre-existing territories. Cyberspace, in Barlow's sense, is a territory *generated* by technology. As such, the "territory" itself is subject to constant growth and permutation — a cybernetic Wyoming writhing in some eerie interstice between concept and silicon. Yet this territory is certainly real because we can be rousted by the Secret Service for crimes alleged to have been committed there.

The electronic frontier

And now, teetering on the brink of a new world order/chaos theory, apparently having arrived just in time to describe the global political situation, we are told that virtual reality technology is about to change everything. The video helmets and data gloves of virtual reality are our hot tickets to the future.

But the future has junkyards, where one day even the hottest machines must be left out in the rain to rust. All technology eventually gathers dust. What matters is territory, and in its generation of territory, the advanced technology of information is unique. The territory is there now, awaiting partition. Fascinating as the potentials of virtual reality may be, I'm more impressed by Kapor's metaphor of the electronic frontier.

Cyberspace today seems just that, a virtual frontier sparsely inhabited by technical pioneers — loners, visionaries and even outlaws — all of whom are willing to live off the land. Both the hacker and the corporation (let us include governments and military entities) have been aware of the territory, in some sense, from the beginning — the hacker, by nature of his being, and the corporation, by virtue of its need to define itself.

The first hackers were — in many instances and quite literally — creators of

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Gibson is author of *Neuromancer, Count Zero, The Mona Lisa Overdrive* and *Burning Chrome*. He is a winner of the Hugo and Nebula Awards for science-fiction writing.

the territory they explored, and as such, they had a certain edge. But the railroad is no doubt on its way, in the form of the Great Big Corporation, and with it will come what my colleague Bruce Sterling has called the planned development of hyperreal estate. The proto-hackers of the 1970s may one day be remembered as cybernetic mountain men, the earliest settlers in a landscape long since dominated by data malls and information megamarts.

Or perhaps I'm merely being romantic; perhaps the mall, the dominant structure of our economy, is already firmly in place. In the data mall, the majority of users go about their business in the most ordinary way. Most, in fact, are as yet unaware of the mall itself and see only their own specific destinations and the functions they must perform there.

Amid these good and ordinary folk of Cyberia, however, there may sometimes be found exceptions: spies, vandals, voyeurs, terrorists, artists and combinations thereof.

But these others have one thing in common, if nothing else: They are aware that there *is* a mall. (Though our data mall currently differs from the concrete and glass model in one minor but perhaps crucial specific: Scattered amid the chain stores and fast-food franchises are meeting places of an almost European intimacy, nonprofit hangouts of hair-down boho splendor. These are bulletin boards, and our "other users" are prone to spend a good bit of time there.

Myself, I'll stick with garbage because my real business has less to do with predicting technological change than making evident its excesses. I'll stick with the poetry inherent in reels of magnetic wire recordings, rusting under a sun-faded card table at a California swap meet. We may not actually recall the machines required to summon voices from these brittle yards of steel, but there's an appealing melancholy in the fact that the vendor is unaware that these *are* recordings. All those voices. Other days, other days.

And one day our floppies will lie there by the millions, warping and gathering dust, not to mention that svelte laptop you've just decided on.

But meanwhile, I'd advise those of you so inclined to definitely go West. It's either El Dorado or a shopping mall — same as it ever was, somehow. ■

Linz, Austria/ Vancouver, B.C.
September 1990

The Difference Engine

An excerpt from Gibson's and Bruce Sterling's new book gives glimpses of life in high-tech, 19th-century London

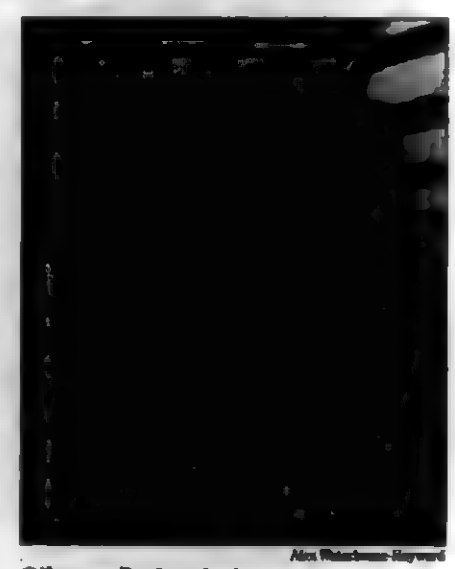
What if the Information Age had begun in the Victorian Era — and Charles Babbage perfected his mechanical computing engine before the development of electronics?

In their forthcoming novel, William Gibson and Bruce Sterling depict a London of 1855 that is both familiar and much changed. Steam-powered Babbage engines are run by an elite group of "clackers." Every man and woman has a government-issued number. Paleontologist Edward Mallory's discoveries made him a sure bet to join the ruling savants.

"Do you like your work, Mr. Tobias?"

"Pay's not much. Gaslight ruins your eyes. But it has advantages." He shrugged again and pushed his way through another door into a clattering anteroom, three of its walls lined with shelves and card files, the fourth with fretted glass.

Behind the glass loomed a vast hall of towering engines — so many that at first Mallory thought the walls must surely be lined with mirrors, like a fancy ballroom. It was like some carnival deception, meant to trick the eye — the giant identical engines, clock-like constructions of intricately interlocking brass, big as railcars set on end, each on its foot-thick padded blocks. The whitewashed ceiling, thirty feet overhead, was alive with spinning pulley belts, the lesser gears drawing power from tremendous spoked flywheels on socketed iron columns. White-coated clackers, dwarfed by their machines, paced the spotless aisles. Their hair was swaddled in wrinkled white berets, their mouths and noses hidden behind squares of white gauze.



Alex Tehelnitschew-Hayward

Gibson: ***Back to the future***

Tobias glanced at these majestic racks of gearage with absolute indifference. "All day starin' at little holes. No mistakes, either! Hit a key-punch wrong, and it's all the difference between a clergyman and an aracnist. Many's the poor innocent bastard ruined like that . . ."

The tick and sizzle of the monster clockwork muffled his words.

Two men, well-dressed and quiet, were engrossed in their work in the library. They bent together over a large square album of color plates. "Pray, have a seat," Tobias said.

Mallory seated himself at a library table, in a maple swivel chair mounted on rubber wheels, while Tobias selected a card file [and] retrieved a pair of cards. "Were these your requests, sir?"

"I filled out paper questionnaires. But you've put all that in engine-form, eh?"

"Well, QC took the requests," Tobias said, squinting. "But we had to route it to Criminal Anthropometry. This card's seen use — they've done a deal of sorting work already." He rose suddenly and fetched a loose-leaf notebook — a clacker's guide. He compared one of Mallory's cards with some ideal within the book with a look of distracted disdain. "Did you fill the forms out completely, sir?"

"I think so," Mallory hedged.

"Height of suspect," the boy mumbled, "reach . . . Length and width of left ear, left foot, left forearm, left forefinger."

"I supplied my best estimates," Mallory said. Tobias plucked up the cards, dropped them through a slot and pulled a bell rope. There was a sharp clanging. In a moment a clacker arrived for the cards.

"Now what?" Mallory said.

"We wait for it to spin through," the boy said.

"How long?"

"It always takes twice as long as you think," the boy said, settling back in his chair. "Even if you double your estimate. Something of a natural law."

■

Tobias lowered his voice. "Truth to tell, sir, you could pay a common magistrate, or even his clerk, and have this intelligence for a few shillings, under the rose. Once you've someone's number, the rest is simple enough. It's a common clacker trick to read the engine-files on someone of the criminal class — they call it 'pulling his string,' or being 'up on a cake.' "

Mallory found this news of remarkable interest. "Suppose I asked for my own file?" he said.

"Well, sir, you're a gentleman, not a criminal. You're not in the common police files. Your magistrates, and court clerks and such, would have to fill out forms and show good cause for the search. Which we grant easily."

"Legal protocols, eh?" Mallory said.

"No sir, it's not law that stops us but the simple trouble of it. Such a search consumes engine-time and money, and we're always over budget in both. But if an M.P. made that request, or a Lordship . . ."

"Suppose I had a good friend here in the Bureau," Mallory said. "Someone who admired me for my generous ways."

Tobias looked reluctant and a bit coy. "It ain't a simple matter sir. Every spinning-run is registered, and each request must have a sponsor. What we did today is done in Mr. Wakefield's name, so there'll be no trouble in that. But your friend would have to forge some sponsor's name, and run the risk of that imposture. It is fraud, sir. An engine fraud, like credit theft or stock fraud, and punished just the same, when it's found out."

"Very enlightening," Mallory said. "I've found that one always profits by talking to a technical man who truly knows his business. Let me give you my card."

Mallory extracted one of his Maull & Polyblank cartes-de-visite from his pocketbook. Folding a five-pound note, he pinched it against the back of his card and passed it over. It was a handsome sum. A deliberate investment.

Tobias dug about beneath his apron, found a greasy leather wallet, stuffed in Mallory's card and money and extracted a dog-eared bit of shiny pasteboard. J. J. TOBIAS, ESQ., the card said in grotesquely elaborate engine-Gothic. KINOTROPY AND THEATRE COLLECTIBLES. There was a Whitechapel address. "Never mind that telegraph number at the bottom," Tobias told him. "I had to stop renting it."

"Have you any interest in French kinotrophy, Mr. Tobias?" Mallory said.

"Oh, yes, sir," nodded Tobias. "Some lovely material is coming out to Montmartre these days."

"I understand the best French *ordinateurs* employ a special gauge of card."

"The Napoleon gauge," Tobias said readily. "Smaller cards of an artificial substance, which move very swiftly in the compilers. That speed-is quite handy in kino-work."

"Do you know where a fellow might rent one of these French compilers here in London?"

"To translate data from French cards, sir?"

"Yes," Mallory said, feigning an only casual interest. "I expect to receive some data from a French colleague, involving a scientific controversy — rather abstruse but still a matter of some scholarly confidentiality. I prefer to examine it privately, at my own convenience."

"Yes, sir," Tobias said. "That is to say, I do know a fellow with a French compiler, and he'd let you do whatever you like with it if the pay were right. Last year, there was quite a mode in London clacking circles for the French standard. But sentiment has turned quite against it, what with the troubles of the Grand Napoleon."

"Really," Mallory said.

Tobias nodded, delighted to show his authority. "I believe it's felt now, sir, that the French were far ahead of themselves with their vast Napoleon project, and made something of a technical misstep!"

Mallory stroked his beard. "That wouldn't be British professional envy talking, I hope."

"Not at all, sir! It's common knowledge that the Grand Napoleon suffered some dire mishap early this year," Tobias assured him, "and the great engine has never spun quite properly since." He lowered his voice. "Some claim sabotage! Do you know that French term, *sabotage?* Comes from *'sabots,'* the wooden shoes worn by French workers. They can kick an engine half off its blocks!" Tobias grinned at this prospect, with a glee that rather disquieted Mallory. "The French have Luddite troubles of a sort, you see, sir, much as we once did, years ago!"

Used by arrangement with the authors from their forthcoming Bantam book to be published in March 1991.

Our man in cyberspace checks out virtual reality

Inside the goggles, you're a cartoon character for an hour

BY JIM NASH

It was like a dream, but electronic, like television. I was flying above a kitchen that I somehow knew was mine, though it resembled no room I had ever floated above. A big blue hand hung in front of my face and arthritically mimicked every movement of my own right hand.

I turned my head and saw that the room stood roofless and alone on a vast, unmarred plane. Hungry, I floated down to the kitchen floor and opened the white refrigerator. No peanut butter, cold chicken or beer. My head began to itch, and my eyes ached. This was becoming a nightmare. But even nightmares are usually more comfortable than this.

This was virtual reality — the sensual computer illusion forecast by William Gibson and other science-faction authors. In Gibson's books, this electronic hallucination is called cyberspace. In my book, it's like being a cartoon character for an hour.

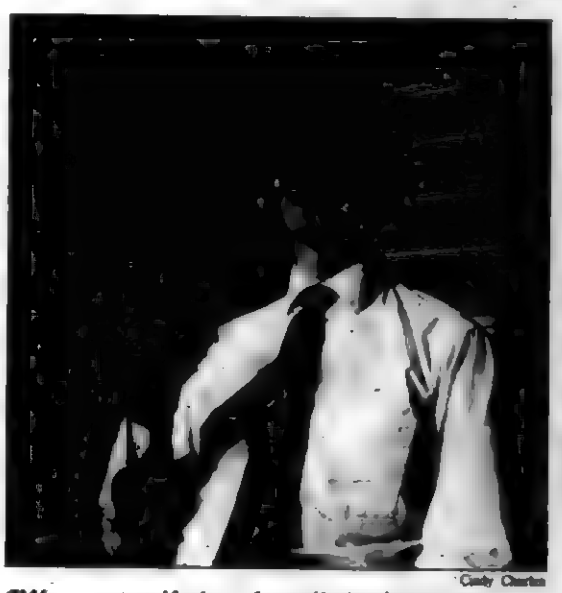
In real reality, I am at VPL Research, Inc. in Redwood City, Calif., which invited me to try out its brand of faux life. As I strapped on a black Lycra data glove, looking like the world's oldest Nintendo player, Ann Lasko-Harville, VPL's director of product design, explained the basic idea:

Three sophisticated, interactive computer programs, written in Forth, C and Pascal, put users inside a world of computer graphics. This allows users to treat system-generated objects almost as if they were real physical things. You interact with the environment using special clothing and fiber-optic sensors that interpret body positions as computer commands. In theory, a user can create a world limited only by his imagination and programming capabilities.

> I GRINNED, ENJOYING the power, as I realized that I was lord of a completely artificial world that would react almost instantly to my presence.

As I slipped the goggles on, I noticed an ankle-to-wrist lycra jumpsuit on a hanger outside VPL's demonstration room. Complete with fiber-optic piping that looks like something June Lockhart wore to bed in *Lost in Space*, the garment, I learned, is a virtual reality suit. It's designed to translate an average-size person's body movements into computer commands for a more realistic approach to virtual reality.

The idea is simple: The more the super-sensitive fiberglass is flexed, the less light is transmitted. The computer senses the lost light, then translates it into a movement command. However, not being average size at 6 ft 3 in., I had to settle for the glove.



Cindy Charles

CW reporter *Nash on the trail of a virtual world*

I nodded in understanding while I strapped on VPL's patented goggles, called Eyephones — a combination of twin color-LCD monitors, cushy ear phones and lead weights. The granulated lead, which hangs in a bag at the back of the phones, acts as a counterweight to the monitors.

Resembling a black cyclist's helmet with front and rear bumpers and weighing as much as two very heavy wet towels, the Eyephone is an interface to be reckoned with. Putting it on is a two-person job; one person pulls apart the headphones, while the other steadies and lowers the bulky Eyephone onto the wearer's head. Wearing it was akin to putting on a welder's mask and a hard hat: You felt secure but a little claustrophobic.

Once you adjust, the resolution is OK, similar to what you would see if you taped a Sony Corp. Watchman to your forehead — but nowhere near as good as your average IBM Video Graphics Array monitor. You can pretty clearly see dots on the screen. The overall effect is a washed-out, shadowy world with a lot of hard angles and no smooth curves.

The glove is connected via a cable to a custom Apple Computer, Inc. Macintosh IIX design/control workstation. The starter setup, called Reality Built for Two (RB^2), costs around $45,000 — plus the cost of the requisite advanced graphics workstation at about $50,000 to $100,000.

A whole new world

At first, it's hard to resist the urge to tug on the cable or avoid getting tangled in the bundle that runs between the Eyephone, the glove and the computer — even when you're sitting in a swivel chair.

But once you get past the heavy-headedness and the stifling feeling, life in a computer-generated world borders on realistic. And fun.

Of course, everything is weightless, an odd sensation to those of us who have never been in space. There are no smells other than the stuffy odors of a small office.

Ironically, although I seemed to be wearing blinders, the three-dimensional environment seemed to really exist. I grinned, enjoying the power, as I realised that I was lord of a completely artificial world that would react almost instantly to my presence.

The omnipresent and disembodied hand floating before me is a stylized 3-D representation of my own hand, which is firmly sheathed in the lycra-and-fiber-optic glove. My hand movements are mimicked by the screen hand with a jumpiness and delay like that of a mouse pointer.

Using the glove, it's possible to "move" in a disembodied fashion by crooking a thumb and pointing in the direction I want to float. I find that I can move, ghost-like, through walls.

Objects created in the application — stove tops, doors, steering wheels — can be moved if they have been programmed with a "hold" command, which allows you to "grip" the thin air and reposition them.

Run wild

During my trip I was transported into several environments. After the kitchen, I found myself in a generic, yellow two-door car. After experimenting a bit, I discovered it was possible to open the door, turn the 10-sided steering wheel and shift gears. The dashboard had all the ergonomics of a covered wagon, but nothing that a little more programming can't fix. Because I, like the car, lacked a body and had no pedals to work, it was impossible to do much more than fiddle with the cockpit controls and watch the idiotically waving dials. Soon, I got bored and turned to the next adventure.

Ahhh. This is much better. Puget Sound, Wash. Crude buildings (including a Space Needle of sorts) loom in the east, a bland strip of land to the west. In between is a placid waterway, complete with a whale and a ferry that crisscrosses the channel. I dive beneath the water.

While the details look more like geometry than reality, the illusion of going under the surface and watching both the whale and the ferry is fun. That's because a special algorithm helps make the movements a little bit more realistic. Playing tag with the whale is challenging, because the creature gains speed in a Doppler sort of way as it approaches.

After an hour, it is time to come back to my reality. I thank the VPL staff and head back to my office in Burlingame, Calif., to think about what I have seen.

VPL says virtual reality can be used today for viewing architectural models, scientific data, geophysical displays, sales pitches and design prototyping.

For all the good virtual reality might eventually hold for teaching bloodless surgery or accurate engineering, I decide that I prefer real flesh and blood. For now.

Nash is a *Computerworld* West Coast bureau correspondent.

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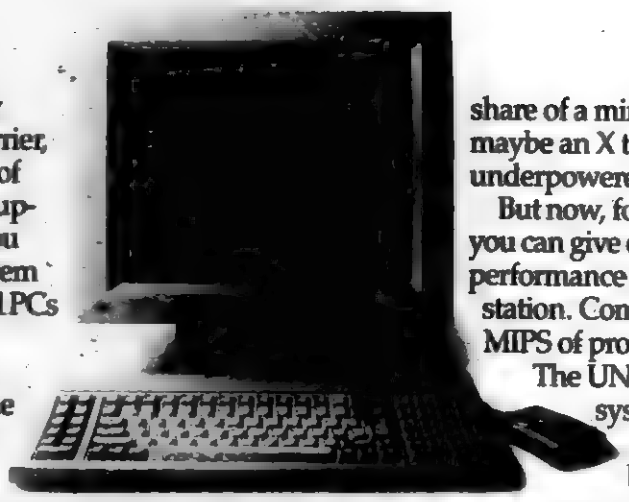

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NATIONAL
BRIEFS

Major shift at DG

Those who wondered what was up at **Data General Corp.** this month when three senior executives dropped from the employee rolls got their answer last week: a reorganization, aimed at speeding DG's return to profits. Under the new order, veteran DG executive **Tom West** will head the Advanced Systems Development Group. **Allan Jennings** will lead DG's Aviion Development Group. **William Zastrow** will do the same for DG. **Peter Gyenes** will head up international operations. **Joel Schwartz** will hold sway over proprietary systems efforts, and **Electronic Data Systems Corp.** veteran **David Jacob** will lead the firm's charge into systems integration.

■

Staying alive

Struggling for survival, San Antonio-based **Datapoint Corp.** released an announcement stating that the firm, aided by financial advisor **Kidder-Peabody & Co.**, "continues to explore [its] strategic alternatives . . . However, there can be no assurance that any strategic transaction will be consummated." Stay tuned.

EDS rides outsourcing to riches

Cost-cutting pitch wins points on executive row, but not always with IS management

BY PAUL GILLIN
CW STAFF

Three years ago, when a major Midwestern manufacturer started work on a new production line, it selected Electronic Data Systems Corp. to handle the factory automation work.

"They were a rather pushy company," remembered the information systems director, who requested anonymity. "They were always trying to expand what they were doing, make contact with upper management and get more business.

"But in the end," he continued, "they threw the resources at the job to get it done. I would rate myself a satisfied customer — with qualifications."

Hot-and-cold attitudes are not unusual among IS directors who have dealt with EDS. The company has a reputation for relentlessly pursuing new business once it gets inside a customer's door. But EDS has also won fans in both IS and senior management for the quality of its facilities management work and for generally delivering the cost savings it promises.

Today, EDS appears to be well-positioned to take advantage of the swell of interest in data center outsourcing. "They are in the finest single position of anybody in the industry," said Howard Anderson, president of The Yankee Group, a market research firm.

Observers cited a number of big advantages EDS enjoys: It has 28 years of outsourcing experience and a $127 billion sugar daddy in parent company General Motors Corp., which acquired EDS in 1984 and still accounts for more than half of its $6 billion in revenue. EDS has technology-sharing agreements or equity investments in dozens of vertical market firms. It is still sitting on nearly $500 million in cash with which to finance acquisitions in a depressed stock market. And a recent reorganization has split the company into vertical industry business units, geared to allow EDS to respond to changes in the market more quickly.

"Competitively, they're an absolute juggernaut," said Stephen McClellan, an analyst at Merrill Lynch Research/U.S.

McClellan rated EDS' stock (GM Class E) a "buy" and forecast 15% annual earnings growth during the next five years. Prudential-Bache Securities, Inc. analyst Charles E. Taylor Jr. rated EDS stock the most attractive of a generally moribund high-tech group right now. The Yankee Group sees EDS revenue approaching $10 billion in 1993 and its GM-derived revenue decreasing to a little more than one-third of total sales, compared with more than half today.

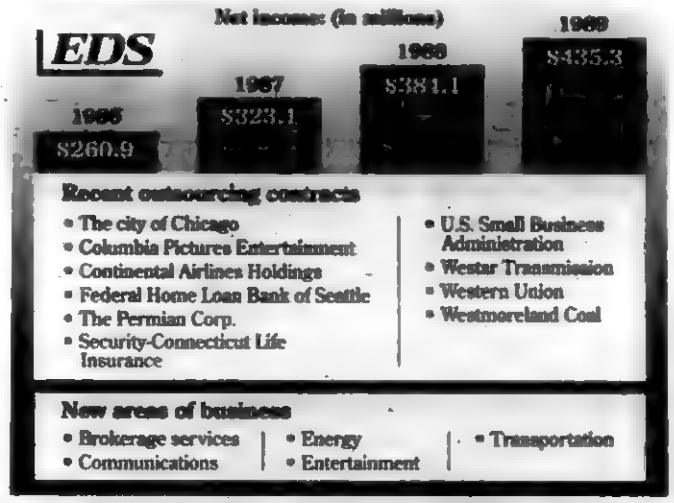
For a company that is still widely viewed as either a government contractor or GM's data processing department, EDS' list of recent commercial outsourcing deals is long. The crown jewel of 1990 is a 10-year contract to manage the IS operations of the System One airline reservations system. The deal, which is still pending, will generate $4 billion in revenue, EDS estimated. The company has a contract backlog of at least $16 billion.

EDS' success is not necessarily good news to IS directors. Many feel the confidence bred by that success has served to strengthen an arrogant strain that already loomed too large for customer comfort. EDS has historically sold over the IS director's head, bid-

Continued on page 117

Mining outsourcing's gold

Even as it piles up facilities management contracts, EDS continues to discover new veins of business to explore



Source: Electronic Data Systems Corp. CW Chart: Doreen St. John

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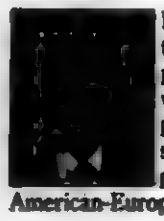
COMMENTARY

Gary H. Anthes

Collaborators with cold feet



Next month, a delegation led by the U.S. Department of Commerce will travel to Tokyo to present the U.S. response to Japan's recent proposal of a Japanese-American-European collaboration in intelligent manufacturing systems. If the tone set at a recent workshop on the topic is any indication, it will be tough going.

More than 100 people from U.S. industry and academia recently attended an informal half-day meeting at the Commerce Department to present their views on international collaboration in advanced manufacturing or, as one official put it, to help decide how to respond to "the wake-up call from Japan." Judging from comments made and not made, it can safely be said that most U.S. companies view intercompany and intercountry collaboration as being a bit like going to the dentist — it's no fun, and you put it off as long as you dare, but eventually you go because you have to.

Suspicion about the idea of getting into the testbed with competitors is natural, and the way the Japanese proposal was first made contributed to the prevalent view that the idea is just another way for Japan to take our ideas and run with them all the way to the bank. Japan's Ministry of International Trade and Development (MITI) originally proposed a 10-year, $1 billion collaboration, with MITI putting up $400 million and Japanese, U.S. and European industries each kicking in $200 million.

The U.S. and Europe looked that gift horse in the mouth, saw too many Japanese teeth and said, "No, thanks." A new proposal from Japan, made in August, suggests equal funding — and, hence, equal control — from the three regions.

An official with the Commerce Department said the Japanese explained the unequal payment idea as simply one of altruism, a way to show gratitude for the Marshall Plan. No one laughed at that, but no one believed it, either. "My greatest nightmare is that we go to all the trouble to set this up, and the Japanese come in and mine it while we stand back and bask in the glow and don't mine it," said Leo Hanifin, director of the Center for Manufacturing Productivity and Technology Transfer at Rensselaer Polytechnic Institute.

Carefully picking the projects on which to collaborate is key to putting together a win-win-win consortium. According to Commerce, Japan spends only 20% of its research and development dollars on basic research and the balance on applied, product-specific research. In the U.S., the numbers are approximately reversed. Balancing and complementing the strengths and weaknesses of each side are necessary to ensure that each party gets to do its fair share of "mining."

Paul Huray, senior vice-president for research at the University of South Carolina, and others suggested that another way to achieve win-win would be to propose projects in areas such as standards and industrial safety.

The Commerce Department says one of the problems with the first Japanese initiative, which bypassed Uncle Sam and went directly to U.S. industry, was that it appeared to be going after superior American know-how in software, artificial intelligence and systems integration technology without an equitable exchange of technologies.

> "MY GREATEST NIGHTMARE is that we go to all the trouble to set this up, and the Japanese come in and mine it while we stand back and bask in the glow and don't mine it."
>
> LEO HANIFIN
> RENSSELAER POLYTECHNIC INSTITUTE

But Masahiro Meshii, a professor in the Department of Materials Science and Engineering at Northwestern University, said U.S. industry is too concerned about the loss of basic research knowledge, inasmuch as most of that is available now for the asking from U.S. universities and federal agencies. He strongly endorsed the consortium idea.

One other area of naivete shown by some attending the workshop was an assumption that the U.S. government would substantially fund one or more international technology consortia. In a climate of budget cuts and anti-"industrial policy," there are two chances the government will do that: slim and none.

Mark S. Lieberman, deputy assistant secretary for technology policy at the Commerce Department, will lead the U.S. delegation. He said he's looking for guidance from industry. Comments may be sent to him at the U.S. Department of Commerce, Washington, D.C. 20230.

Anthes is *Computerworld's* Washington, D.C., correspondent.

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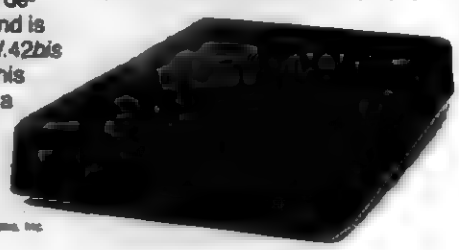

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IBM may be on the lookout for new networking partner

ANALYSIS

BY JIM NASH
CW STAFF

IBM and Microsoft Corp. have been together for so long, they share the same toothbrush. But monogamy may be one thing IBM is willing to sacrifice in the name of long-term networking market share.

About a dozen information systems managers contacted by *Computerworld* earlier this month said they believed IBM would be foolish not to consider at least one more solid local-area network partner beyond Microsoft. With about 60% of the LAN installed base sewn up, Novell, Inc. looks like the logical candidate. Novell would in turn gain much from closer ties to the hardware-standards king, the IS managers contended.

Users said they see greater cooperation between Novell and IBM as key to getting greater network interoperability and investment security. Down the line, every IS manager contacted said the warming rapport between the two companies of late is not enough to allay their overriding concern: How to fully connect extremely heterogeneous workplaces.

This concern could account for the optimism with which all reacted to an item in a newsletter published by consulting firm Meta Group, Inc. that predicted the likelihood of a formal agreement between IBM and Novell within the next 60 days. Meta Group analyst Frank Michnoff said he believes there is a good chance that the two will go so far as to staff a joint office dedicated to smoothing barriers between the two companies' product lines.

Rumors run rampant

Terry Bergman, senior personal computer coordinator at Toshiba America, Inc., and Bill Wolfe, president-elect of the Affiliation of Netware Users, said that they have heard rumors to that effect.

"IBM has realized that it's a multiplayer [LAN] game," Bergman said.

Wolfe said that he first heard murmurs of an IBM/Novell pact in 1989. He speculated that IBM may be growing nervous as Compaq Computer Corp. continues to move ahead in the server and workstation markets. He added that he looks forward to seeing IBM sell PCs with Netware already stored on their hard disks to simplify the configuration process.

Darryl Miller, executive vice-president of Novell's marketing and services, did not deny that such a proposition could be in the works. Miller said that while he knew of no such plans, "we always hold out the potential for such relationships."

An IBM spokesman said that specific cooperative agreements on specific products are anticipated, but no broad initiatives were expected. He emphasized IBM's continued support for Microsoft's LAN Manager network operating system, which serves as the core of IBM's LAN Server.

"On a de facto basis, a cooperative agreement already exists," explained Bill Lawrence, network engineer at Southern California Edison in Irvine, Calif.

IBM currently markets Novell's Netware as part of its education-oriented and federal government networking systems. Novell has demonstrated porting Netware for IBM's Application System/400 using the midrange mainframe as a back up for the network. Also, at the Networld '90 Dallas trade show, the Provo, Utah-based company demonstrated Netware running on Officevision.

However, network managers want more. One IS manager said that he has long and reluctantly planned a shift from the Netware network operating system to Microsoft's LAN Manager in order to capitalize on IBM's staying power. Jeff Larimore, IS director at Home Intensive Care, Inc. in North Miami Beach, Fla., said he would abandon those plans if Novell and IBM were more in synch.

He explained that while Novell currently builds hooks into its products that tie into IBM hardware, that effort is not reciprocated. If it were, Larimore said, he could standardize on Novell without worrying about his long-term investment. Larimore runs a 60-user Netware network today and said he expects to add 15 more users in three regional offices in the Southeast soon. Lawrence said he would like to see Novell more fully support IBM's OS/2 Extended Edition, especially the operating system's data manager capabilities.

"For developers, [a closer relationship] would be fantastic," said Todd Booth, senior software specialist at Quotron Systems, Inc. Quotron develops software to deliver financial information to data brokers, most of whom have multivendor networks. "We have to look at what the customers have [installed], and the customers have everything."

Booth explained that he would like to see a new network-layer product from IBM that would accommodate Novell's media-independent Netware. "Maybe LAN Server could support [Internetwork Packet Exchange]," the protocol used by Netware. "Or at least they could come up with a common protocol," he said.

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IBM in the clear — somewhat

Others dissatisfied that Navy was not found unfairly influenced by IBM

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — IBM is off the hook for now on allegations that it unfairly influenced the U.S. Navy's computer procurement process. But the book is not yet closed on the 2-year-old controversy, in which six IBM competitors charged that IBM, the Navy or both acted improperly in steering business to the computer giant.

Also, independent of the specific Navy/IBM case, various federal oversight groups continue to grumble about what they see as an unjustified tendency to award mainframe contracts to IBM at the expense of viable plug-compatible competitors.

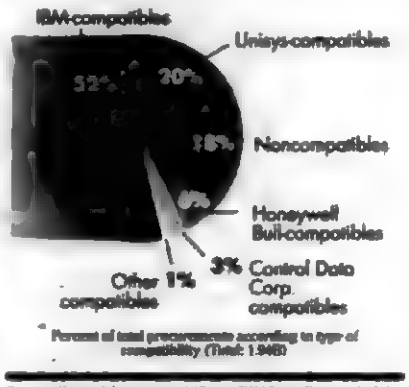
An investigation by the Navy into allegations of unethical conduct in several Navy procurements on which IBM bid found no evidence of wrongdoing on the firm's part.

"My conclusion is that IBM is an aggressive but fair competitor in the federal marketplace," said Rep. Frank Horton (R-N.Y.), a member of the House Government Operations Committee, which had requested the probe.

However, a source close to the investigation said the committee's final investigative report, to be released later this month, will find "a clear intent by the Navy to steer business to IBM." He said the report is likely to say that IBM was not totally blameless either.

Still investigating

Over half of government procurements have been going to IBM, but whether favorites are being played remains to be decided



Percent of total procurements according to type of compatibility (Total: $4.9B)

Source: General Accounting Office CW Chart: Doreen St. John

Despite a host of legal requirements for full and open competition, true competition in the federal marketplace for mainframe computers is "a myth," committee chairman Rep. John Conyers Jr. (D-Mich.) charged at a recent congressional hearing.

Conyers said agencies have a knee-jerk tendency to make awards to IBM, unfairly excluding competitors. "We have found that four federal agencies — Health and Human Services, Treasury, Agriculture and NASA — are so heavily dominated by IBM that it must be discouraging for IBM's competitors to even try," he said.

At Agriculture and Health and Human Services, for example, IBM labels hang on more than 80% of the mainframe boxes, according to figures from the U.S. General Accounting Office (GAO).

IBM disputes the assertion that it unfairly dominates, saying it sees greater competition in the government market than anywhere else.

While IBM has about 70% of the worldwide market for large systems, the GAO says that IBM has won only 47% of the large federal system buys over a recent three-year period.

IBM says the reason for its poorer performance in the government is that federal procurements are more driven by price — where the plug-compatible firms such as Amdahl Corp. generally have an edge — than by considerations of service and technology, where IBM insists it enjoys advantages.

An IBM spokesman said that federal computer users and taxpayers will be ill-served if an obsession to find a level playing field results in requests for proposals that are pitched at the lowest common denominator. "If they drop the level of technology to what's already been copied [from IBM by the plug-compatible competitors], lots of companies can bid, but the government will be 12 to 18 months behind on the technology," the spokesman said.

He added that IBM supports a growing trend for agencies to structure procurements to favor greatest value rather than lowest price.

However, clearly the shoe smarts when it is on the other foot. IBM recently protested an $841 million computer award by the U.S. State Department to Wang Laboratories, Inc., saying the competition was stacked unfairly in Wang's favor in various ways. The assertion is hard to prove or disprove, but a State Department official recently told *Computerworld* why the agency is dominated by Wang gear: "We bought Wang equipment years ago when they had the best word processing capability. We continue to buy it for compatibility reasons and because they give us superb service."

The GAO's figures showed that 82% of all mainframe procurements limit competition in some way. Based on a sample of mainframe buys totalling $1.9 billion, 52% specified IBM compatibility, and of those, IBM won 65% of the awards.

Milton J. Socolar, a GAO official, said agencies sometimes have legitimate reasons for limiting competition, as when a large installed base of software mandates compatibility. But he also said GAO had found examples "where competition was limited by a desire to expedite the procurement process or deliberately favor a particular vendor."

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Elmer Clegg, vice-president for federal operations at Amdahl, said the Navy has made improvements in its procurement processes recently, strengthening procurement management and oversight, appointing a procurement ombudsman and improving systems specifications in requests for bids. "Overall, in the past 12 to 18 months, we've gotten a good shot at the procurements the Navy has put on the street," he said.

However, Clegg added that he still sees "pockets of IBM bias in the Navy and elsewhere in the U.S. government."

New hands on deck at consortium helm

BY SALLY CUSACK
CW STAFF

AUSTIN, Texas — Sematech, a research and development consortium composed of 14 major U.S. semiconductor manufacturers and the U.S. Department of Defense, has named William J. Spencer as its new president and chief executive officer.

Spencer, a group vice-president and senior technical officer at Xerox Corp. in Stamford, Conn., succeeds the late Robert N. Noyce, who headed the consortium from July 1988 until his sudden death last June.

Spencer will direct Sematech's advanced semiconductor manufacturing staff and will also serve as the consortium's primary liaison to its member companies and the government.

Sematech defines its mission as providing the U.S. industry with the domestic capability for world leadership in semiconductor manufacturing. Member companies include: Advanced Micro Devices, AT&T, Digital Equipment Corp., Harris Corp., Micron Technology, Hewlett-Packard Co., IBM, Intel Corp., Motorola, Inc., Rockwell International, NCR Corp., National Semiconductor, Texas Instruments and LSI Logic.

Sematech's Spencer

Other members of the executive suite include Turner E. Hasty, chief operating officer, and Peter H. Mills, chief administrative officer.

Prior to Xerox, Spencer held research positions at Bell Laboratories and Sandia National Laboratories. He was research professor of medicine at the University of New Mexico's School of Medicine and received his Ph.D. in physics from Kansas State University.

> SEMATECH DEFINES ITS mission as providing the U.S. industry with the domestic capability for world leadership in semiconductor manufacturing.

As a consortium, Sematech is working to change national attitudes toward manufacturing by partnering with U.S. universities and research institutions to foster fresh, new ideas and expose academia to opportunities in the manufacturing sector.

EXECUTIVE CORNER

Parallan invites new CEO to guide firm to profitability

William B. Patton, the executive who guided **MAI Basic Four, Inc.** from losses to profits while increasing its profits almost 100% to $450 million, is the new chairman and chief executive officer at **Parallan Computer, Inc.**, in Mountain View, Calif. Parallan Computer makes and markets OS/2-based servers for use in client/server computing. Its executive team, which includes co-founder, President and developer **Giancarlo Ratazzi**, is hoping to leverage Patton's long-term industry experience and reputation for customer focus.

Cambridge, Mass.-based **On Technology, Inc.**, purveyors of applications software for the Apple Computer, Inc. Macintosh, has a new president: former marketing Vice-President **Conall Ryan**, who coordinated the rollout of On Technology's maiden product. Ryan joined the firm last year, following a stint as marketing manager at Next Computer, Inc. He succeeds On Technology co-founder **Mitch Kapor**, who will stay on as chairman.

Twenty-five-year computer industry veteran **J. Carl Masi** has been named vice-president of corporate marketing at **Unisys Corp.** Masi, 49, is a former International Data Corp. chief executive officer; prior to that, he spent 12 years serving Wang Laboratories, Inc. in a variety of senior management positions.

Maxtor Corp. has named **Albert J. Moyer** to the newly-created position of president and chief operating officer at the San Jose, Calif.-based disk drive company. Moyer, an electronics industry veteran, most recently served at Western Digital Corp., where he was senior vice-president and chief financial officer.

EDS

CONTINUED FROM PAGE 113

ding to take over the entire data center, said Rich Schmitt, president of Schmitt Consulting Group, Inc., a St. Louis-based outsourcing consultant. "EDS traditionally has wanted all or nothing," he said.

As a result, "Most IS managers I've dealt with who have worked with EDS have had a negative experience," said Richard A. Katzman, a New Cumberland, Pa.-based consultant who specializes in outsourcing advice. Employees who do not like the high-pressure culture they encounter when they transfer to EDS have no choice but to leave, he said.

EDS officials said they are trying to change the company's hard-bitten image, and they have won some admirers. "EDS has a very progressive set of career opportunities for their people, particularly their technical people," said John L. Torres, vice-president of The Ledgeway Group, a market research firm based in Lexington, Mass.

The company spends more than $100 million per year training its 60,000-employee work force. Its Systems Engineer Development program is so expensive that employees are required to reimburse the company if they leave within three years after completing the 10-week course.

IS managers will probably be hearing a lot more from EDS if the outsourcing trend builds as expected. EDS has used a pile of cash generated by the steady and profitable GM revenue stream to fund a distinctive contracting style: When the firm signs a pact to manage a data center, it also often buys an equity stake in the customer's firm. This allows EDS to gain vertical market footholds while simultaneously winning new business.

EDS paid $250 million for a 50% stake in Texas Air Corp.'s System One in February before signing the $4 billion outsourcing agreement [CW, Feb. 26]. Early last month it bought a stake in Westwood Equities Corp., a financial services firm, and signed a contract for an unspecified amount to run IS for Westwood's operating subsidiaries. Last year, it acquired a 20% equity stake in Hitachi Data Systems Corp. while picking up a deal to run the mainframe maker's North American IS.

EDS Chairman Les Alberthal calls the equity investment strategy merely a customer-driven change in the contracting process. "[Customers] want to take something out of that [data processing] investment that they've spent 30 years putting money into," he said.

It is also a way for EDS to pick up vertical market expertise that it can leverage elsewhere. For example, EDS officials said that the more than 8,000 employees it absorbed in acquiring and consolidating GM's data processing centers gave it manufacturing expertise it could never have acquired otherwise.

"We've had a cram course in manufacturing over the last six years," Alberthal said. That experience has helped EDS win business from such companies as Caterpillar, Inc., Cummins Engine Co. and Hoechst AG of Germany. It also led EDS last month to take an equity stake in Ask Computer Systems, Inc., a developer of manufacturing software [CW, Sept. 17].

Market watchers say that the risks for EDS are fairly small. The firm has a big head start on its direct competitors, said several analysts, and its market is growing fast enough to give everyone a piece of the action.

The most immediate threat to EDS' success is probably its own aggressive expansion, Torres said. "As you expand, your ability to manage consistently becomes much more of a challenge," he said.

EDS also needs to trade in its reputation for targeting only top management for a gentler image that stresses flexibility and accommodation to the customer's needs, analysts observed. EDS officials said that this year's multifaceted campaign to gain expertise in new vertical markets is part of an effort to do just that.

INTERNATIONAL BRIEFS

Philips slashes

The latest move in Dutch electronics giant **Philips N.V.**'s multiphase effort to boost itself back to the black side of the ledger and into a more competitive stance vis-a-vis its Japan rivals by cutting loose its unprofitable computer operations will be the layoff of 4,900 computer-related employees, the firm announced last week. According to recently appointed Chairman **Jan Timmer**, who is bidding to be the architect of Philips' reconstruction, the information systems division cut is one stage of a probable 10,000-person layoff anticipated as required for the firm's recovery.

■

'Bingo' in Spanish?

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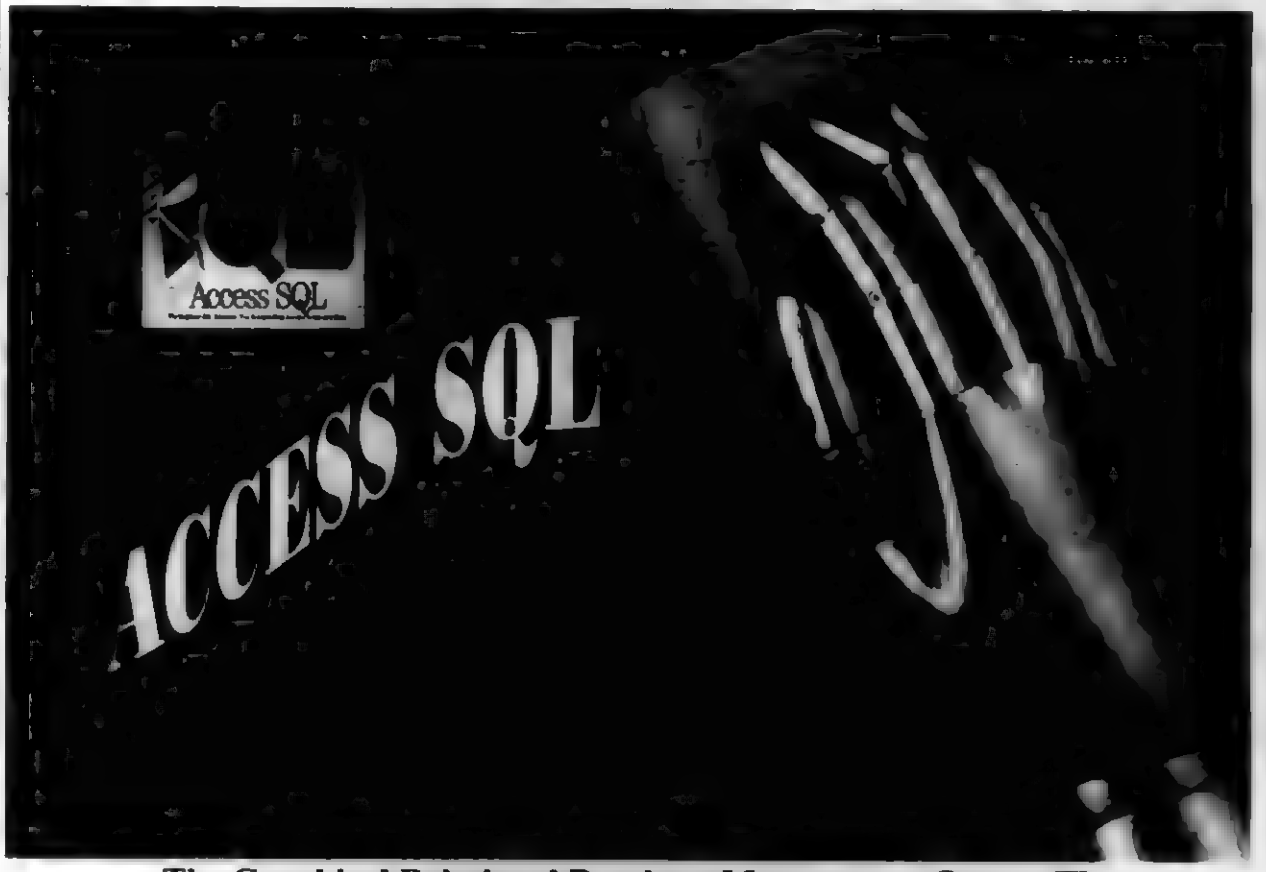

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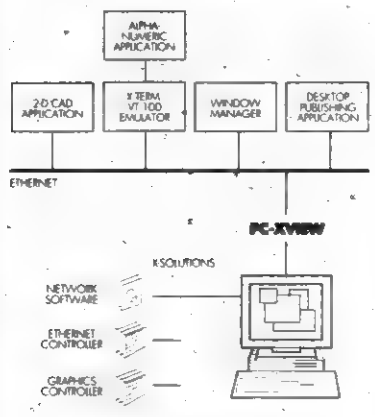

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— Russ Teubner
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IS banking careers feeling the squeeze

BY CONNIE WINKLER
SPECIAL TO CW

The actor's lament, "Don't call us, we'll call you" is proving just as accurate for the banking industry, which is in a state of high economic drama.

Indeed, at the end of first-quarter 1989, the commercial banking industry held 1,526,255 full-time employees; at the end of first-quarter 1990, that figure stood at 1,507,413, according to the FDIC Quarterly Banking Profile. What this translates to is about 18,842 layoffs or jobs slashed through attrition.

Since the first quarter of this year, thousands more bank employees have suffered similar fates. Although data couldn't be located on the number of information systems employees affected, recruiters and consultants report a rather bleak outlook for the industry.

"It's not a pretty picture for banking, what with the rest of the financial world sprawled all over the mat," says Chick Bisberg, president of Two-Party Systems, a recruitment firm in Livingston, N.J. "I'm hearing from senior-level IS managers who were unceremoniously dumped into the marketplace because of cutbacks, mergers or whatever the euphemism [the company uses is]."

The situation is especially painful for the IS professional whom the headhunters label "plain vanilla." Bisberg offers little hope for IS managers with generic management backgrounds: "They've done a solid job for 20 to 25 years, and suddenly they're without prospects."

These plain vanillas — mostly middle-aged, middle managers who have only worked on mainframes in the banking industry — are paying for the huge upheavals now facing the financial arena. It's an industry reeling from the savings and loan crisis, the stock market and real estate crashes and banking industry cutbacks and consolidations.

Curiously, the savings and loan defaults have had a lesser impact on IS employment: The thrifts frequently ran smaller systems and were always short on IS help anyway, employment experts say.

Bleeding nation

Most of the nation's leading banks, ranging from Chase Manhattan in New York to Bank of Boston and Bank of New England in Boston, have already had major employee layoffs. Even banks experiencing no cutbacks in IS are affected: Employee morale is low, and less work gets done because employees spend a lot of time trying to divine the meaning of the top manager realignments at many institutions, employees at several large banks report.

Nowhere is the upheaval greater than in the Northeast — particularly in the Boston and New York headquarters of the nation's biggest banks and financial institutions.

IS employees whose jobs are "safe" are nonetheless suffering the ramifications, salarywise. Even though it's good news that these people still have jobs, they can expect only slight salary improvements, says Roger O'Connor, senior consultant at Edward Perlin Associates, a management consulting firm. Banks are implementing major cost-cutting programs and have a surfeit of job applicants.

While opportunities are close to zero for some, the job scene improves dramatically if employees have strong technical skills, according to employment specialists contacted nationally. Demand is high for technical expertise in workstations and interfaces, the C programming language, Unix, Microsoft Corp.'s Windows, computer-aided software engineering tools and expert systems.

The most sought-after expertise, recruiters say, is in local-area network management, especially connecting networked personal computers to other systems. At one Wall Street bank, an office automation manager hired LAN administrators one year ago for $35,000 to $40,000; this year, the starting salary is $55,000 to $60,000. Suddenly, LANs have the blessing of senior IS management, the manager reports. "Until now, IS got away with thinking of PCs as toys. When they're networked, in order to function effectively, the LANs have to be institutionalized," the manager says.

Suzanna Opper, a consultant in New York who specializes in work-group computing, recommends that IS employees take time to get some LAN experience. After that, she advises them to move into other LAN jobs with greater opportunities outside of the banking industry. "The realistic financial services people I know are looking to move out," she adds.

Oldies show

One hidden area of opportunity is what John Heckers calls the "oldies but goldies." This means knowing how to use systems that are not trendy but are still being used because management can't afford to replace them, says Heckers, the founder and president of JWJ Consulting, Inc. in Denver, which fills jobs in mainframe shops. Programmers just want to learn and play with the newest toys and products and then move on, he says, but firms are stuck with old systems now more than ever.

While the East Coast and the Sunbelt are no longer the promised lands, recruiters report that they're having better luck placing IS professionals in the Midwest — Illinois, Ohio, Wisconsin — and California, particularly in Los Angeles.

However, relocation is no longer the salvation that it seemed to be in the 1970s and 1980s. An increasing number of firms refuse to pay the average $15,000 that it costs to relocate a family. Likewise, individuals are hesitant to take on that risk themselves. People now ask themselves, "What's the downside if things don't work out at the new assignment?" Bisberg says.

Winkler is a free-lance writer based in Seattle.

Two steps back

Hard times in banking and financial industries hits salaries, too

	1989		1990	
Average salaries	Banking	Securities	Banking	Securities
CIO/VP/Director of IS	$87,818	$83,311	$77,483	$78,404
Project manager	$50,950	$55,615	$49,281	$49,250
Senior programmer	$36,257	$32,731	$33,053	$33,231

Source: CW Salary Survey

CW Chart: Doreen St. John

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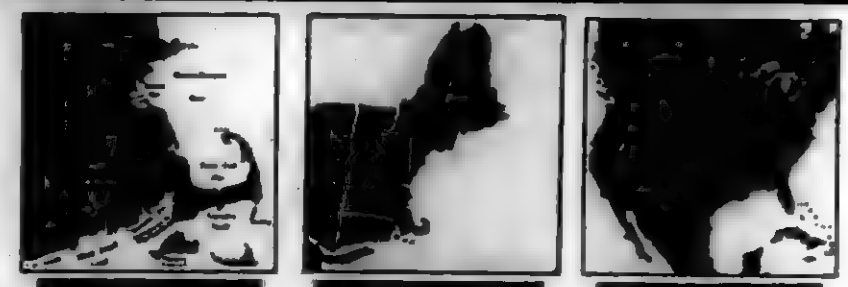

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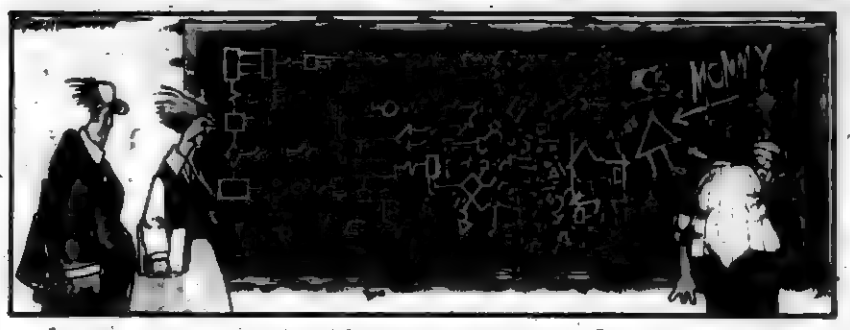

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- 23. Dir./Mgr. Sys. Development, Sys. Architecture
- 31. Mgrs., Supvr. of Programming, Software Dev.
- 32. Programmers, Software Developers
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OTHER COMPANY MANAGEMENT
- 11. President, Owner/Partner, General Mgr.
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- 41. Engineering, Scientific, R&D, Tech. Mgt.
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- 70. Medical, Legal, Accounting Mgt.
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- C. Microcomputers/Desktops
- D. Communications Systems
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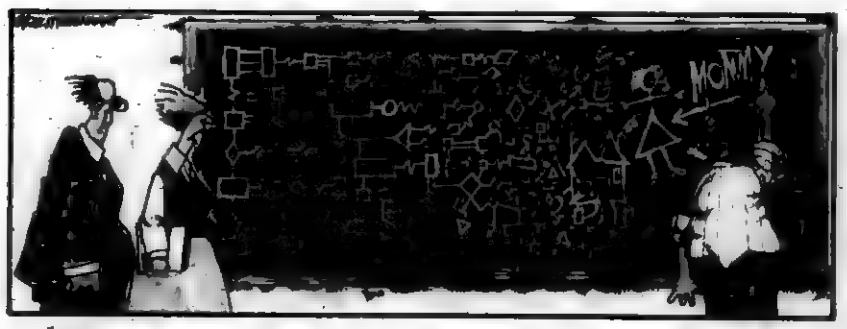

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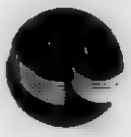

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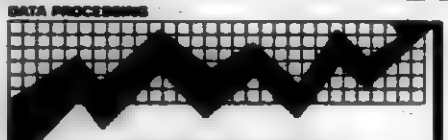

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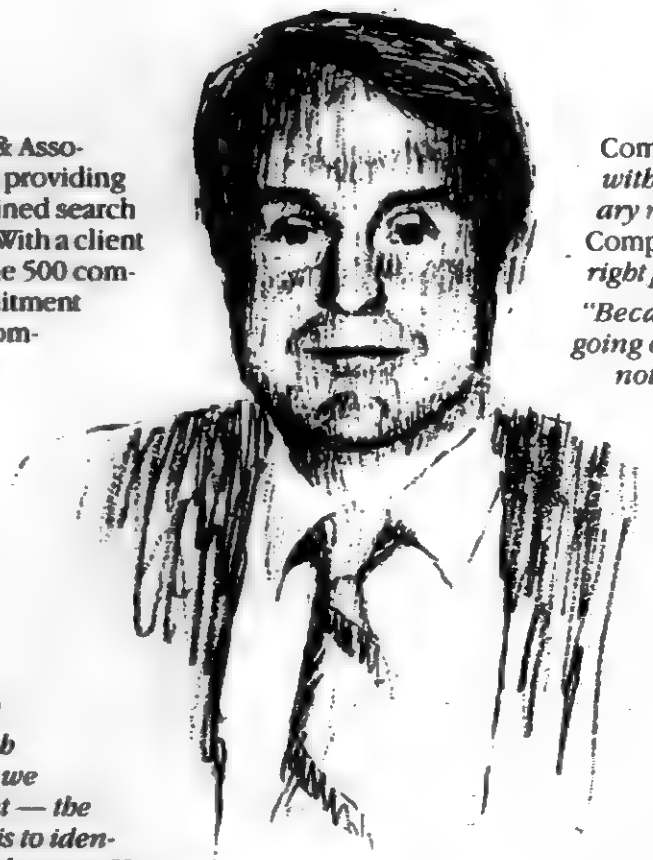
Significant sign-on bonuses, full relocation expenses, highly competitive salaries, exceptional benefits and a state-of-the-art environment are all possible for the best and brightest. If you'd like to be considered, contact us today. Send your resume to: David Brogan, YF56, Financial Staffing, Dept. 3726A, Aetna Life & Casualty, CityPlace, Hartford, CT 06103. Your reply will be acknowledged and held in strict confidence. Principals only; no phone calls, please.

Aetna

Aetna is an Equal Opportunity, Affirmative Action Employer.

"Computerworld is our primary source to find the right pool of top technical talent."

Bill Young
President
Bill Young & Associates



For over a decade, Bill Young & Associates of Fairfax, VA, has been providing cost-effective contingency and retained search services to companies nationwide. With a client base of small, mid-sized and Fortune 500 companies, the firm specializes in recruitment for data processing, engineering, communications, consulting, manufacturing, financial services and defense. On-site consulting and complete administrative/office support placement are offered by other company divisions as well. As explained by President Bill Young, they have a product to sell — and that product is people.

"I consider myself to be a technical talent scout. Every year we talk with over 50,000 professionals. Of those, we actively work with about 10 percent — the 5000 or so top candidates. Our job is to identify the best qualified, the cream of the crop. Here, Computerworld *serves as a valuable tool in helping us find top talent for new openings — and new openings for available talent.*

"The initial and most immediate goal of our recruitment advertising is to fill requisitions for existing positions. Computerworld *is our primary source to find the right pool of top technical talent. And, with* Computerworld, *we also get a secondary residual value that's difficult to measure. As a direct result of our recruitment advertising in* Computerworld, *we've gotten specific retainers with new client companies — plus secondary referrals up to 12 and 18 months later.* Computerworld *definitely gets us talking to the right people.*

"Because Computerworld *is the pulse of what's going on in the industry, the right people take notice. So when our recruitment advertising appears in* Computerworld, *we know we're telling the right people about our full-service package that encompasses everything from initial screening and resume preparation to travel arrangements, relocation issues, salary negotiations — even personnel practices and outplacement.*

"Looking ahead, we hope to expand our search service into the global marketplace. When the time is right, we'll be counting on Computerworld *to help Bill Young & Associates target international recruitment prospects as well. As long as we're in the business,* Computerworld *will always hold a prominent position on our recruitment advertising schedule."*

Computerworld. We're helping serious employers and qualified information systems, communications and PC professionals get together in the computer community. Every week. Just ask Bill Young. For all the facts on how *Computerworld* can put you in touch with qualified personnel, call your local *Computerworld* Recruitment Advertising Sales Representative today.

COMPUTERWORLD

The weekly newspaper of record for computer professionals.

Boston: 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171 (508) 879-0700
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Washington D.C.: 8304 Professional Hill Drive, Fairfax, VA 22031 (703) 573-4115
Chicago: 10400 West Higgins Road, Suite 300, Rosemont, IL 60018 (312) 827-4433
Los Angeles: 18008 Sky Park Circle, Suite 145, Irvine, CA 92714 (714) 250-0164
San Francisco: 18008 Sky Park Circle, Suite 145, Irvine, CA 92714 (714) 250-0164

An IDG Communications Newspaper

STATE OF IDAHO DEPT OF LAW ENFORCEMENT

Assistant Director
Information Systems Division

The Department of Law Enforcement has an immediate requirement for a hands-on Administrator with an extensive Public Safety and/or Law Enforcement background in a large mainframe DP operation. Our environment is a cluster of VAX VMS 6320's with WANS, LANS, on-line/real-time message switching, records management data bases and office automation applications serving a network of over 300 terminals and 150 plus PC's located in criminal justice agencies throughout the State of Idaho.

Responsibilities include overseeing the total needs assessment of the data center, long range planning, computer center design and construction as well as systems and network planning, design, development and procurement. Successful applicants must pass an extensive personal background check and polygraph examination.

Please forward your resume and salary history to the Idaho Dept of Law Enforcement, Dept JB, P.O. Box 55, Boise ID, 83707 to arrive not later than: 11/30/1990.

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Successfully providing software services and technology to Fortune 500 MIS departments and government organizations requires a SMART approach.

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Join our talented team as a Systems Analyst, Programmer/Analyst or Project Leader in positions located in Michigan, Minneapolis, Chicago and New Jersey. Immediate opportunities are available for those with the following skills:

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- CICS
- DB2
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- INGRES
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- SQL/DS
- ORACLE
- MS-WINDOWS
- SYBASE

As a dynamic, entrepreneurial company, we value top quality, experienced professionals interested in an excellent salary package, company-paid benefits, training programs and on-going growth potential. For immediate consideration, please call this week at 313/540-4446 or write:

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30300 Telegraph Rd.
Suite 200 - CW10 - 15
Birmingham, MI 48010
Fax: 313/540-4342

Equal Opportunity Employer M/F/H/V

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PROGRAMMERS AND ANALYSTS

The City of Austin, Texas is expanding system development teams for their financial and public utility systems. Austin, the State Capitol of Texas, has a population of approximately half a million people, and an annual budget nearing a billion dollars. Austin is located in the central Texas hill country on the Colorado River.

We are seeking Programmers and Analysts with a minimum of 2 years in a high volume, mainframe (MVS/XA) environment with experience in any of the following areas:

IDEAL/DATACOM
Job #56030-0050EF

Public Utility Billing & Service Systems
Job #56030-0050EF

AMS-LGFS/GPS Financial/ Accounting Packages
Job #56020-0020EF

Minimum qualifications include a Bachelor's degree in Computer Science, Management Information Systems, Business or related field, plus experience in computer programming and analysis of software in a mainframe environment. Some positions may require supervisory experience.

Applications/resumes must be received in the Employment Office no later than Friday, October 26, 1990. Submit to: CITY OF AUSTIN, Human Resources Dept., Employment Office, P.O. Box 1088, Austin, Texas 78767. Please include job number with application/resume.

Equal Opportunity Employer M/F/H

DB2 SYSTEMS PROGRAMMER

Nebraska Methodist Health System has a challenging opportunity for an experienced DB2 Systems Programmer in our Systems Software Unit.

The successful candidate will have primary responsibilities for the installation, maintenance and support of the DB2 software and all associated systems software. You will also assist in promoting an awareness of the capabilities and benefits of DB2.

This position requires:

- Several years experience with DB2 systems programming
- DB2 Performance tuning experience
- Working knowledge of DB2 structure, flow and logic
- Working knowledge of DB2 security structure and backup/recovery
- Database management experience including IMS/DB
- Strong analytical and problem solving skills
- Strong written and oral communication skills
- Demonstrated ability to manage complex systems software projects.

We offer a competitive salary and benefit package which includes dental insurance. If you are interested in this opportunity please call 402-390-6834 or send your resume to:

Sarah Mlnarik
Nebraska Methodist Hospital
8303 Dodge Street
Omaha, NE 68114

METHODIST HOSPITAL

EOE

ORACLE DATABASE ADMINISTRATOR STUDENT INFORMATION SYSTEMS UNIVERSITY OF CALIFORNIA, DAVIS

To effectively manage the SCT/ORACLE database, the DBA will control the installation of the new system, determine access, proportion resources, guarantee security, monitor resource usage, provide consultation and assistance to users, and oversee conversion and adaption of the new SCT software onto the hardware platform.

Requires strong experience in the management of a large scale ORACLE database and proven expertise in new system development. Knowledge of Student Systems Applications desirable.

Salary negotiable, based on qualifications and experience.

Submit a letter of interest, resume and the names and telephone numbers of three references to James H. Abele, Associated Director, Administrative Information Systems, University of California, Davis, Davis, CA 95616 by November 5, 1990.

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In San Antonio, Texas, you'll discover a rich multi-cultural lifestyle that combines urban amenities, easy commuting and one of the lowest living costs in the nation. It's a great place to raise a family, and we ought to know. USAA's corporate family is one of the biggest and best in San Antonio. We are an integrated family of companies providing insurance and financial products and services to officers of America's armed forces since 1922.

HARDWARE SPECIALIST

- Requires 6 years experience in configuration and environmental planning, installation, vendor coordination, and problem resolution for IBM mainframe and I/O equipment or plug compatible equivalents in a large multi-CPU Multi-Vendor computer center
- Communication equipment experience preferable
- Knowledge of the most current IBM mainframes, IBM I/O equipment, and plug compatible equipment available

MVS SYSTEMS PROGRAMMER

- Requires 2-3 years experience installing purchased packages with:
  — Software installation using SMPE
  — CA Products to include: CA1, CA7, CA11 or ACF2
- Experience supporting programmers, operators, and end users

NETWORK MANAGEMENT SUPPORT

- Minimum of 8 years experience with SNA
- College degree/or equivalent experience required
- Proven skills required:

— VTAM/NCP Dump Debugging
— VTAM/NCP Trace Analysis
— VTAM/NCP Control and Flow
— VTAM Programming
— LU 6.2 Development Experience
— 3745s, Token Ring
— Network Performance Tuning
— Network Management Tools use and/or development: Netview or Netmaster

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Attn: Employment & Placement/SD/TLL/CW
FAX: (512) 498-1489

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No agencies, please. An Equal Opportunity Employer, M/F/H/V.

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PROGRAMMER/ANALYST

For Class I Midwest Truckload Carrier. Leading edge technology AS400 B60. Satellite communication with fleet, Electronic Data Interchange, and Interactive Voice Response systems. Requirements: 2 to 3 years experience on System 38 or AS400. RPG III and CLP, and minimum 2 year degree. Send resume and salary history to: MIS Director, Munson Transportation, N. 6th St. Rd., Monmouth, IL 61462.

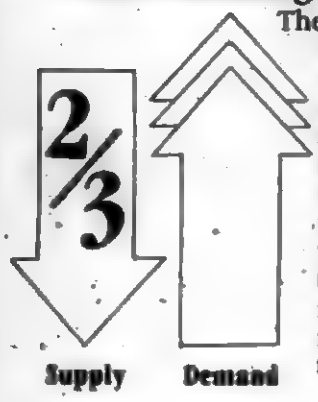
A few important tips on recruiting computer professionals

Finding computer talent isn't as easy as it used to be. In fact, there was a time when you'd just run an ad in the local newspaper and you could make a hire without waiting too long or spending too much.

But times have changed. And like so many facets of today's business, so has the effectiveness of traditional recruiting methods.

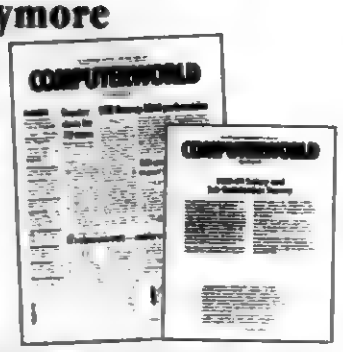
What's more, many of today's recruiters *don't use* today's most efficient methods — methods that save time and money for some widely unknown reasons.

The supply of qualified professionals isn't meeting demand



The American Council on Education reports that the number of college students choosing computer careers is down two-thirds since 1982. To make matters worse, there are more computers in today's business that require the skills of this shrinking market than ever before. And while you may never consider the company next door your competitor, it likely *is* competing for the same computer talent today. The result is a classic supply/demand problem that isn't changing for the better -and that's sure to make your recruiting tougher in the '90s.

Ads in local papers don't reach your major hiring market anymore



That's because they generally reach "active" job seekers — those who actively seek out the local newspaper to find jobs — and who a recent *Computerworld* job satisfaction survey found to represent 2 in 10 of today's computer professionals. The study also found that 7 in 10 of today's computer professionals are "passive" job seekers — those who would *consider* new job options, but likely never look for them in the local newspaper. (The remaining small percentage are "non-movers" content with long-term jobs.)

For every 10 of today's computer job seekers . . .
2 are Active
7 are Passive
1 is a Non-mover

In short, this means that your ad in today's local newspaper reaches no more than 20 percent of today's computer job seekers. What's worse, if you're not using other vehicles that reach far more job seekers, your local newspaper expenses are as inefficient as their limited audience.

More job seekers see your ad in Computerworld than in any other newspaper — Sunday, daily, or trade

That's because *Computerworld* reaches over 612,000 qualified computer professionals every week — the largest audience of its kind, and one that's rich with passive and active job seekers.

That's why more companies advertise more jobs in *Computerworld* than in any other professional newspaper. And why *Computerworld* is the *single place* where America's computer professionals *expect* to see the most jobs every week.

Computerworld gives you regional editions

A key option when you need a regional candidate and want to avoid national response and relocation. Yet if your search is national in scope, *Computerworld* can also give you more widespread national exposure than any other source.

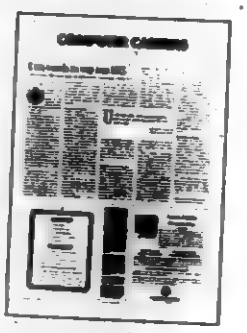
Computerworld needs just 3 working days for your ad to appear

That's comparable to most local newspapers. And why your ad can quickly appear in the next issue to start generating quality response.

Computerworld costs no more than local papers

And with a regional line rate of just $10.80, your cost-per qualified candidate reached is better than *any* newspaper - Sunday, daily or trade. Or just about any other source, for that matter.

Computerworld leads candidates to your ad



Just look at this week's Computer Careers section. You'll find a career editorial topic that will stir the interest of virtually any computer job seeker — passive *or* active. It's just one of countless reasons *Computerworld* is America's newspaper of choice on computing. No matter how much the times change.

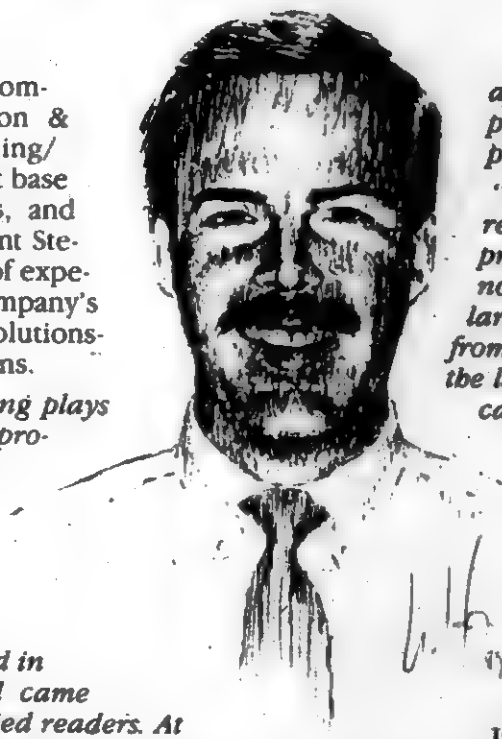
And while times may change, some things won't. Whether you *use* computers, *make* computers, or sell products and services *for* computers, *Computerworld* is still your major source of news today. And your major source of computer professionals tomorrow.

For more recruiting tips, call John Corrigan, Vice President/Classified Advertising, at 800/343-6474 (in MA, 508/879-0700).

Weekly. Regional. National. And it works.

"We'll be running a regular recruitment advertising schedule in Computerworld to get the results we need."

— Steven Tully
President
Brannon & Tully, Inc.



A custom software development company in Norcross, GA, Brannon & Tully, Inc provides contract programing/consulting services to a diverse client base of Fortune 500 companies, utilities, and communications companies. President Steven Tully knows that building a staff of experienced professionals is key to the company's ongoing success in developing solutions-based software for specific applications.

"Because our recruitment advertising plays a vital role in finding the seasoned professionals Brannon & Tully needs, we have to expect one thing. Results. That's why Computerworld *is the only trade publication we use for recruitment advertising.*

"Of the over 50 professionals we hired in the past 18 months, over one-third came from Computerworld's *pool of qualified readers. At our present growth rate, we're expecting to double our size in the next 18 months. That means we'll be looking to augment our staff with more and more industry, applications, software, and programming experts to meet the growing demand for greater project diversification.*

"With Computerworld, *we know our ads get read by a very large audience of seasoned IS professionals. Because these professionals are not industry or hardware specific, we get a larger base of qualified professionals to choose from. We also get national reach. In fact, within the last six months alone, we recruited two candidates who moved all the way from California to the Atlanta area.*

"In other words, recruitment advertising in Computerworld *draws bigger numbers.*

Computerworld. We're helping serious employers and qualified information systems, communications, and PC professionals get together in the computer community. Every week. Just ask Steven Tully. For all the facts on how *Computerworld* can put you in touch with qualified personnel, call your local *Computerworld* Recruitment Advertising Representative today.

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Washington, D.C.: 8304 Professional Hill Drive, Fairfax, VA 22031 (703) 573-4115
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SYSTEMS SPECIALIST — analyze the data processing requirements for new systems. Also design, maintain and program mainframe/micro computer systems. Requires BA in Computer Sci. or related, and 2 years of professional data processing systems analysis with one year of programming in large scale computer applications. Salary range: $29K to $36K.

SYSTEMS PROGRAMMER — assist in the development and modification of the Milwaukee Public School's mainframe operating system. Install, analyze and evaluate software/hardware. Requires degree in Comp. Sci. and three years of systems programming experience. Salary Range: $35K to $40K.

AUTOMATION & MATERIALS MANAGEMENT MANAGER (City Inventory Manager) — implement, coordinate and manage a citywide computerized procurement and inventory control system. Supervise the material management for all City warehouses. Requires degree in Bus./Comp. Sci. and 6 years of experience. Salary Range: $31K to $43K.

For applications and further information contact — Adrian I. Foster, City Staffing Division, Box CWSS, City Hall Rm. 706, 200 East Wells Street, Milwaukee, WI 53202-3554 or call 278-3371.

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City of Milwaukee

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FAX 24 HOURS 404 973 4052 or 404 977 8223 PHONE 404-971-7281

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Software Design Engineer-Chicago. Design, code, test and implement CCITT signalling system No. 7 (SS No.7) message transfer part (MTP) level 3 software for class 5 digital telephone switching systems. Two yrs exp in UNIX operating system and C language. Baccalaureate/Sci or Elect Eng, 2 yrs exp 9-5PM 40 hrs. $42,000./yr. Resume NO CALLS to: Illinois Dept of Employment Security, 401 South State St., 3 South, Chicago, Illinois 60605. ATT: Connie Evans, Ref#V-IL-1742-E. An Employer Paid Ad.

MARKET ANALYST required. Develop marketing proposals for establishing electrical distribution equipment consistent for use in Industrial Plants in Southeast Asia and India. Develop marketing proposals for Power System supply, demand and power factor control. Applicants required to have a Bachelor of Science Degree in Marketing and at least two years experience in the job offered. An annual salary of $28,000.00 will be paid for a 40 hour work week. Interested applicants contact the Oklahoma Employment Security Commission, 3105 E. Skelly Drive, Tulsa, Oklahoma 74105-7202. Phone: (918) 749-6851. Refer to job order number 091277. Ad paid by an Equal Employment Opportunity Employer.

ANOTHER REASON WHY COMPUTERWORLD RECRUITMENT ADVERTISING WORKS ...

Computerworld gives you large numbers of professionals who work in your industry.

When you're recruiting computer professionals, it's often important to find ones with experience working on systems specific to your industry. From manufacturing to banking, healthcare to insurance, Computerworld reaches the right people in every major industry.

Number of Computerworld Readers with Experience in Key Industries (Entire Career)

Job Industry	of Computerworld's Audience ...
Computer Vendor and Consulting	147,897
Computer Manufacturer	79,521
large-scale computers	37,110
medium-scale computers	45,938
small-scale computers	33,851
personal computers	47,758
technical workstations	24,899
Software Vendor	130,589
for large-scale systems	57,561
for medium-scale	74,967
for small-scale systems	61,274
for personal computers	76,787
for technical workstations	26,379
Non-CPU Computer Products Manufacturer	38,994
VAR/dealer/retailer	27,557
DP Service Bureau/contract DP Services	53,077
Consulting/planning	86,677
Manufacturer (not computers)	168,664
Insurance	52,910
Healthcare	64,729
Banking/financial Services	97,953
Government - federal/state/local	110,399
Business Service (except DP)	40,108
Communications Systems	28,913
Public Utilities	54,364
Transportation	26,031
Wholesale/retail Trade	111,095
Education	125,184

SOURCE: Staff Survey of Computerworld's Audience, May 1990.

To place your ad regionally or nationally, call John Corrigan, Vice President/Classified Advertising, at **800/343-6474 (in MA, 508/879-0700).**

COMPUTERWORLD
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Programming CONSULTANT/SYSTEMS ANALYST - With minimal supervision, provide systems analysis/consulting services in project design, development and implementation of communications, financial management information, and commercial systems. Analyze business data and transactions, financial data, statistics and/or accounting operations to design efficient user-friendly applications. Design, analyze, develop, test and implement data base systems and develop both hardware and software modifications. Duties entail work with IBM Mainframes, PL/1, ASSEMBLER, CICS, VSAM AND MVS/XA. Must have Bachelor's in Computer Science or Engineering or Math. Experience required is two years in job offered or two years as a Systems Analyst. Additionally, experience must involve use of IBM Mainframes, PL/1, ASSEMBLER, CICS, VSAM and MVS/XA. M-F; 40 hrs/week; 8:00-5:00; Salary $34,000/year; Dallas, Texas location. Must have proof of legal authority to work in U.S. Apply at the Texas Employment Commission, Dallas, Texas, or send resume to the Texas Employment Commission, TEC Building, Austin, Texas 78778, J.O. #5424583. Ad Paid by An Equal Employment Opportunity Employer.

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Try using CD-ROM technology to eliminate costly paper trails

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SPECIAL TO CW

Need to send three binders of forms and procedures to a dozen offices and update them every month? Why not put the information on a CD-ROM?

CD-ROMs, short for compact disc/read-only memory, look just like the compact discs that have been sold in record stores for the past five years, except instead of holding digitized music, they store data — and lots of it. A single CD-ROM can hold more than 500M bytes of information.

To get that information off the disc, you need a special CD-ROM drive. These drives look like regular compact disc players, except instead of connecting to your amplifer, they connect over a small computer systems interface to your computer. Most CD-ROM drives cost anywhere from $300 wholesale to $900 retail.

Because the data on most CD-ROMs is arranged according to International Standards Organization standards, you can read most CD-ROMs on different kinds of computers, including IBM Personal Computers, Apple Computer, Inc. Macintoshes and a number of workstations.

For nearly three years, publishers have been using CD-ROMs to deliver 100M-byte databases to the desktop. For example, you can buy a CD-ROM set containing the name, address, ZIP code and telephone number of every person living in the U.S. from Phonediac USA in Warwick, N.Y.

However, a less visible and potentially more widespread CD-ROM application is to distribute information internally, according to Jeff Casto, who manages retail products at Dublin, Ohio-based Discovery Systems, one of the largest CD-ROM manufacturers in the U.S.

The reason is cost: After spending between $1,000 and $2,000 to make a CD-ROM master, each disc can be pressed for about two dollars. If you are sending out 222,000 pages of text — about the amount a single CD-ROM can hold — the cost of the paper and postage alone far outweighs the cost of the CD-ROM, according to Knowledge Access International, a maker of CD-ROM indexing and retrieval software in Mountain View, Calif. Even if you are only sending out a 300-page binder, it's still cheaper to press and mail a CD-ROM.

Compared with floppy disks or magnetic tape, CD-ROMs offer the advantages of significantly lower failure rates as well as data permanence: The information on a CD-ROM can't be changed, accidentally or otherwise, and it is also safe from magnetic fields and coffee spills.

These days, it's quite easy for nearly anybody to make a CD-ROM. All you do is set up a hard disk with all of the files and directories that you want on the CD-ROM and copy them onto a backup tape. Next, send that tape to a CD-ROM mastering plant. At the plant, the data will be copied off your tape, processed and etched into a glass master. This master is then used to make the individual discs.

But setting up your hard disk — acquiring and arranging the data — can be a time-consuming task. First, you have to get the data on-line. If most of your documents are available only on paper, they will have to be retyped or scanned with an optical character reader.

Top 5 best-selling CD-ROM discs

1. Microsoft's Bookshelf
2. Grolier Electronic Publishing's Encyclopedia
3. Microsoft's Programmer's Library
4. Bureau of Electronic Publishing's Between Heaven and Hell II
5. PC-SIG's Library

Source: Bureau of Electronic Publishing — CW Chart: Doreen St. John

Next, you must figure out how to organize the data and decide how your users will read the information. For simple applications — having a CD-ROM filled with forms, for example — you may be satisfied just by putting the raw information onto the disc and letting your users copy it off. Most applications, however, will require suitable indexing and retrieval programs that cost $50 to $200 per copy.

Another advantage that companies find with CD-ROMs is their ability to update expeditiously. When a company sends out updated paper pages for a manual or a floppy disk with patches, installing the updates is often so difficult that users simply don't bother. The problem is most severe with technical documentation and procedures, says Richard Bowers, executive director of the Optical Publishing Association in Columbus, Ohio.

With a CD-ROM, instead of sending out updates, you send out new snapshots of the database, each one a complete copy containing every file. Users throw away their old CD-ROM and start using the new master CD-ROM.

Once your users get their CD-ROM drives, a whole world of information literally opens up. Many companies as well as the government are selling massive databases on CD-ROM, many for a few hundred dollars or less. And there are more than a dozen CD-ROMs containing public-domain software, fonts, music and images for IBM PCs and Macintosh computers, most costing $50 or less.

For an idea of the information available, request a catalog from the Bureau of Electronic Publishing, P.O. Box 43131, Upper Montclair, N.J. 07043, or call (201) 746-3031. The Optical Publishing Association provides a list of firms and consultants who specialize in helping businesses develop internal CD-ROM applications. The Association can be reached at P.O. Box 21268, Columbus, Ohio, 43221 or by calling (614) 793-9660.

Garfinkel is a free-lance writer and computer consultant based in Cambridge, Mass.

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XT Model 089	$550	$725	$400
AT Model 099	$900	$1,075	$850
AT Model 239	$975	$1,025	$700
AT Model 339	$1,025	$1,300	$900
PS/2 Model 30-286	$1,250	$1,300	$1,125
PS/2 Model 60	$1,500	$1,800	$1,400
PS/2 Model 70P	$3,375	$3,400	$3,175
Compaq Portable II	$975	$1,050	$875
Portable 286	$1,275	$1,450	$1,100
SLT-286	$2,500	$2,625	$1,700
Portable 386	$2,700	$3,000	$2,500
LTE 286	$2,100	$2,300	$2,000
Deskpro 286	$1,375	$1,400	$1,200
Deskpro 386/20	$2,900	$3,100	$2,400
Apple Macintosh 512	$375	$775	$275
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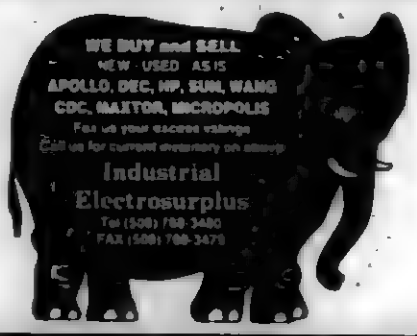

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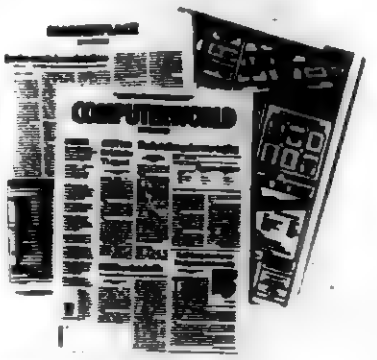

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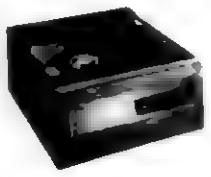

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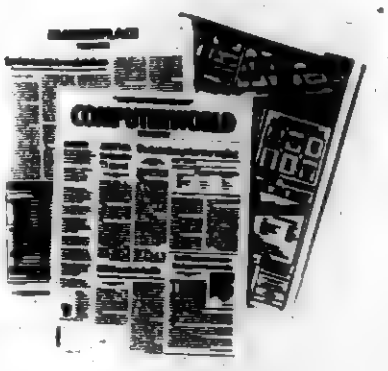

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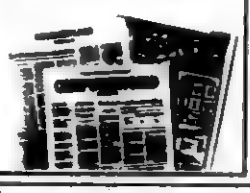

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The power of politics

Enhancing political skills can be a boon to IS managers

BY AVERY CLOUD
SPECIAL TO CW

Is politics a dirty word in your information systems department? It shouldn't be, and here's why.

Politics is the science of self-interest. It is the art of using influence, authority and power to achieve goals. Contrary to what most people think, however, politics is not inherently evil. Political skills, like technical skills, are just a tool for getting things done.

The problem is that political dexterity is not intuitively acquired. Even the brightest, most technically competent professional will have only limited success if he lacks political sophistication. An IS manager, along with everyone else in a company, must develop an understanding of the following concepts before he can wield a political sword:

Influence. Not everyone carries a lot of weight in a company. Respect is earned through social and professional networking, caucusing and so on. Influence can help managers gather voluntary support from the right people, or the right number of people, at the right time.

Authority. This is a valuable tool for any kind of manager because it places the weight of the organization behind his decisions. It is an official sanction that grants control of specific activities.

Power. This is a combination of the authority that is given to a person by the organization and the authority that followers give him by willingly submitting to his leadership.

A good grasp of these concepts can be used to your advantage.

Foul play

The next thing to be prepared for is dirty politics: unethical, illegal or immoral means used to satisfy some self-interest. Dirty politics can also mean the pursuit of some self-interest that is in conflict with the best interests of the company.

IS managers often see what they think is the best way to handle a project get swept under the rug. Why? Because of dirty politics. The solution that the manager thinks is the right one is often forfeited on behalf of some other political self-interest. Without a good understanding of what these self-interests are and how to get around them, IS managers might see outstanding projects crash and burn.

The self-interest stumbling blocks take several forms and all hold their own distinctions:

- **Departmental self-interest.** This might be seen in the department manager who is trying to make his department outshine others. This manager will favor decisions and projects that benefit his competitive agenda.
- **Personal self-interest.** A programmer who is trying to earn a promotion may show more affinity to decisions that will make him more promotable.
- **Corporate self-interest.** The senior executive interested in improving quarterly earnings might wear blinders to achieve this goal, ignoring anything that stands in the way.
- **Group self-interest.** Analysts, for example, might band together on decisions that would affect their position.

Every decision has some effect on, or is in conflict with, at least one of these self-interests. But if an IS professional is armed with influence, authority and power, along with an awareness of the self-interest stumbling blocks, he can take his quest two steps further.

Books for corporate political awareness

Organizations: A Micro, Macro Approach, by Richard L Daft & Richard M. Steers; Publisher – Scott, Foresman & Co.

A Book of 5 Rings: The Classic Guide to Strategies, by Victor Harris; Publisher – Overlook Press

The Art of War, by James Clavell; Publisher – Delacourt Press

Swim With The Sharks Without Being Eaten Alive, by Harvey Mackay; Publisher – Morrow

In Search of Excellence: Lessons From America's Best Run Companies, by Thomas J. Peters and Robert H. Waterman Jr.; Publisher – Harper and Row

CW Chart: Paul Mock

First, he can present each project to the self-interest group in the most nonthreatening manner possible. For example, he can focus everyone's attention on what they will get out of the deal. This way, he will be giving others a stake in the claim. Also, it can't hurt to vigorously market ideas, make decisions by consensus and keep affected parties up to date.

Second, where threat cannot be reduced, the IS manager can lobby for higher support until his decision is pushed through. He can appeal to the power brokers in the institution and use the principle of stakeholdership to gather enough power to overcome resistance.

Political training

An IS manager can play a big part in helping his staff become more politically aware, too. For example, a manager can invite employees to give input regarding decisions that will have a political impact. Managers should frequently and openly discuss the political ramifications of all projects and decisions confronting the department. A manager can use this to illustrate political realities and explain the many nuances of good political planning. Managers can also hold informal classes for their employees on the politics of their organization.

There are many good books, tapes and videos on the market that teach political awareness (see chart). A manager should make these a required part of each employee's annual training activities. He should also include a category in performance reviews that analyzes how well each employee has performed in terms of politics. With this kind of attention paid to political issues, the employee will be encouraged to take it more seriously. Formal education is also available.

While technical skills provide the vehicle for success, political skills grease the wheels. An IS manager should make sure that he and his staff are prepared for all of the twists and turns — and aren't left eating someone else's political dust.

Cloud is manager of technical services in the information services department at Bowman Gray/Baptist Hospital in Winston-Salem, N.C.

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(Required by 39 U.S.C. 3685)

1. Title of Publication: *Computerworld*
1b. Publication No.: 00104841
2. Date of filing: October 15, 1990
3. Frequency of issue: weekly, with a single combined issue the last week in December and the first week in January.
3a. Number of issues published annually: 51
3b. Annual subscription price: $48.00
4. Location of known office of publication: 375 Cochituate Road, Framingham, MA 01701-9171 (Middlesex County).
5. Location of the headquarters of general business offices of the publishers: 375 Cochituate Road, Framingham, MA 01701-9171 (Middlesex County).
6. Names and addresses of the publisher, editor and executive editor: Publisher, Fritz Landmann, 375 Cochituate Road, Framingham, MA 01701-9171. Editor, Bill Laberis, 375 Cochituate Road, Framingham, MA 01701-9171. Executive Editor, Paul Gillin, 375 Cochituate Road, Framingham, MA 01701-9171.
7. Owner: International Data Group, Penthouse, 1 Exeter Plaza, Boston, MA 02116-2851.
8. Known bondholders, mortgages and other security holders owning or holding 1% or more of total amount of bonds, mortgages or other securities: International Data Group, Penthouse, 1 Exeter Plaza, Boston, MA 02116-2851.
9. For completion by nonprofit organizations authorized to mail at special rates: Not applicable.
10. Extent and nature of circulation:

	Average No. Copies Each Issue During Preceding 12 Months	Actual No. Copies of Single Issue Published Nearest to Filing Date
A. Total number of copies printed (net press run)	169,932	165,914
B. Paid-and/or requested circulation		
1. Sales through dealers and carriers, street vendors and counter sales	None	None
2. Mail subscriptions (paid and/or requested)	153,474	149,974
C. Total paid and/or requested circulation	153,474	149,974
D. Free distribution by mail, carrier or other means, samples, complimentary and other free copies	14,021	13,055
E. Total distribution (Sum of C and D)	167,495	163,029
F. Copies not distributed		
1. Office use, left over, unaccounted, spoiled after printing	2,437	2,885
2. Returns from news agents	None	None
G. Total (Sum of E, F1 and 2 — should equal net press run shown in A)	169,932	165,914

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Traffic Manager

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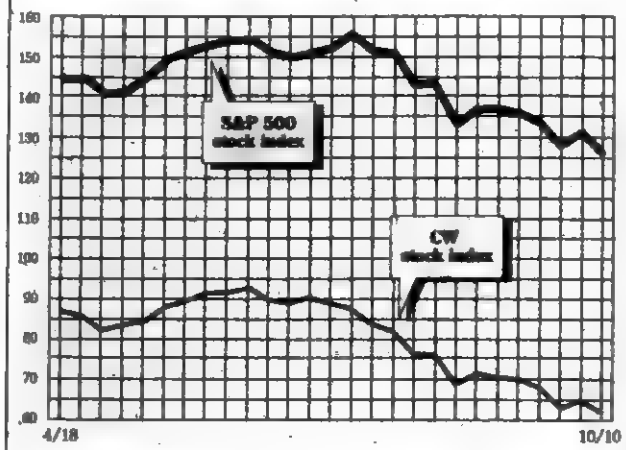
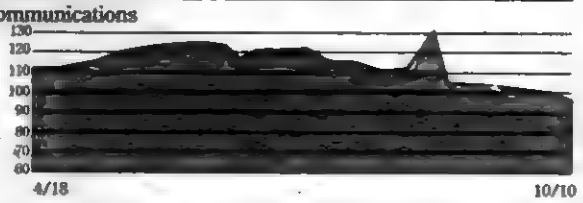


Indexes	Last Week	This Week
Communications	100.9	96.9
Computer Systems	62.2	60.1
Software & DP Services	90.9	86.3
Semiconductors	41.0	36.3
Peripherals & Subsystems	69.5	67.3
Leasing Companies	55.3	53.6
Composite Index	65.0	61.8
S&P 500 Index	131.6	126.9

Communications



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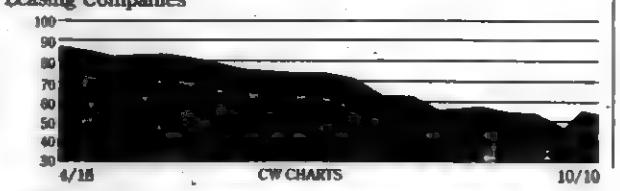
Software & DP Services

Semiconductors

Peripherals & Subsystems

Leasing Companies



CW CHARTS

Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, OCT. 10, 1990

EXCH		PRICE 52-WEEK RANGE		CLOSE OCT. 10, 1990	WEEK NET CHANGE	WEEK PCT CHANGE
Communications and Network Services						
N	AMERICAN INFO TECHS CORP	68	53	61.875	-0.1	-0.2
Q	ANDREW CORP	26	16	16.5	-1.3	-7.0
Q	ARTEL COMM CORP	10	2	2.375	0.0	0.0
N	AT&T	47	30	31.125	-0.4	-1.2
Q	AVANTER INC	6	2	1.75	-0.3	-12.5
N	AYDIN CORP	20	11	11.5	0.8	7.0
N	BELL ATLANTIC CORP	57	40	46.5	-1.5	-3.1
N	BELLSOUTH CORP	59	49	50.75	-1.5	-2.9
Q	COMPRESSION LABS INC	16	7	14.5	-0.9	-5.7
Q	CONTEL CORP	35	23	31.75	-1.0	-3.1
Q	DATA SWITCH CORP	4	2	2.875	-0.3	-8.0
Q	DIGITAL COMM ASSOC	27	9	9.25	-5.8	-38.3
Q	DYNATECH CORP	20	13	12.625	0.1	1.0
Q	FIBRONICS INTNL INC	13	5	6	-0.5	-7.7
Q	GANDALF TECHNOLOGIES	5	2	2.375	0.4	18.8
N	GENERAL DATACOMM INDS	6	2	2.375	-0.1	-5.0
N	GTE CORP	36	26	28.375	-1.1	-4.1
Q	INFOTRON SYS CORP	10	2	2.25	0.3	12.5
N	ITT CORP	63	42	42.375	-4.3	-9.1
N	M A COM INC	7	3	4.25	-0.1	-2.9
Q	MCI COMMUNICATIONS CORP	48	30	32.5	-0.6	-1.9
N	NETWORK EQUIP TECH INC	34	5	6.5	-0.1	-1.9
Q	NETWORK SYS CORP	15	7	8.625	-0.5	-5.5
N	NORTHERN TELECOM LTD	30	21	23.5	-0.6	-2.6
Q	NOVELL INC	29	12	21.5	-3.8	-14.9
N	NYNEX CORP	92	68	74.125	2.5	3.5
N	PACIFIC TELESIS GROUP	52	36	42.375	-0.5	-1.2
A	PENRIL CORP	9	5	4.875	-1.3	-20.4
N	SCIENTIFIC ATLANTA INC	29	13	12.75	-1.5	-10.5
N	SOUTHWESTERN BELL CORP	65	47	51.75	-1.9	-3.5
Q	3 COM CORP	19	7	7.375	-0.4	-4.8
N	U S WEST INC	41	32	35	-0.3	-0.7
Computer Systems						
Q	ALLIANT COMPUTER SYS	9	1	1.5	-0.5	-26.0
Q	ALPHA MICROSYSTEMS	7	1	1.375	0.0	0.0
A	AMDAHL CORP	19	10	11.125	0.0	0.0
Q	APPLE COMPUTER INC	50	26	26.5	-0.5	-1.9
Q	AST RESH INC	26	8	17.25	-0.3	-1.4
N	BOLT BERANEK & NEWMAN	8	4	4.875	-0.1	-2.5
N	COMPAQ COMPUTER CORP	66	37	38.75	-2.9	-6.9
N	COMMODORE INTNL	12	5	6.25	0.9	16.3
Q	COMPUTER AUTOMATION INC	6	0	1	-0.2	-15.8
N	CONTROL DATA CORP	22	8	8.5	-0.8	-8.1
N	CRAY RESH INC	51	22	22	-5.5	-20.0
N	DATA GEN CORP	16	4	4.875	0.0	0.0
N	DATAPOINT CORP	6	1	1.125	0.2	19.9
Q	DELL COMPUTER CORP	14	5	8.625	-1.3	-12.7
N	DIGITAL EQUIP CORP	95	47	47	-5.5	-10.5
N	FLOATING POINT SYS INC	4	0	1.625	0.0	0.0
N	HARRIS CORP	46	17	17.25	-1.5	-8.0
N	HEWLETT PACKARD CO	52	28	28.25	-2.8	-8.9
N	HONEYWELL INC	112	73	74.875	-7.1	-8.7
N	IBM	123	93	103.5	-3.9	-3.6
Q	INFORMATION INTL INC	15	9	9.125	-0.1	-1.4
Q	IPL SYS INC	14	5	9	0.0	0.0
N	MAI BASIC FOUR INC	9	2	1.5	-0.3	-14.3
N	MATSUSHITA ELEC INDL LTD	172	118	138.125	0.6	0.5
Q	MENTOR GRAPHICS CORP	26	10	10	-0.5	-4.8
N	NBI INC	1	0	0.156	0.0	-17.0
N	NCR CORP	72	53	53.125	-5.4	-9.2
Q	PYRAMID TECHNOLOGY	36	14	15.25	-1.4	-8.9
Q	SEQUENT COMP SYS INC	34	13	16.75	1.5	10.5
Q	SUN MICROSYSTEM INC	37	16	17.75	-1.8	-9.0
Q	SYMBOLICS INC	2	0	0.313	0.1	25.2
N	TANDEM COMPUTERS INC	30	10	9.625	-1.5	-13.5
N	TANDY CORP	47	24	25.375	0.3	1.0
N	ULTIMATE CORP	10	3	3.25	0.0	0.0
N	UNISYS CORP	20	3	4	0.0	0.0
A	WANG LABS INC	6	3	3.125	0.0	0.0
Software & DP Services						
Q	AMERICAN MGMT SYS INC	20	11	14	0.4	2.8
Q	AMERICAN SOFTWARE INC	18	8	7.625	-0.4	-4.7
N	ANACOMP INC	5	2	1.75	-0.1	-5.7
Q	ANALYSTS INTL CORP	24	10	10.5	0.0	0.0
Q	ASHTON TATE	15	5	6.375	1.1	21.4
Q	ASK COMPUTER SYS INC	10	4	4.625	-1.8	-27.5
N	AUTO DATA PROCESSING	60	44	47	-1.3	-2.6
Q	AUTODESK INC	60	32	32.5	-4.5	-12.2
Q	BMC SOFTWARE INC	30	16	19.25	-3.5	-15.4
N	BUSINESSLAND INC	12	2	1.875	-0.3	-11.8
Q	COGNOS INC	10	4	5.875	-0.9	-13.0
N	COMPUTER ASSOC INTL INC	17	4	5.25	0.4	7.7
Q	COMPUTER HORIZONS CORP	17	8	11	-0.3	-2.2
N	COMPUTER SCIENCES CORP	58	37	40.5	0.4	0.9
N	COMPUTER TASK GROUP INC	12	8	8.625	-0.9	-9.2
Q	COMSHARE INC	25	14	16	-0.5	-3.0
Q	CORPORATE SOFTWARE	16	7	7.25	-1.8	-19.4
N	GENERAL MTRS (CLS E)	38	24	32.25	-1.5	-4.4
Q	GOAL SYSTEMS INTL	18	10	9.5	-0.8	-7.3
Q	HOGAN SYS INC	7	2	2.625	-0.1	-4.5
Q	INFORMIX CORP	19	5	4.5	-0.3	-6.3
Q	INTELLICORP INC	8	2	2.625	-0.8	-22.2
Q	LEGENT CORP	31	17	17.25	-1.6	-8.6
Q	LOTUS DEV CORP	39	14	15.75	-1.0	-6.0
Q	MICROSOFT CORP	81	35	59.5	-6.3	-9.5
Q	NATIONAL DATA CORP	35	8	9	-0.5	-5.3
N	ON LINE SOFTWARE INTL INC	11	5	5	-0.4	-7.0
Q	ORACLE SYS CORP	188	5	6	0.4	6.7
N	PANSOPHIC SYS INC	18	9	9	-1.3	-12.2
Q	PHOENIX TECHNOLOGIES INC	5	2	1.625	-0.5	-23.5
N	POLICY MGMT SYS CORP	43	30	35.5	-0.8	-1.7
Q	PROGRAMMING & SYS INC	25	12	13	-0.3	-1.9
Q	RELATIONAL TECH INC	10	3	8.5	-0.4	-4.2
N	REYNOLDS & REYNOLDS CO	27	13	13.875	-0.6	-4.3
Q	SAGE SOFTWARE INC	16	8	9.875	0.0	0.0
Q	SEI CORP	22	15	15	-0.5	-3.2
Q	SHARED MED SYS CORP	17	12	15.75	0.0	0.0
Q	SOFTWARE PUBG CORP	28	14	15.75	0.0	0.0
N	STERLING SOFTWARE INC	11	5	6	0.3	4.3
Q	SUNGARD DATA SYS INC	28	15	16	-1.5	-8.1
N	SYSTEM CENTER INC	25	8	8.5	-0.8	-8.1
N	SYS. SOFT INC	29	14	13.875	-1.9	-11.9
Q	WORDSTAR	2	1	1	0.2	23.0
Semiconductors						
N	ADV MICRO DEVICES INC	11	4	3.875	-1.1	-22.5
N	ANALOG DEVICES INC	10	8	6	-0.3	-4.0
Q	ANALOGIC CORP	11	8	8.25	-1.1	-12.0
Q	CHIPS & TECHNOLOGIES INC	26	7	7.25	-1.3	-14.7
Q	INTEL CORP	82	30	29.75	-3.5	-10.5
Q	MICRON TECHNOLOGY INC	16	7	7.5	-0.5	-6.3
N	MOTOROLA INC	88	52	53	-11.0	-17.2
N	NATL SEMICONDUCTOR	9	3	3.375	-0.5	-12.9
N	TEXAS INSTRS INC	44	24	24.25	-2.5	-9.3
A	WESTERN DIGITAL CORP	15	5	5.25	-1.0	-16.0
Peripherals						
Q	ALLOY COMP	2	0	0.5	0.0	0.0
N	AM INTL INC	6	1	1.375	0.0	0.0
Q	AUTO TROL TECH CORP	4	2	2.25	0.0	0.0
Q	BANCTEC INC	24	13	12.75	0.0	0.0
A	COGNITRONICS CORP	6	3	6	1.0	20.0
Q	CONNER PERIPHERALS	31	11	13.625	-1.4	-9.1
A	DATARAM CORP	22	8	9.5	-0.9	-8.4
N	EASTMAN KODAK CO	46	35	38	-2.3	-8.0
N	E M C CORP MASS	7	3	5.625	-0.5	-8.2
Q	EMULEX CORP	8	4	5.625	-0.8	-11.8
Q	EVANS & SUTHERLAND	35	16	21	-0.5	-2.3
Q	ICOT CORP	2	0	0.563	0.0	0.0
Q	INTERLEAF INC	8	3	3	-0.4	-11.1
Q	IOMEGA CORP	6	3	4.375	-0.2	-4.1
Q	MASSTOR SYS CORP	3	1	0.938	0.1	22.2
Q	MAXTOR CORP	17	5	4.75	-1.0	-17.4
Q	MICROPOLIS CORP	10	3	6	0.8	14.3
N	MINNESOTA MNG & MFG CO	91	66	79.875	-2.4	-3.0
Q	PERSONAL COMP PRODUCTS INC	5	4	3.75	-0.1	-1.7
Q	PRINTRONIX INC	15	9	10	-0.3	-2.4
N	QMS INC	21	8	10.125	-1.5	-12.9
Q	QUANTUM CORP	28	9	14.25	-2.3	-13.8
N	RECOGNITION EQUIP INC	8	4	5	-0.1	-2.4
Q	REXON INC	10	4	4.625	-0.3	-6.1
Q	SEAGATE TECHNOLOGY	20	6	8.125	-0.5	-7.5
N	STORAGE TECH CORP	35	11	11.875	-0.9	-6.9
Q	TANDON CORP	4	1	1.625	-0.2	-10.4
N	TEKTRONIX INC	19	12	13.75	-1.1	-7.6
Q	TELEVIDEO SYS INC	1	0	0.219	0.0	-12.4
N	XEROX CORP	67	32	33.25	-1.6	-4.7
Leasing Companies						
N	CAPITAL ASSOC INTNL INC	7	1	1.063	0.0	0.0
N	COMDISCO INC	33	15	16.75	-0.1	-0.7
Q	LDI CORPORATION	18	11	10.75	-0.5	-4.4
Q	PHOENIX AMERN INC	5	3	4.813	0.3	7.0
Q	SELECTERM INC	8	3	3.25	-0.1	-1.9

EXCH: N—NEW YORK; A—AMERICAN; Q—NATIONAL

Castaways

Investors ran for the life boats as tech stocks hit rough seas

Grab those life preservers — technology stocks are sinking fast. In tandem with the big dive of the Dow Jones industrial average last week, tech stocks were also swamped with sellers, leaving many firms searching for a safe harbor.

The riptide pulled several bellwether companies under, including IBM, which lost 7¼ points last week to close Thursday at 101. Microsoft Corp. suffered a 6¾-point drop to 58, and Novell, Inc. skidded 5⅛ points to 15¾ by Thursday.

As in past weeks, the software sector showed more promise than other areas. Witness Ashton-Tate Corp. One of last week's few tech gainers, Ashton-Tate surged 1⅛ points to 7¼. Sterling Software, Inc. was also on the rise, edging up ⅜ of a notch to 6½ after strutting increased earnings for its fourth quarter.

Impending financials have some Wall Street watchers casting doubtful glances toward certain companies. Unisys Corp.'s third-quarter earnings projections were lowered recently by Prudential-Bache Securities, Inc., even though Prudential-Bache called the company a good long-term buy. However, Unisys shares advanced ⅜ of a point last week to 4.

Meanwhile, legal battles among semiconductor firms subsided but left stock prices lacking. Motorola, Inc. settled its disagreement with Hitachi Ltd. out of court and then released disappointing profit figures, yanking Motorola stock down 7⅛ points to 53⅜. No winner was declared in the argument between Advanced Micro Devices, Inc. (AMD) and Intel Corp. over rights to the 80386 chip; the case is still in arbitration. AMD lost ⅝ of a point to 4⅛, while Intel tumbled 3¼ points to 29⅛.

Among long-distance carriers, MCI Communications Corp. fell 1⅛ to 30⅜, AT&T was down by ⅝ of a point to 31⅛, and United Telecom, Inc. slipped 1⅛ points to 26⅜.

KIM S. NASH

NCR's spirit of Cooperation

BY ELLIS BOOKER
CW STAFF

NEW YORK — NCR Corp. last week took the wraps off Cooperation, a distributed, object-oriented software environment for enterprisewide computing.

The arrival of Cooperation is the second major announcement for NCR in the past month. In late September, it unveiled the first systems in a new hardware family to be built exclusively around the Intel Corp. microprocessor family [CW, Sept. 24].

The seven levels of the System 3000 computer family will range from laptops to massively parallel, loosely coupled behemoths composed of thousands of processors that, according to NCR, will be capable of up to 100,000 million instructions per second (MIPS).

The third and final leg in NCR's enterprisewide computer strategy will show its face tomorrow in Boston, when the company will describe a networking and network management scheme that uses the Open Systems Interconnect (OSI) model.

Taken together, the three announcements complete the Dayton, Ohio-based company's attempt to rapidly recast itself from a vendor of proprietary retail and financial systems into a standard bearer for open systems computing in the '90s, analysts said.

First in line

Cooperation is the first implementation of NCR's Open Cooperative Computing Architecture (OCCA), a client/server architecture it unveiled in February. According to NCR, Cooperation will run on Unix, DOS and OS/2 platforms at the client level and on OS/2 or Unix at the server level.

The software received universally high praise from analysts who had seen it.

"It hits all the right buttons," said Stuart Woodring, director of Software Strategy Research at Forrester Research, Inc. in Cambridge, Mass. "It's got open systems, a client/server architecture, object-oriented programming throughout . . . and it works."

However, while he praised Cooperation for its technical merits, Woodring questioned whether NCR, historically a hardware company, will be able to present itself as a credible vendor of software. By analogy, he noted the trouble Texas Instruments, Inc., a semiconductor company, has had in pushing its computer-aided software engineering tools.

Also at issue, according to Woodring, was the relatively hefty price of Cooperation — a couple of thousand dollars per user. "People will think twice or three times before buying an infrastructure product [at that price]," he said.

For the 24-user configuration of Cooperation, the price ranges from $40,000 to $58,000, or $1,700 to $2,500 per user, NCR said.

But Chuck Barney at Workgroup Technologies in Hampton, N.H., said Cooperation, with its promise to provide transparent access to information no matter where it resides in the organization, will have to be sold to "a different audience: decision-makers and executives, not the MIS department."

Barney added, "It strikes me that pricing is a secondary consideration if they can demonstrate [Cooperation's] problem-solving capabilities."

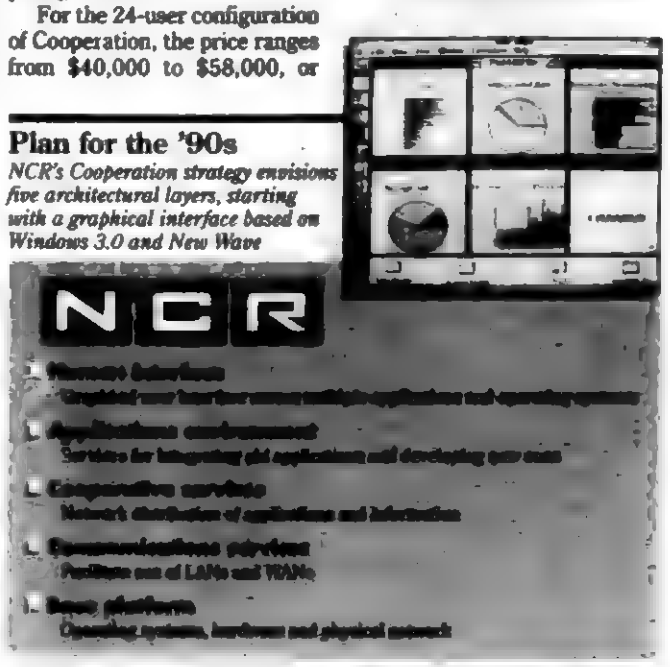
NCR hopes to use Cooperation as an entrance point into the executive suite, later using this to sell its high-performance System 3000 servers and workstations, Barney speculated.

"If NCR makes this work, they'll be No. 2 in no time, and IBM better watch out," said Dick Reddecliff, data processing manager of Sarasota County's MIS department in Sarasota, Fla.

NCR said Cooperation will enter beta testing at several customer sites this month. Availability for Cooperation with OS/2 servers and DOS clients is scheduled for March 1991; general availability of Unix Version 4 servers supporting DOS clients is scheduled for August 1991.

Plan for the '90s

NCR's Cooperation strategy envisions five architectural layers, starting with a graphical interface based on Windows 3.0 and New Wave



CW Chart: Paul Mock

Network edge

On Tuesday, NCR will deliver the third leg of its new computing architecture, a networking and network management scheme called Open Network System (ONS).

According to David Passmore, a partner at Ernst & Young's network strategies consulting group in Fairfax, Va., ONS will run on NCR's recently announced System 3000 hardware platform under Unix and NCR's Cooperation environment. An ONS node can be used either as a multiprotocol bridge router or as a network applications processor, for such services as electronic mail.

ONS will support Transmission Control Protocol/Internet Protocol, OSI, XNS (Xerox's old network protocol, now used in variants by 3Com Corp. and Novell, Inc.) and Digital Equipment Corp.'s Decnet. It will also support T1, Fiber Distributed Data Interface and X.25 transport protocols, as well as Ethernet and token-ring.

Making use of the same object-oriented "encapsulation" technique used by Cooperation to accommodate proprietary sofware applications, an ONS node will be able to handle data traffic using IBM's Systems Network Architecture (SNA) proprietary protocol. Network management will be handled by a new version of NCR's Netmanager software, which already supports LAN and PC management. Netmanager Release 3 will include support for the ONS node.

General availability of the ONS node and the new Netmaster is scheduled for the first quarter of 1991, coinciding with the general release of Cooperation.

OSF outlines pricing for distributed package

BY JOANIE M. WEXLER
CW STAFF

Large user companies and universities that would rather do their own integration of the Open Software Foundation's (OSF) Distributed Computing Environment (DCE), as well as the vendors who intend to support it, now have an inkling of what the price tag will be.

Last week, the OSF outlined the pricing structure for its DCE, a package of operating system- and network-independent integrated technologies announced in May and slated to ship during first-quarter 1991.

Universities may purchase a $5,000 site license, which gives them unlimited copies of source code and object code. For buyers that do not need to redistribute the software — such as companies that would like to study the technology and determine their requirements for their vendors — the cost is $15,000 for a three-copy source-code license. A three-copy license is $60,000 for systems integrators, who will resell the product.

The final cost to end-user companies buying repackaged DCE from vendors cannot be determined until the vendors have ported DCE to their platforms and priced the product. However, according to Jonathan Goslen, OSF's business area manager, a goal of the pricing structure is to allow distributed computing to proliferate, not just to allow deep-pocketed companies to use the technology.

Object-oriented credo praised

It is Cooperation's deep commitment to object-oriented programming that scored the biggest points among observers, who said that while other vendors use the object-oriented metaphor for the visible user interface but employ older, procedural code in the back end, the NCR product scheme extends object-oriented techniques throughout.

NCR said that the object-oriented philosophy, which reuses common pieces of software code across applications wherever possible, has been shown to provide up to 60% improvement in end-user productivity and decrease application development cycles by 70% compared with conventional programming languages.

"This is what IBM should have done with Officevision," said Stuart Woodring, an analyst at Forrester Research, Inc. in Cambridge, Mass.

Indeed, there have been reports that IBM is even now attempting to incorporate object-oriented programming into a number of its systems, including Officevision, AD/Cycle and even Systems Application Architecture (SAA). Woodring said he has heard on the street that IBM would offer an object-oriented SAA language by the end of the year.

Christopher Stone at Object Management Group, Inc. (OMG) in Framingham, Mass., said the object-oriented concept "has been real ethereal for the past year" but that NCR has lent credibility to the approach. "Frankly," he added, "they're one of the first to announce — publicly — but a lot of people are working on it."

NCR is a board member of the OMG, which now claims 90 international software, hardware and end-user members.

Cooperation is composed of 54 software modules, from electronic mail to an SNA APPC developer's kit.

The software consists of five layers (see chart), and applications that do not use object-oriented techniques can be "encapsulated" by the environment, NCR said.

For the user interface, Cooperation has an enhanced version of Hewlett-Packard Co.'s New Wave.

Among the more interesting modules in Cooperation are Workflow Automation, a graphical, object-oriented tool for designing and analyzing complex tasks; and the Business Information Monitor, which NCR bought from Channel Computing, Inc. in Newmarket, N.H., which allows a user to automatically gather data from a variety of sources and display it graphically.

Quake

FROM PAGE 1

last quake, Parady was locked out of the Pacific Stock Exchange building for several days by city officials, who shut off electricity for fear of gas leaks.

Some companies, such as Intel Corp. in Santa Clara, Calif., and Clorox, Inc. — whose Oakland data center was severely damaged — have moved their mainframes out of the most vulnerable areas, citing concerns about earthquakes. American President Companies Ltd., an Oakland shipping firm, is one of several considering the addition of a secondary data center in seismically stable locations — Sacramento in APC's case. The areas most likely to be hit by a major earthquake stretch south from San Francisco to beachside Santa Cruz and extend inland to Berkeley, Oakland and San Jose.

Those who could not or did not want to move the corporate data center spent part of the past year bolting down filing cabinets and anchoring disk drives.

Silicon Valley giant Hewlett-Packard Co. had to close down two buildings for several months after the quake. Now, it is looking for more disaster recovery sites and outfitting computer rooms with rolls of plastic to prevent computers from shorting out if sprinklers are set off. "My gut feeling is that we're taking safety seminars a lot more seriously," said Mary Bechtel, computer operations manager at HP's Palo Alto data center.

Proper testing of disaster recovery procedures, IS managers said, is the only way to plan on continuing operations the next time: "We're going to have a mock earthquake drill this month, complete with an emergency operations center and medical care," said Joe Beaupre, telecommunications manager at Kaiser Permanente, which has a data center in Walnut Creek.

But IS managers in smaller shops find themselves limited in what they can do to prepare for future disasters, other than laying in a supply of folding cots, canned food and water.

"There just isn't any money," said Dave Macdonald, director of data processing for Alameda County, just east of San Francisco. The county, which includes the battered city of Oakland, suffered damage severe enough to close down City Hall — a building that stands empty to this day. Two county workers were among those who died in the collapse of the Cypress overpass on Interstate 880 last year. "The county's priorities are health and police protection," Macdonald said. "When you're laying off deputies and health care workers, it's hard to get another million for DP."

The U.S. Geological Survey (USGS), based in Menlo Park, is telling area residents that there is a 67% chance of another quake of equal or greater size in the next 30 years. "That quake could strike at any time, including today," warned a glossy-paged special USGS report tucked into Sunday newspapers several weeks ago. Scientists do not know whether the next rupture would come on the famed San Andreas coastal fault or the parallel Hayward fault on the inland side of San Francisco Bay.

In anticipation of another large quake, many national and global IS enterprises are quietly planning to take San Francisco out of the loop in nationwide data and voice networks.

"In the last six to nine months, we've seen a focus on alternate network routing," said John Ratliff, senior vice-president at Comdisco Disaster Recovery Services (CDRS) in Rosemont, Ill. "All of the disaster plans got a hard look, with a heavy emphasis on testing [at hot sites]."

CDRS and Sungard Recovery Services, Inc., in Wayne, Pa., which are the two largest recovery firms, reported an increase in satellite and microwave links that could bypass damaged ground lines in another earthquake. Also in the running is IBM, which expanded its own Business Recovery Services Division in late 1989 to compete head-on with CDRS and Sungard. All three disaster planning services offer California "business recovery" sites that can house a client's operations staff during a recovery period.

Through network interfaces, IS staffers are able to launch applications that are actually running on remote mainframes scattered from coast to coast. The industry trend is toward local business recovery centers, which would keep staffers closer to home during emergency periods. During the 1989 quake, however, staffers found themselves scrambling for petty cash before jetting to faraway backup centers (see story below left).

Of all factors, the human component of disaster recovery remains the most difficult to calibrate, IS managers said (see story below right). In the minutes after a quake, psychological trauma, coupled with concerns about immediate family, are of greatest concern.

Senior Correspondents James Daly and J.A. Savage and Correspondent Jim Nash contributed to this report.

An idea comes of age

James Albert had a vision of computing after the earthquake, and it didn't particularly look like mainframes.

Albert, MIS manager at the San Francisco's Bureau of Building Inspections, installed five personal computers at a public school in the city's hard-hit Marina district in the hours following the 1989 quake.

The city's more than 100 inspectors used the PCs to track information on crumbling buildings, including which of the structures were marked for demolition with bright red tags.

Housed in a trailer, those PCs were linked together into a local-area network, using donated Sun Microsystems, Inc. TOPS network cards. "We were jury-rigging an environment that had multiple copies of Ashton-Tate's Dbase III," Albert said.

The bureau's small system proved so effective — and so mobile — that it served as a prototype for a larger system of networked PCs now being installed at bureau headquarters near San Francisco City Hall. By year's end, Albert hopes to have more than 100 Intel 80386-based PCs installed on that Novell, Inc. LAN, along with an aging Four-Phase minicomputer that contains historical data.

Andy Freeberg

James Albert *turned to PCs for help after the quake*

Notes from graduates of Hard Knock U.

The earthquake of '89 taught IS practitioners here a few lessons about surviving a natural disaster that no one teaches in the university — unless it's the College of Hard Knocks.

The lessons, which could just as well apply to another type of natural disaster, or to a power failure like the one caused by this summer's Wall Street fire, include the following:

- Always keep a supply of petty cash on hand. Bechtel Corp. employees, about to fly to Sungard Data Systems, Inc.'s recovery center in Philadelphia, couldn't find very much of it after the quake. "I had about $20 on me," said one Bechtel employee, "and all area ATMs were out of order. I was able to collect about $300 from co-workers, and that proved to be sufficient until we arrived in Philadelphia."
- Have a supply of food, water and cots on hand — you might not be able to get home. A first-aid kit and a supply of portable personal computers might also help. San Francisco commuter trains stopped for a time, and the Bay Bridge became impassable after a 50- by 70-ft upper section fell onto the lower span. "We now have extra cellular phones and computers for our command center, along with cots and food," noted Jane Paradise, manager of corporate information security at Apple Computer, Inc.
- Have a list of home numbers for key personnel, including vendor contacts. Some San Francisco data centers could not get their hands on all their backup data tapes during the first hours after the earthquake. In many cases, the original tapes were placed out of reach by city officials who blocked entry to damaged buildings. One Oakland software firm had to carry data tapes by hand out of the 11th-story window of its building, in which the central staircase separated from the stairwell walls. The person who carried the tapes was rescued by fire truck.
- Get an emergency generator or an uninterruptible power supply if you do not already have one. Many data centers, including the Pacific Stock Exchange, Matson Navigation and Hills Brothers Coffee Co. in San Francisco, were intact but without power for several days.
- Know how to reconfigure your national data net..ork. Apple's primary data center in Cupertino, Calif., kept running after the quake. But the disaster showed how vulnerable it was to disruption from quakes. Following 1989's Hurricane Hugo, Cupertino backed up Apple's Charlotte, N.C., distribution center. Apple has revamped its disaster plans, contracting with all three major hot-site vendors for backup.

Some badly shaken

SANTA CRUZ, Calif. — Doug Michels could not stand up during the Oct. 17, 1989, earthquake. "I'm a native Californian, so I didn't worry about it for the first 10 seconds or so," recalled Michels, executive vice-president of software firm The Santa Cruz Operation last week. "But then, like everybody else at my afternoon meeting, I dove under the conference table. I couldn't do anything else."

Michels was fortunate. Although SCO's three-story headquarters building was within a few miles of the earthquake's epicenter in the Santa Cruz mountains, the building remained intact, and no one was seriously hurt. "Some of the welds in our earthquake bracing cracked, but at least the bracing worked."

SCO's Michels *dove for cover*

"We didn't realise how bad it was until it was over," the 36-year-old Michels said, describing a postquake scene of fallen ceiling panels, keeled-over filing cabinets and drizzling ceiling sprinklers.

Not all the damage was physical, however. "You come to grips with your own mortality after an event like that," Michels said. In the week following the quake, SCO brought three psychologists on-site to help individuals and groups of workers as well as their spouses cope with the emotional trauma.

NEWS SHORTS

Ingres deal progresses

Ask Computer Systems, Inc. last week extended by one week its tender offer of $9.25 per share for shares of Ingres Corp. common stock, setting a new deadline of Friday, Oct. 19. Ask had announced last month that it plans to acquire relational database management system vender Ingres for about $110 million with the backing of Hewlett-Packard Co. and Electronic Data Systems Corp. In a related development, a Delaware judge rejected a major stockholder's bid to block the deal.

Productivity pack for Windows

Microsoft Corp. moved to smooth the bumps users may encounter on the road to Windows 3.0 with the introduction of the Microsoft Productivity Pack for Windows, a collection of programs that work as a computer-based reference program. The pack offers three applications — Learning Windows, Working Smarter and Quick Troubleshooter — that give answers, exercises and technical advice for the graphical user interface. Suggested retail price is $59.95.

German school buys Alliant super

Alliant Computer Systems Corp. announced recently that it had sold the first U.S.-made supercomputer to an eastern Germany customer, Humbolt University. The oldest university in Berlin, where Albert Einstein developed his theory of relativity during 1914-16, will use the Alliant FX/Series supercomputer for scientific applications.

EMC to offer 4M-bit cache boards

EMC Corp. plans to announce cache memory upgrades this week for IBM's top-of-the-line disk controller at prices 25% below IBM's. The IBM 3990 Model 3 cache upgrades, which EMC said will be available immediately, use 4M-bit technology, whereas IBM's upgrade boards use 1M-bit chips. This provides no space advantage or capacity advantage, however, because the actual upgrade cards will be the same size as IBM's. However, a 64M-byte to 128M-byte upgrade from EMC will cost $115,200. The same upgrade from IBM costs $153,600.

Settlement in suit against IBM

IBM reached an out-of-court settlement in a suit filed by XL/Datacomp, Inc., a major distributor of IBM's Application System/400 series machines. The suit was filed when XL and IBM could not agree on how to end XL's role as an authorized industry remarketer for IBM. Under the terms of the agreement, IBM will provide software support at no charge or at limited charges to customers who purchased IBM systems from XL. IBM will also pay an undisclosed amount to XL to resolve disputed bonus claims.

DG wins back federal award

Data General Corp. received good news last week in the form of a $127 million Department of the Interior contract reinstatement. In December 1989, DG had been contracted to provide a nationwide computer network of Aviion systems to the Water Resources Division of the U.S. Geological Survey, when the contract was protested by another bidder. The Court of Appeals for the Federal Circuit in Washington, D.C., ruled in DG's favor and reinstated the contract, which includes more than 6,000 DG Aviion workstations and servers to be installed during the next four years.

Chemical maker outsources

Andersen Consulting racked up its first Canadian outsourcing contract last week, a $5 million deal to take over the entire information systems operation of Marsulex, Inc., a manufacturer of sulfuric chemicals. Marsulex was created by a 1989 leveraged buyout of the chemicals business of another firm, and the new owners decided to transfer IS from the former parent to Andersen. Marsulex, a $160 million company, is the first customer at Andersen's new $23 million data center in Toronto.

Software AG branches out

BY JOHANNA AMBROSIO
CW STAFF

RESTON, Va. — Software AG of North America, Inc. last week made public its far-reaching plans for providing software to help users write distributed and cooperative applications. This represents a major strategic change from the company's primarily mainframe-oriented approach of the past, analysts said.

The goal of the new scheme, called Entire, is to help users move from host-based computing to transparently accessing and manipulating information across multiple and heterogeneous platforms. "Entire will build a bridge between the old and new worlds of computing," said Peter Page, Software AG's executive vice-president.

The first piece of the puzzle to be made available will be the Entire Function Server Technology series. This will allow users to evolve existing applications into functions that sit on servers accessible by personal computers. This way, users can isolate specific applications and share them.

Applications that reside on servers can be written with Software AG's Natural fourth-generation language or Cobol. Software AG officials said the scheme will work with IBM's Repository Manager and will fit within IBM's Systems Application Architecture. Also, Software AG is providing some new PC applications of its own, including text management, office automation and a geographic information system that combines geographical and textual data within one physical database.

Entire will support OS/2 and Unix, as well as VM, MVS and Digital Equipment Corp.'s VMS operating system. Servers will be able to access DB2, Software AG's own Adabas database management system and any other database that understands IBM's SQL. After years of downplaying SQL's importance in the industry, Software AG is finally implementing it in Adabas.

Also, Entire will provide for any-to-any connectivity among the supported clients and servers. Software AG will make a services layer available to take requests from, for example, an OS/2 application and convert it into something that an MVS application can understand. This layer will handle multiple communications protocols, including Systems Network Architecture, Advanced Program-to-Program Communications, Decnet, LU6.2, Netbios and others.

Page said this will allow for "Lego programming" — to hide the communications concerns from both end users and programmers.

Some of the software to allow all this to occur will be available by December; some of it will take 12 to 18 months to roll out, the company said.

Excitement stirred

Observers seem impressed with the plan. "It's an exciting announcement," said John Logan, vice-president of the Aberdeen Group in Boston. "MIS managers' No. 1 concern is using the microcomputers they've bought to distribute the processing."

Of note, analysts said, is that Software AG will allow other applications to be brought in besides those developed with the company's traditional tools.

However, observers said, there was one part of the plan that users should be wary of. "This architecture and set of tools is based on a set of protocols Software AG will develop. So it's not really 'open,' because users are still buying into something that's dependent on a vendor," said Adam Rin, vice-president of Gartner Group, Inc. in Stamford, Conn. "But Software AG is a stable, long-term player, and that alleviates the concern."

Colby Springer, vice-president of information services at Pearle, Inc. in Dallas, said he is most looking forward to the ability to run the same software across different hardware platforms. Pearle, the parent company for stores that sell eyeglasses across the country, has an IBM mainframe and Unix-based point-of-sale systems. "It will be great to be able to cross multiple platforms and not have to reinvest in different tools," he said.

Still, most industry watchers said there is a good chance that the company, long well-regarded for its technological strengths, will be able to pull all this off. "I haven't a doubt that they will be able to do it," said Paul Hessinger, chief technology officer at Computer Task Group, Inc. in Buffalo, N.Y.

Some also noted that this strategy also represents survival for the country's six largest software vendors.

"They're getting into a more robust, growth-oriented segment of the database market," said Stuart Woodring, director of software strategy research at Forrester Research, Inc. in Cambridge, Mass. "They're giving both their customers and themselves a growth path from the old-world DBMS into a new-world DBMS. Now we'll see if they can deliver."

X terminal marks the spot for Wyse system

BY MARYFRAN JOHNSON
CW STAFF

SAN JOSE, Calif. — Wyse Technology jumped into the X terminal market last week and also introduced a Unix-based multiuser midrange system.

Wyse unveiled the Series 7000i Model 740, the first in a series of systems based on the Intel Corp. 1486 chip.

"Wyse's hope is to become a player in the small to medium-size computer market in the same fashion as it has in the terminal market," said Paul Cubbage, an analyst at Dataquest, Inc. Wyse now holds about half the U.S. market for general-purpose terminals.

The new WY-X5 network terminal is based on a 32-bit Motorola, Inc. 68020 microprocessor and is priced at $1,799. Designed for the X Window System operating under Unix environments, the terminal will be available in the first quarter of 1991.

Company officials acknowledged that the worldwide market for X terminals is still relatively small, with less than 70,000 units expected to be sold in 1990. Yet Wyse is banking on that market blossoming to 486,000 annually by 1994, based on projections from International Data Corp. in Framingham, Mass.

The Series 7000i will be marketed as a "bridge platform" between Wyse's low-end 5000 series and high-end 9000 series, aimed at users who want the multiuser power of Unix along with access to DOS- and OS/2-based environments, company officials said.

The Model 740 is scheduled to begin shipping in December at prices ranging from $17,500 to $31,450. Initially, the machine will support one 33-MHz processor and run at 27 million instructions per second (MIPS). Eventually, Wyse said, it will be scalable to three processors, a mix of 33-MHz and 50-MHz chips.

"Wyse is pioneering the technology of pushing the 1486 [processor] into the midrange market," said Rikki Kirzner, a senior analyst at Dataquest. "This is giving a midlife kicker to their existing product line, and it allows them to capitalize on what they knew best without scrapping the old product line."

AMD wins round in 386 dispute

BY MAURA J. HARRINGTON
CW STAFF

SANTA CLARA, Calif. — Intel Corp. "double-crossed" a competing semiconductor firm by not transferring sales and manufacturing rights for its 80386 chip, an arbitrator declared last week. Whether that judgment will allow Advanced Micro Devices, Inc. (AMD) future rights to the 80386 remains unclear.

Retired California Superior District Judge J. Barton Phelps released his decision last week in a 3-year-old dispute over whether Intel subverted a pledge to provide 80386 manufacturing rights to AMD. Such agreements, known as second-sourcing, were formerly a common practice among chip makers to allay concerns among customers about product availability.

Intel's decision to retain sole manufacturing rights to the 80386, which has become the standard for high-performance personal computers, has allowed the firm to maintain a lock on the market and keep prices high.

Last week, Intel reported that third-quarter revenue exceeded $1 billion for the first time in its history, chalking up a profit of $172 million. AMD reported a loss of $17.8 million on revenue of $25.4 million.

Regarding AMD's licensing rights to Intel's IAPX product family under a 1982 agreement, Phelps pulled no punches in affirming that AMD had been wronged. "AMD has been double-crossed by Intel when Intel, having achieved its aims of establishing the IAPX family in the marketplace, abandoned AMD by refusing to transfer to AMD the 80386," he said.

Still questions

Whether AMD can acquire rights to manufacture the 386, however, was left unanswered until a future step in the arbitration process. The 386 is not, Phelps ruled, specifically cited in the agreement between AMD and Intel as a product that would be exchanged. But whether the losses suffered by AMD as a result of Intel's actions are sufficient to warrant such a transfer will be decided later, said Phelps, who also said Intel was within its rights in declining to accept certain AMD products in exchange for Intel technology.

"Intel is pleased that today's decision does not require the transfer of the 386 microprocessor," company General Counsel and Vice-President F. Thomas Dunlap Jr. said in a prepared statement Thursday after the ruling was issued.

AMD, however, said it will ask Phelps to assess $500 million in monetary damages and rights to the 80386 chip during the next phase of the arbitration proceeding, according to Chairman and Chief Executive Officer W. J. Sanders III.

The case "is certainly not going to put either company out of business," said G. Gervaise Davis III, a partner at the Monterey, Calif.-based law firm of Schroeder, Davis & Orliss who has specialized in computer law for more than 20 years and has been following the AMD/Intel dispute. The real issue to consider is not whether AMD will win full rights to the 386 but whether it is legal for the company to copy the technology under the AMD/Intel agreement, he said.

AMD said last week that it has already reverse-engineered its own version of Intel's 386 chip.

However, earlier in the week, U.S. District Judge William Ingram issued a temporary restraining order prohibiting AMD from using the numbers "80386" or "386" in the name of any new product. The order is in effect until a court hearing today.

Intel filed for the order recently after it discovered that AMD was planning on calling a future product the "AM386." Intel said it learned of the upcoming announcement after an Intel employee named Mike Wedd stayed at the same hotel as an AMD employee with the same name. The AMD documents containing news of the upcoming chip were then mistakenly forwarded to the Intel employee.

Diskless PS/2 finally surfaces for LAN use

BY RICHARD PASTORE
CW STAFF

IBM last week dribbled out the first of several anticipated Personal System/2 announcements for the fall season. The least exciting came first in the debut of the PS/2 Model 55 LS, a diskless workstation intended primarily for use as a local-area network node.

The diskless machines are based on the 16-MHz Intel Corp. 80386SX chip and come equipped with 2M bytes of memory, the Micro Channel bus and a remote software-loading utility. They support either IBM Token-Ring LAN installations or Ethernet networks with adapter cards included.

Diskless personal computers have been around for a while, appealing to a subset of users who require data security and begrudge paying extra for magnetic media they do not need on a LAN station. Indeed, according to several observers, IBM had been configuring its Model 55SX without disk drives on special request for the past year.

The IBM entries do not have the value-added security features that distinguished Compaq Computer Corp.'s diskless PCs unveiled last spring [CW, May 21], said Frank Michnoff, an analyst at Meta Group, Inc. in Westport, Conn.

"IBM didn't do anything to distinguish this diskless model from the 55SX with any additional features," he said. "It's another example of IBM being a follower and not a leader."

The Token-Ring model is available now for $3,490 — $5 less than the list price of the Model 55SX with a 30M-byte hard disk. The Ethernet version costs $2,950 and reportedly will ship next month.

IBM also announced an Ethernet PS/2 Adapter/A, which is included with the 55LS but is an option for other PS/2s. The $575 board is set to ship next month.

In addition, the company unveiled a wide-carriage ink-jet printer called the Execjet Printer. Optimized for quiet operation, the printer is available now for $1,099.

Compaq

FROM PAGE 1

Like its Intel 80286-based predecessor, the LTE 386S will set an early standard for both customers and competitors, observers said. "It will become the standard, because the baseline is the 386SX for the desktop PCs, laptops and probably for notebook PCs," said Stephen Rood, microcomputer technology manager at Coopers & Lybrand in New York.

Bruce Rubin

Compaq's Rod Canion *displays company's new 80386SX-based laptop*

Rood had passed up the LTE 286 in favor of high-end Toshiba Corp. portables because of the difference in screen resolution and power, but the LTE 386S will receive "serious" consideration for future purchases, he said, especially when weight is a key factor. The LTE's poundage is less than half that of the 386-based Toshiba 5200.

At fellow New York accounting giant Deloitte Touche, the old LTE could not handle the firm's field applications — more than 30M bytes worth of software. The new LTE high-end model, with a 60M-byte hard disk, is the first notebook PC worth his consideration, said MIS manager Claude Rankin.

Although there is still a market for the less powerful LTEs, which will not be discontinued, the new model "is a great piece of equipment and will be a good seller," said Andy Seybold, a portable computer analyst at Dataquest, Inc. in San Jose, Calif. However, Compaq's market lead will be "very temporary" in light of coming competition, he said.

"We now have a target for everybody in the world to shoot at," Seybold said. "There's going to be a commodity laptop, and it'll be the 386SX notebook with VGA, a couple of megs and a hard drive and floppy."

Seybold said he knows of three rivals coming within the next month, one of which, he said, will beat the LTE's display and weight at about the same price.

Epson America, Inc. has already announced a 386SX-based notebook to be delivered late in the year. Compaq is not worried, however, according to marketing manager Lorie Strong. "We're fairly confident that from a performance and functionality standpoint, we'll have a fairly nice lead," she said.

> THE LTE 386S "will become the standard, because the baseline is the 386SX for the desktop PCs, laptops and probably for notebook PCs."
>
> STEPHEN ROOD
> COOPERS & LYBRAND

Nevertheless, the competition will soon escalate into a price war, observers agreed. "I think we'll see price wars in this category," Rood said. He and other users said they would hold off any purchases to see how the prices shake out.

Competition and the economies afforded by the coming Intel 386SL integrated chip set will drive notebook prices down into the $4,000 to $5,000 range, predicted Richard Horan, editor-in-chief of "Portable Technology Update" in New York.

Distinguishing one 386SX notebook from the next will be increasingly difficult, even for Compaq, observers predicted. "How do you build a commodity product and distinguish it from everybody else?" Seybold said.

Compaq will try to differentiate this unit with a $1,499 custom desktop expansion package. The expansion system, exclusive to the LTE 386S, includes a color VGA monitor, full-size keyboard, two standard expansion slots and mass storage options.

Second-class postage paid at Framingham, Mass., and additional mailing offices.
Computerworld (ISSN 0010-4841) is published weekly, with a single combined issue for the last week in December and the first week in January by CW Publishing/Inc., 375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171.
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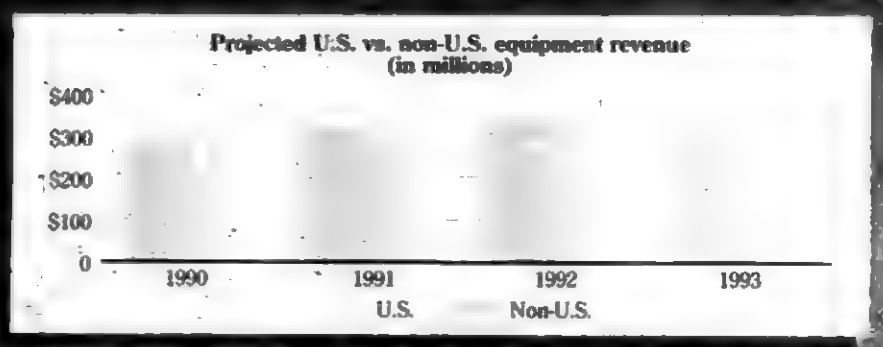
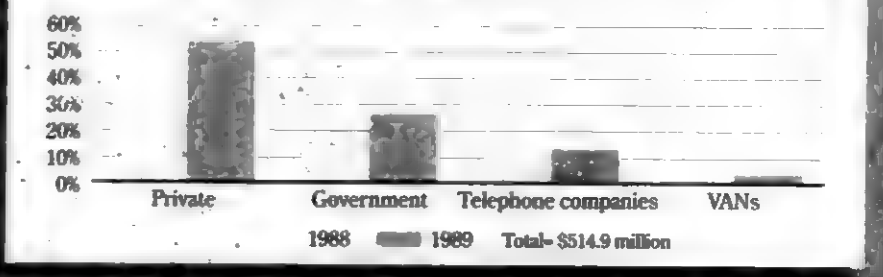


Continued deregulation in Western Europe and the Pacific Rim will open new markets for U.S. vendors, causing non-U.S. sales to slow

New systems enjoy the most growth, but demand continues in the area of add-on business

New vs. add-on business

	1988	1989
New systems	$127.2	$152.9
Percent of growth	—	20.2%
Nodes	$241.0	$280.4
Percent of growth	—	16.3%
PADs	$73.6	$81.6
Percent of growth	—	10.9%



Although sales to private and state accounts for the majority of the market, they fell behind the rate of public spending

Source: International Data Corp.

CW Chart: Doreen St. John

NEXT WEEK

IS management is a different game at The Body Shop, the fast-growing personal care products retail chain. Systems manager **Rick Hellar**'s job is to recognize where technology is a complement to the company's unconventional business philosophy and where it is a conflict. Read more about Hellar's responsibilities in Manager's Journal.

Joyce Rand

DOS loyalists and OS/2 hopefuls are running out of reasons to stay true as the new guy on the desktop — Unix — gains favor with vendors and customers alike. If you're curious about what Lotus, Wordperfect and Ashton-Tate have in mind for the future of their popular business productivity products, turn to Product Spotlight.

INSIDE LINES

Mark of confidence, or warning?

Last year on Oct. 17, the ground shook in California. This year, the date will be marked by the release of Ashton-Tate's financial results for the quarter just ended. Whether the news will send shareholders diving for cover remains to be seen.

What recession?

Agenda '91, the annual gathering of industry giants and those who think they are, featured a fun auction to benefit the nonprofit Foundation of Educational Software, which provides grants to fund software for elementary school teachers. For $2,500, Borland Chief Executive Officer Philippe Kahn bought a cruise on the sailboat of Lotus software guru Frank King. Kahn's contribution, a half-day of code review, went for $8,000 to rival Bill Gates of Microsoft, who also paid $6,000 to purchase former Apple Chief Scientist Jean-Louis Gassee's diamond earring. Gates donated his 20 favorite videos, which were purchased by Dave Liddell of Metaphor for $6,000. Mitch Kapor's 1940s silk Aloha shirt went to Gordon Eubanks for $1,000. In keeping with the conservative fiscal mood at Lotus these days, Lotus head honcho Jim Manzi kept his hands in his pockets and bought nothing.

Promises, promises . . .

IBM has still not delivered a Repository Manager customer document designed to explain the software's key information model. In August, the company said it would deliver it "within a few weeks." As of last week, IBM is now shooting for sometime next month. The document is IBM's attempt to address complaints about the lack of openness to Repository Manager. Currently, the only way to get details on the information model is to license Repository Manager, which costs about $4,500 per month.

. . . reality

The pricing structure for Netview Version 2, announced last month, is apparently so convoluted that even IBM's own salespeople are having trouble getting it straight. As one user tells it, his IBM sales reps were not only unable to tell him how the new pricing would affect his firm but could not even say which of the new Netview categories — distributed, centralized or stand-alone — his firm's Netview systems fell under. "They said they'd get back to me," he said. "Fortunately, we have six weeks before we have to figure out our 1991 MIS budget."

AT&T sales reps, please phone home

Don't look now, but even as AT&T swears it does not have a laptop computer in the works, with or without a radio frequency modem, corporate IS managers report meeting with AT&T representatives to discuss the new machine. The official word is that talks with Marubeni, the large Japanese trading company, are no more conclusive than they were a month ago and have not reached the stage of specific product development. Yet reports from Japan indicate that Marubeni has confirmed the laptop angle of its talks with AT&T. Of course, it is possible that no one has told AT&T's Computer Systems Division about the new product.

When less is more

This time last year, the tales of woe concerning Wang Laboratories' staggering debt load could have filled a book. As of this month, the book would have to be called *Less Than Zero*. Under a game plan fashioned and executed by CEO Richard Miller and Chief Financial Officer Michael Mee, the company quietly extinguished the last of its bank debt two weeks ago.

Oh! somewhere in this high-tech land venture gold will us bless;
The banks build assets somewhere, and somewhere gas costs less;
And somewhere Dukes can manage, somewhere presidents shout;
But there is no joy in Beantown — mighty Clemens has bleeped out.

If you've got more on your mind than the ploys of summer, hit a liner to News Editor Pete Bartolik at 800-343-6474, loop a message to COMPUTERWORLD via MCI Mail or knock one out of the fax at 508-875-8931.

Don't look now, but there's something moving on your desk.

IBM Personal System/2® s with Micro Channel™ on desks everywhere are starting to exhibit some pretty wild and wonderful tendencies. They're creating incredible on-screen presentations. Interactive tutorials with full-motion video and stereo sound. Graphics, text and animation in harmonious coexistence. What makes it all possible is the multimedia capability of the IBM PS/2® with Micro Channel.

Micro Channel Makes It Look Easy.

The PS/2 itself is designed to put multimedia applications to their best use. Micro Channel has always given the PS/2 extremely fast data rates and better multitasking capabilities. But in multimedia it really gets a chance to shine. The multilane highway design of Micro Channel Architecture is perfect for processing complex multimedia applications. Most conventional PCs just don't have the power or the data paths to do it at all. Plus, Micro Channel in the PS/2 lets you use the new IBM CD-ROM that gives you the storage equivalent of over 400 diskettes on a single CD so you can have access to all kinds of data-intensive material like clip art and digital stereo sound.

Do It All. All At Once.

With a PS/2 with Micro Channel, you can start using some hot products right now. One is IBM's Audio Visual Connection.™ It's both a software and a hardware tool that allows your PS/2 to import high-quality audio, dazzling still images, even special effects, as well as text, graphics and other data. Then, you can edit and present it in any combination you like right on your PS/2 screen, share it with a network or project it on a wall. It's impressive, but don't take our word for it—IBM's Audio Visual Connection received *PC Magazine*'s Technical Excellence Award for 1989.

Another exciting multimedia product is the IBM M-Motion Video Adapter/A.™ Coupled with the power of Micro Channel, it lets you incorporate full-motion video and high-quality sound from sources like video disks, VCRs and video cameras, digitize them, and display them in an endless array of formats. And for software developers, there are ActionMedia™ cards, which use the latest DVI™ Technology, allowing full-motion video and analog sound to be compressed, digitized, stored on a hard or optical disk and played back in real time.

You've Already Got The Best Seat In The House.

Best of all, you can do it all today with the Micro Channel PS/2s you've already got. No special monitors to buy. And you'll be perfectly poised for tomorrow's most exciting multimedia technology, like interactive touch displays and much more. Contact your IBM Authorized Dealer or IBM marketing representative. Call 1 800 255-0426, ext. 10, for a free videocassette or a dealer near you. Your desk will never be the same.

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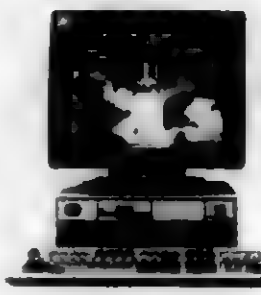

How're you going to do it?

PS/2 it!

IBM

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ISS 43
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THE NEWSWEEKLY OF INFORMATION SYSTEMS MANAGEMENT
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COMPUTERWORLD

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D&B Software points the way to next-generation merger of MSA, McCormack & Dodge software lines. Page 6.

Netview upgrade pricing proves too tangled a web for users to figure out individual costs. Page 117.

VAX 9000 users on VIP list

BY MARYFRAN JOHNSON
CW STAFF

MAYNARD, Mass. — Digital Equipment Corp.'s VAX 9000 mainframe arrives at its 1-year-old mark this week, its reputation a bit tarnished by shipping delays but with sales into commercial accounts coming on stronger than DEC officials said they expected.

The company is also exhibiting an increasingly IBM-like reputation for customer service in mainframe accounts.

From jetting replacement disk drive controllers into Muncie, Ind., at 2 a.m. to stationing three DEC employees at a new mainframe customer site, DEC seems determined to do whatever it takes to keep these users content.

"It was worth the wait," said Michael Guider, vice-president of network and information services at Litel Telecommunications Corp. in Columbus, Ohio, which received one of the first VAX 9000 Model 210s. "DEC's ability to resolve problems has been outstanding."

During DEC's first fiscal quarter from July through September, the company said it delivered 76 mainframes, mainly low-end Model 210s but including a handful of 410s and 420s. Two-thirds of them landed in commercial applications, while the remaining one-third found a home in technical or scientific uses — just about the reverse of what DEC officials had expected.

Continued on page 8

Revenge of the mini makers

	Processor	Memory	Disk	Price
[illegible] (entry)	[illegible]	[illegible]	[illegible]	[illegible]
DEC AD 433MP (entry)	1 x 486	8M bytes	200M bytes	$17,500
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
DEC AD 433MP	1 x 486	64M bytes	618M bytes	$45,900
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
DEC AD 433MP	2 x 486	64M bytes	3G bytes	$78,517

All 1486 chips in this table are 33-MHz
Source: Gartner Group, Inc.
CW Chart: Dawnet St. John

***DEC** last week became the latest vendor to offer up Intel-based multiuser Unix systems, with prices undercutting NCR's recent 3000 line. Story, page 8.*

Japan gets first look at IBM 486

U.S. intro promised before Comdex/Fall

BY RICHARD PASTORE
CW STAFF

In what may be a sign of the growing market clout of Japan, a major IBM product was unveiled in Japan weeks before the expected U.S. debut of similar systems. Japanese versions of the long-rumored Personal System/2 Model 90 and 95 servers were made public earlier this month by IBM's Japan office.

Boasting about IBM's decision to unveil such key products in Japan first, IBM Japan Ltd. Vice-President Nobuo Mii announced two Intel Corp. 1486-based models and added that the 1486-based PS/2s will debut in the U.S. before Comdex/Fall '90 next month.

According to *Computerworld Japan*, Mii described a floor-standing system with a 33-MHz 1486 chip that incorporates IBM's Micro Channel Architecture. The unit can be configured with 4M to 16M bytes of memory and 160M-byte or 320M-byte hard disks. A 25-MHz desktop model offers the same bus, memory and drive options.

Continued on page 4

Repository, Systemview teams take separate paths

BY ROSEMARY HAMILTON
CW STAFF

CHICAGO — Two of the strategic architectures IBM has designed for key roles in its enterprisewide management scheme do not adhere to a consistent data model, IBM officials conceded last week.

Systemview, the recently announced architecture for data center operations and systems management, does not conform to the entity relationship structure of Repository Manager/MVS, the key software component of the AD/Cycle application development architecture, the officials confirmed. While there is little short-term impact for users, the long-term implications could be significant for any user who hopes to unite the two environments someday.

IBM's stated goal is to provide a repository-based world that integrates information concerning various data processing activities, including application development and systems management.

AD/Cycle, announced in September 1989, is IBM's plan for an integrated application development environment. An initial version of Repository Manager/MVS was released earlier this year and is installed at a small number of select customer sites. Systemview was rolled out as part of the System/390 announcement last month. IBM is scheduled to release initial

Continued on page 116

USAF computer crime unit flies solo

BY MICHAEL ALEXANDER
CW STAFF

WASHINGTON, D.C. — On Feb. 20, 1989, U.S. Army Specialist Four Michael Peri, then 21, slipped into East Germany toting a stolen laptop computer and four disks containing classified information about the deployment of tanks and helicopters along the boundary between the two Germanys.

When Peri returned 12 days later, he confessed to being absent without leave but denied that the laptop, which he brought back, had contained military secrets. Hard-pressed to find enough evidence to prosecute Peri for espionage, Army authorities asked the Air Force Office of Special Investigation's unique computer crime unit to look at the laptop. The Army had no special agent in Europe who was trained to analyze computer equipment for evidence.

"It appeared at the time [that Army investigators] were stymied and unable to prove anything," said Lt. Col. William T. Cobb, chief of directorate investigative support at AFOSI, headquartered at Bolling Air Force Base in Washington, D.C.

The AFOSI computer crime unit dispatched one of 12 computer crime investigators that it keeps stationed at Air Force bases around the globe to Fulda, West Germany, where Peri was stationed. There, the investigator unearthed sensitive information stored in hidden files in the laptop and on the disks. In June 1989, Peri was convicted of espionage and sentenced to 30 years in prison.

The Peri case illustrates that with the exception of the Air Force, which operates the only military agency assigned solely to investigating crimes involving computers, the military seems ill-prepared to cope with computer-related crime. Special agents that are employed by the

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6 **Dun & Bradstreet** spreads a comforting migration message to users fearful of the future of applications.

7 Pinning its hopes on Release 3.1 of 1-2-3, **Lotus** is expecting the spreadsheet upgrade to lift it out of its revenue rut.

8 After a quick dip into the red, **DEC** broke the surface for the third quarter with a modest $26 million profit.

10 Two mainstay MV systems are bowing out at **Data General** to make room for its MV/30000 platform.

12 Following the winding road to flexible nationwide ISDN, **AT&T** will offer long-distance connectivity to its Centrex customers.

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Quotable

"In 1992, when they have the United States of Europe, they are going to start acting like a cohesive group of states."

WILLIS WARE
RAND CORP.

On international computer security efforts. See story page 115.

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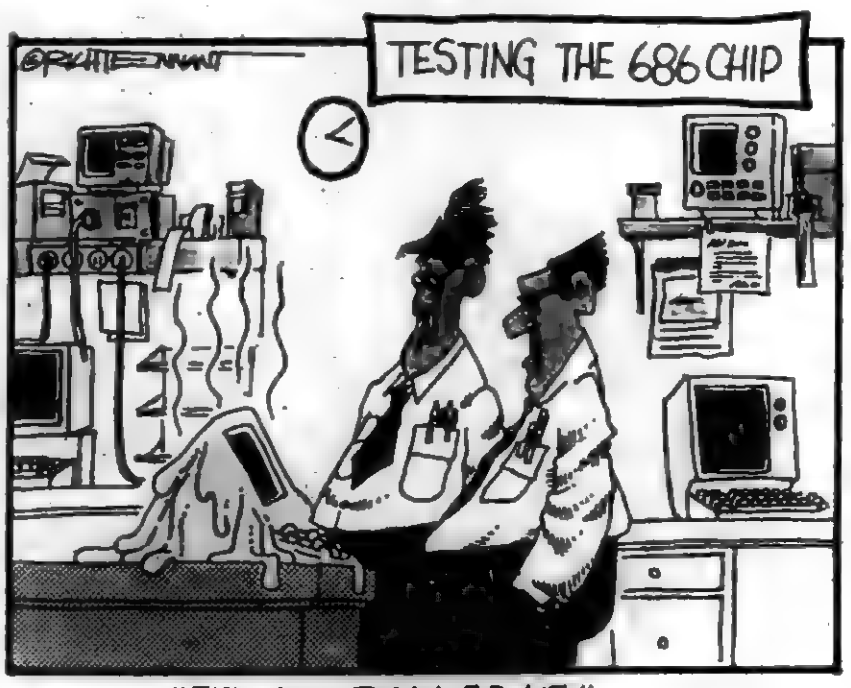

EXECUTIVE BRIEFING

■ **IBM's top-of-the-line Personal System/2 has been introduced in Japan,** marking the first time an IBM product of such importance has hit Japan before it has hit the U.S. The Model 90 and 95 file servers, which are based on the 33-MHz Intel I486 chip, are expected to debut in the U.S. before Comdex/Fall '90 next month. Although the U.S. pricing structure will be different, the basic hardware configuration should be similar. **Page 1.**

■ **Congress has criticized the Resolution Trust's information system** as inadequate. Legislators say the corporation that was created to clean up the savings and loan crisis has failed to form a cohesive information or systems acquisition strategy. They say they are concerned that the inadequate IS strategy will be unable to provide Congress with sufficient data to judge the success or failure of its crisis resolution efforts. **Page 117.**

■ **IBM's Systemview and Repository Manager architectures** are not fully compatible from a data management standpoint, IBM conceded. The inconsistency poses a potential long-term problem for AD/Cycle users seeking enterprisewide data sharing. **Page 1.**

■ **After 20 years, AFIPS will dissolve itself** at the end of the year. One director admitted that the society "has outlived its usefulness" since the demise of the National Computer Conference in 1987. **Page 4.**

■ **Quarterly financial results** found that Lotus and Apple profits are falling to the ground, DEC is inching up from its earlier loss, and IBM is healthy — but with question marks. **Pages 7, 8, 12 and 116.**

■ **Charles H. Mayer, First Boston's new CIO,** says he hopes to decentralize applications development among the investment firm's four business units. Like many others, the company is seeking competitive success through business rather than technology breakthroughs. **Page 67.**

■ **The U.S. armed forces seem to be ill-prepared** to cope with computer-related crimes. To investigate a major espionage case, for example, the Army had to turn to the Air Force for help. Officials question whether the military can deal effectively with threats from both internal hackers and foreign agents. **Page 1.**

■ **Thanks to new connectivity features,** IBM's Netview is becoming viable in multivendor environments. However, Netview/PC users such as Aetna, GE and Union Pacific say the network management system is fine without the new interfaces. **Page 53.**

■ **Reviews are mixed for Unix** playing on the corporate desktop. The operating system is getting raves from some users for its high speed and low cost, while big names from the DOS applications world are beginning to pop up in Unix. The trouble is, users say that the old favorites don't seem to be quite the same in the new setting. **Page 77.**

■ **Colleges look to IS directors** to teach information systems management, but there are obstacles and drawbacks to choosing the professorial career track. Obtaining a Ph.D., taking a hefty pay cut and facing a roomful of students are but a few. **Page 99.**

■ **On-site this week:** Networked PCs are serving as telephones for deaf students at Gallaudet University in Washington, D.C. They are also a major classroom learning tool. **Page 43.** Forty years' worth of paper records will eventually be converted to a Wang imaging system at EG&G's nuclear research facility in Idaho Falls, Idaho. In an unusual twist, the Wang system will be connected to an IBM 3090 Model 200. **Page 29.**

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	VM		✓
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	PC LAN		✓
STANDARDS	ANSI SQL	✓	✓
	FIPS	✓	✓
	SAA	✓	✓
	NAS		✓
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IBM mulls successor to VGA

BY MICHAEL FITZGERALD
CW STAFF

IBM has developed a powerful successor to its Video Graphics Array (VGA) personal computer display standard but is apparently still struggling over what to do with it.

Sources who have attended demonstrations and briefings on the unreleased Extended Graphics Array (XGA) controller say the 16-bit video card is well-positioned to succeed both the 4-bit VGA and the more expensive 8514/A controllers at the top of IBM's graphics line. XGA will reportedly give users better resolution, a faster screen refresh rate, substantially reduced flicker and far better color display than VGA.

However, sources said IBM is still debating whether to announce XGA as a commodity in its Personal System/2 Model 90 and PS/2 Model 95 machines or position it as an expensive high-end option for graphics-intensive applications. IBM announced Japanese versions of the Models 90 and 95 in Japan earlier this month and said they would be announced in the U.S. before Comdex/Fall '90 begins on Nov. 13 (see story page 1).

Sources who have seen XGA demonstrations said it has the following features:

- Options for 1,024- by 768-pixel and 1,280- by 1,024-pixel resolution. VGA resolution is 640 by 480 pixels.
- A 70-Hz screen refresh rate.
- 16-bit color, allowing as many as 32,000 colors to be displayed at once on-screen from a palette of 16 million colors.
- Upward compatibility with VGA.

Sources said that if XGA comes installed on the motherboard of the new PS/2, it will almost certainly become the new PC graphics standard.

Insiders reported that the most serious internal debate in IBM is whether to keep XGA on the motherboard of the Model 90 and 95.

Those who have seen the product said it has always been demonstrated on a PS/2 motherboard. However, they conceded that IBM might also release XGA as, in essence, a replacement for the 8514/A, IBM's current high-level PC graphics card. The 8514/A, which IBM once positioned as a VGA successor, is languishing with 1% to 2% of new graphics card sales, compared with 78% for VGA and compatible cards, according to Dataquest, Inc. in San Jose, Calif.

If sold separately, XGA could become a must-have product for computer-aided design and manufacturing, high-end imaging and desktop publishing users, but it would probably be much more expensive. Few other users would be able to justify spending the money needed for XGA, just as they have balked at spending more than $2,000 for the combined 8514/A, VGA-compatible card and related monitor. A VGA card with a monitor costs as little as $400.

If IBM releases XGA on the motherboard of its new high-end machines, "what that means for all of us in the industry is a new video display standard," said Henry Quan, director of marketing for Scarborough, Ont.-based ATI Technologies, Inc.

However, the standard would take some time to seep down from the high end to general machines and also to drop in price, in much the same way as VGA did when it was introduced in 1987, sources said.

"Assuming XGA was VGA-compatible and it was shipping today, it's at least a two- to three-year process for a new graphics standard to replace the old one as a standard," said Robert Harshman, president of Zeek Corp., a PC graphics firm in Chicago.

XGA is also expected to spearhead IBM's push into multimedia, and this is what is driving the increase in performance.

With 16-bit color, screen displays will offer what is called "perfect video." Perfect video means that the human eye cannot tell the difference between it and true 24-bit color, such as can be seen in a photograph.

By releasing the product at 16 bits, IBM will gain much better hardware performance levels than it would with a 24-bit specification.

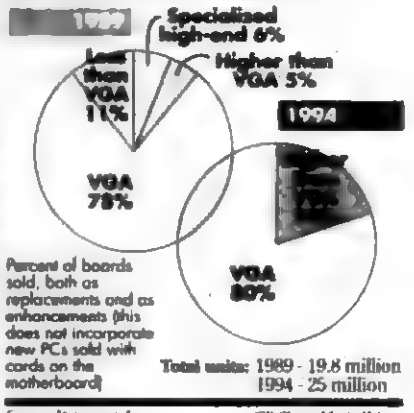
"Twenty-four bits of color only slows down performance and adds an extra megabyte of RAM to the cost of the computer, and how many color printers are in the market?" asked Edward Schaider, vice-president of marketing at Genoa Systems, a major VGA board maker.

Some observers doubted XGA will do much to remove VGA from its position as the graphics standard until prices fall.

"Will it impact VGA substantially? My gut feeling is no, because it's higher end and high cost," said Jim Anderson, director of graphics marketing at Headland Technology, Inc. and chairman of the Video Electronics Standards Association. "If [IBM's] pulled off a higher-resolution card at low cost, then it will be great, and we'll all do it."

What's in a picture

IBM Video Graphics Array boards dominate the market for desktop display cards



Percent of boards sold, both as replacements and as enhancements (this does not incorporate new PCs sold with cards on the motherboard)

Total units: 1989 - 19.8 million
1994 - 25 million

Source: Dataquest, Inc. — CW Chart: Marie Haines

AFIPS votes itself out of existence after 20-year run

BY PATRICIA KEEFE
CW STAFF

RESTON, Va. — The members of the American Federation of Information Processing Societies (AFIPS) voted unanimously last week to dissolve the 20-year-old organization, effective Dec. 31.

Assets of $1.4 million will be divvied up among the 17 societies that make up AFIPS, based on a formula laid out in the by-laws. Through these societies, AFIPS claims a constituency of about 240,000.

There may be an effort among some society members to form a new society, said Dennis Bybee, who represents the International Society of Technology in Education (ISTE) within AFIPS.

The dissolution issue was first broached by ISTE last April [CW, April 10], which almost immediately found its membership under question.

ISTE comprises two former societies, and there was a question as to whether the combined entity needed to reapply to join, even though AFIPS had already accepted its membership fees. Last week, the AFIPS board re-instated the group, Bybee said.

In April, both the Institute of Electrical and Electronics Engineers, Inc. and the Association of Computing Machinery (ACM) countered the ISTE bid to dissolve AFIPS with a plan to buy out any disinterested parties and to remodel AFIPS into a government lobbying force.

Last week, the resolution to dissolve AFIPS originated from the six directors representing ACM and the IEEE Computing Society (IEEE/CS), according to T. Michael Elliott, executive director of the IEEE/CS.

"I think it's true" that AFIPS has outlived its usefulness, said Elliott, who is serving on the committee charged with dissolving AFIPS.

Japan

FROM PAGE 1

The U.S. dollar equivalent of the Japanese pricing ranges from $13,400 to $17,420, depending on model and storage options. The desktop model began shipping last week, and the 33-MHz box is slated to ship next month.

Though the Japanese machine pricing is probably not indicative of U.S. pricing, the hardware specifications are another matter, analysts said. "These gross specs are probably going to be identical right down the line," said Tom Comerford, an analyst at Datapro Research Corp. in Delran, N.J.

Observers originally thought IBM would deliver two I486-based machines dubbed the Models 90 and 95 by early this month. Industry analysts have speculated that complications in Federal Communications Commission certification or availability of a 33-MHz version of the I486 chip have pushed the expected release date back to at least the last week of this month.

IBM spokesman Matt Jeffrey would not comment on unannounced U.S. products but said the Japanese PS/55 personal computer line parallels the U.S. PS/2 line "quite closely." The two lines are growing more similar in architecture at the high end, he added.

The fact that Japan led with a server announcement indicates the growing importance of that market as well as the increased autonomy afforded to IBM divisions, said Sam Albert, an IBM analyst and president of Sam Albert Associates in Scarsdale, N.Y.

Though IBM divisions have been increasingly encouraged to take aggressive initiatives, Albert said the Japanese would not have made the announcement without corporate consent.

"The initiative of the Japanese office has increased," Mii told *Computerworld Japan*. He added that some IBM PC products will be announced first in Japan in the future.

Mii also noted IBM's OS/2 Version 1.3 would accompany the PS/2 introductions in the U.S. He also speculated on an upcoming laptop, which he said will be based on Intel's 32-bit 80386 or I486 processor.

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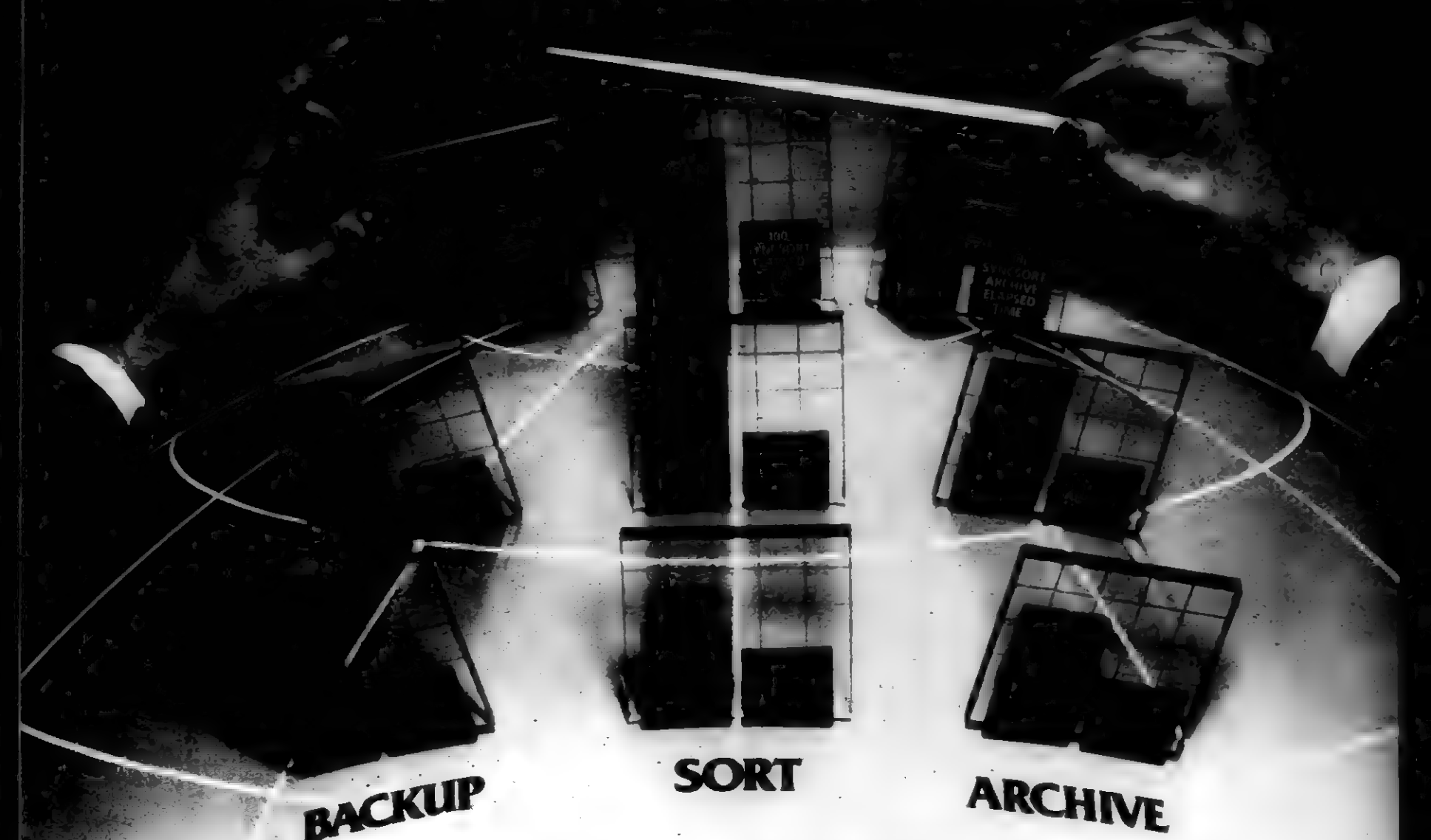

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NEWS SHORTS

Ingres adds gateways

On the eve of its planned merger with Ask Computer Systems, Inc. (see story this page), Ingres Corp. announced gateways between its relational database management system and two of IBM's relational databases, DB2 and SQL/DS. At the same time, Ingres updated its gateways to Digital Equipment Corp.'s RDB relational database. The gateways are intended to boost the use of Ingres in enterprisewide networks and mixed-vendor environments. Ingres gateways to nonrelational database systems — IBM's IMS and DEC's RMS — were also enhanced. Pricing for the DB2, IMS and SQL/DS gateways ranges from $50,000 to $400,000, depending on the size of the machine supported. Prices for the gateways to RDB and RMS range from $2,500 to $150,000.

Silicon Graphics boosts low end

While Silicon Graphics, Inc. waits on the next generation of reduced instruction set computing processors from its supplier, Mips Computer Systems, Inc., it is taking steps to improve its low-end graphics workstations. The company announced an upgrade last week that takes a 16 million instruction per second (MIPS) or 10 MIPS processor-based Personal Iris workstation and, by increasing memory throughput, system bus bandwidth and clock speed, hits a performance level of 33 MIPS or 23 Specmarks for $9,000, Silicon Graphics claimed. In other news, Silicon Graphics reported that net income for its first fiscal quarter was up 84% compared with the comparable period last year, rising from $5.2 million to $9.6 million. Revenue grew from $86.4 million to $115.8 million.

Modest growth at AT&T

AT&T announced modest revenue and profit growth of 5% and 1.9%, respectively, last week for the third quarter. Net income would have been higher than the $712 million posted but for the heavy launching costs associated with AT&T's new Universal Card credit- and calling-card combination. Product sales, which include computer systems and network products, rose 12.7% to $3.08 billion largely on the strength of international markets, and revenue totaled $9.66 billion.

HP tiptoes into X.500

Trying to jump the gun on network directory X.500 standards, Hewlett-Packard Co. last week said it is shipping its X.500 addressing product. The company acknowledged that it was only shipping "core functionality" of the product to a selected group of fewer than 20 customers. The X.500 product acts like a distributed database with information on local network addresses so that local users can find addresses in other areas without having to go through a large central directory.

Stephens named CEO at Emulex

Storage and networking products vendor Emulex Corp. tapped former Western Digital Corp. and IBM executive Robert Stephens as president and chief executive officer. A 20-year veteran of the industry, Stephens last served as senior vice-president and general manager of the microcomputer products group at Western Digital. At Emulex, Stephens replaced interim chief David Hanna, who will continue on the board of directors.

OSF/1 to become a reality

The Open Software Foundation (OSF) said it will start taking orders tomorrow for the long-awaited OSF/1, its version of the Unix operating system intended to challenge AT&T's Unix System V as the industry standard. The expected rollout comes about 30 months after an 18-month delivery time frame cited by OSF when intentions to develop the operating system were announced in May 1988. Because OSF/1 is based on AT&T's Unix System V, OSF said it will take four to six weeks for customers to receive the source code because OSF must verify that they also have a license for Version 2.0 or higher of AT&T's Unix System V.

More news shorts on page 116

D&B's medium is the migration

BY MARYFRAN JOHNSON and MAURA J. HARRINGTON
CW STAFF

FRAMINGHAM, Mass. — Dun & Bradstreet Software began broadcasting a migration message last week to reassure its 11,000 users as they move toward a "future architecture" encompassing the applications inherited in the tumultuous merger of Management Science America, Inc. and McCormack & Dodge Corp.

"We are ready to flex our muscle a little bit," said James Henderson, executive vice-president of marketing and technology for the $500 million software vendor.

Henderson said both product lines will be continuously and equally enhanced as D&B Software merges the lines onto a "next generation" suite of products in the mid-1990s.

"We will have a single product line in the future, but it will be up to customers when they migrate," he said. D&B Software plans to sprinkle financial sweeteners along that migration path by offering upgrades and conversion tools at no extra charge beyond a rise in maintenance fees.

Say the word

"It's still a lot of words at this point, but they're saying the right words," said Scott Davey, assistant controller of systems and planning for the accounting department at Fairchild Fastener Group, an aerospace company based in Carson, Calif. "They're trying to keep us all happy," he said.

Other users contacted last week also seemed pleased with the company's intentions.

"I think they've gone to great lengths to keep their users secure," said Brian Cameron, administrative specialist at Stone & Webster, an engineering construction firm in Boston.

The MSA and M&D applications — renamed the "E Series" and "M Series," respectively — have had some 20 product enhancements throughout the product line since the merger.

"D&B has a good reputation for treating acquired companies carefully and kindly," said Bernard Goldstein, a partner at Broadview Associates, a research firm in Fort Lee, N.J.

After six months of market research and extensive customer interviews, D&B Software officials came up with a two-pronged strategy.

In 1991, customers can expect major hits, or enhancements on all the financials, materials management packages, human resources, tools, manufacturing and higher education software, Henderson said.

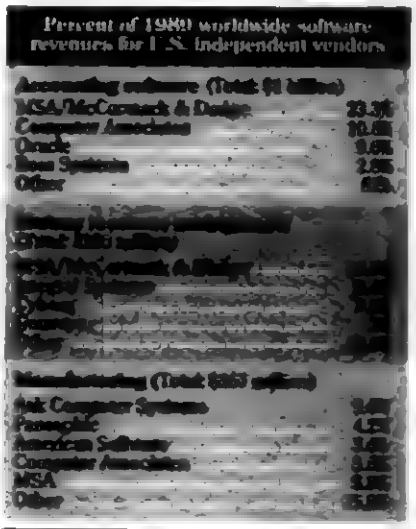
The company will begin introducing what it calls "value-added products" — a kind of bridge to the unified product line — in relational database, workstation and midrange applications.

One example is a full line of products coming for the IBM Application System/400, which has only one D&B manufacturing application now.

By 1994, users should see a "re-architected" product line — built with computer-aided software engineering (CASE) tools — that will merge the two camps.

Biggest little piece of pie

Although it holds less than a quarter of the market, D&B Software (once MSA and M&D) is a major player in application software



Source: International Data Corp. CW Chart: Doreen St. John

Ingres merger plan puts Ask in proxy fight

BY JEAN S. BOZMAN
CW STAFF

MOUNTAIN VIEW, Calif. — The merger of Ingres Corp. and Ask Computer Systems, Inc. turned into a race to the finish line last week as Ask attempted to jump all the legal and financial hurdles before Ask's shareholders meeting this Friday. The latest hurdle was tossed up by Ask's second-largest shareholder, who launched a proxy fight to displace Ask's current management.

At week's end, James T. Lennane in Naples, Fla., who owns 9.7% of Ask shares, had mailed out thousands of proxy letters to Ask shareholders. Lennane, who in 1973 founded System Integrators, Inc., a Sacramento, Calif., electronic publishing firm, now manages multiple investments, including a desktop publishing software firm.

The proxy statement said that Lennane seeks election to the five-person Ask board of directors, along with two of his associates. Lennane's filing said his group "is diametrically opposed to the purchase of Ingres Corp., which it believes will dramatically weaken the financial position of Ask." The proxy fight could go on even after the merger is completed, Lennane's New York attorneys said last week.

An open letter by Ask Chief Executive Officer Sandra Kurtzig, written in response to Lennane's proxy letter, said, in part: "Your board of directors firmly believes that the proposed acquisition of Ingres . . . is in the best interests of stockholders and will enhance long-term stockholder values by positioning Ask to grow in the 1990s."

Last Thursday, Lennane's lawyers requested that a Delaware chancery court reconsider an earlier decision rejecting Lennane's request to bar Ask's sale of $60 million worth of stock to Electronic Data Systems Corp. and Hewlett-Packard Co. That stock sale, part of the complex arrangement to buy Ingres, would unfairly dilute the value of current shares, Lennane said. However, Lennane's latest motion was rejected on Friday.

Barring any legal injunctions, Ask was prepared to buy Ingres by Friday at midnight — the deadline for Ingres stockholders to tender their shares. "The only reason this deal wouldn't go through is if we didn't have enough shares tendered," an Ask spokeswoman said.

Ask planned an immediate layoff as soon as the merger becomes official but would not say how many Ingres workers would be terminated.

At week's end, EDS and HP were on standby. "Our commitment to be Ask's partner has not changed," an EDS spokesman said. "But this is really their fight. We're concerned about it, but it's up to Ask to deal with it." An HP spokeswoman said, "We have not signed a check yet, but we still have every intention of going through with our investment plans."

Paperback pulls spreadsheet, won't appeal Lotus victory

BY PATRICIA KEEFE
CW STAFF

CAMBRIDGE, Mass. — An unrepentant but beaten Paperback Software International agreed last week to stop marketing its VP Planner product line by Dec. 1 and pay Lotus Development Corp. $500,000 for violating its 1-2-3 spreadsheet copyrights.

Paperback also agreed not to appeal a June federal court ruling that it had infringed on Lotus copyrights for the user interface portion of 1-2-3.

The initial outlook for VP Planner users is not good. Lotus said it has no plans either to support them or offer discounts as an incentive to move to 1-2-3.

A Paperback spokesman, Mike Burdick, said it will not "abandon" its VP Planner customers, which number at least 240,000, according to Dataquest, Inc. However, "We are not sure how we'll be able to support them. We have to look at what our options are," Burdick said, adding that it is possible that Paperback could come up with a noninfringing spreadsheet product.

Burdick termed the loss of the three-product VP Planner family, which contributed 68% of the company's revenue, "a significant blow." Two insurers are paying the damages to Lotus.

Although former chairman Adam Osborne has contended that win, lose or draw, the suit would destroy Paperback, Burdick was more upbeat: "We have mostly debt on our balance sheet, but we have enough stability to continue developing products, keep creditors satisfied and market [four remaining] products. We have a chance to [be] a viable entity."

After four years of legal wrangling, the software publisher wants to pick up the pieces and move on. Paperback's primary focus will shift to VP Expert, an expert system development tool. Company President Stephen Cook said a further fight "is best carried on by participants with greater resources."

A similar case, involving another company with limited resources — Brighton, Mass.-based Mosaic Software, Inc. — goes to trial this week. Mosaic has agreed to be bound by Judge Robert Keeton's rulings in the Paperback case concerning the scope of Lotus' copyrights and has also agreed that its Twin spreadsheet package copied 1-2-3.

Keeton faces at least two more Lotus copyright suits, which were filed in June against two better heeled rivals, Borland International and The Santa Cruz Operation. Borland's bid to have its suit tried in California failed; a trial date in Boston is expected to be set shortly.

Paperback's decision not to appeal spares Lotus the risk of having a federal appeals court reverse Keeton's ruling that 1-2-3's interface is copyrightable. "It gives Borland one less straw to cling to," Lotus attorney Hank Gutman said.

"The fact that a small company does not have the money to defend themselves any further does not change the merits of our case," said Borland spokesman Dick O'Donnell.

He claimed that in a case involving Ashton-Tate Corp.'s Full Impact software, the U.S. Court of Appeals for the 9th Circuit recently upheld an earlier ruling that the spreadsheet's menu structure is not copyrightable.

According to an Ashton-Tate spokesman, Borland has it all wrong. The California court only ruled that the spreadsheet metaphor, specifically the cells and "inverted L," were not copyrightable, he said: "The interface wasn't an issue in our case."

3-2-1

After a slumping second quarter, Lotus Development Corp. took it on the chin, as expected, in its third quarter ended Sept. 30. While revenue grew slightly, about 2%, over the same period a year ago, net income plummeted 63%.

Wall Street and Lotus said they expect sales to rebound significantly in the fourth quarter, in part because of the release of 1-2-3 Version 3.1, which corrects some of the shortcomings in predecessor 1-2-3 Version 3.0.

Net sales for the third quarter totaled $157.4 million vs. sales of $153.9 million in 1989's corresponding quarter. Net income was $8.6 million, down from $23 million a year earlier.

In an effort to bolster its sagging stock, which has dropped as low as 12½ points from a 52-week high of 39¼, Lotus announced plans last week to buy back up to 12%, or 5 million shares, of its 43 million shares outstanding.

The news was slightly more upbeat at Ashton-Tate Corp., which reported a net income of $1.1 million on net revenue of $60.4 million in its third quarter ended Sept. 30.

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Unix box poised for small firms

Application DEC 433MP seen as well-positioned market opportunity

BY MARYFRAN JOHNSON
CW STAFF

MAYNARD, Mass. — A Unix-based multiprocessor packed with Intel Corp. chips sashayed forth from Digital Equipment Corp. last week, with company officials eyeing a $40 billion opportunity in computer sales to small to medium-size businesses.

The Application DEC 433MP is billed as the company's most expandable system, scalable from one to six Intel 1486 processors and based on The Santa Cruz Operation's SCO Unix System V. It was designed to be sold through value-added resellers (VAR) and will be available in February at prices ranging from $17,500 to $80,000.

DEC officials said the machine poses no threat to its popular Microvax line, but industry analysts suggested that the system may hold more appeal for Fortune 500 Microvax customers than DEC realizes. "This may eat some low-end VAXs," said Wes Melling, an analyst at Gartner Group, Inc. in Stamford, Conn. "But we think DEC will pick up $1 billion in net revenue that doesn't even touch their existing business in this market."

Companies looking for a Unix-based office automation server or preparing to make the transition from MS-DOS to Unix should find the 433MP particularly attractive as a low-priced server for networked personal computers, Melling said.

Yet the present lack of Decnet support on the 433MP makes it an unlikely candidate to replace Microvaxes in some corporate networks.

Bechtel Corp., for example, has dozens of Microvaxes in its corporatewide DEC environment, said A. B. Cleveland, manager of automation technology at Bechtel's Gaithersburg, Md., regional office. "The more critical issue for us would be how well a machine supports Decnet," he said. "We are a global corporation with wide-area networks integrated tightly with LANs, and Decnet provides that for us."

Pick from three

With the introduction of the 433MP, DEC is now offering its customers three versions of Unix — its own Ultrix operating system for technical computing, AT&T Unix System V for telecommunications and SCO Unix for small businesses.

"DEC sees this as a machine to sell to people who've never bought a medium-size computer before," said Robert Herwick, an analyst at Hambrecht & Quist, Inc. in San Francisco. "The tricky thing is they've been saying that Unix is not commercial, and here they are bringing out a commercial system for the Unix market. Will the real DEC please stand up?"

John Sitar, president of Corstar Business Computer Co., Inc. in Hawthorne, N.Y., views the 433MP as "the beginning of a commitment to a whole new direction in computing by DEC."

As one of DEC's largest VARs for the past two decades, Corstar is a beta-test site for the new Intel-based machine and is now porting 1 million lines of code from VMS to SCO Unix.

The most significant point for users is being able to have low-cost asynchronous terminals accessing a central platform without networking, Sitar said.

DEC also beefed up its support and customer services for resellers, offering to subcontract DEC maintenance, recovery and desktop services for the smaller VARs as well as the larger ones.

The 433MP supports up to 128 users when fully configured with six processors and can operate simultaneously as a multiuser machine, a PC LAN server and an X Window System server. It will run thousands of applications based on the SCO Unix, MS-DOS, Pick and Mumps operating systems.

The system has a dual bus architecture that allows customers to attach additional peripherals — up to seven PC option boards — without slowing system performance, Eichhorn said.

Gartner Group figures the machine will compete handily against Compaq Computer Corp.'s Systempro, IBM's RISC System/6000 and NCR Corp.'s 3345.

DEC rebounds mildly in first-quarter profit

BY RICHARD PASTORE
CW STAFF

MAYNARD, Mass. — Digital Equipment Corp. followed up its first-ever money-losing quarter with a timid step on the road to recovery, analysts said last week. The second largest computer maker announced a small profit of $26 million on sales of $3.1 billion for the first quarter.

The news was a mild surprise for the more pessimistic DEC watchers, who predicted another loss or a break-even showing. "Things are not as bad as people feared; things have at least bottomed out temporarily," said David Wu, an analyst at S. G. Warburg & Co. in New York.

DEC lost $256.7 million in the previous quarter ended June 30, the company's first taste of red ink. The dive prompted a plan to cut more than 5,000 employees from the payroll in this fiscal year.

Though the latest quarter's numbers seem to show DEC on the rebound, "it's a long road back," Wu said. "This is a company that's not healthy."

The main problem is that sales are down, observers noted. Product sales are off more than 6% from the like quarter last year. Though the economy is sluggish, the dip is due to DEC's product transition, according to Shao Wang, an analyst at Smith Barney, Harris Upham & Co. in New York.

However, observers noted that a number of products are doing well for DEC, including its Unix-based workstations and the mainframe-class VAX 9000, which, for the first time, contributed to the bottom line. Seventy-five VAX 9000 shipments added about $100 million to the revenue coffers, Wu said.

DEC's service income grew a total of 8% this quarter, reaching $1.23 billion. The portion of that income derived from systems integration services is growing by 20%, according to Wu.

Though it is difficult to extrapolate from one positive quarter, analysts predicted that DEC will continue its long, slow recovery next quarter with higher revenue.

But analysts warned that DEC's fourth-quarter numbers will probably not compare favorably with last year's like quarter, which was fairly strong. This quarter's earnings suffered in comparison to the previous year as well — revenue was down about 1% while profit fell off by nearly 83%.

Basic math

Despite making cutbacks, DEC has watched climbing expenses and slowing sales combine to pinch profits

digital	Q1 1990	Q1 1991
Revenue		
Product sales	$1.99B	$1.84B
Service and other	$1.14B	$1.23B
	$3.13B	$3.09B
Expenses		
Cost of sales	$1.61B	$1.46B
Research and engineering	$404.1M	$401.9M
Selling, general, and administrative	$938.9M	$1.18B
	$2.95B	$3.04B

Source: Digital Equipment Corp. CW Chart: Paul Mock

VAX

FROM PAGE 1

The VAX 9000 order backlog is reportedly as high as 400 systems already, and the company reportedly plans to ship at least 100 mainframes every quarter. One year ago, however, DEC officials were hoping to have approximately 300 to 400 mainframes out in customer sites by the end of 1990.

"We're still managing the ramp-up to full production," said Bob Glorioso, vice-president of DEC's information systems business unit. "We are paying attention to what the customers tell us, and they're teaching us."

What George Kerns had to teach them, for example, convinced DEC to station three of its full-time employees at Atlanta-based Contel Cellular, Inc. Kerns, who is vice-president of information services at the cellular phone company, rejected the notion of calling the DEC hot line in Colorado Springs to muddle through a system software diagnosis.

"We're all doing some pioneering with their technology, and the way they support their transaction processing customers had to change," Kerns said.

Contel's major application is a "customer care system" that does everything from logging in orders from remote offices to tracking changes in the customer database. Because it was built on DEC's RDB database and several layered system software products, Kerns needed in-house experts to keep his system up and running.

> "DEC IS always successful with its hardware. The shortcomings are on the software side."
>
> PETER CORIASCO
> BANKERS TRUST

While VMS may share the same letters as MVS — IBM's mainframe operating system — the DEC system software is still not quite its equal, according to some users. At Bankers Trust Co. in New York, VMS' inability to be partitioned or to run class scheduling has kept the bank at arm's length from the new mainframe.

"DEC is always successful with its hardware. The shortcomings are on the software side," said Peter Coriasco, vice-president for technological strategic planning at Bankers Trust. Partitioning would allow users to run multiple versions of the operating system, and class scheduling provides a way to "properly assign computing resources to individual applications," he explained.

Taking it seriously

"I see the lack of these two as a major problem for users wanting to run multiple applications," Coriasco said. "But I know DEC is working hard on this, and I believe they will be successful. All the way from Ken Olsen down, they are taking software issues very seriously."

An unexpected use for the mainframe VAX turned up in Albany, Ind., at Paws, Inc., an art studio company founded by cartoonist Jim Davis, creator of Garfield the cat.

MIS director Tim Bird had a VAX 9000 Model 210 installed in August to provide Paws with a giant file server, a general purpose accounting and database machine and a production design system. The DEC service team particularly impressed Bird one night by flying in four KDM-70 disk controllers to replace defective ones that arrived with the machine.

"An hour after the first private jet brought us those KDM boards from Chicago, DEC sent another set of spares in case they didn't work," Bird recalled.

One user who falls into the classic technical mold for use of the mainframe VAX is Chrysler Motors Corp. in Detroit, where the advanced manufacturing technical center has just installed one VAX 9000 Model 210 and has another on its way at Christmastime.

According to Joe Bulat, manager of computer-integrated manufacturing, the mainframe has quadrupled the power of his present Vaxcluster and provided some 1,200 users with the necessary support for product engineering. One key new application made possible with the VAX 9000 is handling the high-speed flow of real-time information between 10 assembly plants and three stamping plants.

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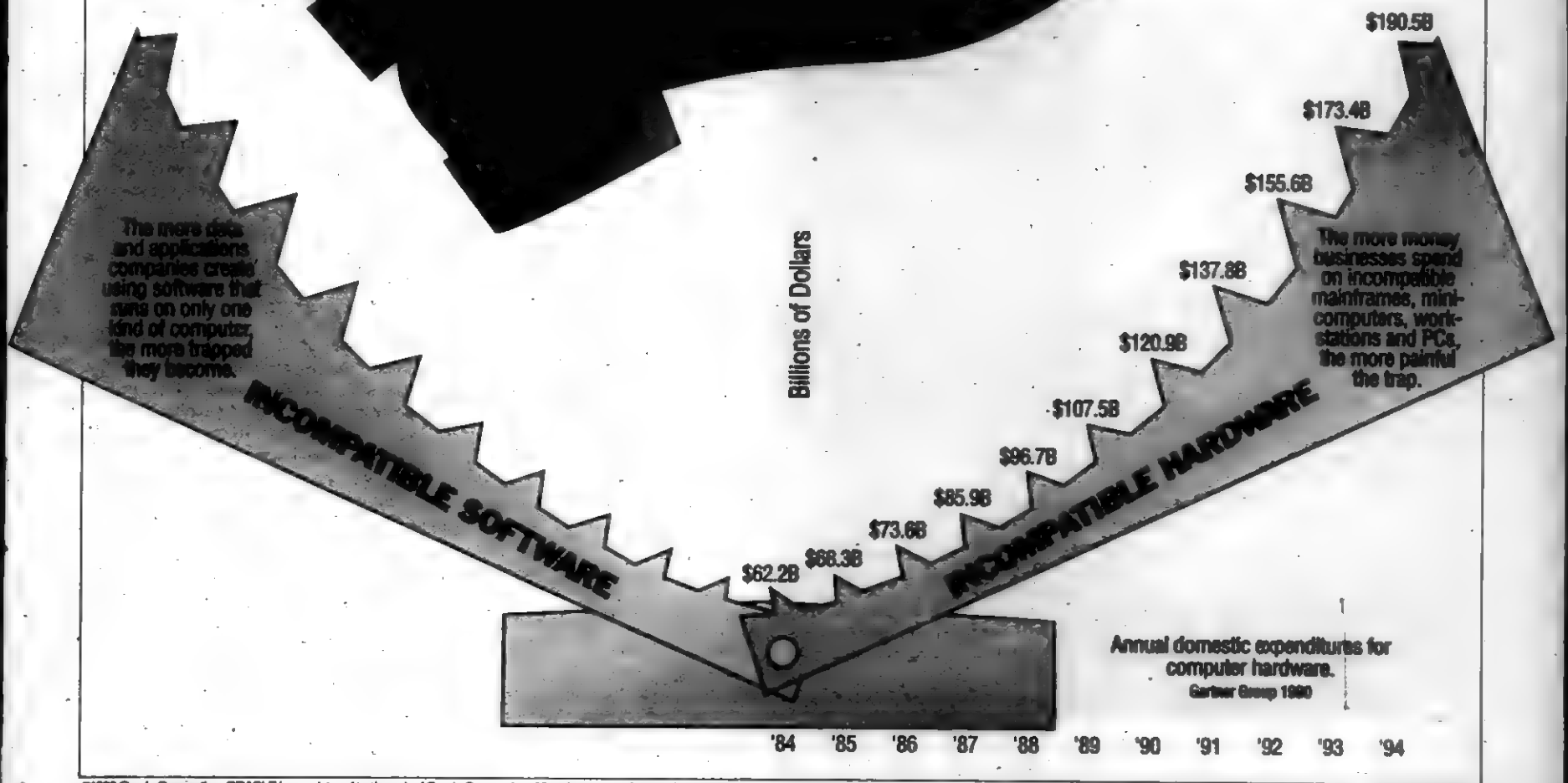

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DG goes with leaner, meaner MV product line

BY SALLY CUSACK
CW STAFF

WESTBORO, Mass. — Data General Corp. has reconfigured its bread-and-butter line of proprietary midrange systems with the announcement of the MV/30000.

"The MV line provides us with over a billion dollars in product and service revenues," said Dave Ellenberger, recently appointed division vice-president at DG's Eclipse marketing unit. "This is the fourth new MV platform we have announced this year."

The MV/30000, scheduled to take its official bow at the annual DG user group meeting in Seattle this week, replaces the vendor's MV/15000 and MV/20000 systems. It is targeted at midrange customers doing office automation and business applications.

Cleaner product

According to Carolyn Griffin, an analyst at International Data Corp., a market research firm based in Framingham, Mass., the positioning creates a "cleaner and more streamlined MV product line." Griffin also said she feels that DG's newly consolidated MV product development and marketing divisions will make MV operations more efficient, from both a customer and a vendor standpoint.

The MV/30000, which runs the AOS/VS II operating system, is available in single- through quad-processor configurations and can be expanded with up to three I/O channels. The processor is based on a single-chip, custom CMOS microprocessor designed by DG and manufactured by Hitachi Data Systems Corp. in Japan.

Single-chip technology, which creates a single-board computer, offers the customer savings in terms of cost and reliability, Ellenberger said. He added that CMOS architecture allows customers to take advantage of developmental advances in the semiconductor world.

One DG MV/15000 user, who wished to remain anonymous, commented that he had little interest in new MV system announcements and was more eager to take advantage of a "definitive" open systems migration plan coming out of the company.

The MV/30000 reportedly supports as many as 2,472 direct asynchronous connections and offers up to 256M bytes of error checking and correcting memory, which is available in 16M-, 32M- and 64M-byte increments. Other features include a diagnostic processor and a rack-mount chassis. Pricing for a single-processor, 16M-byte platform configuration is $120,000.

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Oracle CEO owns up to feet of clay

BY JEAN S. BOZMAN
CW STAFF

BURLINGAME, Calif. — Oracle Systems Corp. executives said they are not blaming anyone but themselves for Oracle's recent financial woes. At last week's shareholders' meeting here, Chief Executive Officer Larry Ellison took personal blame for the firm's recent $36 million loss [CW, Oct. 1] and conceded that Oracle executives had been out of touch with middle managers.

"I wish I had seen it coming and changed our [high-growth] strategy earlier," Ellison told several hundred investors who gathered at Oracle's annual meeting Oct. 15. "If I had seen it six to nine months earlier, the first-quarter disaster need never have happened. But I didn't see it coming, and that responsibility is mine."

Senior management placed too much emphasis on expanding sales at yearly rates of 50% or more and had neglected to fix the bugs in existing software, Ellison said. "Development team managers recently told us, 'It's about time you guys in management finally figured out that we need to take time to fix the bugs,' " he said. "They also told us, 'It's about 18 months too late.' " Ellison said Oracle's new plans call for selling most Oracle products into the firm's existing customer base.

Ellison's remarks at the stockholders' meeting came minutes after a pro-forma renomination of the current board of directors.

Board scout

Ellison said he and Chairman Donald Lucas were spending much of their time scouting for new board members and other senior managers from multibillion-dollar high-tech firms. "We will take all the help we can get, from all quarters," Ellison said. "Nobody on the [current] board has run a multibillion-dollar corporation."

Industry analysts seemed relieved that top management was going on record for failing to forecast Oracle's 1990 sales slump in the face of a slowing world economy. "Oracle management needed to get rid of industry criticism that ... they weren't taking responsibility for what happened," said Charles Phillips, a senior analyst at Soundview Financial Group, Inc. in Stamford, Conn.

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AT&T to give Centrex users long-distance ISDN ability

BY ELLIS BOOKER
CW STAFF

BASKING RIDGE, N.J. — AT&T said last week that it will be able to offer ISDN Centrex customers connectivity over its long-distance network, crediting a software upgrade for the central office switches its Network Systems unit sells to local telephone companies.

While limited for now to Centrex services based on AT&T's 5ESS central office switch, analysts said the new service is significant in that it points the way toward flexible, nationwide Integrated Services Digital Network (ISDN).

"It extends the benefits of ISDN and allows, although with limitations, end-to-end service to Centrex customers," said Steve Sazegari, a senior industry analyst at Dataquest, Inc. in San Jose, Calif.

Up until now, Centrex-based ISDN arrangements have existed as islands, although they have been connected, for demonstration purposes, over private-line networks.

The Primary Rate Interface Nodal/Centrex Express (PRINCE) service will permit ISDN Centrex customers in two locations to establish a Basic Rate Interface ISDN call over AT&T's Primary Rate Interface (PRI), the ISDN service it launched in 1988.

PRINCE will only work for users whose Centrex ISDN service is provided through an AT&T 5ESS central office switch that has been loaded with the 5E6 generic software release that AT&T Network Systems began deploying at local telephone exchanges last year.

A limitation of the service, AT&T said, is that a PRI can only support a single customer connection. AT&T's PRI service has a $3,000 one-time installation fee as well as a $400 per month fee.

Meanwhile, the second largest central office switch vendor, Northern Telecom, Inc., said last week that its local switch, the DMS-100, supports ISDN protocol connectivity with both the AT&T 4ESS and Northern Telecom's own DMS-250 toll switch. AT&T, which said Prince would be available at 250 local exchange central offices by year's end, had no comment on whether PRINCE would work with the Northern Telecom systems.

Apple financials hit slow track

BY JAMES DALY
CW STAFF

CUPERTINO, Calif. — Apple Computer, Inc. felt the crunch from the slowdown in the personal computer industry last week when it announced financial results in which yearly sales figures had inched up slightly while quarterly earnings took a nosedive.

Net revenue for the fiscal year ended Sept. 30 totaled $5.56 billion, a 5% increase over the $5.28 billion reported for 1989. Net income for the full year was $474.9 million, or $3.77 per share, up 5% from profits of $454 million, or $3.53 per share, last year.

Revenue for the fourth quarter was $1.35 billion, down 2% from the $1.38 billion reported for the corresponding period in 1989. Profits for the quarter were $98.5 million, or 81 cents per share, down 39% from the $161.1 million, or $1.24 per share, reported last year. Earnings from one year ago also included $48 million from the sale of Adobe Systems, Inc. common stock.

Chairman John Sculley partially attributed the mixed results to the readjustment of the Macintosh product line, in which anticipation of new low-end Macintoshes stifled sales throughout the line. "We expect that many customers who wanted our products but didn't purchase them because of their prices will now choose Macintosh," he said.

Last week, the firm introduced a trio of new Macintoshes — including one priced at less than $1,000 — that reduced the entry price to Macintosh by as much as 50% and is expected to make Apple machines more competitive with similarly configured MS-DOS machines.

Analysts said they expect the additions will help Apple regroup. "Apple is poised to increase its share of the personal computer market over the next two years," said David Wu, an analyst at S.G. Warburg Securities in New York.

The company, however, still faces tough competition from Microsoft Corp., which in the spring introduced the Windows 3.0 graphical user interface package that closely approximates the point-and-click screen appearance of the Macintosh.

While the domestic market is softening, Apple officials said they will continue to look overseas to take up the slack. The international market, particularly Europe, continues to play an increasingly important role in the firm's financial portfolio. International sales accounted for 42% of net sales for the full year, compared with only 36% one year ago, company officials said.

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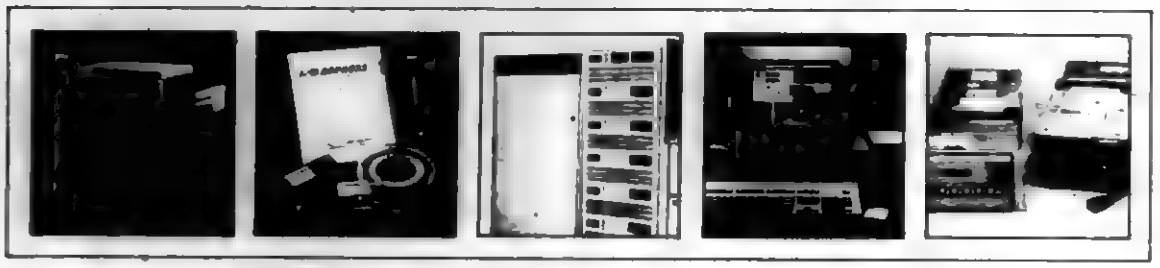

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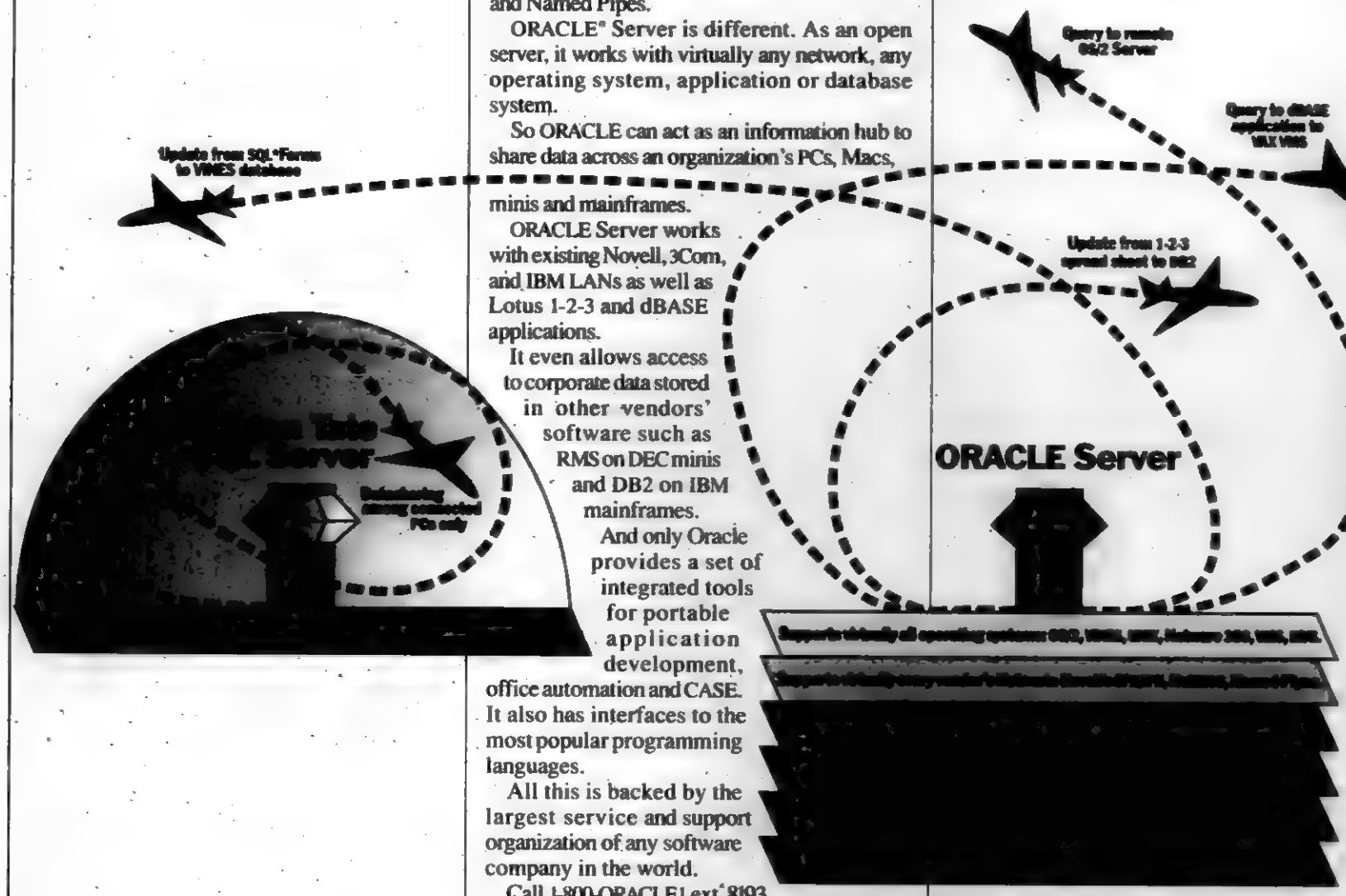

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Wang introduces open standards software plan

BY SALLY CUSACK
CW STAFF

BOSTON — Wang Laboratories, Inc. moved last week to make good on its December 1989 promise of open standards by introducing a software connectivity plan that allows Wang VS minicomputers to work as servers on personal computer-oriented local-area networks.

Introduced at the U.S. Society of Wang Users' (USSWU) annual meeting in Boston, Open/Server also includes enhanced communications with other minicomputer and mainframe hosts.

The Open/Server architecture has been divided into two groups of products.

Level One products allow PC users on industry-standard LANs, including those from Banyan Systems, Inc., Novell, Inc. and 3Com Corp., to access Wang Integrated Image Systems and Wang Office applications on the VS computer. Level Two products enable the user to construct enterprisewide networks that support strategic applications via the client/server model, the company said.

"This means users can have a very standard imaging system on a LAN and also maintain their VS for other applications," said Scott McCready, an analyst at Framingham, Mass.-based International Data Corp.

Peter Forbes Pollack, managing director of MIS at Financial Security Assurance, Inc. (FSA) in New York, said Open/Server capabilities are "crucial to our environment." FSA has been beta-testing Open/Server products since June.

FSA has four Banyan Virtual Networking Software (Vines) LAN installations scattered across the globe and anticipates providing end users with access to office automation, electronic mail and client-tracking system applications currently residing on a VS 10000 computer.

"We want to hook everyone into the mini in a transparent client/server environment," Pollack said, adding that the Open/Server products allow the host system to participate as a peer in server-to-server communications.

Other users are adopting a wait-and-see attitude. Tony Bishop, a manager at Ford of Europe, based in Essex, England, said the product line may protect Ford's heavy investment in Wang systems: "We're hoping that Open/Server will help us reposition ourselves from a mini host to a LAN server environment." Ford of Europe currently has more than 270 Wang VS midrange computer installations and is piloting an imaging application for its customer service program.

Wang also announced OEM and joint development agreements with third parties to support Open/Server, including an agreement with Novell for Wang to resell, service and support Novell's Netware product line; an OEM agreement with Proteon, Inc. that allows Wang to market Proteon's Pronet 4/16 token-ring twisted-pair networking products; and an agreement with Oracle Systems Corp. for a new version of Oracle for Wang VS, a relational database management system.

"Last year, everyone was starved for information on both the company and the products," said Matthew Gillman, president of USSWU. "This year the atmosphere is calm and professional."

Borland one-two aimed at Lotus

BY JAMES DALY
CW STAFF

SCOTTS VALLEY, Calif. — Borland International delivered its latest salvo against struggling Lotus Development Corp. last week when it began shipping a more powerful version of its Quattro Pro spreadsheet program.

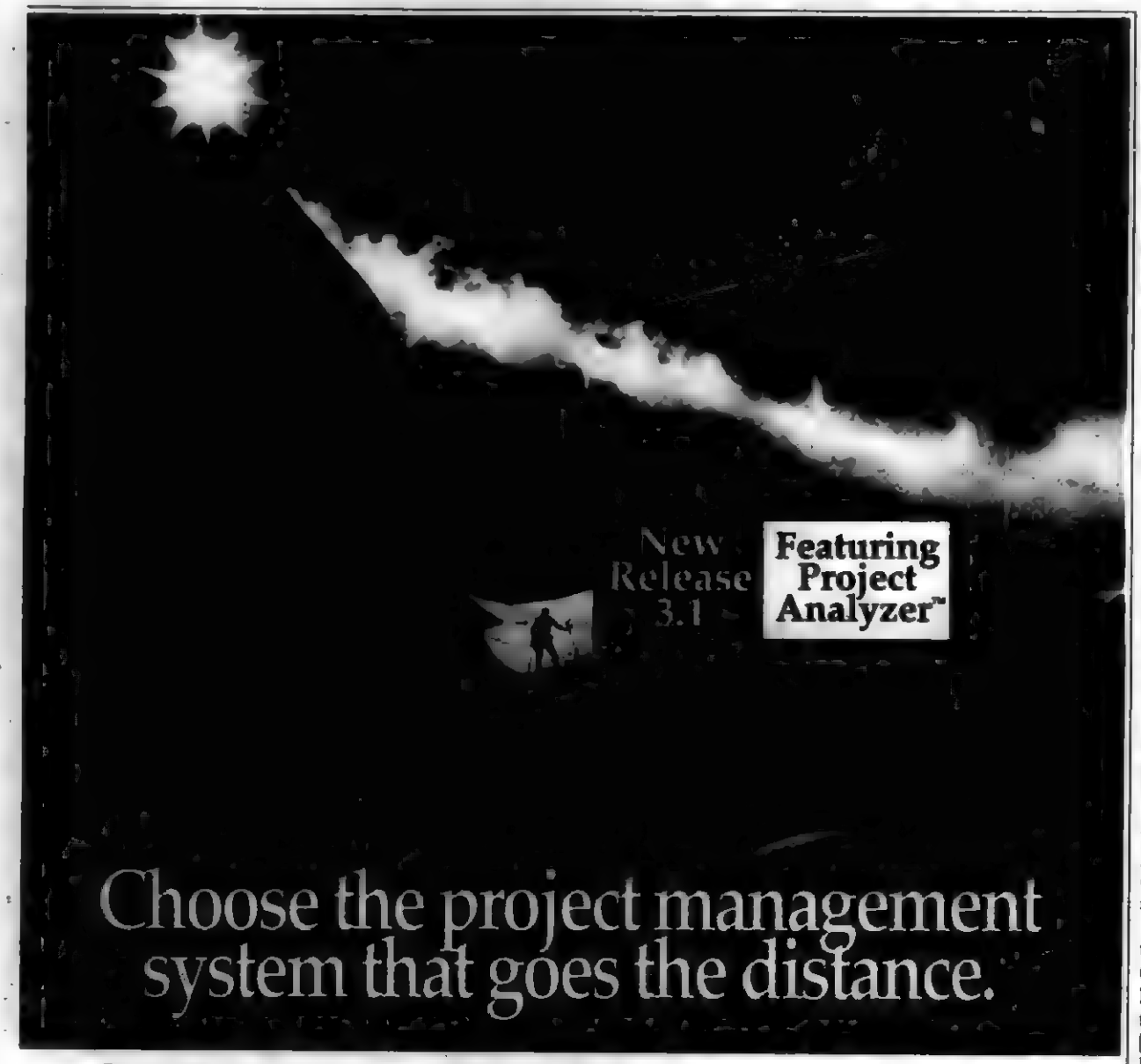
The introduction of Quattro Pro 2.0 continues Borland's intensive campaign to unseat Lotus' 1-2-3 as the longtime king of the hill in the spreadsheet world.

Borland also delivered a follow-up punch with the announcement of an aggressive enticement plan allowing users of competitive spreadsheet packages to swap over to Quattro Pro 2.0 for $99.95.

Borland's previous offensive appears to be making strong headway against Cambridge, Mass.-based Lotus, which last week released third-quarter earnings that were down sharply from last year [see story page 7]. Since early 1989, Borland's share of the spreadsheet market has leaped from 5% to approximately 25%, according to Dataquest, Inc.

Many of the half-million Quattro Pro units sold since its introduction this year appeared to have been bought by disgruntled Lotus users. A study conducted by Vista Marketing Research in Oakland, Calif., indicated that more than 80% of Quattro Pro users previously worked with 1-2-3 for their spreadsheet needs.

Some new Quattro Pro users said they switched from 1-2-3 because Lotus has become difficult to deal with. "We've become very disappointed with Lotus," said Carl Hane, head of microcomputer application systems at MCI International, Inc. in Rye Brook, N.Y. "Their support structure is very bad, and they don't seem to be willing to listen to their customers when it comes to product enhancements."



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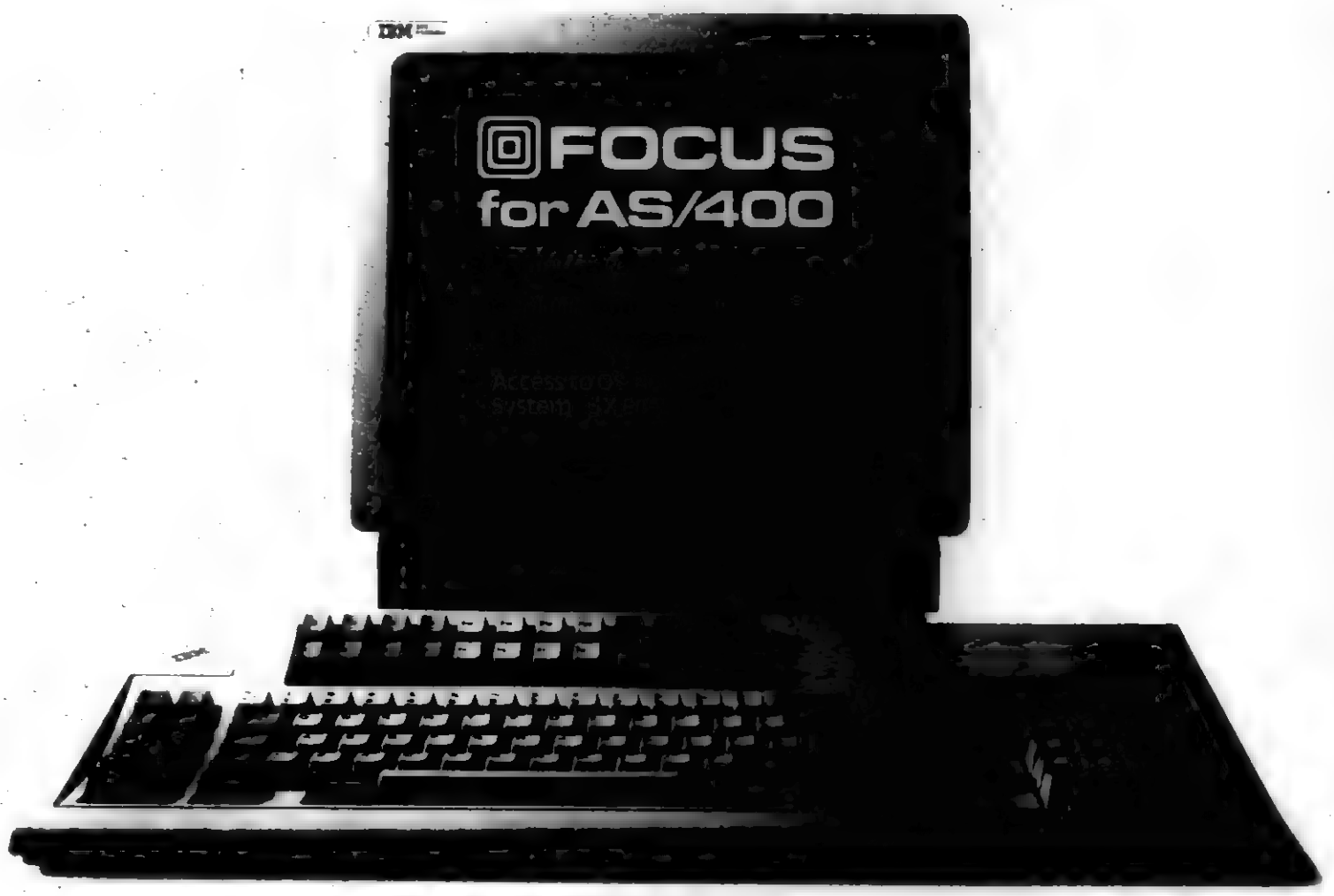

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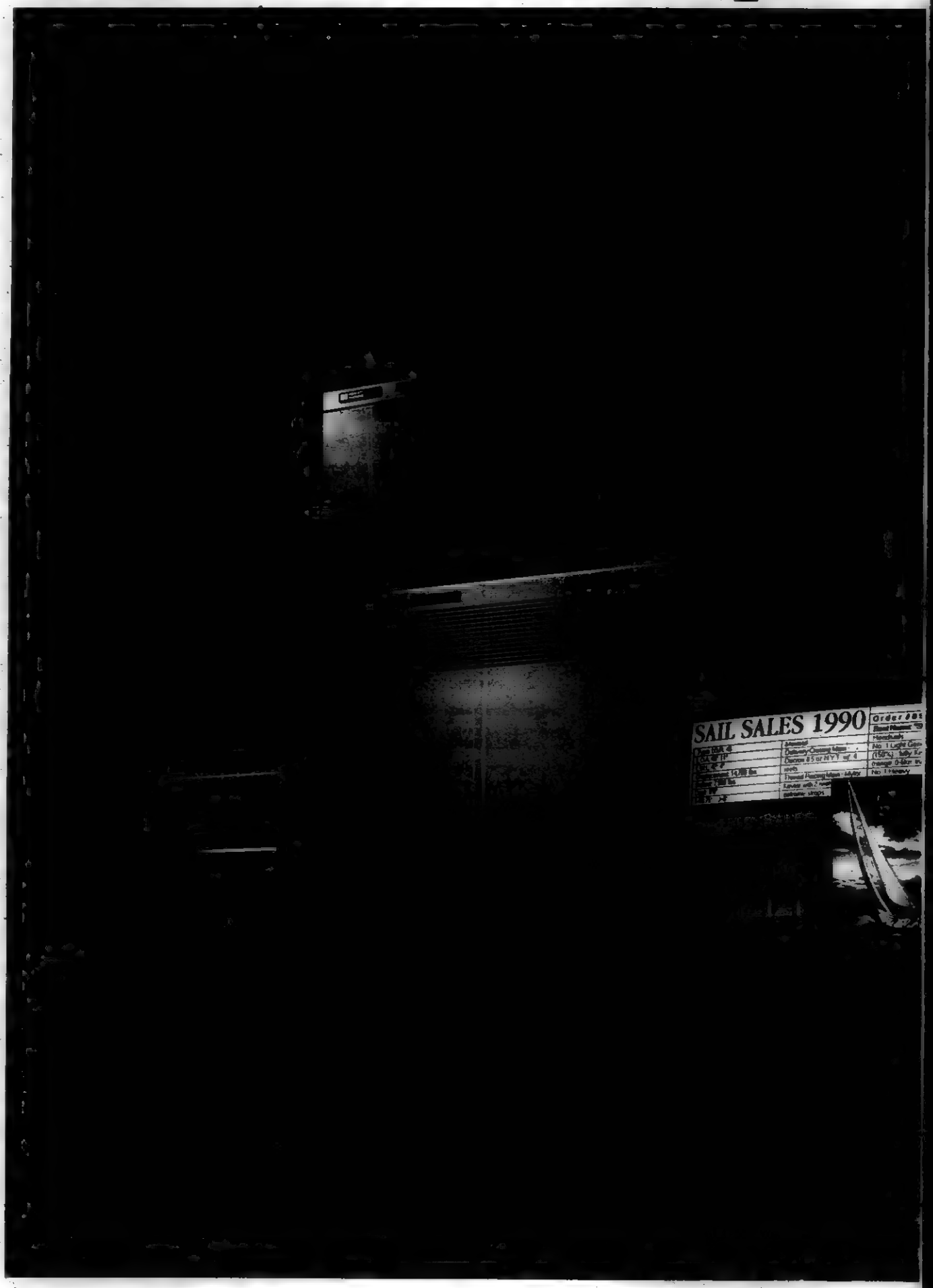

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ADVANCED TECHNOLOGY

TECH TALK

LCD patent in focus

■ In Focus Systems, Inc. said last week that it was awarded a patent for a high-resolution — 1,280 by 1,024 pixels or greater — monochrome LCD. Prior attempts of LCD makers to design high-resolution LCDs were hindered by inadequate refresh rates. In Focus Systems solved the problem by stacking two 1,280- by 512-LCD panels, using a process called interdigitating. Each panel contains alternating rows of active and inactive pixels that are staggered so that each active row aligns with an inactive row. Interdigitating the panels reduces the number of rows that must be refreshed by a single panel, making it possible to achieve the 60 times per second refresh rate that is needed for high-resolution display.

Star Wars medicine

■ Radiologists at Johns Hopkins Hospital claimed recently that a three-dimensional computer system adapted from movie animation technology has been used on nearly 3,000 patients in the past four years to improve treatment and spare many the pain and cost of surgery. A 3-D imager, developed by Elliot Fishman, associate professor of radiology at Johns Hopkins, and computer scientist Derek Ney, is based on Pixar computer technology that was used to create life-like animation sequences for such films as *Star Trek II.*

Complex concerns

■ In a survey commissioned by the Association for Computing Machinery, top scientists expressed doubts about the safety and reliability of complex computer systems. As such systems take charge of everything from phone calls to airplane flights, the scientists warned of an increasing danger of man-made disasters. The scientists also expressed fear that the misuse of computer models could lead the government to adopt disastrous policies in dealing with such topics as global warming and economic growth.

Chief publishing officer to the rescue

Drowning in a sea of paper, corporate America needs someone to take control

BY MICHAEL ALEXANDER
CW STAFF

Despite dreamy predictions to the contrary, corporate America has yet to move into the paperless office. Computer technology now makes it possible for anyone to design and produce reports, forms, white papers and umpteen other documents, sometimes with only a few simple keystrokes. As a result, business is drowning in a sea of paper and shouting for a lifeguard, someone who will take control of corporate publishing and stem the paper flow, according to some analysts.

That lifeguard, with the title of chief publishing officer, may soon move into the office next door to the chief information officer in most large corporations and conceivably even be one rung up on the management ladder, one analyst said.

Xerox's Docutech *electronic printing press*

Stemming the paper flow has become a priority at most large corporations because the costs of creating, printing and storing documents have gotten out of hand, said David Henry Goodstein, a printing industry analyst and president of Interconsult, Inc. in Arlington, Mass.: "The economics are staggering." The corporate paper pile is growing at 4% to 6% per year, and the information on half of those documents is obsolete soon after it is printed, he said.

Mystery chief

Just who will likely be the chief publishing officer remains a toss-up, but it will probably be between IS and in-plant print shop managers. Right now, the odds favor in-plant print shop managers, Goodstein surmised. Only a small percentage of corporate information — primarily financial data — is automated and under the control of the IS manager. The overwhelming bulk of information remains on paper documents consisting of text and images, and that is the domain of the print shop manager, he said.

IS and print shop managers are each at opposite ends of the corporate document creation and publishing stream; what happens in the middle ground, where desktop computer systems will be linked with high-volume electronic printing presses, will determine who will get the nod to take over as chief publishing officer, said Ben Lusby, director of administrative services at Blue Cross and Blue Shield of the National Capitol Area. Lusby oversees desktop publishing and in-plant printing for Blue Cross. "It will depend on whether IBM or Xerox wins," he said.

IBM and Xerox, as well as other companies, are approaching the paper problem from different ends of the spectrum, Lusby said. IBM and others are touting computer systems tied to increasingly powerful laser printers, while Xerox is touting high-volume, electronic printing presses with computer and other digital capabilities.

"I would say if there is a printer from IBM that solves the publishing need, you're going to see a [decentralized] data processing solution; if it is Xerox, it will be a centralized publishing solution," Lusby said.

Earlier this month, Xerox introduced an electronic printing press called the Docutech Production Publisher, which the company said bridges the gap between computer workstations and business publishing by combining advanced technologies in scanning, filing, printing, finishing and networking [CW, Oct. 8].

The two-ton electronic publishing system, which costs $220,000, is capable of producing 135 laser-printed pages a minute at 600 dot/inch. The electronic press forces home the argument that IS and in-plant printing managers are closing in on common ground.

Already, Xerox is planning to make networking software available early next year that will link the Docutech to local-area networks running Novell, Inc.'s Netware. Xerox has also inked pacts with AT&T, Adobe Systems, Inc., Digital Equipment Corp. and Sun Microsystems, Inc., among other computer companies.

Common occupation

Lusby agreed with the notion that a chief publishing officer may one day be a common occupation in large corporations; he and his counterpart in IS already report to the same vice-president at Blue Cross, one indication that the two responsibilities are seen as being compatible, he said. However, "it is not likely" that the chief publishing officer would oversee both IS and publishing. "I can't imagine being that smart in both areas," he said.

Other analysts are skeptical that a chief publishing officer will arise from the middle ground between desktop and electronic printing systems. Ultimately, the task of overseeing corporate publishing will be taken over by a chief information officer because computing and publishing are no longer separate processes but one and the same, said William Clinton, who follows the electronic printing industry as the director of compound document services at BIS CAP International, Inc. in Norwell, Mass.

"The chief information officer is going to be responsible for a corporation's information and systems, but it is still going to need to have expertise in producing the final document and publishing it," Clinton said. "I don't see one replacing the other."

There are several levels of publishing in virtually every part of the organization, and each requires a different amount of end-user education and skill, Clinton said: "They will still need this guy [the print shop manager] controlling information going out of the organization because it will always be important to have consistency."

What the melding of these two systems portends is a new way of assembling and distributing information, which in turn will lead to new responsibilities for both the IS and in-plant print shop manager, he said. "Managers can no longer think of publishing in traditional terms," Clinton said.

ONLY A SMALL percentage of corporate information — primarily financial data — is automated and under the control of the IS manager. The overwhelming bulk of information remains on paper documents consisting of text and images.

The future will be in "compound documents," in which the technologies of computer processing and publishing intertwine. This compound document will probably consist of text, images and multimedia effects. As an example, the insurance claims adjuster who now looks at static, two-dimensional images of an automobile will be handed "documents" that include full-motion video and other effects that will allow the adjuster to look at all facets of an auto, including the inside and undercarriage, Clinton said.

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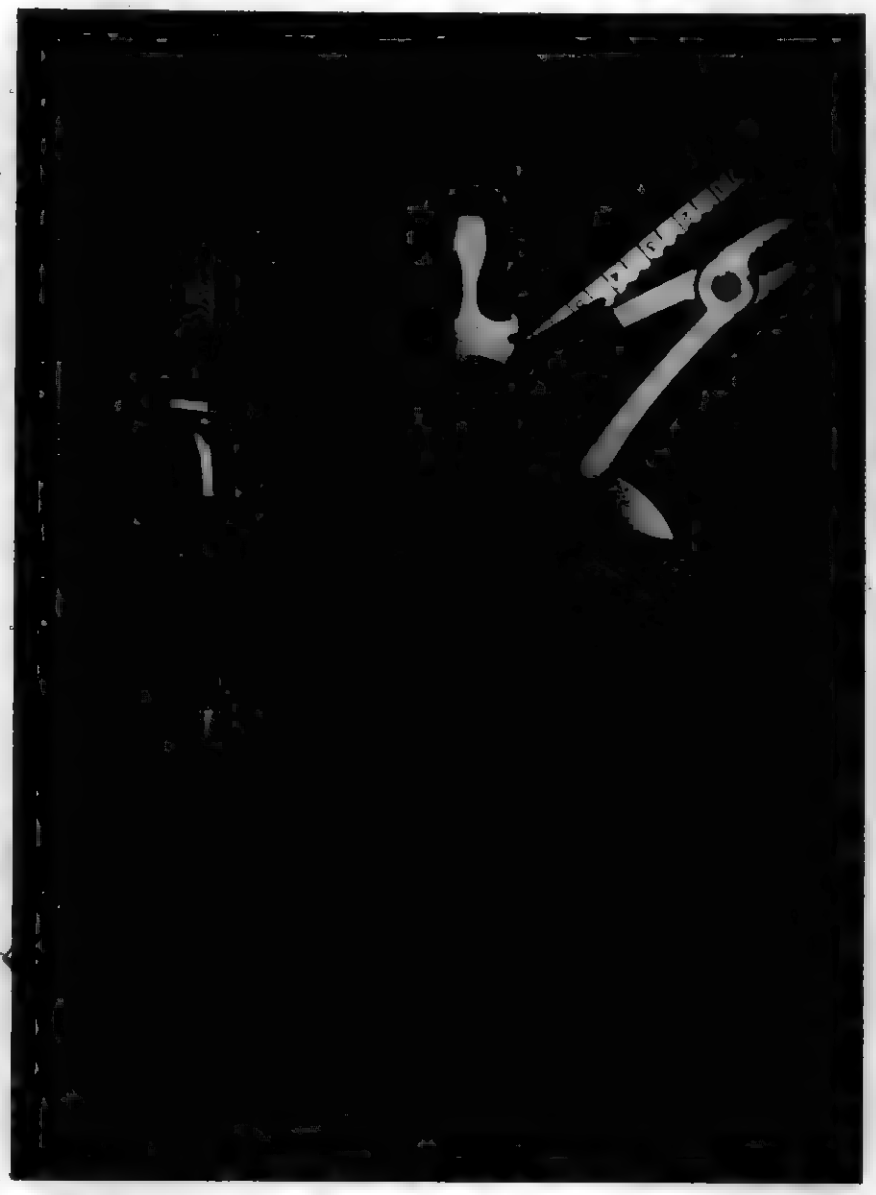

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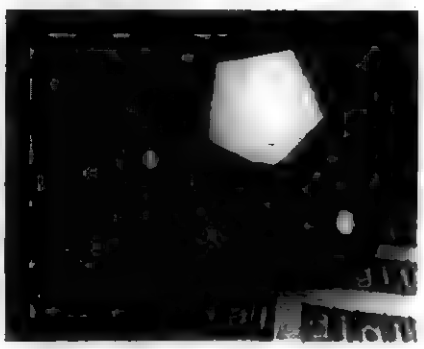

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EDITORIAL

Get comfortable

BUSINESSES BOTH BIG and small in San Francisco are nervous, and they have good reason to be.

Pending legislation seeking to protect VDT workers would saddle user companies with what they consider excessive and unwarranted costs. Bank of America estimated it would have to shell out some $44 million to bring its 6,000 VDT workers into compliance with the proposed rules.

Proponents of the legislation counter by saying that those costs are a small fraction of the estimated medical expenses of treating injured VDT workers. This is an interesting counter, given that the number of workers who have suffered gross injuries directly attributable to VDT use at any site — well, suffice to say you could probably count them on one hand without affecting your typing speed.

Nonetheless, the legislation is not without merit and, in fact, contains some very compelling messages for all organizations that have workers who use VDTs.

Unlike the many unfounded outcries in the past that attempted to link VDT use to serious health side effects because of radiation emissions, virtually all the requirements of the San Francisco legislation deal with basic worker ergonomics: mandatory use of nonglare screens, adjustable chairs and tables, proper spacing of workers (although at five feet of space between each worker, the proposed requirement is perhaps a bit ambitious in this regard).

It is encouraging to see that the blind pursuit of — if not insistence on — proof linking VDT emissions with all sorts of maladies has petered out. There is absolutely no scientific evidence proving that electromagnetic radiation from VDTs is a health risk to operators.

Moving away from the emissions hysteria has allowed researchers to concentrate on the real culprits behind VDT worker discomfort — namely, the workplace environment.

Simply put, the workplace never really adapted properly to the introduction of VDTs, 90% of which occurred in the last decade. Office workers used to handle paper comfortably on a horizontal desk exactly 2½ feet from the floor.

Today, they read this information on blinking colored, curved screens that glare mercilessly in their faces. The workers don't move much. The workplace was never re-engineered to accommodate these basic changes.

Also, there hasn't been much hue and cry about the plight of office workers because of invalid assumptions that office work isn't dangerous because it isn't "heavy" work. Now that's changing.

So there are really two messages coming over the wires from San Francisco. The first is an affirmation of ergonomic requirements. The second is more vital to heed: Business either needs to get busy and start policing these matters on its own or risk having to accede to the demands of politicians. Which would you prefer?

LETTERS TO THE EDITOR

Intelligent design

Computers have found widespread acceptance in analysis and rendering applications in design. The common thread among these applications is the model. In mechanical design, the designer assimilates knowledge about the task (functional specifications) and the world (experience) and produces a model (the conceptual design) that is successively refined and improved until it satisfies all the requirements of the functional specifications and the global constraints imposed by the world (detailed design).

While tremendous contributions have been made using computers to help designers optimize detailed, concrete models, their usefulness in aiding designers in creating models has been limited, particularly in the area of mechanical design. This is because model creation requires the ability to reason abstractly — something uniquely human — and because computers have been traditionally used to manipulate details rather than ideas.

We should begin to explore the requirements of knowledge representation for conceptual design with the ultimate goal of bringing the synergistic power of man and machine together as early as possible in the design process.

Adam Starchild
Ashland, Ky.

Objection

Regarding the In Depth article on object-oriented programming [CW, Sept. 17], it should be understood that there is a difference between object-oriented programming and database design. The impact of database structure on how a system is programmed is important, but it is only a side issue; discussing how object-oriented technology will "compete with" relational technology is missing the point.

Object orientation does not have its origins in the programming language C++: It goes all the way back to Simula67, which is the first language to support the "class" language construct.

I understand that it is good to give a simple and meaningful description, but at what expense? Do we want misinformed IS professionals out there thinking object-oriented programming is just for writing database-oriented systems and that it must be done under Unix?

I urgently request that you publish a follow-up article that is truly "in depth" and accurate. Articles such as this one contribute to the smoke surrounding object orientation.

Philip W. Hall
Software Engineer
Advanced Manufacturing Systems Division
Cincinnati Milacron
Cincinnati, Ohio

Personal problems

I was intrigued by the article by Dennis Noonan on the Viewpoint page [CW, Sept. 10]. As I was reading it, I couldn't make up my mind if he was being serious or very sarcastic.

With the advent of personal computing, many saw the opportunity to wrest control away from those who communicated in dataspeak and put it in the hands of the users. To do this, they did exactly what Mr. Noonan describes: They handed over thousands of dollars worth of hardware and software to managers and clericals and, in essence, said, "Have a ball. Control your own destiny."

What resulted was a world of individuals who were already doing an eight-hour job in an eight-hour day and on top of that were expected to learn, pretty much on their own, something totally and absolutely foreign: DOS, Reboot, EDLIN, DEVICE=ANSI.SYS. Give me a break!

What these people want is exactly what they deserve: applications developed by we in management information systems who (supposedly) know what we're doing; applications which do the exact job needed to be done; applications which "come up" either when the machine is turned on or by pressing one function key; applications with Lots-O-Help that are forgiving, well documented and reliable.

Who are we kidding? PCs are never going to make the applications backlog go away. If anything, they're making them longer. We in MIS are writing the same kinds of applications we've written for years. We're just writing them for a different platform, with different tools and in much less time.

Eric S. Helland
Project Manager
Corporate Financial Systems
Woolworth Corp.
Milwaukee, Wis.

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Get ready for staffing squeeze

DUWAYNE PETERSON

Many of the older systems developed during the IS boom in the '70s and '80s have become obsolete and require heavy maintenance to keep up with business needs. Companies find themselves dependent on employees who have been around since the systems originated. These people may be the only ones who completely understand such systems, and this scenario is more common than most companies would be willing to admit.

The fear of losing these employees almost forces us to consider providing bodyguards and limousines to ensure they make it to work.

Maintaining a supply of qualified personnel is a challenge that IS organizations are going to find increasingly difficult in the 1990s. Addressing this challenge in today's economic environment is especially difficult when many companies have had to downsize their work forces to reduce operating expenses.

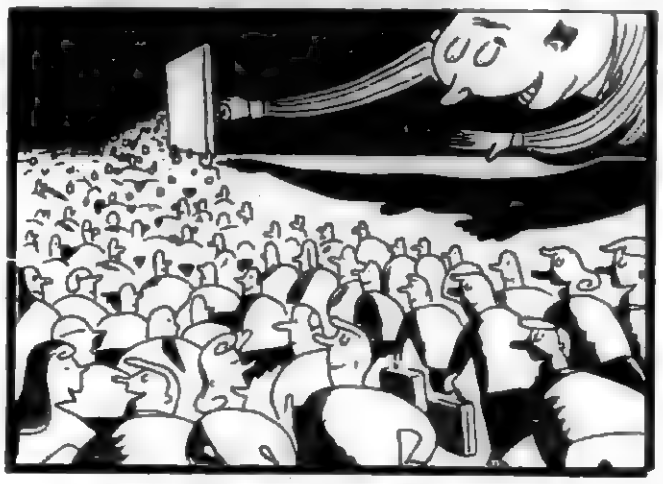
As we move forward in this decade, the supply of qualified IS people will be decreasing as the demand for their skills increases. Factors such as the need to re-engineer older systems, the emergence of new technologies and increases in the technical savvy of business users will foster this demand. Additionally, competition for IS people will strengthen as systems integraters and outsourcing firms enter the marketplace.

Now is the time to develop strategies to enable our companies to meet the future IS resource needs. The firms that achieve an advantage in the 1990s will be those in which a partnership is formed between management and employees.

The key to forming such a partnership is communications. Each individual in a company has dual roles of customer and supplier. Managing the dynamics of this dual role involves the identification of customer requirements and ensuring that the right things are done to satisfy them. Basic employee requirements include the following:

- The desire to work for a company that is respected both internally and externally.
- Open communication with management.
- Challenging goals that are aligned with organization and customer/supplier goals.
- Responsibilities and the power to carry them out.
- Recognition for a job well done and resulting job security.

The best place to look for resources to meet future IS skill demand is in your own organizations. Employee surveys will tell you what the requirements of employees are, how they prioritize them and how good a job your company is doing at meeting them. Salary benchmarking is also important to ensure that your company is compensating on a competitive basis.



M.E. Cohen

Aligning IS strategies with business strategies can help determine future skill needs. As new technologies are introduced, many IS people will need to be retrained. During the next decade, the roles of programmers and systems analysts will change to that of a business analyst. In addition to technical training, these people will also need training on the business operations and functions.

The structure of organizations is also changing from the hierarchical management by function to a flatter organization aligned to technologies and products.

Management development programs are also needed to prepare future managers and enhance the skills of current ones. Policies that provide for job rotation and cross-functional training will facilitate individual growth and reduce the risk of becoming dependent on one person who has always done a certain job.

The Census Bureau has spoken about the "Workforce 2000," which will be characterized by a majority of women and minorities. Preparation for this change makes the effectiveness of equal employment opportunity programs critical. These policies must evolve beyond their current level of ensuring equal opportunity to ensuring that special efforts are made to advance women and minorities.

As these changes come about, a greater effort must also be made in the area of work/family policies. Flexibility in work schedules is needed for mothers and fathers to raise families and also to provide care for aging parents. With the technology available today, it is possible for many people to do some work from home, work flexible hours or even share positions.

Many of the things that need to be done to keep qualified IS employees are the same as for any other employee. The difference is in the greater need for training in both technical and business areas.

In many cases, IS people are bright and creative and often introverted. These individuals thrive on opportunities to experiment with the latest technologies and should be given opportunities to discover new solutions that can help companies support new business opportunities.

Some people will say this is all well and good, but budgetary pressures will not allow these types of programs to be pursued. To these people, I say good-bye, because their organizations are doomed to extinction or second-class status. It's time for executives to lead and provide a workplace where people can operate with dignity and professionalism. The smaller work force of the coming "Baby Bust" generation will put a greater emphasis on human resources, and the way that resource is managed will make the difference in the marketplace.

Peterson is executive vice-president, operations/systems and telecommunications, at Merrill Lynch & Co.

Gary Biddle: A thinking man's IS chief, a friend

CLINTON WILDER

During the unhappy task of doing interviews for last week's *Computerworld* story about Gary Biddle's death, I found a familiar refrain among those who knew him. Whether the person was a fellow IS executive, consultant or vendor, I consistently heard, "But you know, we had more than a business relationship. I regarded him as a personal friend."

The late vice-president of IS at American Standard had that kind of effect on people; he certainly did on me. He was not a gregarious, backslapper type, but he was genuinely warm and keenly interested in other people's ideas. And he was very happy to share many of his own.

After I became *Computerworld's* senior editor of management in early 1989, Biddle was the first IS executive who I profiled. Our 90-minute interview in his quiet Manhattan office was one of those sessions that a journalist lives for — when the interview breaks the boundaries of question-and-answer to become a truly engaging conversation, a sharing of intellect.

When I pulled out that profile for background information to write his obituary 10 days ago, I saw that I had written, "Gary Biddle is one of the deep thinkers of the IS profession."

As we all know, however, there are plenty of IS visionaries out there now working for new companies or consulting firms because they lacked the political skills to implement the vision. Not Biddle. Eastman Kodak IS executive Henry Pfendt paid him perhaps the highest compliment possible to bestow: "He practiced what he preached."

Biddle's intellect was impressive, but what made him *effective* was his ability to talk air brakes and air conditioners. He knew American Standard's business inside and out; he had worked there since age 18 and spent his early career in manufacturing. So when he talked about coordinating information technology with business strategy, senior management listened.

It was a two-way street; because Biddle knew he had that credibility, he didn't have to worry about guarding his data center empire. That led to American Standard becoming the first major proponent of outsourcing, 1990s-style. Biddle didn't farm out the whole ball of wax but instead identified CPU cycle time as a commodity that could be run on a Genix mainframe in Pittsburgh as easily as an American Standard mainframe in New Jersey.

Once American Standard's outsourcing became publicized, Biddle received hundreds of phone calls — many from CEOs who wanted to know more. And for many of them, Biddle obliged. He openly shared what his company had done. Biddle viewed outsourcing as one emerging aspect of the new role of IS executives, and he wanted to share in leading his colleagues — not necessarily to outsourcing, but to that new role.

One enthusiastic disciple was

Biddle *envisioned a transformation in IS management*

Avon IS chief Ray Perry, who is now a vocal *opponent* of outsourcing. But Avon looked long and hard at it, then made other changes — data center consolidations — that now save the company $3 million a year.

Perry has publicly credited Biddle with sparking the thought process that led to those savings. Biddle wasn't so much pro-outsourcing as he was pro-effective IS management.

Biddle clearly enjoyed the limelight but eventually found the conference circuit just too demanding. The outsourcing trend he helped create had turned into something of a monster, with a conference every month, or so it seemed, and he put the brakes on public speaking for a while. He had more on his plate back at the office, too — some new non-IS responsibilities at American Standard that exemplified the emerging CIO role, of which Biddle was a model.

Biddle loved to look ahead. At the end of our discussion on that January morning in New York, I remember Biddle sitting back in his chair across the coffee table and musing about the future of IS management. He saw it evolving into something very, very different in the 21st century, and he even speculated that the concept of an IS function might disappear altogether.

Whatever transformation our profession will undergo in the years to come, I'm sure that Gary Biddle would have played a big part in it. It's a real shame that he won't be with us to watch it happen.

Wilder is *Computerworld's* senior editor, management.

Northwest Airlines' DB2 development gets off-the-ground fast!

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Finally coming into its own

Reverse engineering technology makes headway into IS organizations

ANALYSIS

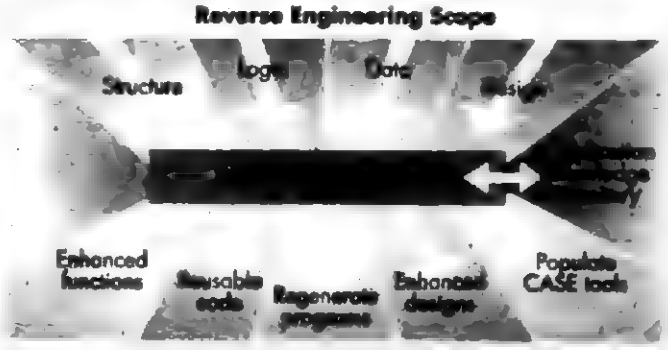
BY JOHANNA AMBROSIO
CW STAFF

Users who are beginning to experiment with reverse engineering and re-engineering tools report top-notch results. But they also say the process is slow going and hard to get one's arms around.

The experience is remarkably similar to what early users of computer-aided software engineering (CASE) tools went through several years ago. The re-engineering and reverse engineering software markets are just beginning to take shape, with increasing numbers of vendors and tools (see story page 37). But because no single vendor provides a complete solution, users must rely on a mix of tools from different sources.

Rules of business

Identifying business needs lies at the heart of reverse engineering



Source: Gartner Group, Inc. CW Chart: Doreen St. John

Another similarity between CASE and these other technologies is that "they have been overpromised and overhyped," said Marc Fey, chairman of XA Systems Corp., a vendor in Los Gatos, Calif. As with CASE, definitions for re-engineering and reverse engineering vary widely. Ask five different experts for definitions, and you are likely to get five different answers.

Still, the broad consensus by users, vendors and observers is that re-engineering refers to restructuring and modularizing code in existing applications. This is commonly known as turning "spaghetti code" into structured code. This code can be more easily maintained in existing applications and reused in new ones.

"It's taking an existing application and recasting it for a new set of needs — migrating to a new platform or a new database management system, for example," said Ed Acly, director of software research at Technology Investment Services Corp., an arm of International Data Corp. in Framingham, Mass.

Reverse engineering takes re-engineering a step further. In this scheme, one extracts the data definitions and process definitions from existing applications and stores those definitions and models in a repository. These definitions and models can then be used to generate new code for existing applications

Continued on page 36

Infodata upgrade links DBMS, workstations

BY ROSEMARY HAMILTON
CW STAFF

Infodata Systems, Inc. rolled out an updated version of its text management system last week that provides workstation support and links to relational database management systems.

Current Inquire/Text users who were contacted said they are anxious to take advantage of the added functions. Company officials said Release E is now shipping, and its workstation support component will be available next month.

Initially, the company will offer Microsoft Corp. MS-DOS support. It plans to offer IBM OS/2 support but did not specify a date.

Inquire/Text provides storage and search facilities for textual data. Unlike an imaging system, it does not provide a view of an actual document. But it also provides higher level search and retrieval capabilities than some imaging systems.

"It's probably the best release we've seen in a number of years," said Richard Stevenson, manager of database administration at Burroughs Wellcome Co. in Research Triangle Park, N.C. "There are some big changes in there."

Burroughs, which has been using Infodata's software since the early 1970s, is particularly interested in the SQL Bridge facility, which it recently beta tested. The company started using IBM's SQL/DS mainframe database earlier this year, and Stevenson said the Infodata tool will allow users to merge data from Inquire/Text databases and SQL/DS into one document.

Armstrong World Industries, Inc. is a new Inquire/Text user that hopes to bring in the workstation support soon. Tom Brown, a senior systems analyst, said Inquire/Text was selected this year to manage product information on-line. A pilot project was recently completed for the customer service department that would allow customer representatives to search for product records on-line. Personal computer support would give customer representatives a more user-friendly front end to the databases.

Towers Perrin, a management consulting firm in New York, is hoping to begin testing the workstation support within the next month, according to Nancy Audino, supervisor of information resource management.

Audino said the company would like to eventually use the workstation support to help create "consultant workstations," so staff members can more easily search through Inquire/Text and use client data.

"We want to make it easier for them to get at the corporate intelligence on the system," Audino said.

Mainframe imaging ties take lead

BY SALLY CUSACK
CW STAFF

NEW YORK — Integrating information from mainframe applications with imaging systems was a mini-theme at the Imaging '90 show earlier this month, as vendors scrambled to dominate the limelight.

Bull HN Information Systems, Inc. stepped into the realm of document image management with Imageworks — a client/server-based suite of document management software optimally designed for Bull's DPX/2 family of Unix processors. It can run on other vendors' Unix systems, and programs can be developed on an IBM mainframe to subsequently function as a client to the Bull server.

According to Najah Naffah, director of Bull's multimedia product line, Imageworks incorporates several industry standard technologies, including DOS, MS Windows, Oracle and Transmission Control Protocol/Internet Protocol (TCP/IP), thus rendering it ideal in the large mainframe world of government agencies, corporations, banks and insurance companies. It would communicate with mainframes via TCP/IP.

The initial delivery platform for Imageworks is a Bull DPX/2 Unix server providing folder and document management, optical discs and jukebox management as well as communications for Zenith Data Systems personal computers. The PCs will function as clients connected via TCP/IP and Ethernet for image capture, retrieve and/or print functions.

Continued on page 36

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Maintenance productivity gains of up to 10-to-1.

In this same study, developers were asked to compare IEF maintenance productivity with their former methods. Of those responding, *more than 80 percent had experienced gains of from 2-to-1 to 10-to-1.* (See chart.)

Specifications always match the executing application.

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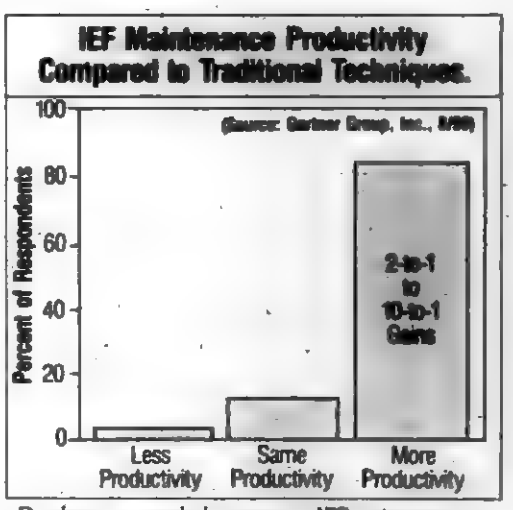

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Multitier team attacks paper

ON SITE

BY SALLY CUSACK
CW STAFF

IDAHO FALLS, Idaho — A nuclear research facility here has procured an elaborate imaging system in hopes of organizing and restructuring several hundred million warehoused documents — a paper fallout that has been accumulating during the past 40 years.

"Whenever we needed something that dated back a few years, we literally sent a small army out to the warehouse to search for it," said Bernard A. Rando, principal information science specialist at EG&G Idaho, Inc. The federally funded facility recently installed three Wang Laboratories, Inc. Wang Integrated Image Systems (WIIS), with a total value reportedly exceeding $800,000.

The unusual twist here is that the EG&G also relies on an IBM 3090 Model 200 mainframe running in the MVS/ESA operating environment, according to Rando, which will connect with the Wang system via Norms, a mainframe-based document control and records management system from Southern Electric International (SEI). Norms links up to the imaging platform via 802.3 Ethernet lines to allow documents that are scanned into the Wang system to be addressed by the mainframe.

When a document is scanned in, Rando said, the interface between Wang and Norms identifies the document and the Wang machine on which it resides. Then Norms hands the address back to the Wang machine, and the imaging applications put the record up on the screen for the user. So far, more than 10,000 pages have been scanned in three weeks, he added.

EG&G chose Norms because of sophisticated search and retrieval capabilities; the facility anticipates being able to search through 3 million records in 1.5 seconds.

"The IBM software just reaches out to the Wang system and passes out addresses," Rando said, explaining that the search mechanism resides within the Norms program and the storage is on the Wang side of the house, via Wang's Image/CICS program.

The hardware portion of the WIIS installation includes two VS 5640s and one VS 8220 computer, two Wang 5¼-in. optical disc jukeboxes, four document scanners, 12 image-capable workstations and two laser printers.

On the software side, EG&G is using Wang's Pace database management package, Wang Open/Image-CICS, Wang Office and Office/Profs Gateway, 802.3 local-area network connectivity and Open Systems Networking. All the systems are connected, Rando said. He added that EG&G also plans to communicate with other agencies via Wang's VS Fax gateway, which permits facsimile transmission of images from a Wang VS minicomputer.

"One of the priorities we had was flexible software for application development," Rando said. "We need to be able to change this on the fly. The biggest problem we've encountered during the entire process is trying to control the growth of this technology."

Rando began researching optical disc technology more than two years ago, trying to determine which platform would be best for EG&G and its employees. The mammoth site spreads out over 894 square miles — about the same size as Rhode Island, Rando noted — and employs approximately 12,000 people. There are more than 10,000 users networked into the IBM mainframe, and security permitting, there will be sitewide access to the imaging system when all is said and done.

After two months in beta testing, the WIIS implementation went into official production mode last month. EG&G has a five-year plan to scan in all the warehoused documents, and according to Rando, it will need additional manpower to complete this task.

"We will also need between five and eight more scanners," he noted, adding that he has also received requests for additional imaging systems.

As the prime contractor for the Idaho National Engineering Laboratory (INEL), EG&G provides facility services to other research contractors at the INEL site, including data processing, mail and security. The need for configuration control, records management and compliance with federal and state record retention regulations were the primary forces driving the move to imaging technology, the company said. Wang won the contract in a competitive procurement bid.

The U.S. Department of Energy headquarters in Washington, D.C., currently communicates with the IBM mainframe via Digital Equipment Corp.'s All-In-1 and IBM Professional Office System packages and will eventually connect to the Wang system through the mainframe, according to Rando.

Access ventures into text management waters

BY MARYFRAN JOHNSON
CW STAFF

Access Technology, Inc. made its splash as the leading spreadsheet vendor for Digital Equipment Corp. VAXs, but these days the Natick, Mass.-based vendor is casting its line into new waters.

Rather than concentrating solely on the joy of manipulating numbers, Access is broadening its scope with two new "groupware" text management products: For Comment and For Words. The $32 million company is also itching to put its applications on Novell, Inc. local-area networks.

"This is a dramatic shift in their product strategy, but it's not a dramatic shift in company policy," said Ronni Marshak, a vice-president at Patricia Seybold's Office Computing Group in Boston. "Access has been making products for group usage, so the company has experience designing network products vs. stand-alone tools."

For Comment is a document review system, priced from $375 to $9,900, that enables work groups on networks of personal computers and DEC VAXs to read, comment on and revise a text document on-line.

For Words is a document retrieval system that gives VAX/VMS users the ability to hunt through an on-line database to find particular documents. It costs from $600 to $25,000.

Grant writer's aid

One user planning to buy both products is William Wiseman, business manager at The Children's Museum in Boston. "I can see a direct application with For Comment in our grant writing," Wiseman said. "For Words could be put to immediate use by our more technical people, such as computer support staff."

The museum has about 80 users on a VAX 6000 Model 310, plus a dozen Decserver machines. Wiseman said that the VMS operating system has some of the features found in For Words, but not the flexibility of the Access product.

Allan Wood, the business applications coordinator at STS Consultants Ltd. in Northbrook, Ill., is also pondering a purchase of For Comment for the engineering firm. "It could be a real nice fit into our environment," he said. "We'd be able to run it on all our VAX nodes" in four locations throughout the Midwest.

Wood said that although STS is already using Vaxnotes, a DEC conferencing software package, it is mainly used for on-line software documentation and lacks the document editing capabilities of For Comment. The Access product also integrates with several popular word processing packages, while Vaxnotes cannot.

One feature users at a recent Access convention in Boston particularly liked was the split-screen format in For Comment, which enables viewers to scroll up and down both the document and comments from reviewers.

The original version of For Comment was introduced by Broderbund Software in 1986 and was hailed as one of the first useful work-group software tools for PCs. Access acquired an exclusive license to the technology, improved the user interface and added other functions.

"In this kind of market, with the recession and everything so tight, a software company can't just go to its existing customers and make money. They don't have as much to spend," Marshak said.

Analysts familiar with the new products praised them but said they needed better graphical presentation and the ability to run in windows.

Yet the market seems ripe for full text retrieval products at an estimated $100 million last year, said Ann Palermo, an analyst at International Data Corp. in Framingham, Mass. "The problem with For Words right now is it only works on VMS," she added.

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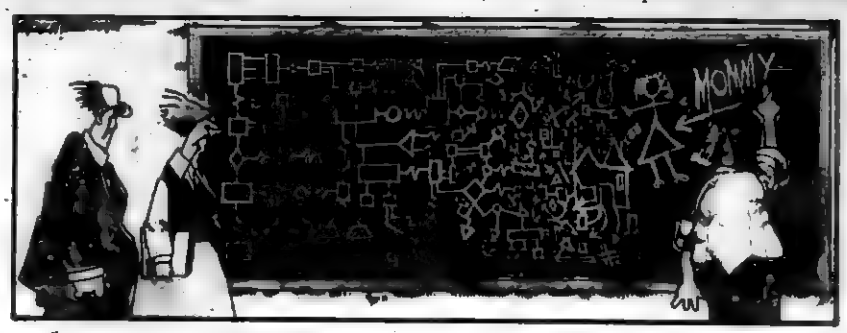

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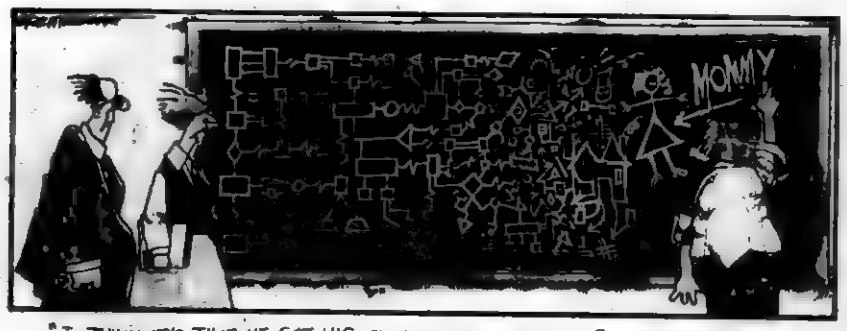

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PRODUCT REVIEW

Solid case for Linc performance

Unisys Corp.

This is the fifth in a monthly series of performance benchmarks that for the next several months will focus on the integration of computer-aided software engineering (CASE) and fourth-generation language (4GL) products. The benchmarks are monitored by an independent team headed by David Whiteside, managing director of Computing Futures Ltd. and his associate, Prof. Eberhard Rudolph, formerly of the University of Auckland, for exclusive publication in Computerworld.

Each product is observed in action over a three-day period during which a vendor team solves the case study project costing system, an application that is familiar to most information systems professionals. The team's mission is to demonstrate the capability of the major CASE/4GL environments to deliver complete and complex business solutions under "live fire" conditions. In this issue, we take a look at Unisys Corp.'s development tool set, which is centered around Linc Design Assistant (LDA), Linc, Mapper and its database DMS II.

•

Carried out by Unisys at its corporate case center located in Malvern, Pa., its team of four professionals provided a comprehensive solution to the benchmark and earned it a total rating of "excellent" for the level of completion category.

•

The team required 18 hours to complete the benchmark and its enhancement. However, this time could have been reduced by two hours had it not been for the lengthy periods that were spent waiting for compilations, particularly during the enhancement stage. The overall effort of 42 man-hours was one of the fastest compared with previous solutions, frequently exhibiting "right the first time" results. Thus, we gave the speed of development category a rating of "very good."

•

A similar performance was achieved for maintenance in areas where the team built on the existing high-level framework of Linc constructs. Therefore, the speed of maintenance was also rated as "very good."

•

The fast development speed was supported by high-quality documentation. Effective CASE graphics complemented well-indexed program listings. In addition, during maintenance, a reverse engineering capability ensured the integrity, even in the high-level documentation. All things considered, a rating of "very good" was awarded for documentation.

•

The integration of the Mapper end-user tool is limited to the database level and is not covered by the LDA CASE tool. However, the Linc 4GL and the LDA CASE tools are fully integrated, providing bidirectional engineering support. For the level of integration, we gave the tools a rating of "very good."

•

Surprisingly, we found the end-user languages to be too programmer-oriented and not easy to comprehend by non-IS staff. Hence, the results may have suffered from hardware problems that required a change of environment and a hastily co-opted team member. What we saw had to be given a mark of "fair" at best.

•

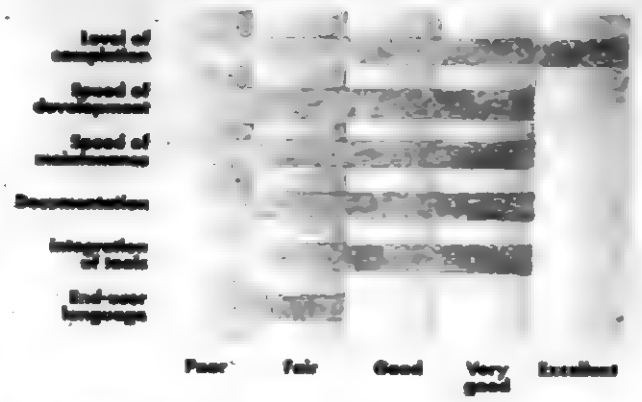
We saw a high level of accomplishment in most areas of the solution, but Unisys still has to give Mapper a face-lift in order to make it a broad end-user tool as well as part of its CASE environment.

In conclusion, Unisys has a well-integrated tool set that was especially effective in handling the more complex elements of the benchmark. It is unfortunate that the tool set is only available on Unisys hardware.

The Unisys tool kit

- Linc Design Assistant (LDA) — Upper CASE tool
- Linc — Lower CASE tool or 4GL
- Mapper — End-user decision support language
- DMS II — Database language that includes SQL support

Consultant's assessment



Development and maintenance report card

Performance in each area is graded from A (excellent) to F (poor).

ANALYSIS AND DESIGN: B
The team implemented the proven Linc methodology as the basis for analyzing and structuring the benchmark specifications. They were then able to directly implement the conceptual Linc solution using the Unisys LDA CASE tool. The Mapper end-user solution, however, could not be addressed by the CASE tool.
Strength: All have a fully integrated design philosophy.
Weakness: The CASE tools are available in single-user personal-computer mode only.

DATABASE SETUP: C
Only the data elements have to be specified in the CASE data dictionary. The database implementation was swift, but it was limited in its scope because of the many editing rules that have to be implemented in the Linc program logic area.
Strength: All physical data structures are generated automatically.
Weakness: There is no data dictionary support for the Mapper tool.

FILE MAINTENANCE TRANSACTIONS: B
The Linc default framework handled the simple screen processing in most cases. Screen scrolling required special attention.
Strength: Simple processes are handled effectively.
Weakness: It has unorthodox change and delete functions.

COMPLEX TRANSACTIONS: A
In the short time it took to complete the benchmark, a correct solution was derived with hardly any bugs. The Linc defaults also gave adequate support.
Strength: Not much coding needs to be done.
Weakness: Time calculations are unsupported.

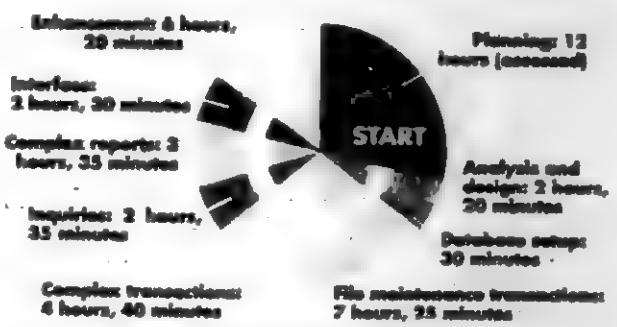
INQUIRIES: D
Linc and Mapper were each used to develop one of two inquiries. In both environments, the development process was lengthy and relatively cumbersome. Professional programmer skills were needed, particularly to extract the files for the Mapper solution.
Strength: It is easy for the experienced professional.
Weakness: It is beyond the capability of the casual end user.

COMPLEX REPORTS: A
As with the complex transaction, Linc was able to handle intricate reporting requirements. The fastest time to date — three hours and 35 minutes — was achieved. It is interesting to note that two developers each took a section of the report.
Strength: There is great flexibility in report generation.
Weakness: There is none evident.

INTERFACE: A
The Ashton-Tate Corp. Dbase file was transferred as an ASCII file and edited before a Linc batch program transferred the data into the Linc database. The task was completed in a short period of time and even uncovered a bug in the specifications.
Strength: External data can be dealt with easily.
Weakness: No standard Dbase interface is provided.

ENHANCEMENT: A
After an hour of analysis, the team implemented a solution to the enhancement requirement using Linc. They then used reverse engineering to reflect this low-level change in the upper-level design documentation.
Strength: Linc methodology is geared for change.
Weakness: Recompilations can be lengthy and impose scheduling restrictions.

Staging the benchmark

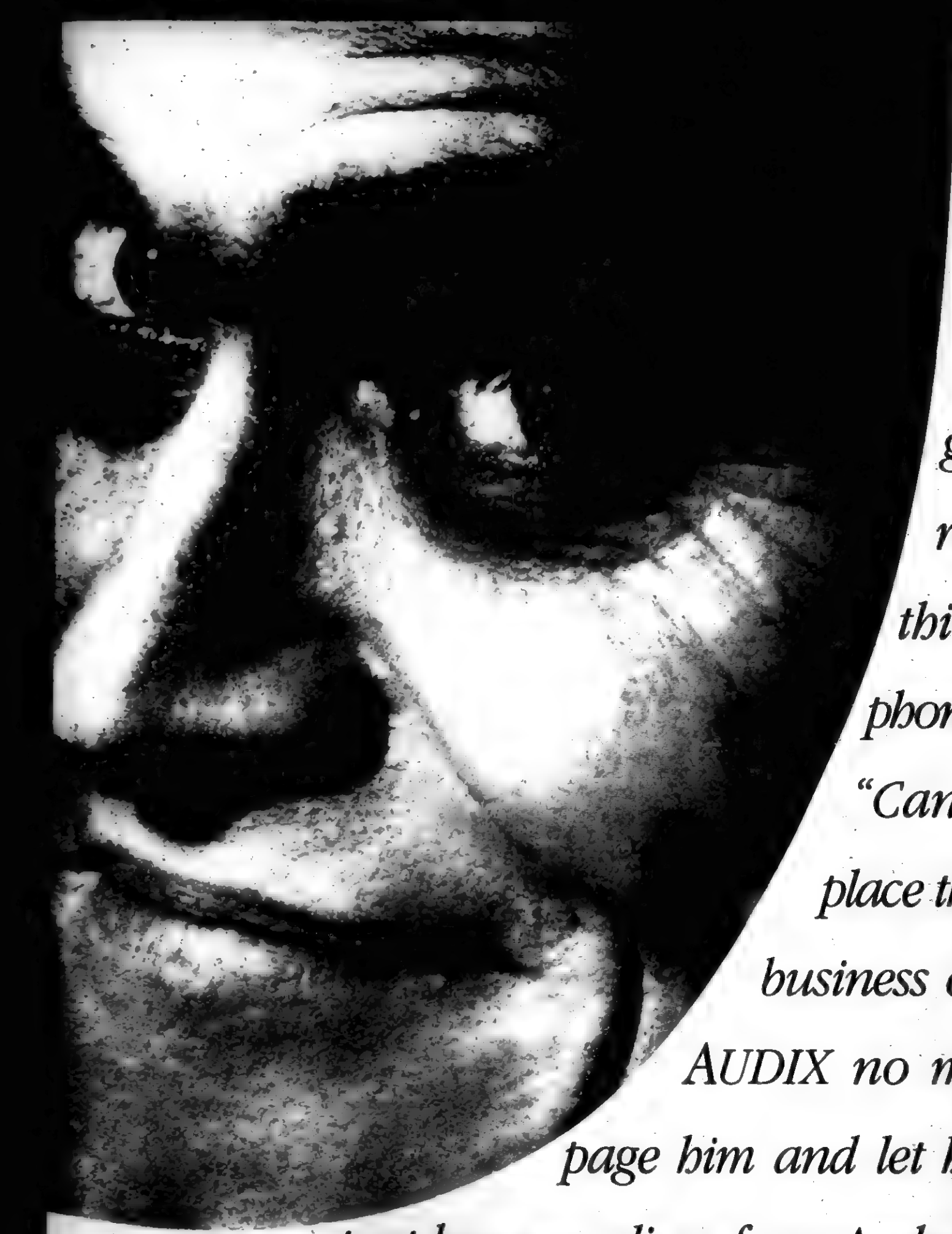


Total effort: 41 hours, 55 minutes
Elapsed time: 18 hours
Team size: 4

The solution was initially developed on a Unisys A6 mainframe, which was dedicated to the benchmark team and supported as many as 12 stations. The Mapper development had to be transferred to a Unisys A12 mainframe because the A6 microcode did not fully support Mapper.

Details of the product are available from Unisys Corp., P.O. Box 500, Blue Bell, Pa. 19424, (215) 986-4011.

***Development World** product briefings are based on a series of full solutions to the case study. They are prepared by leading vendors and published along with in-depth product analyses and consultants' test reports in Development World Libraries. Please see business reply card between pages 76 and 77 or fax (508) 820-0146 for a brochure.*



We send put an And it this smoke gets there? reason I'm third call to phone because "Can I take a place that has an business calls don't AUDIX *no message is page him and let him know tant because aliens from Andromeda are At this point I'm put on hold. And it is my hope that if not currently suffering the indignity of the hold button.*

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up satellites like flowers to strangers. On one we
electronic greeting card and addressed it to infinity.
occurs to me, what if the people who might get
signal from planet Earth aren't around when it
What if they're in a meeting? And the only
thinking this is because I'm on the tenth ring of the
this supplier when someone finally answers the
the ringing noise is ruining his lunch. He says,
message?" And I say, "Tell Ray he needs to work for a
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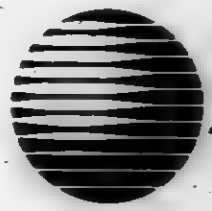
reach their intended party on the first try. But with
missed. Tell him AUDIX features outcalling that can
important messages are waiting. And this is impor-
trying to reach him and they may not call back...."
there is intelligent life somewhere in the universe, it is



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The right choice.

Open systems escape scrutiny

BY J. A. SAVAGE
CW STAFF

Businesses that have embraced open systems have not justified the expense with reams of cost analysis, according a report from the DMR Group, Inc. in association with Uniforum Association and X/Open Consortium Ltd.

Instead, companies use informal economic justification — the Bob Dylan approach. "You don't need a weatherman to know which way the wind blows," the report stated. More than 100 individuals in organizations that have bought or are in the midst of buying open systems were questioned. A secondary poll, with 2,375 general respondents, indicated the strength of the trend toward the open systems market.

DMR's studies found that 15% of the businesses polled were considering the use of open systems. Nearly one in six sites that already have Unix-based computers have explicitly adopted open systems standards. "The evidence is that the shift is occurring," said Don Tapscott, vice-president of DMR.

Among the findings are the following:

- More than half of the organizations that bought into open systems did so in the last two years.
- Price/performance may be the most important criterion, but users also want traditional vendor support and service.
- Vendors may say they adhere to standards, but users are actually keeping track of that conformance, either by developing internal expertise or hiring consultants to validate vendor claims.
- The moves to open systems are either making management problems between central IS and distributed entities worse or raising them for the first time.

Despite the lack of cost justification, cost is still the most important factor, according to DMR. Almost as important, however, is that users feel the direction of open systems as the wind of the future, and they want to be able to take advantage of open systems freedom. The report said there is a "striking" shift in the relationship between users and vendors — that users are empowering themselves by choosing open systems. DMR cited one case in which a customer had two vendors vying for its attention, suggesting that the customer buy the vendors' open systems hardware over its proprietary systems. The customer went one step further, taking the vendors' advice on open systems and buying systems from a completely different vendor.

While all these moves signal a change in the basic structure of IS, one of the most significant changes, and one which has yet to be played out, is that of a relationship between a centralized IS and departments. On one hand, with open systems, an organization reaps the utility of dispersed systems as part of a wider corporate system based on standards, according to the report. On the other hand, "most [managers] are working in the dark" because there is little experience with management forms that work best under such conditions.

Unisys, Chorus develop another version of Unix

BY JOHANNA AMBROSIO
CW STAFF

SAN JOSE, Calif. — Get ready for another version of Unix. This one, being developed by Unisys Corp. and Chorus Systems, Inc., is intended for high-end machines.

"This is not a product announcement; it is a technology announcement," said Jamie Riotto, director of engineering in Unisys' Unix Products Group. He said the operating system will run on a high-end Unisys machine that the company has not yet announced.

The partnership, announced earlier this month, has a goal of developing a Unix version "equivalent to what you have on today's mainframes," said Hubert Zimmerman, chairman and founder of Chorus Systems in Beaverton, Ore. The operating system, which will be based on Chorus' kernel, will support distributed, scalable, fault-tolerant hardware and will provide a single system image and security features, he said.

The operating system will be compatible with AT&T's System V, Release 4. "Customers will not have to rewrite any applications," Riotto said.

The first release of the Chorus/Unisys software will be available in the first half of 1991. "It will find its way out in stages," Riotto said, with the final stage available in 1993. At that point, the operating system will support fully distributed computing.

Mainframe

FROM PAGE 25

"This product line is not limited to Bull accounts," says Naffah, with reference to Imageworks positioning toward mainframe systems integration. He contends that the majority of imaging products currently on the market are positioned as self-contained, departmental systems operations, whereas the Imageworks open architecture, client/server approach allows the image database to be placed in front of the mainframe for easy access to mainframe transaction-oriented environments.

Imageworks is available through Bull's direct sales force, and pricing is determined by the systems integration implementation, the vendor said.

In other announcements, Information Builders, Inc. and Wang Laboratories, Inc. joined forces to premier Focus for Wang VS Image Gateway. The new product allows firms to incorporate existing data and applications on the mainframe as well as IBM Application System/400 minicomputers linked with Wang's imaging systems.

According to Focus, documents are stored and maintained on the Wang VS Image Server, and Focus for Wang VS and the Image Gateway transparently link the document image to data and applications on the mainframe and AS/400. This creates a screen-level data exchange between systems. Focus for Wang VS Image Gateway is available now, with prices ranging from $1,658 to $18,090, depending on the VS hardware platform.

Reverse

FROM PAGE 25

and for new applications. This process does things such as consolidating data definitions. Thus, where re-engineering involves reworking existing code, reverse engineering deals with higher-level definitions of processes and data.

If defining these ideas is tough, putting them into practice can be extremely rewarding. Tom Wheeler, an administrator at Aetna Life & Casualty's Personal Financial Security Division in Hartford, Conn., has been using re-engineering tools since 1986 to update an application containing 3 million lines of code. The application includes an on-line module, a 25-year-old master file containing information about every individual's property and casualty claim and a reporting module.

Wheeler said the maintenance staff for that application has been reduced from 28 to eight people, freeing up those programmers to work on new systems. Also, the application's 15,000 data names are now down to about 2,000.

The next step, Wheeler said, is to reverse-engineer the logic and process definitions in the old application to allow them to be moved from Aetna's homegrown DBMS into IBM's DB2. "The paint is still wet," he said. "We're looking at everything. We know reverse engineering is part of our future; it's just not clear yet which tool we will use."

Maxine Glassberg, manager of Merrill Lynch's Development Technology Center in New York, has also been using re-engineering tools for some time with great success. She is now beginning to experiment with reverse engineering in some pilot programs. Early results indicate a 40% reduction in the number of lines of code and the ability to reuse 80% to 90% of the code that is generated.

However, there is a downside to all this productivity. Getting started can be difficult because it is not always easy to justify these tools to top management, said one user who requested anonymity: "It's hard because the vendors don't always understand the business need behind the technology. We need to justify things by being able to cut dollars and head count."

Then, too, users must do a lot of their own work to coordinate the different software and steps involved. Merrill Lynch, Aetna and Pacific Bell, also working with re-engineering and reverse engineering tools, are using at least four packages from different vendors.

For the time being at least, these tools are only available for Cobol programs. Peter Van Opens, a systems coordinator at Northwestern Mutual Life in Milwaukee, has been re-engineering his PL/1 applications manually. It took him and his staff 2,000 hours to restructure the code in an on-line query system. However, he said he is happy with the results — where it used to take 500 hours to make any changes to the system, now it takes only 50 hours.

Working with the right tools

A plethora of tools has hit the market for tasks such as extraction of data specifications and code analysis.

While software aids for restructuring code have been around for eight years or so, the analysis tools are relatively new. These help users figure out what applications exist in their shops and which could most benefit from restructuring. Other packages help users identify what code is in existing systems, down to the detail of which code performs which function — a specific interest calculation, for example.

In this analysis category are such products as VIA/Center and VIA/Insight from Viasoft in Phoenix and Pinpoint and Inspector from Language Technology, Inc. in Salem, Mass. Another analysis package is Pathvu from XA Systems Corp. in Los Gatos, Calif.; the company also sells Datatek, a tool to help clean up data definitions.

Further, XA will soon announce System Analyzer, a systemwide way to analyse applications' component pieces and their relationship to one another. This information will then be stored in a DB2 database.

Complete reverse engineering tools are not yet available. "There's no true reverse engineering tool. You can capture data and code from existing programs, but you can't pull out of running Cobol code what it's doing and why," said Peter Mimno, an independent consultant in Marblehead, Mass. "You cannot capture the process."

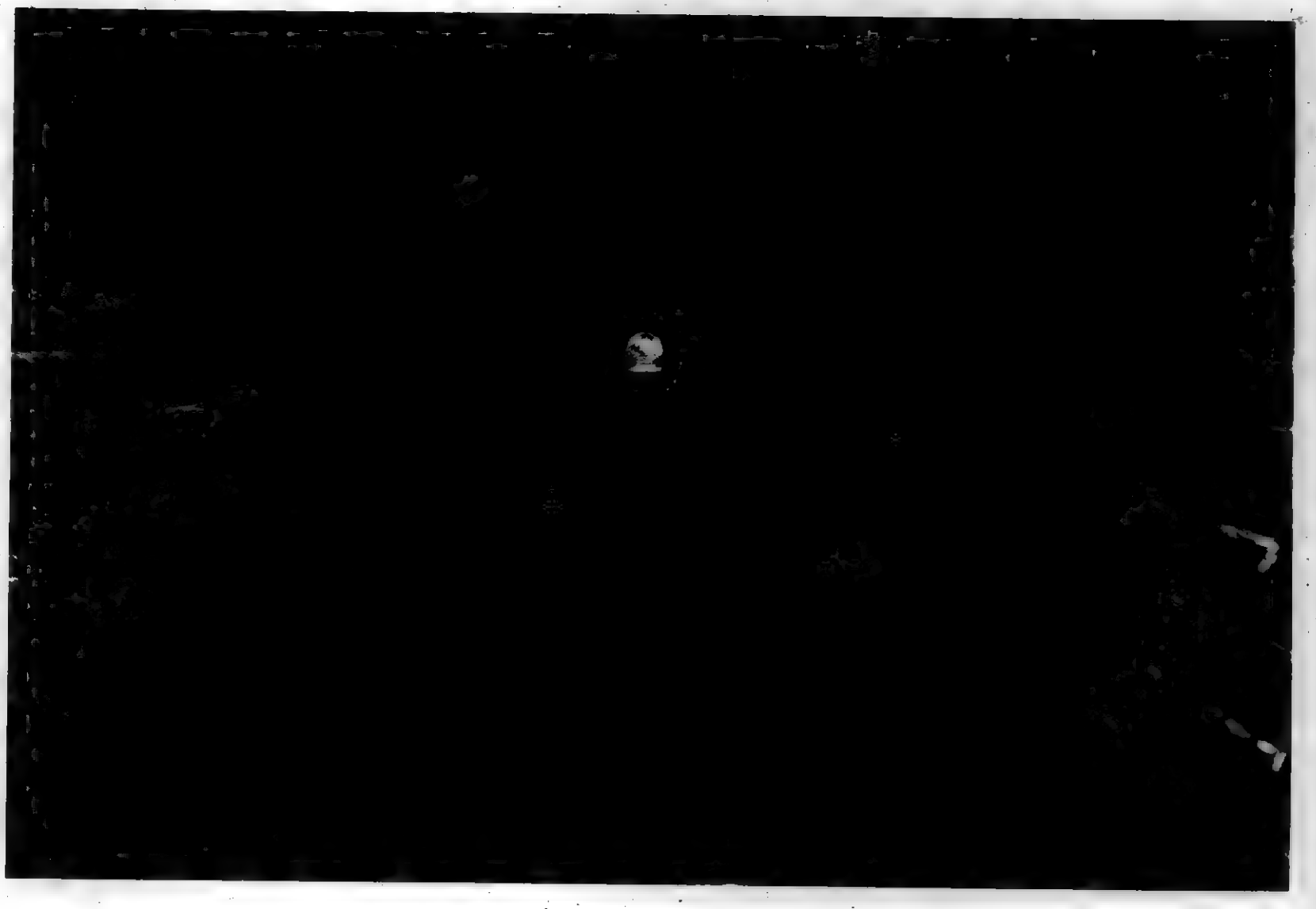
Index Technology, Inc. in Cambridge, Mass., is trying to change that with XL/Recover, introduced in September. The company said the software captures both data and process information.

Another vendor vying for this market is Bachman Information Systems, Inc. in Burlington, Mass. It has released a product called the Bachman Analyst that will eventually address all of these areas.

Also coming in this area is Renaissance from Viasoft. It will extract the data, process and logic information from Cobol programs, save those rules in a repository and allow those rules to generate new code.

CASE vendor CGI Systems Inc. in Pearl River, N.Y., also has a reverse engineering tool in beta test. More CASE vendors are expected to enter the market soon.

JOHANNA AMBROSIO



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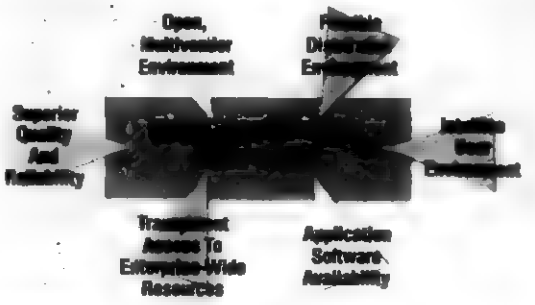

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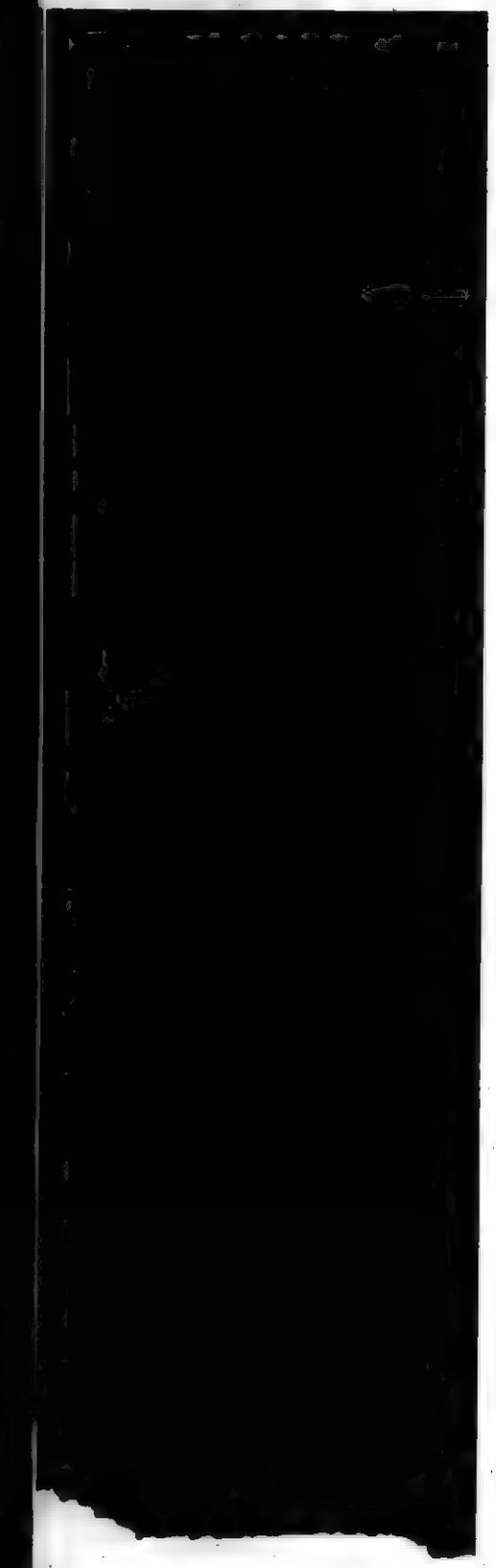

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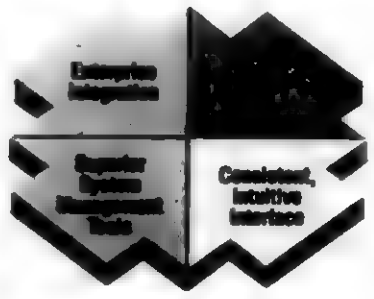

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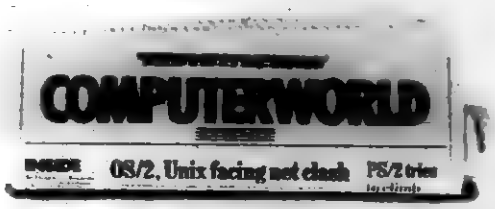

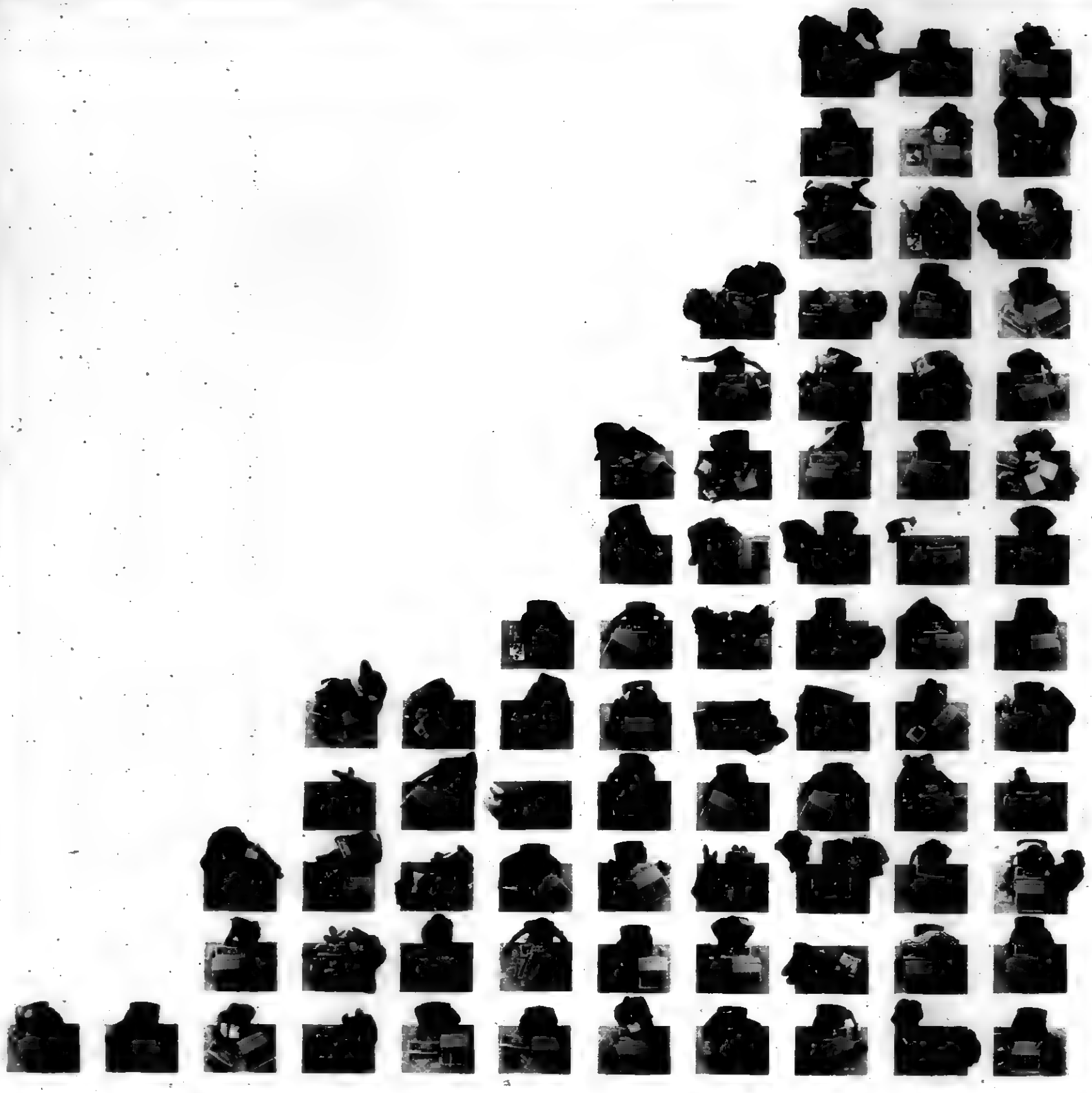

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COMMENTARY

Michael Fitzgerald

Channel interference

Busy reader, please note: unless you currently use a Micro Channel Architecture (MCA, with all due deference to the film company, which has recently become touchy about this) or Extended Industry Standard Architecture (EISA) machine, what you are about to read really has no practical value for several years, so clip it and save it until then.

IBM makes for an easy target, and thus it naturally gets hit a lot. In fact, it's fairly easy to say that the big computer maker (or is that the maker of big computers?) is basically out of touch with what users want and generates sales largely because people and corporations are slow to change. Therefore, they continue to buy mainframes, and because they buy their mainframes from IBM, it's not much of a stretch to also buy IBM's personal computers, no matter how slow and overpriced.

Sometimes, it gets too easy to point fingers. Take this month's announcement of the the Micro Channel Developers Association (MCDA), which has an executive committee consisting of IBM and 13 other companies. Now, it's easy to

Continued on page 48

1486 systems find right balance

ANALYSIS

BY RICHARD PASTORE
CW STAFF

Though observers initially feared that the Intel Corp. 1486 chip might be too fast for the rest of the machine, today's 486-based personal computers appear to be both fleet and well-balanced, analysts said.

For the most part, vendors appear to be supplying users with PC components that are capable of keeping up with the central processor. Potential bottlenecks such as disk drives and display I/O have been tweaked with a variety of controllers and caching technology.

"Most designers have wrestled with the bottleneck problem and come up with different ways of solving it," said Paul Zagacski, a PC analyst at the Yankee Group in Boston.

Users of 486 machines seem satisfied with the early power boost the boxes have given them and have not noticed component performance problems.

"We really don't seem to stress them hard enough to really see any degradation," said Arthur Block, vice-president of end-user automation support at Manufacturers Hanover Trust in New York. With 486s employed as network and application servers, Block said he is confident enough in their performance benefits to consider purchasing several more for use as stand-alone workstations.

To secure a well-balanced 486 system, it is practically a given to employ a 32-bit I/O bus. "The people who are suffering are the ones who are putting a 486 on a 16-bit bus. You have a bog-down at that point," said Dave Kirkey, vice-president of sales at Advanced Logic Research, Inc., a vendor specializing in high-end boxes.

After the I/O path, the most obvious performance bugaboo is magnetic storage, which marks its responses in milliseconds while the CPU conducts its business in microseconds. This gulf is not likely to disappear, but vendors have taken steps to add CPU zip to at least some disk seeks.

"They are using techniques that have been used for 15 to 20 years in the mainframe business — caching," said James Porter, president of Disk/Trend, Inc. in Los Altos, Calif.

Disk caching is the most common speed-boosting technique employed in 486 PC storage. A small amount of semiconductor memory resident on a disk caching controller holds that data the controller predicts will be most often used. That data can be accessed in microseconds, because no disk rotation or drive arm positioning is involved.

Disk caching is an inexact science, however. Hit rates — the chance that the data the user needs will actually be in the

Continued on page 52

Intel 32-bit chip bids for laptop market

BY MAURA J. HARRINGTON
CW STAFF

BURLINGAME, Calif. — In a bid to corner the fastest growing sector of the personal computer market, Intel Corp. recently introduced the latest in its family of 32-bit microprocessor chips, the 80386 SL Microprocessor Superset.

Developed specifically for laptop and notebook-size PCs, the 386 SL and its peripheral counterpart, the 82360 SL, could increase the battery life in laptop and notebook-size computers by as much as 50% while taking up 40% less space on the motherboard, claimed Mike Aymar, vice-president and general manager of Intel's Santa Clara, Calif., Microcomputer Division.

The Intel chip set, according to Michael Slater, editor and publisher of "Microprocessor Report," provides an opportunity for computer manufacturers to produce a wide variety of notebook and laptop computers because of its power management capabilities and because there is extra room available on the motherboard to add peripherals.

Aymar said users will also benefit from the power management features built into the 386 SL chip.

For example, the chip set's system management mode includes a system management interrupt capability said to allow a user to simply shut the notebook or laptop PC in mid-task without losing any completed work.

While this capability is already available in small computers for applications running on 16-bit processors, the Intel 386 SL brings the technology to the 32-bit level, Aymar said.

According to industry analysts, there could be some notebook and laptop announcements incorporating the new chip set as early as this November, possibly at the Comdex/Fall '90 trade show.

Although Slater said Intel is the first vendor to his knowledge to formally introduce a 386-based, two-chip chip set for notebook-size computers, it is not the first to market a condensed PC chip set.

Santa Clara, Calif.-based Advanced Micro Devices, Inc. (AMD), a smaller rival of Intel, introduced its "PC-on-a-Chip" product two weeks before Intel's 386 SL Superset announcement. The product places the CPU and I/O peripheral devices for 80286-based computers on a single chip.

Full production of the Intel Superset 386 SL chip set is scheduled for the first quarter of 1991, the company said. The AMD AM286ZX is scheduled for production in volume by the second quarter of 1991, according to AMD.

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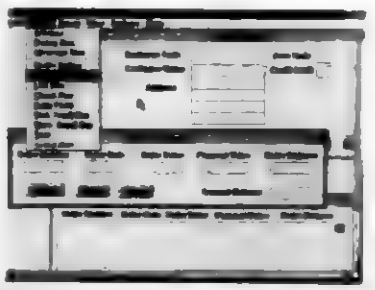

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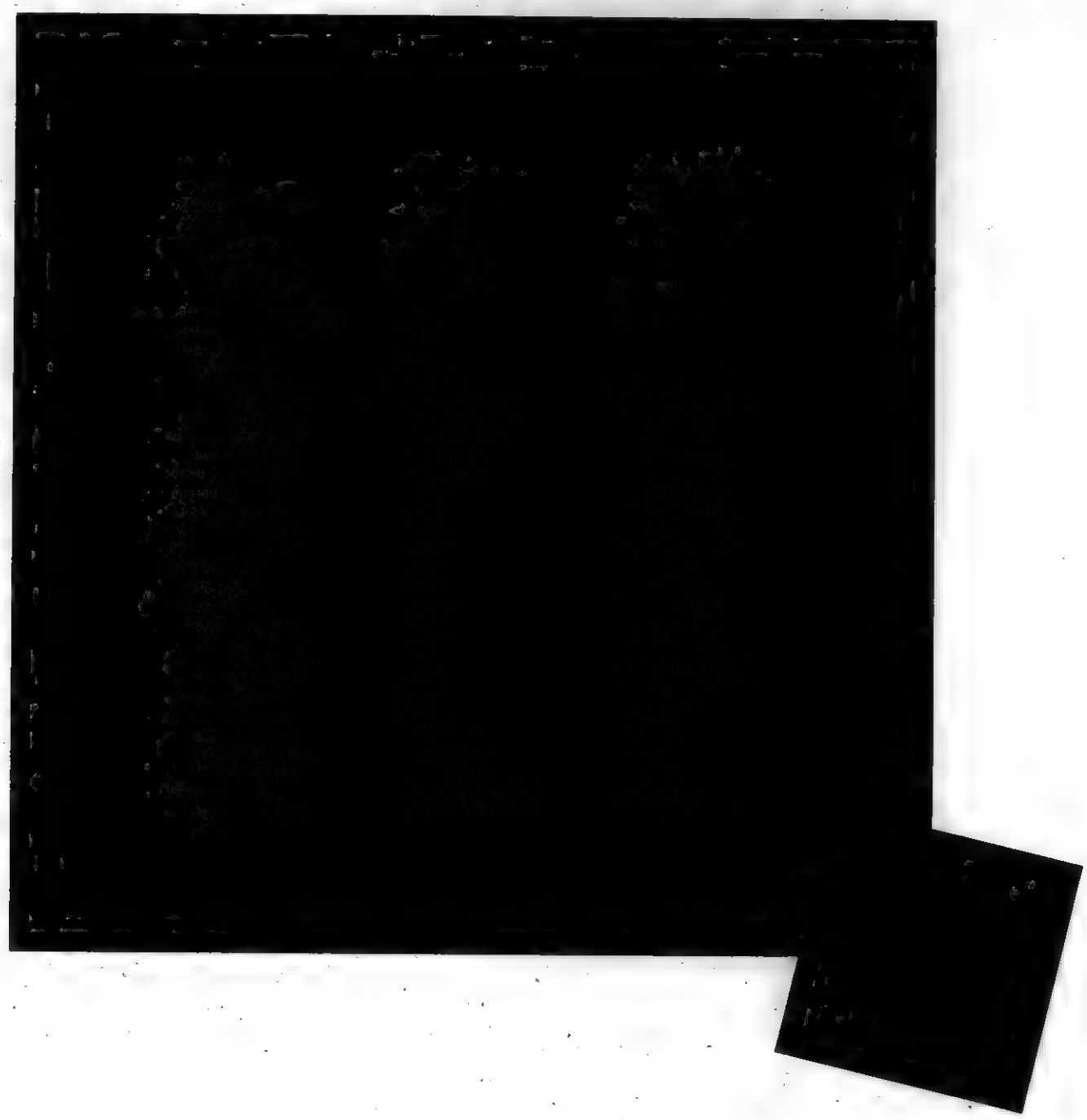

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Nantucket tackles Clipper bugs with fixes

BY PATRICIA KEEFE
CW STAFF

The release of the generally well-reviewed Clipper 5.0 from Nantucket Software, Inc. has not been without its problems. Some users have been tripped up by difficulties related to the install program, the Summer 87 version of Clipper and memory shortages. The company classifies these headaches as relatively minor but has taken steps to deal with them.

According to Larry Heimendinger, Nantucket's president and chief executive officer, an updated release of the Clipper 5.0 master disk will contain changes designed to provide more room to run programs. It will be provided free to current users when ready.

Users stymied by an installation problem with Clipper 5.0 generally have one of two problems: They are either trying to run it under DOS 4.01, or they do not have enough memory, Heimendinger said. However, at least one user running DOS 3.3 said he had great difficulty trying to install Clipper 5.0.

In any case, Heimendinger claimed that Clipper 5.0 is installing "100% OK in all cases." What is happening, he said, is that during the installation process, the utility program is not compiling correctly.

"It's a bug in DOS 4.01" that results in the creation of a larger-than-normal program when running the compile and link utilities, Heimendinger said. In response, Nantucket has changed "what has to come into memory in the install and compile portion" of the program so that some of it can be swapped out of memory. This fix is being tested and will be made available free of charge shortly, he said.

New users will be alerted through a note in the package. "If they still have problems, we'll provide help for free," Heimendinger said.

Nantucket provides 30 days of free support, starting with the first call. The firm has also released a technical bulletin on the install problem that advises users what to do about it. It can be downloaded from Compuserve.

Clipper 5.0 users who still have Summer 87 installed can run into a conflict in the set parameter that sends the compiler to Summer 87 libraries instead of Clipper 5.0 libraries. Users will get an error message. A fix requires a simple change in the set parameter.

A third issue involves memory in general. Some users are finding that they exhaust the swap space available under virtual memory management, Heimendinger said.

"It's not a bug. The system is performing exactly as it should. The problem is that virtual memory system needs a certain amount of RAM to maintain pointers to virtual memory space," Heimendinger explained. What is happening is that users, "through a number of different and very dynamic circumstances, are putting the squeeze on memory and so running out of the actual memory they need to continue.

"We're going to give users more head room on the [master disk]," Heimendinger said. Meanwhile, Nantucket has put out a second bulletin telling users what not to do.

Type-talking is a Gallaudet favorite

For the school's deaf students, E-mail and a PC network open new vistas

ON SITE

BY MAURA J. HARRINGTON
CW STAFF

WASHINGTON, D.C. — While most college students pick up the phone to call their friends to find out about this week's party or the latest gossip on campus, the students at Gallaudet University run not to the phone, but to the nearest networked personal computer.

Why? Because most of the students at Gallaudet are deaf.

Gallaudet University, chartered by Congress in 1864, is the only university in the U.S. completely devoted to educating the deaf. Though computers have been a part of the educational system at Gallaudet for several years, the use of computers as a learning tool for the deaf has increased dramatically in the past few years, according to Kevin Casey, director of Gallaudet's computer services department.

The computer system at Gallaudet consists of 1,000 IBM and compatible personal computers and 200 Apple Computer, Inc. Macintoshes, including SE and IICX models. The PCs are networked together with both thick Ethernet and fiber-optic cabling on a Digital Equipment Corp. Decnet network. The Decnet implementation includes a Vaxcluster with two 8650s and two 11/785 VAXs. The most popular software running on the network is Wordperfect Version 5.1, said John Millikin, director of user services for Gallaudet's computer services department. But there are several other off-the-shelf packages in use, including Lotus Development Corp.'s 1-2-3 and Ashton-Tate Corp.'s Dbase IV, that run off of the network server. Access to Macintosh-based applications is available through Macintosh-to-VAX third-party software, he said.

Some of the ways in which Gallaudet's computer services department has helped to ramp up use of its PCs is by creating a wide variety of training and educational programs that apply to real-life work situations and that require the use of computers.

For example, the university uses closed-captioned videotaped training courses from Minneapolis-based Learn-PC, designed to provide deaf students with hands-on training, a Learn-

Gallaudet officials *(from left) Millikin, Casey and Herbold run popular campus network*

PC spokeswoman said. Otherwise, these students would be forced to watch a translator for instruction first and practice later, she said.

Another project going on at Gallaudet that prepares students for "real-life" work situations is a Minitel USA, Inc. telecommunications system that incorporates video capabilities that allow deaf work-study students to make conference calls and establish ongoing links between students, faculty and the university's corporate sponsors participating in the work-study project.

The Gallaudet University Speech Training and Evaluation System, or GUSTES, is also a student speech training program that uses a specially designed NEC Technologies, Inc. PC-compatible computer that features a board said to allow acquisition and rapid conditioning of multiple voice signals and to provide an array of special sensors to interpret a deaf speaker's voice, according to an article written by Dr. James Mahabie, professor and director of the laboratory.

Unlike other voice interpretation devices, GUSTES uses signals obtained from a variety of sensors that can interpret the actual speech articulation of the voice and minute variations in air pressure that are associated with speech production.

While there are several innovative projects going on at Gallaudet, the most popular computer feature to date among the approximately 2,000 students at Gallaudet is electronic mail.

Mail call

More than 1,000 students log on to DEC's Vaxnotes every day, and many log on at least three times per day, sending three to five messages in each session, estimated Robert Herbold, assistant director of computer services. Vaxnotes, Bitnet and Internet are the most popular E-mail services available on the university's network, but users can also use any standard Transmission Control Protocol/Internet Protocol-compatible E-mail package as well, he said.

Because Internet and Bitnet, two nationwide university and research bulletin board services, provide access to networks located in other colleges throughout the world, students can also take classes at other universities that are not offered at Gallaudet.

Because of the increased popularity of PCs during the past two years, the computer services department has set up several computer centers across campus, locating some in the dormitories, he added. Students can remotely log in to the network, he said.

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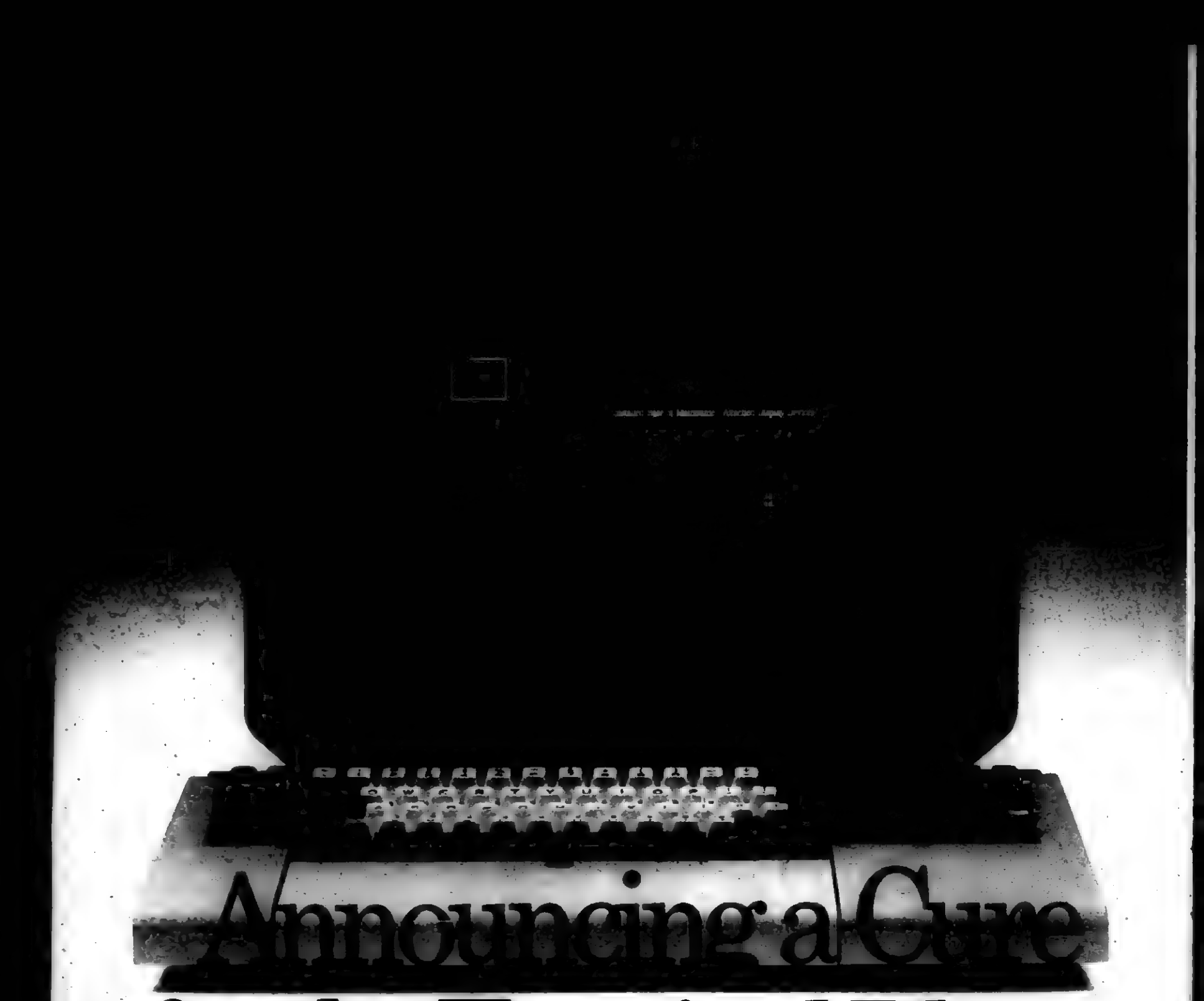

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Agilis stalls workstation, targets wireless LANs

BY JIM NASH
CW STAFF

Months after introducing its portable, wireless local-area network, Agilis Corp. is halting production of its workstations and fighting off a lawsuit launched by three ex-employees who developed Agilis' wireless technology.

Ken Biba, president of Mountain View, Calif.-based Agilis, said stiff competition in the portable market has forced the company to focus exclusively on its spread-spectrum radio LAN connections for portables. At his last count, said Gib Hoxie, an analyst at Arthur D. Little, Inc. in Los Angeles, there were 77 companies making portables.

About 300 of the Agilis workstations, mostly aimed at the high-end military and industrial markets, have been purchased to date, Biba said. About 80% of the workstations have the wireless connections, he said. The radio connections were developed by four men who joined Agilis in 1988 to further their spread-spectrum work.

Analyst Andrew Seybold at Dataquest, Inc. in San Jose, Calif., attributed the Agilis move to the large amount of capital required for portable computer production. He said the company has a better chance of making a name for itself early on in the wireless LAN connection market.

"The product was meeting a cool reception in the marketplace," Hoxie said. "It was too big, too heavy and too expensive. I thought they were off base technologically. The most interesting thing about their workstation was that it was wireless."

"Their workstation was a me-too product, and then it went wireless," Seybold said. Agilis' wireless connections form 230K bit/sec. bridges on any LAN running Ethernet. As many as 100 workstations can be hooked up using the connectors. Their range is 100 meters indoors and a kilometer outdoors.

Agilis' networks support all Ethernet-based systems, Biba said. The company began making wireless network connections 18 months ago, after it picked up a development team from Princeton, N.J., consultancy PA Technology. The team included PA Technology President Peter Cripps and executives Greg Nease, Mike Plotnick and Bill Frezza. They had been seeking funds to build a wireless LAN for Apple Computer, Inc.'s Localtalk connector.

In joining Agilis, the team gave the technology's patent rights to Agilis and received a grant-back agreement allowing them to develop other, noncompeting wireless network products in the future.

Cripps, Plotnick and Frezza split off from Agilis in December 1989, Plotnick said, to form T/BD Associates in Princeton. Nease has remained with Agilis. T/BD is developing its own desktop wireless LAN products.

Shortly after joining the company, Plotnick said he thought wireless LAN connections would be the most profitable line for Agilis. Plotnick, who left Agilis in December to start his own spread-spectrum technology firm, filed suit against the company this summer in connection with a noncompetition agreement he signed with Agilis.

"The market wants a rugged workstation," but in a multiplicity of different designs rather than Agilis' standard modular architecture, Plotnick said. Police cars demand a more stationary workstation than "someone repairing a 747 or an Oldsmobile, who would carry it."

T/BD is avoiding head-to-head competition with Agilis by developing wireless desktop products, he explained, and by working with spread spectrum as well as low-power AM/FM broadcasts. The devices will be introduced during the next 12 to 18 months, Plotnick said.

The lawsuit was filed to cement his company's right to develop and market desktop wireless LAN connections, Plotnick said. Biba said he is "mystified" by T/BD's lawsuit.

MICRO BITS

AST wraps Bravo PC in upgrades

AST Research, Inc. is celebrating its 10th anniversary by bundling more than $1,200 worth of free upgrades with its Bravo/386SX personal computer. Until Dec. 31, the promotion will include a 16-MHz 386SX system with a 5¼-in. floppy drive, 40M-byte hard drive, 2M bytes of memory, IBM Video Graphics Array adapter, AST-VGA color monitor, **Microsoft Corp.**'s Windows 3.0, DOS 3.3 and a Microsoft serial mouse with pad. Valued at $3,900, the package costs $2,795. According to AST, the Bravo/386SX itself normally retails for $2,845.

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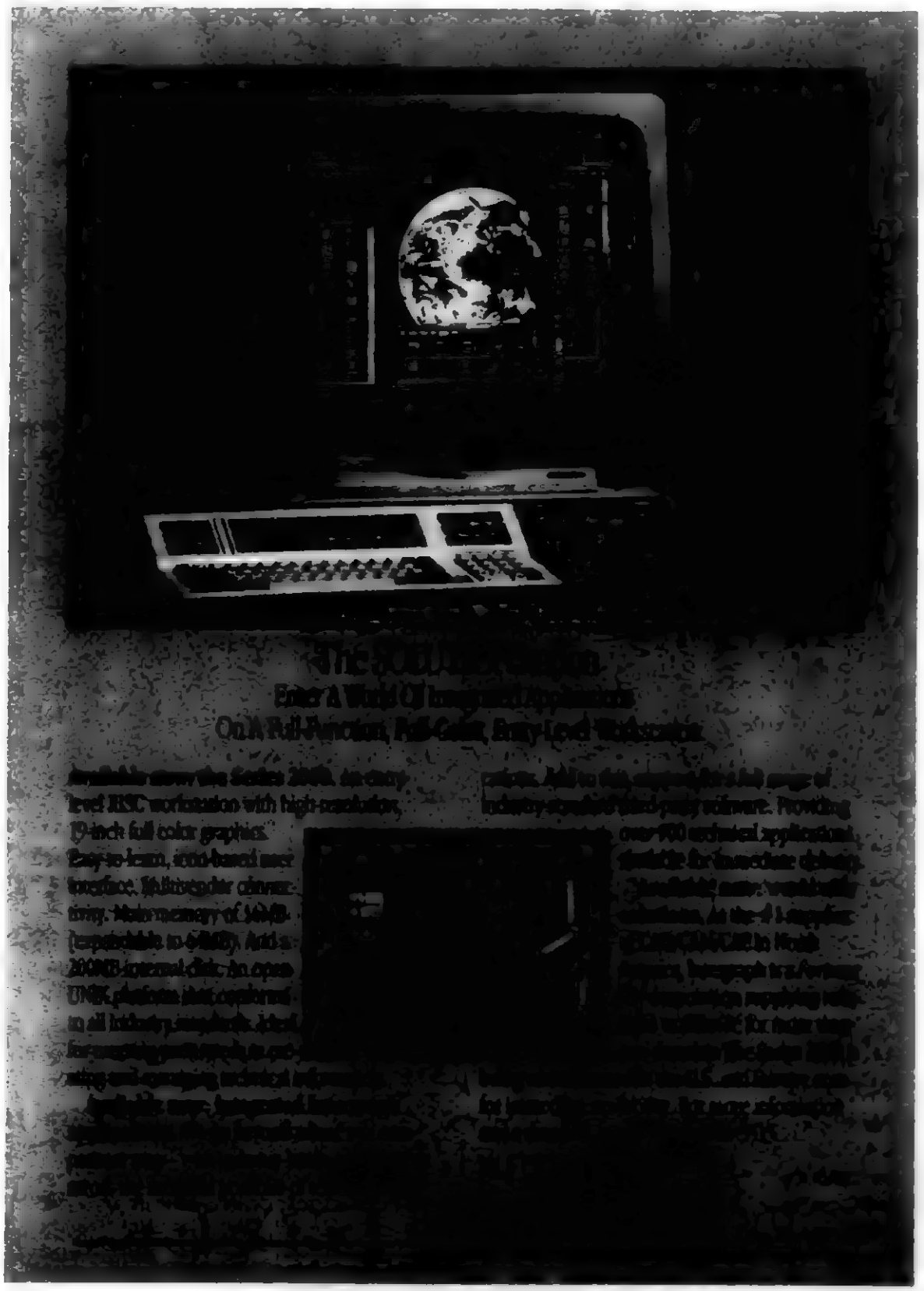

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Fitzgerald

CONTINUED FROM PAGE 39

look at this conso . . . oops, almost said consortium. IBM is adamant that the MCDA is an association, not a consortium.

Anyway, it's easy to look at this group as a sign that IBM is admitting, after 3½ years of living in UK-like splendid isolation, that it's time to get some help before EISA vendors storm the Channel. Most analysts think that this effort by IBM will be too little, too late, even if IBM decides to loosen licensing requirements and share information about MCA products before it brings them to market.

Further, they point to the nature of the group and note that almost half of the executive committee — Intel, Chips & Technologies, AOX, Core International, Western Digital and Cumulus — are chip makers, board makers and a hard drive vendor, who'll support anything that might make them money. The rest of the committee consists of three also-ran PC makers (Apricot, NCR and Olivetti), one company with an identity crisis (Siemens Nixdorf), a test lab (National Software Testing Lab), a company that doesn't even make MCA machines (NEC Technologies) and a company that almost no one has ever heard of (Reply Corp.). In other words, out of the supposed 800 vendors of MCA products, IBM has assembled a cast of self-serving opportunists, clowns and Europeans (and who here cares how well MCA does in Europe, really?) to go into battle against the vendors that support the EISA standard.

Nonetheless, the timing of the group — indeed, its mere existence — may sway corporate purchases from EISA to Micro Channel.

EISA has been, essentially, marketing at its finest. While most analysts say that EISA has already established itself as an alternate standard to MCA, actual sales figures show that EISA is not making a splash in the market (189,000 machines worldwide this year, about 1/10th of total MCA sales), and projections indicate that the new architecture needs at least two years to begin to challenge MCA in the marketplace. So while EISA products do exist, the bus has yet to establish itself in the market. That means EISA vendors are vulnerable right now, despite the marketing hype.

Marketing hype is key in this case, because the Gang of Nine, the EISA consortium, has based its attack on MCA around the incompatibility between MCA and the existing Industry Standard Architecture (ISA) that will dominate the installed base of personal computers until Armageddon or thereabouts. This incompatibility means that ISA boards won't run in MCA machines. As my college writing professor used to say after all my breathy sentences, "So what?"

Think about it: Just how likely is it that your average power-eating user with an expensive, brand-new, 32-bit, 1486-based, loaded-for-bear EISA machine will take a board from a clunky old 8-bit or 16-bit ISA machine and pop it into the power box?

If card compatibility ain't marketing hype, may Madison Avenue sink beneath the surface of the earth.

The MCDA is (if IBM is smart) the first step in a marketing counterattack by IBM that will make buyers who are projected to replace their ISA machines with EISA machines think more than twice before they do so.

IBM is going to have to make it worthwhile for other vendors to join the MCDA and at least give the appearance of being influenced by what MCDA members have to say about MCA, or it runs the risk of having the acronym stand for Machines Containing Dumb Architecture. But if IBM plays its cards right, EISA vendors may start to play a different hand than they have been, one that might even include MCA.

For now, let's hope that the MCDA leads to some truly innovative boards for MCA, something that's lacking right now (not that EISA has them, either). Then, maybe users will start to care about the issue in the near future, rather than four or five years down the line. That would make the coming onslaught of marketing and countermarketing all worthwhile.

Fitzgerald is a Computerworld Midwest bureau correspondent.

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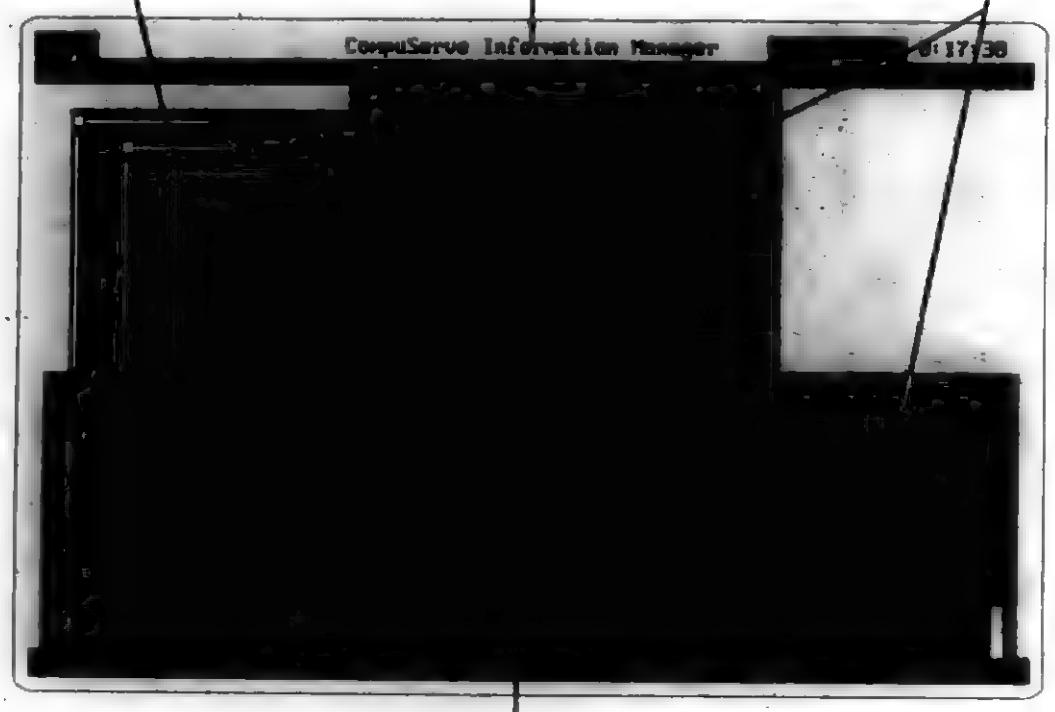

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*Suggested retail price.

ALR weds CPU to Micro Channel

Advanced Logic Research, Inc. earlier this month melded its trademark upgradable CPU technology with IBM's Micro Channel Architecture (MCA) bus. Upgradable systems based on the Extended Industry Standard Architecture bus have been available from ALR and others for more than a year.

Users can upgrade the CPU of the MCA-equipped Modular Processor System from an Intel Corp. 33-MHz 80386 to a 25- or 33-MHz Intel I486.

"This is a major advantage for customers that are planning for more local processing capability in the future but don't want to pay a premium today," said Aaron Goldberg, an analyst at International Data Corp. in Framingham, Mass.

The entry-level system with 386 processor, 1M byte of memory and no hard disk sells for $1,995. At the upper end, a 33-MHz 486-based unit with a 330M-byte hard disk costs $7,595.

Now you can have high-speed data without taking on the whole pipe.

AT&T's ACCUNET® Spectrum of Digital Services gives you the capacity and bandwidth that fits your company's needs.

Now you can upgrade your private network's capacity without carrying a full 24-channel load. Our ACCUNET Spectrum of Digital Services lets you expand at your own pace with only the number of channels you need. And no matter how small your particular piece of the pipe happens to be, ASDS gives you all the options you could want.

Choose from speeds of 96, 56, 64, 128, 256, 384, 512 or 768 kbps. Whether you need capacity for voice, bulk data transport or SNA Polling, or bandwidth for special applications like image processing, video conferencing or CAD/CAM, ASDS can accommodate your needs. We've also got more locations than any comparable service. More than 500 in all.

When it comes to reliability, you can't do any better than AT&T. AT&T offers its customers the highest percentage of error-free seconds of any digital carrier.

And then there are the features that will appeal to your budget managers. Since we have more points of presence than anyone else, chances are you can take advantage of lower access charges. And, of course, there's the whole point of going the ASDS route in the first place: you only pay for the capacity you need.

So if you need to add capacity to your network but you don't want to take on the whole pipe, give us a call. If we haven't already, we can probably take a load off your mind.

Value. Another AT&T advantage.

For more information about the ACCUNET Spectrum of Digital Services, call your AT&T Account Executive or 1 800 247-1212, Ext. 107.

AT&T
The right choice.

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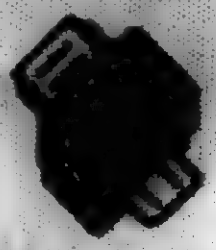
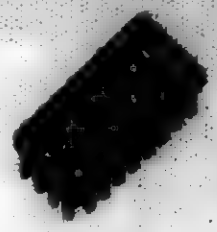
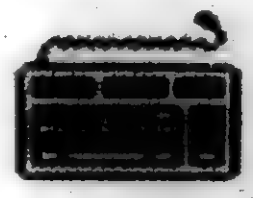


Printers



386 Enhanced

International



Keyboards

Now, all it takes is and you're

It's only fair to warn you that exposure to new Microsoft® Windows™ version 3.0 has been linked to obsessive and habitual usage. Why?

Because with a simple click of the mouse users can connect to the network, even access and manage network resources. All without cumbersome keyboard commands.

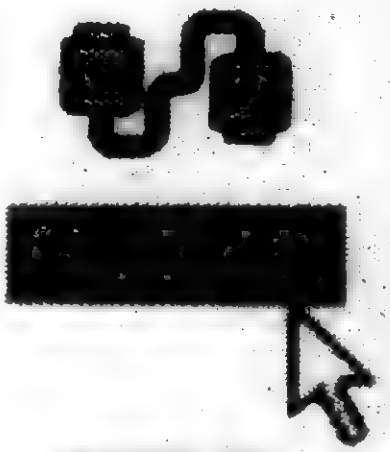
Which means users are now able to share data. Not frustration.

While in the interest of time, the Windows 3.0 graphical user interface was designed to be easy to learn. And use. Neophytes, not to mention troglodytes, will be up and running in no time. With virtually no training.

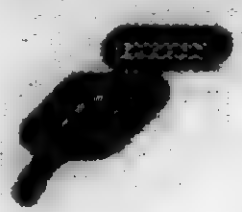
Now, 286/386™ machines running MS-DOS® will no longer be limited to 640K. So there are no more impediments.

Users can even enjoy a network connection and at the very same time satisfy the cravings of multiple applications.

For more information, call (800) 323-3577, Dept. L21. In Canada, call (416) 673-7638. Outside the U.S. and Canada, call (206) 882-8661. *©1990 Microsoft Corporation. All rights reserved. Microsoft, MS-DOS and the Microsoft logo*



Desktop



Ports

Fonts

a point and click hooked.

And since Windows 3.0 has a modular setup program, a single copy now memorizes every user configuration on the network. Which means, so to speak, one size fits all.

Furthermore, Windows 3.0 has redefined its relationship with IBM® 3270 emulation programs. Users can now download corporate data and easily share it with Windows applications. Something we have come to call peaceful coexistence.

One last point. Because Windows 3.0 has been optimized for machines with 1-2 megabytes of RAM, it will go a long way towards protecting your hardware investment.

Call (800) 323-3577, Department L21, for a backgrounder that outlines how Microsoft Windows 3.0 could benefit your corporation.

We're certain that you'll agree it's a habit well worth forming.

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Making it all make sense™

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I486

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cache at any given time — vary widely. Caches work best when they can be optimized for very specific applications.

Unfortunately, most caches sold with off-the-shelf PCs are multipurpose caches, according to Porter. "That kind of cache you can't really optimize for a specific application," and consequently, the hit rate will not be as high, he said.

The most common cache controllers feature capacities of about 4K bytes, but larger caches of 4M or 6M bytes are available. But these can be problematic, according to Kirkey. "You can run into various software compatibility issues when you start putting these esoteric controllers in there," he said.

A rarer strategy to boost disk access is the disk array. Only a handful of companies offer arrays on I486-based PCs, including Compaq Computer Corp. and Dell Computer Corp. With arrays, several drives are stacked and data is striped across the disks in set patterns. One or more of the drives act as a mirror backup to ensure data integrity and fault tolerance.

While arrays do speed access in some cases, access may sometimes actually be slowed, according to Porter. "Arrays won't necessarily speed up seeks; some have slower access than individual drives, depending on the application," Porter said. Also, it takes longer to stripe the data on an array than it does to write data to individual drives, he said.

Better seek times

With or without caches and arrays, hard disk drives in general have improved their average seek times considerably, making them better-suited partners for the I486 CPU.

"For a time, disks lagged behind processors," Zagacski said. "Now, disks have caught up to processors" in their relative speed, he said.

Porter pointed out that a 20M-byte hard drive on an IBM PC AT once offered an average total access time of about 50 msec. Today, a 300M-byte drive on a I486-based PC can retrieve data at less than half that rate.

Displays have also been a potential bottleneck in I486 systems. However, designers have worked around it by using separate controller cards containing random-access memory or a separate video coprocessor.

"Common in the Apple Computer, Inc. Macintosh line and now coming to the PC world, separate video coprocessors remove the heavy graphical data processing burden from the central processor. The video coprocessors help speed things up by handling all the complex calculations involved in displaying graphics.

Another option is separate memory for graphics. "Video RAM provides pages into which video data [such as pixel coordinates] can be temporarily stored so that the central processor can go off and do something else," Zagacski said.

NEW PRODUCTS

Systems

Wyse Technology has announced a terminal that uses X Window System server code X.11 R4 and a 32-bit Motorola, Inc. 68020 microprocessor.

The WY-X5 is equipped with a 17-in., flat noninterlaced monochrome display. Features include 1,280- by 1,024-pixel resolution and a 70-Hz flicker-free refresh rate.

The product is priced at $1,799.

Wyse Technology
3471 N. First St.
San Jose, Calif. 95134
(408) 473-1200

Visual Technology, Inc. has introduced the X-14/ES Display Station, a small footprint networked X graphic display terminal that complies with the X/Open Consortium Ltd.'s X11R4-X server specification.

The unit includes a Motorola, Inc. 68000 processor running at 12 MHz, 1M byte of standard random-access memory and a 14-in. landscape display with 1,024- by 800-pixel resolution.

Pricing starts at $995, and volume shipments are scheduled to begin next month.

Visual Technology
120 Flanders Road
Westboro, Mass. 01581
(508) 836-4400

Software applications packages

Integrated Software Design, Inc. has introduced a personal computer-based software package that integrates graphic design, information management and printing functions for in-house production of labels, forms and signs.

Barney Ellis enables users to prioritize, queue and batch jobs to achieve unattended printing, and up to four printers can be used for separate jobs, the vendor said.

The product is priced at $1,695.

Integrated Software Design
171 Forbes Blvd.
Mansfield, Mass. 02048
(508) 339-4928

Which leading company has developed the last branch automation systems you'll ever need to buy?

Designcad, Inc. has announced a microcomputer-based computer-aided design (CAD) program that deacribes geometric entities via a single, unified parametric representation.

Designcad Macintosh's single parametric representation serves as a cubic spline, and its extension serves as a bicubic surface. It enables users of Apple Computer, Inc.'s Macintosh to change mesh resolution without redrawing, the vendor said.

The product also provides two- and three-dimensional CAD capabilities and complete dimension/annotation capabilities.

Designcad Macintosh is priced at $699.

Designcad
327 S. Mill St.
Pryor, Okla. 74361
(918) 825-4848

Business Forecast Systems, Inc. has released a product that can automatically forecast hundreds or thousands of items.

Forecast Pro Batch Version was designed to interface with corporate databases and production planning systems. Features include exception reports and a built-in forecast evaluation option that automatically withholds data from the end of each series and checks the forecasts against actual values.

The product runs on IBM Personal Computer ATs, XTs, Personal System/2s or compatibles and is available at a special introductory price of $1,995 until Jan. 1, 1991.

Business Forecast Systems
68 Leonard St.
Belmont, Mass. 02178
(617) 484-5050

Bradford Information Systems has announced an application designed to conserve fuel during an oil crisis.

The Interactive Distribution Planning System (IDPS) application enables users to create optimal truck routes from central distribution locations to customer delivery points.

The product runs on IBM Personal Computer ATs, XTs, Personal System/2s and IBM RISC System/6000 workstations that provide multiuser access under Unix-based AIX operating systems.

It is priced from $5,000 to $7,500 and includes two days of installation and training.

Bradford Information Systems
2819 Foster Lane
Austin, Texas 78757
(512) 459-8999

Software utilities

Trend Micro Devices has introduced a laptop-to-desktop and desktop-to-desktop file transfer utility that features file transfer rates of 500K bit/sec. and includes an antivirus scanning system designed to detect and protect against viruses during file transfer operations.

Pcopy uses a virus scan program and a virus pattern bank to examine files before they are transferred. The product is available in 3½- and 5¼-in. formats and is priced at $119.

Trend Micro Devices
2421 W. 205th St.
Torrance, Calif. 90501
(800) 228-5651

Blueridge Technologies, Inc. has announced a software package designed to convert an Apple Computer, Inc. Macintosh system and a scanner into a standalone document imaging system.

The Optix Desktop Imaging System enables users to scan paper documents into a Macintosh system and store them on an optical disc or magnetic disk. The system can do CCITT Group IV image compressions or decompressions in software instead of hardware, the vendor said.

The product runs on any Macintosh II machine and is priced at $495.

Blueridge Technologies
P.O. Box 430
Flint Hill, Va. 22627
(703) 675-3015

Data storage

Priam Systems Corp. has announced a line of 200M-byte 3½-in. disk drives equipped with an adapter card for Intel Corp. 80286-, 80386- or I486-based IBM Personal Computer ATs and compatibles.

The ID200L series consists of the IDL200L-IC ($1,551), ID200L-IF ($1,531) and ID200L-I ($1,500). Features include a 15 msec seek time and 50,000 hours of mean time between failures, according to the vendor. The drives are compatible with systems operating under DOS, Xenix, Unix or OS/2 and provide maximum bus speeds of 16 MHz.

Priam Systems
1140 Ringwood Court
San Jose, Calif. 95131
(408) 954-8680

Mountain Network Solutions, Inc. has announced a mini-cartridge tape subsystem that incorporates an integrated device electronics embedded IBM Personal Computer AT interface.

The Filesafe 8500 can accommodate up to 304M bytes in a 3½-in. half-height form factor while maintaining a data throughput rate of up to 10M byte/min., according to the vendor.

Evaluation units are scheduled to be available in January, and production quantities are slated to be released this March. The product has a retail price of $895.

Mountain Network
240 Hacienda Ave.
Campbell, Calif. 95008
(408) 379-4300

Board-level devices

Pacific Data Products, Inc. has announced Pacific 4 Memory, an upgradable memory board that enables users to expand the memory of Hewlett-Packard Co.'s Laserjet printers.

The memory board can be used to expand the 512K-byte printer memory of the HP Laserjet IIP or Laserjet III devices by a range of 1M to 4M bytes. The product also enables users to print 300 dot/in. graphics and scanned images.

Pricing ranges from $199 to $499, depending on the amount of memory selected.

Pacific Data Products
9125 Rehco Road
San Diego, Calif. 92121
(619) 552-0880

COMMENTARY

Ellis Booker

Not a flash in the pan

Remember The Flash? He's recently made a comeback, starring in his own special-effects-jammed prime-time TV show. And how appropriate: The Flash, one of my favorite superheroes, is the ideal icon of the '90s, an age of quick-response, just-in-time instantaneousness.

Along with double cappuccino, what makes all this hyper-activity possible, of course, are computer and information technologies: on-line transaction processing, local-area networks, electronic mail and the ubiquitous facsimile machine.

Unfortunately, a new class of high-speed applications, particularly those calling for wide-area distributed networking and remote access to digitized images, threatens to outrace the nation's long-distance and local telephone networks.

Flash. Onto the scene bursts a public network technology you will hear much more about in the coming year or two: Switched Multimegabit Data Service (SMDS).

SMDS is a packet-switched networking specification for connecting LANs, host computers, image databases and so on over metropolitan areas. IEEE stan-

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Netview options multiply

Netview/PC users take their time about moving to direct interfaces

BY ELISABETH HORWITT
CW STAFF

WHITE PLAINS, N.Y. — Now that IBM has finally provided users with not one, but two alternatives to Netview/PC, users are starting to think creatively about how best to implement Netview as a multivendor network management system.

IBM announced the long-awaited direct LU6.2 link to Netview last September. The vendor has also made it clear that it will support the Open Systems Interconnect Network Management Forum's specifications as a way for non-IBM networking devices and network management systems to communicate with Netview.

Contrary to what analysts once predicted, however, the existence of direct links to Netview are unlikely to spell the demise of Netview/PC. IBM Vice-President Ellen Hancock emphasized during the announcement that the vendor will continue to support Netview/PC as a separate but equal alternative to the other interfaces.

More importantly, Netview/PC — in particular, the more powerful OS/2 version — has been finding its way into a significant number of user sites, including Aetna Life and Casualty Co., Union Pacific Railroad and General Electric Corp. Automated Network Management, Inc., an IBM business partner that sells Netview/PC applications and development tools, reports approximately 20 installations.

Nor do present Netview/PC users express an urgent need to migrate to the more direct interfaces. "There is no particular advantage for us right now to migrate to LU6.2 or OSI," said Jim Montequin, a senior manager of data communications at Union Pacific Railroad. The railroad, with the help of IBM business partner Diederich & Associates, developed Netview/PC applications to link Netview to a variety of non-Systems Network Architecture devices, including a radio communications network that controls trains through Tandem Computer, Inc. hosts, he added.

GE, an early user of the OS/2 version of Netview/PC, has found the interface more than adequate to support Netview monitoring of various telecommunications devices, according to Kevin Huff, a program manager who headed the Netview/PC implementation project.

On the other hand, IBM shops are likely to start looking at the LU6.2 link as they move toward more sophisticated network management applications that require program-to-program communications. GE initially de-

Continued on page 59

NSF opens up digital doors to scientific data

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — One million Internet users in 35 countries now have on-line access to information about research programs funded by the National Science Foundation (NSF).

The NSF is joining the U.S. Department of Energy, the National Aeronautics and Space Administration, the National Institutes of Health and other agencies in a move to make information about federally funded research available free to the public via electronic bulletin boards and databases.

Officials at the NSF said the data will be used by individual researchers, the offices of NSF-sponsored research, science policy analysts and the press.

NSF's Science and Technology Information System (STIS) can be accessed by dial-up connection or by remote log-in via Internet, the umbrella network of networks used mostly by the research and academic communities. STIS contains the full text of the latest two "NSF Bulletins" — the monthly publication announcing new programs, deadlines for upcoming grant awards, publications, meetings and sources for more detailed information. It also contains press releases and lists of publications and films and will soon contain a database of descriptions of 15,000 to 18,000 active NSF-awarded research projects.

Users may interactively search text of documents by keyword, topic or by Boolean expression, displaying results on-line or downloading documents to a local device. Internet users get files from NSF using the File Transfer Protocol.

Ruta Godwin, project leader in NSF's Office of Information Systems, said that until now, information about NSF programs and grants was available by calling the foundation's office of public affairs or through the Dialog commercial on-line service. The information is now available faster, more conveniently and at no cost other than a possible long-distance telephone charge, she said.

Godwin also said information is now more easily obtainable by those with a limited knowledge of what they are seeking. The retrieval software, Verity, Inc.'s Topic, uses a concept-based retrieval method that automatically relates topics and subtopics. For example, Godwin said, a user specifying an interest in "materials science" would also retrieve information

Continued on page 59

Who created these products to fit virtually any environment, be it UNIX- or MS-DOS-based?

Here's a hint: It's not IBM.

SNA gateways survive adolescence

BY JOANIE M. WEXLER
CW STAFF

They've come a long way, baby.

According to test results in a recent report by J2 Software Labs, Inc. in Santa Cruz, Calif., Systems Network Architecture (SNA) gateways are increasingly feature-rich and reliable, making life in the micro-to-mainframe environment much less painful than in days of yore.

"When SNA gateways came out five years ago, there were concerns about sessions staying active, file transfer failures and communications checks," explained John Siegel, president of J2 Software and author of the report. "The products have really matured in the last couple of years."

SNA is IBM's suite of networking protocols that allows communications between IBM devices and between IBM and non-IBM devices. A hardware adapter inside each desktop computer or a stand-alone gateway is necessary to convert the protocols in the small systems to SNA so they can communicate with the SNA-speaking mainframes.

J2 Software, which evaluated nine SNA MS-DOS-based gateway products during a period of approximately one year (see chart), cited the stand-alone approach as generally the most economical for serving multiple desktops. However, companies using this approach for local-area networks must balance trade-offs in performance — because of data-traffic bottlenecks accumulating in the single device — with the overhead added to the mainframe by direct connections, according to Siegel.

J2 Software's gateway study used an unweighted rating system that resulted in only a 10-point differential between the highest and lowest rated vendors. Out of a possible 81 points, the highest rating of 57 was shared by Attachmate Corp. and Data Interface Systems Corp. The lowest rating (47) was given to 3Com Corp.

Siegel pointed out, though, that most companies would weigh certain categories more heavily than others (J2 Software treated all criteria as equal), rendering certain products more applicable to different environments.

The study provides a ratings worksheet, which an organization can use to fine-tune J2 Software's assessment to suit its own needs.

Siegel added that the study will probably be updated later this year to rank the Microsoft Corp. Windows support now offered by many vendors in their SNA gateway products.

Golden gates

SNA gateways from Attachmate and Digital Interface Systems tallied the highest raw scores in product comparison

J2 product ratings by category	3Com Corp. Megacs SNA GW	Attachmate Corp. Extra! 3270 GW	Data Interface Systems Corp. DI 3270 LAN GW	Digital Communications Associates, Inc. i-rma LAN GW	Rose Technology Corp. Access GW	IBM Personal Comm 3270	Network Software Associates, Inc. Adept SNA GW	Novell Inc. Netware SNA GW	Bubble Software Corp. BNAgate GW
Comprehensiveness	2	7	8	7	3	8	4	8	8
Pricing	6	2	9	5	7	1	8	7	7
Gateway-to-host access features	7	8	8	4	4	5	4	3	6
Manageability and security	7	7	7	8	4	6	6	4	3
Terminal emulation	3	7	6	8	6	8	4	6	6
Printer support	7	6	3	7	8	7	7	5	8
API support	5	5	5	6	7	8	7	8	6
Memory usage and file transfer speed	4	8	5	5	5	5	3	7	5
Ease of use	6	7	6	5	4	5	6	4	7
UNWEIGHTED TOTAL	47	57	57	55	48	53	49	53	56

Rating system: 1-Unacceptable 5-Average 9-Excellent

Source: J2 Software Labs, Inc.

CW Chart: Doreen St. John

Low-cost Macs gain network access

BY JAMES DALY
CW STAFF

While the low price tag of Apple Computer, Inc.'s Macintosh Classic was the star of last week's product introductions, the networking abilities of the newly released Macintosh IISI may go a long way in helping realize an even more important company objective: cracking the corporate market.

With the SI, Apple now has a machine costing only $3,769 that can be easily tied into sophisticated corporate networks. The key to the equation is tucked deep inside the SI with the Nubus expansion slot, an option previously only available on more expensive Macintoshes.

The slot allows users to install the $249 Nubus adapter card, a sophisticated device that supports multiple processors and expands the SI's ability to tap into large communications networks. The Macintosh IISI also includes a slot to install the 030 Direct Slot card, which also beefs up the system's networking options.

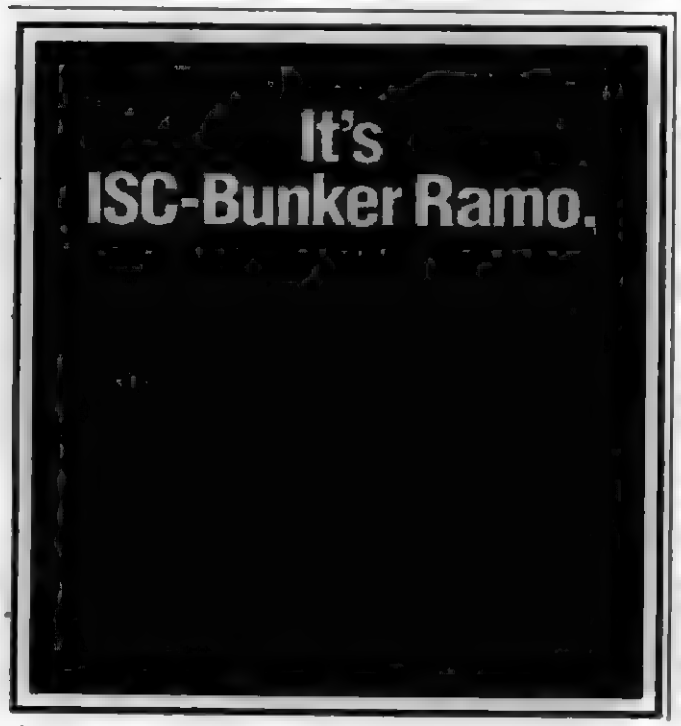
Analysts said the move builds on Apple's strategy to integrate sophisticated communications abilities into its lower-priced machines. "Apple has made tremendous strides in positioning the Macintosh, which once was perceived as a stand-alone device, as a workstation that offers a high level of connectivity," said Lee Doyle, an analyst at International Data Corp. (IDC) in Framingham, Mass.

Networking capabilities have become more important to Apple as the number of Macintoshes linked into networks has skyrocketed, product manager Brodie Keast said. IDC estimated that nearly half of all Macintoshes are networked, and 1.2 million Appletalk nodes will be installed worldwide by 1993.

Apple has moved to take advantage of this dynamic. Last year, Apple introduced 17 networking and communications products, and this spring, the Cupertino, Calif.-based firm made good on a longstanding promise to provide connectivity tools to hook Macintoshes into the Digital Equipment Corp. VAX environment.

The company, however, had been slow out of the gate to provide connectivity products, and third-party developers quickly gobbled up a good part of the market share.

However, Apple said it is committed to correcting former mistakes, specifically toward providing more competitive Ethernet connectivity options. With third-party developers undercutting Apple's $699 Ethernet card by a wide margin, Apple scientists are reportedly working on a new low-cost Ethernet product. Apple is also reportedly developing a line of lower-cost Ethernet adapters for the Macintosh that could sell for less than $300.



Novell manager warns of problems by phone

BY JIM NASH
CW STAFF

Novell, Inc. is giving network monitors a voice through its Lantern Services Manager. The software, currently being beta-tested and scheduled for shipment in January, promises to call information systems managers when statistical thresholds are exceeded on a network.

"This is interesting," said Tom Thibault of Thibault Associates, Inc. "You can sit this on a network, hook up a modem on it, and it will dial up the administrator" to warn of problems, he said. Thibault Associates is a network management services company in Walnut Creek, Calif.

While he has yet to see the Services Manager application, Greg Scott, computing services manager at Oregon State University's school of business, said he has been impressed with Novell's Lantern monitors.

"Lantern really does a better job pulling apart packets to see what the problem is," Scott said. Services Manager would need to do a better job isolating failures than the Hewlett-Packard Co. LAN Probe he uses to monitor his systems, he said. "I want to be able to tell in feet where a cable failure is, for example," he said.

Jeff Turner, product manager at Novell, Inc.'s San Jose, Calif., office, said Services Manager software continuously monitors and logs the activity recorded by all Lantern devices on multiple local-area networks. Turner said that a modem-equipped Services Manager personal computer will automatically dial up Lantern stations if a cable failure occurs between machines.

The Lantern can monitor any device running any protocol on an Ethernet network, he said. While Lantern uses Simple Network Management Protocol (SNMP) to communicate with Services Manager, no SNMP agent is needed on the monitored machines, Turner added.

"What they've found here is their niche," Thibault said of Novell's Lanalyzer LAN analysis unit. "This is aimed at users who want something that does what the Lanalyzer and [Network General Corp.'s] Sniffer will do for a multiple-LAN environment, but with a limited IS staff."

Thibault also said a service firm such as his might use the device remotely to track events on a client's LAN. By setting the warning thresholds low enough, he said, it would be possible to get an alert from Services Manager before the user knew a problem was building.

Lantern Services Manager runs on Intel Corp. 80386- and 1486-based PCs running Microsoft Corp.'s Windows Version 3.0 and will be priced at $4,995. The application does not require Novell's Netware. Lantern monitors began shipping in May, Novell said, and cost $4,495.

"Every new construction site, no matter how remote, can become part of our network. All we do is set up a PC and dial in."

"Only BANYAN could have done it."

From an interview with John Good of The Turner Corporation.

"Our New York headquarters is connected to most of our U.S. offices by VINES,® with our job sites on VINES PC Dial-in.

"This allows us corporate-wide access to critical information such as cost control, job progress, and subcontractor monitoring on all current projects. And when someone accesses information, it's up to the minute because of local updating."

How has VINES changed your business?

"Five years ago, everything was on an IBM mainframe. Now the only thing left on it is Human Resources, Benefits, and Payroll. All of our strategic applications reside on VINES. And by the end of first quarter 1991, we'll be off the mainframe entirely."

How did you learn about Banyan?

"I was researching a network at a reference account in Washington. But it lacked many of the features I felt we needed. I mentioned this to their network administrator. He sighed, and said, "These are the people you should talk to. I wish we had." Then he went to his desk and got me a Banyan brochure."

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Banyan's VINES network operating software offers unmatched flexibility to accommodate your unique business needs. For a further description of The Turner Corporation's networking challenges and solutions, write or call us at 800-828-2404 (in MA 508-836-2828).

BANYAN®

Networking. Without limits.

IBM And Unisys Users Finally Have Something In Common.

Now Unisys 1100 and 2200 users can take advantage of advanced solid state disk technology that was once only available to the IBM world. EMC, the leading solid state disk manufacturer for the IBM mainframe market, brings the unique technology of its ORION Solid State Disk Series to Unisys 1100 and 2200 systems.

ORION lets you access your critical files faster than ever before. With absolute data integrity. And functionality that was never before available for the 1100/2200 Series. All for a price that brings solid state storage within your reach.

Unmatched I/O performance.

ORION provides data transfer rates of up to 4.5 megabytes per second, and an access time of 0.1 milliseconds. It eliminates I/O bottlenecks for greater system utilization and maximum user productivity.

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EMC²

Boston users batten hatches for Big Dig

Redundant communications links are order of the day as eight-year highway project looms

BY SALLY CUSACK
CW STAFF

BOSTON — In 1998, Boston will (it hopes) have completed its multibillion-dollar central artery project. Plans call for 128 miles of highway to run across the city's congested downtown business district and its thick tangle of communication cables.

But just what will happen to telecommunications during the eight-year construction project termed "The Big Dig" by locals?

Jim Allen, vice-president of communications at the Federal Reserve Bank of Boston, said his biggest concern will be driving to work across the construction. "We've taken care of the communications lines," he said confidently.

The Federal Reserve currently has four redundant lines of fiber-optic cable and two different carriers responsible for maintaining uptime during construction.

"No single construction accident will take out all of our facilities," Allen said, noting that the bank started working with both New England Telephone (NET) and Metropolitan Fiber Systems/McCourt, Inc. early in 1989, and the work was completed by the end of the year.

> WITH MORE than 17 million calls every day that cross the path of the artery, the carriers have been working round-the-clock for the past several years to insure that lines will be operational.

The Federal Reserve has been using one fiber line from NET since 1987, and the diversity offered with the automatic switching was basically an enhancement, Allen said. The bank will use the MFS/McCourt network for incoming 800 services and for accessing its long-distance carrier in mid-December. MFS/McCourt is providing two paths for communications to and from the Federal Reserve, with network routes entering the building at separate points and housed in separate conduits.

With more than 17 million calls every day that cross the path of the artery, the carriers have been working round-the-clock for the past several years to ensure that lines will be operational during the massive construction project.

According to John Johnson, a spokesman for NET, the local Nynex carrier, the company has divided the area into two parts in order to reroute the facilities. The first area concentrates on the interoffice circuits responsible for switching offices in the downtown area, he said, indicating that there are literally hundreds of cables intersecting the artery in this area. The other portion consists of the local loop piece of the network, which connects a user with the telephone switching office.

"The local loop portion cannot be moved," Johnson said. "There are 39 conflict locations across the artery construction."

To circumvent this potentially disastrous situation, NET has constructed utility corridors — conduits located in underground infrastructures that house the cables away from construction activities. The company will switch the local loop from the security of these conduits before construction begins, Johnson said, adding that NET has a backup fiber loop in addition to the alternative loop structure.

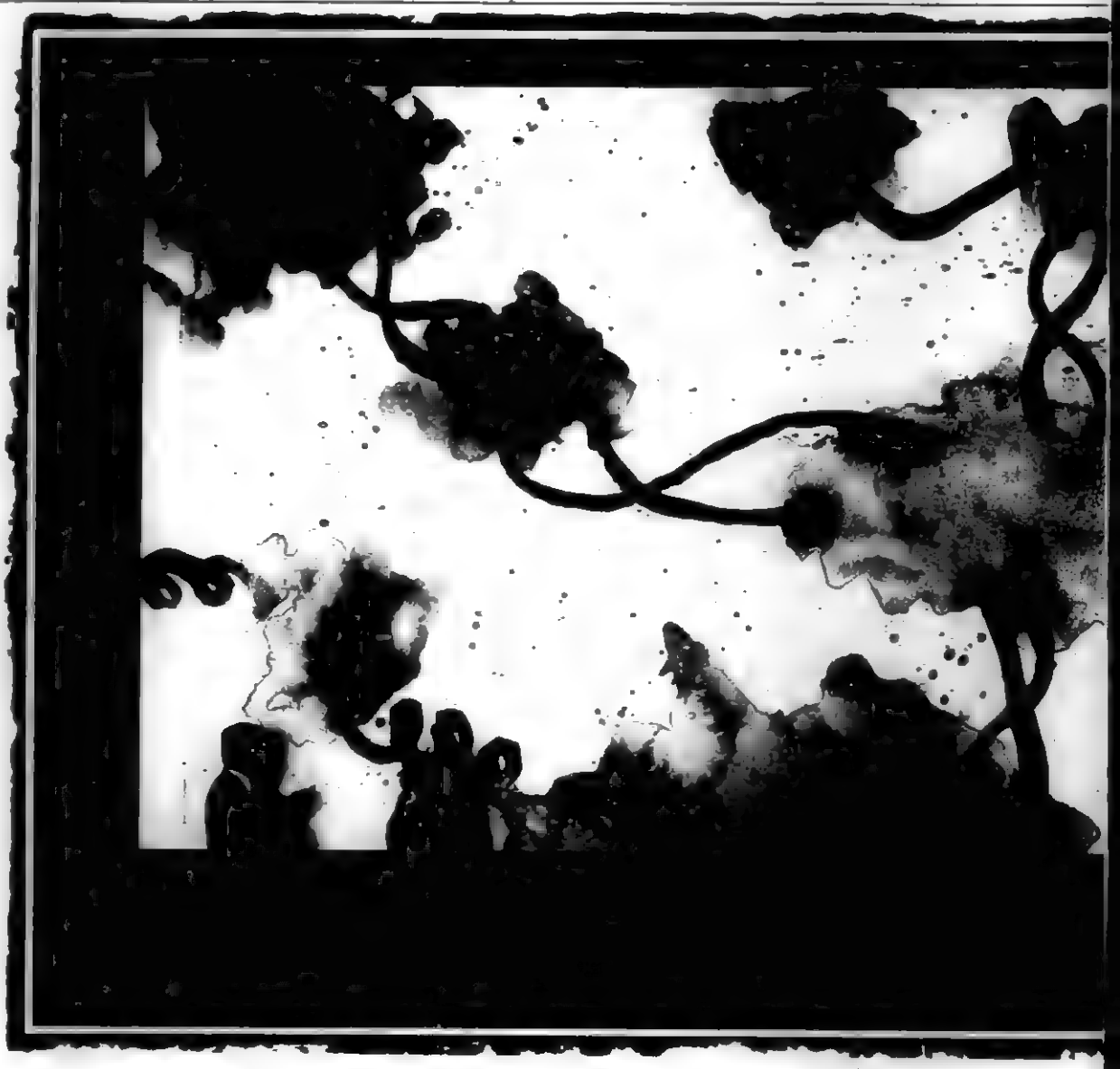
According to Massachusetts Department of Public Works director Robert Albee, the pencil-thin fiber-optic technology allows for the elimination of "a lot of unnecessary cable. We're working with almost 100 years worth of utility companies' infrastructure here, and *none* of it is state of the art."

Not everyone is as optimistic as Allen or Albee. Debra Villani, systems manager at Hemenway & Barnes, a large legal firm, said, "We're right on State Street, overlooking the artery. If they cut a cable, the whole area could be out."

Villani noted that the law firm is not totally dependent on the telephones to conduct business, and "if we *had* to do without them for a couple of days, there are alternatives."

She added that she would like to see a more detailed explanation of the error margin from the state Department of Public Works.

According to Shelly Karp, operations analyst at the New England Medical Center, the hospital is watching the situation and has several auxiliary backup systems and uninterruptible power supply devices to carry it through a potential power cut. The 400-bed facility depends on several different computer vendors to supply its systems, including IBM, Digital Equipment Corp. and Data General Corp.



"That reminds me, now that we've managed to network everything, who's going to manage our network?"

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Netview

CONTINUED FROM PAGE 53

cided not to implement a two-way "command-response" connection on Netview/PC, primarily because "it would be too big a programming investment," Huff said.

"Now, if LU6.2 reduced costs and made it easier to do this," and if the right vendors supported it, "we would be very interested," he said.

CSX has "already automated a significant portion of our operations" using Netview applications, said Doug Underhill, the railway carrier's assistant vice-president of technical services. LU6.2 would provide a way to extend those automation operations by allowing distributed automation system managers to communicate with one another, he said.

Underhill said that he also liked the fact that a Netview program can ask a device to explain an unfamiliar message over the LU6.2 link. In contrast, Netview/PC requires "having to stop everything while you explain to Netview what a new modem status code means," he added. "Periodic interruptions go against the idea of automated operations." CSX currently does not use Netview/PC.

NETVIEW'S OSI network management interface will take longer to reach user sites, because vendors have yet to implement the OSI Network Management Forum specifications.

Another potential use for LU6.2 would be to support communications between Netview hosts at CSX's two data centers, "so that if something goes wrong at one site, one Netview would tell the other and more people could act on the problem," Underhill said.

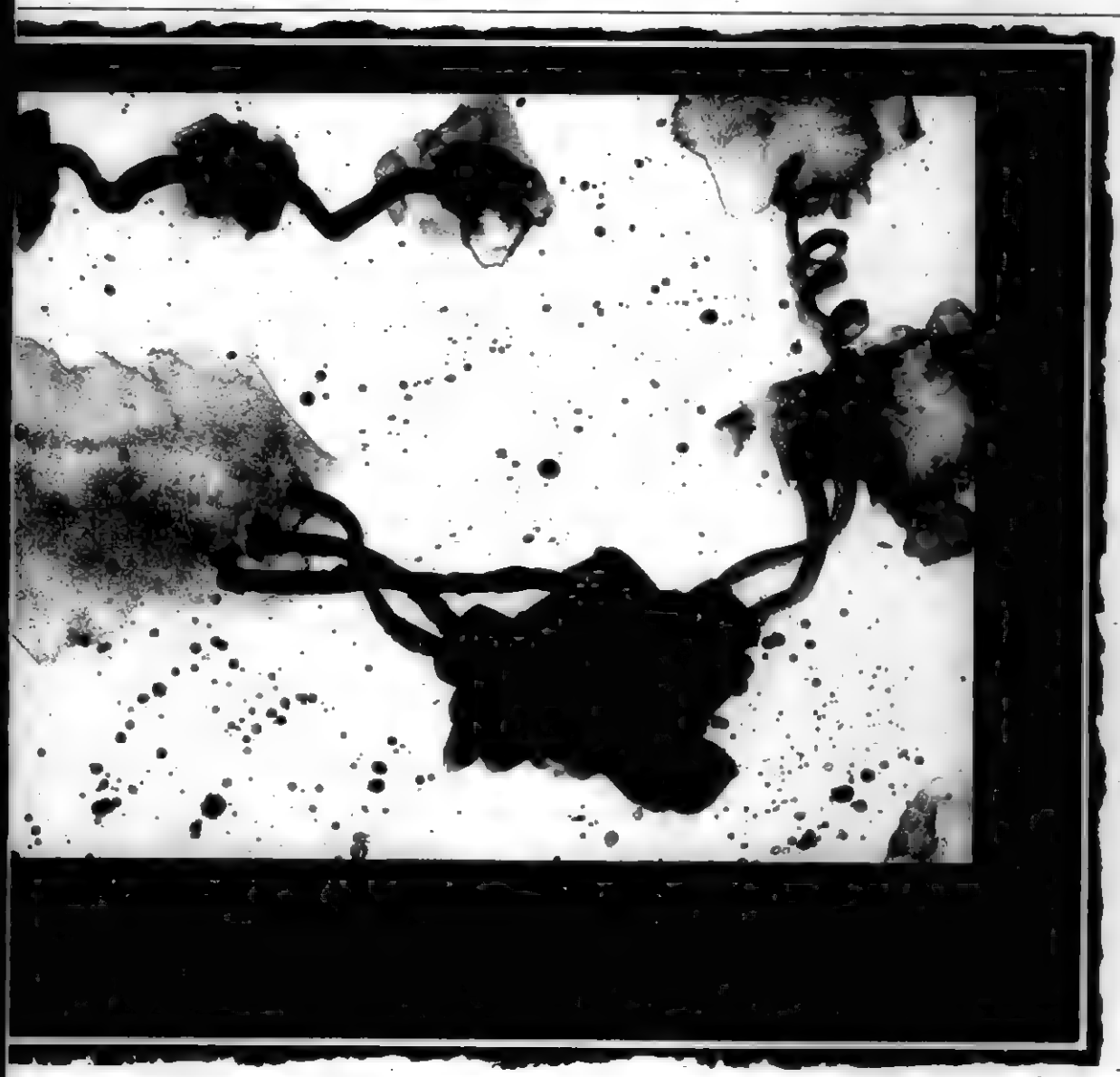
So far, vendor support has been thin for IBM's LU6.2 interface to Netview. Automated Network Management, Inc., a San Juan Capistrano, Calif., third-party Netview/PC application developer, intends to support OSI links to Netview, but not LU6.2, a company spokesman said.

Netview's OSI network management interface will take longer to reach user sites, because vendors, including IBM, have yet to implement the OSI Network Management Forum specifications that will ensure interoperability.

However, users that anticipate using Netview to monitor a wide variety of non-IBM networking systems may decide to wait for the OSI link. Mervyn's, for example, would prefer to use OSI rather than LU6.2 to link Netview to T1 multiplexers and other non-IBM systems, "because when OSI is finally ready, vendors will support it, not LU6.2," said Jim Williams, the department store chain's telecommunications manager.

Demand for OSI and LU6.2 links to Netview will get a boost when IBM makes the network management system available on OS/400 and OS/2 systems, according to David Passmore, a partner at Ernst & Young in Fairfax, Va. IBM quietly announced last month that Netview and OSI network management protocols would be available on OS/400 in September of next year and on OS/2 in March of next year. The smaller Netview "hosts" are likely to act as local managers for a specific location or network subsystem, such as a local-area network, sources said.

Linking up to these smaller Netview systems will not require Netview/PC, Passmore said, because that interface was designed specifically to translate messages into the Network Management Vector Transport protocol used by IBM mainframes.



enhanced, making it easier than ever to use, monitor problem alerts, and "talk" with IBM and non-IBM systems.

Of course, there are other attractive features of NetView to consider.

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NSF

CONTINUED FROM PAGE 53

on 10 logical subtopics — such as ceramics and polymers — previously defined by NSF.

Topic also allows the assignment of weights so that subtopics — which can be nested to any number of levels — thought to be most relevant will pop up first in inquiries.

STIS runs on a Sun Microsystems, Inc. 386I Unix workstation at NSF headquarters here, and it can support 10 simultaneous users at 9.6K bit/sec., according to Godwin. She said 200M to 300M bytes of data will be on-line within a year. The workstation connects to an Internet gateway on a local-area network at NSF headquarters.

The National Institutes of Health set up its own on-line retrieval system, called NIH Grant Line, in July. The free service, also accessible via dial-up or Internet, has 1,500 registered users and contains information about NIH announcements, meeting notices and requests for grant applications. For information, call (301) 496-7554.

Similar information from the Department of Energy, the National Aeronautics and Space Administration, the Office of Naval Research and the Federal Aviation Administration is available from the Federal Information Exchange. Its 1,200 users must currently dial in directly, but a connection to Internet is in the works, a spokesman said.

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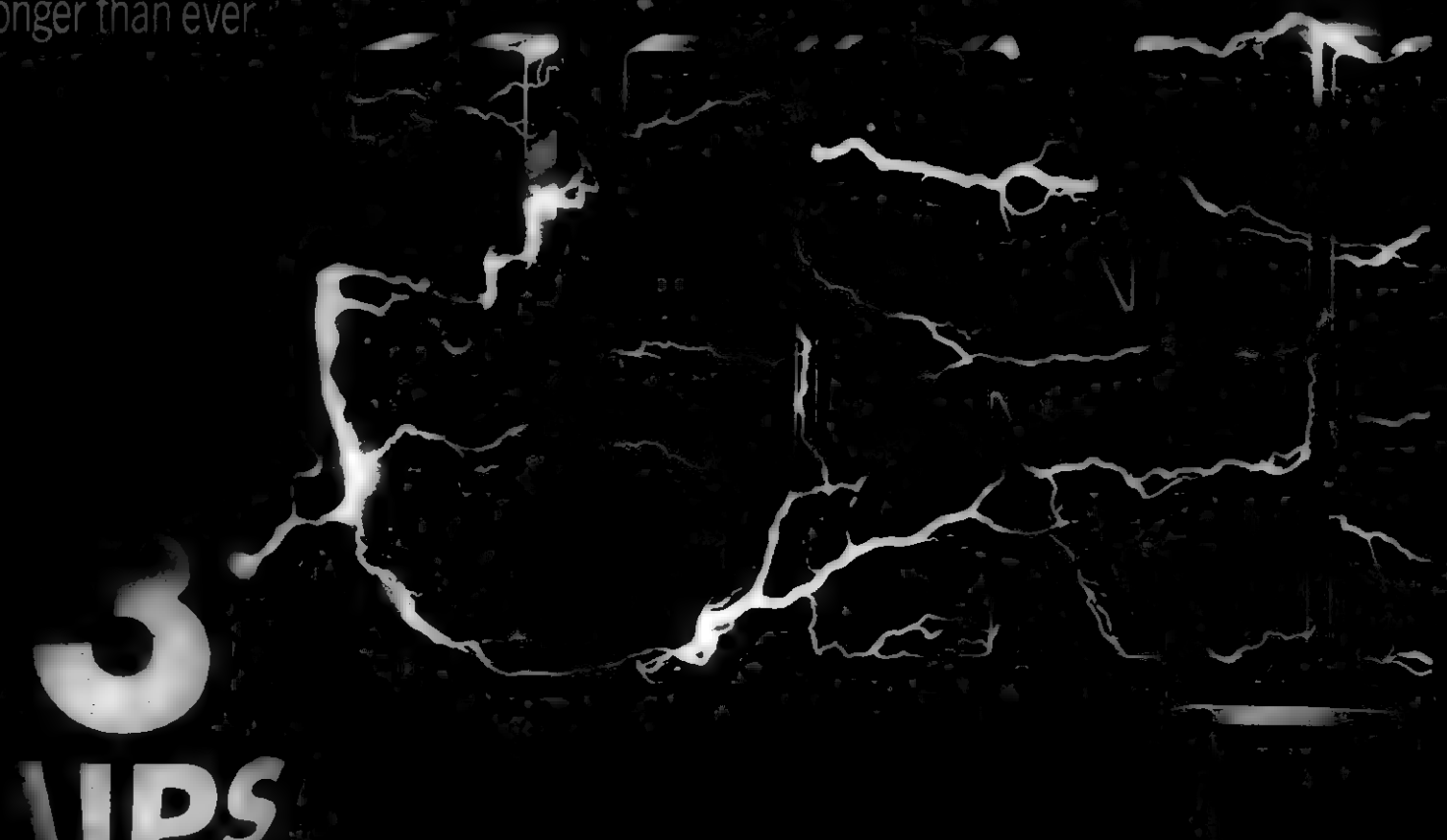

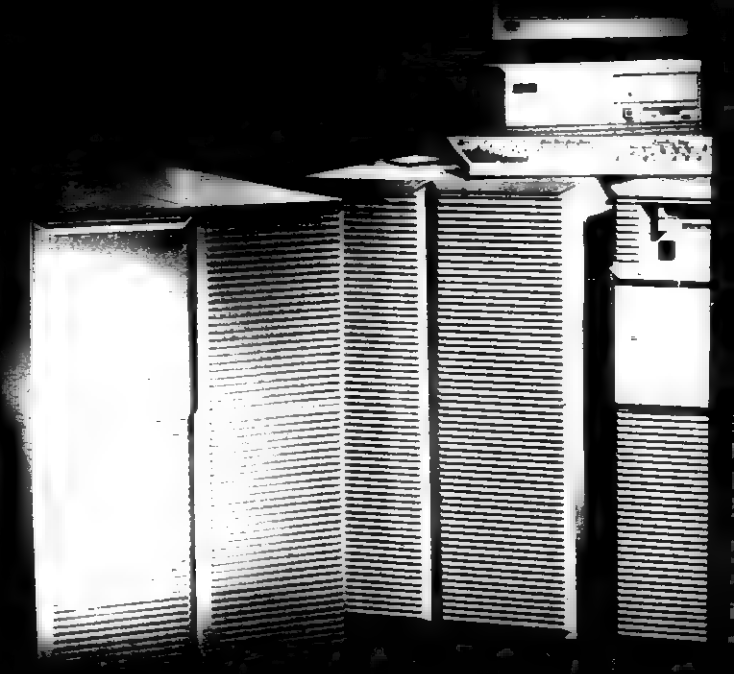

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Booker

FROM PAGE 53

dard 802.6 initially provides for T3 (45M bit/sec.) and T1 (1.5M bit/sec.) access, moving to support for the international Sonet specification of 150M bit/sec. in the future.

But will SMDS, which looks so wonderful on paper, break users' hearts, much as the Integrated Services Digital Network (ISDN) has? The answer is no, but more on that in a moment.

Earlier this month at Interop '90 in San Jose, Calif., Bellcore sketched out a three-tiered implementation plan for SMDS:

- Phase One (1990-1991): Establish SMDS service "presence" over the next 12 to 15 months.
- Phase Two (1992-1994): Based on Bellcore generic requirements, additional capabilities — including various network management features — will be added to the service. Interchange and local exchange companies cooperate to provide early nationwide service.
- Phase Three (late 1994 and beyond): Expand SMDS capabilities to accommodate higher speed broadband access (150M bit/sec.). Local broadband switches and tandem switches arrive to connect these local SMDS switches within and across LATA boundaries.

Two days earlier, in Chicago, AT&T Network Systems said it had developed a high-speed, fast-packet switch to support SMDS. The BNS-200 Broadband Networking Family is already being tested by Bellsouth, Nynex, Pacific Bell and Southwestern Bell in their SMDS trials, said AT&T, which hopes to make the switch generally available in the third quarter of 1992.

Why will customers and carriers rush to SMDS over ISDN? First, there's the market reality. Data services, which only account for 5% of all public network traffic, are nevertheless a growth area for carriers; moreover, data services are predominantly sold to business customers, a key market for carriers.

Meanwhile, many of those corporate telecommunications customers have despaired about the slow deployment of ISDN for years. Ubiquitous ISDN, if it ever arrives, will make terrific sense for telemarketing operations (thanks to features like automatic number identification), but it is not optimized for data transport, these users say.

In other words, while ISDN evolved naturally from analog voice telephony, SMDS, like the LANs, supercomputers and image workstations it will interconnect, has its roots in data networking.

Booker is *Computerworld*'s Chicago bureau chief.

BIT BLAST

LAN services bundled

AT&T is beckoning the growing number of companies needing to link local-area networks over a wide area with a repositioning of its data service offerings. AT&T has bundled services such as its Accunet T1.5, Switched Digital Services, Packet Services and Customer Controlled Reconfiguration into what its sales force will tout as a LAN-interconnect "solution."

The carrier plans to sell services from the package primarily to companies with infrequent LAN-to-LAN traffic; switched services are often more economical for such companies in that they pay for bandwidth only when they use it.

Digital Equipment Corp. has decided to change the name of Lanworks rather than risk delaying shipments of the personal computer integration product while it engages in a lengthy legal battle, the company said. A Maryland-based company called Lanworks, Inc. challenged DEC, and a federal judge has issued a preliminary injunction against DEC's use of the name in several states, a DEC spokesman said. The first Lanworks product began shipping on time last month; a new name has yet to be chosen.

NEW PRODUCTS

Micro-to-host products

Network Software Associates, Inc. and Future Soft Engineering, Inc. have developed a connectivity software package designed for IBM Personal System/2s and compatibles running Microsoft Corp.'s Windows 3.0 or Hewlett-Packard Co.'s New Wave.

Dynacomm/Elite provides multisession IBM 3270 Personal Computer-to-host connectivity and LU6.2 advanced program-to-program communications. A stand-alone version with 3270 features will be available next month for $495.

Network Software
39 Argonaut
Laguna Hills, Calif. 92656
(714) 768-4013

Dataviz, Inc. has announced Version 4.5 of Maclinkplus/Wang VS and Maclinkplus/Wang OIS connectivity software packages.

The products support transfers of Wang Laboratories, Inc. Wang Integrated Image System images from Apple Computer, Inc. Macintosh machines to Wang VS systems. Maclinkplus/Wang VS costs $395, and Maclinkplus/Wang OIS costs $495.

Dataviz
35 Corporate Drive
Trumbull, Conn. 06611
(203) 268-0030

Packet/PC, Inc. has announced Packet/Flash, a bit compression software package designed to reduce the response time of communications done by users of IBM Systems Network Architecture-based 3270 machines and personal computer users who dial into an X.25 packet network.

The package uses Packet/3270 emulation software to provide quick access to electronic mail and transaction processing applications.

Packet/Flash began beta testing in August and is scheduled to be released this month. It reportedly will cost $6,000 for the mainframe component and $75 per PC for the first 50 copies.

Packet/PC
270 Farmington Ave.
Farmington, Conn. 06032
(203) 678-1961

Local-area networking hardware

Hayes Microcomputer Products, Inc. has announced Hayes for LANs, a family of Ethernet local-area network adapters designed for IBM Personal Computer ATs, XTs, Personal System/2s or compatibles.

The line includes Ethermate 8 ($249), an 8-bit half-card designed for thick or thin Ethernet cables; Ethermate 8UTP ($329), an 8-bit half-card that supports thick and unshielded twisted pair (UTP) Ethernet cables; and Ethermate Trio 16 ($349), a 16-bit board that supports thick, thin or UTP Ethernet cables.

Ethermate 8 is already available, and Ethermate 8UTP is slated to ship this month. Ethermate Trio 16 is scheduled for availability in mid-November.

Hayes
P.O. Box 105203
Atlanta, Ga. 30348
(404) 449-8791

Intellicom, Inc. has announced the Quick-Net 3000 Plus series of 10M bit/sec. 10BaseT-based local-area networking wiring concentrator/repeaters, network interface adapters and transceivers.

The Model 212 wiring concentrator ($999) can be used to regenerate received signals for broadcast to attached host computing devices and concentrators. The Model 401 transceiver ($129) allows a coaxial access unit interface 15-pin-based network adapter card to be interfaced with a 10BaseT concentrator.

The Tpair-8T ($325) and Tpair-16T ($449) network adapters include a built-in access unit interface connector that supports connections to coaxial Ethernet networks.

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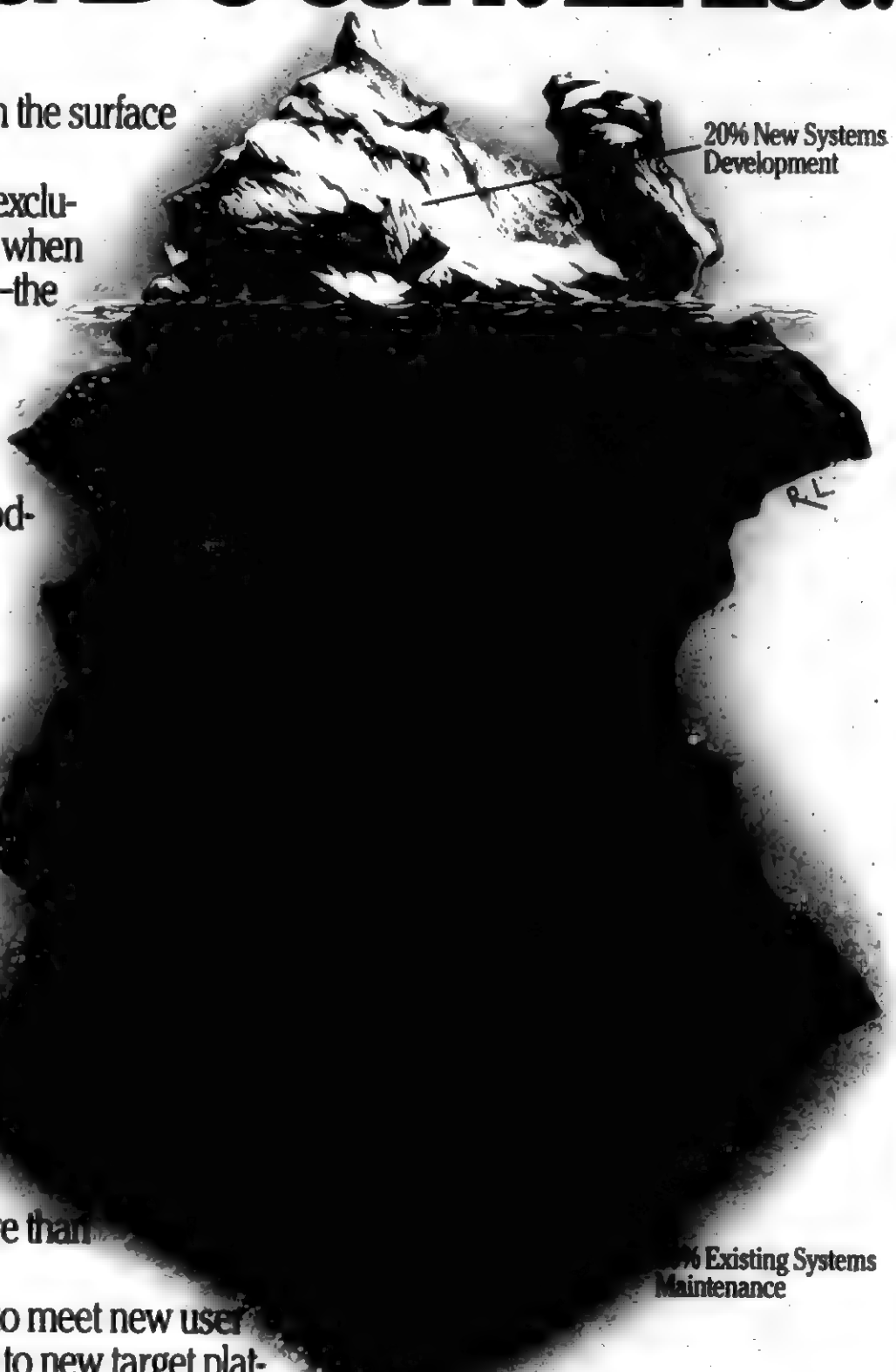

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MANAGER'S JOURNAL

EXECUTIVE TRACK

Thomas H. Dega has been named assistant director of the **Internal Revenue Service's Martinsburg Computer Center** in Martinsburg, W. Va.

The center is the federal income tax record-keeping center of the IRS, maintaining and updating individual and business tax returns on magnetic tape.

Dega had been director of the office of input processing for information systems development since 1987. He was appointed to his current position after completing the IRS executive selection and development program.

Dega became director of the office of electronic filing in Washington, D.C., in 1986. Before that, he held IRS positions in Detroit, Kansas City, Mo., and Andover, Mass. He began his IRS career in 1964 as a tax technician in Milwaukee.

He holds a bachelor's degree in economics from the University of Wisconsin at Milwaukee and a certificate in public administration from Syracuse University.

.....

Rex Schemerhorn was named manager of IS in the production control and systems department of **Diamond-Star Motors Corp.** in Normal, Ill.

Diamond-Star Motors is an automotive joint venture that is 50% owned by Chrysler Corp. and Mitsubishi Motors Corp.

Schemerhorn was previously assistant manager of IS. He joined Diamond-Star in 1987.

.....

Who's on the go?

Changing jobs? Promoting an assistant? Your peers want to know who is coming and going, and *Computerworld* wants to help by mentioning any IS job changes in Executive Track. When you have news about staff changes, be sure to drop a note and photo or have your public relations department write to Clinton Wilder, Senior Editor, Management, *Computerworld*, Box 9171, 375 Cochituate Road, Framingham, Mass. 01701-9171.

More than skin deep

Values come before IS technology at personal care products maker The Body Shop

BY CLINTON WILDER
CW STAFF

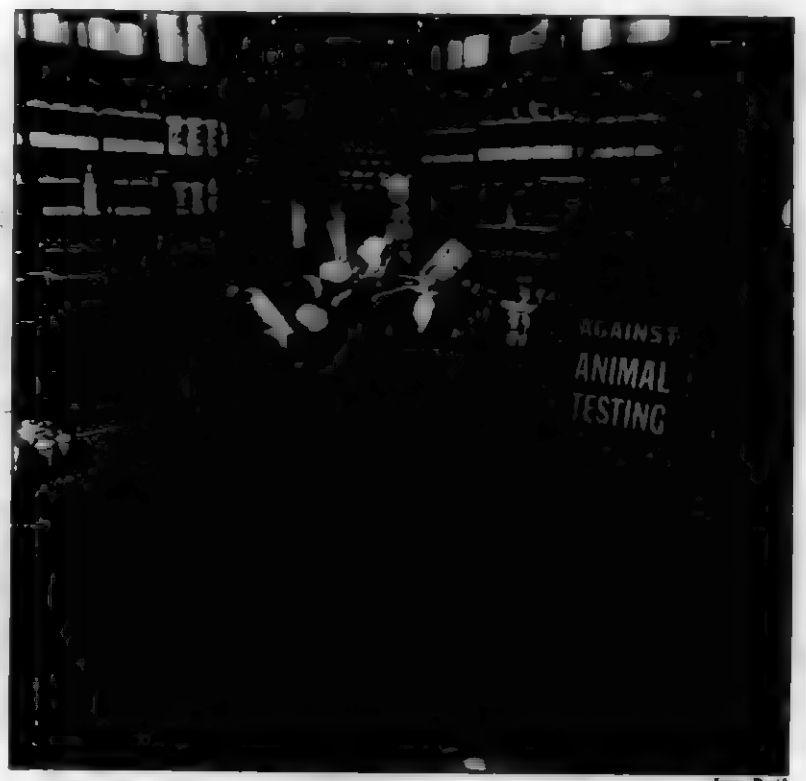
When a visiting journalist is the only person at corporate headquarters wearing a necktie, you know that a company is different. And The Body Shop, Inc. decidedly is.

The fast-growing personal care products company is a place where all paper, including computer printouts, is either recycled or shredded into packing material to stuff mail-order cartons. Sweatshirts and sneakers are standard business dress, opposition to animal testing and rain forest destruction are stated corporate goals, and dynamic company founder Anita Roddick has appeared on the cover of *Inc.* magazine with the weighty introduction, "This woman has changed business forever."

In this unique corporate culture, information technology plays a critical role in warehousing, distribution, order processing and other typical retail functions. Systems manager Rick Hellar is responsible for enhancing The Body Shop's business with technology — but not at the expense of The Body Shop's mission.

"First and foremost are the values," Hellar says. "With technology, there are certain things we don't do. We don't use bar codes on the product labels, for example; that would deface them. That's just not appropriate to our philosophy and the way our customers view us."

The same philosophy also rules out electronic mail and automated call answering; the company insists on human interaction. "Technology is not the driving force here," Hellar adds. "We have a deliberate strategy to use technology as an enhancement."



Joyce Rawl

Hellar *has his hands full keeping up with The Body Shop's growth plans*

Hellar and his company are far from computer technology Luddites, however. Hellar, a former senior systems analyst at Carter Hawley Hale Stores, Inc. and consultant at Coopers & Lybrand, waxes as enthusiastically about his new IBM RISC System/6000 as any hard-core techie. The Unix-based minicomputer will replace an NCR Corp. Tower that The Body Shop's information needs have outgrown.

For Hellar and his staff of one — Karen Mueller, manager of the network of 32 Apple Computer, Inc. Macintoshes — keeping up with The Body Shop's information demands is no small matter. The UK-based company's plan for growth in the U.S. is truly staggering.

There are about 25 retail stores in the U.S. now, with 40 expected to be opened by the end of the year. Plans call for 50 to 60 new stores in each of the next two years, by which time The Body Shop will have a major product-mixing, bottling and packaging operation running at its U.S. headquarters building in Cedar Knolls, N.J. Worldwide sales, from 450 stores in 37 countries, are about $150 million.

"The biggest part of my job is deal-

Continued on page 68

Taking the fast track to decentralization

BY CLINTON WILDER
CW STAFF

If information systems management on Wall Street is life in the fast lane, Charles H. Mayer fits right in.

After less than one month as the new chief information officer and managing director at First Boston Corp., Mayer is already working on an IS decentralization plan. Although the management details are still being worked out, Mayer wants to have individual IS groups assigned to fixed income securities, equity trading, investment banking and corporate support. Under the current structure, all systems development is centrally coordinated.

"We'd like to set up groups with more product orientation," Mayer said in a recent interview at his midtown Manhattan office. "We could have four CIOs, one for each group."

The goal of the plan is a familiar one for IS in the '90s — getting those who understand the business closer to the development of systems for gaining advantage in the business. Mayer said he believes that competitive advantage comes more from identifying the right market needs than from choosing the latest technology.

First Boston's Mayer

"It sounds great to use buzzwords like neural networks and artificial intelligence, and many [financial firms] have tried them," he said. "But very few have produced bottom-line results. What you need is the ability to respond quickly to market opportunities; technology is still a tool."

Mayer, 43, has spent about 20 years in IS on Wall Street and developed Morgan Stanley Group, Inc.'s Trade Analysis and Processing System.

Mayer's commitment to empowering business units with decentralized IS is more than lip service. "If you do it right, there is less need for a strong central technologist," he said. "Maybe the right thing to happen is that I work myself out of a job in three to five years. That would be a success for me."

Skin deep

FROM PAGE 67

ing with growth," says the 31-year-old Hellar. "If you come back in a couple of years, you won't even recognize us."

Ironically, although The Body Shop emphasizes human values, it embodies many characteristics of the Information Age firm that are trumpeted by management gurus. It is fast-paced, flexible and managed with a minimum of bureaucracy. In many ways, it is an IS manager's dream.

"At other companies, a [senior executive's] open door policy means the door is open if you make an appointment three weeks in advance," Hellar says. "Here, it is really open, and that's very unique, very conducive to new ideas. It's a very entrepreneurial atmosphere with a lot of room to suggest and come up with solutions."

One new idea, enabled by information technology, is Homebase, which allows homebound residents to work as part-time Body Shop mail-order takers. Although the current technologies are telephones and facsimile machines, Hellar plans to provide on-line terminals in the future.

It's not an act of charity; The Body Shop needs the people to staff its fast-growing mail-order business, which handles 3,500 calls per week. "We can't get employees in here fast enough," says Janine Newcombe, the firm's inventory and marketing coordinator.

Most strategic business applications, such as sales modeling and pricing structures, are done on the Apple Computer, Inc. Macintosh. One of The Body Shop's important competitive differentiators is giving customers information about its unusual products, which range from Moroccan mud shampoo to Japanese washing grains to Chinese rice-bran body scrub. Product information manuals are published with the Macintosh using Aldus Corp.'s Pagemaker — on recycled paper, of course.

Another project, scheduled to go live this month, calls for franchise store owners to place their weekly orders with Telxon Corp. handheld terminals instead of fax machines. Hellar says he expects the plan to improve the speed and accuracy of supplying up to 200 items per store per week.

> "TECHNOLOGY IS NOT the driving force here. We have a deliberate strategy to use technology as an enhancement."
>
> RICK HELLAR
> THE BODY SHOP

Perhaps most telling of all, the estimated $80,000 project wasn't in Hellar's original IS budget. "If a project makes sense and will enhance the business, it will get funded," he says.

Because of the ambitious growth plans, Hellar says, IS funding has to be based on "what makes sense long-term." In the mail-order department, Hellar could have saved money and met today's needs with an Intel Corp. 80286-based system, but he went with an Intel 80386-based system because he knows it will be needed soon enough. "It's different around here from one day to the next," he says.

An environment of encouraging new approaches to business makes technology a logical fit in many ways, despite its potential conflicts with the organization's philosophy, Hellar says. "People here are used to change, so new technology is easy to implement.

"I've never worked for a company quite like this," Hellar adds, telling the story of how The Body Shop opened a soap factory in Glasgow, Scotland, because unemployment there was running as high as 40%. One-quarter of the profits generated in that operation go into a trust fund for the city. Every retail store around the world is expected to run at least one project for community benefit.

"I go home at night feeling good about my job and about the company," Hellar says. "Those are the principles that I have to be careful about treading on with technology."

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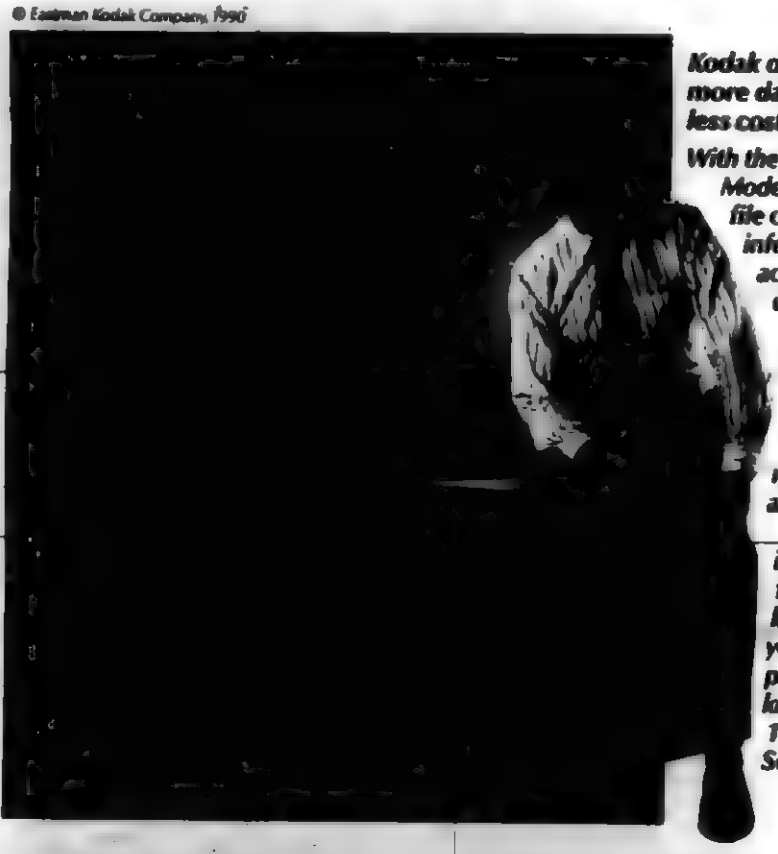

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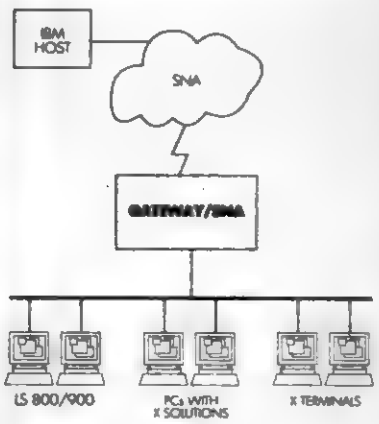

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BOOK REVIEW

High time for the dawning of New Age IS management

COMPUTERIZING THE CORPORATION
By Vicki C. McConnell and Karl Koch
Van Nostrand Reinhold, $32.95

It is up to New Age management techniques to make information technology more useful to companies. Or so argue the authors of *Computerizing the Corporation*, in a readable, useful book that challenges top corporate management to forget its preconceptions about the value of technology and consider carefully the true impact a new system has on a company's operation.

Computerizing the Corporation is centered on the belief that "problems of computerization and automation are management problems, not technical problems." The authors make several serious, though subjective, charges. For instance, they believe that management has created a fantasy world of what information technology can do for a company. As an extension of this fantasy world, McConnell and Koch say they believe that most organizations treat computers as though they were living things, looking at them to solve problems that the authors consider purely human.

The authors also charge that most companies work to integrate human and technical systems, rather than treating the technical system as a tool to improve the way workers work. In other words, by paying more attention to the technology's potential than how a particular company operates, corporations have, by and large, adopted entirely mistaken approaches to computerizing.

That's a strong statement, and while it is difficult to refute, given, for instance, *Computerworld's* own surveys that repeatedly show user dissatisfaction with systems, there is little statistical evidence in the book to back it up.

McConnell and Koch do sprinkle a number of case studies, both successes and failures, throughout the book, which provide solid illustrations of their points. One such example cites a "Midwestern farm equipment manufacturing company" that implemented an on-line inventory control system. The company, though, failed to train the personnel assigned to the system in basic computer use. Even worse, the IS staff interacted poorly with users. As a result, the inventory control system was not fully live for 10 months after its original deadline and cost the company $750,000 more than it originally expected.

The book, which strongly urges that systems are not implemented at the expense of employees but rather to help them grow, ends up reading a bit like a touchy-feely approach to management. Yet punches are not pulled, and in fact corporations are rather soundly pummeled.

For example, in the case of the farm equipment company, the authors point out that the workers could not be blamed for the cost overruns and delays, because the new system represented a new way of working — one that made the workers feel stupid, not skilled. McConnell and Koch say "the typical management response has been that the workers will get used to the new system and will eventually learn how to use it . . . The responsibility for the transfer of new technology to the worker rests with senior management."

Solutions, too

Management frequently gets hit with such shots, as the authors strive to introduce basic human reactions to change into the equation of automating. But the book does not just bash management — it does offer solutions to the issue of automating. The salve comes from exhaustive lists of recommendations for implementing either new systems or replacing old ones.

There is, despite the focus on employees, a strong belief that information technology can be used to offer a company a competitive advantage. But the authors feel that it is a trap to believe that just computerizing will make a company better. Instead, they say that companies must use technology to make employees work better. For those that fail to do so, the authors warn, "bankruptcy will become easier every year."

It should thus be no surprise that communication among and between human beings is the ultimate focus of this book. The authors pound away at this theme, encouraging extensive information gathering and careful thought to developing and implementing a system to guarantee that users will "own" the system and, therefore, put it to work. They also challenge IS departments to keep the lines of communication open with other departments.

There is certainly enough reality in *Computerizing the Corporation* to make the New Information Age sound like it got here just in time.

MICHAEL FITZGERALD

Fitzgerald is a *Computerworld* Midwest bureau correspondent.

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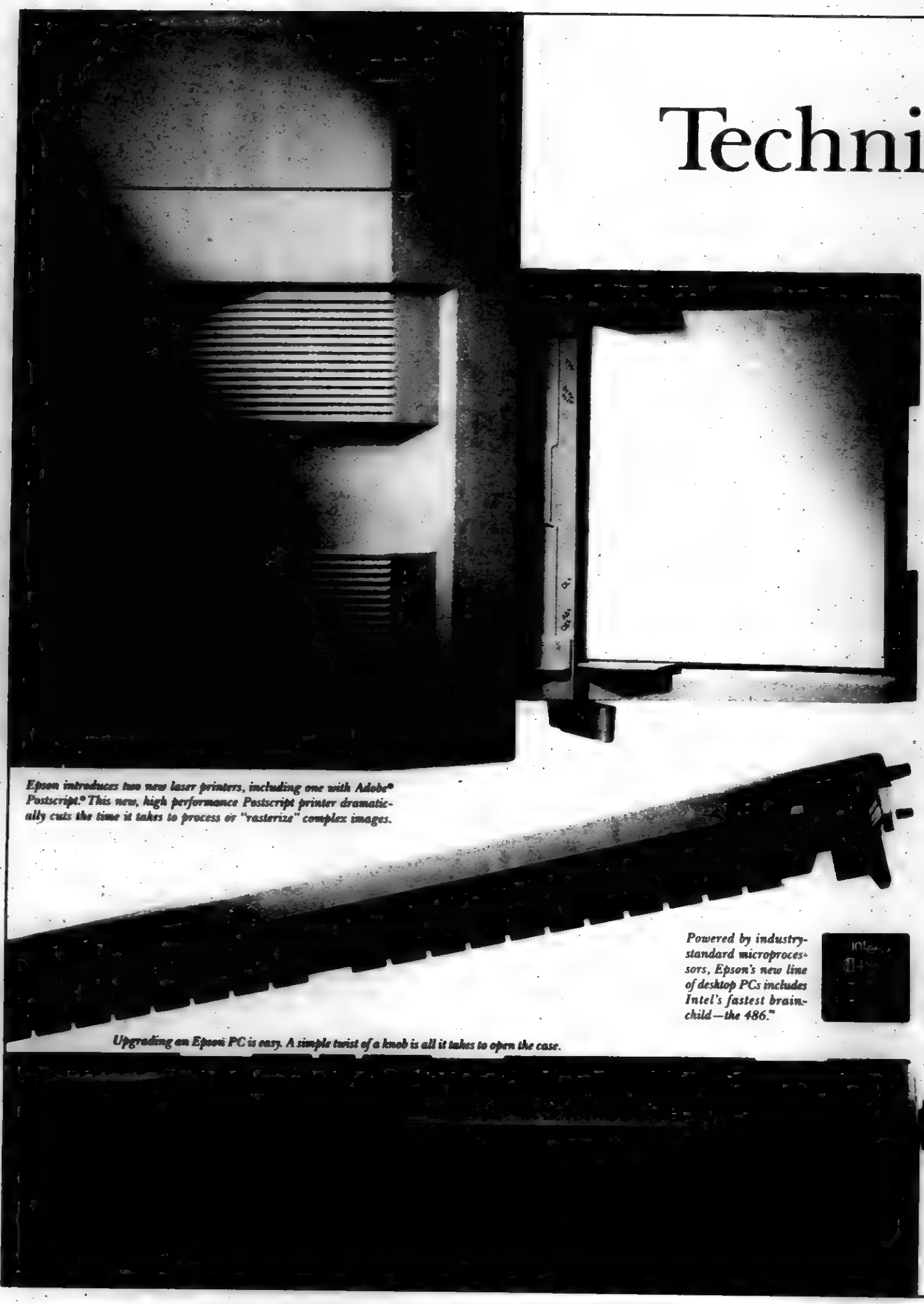

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CALENDAR

The 2nd National EDI Systems Conference & Exhibit will take place Dec. 3-5 at the Washington, D.C., Hilton & Towers. The conference includes more than 40 concurrent session presentations by electronic data interchange users and consultants, as well as vendor exhibits. Keynote speakers from the user community are Robert Fernhoff of Sears, Roebuck and Co., Max Hopper of American Airlines and Carol B. Hallett, commissioner of the U.S. Customs Service.

More information is available from the The Electronic Data Interchange Association, Alexandria, Va. (703) 838-8042.

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Adagen Management Conference. Phoenix, Nov. 4-7 — Contact: Adagen Education Department, Arlington, Va. (703) 284-5355.

Guide 78. Atlanta, Nov. 4-9 — Contact: Guide, Chicago, Ill. (312) 644-6610.

XPLOR Electronic Document Printing Professionals International Conference. Nashville, Tenn., Nov. 4-9 — Contact: XPLOR International, Palos Verdes, Calif. (800) 688-7567.

Decision Support and Executive Information Systems: A Managerial Perspective. Cambridge, Mass., Nov. 5-6 — Contact: Decision Support Technology, Boston, Mass. (617) 482-3586.

Successful Implementation of Imaging Technology. Boston, Nov. 5-6 — Contact: KPMG Peat Marwick, Executive Education Registrar, Montvale, N.J. (800) 762-3932.

Synoptics Communications Users Group Meeting. Santa Clara, Calif., Nov. 5-6 — Contact: Amparo Lago, Synoptics, Mountain View, Calif. (415) 691-7174.

CASE: The Next Generation. Washington, D.C., Nov. 5-7 — Contact: Digital Consulting, Andover, Mass. (508) 470-3880.

ISDN Week. London, Nov. 5-9 — Contact: IGI Europe, London, England (011) 41 61 6915111

Association for Computing Machinery Conference. Arlington, Va., Nov. 6-7 — Contact: Jim Adams, ACM, New York, N.Y. (212) 869-7440.

Nonprofit '90 Conference. Atlanta, Nov. 6-7 — Contact: Barbara Ackerly, Informa, Atlanta, Ga. (404) 220-2640.

Messaging '90. New York, Nov. 6-8 — Contact: Information Publishing Corp., Houston, Texas (713) 974-6637.

Digital Dealers Association Annual Meeting. Tucson, Ariz., Nov. 6-9 — Contact: DDA Administrative Office, Chelsea, Mich. (313) 475-8333.

Understanding IBM's Operations and Systems Management Strategy. Chicago, Nov. 7 — Contact: New Science Associates, Southport, Conn. (203) 259-1661.

Computer, Office Systems & Services Conference. Houston, Nov. 7-8 — Contact: Show America Management, Houston, Texas (713) 890-6397.

Consulting: Building IS Partnerships. Cambridge, Mass., Nov. 7-9 — Contact: Jay Delaune, Index Group, Cambridge, Mass. (617) 498-1373.

Design Engineering Show and Conference. Atlanta, Nov. 7-9 — Contact: DesignSouth, Stamford, Conn. (203) 964-0000.

GE Information Services Business Communications Users Group Meeting. Orlando, Fla., Nov. 7-9 — Contact: Wendy Herman, GE Information Services, Rockville, Md. (301) 340-4977.

GIS/LIS. Anaheim, Calif., Nov. 7-10 — Contact: GIS/LIS, Bethesda, Md. (301) 493-0200.

Expo Comm China '90. Beijing, China, Nov. 8-13 — Contact: Ron Akins, Krause & Associates, Bethesda, Md. (301) 986-7300.

Southeastern Small College Computing Conference. Hickory, N.C., Nov. 9-10 — Contact: Dr. Frank Cheatham, Campbellsville College, Campbellsville, Ky. (502) 465-8158.

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Share 75.5. Fort Worth, Texas, Nov. 11-14 — Contact: Share, Chicago, Ill. (312) 644-6610.

Computer-Canada First. Toronto, Nov. 13-14 — Contact: U.S. Department of Commerce, Office of Canada, Washington, D.C. (202) 377-3718.

Autofact '90. Detroit, Nov. 13-15 — Contact: SME, Dearborn, Mich. (313) 271-0777.

Comdex/Fall '90. Las Vegas, Nov. 12-16 — Contact: The Interface Group, Needham, Mass. (617) 449-6600.

Supercomputing '90. New York, Nov. 12-16 — Contact: Melvin Kalos, Cornell Theory Center, Cornell University, Ithaca, N.Y. (607) 255-7157.

Hawaii's Governor's Symposium on High Technology: Making Strategic and Technical Alliances for East-West Software Development and Trade. Lihue, Kauai, Hawaii, Nov. 13-15 — Contact: High Technology Development Corp., Mililani, Hawaii (808) 625-5293.

Wescon/90. Anaheim, Calif., Nov. 13-15 — Contact: Wescon/90, Los Angeles, Calif. (213) 215-3976.

National Conference and Exposition on Electronic Image Management in Government. Washington, D.C., Nov. 13-16 — Contact: Conference Manager, USPDI, Silver Springs, Md. (301) 445-4400.

Build Boston '90 Technology Conference. Boston, Nov. 14-16 — Contact: Build Boston '90, Newton, Mass. (617) 965-0065.

Strategic Planning for Information and Systems. Houston, Nov. 14-16 — Contact: Barnett Data Systems, Rockville, Md. (301) 762-1288.

NOV. 25 - DEC. 1

Conference on Software Maintenance. San Diego, Nov. 26-29 — Contact: Michelle Carbone, IEEE Computer Society, Washington, D.C. (202) 371-1013.

Video Expo. Orlando, Fla., Nov. 26-30 — Contact: Debbie Rotolo, Knowledge Industry Publications, White Plains, N.Y. (914) 328-9157.

Technology Management Forum, Client Server Computing: The Impact. Cambridge, Mass., Nov. 27-28 — Contact: Forrester Research, Cambridge, Mass. (617) 497-7960.

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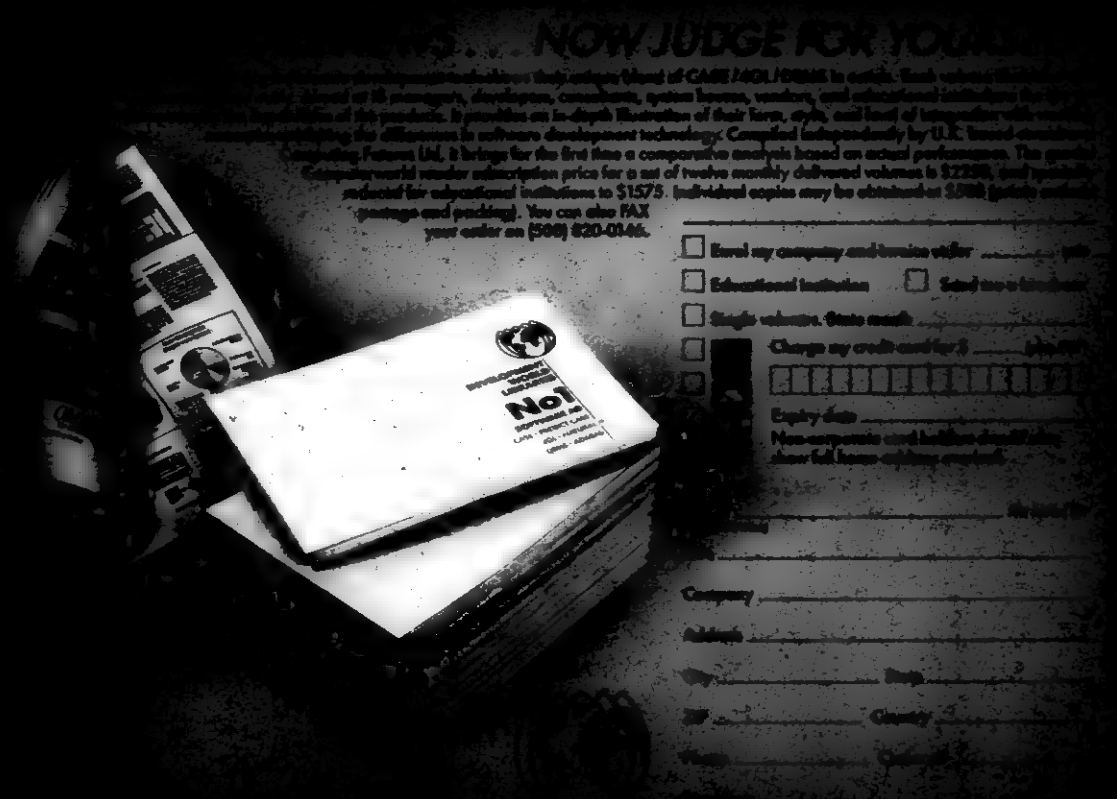
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UNIX ON THE DESKTOP

The grass is getting greener

BY WILLIAM BRANDEL

In January 1990, Peter Messina did more than just hang a new calendar on the wall of his New York office. The first vice-president of corporate telecommunications at Royal Alliance Associates, a brokerage and insurance firm, was informed that the company had been acquired by the Sunamerica family of companies.

While most acquisitions present headaches for information systems managers, this one was a migraine. Messina's group was informed that it had three months to completely revamp its computing structure — everything from the mainframe to its IBM Personal Computers.

At the time, all of Messina's users — 112 customer service and money market representatives — were using AT&T 6539 split-screen terminals. More than 40 of them used PCs for word processing and spreadsheet applications. All told, users were dealing with 17 different software packages and were connected to an IBM 3090 mainframe, an IBM 4300 minicomputer and a Digital Equipment Corp. VAX 6310.

With time running out in April, Messina tried accommodating haste with simplification and sold Royal Alliance management on a centralized desktop concept — based on Unix.

"They said, 'Fine. You have two weeks,' " Messina says.

During the next weekend, Messina got rid of the IBM and Compaq Computer Corp. PCs and installed a Sun Microsystems, Inc. 390 file server running University of California at Berkeley Unix 4.2 to support the AT&T 6500 terminals.

He centralized his users and gave them access to the same word processing and spreadsheet applications in Unix versions of the popular DOS products that a third of them had already been using.

The fact that these commercial DOS applications were available under Unix was the real key to a smooth and rapid transition, according to Messina.

"With split-screen terminals, we were able to give all the brokers access to the same applications," Messina says. "And with Lotus [1-2-3] and Wordperfect available on Unix, I didn't need the 40 or so PCs anymore. At the same time, everyone who didn't have a PC was able to use it on their terminal. As far as what users saw on the screen, they didn't see anything different."

John & Wendy

But what was under the hood was very different indeed, including faster processing, more robust networking and scalability.

"This system gives us more horsepower than we could have ever tried to achieve with a PC LAN," he says, "and not even near the cost."

The Royal Alliance situation represents a landmark for Unix. No longer do hardware vendors such as Sun have to tell customers that the most popular commercial applications are unavailable to them. The major DOS applications have made the Unix transfer, including Lotus Development Corp.'s 1-2-3 spreadsheet, Microsoft Corp.'s Microsoft Word, Wordperfect Corp.'s Wordperfect word processing package, Autodesk, Inc.'s Autocad, Ashton-Tate Corp.'s Dbase, Borland International's Paradox and Informix Corp.'s Wingz, just to name a few.

And no longer do Unix advocates have an excuse for not making it in Fortune 1,000 firms — on the desktop, anyway.

"Pretty much all the personal productivity stuff that you would want on Unix is out there," according to James Knowles, a systems analyst at Salomon Brothers in New York. "Once you have a Lotus spreadsheet, a Wordperfect and a database like Borland's Paradox, you're there. The rest tends to be targeted by industry — and that's stuff a big corporation usually develops internally, anyway."

"We are still predominantly a DOS shop and are just sticking our noses into the Unix tent," says Peter Patterson, senior computer systems analyst for end-user support at the World Bank in New York. "But as we are getting more of our users over to Unix, I must say that I am pleased with the number of DOS applications that have crossed over and the speed that they are getting there."

According to analysts and vendors, if Unix ever had a chance to penetrate the desktop, its time is now. OS/2, once the DOS heir apparent, has failed to dominate that territory. Europe, where Unix has established a stronger user base than in the U.S., presents a booming business environment.

Closer to home, the allure of U.S. government contracts are pulling commercial DOS vendors into Unix development. Orem, Utah-based Wordperfect first cracked the Unix market in March 1988 to run on government-owned NCR Corp. Tower systems. Today, Wordperfect is ported to more than a dozen flavors of Unix and has more developers working on Unix than OS/2, Apple Computer, Inc. and DEC's VMS operating system.

Other developers are following suit. "We now have a special marketing branch in Washington, D.C., that is dedicated to bidding on government projects," says Chris Wraight, manager of Unix product marketing at Lotus in Cambridge, Mass.

"It wasn't like a General Motors or Ford came to us and said, 'I've got to have 1,000 copies of 1-2-3 on Unix,' " Wraight says. "It was more like a Ford coming to us and saying, 'I'm one of your largest PC customers, and I have a large population of engineers running Sun workstations or others, and they need a good office automation suite.' "

A second reason developers are looking into Unix pastures is the growth forecast for that market. Software vendors such as Ashton-Tate that have made their millions in the DOS market are looking at the growth in the Unix segment, not at an installed base that needs to be served. Ken Rhie, Unix marketing manager of Ashton-Tate's Dbase product, believes the Unix personal database market will

Brandel is a free-lance writer based in Boston.

INSIDE

Product Face-Off
Looking Glass and X.desktop compete in the GUI ring. Page 80.

Product Guide
A comprehensive list of Unix terminal emulation software. Page 84.

On the Plus Side
A programmer details the ups and downs of C++. Page 79.

grow by 50% to 100% this year.

"As a company, you have to expand the business," Rhie says. "You can't just stick with a stabilized industry standard like PC-DOS."

According to Judith Hurwitz, an analyst at Patricia Seybold's Office Computing Group, a market research firm in Boston, the movement to Unix results from two ironic industry dynamics. One, she says, is code-writing proximity. The other is users' growing impatience with OS/2.

Hurwitz says that developers were already writing new Microsoft Windows Version 3.0 and OS/2 programs in C. As a result, moving to Unix was not difficult, compared with translating code written in Natural into a Unix application. Nevertheless, turning a DOS-based application into Unix is difficult.

"We did a lot of optimization for the platform, like profiling," Wraight says. "To do a file retrieve on a Sparc architecture, we had to do line-by-line edits because the data file formats of 1-2-3 are designed in the Intel architecture."

The code conversion has the effect of slowing down the product, especially in terms of video performance.

"DOS is synchronous; Unix is asynchronous," says Bob Kruger, manager of Unix business development at Microsoft. "The user makes an input with an application designed for DOS, and it goes off looking around the Unix operating system and then eventually comes back to you. There is a difference in response."

"In the PC world, you just take over the hardware and go right to the video registers on the PC," Wraight says. "With Unix, you are twice removed from the operating system. The video code is written to the windowing implementation, which writes to the operating system, which writes to the hardware.

"As a result, when running 1-2-3 with video performance on a Sparc system, the performance was close to that of our DOS version on a 386-based Compaq/25," Wraight continues. "Without video on that 12.5-MIPS Sun, we were much faster in terms of raw performance."

On the bright side

There is an upshot to this, however. "The tools make Unix a lot easier to deal with once it's over there," Wraight says. "On the Sun system, we had to develop for three different products optimized for three different hardware architectures. But it wasn't that bad just using a common source tree in Unix."

Autodesk's Autocad product was one of the lucky ones. Because the company developed the application on a Unix-based system from the beginning, it did not have to make a DOS-to-Unix transition like other DOS vendors. Autocad currently runs on Unix, Ultrix, Xenix/SCO, Sun OS and Hewlett-Packard Co. Apollo Division's Aegis — all different flavors of Unix.

"It's actually easier to get out a Unix product," says John Forbes, manager of Unix products at Autodesk. "We develop on a Sun workstation because of the debugging environment and then move it over to DOS."

Others have shrink-wrapped their application code so tightly for DOS that they are finding the transition to Unix formidable.

For example, Wordstar International says it would like to have an application that runs on Unix. "The assembly language cannot be ported," says Amy Master, a marketing manager at the Novato, Calif.-based company. "We are already big in government sales and have a great interest in developing products and taking advantage of our presence. There is a group of people in this company who are frustrated about it."

"There is definitely a growing interest in Unix now that commercial applications are making the crossover," Hurwitz says. "But it's happening in bits and pieces — it's not just one big wave."

Despite this, she says, the window for Unix to get to the desktop is wide open, especially because OS/2 is failing to capture users' hearts and minds.

"Applications like databases, spreadsheets and graphics have got to move upward, somewhere," Hurwitz says. "People want to use the applications they know, and Unix is letting them make their move."

One of the most restrictive aspects of DOS is that it was designed with Intel Corp. 8086 or 8088 processors in mind, both of which run at less than one million instructions per second (MIPS). Meanwhile, the Intel 1486 chip is now churning at 10 MIPS.

"If you think of the limitations of DOS — like the 640K-byte memory barrier, the hard disk size, I/O performance, lack of security — there are a lot of things DOS PCs are simply just not designed to do," Rhie says. "If you even want to do some sorting in 10 minutes or less on a 360M-byte database, a PC can't do it. You'll just bog the processor. It needs more horsepower."

Meanwhile, some users are unwilling to wait for the unproven OS/2.

"We are here to support the business, and we are in a competitive business," Messina says. "I need to have the applications and my people working on them today."

"I've played around with OS/2, and I wasn't impressed," says Daryl Jones, IS communications manager at the South San Francisco Police Department. "I need the applications now, and I have budget restrictions. That rules out OS/2."

Jones is also enjoying cost savings. Users at the police department work on dumb terminals connected to Intel 80386- and 1486-based servers, running The Santa Cruz Operation's Xenix 2.3.2. The system is loaded with a Wingz database and Wordperfect.

In one arrangement, Jones is supporting 16 users on one $8,000 server, including software and printer-sharing equipment. On a PC LAN, it would cost him an average of $2,500 per user.

Jones adds that daily maintenance is eased. "We don't have to put the burden of file maintenance on the user, and we aren't stuck with the training," he says. "On Unix, backups are automated by the system administrator, and meanwhile, the users are already familiar with the applications. Definitely the way to go."

But not everyone sees such transparency between the two versions of these products. Despite most vendors' claims to the contrary, there are a few things users will have to get used to when they use traditional DOS applications in Unix. For example, Microsoft Word has a tendency to flicker on Unix terminals and runs at a slower speed.

"Our Unix keyboards look the same as a PC keyboard," says Cheryl Alloway, IS director at Ronder & Legg, a Kingston, N.Y.-based accounting firm that uses Wordperfect Version 4.2. "There is a slight problem if you want to go back and forth between the two systems. We have to use the little labels that they send you to make the distinction clear."

The problem gets exacerbated when Alloway takes a floppy disk with files off the Unix system and tries to run the application on her IBM PC-compatible portable system at home. "It gets confusing," she says.

> "THIS SYSTEM gives us more power than we could have . . . with a PC LAN and not even near the cost."
>
> PETER MESSINA
> ROYAL ALLIANCE

This problem could be overcome by one of Unix's greatest strengths: graphical user interfaces based on the X Window System. Pointing and clicking could erase the function key problem for most applications.

"Let's face it: People aren't moving over to Unix for its command line," Forbes says. "But then, if you use a GUI, your performance takes about a 20% to 40% hit and puts it at about the same level of a PC. And with Autocad, we can suck up as much performance as a workstation can deliver."

"We definitely have concerns about developing a product to run on an X windowing GUI," Kruger says. "You're talking about a lot of horsepower."

However, Wraight counters, that is just the point with Unix — you run it on systems with horsepower, such as reduced instruction set computing-based workstations. "This is exactly why we are specifically developing for a 12.5-MIPS Sun workstation."

All of this, of course, begs the question: If Unix is so great and application developers are scrambling to get a piece of the action, then why aren't mobs of businesses rioting to pull it off dealers' shelves? According to a recent study conducted by DMR Group, Inc. in Toronto, only 8% of 2,750 U.S. companies on the desktop, compared with 10% for OS/2 and 65% for DOS, currently have Unix installed.

The story of Unix on the desktop is another chapter in the bigger problem of the scalable operating system. Without one standard, the market and users will continue to be divided and forced to make choices.

"Until there is one standard Unix operating system for these developers to write to, commercial Unix will suffer," says John Dunkle, an analyst at Workgroup Computing in Hampton, N.H. "You can preach the virtues of Unix: scalability, great networking, cheap, whatever. But try to explain where it's going to be a few years down the road — you can't. Who is going to buy into that?"

Even development race

For now, developers will. All software developers contacted, with the exception of OS/2 advocate Microsoft, say their development efforts are split evenly between Unix and OS/2.

"I have a lot of work to do before I sell $200 million annually in Unix," Rhie says. "Then, we would introduce the Unix product first. But, for now, I can say that soon the Unix product can be introduced only 30 days after the DOS version."

But again, the failure of OS/2 to capture the desktop gives the developers another migration path to frustrated DOS users.

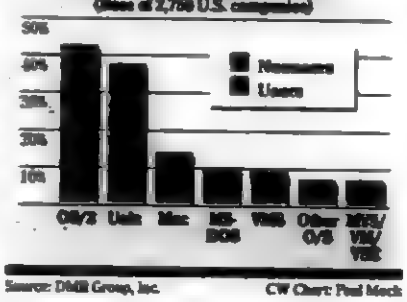
"I don't want to speculate," Rhie says. "But let's just say I would not be surprised if in time my revenues from Unix are greater than OS/2."

"We're crystal-balling here, but there is a real opportunity for Unix here and now," Forbes says. "It is obvious that DOS users have to migrate up somewhere, and that question is, where?"

"The key is for the Unix market to standardize on a GUI, whether it is OSF/Motif or Open Look or whatever — and stick with it," Forbes says. "If they standardize, they could attract a tremendous number of DOS users to come over. But if they continue with more of the same politicking, that will give OS/2 application development and support a chance to catch up." •

Now and then

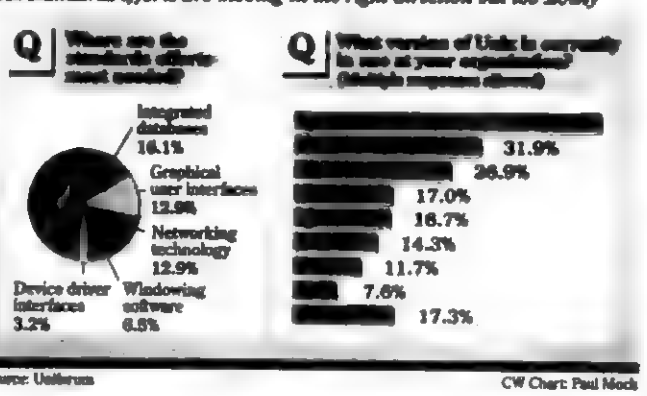
More people have OS/2, DOS and Macintoshes on their desktops than Unix; however, current and prospective users rate it high in terms of future importance



Source: DMR Group, Inc. CW Chart: Paul Mock

Hurry along

Members of Uniforum, the worldwide association of Unix users, agree that standards efforts are moving in the right direction but too slowly



Source: Uniforum CW Chart: Paul Mock

A programmer's view of C++

FIRST PERSON

BY ALEXIS TATARSKY

Programming in a Unix environment used to be fairly devoid of choices, and when it came to what language to program in, there was no choice at all: C was it, and the C language was standard across hardware platforms and versions of Unix.

Those were the good old days. Now there are several versions of the C language to choose from, including ANSI C and object-oriented versions such as Objective C and C++.

In 1988, my firm selected C++ as its language of choice for future development efforts.

The C++ language is an evolutionary step beyond original (Kernigan and Ritchie) C, beyond ANSI C and into object-oriented techniques (see story this page).

Since C++ is essentially a superset of C, most C programs will run virtually unchanged through a C++ compiler. C programmers can learn the language incrementally, using features as they learn them but producing real code all along.

Also, existing C code does not become obsolete: As modules are added or rewritten, C++ features can be used while leaving the rest of the code unchanged.

There are two classes of differences between C++ and C: improvements to the original language and the addition of object-oriented features. Even without using the object-oriented aspects, it is still worthwhile to use C++ instead of C. The most vital of the nonobject-oriented improvements include the following:

• **Function prototypes.** In C, it is a common error to call a function with the wrong number or order of parameters. In C++, function prototypes help avoid this problem. These prototypes, which typically appear in the header file, instruct the compiler about the number and types of parameters a function expects to receive.

• **Overloaded functions.** Function prototypes also make it possible to perform function overloading, or the existence of two or more functions with the same name. Using the prototype, the compiler can differentiate between the "overloaded" functions based on the types of parameters they expect.

ANSI has adopted function prototypes, as well as several other features of C++, to include in ANSI C.

• **Call-by-reference.** C++ passes parameters by reference rather than value, reducing the need for pointers — one of the hallmarks of the C language.

• **In-line functions.** In C++, the preprocessor is de-emphasized by the addition of in-line functions and true constant declarations. An in-line function is better than a C "#define" because it can check for the number and type of its parameters and have a true return value.

The real edge with C++, however, comes when you use its object-oriented features: "classes" and "inheritance." In C++, the term class refers to user-defined structured data types. Objects are defined as instances of a class, just as the C language definition:

```
int age;    /* define a variable age of type int */
```

defines "age" to be an instance of the type "int."

A class can provide (and enforce) data hiding through the use of "private members," which are fields invisible outside of the class itself. Public members provide an interface to the private data.

A class defines not only data fields but also functions that can act on objects of the class. Such "member functions" can provide a public interface to the private data of the object itself.

As an example, here is a class definition:

```
class stack{ private:
char stack—data[MAX];  // a private data item
int top;      // a private data item
public:
void push(int x);  // a public operation
int pop();    // a public operation
};
```

By implementing an abstract data type by using public interface functions and a private set of data representing the state of an object, the programmer can separate the implementation of a class from its public interface.

Even if the (private) implementation changes, the interface can remain exactly the same: Code using the data does not even have to be recompiled. This highlights one of the primary benefits of C++ — its maintainability.

Different classes can also have members (including member functions) of the same name. This eliminates the "name space pollution" problem of traditional C.

For instance, classes "jet" and "truck" can each have a member function "fuel()," and the compiler will understand which one is being invoked by the context.

```
jet my 747;  // define a jet object
truck mack;  // define a truck object

my747.fuel();  // invokes the fuel function for a jet
mack.fuel();  // invokes the fuel function for a truck.
```

"Inheritance" refers to the ability to "derive" one class from another. If one has already defined a class called, for example, "vehicle," one can derive a class from vehicle, such as "truck." Objects of truck will have all the characteristics of objects of vehicle. The class truck would add characteristics specific to trucks, such as gross tonnage and type of trailer.

The latest version of C++ allows for "multiple inheritance." This allows a programmer to derive one class from more than one other class: Truck may be derived not only from vehicle, but also from "diesel" and from "depreciable asset."

Class derivation not only allows for sharing of characteristics and functions between classes with a common ancestor ("car" and truck might both be derived from vehicle) but is also a simple technique for reusing existing code.

If one has a class defined for truck, one might define "bus" in terms of truck rather than starting over again from vehicle: A bus is like a truck, except that it differs in the following ways . . .

C++ programs are centered on class hierarchies. Designing the classes and their interrelation (hierarchy) is the most vital phase of the development cycle. In our experience, C++ cuts development time and dramatically reduces maintenance time when compared with a conventional language. •

Tatarsky is president of Taos Mountain Software, a firm specializing in Unix applications development and training in Mountain View, Calif.

The darker side

There are two sides to every story, and so it is for C++. The language offers many benefits to a programmer, but there are trade-offs as well, mostly attributable to people's unfamiliarity with it.

Its benefits include the following:

• Better reusability of code over C++.
• Better maintainability of code.
• Enforcement of good programming practices.
• Encouragement of good design practices.
• Compatibility with existing C code.

On the other hand, the language itself is still in some flux, with new features being added and standardization efforts under way by ANSI and AT&T. And while the languages themselves are compatible, many tools designed to work with C do not yet have C++ interfaces.

In addition, the number of proficient C++ programmers is still small. Even though C programmers can be retrained rapidly, there is a significant ramp-up effort. Rather than thinking about the logical procedural flow of the program, the analyst's attention is instead given to designing the data "objects" on which the program is to perform. Along with the objects themselves are the operations (also called methods or functions) that are to be performed on the objects. This object-oriented approach — in which the data is central — makes for robust and modular programs.

Lastly, debugging C++ code can be difficult because many debuggers do not understand the concept of class, inheritance, virtual functions and other C++ features. Instead, one has to debug the C code generated by the C++ interpreter — code which is difficult to map to the C++ source.

ALEXIS TATARSKY

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Toward a friendlier view

Looking Glass and X.desktop are two ways to look at Unix

PRODUCT FACE-OFF

BY DAVID FIEDLER

People still tend to fear Unix's "hundreds of commands." Well, it's true; Unix does have hundreds of commands. It's also true, however, that most users will never need to learn and use more than two dozen — the same number and type of commands they use on MS-DOS, MVS or any other operating system.

Old perceptions die hard, however, and only a radically new user interface may convince people that Unix is finally usable by mere mortals. That's why Sun Microsystems, Inc. introduced its Open Look graphical user interface and Open Software Foundation (OSF) rolled out its OSF/Motif.

What isn't always apparent amidst the hoopla, however, is that Open Look and Motif are not user-oriented interfaces in the same way as, say, Microsoft Corp.'s Windows Version 3.0. Instead, they are platforms with a "look and feel" that allow developers to write software for them. This software then uses the built-in functions provided by the underlying interfaces to handle such things as screen and mouse interfacing.

Several developers have taken this one step further, writing a user-oriented — rather than programmer-oriented — graphical interface to Unix that utilizes the facilities of one or more of these underlying graphical interfaces. Such programs might be termed "user GUIs" to distinguish them from the lower level interfaces such as Motif and Open Look (see chart).

While there have been a number of menu systems and friendly front ends available for Unix over the years, they were intended for ordinary character-based terminals rather than workstations.

The new graphical user interfaces are few in number and specifically intended for workstations or personal computers running high-resolution workstation software. Two leading examples are Looking Glass from Visix Software, Inc. in Reston, Va., and X.desktop from IXI Ltd. in Cambridge, UK.

Both products are Motif-compliant and adhere to Posix, OSF and X/Open standards. While they are somewhat similar in many ways, they will most likely appeal to two different user types.

Both products require about the same amount of random-access memory. X.desktop's executable size is between 250K and 400K bytes, and a minimum of 2M to 4M bytes of RAM is required for X.desktop to function. Binary code on Looking Glass uses about 600K bytes, and it requires 4M bytes of RAM.

However, Looking Glass seems to be the faster of the two products, with a proprietary tool kit that enables it to run at a blinding speed. X.desktop uses Motif's tool kit.

On Looking Glass, the user is first presented with a screen that displays several windows, including a home directory. On both products, applications are chosen by clicking on an icon, although Looking Glass allows you to use either icons or names. Both vendors say the next version of their products will support colorable icons.

One difference in screen appearance is that with Looking Glass, you are presented with the home directory when you boot up the system. On X.desktop, the user sees the desktop as he left it.

In its current version, X.desktop's Help capabilities are easy to use. The user simply clicks an icon to pull up a dialogue box. Version 3.0, due out in January, will offer context-sensitive Help with graphics.

Visix says Looking Glass Version 2, due out next month, will offer a context-sensitive, hypertext-based Help system accessible via a hot key. Besides Help functions, the new version will also provide a "tree view" of the file system and the ability to save specific desktop layouts by name.

Where the products differ is in their customization abilities and techniques. On Looking Glass, users can specify their preferences and options to a very detailed degree. For instance, it has an interactive window proportion and color-setting facility as well as an integrated icon editor for those who require extra customization for the more than 450 icons supplied.

All customization can be performed by the end user because it is interactive, with the system offering prompts and users responding by clicking on an icon. First-time users should be able to use the product without customization after reading the user's manual.

The degree to which you can customize X.desktop, however, is more comprehensive than Looking Glass. Far beyond customizing icons, it allows you to assign a text editor, such as Microsoft Word or Wordperfect from Wordperfect Corp., to each of your files. You can also set up the system to execute a string of commands simply by clicking on an icon.

It would be up to a programmer or a very experienced user to go into the rule files to make these types of changes.

Configuration is also more complex on X.desktop. In fact, Looking Glass comes only with a user's guide, while X.desktop also supplies a configuration guide. Both companies say their products are ready to run when delivered.

Although the customizing needs to be done by someone other than the typical end user, the result is a simpler looking system. Whereas Looking Glass at first glance appears to be the more sophisticated of the two products, IXI's design philosophy seems to be "keep it simple."

X.desktop's interface is targeted at less sophisticated users who want to work with an easy-to-use, Macintosh-style graphical representation of a desktop. Looking Glass may have more appeal for the Unix power user or system administrator.

Looking Glass is bundled with Pyramid Technology Corp.'s file servers and will run on workstations from Data General Corp., Intergraph Corp., Stardent Computer, Inc., Motorola, Inc. and Sequent Computer Systems, Inc. as well as Intel Corp. 80386-based PCs under Interactive Systems Corp.'s 386/IX.

X.desktop is bundled with The Santa Cruz Operation's Open Desktop, the IBM RISC System/6000 and Personal System/2 with AIX as well as workstations from Unisys Corp., Motorola, NCR Corp., Tektronix, Inc., NEC Technologies, Inc., Panasonic Co. and Dell Computer Corp.

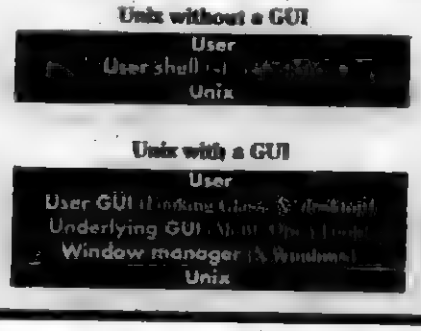
Both products run on all popular workstations from Sun, Digital Equipment Corp., Hewlett-Packard Co.'s Apollo Division, Mips Computer Systems, Inc. and Sony Microsystems Co.

Looking Glass costs from $595 to $1,295, depending on the type of platform, plus about $300 per user. Annual maintenance fees run $99 per user and include a toll-free number for phone support.

X.desktop costs $495 for a single user, regardless of the type of platform. Prices drop when ordering licenses in quantity. An annual support contract costs about 15% of the license fee and includes hot line support via facsimile, electronic mail or telephone as well as free product upgrades and technical bulletins. •

Bring on the GUIs

There are as many as three layers between the user and operating systems when you use a graphical user interface



Fiedler is the executive producer of "Unix Video Quarterly," a video industry newsletter based in Reston, Calif.

How to fit the new kid into the old systems environment

BY DENNIS LINNELL

What happens when you install a Unix system in the middle of an existing setup? Consider the following scenarios:

- A retail store switches to a Unix environment but would like to continue using certain MS-DOS applications, such as a spreadsheet for its financial analysis.
- At a hotel, DOS-based personal computers at the check-in counter are connected on a local-area network to a Unix-based midrange system. Throughout a working day, front desk staff members need to access files residing on the midrange processor.
- Economists working at a brokerage firm need to access data stored on an IBM mainframe from the Unix-based workstations on their desktops.

Not too long ago, this type of connectivity problem would have sent customers back to the software developer. Today, however, new categories of products are allowing corporations to pursue their own strategies to fit Unix in with existing operating systems, such as MS-DOS, VAX/VMS, MVS and VM.

There are two common scenarios in which companies need to integrate Unix with another operating system. In the simpler case, a user wants to run MS-DOS-based applications on his Unix-based workstation. For these people, there is DOS emulation software.

Things get more complicated when the workstation or PC user needs to access data from a host computer across a LAN. These people need to look into terminal emulation, file transfer or file-sharing techniques.

DOS emulation

Virtual emulation software loaded on a Unix computer creates a "virtual machine" within the system, allowing it to run DOS-based applications. There are two different types of this software: packages that operate independently and software that needs to interact with the virtual machine hardware built into Intel Corp. 80386 and I486 chips.

With the latter type of software, the microprocessor is put into "virtual 8086" mode, so instead of using the addressing scheme found on a workstation, the application uses the smaller 1M-byte range found on a PC.

Nevertheless, both products on the market today — VP/ix from Interactive Systems Corp. in Santa Monica, Calif., and Merge 386 from Locus Computing Corp. in Inglewood, Calif. — take advantage of Unix's virtual memory and paging. In addition, Unix memory management and scheduling features remain unchanged. In fact, DOS applications never see any of the Unix features, and Unix applications are unaffected by the DOS emulator.

While software-only products require that no changes need to be made to the Unix kernel, both VP/ix and Merge 386 require a few tweaks to the operating system to make it aware of the 386-based chip. However, operating system overhead is kept to a minimum, and system stability is unaffected.

To emulate the PC's I/O hardware, VP/ix provides a full set of BIOS functions, which translates most I/O requests into equivalent Unix system calls. DOS-based applications can transparently share files and I/O devices with Unix applications.

Interactive and Locus sell their products to hardware vendors on an OEM basis. An obvious drawback to the virtual machine strategy is that many Unix-based workstations — including those marketed by Digital Equipment Corp., Silicon Graphics, Inc. and Sun Microsystems, Inc. — use reduced instruction set computing (RISC) chips, which do not emulate the Intel 8086 microprocessor.

Linnell is president of Gate Technology, Inc., a consulting firm in McLean, Va.

Some hardware vendors fix this problem by providing a suitable Intel microprocessor as a coprocessor or emulating Intel 8086 instructions in software running on the Unix system. For example, Sun's Sun IPC provides an Intel coprocessor on a circuit board, allowing many users to access it through a network.

While this is a workable solution, it is also an expensive one: The add-on boards can cost thousands of dollars.

A second approach is to choose software that emulates both the Intel 8086 and DOS. An example is Soft PC from Sunnyvale, Calif.-based Insignia Solutions, which also markets its product to hardware vendors on an OEM basis.

Although this software is inexpensive, it also delivers slower performance than the virtual machine strategy. For instance, workstations with a microprocessor equivalent to the Motorola Corp. 68030 provide performance equivalent to that of an IBM Personal Computer AT.

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Terminal emulation

You can run terminal emulation software on a Unix machine to access a non-Unix system or you can run it on a PC to access a Unix machine. Either way, this software, which costs about $500 for Unix and $100 on a PC, allows incompatible systems to communicate by making one computer appear like a group of compatible terminals to another computer.

Terminal emulation software runs as a process in the Unix system and provides functions comparable with terminal emulators for PCs, such as Procomm Plus from Datastorm Technologies in Columbia, Mo.

The most common terminals emulated are asynchronous — including the DEC VT100 and IBM 3101 — but the synchronous IBM 3270 is popular as well.

It uses both IBM's Systems Network Architecture (SNA) and binary synchronous (bisynch) protocols. While SNA is more popular and up-to-date, many Unix systems still support bisynch protocols.

Terminal emulators connect to a host computer in two major ways. Most use the EIA-232 (previously called RS-232) interface to connect to modems. These modems hook up to conventional telephone circuits, which physically link the systems together.

A newer type of connectivity involves using a LAN, such as Ethernet or token-ring. This provides higher speeds but shorter distances than modems.

Most terminal emulators can also perform file transfers using either Xmodem, Kermit or 3270-based file transfer using IBM's IND$FILE protocol.

Regardless of protocol, such file transfers have significant drawbacks. Transferring many files can be time-consuming and tedious. The entire process is potentially error-prone, and recovery can be difficult.

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File transfer via TCP/IP

With Transmission Control Protocol/Internet Protocol (TCP/IP), file transfer is greatly simplified. Not only do most Unix systems attach to networks that use this protocol, but TCP/IP provides its own terminal emulation through two sets of protocols — Telnet, which emulates asynchronous terminals, and TN3270, which supports 3270-style terminals.

TCP/IP also has a file-transfer protocol, called FTP, which sends entire files across the TCP/IP network. Nearly all Unix operating systems, such as IBM's AIX for the RISC System/6000 computer family, provide these protocols.

TCP/IP operates on practically every vendor's computers. For example, IBM's TCP/IP for MVS software product enables the largest mainframes to communicate with Unix systems via TCP/IP. This lets Unix users exchange files with and access applications on the MVS system. TCP/IP operates concurrently with the customer's SNA communication network; Unix does not disrupt existing production work.

Several vendors have implemented TCP/IP under DOS on the PC. PC/TCP from FTP Software in Cambridge, Mass., is a typical product. It provides many functions not offered in terminal emulation products. For example, it lets the PC operate as a network server or client.

With the PC as a server, clients on the Unix system can request files to be transferred to or from the PC. Unix users can send output to a printer on the PC. PC/TCP also has an electronic mail package, so PC users can exchange mail with users on the Unix system or anywhere else on the network.

.....

File-sharing

The closest integration achievable — as well as the most complex and expensive — is file-sharing via Sun's Network File System (NFS), a network software package that uses the services of TCP/IP. With file-sharing, users get not only a copy of a file but the file itself.

VIRTUAL EMULATION software loaded on a Unix computer creates a "virtual machine" within the system, allowing it to run DOS-based applications.

NFS uses TCP/IP to allow users to access files and I/O devices on a remote system and never know it; it is as transparent as if they were on their own systems. In essence, NFS provides virtual disks.

The file from the remote system appears as an extension of the local file system. For example, if a PC user wants to load a Unix file into its word processor, the file appears as though it were on drive D on the PC.

NFS also provides remote printing and command execution. A PC user can print on the Unix system by simply directing the PC's LPT2: Output to NFS. The user can tell the system to run programs or utilities on the Unix system and send the results back to the PC. These same options are available between mainframe systems and Unix.

These options for integrating Unix — which are expanding almost daily — also work well in combination. In a sophisticated setup, a PC user connected to a Unix system could log on to a VAX using a terminal emulator and simultaneously access the Unix system's files using NFS. The same user can have sessions with the mainframe using TN3270. Other users with asynchronous terminals can run Lotus Development Corp.'s 1-2-3 spreadsheet using VP/IX on Unix. ●

ASK THE VENDOR

We are currently connecting our server running Xenix to our Novell network using Atlantix's Coconet. We are planning to move to a Unix environment and would like to know how we can accomplish this move while still maintaining the systems we are now using.

Chris McMorrow
Director of MIS
Hotelecopy
Miami, Fla.

ATLANTIX CORP.: Atlantix's new interoperability product, Atlantix Access, provides transparent access among Unix, Novell, IBM LAN Manager and Transmission Control Protocol/Internet Protocol-NFS networks. Atlantix Access also interoperates with Atlantix Coconet on Xenix systems. By simply installing Atlantix on any standard personal computer running SCO Unix, you will have access to Unix, Xenix and Novell files as well as applications across all systems, with no necessary change to the current environment.

Additionally, Atlantix Windowview will allow DOS-based Windows users to access applications across all systems simultaneously from DOS workstations.

I have a copy of the DOS version of Zyindex text retrieval as well as your new Zyindex for Unix. How compatible are the features of your MS-DOS product with your Unix product? Do they work in exactly the same manner? What differences are there, if any?

Gregory Johnson
Attorney at Law
Owner/Operator
Law Office Management Services
Seattle, Wash.

ZYLAB CORP.: The look and feel of Zyindex for Unix is different from the DOS product, but it is still quite easy to use.

Both versions of the text retrieval system allow users to employ a range of search techniques, including Boolean, proximity, wild-card and synonym searching.

Numeric and date-range searches are also available.

New design features for Unix include drop-down menus, dialogue boxes and concurrent displays of multiple queries. New search features include a query history, an interactive dictionary of searchable terms and a clipboard for pasting new queries from retrieved data.

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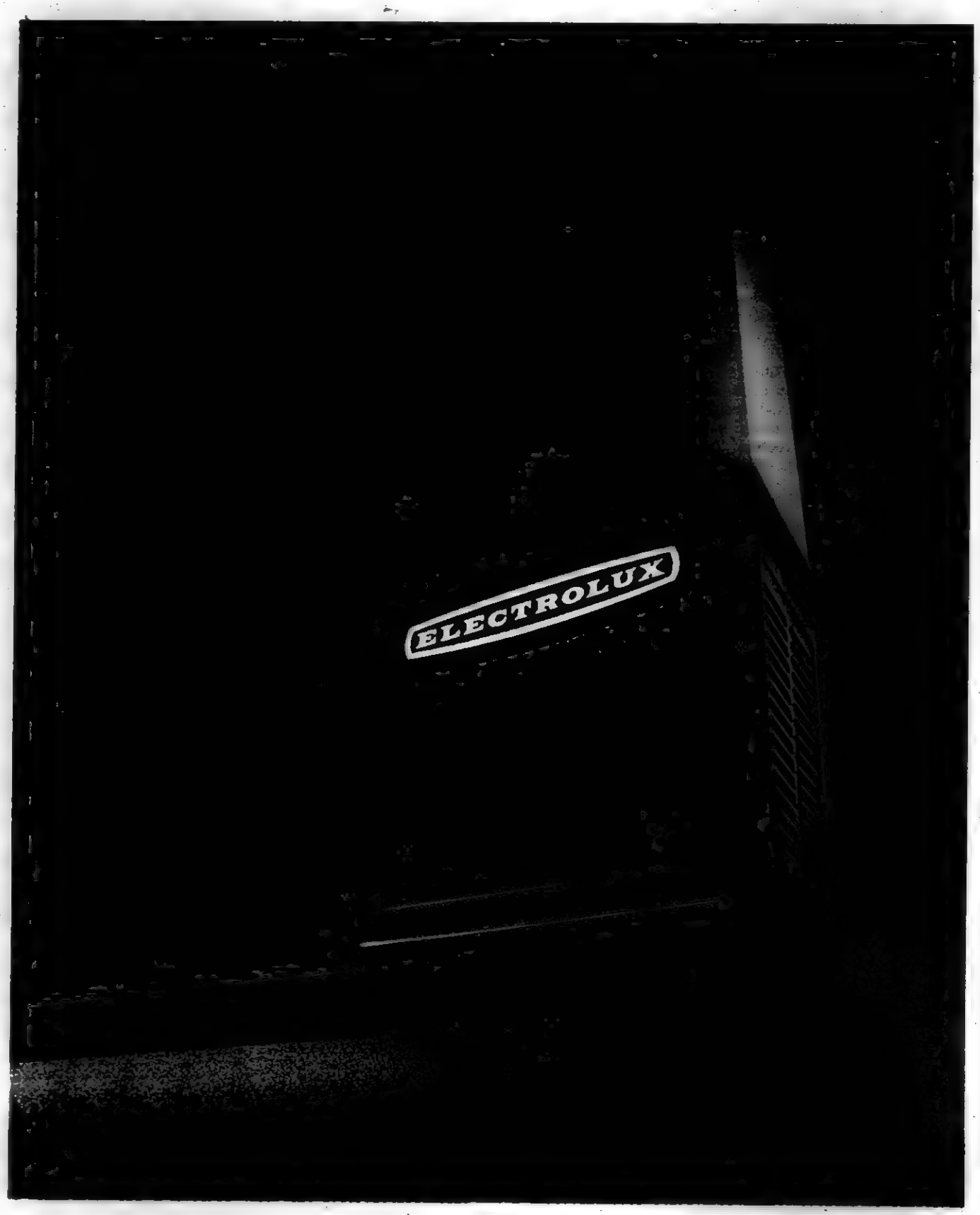

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PRODUCT SPOTLIGHT

Terminal emulation for Unix integration

VENDOR	PRODUCT	EMULATION PROVIDED*	UNIX VERSION SUPPORTED	HARDWARE PLATFORM	TERMINAL EMULATION	OPERATES ACROSS WHICH LOCAL-AREA NETWORK	MEMORY REQUIREMENTS (BYTES)	FILE-TRANSFER PROTOCOLS SUPPORTED	WINDOW ENVIRONMENTS SUPPORTED	MAXIMUM NUMBER OF SESSIONS/VIEWING METHODS	USER-DEFINABLE KEYBOARD MAPPING	MAXIMUM MODEM SPEED SUPPORTED	HIGH-LEVEL LANGUAGE PROGRAMMING APPLICATION SUPPORT	PRICE
Access Ingredients, Inc. (617) 895-0000	Connection	Unix to DOS, Unix, VMS	MACH	Mac	DEC VT100, VT220, Tektronix 4010, 4014	Ethernet, TCP/IP	Less than 200K	Kermit, Xmodem, Ymodem	Next	3	Yes	19.2K	No	$395
Apple Computer, Inc. (408) 996-1010	Macintermal Version 3.0	Macintosh to Unix, VMS	NP	Macintosh Plus, or later	DEC VT102, VT320, TTY	Appletalk	1M	ASCII, Xmodem, Xmodem Text, proprietary	Macintosh	Varies/Menu	No	57.6K	No	$125
Beame & Whiteside Software Ltd. (416) 640-0000	BWTEL	DOS to Unix, VMS	All versions	IBM PCs and compatibles with Ethernet adapters	DEC VT52, VT100	Ethernet, TCP/IP	128K	FTP, NFS, Kermit, Xmodem, TFTP	MS Windows 3.0	8/window, hot key	Yes	19.2K	No	$195
The Bristol Group Ltd. (603) 437-3700	Interex	Unix to VMS	AIX, Domain OS, SunOS	Apollo, IBM RS/6000, Sun	DEC VT340	Decnet, TCP/IP	1M	None	Sunview, Apollo Display Manager, OSF Motif	NP/window	Yes	All	Yes	$600
	Instek	Unix to VMS	Domain OS, SunOS	Apollo workstations, Sun	Tektronix 4000, 4100, 4200 series	Decnet, TCP/IP	2M	None	Sunview, Apollo Display Manager	NP/window	Yes	All	Yes	$3,990
Century Software (561) 368-0000	Term	DOS to Unix, Unix to DOS	Unix System V Release 2, 3, SCO Unix, Xenix, System III, Berkley 4.0	Over 150 hardware platforms	ANSI 3.64, DEC VT52, VT100/102, VT220, Wyse 50, 60, SCO Color Console, Ademl, Televideo 912, 925, TTY	None	512K	Kermit, Xmodem, Ymodem, Modem7, WarmCRC, TermCRC	MS Windows 2.11, 3.0, X Windows	1	Yes	57.6K	Yes	$195 (DOS), $495 (Unix)
	Termnet	DOS to Unix, Unix to DOS	NP	Over 150 hardware platforms	ANSI 3.64, DEC VT52, VT100/102, VT220, Wyse 50, 60, SCO Color Console, Ademl, Televideo 912, 925, TTY	Most major networks	512K	Kermit, Xmodem, Ymodem, Modem7, WarmCRC, TermCRC	NP	101/hot key	Yes	57.6K	Yes	$695
	Term for X Windows	DOS to Unix, Unix to DOS	NP	Over 150 hardware platforms	ANSI 3.64, DEC VT52, VT100, VT102, VT220, Wyse 50, 60, SCO Color Console, Ademl, Televideo 912, 925, TTY	NA	640K	Kermit, Xmodem, Ymodem, Modem7, WarmCRC, TermCRC	X Windows	11/window	Yes	57.6K	Yes	$995
Coefficient Systems Corp. (512) 777-4707	Coterm	DOS to Unix, VMS	All versions	IBM PCs and compatibles	DEC VT52, VT100, VT220, VT240; Tektronix 4010, 4014	Banyan, 3Com, Novell, Ungermann-Bass, Int. 14	320K	ASCII, Kermit, Xmodem, Vtrans	NP	1	Yes	19.2K	NP	$195-$329
Concept Omega Corp. (800) 000-1377	Thoroughbred terminal emulator	DOS to Unix, VMS	Unix System V, Release 3 and higher	IBM PC XTs, ATs and compatibles	Wyse 50, 60	None	10K	None	Any that Wyse 50 or 60 can support	1	No	19.2K	Yes	$195
CSE (603) 448-5185	MLINK	DOS to Unix, Unix to DOS	Unix System V, BSD Unix, Xenix, AIX	IBM PCs and compatibles	Altos III, AT&T 605, DEC VT100, VT220, NCR 7930, Televideo 910, 925, 950, Wyse 50, SCO ANSI console	NP	163K	Kermit, Xmodem CRC, Xmodem 1, proprietary	None	1	Yes	38.4K	Yes	$195-$250
Datacopia (612) 000-0000	Datalaser	Unix to DOS	NP	IBM PCs and compatibles	Televideo 905, Wyse 50	Novell	256K	Open architecture, programmer hooks available	None	1	Yes	9.6K	No	$150
Digiboard, Inc. (612) 000-0000	Double View	DOS to Unix, Unix to DOS	All versions	IBM PC XTs, ATs and compatibles; Personal System/2s	DEC VT100, VT200, SCO ANSI console, Interactive AT/3, Wyse 60	None	64K	Proprietary enhanced version of Kermit	None	7/hot key	Yes	38.4K	No	$239 (8 users)
Diversified Computer Systems, Inc. (303) 447-0000	IBM 320	DOS to Unix, VMS	All versions	IBM PC ATs, PS/2s and compatibles	DEC VT 52, VT100/102, VT220, VT320	Decnet, Excelan, FTP PC/TCP, Novell, 3Com, Sun PC-NFS, Ungermann-Bass, Wollongong	170K	ASCII, Kermit, Xmodem	Desqview, MS Windows 3.0	8/hot key	Yes	9.6K	Yes	$180
	IBM 4010	DOS to Unix, VMS	All versions	IBM PC ATs, PS/2s and compatibles	DEC VT 52, VT100/102, VT220, VT320, VT640, Tektronix 4010, 4014	Decnet, Excelan, FTP PC/TCP, Novell, 3Com, Sun PC-NFS, Ungermann-Bass, Wollongong	230K	ASCII, Kermit, Xmodem	Desqview, MS Windows 3.0	8/hot key	Yes	9.6K	Yes	$340
	IBM 4105	DOS to Unix, VMS	All versions	IBM PC ATs, PS/2s and compatibles	DEC VT 52, VT100/102, VT220, VT320, VT640; Tektronix 4107, 4105, 4010, 4014	Decnet, Excelan, FTP PC/TCP, Novell, 3Com, Sun PC-NFS, Ungermann-Bass, Wollongong	260K	ASCII, Kermit, Xmodem	Desqview, MS Windows 3.0	8/hot key	Yes	9.6K	Yes	$360
Exan Technology Corp. (514) 631-2592	Access/X.25	DOS to Unix	NP	IBM PCs, PS/2s and compatibles with Exan card	DEC VT52, VT100, TTY	Any Netbios LAN, Novell Netware	100K	ASCII, proprietary	None	9/hot key	Yes	NP	No	$1,095 (software and hardware)
FTG Data Systems (714) 000-0000	EMU-TEK 4005	DOS to Unix	All versions	IBM PCs, PS/2s and compatibles	Tektronix 4025	None	265K	None	None	1	No	19.2K	No	$795
	EMU-TEK 4300 Plus	DOS to Unix	All versions	IBM PCs, PS/2s and compatibles	DEC VT100, Tektronix 4010, 4014, 4105, 4107, 4207, 4300	DEC PCSA, Ungermann-Bass, NetOne, Novell Netware for VMS, Novell NACS, IBM LAN ACS, FTP PC/TCP	512K-640K	Kermit, Xmodem	None	6/menu	Yes	38.4K	No	$950

*Ties between other environments available.

The companies included in this chart responded to a recent survey conducted by *Computerworld*. When a vendor is unable to provide specific information about its product, the abbreviation NP (not provided) is used. When a question does not apply to a vendor's product, the abbreviation NA (not applicable) is used. Further product information is available from the vendors.

How Long Will You Have To Wait For VSE/ESA Software Solutions?

VENDOR	PRODUCT	EMULATION PROVIDED	UNIX VERSION SUPPORTED	HARDWARE PLATFORM	TERMINAL EMULATION	OPERATES ACROSS WNOV LOCAL-AREA NETWORK	MEMORY REQUIREMENTS (BYTES)	FILE-TRANSFER PROTOCOLS SUPPORTED	WINDOW ENVIRONMENTS SUPPORTED	MAXIMUM NUMBER OF SESSIONS/VIEWING METHODS	USER-DEFINABLE KEYBOARD MAPPING	MAXIMUM MODEM SPEED SUPPORTED	HIGH-LEVEL LANGUAGE PROGRAMMING APPLICATION SUPPORT	PRICE
[illegible]	[illegible]	[illegible]	[illegible]	IBM PCs, PS/2s and compatibles	DEC VT100, Tektronix 4014, 4105, 4207	NBC PCSA, Digitronics Data, Net/One, Novell Netware for VMS, Novell NACS, IBM LAN ACS, FTP PC/TCP	512E	Kermit, Xmodem	None	4/screen	Yes	38.4K	No	$495
	[illegible]	DOS to Unix	All versions	IBM PCs, PS/2s and compatibles	DEC VT100, Tektronix 4014, 4105, 4107, 4120	None	512E-640E	ASCII, Binary	None	1	Yes	38.4K	No	$695
	[illegible] Level 1	DOS to Unix	All versions	IBM PCs, PS/2s and compatibles	DEC VT100, Tektronix 4014, 4014	None	384K	ASCII, Binary	None	1	Yes	19.2K	No	$95
	[illegible] Level 2	DOS to Unix	All versions	IBM PCs, PS/2s and compatibles	DEC VT100, Digital Engineering VT340, Tektronix 4010, 4014	None	384K	ASCII, Binary	None	1	Yes	19.2K	No	$295
FTP Software, Inc. (617) 246-0900	PC/TCP	DOS to Unix, Ultrix, Xenix	NP	IBM PCs and compatibles	DEC VT220	TCP/IP	512K	Proprietary FTP, RCP	MS Windows 3.0	10/window	Yes	9.6K	No	$400
[illegible]	TNet	DOS to Unix	NP	IBM PCs, PS/2s and compatibles	DEC VT52, VT100, VT200; Tektronix 4105, 4107, 4207, 4115	Most major networks	240K	Kermit, Xmodem, Ymodem	DOS Windows	Limited by memory only/window	Yes	Hardware-dependent	Yes	$195-$1,695
	TGnd-II Mac	Macintosh to Unix	NP	Macintosh II series	DEC VT 52, VT100, Tektronix 4107	TCP/IP	1M	Kermit	MultiFinder	Same as above	Yes	Hardware-dependent	Yes	$995
	TGnd-Workstation	Unix to VMS	All versions	Apollo Computer, Data General Aviion, Encore, Pyramid, HP, IBM RS/6000, Intergraph, Mips, Sun 3/260, 4, Silicon Graphics, Silicon Graphics, Intel 80486-based PCs, Tektronix 8560	DEC VT52, VT100, Tektronix 4107, 4125	Most major networks	Varies	NP	X Windows, Xmodem	Same as above	Yes	Hardware-dependent	Yes	$1,000-$10,000
R&A Computer Services, Inc. (415) 434-3817 (800) 654-3218	PCXVT100	DOS to Unix, Unix to DOS	All versions	IBM PC XTs, ATs and compatibles	DEC VT52, VT100	None	90K	Proprietary	None	1	Yes	9.6K	Yes	$50
[illegible]	Advantage	DOS to Unix, Unix to DOS, Macintosh to Unix, Unix to Macintosh	All versions, HP/UX 6th extended	IBM PC ATs, PS/2s and compatibles, Macintosh	DEC VT100, HP 2392, 2393, 2627, 700/94	HP OfficeShare, LAN Manager, 3Com LAN Manager	270K (DOS), 90K (MS Windows), 200K (Macintosh)	Proprietary Xmodem	Macintosh, HP New Wave, MS Windows	Limited by memory only/window	No	19.2K	No	$550
Bilgraver, Inc. (313) 243-0570 (800) 826-2760	Hyper Access/5	DOS to Unix	NP	IBM PC ATs, Intel 80386-, 1486-based machines	DEC VT100/102, 220, 320; Televideo 925, 950	None	350K	ASCII, Hyper-protocol, Kermit, Xmodem, Ymodem, Zmodem, Ymodem batch	DOS windows, OS/2 windows	8 (DOS), Unlimited (OS/2)/window	Yes	114.2K	No	$199
[illegible]	Connect/PC	DOS to Unix	Unix System V and some other versions	IBM PCs, PS/2s and compatibles	DEC VT100, Texas Instruments 931	None	384K	Character Mode	MS Windows, OS/2 Presentation Manager	1	No	19.2K	No	$395
Hummingbird Communications Ltd. (416) 470-1393	NCL-Exceed, Exceed Plus, Exceed Plus 8514A, Exceed	DOS to Unix, Unix to DOS	All versions	IBM PC ATs, PS/2s, Intel 80286-, 80386-, 1486-based PCs	X terminals	TCP/IP	640K-1.64M	Proprietary	X Windows	1 (DOS), 32/window, hot key	Yes	NA	NA	$495-$595
[illegible]	Ins.TCP	DOS to Unix	Unix System V	IBM PCs and compatibles	ANSI, AT&T 605, DEC VT100, VT220, Wyse 60	Accent, Ethernet, Stanlan, token-ring	256K	Xmodem, Ymodem	None	1	Yes	38.4K	No	$195 (per DOS PC)
	Ins.Tnn	DOS to Unix	Unix System V	IBM PCs and compatibles	ANSI, AT&T 605, DEC VT100, VT220, Wyse 60	None	48K	Xmodem, Ymodem	None	4/hot key	Yes	38.4K	No	$295 (per Unix host)
JYACC, Inc. (213) 387-7723	Jterm	DOS to Unix	All versions	IBM PCs and compatibles	DEC VT100, VT220, TTY, proprietary	NP	256K	ASCII, Kermit, Kermit server, Xmodem, proprietary Jterm	None	1	Yes	192K	NA	$175
RBA Systems Ltd. (604) 681-0727	Xstem 340	DOS to Unix, Unix to VMS	Interactive 386/ix, SCO Unix System V/386	Intel 80386- or 1486-based machines	DEC VT52, VT100, VT220, VT320, VT241, VT340; Tektronix 4010, 4014	Novell, LAN, TCP/IP	384K	ASCII, Kermit, Xmodem, Ymodem	None	4/hot key, autoscroll	Yes	9.6K	No	$295
Microlab, Inc., (402) 483-7474	Chitchat	DOS to Unix	SCO Xenix, SCO Unix	IBM PCs and compatibles	ANSI	Mainlan	35K	None	Desqview	2/window	No	2.4K	No	$79.95
Power Software, Inc. (818) 884-6800	Procomm	DOS to Unix, Unix to DOS, Microsoft software Unix	Unix System V, Release 4.3 SMP	Apollo, DEC, Data General, Harris, HP, Interactive, Mips, Motorola, NCR, Sun	Ado 60; DEC VT100, VT220, VT340, VT241; Data General D460; Televideo 950; TTY	TCP/IP	512K	Telnet proprietary	Macintosh	5-9/Windows, PC task split screen	Yes	19.2K	Yes	$1,200 (Browser license)
Persoon, Inc. (800) 365-0404	TermX 07, TermX 340	POS to Unix	AIX, Ultrix	Decstation, IBM RS/6000, Sun Microsystems 3, 4	DEC VT100, VT220, VT340, VT640; Data General D200; Tektronix 4105, 4207, 4211	Ethernet	NP	FTP	NP	NP	Yes	38.4K	NP	$800
Polygon, Inc. (613) 226-1347	[illegible]	DOS to Unix, Ultrix, VMS	NP	IBM PC ATs, ATs, PS/2s and compatibles	DEC VT200, VT300	AT&T Stargroup, 3Com, Banyan Vines, Novell	384K	Kermit, XPF plus	None	1	Yes	9.6K	No	$250
	[illegible]	DOS to Unix, Ultrix, VMS	NP	IBM PC ATs, ATs, PS/2s and compatibles	DEC VT200, VT300	AT&T Stargroup, 3Com, Banyan Vines, Novell	384K	Kermit, XPF plus	None	1	Yes	9.6K	No	$350
	[illegible]	DOS to Unix, Ultrix, VMS	NP	IBM PC ATs, ATs, PS/2s and compatibles	DEC VT52, VT100, VT220, VT320, Tektronix 4010, 4014	AT&T Stargroup, 3Com, Banyan Vines, Novell	384K-576K	Kermit, XPF plus	MS Windows 3.0	32/window	Yes	19.2K	Yes	$550
	[illegible]	DOS to Unix, Ultrix, VMS	NP	IBM PC ATs, ATs, PS/2s and compatibles	DEC VT200, VT241, VT220, VT340, Tektronix 4010, 4014	AT&T Stargroup, 3Com, Banyan Vines, Novell	384K-576K	Kermit, XPF plus	MS Windows 3.0	32/window	Yes	19.2K	Yes	$550

Now, That Didn't Take Long Did It.

COMPUTER ASSOCIATES *News*

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ALL COMPUTER ASSOCIATES VSE SOFTWARE SUPPORTS IBM VSE/ESA

Garden City, New York -- September 5, 1990 -- COMPUTER ASSOCIATES INTERNATIONAL, INC. announced today complete support for IBM's recently announced VSE/ESA Operating System concurrent with its general availability. Computer Associates, the acknowledged experts in VSE technology, has been committed to the VSE operating system since the company was founded in 1976. With over 20,000 VSE software product licenses worldwide, Computer Associates is the leading independent vendor of VSE software today. A list of the products supporting VSE/ESA follows:

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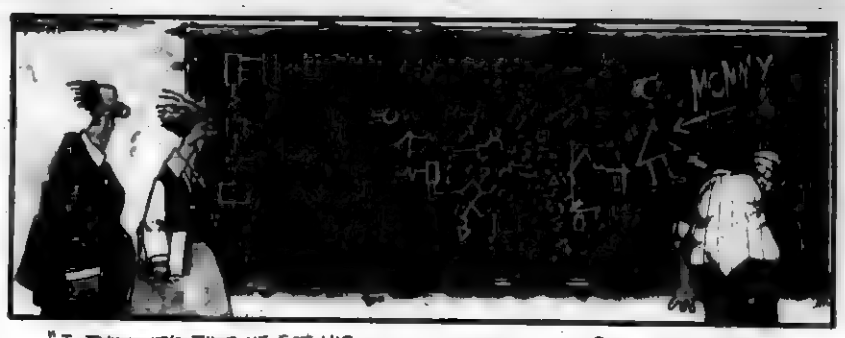
PRODUCT SPOTLIGHT

VENDOR	PRODUCT	EMULATION PROVIDED	UNIX VERSION SUPPORTED	HARDWARE PLATFORM	TERMINAL EMULATION	OPERATES ACROSS WHICH LOCAL-AREA NETWORK	MEMORY REQUIREMENTS (BYTES)	FILE-TRANSFER PROTOCOLS SUPPORTED	WINDOW ENVIRONMENTS SUPPORTED	MAXIMUM NUMBER OF SESSIONS/VIEWING METHODS	USER-DEFINABLE KEYBOARD MAPPING	MAXIMUM MODEM SPEED SUPPORTED	HIGH-LEVEL LANGUAGE PROGRAMMING APPLICATION SUPPORT	PRICE
[illegible]	MacMT	Macintosh to Unix; Macintosh to NCR 3TX	All versions	All Macintosh	ADDS Viewpoint, ANSI, DEC VT100, NCR 7900, Wyse 60	Macintosh	384K	ASCII, Kermit	Macintosh	1	Yes	38.4K	No	$900
	AM320	DOS to Unix, NCR 3TX	All versions	IBM PCs and compatibles	ADDS Viewpoint, ANSI, DEC VT100, NCR 7900, Wyse 60	None	370K	ASCII, Kermit	Dosplore	2	Yes	38.2K	No	$900
Scientific Endeavors Corp. (815) 398-4168	VT32K	DOS to Unix	NP	IBM PC XTs, ATs, PS/2s and compatibles	DEC VT52, VT100/102; Tektronix 4010, 4014, 4105	None	256K	Kermit, Xmodem	NP	1	Yes	38.4K	No	$195
[illegible]	PC88	DOS to Unix, Unix to DOS	Unix System V, Release 3	AT&T 6300-series, IBM PCs and compatibles, Zenith laptop	DEC VT100	Starlan, 3.1Plus by 3B Systems Ltd. Interbased	128K	ASCII	None	2/function key	Yes	38K	No	$99
SoftArtisans (904) 878-6864	Mirror III Version 2.0	DOS to Unix	NP	IBM PCs and compatibles	ADDS Viewpoint; ANSI; D210; DEC VT52, VT100/101, VT220; Honeywell VIP 7200, 7205; Televideo 912, 920C, 925, 950; Texas Instruments 940; Tymnet 78; Wang; Wyse 50, 220	None	185K-480K	ASCII, Compuserve-B, Crosstalk, Hayes, Kermit, Kermit server, Xmodem, Xmodem batch, Xmodem 1K, Ymodem, Ymodem-G, Zmodem	NP	1	Yes	300-38.4K	Yes	$149
[illegible]	PowerPC, PowerTerm	DOS to Unix, Unix to DOS	Unix System V, Xenix	IBM PC XTs, ATs, PS/2s and compatibles	DEC VT100, 220	None	256K (DOS)	Xmodem	None	10/window	Yes	38.4K	No	$189
Telegrams, Inc. (800) 977-4900	Telebase-RM	DOS to Unix, Unix to DOS	All versions	Intel 80286-, 80386-, 1486-based machines	ANSI, DEC VT100, VT220, Wyse 60	None	256K	ASCII, Kermit, Xmodem	NP	1	Yes	19.2K	No	$192
[illegible]	3X Works	DOS to Unix	Unix System V, SCO Unix, Xenix, HPUX, VMS	IBM PCs and compatibles	ANSI, DEC VT100/102, VT220; TTY	Netbios, Starlan, token-ring	256K	ANSI, Kermit, Xmodem, proprietary	None	2/hot key	Yes	38.4K	Yes	$99, $145 (LAN version)
	Modem	DOS to Unix	Unix System V, SCO Unix, Xenix, HPUX, VMS	Macintosh series	ANSI, DEC VT52, VT100	None	512K	ASCII, proprietary	None	1	Yes	9.6K	Yes	$145
	PC Works	DOS to Unix	Unix System V, SCO Unix, Xenix, HPUX, VMS	IBM PCs and compatibles	ANSI, DEC VT100/102, VT220; TTY	Netbios, Starlan, token-ring	256K	ANSI, Kermit, Xmodem, proprietary	None	2/hot key	Yes	38.4K	Yes	$195
Tymshare Corp. (800) 787-8611	Session for Windows/Session for Macintosh	DOS to Unix, Unix to DOS	All versions of HPUX	IBM PCs and compatibles, Vectras, Applesauc 512 and above	HP2392, HP2393, HP2397, HP700/94	HP Telnet, Advancenet, BAPI, X.25, HP ARPA services	1M (Macintosh)	Xmodem, Macbinary, proprietary	MS Windows 2.11, 3.0	1-6/window	No	19.2	Yes	$299
U.S. Systems, Inc. (714) 588-8788	Star, Planet, Star LAN	DOS to Unix	All versions	Intel 80286-, 80386-, 1486-based machines, Sun, Motorola	DEC VT100, English III, Television, Wyse 350, proprietary	Novell, Lantastic, token-ring	70K	Proprietary	MS Windows 3.0	2/window	Yes	9.6K	No	$99
Unisys Corp. Contact local sales office	Informer II Version 3.4	DOS to Unix	HP	Unisys PW, IBM PCs and compatibles	ANSI x3.64, Tektronix 4014	Netbios-compatible	512K	None	Proprietary	1	Yes	9.6K	No	$300
Walker Richer & Quinn, Inc. (800) 334-8000	Reflection 2.1 Plus	DOS to Unix, HPUX	All versions	IBM PCs and compatibles	DEC VT300, HP2392A, HP700/94, HP700/84	Advancenet, NetOne, Novell, Starlan, VIM, IBM LAN, BAP, LAT, Telnet	256K	Kermit, Xmodem, all host applications written for MPE, Unix, Ultrix, HPUX, VMS	MS Windows	4/hot key	Yes	38.4K	Yes	$595, $995
	Reflection 2	DOS to Unix, VMS	All versions	IBM PCs and compatibles	DEC VT300/102, VT220, VT320	DEC Lanworks, PC SA, LAT	98K-200K	Kermit, Xmodem, proprietary	MS Windows, Dosplore	8/hot key	Yes	38.4K	Yes	$150
	Reflection 2 Plus	DOS to Unix, VMS	All versions	IBM PCs and compatibles	DEC VT100/102, VT220, VT320	DEC Lanworks, PC SA, LAT, 3Com, Novell Netware, Netware for VMS, TCP/IP, Ungermann-Bass	98K-200K	Kermit, Xmodem, proprietary	MS Windows, Dosplore	8/hot key	Yes	38.4K	Yes	$300
	Reflection 2 Plus for Macintosh	DOS to VMS	All versions	Macintosh 512K enhanced, Plus, SE, II series	DEC VT100, VT220, VT320	Pathway, Athen, LAT, TCP/IP	410K	Kermit, Xmodem, proprietary	Macintosh	Limited by memory only/Multi-finder	Yes	57.6K	Yes	$595
	Reflection 3 Plus	Macintosh to HPUX	All versions	Macintosh 512, 512K, Plus, SE, Skylab, II, IIX, IIX2	HP2392A	None	256K	Kermit, Xmodem, all host applications written for MPE, Unix, Ultrix, HPUX, VMS	MS Windows	4/window	No	57K	No	$300
	Reflection 4	DOS to Unix, VMS	All versions	IBM PCs and compatibles	DEC VT340, VT241, graphic features of DEC VT100/102, VT220, VT320, VT330, VT340; Tektronix 4014	DEC Lanworks, PC SA, LAT	200K-300K	Kermit, Xmodem, proprietary	MS Windows, Dosplore	8/hot key	Yes	38.4K	Yes	$500
	Reflection 4 Plus	DOS to Unix, VMS	All versions	IBM PCs and compatibles	DEC VT340, VT241, graphic features of DEC VT100/102, VT220, VT320, VT330, VT340; Tektronix 4014	DEC Lanworks, PC SA, LAT, 3Com, Novell Netware, Netware for VMS, TCP/IP, Ungermann-Bass	200K-300K	Kermit, Xmodem, proprietary	MS Windows, Dosplore	8/hot key	Yes	38.4K	Yes	$300
	Reflection X 7 Plus	DOS to Unix, HPUX	All versions	IBM PCs and compatibles	HP2627, HP2623A, Tektronix 4010	Advancenet, NetOne, Novell, Starlan, VIM, IBM LAN, BAP, LAT, Telnet	384K	Kermit, Xmodem, all host applications written for MPE, Unix, Ultrix, HPUX, VMS	MS Windows	4/hot key	Yes	38.4K	Yes	$595, $495
	Software Series Software	DOS to Unix, Unix to DOS	All versions	IBM PCs, PS/2s and compatibles	4920/22A, HP2627A, UT220, UT320, UT2400/241	PC-NFS, TCP/IP	128K-320K	Kermit, Xmodem, FTP, Unix, proprietary	MS Windows 3.0	4/hot key, Session Manager	Yes	19.2K	No	$199-$495



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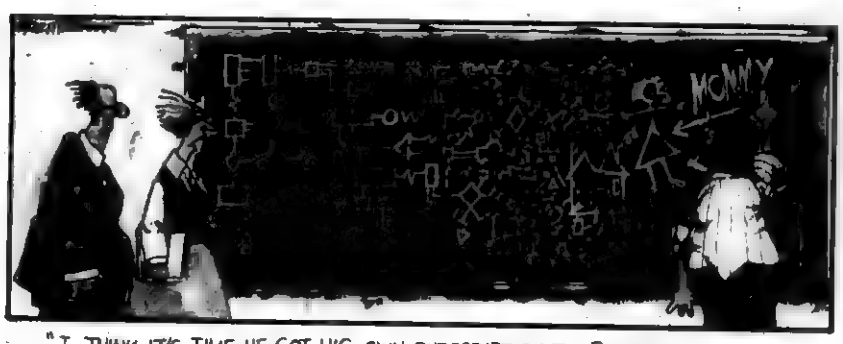

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22. Dir./Mgr. Tech. Planning, Adm. Svcs., Data Comm. Network Sys. Mgt., Dir./Mgr. PC Resources
23. Dir./Mgr. Sys. Development, Sys. Architecture
31. Mgrs., Supry. of Programming, Software Dev.
32. Programmers, Software Developers
60. Sys. Integrators/VARs/Consulting Mgt.
OTHER COMPANY MANAGEMENT
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13. Treasurer, Controller, Financial Officer
41. Engineering, Scientific, R&D, Tech. Mgt.
51. Sales & Mktg. Management
OTHER PROFESSIONALS
70. Medical, Legal, Accounting Mgt.
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90. Others _____
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3. **COMPUTER INVOLVEMENT** (Circle all that apply)
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A. Mainframes/Supermins
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Breaking the software logjam

Forget fancy formulas: Four simple but powerful principles can get developers rolling

BY TODD HIXON and
DAN GINSBURG

Software development is the main obstacle to getting better products out faster for many companies, and it's an area that few chief executive officers feel they have under control. Many view it as a perilous and unmanageable black art.

A few companies have excellent track records in software development, however. An in-depth analysis of their approaches shows that software development *can* be managed effectively. The key is to use an approach that is grounded in the principles of time-based competition while recognizing the special challenges of software engineering.

The president of a successful mobile communications company recently told us: "We've always been a hardware company, but software has become our key technology. Our new product line offers terrific advances in features and the user interface due to a microprocessor-based design. Our problem is that the software is full of bugs. The product is 18 months late, and customers are screaming and withholding payments because it doesn't work."

Hixon, a vice-president at Boston Consulting Group, heads the firm's worldwide high-technology practice. Ginsburg is a BCS consultant experienced in technology and business development.

No end in sight

This problem will get worse. During the 1990s, powerful forces will make software even more important. Demand for standards and effective imitation are turning basic hardware functions and architectures into commodities, causing vendors to reach for added value from additional features, user interface development and application-specific design.

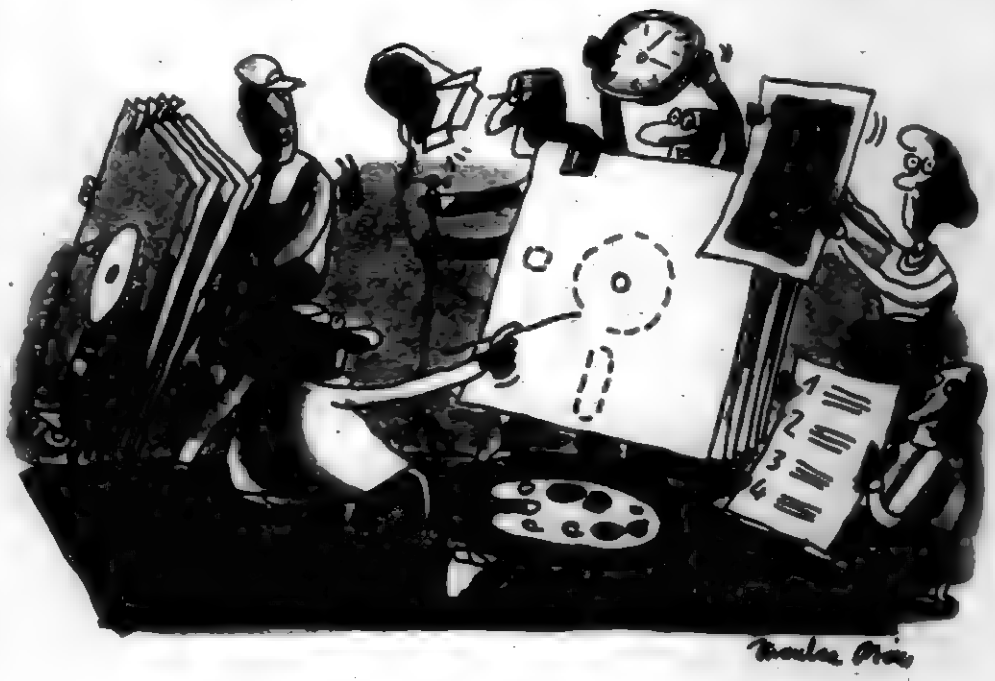
Powerful microprocessors, cheap memories and high-level languages greatly expand the range of situations in which products controlled by complex software are practical. And so do vendors of operating systems and communications capabilities. Each of these product development paths is software-intensive.

The lore of software development contains a rich history of warnings to newcomers, particularly in that software developers are artists who cannot be managed, and traditional approaches to achieving speed (such as using parallel paths, setting deadlines and applying pressure) result in garbage. In fact, there's a classic pattern of disaster in software development that we've often observed and have come to call the slippage loop (see chart page 92).

Yet, the most important differences between the best and the worst performers lie in how they manage the people and the process.

Microsoft Corp.'s CEO Bill Gates has been quoted as saying, "There's only one trick in software and that is to use a piece of software that's already been written." However, that greatly oversimplifies the challenge. Computer-aided software engineering, modularity and software libraries are important, but they are not what distinguish the best performers. Nor do "skunkworks" provide a practical solution. Although they are fast, they are inefficient and disruptive to other products.

Major developers of large complex systems, such as large-scale telecommunications switching equipment and sophisticated radars, are often looking to achieve top-notch improvements in both the speed and quality of their product development. Observing and analyzing the methods and performance of some of the most effective software developers in the world can yield several key lessons.



It's up to management

The bottom line is that breaking the software logjam is primarily a managerial issue. There are great differences in the time required by different teams and companies to complete projects of similar complexity. (Complexity is measured in lines of code.) The worst performers take as much time to complete simple projects as the best performers require for projects that are three times as complex.

The following four basic principles of fast, high-quality software development have emerged from watching world-class software developers.

- **Shoot for effectiveness.** Effectiveness comes from working smarter, not necessarily faster. A strong focus on increasing the percentage of team time spent on the "main sequence" of work — the irreducible core

- **Mostly a management issue**
- **Poor programs waste time**
- **Learn from the best companies**

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of tasks required to produce the product — yields major gains in output accompanied by gains in quality. Must speed come at the expense of quality? No.

An analysis of 16 complex software projects showed that about 30% of engineers' time was spent developing code that became part of the final product. Much of the lost time was caused by interruptions and rework. High-quality output can be greatly increased by managing time and the development process better.

• **Build strong platforms for developers.** Platforms are the superhighways on which fast product development teams race. They include such capabilities as coherent product plans, a well-structured software architecture, anticipatory technology development, libraries of modules and utilities as well as development tools.

Platforms need to be structured and put into place in advance of an immediate need to accelerate the main sequence of new product development.

• **Make communication a religion.** In product development, there is no higher priority than communication. Leading-edge software developers employ a set of integrated organizational strategies to maximize communication among the key members of product development teams. These strategies encompass areas ranging from business and product-line planning to product team structure, membership, tenure and empowerment.

OFTEN, THE APPROPRIATE areas for discipline and autonomy become blurred under the pressure of deadlines. Overmanagement causes delay and loss of project team commitment, which leads to specification creep, errors, more delays, and hence, more management — a descending spiral.

• **Foster creativity in a disciplined framework.** Bringing the project in on time requires establishing an overall structure of reasonable discipline covering such factors as scheduling, architecture and specifications.

Within this structure, teams must be given a lot of freedom to find the best solutions with minimum interference. High quality has to be the final test. Performance, cost and profit objectives will never be achieved if quality is not high.

Establishing a disciplined schedule requires aggressive but reasonable deadlines. This is an area of concern for many managers but one that can be addressed by benchmarking the performance of top competitors and analogs. Like all aspects of business, software must measure up to the competitive environment.

Often, the appropriate areas for discipline and autonomy become blurred under the pressure of deadlines. Overmanagement causes delay and loss of project team commitment, which leads to specification creep, errors, more delays, and hence, more management — a descending spiral.

Fast competitors have achieved a workable balance — which is built into their organization and systems — from team structure to lines of communication, cross-functional measurement and incentive systems.

High hurdles

The challenges facing software developers are great. Technical solutions are not enough. "Common wisdom" is fragmented and often misleading. Perhaps most importantly, the solution lies beyond the best efforts of isolated individuals.

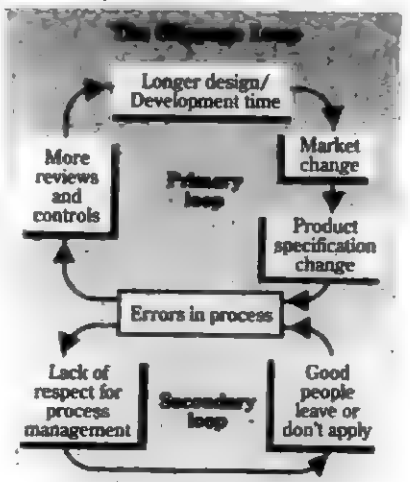
Improving performance is a system change problem, requiring simultaneous actions in multiple areas as well as vision, investments and struggle. Getting results typically involves a change process that takes six to 12 months.

Experienced guidance and external benchmarks are extremely valuable in accomplishing change quickly and confidently. Companies that have gone through this process have experienced 30% to 50% reductions in elapsed time and 20% to 40% reductions in man-years expended. Most importantly, they find that the same group of engineers become able to deliver 40% more high-quality new products each year.

The logjam can be broken. •

Charting disaster

Most software development disasters follow this classic pattern



Source: Boston Consulting Group CW Chart: Doreen St. John

UDS V.32 Modems: winners at 19.2 kbps—now FasTalk doubles the speed

From the day of its introduction, UDS' V.32 modem has gathered honors from leading computer publications and other industry watchers!

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Now comes the FasTalk V.32/42b — a modem that is specifically designed for PC applications and is fully compliant with CCITT's V.42*bis* recommendation. Meeting this standard gives the V.32/42b a maximum data rate of 38.4 kbps!

The modem is particularly useful for bit-intensive data transfers, such as engineering graphics, image processing and complex financial operations. Data Rate is automatically adjusted to 9600, 4800, 2400 or 300 bps (CCITT V.32 and V.22*bis*). At the 9600 bps rate, trellis coding gives the FasTalk V.32/42b an exceptionally high tolerance for noisy lines.

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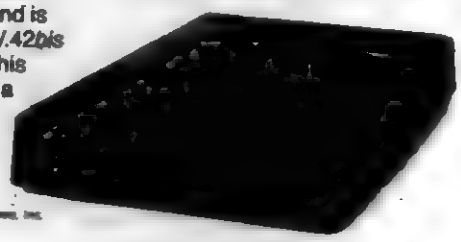

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Within weeks of telling the press that it will vigorously defend its rights in the software licenses that, it says, "are all we've got," software giant **Computer Associates International, Inc.** hauled UK-based professional services firm **Hoskyns Group PLC** into court. What's the charge? Indulging in outsourcing deals that violate CA software licenses. Not so, Hoskyns said. CA is reportedly looking to collect six-figure damages if it prevails.

■

Wrong license

Three San Diego computer retailers — **Byte & Floppy Computers, Datel Systems, Inc.** and **CCC Computers** — were fined $2,000 by the **Federal Communications Commission (FCC)** for selling personal computers that were not certified by the FCC for home use. The PCs were certified as Class A, for use in commercial environments. Class B computers, for home use, must meet more stringent requirements for suppression of radio frequency emissions that may interfere with radio and television reception.

Not many winners in this race

Makers of campaign software face trying to sell their wares in a skittish market

BY MITCH BETTS
CW STAFF

Selling computer software to politicians — for keeping track of fat-cat donors, legions of volunteers and those pesky financial reports — seemed like such a sweet idea back in the mid-1980s, when packages with names like Election Machine and Campaign Coordinator hit the market.

After all, 470 seats in Congress are up for grabs every two years, not to mention state and county races. But veterans of this market niche caution that selling software to political campaigns is a tricky game, where quite a few small-time players come and go and very few make a profit.

Arnold Winikoff knows just how brutal the market can be. He tried to sell a high-end hardware/software combo with a $20,000 price tag and discovered what economists call "price sensitivity." Prospects typically hung up the phone about 15 to 20 seconds after they heard "$20,000," Winikoff said.

With that marketing effort written off as a failure, Winikoff, president of Minneapolis-based Q.E.D., Inc., has decided to skip this year's election, downsize the system and its price and try again next year. "The wounds haven't healed from beating my head against the wall," he said.

The big campaigns for the U.S. House and Senate and state governorships seem to have a lot of money to throw around to high-priced media consultants, but not much for computers and software. Overall, politics was a $1 billion industry over the two-year cycle leading up to the 1988 elections, but software spending probably amounted to less than 5% of the total, according to John Aristotle Phillips, president of Aristotle Industries, Inc. in Washington, D.C.

"It's a tough market to break into," acknowledged Howard Langston, president of the 1-year-old Primary Systems, Inc. in Falls Church, Va. "I think we're going to make it, but there are a lot of companies out there that don't."

Indeed, the industry seems to be in a perpetual state of shakeout. Three years ago, Aristotle Industries bought competitor Campaign Software, Inc. More recently, LSW, Inc. in Landover, Md., sold its Hannibal software unit — which it had acquired in 1988 — to a group of investors led by Jim McCarthy, former president of Campaign Software and president of the new Hannibal Software, Inc. in Washington, D.C.

In addition to the acquisitions among the market leaders, there are the so-called garage-shop operations. "There are lots of small, one- or two-person operations that come in every two years and sell a half-dozen packages, and then they'll go out of business," industry pioneer Phillips said.

"Most of our customers nowadays are people who are not on their first software program. People are bringing us a database that's mangled, or the

Continued on page 95

Campaign software vendors

A sampling of campaign software vendors shows that most are willing to sell to either political party, got their start around 1986 and are located near the nation's capital

Vendor /location	Started	Partisanship
Aristotle Industries, Inc. (Washington, D.C.) **Campaign Software, Inc.** [3]	1983	
Grass Roots Systems, Inc. (Falls Church, Va.)	1986	
Hannibal Software, Inc. [4] (Washington, D.C.)	1983	
Headlee Systems, Inc. (Farmington Hills, Mich.)	1986	
Political Publishing Co. (Alexandria, Va.)	1987	
Primary Systems, Inc. (Falls Church, Va.)	1989	
SD Associates (Hartford, Conn.)	1984	
Victory Technology, Inc. (San Francisco)	1986	

1)A sampling of major vendors, not an exhaustive list 2)Commercial software sales
3)Subsidiary of Aristotle 4)Recently spun off from LSW, Inc.

CW Chart: Paul Mock

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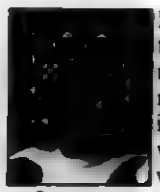
COMMENTARY

Jean S. Bozman

RDBMS: The future is still uncertain



In the universe of relational database management systems, the firmament is shifting — and it isn't all that clear which stars will rise and which will set.

Just two years ago, the brightest stars in the West Coast RDBMS world were easy to pick out: Oracle, Ingres, Sybase and Informix. As the two largest purveyors of RDBMS technology — that is, outside of IBM — Ingres and Oracle were at each other's throats back then. They traded barbs in their advertising campaigns and key executives made veiled references to "the arch-enemy" at industry conferences. Ingres styled itself as "the good guy," complete with white hats sported by attendees at the company's May 1990 user conference in Salt Lake City. Oracle, which didn't particularly seem to mind its "bad-boy" image, never flagged in its attempts to criticize its competitor across the San Francisco Bay.

THE RECENT NEWS about Ingres and Oracle has prompted a fair amount of uncertainty, but few knowledgeable observers fear an immediate impact on either companies' product lines.

Today, their duel is ancient history. Oracle, in the wake of a collision with its first major financial obstacle [CW, Sept. 24], has its worries cut out for it right in its own backyard. Ingres, which struggled along on low cash reserves for most of 1990, is now awaiting the final moves in its pending acquisition by nearby Ask Computer, Inc.

The recent news about Ingres and Oracle has prompted a fair amount of uncertainty, but few knowledgeable observers fear an immediate impact on either company's product lines. At least the near-term survival of both the Ingres and Oracle product sets is guaranteed by the time it takes to migrate data into new DBMS structures. However, uncertainty about whether that "survival" will mean the continued support of all existing products is what's sending shivers of fear down many users' spines. Right now, most users are adopting a wait-and-see attitude while nervously tapping their feet.

At Ingres, no one is sure what eventual shape the new Ask organization will take. That should become clear after the merger is finalized at the end of this month. Early reports indicate that it will be a blended entity, with much blurring of the lines around the Ingres RDBMS product and software tools. Ask's equity partners, EDS and Hewlett-Packard, which fueled the acquisition with $60 million, intend to provide vertical market applications and consulting services to Ingres users.

At Oracle, there is some question about future research and development plans. Worries about support and service surfaced at the recent International Oracle Users Group conference in Anaheim, Calif. [CW, Oct. 1]. The prospect of future financial instability is also beginning to dampen enthusiasm for Oracle products at some large sites. Users are voicing concerns about the degree of vendor dependence that a large-scale Oracle financial application would create.

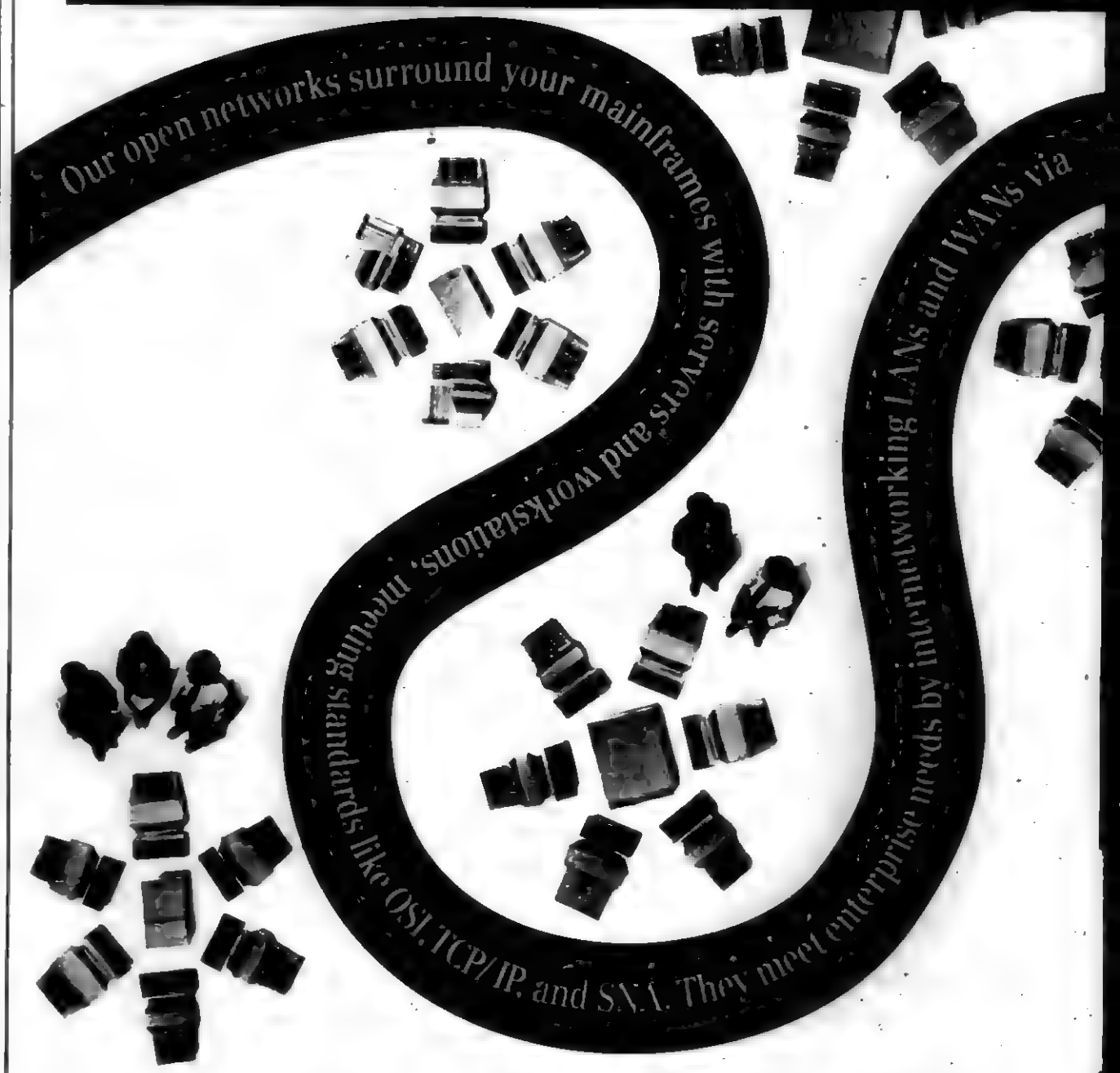
Meanwhile, a fundamental change in the way IS handles multiple DBMSs is taking place. The growing user movement toward open standards and Unix will lessen the proprietary — and therefore the profit-making — value of the raw DBMS engines. Leveraging standards, users are now able to mix and match data from multiple databases.

This technical change, along with a large installed base of nonrelational databases, helps explain why the RDBMS industry is hitting the wall. The impending recession is breeding conservatism in users' purchasing plans. In reaction, Oracle and Ingres/Ask are both shifting toward software tools and applications software. Informix recognized the trend first, as it moved to alliances with more than 2,000 value-added resellers. Even Sybase, the smallest of the RDBMS bunch, is now willing to sell its tools and its network servers independent of its database engine..

No one wants their vendor to be fighting for survival — or even for profitability. No one likes their vendor to be acquired. Most of all, no one likes to guess at the future viability of the RDBMS product that warehouses a corporation's vital sales information. Yet, we will all have to live with this uncertainty in early 1991 until a new picture of these two wounded RDBMS gladiators begins to emerge.

Bozman is *Computerworld's* West Coast bureau chief.

Networking from Unisys by tying it all together.



Winners

CONTINUED FROM PAGE 93

company's no longer in business," he added.

John Stalcup, president of San Francisco-based Victory Technology, Inc., said the short-timers typically lack the financing needed for continuing software development and nationwide marketing.

The few vendors who are making a profit in the campaign market have found that they must keep the software price below $5,000 and provide turnkey consulting services to bring in supplementary revenues. "I don't think we would be making any profit if we just sold software," said John Convy, president of Grass Roots Systems, Inc. in Falls Church, Va.

Consequently, several of the leading vendors are diversified, providing campaigns with sophisticated databases that contain not only politically relevant information on every registered voter in the state but also demographic data about them for targeting campaign mailings. Aristotle Industries has gone even further by publishing a trade magazine, *Campaign*, designed to serve as an advertising vehicle.

One problem facing companies in the industry is competition from people close to the candidate — such as a law partner, the cousin at MIT or "Uncle Buck" — who are willing to write custom software for the campaign. That may work in very small campaigns, but Uncle Buck's software will be be lacking in support, documentation, timeliness and richness of features, the vendors said.

Stalcup noted that his software has been through three revisions, 8,500 man-hours of programming and 32,000 lines of code. "Uncle Buck's not going to do that in three months," he said.

But which?

Each vendor has had to make a strategic decision about whether to sell only to candidates of one political party (see chart page 93). Close ties to one political party can be a marketing advantage, but that strategy also cuts an already-small market in half.

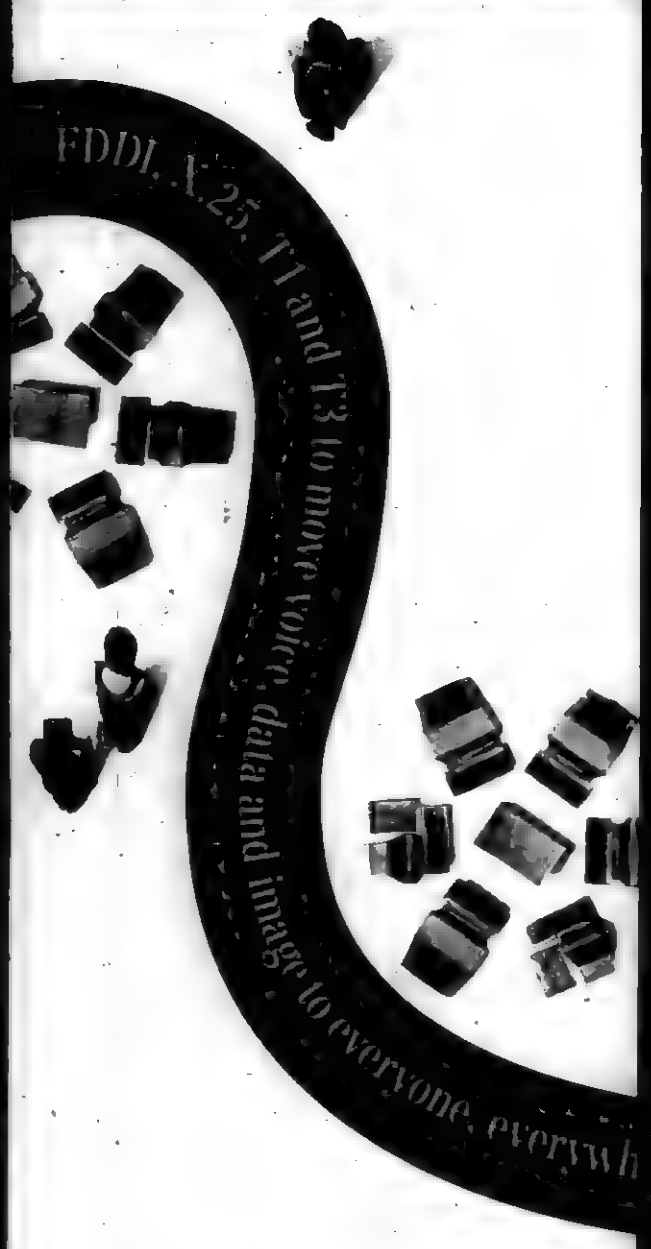
Explaining why his company works only with Democrats, Convy said, "I want people to be comfortable discussing their campaign plans . . . and sending us their donor lists for us to import into our package." However, most of the other vendors are willing to sell to either of the two parties.

"There's not a whole lot of sense in being a partisan company if you're just going to be a computer software vendor. If you're going to be a consultant as well, there are reasons to stay partisan," Langston concluded.

All of the vendors are gearing up for the big 1992 election season, when there will be a slew of competitive races brought on by redistricting and retirements, as well as the presidential campaigns.

Some of the older software packages, first written in the early 1980s, will have to be updated with graphical user interfaces and speedier processing, according to McCarthy. He said the big question for each vendor is, "do they make the investment [in rewriting the software] or do they get out of the business and move on?"

sets information free



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Software campaign

A informal survey of vendors found that the campaign software market has a variety of challenges, some of them peculiar to politics:

- **Entrenched incumbents.** Often, office-holders see little need for computers when they keep winning elections by landslides without them. For 19-term U.S. Rep. William H. Natcher (D-Ky.), who spent only $8,397 on his 1988 re-election campaign and won with 60% of the vote, a computer "would only take up valuable family-picture space on his desk," noted *Campaigns & Elections* magazine.
- **Multiple competitors.** Campaign software vendors are not only competing among themselves but also against other big-ticket campaign expenditures, mostly for television advertising and direct-mail services. In addition, some campaigns are content using conventional spreadsheet and word processing software.
- **Multiple decision-makers.** Buying decisions are usually made by two or three campaign leaders, including the campaign manager or top political consultant, the treasurer and the computer manager, according to John Convy of Grass Roots Systems.
- **Compressed timing.** A campaign is like a corporation with 300,000 records that pops up overnight and closes two years later. "One day in the campaign cycle is worth 20 corporate years," Convy said, so campaign managers expect to have their computer systems up and running virtually the day after they decide to buy them.

MITCH BETTS

Early earnings figures up despite slowdown

BY RICHARD PASTORE
CW STAFF

The first rush of third-quarter earnings showed the rich getting richer, the perennial also-rans running stronger and one behemoth still struggling to build momentum.

Outstanding numbers from **Microsoft Corp.** would seem blase by now if not for the fact that the company remains one of the few consistent bright spots in the industry. This quarter, the leading personal computer software vendor was buoyed by revenue from Windows 3.0, which caught fire upon release earlier this year.

1990 third-quarter earnings

Most companies experienced double-digit earnings gains

AST	$136.3M	18%	$11.4M	293%
Cypress Semiconductor	$55.6M	7%	$8.3M	4%
Microsoft	$360.4M	57%	$87.6M	77%

*Parentheses indicate a reduction or loss

CW Chart: Doreen St. John

However, Microsoft's smaller competitors are not rolling over and playing dead. Toiling in the shadows of the big guys for years, **Borland International** is finally seeing its products gain significan: penetration into the PC applications market.

Borland's Quattro Pro spreadsheet, a new version of which shipped last week (see story page 14), and Paradox database management software packages in particular are logging hefty sales gains at the expense of Lotus Development Corp. and Ashton-Tate Corp., according to surveys by Computer Intelligence in La Jolla, Calif. [CW, Oct. 15]. The copyright infringement lawsuit that has been lodged by Lotus has not seemed to dissuade many users from embracing the Borland products.

Another so-called second-tier player, **AST Research, Inc.**, again posted double-digit gains despite single-digit prospects for overall PC sales growth. AST is doing it largely on the strength of high-end PC sales.

"Increasing sales of higher performance systems — our Premium 386 and 486 computers — continue to provide AST with growth in both revenue and earnings," AST President Safi Qureshey said.

Machines based on Intel Corp.'s 80386 chip accounted for 60% of the quarter's sales at AST, a 77% increase over the comparable period last year, the company said. Intel I486-based sales also grew 20% from the preceeding quarter.

Not all good news

The news was not so cheery at veteran systems maker **NCR Corp.** Though revenue was up 9% for the quarter, net income dipped, prompting Chief Executive Officer Charles Exley Jr. to downgrade his expectations for the year.

"We still expect to achieve growth in revenue and earnings per share for the full year," Exley said.

However, "As a result of disappointing U.S. order levels in the second and third quarters, it now appears unlikely that we will achieve net income growth for the full year," he said.

NCR suffered a "considerable decline" in U.S. orders while noting a gain in overseas orders. Unfortunately, excluding currency adjustments on backlogged orders, the U.S. dollar value on worldwide orders declined during the quarter, Exley revealed.

Chicago-based **Arthur Andersen & Co.** had an exceptionally good year, the company reported at its annual worldwide partners' meeting in San Francisco last week. For the year ended Aug. 31, Andersen's total revenue rose 23% to $4.16 billion from $3.38 billion the year before.

While Andersen's audit and business consulting operation grew 18% to $2.28 billion, the greatest growth was in its other business unit, Andersen Consulting, which grew 30% compared with the previous year to $1.88 billion. Total worldwide personnel increased at the company to 56,800 from 51,400, and the number of worldwide partners increased to 2,292 from 2,134.

One of the first chip makers to report, **Cypress Semiconductor Corp.**, heralded the news of better things to come. Belying the purported industry slowdown, Cypress experienced record demand for its products. The company posted its second-best quarter ever for new orders, according to Cypress President T. J. Rodgers.

XEROX

Motorola wrote the book on cellular phones. A Xerox system lets them rewrite it in minutes.

Motorola is the world's largest producer of cellular phones. Not to mention cellular phone manuals. For which they turn to a company called Rich Graphics.

But when Motorola decided they wanted to be able to revise and reprint their manuals on a "just-in-time" production schedule, Rich Graphics turned to Xerox.

Working with Rich Graphics, Xerox developed a solution that integrated both hardware and software, Xerox products and other suppliers' products. And the resulting phone manual production is something to talk about—to say the least.

The manuals are now printed on Xerox laser printers just minutes after the revisions flash across the screen of a Xerox workstation. Turnaround time is 80% faster. Costs are down 50%. And the documents produced are 99.99966% perfect.

Of course, Motorola isn't the only client that Rich Graphics uses Xerox for. And the resulting improvement in customer satisfaction has helped Rich Graphics *double* their printing business every year since they came to Xerox.

Which just goes to show that a partnership with Xerox can also help a company rewrite its bottom line.

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Making the leap to academia: Take care

BY SHERYL KAY
SPECIAL TO CW

Being the first to formulate ideas and pass them on to others was part of Jack Rockart's motivation to leave IBM 25 years ago and join the faculty at MIT in Cambridge, Mass. He is now the director of the Center for Information Systems Research at MIT's Sloan School of Management.

Two years ago, Bruce Kavin achieved the vice-presidency of information services for a division of The Dun and Bradstreet Corp. but found himself working considerably more than the average work week and enjoying it less. After these first stages of burnout, Kavin decided to pursue a Ph.D. in MIS at the University of Georgia in Athens and, upon completion, seek a university faculty position.

After 13 years at Control Data Corp., Michael Smith chose to head into the academic world where, he says, there is more of an emphasis on leading-edge technology and research. He is currently the associate director of computer operations at the National Center for Supercomputing at the University of Illinois.

Making the switch

However, IS professionals considering a move to academia must be strongly motivated; it's a major career change, a different culture, and many allowances have to be made.

First, IS executives may find it difficult to reverse direction if they find the academic world is not for them, says Dianne Edmondson, president of systems recruiting firm ACP, Inc. in Denton, Texas. "I've never had a client say 'my ideal candidate would come out of academia,' " she says. Companies would prefer to hire someone from an environment similar to their own, such as a competitor. Many firms, she continues, believe the old saying "those who can't do, teach" and will view a faculty position negatively. "And although that obviously isn't true, we are talking about perceptions, not reality," she says.

A second major consideration is salary. The average nine-month salary for an industry executive entering the teaching profession at a university (holding a Ph.D., of course) ranges from $36,000 to $55,000. Those with 10 or more years of university-level teaching experience can expect anywhere from $60,000 to $90,000. These industry executives are often leaving jobs that carry six-figure incomes.

Third, obtaining a Ph.D. — which can take upwards of three years or more — is essential if you're interested in becoming a professor at a top-level university. Some of these schools will hire a nondoctoral degreed teacher but will treat him like a second-class citizen, according to Kavin. Without a Ph.D., he would have been referred to as a visiting executive or something similar, he says.

If you're heading into research, you must publish articles in industry journals as well as academic treatises, says Lewis Leeburg, a 31-year veteran of IBM who is now teaching at the University of California, Los Angeles. This should be done while in the corporate world and during doctoral studies, says Leeburg, who learned that his publications list was on the lean side.

Leeburg says he was able to obtain a lectureship position — not a tenured faculty track position. Therefore, he is not eligibile for a professorship, does not have sabbatical rights and can't vote in the academic senate.

Cultural adjustments

Seven years later and now the director of the IS research program at the Anderson Graduate School of Management at UCLA, Leeburg says that possibly the most difficult adjustment was the cultural change.

When Leeburg first started teaching in 1983, he says, he was "scared to death." He had taken over someone else's syllabus and says that he felt a little lost. "I had been making presentations for years at IBM, but the nature of the audience is totally different in a university classroom. By the end of the first quarter, I was no longer scared to death, but it took me about three years before I felt totally in the groove," he says.

An adjustment Rockart is still dealing with is the slower pace. "Everything in academia is longer term," he observes, "and the rewards may not be as visible or as concrete."

Also, Leeburg finds that universities are more frugal when it comes to travel and reimbursement expenses, while companies are flexible.

"They understand you may not always have a receipt for, let's say, a call from a telephone booth, whereas a university might view a $10 dinner as being expensive and unnecessary," he says.

Common denominators

Whatever the motivation for these former IS executives — burnout, wanting to work on the leading edge of technology — a common goal they all share is the desire to mentor and work in a learning environment.

"One of my favorite tasks at D&B was developing subordinates and mentoring, which, in academia, I can do full-time," Kavin says.

"What really turned me on at IBM was the learning, not the money," Rockart says. After four years, however, he felt most of the learning was behind him at IBM, while with a job in academia, he would be in a teaching/learning environment forever.

Although teaching is secondary to Rockart's research duties, he says, "I get a kick out of working with young, bright people who are hungry to learn."

Maxine Rockoff, a senior administrator for the Carnegie Commission in Manhattan, reaps the advantages from both worlds. In her current consulting position with the commission, Rockoff maintains a corporate-level income, while her part-time teaching positions at New York University and the Polytechnic Institute of New York fulfill her desire to teach. "I love doing something that matters," Rockoff says.

Kay is a Tampa, Fla.-based business consultant and free-lance writer specializing in emerging technologies and human resources.

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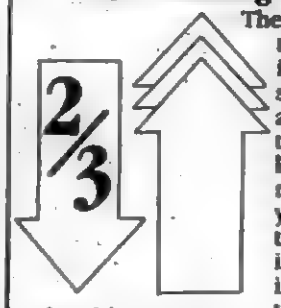
A few important tips on recruiting computer professionals

Finding computer talent isn't as easy as it used to be. In fact, there was a time when you'd just run an ad in the local newspaper and you could make a hire without waiting too long or spending too much.

But times have changed. And like so many facets of today's business, so has the effectiveness of traditional recruiting methods.

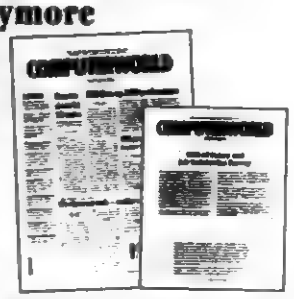
What's more, many of today's recruiters *don't use* today's most efficient methods — methods that save time and money for some widely unknown reasons.

The supply of qualified professionals isn't meeting demand



The American Council on Education reports that the number of college students choosing computer careers is down two-thirds since 1982. To make matters worse, there are more computers in today's business that require the skills of this shrinking market than ever before. And while you may never consider the company next door your competitor, it likely *is* competing for the same computer talent today. The result is a classic supply/demand problem that isn't changing for the better -and that's sure to make your recruiting tougher in the '90s.

Ads in local papers don't reach your major hiring market anymore



That's because they generally reach "active" job seekers — those who actively seek out the local newspaper to find jobs — and who a recent *Computerworld* job satisfaction survey found to represent 2 in 10 of today's computer professionals. The study also found that 7 in 10 of today's computer professionals are "passive" job seekers — those who would *consider* new job options, but likely never look for them in the local newspaper. (The remaining small percentage are "non-movers" content with long-term jobs.)

For every 10 of today's computer job seekers . . .
2 are Active
7 are Passive
1 is a Non-mover

In short, this means that your ad in today's local newspaper reaches no more than 20 percent of today's computer job seekers. What's worse, if you're not using other vehicles that reach far more job seekers, your local newspaper expenses are as inefficient as their limited audience.

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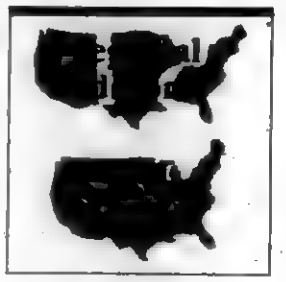

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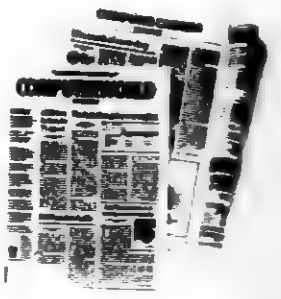

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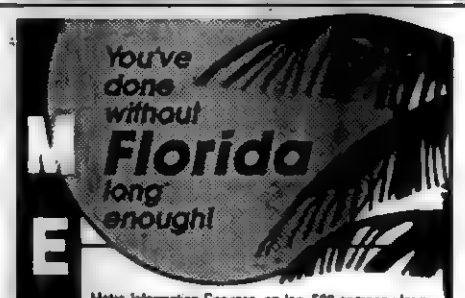

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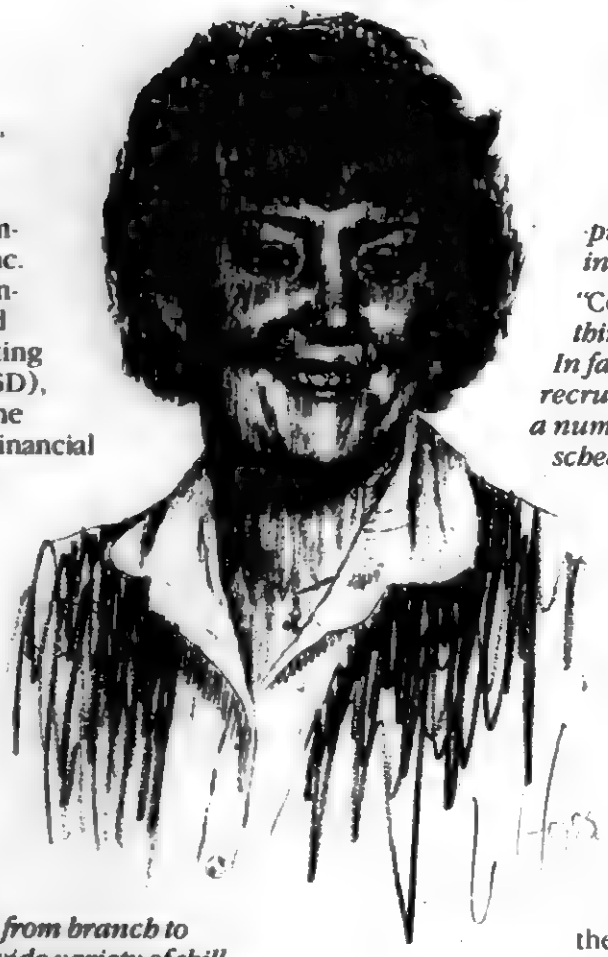

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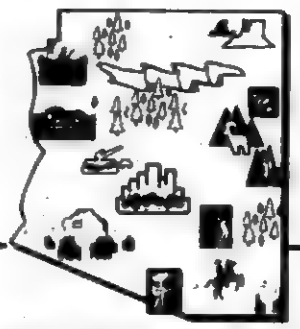

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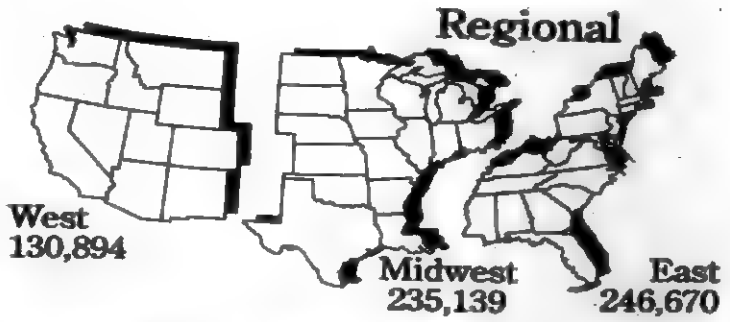

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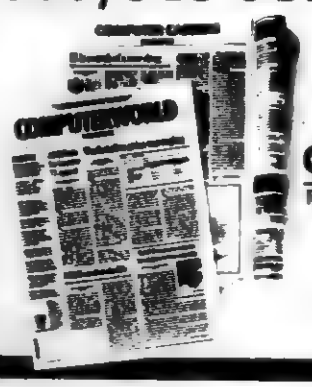

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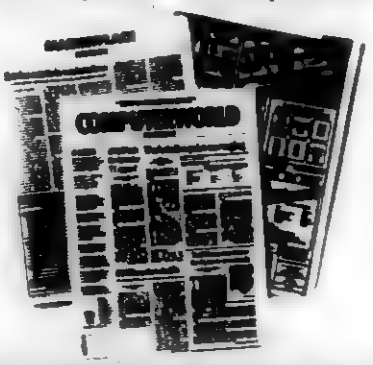

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Computer leasing in Europe: Getting a handle on the rules

BY NORM BARTLETT
SPECIAL TO CW

During the past two decades, European computer leasing companies have undergone a transition similar to those in the U.S. The free-and-easy entrepreneurial approach of the '70s gave way to the mergers-and-acquisitions era of the '80s. Because of this shift, leasing firms of the '90s are following stock exchange disclosure rules more strictly and adopting more traditional accounting practices. What follows is an overview of leasing procedures — European style.

Banks, which play a much larger role in European leasing than in the U.S., control several computer lessors. These firms have handled changes in the computer marketplace with confidence because of ready access to substantial funding from the owning banks.

Leasing in most European countries ranks alongside bank borrowing and other forms of medium-term credit for financing. Thus, leasing companies are offering attractions to the customer such as planning, software applications, maintenance and other things competitors can't offer.

Operational leasing — leasing for a fixed period without obligation to purchase — has steadily become more popular than financial leasing. Operational leasing is preferred at times of business uncertainty or when new products are expected from computer suppliers.

Finance charges are a big factor in European leasing rates. These differ widely from country to country. Rates are partly determined by national economic policies as a means of controlling money supply (thus, inflation) and exchange rates (thus, international competitiveness). These aspects affect the level of economic activity through availability of credit, price of exports on the international market and cost of imports on the domestic market.

European leasing facts

- *In 1989, Europeans users spent approximately $55 billion on computers and equipment — 17% of which is attributed to leasing companies, according to New York market research firm Frost & Sullivan.*
- *Europe's largest lessor is IBM, followed by Hewlett-Packard Co., ICL and Nixdorf Computer Corp.*
- *The most significant U.S.-controlled computer lessors in Europe are Bell Atlantic Corp., Bellsouth Corp. (Datavery) and Comdisco, Inc.*

The largest independent lessor in Europe until April 1990 was Atlantic Computer. In that month, the chickens from its controversial "flexlease" scheme came home to roost, and the receivers were called in. The collapse was big enough to sink its parent company, British & Commonwealth Holdings. The biggest European independent leasing company now operating is ECS, a subsidiary of French bank Societe Generale.

Belgium is one of the few countries that has a clear legal basis for leasing, restricted to industrial products used in the way of business. Office equipment and computers make up about one-third of all leasing. The largest leasing firms are subsidiaries of the Big Three Belgian banks.

French leasing is strictly supervised. Firms involved must be banks or other qualified financial bodies, although operating leases are entirely outside the regulated French leasing business.

The Finanzministerium lays down detailed rules for leasing in Germany. For example, a lease must last for at least 40% and not more than 90% of the depreciated life of the asset. The life of the asset is laid down in the federal tax tables, which list the depreciation rates for virtually every type of equipment that a firm could acquire. For a computer, it is five years.

In contrast to the general tendency in other countries for operational leases, Italian firms prefer financial leases. Vendor leasing is quite important in the office equipment sector, where Ing. C. Olivetti & Co. dominates the market.

The Dutch take a pragmatic view of leasing and consider economic benefit to be more important than legal ownership. The fiscal advantages of leasing have been steadily draining away in the Dutch market since 1986, so that there has been no dramatic growth in leasing.

The conduct of the Spanish leasing market is still dominated commercially and financially by banks and banking subsidiaries. Because Spanish firms are very anxious to copy the successes of firms in other countries, computer leasing has experienced rapid growth.

A major problem that Swedish leasing firms have faced in recent years has been the blow-hot, blow-cold attitude of the government. In 1983, after almost trebling from the previous year, leasing came in for a period of control, which caused the business to halve in 1984. Regulations were relaxed in 1985, and leasing expanded.

Leasing was slow to become accepted in Switzerland mainly because of conservative attitudes of financing.

The UK was a boom town for fast-growing leasing companies in the 1980s. The rise and fall of Atlantic Computers says it all. British leasing in the future will be dominated by suppliers and banks.

This verdict on the UK is true of the continent as a whole. As the Open Market of 1992 approaches, the European Commission will be imposing rules on the tax and accounting treatment of leases, which will strengthen the role of bankers and other institutions even more.

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Bartlett is a researcher and journalist based in Chelmsford, England, who specializes in European computer topics.

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	Closing price	Recent high	Recent low
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XT Model 086	$500	$550	$350
XT Model 089	$550	$725	$400
AT Model 099	$900	$1,075	$850
AT Model 239	$975	$1,025	$700
AT Model 339	$1,025	$1,300	$900
PS/2 Model 30-286	$1,250	$1,300	$1,125
PS/2 Model 60	$1,500	$1,800	$1,400
PS/2 Model 70P	$3,375	$3,400	$3,175
Compaq Portable II	$975	$1,050	$875
Portable 286	$1,275	$1,450	$1,100
SLT 286	$2,600	$2,625	$2,000
Portable 386	$2,700	$3,000	$2,500
LTE 286	$2,000	$2,100	$1,850
Deskpro 286	$1,375	$1,400	$1,200
Deskpro 386/20	$2,900	$3,100	$2,400
Apple Macintosh 512	$375	$775	$275
512E	$450	$450	$350
Plus	$900	$1,075	$800
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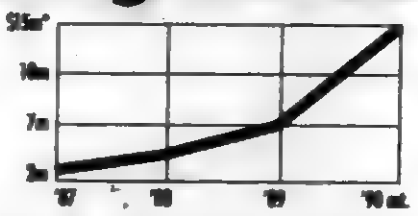

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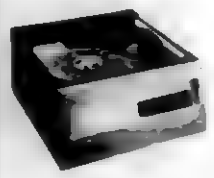

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Stimulating students

Technology-delivered instruction can spice up training sessions

BY JESSICA KEYES
SPECIAL TO CW

How many of you remember sitting in a classroom and watching one of those boring filmstrips? The lights are dim, the fan from the projector is hypnotically whirring, and a voice, somewhere in the darkness, is speaking in a very soothing monotone. Just about the only thing keeping you awake is the piercing beep between each slide frame.

As a former schoolteacher, I've learned to keep teaching interesting and interactive. From performing magic tricks for the class to having the class construct towers made of Lego blocks, the method to this madness is stimulation. But lack of stimulation seems to be the problem with most technology-delivered instruction (TDI) programs today.

TDI, an acronym coined recently by the computer training industry, encompasses computer-based training (CBT), video, interactive video, multimedia and more. In trying to understand the role of TDI in corporate training, the National Training and Computer Project (NTCP) in Raquette Lake, N.Y., conducted a survey of 250 computer training managers. The survey unearthed the following:

- Some 97% of those surveyed were using TDI.
- The most popular form of TDI is video; the second most popular is CBT.
- 100% of the respondents were interested in interactive video, but only 13% had actually implemented an interactive video training program.
- Instructor-led training continues to be the No. 1 mode of instruction, with TDI coming in second place. Most managers surveyed indicated that they plan to move in the TDI direction in the next year or two.
- Even though management viewed TDI as cost-effective, the survey showed that there was some resistance to using it.

The last finding is probably the most revealing. If TDI is gaining in popularity, why the resistance? For the most part, training department forays into TDI have been at the low end — video, audio or CBT. While this path is certainly the cheapest, it is also the least interesting for the user.

Time and time again it's been proven that a rich learning environment will stimulate the learner to absorb more and retain this new information longer. Thus, information systems managers and trainers should look at each of the instructional methods and decide which would be the most effective.

Video training. These programs are usually characterized by what is known as "talking heads" and floating text on the video screen. The video camera pans in on the face of the lecturer (the talking head) half of the time, and the video screen is filled with a large image of a computer screen with text-based examples floating by the rest of the time. This sort of training is not sufficient for intensive instructional sessions. On the other hand, it's great for general "getting started" tutorials and refresher courses.

Interactive video. Interactive videos are definitely one step up from training videos. The student views a segment of the video and is then asked to respond to certain questions. Depending on his responses, the student jumps to a different segment of the video. Basically, this is self-paced instruction — but it still uses "talking heads."

CBT. This form of TDI is currently experiencing the largest growth, spurred by the increasing number of personal computer-based training products. If you go to a computer store, you'll find at least a dozen CBT products that can teach everything from word processing, the C programming language and typing. Here, the student interacts directly with the computer. But as interactive as it is, it's still text-based.

Expert systems. Expert systems have joined the fold of TDI. Increasingly, expert instructional systems are being built with the purpose of providing much more than just standard instruction. The goal is to provide an automated expert so that the student is learning from a recognized master. At IBM's Sterling Forest, N.Y., facility, an expert system is being developed that can teach security guards how to fix broken security doors. The system can instruct guards in all facets of this technical task in a step-by-step manner.

Multimedia. The biggest bang for the TDI buck will come from multimedia. Multimedia is the latest buzzword on the horizon. It is about as high-tech as it gets, with a combination of video, audio, text and graphics that produce one integrated system. What this entails is all forms of TDI combined into one visually glorious and stimulating system.

Instructor-led training. The NTCP survey reveals that instructor-led training is the most popular method of teaching outside of the TDI realm. Therefore, why not take advantage of its acceptance through videoconferencing? If a company has a large number of employees to train, the norm has always been to offer the course many times to accommodate the large registration. While start-up costs for videoconferencing are high, in the long run, it is actually less expensive than paying for airfare and hotels when course locations are widely distributed.

High-tech training systems can help IS managers and trainers invigorate the learning process and put some pizzazz into corporate technical training. However, they must use the best method for each circumstance, or the trainees will lose interest — fast.

Keyes is president of New Art, Inc., a management and computer consulting firm in New York.

? What training issues would you like to see covered? Call Cathy Duffy, associate editor at *Computerworld*, at (800) 343-6474 or fax at (508) 875-8931.

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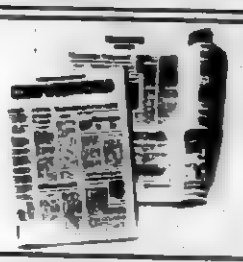
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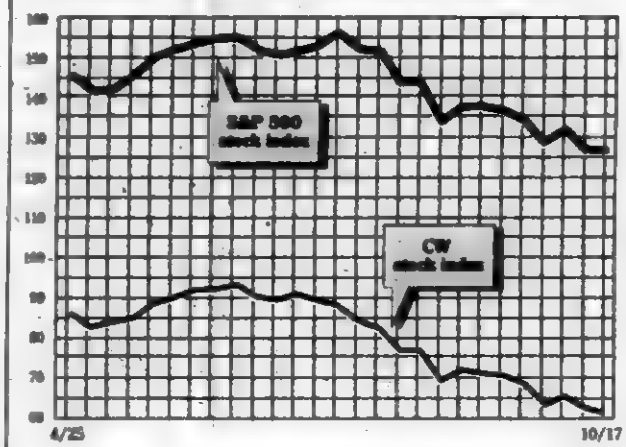
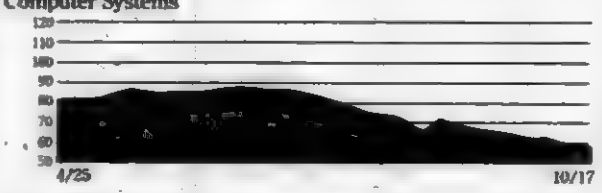


Indexes	Last Week	This Week
Communications	96.9	95.1
Computer Systems	60.1	59.8
Software & DP Services	86.3	86.6
Semiconductors	36.3	35.5
Peripherals & Subsystems	67.3	65.6
Leasing Companies	53.6	50.4
Composite Index	61.8	60.5
S&P 500 Index	126.9	126.2

Communications

Computer Systems



Software & DP Services

Semiconductors

Peripherals & Subsystems

Leasing Companies

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Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, OCT. 17, 1990

EXCH		52-WEEK RANGE		PRICE CLOSE OCT. 17, 1990	WEEK NET CHNGE	WEEK PCT CHNGE
	Communications and Network Services					
N	AMERICAN INFO TECHS CORP	68	53	63.5	1.6	2.6
Q	AMDREW CORP	28	16	16.5	0.0	0.0
Q	ARTEL COMM CORP	10	2	2	-0.4	-15.8
N	AT&T	47	30	30.875	-0.3	-0.8
Q	AVANTEK INC	5	2	1.688	-0.1	-3.5
N	AYDIN CORP	20	10	10.5	-1.0	-8.7
N	BELL ATLANTIC CORP	57	40	49.25	2.8	5.9
N	BELLSOUTH CORP	59	49	52	1.3	2.5
Q	COMPRESSION LABS INC	16	7	12.125	-2.4	-16.4
Q	CONTEL CORP	36	23	32.875	1.1	3.5
Q	DATA SWITCH CORP	4	2	2.875	0.0	0.0
Q	DIGITAL COMM ASSOC	27	9	9.25	0.0	0.0
Q	DYNATECH CORP	19	12	12.25	-0.4	-3.0
Q	FIBRONICS INTNL INC	13	5	6.5	0.5	8.3
Q	GANDALF TECHNOLOGIES	6	2	2.375	0.0	0.0
N	GENERAL DATACOMM INDS	6	2	2.125	-0.3	-10.5
N	GTE CORP	36	24	27.375	1.0	3.8
Q	INFOTRON SYS CORP	10	2	2	-0.3	-11.1
N	ITT CORP	61	40	41.125	-1.3	-2.9
N	M A COM INC	7	3	4.125	-0.1	-2.9
Q	MCI COMMUNICATIONS CORP	48	28	29.625	-2.9	-8.8
N	NETWORK EQUIP TECH INC	34	5	5.875	-0.6	-9.6
Q	NETWORK SYS CORP	15	7	8.75	0.1	1.4
N	NORTHERN TELECOM LTD	30	21	22.75	-0.8	-3.2
Q	NOVELL INC	29	12	20.875	-0.6	-2.9
N	NYNEX CORP	82	68	71.125	-3.0	-4.0
A	PACIFIC TELESIS GROUP	52	36	44	1.6	3.8
A	PEIREL CORP	9	5	4.75	-0.1	-2.6
N	SCIENTIFIC ATLANTA INC	29	12	14.75	2.0	15.7
N	SOUTHWESTERN BELL CORP	65	47	53.625	1.9	3.6
Q	3 COM CORP	19	6	6.625	-0.8	-10.2
N	U S WEST INC	41	32	36	1.0	2.9
	Computer Systems					
Q	ALLIANT COMPUTER SYS	9	1	1.5	0.0	0.0
Q	ALPHA MICROSYSTEMS	5	1	1.5	0.1	9.1
Q	ALTOS COMPUTER SYS	8	5	8.25	0.0	0.0
A	AMDAHL CORP	19	10	11.5	0.4	3.4
Q	APPLE COMPUTER INC	50	24	26.5	0.0	0.0
N	AST RESH INC	25	8	16.5	-0.8	-4.3
N	BOLT BERANEK & NEWMAN	8	4	4.625	-0.3	-5.1
N	COMPAQ COMPUTER CORP	68	38	38.75	0.0	0.0
N	COMMODORE INTNL	12	5	5.875	-0.4	-6.0
Q	COMPUTER AUTOMATION INC	6	0	0.813	-0.2	-18.7
N	CONTROL DATA CORP	22	8	9	-0.5	-5.9
N	CRAY RESH INC	51	20	23.5	1.5	6.8
N	DATA GEN CORP	15	4	4.625	-0.3	-5.1
N	DATAPOINT CORP	5	1	1.375	0.3	22.2
Q	DELL COMPUTER CORP	14	5	9.75	1.1	13.0
N	DIGITAL EQUIP CORP	95	46	46.75	-0.3	-0.5
N	FLOATING POINT SYS INC	4	0	1.375	-0.3	-15.4
N	HARRIS CORP	38	18	15.375	-1.9	-10.9
N	HEWLETT PACKARD CO	51	26	27.75	-0.5	-1.8
N	HONEYWELL INC	112	71	75.75	0.9	1.2
N	IBM	123	93	100.75	-2.8	-2.7
Q	INFORMATION INTL INC	14	9	9	-0.1	-1.4
Q	IPL SYS INC	14	5	8.25	-0.8	-8.3
N	MAI BASIC FOUR INC	5	1	1.25	-0.3	-16.7
N	MATSUSHITA ELEC INDL LTD	167	116	148	9.9	7.1
Q	MENTOR GRAPHICS CORP	26	9	10.125	0.1	1.3
N	NBI INC	1	0	0.141	0.0	-9.6
N	NCR CORP	72	45	45.125	-8.0	-15.1
Q	PYRAMID TECHNOLOGY	36	14	16	0.8	4.9
Q	SEQUENT COMP SYS INC	34	13	18	2.3	14.3
Q	SUN MICROSYSTEM INC	37	15	21.5	3.8	21.1
Q	SYMBOLICS INC	2	0	0.313	0.0	0.0
N	TANDEM COMPUTERS INC	30	10	10.875	1.3	13.0
N	TANDY CORP	46	24	25.125	-0.3	-1.0
N	ULTIMATE CORP	10	3	3.25	0.0	0.0
N	UNISYS CORP	19	3	3.75	-0.3	-6.3
A	WANG LABS INC	6	3	2.875	-0.3	-8.0
	Software & DP Services					
Q	AMERICAN MGMT SYS INC	20	11	14	0.0	0.0
Q	AMERICAN SOFTWARE INC	18	8	8.375	0.8	9.8
N	ANACOMP INC	5	1	1.375	-0.4	-21.4
Q	ANALYSTS INTL CORP	24	10	11.5	1.0	9.5
Q	ASHTON TATE	15	5	6.875	0.5	7.8
Q	ASK COMPUTER SYS INC	10	4	5.25	0.6	13.5
N	AUTO DATA PROCESSING	60	44	48.875	1.9	4.0
Q	AUTODESK INC	60	32	35.75	3.3	10.0
Q	BMC SOFTWARE INC	30	16	19.25	0.0	0.0
N	BUSINESSLAND INC	12	1	2	0.1	6.7
Q	COGNOS INC	10	4	5.5	-0.4	-6.4
N	COMPUTER ASSOC INTL INC	17	4	5.625	0.4	7.1
Q	COMPUTER HORIZONS CORP	17	8	11.75	0.8	6.8
N	COMPUTER SCIENCES CORP	59	37	38.25	-2.3	-5.6
N	COMPUTER TASK GROUP INC	12	8	8.125	-0.5	-5.8
Q	COMSHARE INC	25	14	15.5	-0.5	-3.1
Q	CORPORATE SOFTWARE	16	6	6.5	-0.8	-10.3
N	GENERAL MTRS (CLS E)	38	24	32.75	0.5	1.6
Q	GOAL SYSTEMS INTL	18	10	9.75	0.3	2.6
Q	HOGAN SYS INC	7	2	2.5	-0.1	-4.8
Q	INFORMIX CORP	18	4	5.375	0.9	19.4
Q	INTELLICORP INC	8	2	2	-0.6	-23.8
Q	LEGENT CORP	31	17	17.25	0.0	0.0
Q	LOTUS DEV CORP	39	13	14.5	-1.3	-7.9
Q	MICROSOFT CORP	61	38	56.5	-3.0	-5.0
Q	NATIONAL DATA CORP	35	8	8.75	-0.3	-2.8
N	ON LINE SOFTWARE INTL INC	11	5	4.625	-0.4	-7.5
Q	ORACLE SYS CORP	188	5	6.125	0.1	2.1
N	PANSOPHIC SYS INC	19	8	8	-1.0	-11.1
Q	PHOENIX TECHNOLOGIES INC	5	2	1.875	0.3	15.4
N	POLICY MGMT SYS CORP	43	30	34	-1.5	-4.2
Q	PROGRAMMING & SYS INC	25	12	13.75	0.8	5.8
Q	RELATIONAL TECH INC	10	3	8.625	0.1	1.5
N	REYNOLDS & REYNOLDS CO	27	12	12.125	-1.8	-12.6
Q	SAGE SOFTWARE INC	16	8	9.625	-0.3	-2.5
Q	SEI CORP	22	15	15.25	0.3	1.7
Q	SHARED MED SYS CORP	17	12	15.375	-0.4	-2.4
Q	SOFTWARE PUBS CORP	28	14	16.75	1.0	6.3
N	STERLING SOFTWARE INC	11	6	6.75	0.8	12.5
Q	SUNGARD DATA SYS INC	28	15	15	0.0	0.0
N	SYSTEM CENTER INC	25	6	8.5	0.0	0.0
N	SYS. SOFT INC	29	13	16.75	2.9	20.7
Q	WORDSTAR	2	1	0.813	-0.2	-18.7
	Semiconductors					
N	ADV MICRO DEVICES INC	11	4	3.75	-0.1	-3.2
N	ANALOG DEVICES INC	10	6	5.75	-0.3	-4.2
Q	ANALOGIC CORP	11	8	8.25	0.0	0.0
Q	CHIPS & TECHNOLOGIES INC	25	6	6	-1.3	-17.2
Q	INTEL CORP	52	28	32	2.3	7.6
Q	MICRON TECHNOLOGY INC	16	7	7.375	-0.1	-1.7
N	MOTOROLA INC	88	52	54	1.0	1.9
N	NATL SEMICONDUCTOR	9	3	3.125	-0.3	-7.4
N	TEXAS INSTRS INC	44	23	24.375	0.1	0.5
A	WESTERN DIGITAL CORP	16	6	5.25	0.0	0.0
	Peripherals					
Q	ALLOY COMP	2	0	0.375	-0.1	-25.0
N	AM INTL INC	6	1	1.25	-0.1	-9.1
Q	AUTO TROL TECH CORP	4	2	2	-0.3	-11.1
Q	BANCTEC INC	24	13	13.25	0.5	3.9
A	COGNITRONICS CORP	8	3	6	0.0	0.0
Q	CONNER PERIPHERALS	31	11	17.125	1.5	9.6
A	DATARAM CORP	22	8	9.125	-0.4	-3.9
N	EASTMAN KODAK CO	46	34	37.125	2.1	6.1
N	E M C CORP MASS	7	3	6	0.4	6.7
Q	EMULEX CORP	8	4	5.125	-0.5	-8.9
Q	EVANS & SUTHERLAND	35	18	18.25	-2.8	-13.1
Q	ICOT CORP	2	0	0.375	-0.2	-33.4
Q	INTERLEAF INC	8	3	3.5	0.5	16.7
Q	IOMEGA CORP	6	3	4.188	-0.2	-4.3
Q	MASSTOR SYS CORP	3	1	0.563	-0.1	-18.2
Q	MAXTOR CORP	17	4	5.125	0.4	7.9
Q	MICROPOLIS CORP	10	3	5.25	-0.8	-12.5
N	MINNESOTA MNG & MFG CO	91	71	75.125	-0.8	-1.0
Q	PERSONAL COMP PRODUCTS INC	5	4	3.688	-0.1	-1.7
Q	PRINTRONIX INC	15	8	8.375	-3.6	-30.3
N	QMS INC	21	9	10.125	0.0	0.0
Q	QUANTUM CORP	26	9	14.9	0.3	1.8
N	RECOGNITION EQUIP INC	8	4	5	0.0	0.0
Q	REXON INC	10	4	4	-0.6	-13.5
Q	SEAGATE TECHNOLOGY	20	8	8.125	0.0	0.0
N	STORAGE TECH CORP	35	11	13.5	1.8	13.7
Q	TANDON CORP	4	1	1.688	0.1	3.9
N	TEKTRONIX INC	19	12	14.875	1.1	8.2
Q	TELEVIDEO SYS INC	1	0	0.25	0.0	14.2
N	XEROX CORP	83	30	30.75	-2.5	-7.5
	Leasing Companies					
N	CAPITAL ASSOC INTNL INC	5	1	0.75	-0.3	-28.4
N	COMDISCO INC	31	15	16.25	-0.5	-3.0
Q	LDI CORPORATION	18	11	10.5	-0.3	-2.3
Q	PHOENIX AMERN INC	5	3	4.813	0.0	0.0
Q	SELECTERM INC	7	3	3.5	0.3	7.7

EXCH: N—NEW YORK; A—AMERICAN; Q—NATIONAL

High notes

Tech stocks sing happy tunes after weeks of playing the blues

Many technology firms were singing good news last week, and positive earnings reports were beautiful music to the ears of stock market investors. Software maker Adobe Systems, Inc. warbled the loudest, belting out a 5¾-point gain to close Thursday at 24½; a great cast of other tech stocks also turned in star performances.

Hardware giant Digital Equipment Corp. announced quarterly earnings to the tune of 21 cents per share, higher than many analysts' expectations. DEC stock soared to 51 Thursday, up 4¼ points for the week. Rival IBM rang out with an increase of 5⅛ points to 105⅝, and Compaq Computer Corp., proclaiming a new Intel Corp. 80386-based laptop personal computer and price slashes on desktop models, roared a powerful 5¼-point gain to reach 42.

Cray Research, Inc., after an abysmal recent performance, regained its composure last week and scaled up to 24½ — a climb of 2⅛ points. NCR Corp., however, screeched out a sour note among systems companies. Reporting a decline in domestic orders, NCR sank 3½ points for the week, closing at 46½.

Microsoft Corp., declaring big earnings gains, chimed in with Adobe in leading the software surge. Microsoft jumped 4⅛ points to 61⅛. Despite a 46-cent-per-share loss in earnings for Sanna Corp., its stock hopped up to finish at 11½, up 2⅛ points. Lotus Development Corp. settled its legal squabbles with Paperback Software International, Inc. and crooned a ¾-point gain to close at 15.

Among semiconductor firms, Intel scored consistent gains to add 4 points for the week, despite a minor setback in its dispute with Advanced Micro Devices, Inc. (AMD). Intel recorded a closing value of 34 points. AMD, meanwhile, dropped ⅛ of a notch to 3⅛. Motorola, Inc. jumped 1⅛ points to 55⅛.

MCI Communications Corp., absorbing network upgrading costs in its quarterly statement, plummeted 2½ points to 27⅛.

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NEWS SHORTS

DG contract probed

Data General Corp. has encountered another stumbling block on its way to deliver Aviion Unix-based workstations to the U.S. Geological Survey. A much-needed $127 million contract was restored to DG recently by the U.S. Circuit Court of Appeals for the District of Columbia. The contract, for 6,000 Aviion workstations, was initially won by DG last December and suspended in March after losing bidders complained. The latest controversy involves the U.S. Department of the Interior's investigation into events surrounding a U.S. congressman's charge that aspects of the bid process were unfair. In other news last week, DG signed a five-year OEM agreement, worth as much as $45 million, with Sprint International, a division of U.S. Sprint Communications Co. Under the agreement, Aviion servers and workstations will be sold as enhanced components of Sprint International's private network and messaging system offerings.

Bell Atlantic tries wireless networks

Bell Atlantic Corp. plans to start testing a telecommunications technology that could potentially allow the regional operating companies to set up wireless communications networks without having to pressure the Federal Communications Commission to reallocate radio frequency bandwidth already in use. The equipment, supplied by Omnipoint Data Co., will use spread-spectrum communications, which reportedly do not interfere with other transmissions on the same radio frequency bandwidth. Bell Atlantic said it will be testing other types of wireless communications during the next 12 months.

NCR details networking strategy

As expected, NCR Corp. delivered its open systems-based networking architecture last week. The NCR Open Networking Environment is composed of four elements: an Open Systems Interconnect (OSI) backbone network, the NCR Open Network System (ONS), featuring application services such as X.400 message handling; AT&T Unix System V Release 4 interfaces for de facto industry communications standards such as IBM's Systems Network Architecture; protocol conversion products for moving from old network environments to OSI networking; and an OSI network management tool. ONS will be sold either as a stand-alone software system or as an add-on component to NCR's recently announced System 3000 line.

Phony MS-DOS sweep

A police raid on a trading company in Taipei, Taiwan, last week cracked a sophisticated software counterfeiting ring that had allegedly distributed more than 30,000 copies of Microsoft Corp.'s MS-DOS operating system across Taiwan, North America and Europe. The search of Data State Corp. yielded 5,500 complete counterfeit copies of MS-DOS Versions 3.3 and 4.01, according to Microsoft.

Sun shifts to AT&T Unix

In a step toward moving Sun Microsystems, Inc.'s hardware to the Unix International standard (based on AT&T's Unix System V) Sun announced a developers' platform last week. Sun's current Unix version is based on the University of California at Berkeley's Unix standards. Users' applications will be able to run on the new operating system without recompiling, according to Sun. A user version of the operating system is slated for 1992.

Cray wins deal in Japan

Tohoku University in Miyagi-ken, Japan, has leased a supercomputer from Cray Research, Inc. in Minneapolis. A Cray Y-MP8 system will be installed at the university's Institute of Fluid Science before the end of this year. The computer and peripheral equipment is the first Cray Research system to be installed at a Japanese public university. Cray also announced last week that the NASA Langley Research Center in Hampton, Va., has ordered a second Cray Y-MP8. The used system is scheduled for installation at Langley in the fourth quarter.

U.S. warned on security standard

BY MICHAEL ALEXANDER
CW STAFF

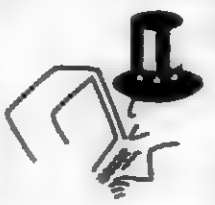
A computer security advisory group will warn U.S. Department of Commerce Secretary Robert Mosbacher this week that a proposed European computer security standard would jeopardize the ability of U.S. vendors to do business abroad.

In a letter that is expected to reach Mosbacher's desk this week, the 12-member panel said that recent efforts by four European nations to push for a single computer standard pose risks for the U.S. computer industry because computer makers would be forced to develop two versions of the same software.

The U.S. already has a security standard for classified, military-related computer systems developed by the National Security Agency (NSA) and detailed in the so-called "orange book."

The Computer Security Act of 1987 mandated that the National Institute of Standards and Technology (NIST) develop guidelines to improve the privacy of sensitive information in federal computer systems. Those standards could be based on the proposed international standard, NIST officials said.

The advisory board was established under the 1987 security act to advise the NSA and NIST on computer security and privacy issues. "The acceptance of European standards would certainly cause mischief, especially to the IBMs and DECs of the world," which derive more than half of their revenue overseas, said Willis Ware, chairman of the advisory board. Ware, a noted computer security expert, is a member of the corporate research board at Rand Corp.



In September, Germany, France, the Netherlands and the UK asked for international comments regarding a proposed plan that is referred to as the international technology security evaluation criteria.

"Whether those four have enough unanimity or clout to bring along the rest of Europe remains to be seen," Ware said. "In 1992, when they have the united states of Europe, they are going to start acting like a cohesive group of states. They are serious about stacking the deck in favor of the indigenous computer industry."

The proposed European standards are based on the orange book criteria for classified, defense-related systems. However, the European plan would set security guidelines for military and civilian commercial systems.

"While it may claim to be in the spirit of the orange book, it is fundamentally different" in that it also aims to cover civilian systems, said Lynn McNulty, associate director for computer security at NIST's National Computer Systems Laboratory.

Also, "there is no consensus within the government whether the orange book is ready to be taken into the international arena," McNulty said. The orange book, which is intended for classified computer systems users, will need to be retooled to fit the diverse needs of civilian computer systems users, he said.

NIST has come under considerable criticism in recent months for failing to develop computer security standards as outlined under the 1987 security act.

In a speech delivered earlier this month at the 13th National Computer Security Conference in Washington, D.C., Rep. Robert G. Torrocelli (D-N.J.), chairman of a U.S. House of Representatives subcommittee on transportation, aviation and materials, blasted NIST for its inactivity and for failing to take a leadership role in developing a civilian orange book that could be implemented here and perhaps abroad.

One NIST official, who asked not to be identified, conceded that the computer laboratory has made little progress in implementing the mandates of the security act but said that it lacked the funds to proceed as required by law.

Crime

FROM PAGE 1

Army's Criminal Investigations Command and the Navy's Investigative Services Command receive little training in computer technology, spokesmen for both agencies said. The few agents who can be considered experts do not solely investigate computer-related crimes and are often required to assist in investigations that occur within territories that span continents.

None of the defense branches specifically track the number of computer-related crimes their agents handle, but they say that the crimes are on the rise.

"The potential for crime is increasing by virtue of the increase in the number of computers in every aspect of our daily lives," said Col. Patrick Letellier, deputy commander of operations at the AFOSI.

Each year, the AFOSI's computer crime agents investigate allegations involving millions of dollars, said Maj. Stephen Headley, director of public affairs.

"People thought computer crime was synonymous with fraud," said Jim Christy, chief of the AFOSI's Computer Crime Division. "We're finding in the three OSI disciplines — general crimes, economic crimes and counterintelligence crimes — that computer crime and computer evidence is in all three of those disciplines."

Software piracy is so widespread, "I am not sure that we can handle it," Christy said. One investigation revealed that 35% of computer users had unauthorized files containing games, letters and resumes that took up 12% of the hard-disk storage space. Two people were also found to be operating part-time businesses.

On the rise

Attempts by hackers from within and outside of the U.S. to break into Air Force and other military computer systems are also increasing, Christy said. Hackers' attacks on military systems "were not a major problem until recently," Christy said. "There weren't that many of what we call world-class hackers. What has happened now is that they're organizing, writing manuals telling the not-so-bright hacker how to break into a system. A 10- or 12-year-old can read and follow directions step-by-step and break into a government computer."

In August, the AFOSI helped nab a 14-year-old boy who is accused of breaking into a superminicomputer at the Pentagon and downloading unclassified documents belonging to the Air Force. Although the pilfered files were innocuous, authorities were alarmed because previous intrusions by hackers have shown that such information collected over a period of time could be revealing, Headley said.

Also in August, an airman pleaded guilty to possession of at least 15 access codes with intent to defraud in a U.S. District Court in Pensacola, Fla. The airman was alleged to be a member of the Legion of Doom, a hacker group currently under investigation.

Foreign intelligence agents also routinely target computer systems, according to some analysts. Again, the problem is not being actively combatted by the military's computer experts. If an intrusion is detected, Navy investigators seek help from the users whose systems have been attacked or the Federal Bureau of Investigation, said Ernest Simon, deputy director of the fraud division of the Navy's Investigative Services Command.

IBM brims with Q3 confidence

Observers question slack sales, comparison to poor '89 third quarter

BY NELL MARGOLIS
CW STAFF

ARMONK, N.Y. — IBM last week reported a banner 1990 third quarter, but analysts and investors spotted a few red flags.

On its face, the report for the quarter ended Sept. 30 was upbeat. IBM logged a 27% net income increase to $1.11 billion on revenue that was up 6.8% to $15.3 billion. In addition, the company showed an after-tax margin of 7.3%, compared with 6.1% in last year's third quarter.

In a prepared statement, Chairman John Akers credited the healthy numbers to the company's ongoing restructuring and extensive product portfolio — the strongest in IBM history, he said. "Assuming no further deterioration in the world's economies," Akers added, "we continue to expect substantially improved financial performance for 1990."

Eye-catching

Nevertheless, three points caught analysts' eyes. Hardware sales were down 1.5% year-over-year — a dip that resulted from a planned high-end product transition to the Enterprise System/9000 family, IBM told analysts during a teleconference.

Peter Labe, an analyst at Labe, Simpson & Co., said the sales line was further weighted down by weak personal computer-generated revenue in the July-August time frame; PC sales rebounded in September, but not enough to counteract the summer sag.

IBM's omission of all reference to currency was disconcerting to several analysts. The weakness of the dollar over the past quarter, analysts said, provided a currency translation benefit to U.S.-based companies. Labe said an IBM financial executive refused to comment on any benefit from currency translations.

The glow on the quarterly report was also dimmed by the recognition that it was being compared with a poor 1989 third quarter, according to analysts.

During that 1989 period, IBM was hard hit by disk drive delays. That last week's figures shone by comparison, several of them said, relays more bad about last year's fall quarter than good about this year's.

On balance, however, analysts agreed that the third quarter was a solid one, if not the rave it initially appeared to be.

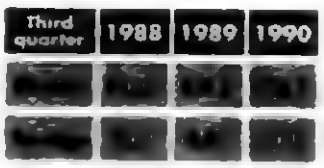
"Other than [hardware] sales, everything in this report is as I expected, or better," said Sanjiv Hingorani, an analyst at Salomon Brothers. Granted, "if you exclude currency," he said, "revenues would be lower — but that is one of the advantages of being a truly global player: Your markets can balance each other out, instead of leaving you vulnerable to one country's currency."

At Manufacturers National Bank in Livonia, Mich., First Vice-President of Information Systems Donald Vaughan echoed the sentiment.

"With a company the size of IBM, I'm not sure that it's meaningful to scrutinize everything on a quarterly basis," he added. "If they consistently had disastrous quarters, then we might get concerned."

Happier days

IBM's third-quarter profits edged up, recovering from last year's earnings dip



(in billions of dollars)

Source: IBM CW Chart: Marie Hanes

Vaughan said he found Akers' bow to macroeconomic shifts a realistic observation rather than a dire portent. "If the whole world economy is in trouble, we're probably not going to run out and buy a new 3090," he said.

On the other hand, he added, even with economists widely acknowledging that the U.S. is nearing a recession, if it is not in one, and with several worldwide economies on shaky ground, the bank's IBM expansion plans are proceeding apace.

Repository

FROM PAGE 1

specifications next year. Systemview is intended to provide a similar overall framework for data center operations and systems management.

With different data models, AD/Cycle and Systemview would view and store data differently and therefore not easily share it. "I am very concerned about this," said Ted Gerbracht, group manager of technical services at Merrill Lynch & Co. "To gain the benefits of Systemview, I'd need one model, and then to deal with the other, I'd have to mount up a different model."

Emmanuel Ackerman, manager of data administration at Depository Trust Co. in New York, an early user of Repository Manager/MVS, said the difference between the two environments will not have a near-term effect on his shop but does raise questions as to how successful IBM will be with its enterprisewide, repository-based scheme.

"The grand view was [the repository] would hold everything for everybody," Ackerman said. "The grand view is a great idea, but what are they doing, cutting us off at the knees?"

A spokesman for Computer Associates International, Inc., which will offer products for both environments, said the company is not concerned about the data model inconsistency. He said CA will rely on IBM-provided interfaces to connect to the two architectures.

IBM officials said last week the goal is to eventually make the two data models consistent but did not specify when.

Although IBM has a single grand plan for its strategic architectures, they are being developed by different teams on different schedules. As is the case with the data models, one group can sometimes get ahead of another, said John Sweitzer, a Systemview data model architect and Al Nisbet, a manager of AD/Cycle tools and services.

Systemview development began a few months ahead of AD/Cycle, the IBM executives said, and both models were originally based on an entity relationship concept, according to Sweitzer. However, Systemview developers changed directions this year and adopted object-oriented principles as outlined by the International Standards Organization's Guidelines for Definition of Managed Objects. Meanwhile, the AD/Cycle group had already committed to a release date of its model and had no choice but to proceed with its product.

"There are efforts now to look at the two models and remove redundancy and converge on a single view from an enterprise perspective," Nisbet said.

Despite IBM's promise to bring consistency to the models, at least one user of Repository Manager is disappointed by the current differences.

According to Gerbracht, the inconsistency could pose a big problem in Merrill Lynch's development and planning efforts. "The reality here is you've got one being built in Santa Teresa and the other in Raleigh," he said. "That's the problem."

IBM offers some AD/Cycle revelations

BY ROSEMARY HAMILTON
CW STAFF

CHICAGO — IBM last week provided a few new peeks into its AD/Cycle strategy that showed its determination to promote applications development as a centralized, host-based operation.

At the first Repository and AD/Cycle user conference, held here, Robert Lord, a manager in the marketing strategy and support group at IBM's Santa Teresa Laboratory, layered on the following AD/Cycle details:

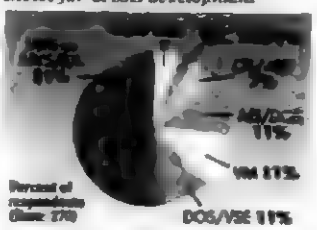
- There are no plans for a distributed repository.
- IBM will not provide a Repository Manager for the OS/2 platform, even though it is one of the four Systems Application Architecture (SAA) platforms.
- The company will not accommodate a three-tiered Repository Manager environment that would include a server as a middle layer.

Some observers suggested that IBM's emphasis on large system-based applications development is not in tune with what many other users want.

"If you talk even to the IBM AIX folks, they'll give you a different view," said Vaughan Merlyn, chairman of CASE Research Corp. "It's not consistent with the market."

Lion's share

IBM's MVS/XA overwhelms other operating systems as the platform of choice for CASE development



Source: CASE Research Corp.
CW Chart: Doreen St. John

An IBM executive who asked not to be identified said IBM's current AD/Cycle target is a shop with at least 100 programmers. "I think it's a fair statement to say that the Repository stays host-based," he said.

The executive said IBM will not build distributed capabilities into Repository Manager. Eventually, the software will be able to access data stored in a distributed database environment, but it would remain a centralized manager of application development.

While the executive said he is aware that people have talked about OS/2 functioning as a Repository Manager host, he noted that it was never IBM's intent to bring the software down to the workstation level.

"That's inconsistent with SAA, and it is inconsistent with previous proclamations from other IBMers," Merlyn said. "This is IBM trying to sell what it has rather than create other avenues for people."

But the host-based strategy suits some users, such as the IS shop at Depository Trust Co., a mainframe shop with a heavy investment in AD/Cycle. "It fits with where I am going," said Emmanuel Ackerman, manager of data administration. "My workstation needs to be able to talk to the host session. I need a direct link to that."

Repository Manager/MVS: A standard before its time

CHICAGO — Like DB2 before it, IBM's Repository Manager/MVS is on its way to becoming a standard long before a functional version is in the hands of many users.

The first Repository and AD/Cycle (RAD) user conference was held here last week, and close to 300 users attended, even though few of them have a Repository product from IBM.

Several attendees interviewed said they will likely install Repository Manager/MVS, the key software component of AD/Cycle, even though they do not fully comprehend it, nor have they evaluated other options.

"When IBM speaks, everyone listens," said Loren Thowe, a manager of data administration at Blue Cross/Blue Shield of Kansas. "Sometimes, it's like we're a bunch of sheep."

Thowe and other attendees said they came to the RAD meeting to learn more about the IBM AD/Cycle strategy.

"We still don't know a lot about this animal," said Cynthia Dwyer, senior data administration analyst at Amoco Corp.

First things first

Dwyer said her staff intends to install Repository Manager/MVS in the future but does not have a specific date. For now, the firm is tackling associated management and staff issues.

The company recently selected information engineering as the corporate methodology and is finishing a dictionary project that called for finding all dictionaries in the company and determining what data was useless and what data should be migrated to the Repository Manager.

Other users, however, have just started on the AD/Cycle trek. "I'm hoping I can gain some insight," said Alan Richards, a senior applications support technician at Allen-Bradley Co. in Milwaukee.

ROSEMARY HAMILTON

Netview pricing stymies users

BY ELISABETH HORWITT
CW STAFF

RYE BROOK, N.Y. — Almost two months after IBM unleashed Version 2 of Netview on the world, users are just beginning to discover that they may have to pay a heavy price for the network management system's added functions and features.

IBM's revamped pricing structure is so complex that even IBM sales representatives are reportedly having difficulties figuring it out.

"We had a presentation by our [IBM branch salespeople] last Monday, and we sent them back with a lot of questions," said Jim Kane, a network management services staff member at Aetna Life and Casualty Co. "We have 17 independent Netviews, and we still don't know" whether they conform to the central, distributed or stand-alone options introduced with Version 2, Kane said.

Not all users will pay more for Version 2. IBM has introduced a graduated pricing structure that ties costs more closely to system size — which means price breaks for firms that are running Netview on low-end IBM hosts (see chart).

In addition, the mainframe portion of Netcenter, IBM's graphics-based user interface, comes free with Netview Version 2, IBM said. Netview Version 1 users had to pay between $45,130 and $139,250 for the mainframe portion of Netcenter.

However, firms with multiple Netview hosts may see their charges increase by as much as 200%.

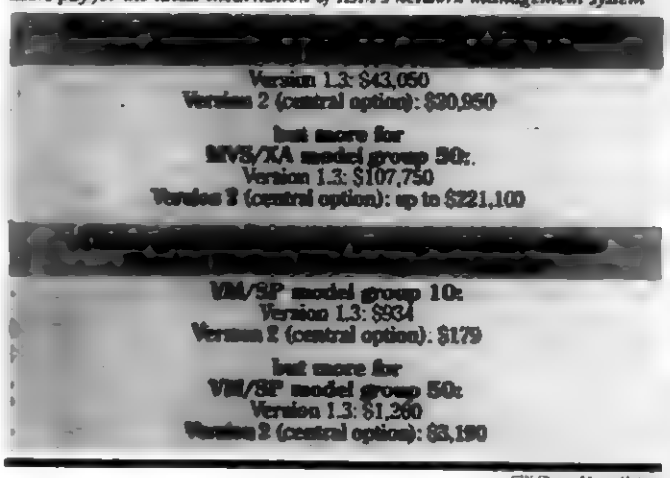
Licensing Version 2 from IBM would take a big bite out of The Travelers Corp.'s information systems budget, said Jim Oleksiw, telecommunications director at the insurance firm.

With his 1991 budget deadline looming ahead, Oleksiw recently tackled the Netview Version 2 pricing structure with a spreadsheet. He said he found that migrating to the new version would cost his company as much as 65% more per year in license charges, "if I run Version 2 the way I am now running Version 1."

Oleksiw originally thought the cost boost would be as much as 116% but revised that figure downward after talking with IBM representatives, he said.

A complicated web

Not all Netview Version 2 prices are the same. Here are examples of what users pay for the latest incarnation of IBM's network management system



CW Chart: Marie Hanes

One twist on IBM's new pricing structure is the division of Netview software into three categories, or options: central systems, which can act as focal points for other Netview hosts; distributed systems, which can manage some portion of a customer's installation and also feed into a central Netview; and stand-alone systems, which do not talk to other Netviews.

Trimming down

By making the distributed option of Netview Version 2 significantly cheaper than the equivalent central option, IBM "influences you to have only one, or at most two, central systems instead of many," Oleksiw said.

For example, it would cost General Electric Co. approximately $15,000 per month to put Netview Version 2 on three high-end central model group 60 hosts but only $11,200 for one central host and two distributed hosts in the same group, Oleksiw said. "That's $4,000 savings, which adds up over a year."

Several IS managers said that they have yet to fully analyze Netview Version 2's functionality and pricing to make a purchasing decision.

"A graphics interface would be nice, but we evaluated Netcenter two years ago, and no one wanted to pay for it," said Morty Eison, a voice and data engineer at First Boston Corp. in New York. Another Version 2 enhancement, direct LU6.2 support, "would also be nice, but I don't think we need it," he added. "We'll probably do an analysis and decide if it pays to migrate in the next few months."

Several users identified specific Version 2.1 and 2.2 enhancements that they would at least consider paying extra to obtain. Northeast Utilities is extremely interested in the fact that Netview Version 2.2, due out next spring, allows a much broader range of Netview commands to be sent down to an enhanced version of IBM's LAN Manager, according to Stan Pelletier, a computer scientist at the utilities firm.

"Those functions, in my eyes, are worth the extra cash, but I still have to sell it to management," Pelletier said.

None of the major IBM shops interviewed said they were seriously considering backing away from Netview entirely as a result of the price increases.

However, The Travelers will now "look twice at what we use Netview for" and more seriously consider moving network management functions to a local-area network-based platform, Oleksiw said.

IBM has been "approached by a number of customers who want to better understand how the new prices and structure changes affect them" and is working with such users individually, a spokeswoman said.

Thrift bailout group faces systems scrutiny

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — Congressional concern about Resolution Trust Corp.'s (RTC) information systems surfaced again last week at a hearing at which the agency charged with cleaning up the savings and loan mess was criticised for its lack of management information and its apparently haphazard approach to acquiring systems.

In March, Rep. Bruce F. Vento (D-Minn.), criticized RTC for lacking a system that would allow it and Congress to evaluate the success or failure of its asset sales efforts. At the hearing last week, Vento said, "While RTC has made progress in establishing such a system, the information available is still inadequate and . . . serious concerns about the direction of the RTC effort remain. It's enormously important that an adequate system is put in place."

The U.S. General Accounting Office (GAO) said in a recent report that in its haste, RTC had failed to develop a strategic plan or an overall systems architecture to guide it and had not devised the policies, standards and procedures for systems necessary to meet its objectives.

RTC generally agreed with those criticisms but said it is creating those things in parallel with its systems development efforts. Last month, it answered a major GAO criticism by hiring its first IS chief.

During the next six years, RTC must dispose of an estimated 600 failed thrifts with assets of $300 billion. So far, RTC has supported that task by cobbling together a number of personal computer-based systems and using systems at other federal agencies.

Meanwhile, the agency put out requests for bids for more permanent solutions, including one for a giant mainframe and telecommunications system to track the management and sale of the real estate inherited from dead thrifts, which is estimated to number between 200,000 and 300,000 properties. A contract award for that system, called Real Estate Owned Asset Management System (REOMS), is expected in December, and the system is slated to be running by early next year.

Faster, faster

RTC Executive Director David C. Cooke said that the need to quickly obtain data processing capabilities had dictated the agency's approach. He also said that an analysis of the agency's IS needs, performed earlier this year by Price Waterhouse, endorsed the approach of developing separate "feeder" systems and integrating them later into an "overall corporate database."

Cooke said that proceeding with the REOMS procurement before the IS framework is complete entails minimal risk. "There is some possibility that the strategic plan may come up with an entirely new approach, but that's very unlikely," he said.

However, Howard G. Rhile, a division director at the GAO, said, "Time is clearly a factor with RTC. But in developing systems, you either pay now or you pay later."

G. Brooks Dickerson, head of RTC's new Office of Corporate Information, said in an interview that operational mandates leave him no choice but to turn the normal serial systems life cycle into a parallel process. In addition, he said he will seek to accelerate systems development by using prototyping, fourth-generation languages, highly portable software, software from other federal agencies and heavy use of contractors.

Dickerson said that development of the IS plan and architecture are a top priority for him and that they should be finished in December, at about the time an award for REOMS is made.

The REOMS solicitation asks for an asset management system with a number of features for budgeting, financial monitoring and marketing. It includes a mainframe computer and a nationwide telecommunications network to be accessed by 2,000 users, including RTC staff, financial institutions, other government agencies, asset managers and real estate brokers.

Cooke would not estimate the cost to acquire REOMS, but he said a rough estimate of the annual cost of operating and maintaining it was in the range of $20 million to $25 million.

Cooke said that procurement time will be about 10 months, compared with the two to five years typically required in other big federal government system purchases.

Second-class postage paid at Framingham, Mass., and additional mailing offices.
Computerworld (ISSN 0010-4841) is published weekly, with a single combined issue for the last week in December and the first week in January by CW Publishing/Inc., 375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171.
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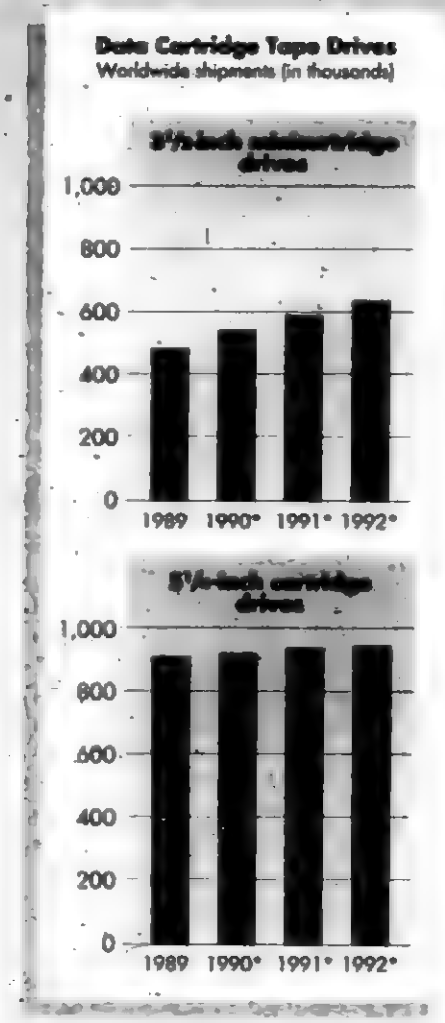
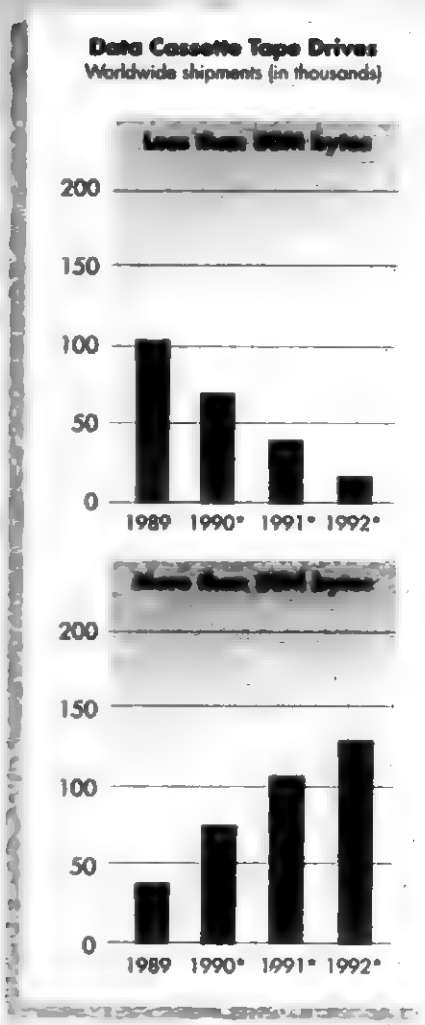
TRENDS

Tape Drives

The markets for data cartridge and data cassette drives will continue to hold their own in the short term despite the optical threat



Combined shipments of all classes of data cartridge drives are expected to experience 14% growth by 1992. Those drives in the high-capacity range — above 70M bytes for a minicartridge and above 80M bytes for a full-sized cartridge — will be in greatest demand



Market growth for cassette drives will be on the modest side; shipments are even expected to drop off after 1992

*Projected

Source: Freeman Associates, Inc., Santa Barbara, Calif.

CW Chart: Doreen St. John

NEXT WEEK

Even though many programmers and software developers consider themselves artists, reality suggests otherwise. New fears that the U.S. is trailing other nations in innovation has sparked a fledgling interest in creativity among IS professionals. See **In Depth** for simple techniques that can yield immediate results.

Philip Anderson

Product pricing can be a bloody business. Many a good product and good company have fallen as a result of miscalculations about how much customers will spend or just how low competitors' prices might go. Information systems can be a powerful weapon on the pricing front. Find out more about this in Executive Report.

INSIDE LINES

Sounds good to us

An Israeli virus tracker reports that a new virus, called the Saddam Virus, has popped up on bulletin boards in Israel. The virus apparently displays the following message on IBM Personal Computers and compatibles running MS-DOS 2.0 or higher: "Hey Saddam, leave quietly before I come." The virus, which is believed to be a strain of the Stupid virus (no kidding), is not widespread.

By invitation only

Christmas Con, a confab of hackers, will get under way in Houston sometime in December, according to Micron, a hacker who knows about these sorts of things. The last hackercon, held in St. Louis in 1988, drew the attention of the U.S. Secret Service, which spent much of the time secretly videotaping the event. This time around, all participants will be carefully screened, and no camera of any sort will be allowed, Micron said. "Anybody who is anybody" in the hacker underground will be there, he promised.

Parlez-vous ISDN?

While a number of countries (including Uncle Sam) have bits of ISDN here and there, France Telecom will announce this week what it claims is the first "true end-to-end ISDN service" — in France, of course. When will ISDN become a transnational as well as an international networking standard? Tune in next year, or the year after that perhaps.

Who's the fastest on the draw?

The New York PC Users Group last week entertained Borland Chairman Philippe Kahn and Lotus Chief Executive Officer Jim Manzi on different nights. The dueling duo proved they can cross swords in and out of the courtroom. Kahn warmed up the crowd by matching a speedy Quattro Pro with a sluggish 1-2-3 Version 3.1, but Manzi followed up with the speedier tongue: "Who knows what that Borland operator was trying to load up on Monday? It could have been anything from the New York City budget to Philippe's expense account. For either one, 14 minutes isn't bad," Manzi said, warming up for the kill. Manzi claimed it's actually much faster to load up or recall on 1-2-3 Version 3.1 but that the Quattro demonstrators didn't use the right keystrokes. "You'd think that by now, Borland would be more familiar with the 1-2-3 command structure," he zinged. Lotus is suing Borland for copyright infringement on 1-2-3's menu.

Re-emulation

Phaser Systems, Inc. is working on software that would have IBM mainframes emulate Novell local-area network interfaces on its terminals. Executives at the South San Francisco, Calif., company say they could be within a year of evening out the micro-to-mainframe world. The result would be, among other things, the ability to manage Novell LANs from an IBM terminal.

Last stop, the Computer Museum

Collectors have until Dec. 1 to pick up one of the remaining copies of the VP Planner spreadsheet family from Paperback Software International. "Some people will want to buy the product before it's gone, and it may be that other buyers recognize a good product," said a Paperback spokesman. And there is the possibility of a sympathy vote. "I suspect some new buyers may just be unhappy with the overall outcome of the litigation," he added, noting that Paperback feels the judge went too far in its ruling against Paperback in a copyright suit filed by Lotus.

Lotus kicks off a separate copyright trial against Mosaic Software this week. According to Lotus attorney Hank Gutman, Mosaic has conceded its twin spreadsheet was copied from 1-2-3 but claims that an unidentified Lotus employee gave verbal permission back at Comdex/Fall '84: "We refer to this as the 'visitation,' " Gutman quipped. You can visit here without fear of legal retribution. Confidential info can reach News Editor Pete Bartolik by phone (800-343-6474), by fax (508-875-8931) or via MCI Mail (address: COMPUTERWORLD).

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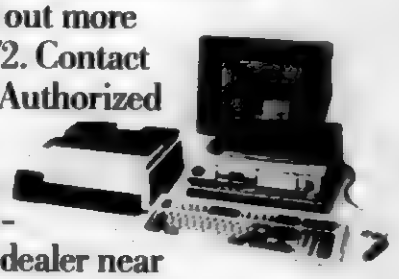

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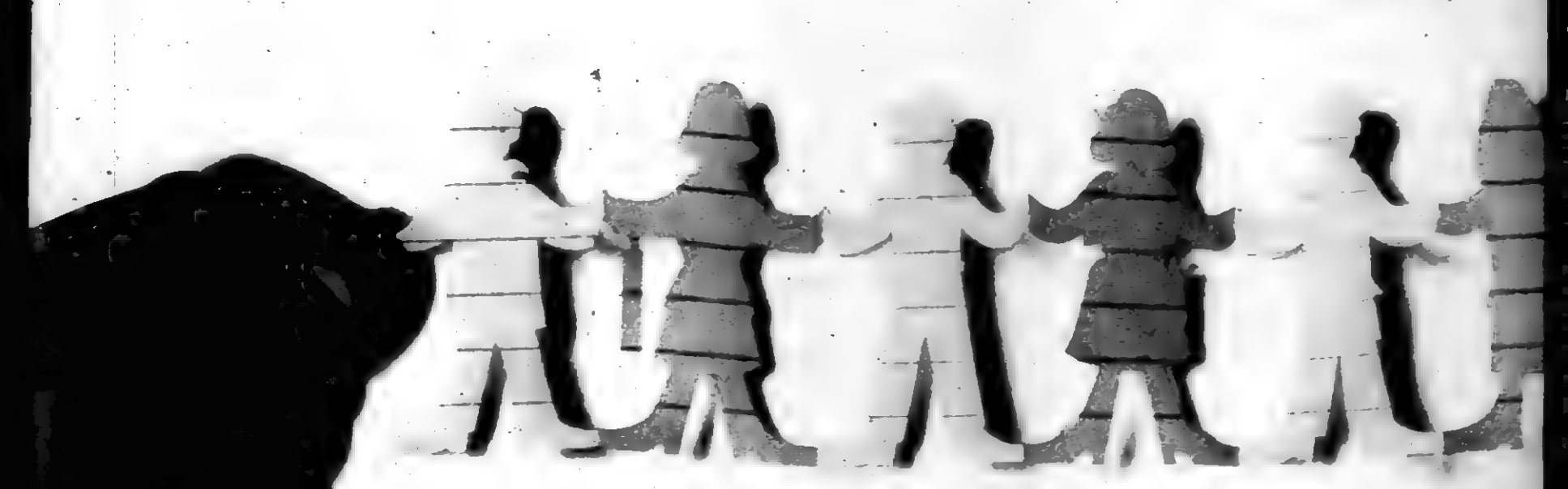

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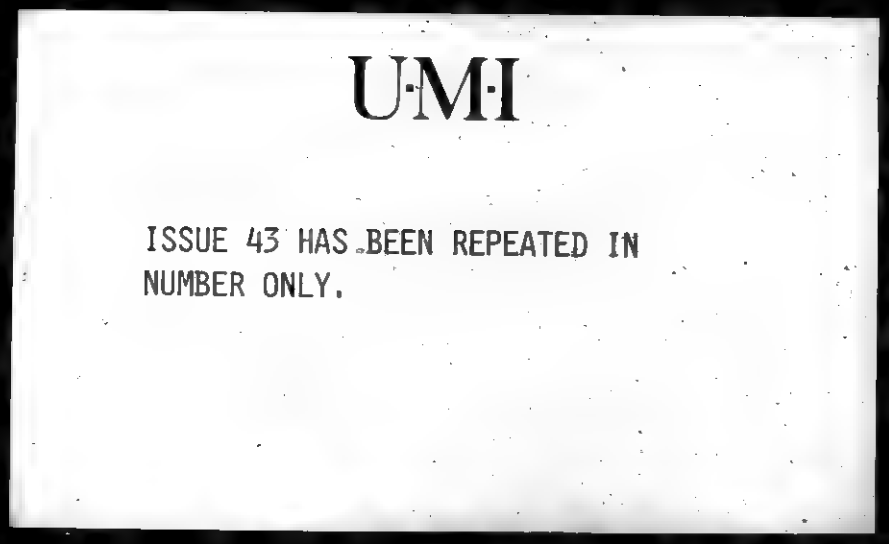


THE NEWSWEEKLY OF INFORMATION SYSTEMS MANAGEMENT
October 29, 1990 · Vol. XXIV · No. 43 · 168 Pages · $2/Copy · $48/Year

COMPUTERWORLD

Officevision exec commits to Windows

Unix also embraced as ship deadline looms

BY ROSEMARY HAMILTON
CW STAFF

MILFORD, Conn. — IBM's Officevision will support Microsoft Corp.'s Windows 3.0 and Unix workstations, an IBM executive said last week. While that may boost support for the strategic office platform, the executive said the company has not yet determined whether it can meet an upcoming deadline for two previously delayed components.

Since introducing its strategic office tools and applications integration platform in mid-1989, IBM has maintained that OS/2 is the Officevision workstation platform of choice. The company was widely criticized for such a rigid approach, and some users rejected Officevision because of it.

IBM will bend

Last week, however, Tony Mondello, IBM's vice-president of office systems development, said that IBM would bend on the issue and support both Windows 3.0 and various Unix-based workstations, including its own AIX-based systems. However, he provided no time frame.

"We are past the point of 'should we?'" Mondello said. "We've now concluded that the [workstation] mix needs to include Windows and Unix."

While that should give Officevision more appeal, Mondello also said IBM may not make the fourth-quarter deadlines for delivering full-function releases of the local-area network and VM versions of the office platform, both of which have already had one delay.

"We will make a determination in December to make sure it's right," Mondello said. "If we

Continued on page 10

Losses force more Unisys cuts

5,000 jobs to be axed; debt, revenue slump prompt another quarterly loss

BY ELLIS BOOKER
CW STAFF

BLUE BELL, Pa. — Setting aside funds to cover the cost of slashing another 5,000 positions, Unisys Corp. announced a third-quarter loss last week that exceeded expectations and cast a gloomy outlook on the rest of the year.

A net loss of $356.8 million for the period ended Sept. 30 included a $181 million charge to cover a job reduction campaign to be completed by the middle of next year.

In addition, Chief Executive Officer James Unruh, citing ongoing weakness in the U.S. market and a recent slowdown in Unisys' promising European business, signaled the strong possibility that the company's fourth quarter may also show a loss. For most of the year, the fourth quarter has been held out as a beacon of light in Unisys' fiscal night.

Users who were contacted last week took the announcements in stride.

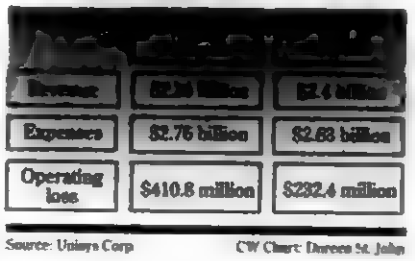
"They are trying to do the right things," said Charlie Hamlett, vice-president of information systems at La Quinta Motor Inns, Inc. in San Antonio. "Whether they will be successful, I don't know."

Concern centered on the potential impact of the job cuts on field service and continued uncertainty about Unisys' future. "I'd like

Continued on page 4

Slow progress

Weak revenue growth has been partially offset by decreased expenses, but Unisys says it still needs to cut 5,000 positions



Source: Unisys Corp — CW Chart: Doreen St. John

Industry PACs tight with candidates

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — Rep. Robert T. Matsui (D-Calif.) may not exactly be an American household name, but he certainly is a political hero of the computer industry. Industry lobbyists gush over his support for industry-backed research tax credits and fair trade policies.

Matsui's reward has been a steady stream of campaign contributions from the computer industry's political action committees (PACs). According to Federal Election Commission records, the six-term congressman from Sacramento received $9,150 from computer industry PACs for his re-election race, which he is expected to win easily on Nov. 6.

Computerworld's review of federal campaign records and interviews with industry lobbyists found that the computer industry is carefully focusing its modest amount of PAC money on such longtime friends as Reps.

Continued on page 154

Inside, outside

Dun & Bradstreet, Motorola and Unisys have the biggest political action committees in the computer industry

Sponsor	Jan. 1989 — Sept. 1990 federal contributions
1 Dun & Bradstreet Corp.	$110,798
2 Motorola, Inc.	$97,048
3 Unisys Corp.	$76,923
4 Texas Instruments, Inc.	$73,700
5 Electronic Data Systems Corp.	$69,866

Source: Federal Election Commission — CW Chart: Tom Monahan

Compaq 386 notebook grip may be shaky

BY MICHAEL FITZGERALD
CW STAFF

DALLAS — Compaq Computer Corp., which was sitting as pretty as the little pig in the brick house after releasing its Intel Corp. 80286-based LTE notebook computer last year, may find itself in a straw house circled by wolves in the 80386SX-based notebook arena.

Texas Instruments, Inc. hopes to be one of the wolves: The company plans to announce its Travelmate 3000 386SX-based notebook today. The Travelmate 3000 will be a formidable competitor for Compaq when the two companies begin shipping 386SX-based machines next month and is a sign of things to come in the 386SX-based notebook market, analysts said.

The TI machine "really compares very favorably and is an indication that Compaq is not going to enjoy the kind of lead in the notebook area that they had a year ago with the first two LTEs," said Peter Teige, a senior analyst at Infocorp, a subsidiary of Gartner Group, Inc., based in Santa Clara, Calif.

Travelmate weighs less than the Compaq 386S/20 — 5.7 pounds compared with 7.5 pounds. The TI machine measures 8½ by 11 in. and is 1.8 in. thick vs. 2.2 in. for the Compaq.

Continued on page 156

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Recession fears put vise on IS funding

BY CLINTON WILDER
CW STAFF

Depending on whom you ask, the U.S. economy either is heading into a recession or is already there. And information systems budgets from Stamford to San Francisco are feeling the squeeze.

Facing the best-case scenario of a slow year in 1991 and the worst-case scenario of a Persian Gulf war and soaring oil prices, companies across a spectrum of industries are calling on IS to hold spending to this year's level or close to it. Even at companies where spending will increase modestly, words like "careful" and "cautious" spike the conversations of IS executives interviewed about their budget plans.

"We are working enormously hard to hold 1991 spending flat," said Al Hyland, director of worldwide systems management at Polaroid Corp. in Waltham, Mass. "At the same time, requests [for more IS services] from areas like marketing and customer service are up substantially. I haven't yet found a way to resolve those two things."

Doing more with less has been an IS watchword for some time, but corporate demand for

Continued on page 8

INSIDE

'Open' season: OSF delivers Unix alternative to members. One member, DEC, also pledged to open up its VMS operating system. Stories, page 157.

Sparcstation 2 coming from Sun, which braces for Sparc clones. Page 14.

Tariff 12 stumbles as court tells FCC to revisit AT&T's tariff packages for big businesses. Page 4.

Executive Report: Using information systems to price your company's products. Page 113.

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4 IBM MVS performance expert **J. William Mullen** dies at the age of 42.

6 A Santa Clara, Calif.-based software vendor pulls the plug — literally — on **Revlon**'s inventory management software.

10 **Gupta** cleans up its SQLbase Server act with Version 4.1.

12 New York Telephone files a tariff that could deposit **ISDN** service practically in the laps of Big Apple Fortune 500 businessmen.

14 Sun's **Sparcstation 2**, running at nearly 30 MIPS, will likely steal the show when it's announced next week.

14 Living a spartan year pays off for **Wang**, whose revenue has winged back up into the shadows.

155 On the Left Coast and the Right, two computer technologists are running for governor of their respective states.

156 Japan is shipping more laptops than desktops, as firms such as **Fujitsu** and **NEC** keep slimming them down.

Quotable

"We have an ethical problem with giving to candidates who might help us down the road — so-called renting votes."

WILLIAM H. SELLS
CDLA

Or why CDLA doesn't contribute to individual politicians.
See story page 154.

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The Fifth Wave

"IT'S AMAZING HOW MUCH MORE SOME PEOPLE CAN GET OUT OF A PC THAN OTHERS."

EXECUTIVE BRIEFING

■ **Momma said there'd be days like this,** and information systems executives are finding out that truth the hard way. IS managers are struggling in these tough economic times to do more with their systems to stay competitive. In describing their budgets, IS executives are using words such as "cautious" and "careful." In several cases, as General Signal Corp. discovered, the battle is to just keep the IS group together. **Page 1.**

■ **There's a right price for every product and service,** and these days, the margin for error in finding that perfect price point is slimmer than ever. That's why many companies are increasing their use of information systems to research, fine-tune and administer pricing. Equally important, some companies are investing in systems for the explicit purpose of shaving production costs to give themselves more pricing leeway. **Page 113.**

■ **Computer systems are bigger than business.** There are growing concerns about the roles computers and the applications running on them play in society. The message for IS professionals is that they have to make consideration of the system's broad impact part of their daily routine. **Page 105.**

■ **Open systems was the operative word** last week. The OSF received mixed reviews when it said its OSF/1 version of Unix will be shipping to vendors in November. Meanwhile, DEC said it will be developing a way to run Unix applications on processors that run its VMS operating system. **Page 157.**

■ **The long silence of Jim Manzi** on the issue of copy protection came to an end last week when the chairman of Lotus asserted that the notion of intellectual property is at the heart of the software industry. Manzi, whose firm recently won a copyright infringement suit and has others pending, said that rathering than stifling innovation, copyrights encourage and reward it. **Page 65.**

■ **The computer industry seems to carefully pick and choose** which congressional candidates it will back with political action committee funds. **Page 1.**

■ **It's getting nasty** in a dispute between cosmetic maker **Revlon** and software vendor **Logisticon**. It all started when Revlon said it would withhold payment because Logisticon's inventory management software wasn't working right. Logisticon responded by pulling the plug on Revlon's software. **Page 6.**

■ **Reorganization is progressing** at Baxter International, where company officials say they are on target for eliminating half of the 3,200 salaried positions by the end of the year. **Page 112.**

■ **Reorganization is also the mandate at Unisys Corp.** The computer maker reported a quarterly loss of $356.8 million and announced plans to cut 5,000 workers. The loss includes a $181 million charge for the work-force reduction. **Page 1.**

■ **The first signs of a shift are emerging** as companies look to save money by migrating their T1 networks to public Integration Services Digital Networks. To do that, some firms are taking a hybrid approach, transitioning low-traffic segments to the switched services. **Page 87.**

■ **On-site this week:** Computer terminals in police cars are a crime-fighting tool in Dallas. **Page 76.** IBM's Netview is at the throttle of railroad carrier CSX, where the network management system has control of several mainframes and 20,000 terminals. **Page 87.** Integrating optical storage of images with a relational DBMS is the key to a document tracking application intended to keep diplomats up to date at the U.S. State Department. **Page 37.**

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Unisys

FROM PAGE 1

Unruh to tell me when they're going to get well," said Joseph Ambrosy, vice-president of information systems at Philadelphia-based Bell Atlantic, Inc.

Unruh last week seemed unable to do that. Deteriorating economic conditions "are the reality of the marketplace now," he said in an interview. He said he believed customers and the marketplace would conclude Unisys had taken the right course of action.

Unisys' Unruh
elected to chairman

Revenue for the quarter ended Sept. 30 was $2.40 billion, compared with $2.35 billion in the corresponding quarter last year. In the third quarter last year, Unisys reported a net loss of $648.2 million, which included a charge of $231 million to cover layoffs and plant closings that year.

However, while the third-quarter loss was not unexpected — the debt-laden $10 billion computer and defense company alerted the financial markets to expect it a month ago — analysts and users said they were surprised by the size of the loss, which was three times greater than had been expected. Some also pointed anxiously to the small rise in revenue relative to the year before.

"The most surprising part is Europe was down, which was the source of their potential revenue growth," said John Clomax, a bankruptcy trading analyst at Mabon, Nugent Co. in New York.

"It's a much larger loss than I thought they'd have," said Dean Sutton, executive vice-president of Softchec, Inc. in Kirkland, Wash., and president of the Cube users group. "It can only mean the U.S. market is nonexistent."

Unisys, which has lost more than 80% of its shareholder value in the past year, plummeted 1¼ points Friday to close at 2¼ in extremely heavy trading. More than 11 million shares were traded on the New York Stock Exchange.

With the recent third-quarter numbers in, "it's absolutely a given" that Unisys will need to make an asset sale to reach its stated goal of a $600 million to $800 million debt reduction by the end of the year, said David Schofield, a technology analyst at Duff & Phelps Investment Research Co. in Chicago.

Unruh declined to specify what Unisys assets might be sold to raise capital. But analysts generally agreed on a short list containing the following: its $2.5 billion defense business; its data communications subsidiary Timeplex, Inc., which former Chief Executive Officer W. Michael Blumenthal acquired in 1988 for $320 million and which grew 20% during last year; and Unisys' finance and leasing arm, Unisys Finance Corp.

Byron Walker, a computer analyst at Moody's Investors Service, Inc., said the finance company — with a book value of $150 million and debt of $750 million — was a likely target. "The problem is," he noted, "a lot of companies are selling off finance companies, and it's a buyer's market." Moody's recently downgraded Unisys' debt, as did Standard & Poor's Corp.

From Blue Bell to Paris

W. Michael Blumenthal, who retired from Unisys as its chief executive officer in April, resigned his position as chairman of the company's board and as a director, effective Nov. 1, Unisys reported last week. James A. Unruh was elected to the additional post of chairman.

Blumenthal, 64, said his business obligations prompted the move. He is a limited partner in the investment banking firm of Lazard Freres & Co. and co-chairman of the newly formed international coordinating group of Lazard, to be headquartered in Paris.

Court orders FCC to revise Tariff 12

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — A federal appeals court last week threw a monkey wrench into AT&T's aggressive campaign to sign up large business customers for customized voice/data networks under Tariff 12.

The court's ruling on Tariff 12 "stalls for at least three to six months AT&T's effort to stem the erosion of its market share in the high-end business customer range," said George R. Dellinger, telecommunications analyst at Washington Analysis Corp.

Responding to complaints by rival MCI Communications Corp. and others, the appeals court said the Federal Communications Commission had applied faulty reasoning in its approval of AT&T's Tariff 12. The court sent the Tariff 12 order back to the FCC for revision, which could take several months.

The court did not declare Tariff 12 illegal, as opponents had requested, and hinted that the FCC probably can find a way to legally justify the tariff. But in the meantime, the ruling may have the practical effect of stifling the Tariff 12 deals still being negotiated or in the FCC's pipeline.

"From a short-term perspective, the problem is that it creates market uncertainty" for unfinished Tariff 12 deals, said Henry D. Levine, an attorney representing many Tariff 12 users. MCI, U.S. Sprint Communications Co. and other less regulated carriers, meanwhile, can continue to offer the same types of custom network contracts.

"In the long term, it's actually very good news for AT&T and AT&T's large users because it affirms that these [negotiated, customer-specific] deals are legal," Levine added.

Tariff 12 provides large users with integrated services and volume discounts in return for five-year contractual commitments — essentially turning a corporation's wide-area network over to AT&T. The carrier has signed up 76 users for Tariff 12, including pioneers Du Pont Co. and General Electric Co. The FCC has approved 60 of the tariff options, and 16 are pending.

"I would expect the FCC to find a way to justify the legality of the tariff, and AT&T could modify the tariff" to comply with new FCC requirements, Dellinger said. "And then it will probably go back to the court," he added.

An AT&T spokesman expressed confidence that the legal technicalities raised in the court opinion "can be easily remedied by the FCC." AT&T said its Tariff 12 service will not be disrupted, and it will continue to offer the service, which it calls Virtual Telecommunications Network Services.

In terms of scoring legal points, however, the ruling was a small victory for MCI, Sprint and others who oppose Tariff 12 as anticompetitive. MCI officials said the decision puts AT&T's Tariff 12 deals in "legal limbo."

In essence, the U.S. Court of Appeals for the D.C. circuit chided the FCC for taking some legal shortcuts in order to help AT&T compete. "The FCC [one way or another] will undoubtedly permit AT&T to compete effectively against its competitors in the large user market . . . But we are obliged to insist that it do so by turning square corners of administrative law," wrote U.S. Circuit Judge Laurence H. Silberman for a three-judge panel.

The ruling said the "core issue" is whether AT&T may charge lower prices for the package deals than it charges for all of the individual parts of the package. In the court's view, the FCC failed to prove "that Tariff 12 is different from the sum of its parts," Levine said.

The Communications Act of 1934 requires the FCC to determine whether it is reasonable for AT&T, designated as a near-monopoly vendor, to charge different prices to different customers for services that are functionally equivalent. The FCC argued that Tariff 12 and its component services are different because they are priced differently.

BGS's Mullen dies at 42

J. William Mullen, president of the National Computer Measurement Group and senior consultant at BGS Systems, Inc. in Waltham, Mass., died Oct. 23 from complications following heart surgery at St. Luke's Episcopal Hospital in Houston.

Mullen *was an MVS expert*

Mullen, 42, an expert on IBM MVS computer performance issues, spoke frequently to groups and organizations in North America, Europe and Australia. He served for eight years in the SHARE organization, most recently in the capacity of secretary, and was a member of the SHARE board of directors.

In addition to his duties as president of the Computer Measurement Group, Mullen also served as editor of "CMG Transactions" for eight years and was founding father of the first CMG regional group — the southern CMG — in 1975.

Results from his research on MVS performance have been made available in over 40 articles in both domestic and international journals.

"This is a big loss to all of us," said Roma Dearness, a six-year veteran of BGS who has worked with Mullen over the years. "He was a tremendous, wonderful person. I can't imagine him not being here."

Mullen resided in Jackson, Miss. He is survived by his wife, Tommie, and his son, Scott.

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NEWS SHORTS

Alliant sues over name

Alliant Computer Systems Corp. last week joined the swelling ranks of computer companies leading competitors to court on trademark infringement and unfair competition charges. This time, the co-defendants are Honeywell, Inc. and a new Honeywell subsidiary composed of its former defense/marine systems business, Test Instruments Division and signal analysis center — and named Alliant Techsystems, Inc.

HP lowers PC prices again

For the third time in three months, Hewlett-Packard Co. will reduce prices on its Vectra personal computers, the firm is expected to announce today. Since July, prices on the Vectra 286/12 base model have dropped from $2,399 to $1,799.

Ingres ports Windows 4/GL

Ingres Corp. is moving its Windows 4/GL application generator onto four more Unix platforms. According to Ingres, the icon-driven generator will run in the following environments by year's end: HP/UX, IBM's RISC System/6000 AIX, Digital Equipment Corp.'s Ultrix and The Santa Cruz Operation's System V/386.

U.S. wants relaxed export controls

The U.S. urged its allies last week to relax export controls on a broad range of computers and software for sale to the Soviet Union and Eastern Europe. The U.S. asked the Coordinating Committee on Multilateral Export Controls to decontrol general-purpose software and hard disk drives up to 800M bytes, as well as loosen controls on minicomputers and workstations.

Esber lands in Poqet

Poqet Computer Corp. has shuffled its executive staff and board of directors. The maker of handheld systems announced that Robb Wilmot, its chairman, has also been named president and chief executive officer. Stav Prodromou, former president and CEO, was named vice-chairman, and former Ashton-Tate Corp. CEO Edward Esber will become acting senior vice-president of sales and marketing.

Carrier adds reconfiguration

Metropolitan Fiber Systems, Inc. last week announced that customers will be able to reconfigure bandwidth and monitor performance on its metropolitan-area networks. Through Metrofiber Network Reconfiguration and Monitoring Service, users can program Metropolitan Fiber's network control center to switch their circuits to backup lines in case of disaster.

Low-radiation VDTs debut

Three vendors announced monochrome VDTs that they claim emit only low levels of electromagnetic radiation. Sigma Designs, Inc. offered a monitor for Apple Computer, Inc.'s Macintosh. Applied Digital Data Systems, Inc. introduced terminals for Digital Equipment Corp.'s computers. Qume Corp. offered terminals for DEC and Wyse Technology, Inc. computers.

Cambex answers EMC

On the heels of rival EMC Corp., Cambex Corp. announced a cache memory system last week for the IBM 3990 Model 3 controller. Cambex will price its add-on cards in the EMC range, which averages about 25% below IBM prices.

Frame relay blankets Codex line

Codex Corp. said last week it has developed frame relay interfaces across multiple elements of its networking product line. Frame relay is a next-generation access standard for T1 and Integrated Services Digital Network circuits that is more efficient than the X.25 interface.

More news shorts on page 186

Revlon riles software vendor

BY SALLY CUSACK
CW STAFF

SAN FRANCISCO — In a case characterized as "shocking" by computer law experts, a Santa Clara, Calif.-based software company abruptly pulled the plug on one of its customers: cosmetics giant Revlon Group, Inc.

Revlon responded by filing a lawsuit in California Superior Court in Santa Clara County last Monday, charging Logisticon, Inc. with extortion and maintaining that the disruption idled hundreds of workers and cost the company $20 million in product deliveries.

Referring to the action as a form of "repossession," Logisticon President Don Gallagher reportedly instructed his employees to use telephone lines to disable the inventory management software in Revlon warehouses after the latter refused to make a major payment.

Revlon contends that it suffered a financial loss when two of its warehouses were later unable to ship products because of disabled software.

On Oct. 9, the New York-based company shot off a letter to Logisticon stating that a $180,000 contract payment would be withheld due to inadequacies in software performance. Revlon also demanded that Logisticon provide it with access to the source code as a condition for payment.

Right back at you

Logisticon, in return, shut down the software operation at Revlon on Oct. 15, reportedly disabling warehouses in Phoenix and Edison, N.J., for three days.

"From an ethical viewpoint, I find the behavior shocking," said Esther Roditti Schachter, a New York lawyer and publisher and editor of the "Computer Law and Tax Report."

Schachter questioned whether the right of repossession claim filed by Logisticon is accurate, given that more than the software was repossessed when Revlon lost money in both product shipments and labor.

Peter Marx, a Boston-based computer lawyer at the Marx Group, said he sees this as more than just a bill dispute. He said this type of action undermines trust between software vendors and the information systems community. "This is a dangerous precedent," Marx said. "My concern is that people will begin thinking of this as more of a means of collecting bills."

Officials at Revlon and Logisticon were unavailable for comment last week.

Ask buys out Ingres, plans to divide up staff

BY MAURA J. HARRINGTON and JEAN S. BOZMAN
CW STAFF

MOUNTAIN VIEW, Calif. — Despite threats of a proxy fight from one of its major shareholders, Ask Computer Systems, Inc. sealed its acquisition of Alameda, Calif.-based Ingres Corp. last week by buying out Ingres shareholders.

At the same time, Ask announced it would cut 15% of Ingres' staff and a "small percentage" of Ask's staff and divide the entire organization into five separate divisions, according to Peter West, Ask's vice-president of business development, who has helped to spearhead the project so far.

Meanwhile, Ask shareholder James T. Lennane of Naples, Fla., who now owns 7% of Ask, continued to raise objections to the deal and sought election to the Ask board at last Friday's annual shareholders meeting.

Although he had put himself and two associates up for election to the five-person board, Lennane focused on a plea to other shareholders to elect him as a director who would not rubber-stamp management decisions.

Lennane had sought to torpedo the complicated acquisition of Ask, alleging that selling 30% of the company to Hewlett-Packard Co. and Electronic Data Systems Corp. (EDS) in order to fund the acquisition would dilute the value of shareholders.

"I would have taken over Ask Corp. by buying it if the Ingres acquisition had not been a fait accompli," Lennane said last week. Ask officials said the board will now be expanded with the addition of a seat to be filled by a representative of EDS.

"We won't be able to disclose the results of the shareholders' votes on the proxy fight, but we aren't that concerned. Maybe they'll elect Lennane onto the board of directors, but we don't know," an Ask spokeswoman said prior to the meeting, adding that the acquisition bears no threat to Ingres users.

Ask has appointed Andy Knowles, former top executive vice-president at Digital Equipment Corp. who left to become an independent consultant in 1983, as the general manager of the project to consolidate Ingres' business into one products division.

Ingres' transitional team, an Ask spokeswoman said, will continue to market and develop its products under the Ingres name as well as work with the Ask Products Division in the future to "help go beyond our present markets" while the new Ingres division is being developed.

Eric Wasiolek, product marketing manager of the Ingres/Star and Ingres/Net products, said he felt positive about the acquisition.

"We are absolutely committed to the database business; that's why Ask bought Ingres. They know there's great growth in the RDBMS market still left," Wasiolek said. "Ingres has a horizontal presence in the industry, spanning many vertical markets. Ask wants to ride that [database] presence to gain access to other market segments. Together, we hope we'll be flying in the face of Oracle [Systems Corp.] with a much superior product," he added.

Pushing $140 million

The acquisition was valued at $106 million for the purchase of Ingres stock, although Ask officials said assumption of debt and other factors pushed the total cost to about $140 million. In addition to the capital raised from HP and EDS, the company used a $75 million loan from The Chase Manhattan Bank NA, for which it mortgaged all the assets of the company.

Ask Chief Executive Officer Sandra Kurtzig said Lennane's legal actions had cost the company $2 million and that he was seeking compensation for the $2 million he claimed to have spent seeking to force a shareholders vote on the merger. "It appears to me that his intentions were to put this company in play and to see it auctioned off," Kurtzig said. "The board and I believe that this company is worth more than its book value."

Analysts agreed that the Ask acquisition of Ingres would probably help users because of its deep pockets.

"With the backing of EDS and HP, I don't think they will have to cut any research and development . . . and I think that makes the users feel more confident about the Ingres products," said Paul Bloom, an analyst at investment firm Volpe, Welty & Co. in San Francisco.

"EDS and HP will be instrumental in helping us penetrate into nonmanufacturing markets," which makes up 60% of Ingres's business, the Ask spokeswoman said.

The Problem With Buying Software From A Hardware Company

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Vendors' pain is users' gain

BY NELL MARGOLIS and MAURA J. HARRINGTON
CW STAFF

The ravaged economy at home and looming fiscal and military uncertainties abroad are turning the computer industry into a bloody battlefield for vendors — and a bloody bonanza for users, according to industry observers.

In the coming months, analysts said last week, we can expect to see U.S.-based computer firms pare down, team up and pay scrupulous — in some cases, novel — attention to their balance sheets. Above all, they will pay court to the customer as they vie for dwindling dollars amid increasingly brutal competition.

Fiscal reality

- Unisys swash in red ink. Page 1.
- Wang breaks into the black but revenue slips. Page 14.
- Compaq price-cutting lifts U.S. market share. Page 129.

It won't be pretty, said one analyst after another. It also won't be new.

"Face the recession?" asked Charlotte Walker, an analyst at Labe, Simpson, Inc. "Hasn't the computer industry been *in* one?"

At the semiannual meeting of the Computer Dealers and Lessors Association (CDLA) held earlier this month, David Estes, marketing manager at North Hollywood, Calif.-based Infinite Computer, said he was sounding out people about the recession outlook. "Most of them believe that it's here, and it will go on for at least two years," he said.

While the computer industry may be seasoned by its own earlier downturn, Walker and other analysts agreed, even more lies ahead as companies go head-to-head in a depressed domestic market and a fiercely competitive global arena that many are just beginning to understand.

While recession-battling tactics and strategies will vary widely from firm to firm, analysts noted, one already-emerging trend is likely to remain front and center: intensified focus on pleasing the user.

The shaky late 1980s economy, analysts said, made vendors pay more heed to the old maxim of giving the customers what they want. Now, with shaky ripening into precarious, firms are falling over one another in the rush to convert lip service into real customer service.

Computer Associates International, Inc., for example, spent the late 1980s racking up a reputation as a high-flying growth company with little concern for users, Walker said. After the shock of a couple of "disastrous" quarters set against the backdrop of impending recession and worldwide unrest, "CA has spent the past year going all out in customer goodwill," she said.

Oracle speaks

Oracle Systems Corp., another software highflier known for spotty support, is making serious user attention the cornerstone of a massive corporate reorganization (see story page 130).

In fact, conservative ways — once the badge of nonplayer status in the computer industry — are suddenly in style and likely to remain so. Infinite Computer's Estes found this reaction among fellow computer lessors who foresee a several-year recession: "They're sitting tight," he said. "I can tell you that in this industry, there are very few sudden moves being made."

The new conservatism is not just for leasing firms. To the contrary, third-quarter computer company earnings reports issued during the past several weeks contained a litany of hedged bets and pledges to proceed cautiously.

Ironically, the users now recognized by vendors as key to survival are not as easy to please as was the case even a few years ago. An increasingly sophisticated and demanding crew even before hard times hit, recession-wary users now sense that they can not afford to make mistakes in selecting technology products and strategies, said John Rohal, an analyst at Alex. Brown & Sons, Inc.

"Companies whose offerings will produce the biggest, earliest returns will sell best to customers who are carefully prioritizing their [technology] investments," he said. This principle, Rohal continued, is keeping spirits and revenues high among, for instance, communications vendors offering products that allow local-area networks to talk to each other and structured wiring systems that tie PC cables into a "smart" central controller.

Recession

FROM PAGE 1

better return on IS investments is exacerbated by the economic downturn. In an Index Group, Inc. survey of about 400 high-level IS executives earlier this month, 61% said they are feeling pressure from senior executives or line management to quantify the value of IS.

"While IS is competitive and strategic, it's also a big expense," said Robert Ferkenhoff, vice-president of information services and quality development at Sears, Roebuck and Co.'s merchandise group in Chicago. "We're constantly pruning and re-evaluating."

Evidence of slow times ahead includes the following:

- The Index survey also found that for 1991, respondents projected the lowest IS budget increase since the survey began two years ago. The average increase among respondents will be below last year's projected 6.9% increase for 1990.
- The U.S. government's projection of growth in spending for computer equipment for 1991 is down to 8% from 9.1% in 1990 and is roughly half of the growth rates in 1988 and 1989 (see chart).
- NDMA, Inc., an IS management consultancy in Ridgefield, Conn., reported that the average projected budget increase among its client base is flat, compared with 5% to 10% in 1990.

"We are in a recession, and in many companies, IS is a prime target," said NDMA President Dean Meyer. "The IS departments who aren't suffering are those who have proven they can deliver high returns on investment."

K Mart Corp. in Troy, Mich., for example, recently approved a corporate budget that includes the IS spending amount planned two years ago, said David Carlson, senior vice-president of corporate IS. But even at firms trying to move ahead aggressively with IS, caution is in order.

"My feeling is that we have to spend now, or it won't matter later," said Joe Harris, director of information technology at National Broadcasting Co.'s TV Stations Division in New York. Harris is trying to push ahead with electronic data interchange, personal computers and OS/2 but admitted, "I have to spend very carefully."

In the hard-hit banking sector, times are even tougher. San Francisco-based Bankamerica Corp., which has seen both IS triumphs and expensive debacles during the past few years, is scaling back to a 4% budget increase after recent years in the 8% to 9% range. Some savings will come from closing a Hong Kong data center and consolidating its operations in London, said Martin Stein, executive vice-president of systems engineering.

Mellon Bank NA in Pittsburgh, planning for what it projects to be the slowest U.S. economic growth in 10 years, will increase IS spending 5%. "But if a war comes, everything's in the tank," said George DiNardo, executive vice-president of information management and research. "The impact on us would be very dynamic, and we have to be prepared to cut back."

Mellon will hold the line on programmers, software packages and almost all new hiring, DiNardo said. Plans for an IBM Enterprise System/9000 in the third or fourth quarter depend on how much Mellon can expand its service bureau processing business.

Recession-related cutbacks have already occurred at Stamford, Conn.-based General Signal Corp., which closed a data center and eliminated 17 out of 58 IS jobs (see story this page). "We have a big business in semiconductor equipment, and that's been hit pretty hard," said Glenn Smith, manager of advanced planning.

Midwest Correspondent Michael Fitzgerald and West Coast Correspondent Jim Nash contributed to this story.

Winds of change

Spending for computers is projected to fall off this year, although not as sharply as for other equipment

Percent of growth in real spending (1982 dollars)	
Investment in computers & office equipment (mainly computers)	
1988	17.9%
1989	15.4%
1990*	9.1%
1991*	8.0%
All other equipment (including machine tools, automobiles, commercial equipment, etc.)	
1988	9.3%
1989	1.3%
1990*	-2.2%
1991*	-3.5%

*Projected

Source: Data Resources, Inc.
CW Chart: Paul Mock

Recession's harvest

STAMFORD, Conn. — Don't tell information systems employees at General Signal Corp.'s IS subsidiary about the "coming" recession. For them, it is here now, and 17 of them, representing 30% of the IS staff, are out of jobs as a result of a data center closing.

In an unrelated change, top IS executive Stefan Gladyszewski left the company two weeks ago to become senior director of development at EMI Music Worldwide in New York. The company plans to begin a search for his replacement as director of operations systems in January.

Sal DiMarco/Blackstar

Gladyszewski *left GSC for EMI*

Under a cost-cutting plan devised by Gladyszewski before he left, General Signal Services (GSS) closed its Andover, Mass.-based data center and consolidated its operations at its mid-Atlantic data center in North Wales, Pa. Only three of 17 Andover employees were transferred, and three North Wales employees were let go to make room for them.

One transferee was Andover data center head Robert Barnwell. Barnwell replaced Christian Getman as head of the mid-Atlantic data center. The two others were Hewlett-Packard Co. technology specialists who were needed to support an HP Spectra 955 and an HP 3000 System 70 moved from Andover.

GSS moved two Digital Equipment Corp. VAX 6310 processors from Andover to North Wales to replace a VAX 8810. The consolidation has also cut expenses for peripherals, tape drives and package software licenses. "We've cut back dramatically," said Glenn Smith, manager of advanced planning at GSS.

General Signal had consolidated virtually all processing for its more than 20 autonomous business units in the two data centers last year [CW, Sept. 11, 1989]. "After consolidating most of our company units [into GSS], now we're consolidating ourselves," Smith said. GSS also runs two IBM 3081s.

The Andover center had served as a disaster recovery hot site for North Wales, but now GSS is considering an offer from IBM to provide disaster recovery services, according to Smith.

Gladyszewski left "on good terms" after 11 years heading IS at General Signal, Smith said. At EMI, he is responsible for developing common systems and managing global technology projects among operations in 38 countries, which reportedly have widely varying information management processes. He reports to Anne Payne, EMI's senior vice-president of information technology.

CLINTON WILDER

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Officevision

CONTINUED FROM PAGE 1

need more testing, we won't hesitate."

He also avoided making any promises that a delivery date for the Application System/400 version would be announced by year's end.

"We've got some idea now, but I've got work to do yet," he said. "I'm not done reviewing it. We are about where we want to be, but I want to get this one right."

Earlier this year, Mondello said IBM would deliver Release 2.0 of Officevision LAN and VM in the fourth quarter of this year, both of which were delayed from a scheduled early 1990 shipment. At that time, he also said IBM would announce an availability date for the OS/400 version by year's end.

The deadlines are critical to IBM — not because users are impatiently waiting for the new releases but because of the credibility problem Officevision has had almost since its debut last year.

"I think this would be a setback for IBM," said Brian Cohen, vice-president of technology and research at Dun & Bradstreet Software, an Officevision business partner. "Everybody in the market is waiting to see this vision come true."

McDonnell Douglas Systems Integration Co. is using Release 1.1 of Officevision LAN and is "sort of anxious" for Release 2.0, according to Mark Trentlage, an information systems consultant. "We have some users right now who are very interested in the integration," Trentlage said. "Release 2.0 is the one that allows that."

Officevision blasted into the market in mid-1989 as IBM's office tools and applications integration platform. Heralded as the first strategic Systems Application Architecture (SAA) application, Officevision is intended to provide a platform on which to use office tools and a variety of applications without moving from one piece of software to another.

John Martin

IBM's Mondello *will fine tune 4.0*

However, Officevision met with almost immediate criticism for being little more than an IBM proprietary collection of routine office tools.

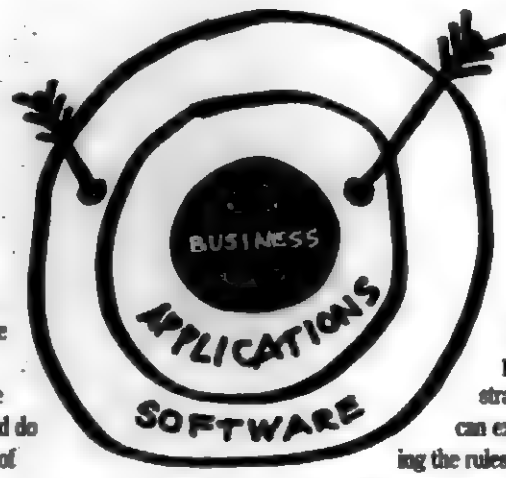
It then took a second major hit earlier this year when IBM delayed the March 1990 shipment of Release 2.0, which some call the "real" Officevision because it has a full office tool set and will provide the complete integration capability for third-party applications.

"If they miss another date, then they have a serious credibility problem," said Stuart Woodring, an analyst at Forrester Research, Inc., which is scheduled to release an Officevision report early next month. "But if Mondello was 100% sure he couldn't do it, he would say so now. He obviously thinks he has a chance."

According to Mondello, test versions of Release 2.0 are out at select customer sites. Furthermore, he maintains he has heard of no critical problems with the software. If there is a delay, it would push off delivery for about another month, he said.

"If 30 days' more testing is needed, and we don't do it, now that's a problem," Mondello said. "Fine-tuning won't be a problem if I needed 30 more days of test."

As long as the aim of CASE vendors is better software, they'll be off-target.



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IBM Business Partner

SQLbase 4.1 fixes problems

BY PATRICIA KEEFE
CW STAFF

MENLO PARK, Calif. — Stung by user complaints and a generally uncomplimentary spate of reviews, Gupta Technologies, Inc. will unwrap SQLbase Server 4.1, a major upgrade of its PC LAN SQL database server for OS/2 and DOS. It is scheduled to ship Nov. 30.

The new version of SQLbase Server will provide cursor context preservation, enhanced router functionality and substantially revised documentation, according to the vendor.

"It's going to be a cleaned up version of [Release] 4.0. User experiences as well as reviews in some major trade journals have pointed out some very substantial bugs, particularly with the programming interface," said Richard Finkelstein, a database consultant at Performance Computing, Inc. in Chicago. Otherwise, he said, SQLbase is "good in terms of what they are trying to do, which is to provide a nice, easy-to-use database server."

Cursor context preservation allows developers to create, with little coding, multiple window browsing and scrolling applications. "Developers can create truly interactive graphical applications for the PC," claimed Bruce Scott, Gupta's senior vice-president of development.

The enhanced router functionality will now allow users of DBwindows, Gupta's single-user engine that runs under Microsoft Corp.'s Windows, to access data managed locally by DBwindows, as well as in remote SQL databases, simultaneously.

The DOS version will cost $1,995; the OS/2 version is priced at $2,495. Purchasers of SQLbase Server after Oct. 1 will receive an free upgrade to 4.1. Other registered users under warranty can purchase an upgrade for $495.

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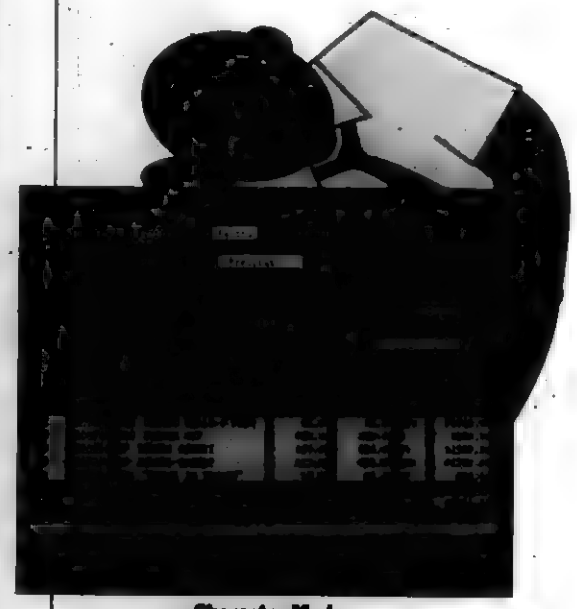

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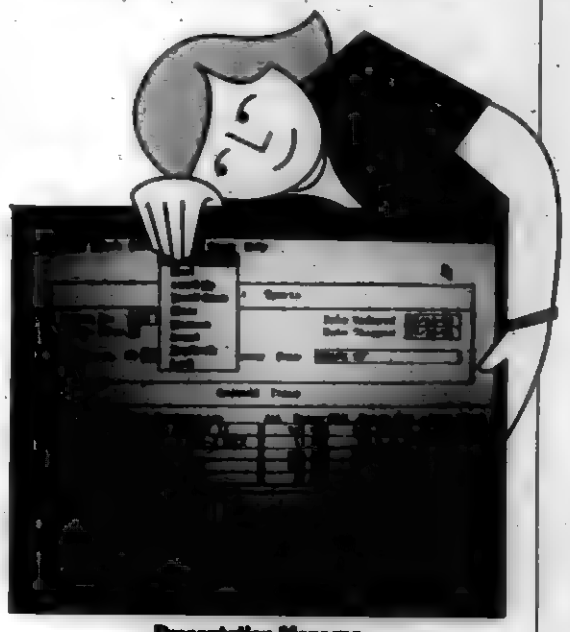

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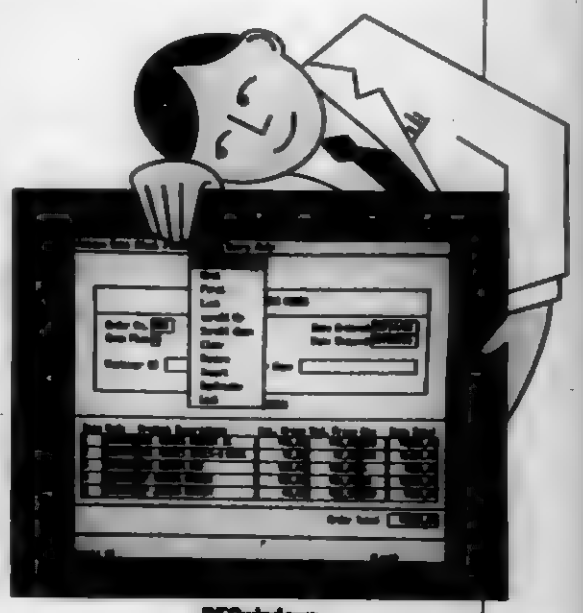

DECwindows

Macintosh

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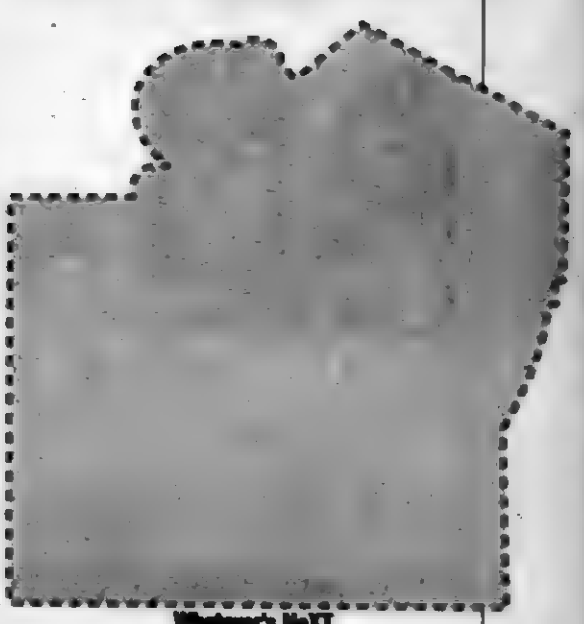

Whatever's NeXT

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Motorola first with microwave LAN link

Use of microwave technology offers an alternative to cable-based office networks

BY JOANIE M. WEXLER
CW STAFF

NEW YORK — Though currently peppered with "ifs," the 15M bit/sec. wireless LAN technology announced last week by Motorola, Inc. could eventually make traditional cabling seem costly and cumbersome to companies installing and moving personal computers, according to analysts.

Motorola's Radio-Telephone Systems Group said its microwave-based Wireless In-building Network products will hit the market during the first quarter of 1991. Motorola is reportedly the first vendor to announce local-area network technology running over microwave links, which — unlike infrared and laser transmissions — do not require line-of-sight visibility between nodes for communications.

NCR Corp. last month announced its $1,390 Wavelan wireless LAN interface card, which employs "spread spectrum" technology and also does not require line of sight. The product, however, transmits at 2M bit/sec., compared with Motorola's promise of 15M bit/sec. speeds.

Motorola demonstrated its technology in an Ethernet environment and said versions for other LANs are in the hopper but declined to be specific. The company said it will position the pending products as an alternative to new — not existing — cable installations to the desktop when users are extending or reconfiguring wired LANs.

Product implementations will reportedly include a 6- by 4-in. radio attached via cable to the PC. The radio will communicate over microwaves to a central, six-antenna controller, which will route data to the intended receiving station.

Analysts agreed that users could be lured away from using wiring by the technology's network-independent nature (it operates at the physical layer), potential cabling cost savings over time when PCs are moved and speed — provided it works reliably.

The actual benefits are still in question, as products have not yet been created and tested. However, Nick Blazensky, director of the telecommunications division at Travelers Insurance Co. in Hartford, Conn., said he figures that a wireless approach will save him about 20% on network costs. He said he beta-tested an infrared token-ring network from BICC Network Solutions, Inc. in January and has ordered five systems to start.

Bob Rosenbaum, president of Integrated Strategies, an Acton, Mass.-based consultancy, estimated that 25% of the installed PC base moves each year. "Wireless LANs will be a significant factor in the future," he said, adding that he expects the U.S. wireless market to reach $600 million by 1994.

Todd Dagres, director of communications research and consulting at The Yankee Group in Boston, projects that by 1992, wireless technology will account for 6% of all LAN connections and will be a $300 million market — up from $3 million in 1990. Forrester Research, Inc., however, projected a conservative figure of less than 1% of the total LAN market through 1995.

Analyst predictions are all over the map (see chart) because there are mitigating factors, including the fact that the technology is not yet proven, questions surrounding Motorola's ability to market what could be perceived as a LAN product, and psychological resistance to microwaves bouncing around the office.

"To what extent will microwaves in the office be secure?" Dagres said. "I don't think Motorola has yet addressed at what level you can tap into a wireless network once you get access to the frequency."

Agree to disagree

Research firms vary greatly on their projections about the likely success of wireless LANs

Estimated shipments of U.S. wireless LAN connections 1992

Forrester Research	9,000
Yankee Group	300,000
Integrated Strategies	500,000
International Data Corp.	40,000

CW Chart: Paul Mack

Phone company tariff filings expand ISDN service options

BY ELISABETH HORWITT
CW STAFF

NEW YORK — ISDN has remained one of the few amenities that Big Apple businesses are unable to have delivered right to their offices — that is, until two weeks ago, when New York Telephone Co. finally filed an Integrated Services Digital Network tariff with the New York Public Service Commission (PSC).

Local ISDN options for East Coast users expanded even further last week, with New England Telephone filing its own tariff for the digital service and Teleport Communications Group revealing plans to offer ISDN connections in the greater New York area, including switched connections to overseas ISDN services, during the first quarter of next year.

The introduction of commercial local ISDN services was good news to New York Fortune 500 companies that are just starting to stick their toes — and business applications — into ISDN waters.

Shearson Lehman Hutton, Inc., for example, "has been waiting for New York Telephone to submit an ISDN tariff so that we can do cost-justification analysis of widespread deployment of ISDN within the firm," said Joseph Tsalik, manager of the ISDN project at Shearson.

While Shearson has no definite time frame for implementing ISDN, the investment firm has begun "researching which of our current internal applications," such as remote IBM 3270 terminal-to-host and CCITT X.25 connections, "would be more cost-effective over ISDN," Tsalik said. Shearson is one of several large organizations participating in an ongoing ISDN pilot test put on by the New York PSC.

Citicorp, another participant in the pilot, plans to start deploying ISDN services at some of its sites by year's end, according to David Isherwood, a Citicorp vice-president. The financial services giant plans to make use of whatever local, long-distance and overseas carriers "are prepared to offer ISDN services," including New York Telephone and Teleport, Isherwood said.

Like Shearson, Citicorp is looking less at finding new applications that ISDN could make possible and more at how existing applications can take advantage of potential ISDN benefits, Isherwood said. However, Citicorp will only implement "non-mission-critical applications" on ISDN until it feels secure that vendor services are "industrial strength," providing the same level of interoperability, reliability and billing infrastructure that plain old telephone service users take for granted, Isherwood emphasized.

The need to put together a solid support and billing infrastructure was one main reason why Nynex delayed its companies' introduction of ISDN services, according to Nynex spokesman Joe Gustafson. The company also waited for the market to take off, he added.

ISDN Basic Rate Interface line revenues are expected to jump from $26.5 million this year to $70.2 million next year and reach $886 million by 1995, according to a recent report released by Eastern Research Corp. "We're moving out of the trial and into deployment phase with ISDN," said Bob Rosenberg, the Parsippany, N.J.-based research firm's director of analytical services.

Major factors in the expanding ISDN market will be the growth of image transfer and telecoferencing applications and increasing business traffic flow to Europe.

New York Telephone's initial tariff is for an ISDN Basic Rate Interface service, which defines two 64K bit/sec. B channels and one 16K bit/sec. D channel. It is scheduled to become available next January. Its rate structure levies the following additional charges over the customer's existing class of telephone service:

- No additional charge for digitized voice.
- $22 per month for circuit-switched data over one B channel.
- $8 per month to send packet-switched data over the D channel.
- $75 per month to send packet-switched data over one B channel.

Nynex expects to implement ISDN on 10 New York Telephone wire centers and 12 New England Telephone wire centers by the end of next year, according to Gustafson. However, such centers will remain "ISDN islands" until various vendors agree on an ISDN standard for exchanging such routing and caller information.

ISDN users served by different switches will be able to communicate via a regular carrier service, such as AT&T's Accunet, but will not be able to make use of enhanced ISDN-based services such as automatic number identification.

New York Telephone plans to file a tariff for the higher speed ISDN Primary Rate Interface in mid-1991.

Hook on the line

Enhanced data services such as electronic data interchange and personal computer facsimile are expected to boost ISDN

ISDN line revenue
(in millions)

Year	BRI	PRI
1988	$4.8	$.1
1989	$9.7	$.3
1990*	$26.5	$.6
1991*	$70.2	$.9
1992*	$135.2	$1.5

*Projected

Source: Eastern Research Corp. CW Chart: Doreen St. John

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Wang Labs is back in the black

BY NELL MARGOLIS
CW STAFF

LOWELL, Mass. — A year's worth of unsparing cost reductions and dramatic corporate reorganization landed Wang Laboratories, Inc. last week right where Chairman and Chief Executive Officer Richard Miller said it would be in its first quarter of fiscal 1991: back in the black.

Analysts hailed Wang's $2.6 million first-quarter profit — its first positive net income since mid-1988 — as a meaningful marker on the firm's comeback trail. However, most were quick to note that Wang, with first-quarter revenue sliding 6% to $576 million from the $605 million logged in during last year's comparable period, still faces an uphill haul.

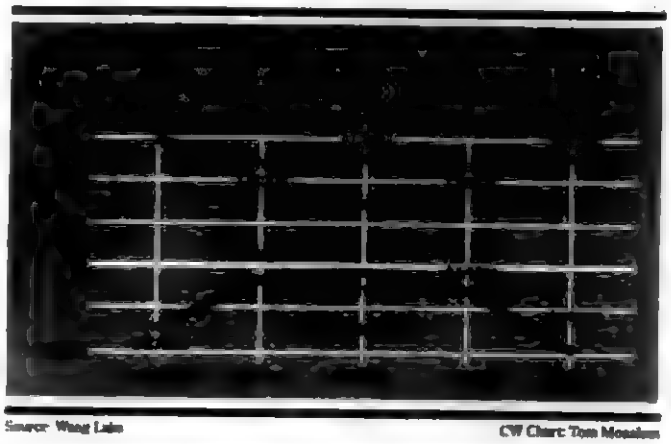
"This company has real problems," said Byron Walker, an analyst at Moody's Investors Services. "The good news is that heroic efforts have yielded massive improvements, but Wang is still dependent on its installed base, which is dwindling."

"Wang is going to have to sell a lot more industry-standard technology configured together into applications that people actually want to buy," said Martyn Roetter, an analyst at Cambridge, Mass.-based consultancy Arthur D. Little, Inc. "Their best bet might be to marry some of their interesting technologies — and they have some — to other companies' [offerings]."

Even assuming that Wang has a winning strategy, analysts questioned whether the firm has the financial staying power to survive as an independent player in a competitive global market.

The first-quarter profit "is very important to us," said Matt Gillman, president of the U.S. Society of Wang Users.

"From the user/IS director standpoint," Gillman said, Wang's posting of a profit "takes an awful lot of pressure off of us. We've been [telling upper management], 'Don't write Wang off.' The company's earning a profit gives us more credibility and a little more security that Wang is going to be there in the future."



Source: Wang Labs
CW Chart: Tom Monahan

In other quarterly earnings announcements last week, Sun Microsystems, Inc. reported net income up 403% to $26.1 million on revenue of $538.5 million — a 26% increase over Sun's sales in last year's comparable period. Amdahl Corp. saw profit increase 41% to $46.4 million; revenue dropped 9% from last year's third quarter to $534.3 million. Computer Associates International, Inc., noting balance-sheet as well as bottom-line improvements, showed revenue up 10% to $310.6 million, and profit spiraled upward 191% to $27.9 million.

Weakness in the financial services sector on which it banked for sales drove Tandem Computers, Inc.'s quarterly revenue below expectations. Tandem posted sales of $506.1 million, up 10% from last year's third quarter, and profits down 19% to $31.8 million. Cray Computer Corp. reported a net loss of $12.7 million on $159,000 of revenue: In times of economic uncertainty, a research-intensive start-up firm is not the easiest thing to be.

Sun to double its Sparc performance

BY J. A. SAVAGE
CW STAFF

MOUNTAIN VIEW, Calif. — Sun Microsystems, Inc. will almost double its Sparcstation performance with its announcement next week of Sparcstation 2, a Unix-based workstation that will run at nearly 30 million instructions per second (MIPS), according to analysts and other industry sources.

The reduced instruction set computing (RISC)-based Sparcstation 2 will either leapfrog or equal the most powerful single-processor workstation currently available: the RISC System/6000 from IBM, which runs at 27.5 MIPS. "It's positioned against the RS/6000 and the Decstation 5000 [from Digital Equipment Corp.]," said Bob Herwick, an analyst at Hambrecht & Quist, Inc. in San Francisco.

"It will be the only 40-MHz workstation out there," said Andrew Allison, editor of "RISC Newsletter" in Los Altos, Calif.

Based on CPUs from LSI Logic Corp. and Ross Technology (through Cypress Semiconductor, Inc.), the workstation will incorporate Sun's own cache and memory controller, according to one analyst.

Additionally, Sun will reportedly announce a graphics co-processor to speed displays in areas such as mechanical design. Sun's graphics response has been grist for complaints among users and potential users such as Thomas Lasinski, chief of the numerical aerodynamic simulation project at the National Aeronautics and Space Administration in Moffett Field, Calif.

Herwick said the coprocessor will make the graphics response "tolerable, but will frankly lag" other graphics workstations.

Users said that both the Sun announcement and related announcements from Sun-compatible manufacturers (see story at right) will affect their buying habits.

This fall, the Sparcstation 2 is only one of at least three workstations based on Scalable Processor Architecture (Sparc) available at the high end. The others, such as Solbourne Computer, Inc.'s, however, get their speed from multiprocessors.

We'll be waiting

Steve Dingfelder, manager of technology computer services at General Tire, Inc. in Akron, Ohio, said that he had put off buying some workstations until the Sparcstation 2 became available. "For some applications, the Sparcserver 1+ was adequate, but on other applications, like for finite element analysis, we're holding out for more power and the Sparcstation 2," he said.

Joel Neisen, director of graphics at the Minnesota Supercomputing Center, said that he is eager for more power and that he will not only evaluate Sun's new workstation but also compatibles that claim similar power. So, too, will Nick Maiorana, a computer scientist at System Exploration, Inc. in Dayton, Ohio: "If they claim 100% compatibility with Sun, then I'd seriously consider taking one — I'd have to go for the value."

Analysts differ on predictions of cost, with predictions ranging between $9,000 and $14,000.

Sun's last Sparcstation, the 1+, was introduced in May. It runs at 15.8 MIPS and 25 MHz and started at $8,995.

Sun-sponsored clones will prompt price competition

BY J. A. SAVAGE
CW STAFF

With both Unix Expo and Comdex/Fall '90 coming up, new computers based on Sun Microsystems, Inc.'s Scalable Processor Architecture (Sparc) are flooding into the market.

This deluge is both expected and dreaded by Sun. The company wants Sparc to be prevalent and thus expand the market for its version of reduced instruction set computing machines. To effect its long-term plan, Sun has licensed its version of the Unix operating system and its chip architecture to all comers. The drawback to that plan, according to Ed Zander, vice-president of corporate marketing, is that with these new products, Sun has to compete for sales.

The Sparc-based system announcements set for Unix Expo and Comdex/Fall include Solbourne Computer, Inc.'s S4000 Deaktop, an expandable workstation with its own graphics accelerator, said Allan Snell, vice-president of marketing.

The computer runs at 25.5 million instructions per second (MIPS) or 12 Specmarks (a Specmark is a rating given by Spec, an industry consortium, based on testing a technical application suite). It has up to 104M bytes of main memory, and pricing starts at $8,995, according to Snell.

Also at the high end is Irvine, Calif.-based ICL, Inc. This company gets its speed from symmetrical multiprocessing servers. The DRS 6000 series will be available in two-processor and four-processor versions beginning at $150,000. Earlier this year, the company said that its multiprocessors would run at up to 60 MIPS, but it could not confirm a MIPS rating on the new products.

Opus Systems Technology Group is offering three product lines: the Personal Mainframe 5120; the Series 500 Personal Mainframe line of personal computer add-in boards; and Opus-engine, a compatible Sparcstation motherboard. The Personal Mainframe begins at $8,995. According to the company, it runs at 18 MIPS with 8M bytes of main memory.

Tatung Co. announced an expandable, entry-level system for $6,995. The diskless Tatung Sparc Workstation runs at 12.5 MIPS and includes a floppy disk drive.

A laptop from RDI, Inc. called Brite Lite is also being announced. The computer runs at 13.5 MIPS and has 8M to 16M bytes of memory. Pricing will start at $7,000 and go up to $12,000 for a fully configured machine, according to the company.

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HEWLETT PACKARD

Bull tries soothing users' open systems fears

BY SALLY CUSACK
CW STAFF

ORLANDO, Fla. — Almost 800 faithful Bull HN Information Systems, Inc. users convened here last week to be reassured by their vendor that large systems customers would not be forgotten during the company's somewhat painful transition to smaller Unix-based platforms.

"There is a definite feeling of stability among the users this year regarding Bull's commitment to both proprietary and open systems," said Shirley Eick, president of North American Honeywell Users (NAHU) and interim president of the Bull User Society (BUS).

Bull depends on its proprietary line of mainframe and midrange processors based on the GCOS operating system to provide approximately 45% of its U.S. revenue, company sources revealed.

"We are very serious about protecting our customers' investments in GCOS," said Maurice Gervais, Bull's director of large- and medium-size systems marketing. He added that the company is sinking millions of dollars into both GCOS and Unix research and development. Gervais said he views Unix capabilities as "complementary" technology for large systems customers as well as a vehicle for offering new platforms and attracting a new user community.

Users expressed confidence in Bull's ability to maintain its large systems environment. Steve Weber, computer services manager at Herff Jones, Inc., an Indianapolis-based manufacturer of high school class rings, caps and graduation gowns, said the company has maintained a good relationship with Bull through the years.

Herff Jones installed a DPS 8000-82 mainframe in August 1989, and, according to Weber, the company is very pleased with the maintenance and service.

Sharon A. Lunder, a data administration analyst at Graybar Electric Co., which is headquartered in St. Louis, echoed similar sentiments, saying that Bull had always provided good service. Graybar, a Bull customer for more than 15 years, is currently linking its DPS 6 minicomputers — scattered across 19 districts throughout the U.S. — into a Bull 9000 mainframe at headquarters.

This year's BUS meeting marked the first occasion that members of the Honeywell Large System Users Association (HLSUA) and NAHU organizations joined together as a single entity. Eick said she anticipates that moving to incorporate both groups will increase regular membership.

Show time

Bull had representatives on hand to display the company's new DPS 6000 Extended Capability Processor — a platform designed to couple proprietary DPS 6000 midrange systems with AT&T Unix System V- and Intel Corp. I486-based capabilities.

Nicknamed the XCP/486, the product hooks into midrange 6000 series machines and integrates several applications into a Unix environment, including those from Oracle Systems Corp., Lotus Development Corp. and Informix Corp. The product is available in both 25- and 33-MHz versions with 16M and 32M bytes of memory and is priced at $17,999 and $30,199, respectively.

The company also launched the DPS 6000 Model 611, a GCOS-based processor designed to supplement Bull's midrange line while providing XCP/386 or XCP/486 capabilities. The system offers 16M bytes of memory, expandable to 64M bytes, and can support as many as 64 asynchronous lines.

CDC watches its fortunes falter in third quarter

MINNEAPOLIS — Control Data Corp. delivered its third-quarter financial results last week, showing a $1.3 million drop and a substantial decline in revenue from the corresponding period last year, when it sold its Imprimis disk drive subsidiary to Seagate Technology, Inc. and took a pretax restructuring gain of $8.5 million.

Control Data officials noted that the company's computer products group had exceeded its earnings targets in the quarter but cited unrelated problems in the company's energy management systems group and its automated wagering businesses.

"We are evaluating alternative solutions to these issues, and earnings in the fourth quarter may be adversely affected as a result," Executive Vice-President and Chief Financial Officer William J. Miller said in a statement.

Control Data reported net earnings of $8.5 million on revenue of $434.1 million for the third quarter of this year.

In the third quarter of 1989, the company had net earnings of $9.8 million — which included the net pretax restructuring gain of $8.5 million from the Imprimis sale — on revenue of $763 million.

ELLIS BOOKER

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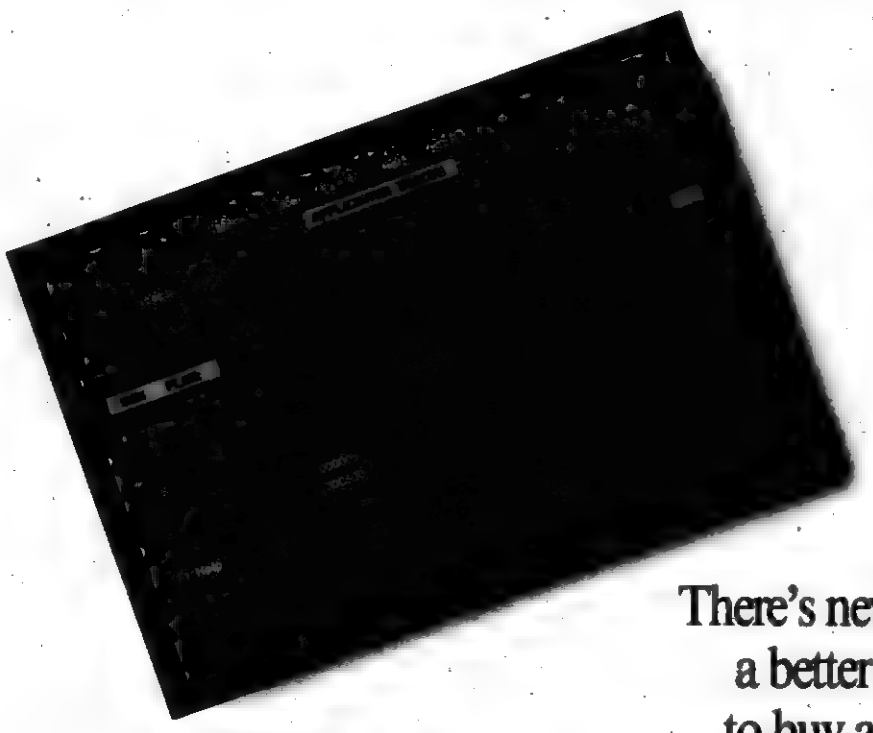

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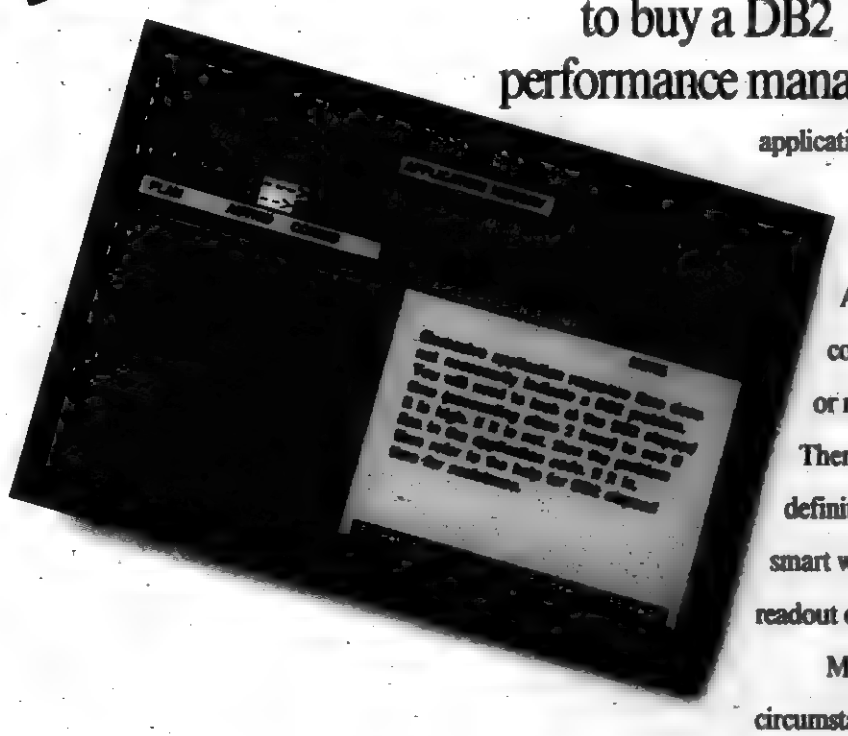

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Silicon Graphics plugging into PCs

BY J. A. SAVAGE
CW STAFF

MOUNTAIN VIEW, Calif. — Silicon Graphics, Inc. will announce plug-in graphics hardware tomorrow to augment the performance of IBM-style Micro Channel Architecture-based personal computers. Also scheduled for announcement this week are a server and workstation as well as price reductions on three of its midrange models.

"It's a Micro Channel and AT board that gives substantial workstation performance from a regular PC," said Charles Foundyller, president of Daratech, Inc., a Cambridge, Mass.-based consulting firm.

He added that the boards will run on either MS-DOS and Microsoft Corp.'s Windows 3.0 or SCO Open Desktop from The Santa Cruz Operation.

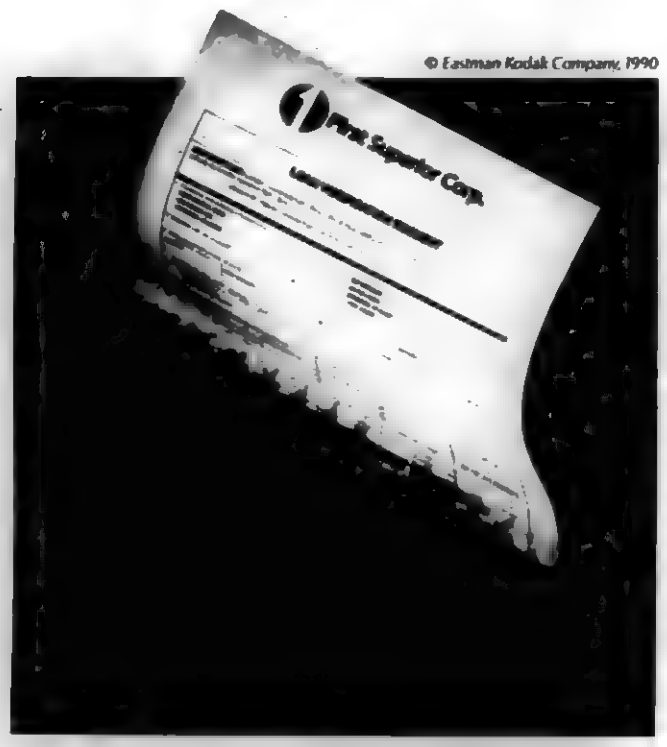
The products, Irisvision 3D Graphics Boards, will cost between $3,500 and $5,000 and should be available in January.

The company refused to comment on the low-end announcement.

In the midrange, a new model called the 4D/310 GTX is scheduled to be introduced today. The graphics computer runs at 30 million instructions per second and 19.5 Specmarks (a rating derived by running a suite of technical applications from SPEC, an industry consortium). It is priced at $49,900, according to Paul Koontz, director of graphics marketing. The 4D/310S, a server based on the same configuration, is priced at $24,900.

The company is lowering its prices on the 4D/380, 4D/340 and 4D/320 between 20% and 28%.

Koontz said the price reduction was in advance of competitive pressures. However, analysts see it as a kicker while Silicon Graphics waits for the next generation of Mips Computer Systems, Inc.'s reduced instruction set computing processors.



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MANAGE THE IMAGE. CALL KODAK

DG users get lower costs, more support

BY SALLY CUSACK
CW STAFF

SEATTLE — Members of the North American Data General Users Group, gathering last week for the annual meeting here, were greeted with the announcement of lower-cost RISC technology and software support from Information Builders, Inc.

With more than 700 attendees listed at preregistration, Data General Corp. officially demonstrated its MV 30000 computer [CW, Oct. 22] and announced a low-cost graphics workstation for its Aviion line of reduced instruction set computing-based systems.

Information Builders announced that its Focus fourth-generation language is now available for applications development and decision support in the Aviion environment.

Focus for Unix runs under DG's DG/UX and supports client/server and X Window System distributed processing. Shipping is scheduled for November. Prices begin at $3,000.

Priced at $3,995, the AV 100 is positioned as an alternative to X Window terminals or personal computers as a graphics-based interface to Unix applications, the vendor said. DG perceives Sun Microsystems, Inc.'s SLC workstation as the AV 100's closest rival.

The machine, based on a 16-MHz Motorola, Inc. 88100 chip, includes 8M bytes of memory, a 20-in. monochrome monitor, small computer systems interface, Ethernet interface and two serial ports. It can be expanded to support 16M bytes of memory and up to 4G bytes of external hard disk.

The system operates under DG/UX and is said to run at 17 million instructions per second.

Keeping It SIMPLE

By
David Stone
Vice President
Software
Engineering

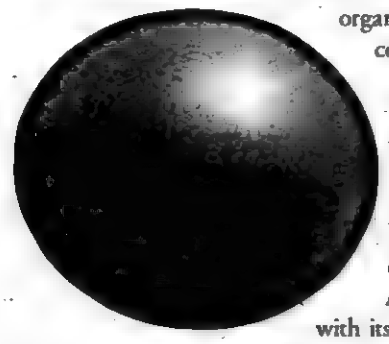
It was Machiavelli who said, "For every complex problem, there is a simple solution, and it's wrong." And Einstein who cautioned that we should strive to make everything as simple as possible, "but not simpler."

We in the computer industry are often guilty of trying to make things simpler than they are.

So, I'll admit it: things are complicated.

For one thing, companies everywhere are working to get "closer to the customer"—which is not as easy as it sounds.

Because most companies have been organized to optimize *internal* communications.



A sphere is the most efficient way to enclose a given volume in three dimensions.

Mathematically-speaking, this makes them somewhat like a sphere—which is the most efficient way to *enclose* a given volume in three dimensions.

A sphere comes into contact with its environment at its surface.

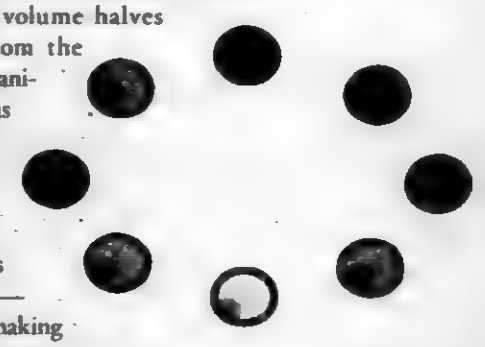
And so, to continue the metaphor, the distance between the center and the surface (the maximum distance any point in the company can be from the outside) gives us a way to represent how quickly an organization can respond to change—or how "close" it is to its customer.

You can see the problem. As a sphere gets larger, the center gets farther away from the real world. In a global economy where things happen faster and faster, it soon takes too long for messages from the "skin" to reach the center and for (re)actions to be carried out. A company loses "touch" with customers, markets, the public.

The simple solution is to split up the volume into many spheres, to create many "centers," and to *distribute* resources—which is exactly what many companies are doing today.

The results are interesting. For example, splitting one sphere into eight spheres with the same total volume halves the distance from the center(s). The organization is twice as "close" to its customer.

Breaking up one sphere into eight also doubles the surface area—or "skin," while making it half as thick. So a company that distributes its resources is not only more responsive, it's potentially more "sensitive," too.

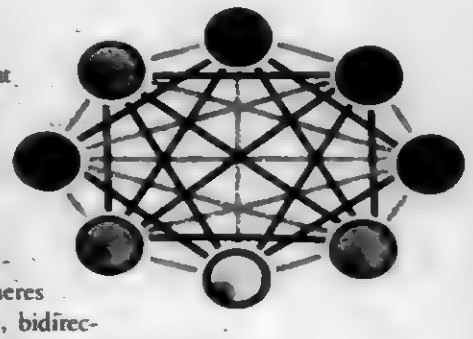


Splitting one sphere into eight spheres with the same total volume halves the distance from the center(s).

It's a cube rule. To be twice as responsive (half the distance from the customer), requires eight spheres; to be three times as responsive (one-third the distance from the customer), requires 27 spheres. Imagine, the same assets, yet three times more responsive . . .

Wait a Minute!

Right. It's not that simple. We're closer to the customer, but internal communications are getting complicated. Eight spheres create 28 formal, bidirectional communication paths. Twenty-seven spheres create 351.



Eight spheres create 28 formal, bidirectional communication paths.

Simply breaking things up, without providing any framework (or *architecture*, as we like to say at Digital) quickly burns up and burns out resources.

continued ➤

The Simple Answer

Managing the complexity that results from moving closer to the customer is a fundamental problem that companies face today.

What's the simple answer to this problem? Computers. Which is ironic, because the same thing (break it up and distribute it) for similar reasons (to get closer to the user) has been happening with computers.

It happened with hardware. The single big sphere, the mainframe computer, was broken up into many smaller spheres: departmental minicomputers, and then desktop microcomputers.

And it's happening with software. Software functions (such as interfaces to the user, data, and system software) that used to be part of the application are being split off. Increasingly, they are located on different computers, and made available as "services" to applications across the network.

The value of splitting off functions is very high. It makes existing computing resources more flexible, more scalable, more responsive, more useful—and greatly reduces the time and effort required to develop new applications.

Technically, however, it makes things very complicated. Just as with an organization, if you break up a computing system without a plan (or *architecture*) to put it back to work together—the effort of managing new complexity can quickly offset the gains realized by distributing functions.

Digital's Added Value: Architecture

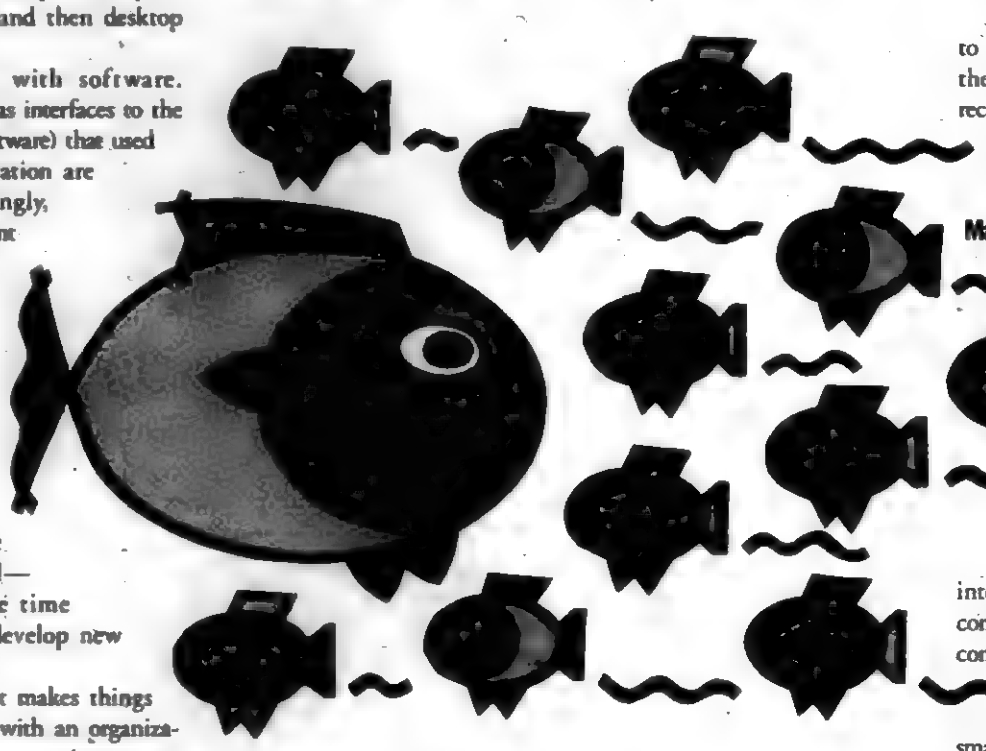
Digital's first-hand experience with distributed systems has led us to develop a tool for managing complexity and rapid change: *architecture*. Architecture is, in fact, the unique advantage Digital offers.

Our VAX/VMS system architecture has, for example, provided our customers with a consistent and constant applications environment, across a range of systems, for more than a dozen years.

Today, Digital is extending the concept of architecture to create a unified applications environment in which distributed computer systems, networks, databases, and applications *from multiple vendors* work together—as easily as they do on a single VAX node.

Creating such an architecture is incredibly complex. But Digital has the technology, people, and processes in place to do it.

In fact, we are already doing it. Digital delivers products *today* through our Network Application Support (NAS) services that provide common application, information and resource management, and communication and control services to a variety of systems. Today these systems include: VMS, UNIX, MS-DOS, Apple Macintosh, and OS/2 systems, as well as IBM systems, databases, networks, and terminals across a DECnet/OSI network.



Nature, more complex than any computer system, has a consistent approach to organizational design.

Industry Standards: An Open Architecture

It's complicated enough getting the people in one company to agree. The challenge in building an architecture to integrate applications in a multivendor environment is just that: it's a multivendor environment.

But it is possible. Customers are demanding it. And the computer industry, ever "closer to the customer," is increasingly adopting industry standards, which, taken together, are creating an architecture for multivendor computing.

Here is where Digital's years of experience in developing architectures and sticking to standards become a crucial advantage for our customers. More than any other company, Digital succeeds in all three aspects of standards:

1. Committing to and implementing relevant standards; for example, Digital's re-engineering of the DECnet network to make it OSI-compliant.

2. Providing the richest stream of new functionality on top of standards; for example, Digital's Compound Document Architecture (CDA) and its suite of products.

3. Effectively moving proprietary products to standards; for example, more than half the products adopted as standards by the recent OSF RFP for Distributed Computing Environment (DCE) are Digital products.

Managing Complexity from the Inside Out

Nature, more complex than any computer system, has a consistent approach to organizational design. It relies on intelligence in all of the parts, united by common guiding principles (*architecture*), to combine to create a self-managing system.

When a large predator fish swims at a school of small fish, all the little fish, in one instant, wheel around and swim back at the big fish. They neatly divide and re-form behind it.

The little fish do this without any boss fish giving the order. A pressure-sensitive band around each fish allows it to perceive the pressure and angle of the big fish and to respond, in the way appropriate for its position, while maintaining its relationship with all the other fish. The big fish, left blinking, wonders where lunch went.

As systems get more complicated, they can no longer be managed from "outside." Digital's mission is to provide the integrated systems, networks, and services to enable individuals everywhere in an organization to be on the leading edge, to interpret and respond to the pressure waves, and to do the right thing for their organization—naturally.

Q and A: Where's Digital Headed with VMS Workstations?

Many of you may be asking that question these days, especially as you look around and see the increased interest in and availability of RISC/UNIX-based systems—from other vendors and from Digital.

You can be sure that Digital is committed to the VMS workstation platform. We will continue to offer VMS as a choice for workstation operating systems—so your investment in VMS workstations will be protected.

The following reflects ongoing discussions on future directions for VMS workstations.

Question 1:
I use VMS. I like VMS. But given the current shift toward RISC/UNIX-based systems, I'm wondering what advantages VMS workstations offer?

Answer:
Implicit advantages include reliability, an assurance of data integrity and security, ease of system management, ease of integration in a multivendor environment, and binary compatibility between new and existing VMS systems. Not to mention Digital's ongoing commitment to industry standards—open buses, NFS, POSIX, and OSF, to name a few.

Also take note of these recent enhancements to the capabilities of VMS workstations (plus some money-saving opportunities):

- The availability of Factory-Installed Software (FIS) for VAXstation 3100 systems, including VMS (with DECwindows), VAXcluster and DECnet-VAX software—at no extra charge on VAXstation 3100 systems with one or more RZ23/RZ24 hard disk drives.
- A Dual Monitor Adapter that allows the connection of two monitors (one must be monochrome) to any model VAXstation 3100, providing a larger screen area for complex applications, or allowing data display on one screen and menus on another.
- Reduced pricing and repackaging of CDROM Subscription Services.
- Special free offer of one decision-support application when you buy a new VAXstation between October 1, 1990 and December 28, 1990, and take delivery before January 31, 1991. Software packages include 20/20 for VAX, dBASE IV for VAX/VMS, DECdecision, and LOTUS 1-2-3 for VAX/VMS.

Question 2:
Where is Digital positioned on price?

Answer:
When it comes to price, we're intent on remaining very competitive—which is why we reduced all VAXstation 3100 Model 30/40 systems by $2,000; and all VAXstation 3100 Model 38/48 systems by $3,000. This means you can now get an entry-level VAXstation system for under $6,000. We've also lowered prices on VMS workstation peripherals, memory, and storage—to support easy, cost-effective upgrading of your VMS workstations.

Question 3:
Graphics play an important role in judging workstation capabilities. What are Digital's future goals for VMS workstation graphics?

Answer:
Our graphics strategy is based on industry standards that comply with open system design principles. The next generation of VAX workstation graphics will have two new graphics accelerators which implement the X Window System.

We're focused on two key issues—high performance and cost. We're moving toward offering lower-cost, basic accelerated 2D graphics on every entry-level system. And we're also headed toward lower-cost VMS workstations with 3D graphics capabilities.

Question 4:
What are Digital's overall goals for VMS workstations?

Answer:
Digital is a major player in the workstation market today, and we plan to stay that way. To keep our edge in this very competitive arena, significant investments are being put into VMS workstations. Our short-term goal calls for doubling our workstation performance every 18 months. Our long-term goal is to offer the best workstation performance and the best price/performance ratio in the industry.

For more information on VMS workstations, related products, and special offers, contact your local Digital sales representative, or call 800-DIGITAL (800-344-4825).

More Open Windows.
The new VT1200 is a high-performance, feature-rich Windowing Terminal that gives users access to multiple VT, X, and DECwindows applications through windows on a high-resolution display. It's available with either a 15-inch or 19-inch monochrome monitor. Both monitors offer 100 dots-per-inch resolution and operate at a 72 Hz "flicker-free" refresh rate. The terminal comes standard with 2 MB memory, expandable to 4 MB.

New PC Debuts.
At NETWORLD 90, Digital announced the new DECstation 425 PC. This high-end system is built on a 25 MHz, Intel 80486 microprocessor, making it ideal for use as a file server or high-performance workstation. It supports MS-DOS and OS/2 operating systems. Configuration features include 8 KB cache memory, three available disk drive expansion bays, support for six AT/XT expansion slots, two dedicated memory option slots, built-in IDE disk controller, and an optional Super VGA video adapter. Entry-level price is set at $6,095.

Digital's EDI Solutions:
Turning Paperwork into Profit

Accompanied with a bit of a smile, the word going around businesses today is that you've got two chances to avoid EDI. Slim. And none.

And that's probably a good thing. Because EDI (Electronic Data Interchange) enables a business to speed the flow of documents between an organization, its customers, and its suppliers via computer-to-computer exchange.

By using EDI in areas such as order administration, distribution, and purchasing, many businesses are already substantially improving their performance in quality control, time-to-market, customer response, and cost containment.

Integrated EDI Lifts the Limits

With EDI, an entire business document is converted into a standard format, which allows it to be treated like a transaction that can be read by other computing systems residing with your trading partners—your vendors, suppliers, and customers. The formats used to convert the documents into EDI data are defined by international and industry standards.

Many EDI products are on the market. However, most of these products offer only limited support of standards and Value-Added Networks (VANs)—the regional and international EDI communications services akin to electronic mail systems. This in turn limits EDI products' usefulness to only a few specific industries or business functions.

Quite the opposite is true with Digital's single, yet comprehensive, approach to EDI.

Our approach gives you the ability to consistently integrate EDI with applications across all departments worldwide, including manufacturing, distribution, purchasing, finance, order processing, and administration.

It works like this: An integrated EDI implementation in your company's inventory control system would automatically generate and send a purchase order when a particular item falls below the optimum inventory level. The purchase order would be received by your trading partner's order processing system. That system would then send an order acknowledgment back to you, followed with an invoice upon shipment. This would all happen automatically, without human intervention.

VAN Independence

Flexibility is a Digital byword. Here, that means the flexibility to implement EDI in a centralized or decentralized fashion, with a few trading partners or with thousands in different industries worldwide—all with a choice of communication options, including multiple VANs and X.400-based direct communications.

Even if you have an EDI product already in place, Digital can step in and help create a more integrated environment for electronic data interchange.

What we're offering you is "VAN independence," freeing you to do business with customers and suppliers who may all use different VANs.

The Core Product: DEC/EDI Software

Announced in May 1990, DEC/EDI software is a component of Digital's Network Application Support (NAS)—our blueprint for open, multivendor application integration.

DEC/EDI software consists of three network-based servers:

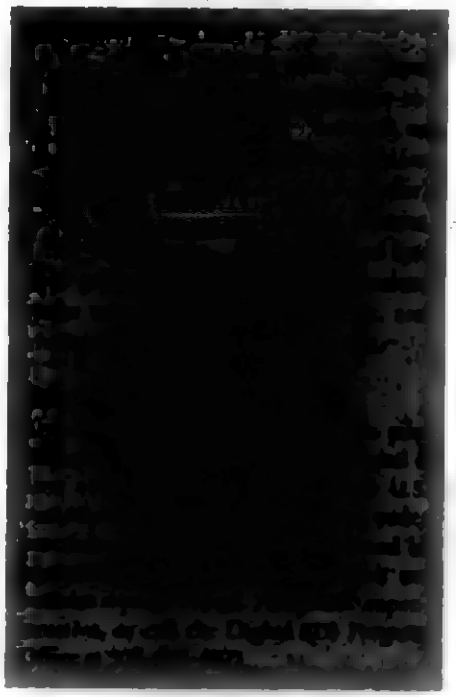
- **DEC/EDI Communications Server**
  The interface to the external communications environment, serving as the gateway for managing, sending, receiving, and logging EDI information with trading partners—either directly or via VAN services.
- **DEC/EDI Translation Server**
  The source for translation and management functions that convert data from an internal data format to an external EDI standard, such as EDIFACT or ANSI X12, and back to the internal format.
- **DEC/EDI Application Server**
  The tools that allow software developers to integrate existing and new applications with DEC/EDI.

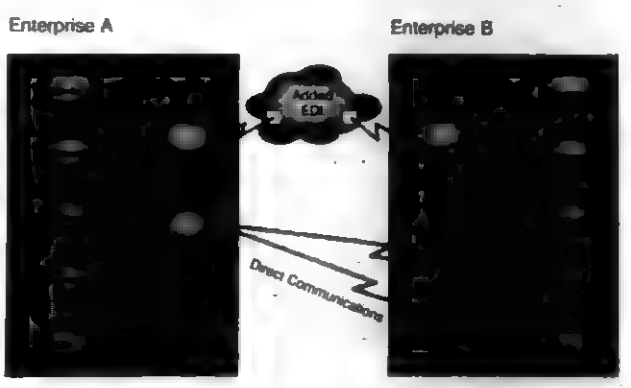
All three DEC/EDI servers automatically log the status and provide a complete audit trail of each document processed.

20 Percent Technology
80 Percent Management

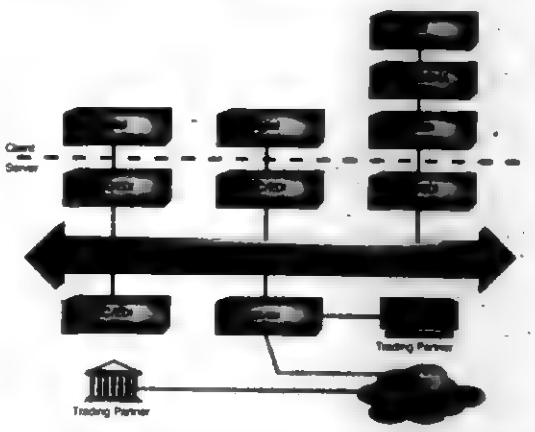
EDI is more than a product; it can signal a whole new way of doing business. Getting the right technology in place is really only a part of the solution. The successful implementation of EDI requires considerable planning, designing, and retraining efforts, as well as ongoing management support.

When it comes to EDI, Digital is with you 100 percent. That's why we've recently established business relationships with Price Waterhouse and Coopers & Lybrand. Together, we can bring you the best EDI consulting and systems integration services available, to help you tailor an EDI solution to your particular business.





With Digital's integrated EDI solution, business applications throughout an organization can use a common, network-based EDI application service.



Digital's distributed approach to EDI makes it easier to work in a business world populated by multiple vendors and VANs.

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Listed prices are U.S. and subject to change.

ADVANCED TECHNOLOGY

TECH TALK

Savings via satellite

■ First Union Corp. recently completed the installation of what the bank holding company said is the nation's first high-speed data communications network linking branch banking operations via satellite. The company said the satellite network is already producing bigger savings than anticipated. Compared with traditional land-based data networks, the satellite network will save the company $4 million over a five-year period. First Union said the system would yield additional savings of $1 million per year once a program to link its branches to a central security monitoring facility is in place.

Chilly Circuit

■ The space and technology group at TRW, Inc. has produced what may be the most advanced working circuit using high-temperature superconductors. The critical breakthrough came from developing a reproducible superfast switch, called a Josephson junction, for the circuit. The TRW circuit is a four-bit, analog-to-digital converter made from the rare earth compound yttrium barium copper oxide, often referred to as 1-2-3 compound. The circuit uses superconductors that operate between 40 and 77 degrees Kelvin (-420 to -360 degrees Fahrenheit).

Pizzabot

■ Researchers at Carnegie Mellon University have developed a voice-controlled pizza-making robot that could give disabled workers and entrepreneurs a chance to get into the restaurant business. The "pizzabot" puts sauce, cheese, mushrooms and other ingredients on a crust and puts the pizza in an oven. The robot, actually an electronic arm, is being put through its paces at a Fox Pizza Den in Pittsburgh. If the test pans out, the robot will set up shop in other Fox fast-food outlets in the fall of next year. The robot will probably sell for $75,000 to $100,000, researchers said.

Justice neither delayed nor denied

Information system saves Florida counties time and more than $500,000 per year

Mark Steele

BY MICHAEL ALEXANDER
CW STAFF

The Gainesville, Fla., judicial circuit judge listened while the state's prosecuting attorney and public defender argued for what each thought would be an appropriate bail. Rather than deciding on whether to set bail and fix an amount, the judge called a short recess and retired to his chambers, where he asked an assistant to retrieve the accused's criminal record from a central database. After mulling over the record, the judge returned to the courtroom and ruled that based on the accused's past criminal activity, he would be kept in jail until trial.

In Florida's 8th Judicial Circuit in north central Florida, neither judges nor justice have to decide blindly when setting bail or meting out sentences. The circuit court system maintains one of only a handful of Criminal Justice Information Systems (CJIS) in the nation. A CJIS is a network of computers used to keep track of those who have been accused of committing a crime as they wend their way through the judicial system.

"CJIS performs the entire scheduling, docketing and calendaring for every felony and misdemeanor in the circuit," said A. Curtis Powers, Alachua County circuit clerk in Gainesville. It was through the 74-year-old Powers' efforts that the system was installed in Alachua County and tied to judicial agencies in the 8th Circuit's six counties in northern Florida. The system also generates arrest, bail, sentencing and case management reports in far less time and at far less cost than was thought possible, Powers said.

The CJIS, which has been in operation for about 10 months, will save the circuit counties more than $500,000 per year, according to Powers.

County and circuit courts are swamped with paperwork that judges, clerks of courts, sheriffs and several others within state judicial systems are required by state law to process for all sorts of crimes. Inevitably, data must be shared among all of those who handle the cases that move through the justice system, adding to the mounting paperwork. As crime increases, jail populations swell and caseloads multiply, a state's demand for crime data is overwhelming counties and circuits.

Roots of CJIS

The CJIS began as part of a semiautomated, statewide "offender-based tracking system" that was mandated under a state law enacted in January 1988. Five of the six counties in the 8th Circuit installed the tracking systems; the sixth — Alachua County — took a different tack. Alachua opted to install a system that not only fulfilled the requirements of the law but would also go beyond it to interconnect with the surrounding counties and serve as the hub of what would become the CJIS. More importantly, it would be fully automated.

The system at Alachua recorded dockets, arrests and sentences but was not fully automated and was unable to track cases by charge or count, Powers explained. The county's mainframe was also unable to produce offender-based tracking system reports, otherwise known as "blue sheets," from among several other documents required by the 1988 law.

"The blue sheets were our toughest report," Powers said. "We were required to file one for each of the county's 25,000 criminal cases a year. Each took a half hour to complete. They were impossible to keep up, and [the county was] thinking of adding six more employees at an annual cost of $150,000."

Now the paperwork can be completed in minutes using a CJIS consisting of computers from IBM, Digital Equipment Corp., Siemens Nixdorf, Inc. and others. In Alachua, which handles 85% of cases in the circuit, the system includes a Nixdorf Seimens triple processor Targon 3550 superminicomputer running Unix V, 8174 control units that link Alachua's IBM mainframe to the rest of the circuit, an X.25 packet-switching network for county-to-county communications and a fourth-generation relational database to generate the mandated reports.

The circuit's administration of justice begins when sheriffs enter arrest and booking information into the system. CJIS generates a case number based on the severity of the charge and provides case information to the chief judge, state attorney, public defender and circuit clerk. With data in hand, the clerks schedule court appearances and docket dispositions and sentences as well as motions filed by attorneys.

Circuit judges have access to criminal histories as they set bail and pronounce sentences. Also, the chief judge knows the precise number of cases on his docket and the availability of every judge. Circuit judges know their case schedules and have access to information on docket lines in other counties.

The system is easy to use, Powers said. A series of menus guides users through each program. A specially designed phonetic name search enables users to retrieve criminal histories quickly. Data field codes facilitate the preparation of state-required forms and ad hoc reports.

EDITORIAL

Just tariff-ic

ONCE AGAIN, FEDERAL regulators, or more accurately, deregulators, have found themselves at odds with the courts on the thorny issue of competition in the massive long-distance telecommunications market.

This time, the courts have raised questions about the legality of AT&T's negotiating special rates with big customers under the auspices of the Tariff 12 option, which the Federal Communications Commission has previously allowed (see story page 4).

While the courts won't likely repeal the six-dozen Tariff 12 contracts that AT&T has already inked, at least not soon, the dispute will probably take AT&T out of the big contract competition until it is resolved. So for starters, you big customers have one less competitor to court you, leaving only two other significant suppliers.

The courts' logic is, well, logical. It is their job to ensure that competition is fair and that customers aren't discriminated against or made to subsidize customers who get preferred rates.

The courts want the FCC to prove that the telecommunications services offered in customized mode to Tariff 12 users are fundamentally different from those offered to non-Tariff 12 users. In fact, they are not — to any great degree. So yes, these service offerings are discriminatory in this sense. Thus, AT&T, which already holds a huge majority of the large-site contracts, faces an uphill struggle against the courts.

In the meantime, MCI and Sprint, AT&T's main competitors, are free to offer strikingly similar deals without regulation. The *de facto* justifications are that AT&T is the dominant carrier (it is, undeniably) and that the market needs more competition, not less. No argument there.

But if that is the case and if that is the ultimate goal of the courts, the government or whatever body has jurisdiction over these matters, then why doesn't someone step forth and tell us just *what* level of competition or market share will be deemed acceptable? Would a 75% big-business market share for AT&T do it? How about 50%?

What the regulators and courts are doing now is casting confusion and doubt into the marketplace. Heretofore, AT&T was apparently free to negotiate more than 70 Tariff 12 contracts with big companies such as General Electric. MCI has mega-users such as Merrill-Lynch on its special-rate trophy wall, while Sprint has Sears. Can customers continue to build long-term plans around the feasibility of negotiating such contracts in the future? Can the current special-rate customers expect their contracts to be invalidated soon?

No one ever said the breakup of AT&T and the insertion of competition into the domestic telecommunications market would be easy. Similarly, few anticipated the magnitude of the benefits that have been gained as a result.

The judges and the FCC live in the same town, are paid by the same purser and are responsible to the same consitituency. Is it asking too much that they deliver consistency and clarity in promulgating rulings of such broad impact?

LETTERS TO THE EDITOR

Think twice

Charles Lecht's "Artificial ignorance: Not bliss" [CW, Oct. 1], argues that the computer can add to human ignorance. In many respects, this gives the professionals in our industry a responsibility that is often forgotten.

We need to always understand what technology can and cannot do. Too often, our capacity to think creatively about our world is undermined by the very information that is supposed to help us understand it. Too often, technology replaces thought; "data mountains" obscure basic questions of purpose. We need to be aware of the risks of confusing what computers can do well (process and store information) with what they cannot do at all (reason and feel). Technology will always be a tool to enhance the human mind, not replace it.

Eric D. Goldfarb
Manager of
Information Systems
Lintax Ceco Communications
Warren, Mich.

Unthinkable

Regarding the Viewpoint article "Artificial ignorance: Not bliss" [CW, Oct. 1], Charles Lecht has mixed together several issues. First, public health, welfare and social policies are never in harmony or complementary to science and technology or defense policies. All this has absolutely nothing to do either with artificial intelligence or artificial ignorance.

Computers are neither thinking nor mental effort-saving devices. I have never seen computer-aided philosophy, logic, pure mathematics or theoretical physics, the way Lecht implies. In genetics, the deciphering of the genetic code would be unthinkable without very powerful computers.

It is one thing to create a theory, as Einstein did, but quite another to try and confirm its consequences, such as the existence of the black holes. The more one tries to achieve, the greater the risks one encounters and has to take. As Theodore Roszak put it: "To claim that a computer will ever master our messy human realities — or indeed improve the mind's way of dealing with them — is . . . a sign of the madness of our time."

Igor Fodor
Munich, Germany

Think again

In your editorial, "Distant Thunder" [CW, Oct. 15], it seems that all of its paragraphs are in support of the idea that "the demand for skilled professionals will outstrip the supply by a substantial margin." I am questioning how the following paragraph supports the writer's prediction:

"Fully 80% of the meager labor-force growth in the U.S. will be composed of immigrants, minorities and women. Only 45% of the labor force in the year 2000 will be white males, whose numbers have dominated IS employment."

I do not want to put words in anyone's mouth, but to me the above suggests that the 80% of the labor force that will be composed of immigrants, minorities and women will not alleviate the shortage because they are not considered skilled professionals.

If this is not what was meant, why is the above breakdown significant? How is this helpful in substantiating the editorial's prediction? As long as they are skilled professionals, why should we worry about the fact that they are not the same white males who "dominate IS employment?"

Susan Farkas
Citibank
New York

Think deep

Your readership, I am sure, found the recent article about Deep Thought, the chess-playing computer, very informative [CW, Oct. 1]. Unfortunately, the article concludes by stating that the Deep Thought team is working on the next-generation machine at Carnegie Mellon University. That is inaccurate. Hsu, Anantharaman and Campbell brought Deep Thought with them when they joined the IBM Research Division after having received doctorates in computer science at Carnegie Mellon in 1989. Their current work on Deep Thought and its successors is an IBM research effort. The ultimate goal of the project is a massively parallel special-purpose computer system that is 1,000 times faster than the existing version.

Kenneth J. Rowe
Manager, Information
IBM Research Division
Yorktown Heights, N.Y.

Computerworld welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor In Chief, Computerworld, P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701. Fax number: (508) 875-8931; MCI Mail: COMPUTERWORLD. *Please include a phone number for verification.*

Shaping up IS support staffs

BARRY WILMETH

A few summers ago, I have to admit, I was a little bit overweight. Something had to be done, and like everyone else, I wanted instant results. I needed to be trim again. I needed it to happen tomorrow, or at the very latest next week.

Well, it doesn't work that way. To trim a few extra pounds and correct some poor eating habits requires careful planning, commitment to the plan and a positive belief that it's going to work.

The same principles and behaviors apply to managing information systems projects and IS departmental support services. There is always a need to cut back a little more, readjust the plans, change the bad habits and rededicate both the IS people's and end users' commitment to the plans.

Trends such as outsourcing, though not really new, are creating serious concerns for IS.

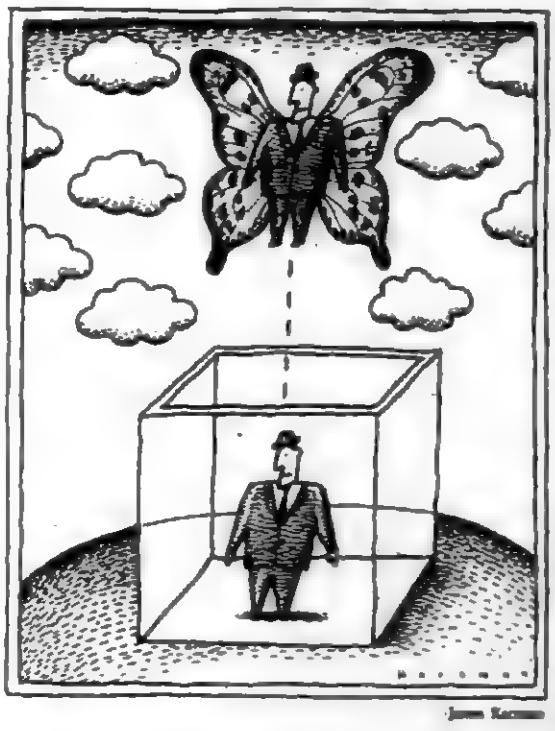
The simple truth is that the profession of IS support is going through a painful and dramatic cultural transformation. Since it is the application of knowledge, not the processing of information, that gives a business its competitive advantage, a corporation strives to get and maintain a business advantage in its primary line of work.

Whatever that line of work is, it requires information processing, which is a support activity. Dedicated outside support is the corporate transformation that has already begun. It is the role of IS professionals that is changing at an extraordinary pace.

The traditional role of the IS staff member is changing into that of a team-oriented specialist.

A "counterculture in values" among business leaders may be directly attributed to the newer views of human resource management, emphasis on assertiveness skills and the decentralization of the formal channels of power. Because those skills and values are directly aimed at the end user of information systems, the IS support staff is now seen as support only and not as a contributing member to the organization's business success.

Business management Machiavellians have never seriously wanted technologists to have input at annual meetings or marketing reviews or to make any forays into sales or manufacturing anyway.



That's because IS managers and professionals are, by their very nature, oriented toward technical issues. Because their support role is minor compared to the total responsive behavior of the organization, their job turnover rate is higher than any other group, and their contributions and proposals are often overlooked or unappreciated.

From Peter Drucker to Isaac Asimov, there is agreement that the 21st-century organization will comprise small sets of teams networked together to accomplish specific business tasks. Organizations are destined to become confederations — assemblages of specialty teams with team leaders and very little corporate bureaucracy. How ironic it is that IS support services and professionals are leading the way to the *unorganizing* of corporate America.

They have become the leaders in this area in two ways. First, with the ability and knowledge of providing direct business information processing needs, IS support organizations have become quickly and firmly established. Second, they have swiftly adapted to the specificity and objectivity required in their contractual roles. Thus, almost overnight, IS support organizations have become solid and successful firms in their own right, with professional staffs.

The role of IS support organizations is clear. They now have charge of their own organizations, and they are in demand because of their important contributions to the competitive nature of American business. Finally, because IS support is really a means of business operations and not an end, "contracted IS support" provides greater flexibility in the management of support activities on both sides, benefiting both the business requiring support and the private IS support company. So outsourcing is not a bad thing for IS.

I was lucky — I trimmed down and got through my weight-loss fight. It was a long, trying period that took a lot of perseverance and attention to a new daily regimen of both diet and exercise. The transformation I went through was great. I've readjusted well. I just wonder how long it will be before I fall back to my old ways and weight.

In the same sense, the transformation of IS professionals is cultural and necessary and should be profitable. The direct pioneering of unorganizing corporate America also requires dedication and perseverance. IS as a clear support function, as part of a team-oriented approach, will help lead 21st-century business strategies to success.

Wilmeth is facilities manager for the Pacific Air Command Center at Hickam Air Force Base in Honolulu.

Secret to skyrocketing success: Kill standards

JEFF ANGUS

What would you think if I told you that most information systems organizations spend 3% to 5% of their time on an activity that not only doesn't contribute to the bottom line but actually degrades the performance of end users? Okay, I'll tell you. It is true, and I'm referring to time spent establishing and enforcing standards.

Standard-setting is the embracing of a group mean. It ignores the individual needs of the people working to make money or achieve success for the organization in favor of the convenience of the IS staff. Fortunately, not all IS organizations fall into the standards trap.

"Our job is focused on solving problems, not on making it easy for our staff," Rick Nordtvedt, an information center manager at Federal Express, said to me recently. The Federal Express approach to standards is regional, allowing each distributed operation a task force to assess for itself what tools best help that operation meet its goals.

Nordtvedt explains that the central information center operation provides advice and helps negotiate with vendors. But because the end users are selecting their own software and hardware, they get something that fits their business needs. And because they're taking ownership of the decision, they're taking responsibility for making the decision work.

The Federal Express approach guarantees the IS staff a challenging job but also guarantees that each user has a stake in the success of the tools that are selected. Standards guarantee simplicity for IS staffs at the expense of what I call "The Mean Effect" for the end users.

The Mean Effect is this: By establishing an average as a standard, the implementor is disenfranchising any subject who is not near the standard mean in perception or ability. Noncustomized education works the same way in our schools. Classes proceed at the pace dictated by standard assumptions for children that age. Brighter students are hindered. Slower learners are ignored. About 40% of the kids are "punished" by classes that ignore their needs. This is an example where there *is* a bell curve — that is, a clumping of most cases near the mean.

In most organizations, there is no bell curve, only an even distribution across the board. The mean is likely to appeal to and work only for the mediocre.

In a distribution like that, playing to any one taste is tantamount to guaranteeing mediocrity. If you want to provide quality services, you have to customize products to each customer's definition of what quality is. Federal Express finds this easier to do because it has a culture set up "to empower people and give them the tools they need to make the business work," according to Nordtvedt.

This is a user-centric view of business tools — optimizing the work of the employees by giving them appropriate, custom tools — as opposed to a techno-centric view, where workers are wrapped around whatever technology is deemed best by the technology professionals. Federal Express has been approaching its business this way for a long time, Nordtvedt says. There are some key advantages to this method and some disadvantages as well, he adds.

For one thing, while end users don't always get the best tools, the tools they do receive get used *more*. Nordtvedt estimates that Federal Express gets a far better return on its investment in user-selected technologies because work accomplished is more a function of end-user variables than the differences between possible technologies.

In other words, an employee with an investment in a way of accomplishing work can get more done than an uncommitted employee with more advanced technology.

The cons of the system are obvious. Technology professionals have to be quick on their feet to support the multitude of products that pervade a user community set up this way.

Local support is critical for the success of the destandardized operation. Each site maintains its own support mechanisms — formal and informal. Federal Express seems to understand that it takes fewer people to support end users when the support is dispersed rather than centralized.

Admittedly, Federal Express has some special advantages in implementing user-centric technology. For one thing, its culture pushes the idea of getting as close as possible to its customers. Nordtvedt notes that this strategy is an internal analog, a message to IS that this is the way to work with end users. Also, the business that Federal Express is in forces it to learn to adapt. The accelerated change patterns of the delivery business mean Federal Express employees are constantly thinking about ways to make change work for them.

Standards can benefit organizations that worship mediocrity but guarantee mediocrity for those that want better. Not all organizations can be as innovative as Federal Express, but if you are standardizing anything more than data dictionaries, you may be sucking the life out of your competitive energy.

Angus is a manager at Farallon Computing, Inc., a manufacturer of Apple Computer, Inc. Macintosh networking hardware and software in Berkeley, Calif.

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COMMENTARY

Rosemary Hamilton

Only a matter of time

Not many vendors could get a few hundred users to attend a conference in honor of a product that virtually none of them have. Guess which one recently did?

Earlier this month, more than 300 people attended the first Repository and AD/Cycle conference in Chicago. While IBM didn't sponsor the event, it was IBM's product and strategic direction for application development that brought those scores of people there.

What was striking was the number of users who said that a commitment to AD/Cycle is pretty much a done deal at their companies. AD/Cycle, announced in September 1989, is IBM's plan for application development. It includes a core piece of software, Repository Manager, that provides both the guidelines for application development — represented in the often-talked-about information model — and functions to manage the development environment. AD/Cycle also greatly depends on third-party software that will connect to Repository Manager and serve as development tools.

Some R/AD attendees said they do not yet fully understand what AD/Cycle is all about. Others doubt there will be any real evaluation of AD/Cycle alternatives. Heck, one user didn't even have DB2 installed yet. But they were all saying that it is only a matter of time before

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Taking a RISC to pick up some speed

ANALYSIS

BY J. A. SAVAGE
CW STAFF

The next generation of reduced instruction set computing (RISC) machines will reportedly hit speeds of nearly 80 million instructions per second with one processor. To make processors that fast, vendors are implementing two methods to send more instructions through the processor for each cycle. The buzzwords associated with improvements in the next generation of RISC processors are "superscalar" and "superpipelining." Each vendor will also increase its processor clock speed from 33 MHz to 50 MHz.

"Think of a two-lane highway," said Howard Sachs, vice-president and general manager at Intergraph Corp.'s Advanced Processor Division, who used cars as an analogy for the computer's instructions. "If you meter the cars' access to the highway, you get a lot of cars on the road, and they won't crash into each other. That's pipelining." He described superscaling as adding more lanes and scheduling the cars into other lanes.

Before implementing these new facets of technology, all vendors are speeding up their CPU clock speeds. The simplest RISC processor sends instructions through the CPU at a rate of one per clock tick. Thus, the simplest method to speed up the instruction rate is to speed up the clock.

Vendors said, however, that relying on increases in clock speed has not been that dependable in manufacturing because of the trial-and-error method of producing high clock-speed chips. The last generation of RISC CPUs was often handpicked to get the current average of 33 MHz, said John Mashey, vice-president of systems technology at Mips Computer Systems, Inc. Handpicking chips made the process less predictable and more expensive.

Vendors plan on using either superpipelining, superscalar techniques or both on top of a faster clock. With superpipelining, instructions are sent at every fraction of a clock-tick through the cycle. Of all the RISC vendors, Intergraph Corp. is the only one who has committed to superpipelining, and it is matching it with superscalar. Mips will not commit either way.

With Sun Microsystems, Inc.'s Scalable Processor Architecture (Sparc), there is no single method used to speed up the chips. Unlike the rest of the chip vendors, Sun allows its semicon-

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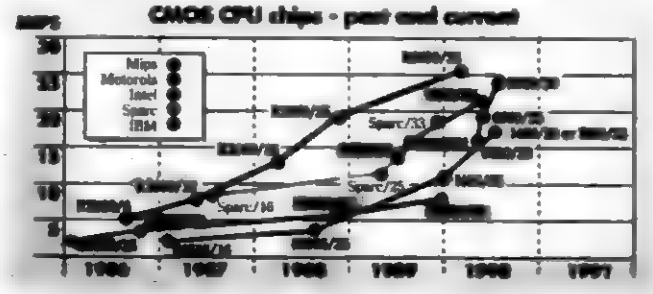
Power pack

RISC processing power is more than five times what was available in 1986



Source: Mips Computer Systems, Inc. CW Chart: Paul Mach

D&B steps into cooperative processing

BY MARYFRAN JOHNSON
CW STAFF

FRAMINGHAM, Mass. — Dun & Bradstreet Software rounded its product line last week by announcing six products for Digital Equipment Corp. VAXs and IBM workstations and mainframes, including new financial applications, relational database software and a workstation-based development tool.

The IBM workstation tool, Frontline Viewbuilder, is the first tangible sign that D&B Software is moving beyond merely enhancing the two product lines it inherited earlier this year in the merger of Management Science America, Inc. and McCormack & Dodge Corp.

Other products announced last week included a Human Resources DB2 package for payroll and personnel that is designed to run under the IBM 370 and 390 architectures and three financial applications in the Millenium line for DEC VAXs.

A solid step

"The idea of Frontline is definitely a step in the right direction for D&B and seems like a natural step toward their future architecture," said Stuart Woodring, director of software strategy research at Forrester Research, Inc. in Cambridge, Mass. "But we're going to see D&B continue to do its old business for a couple years."

Frontline Viewbuilder is a development tool that allows customers to build stand-alone or cooperative processing applications. Specific functions such as data entry can be moved from the mainframe to an IBM Personal System/2 or Personal Computer AT, which can interface with an IBM or DEC host.

Real estate syndicator JMB Properties in Chicago has been using Frontline in beta testing for the past year to downsize property management applications from an IBM 4381 low-end mainframe to IBM PC ATs.

"We had limited use for Frontline when we brought it in, but now we've found three other main uses," said Mike Coxhead, assistant vice-president of MIS.

JMB is developing front-end applications to preprocess information on PCs before shipping it to the mainframe, as well as prototyping a PC-based stand-alone application to track property management, Coxhead said. In addition, JMB is using the development tool to build interactive mainframe/PC applications for uses such as security administration.

At Jet Propulsion Laboratory in Pasadena, Calif., senior systems analyst Bill Dunigan is using Frontline to develop applications for procurement and human resources administration.

"I needed a way to set up screens easy enough for casual users who aren't exposed regularly to the mainframe," said Dunigan, who runs Millenium applications packages on an IBM

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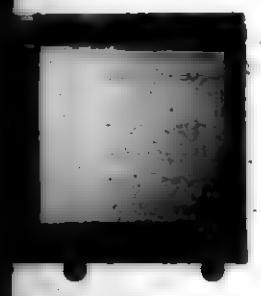

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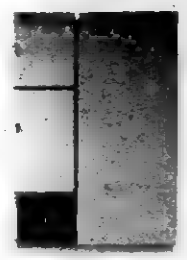

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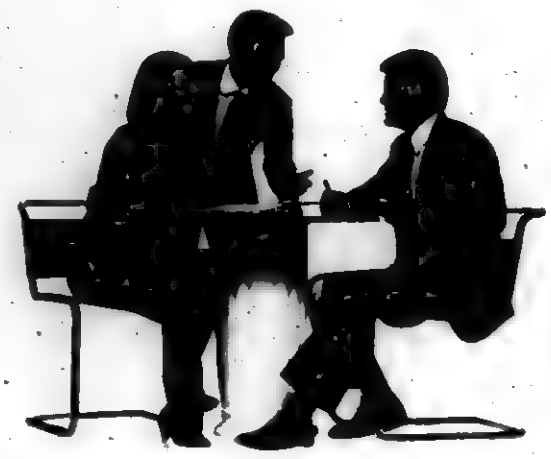

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State Department looks to the STARS

ON SITE

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — When Marilyn Quayle received an invitation last month to meet with a delegation of Soviet officials to discuss disaster relief, the request came through the U.S. Department of State. An ambassador at the State Department had a vague recollection of earlier contact between the Vice-President's wife and Soviet officials, and he wondered if there might be a connection between the two meetings.

Within seconds, he had the answer. Searching through 58G bytes of document images stored in an optical disc jukebox, the ambassador found a 1989 memo that transmitted briefing materials to the White House for a similar meeting Quayle hosted for Soviet officials in the wake of the Armenian earthquake.

Ambassador J. Stapleton Roy, executive secretary of the Department of State, used the Secretariat Tracking and Retrieval System (STARS), which indexes, tracks and retrieves congressional correspondence, foreign policy memos, letters and other important documents going to and from the secretary of state and his six senior deputies.

Backup memory

STARS replaces a cumbersome, partly manual system and the faulty memories of its users. It resides on a Wang Laboratories, Inc. VS 10000 Model 100, the company's largest machine, with 40 Wang imaging workstations attached. A nearly complete array of Wang office automation products coexists on the computer — including such things as electronic mail, word processing, and PACE, Wang's relational database management system and application-development tool. The applications are integrated so that, for example, a word-processing user can retrieve data from the database, put it in a document and then send the whole thing to another user via E-mail.

The State Department scans 35,000 documents annually, averaging five pages each, into STARS. Documents are scanned, indexed and stored on on-line magnetic disks for approximately four weeks. They are then moved to write-once read-many (WORM) optical discs stored in an optical disc jukebox that can hold 176G bytes of data.

STARS users find their requested documents on magnetic disk 90% of the time, said Dan Mcle, director of information resources management within the Executive Secretariat. Requests automatically routed by STARS to the jukebox take 15 to 18 seconds to serve, according to Mcle.

STARS is attached to a local-area network accessible by people with top-secret clearances. The VS 10000 and data storage devices are housed in a shielded room with ties to external terminals via fiber-optic cables.

Katherine Lambert

State's Roy *sees in STARS a qualitative step up*

STARS replaces a Computer Corporation of America Model 204 application running on an IBM mainframe. When queried, that system gave indexes only; users would then have to use the pointers to look up the desired documents on microfilm. "It could take from 10 minutes to two hours to get an answer to a question," Mcle said.

STARS offers a qualitative improvement in information retrieval, Roy said: "If you can't recover a document quickly enough, you may be tempted to rely on your memory. Every issue has a history, and the history has a document trail. You ignore history at your peril."

Roy said he gets many vague requests. "I'll get a call from Secretary [of State James A.] Baker saying, 'Didn't I get something from the President on this?' Or I might be asked to determine what instructions were given to a particular embassy at a particular time. I need to react quickly." STARS shrinks response time from hours to minutes, he said.

Roy said the audit trail provided by STARS is also useful. If the White House complains that it's taking too long to draft a reply to a letter — "a not unheard-of experience" — he can use the system's document tracking feature to pinpoint bottlenecks in the State Department's labyrinthine system of document drafting and approval.

Roy said he uses STARS "all the time," only asking a secretary to do searches when they can be precisely defined. But he said the system is not used by those at the highest levels of the State Department very much. "Most senior officials are of an age that they are computer-illiterate," he said. Part of his challenge is to tailor the technology to the temperament of those officials.

Mcle said the State Department has continued to give Wang the lion's share of its information systems budget partly for reasons of compatibility — both with software and people. "We move people all around the world. We don't want a secretary to go from Bangkok to Rome and have to learn a new system," he said. Wang gives the department superb service, possibly because it is the bluest of Wang's blue-chip accounts, Mcle said.

However, Mcle said, as Wang moves to open systems, he worries that support for the proprietary products may wane: "We may not get the enhancements to the older systems and applications that we need."

STARS replaces a cumbersome, partly manual system and the faulty memories of its users.

Legent takes steps to flesh out SMS

BY SALLY CUSACK
CW STAFF

PITTSBURGH — Moving to fill what it claims are gaps in IBM's system-managed storage (SMS) architecture, Legent Corp. recently introduced a storage performance manager for the IBM MVS environment.

Astex Release 1.0 complements SMS and is designed to locate, identify and recommend solutions for I/O response time delays, as well as ensure efficient use of cache and direct-access storage device (DASD) resources, according to Legent.

IBM's SMS strategy represents an evolution from labor-intensive user-managed storage to automated storage management.

"The performance side of SMS lacks a few pieces, and Astex is plugging those in by providing performance measurement at the data-set level," said Greg Such, product manager at Legent. According to Legent, Astex operates in both SMS and non-SMS environments.

Three-part harmony

Astex consists of three components: Storage Manager, which maintains and improves end-user response time by recommending solutions for proper data placement across the storage hierarchy; a Cache Manager, which provides analysis, automatic optimization, cache simulation routines and data set cache statistics; and DASD Manager, which ensures optimal use of DASD resources.

Hoot Gibson, systems programming specialist at L. L. Bean, Inc., a retail and mail-order outdoor sporting specialties company in Freeport, Maine, has been running Astex as a beta user for a little over a month and said the product "helps quite a bit." L. L. Bean is running Astex on an IBM 3090 600E platform under the MVS/ESA operating system and, according to Gibson, has already been able to convert some volumes to SMS using the Legent product.

"The cache optimizer has allowed us to take some volumes off of cache by identifying what was being overutilized," Gibson said. DASD response time has also improved, he added.

According to Nick Allen, an analyst at Gartner Group, Inc., Astex is valuable in helping a user to determine if the system is "overcached."

Pricing for Astex Release 1.0 starts at $15,000, based on CPU class, and the product is said to support all IBM and non-IBM DASD and cache controllers.

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Users praise Oracle's order-form software

BY JEAN S. BOZMAN
CW STAFF

REDWOOD CITY, Calif. — Suppose you wanted to create an order-entry application that pries data out of an Oracle Systems Corp. database. Then suppose you could not write procedural code. That would be a good time, users say, to turn to Oracle's SQL*Forms, a 5-year-old computer-aided software engineering tool installed at most Oracle database management system sites.

Managers can use SQL* Forms to create order-entry forms by example. The software makes it possible to assemble screen elements, such as pull-down menus and pop-up windows, without having to write the underlying code. The procedure is called "declarative specification," said Sohaib Abbasi, director of tools development at Oracle.

"We give users the high-level objects that handle the mapping [of data] from the database itself onto the user interface," Abbasi explained. "Once an application is developed using SQL*Forms, it can be deployed into any computing environment Oracle supports."

Widely used

First introduced in 1985, SQL*Forms is now used by more than 90% of all Oracle DBMS shops, Abbasi said. Sentry Market Research in Westboro, Mass., estimated that 20% of Digital Equipment Corp. VAX sites use SQL*Forms, based on a survey of 331 firms.

SQL*Forms Version 2.3 is compatible with Version 5.0 of the Oracle DBMS; SQL*Forms Version 3.0 requires the use of the current Oracle Version 6.0 DBMS.

Experienced Oracle users say that by doing away with writing repetitive systems calls, SQL* Forms makes programmers more productive and development more efficient.

"It's used all the time," said Warren Capps, president of the Virginia-based Mid-Atlantic Oracle Users Group. "There certainly are those shops that don't use SQL*Forms at all. They use C to write their own interface to the Oracle DBMS. But most people use SQL*Forms, and they use it happily."

Few users questioned by *Computerworld* wanted to trade in their 2-year-old SQL*Forms Version 2.3 software for the new and improved SQL*Forms Version 3.0 that began shipping to VAX sites last December.

"There's no pressure on me to upgrade from SQL*Forms 2.3," said Bruce Campbell, a software developer at Microtel Pacific Research in Vancouver, B.C. "There are hidden costs of converting to SQL*Forms Version 3.0, including the cost of interrupting business and providing training."

SQL*Forms Version 3.0's new features include PL/SQL, a procedural language extension to industry-standard SQL. The inclusion of PL/SQL is intended to give skillful programmers a way to extend the functionality of an SQL-Forms application. Version 3.0 also supports a standard look-and-feel interface across multiple hardware platforms and supports many graphical user interface-like features, such as pop-up windows. However, SQL*Forms Version 3.0 remains a character-based interface and lacks support for on-screen icons.

Locks speed

Some users who have tried SQL* Forms Version 3.0, including Campbell, say they believe it is running more slowly than Version 2.3, the previous release. That finding does not surprise some industry analysts.

"Since Oracle dominates its market, it tries to stuff too many features into its new products, such as SQL*Forms 3.0," said Paul Cubbage, director of Unix market research at Dataquest, Inc., in San Jose, Calif. "Oracle isn't famous for a new release of software being terrific. They kind of push it out there and keep improving on it."

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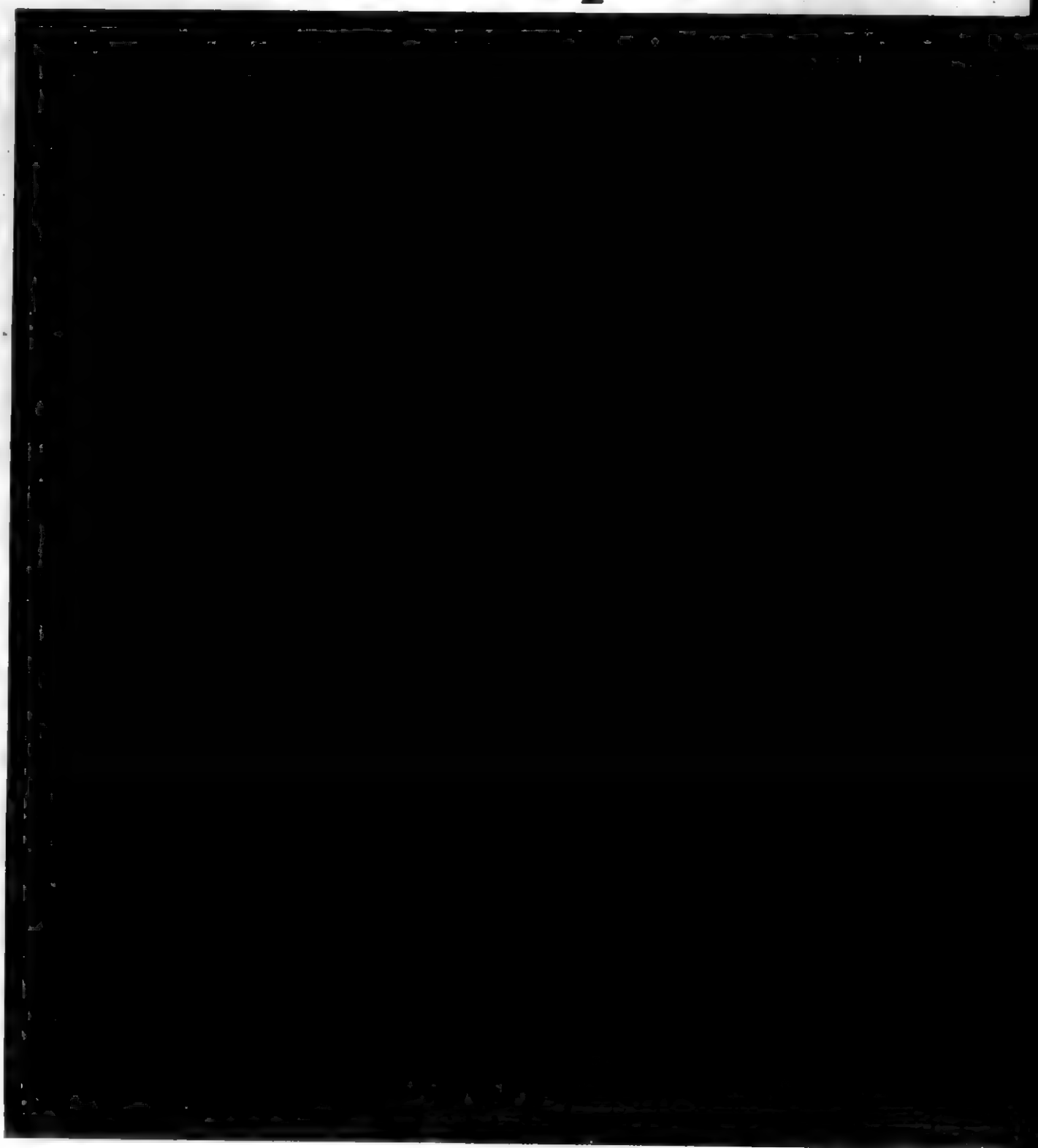

Users blame Prime for Oracle delay

BY MAURA J. HARRINGTON
CW STAFF

NATICK, Mass. — The task of porting popular third-party software products to proprietary systems can be tricky, as Prime Computer, Inc. has learned in its efforts to bring Oracle Systems Corp.'s Oracle Version 6.0 relational database management software compatible system to its Primos 50 series minicomputer platform.

Prime, which has been writing its own port for Oracle since 1985, has been having difficulties with the latest revision of Version 6.0, which includes an SQL report writer.

The revision was due out in full almost six months ago. However, Prime has only managed to port part of the new release and recently told users it would not have the latest revision of Version 6.0 — which has been out for several months on other platforms — until January 1991 at the earliest.

Prime also said that monthly maintenance fees for the latest version's release will increase 100% to 600%. The increase will be necessary because the company has unbundled the services in an "effort to mainstream our maintenance policy with the rest of the industry," according to Perry Bent, Prime's Oracle product marketing manager.

Although Prime's user base of Oracle on its proprietary platform is slightly more than 5% of its total customer base, Bent said, the delay in the newest version of Oracle, which was officially released by the company approximately a year ago, is not a result of Prime assigning it a low priority.

The delay, he said, occurred because the SQL report writer was not written in Oracle's standard port writing code as it usually is.

Nevertheless, users who are running Oracle on their Prime systems claim they are disappointed with Prime rather than with Oracle because of the delay.

One Prime user who is an information systems manager for a city in Southern California and runs Oracle Version 5.1 said he is fed up with the older version but cannot get a hold of the new one.

Another Prime and Oracle user who works for a large utilities comany in the Midwest said that the company runs its Oracle RDBMS on a personal computer because it wants to avoid the "hassle of dealing" with the Prime version.

"We do have a license to run Oracle on our Prime system, but we needed to run Version 6.0, and Prime didn't have it, [so we went with a PC version]," said the user, who is a systems developer at the utilities company.

While the inability to complete the port for Oracle's latest revision of Version 6.0 presents a problem for customers and ultimately for Prime, Wayne Kernochan, senior analyst of distributed systems at The Yankee Group, said that the problem could be the outcome of several other internal difficulties.

For example, the company has recently experienced a large layoff program, a senior management reorganization and a dying minicomputer market, Kernochan said.

"I think some of the problems [Prime] has had have caused some of the good developers to leave, perhaps," said Paul Cubbage, an analyst at Dataquest, Inc., a market research firm based in San Jose, Calif.

Nevertheless, Kernochan said, in the case of Prime, perhaps the company attempted too much, too late.

THE DELAY IN the newest version of Oracle is due to the fact that the SQL report writer was not written in Oracle's standard port writing code.

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SCSI continues its impressive run

Citing speed, addressing capability, supporters say bus will dominate

BY ELLIS BOOKER
CW STAFF

There's nothing small about the importance of the small computer systems interface (SCSI), say vendors who have pushed the standard and analysts who have watched it evolve since 1982.

Most recently, long-time SCSI booster NCR Corp. made SCSI the interface of choice across its System 3000 line of Intel Corp. X86 computers. Apple Computer, Inc. has supported the bus for years across its product line, but virtually every computer company and many peripheral device manufacturers support SCSI for peripheral gear which requires high data throughput.

Why do its backers say the SCSI bus will become the dominant method of connecting computers to all sorts of peripheral systems, from optical disks to parallel disk arrays? The answer rests on two features of the interface. First, SCSI is fast. The current implementation specifies a 5M byte/sec. data transfer rate, and a follow-up standard specifies a 20M and 40M byte/sec. rate, respectively.

Second, SCSI uses logical rather than physical addressing; a "logical unit" may coincide with all or part of a peripheral device. This feature may allow it to play a key role in high-speed, fault-tolerant computer architectures under development.

"Virtually everyone is using SCSI in one place or another," said John B. Lohmeyer, senior consulting engineer at NCR and chairman of ANSI X3T9.2, the committee that develops SCSI standards.

Part of the reason for slow acceptance of SCSI for IBM and compatible personal computers has been the lack of a common command set for SCSI adaptors and devices, Lohmeyer said. This has resulted in a situation whereby an SCSI adapter, which in theory can connect to multiple peripherals, is commonly configured to one peripheral at a time.

However, Lohmeyer's committee has proposed a subset of 18 commands, known as the common command set, as part of its work on the SCSI-2 standard. The command set "should normalize the software layer for [device] drivers," he explained.

No waiting

The basic SCSI-2, approved by the American National Standards Institute in late August, has already started showing up in products. For example, NCR recently unveiled an $8,000 SCSI laser printer that it claims can operate seven times faster than a laser printer attached to a standard parallel port and 100 times faster than an RS-232 serial port.

"We see [SCSI] as very important for image input and output," said NCR Senior Vice-President and Chief Scientist Philip M. Neches. He noted, for instance, that most of the time taken by a laser printer to print a page of graphics is spent transfering data from the computer to the printer over a 19.2K bit/sec. parallel interface.

The System 7000, the 100,000-million instructions per second loosely coupled parallel system NCR hopes to deliver in 1992, will possibly have multiple SCSI ports per processor, Neches said.

In the short term, one of the most promising areas for SCSI will be in support of parallel disk arrays. In this arrangement, groups of storage devices are attached to a SCSI bus. The benefit is that a data file can be spread across multiple disks.

"Your transaction rate is limited by the disk drive," explained Mike Anderson, director of storage systems engineering at Micropolis Corp. in Chatsworth, Calif. A single drive may have an I/O of 40 transactions per second, "but if you string 10 drives together you get in the ballpark of 400 I/Os per second."

This configuration can also be used in fault-tolerant architectures. One of the attached drives can act as a parity check, enabling the system to reconstitute data if one of the drives fails.

Will SCSI dominate among disk drive interfaces for non-Apple microcomputers? Mike Casey, director of storage industry research at Gartner Group/Infocorp, Inc. in Santa Clara, Calif., believes this will come down to whether IBM and its closest competitors find a reason to commit to SCSI across their entire product line. To do so, he noted, will mean either offering SCSI adapter cards for the PC's system bus — using up a card slot in the process — or adding SCSI electronics to the PC's motherboard and creating a dedicated SCSI port at added cost.

Neither approach, he reasoned, makes economic sense if the computer will be configured for a single hard drive. "But once you know you need two or more drives, then SCSI makes all the sense in the world," he said.

Come together

There are four distinct configuration possibilities with SCSI:
- Single Host/Single Controller.
- Single Host/Multiple Controllers.
- Multiple Hosts/Single Controller.
- Multiple Hosts/Multiple Controllers.

The current SCSI specification is a 5M byte/sec., eight-port bus, supporting asynchronous and synchronous data traffic.

Two future iterations of this standard, which was adopted by ANSI in 1986, will significantly increase its data transfer rates. SCSI-2 adds scanning devices and optical memory devices, as well as CD-ROM and network interfaces, to the list of devices supported by SCSI-2. In addition, it expands the bandwidth of the standard with support for 16- and 32-bit bus architectures capable of 20M byte/sec. (SCSI "Fast") and 40M byte/sec. (SCSI "Wide"), respectively. Such throughput will be vital, many think, if I/O is not to become the logjam for next-generation, high-speed computers running at thousands or even hundreds of thousands of millions of instructions per second.

The next jump in the standard will be SCSI-3, which will call for more than eight devices per bus and a fiber-optic interface option. SCSI-3 is now in proposal form before the X3T9.2 committee.

A little history: In 1981, Shugart Associates, in the company of NCR, submitted Shugart Associates System Interface (SASI), an intelligent interface for disk drives, to the ANSI X3T9 standards committee. Renamed the small computer systems interface (SCSI) in 1982, the standard was approved by ANSI in June 1986. The first SCSI protocol chip, developed by NCR in 1983, was added to the Smithsonian Institution's permanent collection this past summer.

ELLIS BOOKER

Hamilton

FROM PAGE 33

their companies would adopt AD/Cycle.

It is discouraging that any company can still carry that kind of clout and that some users would suggest that they plan to license a product and adopt a strategy just because of who and what that company is. This is not to suggest that it is disappointing that people plan to buy from IBM. But it is unfortunate that they'd do so without full-blown competitive evaluations.

These days, when you talk to users, they often say it does not make sense to just go along with IBM anymore. They say it makes sense to hold IBM to a high standard and demand answers, products and a delivery schedule that meets theirneeds. It makes even more sense to check out what the competitors are offering, they say.

So, what's going on here? A trip back in time?

Let's hope not. The bottom line is, if users do not take more control of application development strategy and instead simply follow IBM's lead, they stand less of a chance of getting exactly what they need.

This simply comes down to the old story of a competitive marketplace resulting in better products for users. There are some early signs that this might not happen when it comes to application development.

Take, for example, the information model, the key piece to Repository Manager, which will provide the guidelines for application development. While early users of Repository Manager reportedly have been giving IBM feedback on the product, its information model continues to be crafted by IBM and its business partners, not users. What's more, users still do not have easy access to it. If they want to check out the information model specifications, they are required to license Repository Manager.

However, the typical user at the R/AD conference was very new to the AD/Cycle world. One could assume that they are in no position to challenge or push IBM until they fully understand what is going on.

Further, conversations with some more advanced users — namely, a couple who actually have Repository Manager installed — showed a more aggressive attitude toward IBM. It was one of those users, in fact, who first raised the issue of a different data model between AD/Cycle and Systemview. He was far from shy about indicating his disappointment.

So, to put a positive spin on this, one could assume that it is still too early for users to call the shots. Once they learn more about AD/Cycle, and once they come closer to actually installing products, they may get tougher.

We can't ignore the negative side to this, though. There have clearly been a few warning signs that users are not directing the application development movement as much as they should be.

Hamilton is a *Computerworld* senior editor, systems and software.

SOFT NOTES

Pansophic, Martin sign deal

Pansophic Systems, Inc. signed a cooperative marketing deal with **James Martin Insight**, a division of James Martin Associates, Inc., to provide computer-aided software engineering (CASE) products that blend the Pansophic tools with the James Martin methodologies. The two companies plan to provide versions of Martin's IE-Expert for Pansophic CASE products. IE-Expert provides an automated approach to Martin's information engineering methodology.

TRW Financial Systems, Inc. agreed to port its Insurance Image Transaction System to **Hewlett-Packard Co.**'s Advanced Image Management System. A TRW Information Systems & Services unit based in Berkeley, Calif., TRW Financial Systems has been providing imaging applications since 1978. Both TRW and HP will market the application to midsize life insurance companies within the U.S.

Kapiti, Inc. said it has integrated its Financial Information Systems Toolkit with Dectrade, **Digital Equipment Corp.**'s trading system platform. Kapiti sells trading room and wholesale banking systems.

Bachman Information Systems, Inc. signed a deal with **IBM** to sell its re-engineering products overseas. IBM Asia/Pacific plans to resell the Bachman/Re-Engineering Product Set in eastern Asia. Meanwhile, Bachman and IBM Japan plan to translate the Bachman product into Japanese.

Compuware Corp. announced a licensing agreement with **IBM** that will allow IBM to incorporate Compuware's CICS region analysis technology into the IBM CICS Problem Determination/MVS tool. The IBM tool is designed to diagnose and resolve CICS region failures in CICS/ESA environments. IBM is scheduled to ship its product in December.

A Comparison Chart of the Major Cooperative Processing Software Products:

FUNCTIONS:	SUPER-LINK®	Easel™	Mozart™	Arbiter®	IBM's HLLAPI™	IBM'S APPC™
Peer-to-Peer Processing						
Peer-to-Peer Processing	✓			✓		✓
Existing terminal-based systems	✓	✓	✓		✓	
Mixed Peer-to-Peer and existing systems	✓					
Application integrity/Software Distribution	✓		▬			
SAA/CUA Interface compatibility	✓	✓	▬			
Workstation Environments Supported						
PC/DOS	✓	✓	✓	✓	✓	✓
OS/2	✓	✓	✓	✓	✓	✓
PC/DOS to OS/2 application compatibility	✓		?			
LAN Server for shared applications and data	✓		?			
Multiple transaction servers on a LAN	✓					
Development Environment Comparison						
Object orientation	✓	▬				
Dictionary and documentation	✓					
Panel/Form painter for creation/maintenance	✓	✓	▬			
3270 screen capture: picture and attributes	✓					
CASE/Application Generation	✓	✓				
Intelligent (language-sensitive) editor	✓					
System and user-defined reusable code templates	✓					
Integrated compile/test/debug	✓	✓				
Execution time source debugging	✓	▬				
All development tools for DOS available in DOS	✓		✓			
Objects Supported						
CUA display images	✓	✓				
CUA dialog within display object	✓					
Validation within display object	✓					
Help processing	✓					
Error processing	✓					
Text window interactions	✓	▬				
Business graphics	✓	✓				
3270 definition	✓					
Interactions with 3270	✓					
Interactions with Peer-to-Peer	✓					
"Logon" Scripts	✓					
Application integrity/Software Distribution	✓					
Local Data Access						
Indexed files	✓		✓			
dBase	✓		✓			
Flat Files (random access)	✓					
Flat Files (sequential access)	✓	✓	✓			
Multiple read/write to files on LAN Servers	✓					
High Level Functions Directly Available to the Language						
Field-level context sensitive help	✓		✓			
Optional user learning mode	✓					
Display and selection from:						
Indexed files	✓		✓			
Sequential files	✓	✓	✓			
In-memory lists	✓	✓	✓			
Menu display and selection	✓		✓			
Determining 3270 screen identification	✓		✓			
Read/write to 3270 in a single command	✓					
Read/write to 3270 one field at a time	✓	✓	✓			
Determine dynamic 3270 attribute changes	✓					
Embedded user assistance (pop-up selection lists)	✓					
Data editing/validation:						
Data type/mark checking	✓		✓			
Single range/limit check	✓		✓			
Field/data driven range/limit check	✓					
Date formatting/validation	✓		✓			
Validation against local and LAN files	✓					
Required fields	✓		✓			
"Must Fill" fields	✓					
Zero not valid fields	✓		✓			
Peer to Peer Host Environments Supported						
MVS-CICS	✓			✓		✓
MVS-IDMS/DC	✓					
MVS/TSO	✓					
DOS/VSE-CICS	✓			✓		
VM/CMS	✓			✓		✓
DEC VAX/VMS	✓					
Software Distribution Host Environments Supported						
MVS-CICS	✓		✓			
MVS-IDMS/DC	✓					
MVS/TSO	✓					
DOS/VSE-CICS	✓					
VM/CMS	✓					
DEC VAX/VMS	✓					

Every effort to present an accurate chart has been made, however no guarantee can be made (1/2/90). Super-Link® is a registered trademark of Multi Soft, Inc., Lawrenceville, NJ. Mozart™ is a trademark of Aspen Research. Easel™ is a trademark of Interactive Images, Inc. Arbiter® is a registered trademark of Tangram Systems.

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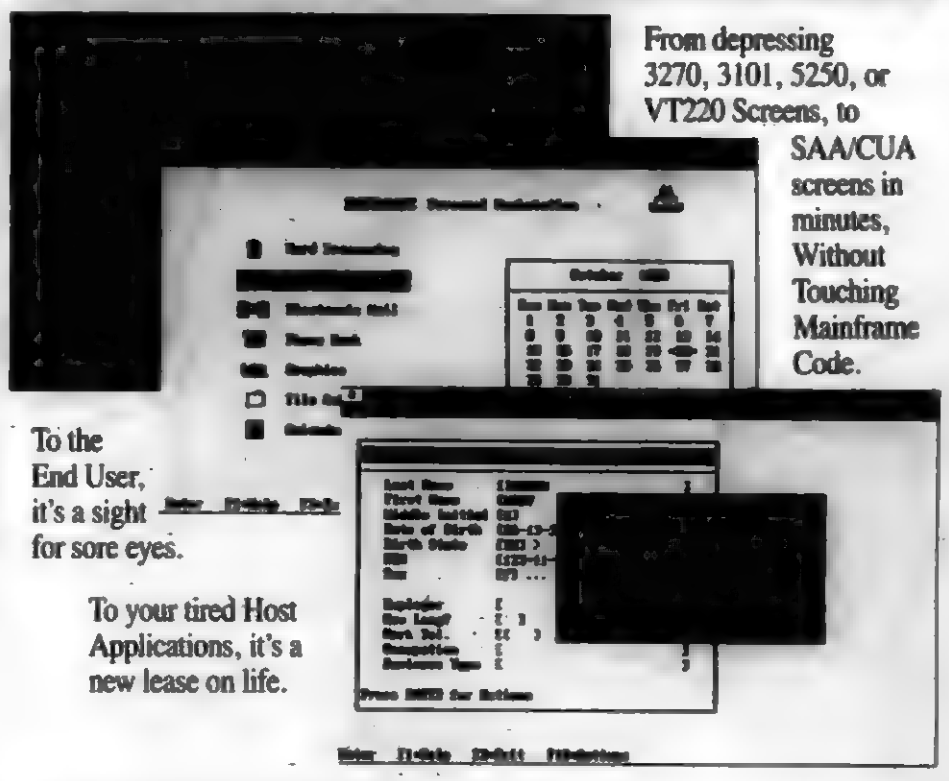

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Product helps debug tangled C code

BY MARYFRAN JOHNSON
CW STAFF

SANTA CLARA, Calif. — Hindsight may be 20/20 when it comes to understanding past mistakes, but can it do something about tangled software code?

Advanced Software Automation, Inc. (ASA) is hoping its own Hindsight — a software maintenance tool introduced recently — will streamline the tedious process of analyzing, testing and debugging existing C language code.

"This is addressing the real issues that corporations face — maintaining existing code," said Les Hellenack, director of new software technologies at International Data Corp. in Framingham, Mass. "Maintenance issues take about 70% of a programmer's time. This helps the programmer save significant time in identifying the code requiring the maintenance, then performing that task."

Hellenack pointed out, however, that the product's availability only for C code could be a drawback for many commercial IS shops. "Those shops are still devoted to Cobol, and it will be much more complex to develop this kind of product for that environment," he said.

Company officials have said they will eventually introduce similar products for Cobol and Fortran code. Hindsight is priced between $12,000 and $23,000 and is currently available from ASA.

As a back-end computer-aided software engineering tool, the product works with existing C code on Unix-based workstations from Digital Equipment Corp., IBM, Sun Microsystems, Inc. and Hewlett-Packard Co.'s Apollo division.

Hindsight requires no new methodologies, special conventions or techniques, company officials emphasized.

It incorporates a variety of software tools to provide automatic analysis, diagramming, code tracing, editing, quality control and documentation.

In addition, graphic structure charts and active logic diagrams give programmers immediate feedback on any "ripple" effects from modifying a code module, according to the company.

"Hindsight graphically explains existing code and shows where it can be improved," said Tom McHugh, vice-president of marketing at ASA.

D&B

FROM PAGE 33

3090 mainframe.

D&B's 3090 Human Resources DB2 package is an integrated relational payroll/personnel application designed to provide users with easier access to a corporation's human resources information. Neither of the previous human resources packages in the M&D or MSA lines worked with DB2.

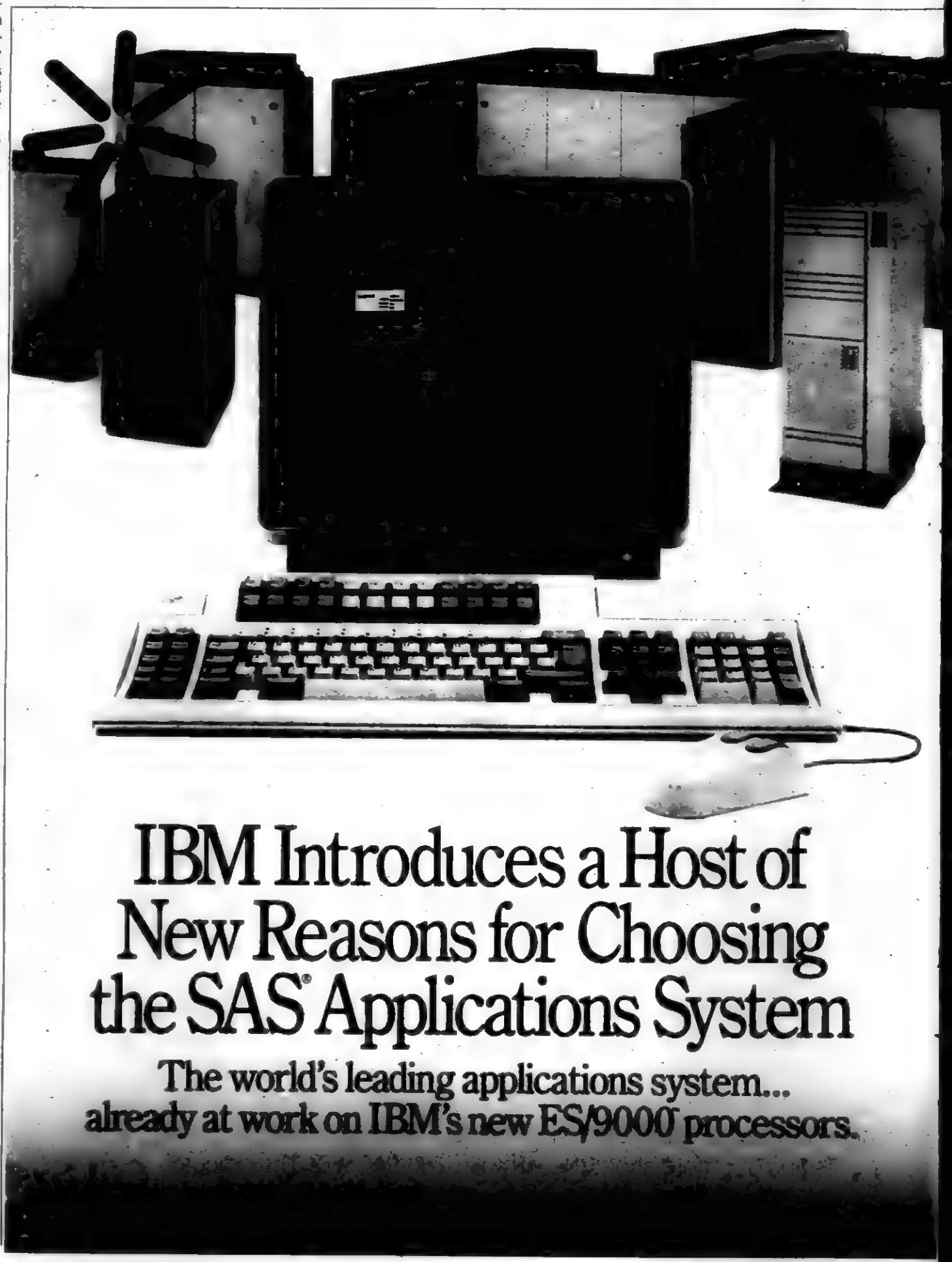
When bought separately, the payroll and personnel components will each be priced from $150,000. Current customers who want to upgrade their human resources package to DB2 capabilities can do so at prices starting from $40,000.

The human resources package, scheduled to be available in December, is designed to take advantage of native DB2 capabilities such as set processing, concurrent processing and referential integrity.

Solid relationship

"These products are a positive sign. It should give customers that warm and fuzzy feeling that there is a valid relationship there [between the former M&D and D&B Software]," said Clare Gillan, an analyst at International Data Corp. in Framingham.

Capital Projects, available immediately and priced from $20,000, provides on-line capabilities for tracking project progress. The purchase order package is priced at $38,000. The accounts receivable application will cost $47,000 and is slated to be available next month.



NEW DEALS

Hogan signs Germany deal

Hogan Systems, Inc. said it has signed a contract with B/S Visa Card Services GmbH of Frankfurt, Germany, to provide card-processing software and services. The Dallas-based software company said the contract is worth close to $2 million.

The German Post Office, which is headquartered in Bonn, selected a **Tandem Computers, Inc.** Nonstop system for an electronic and physical mail distribution system. The contract is valued at $1 million, according to Tandem.

Tandem also announced the sale of a four-processor Cyclone to Heidelberger Drucksmaschinen in Wiesloch. The Cyclone mainframe will be used for warehouse, manufacturing and dispatch operations.

The company produces as many as 30 printing presses per day, and the Tandem system is reportedly handling as many as 120,000 transactions per day.

Intel Scientific Computers in Beaverton, Ore., said it has sold a parallel computer to the University of California in San Diego. The 32-processor IPSC/860 is the first result of an Intel project, which was helped along by a $7.6 million grant from the Defense Advanced Research Project Agency. The goal is to develop a system with 2,048 processors by 1992.

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The SAS System lets you manage relational data with the industry-standard SQL language. It's easy to enter new data into the system...retrieve data as needed...and edit and query data files. You can even merge data from dissimilar files.

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- Unrivaled analytical capabilities including regression, analysis of variance, linear modeling, and more
- Reliable tools for business planning, forecasting, and decision support
- Specialized applications such as statistical quality improvement and matrix programming.

Regardless of your analytical needs—from computer performance evaluation to executive information systems—the SAS System is the standard by which other software is measured.

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- Automated and ad hoc report writing
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The SAS System also includes a command-driven programming interface. Experienced users and applications programmers can directly access the powerful SAS command language...and customize the programming environment with pull-down menus for file management, editing, and other essential tasks.

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Business Partner

Authorized Cooperative Software Supplier

RISC

FROM PAGE 33

ductor partners to do whatever they want to the chip to make it function, as long as it follows basic Sparc guidelines.

Superscalar is the choice of Hewlett-Packard Co., IBM, Intel Corp. and Motorola, Inc. Superscalar sends two or more instructions through the processor at once. Each send is staggered, somewhat like singing a round of "Row, Row, Row Your Boat," where the instructions are in the same order, like the verse, but each tick of the clock yields a different mix.

IBM does this in its RISC System/6000, but the computer is tied to certain instructions and cannot pick them arbitrarily. In its next version of the processor, IBM will run eight to 10 instructions per cycle instead of four or five, thus giving the processor a wider range of computation, according to Phil Hester, director of IBM's Advanced Workstation Engineering Center.

For its next generation of processors, Intel will concentrate on broadening its superacalar implementation, according to Dick Pierce, marketing manager of the i860 chip.

Intel has a level of scalar in its current i860 processor, but it is limited to one general instruction and two floating point instructions per cycle.

Clearing hurdles

Getting more instructions through the processor at one time is one hurdle, because with more instructions being sent at any one time, it becomes more difficult to make sure the processor remembers where it was in the cycle if it is interrupted by a high-priority request.

"It's one of the most subtle and hardest problems in making faster CPUs," Mashey said. If the CPU is not programmed to remember the place it was at in the multiple instructions coming through, it will either crash or come up with the wrong answer.

This is where bugs come in that make CPUs late to market, said Mashey and sources from other vendors. The more complex the processor, the more chance for bugs, particularly in reacting to interrupts, Intel said.

Most vendors are expected to have their next RISC processors available in 1991, and executives said they think this is probably the last generation of uniprocessors to continue the double-performance-every-year continuum of RISC. Most future price/performance gains are expected to come from multi- or parallel-processing RISC CPUs. Digital Equipment Corp., Silicon Graphics, Inc. and Solborne Computer, Inc. already have multiprocessors, and HP should have a multiprocessing RISC computer out by the end of the year.

NEW PRODUCTS — SOFTWARE

Applications packages

Halberstadt & Company, Inc. has announced Release 2.0 of its Equipment Management System/400, a software application designed for IBM Application System/400 machines.

The product is a vehicle maintenance management information system that performs equipment repair history analysis, repair parts inventory control and purchasing, preventive maintenance scheduling and mechanic productivity analysis.

The product is priced between $9,500 and $20,000, depending on CPU size.

Halberstadt & Co.
One Woodlawn Green
Charlotte, N.C. 28210
(704) 527-7940

System Software Associates, Inc. has announced Version 2.1 of its Business Planning and Control System (BPCS), a series that comprises 27 integrated application software products designed for use on IBM's Application System/400.

The BPCS supports multiple plant and multiple facility processing on one AS/400 database. Other features include support for centralized and decentralized operating functions, including customer order processing and general accounting.

Pricing ranges from $3,000 to $30,000, depending on hardware model.

System Software Associates
500 W. Madison
Chicago, Ill. 60606
(312) 641-2900

Lawson Associates, Inc. has announced a version of its Pinstripe general-ledger software package designed for IBM Application System/400s and System/38s.

The product enables users to graphically display information and upload data from Lotus Development Corp.'s 1-2-3 spreadsheets and Symphony worksheets.

Pricing begins at $20,000, and pricing for optional modules begins at $4,000.

Lawson Associates
1300 Godward St.
Minneapolis, Minn. 55413
(612) 379-0258

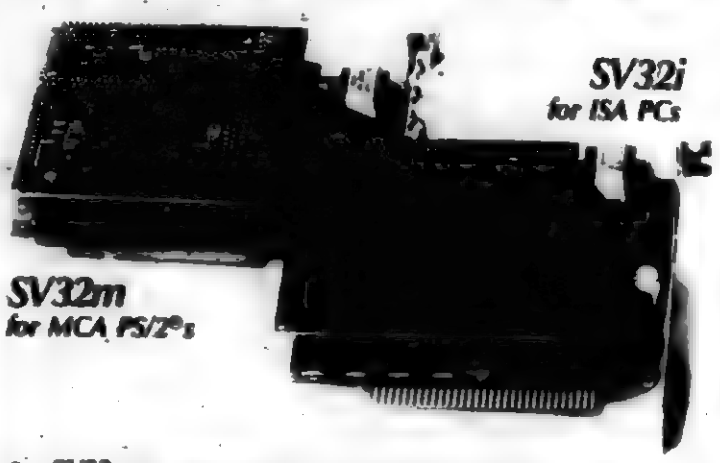
Allen Systems Group, Inc. has announced an automated job documentation application designed for users at IBM MVS sites.

Doc-Aid 3.7 features a scan facility that reduces the time needed to modify and standardize JCL, an audit trail reporting facility and an interface to Computer Associates International, Inc.'s CA-7 Prose facility.

Perpetual license fees range from $27,000 to $34,500, depending on site size.

Allen Systems Group
750 11th St.
S. Naples, Fla. 33940
(813) 263-6700

V.32 SNA ENGINES



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MICROGATE CORPORATION

NEW PRODUCTS — HARDWARE

Data storage

American International Devices, Inc. has announced a product designed to provide unattended backup for IBM Application System/400 9406 rack models.

The AI/T366 Intelligent Tape Array uses helical scan technology to record 6.6G bytes of data at a 716K byte/sec. transfer rate on three 8mm drives operating in parallel.

The device can be directly attached to an IBM 2602, 2607 or 2608 small computer systems interface. It is priced at $48,600.

American International Devices
12450 Beatrice St.
Los Angeles, Calif. 90066
(800) 243-4433

CFR Associates, Inc. has announced a plug-compatible device that can store 14G bytes of data on a single VHS cassette.

Megastor X was designed for multiple interfacing via IBM channels or Wang Laboratories, Inc. VS interfaces. The product features a maximum data transfer rate of 4M byte/sec. and is plug-compatible with several IBM mainframe and Application System/400 channel connections.

The price for a unit integrated with a 48-cassette handler is about $200 per 1G byte. Megastor X is scheduled to be available in December in versions that include IBM mainframe channel and Wang VS interfaces.

CFR Associates
18 Granite St.
Haverhill, Mass. 01830
(800) 237-9264

Alloy Computer Products, Inc. has introduced a network backup subsystem designed to provide up to 2.5G bytes of data storage on a single 8mm cartridge tape.

Retriever/2200 combines removable, rewritable magnetic media with a compact, integrated drive or controller and Alloy's Resqlan backup software package. It can be used for backups of Novell, Inc. networks, as well as personal computer-based local-area networks, 3Com Corp. and Banyan Systems, Inc. networks.

The subsystem is installed on a network node and enables data to be backed up unattended from any point on a network, the vendor said. It is priced at $7,995.

Alloy Computer Products
165 Forest St.
Marlboro, Mass. 01752
(508) 481-8500

Memorex Telex N.V. has introduced a reel-to-reel tape unit designed primarily for IBM Application System/400 environments.

The 5430 Magnetic Tape Subsystem is a front-loading, rack-mountable unit that can be installed in an AS/400 9309 or equivalent rack configuration without requiring any modifications to the AS/400's operating system or hardware.

The product is scheduled to ship next month and will have a list price of $22,660.

Memorex Telex
6929 N. Lakewood Ave.
Tulsa, Okla. 74117
(918) 274-5518

I/O devices

Genicom Corp. has introduced a line of printers designed to function in IBM 3270; System/34, 36 and 38; and Application System/400 environments.

Models 3930 and 3940 are serial-impact dot matrix printers that operate at 600 character/sec., and Models 4570 and 4590 reportedly operate at 1,200 and 1,400 line/min, respectively.

Pricing ranges from $3,795 to $16,620, depending on model.

Genicom
One Genicom Drive
Waynesboro, Va. 22980
(703) 949-1492

Talaris' *2090 Printstation*

Talaris Systems, Inc. has announced a 20 page/min laser printer designed for multiuser environments.

The 2090 Printstation features three paper trays that enable users to print data on standard paper sizes ranging from half-letter to B size (11 in. by 17 in.). The product can run in duplex mode at a rate of 16 sides per minute, the vendor said.

The 2090 Printstation costs $19,990.

Talaris Systems
6059 Cornerstone Court West
San Diego, Calif. 92126
(619) 587-0787

NCR Corp. has introduced a small computer systems interface-based laser printer that operates at 15 page/min.

The NCR 6436-0301 was designed for graphics-intensive applications and has been targeted for users of personal computers in office printing or network environments. Its interface enables disks, tapes, printers and scanners to be connected to a shared I/O channel.

The product is priced at $7,995.

NCR
1700 S. Patterson
Dayton, Ohio 45479
(800) 225-5627

Interaction Systems, Inc. has announced its Crystal Clear line of touch screens designed to reduce glare, dispersion and diffusion of screen images.

The hermetically sealed unit can operate in extremely humid environments and preserves more than 95% of light transmission, the vendor said.

A 14-in. screen with a controller costs $395 in OEM quantities of 1,000 or more.

Interaction Systems
86 Coolidge Ave.
Watertown, Mass. 02172
(617) 923-6001

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If you're shopping around for a better way to shrink your applications backlog, make sure the latest release of IBM's Cross System Product application generator is on your software tools list.

With its new enhancements, Cross System Product can revolutionize the way you develop, test and maintain programs.

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And because it can work with the IBM PS/2,® your programmers can have the productivity benefits of OS/2 Presentation Manager.™ Such as windowed selection lists, dialog boxes, function icons and select-and-drag mouse controls. Plus, you'll reduce demands on your mainframe.

As if all this weren't enough to spark your interest, Cross System Product comes with some very attractive extras—free AD/Cycle software.

With the initial license at each site, you'll get two free copies of the Cross System Product programmable workstation feature—plus a free copy of the Workstation Interactive Test Tool. With the MVS feature, you also get a free copy of the Software Analysis Test Tool. This special offer will be in effect until December 31, 1990.

So if you want to start developing better applications quickly, act quickly. Call your IBM marketing representative for a demonstration of the new Cross System Product today.

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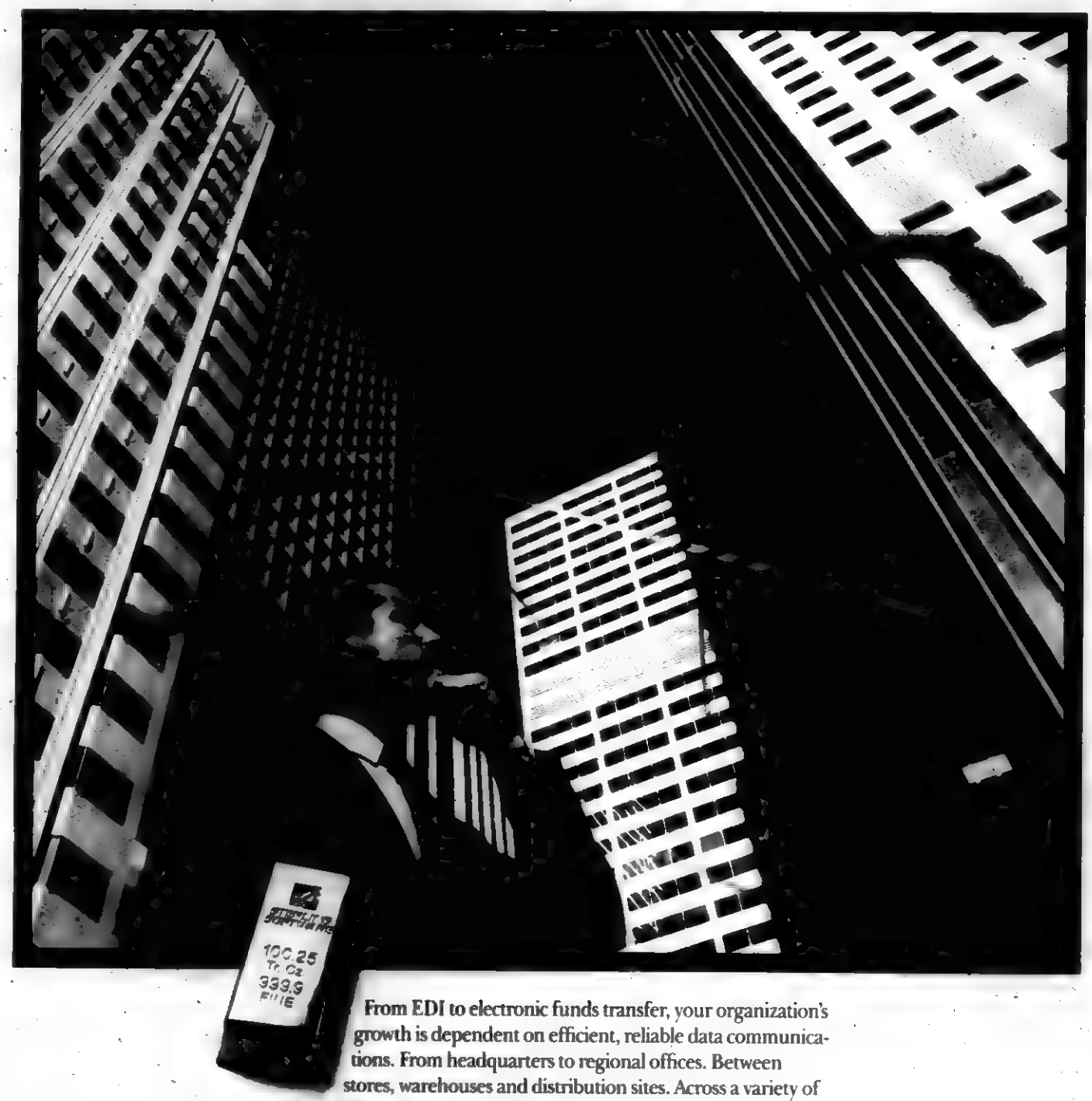

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IDC WHITE PAPER

The Pick System Environment

EXECUTIVE SUMMARY

In this day of hostile takeovers and faceless corporations, it is refreshing to come upon a privately held company still based on the vision of its founder. Indeed, 25 years after he converted his dream to reality, Dick Pick remains the guiding light behind Pick Systems. A lot of promising companies have come and gone in that time, but Pick persists.

Not only does the company persist, but it prospers. Building upon its innovation of the early days, the Pick environment has expanded to embrace today's technology. No longer just an operating system, Pick has reached out to the information systems world by developing a relational database management system. This has made it a player in the UNIX and MS-DOS worlds.

Ease of access and use distinguish the Pick environment. The way various levels are presented lends itself to a logical understanding by users, allowing them to navigate through these levels without the aid of programmers. This ability to view data without concern for how the database management system software has to handle fields, records, files and strings makes Pick a powerful query and information retrieval model. Advanced Pick enhances ease of access and use by making it even easier for end users to browse through data.

Despite its innovative past and aggressive plans for the future, Pick is still competing in a hostile world. The Pick environment has a host of strengths to see it through. Its original design, the single vision of Dick Pick and its application base of over 3,000 products place it in a strong competitive position. However, Pick must contend with threats such as its limited marketing, hostile advances from larger database companies and the possibility, however remote, of an outside acquisition.

If the company parrys these threats, IDC believes it is poised to thrive in the '90s.

THE PICK SYSTEM ENVIRONMENT

AN IDC WHITE PAPER FOR INFORMATION SYSTEMS MANAGEMENT

THE HISTORY OF PICK

The Six Goals of Pick

KEY SUCCESSES IN THE PICK DESIGN

The Pick Data Model
The Correlative Concept
The Data Dictionary
The Pick File System

THE PICK FILE SYSTEM

The System Level
The Account Level
The Dictionary Level
The Data File Level

THE PICK ENVIRONMENT TODAY

Movement to Industry-Standard Operating Systems
Pick and MS-DOS
Adding DBMS and Applications to the Operating System Mix
Advanced Pick

PICK IN THE '90s

PICK WEAKNESSES

PICK OPPORTUNITIES

THREATS TO PICK

PICK STRENGTHS

SUMMARY

PICK

THERE ARE PRODUCTS THAT ARE CONSIDERED CLASSICS DUE TO AGELESS DESIGN AND CONTINUING FUNCTION. WORDSTAR, 1-2-3 AND THE VAX ARE AMONG THEM. WITH SUCH PRODUCTS, THE PASSAGE OF TIME ONLY SERVES TO REINFORCE THE CORRECTNESS OF THE EARLY VISION, THE UTILITY OF THE INITIAL DESIGN. THE PICK SYSTEM BELONGS ON THIS LOFTY LIST OF INFORMATION INDUSTRY CLASSICS. ■ ALTHOUGH IT HAS DEVELOPED INTO AN APPLICATIONS-BASED DATABASE MANAGEMENT SYSTEM (DBMS), PICK WAS THE FIRST OPEN OPERATING SYSTEM FOR GENERAL BUSINESS USAGE. IT TOOK A DIFFERENT TACK FROM ITS CONTEMPORARY COMPETITOR, UNIX. PICK WAS ORIGINALLY ORIENTED TOWARD BUSINESS APPLICATIONS WHEREAS UNIX WAS USED FOR SOFTWARE DEVELOPMENT. ■ IN ITS INITIAL IMPLEMENTATIONS, THE PICK ENVIRONMENT WAS DEVELOPED ON

minicomputer-level products for small–and medium-sized businesses. It was first implemented on Microdata systems, but moved to a large number of additional platforms in the late '70s.

The key to its design was the multi-user BASIC environment with its reporting capability and query access. These traits allowed the casual business user, who was not a computer professional but needed information, to run his business. This orientation toward the information content in the data files was a unique feature to Pick in its early days.

If you are talking about Pick Systems–the name of the company –you have to talk about Dick Pick himself. Although Dick Pick and Don Nelson were instrumental in the early design of the system, Dick Pick provided the single vision and driving force behind the Pick environment. His single-minded focus enabled Pick to weather many storms and changing trends in the industry.

Pick has endured because concepts thought of as leading edge in the '90s were implemented by Pick in the '70s. Features such as information access, global data dictionaries, end-user programming and application portability are not news to Pick users, who have enjoyed them for 20 years.

This IDC White Paper provides the reader with a clear statement of the genesis, current capabilities and outlook for the Pick environment. Although some that are short-sighted might dismiss Pick from their plans, the utility and function of this open computing environment demand more than cursory examination.

1965 Dick Pick and Don Nelson start work on GIRLS for TRW.

1969 Pick and Nelson deliver their software to the Army.

1972 Pick incorporates Richard Pick & Associates.

1973 First commercial introduction of Pick occurs on Microdata 1600.

1976 Dick Pick splits with Microdata.

1977 Ultimate Corp. becomes second licensee.

1981 Pick system implemented on IBM Series/1.

1984 Pick system released for IBM PC XT.

1985 Pick system released for IBM PC AT.

1988 One millionth Pick user, and implementation for IBM RT PC.

1989 Pick announces availability of Pick data base for UNIX.

1990 Pick ships Advanced Pick on AT&T UNIX, IBM AIX and SCO/UNIX platforms.

Pick's distinction as an industry classic dates back to its 1965 origins.

THE HISTORY OF PICK

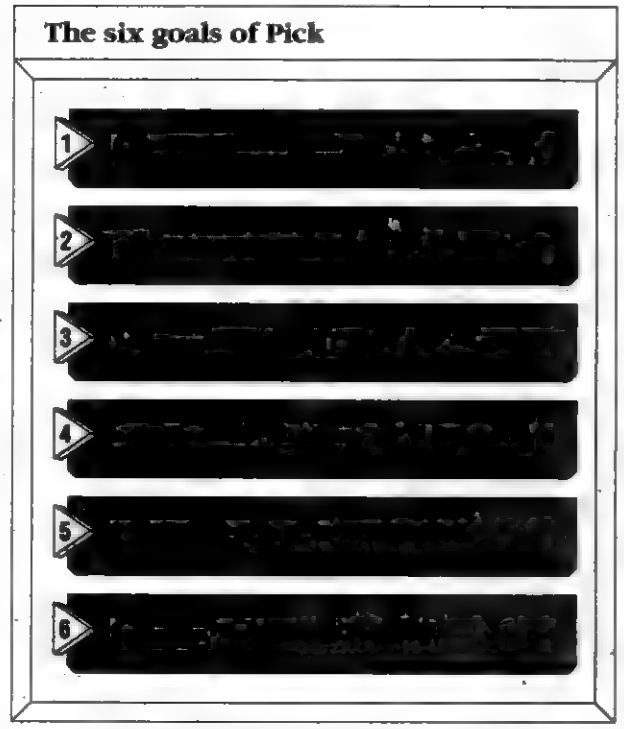
The factors that influenced the development of the Pick system are not in the same mold as those that shaped

thousands of other engineering projects. As we shall see, the Pick System is an outgrowth of business requirements, not technology problems.

The precursor to this unique environment was described uniquely by the U.S. Army in 1965, as the "Generalized Information Retrieval Language and System," or GIRLS for short. The name was subsequently changed to "General Information Management." Used as an information retrieval tool, its first business application was tracking parts for the Army's Cheyenne helicopter project. At this point, its name was changed again to Integrated Technical Data System (ITDS).

After the completion of this project, Dick Pick continued to refine the concepts found in ITDS and explore the possibilities for its use in the commercial processing environment. As a result of this 1972 work, in 1973, the environment was ported to the Microdata 1600 processor with limited success, as the 1600 achieved only a 7% market share in the small computer market.

The six goals of Pick



Based on the realization of these goals, the Pick environment was a forerunner of systems to follow it by 20 years.

The Six Goals of Pick

Given the successes with the Army, and the burgeoning market at the time for minicomputer products, Dick Pick founded Pick and Associates in 1972. The new company's immediate goal was to continue development on the Microdata 800 that was originally started on its predecessor, the Microdata 1600.

The new company had six primary goals:

- Provide a highly productive development environment
- Provide a highly productive end-user environment
- Reduce keystrokes for non-expert computer users
- Simplify the organization of the data
- Use minimal system resources
- Provide hardware portability.

Although IDC readily admits that advances in processor and system technology have enhanced the ability of vendors in general to deliver performance, it is the fulfillment of these underlying six points that makes for the timelessness of the Pick design and its appeal to users.

Between 1973 and 1977, when the Microdata systems were achieving their limited success in the market, Microdata had what amounted to a monopoly on Pick. However, in 1977 there was a falling out between the two, which became an opportunity for Pick to support other systems.

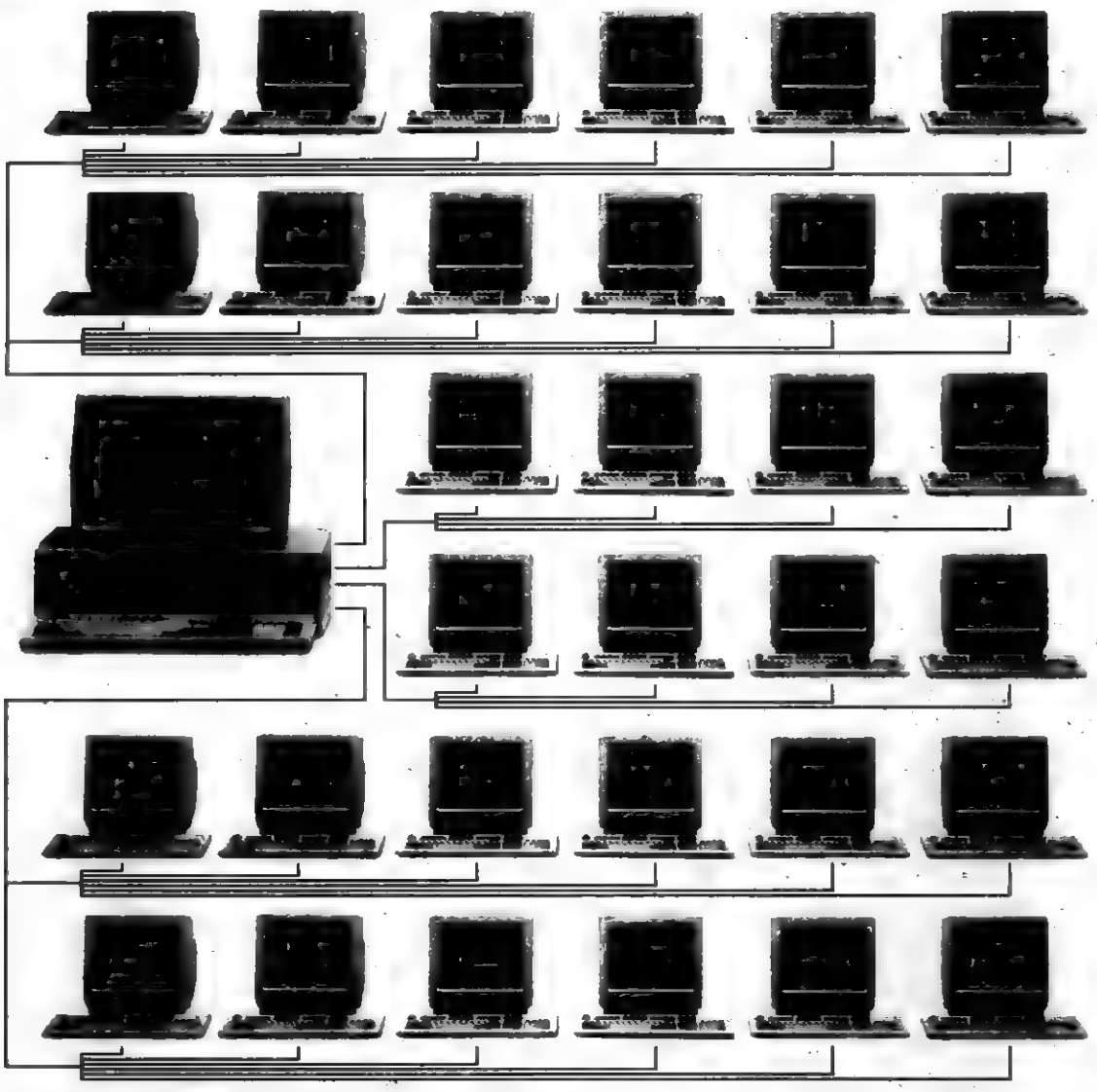
During 1978 and 1979, new licensees such as Intertechnique, Ultimate Corp. and ADDS paid fees reported to be over $1 million for their ports. However, the distinction of the first port went to the Honeywell Level 6 minicomputer, which achieved this milestone in the form of a product made by its licensee, Ultimate. Porting efforts really heated up in 1981 and 1982 when the IBM Series/1 and 43XX, and models from Pertec, SMI and Altos were all added to the base of Pick-capable systems.

Despite Pick's limited success at the time, clones were springing up. In 1977, a company called Devcom started developing a product that eventually became the Prime Computer, Inc. "Information" series. In 1982, the Pick-based Revelation system from Cosmos came to market for MS-DOS and the MS-DOS-oriented retail market. Finally, in 1985 VMark Software developed a Pick derivative to run under UNIX. All of these products had some incompatibilities with Pick, but all embodied the same heritage of usability, information access and efficiency.

Currently, sales of hardware using the Pick environment approaches $2 billion a year and there are three million users, all of whom are taking advantage of one of the most consistently useful environments for users with business problems.

KEY SUCCESSES IN THE PICK DESIGN

Calling Pick a classic in an industry where there are so few implies the company has realized some incredibly



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There's no other relational database system more cost-effective and efficient for developing, maintaining and supporting multiuser applications. Call Pick Systems for the story the LAN people won't tell you until you turn grey before your time.

PICK® PC SYSTEMS

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prescient design achievements. From IDC's perspective, the four most important of these are:

- The Pick data model
- The correlative database
- The data dictionary concept
- The Pick file system

Each of these building blocks is critical to the timeless viability of the Pick design. They enable Pick users to have capabilities today that the trade press "predicts" will be on the horizon tomorrow. They all underlie Pick's philosophy that the goal of the information system is to readily provide information. It is clear that the Pick environment was designed with that as its highest priority.

The Data Model

The Pick data model is one of the most elegant characteristics of the entire design. As is evident from the Pick data model chart, it is designed to avoid the issue of the single purpose "fields and values" that is common in so many other products. Within a Pick file there are items, values and attributes. The beauty of the system lies in the fact that values can be items, and attributes can also be files. This leads to a truly relational environment where the view of the information can be tilted to whatever axis of entry specific users may have.

In addition, the presentation of the information is done in a layered fashion allowing users to see levels of information. As can be seen from the Pick layering effect chart, in this environment, a query can start at one level and then proceed through the data to greater levels of specificity. As the chart shows, the presentation of the information lends itself to a logical understanding by users of the relationships as they navigate through the data. This is done based on their own logic, not a programmer's.

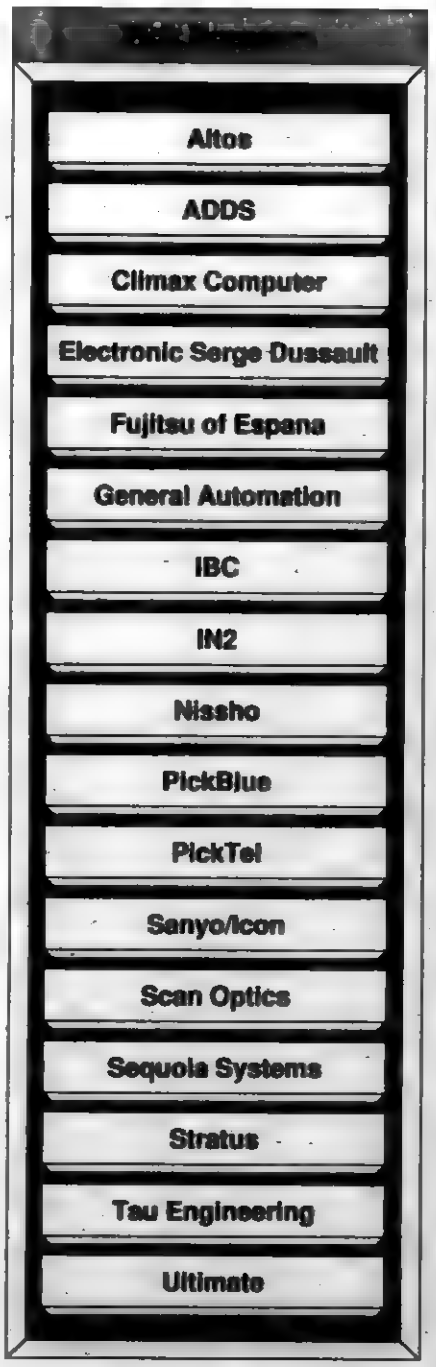
This ability to go up and down through the base of information without worrying about how the DBMS software has to handle fields, records, files and strings constitutes a powerful query and information retrieval model. This is the basis of the "correlative" concept. IDC has found that this concept's flexibility in letting users structure what they perceive to be elemental relationships is very beneficial and productive.

The Correlative Database

This second design aspect is best described by a term that is unique to the Pick environment, correlative. It describes a fundamentally different approach to applications and queries from that taken by relational systems, and has significant merit. The correlative is essentially a comprehensive way to report on information in the database without the need for understanding specific relationships and dependencies of data. This is accomplished via the rules and paradigms that are inherent in the master data dictionary of all Pick systems.

An additional difference between the relational and correlative query is the bidirectional capability that is found in the Pick correlatives. In the majority of competing databases the relationships and queries are typically handled in a unidirectional fashion. While it is possible to have two distinct pieces of data, fields or records relate in two directions, this is typically accomplished via a circular logic route, not a single path with two directions.

Pick's ability to do this transparently not only simplifies the process for users, it results in better efficiency. This capa-



What started out as a trickle with the first commercial port to Microdata in 1973 snowballed by the end of the decade. Now, Pick has established a working relationship with both AT&T and IBM through the formation of Pick subsidiaries, PickTel and PickBlue.

bility makes the correlative an extremely powerful vehicle for query and report generation.

As will be evident in the next section, the presence of the master dictionary and its rule set mitigates the "correct-query-syntax/incorrect-results" phenomenon that occurs in other environments.

The Data Dictionary

One of the vogue concepts among the information system cognoscenti is "global data dictionary". It describes an environment where all information contained within a given system is listed, along with necessary conditions, in a master data dictionary. Many large IBM users pursue the realization of this concept today as if it were the Holy Grail.

Here again is where the initial GIRLS specification, which provided the foundation of the data dictionary, proves its timelessness. In this dictionary, every file and attribute is recorded along with key relative information.

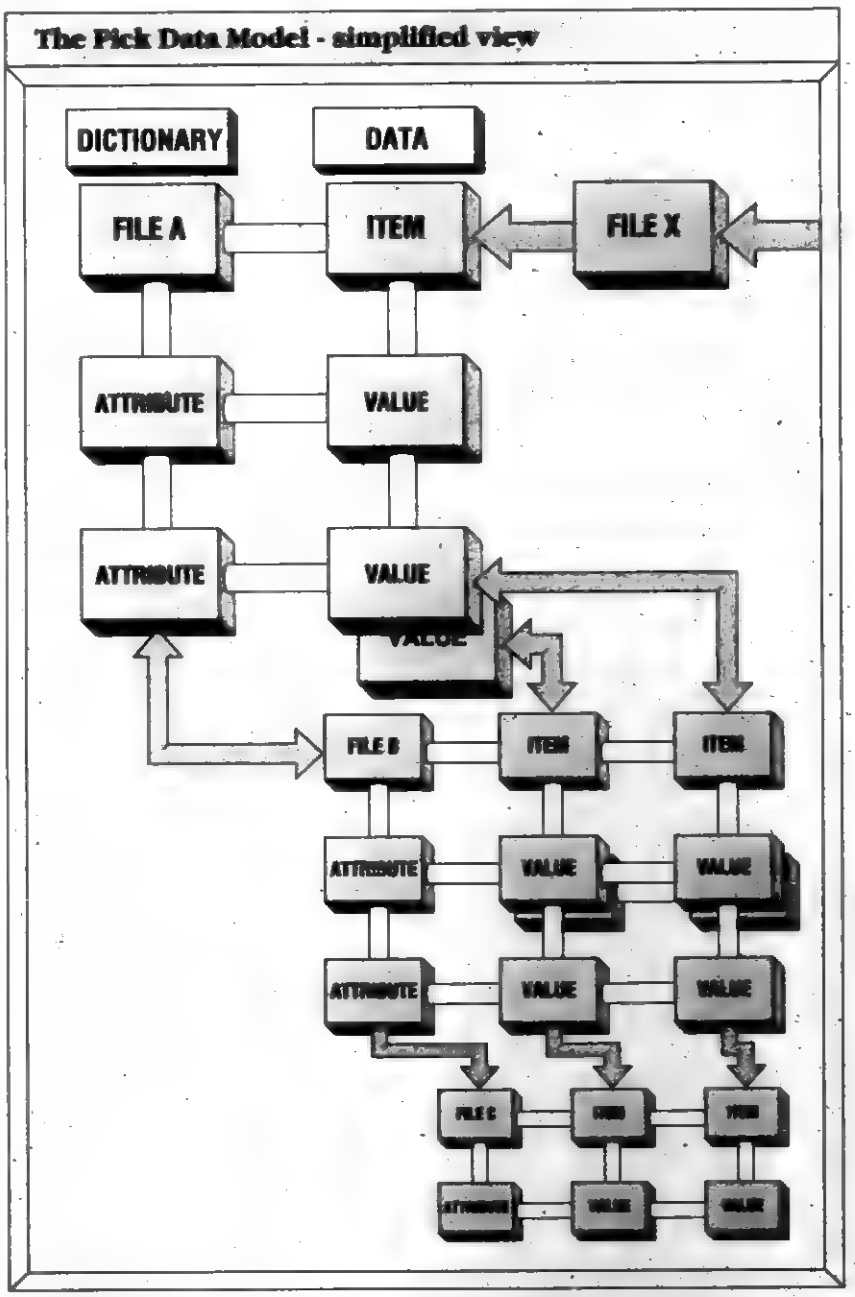
Invoked upon logon, the data dictionary allows Pick reports and queries to be organized simply. The availability and location of information is made comprehensible to users who are no longer required to become experts in data structures.

The ability to move beyond the issue of finding information and into using it is essential not only to Pick users. For instance, one of the key tenets of IBM's Systems Application Architecture strategy is the eventual development of a comprehensive data dictionary. It will be a triumph for IBM if it can replicate the ease of use achieved by Pick.

In the design of the Pick file system, the dictionary is the interface between the user and the data files. This relationship manifests itself in the processing speed and organization found in Pick application systems.

THE PICK FILE SYSTEM

The Pick DBMS is comprised of four key elements: The system level, the account level, the dictionary level and the data file level. A discussion of each follows.



The beauty of the Pick Data Model lies in its relational characteristics which provide users with a flexible view of data.

The System Level

The system level handles many of the system's administrative duties. Every time there is an end-user request, it is called to determine if the inquiry is valid in light of the privileges allowed to that account. The system level operates in conjunction with the next level, the account level.

The Account Level

The account level's main function is to record and provide to the system level the details about each valid user account. The information maintained includes file restrictions, allowed access methods, security information and the number or type of commands that are permitted by that particular user account. The centralization of these tasks and their inherent function within the overall system increase the ease of security and account/user control.

The Dictionary Level

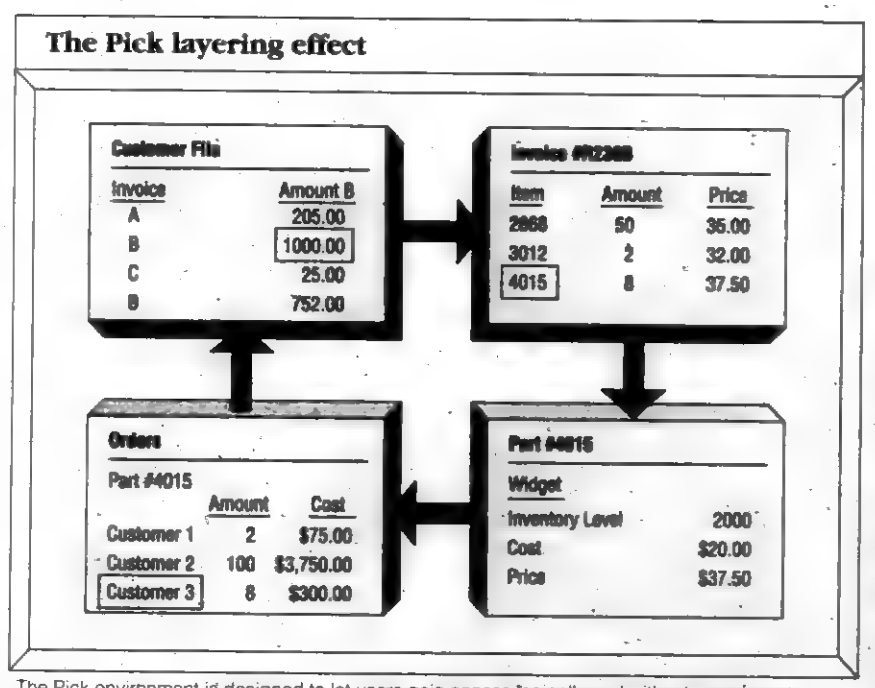
The dictionary level is described thoroughly in the preceding section. It is important to remember that this level is the actual point at which the user interfaces with the system.

The Data File Level

The data file level in the Pick environment is not notably different from many other DBMS systems in which files comprise the lowest level.

It is significant that within this four-part structure there is a dependent relationship between the four elements. This integration simplifies system use. There is, however, one caveat to consider. Pick does not presently allow for the substitution of third-party products to replace any of the four levels described here. This can be a problem for users who wish to use a PC front end or a different query tool.

The Pick layering effect



The Pick environment is designed to let users gain access logically and without programmer intervention.

THE PICK ENVIRONMENT TODAY

As would be expected from any 25-year-old product, there have been a number of changes to the initial Pick implementation. These key changes are:

- The movement to industry-standard operating systems, especially UNIX and MD-DOS
- Pick's movement away from being an operating system vendor to becoming a DBMS and applications supplier
- Advanced Pick and the introduction of system-wide automatic, ad hoc updating.

Movement to Industry-Standard Operating Systems

For years, the press and analysts chronicled the competition between Pick and UNIX as warfare. In that war, the goal was to conquer the minicomputer market. Pick was armed with its applications and commercial appeal, while UNIX fired back with its availability and the C language. Now the battles are largely over and the two combatants are realizing a peace dividend in the postwar years. Some Pick licensees will continue to use the entire Pick operating system and database, but it is no longer necessary.

This is because the Pick database and its applications are now portable to UNIX and other industry-standard operating systems. While UNIX integration is the primary thrust today, IDC believes MS-DOS and OS/2 will also be targeted.

Implementing Pick on UNIX is a straightforward procedure. Seemlessly combined, they are two highly complementary products, with each having strengths that counter the other's weaknesses. Most notably, Pick has a strong application base and is easy to use, while UNIX has strong communi-

cation capabilities and development tools.

Pick's application base of over 3,000 products is composed of both vertical-industry and generic offerings, with vertical-industry comprising the vast majority. On the vertical-industry side, there are products such as ACT II, a mail-order house software product from Rigden, Inc., Cacos, a cargo control system from CRS Systems and Distributors INFO FLO, a wholesale distribution package from Interactive, Inc.

Generic products include CompuSheet+, a spreadsheet product from Via Systems, Inc., The Works, a word processing program from Jet Software, Inc. and Accu/PlotII, a graphics product from AccuSoft Enterprises.

Pick and MS-DOS

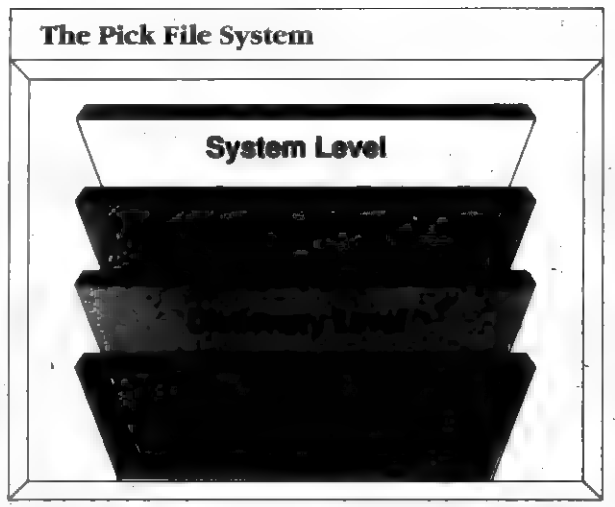
The benefits to MS-DOS can be be extensive for smaller companies or workgroups that want more function than they can get from today's rudimentary DOS software, but lack the financial resources to acquire that function.

The Pick DBMS combined with MS-DOS on PCs provides a migration path for many smaller firms or workgroups in larger companies that are at the difficult stage of outgrowing their current PC systems.

Adding DBMS and Applications to the Operating Systems Mix

The biggest misconception regarding Pick is that it is only an operating system. Even though this statement was valid in the past, it is no longer true as Pick moves into the '90s.

Just as it is a misconception to think of Pick as only an operating system, it is an underestimation to ignore Pick as the foundation for its 3,000-plus database applications that are built, debugged, tested and maintained.



The Pick file system appears to be hierarchical, but the Pick dictionaries (data which describes data, or meta data) make it global.

Database technology is not new to Pick. The initial goal of the product design was to build the "Data Management System." However, the technology of the time required that an operating system component also be built in order to deliver a fully functioning system.

Times have changed dramatically. The effects of integrating Pick with industry-standard operating systems like UNIX, MS-DOS and OS/2 eliminate many objections to Pick as a database, and elevate the Pick environment to a more competitive position. Of course UNIX and MS-DOS have also benefited from their newfound Pick compatibility.

IDC believes that many new customers will be attracted to Pick's appealing database and application features. Large companies may spearhead this movement. One of their biggest challenges is providing server-level implementations of data sets for ad hoc query and reporting functions. While UNIX is clearly becoming more capable in that area, its coupling with a truly end-user-oriented tool such as the Pick DBMS will solve many application problems that would otherwise go unresolved.

Advanced Pick

The ongoing development of Pick has lead to a number of enhanced versions. Despite this evolution, however, the environment's first monumental change is embodied in Advanced Pick. This change can be divided into three areas:

- Improvements in the actual system
- Improvements for programmers and developers
- Improvements for end users.

The improvements in Advanced Pick at the system level include transaction logging, secondary indexing and B-Tree capabilities. The goal in these changes is to add features for some of the more demanding environments, as well as to improve Pick performance in on-line transaction processing applications.

Improvements for programmers come primarily in the form of tools to improve the efficiency of the development effort and to reduce program code size. The most important of these, in IDC's opinion, is the ability to update data across the critical master dictionary without programming. Another important advance is the inclusion of an input/output processor to eliminate the need to write long system function calls.

For end users, the benefits are most easily seen in the browsing of data.

Advanced Pick allows users to step or browse through data via whatever route strikes their fancy. In addition, font and proportional spacing support have been added, allowing Pick systems to incorporate some of the desktop processing features desirable to end users.

PICK IN THE '90S

Calling Pick an industry classic is eminently justifiable. But how long can it maintain this lofty status in an industry that thrives on change? IDC believes there will be an increasingly important role for Pick. Some database technologists may disagree, but the need for information access and usability by the more than 50 million regular computer users in the U.S. is a strong force.

In order to fairly consider how Pick Systems and the Pick environment might look five or six years from now, IDC believes that a "Weaknesses, Opportunities, Threats and Strengths Analysis" is in order.

PICK WEAKNESSES

The weaknesses of the Pick environment fall into two disparate categories: the inherent weaknesses of the system and the lack of publicity leading to misconceptions about the company. They are by no means fatal; in fact, the Pick environment could continue successfully and even grow in it's present state. Nonetheless, there are these problems to consider:

Lack of Fortune 1000 Impact

The Pick environment has been a success in the small-business segment of the market that, unfortunately, draws little attention. Despite the size, growth and utility of small-business solutions, they are generally ignored by many high-powered movers and shakers. Pick has to improve its image and impact in larger sites. One way to do this is by aligning itself with UNIX.

Lack of Communication Capabilities

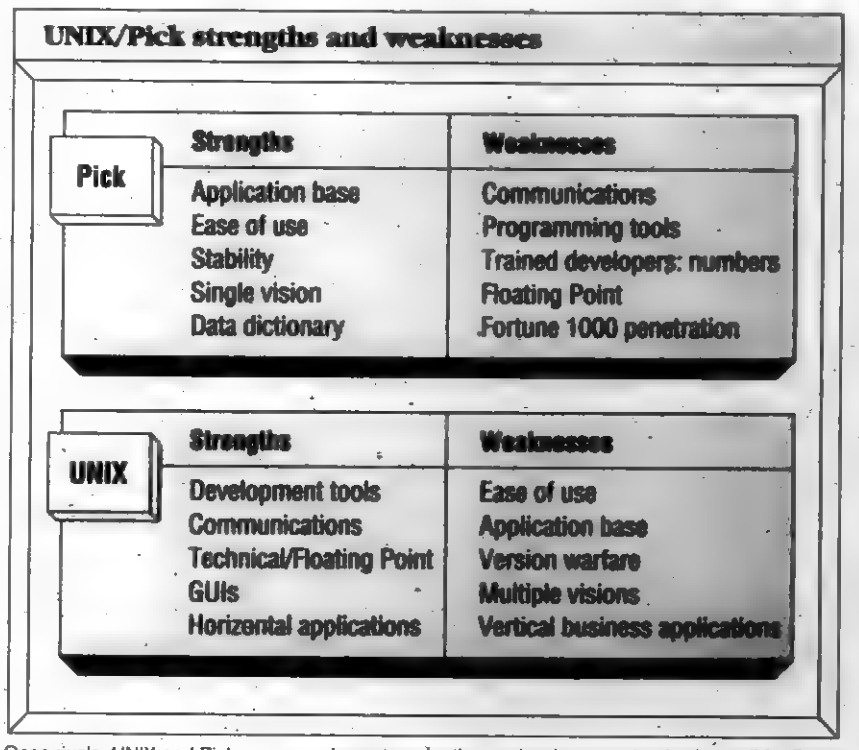
The issue that was not foreseen in the initial design of Pick was communication. Pick is inherently a standalone system. The addition of UNIX partially mitigates this problem, but how Pick will integrate into a truly distributed DBMS environment is still a looming question. Again, its newfound affiliation with UNIX may help.

Limited Programming Tools

Despite the large amount of function provided in the Pick development environment today, there is still room for more. With the rest of the world moving toward C, Pick must add to its own Basic programming language offering. Also, there may be some issues at the graphic user interface (GUI) level. Pick does presently support GUI, but the inclusion of Native X or Windows/PM calls might be required in the future. The addition of Advanced Program-to-Program Capabilities would help.

Poor Performance in Floating Point

While it is certainly no secret that the Pick environment was designed to deal with textual or string-related business data processing, the pressure for expanded quantitative, computational facilities is being felt. IDC's user surveys have found that the performance issue is not going away. The pressure may get turned up even more by the



Once rivals, UNIX and Pick now complement each other, a development that bodes well for Pick's commercial fortunes.

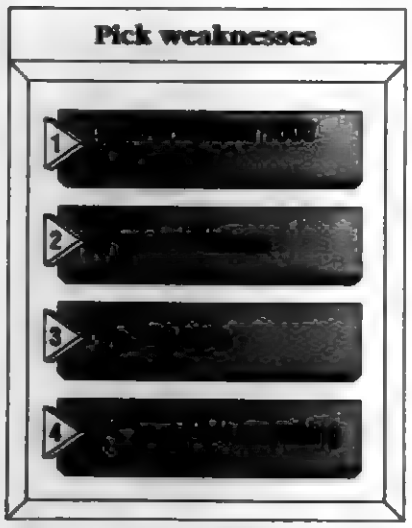
inclusion of more complex budget and numerical calculations as new business applications strain the present Pick system.

PICK OPPORTUNITIES

The movement to UNIX and the break with some of the historical emphasis on Pick being only an operating system have positioned Pick in a strong marketing position. While the firm is not cultivating "unplowed fields" untrodden by the competition, IDC believes there are still substantial opportunities. They include:

Small Business Upgrades

Although the small business segment of the market has its drawbacks, it also has its advantages. The trade press and analysts may think there is no market outside the Fortune 1000, but IDC has found that the small business market is comparable in size to its Fortune 1000 counterpart. IDC estimates that as many as 750,000 of these small establishments are outgrowing their stand-alone PC systems. Pick is very well positioned to make major sales gains in this segment.



While Pick's lack of visibility among Fortune 1000 companies is countered by a strong presence among smaller firms, its lack of communication capabilities makes it reliant on systems such as UNIX and MS-DOS.

The UNIX Business Database

Although there are a number of UNIX database products that are selling very well, all of them tend to be high-end products with limited application catalogs. The Pick system is a very different product from those of Oracle, Ingres, or Informix. For those customers who are more business- than technology-oriented, Pick is likely to have a strong appeal.

PickBlue and PickTel

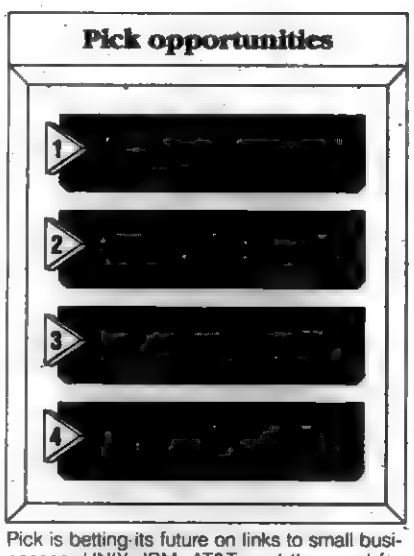
These two Pick subsidiaries are charged, respectively, with optimizing Pick's presence with IBM and AT&T. These alliances are structured in a manner to more effectively generate business than engineering exchanges. The IBM RS/6000 implementation, in particular, appears to give Pick a broad market, with little in the way of established competition.

Increasing Customer Attention to Information Access

The Pick environment clearly provides access to information contained in the database with minimal programming and maximum organization. Microsoft's big thrust, its "Information at your fingertips" concept, is similar. As actual applications that require user access to information grow, Pick has a large opportunity to play an important role.

THREATS TO PICK

As with any other player in the information industry, Pick is subject to menace from within and without. The threats it should be most immediately concerned with include:



Pick is betting its future on links to small businesses, UNIX, IBM, AT&T, and the need for user-friendly information access.

Limited Marketing

In an industry where making the loudest possible noise has become a key selling requirement, Pick clearly is not shouting. It does not help that the word "Pick" does not show up in many of the licensees' marketing materials. The decision by more aggressive companies to bury Pick under a ton of marketing fodder is clearly a concern. Pick must respond by aggressively promoting its existence and its quality. This means spending money.

Slow UNIX Acceptance

Pick's increasing reliance on the UNIX connection closely ties its fortunes to those of UNIX. If UNIX stumbles in its march toward universal acceptance, Pick will also feel the pain. IDC expects that Pick license sales will continue to grow based on Pick as a standalone entity, but the largest long-term growth will come if UNIX succeeds. What can Pick do to help ensure that success? Unfortunately, very little. However, it has

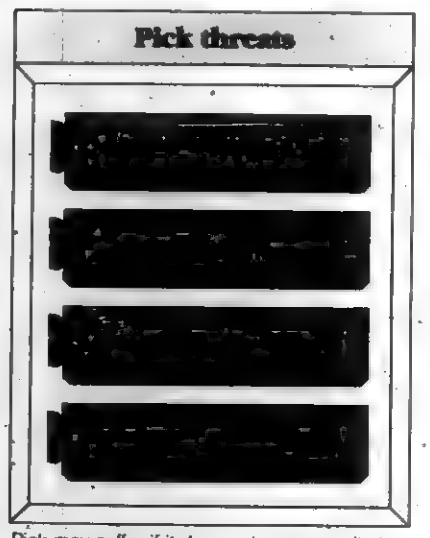
joined UNIX International and that can only help.

Acquisition of Pick

With revenues of around $25 million annually,the privately-held Pick is not attractive to would-be suitors based on its financial prospects. However, if the company were bought – and it is definitely not for sale – the delicate formula that has guided it since its inception could be irretrievably altered for the worse. Of course, a well-managed acquisition could also be a great benefit.

The Large Database Suppliers

Clearly companies such as Oracle, Microsoft, Sybase, Ashton-Tate and even IBM have not yet considered Pick a threat to their sales or market share. If there were a change of mind and some of these powerful DBMS vendors attacked Pick in the marketplace, Pick could have serious problems—problems it has never before faced. It would be in a stronger position to ward off the behemoths if it increases its revenues.



Pick may suffer if it does not overcome its traditional disdain for self promotion. An acquisition could also change the company for the worse, as could increased competition from the large DBMS vendors.

PICK STRENGTHS

There are many things that are right with Pick, or the environment would not have grown and prospered for so long. These strengths are the key to continued future growth:

The Pick Design

The fundamental design, specified 25 years ago, is as appropriate today as it was in 1965. The concepts of information access and data dictionaries are the building blocks that other systems are just now trying to add.

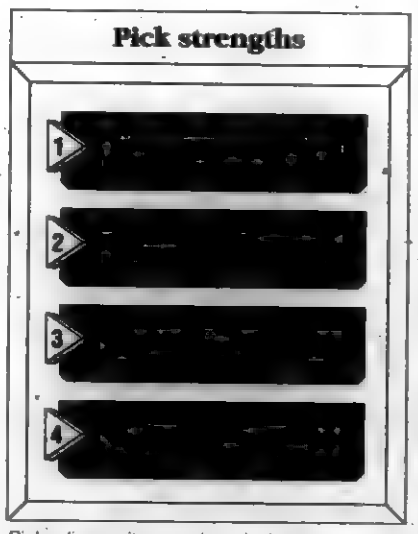
Single Vision

Time after time, IDC has seen that the most effective, efficient and timely designs are controlled and managed by either a single individual or a very small group. In the Pick case, it is accurate to say Advanced Pick represents 25 years of vision by Dick Pick. Because of his stewardship, the company maintains a clear goal and a definite direction. All these pieces add up to a competitive advantage.

System Efficiency

Somehow, the incredible efficiency of the Pick environment seems to be ignored. With OS/2 requiring 4M bytes of memory per user, Windows needing 2M bytes and Apple's Multifinder also consuming 2M bytes, it is amazing to see this elegant multi-user system supporting 65 on-line users with only 16M bytes. For smaller environments, Pick can run up to 10 users on a 640K byte, 286-based machine.

While little is made of the fact that Pick will run under configurations not seen since the late '70s, IDC believes customers who prefer to buy less hardware will be attracted to the Pick solution.



Pick relies on its prescient design to survive in today's competitive information industry environment.

Application Base

Even though many of the Pick applications are vertically oriented for smaller firms, there are others that are universally useful. It is important to realize most of these applications have been around long enough to be fully tested and debugged. IDC believes this is the kind of mature technology that users feel most comfortable with.

SUMMARY

In summary, the Pick environment is one of a handful of products that can be considered a classic in its design. Due to its many strengths, it is better positioned today than ever before. It is especially well positioned to take advantage of UNIX and other non-proprietary systems.

The fact that Pick is end-user oriented, and is designed to solve information needs outside the realm of programmers is its strongest edge. As the industry has become computer-rich and information-poor, the need for the Pick environment has grown exponentially.

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COMMENTARY

Christopher Lindquist

Time to turn up the heat

It's becoming harder to trust the personal computer software industry. What once seemed to be a vibrant market full of quality-conscious competitors viciously trying to outdo one another has become a rundown and listless arena based more on marketing than products. Software often arrives well after scheduled release dates, without promised functionality; what functionality is provided is often so buggy as to make a "use at your own risk" sign seem appropriate.

Ashton-Tate's Dbase IV Version 1.0 was one of the most notable examples of this trend. The product, since succeeded by Version 1.1, was so unstable that some consultants refused to take contracts requiring its use. Ashton-Tate is far from alone. Microsoft's latest version of Windows has many users enthralled — but also has bulletin boards crawling with reports of disk-threatening problems.

Nantucket Software's Clipper 5.0 is a great product by most accounts — if you manage to install it and get past the typos in the "Getting Started" guide.

Continued on page 73

Apple looks at second-sourcing

As market share, earnings slip, Apple considers a once-unlikely option

BY JAMES DALY
CW STAFF

CUPERTINO, Calif. — If an Apple Computer, Inc. employee had poked his hand in the air at a staff meeting two years ago and suggested that the company look beyond its own four walls for a partner to manufacture important system components, the situation could have turned ugly. Today, that person might be considered a visionary.

With market share and earnings slipping, Apple's top executives are considering a broad second-sourcing project that could put the spark back in the firm's bottom line and offer customers something they haven't seen in years — steady enhancements to the Macintosh personal computer line at rapid intervals.

Apple will reportedly work with Japanese giants Sony Corp. and Toshiba America, Inc. to develop and manufacture its next-generation Macintosh laptop, a move that would link Apple with experienced players in a hot market in which it has thus far only managed to stub its toe.

While the concept of second-sourcing has long played an integral role at firms such as IBM and Compaq Computer Corp., one of Apple's cornerstone tenets has always been that its machines be wholly manufactured within its own facilities.

"Apple always believed that designing the right product was more important than time to market," said Peter Rogers, an analyst at Robertson, Stephens & Co., an investment house in San Francisco.

The result of this mind-set was a sluggish product introduction pace that frustrated users. "For a company that has a reputation for being an innovator, they often seem to miss their chance to be the first one out of the gate with a new product," said Bill McCloud, document publications systems manager at the Jet Propulsion Laboratory.

After the 1984 arrival of the Macintosh, for instance, Apple brought forth only four additional models from 1985 through 1988. Compaq, meanwhile, introduced four new models in 1987 and four more in 1988, a pace that analysts said resulted in exceptional sales and profits for the Houston-based firm.

Laptops an option

Observers said the rapidly expanding laptop market makes a logical first choice for a major second-sourcing venture. "Over the next few years, portability will become as commercially significant in computers as it now is in typewriters, televisions and stereo equipment," said Richard Shaffer, editor of "Technologic Computer Letter," an industry newsletter in New York. The laptop arena is expected to grow 16% to $2.75 billion this year, according to International Data Corp. in Framingham, Mass.

So far, Apple has failed to take advantage of the uptick. The expensive Macintosh Portable has failed to catch on, despite a 15% price cut in April. Apple insiders have confessed disappointment with the machine.

The move could be extended to notebook portables in a market that is also growing tremendously. Although Apple Chief Executive Officer John Sculley would not discuss the possibility of a second-sourcing deal, he has acknowledged that there are no "sacred cows" at Apple and that the miniaturization processes needed to craft a notebook computer are beyond Apple's present capability.

Ed Birss, senior vice-president of engineering operations, also indicated that there is a strong possibility Apple will have an outside producer manufacture its next-generation laptop.

If the firm's second-sourcing plans reach fruition, it will represent another step in a series of moves to get Apple computers out the door quickly. During the past two years, Apple executives have reorganized operating units, reconfigured manufacturing facilities and streamlined the design process.

Analysts said such moves are necessary for Apple, which has seen its share of the PC market fall from nearly 15% to about 10%, according to Dataquest. "Second-sourcing may be a new concept at Apple, but Apple is going to have to assimilate a lot of new concepts if they want to remain competitive," Rogers said.

Manzi defends Lotus' fight to protect 1-2-3 copyright

BY PATRICIA KEEFE
CW STAFF

NEW YORK — Breaking a long silence on the topic, Lotus Development Corp. President and Chief Executive Officer Jim Manzi took a stab last week at clearing up what he called the controversy and misunderstanding surrounding Lotus' aggressive protection of its spreadsheet technology.

John Owens

Lotus CEO *Manzi*

A U.S. district judge in Boston ruled recently that Paperback Software International had infringed on Lotus' 1-2-3 copyrights [CW, Oct. 22].

"Paperback didn't just appropriate a command here, a command there. They pretty much ate the whole thing," Manzi said, referring to 1-2-3's menu.

Lotus has separate but similar suits pending against Mosaic Software, Inc., Borland International and The Santa Cruz Operation.

Despite appearances to the contrary, the software industry is not about to be taken over by lawyers,

To page 76

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This is all of them. From left to right: The new Macintosh Classic, the well-established Macintosh SE/30, the Macintosh Portable, the new Macintosh LC, the new Macintosh IIsi, plus the Macintosh

In 1984, Apple introduced the first Macintosh® on the simple premise that people shouldn't have to learn to work with computers. Computers should learn to work with people.

Today, Macintosh is still the only computer system designed from the chip up on this principle.

Meanwhile, other computer companies are scrambling to make their conventional technologies emulate what is still unique about Macintosh. But no other personal computer comes close to matching the record of stability, consistency, and innovation enjoyed by the Apple Macintosh.

At $999,* the computer people actually use can be used by a lot more people.

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It has everything that makes a Macintosh a Macintosh.

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And a $999* price that includes the built-in monitor, 1MB of RAM, keyboard, mouse, and system software.

The 40MB hard disk is optional.

Its processor is an 8 MHz 68000 chip. And it outperforms even its popular predecessor, the Mac® SE.

The charts shown use figures included in a 1990 study conducted by Dataquest Research, Inc., among Fortune 1000 MIS managers familiar with Macintosh and MS-DOS or Windows systems. Call and we'll send you

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PRODUCT REVIEWS

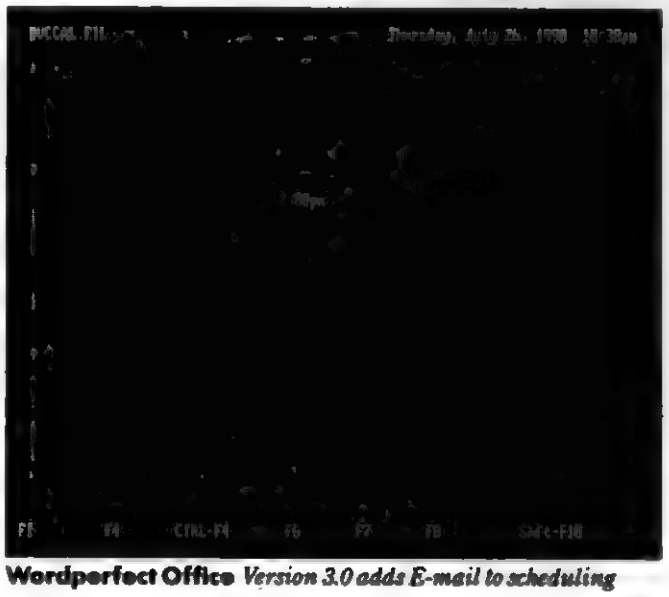
Word of perfect E-mail competition

Wordperfect Office Version 3.0 is more than an appointment scheduler

With the release of Version 3.0, Wordperfect Corp.'s Wordperfect Office has gone from being an appointment scheduling novelty to a distributed mail and scheduling tool that challenges stand-alone electronic mail packages as directly as it challenges work group packages.

Although it still lacks the capability of setting recurring meetings for a whole work group, previous limitations such as connectivity and improved E-mail functionality have been addressed successfully.

Wordperfect Office runs from a 49K-byte resident module called Shell, which functions as a memory manager; the product also supports virtual memory. Because any module in Wordperfect Office can remain in memory while other modules and applications are accessed, the product offers accessibility and ease of information exchange.



Wordperfect Office *Version 3.0 adds E-mail to scheduling*

Oodles of options

A GOTO DOS option can be used to integrate schedule-related information with other applications on the fly. There is also a clipboard that can be used to integrate schedules and to-do list information with files from other applications and Wordperfect Office's own mail system. Wordperfect Office Version 3.0 retains the function key-based Wordperfect interface.

A series of utilities is included with the product, such as a file manager, a macro editor for Wordperfect products, a program editor and a multimodule calculator. Wordperfect Office also includes a notebook that functions as a shared database.

Unlike more bare-bones schedulers, Wordperfect Office's scheduler manages resources as well as people. Notification to specified users includes an alarm and message that will pop up over other applications.

Wordperfect Office now supports wide-area networks through asynchronous communications, gateways or network connections. The most significant of the new gateways is a Message Handling System gateway from Action Technologies for Novell, Inc. networks.

Wordperfect Office users can communicate with other E-mail systems such as IBM's Professional Office System and Distributed Office Support System, MCI, facsimiles, VAX/VMS, Compuserve and Telex. The product also has Retix X.400, MCI and Easylink gateways and supports public electronic mail standards such as MCI and Western Union.

A Fax gateway is on the way and PC Wordperfect Office will soon be able to communicate across platforms with Apple Computer, Inc. Macintosh Wordperfect Office users.

Wordperfect Office's E-mail capabilities are competitive with stand-alone E-mail packages. Messages can be sent encrypted or password protected, and carbon copies are supported. Blind copying to other users is provided, and messages can be given priorities. Both personal and shared user lists can be maintained for messaging, and message notification shows up over other applications.

The E-mail capabilities include such significant extras as status monitoring and retraction of group messages. In addition, Wordperfect Office can be set up to spell check both incoming and archived mail messages.

Wordperfect Office's documentation consists of a short system administrator's guide that explains the user ID management system and a well-indexed, three-ring user guide that includes illustrations and a tutorial. There are well-organized quick-reference pamphlets and a complete on-line Help system.

There is a toll-free support line, a Compuserve bulletin board and a newsletter. Support is available from 7 a.m. to 6 p.m. Mountain Standard Time, and extended and corporate support is available from knowledgeable technicians.

Wordperfect Office Version 3.0

Price: $495 or $1,495

- Performance: Very good
- Documentation: Excellent
- Ease of administration: Satisfactory
- Ease of use: Very good
- Error handling: Very good
- Support: Very good to excellent
- Value: Very good

The five-user version of Wordperfect Office costs $495 and the 20-user version costs $1,495. Wordperfect Office Version 3.0 is a fully developed work group package with an interface and features set that can actually integrate co-workers. Its mail system alone is very useful.

Wordperfect Corp., 1555 N. Technology Way, Orem, Utah 84057. (801) 225-5000.

Reviews are compiled from information supplied by *Infoworld*.

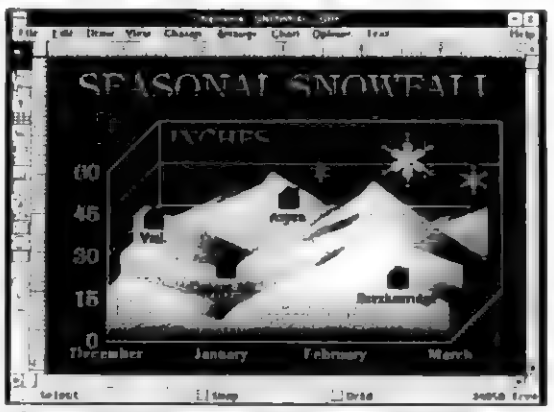
Micrografx maintains market charisma

With the recent release of Charisma, Micrografx, Inc. keeps pace with the extremely competitive charting and presentation graphics market.

Charisma's main screen features ruler lines that frame the drawing area and toolbox icons that run down the left side. The drawing area can be expanded into multiple pages with an image on each page.

A master page groups all of the images together into small thumbnail views. From this drawing screen, users can cue up templates for making a text chart, pop up a worksheet for making a numerical chart or directly import a piece of clip art from a library of more than 2,200 images.

Like its predecessor, Graph Plus, Charisma provides a wide selection of numeric charts, but its most significant improvement is in its text chart capabilities. Now a Text Chart toolbox icon is available with eight default templates and additional custom templates for specific output devices.



Charisma lets *users season charts with graphics*

These templates contain default bullets, headings, fonts and colors. Once picked, the template fills the drawing page.

Charisma's text editor is used to add the text. Other toolbox icons let users import clip art or create a numeric chart. Charisma supports the Microsoft Corp. Windows 3.0

To page 73

DB2 ON YOUR PC

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PC Week, June 12, 1989

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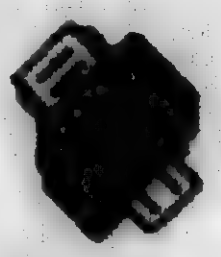
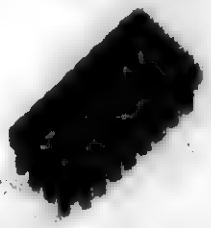
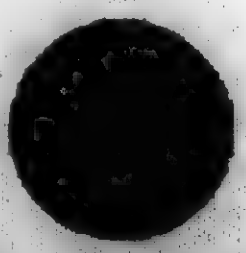


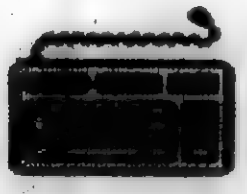
Printers



386 Enhanced



International



Keyboards

Now, all it takes is and you're

It's only fair to warn you that exposure to new Microsoft® Windows™ version 3.0 has been linked to obsessive and habitual usage. Why?

Because with a simple click of the mouse users can connect to the network, even access and manage network resources. All without cumbersome keyboard commands.

Which means users are now able to share data. Not frustration.

While in the interest of time, the Windows 3.0 graphical user interface was designed to be easy to learn. And use. Neophytes, not to mention troglodytes, will be up and running in no time. With virtually no training.

Now, 286/386™ machines running MS-DOS® will no longer be limited to 640K. So there are no more impediments.

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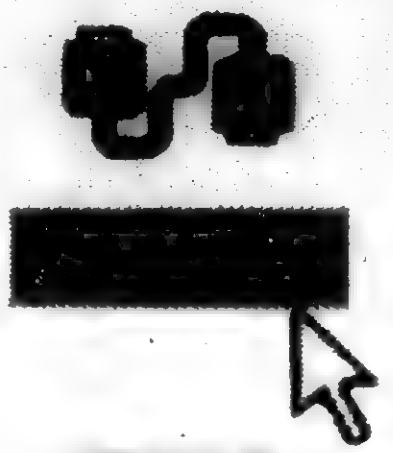
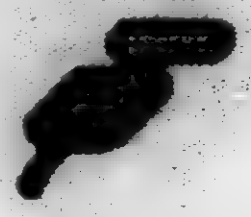
For more information, call (800) 323-3577, Dept. L21. In Canada, call (416) 673-7638. Outside the U.S. and Canada, call (206) 882-8661. *©1990 Microsoft Corporation. All rights reserved. Microsoft, MS-DOS and the Microsoft logo*



Desktop



Ports

Fonts

a point and click hooked.

And since Windows 3.0 has a modular setup program, a single copy now memorizes every user configuration on the network. Which means, so to speak, one size fits all.

Furthermore, Windows 3.0 has redefined its relationship with IBM® 3270 emulation programs. Users can now download corporate data and easily share it with Windows applications. Something we have come to call peaceful coexistence.

One last point. Because Windows 3.0 has been optimized for machines with 1-2 megabytes of RAM, it will go a long way towards protecting your hardware investment.

Call (800) 323-3577, Department L21, for a backgrounder that outlines how Microsoft Windows 3.0 could benefit your corporation.

We're certain that you'll agree it's a habit well worth forming.

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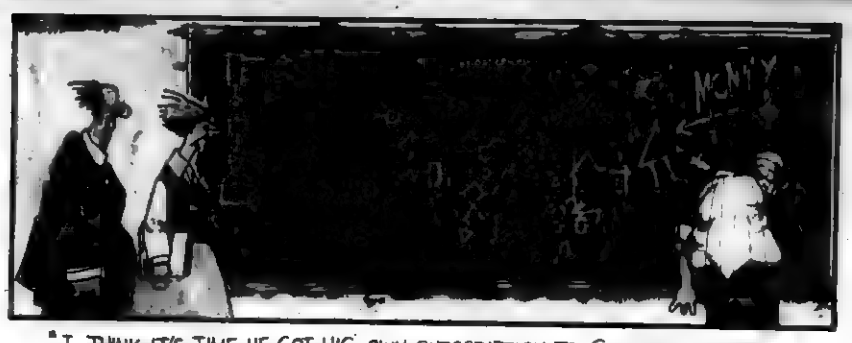

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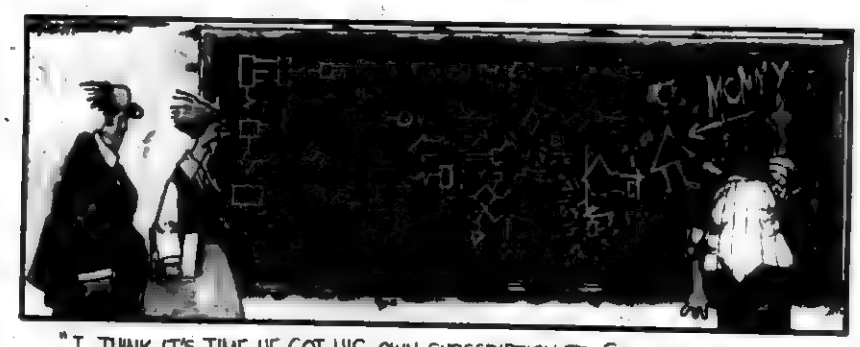

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3. **COMPUTER INVOLVEMENT** (Circle all that apply)
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C. Microcomputers/Desktops
D. Communications Systems
E. Local Area Networks
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Micro orientation of SQLbase helpful

PRODUCT REVIEW

Gupta Technology, Inc.'s SQLbase database server is microcomputer-oriented, so it offers a potentially less imposing approach to corporate database design than products adapted from mainframe database servers.

SQLbase runs under either DOS or OS/2. It comes with a C language call interface, a character-based interface for DOS and OS/2 and a Microsoft Corp. Windows front end. It supports ANSI Level I SQL, but its best features are those that are not ANSI Level I-compatible. Some, but not all, of these extensions are in ANSI Level II SQL.

SQLbase provides simple record-handling functions in a set-based environment. It lets users process a query and then move to any record in the answer in any order. To make it easier to program interactive database access, Gupta's SQLbase engine supports a variety of locking mechanisms and an implementation of "scrollable cursors."

Gupta SQLbase Server Version 4.0.4

Price: $2,495

- Performance: Poor - excellent
- Documentation: Unacceptable
- Ease of learning: Satisfactory
- Ease of use: Good
- Error handling: Poor - good
- Support: Poor - satisfactory
- Value: Satisfactory

The four related lock levels are Read Repeatability, Cursor Stability, Read Only and Release Locks. Read Repeatability puts a shared read lock on all the pages accessed with a query. Cursor Stability locks only the page of data that the server is currently using in order to process a query. Read Only mode causes the server to take a snapshot of data in read-only mode. In Release Locks mode, data is not locked between the time it is read and the time the database is updated.

SQLbase has most of the basic relational features inherent in SQL, including the use of an on-line catalog that can be examined using SQL and tables and columns. However, some important relational features, such as referential integrity, are not supported. Additionally, Gupta's cost-based query optimizer is weak.

SQL cursors keep a user's place when he is sifting through the answer to a query. They also serve as a software-based communications link between client and server. Because ANSI-standard SQL cursors can only move forward through the data one row at a time, Gupta includes Result Set mode, which lets users access virtually any row in any order when the answer to a query is fetched.

Result Set mode works in conjunction with Restriction mode, which provides a quick means of refining the selection of records in a result set without having to go back and reissue a query on the entire table.

Simultaneous connection

A single SQLbase application can connect a number of cursors to a database simultaneously, and each cursor can be used to process a different request, be it query, update, insert or other.

SQLbase shines in transaction processing. The performance speed remains almost flat from one station to 24. Only when transaction processing is combined with other update and insert operations does SQLbase show any significant degradation in performance.

SQLbase does not support some of the advanced features found in other products, such as stored procedures, triggers and two-phase commit, but it does allow users to store commands in precompiled formats and chain commands for batch execution.

The latest release of SQLbase is Version 4.0.4. The documentation consists of the manual for Version 3.4 with three sets of error-filled release notes. The index is weak, covering only the oldest version of the manual. Examples are ambiguous and leave many questions unanswered.

The documentation is the biggest impediment to learning the SQLbase C language call interface, but SQLbase is actually very easy to install and equally easy to get working.

SQLbase supports transaction logging, rollback and automatic roll-forward recovery. SQLbase also supports save points, which allow users to roll back to intermediate points in a transaction.

Two methods of on-line backup are available: One takes a snapshot of the database and logs. The other lets users back up the database at a given point and archive the transaction logs.

SQLbase can also allocate disk space dynamically. However, Gupta does not supply a utility for recovering a database that might become corrupted if the system fails at the moment additional file space is allocated. Moreover, SQLbase lumps all possible disk errors into a single category — read/write error.

Technical support is free for 90 days; after that, it costs $300 per year for the DOS server or $375 per year for the OS/2 server. Support lines are open from 7 a.m. to 5:30 p.m. Pacific time, and there is a bulletin board for support questions. Technicians are acceptable.

SQLbase server for OS/2 costs $2,495 for unlimited users. The DOS version costs $1,995.

Developers who started out on microcomputers will find SQLbase a more familiar development environment than those who have migrated from larger systems.

Gupta Technologies, Inc., 1040 Marsh Road, Menlo Park, Calif., 94025. (415) 321-9500.

Micrografx

FROM PAGE 69

Dynamic Data Exchange facility as well as the Windows Clipboard. It makes intelligent use of the Windows 3.0 interface.

Charisma is faster at popping up dialog boxes and displaying menus than the usual Windows packages, but its drawing speed is a bit sluggish. It includes a wire-frame mode for better speed, and it allows users to continue work without waiting for redraws to be completed.

Data for numeric charts can be entered either by keyboard or by importing spreadsheet files from common spreadsheet programs. Charisma's numeric chart styles include area charts, horizontal and vertical bar charts and data tables.

More than one chart can be overlayed, stacked or arranged on one screen. Most charts have a three-dimensional option with a variable perspective.

Unfortunately, Charisma omits the capability to place standard error bars on charts. It also does not have a broken-bar option, and it could use more basic mathematical spreadsheet functions such as calculation of smoothed averages, means, standard deviations and data frequencies.

With Charisma, text charts are assembled from the supplied templates. Bulleted charts use graphics symbols as bullets, making it possible to resize or recolor them at will. Charisma

Micrografx Charisma Version 2.0

Price: $495

- Documentation: Very good
- Ease of learning: Good
- Ease of use: Very good
- Error handling: Very good
- Support: Good - very good
- Value: Very good

comes standard with a first-rate selection of text fonts. All fonts can be resized, recolored, rotated or converted to graphic symbols and edited.

There is no built-in organizational chart routine. The blank organization framework has to be imported as clip art. Charisma also does not provide dedicated speaker's notes or audience handout facilities.

Charisma is closer to a charting package than a presentation package. Although it lets users view multiple images simultaneously and reorder these images, it does not have true presentation/organizing capabilities. However, Charisma's slide-show features are very good.

Charisma's output support is better than most Windows-based presentation packages.

Charisma's manuals are spiral-bound and well written but could be improved with color illustrations and more extensive indexes. There is an on-line, context-sensitive Help facility.

Even users who are familiar with Windows will need time to learn Charisma. Novice users may be a bit daunted by all the options and features. Once learned, however, the package is fast and efficient.

Micrografx offers unlimited technical support. Extended support costs $150 per year. Hours are 7 a.m to 7 p.m. Central time. The phone lines are not toll free. The technicians are courteous and provide competent answers. Charisma lists for $495.

Micrografx, 1303 E. Arapaho Road, Richardson, Texas, 75081. (214) 234-1769.

Lindquist

FROM PAGE 65

Of course, Lotus has a record for product prognostication that rivals government contractors.

You'd think the seeming deluge of such problematic products would be bringing the software industry, or at least the offending vendors, to a halt. It isn't. While firms in other high-tech areas fight recession, Software Publishers Association reports paint an ever-rosy revenue picture for PC software.

Who's to blame for this situation? Profit-fattened vendors swarming with executives ready to pull the ripcords on their golden parachutes if things get too tough? Marketing and sales departments making pillow talk with buyers to get a sale? I say it's none of the above. I blame the users. They're taking all the abuse the software industry is giving them and begging for more.

Dbase IV Version 1.1 is a dramatic improvement over the previous release, but it is still several steps behind state-of-the-art. A compiler is the stuff of future versions, and tests show that Dbase falls far behind such products as Fox Software's Foxbase and Borland's Paradox in operational speed. Maybe Ashton-Tate can jump back in with the technological leaders, but its recent record doesn't make that a good bet. So why do users keep holding on?

It is often user inflexibility that allows vendors to produce poor products and take forever to fix them (some even have the gall to charge an "upgrade" fee) while still watching their profits soar. Granted, after spending thousands of dollars acquiring and training a Dbase programmer or taking the time to train yourself, developing applications and training end users to operate them, it may seem foolish to grab another product off the shelf and start over.

Some companies have done this, though, and profited from it. In fact, Ashton-Tate's slip opened what was once only a crack in the PC database market to full-fledged nichehood. Several smaller vendors built their market shares while Dbase was in the repair shop. Nearly two years later, however, Dbase still holds the lead in the PC database market. Ashton-Tate led with its chin and was tagged, but users waited out a 10-count long enough to make the most crooked boxer blush.

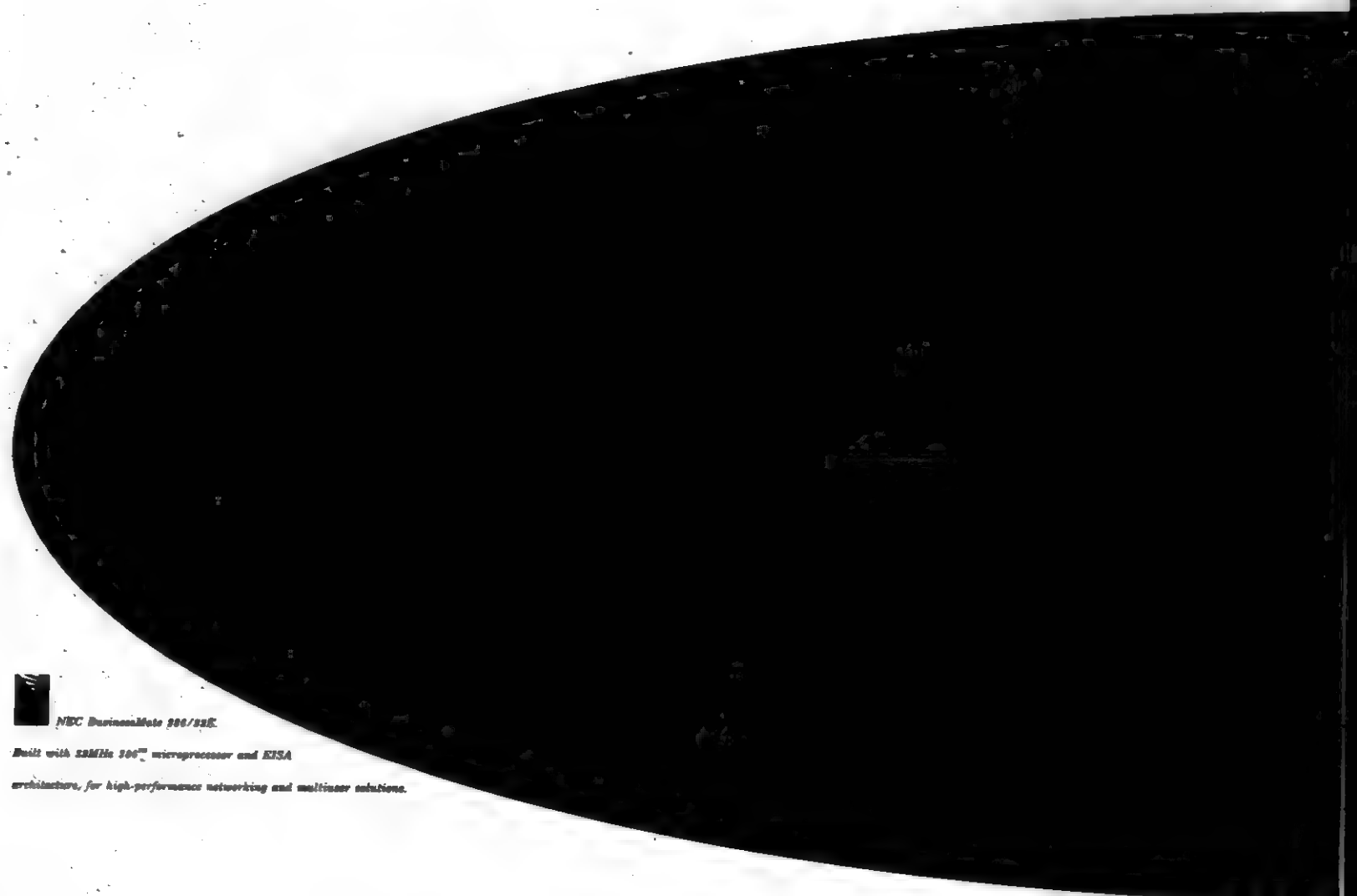
Perhaps a company the size of Ashton-Tate going down for the count would rouse the vendors from their profit-induced stupor. But maybe it wouldn't even take something that drastic. Maybe something positive would happen if more users began telling their sales representatives, "We've been testing similar products from The Other Guys, and they do X, Y and Z now. If you can't do that, we have alternatives." This would be aided by a few more vendors taking the Borland route of offering low-priced upgrades to owners of competing products and a few more users taking them up on the offer.

Users should constantly re-evaluate the reasons why they stay with faltering products. Is it really the cost or simply the inconvenience of the conversion? Do the short-term benefits of sticking with a platform, even if the vendor seems to have deserted you on it, outweigh the long-term gains of using a superior product? I'm not trying to promote jumping ship at the first sign of a leak, but there's no reason not to familiarize yourself with the life preservers.

Something needs to light a fire under the established members of the PC software industry. They've been piling on the fuel, but it's the users who hold the matches.

Lindquist is a *Computerworld* copy editor.

Perhaps its best fea



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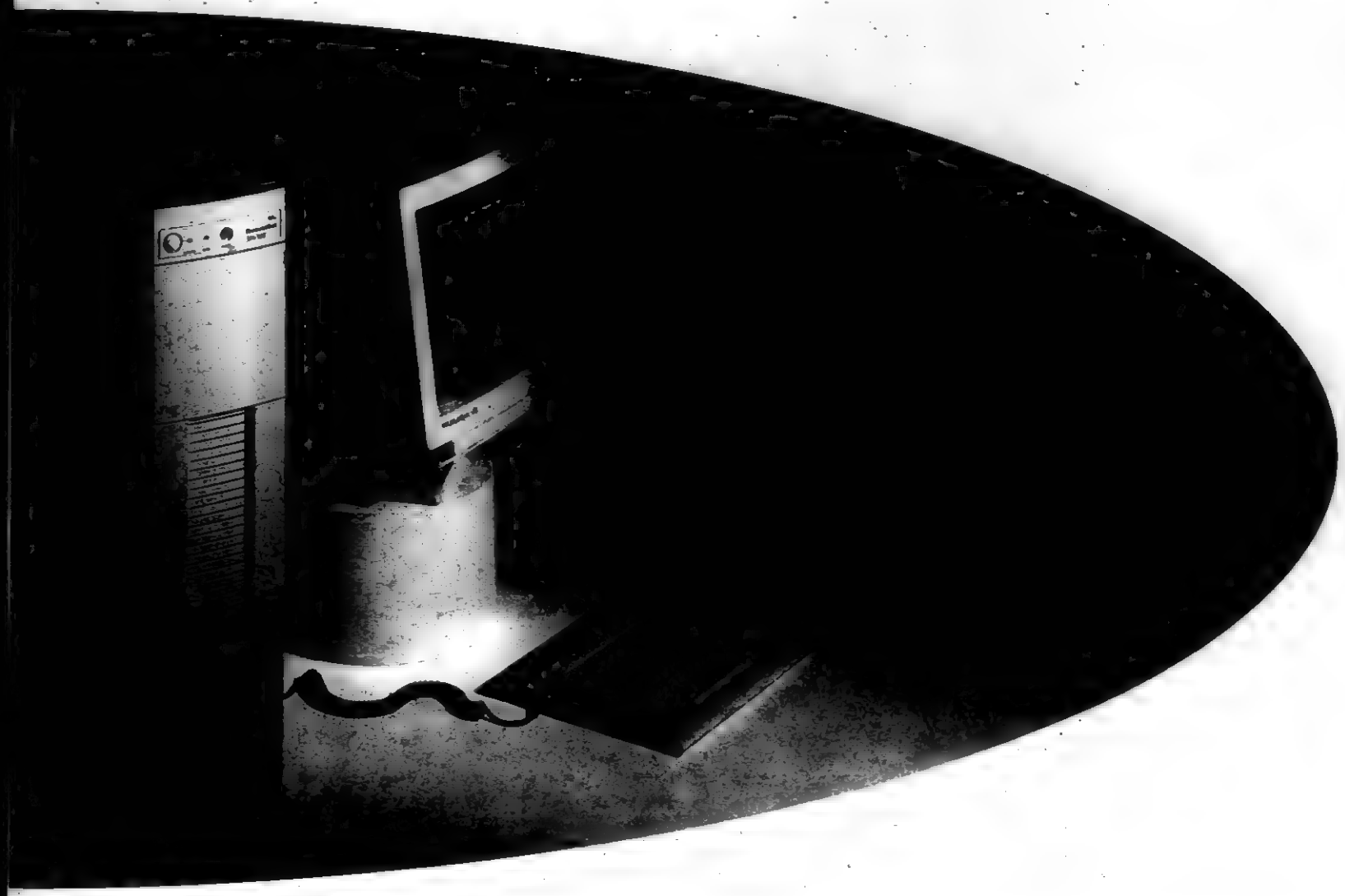

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NEC

City cops take byte out of crime

Dallas police force adds mobile data terminals to its anticrime arsenal

ON SITE

BY CLINTON WILDER
CW STAFF

At 10:40 p.m. on an oppressively hot late summer night, Dallas Police Officers David Vestal and Don Waterson steer their patrol cruiser toward "Crack Alley" — their nickname for a northwest Dallas housing project known as a hotbed for drug dealers. When they spot several men congregated on a sidewalk ahead, Vestal zooms in and screeches the car to a stop, scattering the men to their various hiding places as if fleeing a live grenade.

At the same time, the officers spot a suspicious car across the street. From the passenger seat, Waterson quickly enters the license number into a formatted screen on the cruiser's mobile data terminal. "C'mon, come back stolen for me, baby," Vestal says as Waterson hits the transmit key.

In seconds, the terminal beeps and the small screen glows with the car's registration data, owner's name and address. But there are no warrants; it's clean. "Damn, not this time," Vestal says.

Crime-fighting tools

Every day and night, more than 1,000 police officers cruise the streets and highways of Dallas with computer technology on board. Each patrol car is equipped with a mobile data terminal from Mobile Data International, Inc., in Vancouver, B.C. Mounted near the middle of the dashboard and linked via an 800-MHz cellular radio frequency to an IBM 3083E in the Dallas City Hall data center, the terminal is as much a part of the crime-fighting arsenal as the 12-gauge shotgun on the floor next to it.

"We work the crud out of it, that's for sure," Vestal says.

The mobile terminals are just one piece of a law enforcement technology infrastructure that made the city of Dallas the first municipality to win a Partners in Leadership Award from the Society for Information Management [CW, Aug. 6].

Assistant Police Chief Leslie Sweet and Director of Information Services David J. Morgan were honored for the $10.2 million crime-fighting system that also includes cellular telephones in patrol cars, automatic location identification on 911 calls and computerized fingerprint matching. It is information technology for which the "payback" is measured in murder arrests or rape convictions.

Vestal and Waterson have been partners for about two years, which is a long time on the Dallas patrol force. The city is a tough place to be a cop; the crime rate is high, police/community relations are among the most volatile in the U.S., and the department was rocked recently by the indictment of Police Chief Mack Vines on a perjury charge.

Vestal and Waterson spend much of their evening patrol on Harry Hines Boulevard, a broad avenue where prostitutes, known by name to the officers, work their own evening shifts in cheap motel rooms or cars in deserted parking lots. Cruising through the stifling heat with air conditioning and rock music going, Vestal and Waterson make constant use of their on-board, on-line computer link.

Stan Wakefield

Dallas cops *measure mobile terminal payback in felony arrests*

The most common use is license plate checks for stolen car warrants. At 7:15 p.m. on the Stemmons Freeway, Vestal sees a car suddenly veer onto an exit ramp. He recites the plate number to Waterson, who immediately enters it.

The car comes up clean on the on-line query. "Probably just a kid without his license," Vestal says with a sigh. The ability to check licenses without voice communication to a dispatcher has doubled the number of checks that reveal a warrant on the car or its owner. "We'd never ask a dispatcher to run as many requests as we do now," Waterson says. "We'll run makes that are the big cars to steal around here, or anyone that just looks a little out of place for some reason."

If a car is stopped, the mobile terminal can give the approaching officer information about whether the driver may be armed or dangerous. On this score, Vestal is particularly grateful for the terminals' faster on-line response compared with a dispatcher's need to run the check at the station and read it back over the radio. "While you're waiting, you could be in trouble, and that's how you can get killed," he says.

Throughout the evening shift, the terminal screen is the officers' information link. Each time they return to the car after answering a call — checking a burglar alarm, for example — Waterson logs on and sees a list of outstanding calls to be answered. Top priority calls appear in a different color. The officers can key to another screen for more details on a particular situation, or ask the dispatcher about it verbally, or both. They also trade messages with other patrol cars — electronic mail on the roads.

Since the terminals were installed in 1987, Vestal remembers some vivid examples of the technology at work. In one case, he and Waterson responded to a report of gunshots in the rough Crack Alley area and found two prostitutes had been shot, one fatally.

A witness had seen a license plate number as the gunman sped away. The computer check revealed that the car was registered in the town of Bedford, Texas, and Bedford police were alerted on the chance that the culprit would return to his residence. He did — and was arrested for murder the same day.

That is the kind of challenge that Vestal and Waterson face fairly often, but this is a slow night. The officers decide to call it quits about 11:30 p.m.; they're both due in court early the next morning to testify in a drug case. Before returning to the station, however, they check the terminal screen for any new calls.

Manzi

FROM PAGE 65

Manzi quipped while speaking before the New York PC User Group two weeks ago. On a more serious note, he stressed that the notion of intellectual property is not only important, but that it lies at the heart of the software industry.

"Our industry is one that has been built by creativity and innovation," Manzi said. Noting that the main purpose of a copyright is to reward and encourage innovation, he termed as "strange" charges that copyright protection stifles innovation or infringes on programming freedom.

The real issues, according to Manzi, lie in how best to reward creativity, ensure competition and encourage the continued innovation on which users and the industry depend.

Manzi maintains that if various elements in new software are not protected by copyright, small developers in particular would lose out. "Without copyright protection, you can imagine what would happen. The first time a developer demonstrated an attractive new product at [a trade show], hundreds of programmers . . . would quickly hunker down to create their own versions." In short, he said, any big developer could quickly put together and heavily market a clone, robbing the developer of the value of his creative efforts.

> "WE ARE talking about protecting a complex work, not just a small piece of work."
>
> JIM MANZI
> LOTUS

The end result of this diluted reward, he claimed, would have to be fewer creators and fewer new products; thus, users would also lose out. Consequently, Lotus sees "nothing wrong with standing up for [its] rights in a highly competitive marketplace," he said.

Manzi also pointed out that Lotus "has always encouraged the use of our products to develop other products. It's in our interest to do so." As he noted, 1-2-3 has spawned a whole submarket of add-ins, add-ons and other related packages. Lotus is not against anyone taking 1-2-3 and putting it to use in development, he said.

"But we are against someone taking the core of our product, marketing it as part of their product and taking money from us. That's unfair, that's against the law, and that's the sort of thing, if it goes unchecked, that *would* have the effect of stifling innovation," Manzi said.

He also took a shot at the popular euphemism "look and feel," calling for its ban. "That unfortunate phrase" has been the biggest single source of confusion in the whole debate, according to Manzi, who claimed it "conveys the notion that what is at issue is highly subjective and insubstantial."

This is not the case with the Lotus suits, he claimed: "We are talking about hundreds of different commands that are tied together in a particular way. We are talking about protecting a complex work, not just a small piece of work . . . or every little piece of a command structure."

The industry needs to understand that the menu commands and structure for an application, which is what Lotus says it is trying to protect, are different than the basic idea behind an application or what the program does, Manzi contended.

So how much can you copy? "I don't know the answer to that," Manzi admitted, noting that the courts as of yet do not have a hard and fast rule either. "It is a bit like Justice [Potter] Stewart's famous dictum on pornography: 'I know it when I see it.' "

MICRO BITS

USAF leans toward Zenith

The **U.S. Air Force Standard Systems Center** at Gunter Air Force Base in Montgomery, Ala., expects to award **Zenith Data Systems** (ZDS) the contract for its Standard Software Requirements Contract 1. Estimated at $21.9 million, the pact is to be awarded in November pending approval. ZDS is expected to supply more than 300,000 upgrades to 19 software packages. They will be used by desktop computers purchased by the Air Force, Navy, Army and Defense Logistics Agency.

Interactive Systems Corp., which markets a version of Unix System V, Release 3.2, will market **Lotus Development Corp.**'s 1-2-3 Unix System V.

Compaq Computer Corp. has signed integration agreements with business partners Microsoft Corp., Novell, Inc. and The Santa Cruz Operation, Inc. These pacts provide joint development training and marketing.

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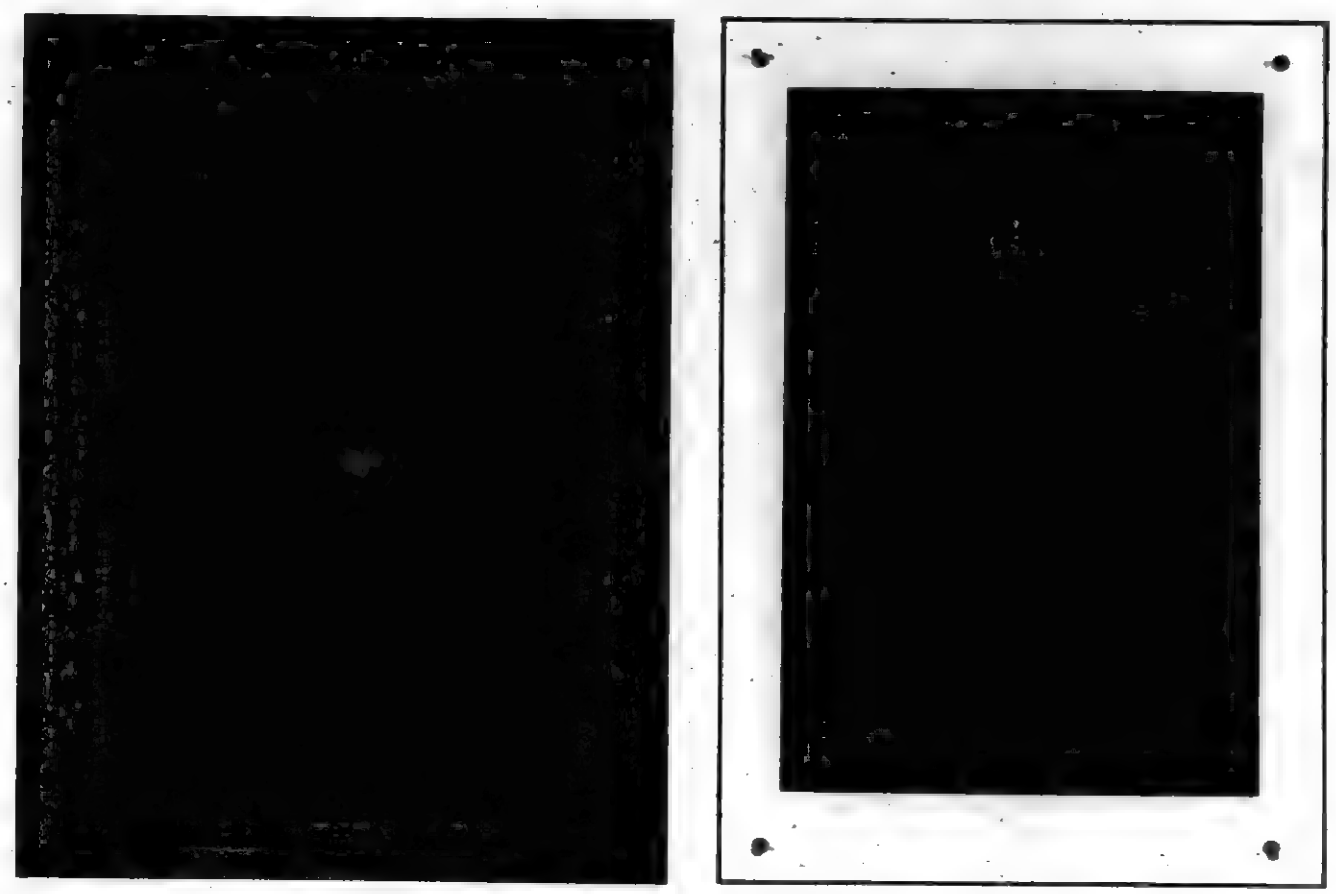

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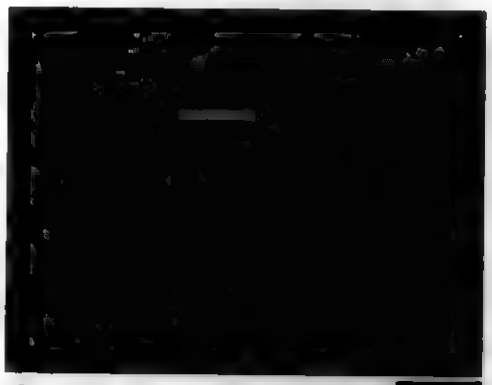

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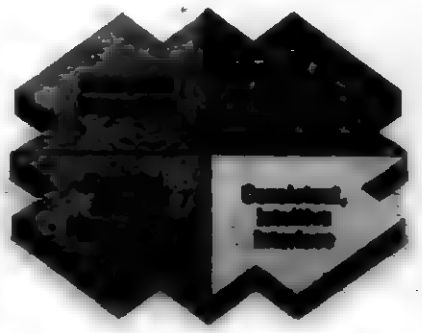

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NEW PRODUCTS

Unix software

Unitech Software, Inc. has announced a password management and control package designed for Unix-based sytems.

Upass includes transparent password control and automatic reporting features that provide system administrators with more security for their Unix systems. The software package runs on Digital Equipment Corp., Sun Microsystems, Inc., Hewlett-Packard Co., Unisys Corp. and other platforms.

License fees range from $1,000 to $4,000, depending on CPU size and type of Unix version supported.

Unitech Software
1800 Alexander Bell Drive
Reston, Va. 22091
(703) 264-3301

Development tools

Software Products International, Inc. has announced the Open Architecture Development System, a C-language interface that enables developers to incorporate original features or make changes to the existing functions and interface of its Open Access III database-oriented multifunction business software package.

The product comprises a set of C libraries that provide users with complete access to Open Access III's internal routines, thereby enabling users to make customizations to Open Access III's modules and applications.

The product and reference library can be purchased separately for $595 or as part of the Open Access III Developer's Tool Kit for $995.

Software Products International
10240 Sorrento Valley Road
San Diego, Calif. 92121
(619) 450-1526

Data storage

Mass Microsystems, Inc. has announced the Optipak, a magneto-optical disc drive designed for Apple Computer, Inc. Macintosh systems.

The product provides 512M bytes of storage on a removable, rewritable cartridge and uses a noncontact laser read/write system that will not deteriorate data, regardless of how often the data is erased or rewritten, the vendor said. It can be used for desktop publishing, computer-aided design and manufacturing and multimedia, archival and backup storage. It costs $4,349.

Mass Microsystems
810 W. Maude Ave.
Sunnyvale, Calif. 94086
(408) 522-1200

Board-level devices

AST Research, Inc. has announced a 16-bit version of its Sixpak 286 memory board.

Features include support for expanded memory specification 4.0 hardware, flexible memory configuration up to 4M bytes and expandable random-access memory. An optional piggyback I/O module is also included. The product costs $169.

AST Research
P.O. Box 19658
16215 Alton Pkwy.
Irvine, Calif. 92713
(714) 727-7960

Ventek Corp. has announced a video digitizer board that features 24-bit color capability.

The VIP 640C was designed for use in an IBM Personal Computer AT or compatible equipped with Industry Standard Architecture, an Intel Corp. 80286, 80386 or I486 processor; and IBM Video Graphics Array-compatible display capabilities. It can capture 640- by 480-pixel resolutions with color resolutions of up to 24 bits, the vendor said.

The product has a list price of $449.

Ventek
31336 Via Colinas
Westlake Village, Calif. 91362
(818) 991-3688

Ward Systems Group, Inc. has announced a neural network accelerator board based on a reduced instuction set computing workstation with a digital signal processor, running at 25 million floating-point operations per second.

The Neuroboard can run Ward's Neuroshell software 100 times faster than a 20-MHz Intel Corp. 80386 processor equipped with a math coprocessor, according to the vendor. It performs multiple overlapping multiply/add instructions and features a range of memory sizes.

Prices range from $1,695 to $3,295.

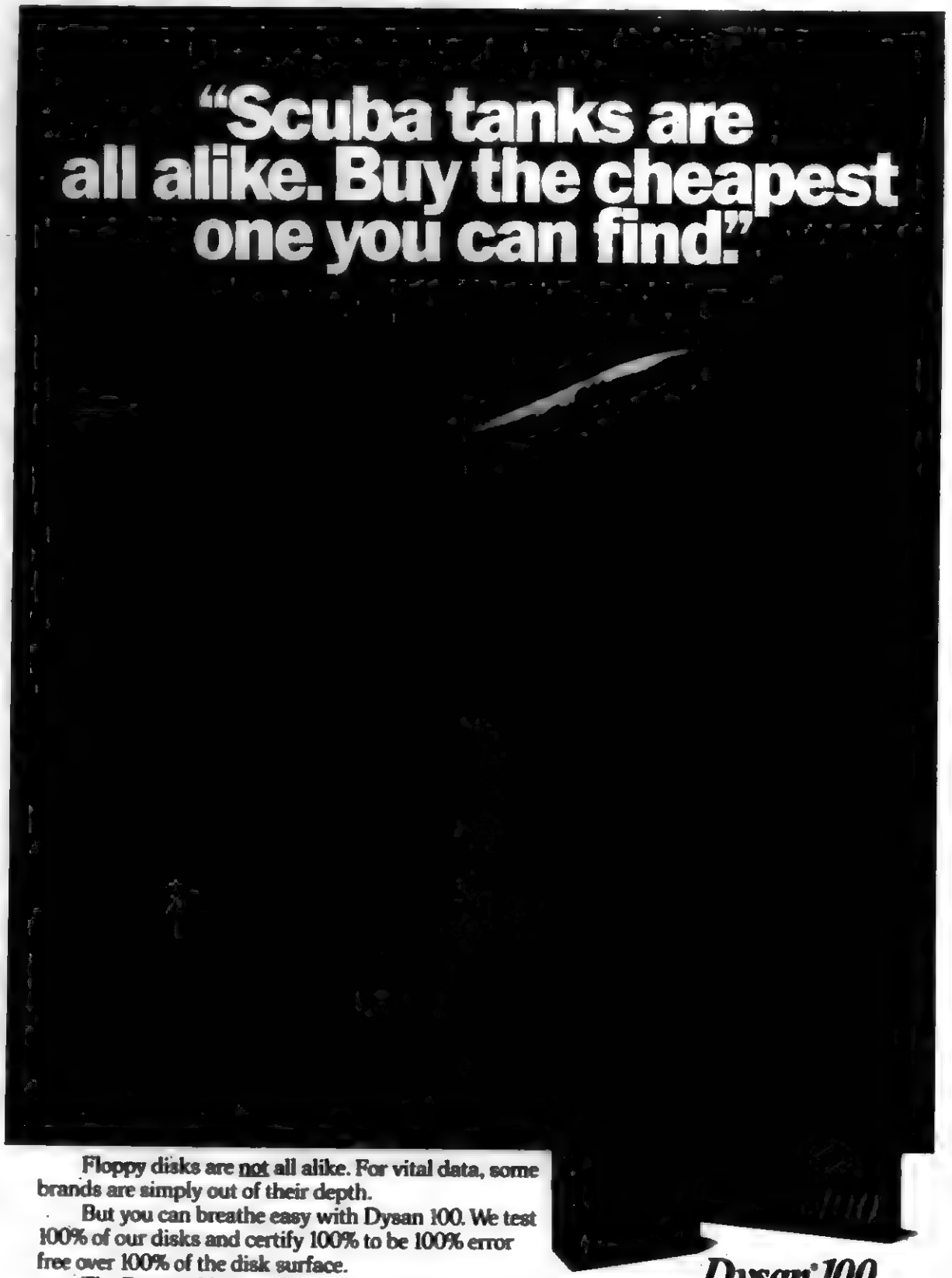
Ward Systems
245 W. Patrick St.
Frederick, Md. 21701
(301) 662-7950

Software applications packages

Wang Laboratories, Inc. has introduced an expert system-based application development tool that enables users to create, distribute and maintain decision-making or problem-solving applications in workgroup or companywide environments.

Commonknowledge runs on IBM Personal Computer ATs, compatibles or Micro Channel Architecture-based systems. The product is available in two packages:

Continued on page 84



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electronic greeting card and addressed it to infinity.
occurs to me, what if the people who might get
signal from planet Earth aren't around when it
What if they're in a meeting? And the only
thinking this is because I'm on the tenth ring of the
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the ringing noise is ruining his lunch. He says,
message?" And I say, "Tell Ray he needs to work for a
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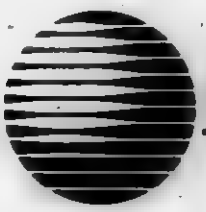
reach their intended party on the first try. But with
missed. Tell him AUDIX features outcalling that can
important messages are waiting. And this is impor-
trying to reach him and they may not call back...."
there is intelligent life somewhere in the universe, it is



AT&T
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Continued from page 80

A development component ($950) includes a set of applications-building tools, and a runtime component ($150 per user or $750 for a site license) allows users to run applications developed with Commonknowledge.

Wang Laboratories
One Industrial Ave.
Lowell, Mass. 01851
(508) 459-5000

Information Retrieval Methods, Inc. has released Version 3.0 of Enter/Pace, a development/management system for handheld terminal data collection systems.

The product includes a project management system that automatically generates communications scripts while an application is being built, a mouse-driven command generator that incorporates pull-down menus and windows and a terminal configuration feature, according to the company.

Enter/Pace Version 3.0 costs $4,000 and is also available from value-added resellers.

Information Retrieval Methods
1525 N. Stemmons
Carrollton, Texas 75006
(214) 242-2312

Power Up Software Corp. has announced Express Publisher Version 2.0, a software package designed for users of IBM Personal Computer XTs, ATs and compatibles.

The product includes Text Effects, a graphics module that enables users to create headlines or logos with sophisticated typesetting effects, such as manipulating text to fill a polygon or bending text along a curve.

Express Publisher Version 2.0 is priced at approximately $160.

Registered users of Express Publisher can upgrade their systems for $34.95.

Power Up Software
2929 Campus Drive
San Mateo, Calif. 94403
(415) 345-5900

Software utilities

Now Software, Inc. has announced Now Utilities Version 2.0, an upgraded version of its utility software package designed for Apple Computer, Inc. Macintosh systems.

The product includes Super Boomerang, a commercial version of Hiroaki Yamamoto's Boomerang product. Super Boomerang was designed to accelerate navigating and searching in open and save dialogues. It also features Screen Locker, which protects users' confidential data, and Multimaster, which facilitates file and application launching.

The product costs $129.

Now Software
520 S.W. Harrison St.
Portland, Ore. 97201
(503) 274-2800

Adlersparre and Associates Consulting, Inc. has announced a product designed to allow systems running under PC-DOS or MS-DOS to load and unload memory-resident software such as terminate-and-stay-resident programs and device drivers.

Dynamic Memory Control can note memory pieces in conventional or high memory and remove programs loaded in these pieces at any time, the vendor said.

The product includes software on 5¼- or 3½-in. diskettes and is priced at approximately $40.

Adlersparre and Associates
1803 Douglas St.
Victoria, B.C.
Canada V8T 5C3

Peripherals

Matrox Electronic Systems Ltd. has announced Image-CLD, a color digitizer that features the ability to convert 24-bit data into 16-bit red-green-blue data.

The device was designed to be linked to Matrox' Image series of image processing and graphics boards. The product can support applications that require color acquisition, including page layouts and machine vision. It can also scan and convert interlaced video and prepare it to be displayed as noninterlaced images, the vendor said.

Image-CLD is priced at $1,995.

Matrox Electronic Systems
1055 St. Regis Blvd.
Dorval, Que.
Canada H9P 2T4
(514) 685-2630

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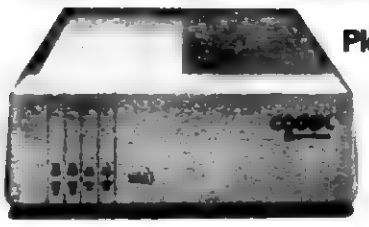

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COMMENTARY

Jeffrey N. Fritz

'Hey, anyone seen Coach?'

For just a moment, try to imagine CBS football commentator John Madden as a LAN specialist. Touring your state-of-the-art data center, Madden excitedly proclaims, "Holy Cow! Look at all these high-powered networks running here. There's an Ethernet wide open on a crossing pattern. And throwing a great block on the right side of the line is a token-ring. Look at that! Charging in from the backfield is an Appletalk network. There are lots of options on the field, including great plays by bridges, gateways, routers and brouters. There are even plans for new plays from something called FDDI. But, hey, there's no coach on the sidelines! Who's out there managing all this stuff?"

Madden's question would be appropriate in many LAN network operations. Who *is* out there managing all this stuff? Tremendous growth has occurred in LAN technology, but network management, the control and monitoring of network performance, has been conspicuous by its absence. Even with the leaps and bounds made in networking over the last six years, network management

Continued on page 96

Rolling along with Netview

BY ELISABETH HORWITT
CW STAFF

A major railway carrier has been handing IBM's Netview more and more responsibility for managing a multimainframe network with 20,000 terminals that in turn coordinates shipments across 22,000 miles of track.

"The benefit we've seen is that Netview lets you get a very early picture across a spectrum of activities — in our case, the mainframes and the network," said Doug Underhill, assistant vice-president of technical services at the railway carrier's CSX Technology subsidiary.

CSX Corp., which is said to be the largest railroad carrier in the eastern U.S., uses networked IBM 3090 mainframes to track the disposition of CSX's railcar fleet on a real-time basis, 24 hours a day. The hosts also interface with a process control system that manages the automated switch and signal network for CSX's railway network.

The interface allows the hosts to collect information about physical train activity and coordinate it with changing delivery priorities. This can be crucial, given that many shipment contracts invoke penalty clauses when a carrier fails to deliver within minutes of the agreed time.

The major thrust of CSX's network management strategy right now is toward "automation, using the system as a self-regulating mechanism," Underhill said.

CSX's Underhill *manages rail net*

CSX has been using a variety of tools to develop applications under Netview that automate "a significant portion of our operations," Underhill said. The company has been generating applications to automate management tasks using IBM's C List programming tools and, since it was released as part of Netview, the Rexx programming language. In addition, CSX has implemented two Netview programs, Automated Console Operations and Automated Network Operations, to minimize the need for human intervention in system and network monitoring, respectively.

"Something in excess of 90% of the messages that used to appear on the console daily don't appear any more; they are intercepted by Netview," Underhill said.

Snowed under

Before the implementation of the above systems, operators at mainframe consoles were bombarded with more than 500,000 messages daily.

Indeed, Netview "now does virtually all recovery from most recoverable types of failures, from loss of [Job Entry Subsystem transactions] to a line failure," Underhill added.

In addition to detecting and responding to a widening range of network and system events, Netview has been "scripted" to collect documentation, to reload software on the front-end processor, and to re-initiate host operations after a system failure, Underhill said.

T1 TO ISDN TRANSITION

Hybrid nets gaining favor

BY JOANIE M. WEXLER
CW STAFF

It's not happening in droves yet, but many companies are preparing to save a significant chunk of change and gain new networking capabilities by migrating some or all of their private T1 networks to public Integrated Services Digital Networks (ISDN).

Bunge Australia Proprietary Ltd., headquartered in Melbourne, Australia, is transitioning its entire 10-node T1 network to ISDN and anticipates a drop in annual telecommunications costs from $2.2 million to $900,000 (in Australian currency), according to Ramsay Gunasekera, group business systems manager.

As user firms face a burgeoning need to interconnect their local-area networks over wide geographical areas, they are starting to consid-

Continued on page 90

Cindy Panich

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Hybrid

FROM PAGE 87

er transitioning low-traffic segments of their T1 networks to ISDN to gain the economic advantages the switched service can provide.

A major reason the hybrid approach is attractive from a cost standpoint is that on dedicated T1 network segments configured to handle peak traffic periods, there could be chunks of prepaid bandwidth sitting idle for several hours a day — adding up to megadollars down the drain. ISDN, on the other hand, can replace those segments with switched bandwidth that is paid for only when used.

T1 suppliers are putting artillery in place for the looming hybrid market. During the past year, most have started shipping or have announced intentions to ship stand-alone T1-to-ISDN gateways or T1 multiplexers with integrated ISDN interfaces.

On the ISDN side, start-up Ascend Communications, Inc. in San Francisco said it will today announce The Pipeline, a stand-alone, modular device that allows host computers and local-area networks to use ISDN Basic Rate Interface, Primary Rate Interface or T1 access to get from the customer's premises to a carrier's point of presence.

User companies are primarily evaluating migration to the ISDN's Primary Rate Interface, which has equivalent bandwidth to a T1 circuit (1.54M bit/sec.) and certain advantages.

Primary Rate Interface's attractive features include bandwidth-on-demand, which is made possible by ISDN's dedicated signaling — or D — channel.

"The advantage to ISDN," says H. Paris Burstyn, vice-president of telecommunications at Business Research Group in Newton, Mass., "is that the D channel allows you to tell the network what capacity you need on the fly and dial it up."

The hybrid approach has also been cited by users and analysts as particularly cost-effective for network segments that handle bursts of traffic — common to inter-LAN activity — rather than a steady data flow. It is also an alternative for disaster back-up and full-motion videoconferencing applications, for which users can dial up 384K bit/sec. of bandwidth on demand.

Bunge Australia, a worldwide food and textiles conglomerate, has an advantage over U.S. companies in its transition efforts because the country's telecommunications authority made Primary Rate Interface available last year to the Australian business community. While ISDN is perceived as less widespread in the U.S., there will be 344 U.S. cities served by AT&T's Primary Rate Interface service by the end of the year, which is about the same number of AT&T T1 points-of-presence, says AT&T spokeswoman Claire Diamond.

Gunasekera says that his company's transition to Primary Rate Interface included only the $1.8 million (Australian) cost of the ISDN-capable T1 multiplexers, which are being provided by General Datacomm, Inc.

"We expect a payback on our investment in 17 or 18 months," Gunasekera says. He acknowledges, however, that Bunge did not previously own any private T1 multiplexing equipment — it was provided by the Australian telecommunications authority — so he had no equipment investment to swap out.

While ISDN enables companies to pay for switched bandwidth only when they use it, AT&T's and MCI Communications Corp.'s Primary Rate Interface tariffs do require a $3,000 installation charge per Primary Rate Interface connection plus a $400 monthly recurring charge and usage fees. U.S. Sprint Communications Co.'s installation fee is $2,000 plus a $300 monthly charge.

Master of disaster

The switched nature of ISDN makes the technology particularly economical for disaster recovery because bandwidth doesn't have to be dedicated — and paid for — at all times just to protect against potential circuit failures.

Fazil Bhimani, manager of network services at Heller Financial, Inc. in Chicago, cites three reasons why he is about to start testing Primary Rate Interface on segments of his fractional T1 network. In addition to cost-effective full-motion video applications that he anticipates arising at his company, he says he plans to save money by "not having to buy a lot of modems for dial backup" and by combining the access for fractional T1 and switched digital service on the same link.

Hybrid T1/ISDN customers can save on access charges because when they subscribe to a carrier's Primary Rate Interface ISDN service, they buy a T1 trunk to one of their carrier's central offices, along with access to an ISDN D channel. The D channel allows the customer to access the carrier's point-of-presence — on one trunk — and then access any of a number of switched digital services offered by the carrier. Examples of these services are AT&T's Megacom 800 or U.S. Sprint Communications Co.'s Sprintnet Packet Data Network.

By eliminating the need for a separate access trunk for each service, users could save thousand of dollars a month, according to Bob Kinderlehrer, senior product marketing manager at Timeplex, Inc. in Woodcliff Lake, N.J. Last month, Timeplex, a pioneer in the T1 market, announced the ISDN Gateway Server, a $12,500 to $24,000 stand-alone device scheduled to ship next month, which interfaces the company's Link+ family of T1 multiplexers onto a Primary Rate Interface line.

Almost there

Infotron Systems Corp., another global T1 multiplexer vendor, says it is in the midst of finishing up its "next-generation" product, which will include a Primary Rate Interface module. Louis Stilp, manager of product marketing, expects 3,000 to 5,000 of the 30,000 existing T1 lines to make the transition to ISDN during the next two to three years.

Business Research Group recently conducted a survey of more than 200 large companies about T1-to-ISDN migration plans. According to Burstyn, 10% of the respondents had already done some T1-to-ISDN transitioning, and another 17% said they plan to.

The hybrid T1/ISDN network scenario, though, is not yet barrier-free. "It's pretty simple if you have the service from a single carrier," Bhimani notes, "but you run into a problem if you use multiple carriers, because they haven't yet worked out Signaling System No. 7," a standard that allows carriers' central offices to communicate.

Timeplex acknowledges that its customers have to determine up front which carrier will provide ISDN service in order to specify the appropriate interface board to connect to AT&T's 4ESS or Northern Telecom, Inc.'s DMS-250 switch to be bundled into the gateway. In addition, Timeplex's Kinderlehrer says, in a hybrid network, users would need two separate network management systems.

Gunasekera adds that global companies will have to seek approval from the government of the country in which they will run their T1/ISDN-capable products, which took a week in Australia when he purchased his General Datacomm equipment.

Kevin Shannon, telecommunications manager at General Electric Corp. in Syracuse, N.Y., says he would "be crazy not to consider transitioning from dedicated T1 to switched ISDN," but that he "wouldn't jump into the pool with all my clothes on." He expressed a concern that there are not enough tools yet available for adequately managing the hybrid network.

"I'd have to figure the cost differentials between Primary Rate Interface vs. straight T1 and find out whether the AT&T points of presence I'd need to connect to offer a [Primary Rate Interface-capable] Class 4 switch," he adds. "The question of the islands of ISDN is still a valid one."

Basic-rate barrier

One barrier to a move from T1 to Integrated Services Digital Network (ISDN), users say, is the lack of availability of Basic Rate Interface ISDN services. Basic Rate Interface services offer 144K bit/sec. of bandwidth and are being eked out by the local telephone companies in a much less timely manner than the industry had hoped years ago when the technology was introduced.

According to Steve Saxegari, an analyst at Dataquest, Inc. in San Jose, Calif., there are no T1-to-Basic Rate Interface interfaces commercially available yet, though support for Basic Rate Interface is "in the future" in Timeplex, Inc.'s recently released ISDN Gateway Server, the company said.

In addition, Pacific Bell reportedly has been allowing customers to use its Centrex Basic Rate Interface service as a connection to T1 services such as AT&T's Accunet. Facsimile machine manufacturer Ricoh Corp. became the first customer to use Pacific Bell's Basic Rate Interface on-demand dial-up links to Accunet, and the company now uses such connections to transmit Group IV faxes among its U.S. sites and overseas to French and Japanese ISDN networks, according to John Zebrowski, sales support engineer.

Ricoh is also using two amalgamated 56K bit/sec. links to simultaneously support videoconferencing and document exchange.

Using ISDN on the local loop provides Ricoh with major cost savings over direct leased-line links to Accunet, Zebrowski says, even though "end-to-end ISDN" is not yet possible. A dial-up ISDN line lets Ricoh send Group IV faxes for 26 cents per minute — about the same cost as a voice call, he adds.

In Australia, Basic Rate Interface service is available countrywide, according to Ramsay Gunasekera, group business systems manager with Bunge Australia Proprietary Ltd. Gunasekera says he just completed successful testing of the service for a video application with a Bunge site in the UK.

Tom O'Sullivan, manager of network design and development at the Los Angeles office of Kaiser Permanente, a health maintenance organization, runs a fractional Infotron Systems Corp. T1 network spanning seven counties in Southern California and is eyeing a hybrid T1/Basic Rate Interface for future "occasional" data transmission applications, such as linking doctors to medical centers and home health-care applications.

JOANIE WEXLER and ELISABETH HORWITT

HP X.500 product draws fire

BY J. A. SAVAGE
CW STAFF

Despite the promise that the announcement carries and Hewlett-Packard Co.'s usual conservatism in having a complete product before release, there are doubts in the industry about HP's recent release of an X.500 network directory product. Other companies have announced products but have yet to ship them, and the X.500 standard is not yet complete.

"It's one of those announcements of a product before its time," said Steve Wendler, vice-president of Gartner Group, Inc. in Stamford, Conn. "It's vaporware. They do have code, but it's not industrial-strength code."

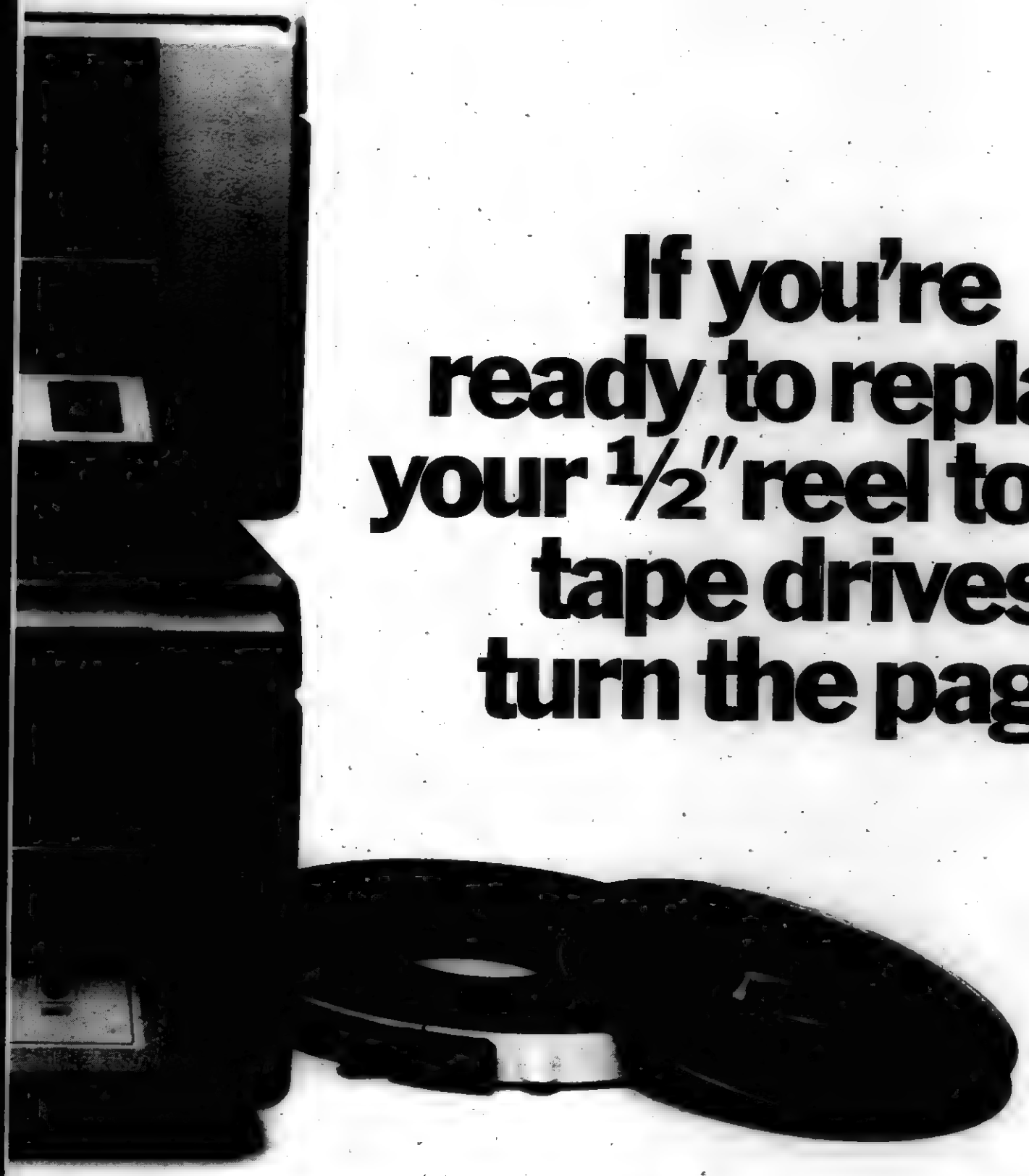
Gordon Preston, electronic mail manager at Du Pont Co., has been testing HP's X.500 product. "It's very, very new," he said. "There are still a lot of issues to resolve such as security and user friendliness. There may be several hundred bytes of information on an address — that's absolutely not user-friendly." He said that an effective product is several years away.

Backtracking from the official announcement, HP Open Systems Interface marketing program manager Michael Johansson said the company was only shipping "core functionality" of the product to a group of fewer than 20 customers.

With messaging systems multiplying in large firms, directory and addressing assistance, which could be provided by products using X.500, is increasing in importance. "We recently conducted a straw poll and found that directory and addressing, as a specific issue, was mentioned frequently as [internally] important to corporations," said Walter Ulrich, a management consultant at Arthur D. Little, Inc. in Los Angeles.

Johansson argued, however, that the standards have settled enough to issue products. "Since it reached the Draft International Standards stage, we are confident that [the final standard] will not be much different."

As the first major host vendor with such a product on the market, HP has not yet tested X.500 for interoperability with other firms' products, Johansson said.



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Integrated mail package lightens traveler's load

BY JOANIE M. WEXLER
CW STAFF

American Progressive Corp. originally purchased its Voxlink Corp. Voice Server because the firm's president found it unwieldy to lug around a portable computer. Now, with the product's recently added facsimile mail capability, the firm anticipates savings of 50% on its monthly fax charges and is also designing what it hopes will be a lucrative application around the package.

American Progressive is a health insurance underwriter that recently purchased the fax capability for Voice Server, which allows users to check voice, electronic and fax mailboxes with one phone call. The product integrates with several electronic mail packages for MS-DOS local-area networks, such as those from CC:Mail, Inc. and Da Vinci Systems. American Progressive runs the Postmaster E-mail package from Modem Controls, Inc. over three Novell, Inc. Netware LANs.

Voxlink's original intent was to relieve the business traveler of having to carry a portable computer to access electronic mailboxes from the road. When a traveler punches in an identification number from a Touch-Tone phone, Voice Server will check that individual's voice, electronic and fax mailboxes. If an E-mail message exists, the system will either convert the text to synthesized voice and read the message — much more quickly than a human, said American Progressive President Ernest Clevenger — or redirect it to a fax number designated by the caller.

Voice Server will also redirect mail downloaded from a fax server to another fax machine. "All 80 users on our three LANs now have the capability of rerouting text to fax," Clevenger said. "This is handy for producing quotes for global clients in that our underwriters don't all have to produce a hard copy and hand it to someone standing at the fax machine."

Before Voxlink added the fax-mail capability to Voice Server, American Progressive used Compuserve's fax service, which Clevenger said cost between $3,000 and $4,000 a month. "We hope to cut that expenditure in half," he said.

Digital talk

The firm will soon conduct a beta test of a Voice Server application it is developing with Voxlink and IBM. The application will allow callers to enter a password and learn the status of their claims or quotes from database text converted into digitized voice, Clevenger said, adding that 10 to 15 customers should be using the application in early 1991.

"Service is the only edge we can offer, because we're small," he said. "Many people are not computer-literate. We're looking at ways to come to the customer's level, and that's the telephone."

Clevenger said his company has also teamed up with Voxlink and IBM to tweak the customer service application and market it to other industries.

"For example, truck drivers could call a clearinghouse and get a voice-synthesized message of the nearest load to pick up for a return trip," he explained.

IBM got in on the act when Lloyds of London, an American Progressive client, requested the underwriter to route information across IBM's Information Network. American Progressive will receive royalties from Voxlink on application sales, and Clevenger said IBM will likely receive its compensation through business in its Information Network. "It isn't clear yet whether any royalties will be paid to IBM," he said.

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EDS moves into video

Electronic Data Systems Corp. (EDS) and **Compression Labs, Inc. (CLI)** have said they will jointly develop and market video communications products that will incorporate CLI's compressed digital video technology for interactive applications and EDS's infrastructure and communications network.

Andersen Consulting has reportedly signed an agreement with **Vicorp Interactive Systems, Inc.** under which the systems integrator will resell Vicorp's Betex software, which integrates voice, data and image services.

Development of software to integrate **AT&T Tridom's** very small aperture terminals with **Innovative Electronics'** Netmaster System — an automated price verification and inventory-checking system — is reportedly underway by the two companies, which said they plan to jointly market their integrated products and services to the retail industry.

Easel Corp. said it is offering **Annatek Systems, Inc.'s** Network Navigator software — which automates the management of software distribution, data distribution and collection, configuration management of personal computers and remote support — with Easel's graphical application development environment.

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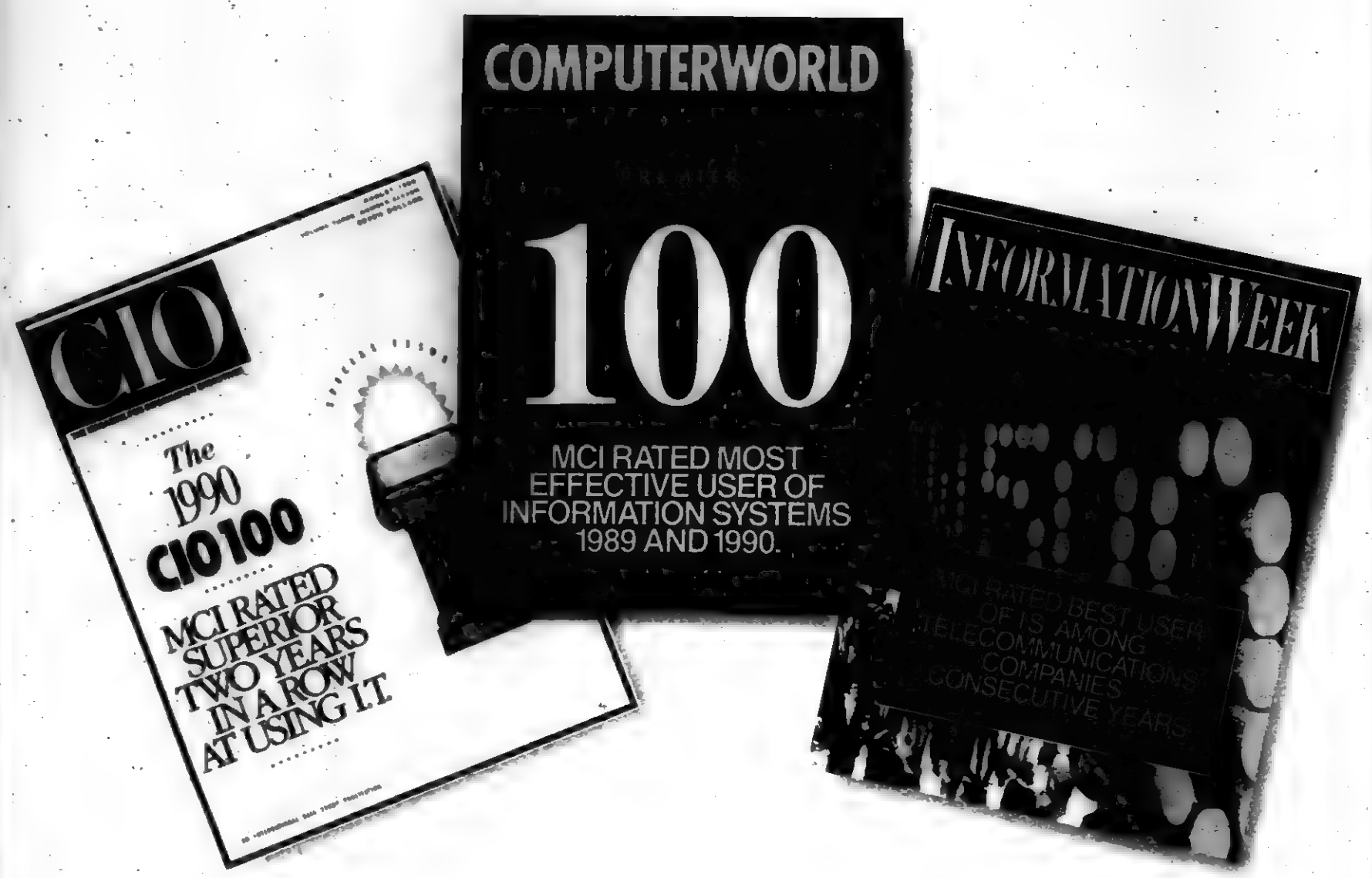

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Gearing up for communications

BY ELISABETH HORWITT
CW STAFF

Automobile dealers that need a more flexible, cost-effective way to keep in touch with their manufacturers will soon have help from a partnership made up of Scientific-Atlanta, Inc. and V-Crest Systems, Inc., a wholly owned subsidiary of Volkswagen of America, Inc.

The two firms recently announced they will provide turnkey communications systems that mesh Scientific-Atlanta's very small-aperture terminal (VSAT) networking service, SkylinX.25, and V-Crest's expertise at developing auto dealership management applications and services.

At the same time, the firms announced a contract valued at $12 million under which Scientific-Atlanta will design, install and service a VSAT network for V-Crest. Based on the Atlanta, Ga.-based satellite network vendor's Skylin X.25 VSAT offering, the network will link as many as 835 Volkswagen and Audi dealers across the U.S. to V-Crest's headquarters, the two firms said.

THE VSAT network will link as many as 835 Volkswagen and Audi dealers across the U.S. to V-Crest's headquarters.

V-Crest is in the process of migrating to Skylin X.25 from a terrestrial network of 4.8K bit/sec. leased multidrop lines from AT&T, said Jim Smith, research and development manager at V-Crest. Linking to dealers was getting too costly, "and we couldn't deploy new dealership links fast enough" with the terrestrial network, he added. V-Crest expects to have completed the migration by the first quarter of next year.

Volkswagen's VSAT-based dealer network will support 56K bit/sec. in both directions and carry video and data, Smith said. An important reliability feature is the system's ability to automatically switch transmissions from one transponder circuit to another when there is a line failure, he added.

V-Crest has already signed a contract with Porsche Cars North America, Inc. to provide communications between the importer and its dealers over the same network that Volkswagen and Audi dealerships use. Because nearly 80% of Porsche's dealers reside at the same location as a Volkswagen or Audi franchise, only one satellite dish will be required for all three franchise units, V-Crest said.

The alliance between V-Crest and Scientific-Atlanta will concentrate on providing import car dealers with the same level of interactive, satellite-based communications that Volkswagen and major U.S. manufacturers have been setting up for their own dealers, Smith said. Such links are growing important to dealers as a way to support key applications such as electronic distribution of parts catalogs, electronic-mail exchange and video for service training, he added.

To communicate effectively with each supplier, dealers typically have to set up separate terrestrial links and communications systems, because each manufacturer may use a different set of protocols, Smith said.

In contrast, a dealership can use a single VSAT to communicate with all of its manufacturers by transmitting to the Scientific-Atlanta hub, which then routes transmissions to the correct supplier site, Smith said. V-crest and Scientific-Atlanta will sell a digital processing unit that can handle asynchronous, IBM's Synchronous Data Link Control and X.25 transmissions, translating whatever format the dealer uses into a given supplier's format, he added.

ANSI pursues 'FDDI lite'

BY JOANIE M. WEXLER
CW STAFF

FORT LAUDERDALE, Fla. — The much-bandied-about issue of rigging up less costly Fiber Distributed Data Interface (FDDI) alternatives became slightly less amorphous after the American National Standards Institute's (ANSI) FDDI committee meeting earlier this month.

Two ad hoc committees — one exploring the viability of running FDDI's 100M bit/sec. data rates over twisted-pair wiring and the other examining less costly ways to build fiber components — approved proposals targeted to receive ANSI's final nod in December 1992.

The existing FDDI standard specifies a token-ring local-area network that communicates over glass fiber-optic cabling, a highly reliable medium that is completely resistant to electromagnetic interference and offers bandwidth capacity into the gigabits per second. However, the fiber-optic components for FDDI are still expensive, and glass fiber is difficult — and thus costly — to install.

Given the long lead time required by new standards activity, the threat of lower cost alternatives to achieving FDDI's high communications speeds could serve mainly as an invisible hand of looming competition and push FDDI vendors to reduce their prices in a more timely manner. While the price of fiber components and chip sets to vendors has dropped by nearly 50% over the last year, the cost per seat still averages about $11,000 to the user.

"Fiber-optic vendors are seeing pressure from the copper advocates and are realizing that they won't recover their engineering costs on their first 10,000 units sold," said Ron Perloff, president of Xlnt Designs, Inc., an FDDI vendor in San Diego. "They're going to have to lower their prices to salvage the market."

From the twisted-pair perspective, the issue revolves around whether to develop technologies for the high speeds over unshielded twisted-pair in addition to shielded twisted-pair, said Floyd Ross, vice-chairman of the FDDI ANSI committee.

One reported problem is that few users trying to capitalize on the existing unshielded copper in their walls probably have a high enough grade of wire to reliably support the 100M bit/sec. data rates, even over the proposed reduced distances between nodes — from 2 km over glass to 100 meters over copper.

Also, while writing specifications for IBM's Type 1 shielded twisted-pair would reportedly be fairly simple, there are significantly fewer numbers of users who have that type of wiring installed and could take advantage of the technology. CIMI Corp., a market research and consulting firm in Voorhees, N.J., estimated that 23% of large companies have shielded wire installed for LAN use, compared with 77% running unshielded wire.

The low-cost fiber ad hoc committee decided that any new standard — such as one specifying a plastic fiber medium — would be interoperable with the existing glass standard.

A few dissenters pushed for a new stand-alone standard, which the majority of the committee felt would only serve to fragment the FDDI market, keeping volume down and prices elevated.

Since the efforts of both ad hoc committees include reducing FDDI's internodal requirements to 100 meters, "you can relax the transmitting power specification and the receiver sensitivity, so it would be easier and cheaper to build parts," explained Bruce McClure, who chaired the low-cost fiber group and is chief technical officer at Synernetics, Inc., in North Billerica, Mass.

The committee's intent, McClure said, is to retain FDDI's high performance and low error rate over shorter distances. The shorter distance would make the alternatives more suited for to-the-desktop applications than for use as a backbone.

According to Perloff, applications that would be unsuitable for the 100-meter alternatives would be in environment-sensitive areas, such as those in the military and financial industries. He said that the current standard specifies one undetected error rate in 20 years and that moving to a copper link with a signficantly higher bit error rate could "ruin a launch or add or subtract millions to a bank account."

Beating the bottlenecks

Once users figure out a way to afford FDDI's 100M bit/sec. speeds, they may discover they've merged onto an eight-lane highway in a Model T.

Most of today's transport-layer communications protocols are too slow to capitalize on FDDI's high data rates. FDDI specifies only the first two layers of the Open Systems Interconnect model — the physical and data link layers.

The transport- and network-layer protocols running over FDDI, such as the widely used Transmission Control Protocol/Internet Protocol (TCP/IP), run much slower than 100M bit/sec., shifting the traffic bottleneck from the network to the workstation.

TCP/IP, for example, was originally designed for use in unreliable environments and thus carries with it a lot of overhead that slows it down — overhead that is not needed by FDDI, which runs over the highly reliable fiber medium.

In today's neophyte FDDI environment, users generally use FDDI as a backbone to interconnect LANs, which may cumulatively make full use of the 100M bit/sec. speeds.

But for users who soon wish to use the full capacity of FDDI on a peer-to-peer LAN — such as Case Western Reserve University in Cleveland, which intends to interconnect individual FDDI LANs over a Sonet backbone — communications protocols that run over FDDI will have to be stepped up.

Work is under way. Protocol Engines, Inc. in Santa Barbara, Calif., has been working on XTP, a high-performance transport-layer protocol on the table for standardization at ANSI. According to Protocol Engines President Larry Green, XTP runs 15% faster than TCP/IP when implemented in software and will run "orders of magnitude faster when put in silicon," an event slated for May 1991. The protocol exists in some software implementations today.

JOANIE M. WEXLER

Fritz

CONTINUED FROM PAGE 87

has remained "out of sight, out of mind" — that is, until the previous lack of management catches up with the LAN. Then the network begins to collapse under the load of increased traffic, heavy broadcast traffic, inadvertently duplicated network addresses and excessive packet errors.

Given the high bandwidth provided by today's LAN media, early problems can easily go unnoticed. When the LAN is small, the extra bandwidth covers up most problems. However, the problems increase exponentially as the LAN grows and becomes interconnected with other networks. The resulting sequence of events is predictable. At first, administrators tend to regard problems as a "fluke." However, the house comes down before long, and LAN users demand a cure. Once the smoke settles, approval finally comes for network management tools to prevent future problems.

LAN operators alone are not to blame for this state of affairs. Corporate administrators are often unwilling to commit up-front dollars for LAN management. This kind of thinking must change.

Administrators and LAN operators must realize that a LAN that is stable today may become a major problem tomorrow. Few LANs are static, remaining at the same size and power forever. LANs quickly evolve into metropolitan-area and even wide-area networks as bridges, gateways and routers extend their range and interconnectivity.

To be fair, effective tools for dealing with network management have not always been easy to find. Fortunately, this now seems to be changing. Devices such as Network General's Sniffer and Expertdata's Vigilan are available to monitor LAN performance.

There are a growing number of software tools available for network management. Some packages, such as Cabletron System's just-announced Spectrum, provide an early warning system for potential problems. Most importantly, the industry has begun to set a standard for network management. A developing protocol called Simple Network Management Protocol (SNMP) has garnered support from such well-known networking vendors as Novell, Vitalink and 3Com. The development and use of network management tools based on SNMP is critical.

Clearly, there is hope for effective network management tools on the horizon. However, such tools are of little value without the user community implementing them. It is now up to LAN operators, administrators and users to make LAN management a part of their design and day-to-day operations. Without effective network management, LAN chaos is guaranteed to follow.

Fritz is a data communications analyst at West Virginia University in Morgantown, W. Va.

Unhelpful help line personnel

BY JIM NASH
CW STAFF

User demand for local-area network service is not abating. An unpublished study of network administrators indicated that their frustration — particularly with telephone support on software problems — will only grow as networks multiply.

The study, to be published this fall by International Data Corp. in Framingham, Mass., indicates that telephone support for network software is the weakest link in the loose chain of network service.

IDC analyst Carol Watson said that in a study of 262 data communications managers, the most frequently cited source of dissatisfaction was the inability to get qualified help over the phone.

One indication of the increasing importance of LANs is the growing amount of money Watson said network administrators will spend on LAN hardware support versus wide-area network support. According to the report, service and support for LAN hardware equaled WAN support in 1989. But Watson predicted that by 1994, LANs will account for 71% of the estimated $2.9 billion spent on networking hardware support.

Aimed at network vendors, the study indicated that LAN manufacturers looking for value-added points can benefit by devising efficient help services.

"That's definitely true," said Avo Amirian, LAN specialist at City National Bank in Beverly Hills, Calif. Amirian said he recently tried to connect a Compaq Computer Corp. 386N diskless workstation to his Novell, Inc. Netware Version 2.15C network with an IBM Token-Ring adapter card. When he was unable to make the connection, he got a round of finger-pointing from all vendors involved.

"Everyone was giving me different answers," he said. "It was frustrating."

Watson said such experiences point to a common complaint among administrators: They do not usually find the most qualified person manning help lines.

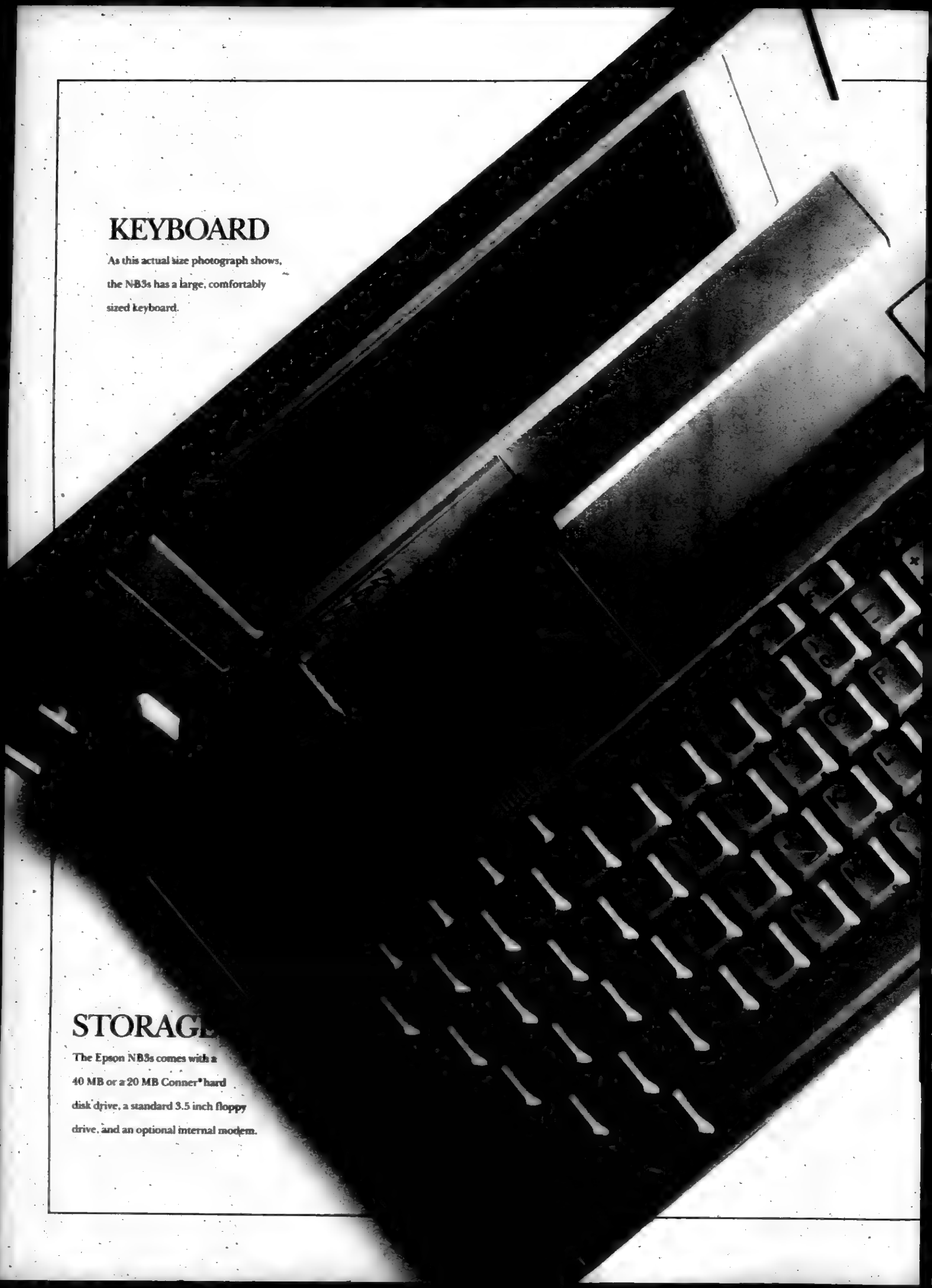
Michael Sanchez, chairman of a 3Com Corp. users group called 3Group New Mexico, said 3Com phone assistants "are not always as responsive or attuned to what customers want."

Amirian said Novell's expensive help charges further aggravate users.

3Com offers a subscription service in which its technicians remotely enter a client's network to find flaws, Sanchez said, which only helps if the system is operational. Sanchez is manager of technical support at High-Tech Associates, Inc.

Looking at it from the vendor's perspective, Alice Bradie, an analyst at Hambrecht & Quist, Inc., said the need could be turned to profit: "I wouldn't call it a bonanza, but it's an opportunity" for third-party companies and vendors looking to stand out from their competition.

In designing the new
386SX notebook,
Epson engineers had to
weigh a lot of options.



KEYBOARD

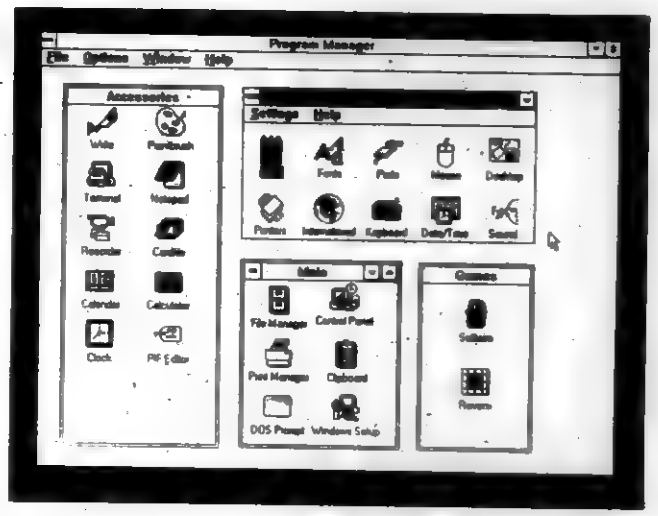
As this actual size photograph shows, the NB3s has a large, comfortably sized keyboard.

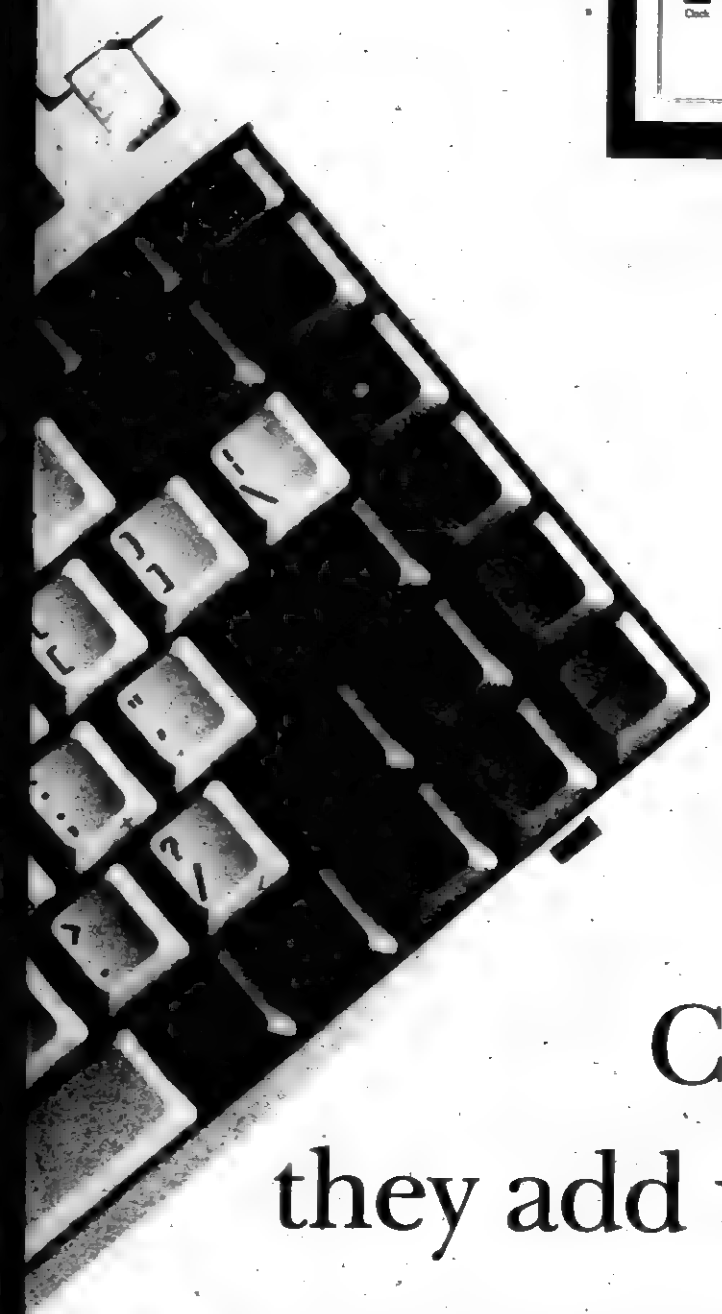
STORAGE

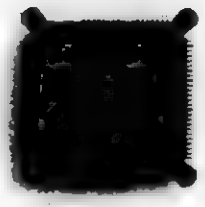
The Epson NB3s comes with a 40 MB or a 20 MB Conner* hard disk drive, a standard 3.5 inch floppy drive, and an optional internal modem.

VGA

The large backlit, 640 x 480 resolution LCD screen includes 16 gray scales for sharp black-on-white VGA graphics.







386SX

Finally a notebook computer with the power and performance of a 386SX and up to 5 MB of RAM to run all of your most popular applications, including Windows™ 3.0. You can even install an optional math co-processor.

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In a world where PC users demand uncompromised performance from a portable computer, Epson® introduces a 5.8 pound engineering breakthrough that dispels the notion that less weight means less computer.

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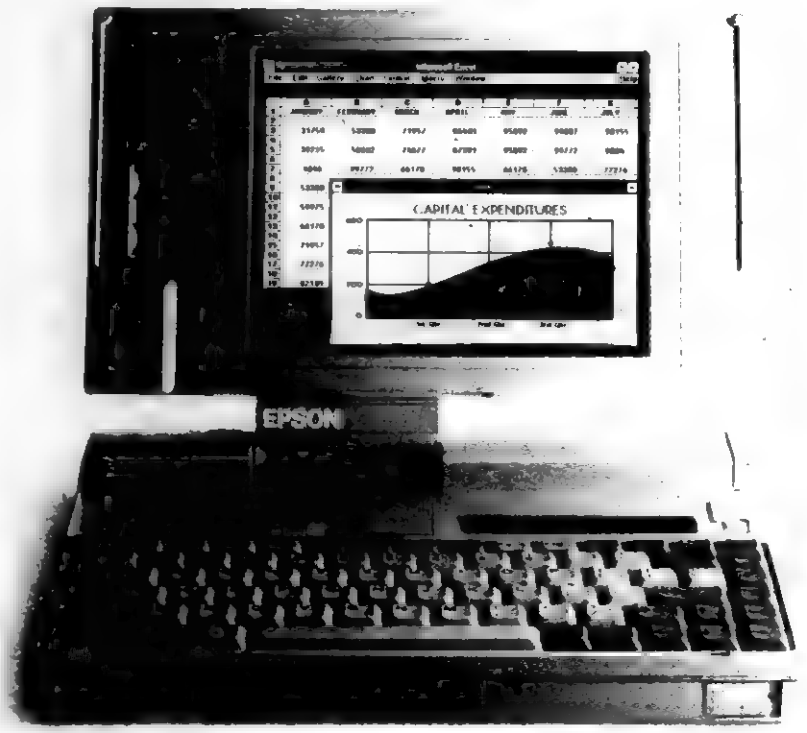
That combination of power and portability makes the Epson NB3s the perfect computer for people who simply don't believe in compromise.



Pick one up at COMDEX.

To see how light a 386SX notebook can be, you'll have to pick up an Epson NB3s. To see how fast and powerful it can be, you'll have to spend a few minutes working with this high performance notebook computer.

You can do both at COMDEX. The new Epson NB3s notebook computer will be on display in booth 1178 in the Las Vegas Convention Center's East Hall, so you can weigh all your options yourself. At the same booth, you can also see our entire new line of desktop computers and laser printers, including a new Postscript® model.

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EPSON

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Tax collection warms up as Canada makes network plans

BY JIM NASH
CW STAFF

OTTAWA — The good news in Canada is that work will soon start on one of that country's largest personal computer-based local-area networks. The bad news for some people is that the network will be used to speed collection of taxes.

3Com Corp. in Santa Clara, Calif., was awarded a contract recently to install its 3+Open network operating system and communications software in 54 tax-collection offices nationwide for Revenue Canada, a northern cousin to the U.S. Internal Revenue Service.

The sites must be linked by Jan. 31, 1991, to process anticipated new tax returns. As many as 200 more tax and customs sites could be networked during the next two years should the Canadian Parliament decide to do so.

A spokeswoman for 3Com Canada, Inc. said the initial contract is worth about $3 million (Canadian) and will involve as many as 3,000 workstations. The spokeswoman said 3Com will install one network per day to meet the deadline.

Peter Hyne, president of Remuera Corp., an Ottawa network management service, said the project had been discussed for years. It was the prospect of asking the existing mainframe-only system to handle new expanded revenue-collecting duties as part of a proposed consumption tax that forced Canada's hand, Hyne said. Hyne was hired by Revenue Canada to act as director of the project.

WITHOUT greater automation, as many as five times more employees would be needed to perform processing and related tasks, Hyne explained.

The proposed tax demands a percentage of almost every sale with the exception of food and medicine and will be collected monthly, he said. Without greater automation, as many as five times more employees would be needed to perform processing and related tasks, Hyne said.

"Every government department is undergoing a fairly dramatic wave of new technology," he explained. For Revenue Canada, that means virtually abandoning its Hitachi Ltd. terminals and replacing most of them with 20-MHz Intel Corp. 80386SX- and 80386-based IBM clones. The PC contract has yet to be signed, he said.

All major data processing will be done on the Hitachi mainframe in Ottawa using Icon, Inc.'s IBM 3270 emulation product. The desktop machines "will virtually have a dedicated line via unshielded twisted pair to an IBM Token-Ring backbone to the Hitachi mainframe," Hyne said.

Depending on how heavy data flow is predicted at each office, either 4M bit/sec. or 4M/16M bit/sec. Token-Ring will be installed.

Regional offices will perform significantly more tax functions. Using the mainframe's and their own new databases, employees will be able to answer the public's questions about what will be taxable under the proposed law.

More importantly, regional offices will conduct more on-site audits of virtually all businesses. Without the new micro-to-mainframe system, Hyne said, the process of assigning, carrying out and filing audits would be paper-based. Office workers are expected to be issued laptops to aid in the audits, he explained.

Local word processing and spreadsheet analysis will also be added to regional offices. Later, with the adoption of a CCITT X.500 directory service, the switch will mean greater information swapping capabilities through peer-to-peer operation for PC users.

3+Open's adherence to standards, Hyne explained, ultimately led to 3Com being chosen over Novell, Inc. and Banyan Systems, Inc. network operating systems. In addition, Hyne said, Novell is better with LANs than wide-area networks.

"Banyan was a good alternative, but the direction of the 3Com/IBM/Microsoft Corp. juggernaut in the next three to five years matches our course," Hyne said. He was referring to the three firms' announced intention to standardize on X.400 and X.500 communications protocols.

3+Open also supports IBM's OS/2. "Our sense of the marketplace is that applications today and tomorrow will be written first for DOS and OS/2 and Novell's Netware later," Hyne said.

Beyond that, he said, 3Com can dynamically switch between Data Link Control, Xerox Network Services and Netbios protocols. Finally, Hyne explained, 3+Open frees more memory at the desktop. Compared with a fully configured Banyan Virtual Networking Software operating system, Hyne added, 3+Open left as much as 25K bytes more memory free.

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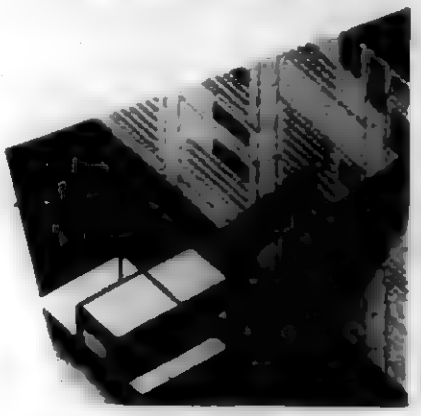
dBASE 3270 language extension to mainframes



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NEW PRODUCTS

Local-area networking hardware

Everex Systems, Inc. has announced a line of token-ring network adapters that incorporate a bus master design and are equipped with a 128K-byte memory buffer to improve data transfer rates over local-area networks.

The Speedlink/TR adapters can be connected to IBM mainframes via LAN gateways and are available in 4M and 16M bit/sec. versions.

The products were designed for IBM Personal Computer ATs, Personal System/2s and compatibles and are scheduled to be released this month. Pricing ranges from $645 to $925.

Everex Systems
48431 Milmont Drive
Fremont, Calif. 94538
(415) 498-1111

US Sage, Inc. has announced a 10M bit/sec. Ethernet adapter card designed to link IBM Personal System/1 computers in peer-to-peer or file server environments.

Mainlan for PS/1 is available as a complete starter pack that includes two 10M bit/sec. Ethernet cards and peer-to-peer operating system software. It also can be purchased as a separate card. The card uses 30K bytes of memory in conventional personal computer workstations, the vendor said.

The starter pack has a list price of $499. Separate cards with Novell, Inc. network drivers are priced at $199 each.

US Sage
2005 Tree Fork Lane
Longwood, Fla. 32750
(407) 331-4400

Maco Networks, Inc. has announced an expansion product for its Lanframe server system.

Lanframe-4 Server can simultaneously support four separate dedicated local-area network processes from one rack-mount enclosure. It is separated into four equal computer segments with three slots, and each segment can be configured with an Intel Corp. 80286 processor configured with 1M byte of random-access memory, 250K bytes of static RAM, a built-in serial port and video support for monochrome and IBM Enhanced Graphics Adapter displays.

The product is priced at $3,995, and additional 286 CPUs cost $1,995 each.

Maco Networks
802 E. Martintown Road
N. Augusta, S.C. 29841
(803) 278-7225

Local-area networking software

Access Technology, Inc. has announced an enhanced version of its Forcomment Document Review Groupware, a software package designed to enable connected personal computer work groups and users of Digital Equipment Corp. VAX systems to increase the efficiency of their document review cycles.

The product allows selected reviewers across a network to share a common text document and add on-line comments and suggested revisions. VAX/VMS and All-In-1 editions are now available. Perpetual license fees range from $375 for a Vaxstation to $9,900 for a VAX 9000. All-In-1 editions cost $450 for a Vaxstation and $11,880 for a VAX 9000.

Access Technology
Two Natick Executive Park
Natick, Mass. 01760
(508) 655-9191

Xtree Co. has announced a network utility that can access local drives and file server volumes. Xtreenet 2.0 was designed for Novell, Inc. networks. It includes a graphical tree display of a disk's directory structure and a peer-to-peer capability that allows administrators to access any workstation on a network.

A Novell, Inc. Entry Level System (ELS) version is priced at $249, and an advanced SFT/386 version is available for $495. Registered Xtreenet 1.0 users can upgrade to the ELS or SFT/386 versions for $95.

Xtree
4330 Santa Fe Road
San Luis Obispo, Calif. 93401
(805) 541-0604

United Information Technologies has announced a financial analysis application designed for local-area networks.

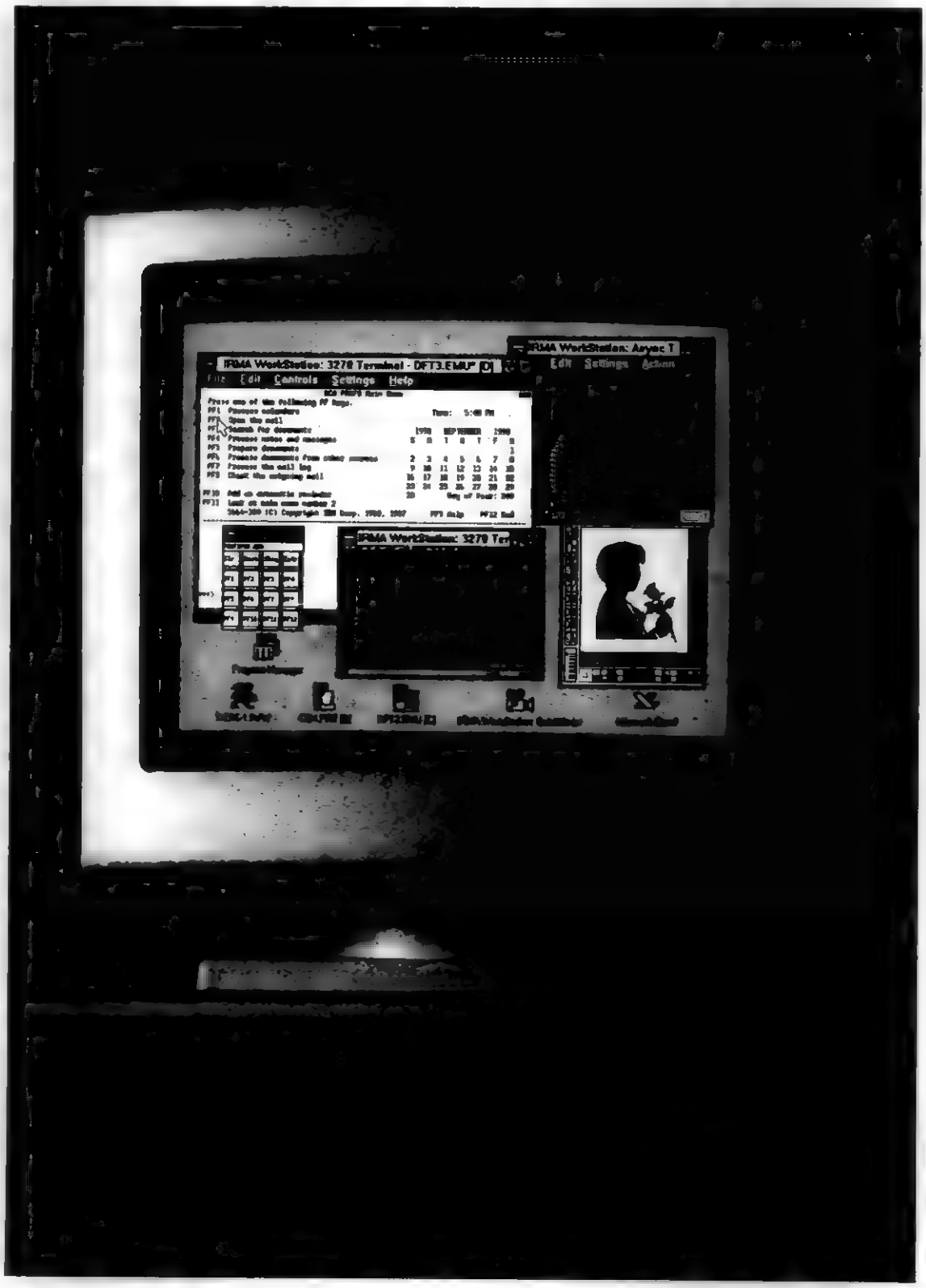
Planning and Analysis Groupware integrates menu-driven functionality with spreadsheet and multidimensional database capabilities. Because the product was written in Sinper Corp.'s TM/1 relational spreadsheet language, it provides users of TM/1 or Lotus Development Corp.'s 1-2-3 spreadsheet with networking capabilities, the vendor said.

The package is priced at $3,495 per table server plus $995 for each license.

United Information Technologies
350 S. Main St.
Doylestown, Pa. 18901
(800) 237-5089

Persoft, Inc. has announced Intersect, a software bridge designed to connect and exchange data between Ethernet local-area networks.

The product operates at the Media Access Control level of the Open Systems Interconnect's Data Link Layer and complies with the IEEE's 802 standard. It



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uses the Spanning Tree Protocol to detect loops and dynamically locate network nodes.

Intersect runs over Ethernet, thin Ethernet and twisted-pair media connections. It requires personal computers running DOS Version 2.0 or higher. A unit with two Ethernet boards is priced at $1,495.

Persoft
UW Research Park
465 Science Drive
Madison, Wis. 53711
(608) 273-6000

Links

Til Systems, Inc. has announced Xpert/Office on the Go, a software package designed to enable users of laptops and portable computers to access X.25 packet-switched networks via regular telephone lines.

The product comprises a personal computer-based X.25 half-card that integrates a V.22 bis modem, VT100 and Xpert file transfer emulation packages. It also incorporates X.32 technology that provides synchronous dial-up access to X.25 public and private packet-switched networks through standard telephone lines.

Xpert/Office on the Go is priced at $1,350.

Til Systems
225 Stedman St.
Lowell, Mass. 01851
(508) 970-1189

Computer Network Technology Corp.'s Graphics Controller Interface allows multiple IBM 5088 or 6098 Graphics Channel Controllers to be attached to a single channel.

The product enables engineers at different locations to share access to common mainframe-based graphics design applications. It is offered free to customers who already have a sufficiently configured extended channel network. A hardware upgrade costs $19,000. For customers who need to purchase an extended channel network, pricing begins at $50,000 per network processor.

Computer Network Technology
5655 Wedgwood Road
Maple Grove, Minn. 55369
(612) 420-4466

Gateways/bridges/routers

Interlink Computer Sciences, Inc. has announced a product that allows users of IBM 3270 terminals to access non-IBM applications on Transmission Control Protocol/Internet Protocol (TCP/IP) networks with full-screen ASCII terminal emulation.

SNS/TCPVT Release 2.1 enables users to access applications on IBM systems and a TCP/IP network from a single terminal, the vendor said.

The product can be used on an IBM 3270 display system terminal or an IBM Personal Computer emulating a 3270. It is priced at $10,950.

Interlink
47370 Fremont Blvd.
Fremont, Calif. 94538
(415) 657-9800

Comware International has announced a gateway processor designed to support file transfer and terminal emulation for IBM midrange systems.

Comgate/FS links an IBM Application System/400, System/36 or System/38 with file servers residing on local- or wide-area networks. It uses IBM's LU6.2 protocol to allow partial or complete files to be transferred between IBM midrange hosts and network-based personal computers.

A basic system with as many as eight simultaneous PC connections and 20M bytes of file storage costs $9,500; a 16-PC version sells for $12,900.

Comware
P.O. Box 410
451-K Second St.
Solvang, Calif. 93464
(805) 686-1262

Rad Network Devices, Inc. has announced a stand-alone local token-ring bridge that features support for the impending source-routing transparent bridge standard.

The bridge filters and forwards source and transparent non-source-routing packets at maximum filtering rates of 120,000 frame/sec.

The bridge is available in two models, both of which are priced from $3,995.

Rad
7711 Center Ave.
Huntington Beach, Calif. 92647
(714) 891-1964

Microcom, Inc. has announced enhancements to its Microcom LAN Bridge (MLB) series of products.

The MLB/6000 for private-line connections and the MLB/5000 for dial-up links both feature data compression at a four-to-one ratio at up to T1 speeds. Both products also feature a local/remote bridge that obviates the need for separate units to be installed at sites that require both types of bridges.

The MLB/6500 bridge for X.25 links features a two-to-one data compression ratio.

Pricing ranges from $4,999 to $13,199 for the MLB/6000, from $4,599 to $7,599 for the MLB/5000 and from $5,699 to $8,499 for the MLB/6500. All pricing is based on type of configuration and hardware requirements.

Microcom
500 River Ridge Drive
Norwood, Mass. 02062
(617) 551-1000

For once, an announcement that will have businesspeople jumping into windows.

Until now, a lot of businesses have been hesitant to take the plunge into Windows. People have wondered, for instance, whether critical applications and viable communications would become available.

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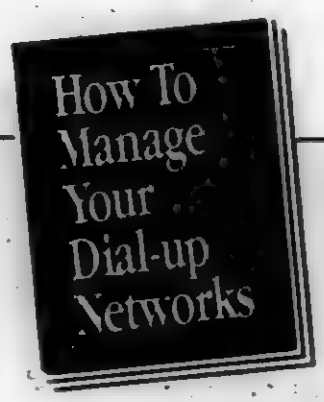

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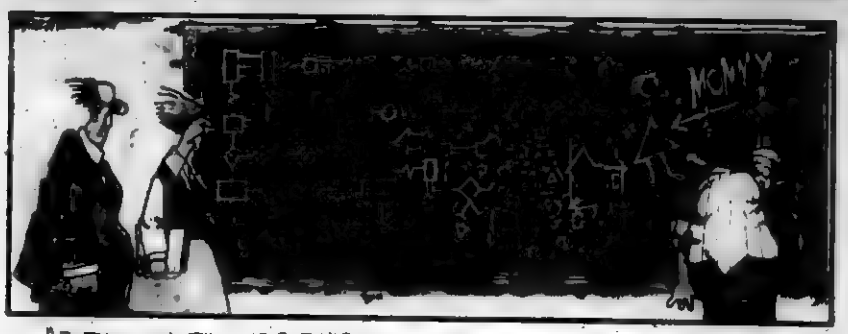

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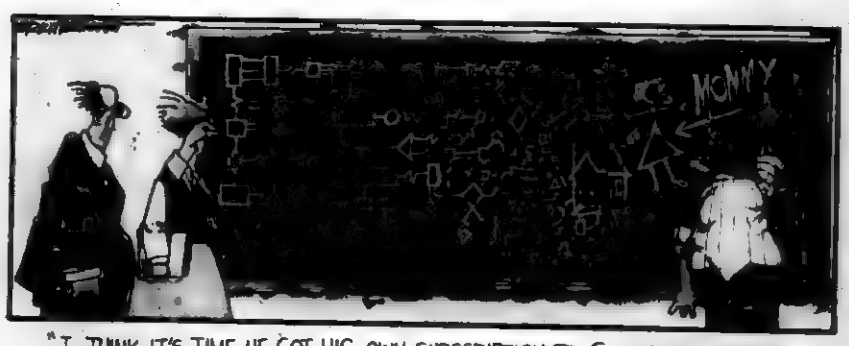

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MANAGER'S JOURNAL

EXECUTIVE TRACK

Sheleme M. Sendaba has been appointed vice-president of finance and information systems at **Nissan Motor Corp. U.S.A.**, based in Carson, Calif.

Sendaba, 40, was previously comptroller at General Motors Corp.'s Truck & Bus Group in Janesville, Wis. Before that, he was comptroller of Buick-Oldsmobile-Cadillac in Chicago.

Sendaba began his GM career in 1979 in the MBA financial training program at Buick. He held various positions in finance, IS and other functions, including the post of director of general accounting and special studies at the Buick Motor Division in Flint, Mich.

He holds a bachelor's degree from the University of Illinois and an MBA from the Walter Heller Graduate School of Business in Chicago.

.....

Thomas A. Maguire was promoted to executive vice-president and elected to the board of directors of **Smith Barney, Harris Upham & Co.** in New York.

Maguire, Smith Barney's manager of information services, had been a managing director of the firm. He joined the investment banking firm in 1989 from municipal bond trading firm J. J. Kenny, where he was executive vice-president and chief information officer.

Maguire holds a bachelor's degree from the University of Rhode Island and an MBA from the University of Massachusetts-Amherst.

.....

Who's on the go?

Changing jobs? Promoting an assistant? Your peers want to know who is coming and going, and *Computerworld* wants to help by mentioning any IS job changes in Executive Track. When you have news about staff changes, be sure to drop a note and photo or have your public relations department write to Clinton Wilder, Senior Editor, Management, *Computerworld*, Box 9171, 375 Cochituate Road, Framingham, Mass. 01701-9171.

Plumbing the soul of IS

'Computers and society' proponents question social consequences of new technology

BY MITCH BETTS
CW STAFF

R. M. Kato

Visionaries say every information system has the potential to change the world, at least a tiny bit.

The question that computer professionals should be asking on the front end of an IS design project is whether it will change the world for better or for worse, according to leading scholars in the field known as "computers and society."

In addition to designing the system to meet business objectives, the scholars are urging IS professionals to consider broader questions, such as: Does the database permit invasions of privacy? Will the automated business system enhance people's jobs, or will it degrade and monitor those workers? Does the technology promote or hinder the social goals of world peace, environmental protection and the like?

Ben Shneiderman, keynote speaker at the first annual conference on Computers and the Quality of Life held in Washington, D.C., last month, urged IS professionals to take responsibility for the social consequences of the systems they create. Guide the technology "to produce the maximum benefits with the minimum harm," he said.

Shneiderman, professor of computer science at the University of Maryland, suggested that computer professionals prepare a social impact statement — modeled on the government's environmental impact statements — at the start of every IS project. "We have a history where the technologists have often been less thoughtful than they should have been about these [social] issues. So I want to encourage technologists to be more thoughtful," he said in an interview.

It is up to the corporation's chief information officer to establish a computer ethics code and ethics training for IS personnel, added Susan J. Harrington, assistant professor of computer technology at Kent State University. "An ethical culture . . . has to start at the top," she said.

This call for action comes at a time when 45% of the American public agrees with the chilling statement that "technology has almost gotten out of control," according to a 1990 poll by Louis Harris and Associates, Inc. A demographic breakdown of the poll showed that people with low incomes and little education — people who tend to feel that business, government and technology are working against them, not for them — are most likely to worry about uncontrolled technology, according to Alan J. Westin, professor of public law and government at Columbia University.

C. Dianne Martin, assistant professor of computer science at George Washington University in Washington, D.C., said she blames public distrust of computers on the "mixed messages" delivered by the news media. The public, which swallowed the "thinking machines" hype of the 1950s, now reads about or experiences computer billing errors, computer viruses, privacy invasions and software failures, such as the AT&T network glitch last January,

Continued on page 110

Retail pushes the just-in-time envelope

BY MICHAEL FITZGERALD
CW STAFF

Hundreds of information systems executives looking for the latest developments in just-in-time retailing techniques attended the 32nd annual Retail Information Systems Conference (Riscon) in St. Louis earlier this month.

In general, retail stores are moving to on-line, real-time, highly networked environments, said Steve Johnson, managing partner of the central region retail industry practice at Andersen Consulting.

In tune with this theme was an announcement by K Mart Corp. that it had moved part of its 2,211-store telecommunications network off of its IBM mainframe host to a Stratus Computer, Inc. XA 2200 class fault-tolerant machine.

K Mart said the Stratus CPU has cut inventory replenishment time for its stores from two days to one and has saved money on credit card authorization expenses.

Another major theme of Riscon was how to get top-management support for IS projects. "The CEO must take a role in a project, or it will fail," John A. Hacala, president and chief executive officer of Spencer Gifts, Inc., stated in his keynote address.

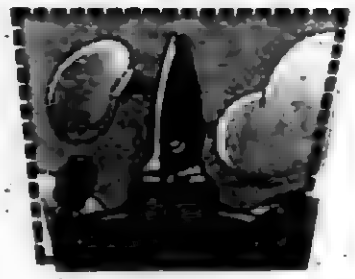
Hacala sits on a mandatory-attendance, weekly committee devoted to planning the Spencer Integrated Retail Information System, a major project designed to completely change the ways in which the company operates.

The question of how to gain support for IS projects from top management surfaced again after an address by Jeff Sobeck, director of store systems MIS at the Vons Companies, Inc., a Los Angeles-based supermarket chain.

Sobeck, in response to a question on how the IS department was able to get its projects off the ground, credited the company's forward-thinking management.

"Management is progressive," Sobeck said. "We don't pilot systems — we consider them the first installation of a chainwide rollout."

CLIPS



Tim Lewis

Summaries from leading scientific and management journals

"Information system cost estimating: A management perspective"

By Albert Lederer et al

MIS Quarterly
June 1990

■ Why do information systems projects often wind up behind schedule and over budget? Part of the reason is that the original estimate fails to recognize the technical complexity of the task.

Project estimates also go awry because of company politics and the personal motivations of individuals. Some of the players in the systems development process want to understate the costs of the project to make sure it gets approved, while others want to inflate the estimate so they can later boast that the project was finished on time and under budget.

In addition to this political tug-of-war, the IS department tends to stick with its original estimate — even when it should be raised to reflect the user requirements added midstream — to avoid embarrassment and hassles.

Because overruns can destroy IS management's reputation, IS uses three tactics to meet the old estimate:

- Defer deliverables. That is, finish part of the system within the time and money limits, but delay the rest.
- Make programmers work overtime to meet the deadline.
- Use "creative accounting" to hide some of the project's labor costs.

IS managers should recognize the pervasiveness of political motivations and foster a spirit of cooperation and candor among users, estimators and implementors. — Mitch Betts

"Managing technology as a business strategy"

By Tamara Erickson, John Magee, Philip Roussel and Kamal Saad

Sloan Management Review
Spring 1990

■ The strategic management of technology consists of an ongoing review process. For success, a research and development program must constantly be revised in light of the firm's business objectives and technological advances.

A firm must determine the mix of markets and products that will yield the optimal cash flow. Then it must consider how well its current portfolio of technologies supports that ideal mix. The highest priority in research and development should be given to key technologies — those mature technologies providing today's competitive advantage. However, the pressure of achieving short-term profit must not cause the exclusion of "pacing technologies" — concepts and processes that must be further developed to offer long-term vitality.

It is critical that R&D communicates directly with manufacturing and marketing, as well as with potential customers. Such links allow clear evaluation of the potential value of pacing technologies and smooth implementation of new products and procedures. — Derek Slater

"Justifying image management systems"

By Barry Cinnamon

IMC Journal
September/October 1990

■ There are specific steps needed for a preliminary financial analysis of an electronic image management system: Establish a baseline for comparison, evaluate the image system's costs, analyze its benefits and perform a financial analysis.

In establishing a baseline for comparison between your current system and the imaging system, you need to look at the number of processed documents, size and type of documents, time distribution of document processing, document retention, storage space costs, storage materials costs, document handling and processing time, photocopying costs, overhead costs and personnel costs for each. You also need to determine the image system's hardware, customized software, installation, training, consulting services and system start-up costs.

Such a comparison enables image management benefits to be translated into financial terms. For instance, fewer customer callbacks and improved document processing mean direct personnel savings. A reduced need for paper document filing means reduced costs for office space and filing materials.

At this point, you need to choose a financial technique to complete the analysis. You may want to determine either the present net value, the payback or the internal rate of return of the image system. Regardless of technique, the result will be a hard number. — Lory Zottola

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Fallout from the New York blackout

Some IS staff fired, data centers moved in wake of Aug. 13 power outage

BY JOHANNA AMBROSIO
CW STAFF

NEW YORK — The blackout that ate lower Manhattan may be over, but its effects are still being felt two months later. Although most companies have not made major changes to their disaster planning and recovery strategies, a handful have gone so far as to fire information systems staffers or move their data centers out of New York.

The power outage began Aug. 13 and lasted almost a week in some parts of lower Manhattan. It left at least 200 data centers in the dark and caused some 24 companies to declare disasters and move to hot sites [CW, Aug. 20]. This made it the largest regional computer-related disaster ever.

This, in turn, has caused plenty of fallout. Tari Schreider, president of Contingency Planning Research, Inc., a Jericho, N.Y.-based consulting firm, said he has received resumes from five IS professionals who were fired because their companies were heavily hit by the blackout.

These are people whose top management is "using them as the scapegoats," Schreider said. "They're saying, 'It's your fault, even though you told us it could happen and we never gave you the money to do anything about it.'" Schreider would not disclose the names of the companies involved.

Some are looking for new jobs because their companies are moving data centers out of New York, partly due to the power outage, Schreider said. "These companies were thinking about moving anyway. But the blackout was the straw that broke the camel's back," he said.

Citicorp N.A.'s Citibank unit had to move so much equipment to a New Jersey site during the blackout that IS management decided to move their operations there rather than bring the gear back to Manhattan. Citibank still has data centers in New York, but one will now be in New Jersey, one source said.

Also, the source said, Citibank had to give its home-banking customers credit for service lost because of the blackout — at a cost to the bank of at least $300,000. Citibank officials did not return phone calls seeking confirmation of that fact.

Another blackout result: The number of companies that have signed with hot-site vendors has increased markedly. John Nevola, manager of IBM's Business Recovery Services Center in Franklin Lakes, N.J., said that the number of customers that signed contracts with IBM in the months after the disaster increased 15% to 30% compared with the months before the blackout.

Other companies moved up their plans to implement contingency facilities. Participants Trust Co. in New York was going to deploy remote database journaling next year. But because of the blackout, the company is completing that by December. "Our board of directors asked us to do it, and we are," said Pat Buonincontri, senior vice-president.

Still, many believe that the majority of companies will not address the fundamental problems that caused others to be caught short. Most of the difficulties during the blackout were from generators that failed or ran out of fuel — problems that could have been prevented, some said.

"It's not enough to go out and buy equipment," said Kenneth G. Brill, president of Computer-site Engineering, a consulting firm in Danvers, Mass. "You have to install it correctly, maintain it and test it." Vigorous testing is required under peak loads, for sustained periods of time and for all facets of the computer operation, he said.

"Most people won't do anything," said Alan Freedman, vice-president of technology strategic planning at Bankers Trust Co. in New York. "Most are saying 'I'm glad it's [them] and not me.'"

Bankers Trust, although located in the power grid that lost electricity, "didn't miss a beat," thanks to a $10 million disaster contingency plan put in place two years ago, according to Freedman.

The plan includes two "pull the plug" tests each year, where the building is blacked out completely to see if everything will continue to function.

"Getting everyone to do that was like pulling teeth," Freedman said. "But now they're thanking me."

Martin

FROM PAGE 105

she said.

From robot-run assembly lines to automated bank tellers, computers make the modern world possible, and yet they get a lot of bad press, Bryan Kocher, past president of the Association for Computing Machinery (ACM), lamented in a column earlier this year. For example, the Jan. 29 issue of *Newsweek* had a three-page article on computer failures and noted that plumbers have stricter licensing procedures than programmers do.

Software disasters are also getting some attention in the U.S. Congress. A 1989 congressional study, "Bugs in the Program," warned of possible government regulation — such as mandatory certification of programmers — if the software community does not police itself to ensure software reliability [CW, Oct. 23, 1989].

"The government and politicians are realizing that computing is too important for society to ignore," Kocher wrote. "If we do not manage computing's relationship to government and society, Congress will manage it for us."

In an attempt to develop a consensus on issues such as how to prevent computer disasters like the AT&T network glitch last January [CW, Jan. 22], the ACM has scheduled a special "summit meeting" on Nov. 6-7 in Arlington, Va. The conference on "Responsible Leadership in Computing" will address the problems associated with ultra-complex software systems and computer models.

Many sociologists, such as Judith A. Perrolle at Northeastern University in Boston, argued that technologists cannot be trusted to make sure that computers benefit society, because they are so enamored of the technology. Computer scientists are beginning to disagree, responding that the profession has matured beyond the stereotype of hackers oblivious to the society around them.

"There is an elite group of computer scientists who deal with the big issues, but the guy in the trenches is worried about his job and . . . doesn't have time to deal with the big issues," said Kenneth Fidel, associate professor of sociology at DePaul University in Chicago.

Holding to the center

Aware of the conflict between the anti- and pro-technology camps, Ronald E. Anderson, a sociologist at the University of Minnesota and chairman of ACM's Special Interest Group on Computers and Society, said he is trying to forge a middle-of-the-road position.

"Ten or 15 years ago, people felt powerless with the computerization movement coming down on top of them. Now people feel there are some choices, and they're wondering what they can do to make sure machines don't trample us down," he said.

Anderson, who co-chaired the conference with Martin, said he is becoming somewhat more optimistic about technology as the ACM leadership begins to give social and political issues a high priority. "That reflects a growing concern within the computer science community about better design and more concern about the overall impact," he said.

A decade ago, the "computers and society" field was mostly a forum for computer bashing. Today, scholars continue to raise serious concerns, but the field also acknowledges some social benefits from technology. At the conference, for example, there were sessions about technology assisting people with disabilities and the use of information technology to improve the delivery of social services.

But the greatest challenge of all may be addressing the "equity issue." As Martin described it: "How can computers improve the quality of life for the disenfranchised groups in society, such as the homeless?"

A prime example of how computer experts can become active in social issues occurred last year when members of Computer Professionals for Social Responsibility (CPSR), a group based in Palo Alto, Calif., reviewed a Federal Bureau of Investigation proposal to add a suspect-tracking feature to its national crime database. CPSR was concerned about potential civil liberties violations.

More often, however, privacy and other social issues are raised only as an afterthought. For example, a now-defunct federal program to create a giant database of pharmacy records was nearly implemented before any privacy questions were raised, said Robert Veeder, acting chief of information policy at the White House Office of Management and Budget.

New priorities

In a break from its previous seven-year history, Computer Professionals for Social Responsibility (CPSR) used its recent annual meeting to focus on issues of freedom of speech, public access to government information and women in computing instead of issues of war and peace.

The organization is also attempting a comprehensive project to "reorient scientific and technology policy away from the narrow concerns of economic competition to more pressing problems like the environment, health and education," said Gary Chapman, the organization's president.

Freedom of speech is not being granted to those who use computer bulletin boards, according to speaker John Perry Barlow, co-founder of the Electronic Frontier Foundation with former Lotus Development Corp. Chairman Mitch Kapor. Barlow told of several instances in which the Federal Bureau of Investigation has seized computer equipment — down to a telephone answering machine — from users who are not criminals but are merely navigating through public networks.

"That's just the tip of the iceberg of government incomprehensibility of computer crime," Barlow said. He also defended the Southwestern Bell 911 hackers. "Publishing that on a bulletin board is no different than what *The Washington Post* and *The New York Times* did with the Pentagon Papers. There is a failure on government's part to understand the difference between free speech and theft of data."

CPSR is also facing a "crisis in funding," according to Clifford Johnson, manager of administrative computers and the president of the Palo Alto, Calif., chapter. "One has to think in terms of layoffs" for the four-person staff, he said.

This crisis is despite a recent infusion of $250,000 from Kapor to help the 2,000-member organization address First Amendment issues, according to Johnson.

While educating law enforcement to the high-tech intricacies of freedom of speech, the issue that "needs the most work" remains women in computing, according to Chapman. "I'm struck by the hostility of men for even discussing the subject," he said.

A panel of women presented a preliminary report that shows a decline in the number of women in computer sciences. "All of us in the university have seen a decline in enrollment in computer science, both men and women, but it's much greater for women," said Sheila Humphreys, a professor at the University of California at Berkeley.

Additionally, the corporate culture of short-term profits exacerbates the situation, said Sheri Lawrence Pfleeger, chair of the Status of Women and Minorities for the Association of Computing Machinery.

J.A. SAVAGE

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Baxter considering life after layoffs

BY ELLIS BOOKER
CW STAFF

OAK BROOK, Ill. — Baxter International, Inc. has long been regarded as a technology innovator. At a recent company meeting, however, about 100 managers spent about as much time absorbing a radically changed IS organizational chart as they did reviewing electronic mail and computer-aided software engineering (CASE) projects.

In April, Baxter announced a $566 million restructuring, including a substantial realignment of its information resources group, moving the once-centralized function out to various divisions. Baxter has said it is on target for eliminating half of the 3,200 salaried positions it hopes to eventually cut by the end of the year.

The restructuring was especially hard on Baxter's information systems organization, which will reduce its staff by about 20%. Earlier this month, Baxter explained the new structure to approximately 100 managers from around the world in a three-day, off-site company gathering here.

In addition to fewer bodies, members of the large and centrally managed information resources group had to adapt to new assignments and reporting structures. Except for a core of about 90 people supporting corporate IS, the remaining staff was divvied up among the divisions and a newly formed service and maintenance operation.

A second major modification in the new command structure was that IS now reports to finance. Ervin Uskup, former vice-president of business technology at principal U.S. subsidiary Baxter Healthcare Corp. and now vice-president of corporate IS, reports to Chief Financial Officer Bob Lambrix.

Under the old information resources organization, IS Chief Michael Heschel reported directly to Baxter Chairman and Chief Executive Officer Vernon R. Loucks Jr. Heschel left Baxter earlier this year to head Security Pacific Automation Corp.

Smooth sailing

To keep the new structure working smoothly, a new high-level policy group has been created at Baxter: the Information Systems Management Council (ISMC). The ISMC, with its associated technical subcommittees and the new Systems Architecture Review Board, will chart Baxter's long-term IS strategy. It is responsible for Baxter's mainframe and midrange systems strategy as well as for telecommunications, CASE and artificial intelligence.

"The budget for corporate IR in 1990 was 850 [positions]," Lambrix explained. Of that, he said, 35 positions were contract programmers and 120 were budgeted as full-time new hires.

On the Baxter IS staff in 1990, only 15 contract programmers were hired, and 135 jobs were cut, Lambrix said.

That left 610 employees for the IS function. Of those, 255 went to Kretz's computer operations and services unit, another 85 went to Uskup in corporate IS, and the rest were distributed among the divisions.

Staff survivors

One corporate IS staff member, who asked for anonymity, said that morale was better than before the restructuring but that turnover is still high, as staff members continue to answer calls from the headhunters they contacted in April.

"It's the second wave," he said. "We think we're past it, but I couldn't tell you for sure."

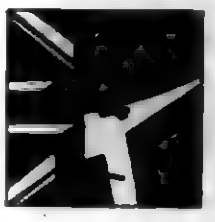
To this, Lambrix responded that the first quarter after the restructuring saw a 17% turnover rate, which has since modulated down to 14%. This, he added, is still higher than Baxter's historical 12% turnover rate but not dramatically so.

"As a company, we threw the cards up in the air, and nobody knew what would happen," Lambrix said. "[But] reliability and uptime of our computer systems this year has been better than in the past two or three years."

UK aerospace employees charged with PC fraud

BY RALPH BANCROFT
IDG NEWS SERVICE

BRISTOL, England — Police here charged two men and arrested six others earlier this month in connection with an alleged computer fraud attempt at British Aerospace PLC. The two men have been charged with conspiring to defraud the company of $80 million, contrary to common law.



The people arrested reportedly worked in computer systems at British Aerospace, and the fraud involved the firm's personal computer-based treasury system, which has links to the manufacturing facility. The treasury system is linked via a bank to Swift, the worldwide electronic money transfer system.

The company declined to discuss the details of the allegations. "The police warned us we were the target of an attempted fraud, and we have been cooperating with them," a company spokesman said.

Detective superintendent Roger Clarke, second in command of the Bristol crime squad and in charge of the investigation, said the alleged fraud attempt involved a computer-based transaction. Inquiries are now being made into a number of bank accounts in Australia, Hong Kong, Switzerland and the UK.

British Aerospace uses an in-house treasury operation to move surplus funds on a daily basis to ensure that they get the best rates of interest. The operation is also used for foreign currency transactions to hedge against adverse movements in exchange rates — a major issue for a member of the pan-European Airbus Industrie, which prices its airplanes in U.S. dollars.

The transactions can involve substantial sums of money. For a firm the size of British Aerospace, they would involve hundreds of thousands, if not millions, of British pounds per day.

Access to the treasury system is controlled by password. From there, a two-password mechanism controls access to a bank's computer system, which would provide the gateway to Swift's worldwide network. Once linked into Swift, treasury system staff members — or 'fraudsters' — could move money to bank accounts anywhere in the world.

Ironically, at the time of the fraud, British Aerospace was in discussions with a security company about the introduction of a system that would prevent password abuse by double checking the identities of computer users.

The arrests came after police mounted an undercover investigation lasting several weeks. Ten arrests by Bristol police included staff members working at British Aerospace; in addition to the two men charged, two women have since been released, while six people have been released on bail pending further inquiries.

Bancroft is an IDG News Service European correspondent based in London.

Du Pont promotes IS exec

BY CLINTON WILDER
CW STAFF

WILMINGTON, Del. — Raymond E. Cairns Jr., one of the most widely respected information systems executives in the field, got a vote of respect and confidence from his company earlier this month.

Du Pont Co. promoted Cairns, 57, to senior vice-president of IS in recognition of his performance since becoming vice-president of the function in 1985. The new title will not change his responsibilities in presiding over the chemical and oil giant's worldwide systems.

Under Cairns, Du Pont's IS group has earned a reputation for innovative management, education of and partnership with executives and effective use of supercomputing, electronic mail and expert systems.

Cairns joined Du Pont as a research metallurgist. He later became a manager in the corporate plans department and assistant director of IS in 1979. He became director in 1982 and vice-president in 1985.

Three IS directors were promoted to the level of vice-president, including the first woman to reach that level in the IS group. Cinda Hallman, director of the Core Applications Systems Division, was given responsibility for office and decision support systems as well as data management.

Also promoted were directors J. David Mengden, director of computing and networking services, and William H. Hale Jr., director of computer and telecommunications services at energy subsidiary Conoco.

CALENDAR

NOV. 11 - 17

Share 73.5. Fort Worth, Texas, Nov. 11-14 — Contact: Share, Chicago, Ill. (312) 644-0610.

Computer-Comm '90. Toronto, Nov. 12-14 — Contact: U.S. Department of Commerce, Office of Canada, Washington, D.C. (202) 377-3716.

Autofact '90. Detroit, Nov. 12-15 — Contact: SME, Dearborn, Mich. (313) 271-0777.

Comdex/Fall '90. Las Vegas, Nov. 12-16 — Contact: The Interface Group, Needham, Mass. (617) 449-6600.

Supercomputing '90. New York, Nov. 12-16 — Contact: Melvin Kalos, Cornell Theory Center, Cornell University, Ithaca, N.Y. (607) 255-7157.

Hawaii's Governor's Symposium on High Technology: Making Strategic and Technical Alliances for East-West Software Development and Trade. Lihue, Kauai, Hawaii, Nov. 13-15 — Contact: High Technology Development Corp., Mililani, Hawaii (808) 625-5293.

Wincon/90. Anaheim, Calif., Nov. 13-15 — Contact: Wincon/90, Los Angeles, Calif. (213) 215-3976.

National Conference and Exposition on Electronic Image Management in Government. Washington, D.C., Nov. 13-16 — Contact: Conference Manager, USPDI, Silver Springs, Md. (301) 445-4400.

Build Boston '90 Technology Conference. Boston, Nov. 14-16 — Contact: Build Boston '90, Newton, Mass. (617) 965-0055.

Strategic Planning for Information and Systems. Houston, Nov. 14-16 — Contact: Barnett Data Systems, Rockville, Md. (301) 762-1388.

Competing Through Total Customer Service in the Telecommunications Industry. Los Angeles, Nov. 15-17 — Contact: Matthew Berndt, Center for Telecommunications Management, Los Angeles, Calif. (213) 743-0304.

NOV. 25 - DEC. 1

Conference on Software Maintenance. San Diego, Nov. 26-29 — Contact: Michelle Carbone, IEEE Computer Society, Washington, D.C. (202) 371-1013.

Video Expo. Orlando, Fla., Nov. 26-30 — Contact: Debbie Rotolo, Knowledge Industry Publications, White Plains, N.Y. (914) 328-9157.

Technology Management Forum, Client Serving Computing: The Impact. Cambridge, Mass., Nov. 27-28 — Contact: Forrester Research, Inc., Cambridge, Mass. (617) 497-7090.

Comm '90: Challenges and Opportunities of Information Technology in the 90s. Miami Beach, Fla., Nov. 27-30 — Contact: Comm, Boulder, Colo. (303) 449-4430.

OSI 111: The Interoperability Advantage. Arlington, Va., Nov. 27-30 — Contact: Phillips Publishing, Potomac, Md. (301) 340-2100.

Omni User Annual Technical Conference. Itasca, Ill., Nov. 28 — Contact: The Omni User Association, Chicago, Ill. (312) 470-8787.

Microsoft Multimedia Developers Conference. San Jose, Calif., Nov. 28-29 — Contact: Microsoft Corp., Redmond, Wash. (800) 628-1701.

Global Advanced Manufacturing Solutions. Paris, Nov. 28-30 — Contact: Sharon Sutton, National Computer Graphics Association, Fairfax, Va. (703) 698-9600, ext. 336.

Software Improvement Conference. Washington, D.C., Nov. 29-30 — Contact: EFDPMA Conferences, Torrance, Calif. (213) 534-3822.

X Window System Forum. Washington, D.C., Nov. 29-30 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

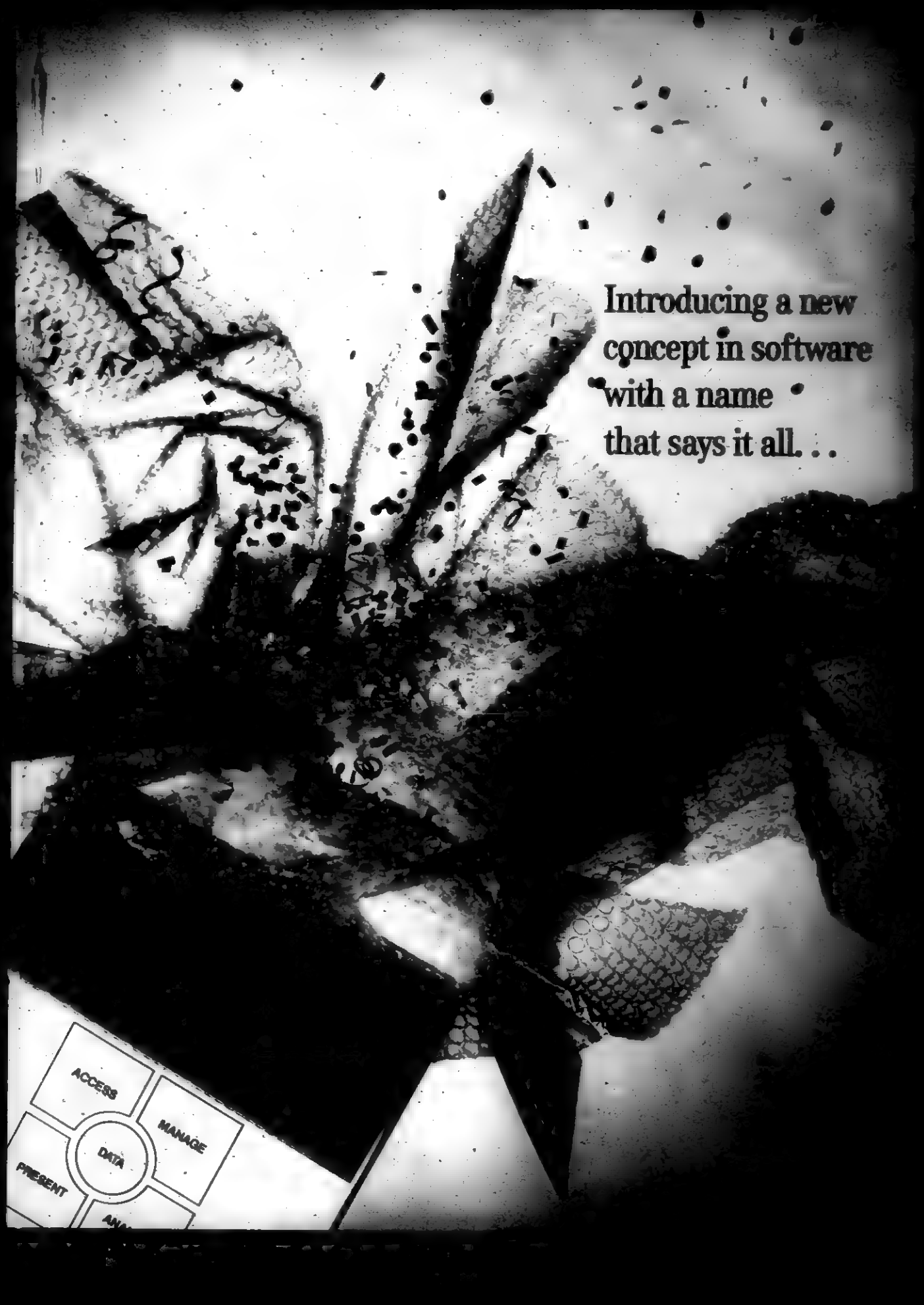
DEC. 2 - DEC. 8

Executive Information Systems '90. Washington, D.C., Dec. 2-4 — Contact: Peggy Kilburn, The EIS Institute, Newton, Mass. (617) 965-8366.

The Dooley Group Executive Conference. Tempe, Ariz., Dec. 2-5 — Contact: The Dooley Group, Hopkins, Minn. (612) 935-8022.

Globecom '90. San Diego, Dec. 2-5 — Contact: Nomi Feldman, San Diego, Calif. (619) 453-6222.

Automatic Object Recognition Systems. Los Angeles, Dec. 3-7 — Contact: UCLA Extension, Los Angeles, Calif. (213) 825-1901.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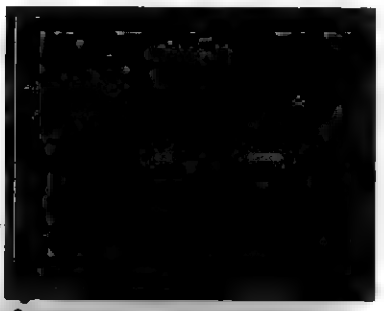

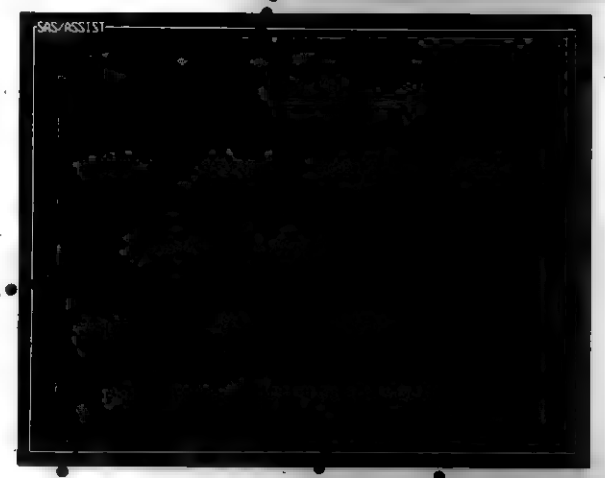

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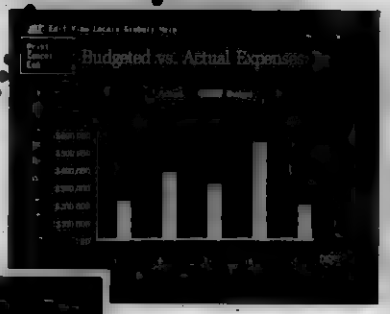

The menus, powered by keywords, make it even easier to run the SAS System's most widely used applications. Without having to know a word of syntax, users can access a data base... read in data... perform analyses ranging from simple statistics to specialized applications such as forecasting, project management, and quality improvement... and generate a variety of reports and graphs.

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There's a command-driven interface especially for systems analysts, applications developers, MIS personnel, and the Information Center staff.

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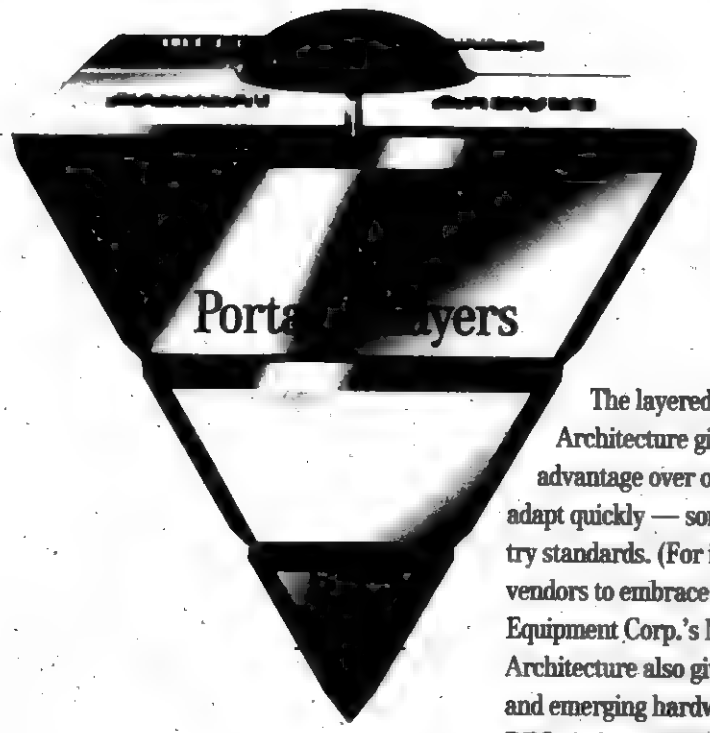

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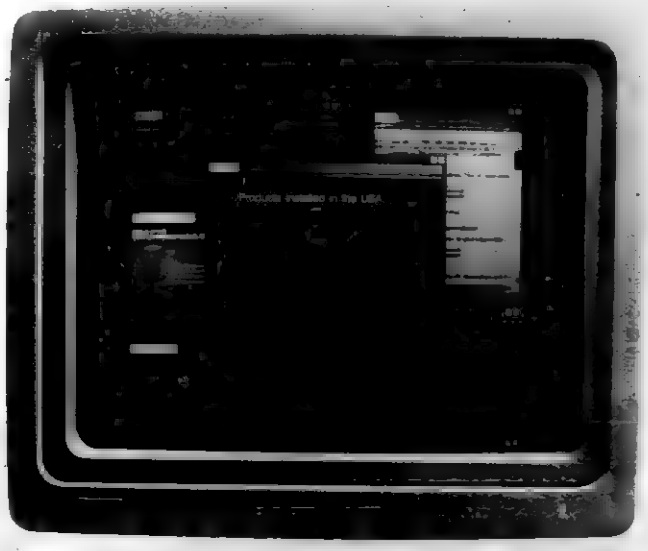

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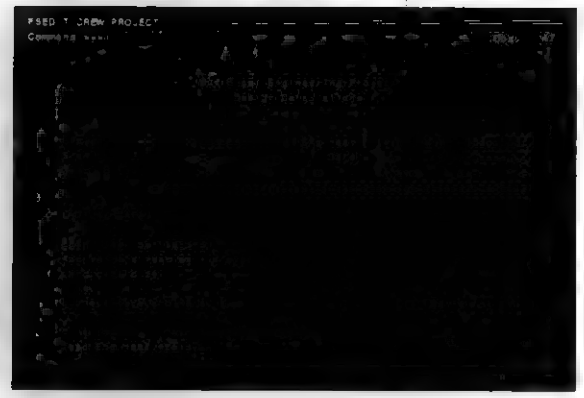

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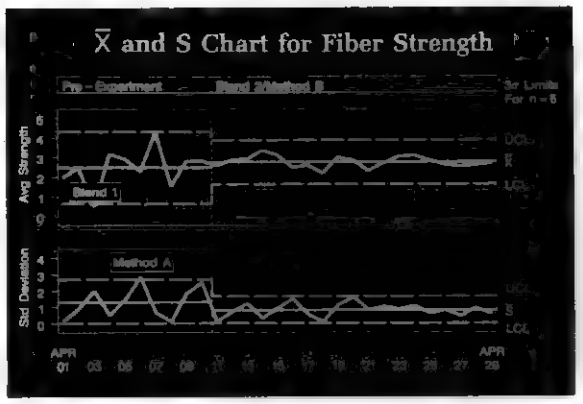
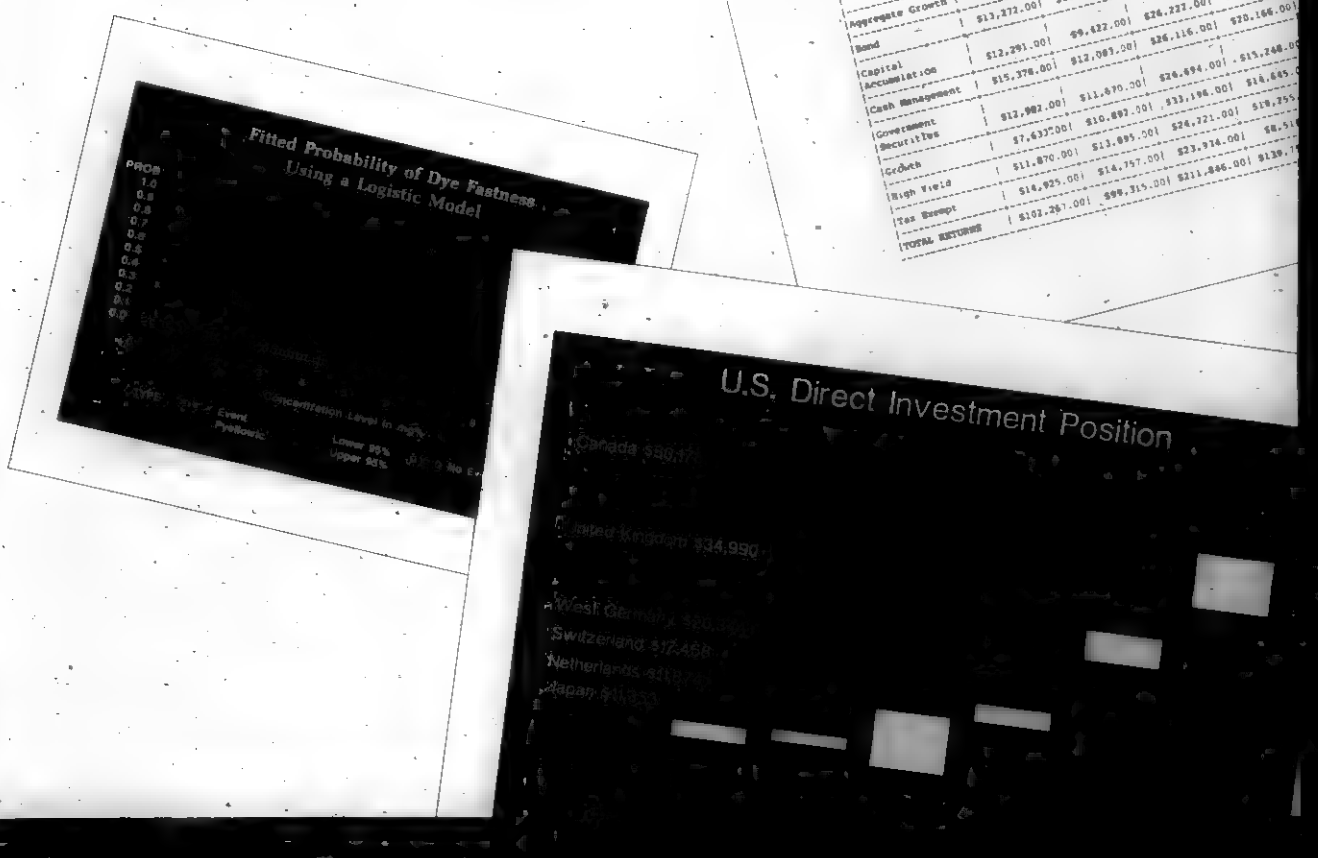


You can rely on one software to handle all your analytical needs.



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Finding the leeway to price effectively

BY ALICE LAPLANTE

Competitive pricing seems like a fairly straightforward concept: You either charge less for your product or service than your competitors do for theirs or give customers a darned good reason to pay more.

Start looking at what is really entailed in either alternative, however, and it quickly becomes clear that what you can do with prices depends on a myriad of other operational factors, such as the supply, purchase price and level of efficiency in use of raw materials; manufacturing quality controls; inventory and distribution practices; and so on. Providing a clear and continuous view of all the related operational factors within the business is one of the most important ways that information systems can help a company gain marketplace advantage. Another is through system-enabled process improvements, which either give a company some margin for price movement or a value advantage on which higher prices can be hung.

Information systems can, of course, also be used to analyze various pricing scenarios and administer pricing policies (see stories pages 116 and 120), but that's not where they have their greatest impact. Success does not depend as much on using technology to set prices, says Robert Pratesi, a partner at Index Group, Inc., in Cambridge, Mass. The real make-or-break contribution of IS to pricing decisions lies in the ability it bestows to change and improve the workings of the business.

In price-competitive industries, many companies do not have the luxury of increasing prices to expand revenues or boost profits. Instead, they must focus on cutting costs through elimination of manufacturing waste and inefficiency. Bama Pie, Inc., of Tulsa, Okla., falls into this category.

LaPlante is a free-lance writer based in Palo Alto, Calif.

Stan Wakowski

Bama Pie's Charles Green and Bill Chew *get the mix right with a little help from information systems*

Bama manufactures pies and biscuits sold by McDonald's Corp. fast-food franchises throughout the world, as well as other retail foods that are distributed through grocery stores nationwide. The company competes with such multinational giants as Pillsbury Co. and Nabisco Brands, Inc. in a market in which new products debut weekly, shelf space represents a vicious battleground, and profit margins are regularly shaved in recurring price wars.

In mid-1989, Bama management decided that the company must be able to respond more quickly to changes in raw goods — specifically, the daily fluctuations in the price of staples such as flour and sugar — as well as more accurately monitor inventory and sales of finished products.

"We realized that our reaction time to changes in the cost of raw goods was critical but that we were not able to take control, due to lack of information," says Charles Green, Bama's MIS manager.

When Green began searching for commercial software that would help the company track raw material costs, he could not find anything that would run on the company's NCR Corp. 9000 mainframe computer. So in December of 1989, Bama purchased an IBM Application System/400 and Marcam Corp.'s Prism manufacturing planning, control and costing system, designed for process manufacturers using IBM midrange computers.

Almost immediately, the firm found ways to reduce costs. "We thought we were adding 110 pounds of flour [to one recipe], and we were really using 115 pounds," Green says. Nor was this an isolated instance of mismeasurement. Twice the necessary amount of shortening was regularly being added to the mix for another product.

Green worked closely with Bill Chew, vice-president of finance at Bama, figuring out exactly how to deploy the system and what reports were needed. Since it came on-line at the beginning of the year, Chew says he has been able to get his hands on valuable data that was previously inaccessible — data he needs in order to run a profitable business.

"I can analyze sales by geographic region, by customer type, by customer profile, by time period, by broker and by numerous other factors," Chew says. "I now know what effect seasonality and promotions have on sales."

Even more important to him, however, is the fact that he now has considerably more control over what the company pays for raw ingredients. "The price of flour changes daily," Chew says. "So does the price of shortening. I am always contracting for raw ingredients from different brokers, and now I know exactly how it affects my profitability if the cost of something goes up."

Another benefit of the system acquisition is the precision it brings to the contract-bidding process. "In the past," Green says, "when a customer asked us for a price estimate on a new product, our sales staff would try and get a ballpark figure, but it was a very tedious operation, done by hand and, ultimately, wasn't very accurate."

Furthermore, because price-

Continued on page 114

INSIDE

Playing the market
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setting was usually the last step in a new product proposal and, even then, more a close guess than an absolute, the company had often found itself locked into unprofitable agreements.

Green says Prism has already saved the company substantial money by red-flagging those proposals that are unprofitable. "Now we can see much more quickly if a product is not feasible," he says. "To be honest, some of our current products would not have been attempted had we known the true costs."

Another immediate benefit of the new system was improved inventory accuracy. Bama maintains a number of warehouses across the country, and these warehouses are now able to handle their own inventory management rather than simply filling out forms for inventory tracking at company headquarters.

As a result of this modification, inventory variance — in other words, the difference between the inventory on paper and the actual count of products on warehouse shelves — has been greatly reduced. One warehouse has even come in with a zero inventory variance for the past five months.

"That is truly an amazing feat and one that has an immediate, quantitative effect on the company books," Green says.

If cost savings and pricing latitude are important in the pie and pastry business, they are even more crucial in industries in which consumer taste takes a definite backseat to terms.

Escaping commodity class

In the highly competitive vehicle-leasing business, participants are resigned to operating in a commodity market, one in which price is the only thing that differentiates one vendor from its competition.

"Leasing four tires from one company is viewed the same as leasing from another," says Larry Runge, director of advanced applied technologies at GE Capital Fleet Services in Stamford, Conn. Although value-added service can sometimes make a difference, he says, that is not what lessors look at during price wars, which are almost constant in this business. So the only way to survive is to reduce costs so that profitability goes up even if prices remain constant or go down.

"If it costs your competition $100 per transaction to serve a customer and you can reduce your costs to $90 per transaction, that gives you an edge," says Runge, who was brought into GE Capital Fleet from GE Aerospace for the specific purpose of designing a new information system. His instructions, Runge says, were to build a system that would both help the company identify and trim excess costs from operations and assist in identification of value-added services that customers would pay to get.

As with all mission-critical applications, speed of system development and installation was a critical factor. In February 1989, Runge put together a development team. By September 1989, requirements for the $20 million system were complete. Coding began around Thanksgiving, and the first functional modules were delivered in March 1990.

What Runge tried to accomplish is best illustrated by the automation of the GE Capital Fleet control room, where 65 mechanics are on call 24 hours per day to help customers on the road who experience problems with their vehicles.

Before the new system was installed, a typical customer call entailed making three separate data requests to the mainframe. Runge designed a system that involved only one mainframe transaction in which all necessary data was downloaded from the mainframe to the personal computer in one client/server request.

One portion of the system enabled the mechanics to look up on-line the name of any service station in the country by ZIP code, phone number or city. Data was also made available on the quality of the service provided by each vendor. This system replaced a cumbersome combination of limited on-line data supplemented with three-ring binder notebooks.

The mechanics now had much more detailed information at their fingertips. In addition, an entire costly step — converting paper data into electronic information — was completely eliminated.

Controlling repairs

But the really big savings for GE Capital Fleet, according to Runge, come from the fact that the company now has a way of verifying, authorizing — and thus, controlling — expensive repair costs that can take place on an emergency basis anywhere in the country.

As always, when a GE Capital Fleet vehicle breaks down, the customer takes it to a local garage or service center, which then contacts the GE Capital Fleet mechanic hot line with repair estimates. But what happens at that point is now completely changed.

The mechanics, in addition to having extensive data on most repair facilities around the country, have the entire history of that particular vehicle available at the touch of a keystroke. Thus, the age of the vehicle, the mileage, any repair work performed and even statistics on the particular make, model and year of the vehicle in question are provided.

"Now we can tell if a particular repair estimate is reasonable," Runge says. "If a car only has 10,000 miles on it, and a garage in the middle of Wyoming says it needs a new exhaust system, a warning screen pops up."

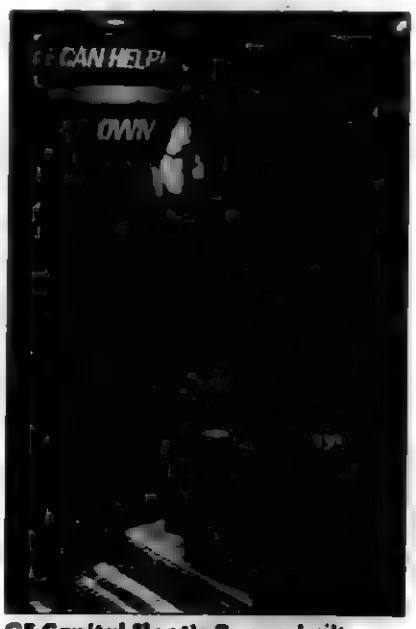
Finding the value added

It has become quite common in industries in which fierce price competition is the norm to talk about putting "value-added service" into otherwise commodity-level products in order to maintain profit margins — but it is another matter altogether to successfully accomplish this. Still, consultants and pricing managers agree that it is achievable and that IS can help.

"When your customer perceives that you are providing an outstanding or extraordinary service level, price becomes less of an issue," says John Cunningham, a consultant at KMD Associates in Stamford, Conn. Cunningham says that companies providing adequate service can maintain average pricing within an industry, whereas firms offering extraordinary service levels enjoy a 9% price differential over the industry average. For 80% of businesses, Cunningham says, information systems provide a viable way to accomplish this.

Question everything

Frequently, the hardest thing to determine is where information systems can make an appreciable difference. Many profitability-enhancing process improvements are only obvious after the fact. The best rule, consultants say, is to uncover and question as many assumptions as possible about the way that work is accomplished.



GE Capital Fleet's Runge *built a system to identify trimmable costs*

"There's the sin of incrementalism," Cunningham says. "You really need to clear the decks of all expectations and past practices in order to reap the benefits that an innovative information system can offer."

According to Index Group's Pratesi, the Japanese are much more proficient at taking a fresh approach, and U.S. businesses can learn quite a lot from them.

"If Americans get a 10% to 15% better return on our investment, we think we've done our job," he says. "However, if an organization is willing to rethink the way they work, instead of incremental gains, they can realize improvements of 80% to 100%."

Ford Motor Co. provides one example, Pratesi says. Ford wanted to increase efficiency of its accounts-payable department, which employed more than 500 people. "It thought it could possibly eliminate 10% of the accounts-payable personnel by overhauling the on-line system," he says.

At about the same time, however, Ford bought a share of Mazda and got a peek inside that automaker's accounts-payable department, which consisted of five employees.

When Ford management visited the Mazda plant, Pratesi says, it saw a fundamentally different method of handling accounts-payable: No paper invoices were used. The whole notion of having an invoice was eliminated: "In effect, the on-line capability of the system made paper invoices — and all the attendant work involved in creating, filing and accessing them — obsolete," he says.

Assessing profitability

Most companies fail to do the single most useful thing they could do to improve overall productivity, says Michael Packer, a consultant at The MAC Group, a management consulting firm in Cambridge, Mass. What organizations should be doing, he says, is carefully calculating all the real costs involved in each customer transaction and using that as the basis for pricing decisions.

What many firms do not take into account, Packer says, is the fact that "one customer transaction could be much more profitable than another — even if it involves the sale of the same quantity of the same product." For example, he says, the fact that one client is located 10 miles further away than another can actually make the difference between profit and loss.

"If you think of things in terms of transactions, not just volume of sales, it becomes much clearer," he says: "In one company we studied recently, it turned out that 50% to 70% of its transactions were not profitable."

Covia Corp., the Rosemont, Ill., reservations organization, has become a fervent practitioner of the kind of transaction cost scrutiny that Packer preaches. Originally the computerized reservations arm of United Airlines, Covia now operates as a separate corporation, serving other major airlines as well as hotel chains and other travel-related services worldwide. Covia recently changed its billing system to more closely reflect the true costs of its daily business, according to Tom Colton, manager of pricing.

"We needed to bring our revenue stream in line with the actual transactions we performed in our bookings," Colton says.

The reservations industry is unique in that although it sells its services through travel agents, who book flights and hotel rooms for clients using the computerized reservations system of their choice, it is the airlines and hotel chains that actually pay for the services. At the end of each billing period, each airline and hotel is charged by the reservations services based on the bookings made by travel agents.

Other airline reservations services, including American Airlines' Sabre system, bill airlines and hotels on a "net booking" basis — only for the tickets actually used. Thus, if a traveler first makes, then cancels, a reservation to fly to Japan, there is no charge to the airline for that service, even though the reservations agency has incurred costs during the process.

But Covia decided to change that system, and as of one year ago, began charging airlines on a transaction basis. So if a flight reservation is made, then canceled, the airline gets charged for both transactions. There is now a clear correlation between the communications and processing costs involved in making, changing or canceling a reservation and the amount billed to the airlines.

The new costing realignment has helped Covia maintain profitability and has improved its ability to invest in the development of new computerized services, Colton says.

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Using pricing to change buying patterns

Systems can help companies put the bite on competitors with variable pricing strategies

BY BARBARA FRANCETT

Few people know better than Don Burr, the former chief executive officer of now-defunct air carrier People Express, the value of an information system for reacting to competitive pricing challenges. People Express didn't have one. But American Airlines and United Airlines had their Sabre and Covia systems, respectively, and that, Burr says, is how they were able to respond to People's low rates — and ultimately drive their younger competitor out of business.

"Our pricing was simple: $29 peak and $19 off-peak. They took the price down to nothing and blew us away," Burr says. In just months, People Express slid to near bankruptcy.

"Variable pricing is very complex," Burr continues. "American and United invested billions in their systems." With them, the two airlines can make hundreds of thousands of pricing changes daily.

American and United match seat supply with many demand patterns, Burr says. Thus, they can sell more tickets at higher rates than competitors, while still cutting prices whenever necessary. "If we'd had a variable pricing system, we'd have done the same thing," he says.

IS can supply that crucial pricing edge to maintain customer interest in current products and keep competitors at bay in a couple of ways, says Jim Webber, president of Omicron, a Mountain Lakes, N.J.-based consortium of 60 major firms formed to share IS insights and experience.

"Services like the airlines and utilities can use pricing to change buying patterns," he says. "Consumer products companies can use information technology to build 'what if' pricing models to predict profit and market share."

At Alamo Rent-A-Car, Inc. in Ft. Lauderdale, Fla., an expert system is key to managing highly variable pricing structures. "You want to set the highest price consistent with marketing objectives," says Tom Loane, an Alamo vice-president. "You want to grow volume, make a profit, dominate the market and do it all by tomorrow."

Alamo chose The Integrated Reasoning Shell (TIRS) from IBM. TIRS runs on a Personal System/2 Model 70 tied to a local-area network. Although Alamo has been working with the system since the beginning of the year, it has only recently gone into production.

"An expert system approach is consistent with the conflicts and uncertainty in our business," Loane says. "We're dealing with a product that is perishable. Cars move around fairly readily; so, unlike airlines, we can add seats very quickly. We have a greater degree of flexibility but more complexity, too."

That complexity takes the form of about 2.8 million different rates. "We must also consider volume and be consistent across cities," Loane adds. "This is a very significant system."

Manual methods simply cannot analyze all the variables and conflicting signals, Loane says. "We have to take into account our position against national and regional competitors — as well as demand and fleet availability — multiplied by 100 cities by 365 days by 43 models."

The system helps Alamo respond rapidly to competitive pressures. "For example, we might have plenty of cars available, but our competitors raise their prices," Loane says. "What do we do?"

TIRS will make recommendations based on specific competitive data and generic demand factors. "Our decision will depend on the circumstances," Loane says. "That's what pricing is about."

An information system can also provide a means for keeping existing product lines optimally priced. Avon Products Co. in Rye, N.Y., taps an internally developed price history and sales volume system to predict the performance of new price

> "ONCE, IF INFLATION was 5%, we simply raised prices by 5%. Now, we analyze products and customers by type, as well as looking at the costs associated with the particular channel of business."
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points for its 5,000 products.

The frequency of the company's sales campaigns, in combination with its ever-changing prices, products and special offers, make the system especially important, says Jim Hoffman, director of worldwide systems. "For instance, if we're offering a particular product in campaign 20, we would look at the history of the product at $2.99 and maybe discount it to $1.99."

Products offered in combinations at special rates further complicate pricing, as does the type of product offered. "It's much easier to predict the price performance of standard products, like lipstick," Hoffman says, "than new or seasonal items, like figurines or toys."

With the price history system, Avon also uses an inflation-factors database to track and analyze the costs of specific materials, such as glass for fragrance or after-shave decanters. "This information is integrated with the price history information. The marketing group then determines product prices," Hoffman says.

> "YOU WANT TO set the highest price consistent with marketing objectives. You want to grow volume, make a profit, dominate the market and do it all by tomorrow."
>
> TOM LOANE
> ALAMO

Both systems run on the company's IBM 3090/600 mainframe with DB2, Hoffman says. The last piece of the price history system was added a month ago following a two-year development effort.

Determining how high prices can be pushed is difficult, Hoffman says, because "Customer loyalty is hard to measure, but we can look at the history of products and get a pretty good curve of unit sales vs. price."

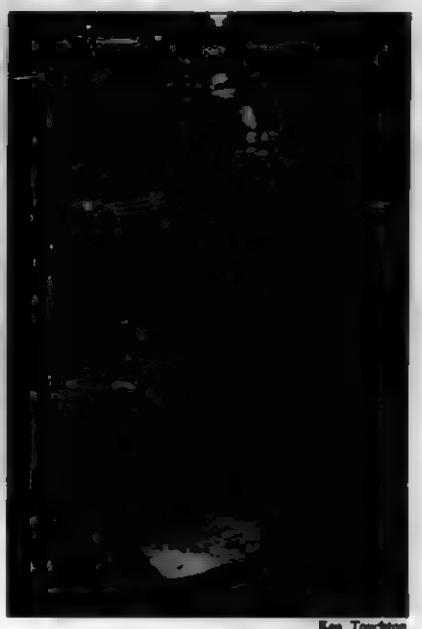
The Hon Co., an office furniture manufacturer based in Muscatine, Iowa, uses a recently developed homegrown report writer to analyze buying patterns and develop new terms and conditions for its customers, says Jim Goughenour, vice-president of customer service and distribution.

This approach to pricing is far more sophisticated than the rudimentary method the company used in the past, Goughenour says. "Once, if inflation was 5%, we simply raised prices by 5%. Now, we analyse products and customers by type, as well as looking at the costs associated with the particular channel of business."

It's no small task. The company manufactures 48 product lines consisting of about 35,000 to 40,000 stock-keeping units, Goughenour says.

The system runs on the company's Unisys Corp. A15 mainframe. "With the report writer, we can download mainframe information to analyze on our PCs using programs like Lotus or Excel," Goughenour says. "We can scan several million records to see buying patterns."

The company has gleaned several important benefits from the system. "We found areas where we could sharpen our pricing to balance better across the country and our distribution channels," Goughenour says. "We were also able to change our discount schedule structure to make it easier for our customers to understand. Finally, price restructuring gives us a way to increase our penetration to wholesalers."



Ken Touchton

Alamo's Loane *says computers improve rapid-response capability*

IS can help maintain competitive strength at the retail store level as well, says Bob Dylan, chairman of the marketing department at Harvard Business School in Cambridge, Mass. "They can impact the frequency of price deals. In some product categories, 70% to 80% of the business is 'done on deal,' " Dylan says. "But how deep should the deal be? Should you offer a deal at the same time as your competitors? Information technology can recommend how to promote products and when to offer specials."

Finally, although IS can help companies keep that critical pricing edge, skill in its use is equally vital, users agree. "You need the talent to know what to do with the system," Burr says. "That makes all the difference." •

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Complex price structures call for improved controls

Industries look for flexible systems to manage deal-making

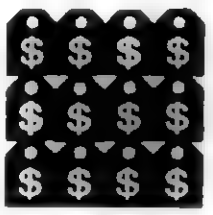
BY LARRY STEVENS

At times when prices remain relatively stable and distributors receive a constant discount off the retail price, traditional order entry and accounts-payable software packages are sufficient.

However, many industries are now experiencing wide fluctuations in the cost of raw materials. These fluctuations, as well as the need for aggressive pricing in order to maintain market share, are causing a lot of companies to seek more flexible systems for pricing administration.

Process industries, which produce an extensive range of products using many different types of raw materials, are quite often hit particularly hard by price fluctuations.

Roger Falen is the information systems manager at Mannapro, Inc., a large animal feed company based in Denver. The company, which sells almost entirely through distributors, currently has more than 500 products, many of which are made with more than a dozen raw materials.



There is a standard formula that governs routine price setting at Mannapro. It entails tallying Mannapro's cost of raw materials for a product and adding a percentage, which is negotiated at set intervals with each distributor and is based on the distributor's volume.

At one time, Falen says, it was possible to handle all pricing using that formula and a calculator. Ten years ago, the calculator was replaced with a computer programmed with a simple routine that performed the same kind of calculation. That worked fine until four years ago, when it became apparent that routine pricing was starting to be less the rule than the exception.

Calculating tolerance

Mannapro's existing system lacked a number of the features necessary to handle the company's real-world pricing practices.

The first was the ability to consider the "price elasticity" of the various products. Falen points out that markets vary in their tolerance for price increases.

In some cases, when production costs increase, prices can be adjusted to absorb the change. There are, however, other markets that have little or no tolerance for any kind of price hikes. Raising prices on products in these areas is likely to cause a drop in demand and a loss of market share.

Four years ago, Falen purchased Cost Pricing System (CPS) software from Agri-Data Systems, Inc., which allows him to account for price elasticity by specifying how much weight to give the cost of raw materials in determining the price of each product.

"Price elasticity used to be a seat-of-the-pants judgment made by the person who happened to be quoting prices to a distributor," Falen says. "Now the price is more or less standardized."

> "ABOUT 70% OF marketing energy now goes toward creating deals: deals to distributors to encourage them to sell more of a particular product and discounts that are passed on by distributors to consumers."
>
> GEORGE WILLIAMS
> ANDERSEN CONSULTING

The system does not always rule, however. Although it is designed to account for price elasticity, there are still numerous occasions on which the market price for a product differs from the price computed by Mannapro's system.

"At least half the time," Falen estimates, "we're ruled by influences outside our company. When that happens, we have to ignore what CPS tells us and sell at the market rate, or we don't sell at all."

Product handicapping

Occasionally that means selling at or even below cost. And, in such instances, the job of the information system switches to one of impact tracking. With the old system, there was no way to track the financial result of that action. An advantage of CPS is that it gives Falen retrospective reports showing in detail the financial consequences of each sale and the profitability of each product.

These reports can tell the firm when a

Stevens is a free-lance writer based in Springfield, Mass.

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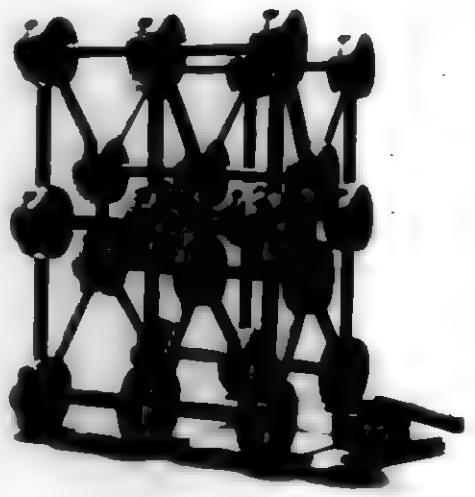

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product is no longer profitable so it can consider getting out of that particular market. They can also reveal important details that go beyond cut-and-dried separation of the profitable from the unprofitable.

It is possible, for example, to ascertain that even though a product is not profitable on its face, it is worthwhile to manufacture, even at the current price, because its use of a particular raw material helps to lower the company's costs for that material in the production of other goods.

The art of the deal

Process industries are not the only ones struggling with the need for greater flexibility and better control of information in price administration. Companies operating in other spheres are also finding it necessary to institute more creative pricing strategies and install software systems to support them.

Consumer products companies are particularly active in this regard. George Williams, a partner at the Denver office of Andersen Consulting, estimates that at such companies, "about 70% of marketing energy now goes toward creating deals: deals to distributors to encourage them to sell more of a particular product and discounts that are passed on by distributors to consumers."

> "PRICE ELASTICITY used to be a seat-of-the-pants judgment made by the person who happened to be quoting prices to a distributor. Now the price is more or less standardized."
>
> ROGER FALEN
> MANNAPRO

Williams notes that most systems currently in place to handle price administration were not designed to handle anything more than simple cost-of-production plus profit margin calculations. As a result, many organizations become enmeshed in an "accounting nightmare" when they attempt to keep track of an expanding variety of prices and deals relating to individual products.

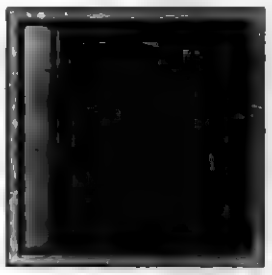
Another problem, according to Williams, is that various studies have shown that only between 20% to 50% of the special price deals that companies strike ever turn out to be profitable. But because most systems are unable to keep track of the financial consequences of deals, few companies know which are profitable and which are not.

Recently, Andersen introduced DCS/Logistics Extended Pricing software to manage complex pricing structures.

Beyond patching

One of the first organizations to use Extended Pricing is a Colorado-based consumer products company, which asked not to be named. According to the company's IS manager, the firm's original order-entry system was created about 10 years ago "when times were simpler." This system was able to accommodate periodic price changes, and each distributor could be assigned a discount schedule.

What the system couldn't do without great difficulty, however, was tally up data pertaining to such things as quarterly breaks, quantity discounts, truckload surcharges and discounts for items purchased within a certain time period.



In order to permit computerized tracking of these complex pricing variables, the IS department had to resort to patchwork solutions. For example, it constructed a procedure for dealing with complexity by assigning multiple deal-specific numbers to each product. This meant that if a distributor purchased more than a certain quantity, the product would have a different number than the same product when bought in a smaller quantity. This cumbersome system resulted in errors and hindered record-keeping on product profitability.

The advantage of Extended Pricing, which can handle different prices for the same product, is that it makes accounting reports less complex.

The system is also able to generate reports on the profitability of each deal. This helps the company study the effects of its past strategies to help in price planning.

The IS manager also says that the new system gives the company more flexibility to quickly respond to changes in the business environment. For example, if freight prices increase, he can type in one figure to add a truckload surcharge for all products or for certain classes of products. Previously, he would have had to add the surcharge to each product individually.

Complex pricing was once the exception at many companies, and IS managers felt comfortable accommodating special circumstances with temporary fixes. But in recent years, multitiered price structures have become an integral part of many companies' marketing strategies.

Williams says, "When IS finds itself working around the software in order to reflect a new price and it has to do that more than once every quarter or so, it's time to look for a new system." ●

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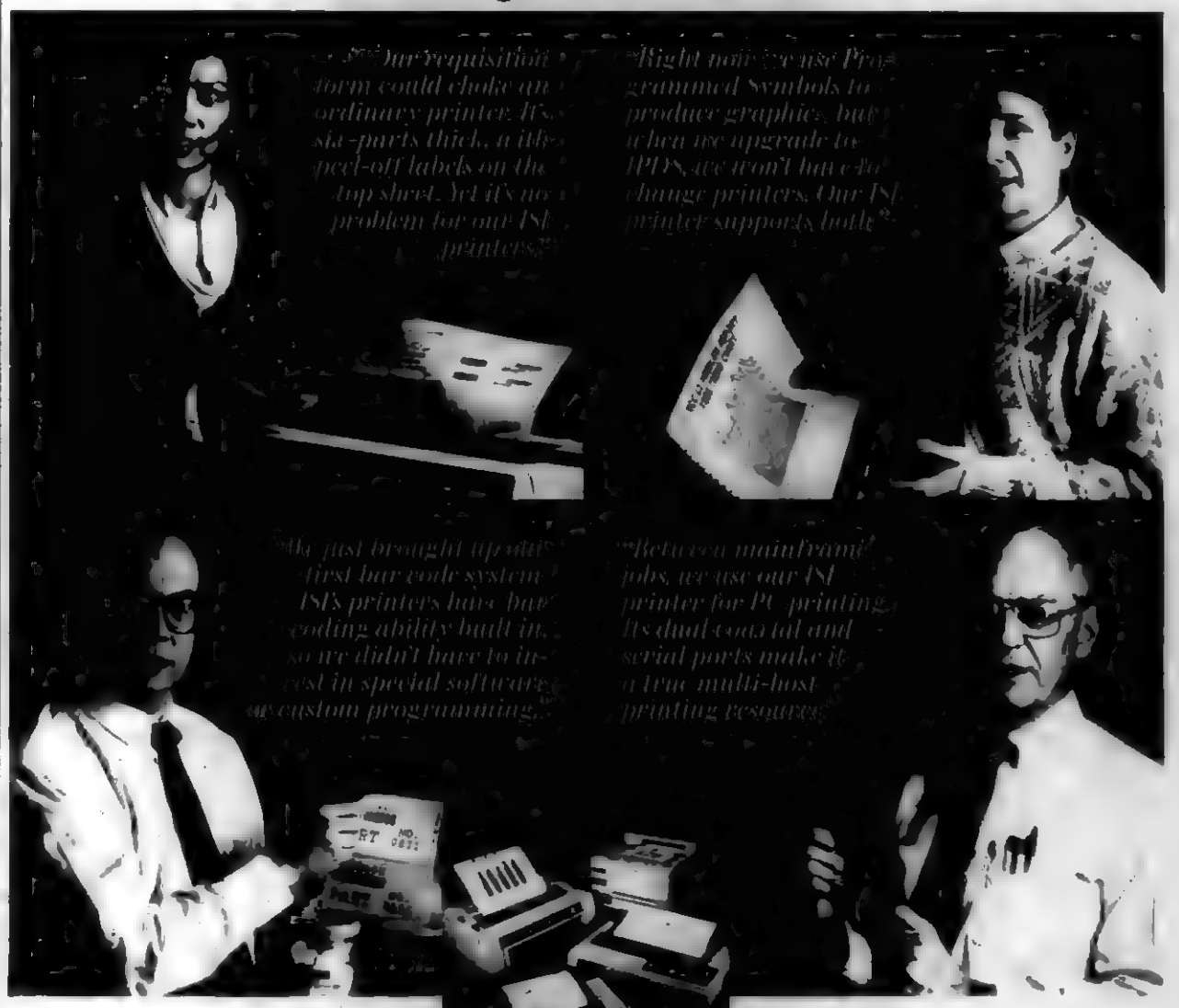

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Creativity in IS

Even though many techies consider themselves artists, there's still lots to learn about IS innovation

BY J. DANIEL COUGER

During the past year, there has been a huge leap in interest about creativity and innovation in business and industry. Numerous business and government leaders emphasize the fact that the U.S. needs a drastic infusion of creativity to regain its economic stature as a world leader. As a recent *Business Week* series concluded: "We are clearly not as competitive as we once were . . . Americans are losing the ability to innovate."

Is there a similar push for creativity and innovation in IS? Sadly, no. In the 35-year history of the IS field, there have only been five articles published concerning creativity in IS. In the few cases in which IS is using creativity techniques, they are being used incorrectly.

Contrary to the widely held view that structure stifles creativity, outside of IS it's clear that there are processes for generating and enhancing creativity that can be taught and learned. Because IS literature provides little evidence to prove or disprove this belief, IS must look to other disciplines: science, art, prose, education, engineering and psychology. In each of those fields, there is clear evidence to support the notion that creativity can be taught to IS workers and used to enhance system design and other IS projects.

Why IS needs creativity

The computer field is one of the few areas in which the U.S. is still the world leader — a testament to past creativity. Retaining leadership will require even more creativity in the future.

The same logic applies to individual companies: Easy applications have been computerized, while the tough ones lie ahead. IS needs to come up with creative designs for those applications. Domestic and foreign competition is increasing, and companies need to think of new ways to use systems to head off rivals and exploit market niches.

Less than 20 years ago, most Americans viewed the Japanese as far less creative than themselves. They saw Japan as confined more to copying and improving on other nation's products and processes. Judging by Japan's number of new patents at the time, that was true.

It is no longer the case.

A study by the National Science Foundation revealed that in 1987, foreigners obtained 47% of U.S. patents, up from 34% in 1977. The Japanese led with 17,288 patents — 19% of all U.S. patents — a 25% increase over 1986. In 1987, West Germany acquired 8,030 U.S. patents, up 15% from the prior year. France received 2,990, up 19%. For the first time, the top three recipients of U.S. patents were Japanese firms: Canon U.S.A., Inc., Hitachi America Ltd. and Toshiba America, Inc. General Electric Co., which had held the top spot for 25 years, fell to fourth place.

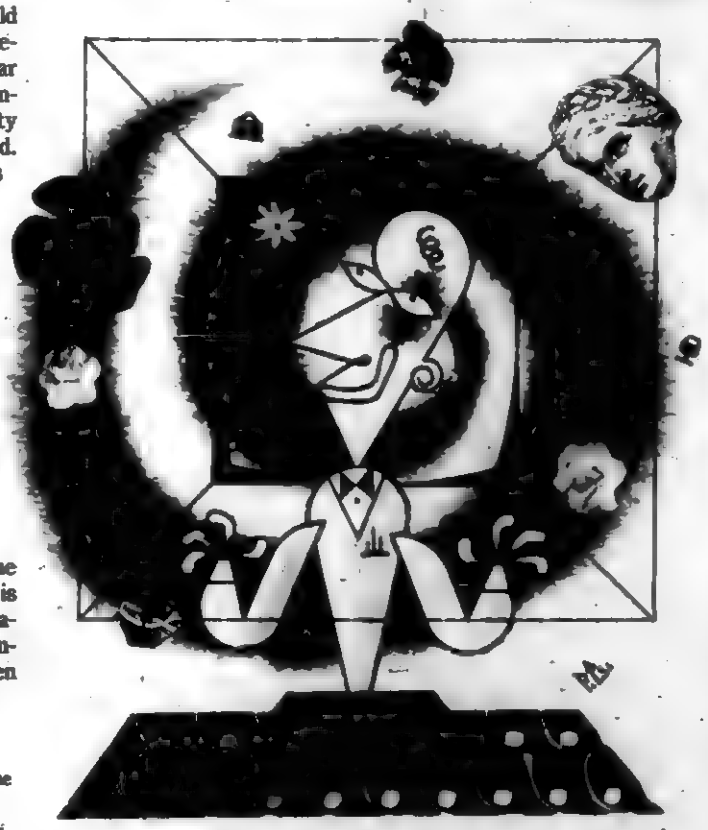
NSF also evaluated the quality of patents. The standard measure of quality is how often the patents are cited; when a patent is noted frequently, it has had a significant impact on subsequent research. In citations, Japanese inventors scored 26% higher than their American counterparts.

In a 1988 study, the National Research Council warned that the U.S. "is already a follower — or worse, an observer — in the development of many of the commercial products of the field." Stakes will be even higher in the 1990s.

IS management can begin by establishing a positive environment for creativity and then following up with training for subordinates on the use of specific creativity enhancement techniques. Placing more emphasis on creative solutions will not result in an exorbitant cost. On the contrary: Applications built by such staff can produce a significant return on investment for their companies.

Initially, creativity techniques can substantially improve the IS design process. However, creativity approaches are useful and necessary throughout the IS organization, from strategic planning to maintenance programming.

Creativity techniques used in IS are implicit. IS management assumes that people will approach all of their tasks



Philip Anderson

Couger is a professor of information systems and management science at the University of Colorado in Colorado Springs and head of the school's center for research on creativity.

- **Historically, a dearth of thought**
- **Twenty techniques can help**
- **A way to halt U.S. slide?**

creatively. In other words, when managers hire, they try to get the most qualified people available. It's assumed that intelligent people will try to find creative ways to perform assigned tasks. That assumption is partially true.

Yet managers cannot be assured that the most creative approaches have been used if employees have not be taught creativity enhancement techniques. Thus, IS needs to move the objective of creative approaches from an implicit to an explicit one.

Few IS users (clients) are fully aware of what the computer system can do for them. Even in this era of accelerating computer knowledge among clients, few have in-depth understanding of computer capability. IS is in a better position than clients to evaluate how the computer might be more useful.

Thus, IS needs to guide clients into a statement of requirements for systems that are more capable and more intelligent than they knew possible. To do so requires system designers to be more creative than merely responding to the initial set of requirements.

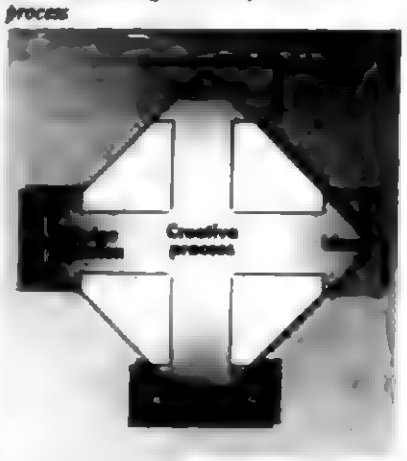
If information systems staff members do not use creativity techniques, they tend to rely on approaches that proved satisfactory in the past. As Abraham Maslow said: "If the only tool you have is a hammer, you tend to see every problem as a nail."

Creativity gone wrong

More than 20 techniques have been identified that can be useful in IS for generating creativity. Unfortunately, the IS field has used only two techniques, according to the literature available in the field, and these two are generally not being used correctly.

The creative diamond

Four distinct stages make up the creative process



Source: The Center for Research on Creativity
CW Chart: Paul Monk

Brainstorming is the most widely used idea-generation technique in the IS field. It was developed by Alex Osborn in the 1960s. Almost everyone in IS has participated in brainstorming activities. Nevertheless, a review of psychology literature identifies a number of experiments that prove that individuals produce more ideas alone than through brainstorming in small face-to-face groups.

The main reason for this is that groups inhibit idea generation for many participants. Many individuals find it difficult to express true feelings without fear of social disapproval or the effects of authority hierarchy.

The Nominal Group Technique (NGT) uses the positive features of both brainstorming and brainwriting. There is a silent generation of ideas in writing, round-robin recording of ideas, serial discussion for clarification, then subsequent rounds of writing. Using this approach, the inhibiting factors of both brainstorming and brainwriting are reduced while retaining public sharing of ideas to stimulate new ideas.

Quick techniques

A number of creativity techniques can be brought to the IS field from other disciplines.

Techniques for groups include the following: 5 W's and the H (see story at left), assumption reversals, bionics, circumrelation, metaphors, relational algorithms and symbolic representations.

Techniques for individuals include the following: Nominal group technique, component detailing, force fit, sculptures, stimulus analysis, synectics and systematized directed induction.

A particularly helpful creativity technique has been devised by Edward DeBono, the British author of more than 30 books, and a well-known creative luminary. DeBono's "Six Thinking Hats" technique is used by Nippon Telephone and Telegraph as well as many other corporations.

In the Six Hat system, people in a group discussion actually put on different hats that represent different modes of thinking. It's a convenient way to switch thinking without offending anyone. It works like this:

The white hat represents information and data.

The red hat legitimizes feelings, intuition and hunches without the need for justification.

The black hat is the logical negative: why something won't work.

The yellow hat is the logical positive that talks about benefits, feasibility, etc.

The green hat is the creative hat, which allows someone to ask for creativity.

The blue hat is the process control hat that thinks about and plans the thinking itself.

Another simple but powerful technique for creative decision-making is PMI. In this approach, the Plus, Minus and Interesting points of a decision are listed in separate columns.

Simple devices such as these can help a corporation bring about gradual change while immediately improving creativity.

Future at stake

Creativity in system design *can* be enhanced significantly while increasing the cost of system development less than one-half of one percent. This is known as the "half-cent guideline."

British historian Arnold Toynbee commented on the necessity of creativity more than 50 years ago: "To give a fair chance to creativity is a matter of life and death for any society." There is little evidence that management in the IS field has given a fair chance to the use of creativity techniques. IS needs to do so to exploit the potential of the computer for aiding companies to face the life-and-death situation inherent in present-day competition.

In this era of cost-cutting, management is hesitant to try new things unless it is confident of the cost-effectiveness of a new approach. The potential for improvement of system design by enhancing the creativity of designers is significant.

With such a low threshold in cost to explore more creative approaches, there is little reason not to proceed. •

Just what is creativity, anyway?

More than one hundred definitions of creativity are recorded in the literature outside IS. Creativity is often defined by use of synonyms — for example, "productive thinking," "divergent thinking," "originality," "imagination" and "lateral thinking."

A practical definition — one that should convince IS managers of the viability of the subject — is the following: "Creativity is a process that solves a problem in an original and useful way." The elements of uniqueness of solution and value of results are both essential in the definition.

P. R. Nayak and J. M. Ketteringham, in their book, *Breakthroughs*, document 13 cases of creativity and innovation. "In every case," they say, ". . . it was the curiosity within the originating person that lit the fire. Neither financial need nor market intelligence played a major role in these exceptional beginnings . . . it always was a problem to be solved, not a fortune to be made, not a market to be exploited."

Review of the breakthroughs described by Nayak and Ketteringham reveals three things in common in all 13 cases:

- Investigators expected a creative idea to occur, then went into the experiment with a confident attitude.
- They used a methodical process to reach the result. It was not a product of chance or inspiration but rather one of systematic investigation.
- A period of incubation was needed to put the ideas into "secondary memory" to let the subconscious work on them.

More formally, the process of creativity is considered to have four stages: preparation, incubation, illumination and verification. Although several variations of depicting this process exist in the literature, they are essentially the same (see chart above). A similar process can help to ensure creativity in an IS organization.

There may be a lengthy period between stages. An example of the gap between discovery and use is illustrated by the invention of the Swiss chemist, George Anderman, who discovered cellulosic materials. Almost 50 years elapsed before any practical use occurred with artificial silk, under the name of rayon, by Comte Hilaire de Chardonnet. Fortunately, in IS, there are much shorter periods between the stages.

J. DANIEL COUGER

The Five W's and H

This creativity technique can drive systems applications

A creativity technique, referred to as the "5 W's and the H," is quite useful for deriving systems applications. The technique asks "who, where, why, when, what and how" to ensure that all alternatives are considered. Using the 5Ws/H technique, IS managers can analyze their portfolio of applications and ask the following questions:

1. How might an application be used for other purposes? Could it be used not just to support internal clients but company customers as well?
2. Why would we want to provide the service to our customers? How can it provide us a competitive advantage?
3. Who could best use it? Which customer category?
4. Where could it be used? Customer management, customer purchasing agents, customer accounting?
5. What is necessary to reorient the application to this new purpose?
6. When would it best be installed to provide optimal competitive advantage?

The 5 W's and the H technique can also be used at key points in the system development cycle to ensure that creative approaches have been utilized. An example is the review of the logical design. The designers can ask the following:

1. Where in the system can we embed more intelligence to make sure that the right decision is made?
2. How can we enhance the system to improve its reliability?
3. How do we make sure the system is robust?
4. What areas of the system can be redesigned to produce information that is more timely?
5. Who are other possible managers who could make use of the information produced by the system?
6. Why have we narrowed the design alternatives to the one used here? What are the other approaches that we should consider?
7. What characteristics of the system are weak? Where is it likely to fail?
8. When will the client be accessing this system? How are we ensuring proper response times for peak periods?

The same 5W/H technique can be used with different questions at other review points in the development process: physical design review, program design review and test design review. It is also useful in cost/benefit analysis.

J. DANIEL COUGER

Technical problems, creative solutions

Corporate creativity programs use innovative methods to pull usable ideas out of fishing talk

BY JANET MASON

What do juggling, classical music and fishing trips have to do with information systems problems? The answer could be nothing — or everything.

At GE Aerospace Computer Services in Valley Forge, Pa., for example, IS managers trying to decide whether to swap an NCR telecommunications front-end processor for IBM equipment loosen their imaginations by talking about fishing trips and their ideal vacations.

At Du Pont Co., vice-presidents stand alongside new hires in seminars and take "brain breaks" by juggling and listening to classical music.

While skeptics scoff at such tactics, creativity converts say the approaches can yield novel solutions for everything from network debugging to training employees in new technologies.

And, they add, with increased competitive pressures and the need to cut costs and do more with fewer employees, creativity programs make even more sense, even in the short term. AT&T and Du Pont say their creativity programs have cut training time in half.

"Business can no longer pay the expense of useless, long training sessions," says Charles Martinetz, director of corporate education and training at AT&T's training division in Hopewell, N.J., justifying his company's creativity-enhancing offerings.

Right brain gain

Although creativity programs are offered to many different professionals, they hold special appeal for computer personnel. "IS people can relate to the way their brains work and how to improve their thinking because they see the connection between their minds and computers," says Bill Abrams, who is principal consultant at GE Consulting Services, Inc., in Cherry Hill, N.J., and teaches creativity to General Electric employees.

IS employees also benefit from such programs, Abrams and others say, because they traditionally are rewarded for using their "left" brains, which contain the logic necessary to understand technology. By learning how to use their intuitive "right" brains, Abrams explains, IS professionals can integrate their logic with creativity, which enhances problem-solving.

Paul Jordon, director of training and education at GE Consulting Services Corp., which provides computer training to GE divisions and other companies, says Abram's creativity and reading improvement seminar enables him to better absorb and spend less time staying abreast of "information on the latest and greatest computer products."

Creativity programs have different labels and methods. GE's program, called "Mind Management," offers a day-long seminar that explains how the brain works and how brain power can be enhanced. The company also uses outside consultants in brainstorming techniques for specific problems called Synetics. Du Pont uses customized training from an outside consultant. At AT&T, accelerated learning techniques enhance employee training programs.

The underlying principles of many creativity programs are the same, however. By using both the left and right hemispheres of the brain, says Michael Gelb, president of Washington, D.C.-based High Performance Learning, employees can change their mind-sets from doing what they have always done to looking at the broader picture.

The technique uses rhyming and images to enable employees to make associations with words and images, such as "one, bun and two, shoe." To remember a third word in each series, the employee visualizes a bun or a shoe next to the additional piece of information, such as a feather sticking out of a bun.

"This reinforces a positive attitude because when employees first try to memorize 10 items, they only remember about one-third of the list. After learning the technique, however, they remember all 10 items," Gelb says.

Walter Marz, who leads the Synetics sessions, instills confidence by starting his sessions on a positive note. "We start out with 'I wish' and 'How to' statements where participants say what they need to solve the problem," says the Kendall Park, N.J.-based consultant. "When people approach a problem by saying 'we can't do this,' it becomes a self-fulfilling prophecy."

> "IS PEOPLE CAN relate to the way their brains work and how to improve their thinking because they see the connection between their minds and computers."
>
> BILL ABRAMS
> GE CONSULTING SERVICES

GE's day-long Mind Management seminar is distilled from a three-day video-based course called "Becoming an Everyday Genius," based on the work of Gelb and Tony Buzan, a Marlow Bucks, England-based creativity trainer. Although the Genius program was used to train employees in how to the use of personal computers, the Mind Management seminar is taught to employees in a variety of functions throughout GE.

Abrams estimates that he teaches 100 to 300 employees per year in the various GE divisions that contract his services.

A popular technique in the program is called mind-mapping, a process of organizing and taking notes. The person making the map uses colored markers to draw a central image in the middle of a page with branches stemming out from the image to related images and written ideas. The theory is that this process of taking notes mirrors the way the brain makes associations.

Katherine Lambert

Creativity consultant Gelb: *"We start out with 'I wish' "*

"I use mind maps to plan everything," says Dan Ladik, lead analyst for datacom support at GE Aerospace. Along with using them to plan memos and do strategic planning, Ladik also uses mind maps to solve data communications problems.

"I put the components on the mind map, the chain of multiple vendors, and then draw lines to show how they interrelate back to the main processor," Ladik says. The mind map helps him figure out which pieces of the network "effect the transfer of data."

Using a mind map, he adds, is like using a random-access disk: "The map starts in the center, and the connections move out from there. Like a random-access disk, it gets you where you want to go faster."

Learning is fun-damental

Gelb teaches that learning can be fun. To demonstrate this, he teaches corporate employees how to juggle.

Juggling, which involves rhythmic coordination of the right and left side of the body, "is an ideal brain break that mirrors the effect of sleeping on a problem," Gelb explains.

It is also something that everyone can do together. "It's a great leveler," Gelb says. "Everyone from the vice-president to new hires will be dropping balls together as they learn how to juggle."

Well-seasoned juggler and IS consultant Tom Jenkins first learned to juggle while taking a seminar at Du Pont. "We had a problem because it took too long to train our end users, and they weren't retaining the information," he recalls. His division was training users of Du Pont's Automatic Clinical Analyzer, which was marketed to hospitals and used by technicians.

By using "brain breaks" for 10 minutes each hour, such as juggling and having the users listen to classical music, Jenkins says, the users found they could retain more information.

"Everyone thinks you have to be exhausted to be working," says Jenkins, who was previously manager of learning resources at Du Pont clinical systems. "But by taking a break and having fun, your brain has a chance to really absorb the information."

Creativity techniques were part of the plan to switch training from instructors to students using computer- and video-based materials. The result of the entire program was that Du Pont cut its training time in half, cut its training staff by a third and increased the number of users it trained by 50%.

Brain breaks and mind mapping are also used as part of AT&T's accelerated learning programs. Employees in these programs learn subjects and techniques all at once.

AT&T uses the techniques to train employees in a variety of disciplines such as learning foreign languages and new skills.

"The information stays in their minds longer because it is based on images," explains Martinetz, who has a doctorate in educational psychology. He notes that research proves that rote memorization only stays in people's minds for a short time.

Marbles and bits

"When teaching employees about data streams, we illustrate the process by blowing black and white marbles representing bits and bytes through a clear tube," says Martinetz, who consults with AT&T trainers on incorporating accelerated learning techniques into their training programs.

Imagery also plays a large part in the Synetics training. Marz leads problem-solving groups using what he calls "side trips," where the participants discuss seemingly unrelated issues.

"We could be discussing a networking problem," Marz says, "and then we will take a break and think about images from the natural world. Someone might use the image of a lion and then see how the lion's attributes can be used to solve the network problem.

"Each person has a database in their mind," Marz says. "And the solution to the problem lies in the collective database of employees who are participating." The side trips, which get the employees thinking with their right brains, help stimulate people into coming up with new solutions, he says. ●

Mason is a free-lance writer living in Philadelphia.

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IS 'intrapreneurs' hold key to open doors to innovation

BY AVERY CLOUD

Information technology is a neutral force in and of itself. It only becomes a potent force when creative people find ways to use it in innovative ways. Information systems professionals with the proclivity to innovate are becoming extremely valuable assets.

IS professionals with entrepreneurial spirits are leading the way for companies that use information technology as a competitive weapon. An entrepreneur is someone who creates a new product, service or process outside of the confines of established business enterprises. But companies also need internal innovators.

In a recent work by authors Tom Peters and Gifford Pinchot, this internal innovator is called an "intrapreneur," someone who develops a new product, service or process within an existing organization.

Intrapreneurs are needed in the ranks of IS professionals. Also needed is enlightened IS management that knows how to foster an environment in which intrapreneurship thrives.

In today's competitive marketplace, innovation has become a critical factor. Peter Drucker, an authority on business philosophy, puts it this way: "The enterprise that does not innovate inevitably ages and declines. And in a period of rapid change such as the present, an entrepreneurial period, the decline will be fast."

Nowhere are changes coming faster than in the field of IS, and in no other field will innovation yield more competitive advantages than in IS. However, innovation only thrives in an environment that cultivates and accepts new ideas. Drucker says that entrepreneurial management requires policies and practices in the following four areas:

- The organization must be made receptive to innovation and willing to perceive change as an opportunity, not a threat.
- Systematic measurement, or at least appraisal of a company's performance as entrepreneur and innovator, is mandatory.
- Entrepreneurial practices pertain to organizational structure, staffing, managing, compensation, incentives and rewards.
- There are some things that shouldn't be done in entrepreneurial management. Good innovations are not necessarily totally new things conjured up from the scientific abyss. They are often the result of combining known methods or materials in a new way. Here are some tips on how to foster intrapreneurship:

Educate. Training and education are important in the intrapreneurial environment. For example, it is not likely that IS professionals will come up with an innovative way to use optical discs if they know nothing about them. Seminars, classes and trade journals are invaluable.

Reward. A reward system should motivate employees to innovate. Rewards should be a mixture of recognition and money.

Encourage risk-taking. Managers should encourage experimentation and risk-taking and allow failure. When employees are burned at the stake for making mistakes, they will likely always choose the safe route and do only what they are told.

Welcome input. Managers must allow and encourage input in the decision-making process from all levels. How many opportunity dollars have been lost because an employee kept a good idea to himself, thinking his superiors didn't care to hear it?

Study new technology. Special committees, task forces and departments should be established to study and test new technologies. Write up the results of these tests well, including suggestions on how the product might be used in your company.

Consistent and powerful innovations are not just the product of chance. A little luck doesn't hurt; but organizations that are not structured to allow innovation usually won't achieve it. Creating and enforcing policies and practices to foster the intrapreneurial environment is the only way to acquire the holy grail of innovativeness.

Cloud is manager of technical services in the information services department at Bowman Gray/Baptist Hospital in Winston-Salem, N.C.

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Creative writing

The following is a starter reading list for cultivating creativity, provided by Phyllis S. Kramer, a partner at Engineered Software in Alhambra, Calif.:

Adams, James. *Conceptual Blockbusting*

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NATIONAL
BRIEFS

Italian sub

Dell Computer Corp. finally claimed its place last week as the first direct marketing personal computer company in the Italian market. The newly opened **Dell Italy**, which is subsidiary No. 6 for the Austin, Texas-based PC vendor, will be headed up by industry veteran **Enzo Urbani**, who is the former area general manager at Ing. C. Olivetti & Co. What's more, Dell Italy's products will come forth from Dell's other late-October entry: a manufacturing plant in Limerick, Ireland, that is positioned to gain tax and duty advantages for Dell as well as to supply the company's European subsidiaries.

■

Son of Aldus

Axon Corp., which plans to deliver Microsoft Corp.'s Windows 3.0-based business graphics software applications to the personal computer market, made its official corporate debut in Seattle last week. For the company's founders, however, the start-up trail is familiar territory. **Jeremy Jaech** and **Dave Walter** were also co-founders of **Aldus Corp.**, while third Axon founder **Ted Johnson** helped to spearhead the development of Aldus' crown jewel offering: the Pagemaker desktop publishing software package.

■

How do you say . . . ?

What is this rumor that Dutch electronics firm **Philips N.V.** is joining MCC? It's true enough, but the MCC that Philips is teaming up with is not the consortium located in Texas — it's the company in Tennessee. Knoxville-based **Maxwell Communications Corp. PLC** and Philips are forming a joint venture to launch a multimedia publishing company that will bring the well-known Berlitz method of speedy language instruction to the home, school and office via interactive compact disc.

High hopes for home PC market

Despite best-forgotten forays into home market, PC vendors say this time they'll do it

BY MICHAEL ALEXANDER
CW STAFF

Remember Adam? When Coleco Industries, Inc. introduced Adam in January 1985, the company crowed that its home computer would one day be as popular as the television set. Adam went off to technology's trash heap, but the allure of a home computer market remained.

Today, despite the industry's notable flops, IBM, Tandy Corp. and Apple Computer, Inc., among others, are making another run at the home market. What is different this time around is that the computers are easier to use, and consumers are more comfortable with the technology, the vendors said.

According to several market researchers, however, the emergence of a home market may owe more to the growing popularity of home businesses than to any other reason.

Do your homework

Link Resources has calculated that 26.8 million Americans work at home at least part time. More than 35% of those home worker households — compared with 22% of all U.S. households — have personal computers, Link researchers said.

Millions of consumers are also buying home computers to continue working at home either to get ahead or to be able to leave the office at 5 p.m., spend time with the family and then complete the day's work in the evening.

There are actually two home markets: the work-at-home market and the "home task" market, said Ed Juge, Tandy's director of market planning. Tandy, which has been selling computers to the home market for 10 years, has the largest share of the installed based of home computers — approximately 17%, he said.

The work-at-home market is already showing signs of stagnating, Juge said. Computer penetration has been stuck at about 20% of households for the last three or fours years, he noted. "People are continuing to buy computers for the home," he said, "but the market is not getting any bigger."

Tandy believes that there is a lucrative market of consumers who want to use a computer at home for everyday tasks but have no inclination to run a home business or shuttle work between office and home. "It's more like a home appliance market," Juge said.

In July, Tandy introduced its Tandy 1000 RL home computer, which lists for $750 to $1,299 and offers a slew of built-in programs developed especially to make everyday home tasks easier. There is a Home Information Center program, for example, that includes a bulletin board where family members can pick up and leave messages for each other. The computer is designed to be on all day — the screen blanks out, and the hard disk shuts off if left idle for five minutes, Juge said. "Sales of the new machine are going well ahead of expectation. There is a market out here, but we don't know just how large it is yet," he said.

"Based on my experience of 11 years in the retail computer field, I put my thumb on my nose and give them a big raspberry," said William Blocher, president of the Bit Bucket computer retail and direct sales outlets in Massachusetts and New Hampshire. Consumers are not interested in keeping recipes or balancing their checkbooks on computers, he said: "The people coming into computers today want a tool at home. They know what they want to use it for, and they have a specific price in mind." PC vendors may be overestimating the long-term potential of the work-at-home market.

Continued on page 135

Compaq reaps rewards of aggressive pricing policy

BY RICHARD PASTORE
CW STAFF

Compaq Computer Corp.'s recent capitulation to pricing pressures has paid dividends in surprisingly high third-quarter revenue and shipment growth, observers said last week.

Total revenue rose 26% to $863 million, while net income jumped to $124 million, a 42% increase over the corresponding quarter last year.

Compaq had no choice but to be more aggressive on pricing, said Benny Lorenzo, an analyst at Volpe, Welty & Co. in San Francisco. Because of the sluggish U.S. market and mounting competitive pressures, "Compaq's revenue might have been negative in the U.S. without these price cuts," Lorenzo explained.

Since August, Compaq has cut the prices of at least nine personal computer lines as well as options such as memory cards. Grateful customers in turn boosted unit shipments in North America 20% over the corresponding quarter last year. This figure contrasts favorably with an overall North American shipment growth of just 5%.

Typically, price cutting such as Compaq's has a negative effect on gross margins, analysts noted. However, Compaq's margin for the quarter was above expectation at 43.6%, largely because of lower component costs and improved factory efficiencies, the company said.

However pleasant that surprise, Compaq is taking a cautious attitude regarding future margins and the fourth quarter. "We certainly don't think those levels of growth margin are sustainable in the long term," said Michael Swavely, president of Compaq North America.

Swavely also struck a "cautiously optimistic" chord for the fourth quarter. While product orders for October appear to be meeting or exceeding plans, the specters of U.S. economic problems and the Middle East crisis may yet cast a hex over this year's earnings, he said.

Oracle resets track to the black

BY JEAN S. BOZMAN
CW STAFF

REDWOOD CITY, Calif. — Work on Oracle Systems Corp.'s glittering new headquarters complex — halted last month as the high-flying firm pondered the impact of its recent $36 million quarterly loss [CW, Oct. 1] — is back on track.

And so it is inside the green-glass towers that Oracle executives are still struggling to put their software business in order — and do it quickly. "We're inwardly focused," Oracle Chief Financial Officer Jeffrey Walker said. "We believe that our wounds were self-inflicted, and we're trying to correct what we've done wrong."

To regain profitability and retain its thousands of corporate clients, Oracle is in the midst of a massive restructuring. October has seen the exit of several key executives — some by choice and some by fiat. Now there are three lieutenants at the helm of Chief Executive Officer Lawrence Ellison's ship: Geoffrey Squire, who directs worldwide sales; CFO Walker; and former ADR executive Michael Fields, president of Oracle USA.

All three said that Oracle is taking many steps to strengthen ties with its user base. "Unless you satisfy the users, everything else is a waste of time," said Squire, who is based in London but is currently spending three weeks of every four in California.

"I've got to put it right," he said. "I won't go home until I put it right. This company is my whole life."

Squire, who has been with the firm since 1981, served as managing director at Oracle UK from 1984 to 1986 and as CEO of Oracle Europe from December 1986, until his appointment as corporate vice-president in charge of worldwide sales this past May. Although his career began in accounting in the late 1960s, he quickly moved into software development and consulting.

"I'm a detail person," Squire said. "I get furious when I see anyone making a detail mistake."

Need for new attitudes

But "putting it right" means taking Oracle sales through an abrupt cultural change, Squire said. As a measure of cost-consciousness, he said, quarterly quotas are out — and monthly quotas are in. "We'll be closing the books at the end of every month, so we'll know September's results in October rather than in November," Squire said. "In the old system, an Oracle salesman would hold an order in his desk drawer until the end of the quarter, because that's when he got his sales incentives."

Once the sales are made, Oracle must be prepared to follow through with the kind of hand-holding and technical support that some of the more seasoned systems vendors provide. Historically, Oracle was known for its efficient sales activities and marketing — and for an unacceptably high error rate in new software releases, according to several executives.

"In order for us to achieve the level of [financial] return we expect, large corporations will have to acquire significantly more products from Oracle," Fields said. "We have to earn the right to be there. We can't just be a sales force selling revenue. We've got to [learn how to] be a strategic partner."

Fields, meanwhile, said that he is spending much of his time traveling cross-country to meet with Oracle's largest clients. In key cities, he is holding customer roundtables to get feedback on Oracle's technical support and services.

At the same time, Oracle is beefing up its technical support staff and considering a 24-hour, seven-day global maintenance service.

Squire contends that far from cutting technical support in the name of budgetary efficiency, Oracle is increasing it. "One of the basic mistakes we made was having inexperienced operators answer those customer calls for technical assistance," he said. "That was a fundamental error. Those calls should have been answered by technicians." Oracle began a "real-time" technical call-in service earlier this month, tracking calls for assistance and speeding resolution of technical problems (see story below).

To regain its footing, Oracle is trying to put the brakes on its once high-flying business, which used to double on an yearly basis, Walker said. Cost-cutting measures, such as consolidating office space and subletting leased properties, are now in place. Research and development funding will remain constant, Walker said, although it will decrease as a percentage of sales. Hiring is frozen worldwide, with few exceptions.

Oracle's users seem to be responding to the new management statements, although it isn't clear how hopeful they are, said Charles Phillips, a senior analyst at Soundview Financial Group, Inc. in Stamford, Conn. "Users are saying they don't know where else they can go for relational technology, since they have concerns about Oracle's competitors," Phillips said. "Ingres [Corp.] is being acquired by Ask [Computers, Inc.], and Sybase Corp. appears not to have been profitable in recent quarters."

What's in the works

At Oracle's Oct. 15 stockholder meeting, Chief Executive Officer Lawrence Ellison fielded questions from investors and employees for nearly 90 minutes. He used the occasion to shed light on management changes designed to respond to the firm's financial crisis.

Among the revelations that came to light during Ellison's question and answer session were the following:

- Oracle's new customer-support telephone service is receiving 500 calls per day and, according to Ellison, resolving 600 technical problems daily, reversing a backlog of requests. "We want to start fixing bugs at a predictable rate," Ellison said. "We're selling software with some bugs, but we don't want to have any."
- Oracle Chairman Donald Lucas and Ellison are spending much of their time scouting for new board members and other senior managers from multibillion-dollar high-tech firms. Executives from overseas corporations are among those being considered.
- Plans to build an additional building at the firm's Redwood City, Calif., headquarters complex have been placed on hold. Meanwhile, the firm is consolidating leased space in 19 office complexes in the area and is subleasing empty space.
- Oracle will not buy back shares of its stock to boost share prices above the current $6 per share trading level, even though investors have requested that move. "We simply don't have the cash available to buy back our stock," Ellison said.

JEAN S. BOZMAN

INTERNATIONAL BRIEFS

Taking care of bidness

Canada's **Northern Telecom Ltd.** and **AT&T** said they had no comment on recent speculation that they may be among several potential bidders for UK-based telecommunications group **STC PLC.** At the top of the list that includes AT&T and Northern Telecom — already a 27% stakeholder in STC — is France's **Alcatel N.V.**, according to London-based analysts; Alcatel has denied that it is holding takeover talks with the British firm.

■

Going Dutch

By the end of the year, **Philips-Du Pont Optical**, currently a 50-50 joint venture between Netherlands-based Philips N.V. and U.S.-based Du Pont Co., will cease to be a dutch treat and begin to be more of a Dutch company, the co-owners announced last week. As a result of diverging long-term goals, Philips plans to buy its partner out of the entertainment-oriented consumer activities of the optical disc concern. Meanwhile, the firms seek a third-party buyer for the firm's professional and optical disc mastering activities.

■

Finnish lines

State-owned **Telecom Finland**'s development of the European digital cellular telephone network, the **Groupe Speciale Mobile (GSM)** — a memorandum of understanding for a digital cellular standard signed by European phone companies and telecommunications vendors — is still on track, but with some competition. The Finnish government recently granted a license to build a GSM network to **Oy Radiolinja Ab**, a firm co-owned by several financial institutions and phone companies.

■

Cap's off

For the first half of 1990, Europe's leading software and computer services group, **Cap Gemini Sogeti**, reported a slight drop in pretax profit, sliding to $71 million from $75 million logged in last year's comparable period. Consolidated revenue for the Paris-based firm grew to $773 million, increased from $652 million last year. Taking into account its summer acquisitions of UK-based Hoskyns PLC and SCS Scientific Control Systems GmbH, Cap Gemini said it expects to report some $1.8 billion in total 1990 revenue. If realized, this will mark a 28% revenue jump over last year.

In the balance

October earnings show more treats than tricks

Ameritech	$2.7B	4.5%	$311.2M	7.6%
Conner Peripherals	$380.4M	109%	$40.6M	244%
Cray Research	$186.64M	(11%)	$27.55M	(10%)
Legent Corp.	$46.5M	33%	$8.9M	18%
Mips Computer	$37.5M	38%	$143,000	(92%)
Storage Technology [2]	$265M	14%	$12.1M	46%
Sungard Data	$62.7M	20%	$4.8M	2%

Parentheses indicate a reduction or loss
1) Reflects consolidation with revenue and net income of Maxtor Colorado (Miniscribe)
2) Net income excludes an extraordinary gain from purchase of convertible debentures

CW Chart: Paul Mock

Disk drive survivors emerge

After shakeout, three U.S. hard disk drive makers are reigning leaders

BY MAURA J. HARRINGTON
CW STAFF

MONTEREY, Calif. — The hard disk drive is the computer's equivalent of a kidney: an important organ that is typically ignored until it breaks down.

The multibillion-dollar magnetic hard disk drive market — which includes the 5¼-in., 3½-in. and now 2½-in. magnetic hard disk drives — is one of the few computer industry niches in which the leaders in the field are all U.S.-based companies. And exactly who these leaders are is easier to pinpoint today, in the wake of a small shakeout in the sector during the past year.

As it now stands, the three leading vendors of hard disk drives in terms of market share and revenue are Conner Peripherals, Inc. and Maxtor Corp., both in San Jose, Calif., and Scotts Valley, Calif.-based Seagate Technology, Inc., according to Katherine Hilton, an analyst at market research firm Infocorp, a Gartner Group, Inc. subsidiary based in Santa Clara, Calif. Two of the three solidified their positions through recent market consolidation.

In June, Maxtor doubled its size and became a $1 billion company when it bought Miniscribe, Inc. in Longwood, Colo., out of bankruptcy.

Seagate Technology, a leading 5¼-in. disk drive manufacturer, also gained some market share by acquiring Imprimis, Inc., the former disk drive and related technologies subsidiary of Control Data Corp., last October.

These two acquisitions, coupled with the increasing popularity of the 2½-in. hard disk drive — originally developed by Prairietek, Inc., a start-up company located in Mountain View, Calif. — have helped to stabilize the hard drive industry, leaving little room for any more leaders, which analysts said has helped stabilize the worldwide market for U.S. drive manufacturers.

The hard disk drive industry, however, remains fiercely competitive, and while analysts do not predict any major changes of market share leaders in the next couple of years, "nobody in this industry owns anything. You have to run like hell if you're in front and never look behind you," said Jim Porter, president and publisher of Mountain View, Calif.-based Disk/Trend, Inc., an independent newsletter that tracks the hard disk drive industry.

At the moment, Porter said, the hard drive market is healthy, with a good number of manufacturers and several routes to potential market growth.

In addition to the trend toward higher capacity, smaller size drives, Porter said that demand for the 5¼-in. disk drive — always a big seller on lower capacity computers — is also growing at the 500M-byte and higher capacity level. Approximately 57% of the growing 2½-in. drive market currently belongs to Conner Peripherals, according to Infocorp.

Overall demand, Hilton said, is sufficient to support not only the boisterous growth of market leaders Conner Peripherals, Maxtor and Seagate, but also "a lot of strong players underneath them, as well as the nonindependent players like NEC Corp. of Japan and IBM here." She added that both Prairietek and Quantum Corp. in Milpitas, Calif., although comparatively small in size, are also considered "healthy" independents.

Conner Peripherals, a multibillion-dollar company, owns the highest percentage of market share, followed by Prairietek with 30%, according to Infocorp.

"The industry is clearly moving toward smaller, higher capacity hard drives, particularly those made for the notebook-size computers," Hilton said.

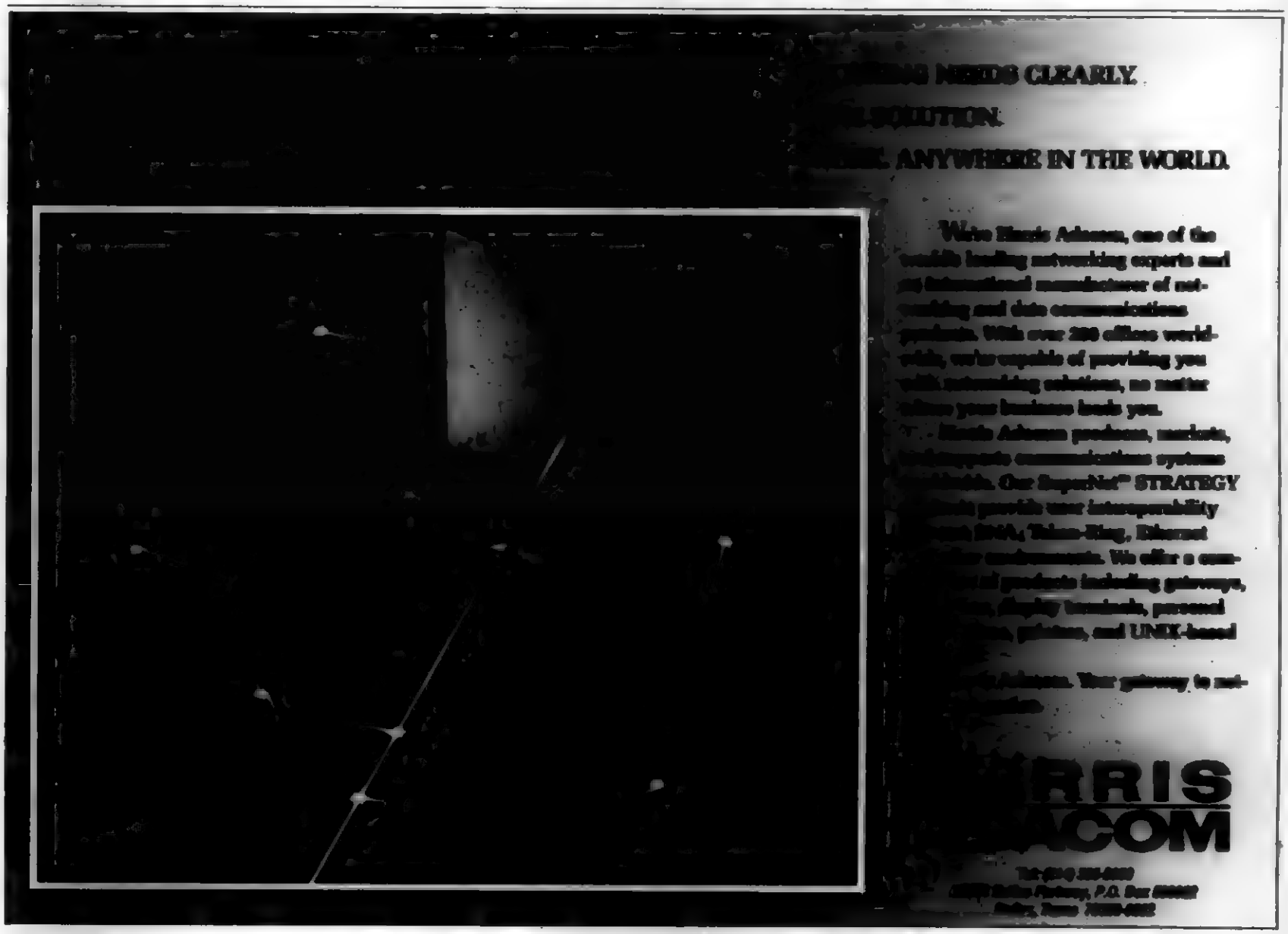
"We expect several new announcements of higher capacity, smaller form-factor drives within the next month," she added. Indeed, Conner Peripherals announced a new series of 2½-in. and 3½-in. hard disk drives last week.

The new 2½-in. drives feature an average seek time of 19 msec and include drives in 32M bytes, 42M bytes and 64M bytes of formatted storage in a ¾-in.-high package, according to the company.

Quantum also introduced a new drive this month called the Prodrive LPS, a 105M-byte, 3½-in. formatted drive with an embedded small computer systems interface controller in a 1-in. high form factor, according to the company.

A spokeswoman for Maxtor said that it, too, is preparing to roll out a new line of 3½-in. drives soon, including 100M-byte, 200M-byte and 535M-byte drives.

> "NOBODY IN THIS industry owns anything. You have to run like hell if you're in front and never look behind you."
>
> JIM PORTER
> DISK/TREND



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COMMENTARY

J.A. Savage

How (not) to market

Riddle: Which computer vendor has had easy-to-use software for as long as the concept has been around? Whose lawyers failed to follow up on other corporations' "liberating" software ideas until it was too late — way too late? What company name is synonymous with "Kleenex" to trademark lawyers? Which company is about as close to making it in the 1990s as it is to the front of the alphabet?

If you haven't guessed Xerox by now, you should read this column.

XEROX SEEMS to think that it can change the minds of consumers more easily than it can change the style of the company.

Last month, Xerox introduced two new products. First, it ported its easy-to-use document and networking software — a hit with the few people who had bought its proprietary systems in the last few years — to a Unix platform on Sun Microsystems hardware.

Next, it introduced a machine of great proportions — one that copies, scans images and prints. It also slices, dices and shines your wingtips while humming.

With its historical lack of marketing in mind, the new tack appears to be selling Xerox as a "document company." Whoa, new stuff here. Why not a "computer company" or a "document and computer company?"

Xerox seems to think that it can change the minds of consumers more easily than it can change the style of the company.

Xerox officials say that the new way of thinking about the word "document" includes computers in its definition; that is, "document" can mean something other than just a piece of text.

"The document of the future will not be passive. It will not be just paper. It will be digital, even when it's on paper. And because it will be digital, it will be compound, complex, collaborative and computational.

It will not be linear. It will be instead a multidimensional web of information." So speaketh John Seely Brown, vice-president of advanced research at Xerox.

Please read more of Xerox-speak, and I won't have to remind you that it was developed and delivered in northern California, where even as companies attempt to sell to consumers, they mock those same consumers as macrobiotic airheads (Honda and Ford, for two instances).

Only Seely Brown did not appear to be making fun of anything in this speech, delivered at a recent press conference.

"The document will be a space," he said. "We actually use the term 'docuspace' here at [Palo Alto Research Center] — an evolving spiral of information like a spiral galaxy trailing connections to other spiral galaxies of information."

If this is Xerox's new marketing technique, it appears that the only people who will understand it are sitting in the lotus position — I don't mean 1-2-3 — on top of a mountain.

P.S. If you still don't get the Kleenex connection, Xerox lawyers jump all over us writer-types when we use the word xerox to mean "copy." Xerox is a trademark, like Kleenex, say the lawyers. If only they were as quick to spot all those other vendors that admittedly lifted the look-and-feel of Xerox's software ideas . . .

Savage is a Computerworld West Coast senior correspondent.

How did anyone WordPerfect

For years now, people have been searching for a better way to communicate. Where information is shared and a diversity of ideas can flow. It's a simple concept, really. Keeping it simple, however, takes a powerful solution.

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And if you're worried about something you may have said, don't worry. E-Mail even gives you control over messages that have been sent. It lets you see when a message has been delivered, opened or deleted. Then it lets you retract it, change it and send it back again.

EXECUTIVE CORNER

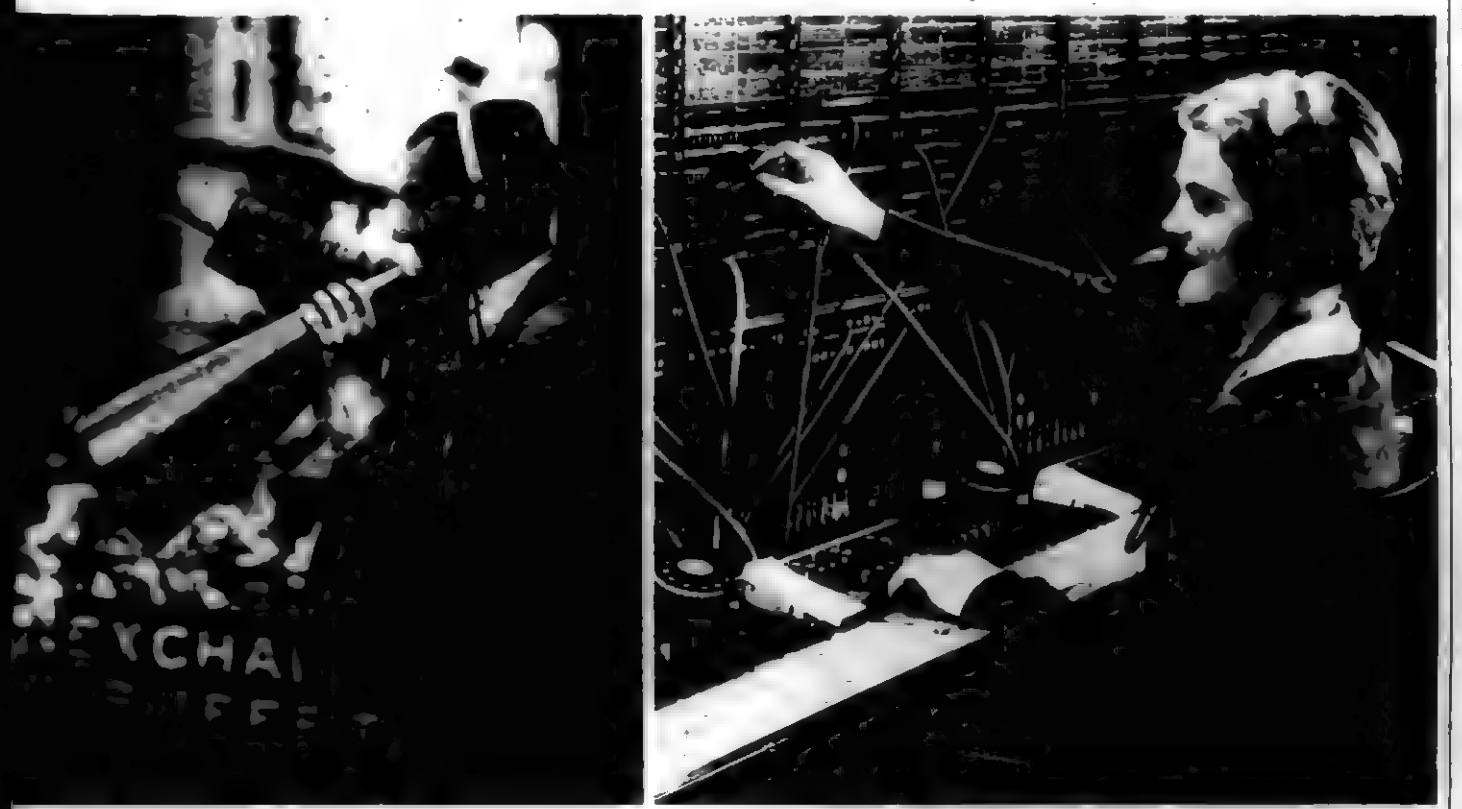
Prime reaches out to AT&T for VP

Prime Computer, Inc. announced earlier this month the appointment of **David R. Fernald** as vice-president of marketing at its Computer Systems Business Unit, an autonomous unit that contributed $420 million in revenue to Prime's bottom line last year. Prior to Prime, Fernald served as distribution vice-president at AT&T.

Ending a four-month search, **Octel Communications Corp.** in Milpitas, Calif., appointed **Gary A. Wetsel** as its vice-president of finance and chief financial officer. Wetsel came to Octel from American President Companies in Oakland, Calif., where he served as vice-president of financial plans and controls. He replaces Robert G. Sweifach, who worked as Octel's financial expert from the firm's start-up.

Effective today, electronics industry veteran and former Thomson Consumer Electronics C.V. executive **James J. Hogan** is senior vice-president at **Wang Laboratories, Inc.** Hogan, who began his career at General Electric Co. — the firm that gave Wang its chief executive officer, Richard Miller — will also serve as president of Wang's worldwide personal computer systems business.

Switching from production to testing, former **3Com Corp.** marketing manager **Robert Buchanan**, 43, has moved to LanQuest Group in San Jose, Calif. Buchanan, one of 3Com's first employees when it started up seven years ago, will become vice-president and general manager at the network testing and engineering company's Labs Division.



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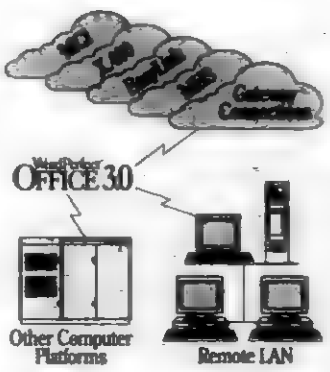

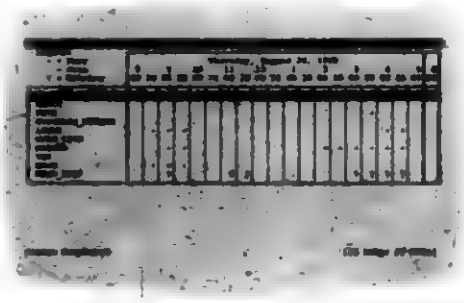

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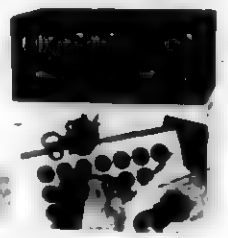

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Home PC

FROM PAGE 129

Blocher added. Business has been steady in recent years, but it appears to be slowing, he said.

An estimated 18 million U.S. households have income-generating home offices, and some 16 million households bring home at least one hour's worth of work per week, said Ray Boggs, who directs the small business/home office market service at research firm BIS CAP International, Inc. "With the overlap, that makes 31 million households that have a compelling need for PCs," Boggs said. "Right now, only 20% to 30% of those households have PCs."

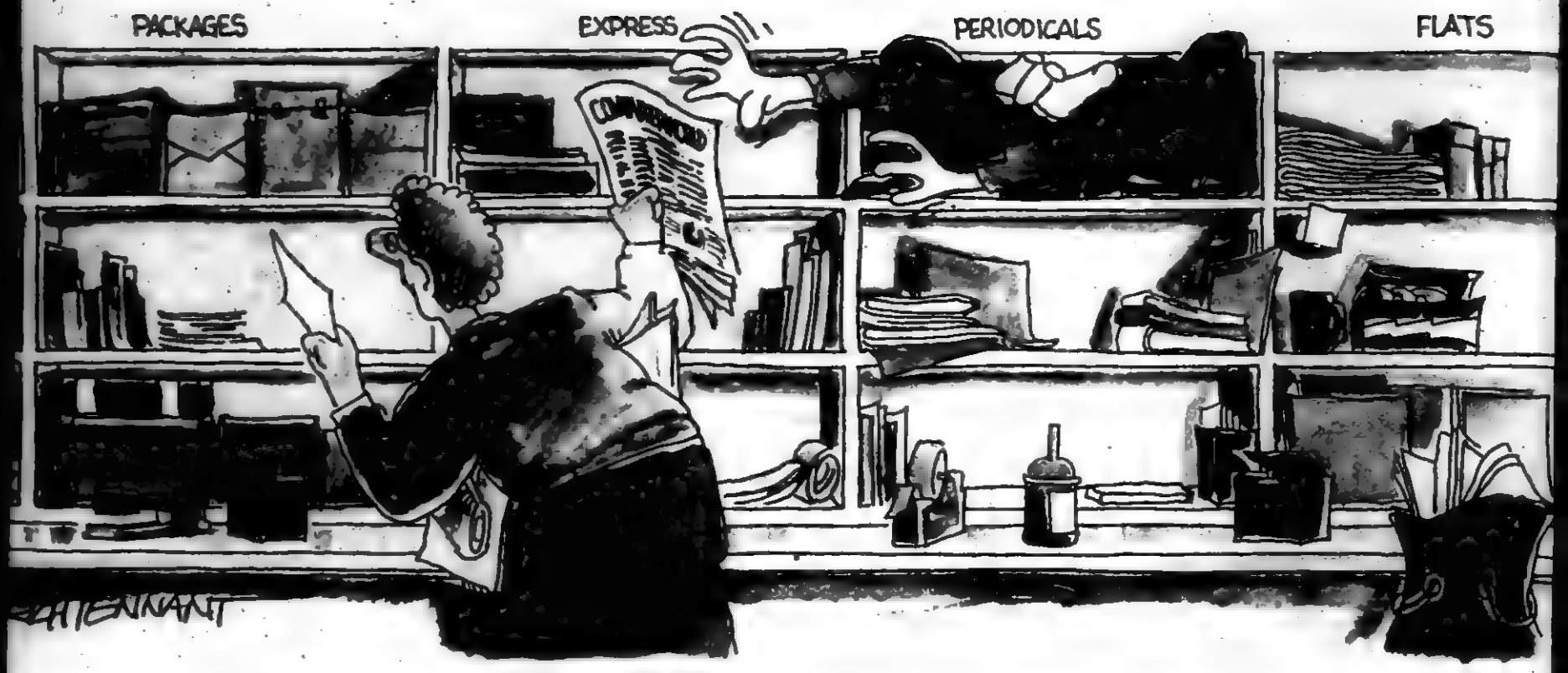
Pleased with the early acceptance of the Personal System/1, IBM last month broadened the distribution into Europe and Canada and introduced a companion $499 printer.

IBM said it sold "thousands" of the machines to home computer buyers in the first two months after the PS/1's June launch.

"New users — people who have never seen a computer outside of a video arcade" — make up the largest potential market for IBM's PS/1, according to James Cannavino, who heads IBM's personal systems business. Cannavino told a gathering of analysts this summer that he envisions "a computer in every kitchen."

Apple also expects to see its Macintosh in at least some of the estimated 93 million U.S. households. Earlier this month, Apple introduced a no-frills Macintosh dubbed the Classic with a suggested retail price of $999. The machine comes with 1M byte of random-access memory and a floppy disk drive. A Classic with 2M bytes of RAM and a 40M-byte hard disk drive is priced at about $1,500.

PC sales are showing signs of slowing, dropping from a 14% growth rate in 1988 to less than 10% this year, according to International Data Corp., a market research firm in Framingham, Mass. The home market, if one really exists, could help reverse the downward sales spiral, at least for a few years, analysts said.



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COMPUTER CAREERS

Job hunting? Consider searching on-line

BY KRIS HERBST
SPECIAL TO CW

The number of on-line, computerized employment services is growing, despite the fact that many job seekers and employment professionals continue to use traditional methods to find a job or fill a vacancy. Representatives of computerized employment services say they are optimistic about the future, after having observed and learned from the mistakes of their predecessors — such as charging users for the service, for instance.

Electronic employment services use computers to store, retrieve and search job listings and resumes of job seekers from all walks of life. The diversity of these services is impressive; they offer an intriguing array of employment databases ranging from computer specializations to placement of the disabled to placement of ex-military personnel, according to Gayle Taylor, an editor of Cuadra Associates, Inc.'s "Directory of On-line Databases" in Los Angeles.

One driving force is the changing nature of the economy, which encourages the use of nationwide computerized databases: Rolling recessions that hit different industries and regions of the country at different times, along with shifts in the types of job skills now in demand because of technological advances and global trade pressures, have caused a certain amount of job churning.

Also, the relatively low cost of using an on-line service is appealing to John Reche, president of Polycon Corp. in Tempe, Ariz., he says. "For one thing, you're not paying for somebody who doesn't do much other than give you someone else's name. "Charging 30% [of the initial year's salary] for a guy's yearly fee for that is a little exorbitant."

Some systems, such as one used by Career Technologies Corp. in Londonderry, N.H., allow employees to screen prospective employers before applying for a job by providing company profiles that give detailed information in categories such as working conditions and the financial health of the company.

Other advantages offered by electronic services include the following: employers don't have to maintain a large inventory of resumes; information can remain on a system for months at a time, whereas newspaper advertisements have a very short duration; and electronic screening using a standard format discourages job discrimination.

The Career Placement Registry, Inc., a subsidiary of IFI Plenum Data Corp. in Alexandria, Va., provides a general-purpose resume service on Dialog Information Services, Inc.'s on-line database. In an average month, it is accessed by 500 corporations that are looking for job candidates, according to Harry Allcock, vice-president of the Registry.

In 1981, IFI Plenum was one of the first firms to enter the on-line employment business. At that time, it already had a large database of patent applications available on Dialog. However, acceptance of the Registry's system was much slower than expected, Allcock says: "In the early '80s, there were seven or eight firms that spent several millions trying to compete with us, and all of them in turn failed."

John Hawkins, president of Human Resources Information Network (HRIN), concurs: "Everybody who has gotten into the business of resume databases during the past five or six years has failed or met with marginal success, to say the best." However, he adds, HRIN watched for what it believed were the mistakes and tried to learn from them.

Possibly the biggest stump in the electronic employment path is tradition. On-line employment firms will have to displace universally accepted and well-entrenched traditional methods. The newspaper advertising bureau estimates that employers pay $3 billion per year to obtain resumes by placing employment classified ads, notes Becky Van Winkle, a marketing representative for HRIN.

"Since the Civil War days, there have been only two traditional sources of employment information: the employment agency and newspaper classified ads," notes Steve Johnson, a career consultant for Behavioral Images, Inc. in Bloomington, Ind., an outplacement firm that uses both electronic and traditional employment services.

Employment and career professionals' fears that computers will oust them from their jobs is another major obstacle. When representatives from the Registry first tried to meet with employment professionals, Allcock says, "The comment was we are replacing people with a computer. So we decided we have to do it on our own."

The Registry's strategy was to offer its service on Dialog, which allowed it to tap the large pool of clients, many from large, well-funded corporations that could already access IFI Plenum's patent service on Dialog. These potential customers already had Dialog passwords and didn't require training to understand on-line database searching.

In 1987, Jobnet, Inc. in Readstown, Wis., began offering a job listing and resume service called Employers' Jobnet via Compuserve, Inc.'s on-line service. "For a number of years, we tried to market this to the employment services placement people, and there was a great reluctance on their part to go computer," says Carl Poole, president of Jobnet. Faced with this rejection, Jobnet hired The Boeing Co. to create a sophisticated, user-friendly database system accessible to any job seeker or company recruitment officer who has a computer equipped with a modem.

Another problem is getting a sufficient volume of job or prospective employee listings, according to Allcock. Some firms tried to charge job seekers for listing their resumes on a system, but this discouraged large numbers of users from signing up.

Despite the painful lessons learned, most of the companies that have kept their heads above water, as well as users of these systems, are optimistic. "I think you are going to find that on-line information services are going to be the wave of the future," says Tom Price, vice-president of job development for Drake Beam Morin, Inc., a New York-based outplacement firm.

"We have invested a lot of money and time on the premise that employer recruitment is going to go electronic in the '90s," Poole says. "The question is, how rapidly is it going to go?"

Herbst is a free-lance writer based in Washington, D.C.

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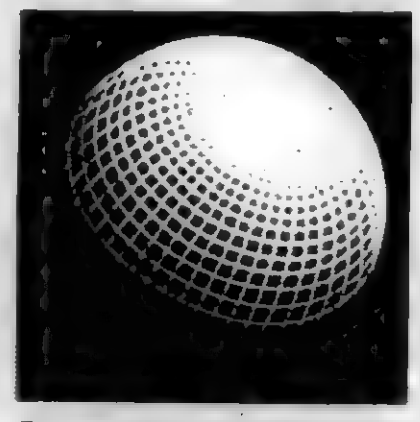

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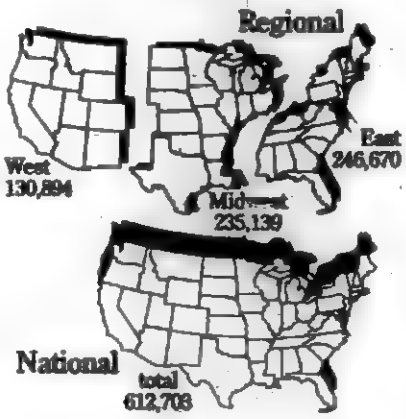

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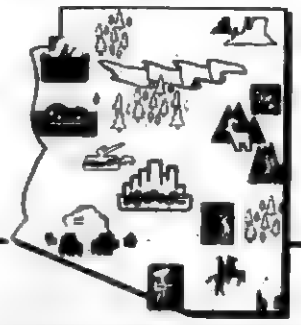

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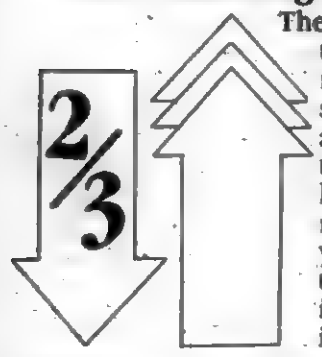
A few important tips on recruiting computer professionals

Finding computer talent isn't as easy as it used to be. In fact, there was a time when you'd just run an ad in the local newspaper and you could make a hire without waiting too long or spending too much.

But times have changed. And like so many facets of today's business, so has the effectiveness of traditional recruiting methods.

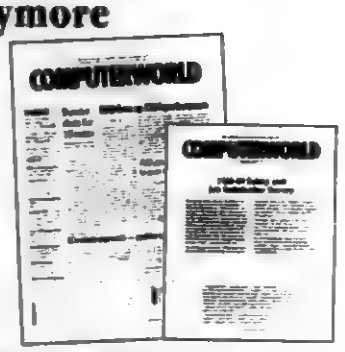
What's more, many of today's recruiters *don't use* today's most efficient methods — methods that save time and money for some widely unknown reasons.

The supply of qualified professionals isn't meeting demand



The American Council on Education reports that the number of college students choosing computer careers is down two-thirds since 1982. To make matters worse, there are more computers in today's business that require the skills of this shrinking market than ever before. And while you may never consider the company next door your competitor, it likely *is* competing for the same computer talent today. The result is a classic supply/demand problem that isn't changing for the better -and that's sure to make your recruiting tougher in the '90s.

Ads in local papers don't reach your major hiring market anymore



That's because they generally reach "active" job seekers — those who actively seek out the local newspaper to find jobs — and who a recent *Computerworld* job satisfaction survey found to represent 2 in 10 of today's computer professionals. The study also found that 7 in 10 of today's computer professionals are "passive" job seekers — those who would *consider* new job options, but likely never look for them in the local newspaper. (The remaining small percentage are "non-movers" content with long-term jobs.)

For every 10 of today's computer job seekers . . .
2 are Active
7 are Passive
1 is a Non-mover

In short, this means that your ad in today's local newspaper reaches no more than 20 percent of today's computer job seekers. What's worse, if you're not using other vehicles that reach far more job seekers, your local newspaper expenses are as inefficient as their limited audience.

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Computerworld needs just 3 working days for your ad to appear

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Computerworld costs no more than local papers

And with a regional line rate of just $10.80, your cost-per qualified candidate reached is better than *any* newspaper - Sunday, daily or trade. Or just about any other source, for that matter.

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Just look at this week's Computer Careers section. You'll find a career editorial topic that will stir the interest of virtually any computer job seeker — passive *or* active. It's just one of countless reasons *Computerworld* is America's newspaper of choice on computing. No matter how much the times change.

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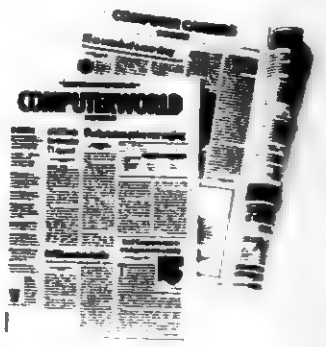
For more recruiting tips, call John Corrigan, Vice President/Classified Advertising, at 800/343-6474 (in MA, 508/879-0700).



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Superstores muscling in on resellers' territories

BY ALICE LAPLANTE
SPECIAL TO CW

Just as mom-and-pop grocery stores shudder when large supermarket chains move into their neighborhoods, traditional personal computer resellers flinch when a 30,000-sq-ft Soft Warehouse or Micro Center sets up shop nearby.

Called "category killers" because of their propensity to ruthlessly eliminate less-efficient competitors, computer superstores deliver the largest selection of hardware, software and peripherals at the lowest possible cost to the buyer.

"What is happening in our industry is an accelerated microcosm of what has happened in virtually all other industries," says Seymour Merrin, president of Information Resources in Palo Alto, Calif.

The basic premise of a superstore is identical, regardless of the type of product sold. A large warehouse is filled with every imaginable product from virtually every vendor in the business.

Because of low overhead costs and tightly controlled inventory, superstores offer substantial savings to their customers, ranging from 40% to 80% off retail prices. Even for the heavily discounted PC industry, these are numbers to be reckoned with.

Superstores also market aggressively, spending tens of millions of dollars in advertising campaigns designed to get consumers into the stores and spur them into as much of a buying frenzy as is possible. Again, such a strategy has more in common with tactics used by mass merchandisers such as Sears, Roebuck and Co. and K Mart Corp. than Businessland, Inc. Computerland Corp. or Microage, Inc. — but it is working, nonetheless.

"The traditional computer store is no longer feasible," says Rob Howe, marketing vice-president at Computer Bay, a Milwaukee-based franchiser of PC retailers. Computer Bay franchisees have seen a major impact on their business when superstores have moved into their markets.

Superstores expand

Currently, no one superstore chain dominates coast to coast. Soft Warehouse, based in Dallas, is the most rapidly expanding organization, with 13 stores currently open and 20 more slated for opening by the end of 1991; Micro Center, based in Columbus, Ohio, now has three superstores; and Silicon Valley superstore pioneer Fry's Electronics just opened its third superstore in Palo Alto, Calif., and is expected to venture out of the Northern California region soon.

Computer resellers have seen the writing on the wall for some time. Long gone are the days when corporate customers would buy all their PCs, applications software, printers, cables and disks from one location. Fierce discounting has put many dealers in untenable financial positions. To meet competition, they have to cut prices but still stay in business; to stay in business, they need to sell more equipment; to sell more equipment, they need to cut prices even further.

A look at the once-flourishing Businessland is a case in point. Once one of the country's largest and most successful resellers, Businessland has lately fallen on hard times, reporting a $21.5 million loss last quarter [CW, Aug. 13] and laying off 10% of its work force a month later.

All is not lost

It is possible for a reseller to survive without going the superstore route. Dataflex Corp., a value-added reseller based in Edison, N.J., concentrates on providing Fortune 1,000 companies in the New York metropolitan area with a wide range of products and services. Richard Rose, president and chief executive officer of Dataflex, says that if a customer is only interested in the lowest price, he walks away from the sale. "We decided eight months ago that we didn't want to compete in that market," Rose says. Dataflex managed to boost its net income for the quarter ending June 30, 1990, by 45% over the corresponding quarter last year, while its total revenue grew only 5%.

Merrin calls reseller outfits such as Dataflex "boutiques" because they appeal to a certain kind of corporate customer — one that is willing to pay the price for significant value-added services. However, although many reseller chains have paid lip service to that idea, few actually deliver. Merrin and others believe that when the dust settles in the PC reseller channel, there will be two kinds of survivors: superstores and boutiques.

Superstores have not yet completely won the battle. Many such organizations suffer from the stigma of not carrying the "Big Three" computer names dear to the hearts of corporate America: IBM, Compaq Computer Corp. and Apple Computer, Inc.

All three vendors, which rely heavily on their authorized resellers, are loath to offend their own resellers by endorsing what are, in effect, discount houses. However, Merrin and others predict that this will change shortly. "As their own dealers start dying off, they will have no choice," Merrin said.

Furthermore, superstores are criticized as being oriented to the individual consumer rather than the corporate customer. Proponents of this view argue that corporations require much more sophisticated services than superstores could hope to provide.

The superstores themselves argue that there shouldn't be a mystique about their success. "Anyone who has a good relationship with their customer doesn't have to worry about us," says Soft Warehouse President Nathan Morton, a former executive of do-it-yourself building supply superstore Home Depot.

LaPlante is a free-lance writer based in Palo Alto, Calif.

Buy/Sell/Lease

The BoCoEx index on used computers

Closing prices report for the week ending October 19, 1990

	Closing price	Recent high	Recent low
IBM PC Model 176	$325	$660	$200
XT Model 086	$450	$550	$350
XT Model 089	$500	$725	$400
AT Model 099	$600	$1,075	$500
AT Model 239	$775	$1,025	$700
AT Model 339	$925	$1,300	$900
PS/2 Model 30-286	$1,250	$1,300	$1,125
PS/2 Model 60	$1,500	$1,800	$1,400
PS/2 Model 70P	$3,375	$3,400	$3,175
Compaq Portable II	$975	$1,050	$875
Portable 286	$1,275	$1,450	$1,100
SLT 286	$2,600	$2,625	$2,000
Portable 386	$2,600	$3,000	$2,500
LTE 286	$2,000	$2,100	$1,850
Deskpro 286	$1,375	$1,400	$1,200
Deskpro 386/20	$2,900	$3,100	$2,400
Apple Macintosh Plus	$750	$1,075	$700
SE	$1,250	$2,050	$1,200
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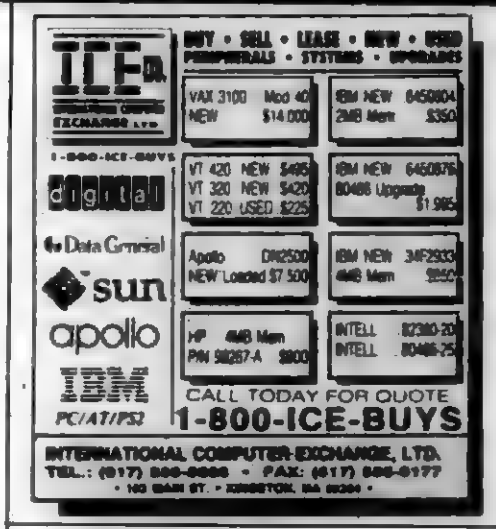

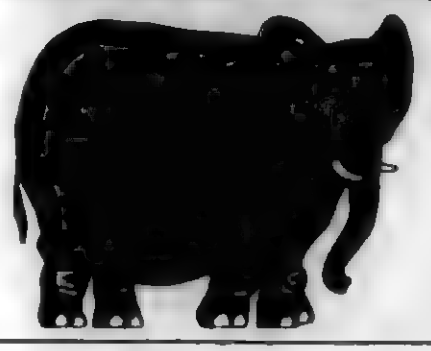

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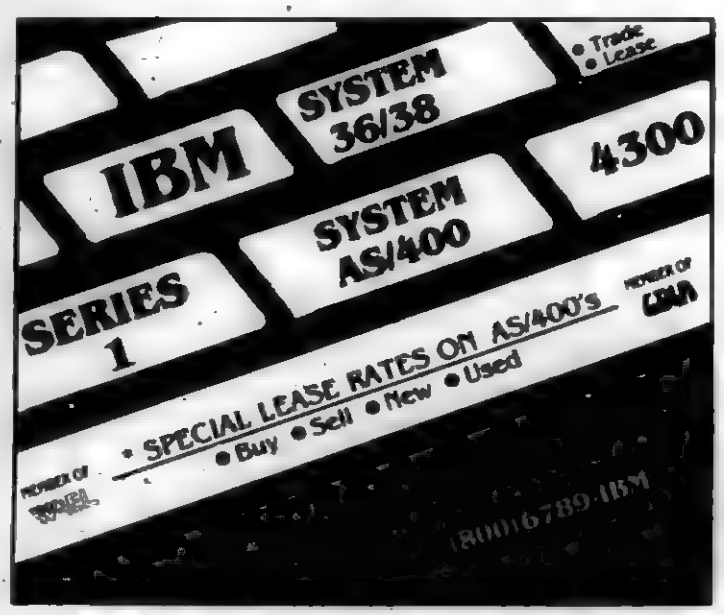

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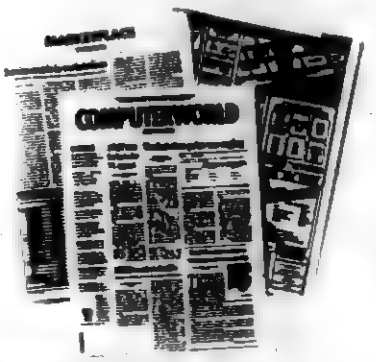

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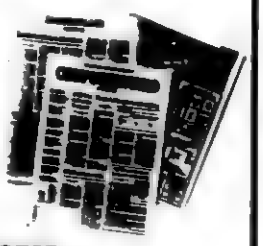

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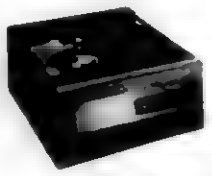

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How you play the game

Content- or skill-based methods: The choice depends on the goal

BY JOEL RAKOW
SPECIAL TO CW

Most people don't need to know how a combustion engine works to drive a car. Similarly, most users don't need to know the details of how a system or program works; they just want to put it into gear and go.

On the other hand, auto mechanics certainly need to know the ins and outs of combustion engines. It is necessary that neural network programmers understand all about that technology before daring to "drive" the applications. In the simplest terms, training boils down to what a particular person needs to know to do his job.

Information systems managers can steer their users and staff members in the right direction by deciding which approach is best for each training circumstance.

Two categories that can act as a cover-all in training techniques are content-based training (designed to teach knowledge) and skill-based training (designed to teach skills).

Content-based training

Content-based training is commonly used in schools. Its goal is theoretical knowledge and understanding of the subject. Because content-based training primarily teaches knowledge, sometimes there is a long period before the student is able to apply that knowledge in a work situation.

Content-based training is ideal for settings in which it has not yet been determined how the information will be implemented. For example, someone being trained to become a manager will have to imagine how to implement the knowledge in unknown situations and under unknown circumstances. Content-based training arms that individual with the information necessary to make educated decisions.

Skill-based training

In contrast, skill-based training is the best approach for learning specific skills for a specific job. For example, if a manager of billing clerks needs to learn a spreadsheet package that evaluates the efficiency of his department, the skills needed can be taught quickly with a skill-based method because the task at hand is well defined.

With skill-based training, the action is placed at the front of each training episode and the explanation at the rear. Thus, a task that might take days to learn with a content-based approach might be learned in hours with a skill-based method (see story this page).

Conceptual explanations require approximately 40% fewer words in skill-based training than in traditional content-based training because the explanation follows the experience. By using fewer words and putting the action before the explanation, the rate of learning increases, and the opportunity for misunderstanding and confusion decreases.

Training grounds

At least half the cost associated with computerizing an organization can be related directly to the cost of training. Thus, choices about skill- and content-based approaches should be made after careful consideration of the issues involved.

Six basic steps of selecting and implementing training are as follows:

- Define the training need, including the content and target audience.
- Identify the minimum performance levels necessary to achieve management goals. Separate the "nice to know" points from the "need to know." Select only the "need to know" for the initial training objectives.
- Establish whether a skill-based or content-based approach will best meet your goals, and prioritize training media, from the most desired to the least favored.
- Survey potential vendors of off-the-shelf training products in the desired media. Consider the development of customized training if products don't exist.
- Select and implement training, making sure that management is included to ensure that the new skills will be used in the workplace following the training.
- Monitor the use of the newly learned skills after instruction.

Case study

Harvard Business School conducted an informal case study comparing skill- and content-based training for learning a specific computer application program.

Professionals who had no previous experience with computers were divided into two groups and given a problem to solve with a spreadsheet program. One group was given a skill-based program designed to teach them to use the spreadsheet program; the other group was given a similar content-based program.

The skill-based group came back with the problem solved in 4½ hours, and the content-based group came back with the problem solved in 8 hours.

Everybody was able to solve the problem, even though they had no prior computer experience and had been given a relatively sophisticated problem. The only difference was that one group accomplished the task in less time.

Used effectively, training — whether skill- or content-based — can be a potent tool to close the technology gap and squeeze that last bit of operating effectiveness out of an organization.

Rakow is the founder and president of Los Angeles-based American Training International, or ATI, a publisher of computer-based tutorials for application software.

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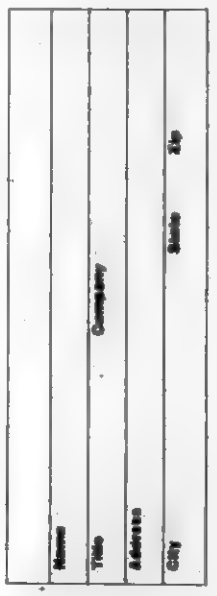

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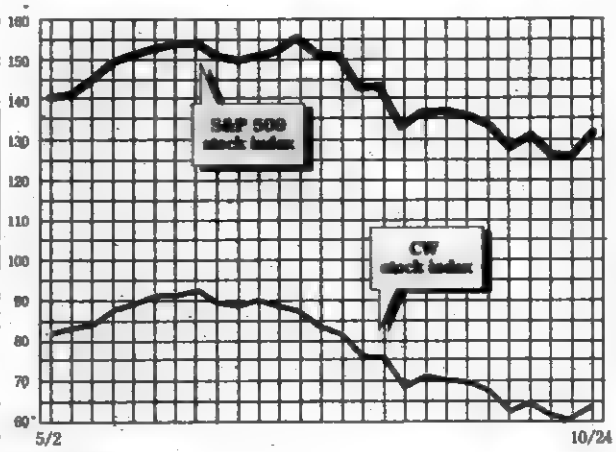

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Semiconductors	35.5	37.6
Peripherals & Subsystems	65.6	70.8
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Composite Index	60.5	64.2
S&P 500 Index	126.2	132.0

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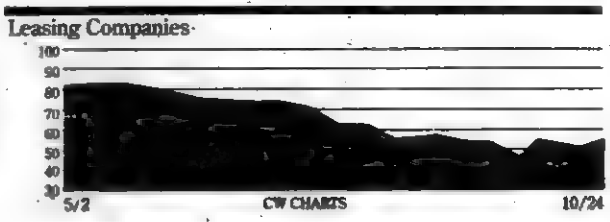

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Communications and Network Services

EXCH		52-WEEK RANGE		PRICE CLOSE OCT. 24, 1990	WEEK NET CHANGE	WEEK PCT CHANGE
N	AMERICAN INFO TECHS CORP	66	53	65.75	2.3	3.6
Q	ANDREW CORP	35	18	17.25	0.8	4.5
Q	ARTEL COMM CORP	10	2	2.125	0.1	5.3
N	AT&T	47	30	33.375	2.8	8.1
Q	AVANTEK INC	5	2	1.75	0.1	3.7
N	AYDIN CORP	20	10	10.5	0.0	0.0
N	BELL ATLANTIC CORP	57	40	51	1.8	3.6
N	BELLSOUTH CORP	59	46	52	0.0	0.0
Q	COMPRESSION LABS INC	16	7	14.5	2.4	19.6
Q	CONTEL CORP	36	23	34	1.1	3.4
Q	DATA SWITCH CORP	4	2	3	0.1	4.3
Q	DIGITAL COMM ASSOC	27	9	9.5	0.3	2.7
Q	DYNATECH CORP	19	12	14.25	2.0	16.3
Q	FIBRONICS INTNL INC	13	5	8	1.5	23.1
Q	GANDALF TECHNOLOGIES	6	3	2.375	0.0	0.0
N	GENERAL DATACOMM INDS	5	2	2	-0.1	-5.9
N	GTE CORP	36	34	28.5	1.1	4.1
Q	INFOTRON SYS CORP	10	2	1.75	-0.3	-12.5
N	ITT CORP	61	40	44.625	3.5	8.5
N	M A COM INC	6	3	4.375	0.3	6.1
Q	MCI COMMUNICATIONS CORP	48	28	31.125	1.5	5.1
N	NETWORK EQUIP TECH INC	34	5	5.875	0.0	0.0
Q	NETWORK SYS CORP	15	7	8.25	-0.5	-5.7
N	NORTHERN TELECOM LTD	30	21	25.625	2.9	12.8
Q	NOVELL INC	29	12	24	3.1	15.0
N	NYNEX CORP	92	68	70.625	-0.5	-0.7
N	PACIFIC TELESIS GROUP	52	38	44.5	0.5	1.1
A	PENRIL CORP	9	5	5.875	1.1	23.7
N	SCIENTIFIC ATLANTA INC	29	12	13.625	-1.1	-7.5
N	SOUTHWESTERN BELL CORP	65	47	53.5	-0.1	-0.2
Q	3 COM CORP	19	5	5.75	-0.9	-13.2
N	U S WEST INC	41	32	37.625	1.8	4.5

Computer Systems

EXCH		52-WEEK RANGE		PRICE CLOSE OCT. 24, 1990	WEEK NET CHANGE	WEEK PCT CHANGE
Q	ALLIANT COMPUTER SYS	5	1	1.875	0.4	25.0
Q	ALPHA MICROSYSTEMS	5	1	1.875	0.4	25.0
A	AMDAHL CORP	19	10	11	-0.5	-4.3
Q	APPLE COMPUTER INC	48	24	30.5	4.0	15.1
Q	AST RESH INC	26	9	20	3.5	21.2
N	BOLT BERANEK & NEWMAN	8	4	5.125	0.5	10.8
N	COMPAQ COMPUTER CORP	48	26	47.5	8.8	22.8
N	COMMODORE INTNL	12	5	6.375	0.5	8.5
Q	COMPUTER AUTOMATION INC	0	0	0.813	0.0	0.0
N	CONTROL DATA CORP	22	8	9.625	1.8	20.3
N	CRAY RESH INC	51	20	24.875	1.4	5.9
N	DATA GEN CORP	14	4	5	0.4	8.1
N	DATAPOINT CORP	5	1	1.375	0.0	0.0
Q	DELL COMPUTER CORP	14	5	11	1.3	12.8
N	DIGITAL EQUIP CORP	95	48	51.75	5.0	10.7
N	FLOATING POINT SYS INC	4	0	1.375	0.0	0.0
N	HARRIS CORP	26	15	16	0.6	4.1
N	HEWLETT PACKARD CO	51	28	29.375	1.6	5.9
N	HONEYWELL INC	112	71	83.75	8.0	10.6
N	IBM	123	93	108.625	7.9	7.8
Q	INFORMATION INTL INC	14	9	9.75	-0.3	-2.8
Q	IPL SYS INC	14	8	9.5	1.3	15.2
N	MAI BASIC FOUR INC	4	1	1.5	0.3	20.0
N	MATSUSHITA ELEC INDL LTD	165	116	141	-7.0	-4.7
Q	MENTOR GRAPHICS CORP	26	9	10	-0.7	-1.2
N	MSI INC	1	0	0.172	0.0	22.0
N	NCR CORP	72	45	51.25	5.1	13.8
Q	PYRAMID TECHNOLOGY	36	15	18.5	2.5	15.6
Q	SEQUENT COMP SYS INC	34	13	18.75	-1.3	-8.9
Q	SUN MICROSYSTEM INC	57	15	15.75	-5.8	-26.7
Q	SYMBOLICS INC	2	0	0.25	-0.1	-20.1
N	TANDEM COMPUTERS INC	20	10	12	1.1	10.3
N	TANDY CORP	44	24	25.125	0.0	0.0
N	ULTIMATE CORP	10	3	3	-0.3	-7.7
N	UNISYS CORP	18	3	3.5	-0.3	-8.7
A	WANG LABS INC	6	3	3.125	0.3	8.7

Software & DP Services

EXCH		52-WEEK RANGE		PRICE CLOSE OCT. 24, 1990	WEEK NET CHANGE	WEEK PCT CHANGE
Q	AMERICAN MGMT SYS INC	20	11	14.875	0.9	6.3
Q	AMERICAN SOFTWARE INC	18	8	9.875	1.5	17.9
N	ANACOMP INC	5	1	2.25	0.9	63.6
Q	ANALYSTS INTL CORP	24	10	12.5	1.0	8.7
Q	ASHTON TATE	15	5	7.375	0.5	7.3
N	AUTO DATA PROCESSING	60	44	51.125	2.3	4.6
Q	AUTODESK INC	60	32	41	5.3	14.7
Q	BMC SOFTWARE INC	30	16	23	3.8	19.5
N	BUSINESSLAND INC	12	1	1.625	-0.4	-18.8
Q	COGNOS INC	10	4	6.75	1.3	22.7
N	COMPUTER ASSOC INTL INC	17	4	7.125	1.5	26.7
Q	COMPUTER HORIZONS CORP	17	8	12.5	0.8	6.4
N	COMPUTER SCIENCES CORP	60	37	40.5	2.3	5.9
N	COMPUTER TASK GROUP INC	12	8	7.875	-0.3	-3.1
Q	COMSHARE INC	25	14	17.75	2.3	14.5
Q	CORPORATE SOFTWARE	16	5	5.5	-1.0	-15.4
N	GENERAL MTRS (CLS E)	38	24	34.5	1.8	5.2
Q	GOAL SYSTEMS INTL	18	10	9.75	0.3	2.6
Q	HOGAN SYS INC	7	2	2.25	-0.3	-10.0
Q	INFORMIX CORP	18	4	4.375	-1.0	-18.6
Q	INTELLICORP INC	8	2	2.125	0.1	6.3
Q	LEGENT CORP	31	17	19.75	2.5	14.5
Q	LOTUS DEV CORP	30	19	15.25	0.8	5.2
Q	MICROSOFT CORP	91	38	65.375	8.9	15.7
Q	NATIONAL DATA CORP	28	8	9.125	0.4	4.3
N	ON LINE SOFTWARE INTL INC	11	4	4.25	-0.4	-8.1
Q	ORACLE SYS CORP	188	5	8	-0.1	-2.0
N	PANSOPHIC SYS INC	19	8	7.875	-0.1	-1.8
Q	PHOENIX TECHNOLOGIES INC	8	2	1.875	0.0	0.0
N	POLICY MGMT SYS CORP	43	30	39	5.0	14.7
Q	PROGRAMMING & SYS INC	25	11	11.5	-2.3	-16.4
Q	RELATIONAL TECH INC	10	3	9.125	0.5	5.8
N	REYNOLDS & REYNOLDS CO	27	12	13	0.9	7.2
Q	SAGE SOFTWARE INC	16	8	12	2.4	24.7
Q	SEI CORP	22	15	16.5	1.3	8.2
Q	SHARED MED SYS CORP	17	12	15.375	0.0	0.0
Q	SOFTWARE PUBG CORP	28	14	16	-0.8	-4.5
N	STERLING SOFTWARE INC	11	6	7.125	0.4	5.6
Q	SUNGARD DATA SYS INC	28	11	10.75	-4.3	-28.3
N	SYSTEM CENTER INC	25	6	6.375	-0.1	-1.5
N	SYS. SOFT INC	29	13	19	2.3	13.4
Q	WORDSTAR	2	1	0.813	0.0	0.0

Semiconductors

EXCH		52-WEEK RANGE		PRICE CLOSE OCT. 24, 1990	WEEK NET CHANGE	WEEK PCT CHANGE
N	ADV MICRO DEVICES INC	11	4	4	0.3	8.7
N	ANALOG DEVICES INC	10	6	6.875	0.1	2.2
Q	ANALOGIC CORP	10	6	6.375	0.1	1.5
Q	CHIPS & TECHNOLOGIES INC	24	5	6	0.0	0.0
Q	INTEL CORP	52	28	35	3.0	9.4
Q	MICRON TECHNOLOGY INC	16	7	7.875	0.5	6.8
N	MOTOROLA INC	88	61	64.375	0.4	0.7
N	NATL SEMICONDUCTOR	9	3	3.75	0.6	20.0
N	TEXAS INSTRS INC	44	22	24.875	0.5	2.1
A	WESTERN DIGITAL CORP	15	5	6	0.8	14.3

Peripherals

EXCH		52-WEEK RANGE		PRICE CLOSE OCT. 24, 1990	WEEK NET CHANGE	WEEK PCT CHANGE
Q	ALLOY COMP	2	0	0.625	0.3	88.7
N	AM INTL INC	6	1	1.25	0.0	0.0
Q	AUTO TROL TECH CORP	4	2	2.25	0.3	12.5
Q	BANCTEC INC	24	12	11.5	-1.8	-13.2
A	CDC INTRONICS CORP	8	3	5.125	-0.9	-14.6
Q	CONNER PERIPHERALS	31	11	23.5	6.4	37.2
A	DATARAM CORP	22	8	8.25	-0.9	-9.8
N	EASTMAN KODAK CO	45	34	39.875	2.8	7.4
N	E M C CORP MASS	7	3	8.75	0.8	12.5
Q	EMULEX CORP	9	4	4.875	-0.3	-4.9
Q	EVANS & SUTHERLAND	35	18	18	-0.3	-1.4
Q	IDOT CORP	2	0	0.438	0.1	16.8
Q	INTERLEAF INC	8	3	3.25	-0.3	-7.1
Q	IOMEGA CORP	8	3	4.438	0.3	6.9
Q	MASSTOR SYS CORP	9	1	0.562	0.0	0.0
Q	MAXTOR CORP	17	4	4.813	-0.3	-6.1
Q	MICROPOLIS CORP	10	3	6	0.8	14.3
N	MINNESOTA MNG & MFG CO	91	71	78.25	3.1	4.2
Q	PERSONAL COMP PRODUCTS INC	5	4	3.625	-0.1	-1.7
Q	PRINTRONIX INC	15	8	8	1.6	25.5
N	QMS INC	21	9	13.5	3.4	33.3
Q	QUANTUM CORP	38	9	16.5	4.0	37.6
N	RECOGNITION EQUIP INC	8	4	5	0.0	0.0
Q	REXON INC	10	4	5.75	1.8	42.8
Q	SEAGATE TECHNOLOGY	20	8	7.5	1.4	22.4
N	STORAGE TECH CORP	36	11	15	1.5	11.1
Q	TANDON CORP	4	1	1.875	0.2	11.1
N	TEKTRONIX INC	19	12	15.5	0.6	4.2
Q	TELEVIDEO SYS INC	1	0	0.313	0.1	25.2
N	XEROX CORP	63	30	30.625	-0.1	-0.4

Leasing Companies

EXCH		52-WEEK RANGE		PRICE CLOSE OCT. 24, 1990	WEEK NET CHANGE	WEEK PCT CHANGE
N	CAPITAL ASSOC INTNL INC	5	1	1.063	0.3	41.7
N	COMDISCO INC	31	15	16.375	0.1	0.8
Q	LDI CORPORATION	18	11	10.625	0.1	1.2
Q	PHOENIX AMERN INC	5	3	4.813	0.0	0.0
Q	SELECTERM INC	7	3	3.5	0.0	0.0

EXCH: N—NEW YORK; A—AMERICAN; Q—NATIONAL

High-low

Increased profits do not always lead to higher tech stock prices

You can't please everybody. That maxim was never more tried or true than it was last week when Sun Microsystems, Inc. released its quarterly earnings figures. Despite the fact that the firm quintupled its profits, investors still went away mad — and stomped the stock down 4¾ points in the process. By Thursday, Sun closed at 16¾, near its 52-week low of 15.

The onslaught of quarterly financials jolted into action what had been a listless market for some tech stocks, a crash course in bottoming out for others. The one-two punch of new midrange machines last week and positive earnings reports the week before made heavyweight Digital Equipment Corp. a winner. DEC picked up 3¼ points to close Thursday at 53. Opponent IBM waffled during the week, finally gaining ½ of a point to close at 108⅛.

Unisys Corp. dealt Wall Street a heavy blow in the form of yet another quarterly loss. Although its income improved, Unisys did not fulfill its earlier prediction of a profitable third quarter. This, coupled with the resignation of chairman Michael Blumenthal, pushed Unisys stock down ⅜ of a point to a new low of 3⅛.

Motorola, Inc. evidently bewitched investors with its wireless radio technology as it shot up 2½ points to 53⅜ (see story page 12). Intel Corp. slipped ⅛ points to 34½, while Advanced Micro Devices, Inc. inched up ⅛ of a point to 4⅛.

Elsewhere, Computer Associates International, Inc. posted a threefold profit increase, kicking its share price up a point to 6⅛. Microsoft Corp. added 2⅜ points to 64⅝, and Lotus Development Corp. gained ½ of a point to close at 15½.

MCI Communications Corp. soared 2⅛ points to 30⅝, recovering exactly those points lost after its disappointing financial news the week before last.

KIM S. NASH

PACs

FROM PAGE 1

Matsui, Norman Y. Mineta (D-Calif.) and Sen. Max Baucus (D-Mont.), as well as key committee chairmen.

Matsui's corporate benefactors came from all segments of the industry, including Motorola, Inc., Electronic Data Systems Corp. and Hewlett-Packard Co. "He's the kind of Democrat we like to see on the [House] Ways and Means Committee," said Mary Dee Beall, PAC manager at HP in Palo Alto, Calif.

Among the top recipients of computer PAC funds is Rep. John Conyers Jr. (D-Mich.), who oversees federal computer procurement policies as head of the House Government Operations Committee.

In the Senate, another political force is at work. There, several industry PACs are backing Republicans in hopes of switching that chamber to GOP control someday soon. The business community generally feels that a Republican-controlled Senate could put the brakes on any anti-business legislation coming out of the Democratic-controlled House of Representatives.

Consequently, computer industry PACs are backing all of the Republican incumbents in the Senate as well as GOP challengers Claudine Schneider in Rhode Island and Lynn Martin in Illinois.

"We feel that legislation gets a better hearing when it has to go through a two-party system," Beall said.

The top recipient is Sen. John Warner (R-Va.), who received $20,375 from computer industry PACs — although he had no significant opposition this election. Lobbyists explained that Warner is the top Republican on the Senate Armed Services Committee, very accessible and the "local senator" for the industry's government relations offices in northern Virginia.

Other highlights of the study include the following:

- The biggest PAC in the computer business is run by Dun & Bradstreet Corp., which has one foot in the software industry and the other in the information services industry.
- Many of the industry's smaller PACs, such as those run by Microsoft Corp., Storage Technology Corp. and Tektronix, Inc., focused their contributions on the congressional delegation of their home state.
- PACs sponsored by Dun & Bradstreet, Motorola and Xerox Corp. have a historical pattern of favoring Republicans.
- An up-and-comer is Rep. Tom Campbell (R-Calif.), a freshman representing the district once held by Ed Zschau, who was immensely popular with high-tech industries and backed Campbell as his heir apparent. Campbell has already become a key GOP strategist on high-tech policy and received $7,150 in computer PAC money.

Overall, the computer industry's 21 PACs contributed nearly $611,000 directly to federal candidates from the start of the election cycle in January 1989 through September this year. That puts the industry on a par with car dealers but well below the million-dollar PACs run by the American Medical Association and the National Association of Realtors.

The computer industry's PAC totals are not any larger because several of the industry's biggest companies do not have PACs, including IBM, Digital Equipment Corp., Apple Computer, Inc., Computer Associates International, Inc. and the Computer and Business Equipment Manufacturers Association (CBEMA).

CBEMA's members "have just not thought it is worth the effort it takes to put one together, solicit the money and manage it," said Ted Heydinger, vice-president of government relations at CBEMA.

Others, such as the American Electronics Association and the Information Industry Association (IIA), had PACs in the mid-1980s but eliminated them. "Given the amount of administrative hassle required to fill out the paperwork, we got rid of it," explained Kenneth B. Allen, senior vice-president for government relations at the IIA.

Narrow field

Industry PACs are deluged with requests for money, so the PACs typically narrow the field of candidates by selecting those with favorable positions on industry issues, key leadership posts and constituents who are company employees, PAC managers said. Also, PACs tend to give larger amounts to candidates in a tough race, where the money might make a difference.

At HP, there is one more test for ethics and statesmanship, Beall said. PAC funds are denied if "we think he's been a sleazeball or an extremist," she said.

Michael C. Maibach, director of government affairs at Intel Corp., said the biggest determining factor for his semiconductor company is whether the candidate supports a "vigorous trade policy rather than a hands-off trade policy."

Most of the candidates heavily favored by the computer industry are incumbents expected to win re-election easily. The exceptions include GOP challengers Schneider and Martin, who are opposing Sens. Claiborne Pell (D-R.I.) and Paul Simon (D-Ill.), respectively. Industry lobbyists said they favor Schneider and Martin because they are more responsive to business.

However, PAC managers recognize that there are risks in backing a candidate who may be on the losing side. "We like to look for challenge situations which won't kill us one way or the other if we choose the wrong one," Beall said.

The high-tech industry went all out in support of Ed Zschau for the Senate in 1986, she noted, but Zschau lost narrowly to incumbent Sen. Alan Cranston (D-Calif.). Fortunately, "Cranston has continued to be very accessible to us," Beall said.

PAC it in

For the telecommunications industry, the hottest campaign by far is in low-tech Iowa, where the very close U.S. Senate race pits Republican Rep. Thomas J. Tauke against Democratic incumbent Sen. Tom Harkin. Tauke is the darling of the seven regional Bell holding companies for promoting legislation to lift the court-ordered restrictions on their business activities.

The result: Tauke has received a whopping $75,000 from telecommunications political action committees, mostly from regional Bell companies such as Nynex Corp., Pacific Telesis Group and Southwestern Bell Corp.

Not surprisingly, Harkin is backed by industry opponents of Tauke's bill; notably MCI Communications Corp., AT&T and the North American Telecommunications Association (NATA).

The telecommunications industry, still heavily influenced by Washington policymakers, is naturally more active in political campaigns than is the computer industry. Overall, 19 telecommunications industry PACs gave nearly $2.8 million to federal candidates through last month.

AT&T's PAC — the biggest corporate PAC in the U.S. — accounted for nearly $1.3 million of that total, and the regional Bell holding companies together accounted for approximately $796,000.

MITCH BETTS

Even Steven

Unlike the other computer PACs, the Computer Dealers and Lessors Association (CDLA) distributes the bulk of its PAC funds to the Republican and Democratic campaign committees, rather than doling out the funds directly to individual candidates.

"We have an ethical problem with giving to candidates who might help us down the road — so-called resting votes," explained William H. Sells, CDLA's director of government relations.

CDLA instructs the party campaign committees to distribute the money evenly to incumbents and challengers, Sells added, in order to give challengers a chance at unseating incumbents.

"If incumbents get all the money, they just keep getting elected over and over again. Some may deserve it . . . but the budget mess shows that incumbents are a little bit gun-shy about making the tough decisions. They keep getting elected, and they probably shouldn't be," he said.

MITCH BETTS

Top 5 recipients in the Senate and House

The top recipients of computer industry PAC contributions include pro-business candidates, particularly Republicans, and longtime friends in the House races

U.S. Senate

Candidate/ Profile	Total computer industry PAC contributions Jan. 1989 - Sept. 1990 (with top donors)
1 Sen. John Warner (R-Va.) Defense powerhouse; top Republican on the Senate Armed Services Committee. No Democratic opponent	$20,375 (DSD, Unisys)
2 Sen. J. Bennett Johnston (D-La.) Pro-business moderate; active member of Senate Appropriations Committee. Re-elected Oct. 6 in an open primary	$16,414 (CDLA, DSD)
3 Rep. Hank Brown (R-Colo.) Conservative GOP candidate for open Senate seat. Favored to win	$14,366 (DSD, Motorola)
4 Sen. Rudy Boschwitz (R-Minn.) Moderate Republican and champion fundraiser. Safe seat	$13,875 (DSD, EDS)
5 Rep. Claudine Schneider (R-R.I.) Friendly with high-tech industries; co-chairs the Congressional Competitiveness Caucus. Liberal Republican in uphill Senate race against Sen. Claiborne Pell (D-R.I.)	$12,516 (DSD, Motorola)

U.S. House of Representatives

1 Rep. Robert T. Matsui (D-Calif.) Champion of high-tech industry's tax and trade policies; chairs the House Ways & Means Committee's Subcommittee on Trade. Safe seat	$9,150 (Motorola, EDS)
2 Rep. Tom Campbell (R-Calif.) Freshman, becoming a key GOP strategist on technology policy. Safe seat	$7,150 (Intel, Motorola)
3 Rep. Les AuCoin (D-Ore.) Long-time friend of the semiconductor industry; district includes Mentor Graphics Corp., Intel and Tektronix facilities. Safe seat	$7,000 (TI, Intel)
4 Rep. John Conyers Jr. (D-Mich.) Chairman of the House Government Operations Committee, in charge of federal procurement. Safe seat	$6,250 (CSC)
5 (tie) Rep. Les Aspin (D-Wis.) Defense powerhouse; chairman of the House Armed Services Committee. Safe seat	$6,000 (IBM, Unisys)
5 (tie) Rep. Charles Wilson (D-Texas) Supported by Texas-based corporations. Safe seat	$6,000 (TI, EDS)

CDLA: Computer Dealers and Lessors Association
CSC: Computer Sciences Corp.
EDS: Electronic Data Systems Corp.

Sources: Federal Election Commission; Congressional Quarterly, Inc.

CW Chart: Tom Monahan

Tech execs hit campaign trail

BY JAMES DALY
CW STAFF

Computer company executives Dennis Thompson of California and Len Umina of Massachusetts have temporarily departed the corporate office to take on the political establishment. Both are long-shot, independent party candidates for the office of governor of their states in next week's elections.

For the past few months, both men have wrapped themselves in the flag instead of in mundane business concerns and have given the political trail a technological twist as they seek victory in next week's elections.

"I've been a programmer for 30 years, and if there's one thing writing millions of lines of code teaches you, it's that you have to be honest or you're going to get nailed in the end," said Thompson, who is president of Epicom, Inc., a software development house in San Diego.

Although they are a continent apart, Thompson and Umina, who develops new technologies at Digital Equipment Corp. in Maynard, Mass., share several personal and ideological traits.

Both hail from states closely linked with high technology, neither has held a political office, and both feel that the white line down the center of the road is about as much governmental interference as they can take. Most political analysts say that realistically, they have about as much chance of becoming governor as a ham sandwich does.

Thompson sees *himself as a 'spreader of ideas'*

Instead, in Thompson's own words, they view themselves as "spreaders of ideas."

The central tenet of both campaigns is that state government is a field of incompetence that has grown weedlike and needs to be hacked back.

"We've had enough of the patronage, we've had enough of the consultants, we've had enough of the corruption and mismanagement," said Umina, who leads the Independent High-Tech party ticket. "We don't want services cut — we want government cut."

Umina, 38, has proposed an ambitious watchdog approach to state government in which the Information Age wraps its arms snugly around the machinery of state politics.

His central plan calls for an elaborate technological hookup called Public Access Computerization in which government agencies are compelled to provide weekly updates of their goals and budgets.

The Public Access Computerization information would reside in a central mainframe repository in Boston that could be accessed via modem from either a home personal computer or a network of terminals at local public libraries. "Citizens get apathetic because they don't know what's going on," Umina said.

Umina said he does not expect every citizen to spend hours sifting through the reams of data such a system would generate, but the scores of localised investigations would cover enough ground to keep the service worthwhile and the politicans honest. Additionally, each voter would be mailed a yearly update on the state government — on an optical disc.

Umina feels *that citizens don't know what's going on*

Although Umina is a long shot, some of his messages appear to have struck a chord with state voters. *The Boston Globe* has already reported that Umina and running-mate Lawrence DeBerry are supported by 5% of the eligible voters.

Thompson's political agenda, on the other hand, bears little technological coloration but instead attacks what he considers to be the cause of America's slipping high-tech leadership: high business taxes.

The "star that would guide my ship of state," he said, would be the elimination of all business taxes.

"In truth, businesses don't pay these taxes — consumers do, through increased price," said Thompson, 51, who is the gubernatorial candidate for the state's 50,000-member Libertarian party.

Thompson said the elimination of these taxes would make the state's industrial goods and services much more desirable throughout the country and the world.

Adaptive prepares 45M-bit platform

BY ELISABETH HORWITT
CW STAFF

REDWOOD, Calif. — Founded a year ago to develop the next generation of switches for parent company Network Equipment Technologies, Inc. (NET), Adaptive is expected to justify its existence this week by announcing a high-end platform for 45M bit/sec. networking.

Adaptive Chief Executive Officer Audrey MacLean confirmed that the firm will introduce "broadband products for both the corporate user and carrier" that will support multiple 45M bit/sec. T3 links and provide the basis for future support of network industry standards such as broadband Integrated Services Digital Network and Synchronous Optical Network.

The products will also eventually support both switched multimegabit data service and frame relay.

NET and Adaptive are also expected to announce their intent to provide a network management system that would use Open Systems Interconnect's Common Management Information Protocol to manage NET switches and Simple Network Management Protocol to manage local-area network interconnectivity devices, a spokeswoman said.

Sears Technology Services, Inc. has "been working with Adaptive to take advantage of their first product in the T3 multiplexing environment," said Gary Weis, a senior vice-president at the Sears, Roebuck and Co. subsidiary. "They have shared their technology direction with us, and we feel comfortable with it," Weis added.

Support of the carrier industry's standards will be a crucial attribute for the new switch, according to Richard Malone, a principal at Dedham, Mass.-based research firm Vertical Systems Group. "This switch should go into anybody's network," in contrast to NET's existing IDNX line, Malone said.

The Adaptive switch may be justifiable only for carriers or end-user companies such as Sears, said Frank Dzubeck, president of Communications Network Architects, Inc.

End-user market demand for T3 switches is projected to reach $20 million this year, climb to $45.1 million next year and reach $203.9 million in 1994, according to a report recently published by Vertical Systems.

Kodak gives sneak peek at high-resolution technology

BY RICHARD PASTORE
CW STAFF

NEW YORK — Eastman Kodak Co. preannounced compact disc/read-only memory (CD-ROM)-based technology last week designed to make it possible for desktop computer users to manipulate, edit and print full-color images with resolution four times that of high-definition television by 1992.

Furthermore, Kodak promised that the prices for the system and service will be kept down to mass-consumer levels.

"Businesses will be able to pull up and edit color images at a digital level — something not possible before at this level of detail and price," said Bill Perry, director of research at Helgerson Associates in Falls Church, Va.

The Kodak technology transforms a 35mm color image into 18M bytes of data and places it on a special Photo CD. Played on an industry standard CD-ROM XA or CD-I player, the images can be displayed on MS-DOS, OS/2, Unix and Apple Computer, Inc. Macintosh platforms.

Utilities and hardware announced last week allow users to incorporate the CD images into other applications packages. The images can also be printed with resolution intact with a Kodak thermal printer.

At the same time, Kodak proposed a standard for the consistent depiction of high-resolution color across computer, print and broadcast media. "There are a whole set of various standards in terms of how people characterize color," said John White, vice-president and general manager at Kodak's Integration and Systems Products Division.

"If anyone can establish a standard, Kodak can," Perry added.

Microsoft plans interface between Windows and OS/2

BY MARK HAMILTON
IDG NEWS SERVICE
and JAMES DALY
CW STAFF

Microsoft Corp. officials ended months of speculation recently by indicating that they are developing methods to allow the popular Windows graphical user interface environment to run under the still-struggling OS/2 and that they have no plans to merge DOS and Windows.

Microsoft intends to provide libraries that will act as interface layers between Windows applications and OS/2, said Steve Ballmer, senior vice-president in charge of systems software.

The firm has already moved in this direction with its Software Migration Kit and the Binary Compatibility Layer, which is slated for inclusion in a later release of OS/2.

President William Gates also indicated that Microsoft developers will add support for Windows programming interfaces to a portable implementation of OS/2 under development. This would allow users to run Windows applications directly from OS/2 without performance loss.

Ballmer said DOS and Windows will not be merged nor will the firm force its OEM customers to take both products and offer them as a standard bundle.

Analysts said users continued to remain cool toward the newer operating system. As a result, Ballmer said that users should only adopt OS/2 immediately if they need to run mission-critical applications requiring the additional features provided by OS/2 that are not in DOS.

"OS/2 will not replace DOS in the foreseeable future," Ballmer said. Meanwhile, Windows 3.0 continues to be a hit among the installed base of DOS users.

Loyalty to DOS

Gates recently said that the Redmond, Wash.-based firm does not intend to pull back support for Windows-DOS users. "In terms of volume, Windows has won [the battle for the desktop], and it's important for us to enhance that," Gates said. "In terms of the mainstream, Windows is it."

According to Ballmer, upcoming versions of Windows will lean toward object-oriented features that make them powerful, yet easy to use. This would go further than Hewlett-Packard Co.'s New Wave, he said.

A future version of Windows, expected by mid-1991, will also support True Type font scaling and offer more networking capabilities, Ballmer added. "We are putting in hooks to allow more devices to be used: multimedia systems, handwriting input — all of those things are important."

Microsoft is also reportedly considering adding task switching capabilities to DOS 5.0, which is expected to be released in January.

Hamilton is on the staff of PC Business World *in London.*

NEWS SHORTS

NREN legislation advances

The U.S. Senate approved a bill last week accelerating research on high-performance computers and creating a National Research and Education Network [CW, Oct. 8] that would link the nation's science centers with a high-speed data network for collaborative work. The U.S. House of Representatives has not passed the authorizing bill, but Sen. Albert Gore Jr. (D-Tenn.) successfully lobbied for $35 million in appropriations so work can begin anyway. The funds were added to the budgets of the Defense Advanced Research Projects Agency and the National Aeronautics and Space Administration.

Parallan ships multiprocessor

Parallan Computer, Inc. in Mountain View, Calif., said last week that it is shipping a line of multiprocessing servers that offers the same data integrity and error-correcting memory capabilities found on minicomputers. Called Server 290, the product runs OS/2 LAN Manager, DOS and Windows applications. Parallan enters a fray in which vendors are trying to give networks the reliability of minicomputers and mainframes. Already in the fight are Compaq Computer Corp. and Netframe Systems, Inc.

Entry-level Framework delivered

Ashton-Tate Corp. has begun shipping Framework XE, a package of seven commonly used business software applications. The entry-level version of the company's Framework III package offers word processing, spreadsheet, data management, graphics, outlining, communications and electronic mail functions and is available at a suggested retail price of $149.

Shift in Dow's IS group

A recent management shakeup at Dow Chemical U.S.A. has changed the highest-level information systems executive. Donald S. Pirkle was named to replace Ralph W. Boeker as vice-president of IS in the executive department and also became a member of the management committee. Pirkle, whose background is in engineering and sales, is responsible for long-range IS strategy and planning. Hans Huppertz, director of corporate IS, continues to be in charge of the daily IS function and its staff. Boeker was named group vice-president of Dow U.S.A.'s Chemicals and Performance Products Division.

HDS disk users cite delays

Hitachi Data Systems, Inc. began shipping its 7390 high-capacity disk drive last week, but users are already complaining about the availability of the older 7380 K disk drives. The company confirmed that the transition to the new drives has created a three-month backlog for orders.

Conner offers new disks

Conner Peripherals, Inc. last week introduced several hard disk drives designed for the high-end, compact laptop and notebook computer market (see stories pages 1 and 131). Developed in cooperation with Compaq, the 2½-in. drives range in capacity up to 64M bytes. A family of 3½-in. drives with capacities of up to 510M bytes was developed with Olivetti PLC Ltd. and is designed for servers, workstations and multiuser systems.

Advances in C++

Hewlett-Packard Co. and AT&T's Unix System Laboratories have implemented new features in their respective versions of the C++ programming language. AT&T has adopted technology from Object Design, Inc. in Burlington, Mass., which includes Release 3.0 of AT&T's C++ "parameterized types" or templates. This allows programmers to build libraries of structures without having to know about the objects manipulated by the structures, the company said. HP now has a C++ compiler for its HP-UX system that generates native code for the HP 9000 computer. Also, C++ Developer, a class construction and browsing tool, is now available for the HP Domain/OS system.

IBM, DEC to unwrap Unix treats

BY MARYFRAN JOHNSON
CW STAFF

NEW YORK — IBM and Digital Equipment Corp. will play the Dynamic Duo on Halloween this week as they introduce new Unix-based systems to flesh out their reduced instruction set computing (RISC) product lines.

At the Unix Expo trade show, IBM is expected to unveil a high-end RISC System/6000 Powerserver offering 25% more power than the current top of that line. Industry observers said they believe the machine will pack 55 million instructions per second (MIPS) in power and show an IBM dedication to the Unix workstation market.

"In a market that changes as rapidly as the Unix workstation market does, you have to revisit your strategy frequently," said Peter Burris an analyst at International Data Corp. in Framingham, Mass. "IBM needs to show that it is capable of seeing where the holes in its product line are and responding to that quickly."

Soup to nuts

DEC will be introducing two new machines — the Decsystem 5100 and Decsystem 5500 — which give it a new entry-level RISC box on one end and its fastest uniprocessor Decsystem on the other.

The Decsystem 5100, at 18 MIPS, is priced from $10,995 and comes with 8M bytes of memory and 209M bytes of disk storage, according to Terry Shannon, an IDC analyst.

The high-end Decsystem 5500, at 28 MIPS, starts at $41,900 for a system with 32M bytes of memory but no disk storage. It will also be offered for $63,000 with a 665M-byte disk, compact disc/read-only memory reader and digital audio tape drive, Shannon said. "This will certainly lend credibility to DEC's contention that it's in the market to stay," Shannon said.

The company will also be dropping prices by roughly $2,000 on both the Decstation 2100 and 3100, to $4,995 and $6,995 respectively.

One user who has been anxiously awaiting the debut of the Decsystem 5500 is Gerald Siddons, director of scientific computing at the Dana-Farber Cancer Institute in Boston.

"We've got our purchase order in. It's a hot machine, and we're drowning in information," Siddons said last week. He plans to put three of the new systems on his Unix-based network, which once relied on a VAX 8500 to support hundreds of users.

Compaq

FROM PAGE 1

Both systems run at 20 MHz and support IBM VGA-compatible resolution. At a starting price of $5,499, the TI is priced $1,000 lower than the Compaq notebook. The TI falls short in storage, however, offering 20M- and 40M-byte hard drives as opposed to the 30M- and 60M-byte drives Compaq offers.

Storage issues may slow the entire market for 386SX-based notebooks.

Conner Peripherals, Inc., which provides hard drives to a number of computer vendors, including Compaq, has announced that its 40M-byte 2½-in. hard drives will not be available until January. Analysts said that problem has delayed 386SX-based notebook announcements from such vendors as Toshiba America Information Systems, Inc. and has slowed already announced vendors, such as Epson America, Inc.

There have been reports in the industry that Conner is having difficulty making its 60M-byte drives in volume, although Conner said it is meeting its scheduled shipments to Compaq, and the 60M-byte drives should be available in volume in the first quarter of 1991.

"If Compaq can't ship its 60-meg machine, there could be a tremendous window for competitors," said David Korus, a personal computer analyst at Kidder, Peabody & Co. Korus said he thinks the fourth quarter could be a long one for vendors of 386SX-based notebooks while they wait for Conner to produce drives. "I think you have to ask, 'Will people want an SX with a 20-meg hard drive?' " he said. "Also, who's going to buy a 30-meg machine in [Compaq's] price range?"

Korus said Compaq has seriously overpriced its 386SX-based notebook and added that a number of vendors will introduce similar machines before the end of the year with prices ranging from $2,500 to $3,000.

For instance, Austin Computer Systems recently introduced a 6-pound, 20-MHz 386SX-based notebook with a 10-in. diagonal VGA-compatible screen and 3½-in., 1.44M-byte floppy drive for $2,690.

Analysts said they expect that the 386SX market will see a number of vendors new to the laptop arena, much as TI is.

Is it smaller than a laptop? Yes, at Tokyo Data Show

BY LORI VALIGRA
IDG NEWS SERVICE

TOKYO — Tiny portable computers caught the spotlight at the annual Data Show, a major Japanese computer show held last week.

Laptops, book-size and handheld portables proliferated at the show. Fujitsu Ltd. and NEC Corp. both displayed their recently announced slim-profile laptops, made smaller and lighter by power-saving circuits and plug-in memory cards instead of floppy disks.

Fujitsu's FMR-50NB1, which is about half the size of a briefcase, measures 1 in. high, 11½ in. wide and 8 in. deep and weighs in at 2.2 pounds. Though lighter than NEC's PC-98 HA (2.4 pounds), the Fujitsu model possesses a full-size keyboard, while NEC's has a Chiclet-style board reminiscent of IBM's old Peanut small computer, industry analysts said.

Fujitsu's model is higher priced at $1,831, while NEC's sells for $1,523. Both use plug-in memory cards instead of floppy disks to keep the compact footprint. They are comparatively expensive, according to Fujitsu, which said one card could cost about $76.90 to produce.

The power-saving Fujitsu model uses technology developed by U.S.-based Poqet Computer Corp., in which Fujitsu has a 58% investment. Both NEC's and Fujitsu's models use LCDs.

According to estimates by the Japan Electronic Industry Development Association, shipments of book-size and laptop computers exceeded desktop shipments for the first time in the first quarter of this year, with 327,000 of the small computers shipped, representing 51% of a total of 644,000 personal computers.

Portable laptops are expected to see strong growth during the next three years, according to the association, with shipments increasing from 1.5 million units in 1991 to 2.4 million units in 1993.

The show held other attractions, such as multimedia systems from IBM Japan Ltd. and NEC using Intel's DVI multimedia standard. The show is sponsored by the Japan Electronic Industry Development Association and the Communication Industry Association of Japan.

Lori Valigra is the Tokyo bureau chief for IDG News Service.

DEC opens door, lets Unix in

BY MARYFRAN JOHNSON
CW STAFF

MAYNARD, Mass. — Like an old tiger resigned to changing its stripes, Digital Equipment Corp. last week declared its intention of prying open the proprietary VAX/VMS operating system and allowing Unix into the lair.

Amidst a flurry of product announcements (see story at right), the company also revealed the bare bones of a plan to re-engineer VAX/VMS onto a reduced instruction set computing (RISC) CPU, a transition similar to Hewlett-Packard Co.'s development of its RISC-based Precision Architecture.

The only detail that company officials were willing to provide about the shift to a high-speed RISC CPU was that all VMS applications will run on the new systems without major code rewriting.

Yet behind the marketing razzle-dazzle about freewheeling applications portability on multivendor networks, there lurks a long wait for users who are hankering to run Unix applications under VMS without serious performance problems.

"A key issue is having sufficient performance on your system to make it practical to use a VMS system to run Unix," said Kevin Oberman, a network manager at Lawrence Livermore Laboratories in Livermore, Calif.

Oberman, who manages Unix and VMS environments at his lab, said the VMS system kernel will require substantial tinkering before it can handle certain functions Unix does well. How DEC plans to run Unix applications under VMS is still unclear, but company officials said they will not employ the IBM method of running a "guest" operating system under the host.

DEC officials also acknowledged that they are taking only the first steps in what will be a three- to five-year journey. The road is littered with so-called industry standards still in dispute.

"It's a wait-and-see game on where these Unix standards are going to fall out," said Gordon Brazas, director of telecommunications and computer facility planning at Kellogg Co. in Battle Creek, Mich. "We're doing what a lot of people are doing — sitting back and saying they're tired of waiting for two years for the promises to develop."

By mid-1991, customers should see the first tangible signs of DEC's shift toward an open VMS in an enhancement to VMS Version 5.4, which will support three Posix standards under development by the Institute of Electrical and Electronics Engineers. These standards include an application interface, a shell utility and real-time processing for Unix applications.

DEC is also applying for "branding," or certification, of VMS by X/Open Consortium Ltd., a standards consortium of which DEC was the first member. The company said it will make VMS comply with XPG3, X/Open's latest set of applications portability standards.

How much portability Posix compliance will provide is still in question, however.

"Posix and X/Open is a 40% solution," said Mark Scherfling, supervisor of Unix and communications support at GTE Laboratories in Waltham, Mass. "A lot of the software we use goes beyond Posix, and there's just so much you can do before you have to get into the internals of the system. But I do think DEC has gone a long way toward a common foundation for the Unixes."

Peter Schay, an analyst at Gartner Group, Inc. in Stamford, Conn., said DEC's strategy will particularly appeal to VMS users who need to run one or more Unix applications and those companies eyeing open systems as a long-term direction.

DEC officials stressed that there are no plans to blend VMS and Ultrix, DEC's own Unix version. Last week, the company committed to blending Ultrix with the Open Software Foundation's OSF/1 version of Unix (see story below).

While DEC is trumpeting its progress toward becoming the first proprietary operating system to support the Posix standard, many users noted that by the time those standards become reality, IBM and other major vendors will be supporting them as well.

digital

Power up

DEC's Model 500 lineup doubles the performance of the VAX 6000 family

VAX 6000 model	Performance improvement over VAX-11/780	Server base system price*	Base system price*	Preconfigured system price**
510	13	$156,000	$227,000	$388,000
520	up to 25	$279,000	$393,000	$654,000
530	up to 37	N/A	$523,000	$930,000
540	up to 49	N/A	$649,000	$1,205,000
550	up to 61	N/A	$742,000	$1,290,000
560	up to 72	N/A	$811,000	$1,470,000

*Prices shown are for VMS systems with one-year product warranty (standard warranty recommended)
**Preconfigured systems include memory, disks and other features

Source: Digital Equipment Corp. CW Chart: Paul Mock

VAX attack

Digital Equipment Corp. rolled out a slew of new products last week alongside a rough sketch of its future VAX/VMS architecture. Among the hardware highlights are the following:

- DEC introduced the VAX 6000 Model 500, which offers at least 85% more performance for a 16% to 18% increase in price compared with the Model 400.

DEC also cut prices by an average of 27% on the VAX 6000 Models 310 and 410. Yet, the base system prices on the new models can be somewhat misleading, analysts noted. The VAX 6000 Model 510, for example, has a base price of $227,000 but includes no disk, memory or I/O channel. The "preconfigured" Model 510 at $388,000 is "closer to the real-world configuration," said Terry Shannon, an analyst at International Data Corp. in Framingham, Mass.

The Model 500s also require new memory based on 4M-bit dynamic random-access memory technology. Memory is available at $34,650 for the 32M-byte module, $67,200 for the 64M-byte module and $115,500 for the 128M-byte module. All systems and memory are available now.

- Two new Microvaxes joined the bottom of that line as the lowest priced multiuser VAXs. The Microvax 3100 Models 10E and 20E, starting at $8,000, are 45% more powerful than current 3100s for the same price and are available now.
- The Vaxstation 3100 Model 76 workstation tops off DEC's proprietary workstation line with a 100% performance boost over the previous models and is priced at $11,950 to $27,840. It is scheduled for availability Nov. 15.

OSF/1 unveiling gets mixed reviews

BY JOHANNA AMBROSIO
CW STAFF

NEW YORK — The Open Software Foundation last week announced — to decidedly mixed reviews — that its OSF/1 Unix-like operating system will be available for purchase by vendors beginning next month.

With a couple of exceptions in the areas of multiprocessing and parallel processing, OSF/1 does not appear to have any significant technical advantages over AT&T's Unix System V, critics charged. Because System V, Release 4 is already entrenched, and it will probably take at least a year for OSF/1 to show up in users' hands, it is unlikely that OSF members will prevail in the Unix market, according to industry observers.

All three major OSF backers — IBM, Digital Equipment Corp. and Hewlett-Packard Co. — said they will blend OSF/1 into their existing versions of Unix. DEC said it will make an OSF/1 developer's tool kit available during the first quarter of next year.

DEC will ship a version combining OSF/1 and its Ultrix operating system during 1991, and IBM will similarly incorporate OSF/1 into its AIX product line. However, executives from both companies refused to say how much the resulting products would resemble their existing systems and how much would actually be taken from OSF/1.

Of the three, only HP committed to using a more-or-less unadulterated version of OSF/1, which will be on a reduced instruction set computing workstation to ship next year.

The Open Software Foundation, however, said that OSF/1 was written for the computing models of the future and that it will require some time to catch on. "It's a new technology, and it takes a while for this sort of thing to find its way into products," said OSF President David Tory.

Users said they are not overly concerned about the Unix wars, especially because executives from both major camps have said their products will remain compatible with international standards, most notably the X/Open Portability Guide. This will ensure some degree of compatibility among most of the different Unix versions, observers said.

"From a practical perspective, there are no real differences among the different types of Unix," said Michael Prince, director of information services at the Burlington Coat Factory in Lebanon, N.H. "Sure, there are some inconveniences for porting, but I find the differences mostly irrelevant to anything except systems administration."

Timothy Cutler, director of information systems at Kodak Park in Rochester, N.Y., which is Eastman Kodak Co.'s largest manufacturing facility, said he is not too worried, either: "My expectation is that both System V and OSF/1 will comply with industry specifications and will incorporate standard remote procedure calls and user interfaces. As long as they do that, the operating system itself is not an issue."

Thus, it seems for now to be mostly a vendor-driven tug-of-war between the two major Unix variants. However, some observers questioned vendors' commitment to incorporating OSF/1 into their products. "The backers' comments were kind of squishy," said Maureen O'Gara, publisher of "Unigram X," a weekly Unix newsletter in Garden City, N.Y. "They didn't say anything too specific."

Second-class postage paid at Framingham, Mass., and additional mailing offices.
Computerworld (ISSN 0010-4841) is published weekly, with a single combined issue for the last week in December and the first week in January by CW Publishing/Inc., 375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171.
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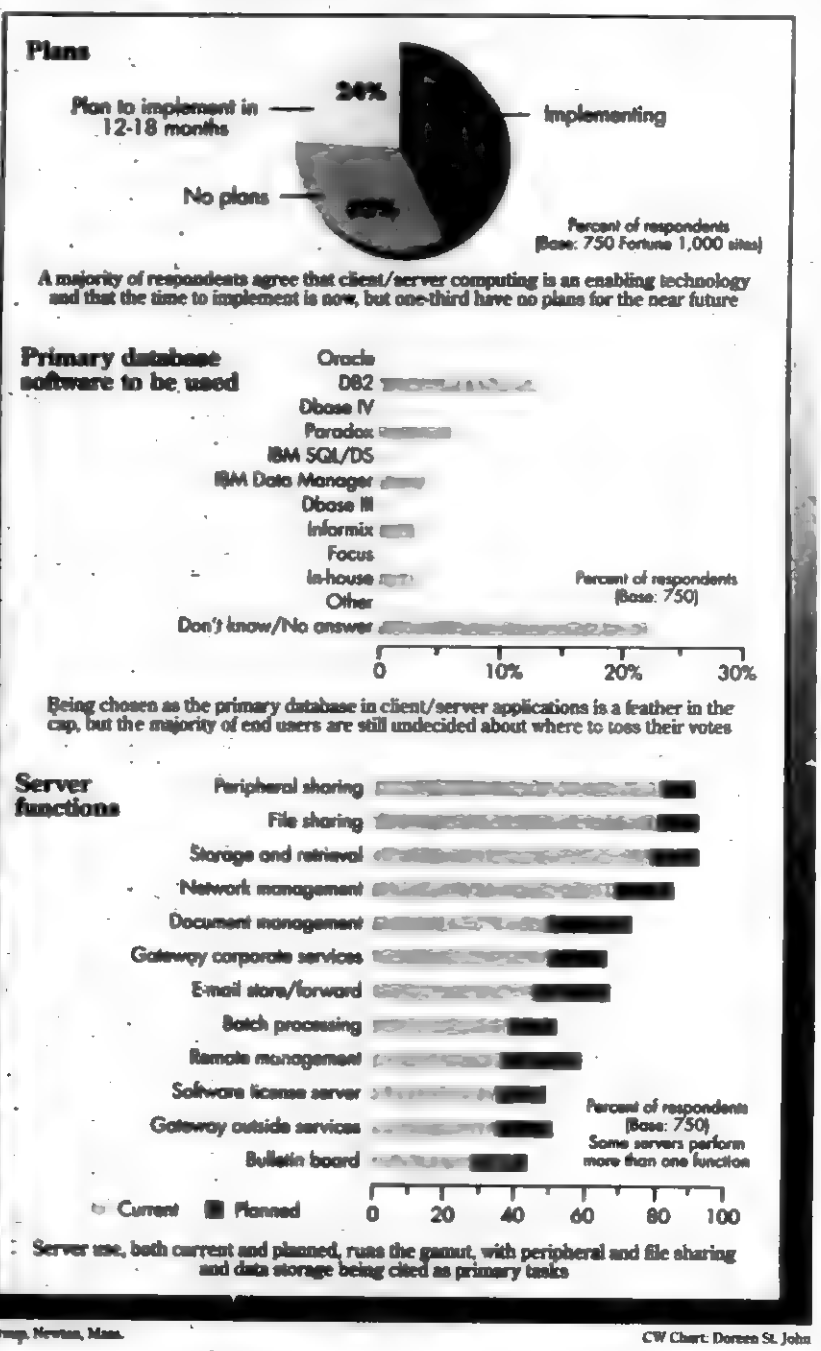
TRENDS

CLIENT/SERVER COMPUTING

Appetites have been whetted by the promised flexibility and power of client/server technology, and users know what they want but are still treading lightly



A majority of respondents agree that client/server computing is an enabling technology and that the time to implement is now, but one-third have no plans for the near future

Being chosen as the primary database in client/server applications is a feather in the cap, but the majority of end users are still undecided about where to toss their votes

Server use, both current and planned, runs the gamut, with peripheral and file sharing and data storage being cited as primary tasks

Source: Business Research Group, Newton, Mass.

CW Chart: Doreen St. John

NEXT WEEK

Networks and companywide databases keep the legal eagles of Jones, Day, Reavis & Pogue flying together even as they spread their wings out to soar from their Cleveland-based company throughout the U.S., Europe and the Far East. See how **Bill Steinbrink** helped the law firm accomplish this in Manager's Journal.

Bruce Zake

It's new. It's hot. It saves money, time and space. It can even change the way that people work. But what is imaging, really? It's a complicated mixture of technologies that can mean either big gains or big pains, depending on how meticulously it is planned. See our Special Report on Image Processing Systems for important details.

INSIDE LINES

Looking for the 'classified' ads?

Sure, we like our name bandied about, but not like this: A *Washington Post* story last week described life in the Soviet Union for Edward Lee Howard, reputedly the first CIA agent to ever defect to Moscow. "Howard said he picks up *USA Today* and *Newsweek* on trips downtown, and the KGB bought him subscriptions to *National Geographic*, *Money* and *Computer World* (sic)," the *Post* said. Howard has been blamed for the reported execution of the Soviet who spied for the CIA.

Wants to come in from the cold

Marcus Hess wants to tell his side of the case that was chronicled in Clifford Stoll's *The Cuckoo's Egg*. Hess is one of three German hackers who were nabbed for repeatedly rummaging through computers on the Internet network, gathering information for the KGB in exchange for cash and cocaine. Hess has penned a book in Germany, entitled *Hacker from Moscow*.

Global information

Breaking into computers for fun and profit has taken on international flavor, posing new challenges in combating illegal hacking, according to many law enforcement officials. About half of the cases now under investigation by the U.S. Department of Justice in Chicago involve hackers who are illegally penetrating computer systems in the U.S. from overseas, according to William Cook, assistant U.S. attorney. New York state police officials said recently that every computer crime case it expects to handle from here on out will be a joint effort with the U.S. Secret Service.

Domestic intelligence

A source recently shared with us a letter from Microsoft that, intentionally or not, redefines the term nondisclosure. The DOS 5.0 beta-testing program is so large that leaks *are* expected (go ahead, you'll feel better). So Microsoft has issued new nondisclosure guidelines: "Anything that we have confirmed publically is not under nondisclosure. Finally, you are free to share information gathered from parties other than Microsoft, such as beta testers, other industry analysts or other publications." We look forward to hearing from you on this product. The letter, by the way, says, "February is likely, but it is *not guaranteed*" for the announcement of DOS 5.0, with its features of memory management, utilities, and a new shell.

Steelmaker's launch

Sources close to the company say one thing you'll definitely see at Comdex/Fall '90 are notebook computers from Nippon Steel's newest subsidiary, San Jose, Calif.-based Librex Computer Systems. Librex plans to show six-pound units using Intel 80286 and 80386SX chips.

Believe it when you see it

The ubiquitous IBM Personal System/2 Model 90 and 95 servers, which have popped up in slightly altered form in Japan and the UK, will finally make their domestic debut tomorrow in New York. IBM will have at least two of its OS/2 heavyweights on hand — Lee Reiswieg and Dan Lautenbach — so it's likely they'll be unwrapping OS/2 Version 1.3, the 2M-byte version of OS/2.

First the T-word, now the L-word

In a month when President Bush endorsed new taxes, DEC finally raised the possibility of layoffs. Ranking executive Jack Smith said last week that involuntary cuts are an option the company may consider if its voluntary severance plan does not trim away 5,000 employees by the end of June 1991. DEC began its second round of severance offers in September, offering a variety of financial options to people willing to quit. At last count, there were 124,000 employees worldwide.

The "Hi-Cap Group" — that's what it's dubbed by sponsors Peripheral Strategies and Peripheral Outputs, two market research groups — will hold its first meeting at Comdex/Fall '90 as it sets out in pursuit of an industry standard for the 20M-byte class of floppy drives and media. Make us your standard for information exchange; contact News Editor Pete Bartolik at (800) 343-6474, send a fax to (508) 875-8931 or message COMPUTERWORLD *on MCI Mail.*

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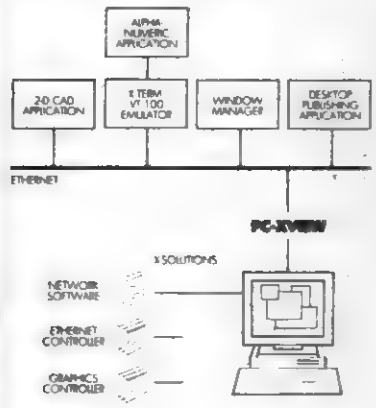

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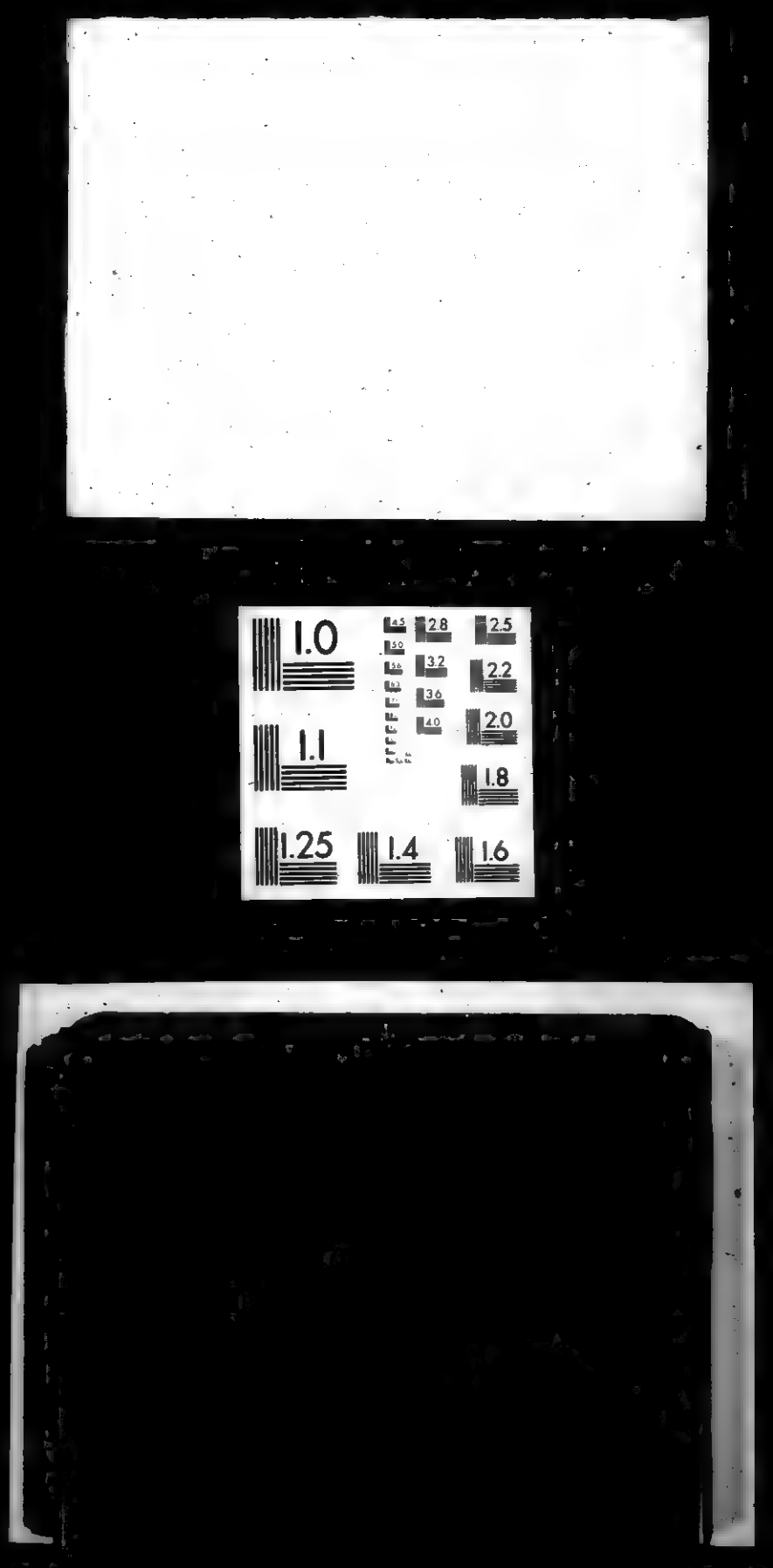
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VOL 24
ISS 44
NO 5 1990

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ANN ARBOR, MICHIGAN

THE NEWSWEEKLY OF INFORMATION SYSTEMS MANAGEMENT
November 5, 1990 · Vol. XXIV · No. 44 · 158 Pages · $2/Copy · $48/Year

COMPUTERWORLD

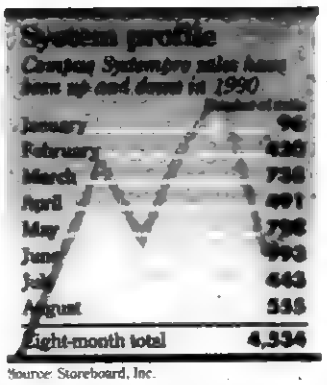
Systempro wins user respect

BY RICHARD PASTORE
CW STAFF

It's a miniature minicomputer! It's a mighty PC! It'll change the face of computing!

That was some of the ballyhoo that surrounded the introduction of Compaq Computer Corp.'s Systempro one year ago. The hype was met with gibes at the machine's sales, positioning and design. But users and analysts now say the Systempro has succeeded as a premier file server and is leading a new wave of personal computing.

Despite software delays and a sputtering start, the Systempro seems to be winning a place in the high-end file-server market. "Earlier in the year, the technology was new, and people were staying away from it. Now, I see sales picking up," said Frank Michnoff, an analyst at Meta Group, Inc. in Westport, Conn.



Source: Storeboard, Inc.

It is also attracting a flood of competitors, notably IBM Personal System/2 servers announced last week (see story page 152) and systems from NCR Corp., Digital Equipment Corp. and a variety of PC clone vendors.

Problems surfaced for Compaq immediately after the Systempro's introduction in November 1989. Development delays in multiprocessor versions of Microsoft Corp.'s LAN Manager and Novell, Inc.'s Netware put a crimp in Compaq's plans.

"We had hoped all of the

Continued on page 152

OS/2 trimmed down in hopes of a better fit

BY PATRICIA KEEFE
CW STAFF

NEW YORK — True to its word and despite a qualified endorsement from co-developer Microsoft Corp., IBM rolled out OS/2 Standard Edition Version 1.3 last week, a 2M-byte release said to offer substantial improvements in performance, quality and printer support. So far, however, user reaction has been restrained.

IBM also unwrapped OS/2 Extended Edition 1.3 and OS/2 LAN Server 1.3 (see story page 153) and multimedia enhancements said to allow users of IBM's Audio Visual Connection software to create full-motion video presentations on an IBM Personal System/2.

Typically, users looking to boost the power of Intel Corp. 80286-based personal computers are the most enthusiastic about OS/2 1.3. Other users tended to agree with Microsoft Chairman Bill Gates, who said last week that OS/2 1.3 was "not a significant upgrade" but rather "just an improvement."

Still others, such as Mike Drips, PC guru at U.S. Sprint Communications Co.'s information systems department, said most users are more interested in the soon-to-come 32-bit OS/2 2.0 and portable OS/2 3.0. "I don't think users will flock to OS/2 because of 1.3's reduced memory requirements," he said.

Drips estimated there are only about a dozen mainstream OS/2 applications. "The number of products under OS/2 compared to Windows is [still] minuscule," he said.

Continued on page 153

Outsourcing threat spurs court battle

BY CLINTON WILDER
CW STAFF

NASHVILLE — Most information systems staffs are probably opposed to outsourcing, but one IS staff is actively challenging it in a county court here.

Employees at the Nashville Electric Service filed a lawsuit last week seeking to prevent the utility from outsourcing its IS functions to a Memphis-based computer services vendor. The Nashville Electric Service Employees Association, which represents 29 of the agency's 43 IS staff members, claims that transferring them to the vendor's employment would violate city charter stipulations that job transfers be based on seniority and performance.

Nashville Electric, a quasi-public agency responsible for electric power in Nashville and the surrounding county, has announced its intention to sign a seven-year contract with

Continued on page 151

Special Report: Imaging systems

Platform preferences

On which platforms are you running or would you be most likely to run image processing applications?

Base: 291 (multiple responses allowed)

	Percent of respondents
Midrange	40.5%
PC LAN with PC or mini-server	33%
Mainframe	29.6%
Stand-alone PC	27.8%
PC LAN with mini-server linked to mainframe	26.5%
Other	2.1%

Source: Computerworld survey

***Imaging** may be an answer to the prayers of both paper-choked companies and mini makers (see chart). Learn how the technology works and how more than 300 IS managers view it. Page 65.*

IBM on object-oriented path

BY ROSEMARY HAMILTON
CW STAFF

IBM will adapt AD/Cycle, its strategic application development architecture, to an object-oriented programming environment and will show the initial results of this in the first half of 1991, a company executive said last week.

The plans for AD/Cycle are one aspect of a major effort under way at IBM to move to object-oriented technology. In an interview last week, Cliff Reeves, manager of Common User Access architecture at IBM's Carey, N.C., laboratory, said the company will also enhance its relational database management systems to accommodate this technology and will use it extensively for its own internal development.

"We've got internal and external pressures about object-oriented technology," Reeves said. "So it was inevitable that we would come to it."

The AD/Cycle project will likely take years to complete, Reeves said. He did not provide a time frame for the relational DBMSs. But analysts, along with [illegible], said it will take at least two or three years before object-oriented technology gains widespread use in mainstream information systems shops.

"The cultural changes to

Continued on page 6

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TKO for programmer OT

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — Amid the hoopla over the federal budget, the U.S. Congress approved a little-noticed provision that will eliminate overtime pay for some computer programmers.

Tucked away in a minor bill on American Samoa labor rules was a section exempting many nonsalaried programmers from overtime pay provisions of federal labor laws. It was passed Oct. 27 as Congress scurried to push through a flurry of last-minute bills, including several that benefit the computer industry (see story page 151).

No hearings were ever held on the bill, which was supported by the National Association of Computer Consultant Businesses and Adapso.

The bill affects "computer systems analysts, computer programmers, software engineers" and other computer professionals who earn $25 per hour or more, on the grounds that these highly paid workers do not need federal protection.

Supporters of the bill claimed it benefits the workers.

Most companies consider 150% overtime pay to be prohibitive for employees earning $40 or $50 per hour, so they either forbid overtime work or convert the employee to a salary with limited overtime pay, said Harvey Shulman, general counsel for the NACCB. These employees will now be able to work extra hours and get paid their regular hourly rates, he said. ●

INSIDE

Windows 3.0 wows users, but reviewers have some reservations. For summary of results from leading PC labs and expert opinions, see the premiere of Technology Analysis. Page 38.

IBM, DEC workstations lead Unix Expo product parade. Page 12.

Global computer security group being formed to coordinate international response to hackers, viruses. Page 4.

DEC set to link competing VAX databases. Page 6.

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4 The international **CERT System** group is about to be born in Gaithersburg, Md., to combat computer viruses and security loopholes.

7 A raft of executives deserts **Ingres'** ship before it sinks into Ask waters.

8 Lethal weapons: Loyal **Unisys** users blame the press for taking exaggerated shots at the wounded firm.

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12 **Unix** and **OSF/1** were the attention-getters at last week's Unix Expo in New York.

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152 **IBM** wins some and loses some — customers, that is — with its delayed introduction of PS/2 servers.

153 Citrix Systems appears to be winning the race for a multiuser **OS/2** system by a nose, expecting to cross the finish line by first-quarter 1991.

Quotable

"DEC's whole direction promises great things in the future, but the key word is promises."

LAWRENCE CARDARELLI
R.W. JOHNSON PHARMACEUTICAL

On DEC's links to other research institutes' databases.
See story page 6.

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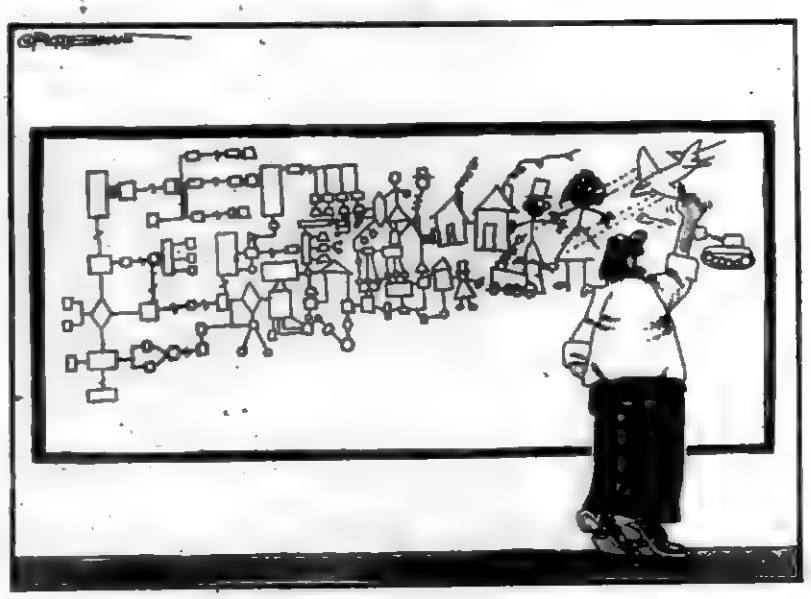
The Fifth Wave



EXECUTIVE BRIEFING

■ **A controversy over outsourcing has moved from the boardroom to the courtroom** in Nashville. Employees at the city's quasi-public electric utility have sued the utility's board to prevent its intended outsourcing of information systems to a Memphis-based services firm. Although the vendor plans to hire the 43 IS employees, the suit claims they should be free to apply for non-IS municipal jobs and are unfairly losing seniority status. **Page 1.**

■ **Image processing technology is producing big benefits** in both time and space savings for early adopters — but those benefits don't come without effort and expense. Document conversion and indexing can be costly and lengthy. Many users say they worry that today's imaging technology won't be adaptable to future broader-based applications. Still, companies that have taken the first step are loud in their praises, and many organizations are poised on the brink of investment. **Special Report, page 65.**

■ **IBM's AD/Cycle will be an object-oriented programming environment,** an IBM official confirmed. Although the full adaptation to object-oriented methods will reportedly take years to complete, IBM is expected to showcase its initial results sometime in the first half of 1991. **Page 1.**

■ **Hourly wage computer programmers will be exempt from overtime pay,** according to an obscure regulation passed by Congress last week. The exemption, which will be applicable to technicians who make at least $25 per hour, was supported by the software, services and consulting industries. **Page 1.**

■ **The venerable Series/1 minicomputer** will no longer be sold by IBM, although support will continue for at least five years. The announcement, which was made to members of Common, the IBM midrange user group, was attributed to the success of the RISC System/6000. **Page 153.**

■ **IS executives said they perceive a "leadership gap"** in their companies on key IS issues, according to an Andersen Consulting survey. On nearly a dozen issues that IS executives said they consider to be important, they rated their organizations as not doing an effective job. **Page 57.**

■ **IBM rolled out both its new version of OS/2 and its long-awaited Personal System/2** file servers. The servers will mean new competition for the Compaq Systempro, which has had a sometimes rocky but generally successful year on the market. At least one user, Gibson Greetings in Cincinnati, has opted for the PS/2 instead now that it is available. **Pages 1 and 152.**

■ **Rapid growth in the biotechnology industry** isn't translating into more jobs for IS professionals. Biotech companies are still concentrating on research rather than on the production and customer service areas that drive the need for systems. **Page 135.**

■ **Training isn't just for trainers** anymore. Managers are being asked for more input to ensure that the best training is being delivered to the right people at the right time. **Page 147.**

■ **On-site this week:** In Moffett Field, Calif., NASA's test bed for emerging technologies is attempting to rewrite its aerodynamic simulation software every three years using Silicon Graphics' workstations. **Page 37.** Systems revamps are also taking place at the Fort Wayne, Ind.-based General Motors truck and bus assembly line, where Electronic Data Systems has recently installed a problem tracking system and inspection feedback application as part of General Motors' quality assurance program. **Page 29.**

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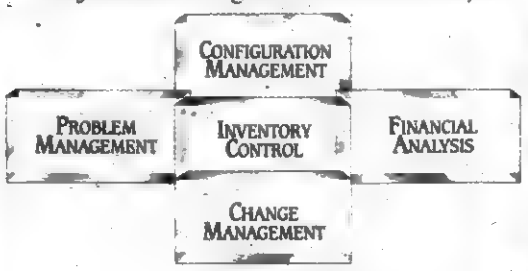

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Lotus scoops Samna for $65M

BY PATRICIA KEEFE
CW STAFF

CAMBRIDGE, Mass. — Lotus Development Corp. paid dearly to get its foot in the door of the emerging Windows word processing market, coughing up $65 million under a definitive agreement to acquire struggling Atlanta-based Samna Corp.

While across the country in Redmond, Wash., Microsoft Corp. was celebrating the first anniversary of Word for Windows, Lotus Chairman and Chief Executive Officer Jim Manzi left no doubt he plans an "extremely aggressive" run at the Windows word processing market.

The deal is expected to be completed by year's end. Estimates that it will cost Lotus more than four times Samna's revenue run rate have raised eyebrows. Samna posted a net income of $145,000 for the quarter ended Sept. 30 and has suffered a loss of $1.2 million for the nine months ended Sept. 30.

Samna, producer of Ami word processing products, has a relatively small share of the personal computer word processing market (see chart) but has reportedly captured 15% to 20% of the market for Windows word processing applications.

The acquisition caught the industry off guard in more ways than one. Some had expected Lotus to purchase database vendor Sybase, Inc., in which it holds a 17% stake; additionally, Lotus has had a tight relationship with Wordperfect Corp.

Lotus and Wordperfect have shared technology and have promised to align their user interfaces and improve interoperability between their products.

Wordperfect Vice-President W. E. Pete Petersen said Wordperfect is not for sale. "Lotus may have wanted a date, but they never came out and asked us," he said, adding that the two firms have never seriously considered merging. While Manzi expects to compete with Wordperfect, Petersen said, "I'll save my paranoia for Microsoft."

Last spring, Lotus scrapped a merger attempt via a stock swap with Novell, Inc., after being frustrated by demands for equal board representation.

This time around, Lotus went for the straight cash deal. This could create a loss in the fourth quarter, which was expected to show improvement over the last two disappointing quarters, but Wall Street seems unconcerned.

Samna became a wholly owned subsidiary and received no seats on the board. It will continue to operate in Georgia, but its logo will be replaced by Lotus'. Samna President Said Mohammadioun will report to Frank King, Lotus' senior vice-president of business group software.

What Lotus gets for its investment is an already shipping addition to a planned suite of Windows products, a shot at grabbing share in the second generation of the word processing market and ammunition to toss at critics who complain Lotus is too reliant on one product.

"We stacked up the purchase price against the size of the business opportunity, which is to participate as a major player in what will be, in the not-too-distant future, a billion-dollar market," said Robert Schechter, Lotus' vice-president of finance.

Buying in

The acquisition of Samna will give Lotus a tiny foothold in the PC word processing market

	1989 worldwide shipments	Percent of '89 worldwide market share by shipments
Wordperfect	1,400,000	39.8%
Microsoft Word	500,000	14.2%
Wordstar 5.0 and 5.5	345,000	9.8%
IBM Display Write 4	300,000	8.5%
Software Publishing Professional Write	250,000	7.1%
Ashton-Tate Multimate	200,000	5.7%
Samna Word4, Ami	47,000	1.3%
Other		13.6%

Source: International Data Corp. CW Chart: Doreen St. John

CERTs unite to combat viruses, deter hackers

BY MICHAEL ALEXANDER
CW STAFF

GAITHERSBURG, Md. — A group of about 11 organizations plans to announce the formation of a Computer Emergency Response Team (CERT) with an international flavor next week.

CERTs have sprung up around the world in recent years to cope with computer viruses, develop and distribute software patches for security loopholes and collaborate on other computer security-related issues. The new group, which is to be called CERT System, would coordinate the activities of the individual CERTs during computer-related emergencies with international scope.

The charter members consist of government agencies, research laboratories and vendors, both here and abroad, including CERTs at Carnegie Mellon University and in France, Canada and Australia, as well as at NASA, Lawrence Livermore Laboratories and IBM, among other vendors.

The notion of an international CERT arose during an emergency meeting convened to combat the "No Nukes" worm that wriggled its way into the Space Physics Analysis Network (SPAN) operated by NASA in October 1989, said Ron Tencati, SPAN security manager. Security experts suspect that the worm was launched from France and entered NASA's network and the Decnet Internet via the European E-SPAN.

Helping to combat this and other forms of high-tech tampering that crosses international boundaries will be one of the missions of CERT System, Tencati said. "Trying to prosecute a hacker in a remote country is almost impossible," he said. Many countries do not have clear laws prohibiting illegal computer entry, and law enforcement authorities here and abroad are reluctant to become embroiled in what amounts to an "international incident" to arrest a lone hacker, Tencati said.

"The hackers are untouchable, and they know that," Tencati added.

The organization will be sponsored by the National Institute of Standards and Technology (NIST) and is headquartered here, at least for now, Tencati said. The headquarters is expected to move every two years with the election of a secretary, who will be charged with overseeing CERT System activities. The first secretary will probably be Dennis Steinauer, manager of computer security management and evaluation at NIST, Tencati said.

Steinauer did not return calls seeking comment.

CERT System will in some ways be patterned after the CERT at Carnegie Mellon's Software Engineering Institute. This CERT, which is funded by the Department of Defense, was set up in November 1988 following the infamous worm attack that crippled thousands of computers on the Internet.

Even then, it was apparent that several CERTs would be needed, said Richard Pethia, CERT coordinator at Carnegie Mellon's SEI. "There are different communities of computing, and each has a unique set of cultures, policies, procedures," Pethia said. "To have a single organization responsible to all of these computing communities did not make sense."

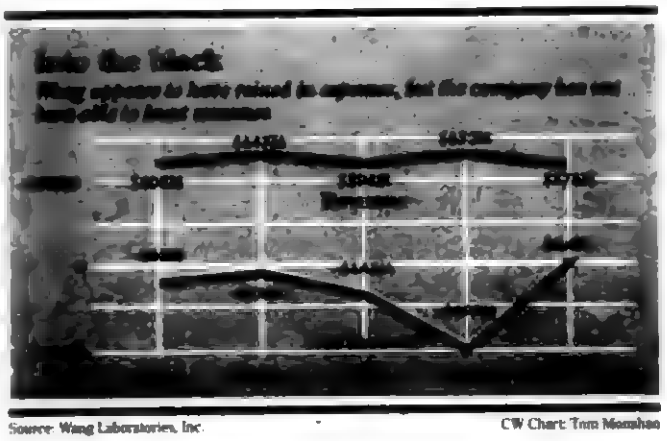
CORRECTION

Computer Professionals for Social Responsibility decided just before press time for the Oct. 29 issue that it would not consider layoffs despite difficult budget times.

Maximum Strategy Corp. in San Jose, Calif., was incorrectly referred to in the Oct. 15 issue as Maximum Strategies Corp.

The chart on page 6 [CW, Oct. 22] was incorrectly labeled. Under accounting software, it should read Computer Associates 9.6%, Oracle 2.8% and Ross Systems 2.3%.

The chart accompanying a story on Wang Laboratories, Inc.'s first-quarter profits [CW, Oct. 29] did not include the firm's first-quarter results, and the caption failed to reflect that Wang had posted a profit. The correct version is printed below.



Source: Wang Laboratories, Inc. CW Chart: Tom Monahan

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DEC rains on Oracle's parade

BY MARYFRAN JOHNSON
CW STAFF

BOSTON — Digital Equipment Corp. hopes to blow away the clouds hanging over its own RDB/VMS relational database management software today and rain on Oracle Systems Corp.'s parade. Archrival IBM may notice a few sprinkles as well.

DEC is expected to announce new tools and expanded functions for RDB, among them the capability for users to transparently access both Oracle's RDBMS and flat files under DEC's own RMS file management system. The company is also expected to spell out — for the first time — its long-term database plans.

DEC officials last week confirmed the details of a massive strategic push to enable users to interoperate among third-party databases — a direction that industry analysts said gives the Maynard, Mass.-based vendor a notable jump on IBM.

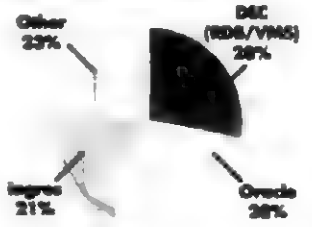
"This announcement is an important move for DEC in supporting a connection between different databases — not just separate [DEC databases] but ones from different vendors," said Bob Herwick, an analyst at Hambrecht & Quist, Inc. in San Francisco. "That certainly is a very important step in that direction and one where DEC is way ahead of IBM."

DEC's plan hinges on several alliances with third-party database tool vendors and systems integrators.

Third-party vendor Smartstar Corp. confirmed last week that it will announce data conversion and migration tools for users "looking for the road out of Oracle and into RDB," a spokesman said. Additional database conversion tools will be announced by Sunnyvale, Calif.-based Trifox, which converts applications written in Oracle's SQL Forms and SQL RPT to its own RDB-compatible tool set.

Close relations

DEC and Oracle carve up the lion's share of the VAX relational DBMS market



Source: Computer Intelligence

Next month, DEC will release an object-oriented application development environment called Trellis, used in-house at DEC since 1985 for constructing complex database applications on VMS and Ultrix, DEC's own version of Unix. For RDB users who want to integrate object-oriented technology, DEC will also provide Objectivity/DB for VMS and Ultrix.

Objectivity/DB on the DEC platform is the result of an alliance announced in August between DEC and Objectivity, Inc. in Menlo Park, Calif. The object-oriented database is already popular on Sun Microsystems, Inc. workstations.

"DEC's whole direction promises great things in the future, but the key word is promises," said Lawrence Cardarelli, an information specialist at R.W. Johnson Pharmaceutical Research Institute in Raritan, N.J., the clinical research arm of the Johnson & Johnson operating companies.

Cardarelli, who had been briefed on the software announcements, said he was impressed with the scope and capabilities of the products. R.W. Johnson is standardized on Oracle's RDBMS, but developers there would like to interoperate among other DBMSs in use throughout the firm, he said.

"We would like transparent access to numerous sites and the ability to optimize our databases and minimize traffic on the network," Cardarelli explained.

As part of its Network Applications Support (NAS) services, DEC is expected to introduce an "information network" that integrates database capability such as SQL into NAS. Analysts said that will enable users to create distributable applications for multivendor environments.

IBM has been tackling distributed databases for years and now provides some capabilities to allow mainframe databases to talk. That function is limited, however, in that one DB2 database can communicate with another DB2 database but not with other IBM relational systems.

"DEC's longtime strategy for distributed RDB is pretty exciting, but you can't buy it yet," said Bill Wood, assistant director of scientific computing at Smithkline Beecham Corp. in Philadelphia.

"Being able to migrate applications away from Oracle could provide users with a lot of flexibility, especially in pricing," Wood added. "If you want to stay with Oracle, you can apply a lot of pressure."

IBM

CONTINUED FROM PAGE 1

adopt this approach will be of an enormous magnitude," said Greg Boone, president of Case Research, Inc. "Computer-aided software engineering is what a lot of people are doing now, and they are having trouble with it. [Object-oriented programming] is just an enormous, enormous shift from that."

While IBM has announced development agreements with object-oriented language companies in recent weeks, it has yet to publicly spell out its plans for this technology, which has become one of the hottest software topics of the year.

"We've wanted them to part the kimono a bit more on this so we can understand where they are headed," said David Moore, a senior vice-president at Mellon Bank in Pittsburgh.

Object-oriented programming (OOP) is radically different from today's software development procedures. It also provides a key benefit of reusable code, which cuts down on both development and maintenance time (see story below).

According to Reeves, the company has several object-oriented efforts under way. For starters, IBM is becoming a big user of OOP, Reeves said. He confirmed that IBM in Denmark used Smalltalk to develop its own version of Officevision. U.S. developers of Officevision have also "done a great deal of work" with Smalltalk, Reeves said.

Versions of Smalltalk, which was originally developed at Xerox Corp. in the 1970s, are marketed by at least two companies, including Parcplace Systems and Digitalk, Inc., both of which recently inked licensing and development agreements with IBM.

"The technology will be used all over IBM," Reeves said. "Not as a policy, but because it is so useful."

Meeting the goal

Perhaps most challenging will be the goal for AD/Cycle. As this architecture is outlined today, it provides increased productivity for traditional programming languages. A move to object-oriented methods, therefore, will require extensions and changes across virtually all of AD/Cycle's components, including the key piece: its information model.

Reeves said IBM will take on the easiest aspect of this task first by announcing support of object-oriented languages, beginning with Smalltalk, in the first half of 1991. Today, AD/Cycle is designed to support the Systems Application Architecture languages, such as Cobol.

"It is safe to assume that one of the first things we will do is introduce OOP within AD/Cycle," Reeves said. "The first thing will be the languages, and of course, Smalltalk will be one."

Starting next year, IBM will take on the far more difficult job of adopting object-oriented approaches and methods for AD/Cycle. Reeves said IBM will extend the Repository Manager Information Model, which currently uses an entity-relationship approach of representing data, to accommodate objects. IBM will simultaneously be working with its AD/Cycle business partners to expand the design and modeling tools into the object-oriented world, Reeves said.

"I don't believe the current AD/Cycle technology is directed only at procedural languages," he said. "If the methodologies were adjusted, the benefits of OOP could move across the life cycle. That's exactly our approach."

In the meantime, IBM said it intends to bring object-oriented capabilities to existing RDBMSs, although no time frame was provided. Reeves said IBM has not ruled out developing a new object-oriented DBMS but will work with this add-on approach in the near term.

Wait 'n' see

While some IS executives contacted last week said they are in a wait-and-see mode when it comes to object-oriented technology, one IS shop is running a customer information system built with object-oriented concepts.

Earlier this year, The Brooklyn Union Gas Co. went live with its Customer-Related Information System, which was written in PL/1 but uses object-oriented techniques, according to William Feraudo, vice-president of IS. Feraudo said the company had no choice but to apply object-oriented techniques to PL/1, because there is no mainframe-based object-oriented language.

The system, which took 2½ years to build, runs on an IBM 3090 and is made up of 900,000 lines of code. It replaced an outdated system consisting of 1.5 million lines of code, Feraudo said.

He said the major benefit so far is the ease with which modifications can be made to the system. "We're down from 200 people who built the system to 12 people maintaining it," he said.

Object orientation brings a new dimension into play

For many of today's programmers, a move to OOP would be stepping into a new dimension.

OOP requires a programmer to isolate data and related processes. Together, they make up a single object. Programs become a collection of objects that swap messages between one another to trigger events.

"With traditional languages, the sequence of events is driven by the program," said Jeff Tash, president of Database Decisions in Newton, Mass. "The user reacts to the program. With object-oriented programs, it is controlled by the user."

A key benefit is the reusability of objects. Once one is created and accepted, a programmer would have an error-free capsule of code that can be reused. Not only would that reduce development time, but it would also cut down on maintenance.

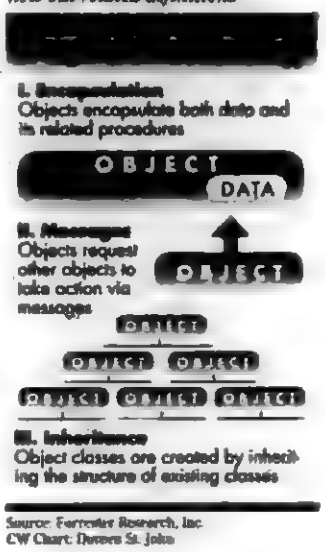
While OOP is hardly new — it was created at Xerox Corp. in the 1970s — it has remained on the outer edges of information systems until recently. Increasingly, it is catching the attention of mainstream IS executives, many of whom are overseeing task forces or pilot projects.

OOP has been endorsed by major vendors, and it is well suited for programming graphical user interfaces.

ROSEMARY HAMILTON

The object of the game

Object-oriented programming relies on utilizing reusable data objects for new but related definitions



Source: Forrester Research, Inc.
CW Chart: Doreen St. John

DEC stands behind long-term strategy; no 'layoffs' planned

BY NELL MARGOLIS
CW STAFF

BOSTON — The nation's recession and the company's battered stock notwithstanding, Digital Equipment Corp. plans no layoffs, DEC President Kenneth H. Olsen told stockholders at the firm's annual meeting last week.

However, as he made clear in answers to persistent questions from the floor, we can expect to see DEC try any measure short of "old-fashioned, pink-slip-and-out-the-door layoffs" in its attempts to compromise between its staunch tradition of humane treatment of employees and the dire need to reduce expenses.

"We never say that we'll keep the same people forever, whether we need them or not," Olsen said. "We try to avoid layoffs — but we always make adjustments."

Olsen conceded that precarious economic conditions across the U.S. and particularly in the company's headquarters state of Massachusetts are undercutting the effectiveness of DEC's voluntary retirement and attrition strategy. Moreover, he added, "We never have said we won't have layoffs, just that we want to avoid them. Never say never about anything."

Stand their ground

Throughout his address to shareholders, many of whom have seen their investments in DEC trounced during the past four difficult quarters, Olsen repeatedly emphasized long-term strategy rather than short-term reaction to market swings as the key to DEC's strength. "These strategies are what make this company what it is, and we won't back down," Olsen said.

Among the long-term strategies to which DEC will adhere, he said, are the following:

- An increased emphasis on — and autonomy for — the targeted business units into which the firm has been divided.
- A more aggressive assault on computer leasing, including possible use of some of DEC's rich cash reserves for lease financing.
- An implacable resolve not to shrink the breadth of DEC's hardware or software product lines or diminish its zeal for alliances in the face of financial pressure.

However, the company does plan to break with one recent tradition: "When the good times come back around," he said, "we will declare a dividend."

Exec egress hits Ingres

BY JEAN S. BOZMAN
CW STAFF

ALAMEDA, Calif. — A raft of top executives is leaving Ingres Corp. just days before an anticipated 200-person layoff at the 1,200-person firm, which was acquired on Oct. 22 by Ask Computer Systems, Inc. in Mountain View, Calif. The executives were all involved in product planning — the type of personnel Ask executives had said would be staying on.

Ed Horst, director of product management, who had been at Ingres for more than five years, is leaving to become director of product marketing at Servio Corp., an object-oriented database firm also in Alameda. Horst will join Paul Butterworth, Ingres' chief scientist, who left Ingres Oct. 5 to become Servio's vice-president of engineering. Mitch Bishop, director of Ingres' Open Systems Products Group, also resigned last week. Bishop will be director of marketing at nearby Wind River Systems, Inc. in Alameda.

More changes

As expected, Ingres President and Chief Executive Officer Paul Newton also left Ingres last week. However, Newton had publicly stated that he would only remain with the firm until the acquisition by Ask was complete [CW, Sept. 17]. William Smartt, Ingres' chief financial officer, also left last week.

Ask CEO Sandra Kurtzig said she had hoped to retain most Ingres engineers and technologists. "I have often said that a software company's assets come in the building every morning and walk out the door at night," Kurtzig said at a press conference Oct. 26. "Our human resources department is trying to put together a reduction-in-force package that is viewed as positive by the employees [who] stay. We are very interested in the Ingres technology and in moving it forward."

Across San Francisco Bay at Ask/Ingres competitor Oracle Systems Corp., two top executives are also leaving their jobs. Brian Owens, vice-president of Oracle's minicomputer marketing group, has resigned and will take a senior management position at Legent Corp.

And, in a surprise move, Chris Greendale, vice-president of the Oracle USA Sales Division, was terminated. The company said Greendale's termination was part of a continuing consolidation.

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NEWS SHORTS

Wang introduces Unix boxes

Wang Laboratories, Inc. unveiled two Unix-based, entry-level multiuser microcomputers last week. The 16-user DX100 and 32-user DX200 are the company's first micros to be preconfigured specifically for the Unix community and are priced at $8,995 and $10,995, respectively.

Ask stockholder bid rejected

Ask Computer, Inc. repelled a proxy fight by independent investor James Lennane last week, announcing that a tally of shareholder votes had denied Lennane a seat on the board of directors. Lennane, who owns roughly 7% of all Ask stock, had protested the Ask board's tender offer for Ingres Corp., which was made without shareholder approval [CW, Oct. 29].

Turbo Pascal upgrade due

Borland International will announce today the latest version of its popular Pascal programming language, Turbo Pascal. Turbo Pascal Version 6.0 is an object-oriented language and will sport several new features, including Turbo Vision, an application framework that allows programmers to start from a generic application that includes support for overlapping windows, pull-down windows and the handling of the mouse. The enhanced system will also include a spruced-up development environment.

The word on Word

Microsoft Corp. will continue to shift its leading character-based applications to a more intuitive and visually appealing setting today with the introduction of Word Version 5.5 for DOS systems, the latest version of its popular word processing application. The updated application will adopt many of the graphical interface features found in Microsoft Windows, OS/2 and Apple Computer, Inc. Macintosh environments, according to company officials. For example, several features that could previously be accessed solely from the keyboard can now be accessed by pull-down menus and pop-up dialog boxes.

OMG lands Apple

Apple Computer, Inc. last week became the newest member of the Object Management Group (OMG), a trade association intended to promote standards for object-oriented technology. With the latest addition, the OMG has been endorsed by nearly every major systems and software company, with the notable exceptions of IBM and Microsoft Corp., said John Slitz, the group's vice-president of marketing. Also last week, the group issued a request for proposals for object request broker technology. An object request broker is a key element in object-oriented programs because it functions as the primary message vehicle between objects.

Unisys forms software group

Unisys Corp. formally announced its software subsidiary last week during Unix Expo, which was held in New York. The wholly owned subsidiary, called Ally Software, Inc., was hinted at by Unisys last summer. However, the formal name and incorporation were not announced until last week. Ally Software, which is based at the parent company's Blue Bell, Pa., headquarters, has some 59 employees, 21 in sales and marketing and 38 in engineering. All were drafted from Unisys, Ally President Richard C. Goyette said.

AST 486 breaks $4,000 barrier

AST Research, Inc. released a small-footprint Intel Corp. 1486-based microcomputer last week that sells for less than $4,000. The AST Bravo 486/25 is based around the Industry Standard Architecture bus, comes with 2M bytes of memory and has a footprint of 15.5 in. by 16 in. It comes in two models without a hard drive that retail for $3,995 each and one with an 80M-byte hard drive for $4,725.

More news shorts on page 151

Unisys users concerned, not panicked

BY ELLIS BOOKER
CW STAFF

NASHVILLE — Just days after Unisys Corp. reported worse-than-expected financial results that sent its stock sliding to an all-time low, customers of the nation's No. 3 computer company expressed concern but little panic about their vendor's recent drubbing on Wall Street.

Users and Unisys executives at the Cube, Inc. meeting last week rallied behind the beleaguered firm, saying its technology and support were still good and claiming its recent financial woes had been overplayed in the press and in the financial markets.

Two weeks ago, Unisys reported a $356.8 million loss for the period, including a $181 million charge to reduce its 75,000 person work force by 5,000 by the middle of next year [CW, Oct. 29]. Late last week, Unisys stock closed at 2⅝.

Unisys officials last week stepped up damage control at the four-day meeting and vendor fair, which attracted more than 1,600 people, nipping in the bud analyst speculation that the company was headed for a Chapter 11 reorganization or a Chapter 7 bankruptcy.

"I believe we are more than halfway though the transformation of Unisys," said Cyril Yansouni, head of the newly formed Computer Systems Product Group, in his keynote address. He said the management team had decided to make hard choices and focus on the long term, "but the stock market is focusing on the very short term."

A number of Cube members picked up this theme, beginning with current Cube President and Softchec, Inc. Executive Vice-President Dean Sutton, who urged the audience to promote and support their vendor. Cube is the largest of the two domestic Unisys user groups; the other, Use, Inc., claims about 650 organizational members.

Unisys' Yansouni *looks to long term*

"The recent panic on Wall Street is ludicrous, truly ludicrous," Sutton said in his keynote address. Illustrating Cube's confidence in the company, Sutton reported that the organization had recently acquired Unisys stock — "at an unbeatable price." Indeed, several individuals at Cube last week said they had bought Unisys common stock, which was trading late last week at 2⅝.

"I bought some. I never did that before, and I've dealt with Unisys for 15 years," said Robert M. Owsinski, general manager at Virtual Soft, Inc., a computer products and service company in Rochester Hills, Mich.

Lots of technology companies have had a bad year, "[but] they are not being painted similarly," said Eric Thomas, director of information systems and services at John C. Lincoln Hospital and Health Center in Phoenix. "This is still a $9 billion to $10 billion company," he added. "You can't lose sight of that."

Unisys is not experiencing a liquidity shortage, said Yansouni, referring to the $1.25 billion in revolving credit that Unisys has access to until January 1993.

For other Cube attendees, however, Unisys's recent financial troubles have reopened old complaints dating back to 1986, when Unisys was formed in the complex merger of Sperry Corp. and Burroughs Corp.

"I hated to see the merger. It was like mixing apples and oranges," said an IS executive at a Pennsylvania utility, who asked not to be named.

IBM pays up on patent

BY NELL MARGOLIS
CW STAFF

BOCA RATON, Fla. — IBM last week agreed to pay royalties to Rodime PLC, settling a three-year charge that it had trampled on the struggling Scottish manufacturer's 3½-in. disk drive technology rights.

For IBM and Rodime, the settlement and subsequent cross-licensing agreements put an end to expensive legal skirmishing. For other firms in the 3½-in. drive market, however, it means that the season of lawyers and licenses is just about to begin. For users, analysts said, it is likely to mean a price hike for 3½-in. drives.

"We definitely plan to pursue a licensing program with the rest of the 3½-in. industry," said Rodime Chief Financial Officer Jay Swent. A suit against 3½-in. market leader Conner Peripherals, Inc., which had been stayed pending the outcome of the IBM case, will return to the front burner, Swent said.

Terms of the IBM/Rodime accord were not released. However, John Altmiller, an attorney at the intellectual property law firm of Kenyon & Kenyon, which represented the Scottish contender, said that "the majority of 3½-in. drives on the market today do infringe claims of the Rodime patents."

The list of firms likely to get the first invitations to negotiate with Rodime include Conner, Quantum, Inc. and Maxtor Corp.

Harvey Allison, an analyst at Alex. Brown & Sons, Inc., indicated that the successful challenge to IBM may be a short-lived victory for Rodime. "It's inconceivable that they could leverage this win into competitive advantage before the market moves to 2½-in. drives," he said.

IBM's agreement to pay license fees to Rodime surprised observers, according to Jean Orr, an analyst at Labe, Simpson & Co., who said Rodime's patents had been considered to be much too broad to be enforced. However, she added, "experience tells us that IBM doesn't [make concessions] like this without a very good reason."

EDS cans System One deal

HOUSTON — A partnership that promised to add an estimated $350 million to Electronic Data Systems Corp.'s (EDS) coffers was suddenly scuttled last week in the wake of a legal challenge from IBM Credit Corp. (ICC).

In a joint announcement issued on Friday afternoon, EDS and Continental Airlines said they will modify the deal that originally would have given EDS a 50% stake in Continental's System One airline reservations system as well as an outsourcing contract with System One, Continental and Eastern Airlines. The new deal, they said, could focus on joint marketing and facilities management.

Details as to what blew the EDS/Continental deal out of the air were in short supply as the week closed. An ICC spokeswoman confirmed that the firm had filed a lawsuit against EDS and Continental earlier last week but refused to state the grounds on which the suit was based.

A hearing on the ICC action, scheduled for Thursday, was called off when it appeared that the the deal was off. According to the ICC spokeswoman, "it's history."

EDS and Continental, in the prepared statement, also cited "the fuel crisis facing the airline industry" as a reason for modifying the pact.

NELL MARGOLIS

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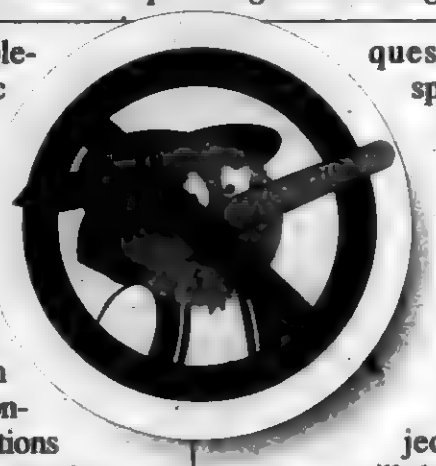

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Multimedia boards tuned up for Comdex/Fall '90

BY MAURA J. HARRINGTON
CW STAFF

BILLERICA, Mass. — New Media Graphics, Inc. will announce a family of personal computer multimedia boards at Comdex/Fall '90 in Las Vegas next week that will allow a user to turn his or her PC into a television, a videoconferencing screen or even an interactive training facility.

Although there are already several similar video boards on the market today for PC users, Marty Duhms, president of New Media Graphics, said the new Super Videowindows board is more than 60% cheaper than competitors' boards, and it incorporates sound.

"My closest competitor, the IBM Motion Card, sells for $2,250. My board will retail for $695," Duhms said.

Duhms, who has been selling a video imaging board product called Videowindows AT for two years, said that in addition to the sound control capabilities, a new chip with "all the necessary video manipulation capabilities," developed for New Media Graphics by Chips & Technologies, Inc., is responsible for big savings in manufacturing costs in Super Videowindows.

The new chip, called the PC Video chip, will be formally introduced at Comdex and can run under either Microsoft Corp.'s Windows 3.0 or Hewlett-Packard Co.'s version of Windows 3.0, which includes its New Wave graphics package, Duhms said.

New Media Graphics will also introduce three daughter cards at Comdex designed to attach onto the Super Videowindows card without taking up another slot in the PC.

They will include the Super TV tuner for $395; the Super Video Graphics Array daughterboard with 1M byte of video memory for $395; and the Super Compression Card, due out in March 1991. Pricing for the latter has not yet been set, Duhms said.

UVC Corp., based in Irvine, Calif., is also experimenting with compression/decompression technology. Last week, the company announced its Multimedia I Processor board and Multimedia Plus Software products, which included a "full multimedia processor board" with compression/decompression capabilities, a company spokesman said.

The board will have an estimated price of $799, and the software will cost from $199 to $299, the company said.

3Com reshuffles one more time

BY JIM NASH
CW STAFF

SANTA CLARA, Calif. — Change, one of the few constants being produced by 3Com Corp., continues at the networking company.

Analysts and even some company insiders said they were surprised last week to hear that Les Denend, executive vice-president of product operations, had bolted to Vitalink Communications Corp. One day later, on Oct. 31, 3Com reorganized its product divisions.

The jinks come on the heels of wrenching administrative changes that began last year. Denend, who oversaw day-to-day activities in 3Com's diverse product units, was one of the three executive vice-presidents who had vied for 3Com's presidency. An aborted attempt to seat Ken Oshman, chairman and chief executive officer of Echelon Corp., as president in March precipitated an unexpectedly swift board of directors' decision to promote Eric Benhamou, head of product operations, to president.

Since then, 3Com founder Bob Metcalfe has left the company, and Chairman and former CEO Bill Krause has retreated to his chairman role, handing the CEO title to Benhamou. There has been no word as to who will replace Denend.

Denend said that disappointment at not being chosen to lead did not play a role in his decision to leave 3Com: "I saw Eric over the summer and fall expanding into his new role as president, and I decided I would like to have that kind of role." Then, he said, first-quarter results made it clear to him that management had to be flattened, eliminating his product operations post.

Reaction to Denend's move varied from disinterest among 3Com resellers to death knell predictions from one analyst. Bob Buchanan, a former group manager at 3Com's Distributed Systems Division, said the news came as a surprise to him.

Buchanan, who left 3Com in September to become vice-president and general manager at Lanquest Group, Inc., a consultancy in San Jose, Calif., said Denend had been a mismatch for his product operations post. He said Denend's strengths were more in management and less in knowledge of technical issues surrounding 3Com's diverse product lines.

Under the reorganization, 3Com's Work Group and Enterprise Systems Divisions have been folded together to form the new Network Systems Division. Another new unit, the Network Adapter Division, was also formed. Benhamou will manage the Network Systems Division.

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IBM and DEC pump up workstation offerings

BY MARYFRAN JOHNSON
CW STAFF

NEW YORK — IBM and Digital Equipment Corp. last week shored up their positions in the workstation market with new offerings that substantially boost the high-end performance of both companies' Unix-based machines.

IBM introduced the RISC System/6000 Powerstation/Powerserver 550, a deskside "minisupercomputer" priced in the $130,000 range and running at 56 million instructions per second (MIPS). The company also expanded its offering of 4M-bit memory technology, previously available only on the Model 540, to quadruple system memory capacity on other RS/6000 models.

IBM also introduced a more powerful, 25% faster version of the AIX Fortran compiler that will be available in March 1991 for the RS/6000.

DEC unveiled two "second-generation" processors for its reduced instruction set computing (RISC)-based Decsystem line — the entry-level Decsystem 5100 and the Decsystem 5500, the most powerful Unix uniprocessor now available from DEC. The Maynard, Mass.-based vendor also trotted out seven software applications and tools and cut prices on its low-end Decstation workstations by as much as 32%.

The Decsystem 5100, at a base system price of $10,995, runs at 19.4 MIPS under Ultrix Version 4.1, DEC's new version of its Unix-based operating system. The new entry-level machine has a memory capacity of 8M bytes to 128M bytes and a storage range of 209M bytes to 4.4G bytes.

The Decsystem 5500, at 28.2 MIPS, is priced from $41,900 and supports memory from 32M bytes to 256M bytes and storage from 355M bytes to 28G bytes. Both systems are scheduled to be available in December.

At Bankers Trust Co. in New York, where DEC and IBM are the two major computing platforms, the new Unix boxes were good news for departments "in need of serious compute cycles," said Shalom Bryski, manager of VAX systems and networks at the bank.

AIX evaluation

One month ago, Bankers Trust began evaluating AIX, IBM's implementation of Unix, on an RS/6000 Model 320. There are also 10 to 15 Decsystems in place, some of them already in production use as computational servers.

"Between these two vendors, it's been fantastic for us," Bryski said. "When I compare how it's so expensive and difficult to get the two platforms talking to each other under their proprietary operating systems, the same thing in their Unix-based stuff is fairly trivial because they've agreed on the same set of open system standards."

"DEC is probably becoming most competitive with itself," said Robert Herwick, an analyst at Hambrecht & Quist, Inc. in San Francisco. "For anybody with VAXs in a technical computing environment, [the Decsystem 5500] is probably an argument for even the truest blue of DEC accounts to replace their current computational server."

On the software front, DEC announced four Ultrix-based products for integrating information across networks and three software development tools that run under both VMS and Ultrix.

While DEC made no mention of the enhanced Mips Computer Systems, Inc. chip powering the speedier Decsystem 5500, that R3000-A chip enables a speed of 30 MHz, while its predecessor Model 5400 ran at 20 MHz. The chip also synchronizes the CPU and floating-point processors in the 5500 to improve multiprocessing capabilities.

User excitement grows as Unix attracts more attention

BY JOHANNA AMBROSIO
CW STAFF

NEW YORK — Unix Expo, held last week, yielded no real surprises. Instead, companies unveiled products in line with already-announced strategies.

Still, there was palpable excitement on the show floor. People were talking about what impact, if any, the Open Software Foundation's OSF/1 operating system would have on the Unix market. Digital Equipment Corp., IBM, Siemens Nixdorf Information Systems and others were demonstrating OSF/1 in their booths. However, opinions about OSF/1's success are still very mixed.

Another source of excitement — among the vendors, at any rate — was how this appears to be the year that Unix began receiving more corporate information systems attention. During one of the keynote speeches, the crowd was asked who among them were considering Unix for the first time. At least half of the people's hands shot up.

Michael A. Kaminski, manager of computer-integrated manufacturing and networking technology at General Motors Corp., said the plethora of products on the floor should help users implement Unix and other standards. "For a long time, there were no real open systems products available, and users blamed that for not implementing standards," he said.

In addition to workstations from DEC and IBM (see story above), hardware announcements included the following:

- NCR Corp. added an industry-first bonus to its product line by bundling the OSF/Motif graphical interface window manager into its display stations. By running Motif locally rather than on a host, the stations reduce host communications.
- Network Computing Devices, Inc. broadened its extensive X Window System display line with a $1,495, 15-in. monochrome terminal, which the company said breaks a new price/performance barrier. The NCD15B offers screen resolution of 1024 by 800 pixels and is based on the Motorola, Inc. 68000 chip.

Software and communications announcements were also the order of the day. A score of vendors, among them Oracle Systems Corp., Informix Software, Inc. and Information Builders, Inc., said they had ported their software over to new hardware platforms.

Also unveiled at the show were the following:

- The first Unix implementation of Supra, Cincom Systems, Inc.'s relational database management system, for Sun Microsystem, Inc. workstations. Supra will be ported to four other Unix platforms, including IBM's RISC System/6000.
- Saber C++, a C++ programming environment from Saber Software, Inc.
- Suncobol, a distributed version of the programming language for Sun's Unix workstations, available from Sun.
- Communications software designed to connect Unix systems to IBM mainframes, from Rabbit Software Corp. in Malvern, Pa.

Senior writer Joanie M. Wexler contributed to this report.

Manzi links Unix success to Lotus

NEW YORK — Lotus Development Corp. President Jim Manzi was hardly humble during his keynote speech at last week's Unix Expo. He told hundreds of attendees that much of the future success of Unix on the desktop will be attributable to Lotus' rollout of its 1-2-3 spreadsheet package designed for that operating system.

"Unix will gain significantly from its support by Lotus," asserted Manzi, who noted that two versions of 1-2-3 for Unix — one for Sun Microsystems, Inc. workstations and one for AT&T's Unix System V — started shipping this year. He said there are currently 15 million 1-2-3 users, and "10% of all data entered into desktops goes through 1-2-3."

Manzi ambitiously predicted that by 1995, 25% of the desktop market will belong to Unix. He also took the opportunity to roast nemesis Bill Gates, president of Microsoft Corp., which focuses on software for MS-DOS and OS/2 operating systems rather than Unix.

"Bill Gates forecasts no future for Unix on the desktop," Manzi said, "though I have to believe his perceptions are colored by self-interest."

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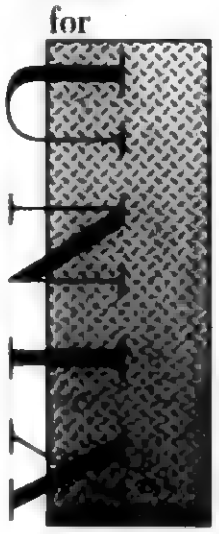

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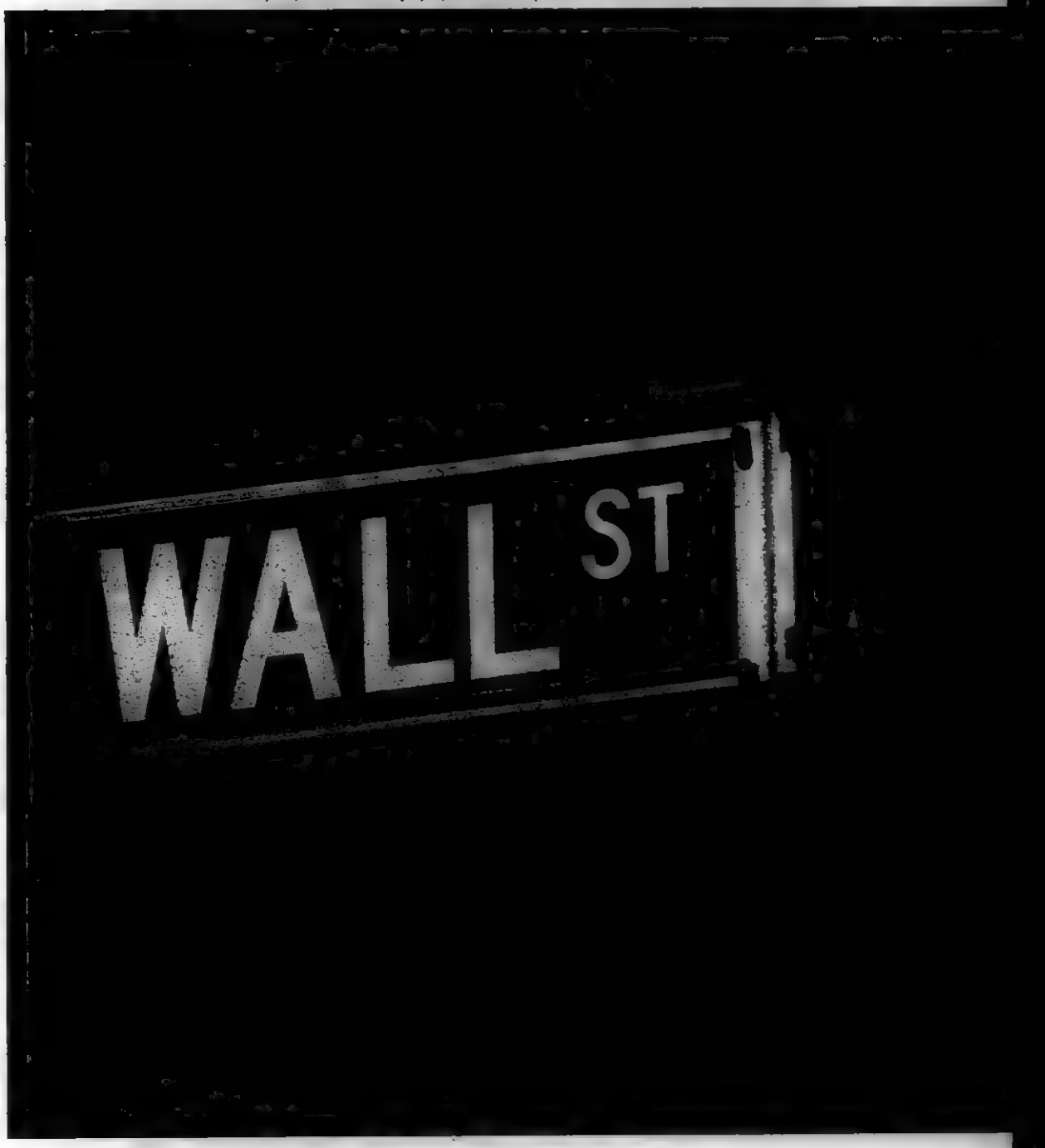

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Sears buys into high-end connectivity

BY ELISABETH HORWITT
CW STAFF

Sears Technology Services, Inc. set its data center connectivity strategy on the bleeding edge last week by announcing plans to replace its IBM 3745 front-end processors with the recently announced IBM 3172 Interconnect Controller and a third-party switching platform.

The firm, a division of Sears, Roebuck and Co., will become the premier customer of a high-end switching product introduced last week by Network Equipment Technologies, Inc. subsidiary Adaptive.

The Adaptive Synchronous Optical Network Transmission Manager (STM) will provide dual 45M bit/sec. T3 connections between each of Sears' three data centers and will support up to eight hosts at each center, according to Gary Weis, senior vice-president of networking and technical services at Sears.

The firm will be using the Model 18 STM, which is said to support up to 18 T3 links, and plans to have completed installation by the fourth quarter of next year.

In the same time frame, Weis said, Sears will link the mainframes at each data center with IBM's Enterprise Systems Connection, a fiber-based high-speed link announced last September.

The STM-18s will also be used as the basis of a T3 backbone that will concentrate multiple 1.5M bit/sec. T1 lines from various remote Sears sites, Weis said. Sears' existing IDNX T1 switches will feed into the STM hubs, and IBM's Netview will manage both types of switches via a homegrown link that Sears originally developed for the IDNXs, he added.

Sears apparently feels little unease about purchasing a product that not only combines a number of embryonic technologies, such as Synchronous Optical Network and frame relay, but also has not yet gone into beta testing and will not ship until the middle of next year.

"The switch is industrial-strength, [telecommunications carrier] quality," Weis said. "Its redundant architecture and hot pluggability," which enables modules to be taken out and put back in without interrupting service, "is crucial, given Sears' high-availability environment."

However, the firm will hold off on tentative plans to use the STM "for more traditional T3 multiplexing" at additional sites until it has evaluated the product at its initial installations, Weis said.

The 3172 Model 2s, which IBM announced last September, will support multiple T1 links between the hosts and STM switch at each site.

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TI factory cited for automation

BY MITCH BETTS
CW STAFF

LUBBOCK, Texas — At Texas Instruments, Inc.'s consumer electronics plant, computer-integrated manufacturing (CIM) systems have reduced manufacturing costs enough that a competitive line of pocket calculators can actually be "Made in the U.S.A."

The calculators — packaged in red, white and blue — are being sold at Wal-Mart Stores, Inc. outlets nationwide, and the TI factory won the Automation Forum's Renewal Award last week for bringing manufacturing back to North America.

The award sponsors praised the managers at TI Lubbock for their bold decision to compete against Far East manufacturers known for their low-cost production facilities.

The Lubbock plant uses a highly automated, continuous-flow production system that turns raw plastic pellets into a finished calculator (packaged and ready to ship) in just 20 minutes.

"So integrated is the production line that the plastic cases are still slightly warm to the touch from the molding operation when the electronic components are installed," said William Rolland, executive director of the Automation Forum.

The CIM system and the calculator itself were designed to lower production costs; the calculator has only seven components, for example. Robotic arms remove the plastic parts from the molds, apply decals and seal the components.

However, the heart of the CIM application is a TI 990 minicomputer and several microcomputers linked to sensors on the assembly line, according to Ken Barnes, equipment engineering manager at the Lubbock facility.

The system provides real-time monitoring of the assembly line, which gives immediate feedback on throughput, scrap and yield from start to finish. "We know exactly what's going on right now, any place on the factory floor," Barnes said.

An Ethernet network links the shop floor to TI's accounting and inventory systems. In addition, TI's suppliers can call into the factory's minicomputer to find out if any parts were defective.

Barnes said the Lubbock factory plans to improve its 20-minute record by eliminating manual operations.

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EDI test drive

■ Thinking about setting up an electronic data interchange (EDI) but reluctant to give it a whirl? Foresight Corp. has introduced what it calls an EDI Simulator, designed to facilitate setting up and testing an EDI system. The simulator package also includes Edisim software for mainframes, allowing the user to generate EDI test data of any type or quantity, the company said.

Supercool chip

■ Velox Computer Technology, Inc. said that it can crank out a 50% higher microprocessor clock speed by lowering the microprocessor's operating temperature to a brisk 0 degrees Celsius and precisely controlling the voltage. That means an Intel Corp. I486 rated at 33 MHz can be made to run at 50 MHz, the company said. The company's first product based on this new class of ICEC, shorthand for integrated circuit, environmentally controlled component, will be an add-in module called the Icecap 486 for personal computers based on the I486 microprocessor. The module consists of a special cooler and electrical unit in an insulated enclosure that controls the temperature and voltage of the principal integrated circuits of a PC at their peak performance point. The company plans to sell it for about $150 in OEM quantities.

Embedded lead

■ A new report published by Electronic Trends Publications, a market research firm, concludes that the U.S. will continue to lead the rest of the world in the embedded controller market. Demand is rising for 8-, 16- and 32-bit advanced controllers, a market already dominated by U.S. firms, while demand for 4-bit controllers made by Japanese firms is slackening, the firm said. International shipments of microcontrollers, microprocessors and embedded processors will top $8.3 billion in 1995, rising from $3.3 billion in 1989.

With complexity, a threat of chaos

Scientists to discuss whether system complexity could lead to life-threatening glitches

BY MICHAEL ALEXANDER
CW STAFF

Elaborate computer systems are increasingly being used to control everything from long-distance telephone calls to transcontinental flights. Now, some computer scientists worry that such complex computer systems are not as reliable as needed and, should they fail, they would set off mishaps that could result in the loss of life.

Tomorrow, about 100 computer scientists will convene to discuss their concerns about the reliability and safety of complex computer systems during a two-day summit meeting in Arlington, Va., sponsored by The Association for Computing Machinery (ACM). The scientists will also discuss what some said is a disquieting trend toward the use of computer modeling to simulate human behavior.

Many of the scientists said they fear that as computer systems become more elaborate, they may be more prone to the sort of software glitches that triggered the shutdown of AT&T long-distance service for several hours early this year.

For example, the scientists pointed to such calamities as the two accidental downings of civilian aircraft and the radiation therapy machines that run amok, exposing four patients to fatal overdoses of radiation. Those incidents were caused by software that did not perform as expected, they said.

"Commercial pilots are getting more and more information from radar and computer systems on board and not from their own senses," said Frederic Withington, a computer consultant and member of the ACM program committee. "If the information is wrong, the results can be disastrous, as in the case when the Soviets shot down a Korean airliner that had strayed into its territory. The flight was shot down basically because of a misprogrammed computer."

The nanosecond suddenness with which some events occur using computer-controlled systems means that we must also depend more on the systems and not on common sense when coping with emergencies, Withington said.

"We need to do our jobs [as software engineers] better, exercise software more thoroughly and anticipate problems, perhaps with a fail/safe mode so the system can sense when things are not right," Withington said.

In some instances, software engineers simply lack the intellectual capacity to develop nearly foolproof complex computer systems, said Anthony Wasserman, a software engineer and president of Interactive Development Environments, Inc. Systems such as multinational air traffic control may be beyond our grasp, but that is not stopping engineers from attempting to build such systems, he said.

"The fact is, whether it is a system for home shopping or electronic funds transfer, there is a level of complexity, and we need to better manage it," Wasserman said. He advocated a more structured approach to software design, which traditionally has been treated as a "programming mystique."

Complex systems are not necessarily less reliable, but more can go wrong, he said. For that reason, software engineers must do a more careful job of analyzing the risks associated with a complex system, even if it means stretching out the design process, Wasserman said.

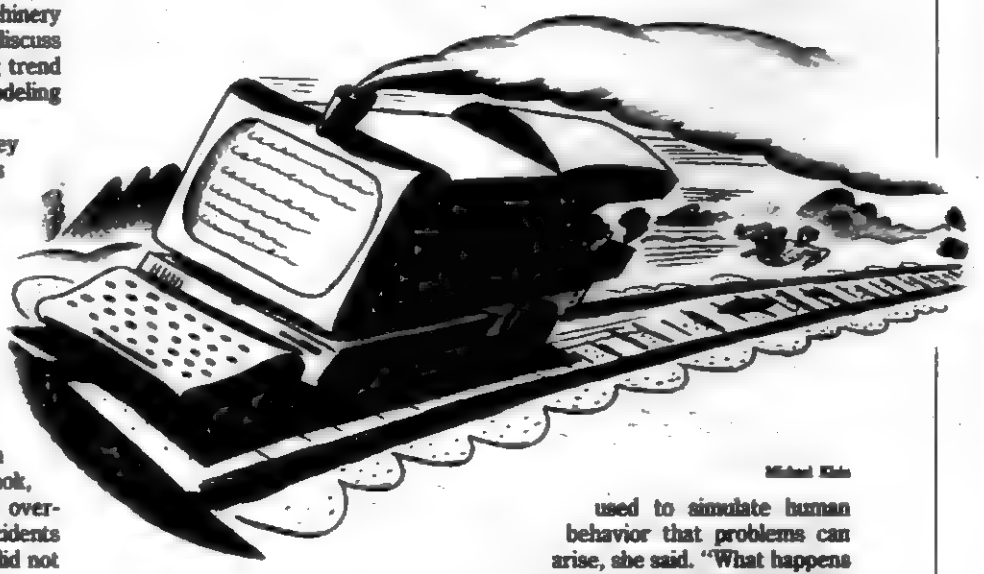
Some scientists at the summit meeting also fretted that the growing reliance on computer modeling may lead some to use the technology to support conflicting points of view. For example, the scientists pointed to the use of computer simulations supporting conflicting theories of such hotly debated issues as global warming and the possibility of a nuclear winter.

The most useful models are typically those that have been applied to the physical world, where there are small numbers of known variables, said Stuart Dreyfus, a professor at the University of California at Berkeley, whose expertise is in examining the limits of modeling. Applying modeling to socioeconomic situations or trying to predict human behavior "can lead to making inferior decisions," Dreyfus said.

For example, studies show that managers do not do a lot of detached meditation before making a decision, Dreyfus said. "They circulate, gossip and use intuition, not methodologies." Even the best of expert systems fail to come close to turning this sort of experience into rules that a computer can follow, he said.

"As long as we see models as untrustworthy but interesting, or as a new tool with error correction, they are not totally irrelevant," Dreyfus said.

When applied to limited variables with known interaction between those variables, computer modeling can be a "fabulous tool," agreed Eleanor Wynn, an anthropologist and publisher of *Information Technology and People*. It is when computer modeling is used to simulate human behavior that problems can arise, she said. "What happens so often is that they begin assuming that model is a reflection of the real world and not a hypothesis."



Michael Klein

One reason that computer systems fail is that their designers did not adequately consider the human element in their planning, said Rod Leddy, systems training consultant at Mobil Oil Corp. Computer-supported systems have to be designed with communication between users and technicians rather than from a distance or a set of abstractions, he said.

One solution may be to require computer scientists to study sociology, philosophy and other areas. European computer scientists have a broader education and are more comfortable incorporating those areas in computer systems design, Wynn said.

Despite fears that computer system failures will become more frequent, the scientists said they see cause for optimism: Computer users are more knowledgeable and are cooperating more closely with computer manufacturers to develop better systems; integrated sets of software tools are making software cheaper and more reliable; and new methods known as software quality metrics are helping to make software of complex computer systems more foolproof.

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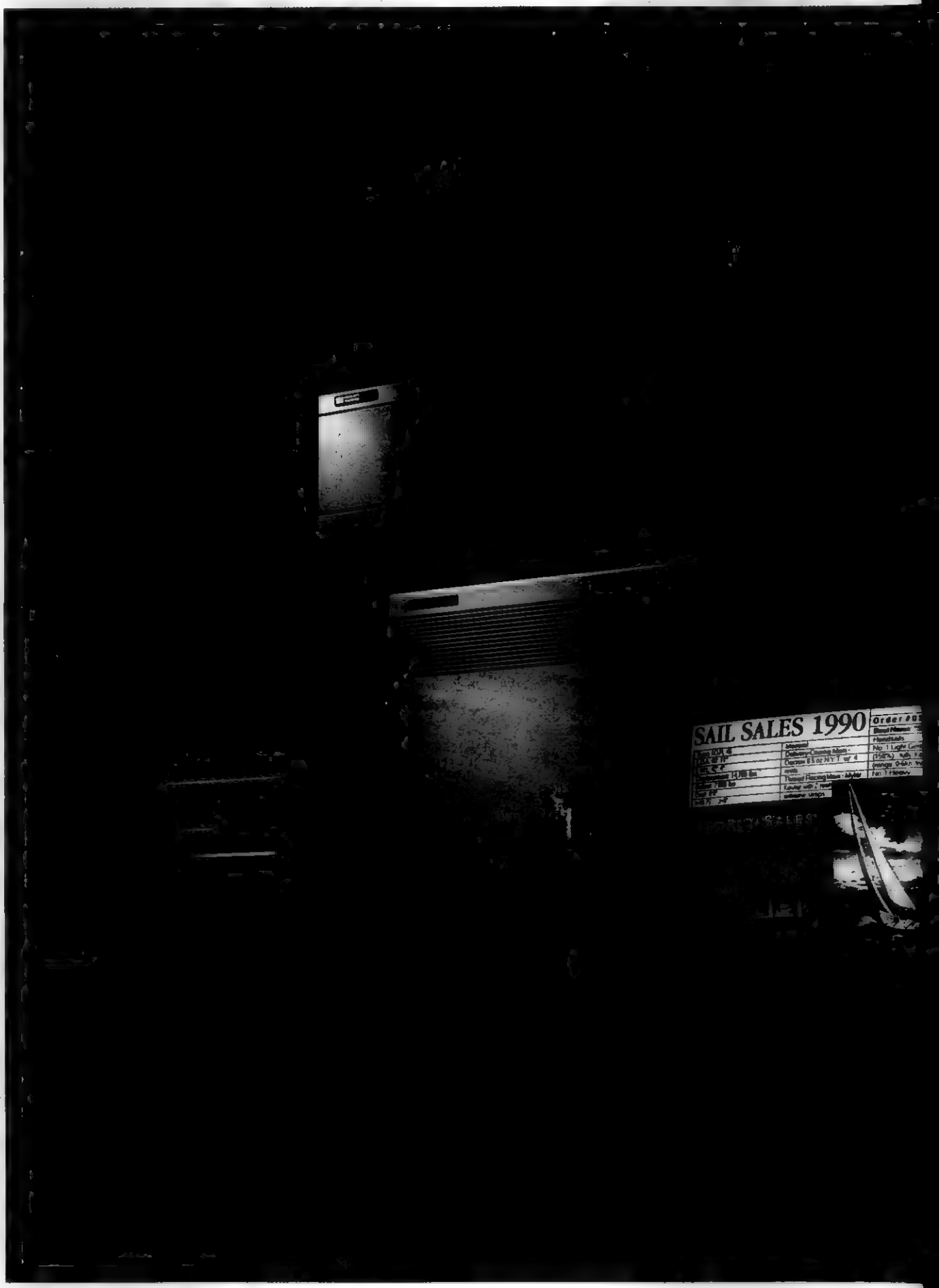

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EDITORIAL

War?

THIS NEWSPAPER AND others plastered the word "war" all over their front pages several times two years ago to describe the fractionated Unix market, split between the AT&T camp and the then-forming Open Software Foundation (OSF).

In retrospect, the phrase "smoke screen" might have been more appropriate. For the OSF has finally released its version of the operating system, but its very backers, who so proudly shared center stage at the unveiling of the OSF, are responding rather limply to the product of their own creation.

In fact, only two of the seven companies that formed the OSF have committed to using the new product on all of their open systems. The biggest OSF sugar daddy, IBM, will continue using its own brand of Unix for its hot-selling workstations — at least for now. Others in the group will rely on AT&T's Unix System V.

And some users who have dissected the OSF's product have found, as one customer told us, "no real difference among the different types of Unix." No difference, no war — just smoke.

If you sold a product and it was fairly unique ("proprietary," in today's parlance) and it made you lots of money, how great would the incentive be to aggressively sell products that others would be free to sell as well? Herein lies the reason why the OSF will not live up to all the hoopla and promise surrounding its creation.

There just isn't a strong incentive to move to open systems when you can sell a proprietary high-margin item. This assumes customers are willing to buy these proprietary products, which they still are — and in large numbers.

Editor's note

During the next five years, information systems will place some of the biggest-ever technology bets as a result of the exciting technologies that are emerging. Thus, it is no surprise that IS management has found its attention turning slightly more toward technology issues as management mulls the platforms and architectures of the future.

To address this growing need to assess and evaluate new technology, *Computerworld* has added several features in the last year, including our monthly Buyers' Scorecard and product benchmarks, as well as our weekly Advanced Technology page. We will also expand the number of Product Spotlights we present in 1991.

This week on page 38, we unveil Technology Analysis, which we hope you will find to be a comprehensive analysis of some of the hottest new products. Tech Analysis combines a digest of findings of the best product testing laboratories with the insightful analysis of industry experts, Wall Street watchers and user input to yield a truly complete technology assessment. The section will run every other week until the end of 1990 and weekly thereafter.

LETTERS TO THE EDITOR

Geography 101

In the Executive Report article "Information must conform in a world without borders" [CW, Oct. 1], Mr. Huppertz is quoted as saying that it is necessary to forget most of what was learned in geography class. I am currently in an MBA/Information Systems program, with a background in geography. I believe that geography is more important than ever to markets, business and IS.

When working with people in other countries, one must understand the peculiarities of the cultures that exists there. More than one businessperson has lost sales because of a cultural faux pas.

Also, should one decide to expand or relocate, knowledge of geography is essential to doing proper cost and feasibility studies. As an IS person, you had better be sure that the area where you set up will be able to support your system.

There are still many places in the world that cannot support digital communications without a major capital investment in materials and support, and if that is a part of your business, then you had better know where this occurs.

The values and standards that we take for granted here in the U.S. do not apply to many other places in the world. We need to remember that the U.S. is no longer a big fish in a small pond.

John A. Slater
Walnut Creek, Calif.

No guarantees

Regarding the article by Lee Gruenfeld, "Even if you have a warranty, you may not have a guarantee" [CW, Oct. 1], the case was tried in the Massachusetts Superior Court. The appeal was to the Massachusetts Appeals Court, not the U.S. Court of Appeals. The feds had nothing to do with the case.

Secondly, the real question the appellate court decided was which innocent party should bear the loss; both had relied upon erroneous statements by the hardware manufacturer as to response time. The manufacturer was not a party to the litigation.

What really disturbs me is that your readers who are users may get the idea that the user wins most of these cases. Mr. Gruenfeld says, "Customers are usually favored in these cases because the court often finds computer warranties to be ambiguous, unclear or 'unconscionable.' The theory is that the customer is the novice in the deal, and the vendor is experienced." Not true. I've been reading computer contract cases since the first opinion was handed down more than 25 years ago. The hardware and software companies win many of the cases, probably a majority. The courts don't find the clauses unconscionable very often, and the "novice" argument is just about dead.

Robert P. Bigelow
Counselor at Law
Winchester, Mass.

Something for all

Regarding the In Depth article by John Chisholm [CW, Oct. 8]: Is he aware that IBM has tried to abandon both VSE and VM? The resultant user uproar has forced IBM to keep both products. VSE users are tired of being told that they are "nonstrategic." They use VSE because it meets their needs in a way that neither VM nor MVS can.

The same holds true for VM users. Not all companies need the same features in an operating system. If they did, there would not be the multitude of processors and vendors available to the user community across the range of micros to mainframes.

IBM is primarily a hardware, not software, company. IBM's real competition in the mainframe arena lies with Hitachi and Fujitsu. The price tag associated with a project like Mr. Chisholm's "modest proposal" would have to be funded from hardware sales and not software license fees. Any attempt to fund such an undertaking with software fees would seriously impact sales of hardware as companies re-evaluate computing needs in light of reduced corporate spending. Both Hitachi and Fujitsu offer quality hardware at a lower cost than IBM.

A first step toward Mr. Chisholm's goal is the family of ESA operating systems. Let's see what type of price tag these carry when they are delivered and their impact on the majority of IBM system users is known.

Cynthia G. Kern
Delaware Service Co.
Philadelphia, Pa.

Computerworld welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor In Chief, Computerworld, *P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701. Fax number: (508) 875-8931; MCI Mail:* COMPUTERWORLD. *Please include a phone number for verification.*

Good growth, happy customers

PHILIPPE BEAURAIN

The American Dream: Take an original idea, nurture it, turn it into a thriving business — and then sell it for an enormous profit.

This is the dream that has cast its spell over many an enterprising company, but nowhere is it more apparent than in the computer software business and other high-tech industries. Up-and-coming firms in this arena are the ones that can cite the most impressive growth figures — and revel in the widespread public attention they attract.

And yet, behind the allure of fast growth lurks a basic problem that can jeopardize a company's very survival. For too many companies, a single-minded focus on growth ends up leaving customers in the lurch.

The problem comes from losing sight of long-term goals for the sake of immediate growth. A chief executive officer can become obsessed with how the company is perceived by potential investors and buyers and be more concerned with revenue than profits.

He might focus on tactics that boost quarterly earnings rather than on strategies that are customer-oriented, such as innovative employee training and quality programs.

Growth can become the No. 1 priority, at the expense of quality and — ultimately — customer satisfaction.

Massacre that myth

This brings up one of the most dangerous myths in the business world: that growth is inherently good. The only deadlier notion may be that if some growth is good, more must be even better. The truth is, despite the homage many top managers (and market analysts) pay to growth indicators, they do not necessarily mean that a company is in good health.

In a competitive environment, of course, managers must fight for market share, but they must also examine the impact such increases would have on the quality of their products and the needs of their customers.

In fact, a clear focus on these basics — quality and the needs of customers — is the best guide to healthy, controlled growth — the kind that truly serves a company's best interests.

As managers, we must look beyond quarterly profits and analyze the long-term impact of our decisions on the basic elements of the business. At times, the best decisions may be the ones that actually hinder short-term growth.

We may, for example, invest heavily in training because in the long-run, well-trained employees are essential to provide customers with added value through quality goods and/or services.

In many decisions (e.g., pursuing new or larger contracts), we must put ourselves in the customer's shoes to provide the sense of direction we need.

No matter how tempting the opportunity, we need to be realistic about how much business we can manage effectively without sacrificing the quality of our workmanship or jeopardizing the faith of our customers. Remember: If we fail in these basic areas, we will fail as a business.

Whether we are adding new facilities, expanding product lines or growing a whole new business area, these basic issues still rule. If we cannot ensure them, even the most impressive-sounding growth jump will be a mistake over the long run.

It is better to have steady, "boring" revenue increases of 35% for two years than 65% for one year and 10% the next.

Stuart Goldenberg

With this outlook, growth isn't as much a matter of sales forecasts and capital budgeting as it is a practical concern for satisfying customers, both old and new. This must be the driving force, as well as the control, behind growth decisions.

It must also be the core value for staffing, because in virtually any business, customer satisfaction is directly related to the knowledge and commitment of the people who make up the organization.

According to William Davidow and Bro Uttal in their recent book *Total Customer Service*, current economics have forced many managers to adopt "myopic," short-term philosophies. They write, "The result: Many managers have developed an involuntary reflex of trimming any business activity whose impact on profits isn't immediately obvious to a first-year accounting student — or an institutional investor. Customer service is a favorite victim..."

Given today's competitive business environment, companies dare not stand still; we must move forward, adapt and grow. The challenge is to do so with a clear sense of how much and how fast, without short-changing customers or compromising the quality of products and services. Even if our goal is the "American Dream," we need a solid foundation of reality on which to build.

Beaurain is president of GSI Transcomm, a Pittsburgh-based software company.

Abort, retry, ignore — truth about the PC age

GLENN RIFKIN

I will never be a power user of PCs, just as I will never be a power forward for the New York Knicks. It's not that I don't covet these things; it's just that I am not cut out for either sport. I'm far too short, far too slow and far too left-brained (or is it right-brained?).

I don't feel all that bad about this, mind you. I expect there are only about 50 or 60 power forwards in the NBA, and I'm confident there are only 12 power PC users. Slam-dunking is one thing, but have you ever tried to hook up a printer or install a memory upgrade board?

The problem with PCs is something I call the Barrier to Entry. This concept is based on the theory that PCs don't really want to let you in. Of course, they are very sneaky about this. They lull you into a sense of accomplishment by letting you boot up the system and even open a file in some application program. Some of you clever types will even do this several times, and that smug feeling will come over you. "I've got this thing licked," you think to yourself. Then comes the surprise.

Systems people call the surprise a glitch. The glitch comes in many disguises: It comes as an error message. It comes as a garbled screen. It comes as a printer that runs out pages with strange margins and bizarre type fonts.

Your first instinct is to panic. You quickly type in a command that should stop whatever horrible deed is being done on the screen. It does no good. You try the command again (maybe it didn't hear you). Still nothing.

If you are a masochist, you pick up the dog-eared documentation manual. You flip quickly to the back, where it lists things that can go wrong and what to do about them. Inevitably, whatever is happening to your system isn't there.

You toss the manual across the room and type in another command: Stop Doing This. The computer responds: Bad command. Bad boy. Bad dog. You're being reprimanded by a machine. You hit the return key. The screen says Abort, Retry, Ignore. What does it mean, Ignore? Ignore the frustration? You type Abort, and nothing happens.

Right about now, I start reaching for the monitor with an eye toward the window. But I know deep down it isn't the poor monitor's fault — it's sort of like killing the messenger. The PC is just a damned box, and it won't fit through the window anyway.

Instead, I shut the system off. The pathetic sound is an electronic sigh. It says, "Haven't you gotten the message by now? Haven't you had enough?" And it is right. I have had enough. I stomp upstairs, pick a fight with the cat and turn on Donna Reed reruns on Nick at Nite.

It's no accident that I escape to my beloved TV. That is technology at its best. I hit a button, and on it goes. I hit another button and change the channel. I hit yet another to make it go mute when a commercial comes on. I hit another, and it clicks off obediently without a bad attitude.

Don't think this isn't embarrassing. I mean, here I am writing about this stuff for years, making a living documenting the Information Age, and I still approach my PC as if it's going to give me a tetanus shot. You are probably sneering right now. You technology pros look at the PC the way Richard Petty looks at a Honda Civic: After you've driven a Formula One, the small ones ain't worth a sneer.

But maybe there are more than just a few IS pros who have spent their careers working on 370s and 3090s and VAXs and find these PCs just a bit unnerving. Maybe DOS looks like Swahili to a few of you as well. Come on, I'm right — sure I am.

> **HERE I AM making a living documenting the Information Age, and I still approach my PC as if it's going to give me a tetanus shot.**

You probably hired a young PC maverick to handle the problems and questions pouring in from the bewildered populace. Perhaps you conceived (or agreed to) an information center approach. And then you walked back to the water cooler and breathed a sigh of relief.

You've even got a PC on your desk, humming away near the family photos. You sort of grew fond of the little critter and find yourself pumping out E-mail messages or memos now and then to keep up appearances.

You also remember the day you decided to load up a new accounting program by yourself. You didn't bother with the manual because it should be self-evident once you got going, right?

Two hours later, the young PC whiz came rushing in the door just as you were about to drop the monitor out the window. Your secretary gave you a glass of water and led you to a chair while you muttered, "Abort, retry, ignore, abort, retry, ignore."

The PC guy sat down smiling at the keyboard. He began to type a series of commands. It was a blur of backslashes and colons, and he whipped through functions that you couldn't find even if you had another decade to poke around.

Fifteen minutes later, he stood up, rubbed his hands together and said, "Boss, you're golden. Come on back now, and you won't have any problems."

Ten minutes later, you were stuck again — horribly, inexplicably, forever. You shut the machine off, wandered quietly to the data center and stroked your System 38.

I personally have relied on a first-class PC expert to get me through this nightmare. Unfortunately, I have a feeling she is getting tired of sitting next to me all day and wants to go back to her office.

Rifkin is a *Computerworld* features editor.

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COMMENTARY

Lori Kleinman

In-house options

Finding the right vendor to help you with your minicomputer and mainframe software support needs is like finding a good dentist — you want someone who can respond quickly to your pain and won't cause you to scream about the size of the hole drilled in your budget.

Too often, users worry about what services vendors offer without fully considering the talent and performance records of their in-house support staffs. Ledgeway research has repeatedly shown that internal staffs outperform outside vendors. So why not take advantage of this knowledge and use internal benchmarks to set problem response and resolution time standards for your vendors? Users who appreciate the value of applying internal support standards to their outside vendors will gain far greater performance from their support providers and get more bang for the buck.

Customers feel that they have two choices when looking for minicomputer and mainframe software support — their internal staffers, who typically reside in a centralized data center, or an outside support sup-

Continued on page 32

Uniting VMS and Unix could foster innovation

BY MARYFRAN JOHNSON
CW STAFF

Like mixing oil and water.

That was the first reaction many users had to the recent news that Digital Equipment Corp.'s 13-year-old, proprietary VMS operating system will eventually run Unix-based applications.

"There are a lot of VMS shops with too much investment in customer applications to change," warned Gerald Siddons, director of scientific computing at the Dana-Farber Cancer Institute in Boston.

Yet while a healthy dose of skepticism greeted DEC's bombshell announcement [CW, Oct. 29], industry analysts and customers alike were intrigued with the possibilities.

Siddons said he could envision, for example, how his colleagues at Children's Hospital in Boston — a stalwart VMS shop for its patient records and financial applications — might be able to pull in some renegade researchers now working on Unix-based machines with the prom-

Continued on page 33

Opening up DEC

DEC's open systems strategy is supposed to provide users with application portability among different vendors' machines — the ability to develop an application on one machine and run it on any computer in the network. The strategy has three major threads:

- Eventual compliance with Posix standards now under development by the Institute of Electrical and Electronics Engineers, Inc. Next quarter, DEC will field-test three Posix standards that cover applications interface, shell utilities and real-time processing.
- Applying for certification and "branding" of VMS by the X/Open Consortium, a standards body in the process of defining a common application environment based on de facto and internationally accepted standards. To get X/Open's XPG3 verification, a company must submit its operating system to a battery of 5,232 tests run by Unix System Laboratories, Inc.
- Support for key standards developed by the Open Software Foundation in Cambridge, Mass., for its Distributed Computing Environment.

MARYFRAN JOHNSON

Officevision: A great debate

BY ROSEMARY HAMILTON
CW STAFF

Although thousands of people will be using IBM's Officevision by the end of 1990, it still struggles with a negative image.

According to Tony Mondello, IBM's vice-president of office systems development, Officevision is misunderstood. But according to one market research firm, the industry is not confused about Officevision. In a report scheduled for release this week, Forrester Research, Inc. in Cambridge, Mass., asserts that Officevision will be a modest success as host software but will fail as a desktop system.

"Officevision will continue forever," said Stuart Woodring, an analyst at Forrester. "But the question is, what will be the value of those products?"

Mondello, who is critical of the Forrester report, said Officevision has been a success and pointed to an expected user base of nearly 1 million by year's end as proof. The total includes the nine products under the Officevision umbrella, including decision support and executive information software, as well as upgrades of existing IBM office products, he said.

"There is a lack of understanding," Mondello said. "Maybe it's IBM's problem. We believe we understand the [office automation] problem, and we believe that this strategy will lead to the solution. We are only partially down the path today."

Forrester claims that a closer look at the Officevision installed base shows that it consists primarily of host upgrades, which in some cases are only renamed existing office software. As a result, the firm claims that while Officevision technically has thousands of users, only a few new users actually selected it over other vendors' products.

A big problem

Woodring said there is only a handful of users running the local-area network version of Officevision in production mode, and he sees this as a big problem.

First, he said, the desktop is an obvious strategic platform for the future. Secondly, of all the Officevision products, the LAN version is the only platform that did not have an existing set of office tools and would therefore require brand-new users.

He further claimed that the biggest chunk of Officevision installations comes from the Application System/400 community. This, he suggested, should not count as true Officevision numbers, because it is merely a renamed release of AS/Office, the initial OS/400 office software.

In response, Mondello said the host platform will continue to play a major role in information systems and cannot be overlooked. In the case of Officevision/400, he said it is not only a renamed but also a restructured product that users license separately from the OS/400 software. He also said that there are "a couple hundred users kicking the tires" of the LAN version.

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Maintenance productivity gains of up to 10-to-1.

In this same study, developers were asked to compare IEF maintenance productivity with their former methods. Of those responding, *more than 80 percent had experienced gains of from 2-to-1 to 10-to-1.* (See chart.)

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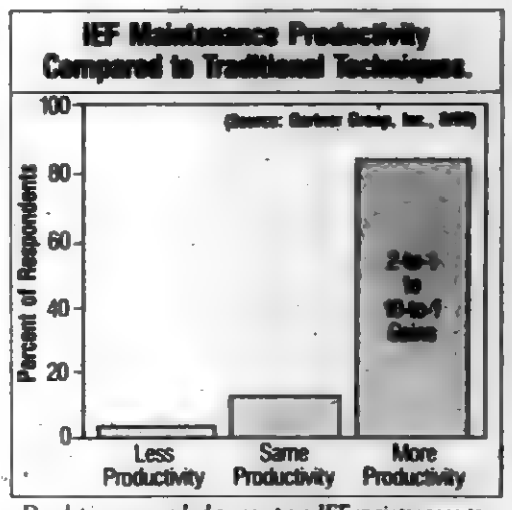
With the IEF, application changes are made to diagrams, not code. So, for the life of your system, specifications will always match the executing application. The Gartner Group research showed that *all* IEF users who reported making application changes made *all* changes at the diagram level.



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Of course, our technical support, consultancy, training courses, satellite seminars, and other informational assistance will continue apace. We also offer re-engineering and template services. This full-service support will remain an integral part of the IEF product.

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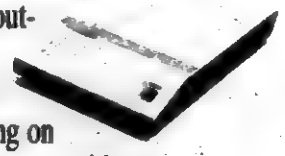

Since NEC modems are designed to rapidly and accurately transmit huge volumes of data, Lake County's 911 operators can now quickly pinpoint accident locations, provide traffic instructions, find patient medical records, and dispatch back-ups when needed. And because NEC's Dual Modem Card links 911's control center to NEC Dial-up Modems in remote locations, Lake County feels it has found the best data networking solution attainable.

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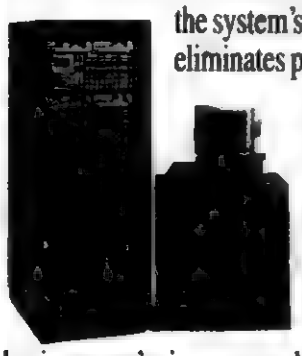

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Troubleshooting for success

Problem-tracking, feedback systems help ensure quality at GM plant

ON SITE

BY MICHAEL FITZGERALD
CW STAFF

FORT WAYNE, Ind. — A 1-month-old problem-tracking system and a major upgrade to an inspection feedback application are the latest systems tune-ups at what for four years has been one of the most technologically advanced plants in the General Motors Corp. empire.

GM's Truck and Bus Group Fort Wayne Assembly Plant was a green-fields project that was finished in 1986. Since that time, systems development — the addition of new applications and the enhancement of existing programs — has continued.

Electronic Data Systems Corp. (EDS), the GM subsidiary, in essence, acts as the company's information systems department. It also oversees the systems work at Fort Wayne, the most successful plant start-up in GM history, reaching production and quality targets faster than any other new GM plant. What remains to be seen by the public is how systems use at the Fort Wayne plant compares with the facilities in the newest GM division, Saturn.

Among the projects EDS is testing or has recently installed are systems designed to improve specific plant functions. For instance, a month ago, EDS installed a problem-tracking system for the paint shop. Before the system was created, workers were shotgunning solutions.

Eight months ago, EDS installed a project-tracking system for its maintenance and plant engineers and is scheduled today to install a major upgrade to the inspection feedback system, a crucial part of GM's quality assurance program.

EDS programmers wrote all these systems, which run on a Digital Equipment Corp. VAX cluster (two 8810s and an 8350) that serves as the area manager for the local plant. Monty Hansen, an EDS account manager at the Fort Wayne plant, said his staff in Fort Wayne had written the paint shop system; EDS employees in Oshawa, Ontario, wrote the project-tracking system; and EDS programmers in Troy, Mich., were responsible for the inspection feedback system.

The plant's host complex consists of two IBM 4381s, which are hooked together via a Systems Network Architecture gateway and linked to the VAX area manager by a DEC gateway. EDS makes heavy use of programs written in PL/1 to run the plant, using IMS on the host and Ingres Corp. Ingres on the VAXs.

Plantwide monitoring

The systems monitor approximately 5,000 points in the plant. The computer-integrated manufacturing process starts when a dealer orders a truck. These orders are processed and routed electronically. The only documents produced are those that are required by federal law. Once in the factory, the systems dictate the entire process of building the truck.

GM's Hansen says better IS helps the company build better trucks

Hansen has had to meet management challenges such as devising ways to ensure that basic line workers were comfortable with the technology and solving misbehaving pieces of the systems, such as the recurring problem that the plant had with its tire attachment process.

"They were getting a lot of breakdowns in this system, which is critical to the process of getting a truck off the line," Hansen said. "So we did some programming on programmable line controllers to be able to collect and analyze data, and we've since been able to have this run successfully."

Hansen and his staff occasionally respond to nontraditional IS functions. For instance, when the Occupational Safety and Health Administration decreed that each manufacturing area have clearly labeled safety instructions for equipment, the local EDS staff did the surveys and created the computerized instruction manuals that met the requirements.

Ideally, Hansen's staff operates as "Maytag repairmen:" there to troubleshoot, but rarely called on to do much.

Every minute

What kind of systems does it take to produce 230,000 trucks per year, at the rate of one per minute?

GM Truck and Bus Group Fort Wayne Assembly Plant has 56 large systems, ranging from mainframes to relatively small minicomputers, 110 microcomputers, 561 terminals, 316 printers and 577 communications devices.

The main systems are two IBM 4381s, two DEC 8810s and a DEC 8350 and 23 Hewlett-Packard Co. 1000 cell controllers that act as gateways between the main systems and the automated processors on the plant floor.

Operating systems in the plant include MVS/XA, VMS, Ultrix, DOS, Sun Microsystems, Inc. SunOS and even one or two Apple Computer, Inc. Macintoshes.

Also within the plant are some nine miles of redundant broadband cable, with Ungermann-Bass, Inc. asynchronous broadband links to file servers.

The plant was the first major user of what was then a GM-sponsored Manufacturing Automation Protocol, MAP 2.1. Saturn will use an updated version of MAP.

MICHAEL FITZGERALD

PC security controlled from mainframe

BY JOHANNA AMBROSIO
CW STAFF

GARDEN CITY, N.Y. — Computer Associates International, Inc. recently unveiled products that allow users to control personal computer security from a mainframe.

The products, called CA-ACF2/PC and CA-Top Secret/PC, work with their counterparts on the mainframe and build on CA's Cortana PC security package. Both packages run on MS-DOS computers; OS/2 versions are planned.

This allows users to do several things, CA said. One is to permit users to log on to both the PC and the mainframe with just one password. Another feature permits security administrators to audit, from the mainframe, all connections made from a PC to the mainframe to see who did what and for how long.

Users said they are looking forward to the enhanced security abilities. "I very much welcome the ability to administer security for all those systems from one place," said Nelson Beers, a data security officer at Union Trust Co. in Trumbull, Conn.

"If they do it, and it's done well, it's a feather in their cap," said David Wetter, senior data security analyst at Kelly Services in Troy, Mich. "I administer security for an MVS mainframe and a Novell LAN, and if I can have a single point of security administration, it would make me a very happy man. It would make my job a lot easier."

Yet another feature makes sure that each connected PC has an adequate level of security resident in it; if none is present, the mainframe will download a security package to the PC.

Both packages are slated for beta testing in January; general availability is scheduled for six months later. Although the PC products do not currently run on local-area networks, CA said that is in the works.

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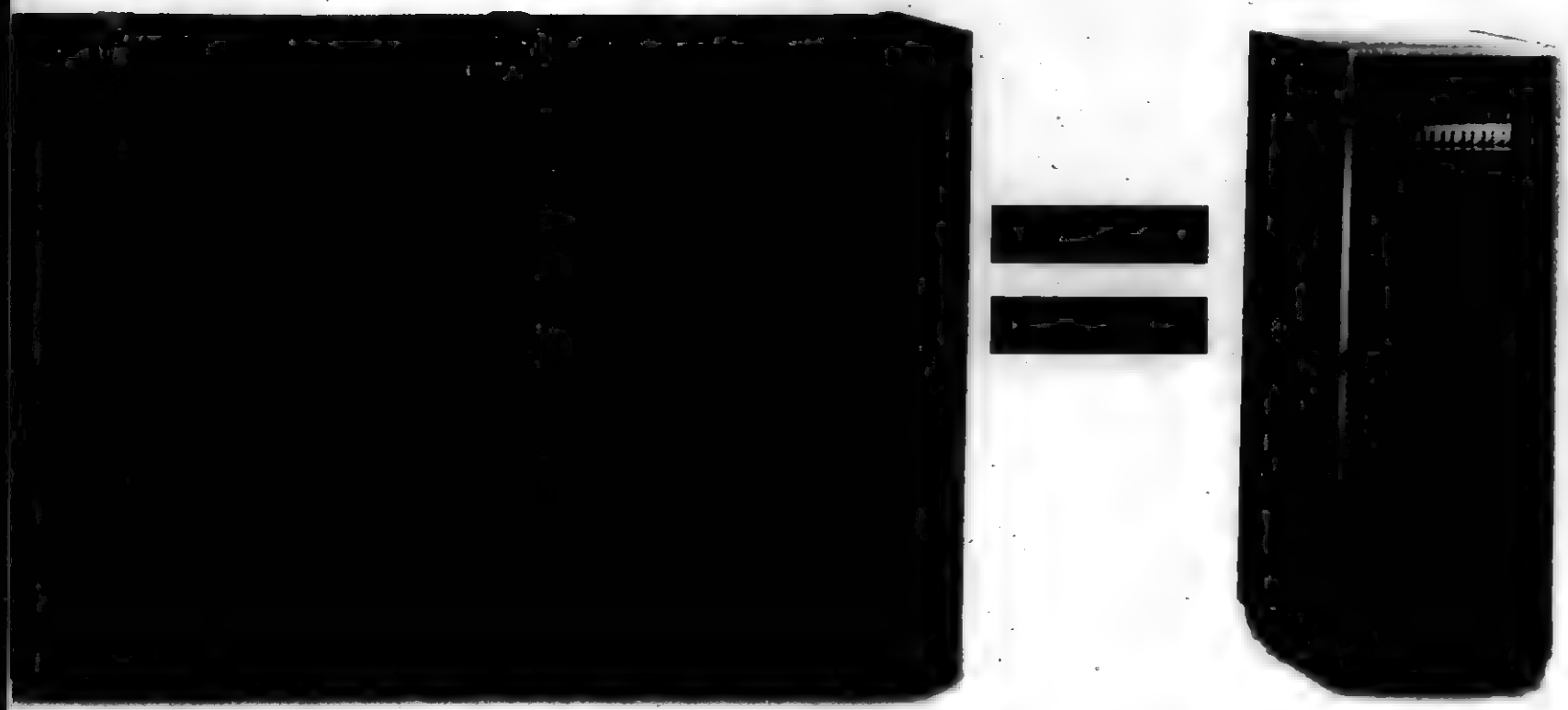

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EMC²

Computervision in its Prime

ANALYSIS

BY SALLY CUSACK
CW STAFF

BEDFORD, Mass. — It was the late 1970s. Bell-bottomed blue jeans were "out." Billy Beer was "in." *Bonanza* was "out," but Charlie and his Angels were definitely "in." And Prime Computer, Inc., the successful Massachusetts-based minicomputer maker, made its first foray "in" to the world of computer-aided design and manufacturing (CAD/CAM) — a move that would one day prove pivotal to the company's survival.

Who would have thought? But industry analysts agree Prime's future rests with its CAD company, Computervision. With 150,000 installed seats, Computervision, the recent recipient of several major contracts, seems to be the brightest star in Prime's dimming constellation.

Fond of Medusa

John Steffan, vice-president at Steffan Associates, a St. Louis CAD consulting firm specializing in facilities management and architecture, said he thinks Prime will sell "a lot of Medusa on the Sparcstation systems." A Prime Medusa user for five years, he recently purchased Release 5.2, which came out earlier this year and allows Medusa to run on the Sun Microsystems, Inc. Sparcstation. Prior to that, Medusa was proprietary to the 50 series and Tektronix platforms.

"I love the [Scalable Processor Architecture] technology," he continued, ticking off increased functionality, screen menus and icons as reasons for embracing the Sun platform. He is anticipating Release 12 of Medusa, which will unite the existing two versions and allow the software to run on the Digital Equipment Corp. family of VAX systems while sharing Medusa's strong database functionality among platforms.

Steffan is apparently not the only one pleased with Computervision's current offerings. The company has won several major contracts and has established a strong international presence in several large firms, including Ontario Hydro of Canada, the Fiat Group in Italy and the Consumer Electronics Division of Philips N.V., headquartered in The Netherlands.

Computervision's current offerings include the following: the CADDS series of applications, running primarily on the Sun Sparcstation; Medusa, a set of CAD/CAM applications running on both Sparcstation and DEC workstations, and Prime 50 series and DEC VAX minicomputers; PDGS, Prime's original entry in the CAD marketplace; and the Calma product line, CAD/CAM/CAE three-dimensional software acquired from General Electric Co. in 1988 — the same year Computervision was acquired by Prime.

"They have made appropriate platform changes and have sorted out internal upheavals. They are now facing a life as a software company with a well-rounded product line," said Gisela Wilson, an analyst at International Data Corp.

She added that while the company lost some momentum by refusing to be "pre-leading edge," it is catching up by working with other companies to sell and expand the Computervision product line. This includes a recent agreement with Sun to integrate Computervision's CADDS 4X software with the Sun Sparcstation IPC workstation.

Not to be outdone by its sister operating unit, Prime recently inked a four-year, $19 million contract with the U.S. Navy to provide hardware maintenance for the Navy's CAE DOS systems. Carl J. Madsen, federal contract manager of Prime's Federal Support Group, said, "We anticipate the award of other contracts from the government."

Computervision has had the foresight to round out its CAD strategy by establishing the Personal CAD/CAM business unit, a separate entity within Computervision devoted to designing and marketing Personal Designer, Personal Machinist and Versacad software for the MS-DOS and Unix workstation environment.

According to Al Fernandes, former CAD/CAM manager at Orthomet, Inc., his company has been using Personal Machinist since its debut in 1985.

"Our industry relies on a lot of curves, arcs and blending shapes. We also need 3-D capabilities," Fernandes said. "We looked at other packages, but at the time, [Computervision] had the only 3-D surface modeling package for the PC platform."

While Computervision will probably never push Autocad off of its personal computer CAD pedestal, it has certainly established itself as a viable player in the PC CAD world, with 20,000 individual seats for Personal Designer and 80,000 Versacad seats installed to date.

And for the future, it is a pretty safe bet that the company will gather more users under the newer Sun platforms and increase business with the next release of Medusa.

A 1990 CAD/CAM/CAE revenue forecast from Daratech, Inc. shows that Prime/Computervision is expected to capture 12.1% of the market, edged out by IBM with 30.7% and Intergraph Corp. in Huntsville, Ala., which placed second with a 14.9% prediction.

Small by comparison

The combined Prime/Computervision team is left, like peers in other markets, to chip away at a market led by IBM and other smaller vendors

Total worldwide $6.8 billion

Source: Daratech, Inc. CW Chart: Paul Mock

Kleinman

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plier, who is familiar with the applications or operating systems support requirements. Internal staffs know more about their own computing environment, and vendors know more about specific applications or operating systems. However, research shows that customers expect — and get — *a lot more* from internal staff members than from outside vendors.

The high dependence on internal staffs explains why almost half of the customers' 1990 and projected 1992 software budgets are allocated to personnel costs. This includes supporting internal operations, applications development and internal software maintenance. The remaining dollars are left to be split among outside services (e.g., software support, training and education and consulting) and software acquisition.

According to Ledgeway's recent survey of 600 IS managers, internal staffs generally outperform outside support vendors. On the average, a user of mini/mainframe software receives a response to a question or problem from his or her internal staff in one to two hours. Problems are typically resolved in two to three hours, and between 72% and 74% of all issues are resolved on the first call. In comparison, outside support vendors respond in two to three hours, take three to four hours to resolve a problem and only resolve 62% to 64% of issues on the first call.

How critical is the difference of an hour? Well, it may not be important to someone wanting to know if a feature is going to be added to the next revision of software. But ask someone trying to understand why the mainframe just crashed, and the difference between one hour and two hours becomes clear.

Knowing this, the challenge is now twofold.

- Users should apply internal benchmarks to evaluate vendor support offerings. By doing so, they will have a stronger basis for critiquing vendor performance and become better consumers of software support.
- At the same time, vendors need to step up to the challenge of performing at a level consistent with internal staffs. By doing so, vendors will generate increased customer satisfaction and, hopefully, loyalty.

In defense of vendors, remember that they cannot be expected to know the customers' computing environment as well as the staff.

Internal resources are also preferred when it comes to performing a variety of "professional services" projects. Rather than turning immediately to an outside vendor, customers initially give consideration to their internal staffs for help with systems planning and design, applications development, systems integration and facilities management projects. Only for training, education and migration services do systems vendors rank higher than internal staffs; while multiservice firms such as Computer Sciences Corp. or EDS are the strongest candidates for multivendor service.

The challenge for both parties is to identify ways to work together effectively. Managers should learn from their own staff and use the standards they set to evaluate and select vendor support. And vendors must remember that while customer support issues tend to be low on the list of selection criteria when choosing a software application, it jumps to a prominent level of importance when making repurchase decisions. Besides, what better way to ensure top-notch support than to let your vendor know you are watching?

Kleinman is manager of the software support program at The Ledgeway Group in Lexington, Mass.

Parallan blurs mini/microcomputer line

BY JIM NASH
CW STAFF

MOUNTAIN VIEW, Calif. — The line between microcomputing and minicomputing is getting fuzzier than "ohpntz" at the bottom of an eye chart.

Parallan Computer, Inc. recently said it is shipping a line of multiprocessing servers that offers the same data integrity and error-correcting memory capabilities found on minicomputers. Server 290 runs OS/2 LAN Manager, DOS and Microsoft Corp.'s Windows applications.

With the introduction, Parallan enters a growing fray to give networks the reliability of minis. Already in the fight are Compaq Computer Corp. with its Systempro and Netframe Systems, Inc. with the NF400.

"We're enthusiastic about this," said Dennis McEvoy, president of Cooperative Solutions, Inc., a start-up software firm in San Jose, Calif. McEvoy said his firm has conducted beta tests for the past month on Parallan's Server 290 15 to 20 million instructions per second Model 20, with two Intel Corp. I486-based 33-MHz processors and one small computer systems interface. The Model 20 has 32M bytes of memory and four 676M-byte hard disk drives.

Developing OLTP tools

McEvoy said he is using the Parallan system to develop and test Cooperative Solutions' own online transaction processing (OLTP) software. He said he is evaluating the standards-based Server 290 for possible internal administrative use in the future. The multiple processors, he explained, allow him to store database applications, such as Sybase, Inc.'s SQL Server, on one processor and his local-area network operating system on the other processor. His software could run such a machine.

Parallan's low-end five-processor Server 290 Model 10 carries a base price of $50,000. The company's high-end server, the Model 60, sports eight processors and has a list price of $250,000 installed.

Gianluca Rattazzi, president of Parallan, stressed the fault tolerance inherent in the system, which mimics Tandem Computers, Inc.'s mirroring nature.

Steve Madigan, senior program manager in Microsoft's Networks Division, said support for the system should be made easier given Server 290's open architecture. "When a service person opens it up, it looks exactly like an IBM [Personal System/2], something almost everyone is familiar with."

He said Microsoft may pick up one of the systems for its dual-processor abilities, putting SQL on one and file management on the other.

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Printer intros continue

BY JAMES CONNOLLY
CW STAFF

TUSTIN, Calif. — The recent wave of high-end nonimpact printer introductions rolled on last week when Siemens Information Systems, Inc. announced the successors to its laser printers, a pair of LED-based printing systems for use with IBM mainframes and other hosts.

The Siemens introduction of the 2140 and the 2090 came less than a month after IBM replaced its decade-old 3800 laser printer with the 3900 and Xerox Corp. announced its next-generation laser printer family, the Docutech series, in early October.

Siemens, which will continue to market its older, laser-based 2300 and 2200 printers, claimed no speed advantages over IBM but, rather, promoted what it said was the superior print quality of the LED engine and the 17-in. paper width. Martin Ginger, manager of product marketing for Siemens' Peripheral Systems Division, claimed the new Siemens printers produce images comparable to those offered by desktop nonimpact printers.

A beta user of the 135 page/min. 2140 praised the product's print quality. Paul LaFlamme, data processing manager at Scanforms, Inc., a direct-mail house in Bristol, Pa., said the printer eliminates the ragged edges found in laser printers.

However, of equal importance to LaFlamme is the 17-in. printing surface, four inches wider than other companies use offer. "Knowing that we have a 17-in. print area we can run some two-up or side-by-side forms, although being a direct-mail house we have some customers who will want to use the full 17 inches."

LaFlamme's shop has had the 2140 connected to Scanforms' two IBM 4341 Model 2 hosts since August. He said "minor glitches" have been typical of those found in a beta test and that Siemens has corrected such problems as excessive heat and misalignment of rollers.

The printers are available now and designed to be plug-compatible with IBM mainframes. They are also intended for use with IBM Application System/400 and Digital Equipment Corp. minicomputers, Unisys Corp. mainframes and IBM Token-Ring networks.

Base models of the 2140 and the 2090 are priced at $198,000 and $148,000.

VMS

FROM PAGE 25

ise of system support, which the VMS folks cannot offer today.

The question that DEC officials refuse to answer is how they plan to pull this off.

"DEC is trying to put as much Unix functionality and Unix system calls into the VMS kernel as possible," said Kevin Oberman, network manager for the engineering division at Lawrence Livermore Laboratories in Livermore, Calif. "I would presume they're going to build some separate command language interpreter into the VMS kernel."

At Lawrence Livermore, VMS is gradually losing ground to Unix applications, mainly because of the superior performance of the reduced instruction set computing (RISC) machines that run them, Oberman said.

DEC said it hopes to remedy that situation by altering the heart of the VAX architecture with the introduction of RISC technology into the CPU, now based solely on complex instruction set computing (CISC). But that process will take the firm at least three years to accomplish.

In the meantime, DEC will be trumpeting its open systems strategy of application portability through compliance to industry standards developed under Posix, the X/Open Portability Guide and the Open Software Foundation. The short-term benefits of Posix compliance, however, are virtually nil.

"You can't really tell yet what Posix compliance buys you, because no one is writing applications to Posix interfaces yet," cautioned Dave Card, an analyst at International Data Corp. in Framingham, Mass. "Old Unix applications will not run on VMS boxes, nor will old VMS run on the Unix boxes. DEC is hoping that Posix and XPG will be a rich enough set of interfaces so developers will write real programs to those interfaces."

Tall task

One of the tallest technical hurdles DEC faces in running Unix applications under VMS is the vastly different way Unix and VMS handle "process creation," Oberman noted. While Unix can spin off so-called "lightweight" processes as easily as a duck shaking off water, the same maneuver under VMS would drown the machine.

A process in the Unix world is actually a program or thread of execution, and a lightweight process is one that requires minimum CPU and memory use. Examples of processes could include running a word processor or creating an electronic-mail routing system.

"Under VMS, creating a process is a very heavy-duty operation that involves tremendous amounts of resources," Oberman said. "But the entire Unix philosophy is that you fork off new processes at the drop of a hat."

One point DEC customers and analysts agreed on is that the company has no choice but to embrace Unix as wholeheartedly as it can stomach.

"Our top-level people are deciding they don't want to be locked in or beaten over the head by a vendor or proprietary operating system," said Derek Haining, a systems programmer in the University Computing Services at the University of Washington in Seattle. "Even if VMS is superior to [University of California at Berkeley] Unix, they want to go with Unix."

"The fact that DEC is considering opening up VMS and truly treating Unix as a coequal operating system environment, is an important shift for them," added Kevin O'Neill, vice-president of research at Business Research Group in Newton, Mass. "Like it, love it or hate it — Unix is a reality as the most pervasively available operating system across the widest array of platforms."

NEW PRODUCTS — SOFTWARE

System software

Compuware Corp. has announced Playback/File Extension, a file simulation feature that has been added to Compuware Playback 5.0, its mainframe software automated testing tool.

The tool enables users to capture transactions and related file activities in an application test procedure and then make them available during re-execution in subsequent test scenarios, the vendor said.

The product also supports on-line applications running under VTAM.

Prices range from $27,000 to $93,000, based on CPU size.

Compuware
31440 Northwestern Highway
Farmington Hills, Mich. 48333
(313) 737-7300

Applications packages

Jyacc, Inc. has announced Version 5.0 of its JYACC Application Manager (JAM), a software package that enables developers to prototype and deliver applications that can be ported to other platforms or transferred to other databases.

The product provides an application development environment that requires a minimal amount of third-generation language.

JAM runs on most major platforms, including Digital Equipment Corp. VAX/VMS and VAX/Ultrix systems, MS-DOS-based machines and Amdahl Corp. mainframes. Pricing ranges from $395 to $38,820, depending on type of platform.

JYACC
116 John St.
New York, N.Y. 10038
(212) 267-7722

Trax Softworks, Inc. has introduced its latest version of Edword, word processing software designed for mainframes.

Edword Version 3.0 can be customized to operate with current mainframe software packages to create reporting systems, letter-writing systems and communication facilities.

The software runs on VM/CMS, TSO, CICS and Roscoe operating systems. Pricing ranges from $6,200 to $23,370, depending on CPU size.

Trax Softworks, Inc.
5840 Uplander Way
Culver City, Calif. 90230
(213) 649-5800

Development tools

Cognos Corp. has announced an application development software package designed for Release 6.09 of Hewlett-Packard Co.'s HP MPE/XL system.

Powerhouse 6.09 includes a screen painter and Powerhouse Quick, an on-line interactive debugger. The product also provides users with read and write access to all HP environments, according to the company.

Pricing ranges from $17,600 to $213,000, depending on configuration.

Cognos
67 S. Bedford St.
Burlington, Mass. 01803
(800) 426-4667

Languages

AT&T Unix Systems Laboratories, Inc. has announced a set of C++ tools designed to complement its C++ Standard Library.

Release 1 of the C++ Standard Library Extension was designed to facilitate the building of commercial-quality application programs. It includes source code for AT&T's 3B2 minicomputer running Unix System V, Release 3.0 or higher. The product can also be ported to other Unix platforms, the vendor said.

Pricing is $5,000 for the initial CPU and $2,500 for each additional CPU.

AT&T Unix System Laboratories
P.O. Box 25000
Greensboro, N.C. 27420
(800) 828-8649

NEW PRODUCTS — HARDWARE

Processors

NCR Corp. has added an enhanced processor memory controller to its NCR Tower 32/500 and Tower 32/700 systems.

Version VI of NCR's Processor Memory Controller enables users of Tower 32/500s and 32/700s to integrate a Motorola, Inc. 25-MHz 68040 microprocessor into their systems.

According to the vendor, the upgrade provides twice the processing performance of an NCR Tower 32/700.

The upgrade kit costs $4,000 for the Tower 32/700 and $7,500 for the Tower 32/500.

NCR
1334 S. Patterson Blvd.
Dayton, Ohio 45479
(800) 225-5627

I/O devices

Interaction Systems, Inc. has announced a serial touch-screen controller designed for its line of capacitive touch screens.

The 5002 controller is packaged as two 2.5- by 5.5-in. piggyback boards. Features include a +5-volt input power, X-Y resolution of 512 by 512 pixels and support for transmission rates of 300 bit/sec. to 19.2K bit/sec.

Pricing for 14-in. units starts at $395 and $620, depending on quantity purchased.

Interaction Systems
86 Coolidge Ave.
Watertown, Mass. 02172
(617) 923-2112

Aamazing Technologies Corp. has introduced a 14-in. analog multisynchronous color monitor that provides 1,024- by 768-pixel resolution and more than 256 simultaneous colors.

Model CM-61428 is compatible with IBM Video Graphics Array (VGA), Super VGA and 8514/A standards. Its horizontal scan frequency ranges from 31.5 to 38 KHz, and its vertical scan frequency ranges from 45Hz to 90Hz.

The product costs $639.

Aamazing Technologies
5980 Lakesbore Drive
Cypress, Calif. 90630
(714) 826-9680

Northwest Digital Systems has introduced its NDS X Station Models XT.15 and XT.19 of monochrome X Windows display stations.

The products feature 1,024- by 800-pixel resolution at a 76Hz refresh rate and terminal memory that can be expanded to 10M bytes. They are available in 15- and 19-in. versions. The XT.15 is costs $2,295 and the XT.19 costs $2,495.

Northwest Digital Systems
P. O. Box 15288
Seattle, Wash. 98115
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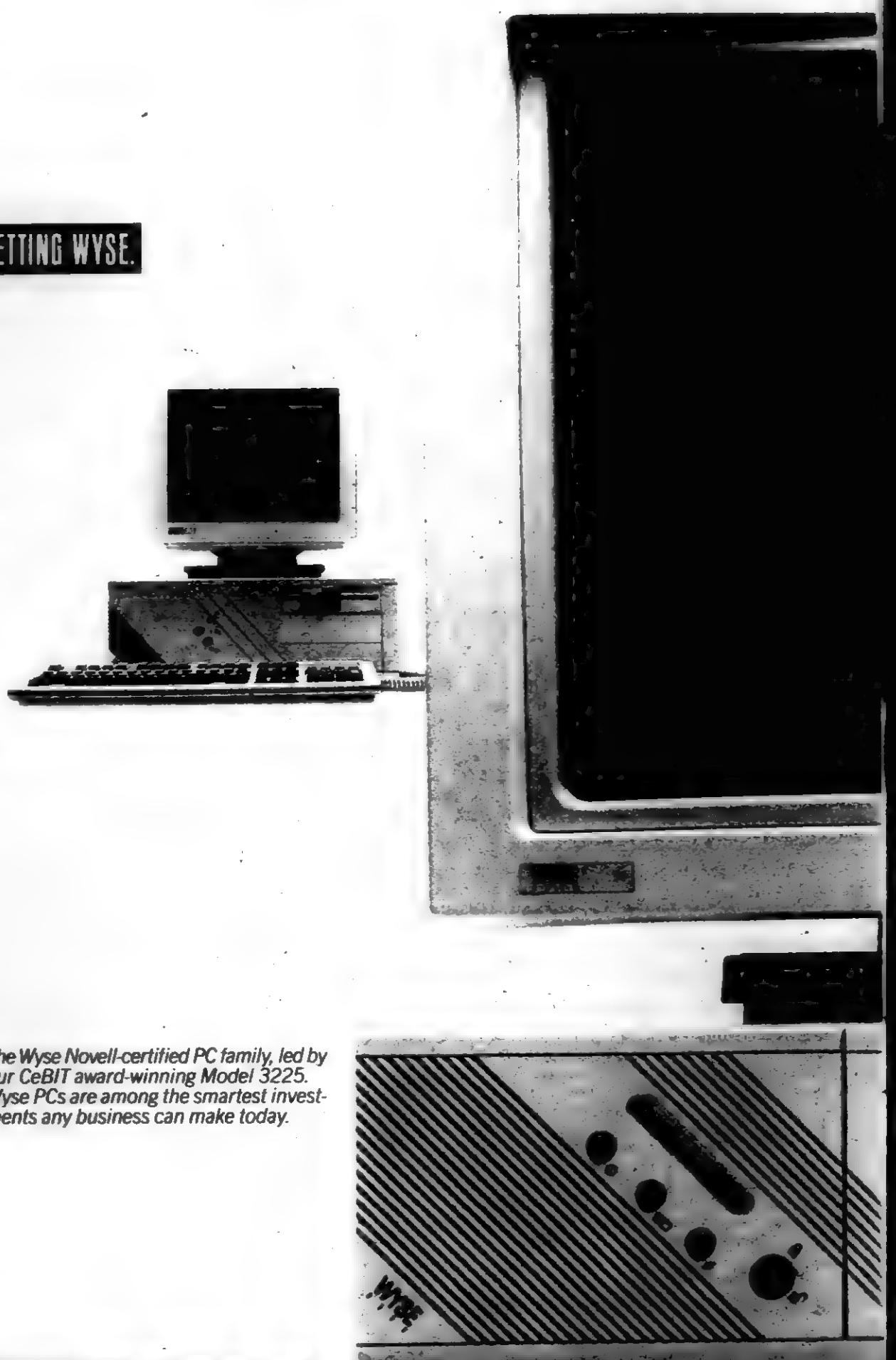

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COMMENTARY

Patricia Keefe

Lotus DBMS: MIA or DOA?

Lotus DBMS: Dump big mistake soon? Lotus, Sun and Sybase recently busied themselves wining and dining the press in a bid to talk up 1-2-3 for Sun and the Datalens/Sybase link — all of which brings to mind Lotus DBMS, first announced in 1987. At this point, given Lotus' relationship with Sybase, that project is probably dead, but Lotus has never come out and said so. In fact, it never says anything about it anymore.

Meanwhile, Lotus reportedly trimmed between 40 and 70 staffers out of the DBMS group, deploying their talents elsewhere. At least one database consultant thinks a shift in focus is good. "They think the whole world looks at a database through a spreadsheet! How ridiculous. I haven't touched a spreadsheet in five years," he said, noting that the same can be said for many of his clients.

In 1991, the Lotus flower may bear fruit. On the Apple front, one Lotus executive tells us that he has 1-2-3 for the Macintosh in his office and it's looking pretty good. You won't see it in 1990, but plan on the first half of 1991 if first-quarter beta testing goes well, Lotus

Continued on page 40

Claris looks to pump up

Apple unit focuses on building onto low end

BY JAMES DALY
CW STAFF

SANTA CLARA, Calif. — Like a gangly teenager on the verge of bulking up into full adulthood, Claris Corp. is preparing to strengthen its array of entry-level Apple Computer, Inc. Macintosh products in the upcoming months as it moves into its role as a permanent Apple subsidiary.

The push for more muscular versions of its popular low-end applications should neatly mesh with the stepped-up wooing of the business market by Apple, which stunned the Macintosh software development community in July when it announced that long-standing plans to turn the $80 million software unit into a separate business had been scrapped. Analysts said they expected Claris to go public later this year.

"We're looking at the second wave of Claris," said Steve Ruddock, a spokesman for the 3-year-old firm, which produces graphics (Maxdraw), word processing (Macwrite), database management (Filemaker) and computer-aided design (Claris CAD) packages. "We were always known as a provider of low-end Mac packages, but I think

Continued on page 44

Plotting a course

Will Claris ever develop for the DOS world? "It's certainly not a priority," company spokesman Steve Ruddock said. "But I won't rule it out. If an application would help sell more [Apple Computer, Inc. Macintoshes] in a multiplatform environment, then we certainly will consider it."

One area where Claris will not venture in the near future, Ruddock said, is multimedia applications, because the firm is focusing on higher volume products.

Clearly, the dust still needs to settle before the exact direction of Claris can be determined — a plan to develop a version of Informix Software, Inc.'s Wingz graphic spreadsheet for the Macintosh has stalled. In January, Claris acquired the right to the Wingz technology, but so far nothing has resulted from the union, and Claris officials warned users not to hold their breath.

Observers said such delays should be be expected; Claris may often get wrapped up in a holding pattern until Apple is clear on setting its own corporate direction.

Inventor yields copy-protection scheme

BY JOHANNA AMBROSIO
CW STAFF

Software pirates, beware. A new invention might forever foil you from making unauthorized copies of personal computer packages.

This scheme overcomes the traditional problems of most other types of copy-protection mechanisms, according to inventor Drew Logan, an independent consultant in Haverford, Pa. It permits information systems professionals to make as many copies as they want, while at the same time allowing the software vendor to keep track of how many copies are made and charge users accordingly.

Although two vendors are currently evaluating the idea, Logan said, neither has yet committed to implementing it.

The invention is based on mathematical algorithms that are hidden inside the software. Every time an IS staffer copies a package, he keeps track of the order in which he makes the copy. To initialize the copy, he boots up the copy and types in the serial numbers of the PC and the original software disk.

Then he calls the vendor and receives an "activation" number, which he also types in. The software compares that number with a series of numbers that are already inside the program. If the comparison matches, the person can keep using the copy.

A new activation number is required for each copy made. Once an activation number is used, it cannot be reused to make additional copies. This prevents people from using the same number to make illegal copies, Logan said.

"You can make 9 million copies if you want to," he said. "You just can't use any of them until you get and type in the activation number."

User workout

Although Logan conceded this scheme requires some work from users, he maintained "it is no different from what they already do. Every time you make a copy of something, you're supposed to call the vendor and register it, but I don't know very many people who do that."

He also agreed it would require more record keeping by vendors. "They'd need a database to keep track of the numbers. It may seem like a lot of work, but it's really not. Plus, it would have paybacks like showing the vendors who is buying their software and what they're using it for," Logan said.

Observers said that although the idea seems intriguing and technically feasible, it has some obvious drawbacks. "MIS will accept something that controls copy protection, but they will not accept anything that requires more work on their part," said Michael Millikin, vice-president at Patricia Seybold's Office Computing Group in Boston.

"The scheme that seems to be far more practical is a network license server that keeps track of how many copies are out there. It works and doesn't add an additional burden onto MIS," Millikin said.

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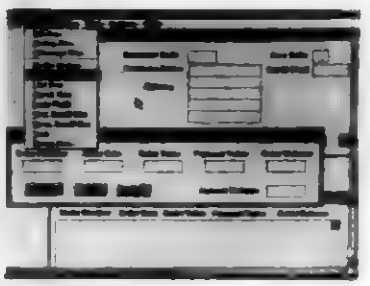

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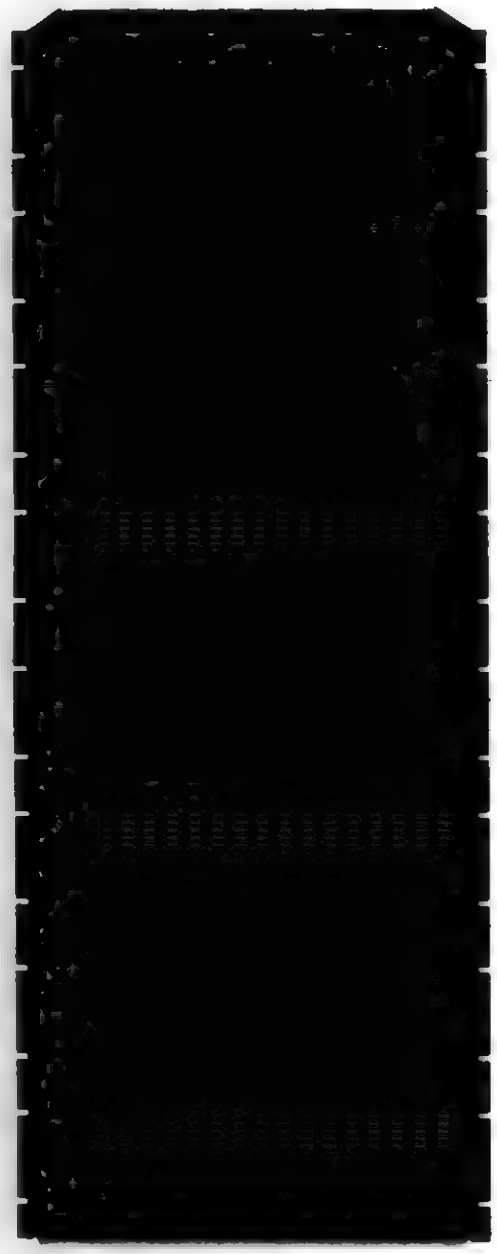

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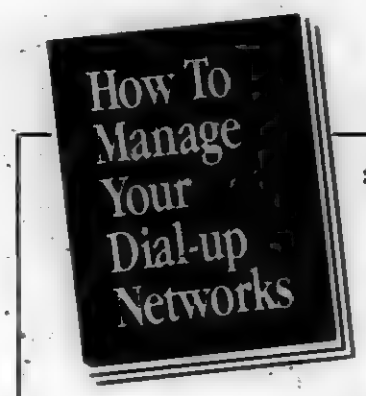

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Toss the old, create the new

ON SITE

BY J. A. SAVAGE
CW STAFF

MOFFETT FIELD, Calif. — Writing software for immensely complicated technical applications is hard enough, but Thomas Lasinski, chief of numerical aerodynamic simulation at the National Aeronautics and Space Administration, suggests throwing it out every three years and writing it anew.

Luckily, throwing out the old and keeping up with the new is in Lasinski's job description. The simulation program, begun this year with the acquisition of Silicon Graphics, Inc. 320 and 340 VGX computers in June, is charged with "providing a test-bed environment for new, emerging technologies," according to a NASA statement.

Lasinski's old fluid dynamics visualization software was not yet three years old, so when Lasinski got new Silicon Graphics 370 Iris workstations in June, he ported "lots" of software to the new models. Still, he advises users to keep lean and efficient by writing to new algorithms and new computers whenever possible.

"It's an issue of competitiveness," he said. "As newer technology comes out, you see you can do it faster." Lasinski also added that despite the problem of sunken costs, the pressure to change can be economically justified.

Few standards

While this smacks of blasphemy to commercial users, in the world of three-dimensional graphics (image plus shading plus movement), there are few standards to write to even if they do share some version of the Unix operating system. Thus, old software may have little in common with the latest hardware.

"In 2-D, there are sets of standards," Lasinski said. He added that 3-D graphics vendors find themselves in the position of wanting to support standards, but the technology is changing too rapidly.

Silicon Graphics has applications packages, but NASA is not interested. "The problem with packaged software is that it's geared too much toward glossy, high-quality rendering, and what we're concerned with is the research," said Creon Levit, a research scientist.

Lasinski described his mission: "We make mistakes so industry doesn't have to." The fluid dynamic software his organization develops tracks the flow of air over model aircraft — instead of going to the expense of using the enormous wind tunnels that surround Lasinski's NASA office.

The developed software is then offered to private companies such as The Boeing Co. and Northrop Corp. to assist in space and aircraft design. "Typically, NASA will do the complicated algorithms to see if they work first," Lasinski said.

Andy Freeberg

NASA's Lasinski *has ported lots of software to new models*

The $32 million simulation project is not in trouble with budget cuts, according to Lasinski. In its first phase, about 30 Silicon Graphics workstations were set up at Moffett Field and two other remote sites (in Virginia and Ohio). At this point, they are "basically stand-alone" with a couple servers to offload some of the work. However, Lasinski configured the workstations with I/O processors so they can later be hooked up to the organization's Cray Research, Inc. supercomputers.

Pre-Comdex announcements barrage the marketplace

BY RICHARD PASTORE
CW STAFF

A plethora of pre-Comdex announcements have bombarded potential users in the past two weeks, with new product choices ranging from high-end multiprocessor systems to low-end laptops.

In the emerging megaprocessor arena, Arche Technologies, Inc. in Fremont, Calif., announced a symmetrical multiprocessor system that supports up to 32 Intel Corp. 80386 or 33-MHz I486 microprocessors.

The Arche MP will support Extended Industry Standard Architecture (EISA) peripherals and features 18 expansion slots, 128K to 1,024K bytes of disk cache and up to 1G byte of system memory. Pricing will be announced at Comdex next month. The product is expected to ship by the second quarter of 1991.

Although it is not a multiprocessor box, Advanced Logic Research, Inc.'s latest I486 system distinguishes itself with low pricing. With 1M byte of memory, a floppy drive, the EISA bus and no hard disk, the Businessveisa 486/33 Model 101 sells for just under $4,000.

Only a few firms have yet to announce notebook-class portables based on the Intel 80386SX chip, but there is no shortage of SX portable introductions in weightier configurations.

Hyundai Electronics America in San Jose, Calif., unveiled its Super-LT5 earlier this month, an 11.6-pound unit based on the 16-MHz 386SX. With 2M bytes of memory, backlit IBM Video Graphics Array (VGA) graphics and a 40M-byte hard disk, the unit retails for $3,995.

Fora, Inc., also in San Jose, unveiled its own SX laptop, this one based on the 20-MHz version of the chip. The 15-pound unit comes configured with 1M byte of system memory, two expansion slots, VGA graphics, a floppy drive and a 40M-byte hard disk. The unit costs $4,499; a 16-MHz model costs $3,999.

Still room for 286

Although the 386SX seems to be the new standard platform for vendors to aspire to, there are still Intel 80286-based units coming down the pike for users with less sophisticated processing requirements.

Montreal's Ogivar Technologies, Inc. earlier this month added its own 286 notebook personal computer to the ranks. Unlike most 286s, the Internote 286 offers VGA graphics with 32 shades of gray. It also includes a 20M-byte hard disk, a floppy drive and 1M byte of memory and costs $3,000.

Peripherals makers are also warming up for Comdex. Okidata in Mount Laurel, N.J., announced a 4 page/min LED nonimpact printer priced under $1,000. The introduction bests Okidata's previous low-end price/performance by 15% to 30%, according to the company.

Maxell Corp. of America introduced a write-once read-many optical disc with a total capacity of 7G bytes. The 12-in. disc is designed to operate with Hitachi Data Systems Corp.'s newly released OD-321 optical drive. The discs are slated to ship in the first quarter of 1991.

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Windows 3.0 breaks through DOS barriers

Technology Analysis is a roundup of expert opinions about major new products.

BY SUZANNE WEIXEL
SPECIAL TO CW

Surrounded by hype, lost in comparisons with OS/2 and Unix, Microsoft Corp.'s Windows 3.0 might be the most misunderstood graphical DOS shell ever released.

Windows is not an operating system, but reviewers at the major personal computer laboratories and publications have often treated it as if it were, knocking the product for failing to provide the multithreading and true multitasking capabilities that OS/2 and Unix deliver, largely because Windows 3.0 offers comparable interface and operating features.

Viewed simply as a graphical user interface that brings effective windowing and point-and-shoot capability to IBM-compatible systems, Windows fares much better, winning praises with few reservations from the reviewers.

Despite the limitations imposed by DOS, Windows' most significant feature is its memory management. Windows makes use of the protected mode of Intel Corp. 80286, 80386 and 1486-based systems to provide access to extra memory.

This capability should result in faster performance, but the majority of applications available for use with Windows do not make use of protected mode. Unless you are using Windows 3.0-specific applications, you will realize little improvement in speed over earlier versions.

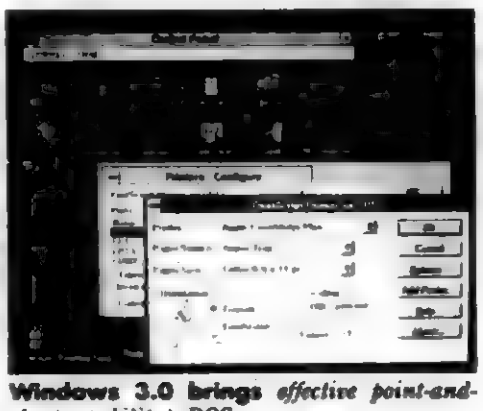
Optimal performance with 386

If you expect to get any value out of Windows memory management, most reviewers said you should not even bother running it on a 286-based system. *PC Week* likens running Windows on a 286 to a "leisurely stroll."

This requirement can raise the price significantly. Windows 3.0's list price is $149, and upgrades for registered users of previous versions cost $50. But achieving optimal performance requires a 386-based PC with 2M bytes of RAM; a hard disk drive; a monitor with IBM Video Graphics Array, Color Graphics Adapter or compatible video graphics adapter; and MS-DOS or PC-DOS 3.1 or higher. The minimum investment, assuming that none of these pieces is already in place, is $2,000 plus.

Visually, Windows 3.0 delivers a clean, professional interface, which reviewers find comparable to Presentation Manager and Motif. Features that make the program look nice also make it easier to use. Reviewers at *PC World* said the consistent use of icons reduces learning time.

In short, reviewers see Windows 3.0 as a vast improvement over previous versions. However, because it lacks full multitasking capabilities, Windows is not seen as a strong choice for the long term when compared with OS/2 and Unix.



Windows 3.0 brings *effective point-and-shoot capability to DOS*

Healthy returns

- One million Windows 3.0 units sold since May 22 release.
- Microsoft profits: $275 million — a 60% increase.
- Windows 3.0 predicted 1991 sales: $415 million.
- Company & product sales (one - poor, ten - excellent): Terence Quinn, Kidder Peabody-9; Rick Sherlund, Goldman Sachs-10; Charlotte Walker, Lehe Simpson-10.

PRODUCT: Windows 3.0 SCORE: 80

Points	Category	Methodology*
21	Reviews	Average of available numeric scores from reviews multiplied by a factor of 3
15	Analysts	Average of 1-to-10 rating from five product analysts multiplied by a factor of 2
13	Users	Average of 1-to-10 rating from five major users multiplied by a factor of 1.5
16	Costs	Average of users' and analysts' rating of cost to get product up and running multiplied by a factor of 2
15	Financials	Average of 1-to-10 rating from three analysts on health of company and product sales; factor: 1.5
80 (Maximum score: 100)		**The 1-to-10 scale: 1 equals poor, and 10 equals excellent. Maximum points per category: Reviews – 30; Analysts – 20; Users – 15; Costs – 20; Financials – 15 (See detailed ratings below)*

CW Charts: Paul Mach

REVIEWS SUMMARY

Criteria	PC Week 8/13/90	Infoworld 9/24/90	PC World 7/90	PC Magazine 9/11/90
Ease of use	5	Very good	A breeze to use	Easy to customize
File manager	NC	NC	Could be better integrated	Too awkward
Memory manager	7	Very good	Powerful	Full-fledged environment
Multitasking	7	Good	Pleasant surprises	NC
DOS compatibility	III	Very good	Fabulous	Fewer limitations
New applications	8	NC	Away on the way	Explosion of products
Documentation	5	Very good	Concise and clear	NC
Reviewer's score	6.4	7.4	NC	NC

Ratings are based on a scale of 0 to 10; 10 is the best. Numbers reflect weighted scores used by each publication. Only PC Week and Infoworld scores are included in chart (above). These are excerpts of the reviews. Refer to actual articles for details. NC: No comment

Microsoft response

Comments from Microsoft's Rich Abel, Windows Group Product Manager

System requirements
Microsoft's position is that regardless of platform, users gain something with Windows 3.0. The best performance is on a 386-based system, but at minimum the product acts as a task-switcher. Also, users gain a graphical user interface for DOS.

File Manager
Microsoft plans to revamp the File Manager, but Abel says, before condemning it as awkward and confusing, consider its predecessor, the MS-DOS Executive.

Signs of adoption
Microsoft believes people are committing to Windows 3.0 for the long term. Signs of success include: sales volume, independent user groups and the large number of Windows 3.0-compatible products.

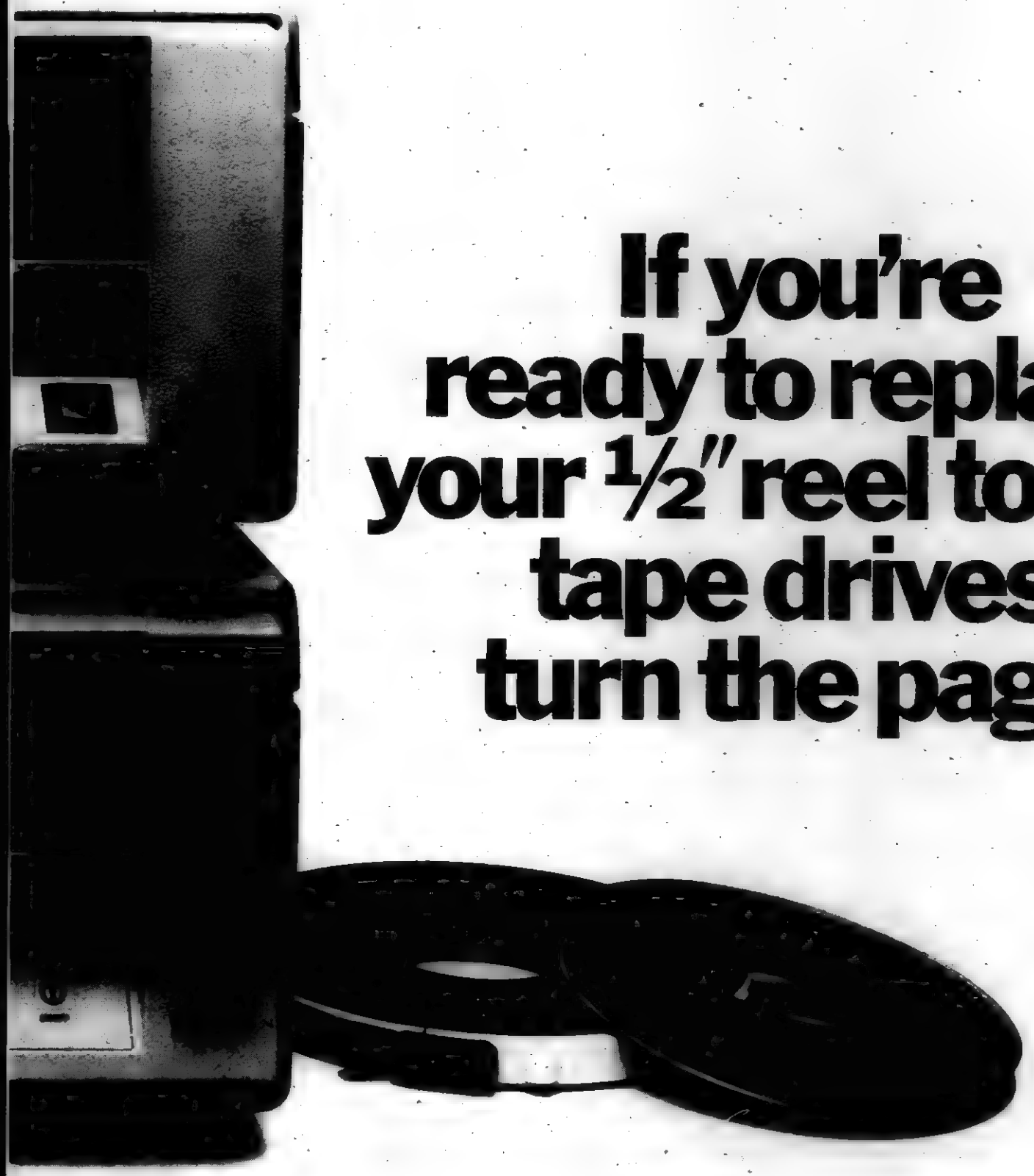
Productivity worth the price

Five users at large scale installations and five software analysts evaluated Microsoft Corp.'s Windows 3.0 on a scale of one to 10 (one being poor and 10 being excellent) in terms of the overall product and cost. Users: Dale Smith, General Electric Co. (8 overall, 10 cost); George Stromberg, Textron (8,10); Steve Birgfeld, Martin Marietta Corp. (8,6); Ted Savas, Cox Enterprises (8,9); a manager at a large bank in the Midwest (10,8); Analysts: Andrew Seybold, Dataquest (7,8); Jeffrey Tarter, Softletter (8,8); Dan Ness, Computer Intelligence (8,6); David Cearley, Gartner Group (6,7); Amy Wohl, Wohl Associates (8,8).

"We don't simply have Windows 3.0 to run multiple DOS applications. It's our chosen architecture, which should tell you something about how we feel about it. It's not cheap, and you don't want to set this up on the cheap. You want the right system, memory and applications."
Steven Morse, *Senior Technical Officer, Wholesale Banking Unit, Manufacturers Hanover Trust*

"It is an insignificant amount of money for a significant improvement in the operating environment. It makes a graphical user interface available to DOS. That's what we've all been waiting for, and that's what users are buying. They are not buying it for the performance or the applications."
Amy Wohl, *Wohl Associates, Inc.*

"We're experiencing a 30% increase in throughput. Before Windows 3.0, we always had to stop one program and start another. Now we can just cut and paste."
Steve Birgfeld, *Manager of Computing Standards Product Evaluation Center, Martin Marietta Corp.*



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CONTINUED FROM PAGE 35

sources say.

Keep those upgrade cards and letters coming. Since 1-2-3 for Windows won't be out until 1991 — again, the second quarter is most likely — Lotus has a lot riding on upgrades to Release 3.1.

The firm has been open about the disappointing sales of Release 3.0, which lacked the desktop publishing features available under Release 2.2. It is hoping to move the vast base of Release 2.0 and 2.2 users forward, however, to Release 3.1, which fixes that glaring error and has the added bonus of running under Windows.

This effort is backed by a gargantuan direct-mail campaign, heavy advertising and a faster turnaround time on upgrades.

Lotus has already issued a release touting strong initial sales through the channel, quoting resellers who quickly sold out their stock and citing account wins at Firemen's Fund Mortgage, Amoco and American Cyanamid. But it's still early.

Consider that users know 1-2-3/W could be six months away. Note also the rain of upgrades inundating the user community these days and the fact that many micro managers prefer to have major upgrades spaced 12 months apart.

Moreover, more sites than not are not networked. Unlike their networked brethren, stand-alone users are usually given the choice of whether to upgrade. And the bigger the shop, the more likely these users will not be forced to upgrade.

Tie all those factors together and Release 3.1 could suffer the same snub that befell 3.0. Only time, of course, will tell.

Run that by me again? One of the more amusing junctures in the ongoing battle between Nynex and attorney and whistle-blower Scott Rafferty — who worked a while back at Nynex's Telco Research subsidiary — involves phone logs. Testimony from Rafferty and other Nynex whistle-blowers has figured in eight legal actions against the increasingly defensive regional holding company.

In his own suit against Nynex for wrongful discharge, Rafferty won a court order to give him access to those logs. But his access was limited because Nynex officials in Nashville and New York claimed to have *lost* most of the firm's phone records.

"Now this is the subsidiary that makes the station message detail recorders to keep phone records for private branch exchanges," Rafferty exclaimed. "I believe that like I believe Rosemary Woods."

Still, Rafferty had the last laugh. He used Lotus Symphony to sort Nynex' phone logs in order to create a map of who was where when. That map pointed "toward all kinds of contradictions" in testimony.

Symphony also came in handy when sorting electronic mail messages to and from specific Nynex executives into a giant spreadsheet. These were then sorted by date and matched up to hard-copy documents provided by Nynex. This helped to find documents Rafferty wasn't given, forcing a reopening of the discovery process. "This happens once in a blue moon," he said.

Perhaps it didn't fly. First Lotus copyright attorney Hank Gutman scoffs at what he alleged was to be Mosaic Software's defense against copyright infringement charges, namely insisting that they are the "only people in the universe Lotus gave license to clone 1-2-3." The next thing we hear, the trial is postponed from Oct. 25 to Nov. 20 because Mosaic has hired a new attorney to try its case.

Also on the copyright front, Charles Taylor, an analyst at Prudential Bache Securities, offered a new twist on an old slogan. Pointing to the "innovate, don't litigate," favorite of groups like the League for Programming Freedom, Taylor offers the following less catchy, but possibly more pointed, response: "Innovate, don't copy."

Keefe is *Computerworld's* senior editor, PCs and workstations.

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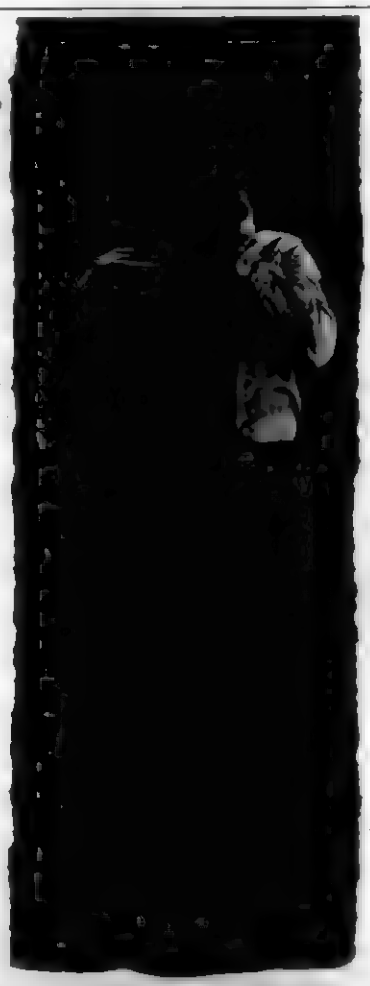

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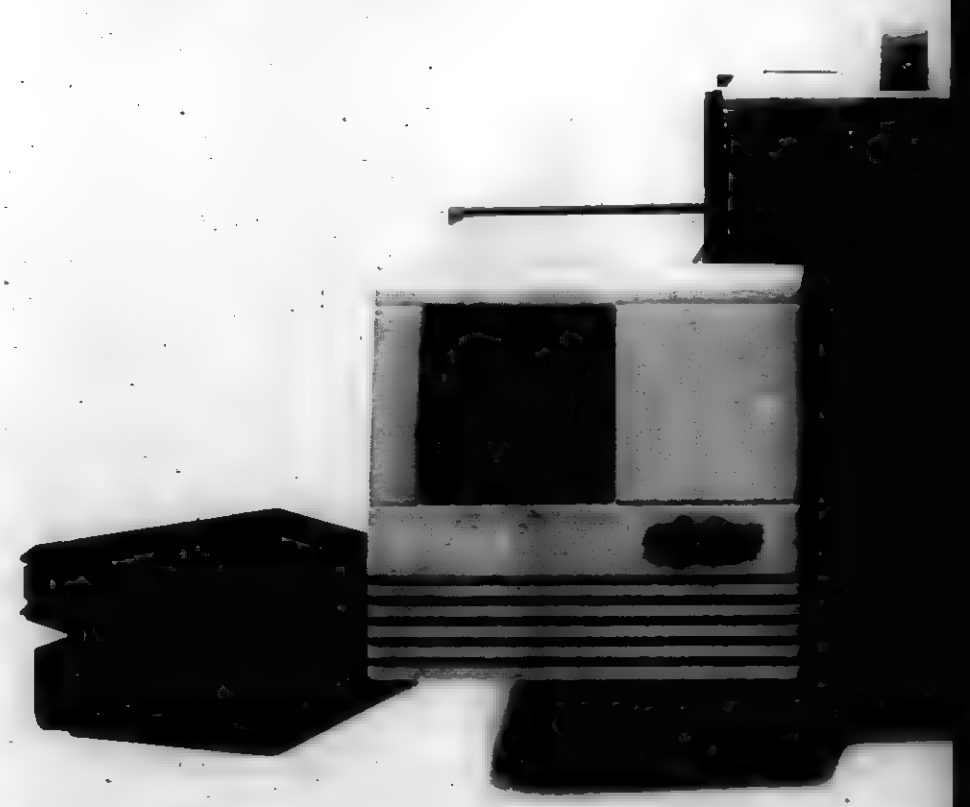

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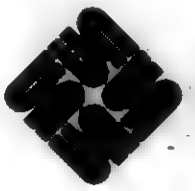

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No Go on pen-based box

BY JAMES DALY
CW STAFF

FOSTER CITY, Calif. — In a surprising reversal, Go Corp. has shelved plans to produce a commercially available pen-based computer and instead will concentrate on developing the operating system software that drives the notepad-size machines.

At a July press conference in which Go announced it was licensing the still-unreleased software to IBM, President Jerry Kaplan broadly suggested that both companies would produce commercial machines that use an electronic stylus instead of a keyboard. The decision to pare down their corporate mission will have no effect on the IBM agreement, a Go official said.

Some industry observers had predicted that the 3-year-old firm would use next month's Comdex/Fall '90 trade show as a pulpit to unveil a computer based on the new technology.

Although several prototypes of the lightweight handheld boxes had been built, a Go spokeswoman said they were used only to test the operating system software. "We've always been a software company not a hardware company," said spokeswoman Carol Broadbent, who added that Go would like to replicate Microsoft Corp.'s approach of widely licensing its operating system to establish a de facto industry standard.

Some analysts have conjectured that pen-based computers could affect the industry unlike anything since Apple Computer, Inc.'s Macintosh, with users ranging from insurance adjusters visiting the scene of an accident to store clerks taking inventory. Firms such as Fremont, Calif.-based Grid Systems Corp., as well as Sony Corp. and Canon, Inc. of Japan already have commercially available systems.

Stacking up on real-time

BY SALLY CUSACK
CW STAFF

CARLSBAD, Calif. — Stac Electronics, a 7-year-old company that specializes in personal computer data compression products, unveiled a real-time compression product for DOS-based systems at Data Show '90 in Tokyo.

Stacker is available in three configurations: software for laptop, notebook-size and IBM Micro Channel Architecture-based computers; an add-in board for IBM Personal Computer, XTs, ATs and compatibles; and in coprocessors, so that computer manufacturers may incorporate the technology into new systems.

Offering a reported compression ratio of 2:1, Stacker is said to allow users to double their Winchester disk storage capacity without adding a hard disk.

"The Stac algorithm works on any PC file," said Gary Clow, Stac's president. "There are no limitations, and real-time compression can even be applied to previously compressed graphics."

The 30K-byte program can be loaded into high memory using a memory manager utility, and according to Stac, can be installed in less than five minutes. Actual compression on the hard disk can occur at speeds up to 20M bytes per minute.

Stacker runs under Microsoft Corp.'s Windows 3.0 and is said to be compatible with all versions of MS- and PC-DOS 3.0 or higher, including Compaq Computer Corp.'s DOS 3.31.

The software-only version costs $129. Both the software and coprocessor card are priced at $229.

Claris

FROM PAGE 35

you're going to see that change over the next 12 to 18 months."

Users said they welcome the evolution. "Claris has a great product, but it can sometimes be a little wimpy," said Ken Wells, a project engineer and Claris CAD application user at Design Engineering Services, Inc. in San Francisco. "If they could marry their ease of use with a more sophisticated product, they'd have a real winner."

That transformation began in September when Apple shifted full possession and responsibility for its popular Hypercard program — as well as a handful of software engineers — over to Claris. The move, Ruddock said, would allow a more intense feature enhancement effort to be focused on Hypercard.

Other moves include the recent introduction of the more powerful Filemaker Pro, which replaces the aging Filemaker 2.0 package. Networking development has also been moved over to Claris, Ruddock said, although Apple will retain control of Appleshare network development until at least the introduction of System 7.0, which should arrive by the middle of next year.

Claris seems unlikely to make an immediate assault on the DOS marketplace. Just before Apple announced its decision to retain Claris, Apple top management reportedly began to worry that Claris could focus future development efforts on competitive programs such as Microsoft Corp.'s Windows Version 3.0, which gives a Macintosh-like interface to IBM Personal Computers and compatibles. "It would have killed [Apple Chief Executive Officer John] Sculley to see Claris jump on the 3.0 bandwagon," said Charles Rothschild, an analyst at the research firm Pershing & Co.

Claris officials acknowledged that any move to develop a non-Macintosh application begins with several strikes against it. "Obviously, we would have moved in some directions because they made good business sense," Ruddock said. "But now we have to consider whether it makes good strategic sense for Apple."

NEW PRODUCTS

Software applications packages

Softsource has announced that its Standard, Professional and Junior versions of Drawing Librarian have been enhanced to work with Release 11 of Autodesk, Inc.'s Autocad software package.

The upgraded product features display, print, plot and translation capabilities that are completely functional with Release 11 of Autocad.

Current users of Drawing Librarian can upgrade their systems for $25. Retail pricing is $500 for Drawing Librarian Professional, $250 for Drawing Librarian Standard and $125 for Drawing Librarian Junior.

Softsource
301 W. Holly
Bellingham, Wash. 98225
(206) 676-0999

Geovision, Inc. has announced a desktop mapping system based on compact disc/read-only memory and designed for use in Microsoft Corp.'s Windows 3.0 environments.

Windows/On the World operates in conjunction with the Geodisc U.S. Atlas CD/ROM, a software package based on a Digital Line Graph database developed by the U.S. Geological Survey to provide users with interactive mapping capabilities and a transportable geographic database for use with other applications.

The products are individually priced at $495 or as a package for $595.

Geovision
5680 Peachtree Pkwy.
Norcross, Ga. 30092
(404) 448-8224

Intermec Corp. has announced enhancements to Shopscan, its modular software system designed for work-in-progress tracking, labor data collection, material tracking and time and attendance applications.

Shopscan Version 3.0 is a shop-floor reporting system that collects data through bar-code devices and validates, organizes and reports in real time all activities that occur on a manufacturing shop floor. The product runs on IBM Personal Computer XTs, ATs or compatibles, Personal System/2s and local-area networks.

Pricing begins at $4,000.

Intermec
6001 36th Ave. W.
Everett, Wash. 98203
(206) 348-2600

Knowledgeset Corp. has introduced a version of its Graphic Knowledge Retrieval System that was designed for Microsoft Corp.'s Windows 3.0 running under DOS.

The product features full-text capabilities, hypertext links that accelerate navigation through data and multiple window viewing. It also enables users to access vector and raster images and display multiple fonts and point sizes in database text.

The Windows 3.0 version is scheduled to be available in the first quarter of 1991. Prices start at $75 per copy.

Knowledgeset
888 Villa St.
Mountain View, Calif.
94041
(415) 968-9888

Jandel Scientific has announced a software package designed for researchers who need to separate and analyze multiple overlapping peaks or functional forms.

Peakfit was developed to assist scientists and engineers to observe and manipulate peak placement and parameter values graphically on-screen, thereby ensuring fast, accurate convergence, according to the vendor. Other features include pull-down menus, mouse support and the ability to operate in a Microsoft Corp. Windows environment.

The product runs on IBM Personal Computer XTs, ATs, Personal System/2s and compatibles and is available for $595.

Jandel Scientific
65 Koch Road
Corte Madera, Calif. 94925
(800) 874-1888

Software utilities

Ajida Technologies, Inc. has introduced Release 2.5 of Plotview, a utility program that lets users view, print, cut and paste Hewlett-Packard Co. Graphics Language format plot files.

The product was designed for Versions 2.1 and 3.0 of Microsoft Corp.'s Windows. It enables users to examine and manipulate graphics that were created in drawing, paint or computer-aided design and manufacturing programs and then saved as plot files.

Plotview is priced at $99 for domestic versions and $129 for international versions.

Ajida Technologies
613 Fourth St.
Santa Rosa, Calif. 95404
(707) 545-7777

Peripherals

In Focus Systems, Inc. has announced a portable presentation manager designed to help users organize, enhance and present computer-generated images.

Liteshow II is compatible with applications created using DOS, OS/2, Microsoft Corp.'s Windows 3.0 and Apple Computer, Inc. Macintosh operating systems. A grab function captures computer images and stores them on a 3½-in. diskette, and a special-effects generator enables users to enhance and manipulate these images.

The product is priced at $1,995.

In Focus Systems
7770 S.W. Mohawk St.
Tualatin, Ore. 97062
(800) 327-7231

Mass Microsystems, Inc. has introduced Easyvideo 8, a National Television System Committee (NTSC) video output card designed for Apple Computer, Inc. Macintosh II systems.

The 8-bit Nubus card fits into a single slot of any Macintosh II machine. It can simultaneously display 256 colors as a standard NTSC composite video signal and allows users to view presentations or animations prior to recording, the vendor said.

Easyvideo 8 is priced at $599.

Mass Microsystems
810 W. Maude Ave.
Sunnyvale, Calif. 94086
(408) 522-1200

Nisca, Inc. has introduced an 8-bit handheld scanner designed to reproduce 256 shades of gray within a Microsoft Corp. Windows 3.0 environment.

Niscan/GS can be used to capture gray-scale images through hardware controls rather than software interpolation.

System requirements include an IBM Personal Computer AT or Personal System/2. The product is priced at $399.

Nisca
1919 Old Denton Road
Carrollton, Texas 75006
(214) 242-9696

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Author of "Inside dBASE IV," President, Pacific Systems Design Workshop Inc., San Carlos, CA:

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Programmer Analyst, Chevron CEPS, New Orleans, LA:

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President, Westar Systems, Colorado Springs, CO:

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SAM GILL
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COMMENTARY

Elisabeth Horwitt

Hidden price, odd strategy

It's not so much the 200% extra that some companies will have to pay for the new version of Netview; it's the way IBM snuck those price increases in under the rug that passes the bounds of good taste and good judgment.

Netview Version 2 was part of the introduction avalanche that IBM let loose last September. IBM Vice-President Ellen Hancock and her gang had plenty to say about the functional significance of Version 2, such as its support of a direct LU6.2 interface and its enhanced command structure for managing LANs.

However, no one mentioned Netview 2 prices at the press conference — at least within my hearing. OK, we didn't expect IBM spokesmen to jump up on the podium and trumpet the news of a major price jump. IBM always tucks away the subtler and less positive aspects of its announcements in the middle of customer letters, for reporters to take home and chew like baffled bulldogs.

Apparently, however, IBM neglected to make its pricing strategy clear to key customers and consultants who cater to such key customers. That's not just rude, it's stupid.

Mind you, there are plenty of precedents for IBM announcing a major price boost with a new version of a strategic product. Some analysts even claim that IBM may actually have been

Continued on page 56

Store chain may banish Banyan

BY JOANIE M. WEXLER
CW STAFF

HAYWARD, Calif. — Like a hippie turned stockbroker, Mervyn's department store may find itself migrating back to The Establishment — meaning, of course, IBM.

Mervyn's, a clothing and housewares chain that spans 20 states, said it will probably swap out its Banyan Systems, Inc. Virtual Network System (Vines) networks in favor of IBM's LAN Server, which is based on the multitasking OS/2 operating system. One reason for the proposed change is that the company wants to hook up with a business partner that will provide full-time network planning, design and technical support.

The conversion, which will depend on results of a LAN Server pilot slated to run from December through March, would involve moving key corporate data on 30 local-area networks serving nearly 500 users, according to the company. The firm uses the Banyan networks for resource sharing and local processing but stores corporate resources on an IBM 3090 mainframe, which it will retain.

"We need more support than the vendor is willing or able to give, and there is a lack of applications available for the Vines network operating system," said Conrad Spielman, Mervyn's information center consultant.

Spielman added that Mervyn's felt the need to partner with a vendor able to provide a spectrum of consulting services. He acknowledged, however, that he does not think other local-area networking companies, such as Novell, Inc. and Microsoft Corp., are structured any better than Banyan to provide the extensive partnership arrangement the retailer requires.

Craig Buchanan

Mervyn's *considers switch to IBM LAN Server*

In addition, Spielman said, Mervyn's is attempting to minimize the number of vendors it deals with — aiming to pare down to just IBM and AT&T (for telecommunications services).

Technology planner Christopher Joyce added that the increased expense of doing business with IBM "should be offset by better support and fewer application integration headaches."

Increasing the number of LAN applications available while reducing in-house integration is a top goal, Joyce said.

"Generally, end users have to integrate applications for Vines themselves, and Mervyn's is lagging behind in decision support applications. We figure that right now there isn't anyone out there not writing applications for LAN Server."

The Vines-to-LAN Server migration could be eased by Banyan's alliance with Microsoft to develop software that will allow interoperability between Vines and LAN Manager, Microsoft's network operating system on which LAN Server is based.

Spielman said Mervyn's made

Continued on page 52

ISDN: Connecting U.S. to overseas

BY ELISABETH HORWITT
CW STAFF

NEW YORK — While local U.S. carriers are still a long way from linking their "ISDN islands" across the U.S., they have begun providing users with switched connections to overseas' Integrated Services Digital Network services.

At the recent Communications Managers Association '90 conference, Teleport Communications Group and France Telecom demonstrated an "end-to-end switched ISDN connection" that should become commercially available sometime next year, the carriers said.

Users within Teleport and France Telecom CMA booths demonstrated how ICL North America desktop conferencing systems in the U.S. and France could exchange data and update the same file over an ISDN link. However, since standards do not yet exist for intelligent ISDN connections between two carrier switches, AT&T's Switched Digital Service was used to provide a 64K bit/sec. connection between Teleport's AT&T 5ESS ISDN switch and France Telecom's ISDN network.

Pacific Bell now offers a commercial version of this type of link in which the carrier's Centrex ISDN users can dial out to switched services such as AT&T's Switched Digital Service offering — and from there to users on other carriers' ISDN services, both in the U.S. and overseas. Ricoh Corp. now uses such links to send facsimiles and establish videoconferences with sites here and abroad.

Overseas links

A number of business companies that have begun evaluating domestic ISDN services are now eyeing the possibility of extending those links overseas. Ricoh, for example, now uses Pacific Bell's ISDN Centrex service to dial out to an AT&T switched 56K bit/sec. link to other offices both in the U.S. and in overseas countries, according to company spokesman John Zebrowski.

Manufacturers Hanover Corp. has been talking to New York Telephone about becoming a pilot for the local carrier's ISDN service, said Pat Molloy, network manager at Manufacturers Hanover's Global Banking Technology Division. The bank is considering using ISDN to provide up-to-date product and market data to customers and internal users, he added. The firm makes use of a Reuters Holdings PLC service to distribute this information, Molloy said.

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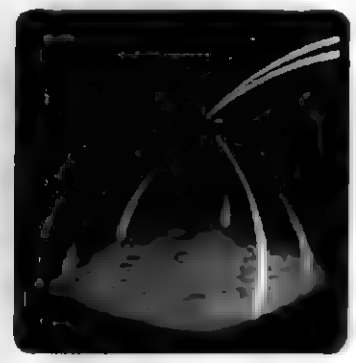

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Help on way for APPC users

Object-oriented development tool could make life easier for programmers

BY PATRICIA KEEFE
CW STAFF

MOODUS, Conn. — Microformatic, Inc. USA, along with its Paris-based parent company, Microformatic, SA, recently introduced the first object-oriented development tool for OS/2 users of IBM's Advanced Program-to-Program Communications (APPC).

This has become an issue because OS/2 Extended Edition's Communications Manager provides APPC under OS/2.

Developed in part at the urging of IBM France, APPC++ cuts programmer training and development time by hiding much of IBM's complex communications environment behind objects. "It's a bear to use. A few commands involve 10 to 15 lines of code," said Stefan Kent, director of sales and marketing at Microformatic USA.

"The idea is that you can use [APPC], but you don't have to understand it. Using the product is like opening and closing a file," claimed Jean-Jaques Fouchet, Microformatic, SA's president.

"We're saying it reduces development time from several weeks to a few minutes and that the ramp-up time is almost zero vs. having to learn and configure APPC. It all depends on whether you have Com Manager or [Microsoft Corp.'s] Communications Select Workstation properly installed, which is no simple feat," Kent claimed.

Programmers see APPC++ as a regular call to a normal function, just as if they were programming in the regular C language. They can invoke one of two library classes: A simple class allows the user to send and/or receive in APPC; an expanded class provides access to more, but a still reduced set of APPC verbs, Kent said. "This lets the programmer worry about the application he or she is trying to develop and not worry about the mechanics of [APPC]," he added.

Embedded verbs

A lot of the APPC verbs are embedded in an object, which the programmer can use to kick off the application.

Conceding that it is very difficult to develop in APPC, Michel Granger, an OS/2 marketing manager at IBM France in Paris, said people in IBM [France] wanted to present customers with an APPC applications development tool. Ironically, IBM's efforts to simplify the number of APPC's verbs only complicated matters for programmers, Fouchet said.

The APPC Development Group at IBM Raleigh was working on a similar product when it caught wind of APPC++, according to Kent. It is now evaluating the product.

"John Walker of IBM USA, who is also known as the 'Pope of APPC,' is very interested in the product," Kent said. Various IBM USA laboratories are said to be evaluating the product and, in some cases, using it internally.

According to Fouchet and Granger, many large French financial institutions and travel systems have committed to OS/2. Fouchet said many of these firms began their migrations last year.

Banc Nationale de Paris, for example, purchased more than 10,000 units of OS/2. The Amadeus reservation consortium bought 55,000 units of OS/2. But OS/2 is especially hot among banks and insurers, which began to replace terminals with OS/2 workstations last year. "APPC++ is very useful for doing cooperative processing between the workstation and the host system," Granger said.

At the same time, there is a lot of support for the C++ language.

APPC++ was introduced in France in July and in the U.S. in October. So far, Fouchet has four French customers. In general, APPC++ is being used to get data back and forth between the host and desktops scattered throughout branch offices. There is one U.S. beta-test site.

Banyan and CC:Mail branch out into E-mail

BY JIM NASH
CW STAFF

SAN FRANCISCO — Banyan Systems, Inc. and CC:Mail, Inc. recently said they will deliver an electronic mail application next year that will allow network administrators to consolidate their combined user directories.

Short of rudimentary messaging services of their own, the major local-area networking companies have been noticeably absent from the E-mail arena.

Banyan's decision to work with Mountain View, Calif.-based CC:Mail to develop CC:Mail for Virtual Networking Software (Vines) will produce the first bundling of such communications tools.

Banyan has an X.400 messaging protocol interface now, and according to Dave Mahoney, president and chief executive officer of Banyan, the new product does not rule out a Banyan-X.400 product in the future.

The lack of E-mail is especially curious given that many personal computer users are coaxed into using LANs by the promise of E-mail connections, said Chris Lyon, a systems analyst at the University of California at San Diego.

The university's business affairs department, he said, has standardized on CC:Mail and Novell, Inc.'s Netware network operating system. Similar packages with Novell and Microsoft Corp. would lower administrative overhead, Lyon said.

With the new product, a manager of Banyan's Vines network operating system will be able to consolidate the Streettalk global directory database with CC:Mail's user directory. This simplifies the task of finding and electronically contacting users.

Ben Finnegan, information center analyst at Hayward, Calif.-based Mervyn's department stores (see story page 49), said the announcement "definitely piques our interest." He said CC:Mail for Vines is unlikely to answer the debate, but it does give Banyan a unique advantage.

Testing an alternative

The chain has been testing Consumer Software, Inc.'s Network Courier messaging product as an alternative to Streettalk's more basic messaging service. The collaboration, along with CC:Mail's compatibility with Microsoft's Windows, gives CC:Mail an advantage should Mervyn's decide to stay with Westboro, Mass.-based Banyan, Finnegan said.

Banyan's and CC:Mail's move "sure makes a lot of sense," said Mike Heylin, an analyst at Creative Strategies in Santa Clara, Calif. The move will pull Banyan's appeal into the middle market, expanding its overall market share from the Fortune 500, Heylin said. "Banyan has a lot of tenacity."

It is CC:Mail, however, that stands to gain more from the partnership, according to Heylin. CC:Mail gets access to a loyal and growing installed base.

A study by Dataquest, Inc., a market research firm in San Jose, Calif., indicated that CC:Mail holds fully one-third of the DOS E-mail market in terms of mailboxes, said Connie Duncan, a Dataquest analyst.

INTERNATIONAL BITS

Infonet acquires interest in Paris firm

Infonet, the international value-added network service provider, has acquired a majority ownership interest in **OSIware International**, a Paris-based company that offers Open Systems Interconnect-compatible software. Infonet plans to use OSIware's CCITT-compliant X.400 products to enhance its own X.400-based Notice 400 electronic mail family, the company said. It also plans to use OSIware's expertise to develop other standards-based messaging products and services, such as CCITT X.500-compliant directory offerings.

Halliburton Company, which provides diversified oil field services worldwide, has signed a **$1.4 million** order for more than 30 videoconferencing systems from **Picturetel Corp.** The systems will be used to link employees at Halliburton facilities throughout the U.S. and overseas. They will also be used to link Halliburton with its customers worldwide. Halliburton hopes the videoconferencing systems will help accelerate decision-making and problem resolution while reducing travel time and expense.

Western Union Telegraph Co. has signed an agreement to interconnect its electronic mail service with Sweden's TEDE400/Telebox service via the CCITT X.400 E-mail standard.

General Electric Information Services has announced the installation of a GEIS network node in East Berlin, as well as plans to install network nodes in three other cities in Germany — Dresden, Leipzig and Chemnitz — by year's end. The new nodes will allow German users to directly access GEIS' international value-added network.

Banyan

FROM PAGE 49

a transition from a centralized terminal-to-mainframe setup established in the mid-1970s to local-area networking in June 1989 because "the quality of the mainframe is still what it was 20 years ago. There's a five-year backlog for writing mainframe applications, while there are thousands of applications out there for PCs."

Banyan was chosen "because it is the easiest LAN to set up, administer and network with other systems," Joyce said. However, Mervyn's has turned to Syntrex, Inc. — a Banyan reseller — to fill in the Banyan support gap and for some of Syntrex's Vines-certified servers.

Mervyn's plans to put OS/2 on several desktops in addition to many of its servers, citing such upcoming applications needs as multimedia in-store training and accessing multiple mainframe resources simultaneously as justification for widely installing the multitasking operating system.

Joyce emphasized that IBM is going to have to prove itself before the Vines-to-LAN Server conversion is approved. "IBM itself doesn't understand LAN Server all that well yet," he said, "and OS/2 and [IBM's network management system] Netview are not very user-friendly. We'll have to see if IBM comes through with the support and product development we need."

Spielman added that if the IBM pilot was unsuccessful, Mervyn's would turn to other "standards-based" platforms, such as Microsoft's LAN Manager and 3Com Corp.'s 3+Open.

Banyan declined to comment on Mervyn's possible switch to another vendor. However, one Banyan customer, Jonathan Oski, senior technical engineer in the Boston office of Bank of Tokyo Financial Corp., said, "We've been a Vines user since 1984 and have always felt we've been in partnership with them."

Oski said the bank attempted to transition about 10 nodes of its 1,500-node Vines network to OS/2 LAN Server earlier this year for a vertical market application that the firm needed to quickly implement.

"IBM couldn't get the product going," said Oski, adding that because the system kept crashing, the company swapped out the LAN Server network for a 3+Open network, which is also LAN Manager-based.

"There is nothing our users are demanding that we can't deliver with Banyan," Oski said, although he acknowledged that his company has strong in-house network expertise. In addition, he said, "there are a lot of resellers better equipped than Banyan to field network problems, since Banyan is getting away from direct customer relationships."

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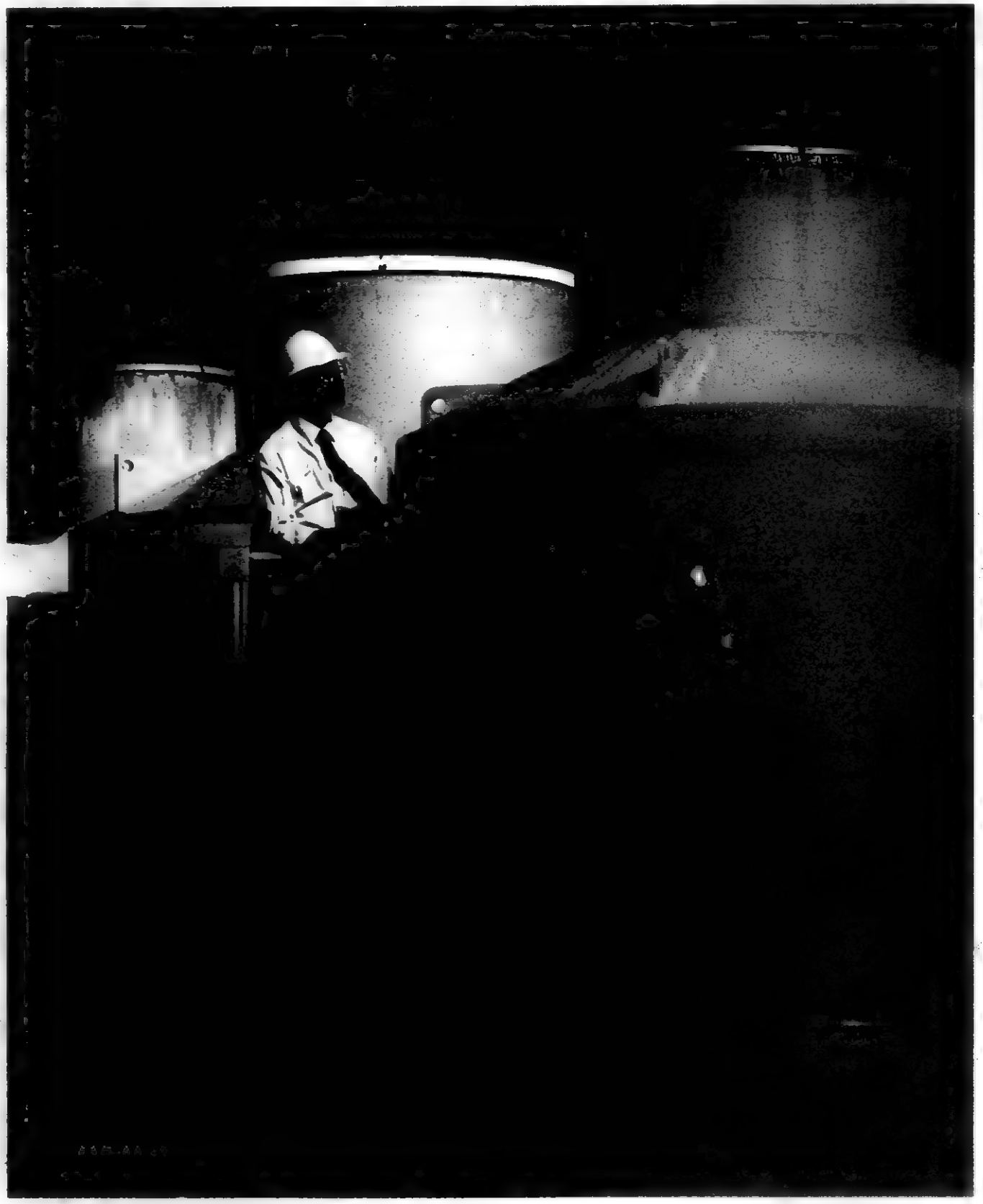
NetWare Solves Issues At



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But open connectivity is only one consideration. After all, the EPA can't afford to test the waters with an unreliable network. So they use the only PC-based network operating system that's in its eighth generation. According to Stoneman, "We use NetWare for its reliability, advanced capabilities and functionality. It's easy to maintain, and we are very pleased with the security that NetWare provides."

In addition to sharing information and accessing several host systems, the EPA tracks cleanup efforts and communicates through E-mail over its NetWare network. All of which make for a very productive office environment. In fact, Stoneman attributes some significant cost savings to NetWare, "We no longer need a laser printer on every desk or 12,000 copies of dBase, Lotus and WordPerfect."

Fact is, NetWare is compatible with more applications and hardware than any other network operating system. Which makes software incompatibility and equipment obsolescence things of the past.

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NOVELL

The Past, Present, and Future of Network Computing.

Prodigy suspends vocal E-mail price critics

BY ELLIS BOOKER
CW STAFF

WHITE PLAINS, N.Y. — The battle between Prodigy Services Co. and the Cooperative Defense Committee escalated last week when Prodigy suspended without explanation the accounts of several electronic mail activists who had recently begun a mailing campaign to Prodigy advertisers and other subscribers.

The vocal group of Prodigy users wants the videotex provider to back off on its plan, announced in early September, to end unlimited free E-mail on the service sometime next year.

"It's bait-and-switch advertising," declared the group's coordinator, Russ Singer, who pointed to Prodigy's promotional material, which still declares that Prodigy is a "flat rate" service. He said his group has compiled a database of 15,000 Prodigy user identifications from customers who also oppose the rate change.

Prodigy posted a message in its Feedback section stating that further discussion regarding the E-mail pricing change would not be allowed on the bulletin board and that messages regarding the controversy would be returned

Geoffrey Moore, director of market programs and communications for Prodigy said of the suspended accounts that Prodigy routinely terminates the accounts of users who violate policies. He said the "repeatedly and increasingly strident harangues" of a small number of customers had generated complaints from other subscribers.

Moore also said that Prodigy has no objection to users complaining but that hundreds and thousands of messages sent by a small number of people had been "flooding mailboxes," and this amounted to harassment.

The E-mail group said it is considering legal action in the wake of the terminations.

Analyst Karen Nielsen at Link Resources Corp. in New York noted that information networks are private services and that providers are within their rights to restrict messages. "This is not a public network; it's a private one."

Horwitt

FROM PAGE 49

charging far too little for Netview, given the flood of enhancements and capabilities it has added in the past couple of years.

IBM may have even done its smaller competitors a backhanded favor by bringing its prices more in line with the cost of developing a major network management platform. Until now, all but the most determined have been discouraged from entering the network management platform market because if they charge prices comparable to Netview's, they will never recoup their initial investments.

In addition to handing off a bit more of IBM's research and development costs onto customers, however, Netview Version 2 represents a major development in IBM's pricing policies. First, it introduces additional intermediate pricing levels that are tied to specific model types. Thus, the cost of a Netview installation reflects much more accurately the size of the host Netview runs on.

Second, pricing is now differentiated by whether a Netview host is stand-alone, distributed or central. Stand-alone Netview hosts are just what they sound like. Distributed Netview systems can act both as local nodes that manage a particular segment of the network, and as liaisons that pass the information they have collected up to a central Netview host. The central Netview is a focal point that collects and coordinates information from multiple distributed Netview hosts.

Netview Version 2 costs a lot more for central hosts than it does for distributed hosts. This has led at least one IS manager to conclude that IBM is pressuring its users to set up a more hierarchical enterprisewide Netview installation.

Trouble is, IBM hasn't come out and said what it means by its pricing strategy. And there are certain Netview configurations where it is very hard to tell exactly what label to tack onto a Netview host. If two Netview systems talk regularly in peer-to-peer fashion, are both central? How subordinate does one host have to be to earn the name "distributed"? What functions does Netview Version 2 offer on a central host that are lacking on a distributed system?

IBM has said it will answer these questions for its customers on a one-on-one basis. During their first post-announcement visits, however, some IBM sales reps seemed to be almost as mystified about the new pricing regime as the users were. One IS manager said his reps could give little help in figuring out what the new version would cost his company and left him as baffled as ever as to the nature of his systems: distributed, central or stand-alone.

Presumably, some of IBM's most valued customers are getting straight answers by now. One manager went through an arduous spreadsheet analysis and figured out that his firm would probably pay 116% more for the new version. Then IBM reps took his figures, did some calculations and told him, no, the number was more like 65%.

The unlucky ones are IS managers who have yet to get hold of a knowledgeable IBM sales rep but need at least a general idea of how much the new Version 2 enhancements would cost their companies, so they can put together their pitch to management. Some of these users may be asking themselves, as one manager apparently is, whether they should take at least some of their network management eggs out of the Netview basket and put them into a LAN-based product — or even System Center's Net/Master.

Horwitt is a Computerworld senior editor, networking.

NEW PRODUCTS

Local-area networking hardware

Telco Systems Network Access Corp.'s Fastlane four-to-one compression bridge was designed to link local- and wide-area networks over a T1 network.

The product supports link speeds that range from 4.8K to 64K bit/sec., thereby quadrupling effective throughput rates, the vendor said. Its Adaptive High-Density Compression algorithm enables Fastlane to learn data stream characteristics and yield a compression of more than six to one for several applications.

Fastlane is scheduled to begin shipping next month at an initial price of $8,500.

Telco Systems
48430 Milmont Drive
Fremont, Calif. 94537
(415) 490-3111

Cabletron Systems, Inc. has announced a 4M and 16M bit/sec. IEEE 802.5 line of token-ring products.

The family includes Desktop Network Interface cards designed for IBM Personal Computer XTs, ATs, Micro Channel Architecture-based PCs and Apple Computer, Inc. Macintosh II machines; six connectivity Media Interface Modules for its Multi Media Access Center intelligent wiring hub; management modules for local and remote network management; and a stand-alone concentrator with ring-in/ring-out ports.

Pricing ranges from $735 to $8,000, depending on type of product, options purchased and port configuration.

Cabletron Systems
35 Industrial Way
Rochester, N.H. 03867
(603) 332-9400

Network management

Packet/PC, Inc. has announced a software package designed to automatically distribute, install and retrieve personal computer programs and data files for local and remote PCs.

Synchrony Version 2.0 enables firms to send and install files on an unlimited number of designated PCs in attended or unattended mode and then automatically retrieve files, reports and on-line data.

Pricing is $30,000 for the first mainframe license and $75 to $195 for PC software packages, depending on quantity.

Packet/PC
270 Farmington Ave.
Farmington, Conn. 06032
(203) 678-1961

Gateways/ Bridges/ Routers

Network Systems Corp. has announced a dual-attached Fiber Distributed Data Interface (FDDI)-to-T3 router that permits 100M bit/sec. networks to be connected over wide-area links to other networks operating at 1.5M to 44M bit/sec. full-duplex speeds.

The FE648 includes complete Simple Network Management Protocol agent software for standard network management capabilities.

The product is priced at $50,000 for one T3 and one dual-attached FDDI connection.

Network Systems
7600 Boone Ave. N.
Minneapolis, Minn. 55428
(612) 424-4888

BICC Data Networks, Inc. has enhanced its product line for its Isolan Etherconnect System for local-area networks.

The 1201-3 STP system, which includes a shielded twisted-pair repeater line card, is priced at $1,595, and the 1182 STP transceiver, costs $195. Both provide Etherconnect Systems with shielded twisted-pair wiring schemes, according to the company.

BICC Data Networks
1800 W. Park Drive
Westboro, Mass. 01581
(508) 898-2422

ISDN

FROM PAGE 49

"European ISDN activity is of interest to us, but we don't know how it fits our needs yet," Molloy said. "We have an X.25 international network, and it all works — we don't experience any shocks now. We are waiting to see how solid ISDN products are."

Citicorp hopes to begin a limited deployment of an ISDN network by year's end that will eventually include both domestic and overseas connections, said David Isherwood, a vice-president at the bank holding company. [CW, Oct. 29].

Among recent overseas ISDN developments are these:

- Teleport, an alternative access carrier that provides fiber-based metropolitan-area networks in New York and other cities, is planning to make a "controlled market introduction of Centrex plus international ISDN services" this quarter in New York, Teleport spokesman Baldwin said. General availability is slated for first-quarter 1991.
- British Telecom PLC hopes to offer switched links between its own ISDN services and U.S. ISDN services by spring. The company is considering a link to Teleport, primarily as a way to provide ISDN to its major customer, Merrill Lynch & Co., British Telecom spokesman Nigel Taylor said. Merrill Lynch owns a stake in Teleport and is rumored to be considering entry into an ISDN pilot that was initiated by the New York Public Service Commission.
- International Telecom Japan, Inc. plans to offer ISDN services both within Japan and to the U.S. by the middle of next year, a spokesman said.
- France Telecom plans to roll out its switched ISDN links to the U.S. sometime in the first half of next year, with a limited rollout to customers late this year, according to Gabriel Sidhom, director of marketing for the overseas carrier.

One reason that regional carriers are behind when it comes to offering true ISDN connections to long-distance carriers is regulatory hurdles to offering out-of-band signaling, according to Pacific Bell spokeswoman Ella Spradley. In a true end-to-end ISDN network, a separate D channel is allocated for sending network routing, management, and call setup information between carrier switches.

Without that capability, carrier networks must reserve a portion of each user circuit to send such information, leaving users with 56K bit/sec. instead of 64K bit/sec. to send voice, data and video, Spradley said.

The Federal Communications Commission has yet to approve out-of-band signaling proposals from Pacific Bell and several other regional operating companies, Spradley said.

MANAGER'S JOURNAL

EXECUTIVE TRACK

Mark Rosenthal has been named director of MIS at **Quill Corp.** in Lincolnshire, Ill., a large office products distributor.

He is responsible for systems design and programming, computer operations, records management and telephone systems.

Rosenthal is a former partner at Computer Sciences Corp.'s CSC Partners' office in Oak Brook, Ill., and former vice-president at Planmetrics, Inc. in Chicago. He has also held positions at World Book Encyclopedia and Arthur Andersen & Co.

Joseph Brigandi has been named applications development manager at **Wachovia Bank** in Winston-Salem, N.C. He is responsible for developing a trust and investment application at Wachovia.

Brigandi has developed similar systems at two Philadelphia-based banks. He spent the last 11 years at First Pennsylvania Bank, most recently as group leader and an MIS officer.

Before that, Brigandi spent seven years at Fidelity Bank, where he rose to the position of senior systems analyst. He is a graduate of Temple University in Philadelphia.

Brigandi is a former board member of the Association for Systems Management (ASM) and a recipient of the ASM Distinguished Service Award.

Patrick Fleming has been promoted to director of **CLC Training Corp.'s Computer Learning Center** in Santa Clara, Calif.

Fleming is a 30-year IS veteran. His past positions have included director of applications programming at Nordstrom's and engineering manager of internal systems at Pacific Northwest Bell.

Before joining CLC, he was vice-president and general manager at Western Computer Group, Inc. in Burlingame, Calif. He joined CLC as lead instructor for the microcomputer specialist program.

Expanding without spreading thin

Jones Day law firm networks its expertise worldwide from home base

BY RICHARD PASTORE
CW STAFF

Some would argue vehemently with the notion that the world revolves around Cleveland. However, Cleveland-based law firm Jones, Day, Reavis & Pogue is deploying a computer strategy to achieve that net result, extending its brain trust to offices across the country and around the world.

Jones Day, the U.S.' second largest law firm, has rightly supposed that such heavyweight corporate clients as General Motors Corp. and Citibank N.A. would not want to come to Cleveland for counsel. Yet at the same time, they expect all Jones Day physical and mental resources to be available at any regional office.

"They don't want to be subject to the capabilities of a few people in a particular office," says William Steinbrink, a Jones Day partner and chairman of the technical services committee.

Bruce Zake

Jones Day's Steinbrink: *Interoffice communication impresses clients*

One level of legal service

With 10 offices from Los Angeles to Atlanta and seven across Europe, the Middle East and Asia, the firm has turned to computer technology to achieve its single-firm philosophy.

"We use technology to support the concept of a single firm providing a single level of legal services," Steinbrink says.

With a network stringing its offices together, a lawyer in the Los Angeles office can instantly tap into extensive database libraries at the Cleveland headquarters. Although too large to reproduce at the various remote offices, the database resources in Cleveland are available to lawyers at all Jones Day locations.

This universal, instant access has allowed Jones Day to achieve its expansion goals without spreading its expertise too thin. Major clients who might otherwise feel nervous doing business with an "extension" of the firm are comforted and impressed by the degree of communication between offices, Steinbrink says.

Jones Day could still achieve its goal of nationwide integration without technology, Steinbrink contends. However, the quickening pace of doing business and the growing expectations of clients are making high-tech techniques more indispensable. "Technology is about the only way to provide these services in a fast-moving environment," he says.

Other law firms have varying degrees of automation, but in general, the profession has been slow to adopt distributed technology, according to observers. Even at Jones Day, which considers itself on the leading edge, there was some early resistance to the system, which has been evolving over several years.

"There has been some resistance,

Continued on page 60

Falling into the leadership gap

BY CLINTON WILDER
CW STAFF

The 1960s are remembered for the Generation Gap. The 1970s had the Credibility Gap. And according to Andersen Consulting, information systems executives in the 1990s are facing the Leadership Gap.

Andersen's biennial study, "The Changing Shape of IS," surveyed 125 IS chiefs in the U.S. and Canada on 17 technology, business strategy and human resources issues. Respondents said that 11 of those issues were very or extremely important but were *not* being effectively dealt with by their company.

The Leadership Gap refers to how much an issue's rated effectiveness lags behind its importance. For example, 88% of the IS executives said it was important to get functional managers involved in using information technology to reshape business processes, but only 30% said their company does it effectively.

Filling the gap

Other issues with a 50% or larger gap between importance and effectiveness were the following:

- Integrating technology into corporate strategy
- Developing corporate IS strategy
- Training workers in the use of IS
- Developing a quick-response capability to handle changing business opportunities
- Improving applications development productivity

Andersen interpreted this Leadership Gap as reinforcing an old message: Top business executives must be involved with IS. "If an organization is to be successful in the 1990s, it cannot compartmentalize the IS function," said Jim Fischer, managing partner at the technical services organization of Chicago-based Andersen. "Senior IS management must be part of corporate strategy planning."

Any good news? A little. Two issues that scored above 80% in importance were also rated as effectively executed by more than half the respondents: communicating with top management and managing information resources such as databases.

BOOK REVIEW

Learning to collaborate and cooperate without hating it

SHARED MINDS: THE NEW TECHNOLOGIES OF COLLABORATION
By Michael Schrage
Random House, $19.95

From the days of watching *Sesame Street* on into adulthood, we're told about the value of cooperating and collaborating. Why, then, do smart and eager businessmen despise going to meetings?

In *Shared Minds*, Michael Schrage offers an explanation. Businessmen genuinely want to collaborate, he says, but the technologies at their disposal — pens, paper, whiteboards, even electronic mail — do not encourage collaborative activities.

"We need to gain a deeper insight into what makes tools effective for communities, not just individuals," Schrage says.

Schrage also implies that the search for such new collaborative technologies, valuable as they may be for improving the performance of people and companies, is also demanded by the way we live in the twilight of the 20th century. Consider what happens when the poor collaborative work of a cockpit crew causes a mistake. "The cockpit," Schrage writes, "is thus a microcosm — albeit an unusually dramatic one — of the technological environments we all inhabit."

How we inhabit environments and the way information flows in and out of these "shared spaces" is a vital and well-constructed part of *Shared Minds*. This train of thought produces some of the author's best insights into communication and comprehension, and how both are shaped by technology.

"Each successive generation of technology has fragmented shared understandings further by putting more power in the distribution/transmission process. People are more concerned with presenting their messages within the constraints of the medium than ensuring that the recipient actually understands the message." Better "communicators" aren't enough. The corporation thinks its various parts communicate, when in fact it is a Tower of Babel; marketing can't talk to accounting, and neither can talk to research. A new paradigm — a new set of collaborative tools — is required.

Schrage acknowledges the obvious: Even the most innovative collaborative technology — say, a high-definition, holographic, voice-activated and intelligent conference table — can't accomplish a thing without the right people around it.

Many of the examples of successful collaborations in *Shared Minds* are drawn from the arts and sciences. Certainly, some readers will immediately protest Schrage's selection of people such as Picasso and Braque, the creators of Cubism, as models of the collaborative process. "Hey, these guys were geniuses, and we don't have any geniuses on my management team," the skeptic might say.

Schrage argues that such collaborations "can and should serve as models for people who are working together to create innovations or solutions to problems."

However, Schrage chooses his model collaborators for other reasons as well. He wants to show that the collaborative experience must take place in a "shared space," one in which the participants are free to interact, brainstorm and even play.

Some technology companies are already exploring the possibilities of such shared spaces. Xerox Corp.'s Palo Alto Research Center in California has its Colab, featuring a meeting room with a large "community computer screen" that meeting participants can send symbols to or draw or write on.

No matter what kind of software or hardware resides in these special rooms, the common aspect is their WYSIWIS (what-you-see-is-what-I-see) interface, Schrage states.

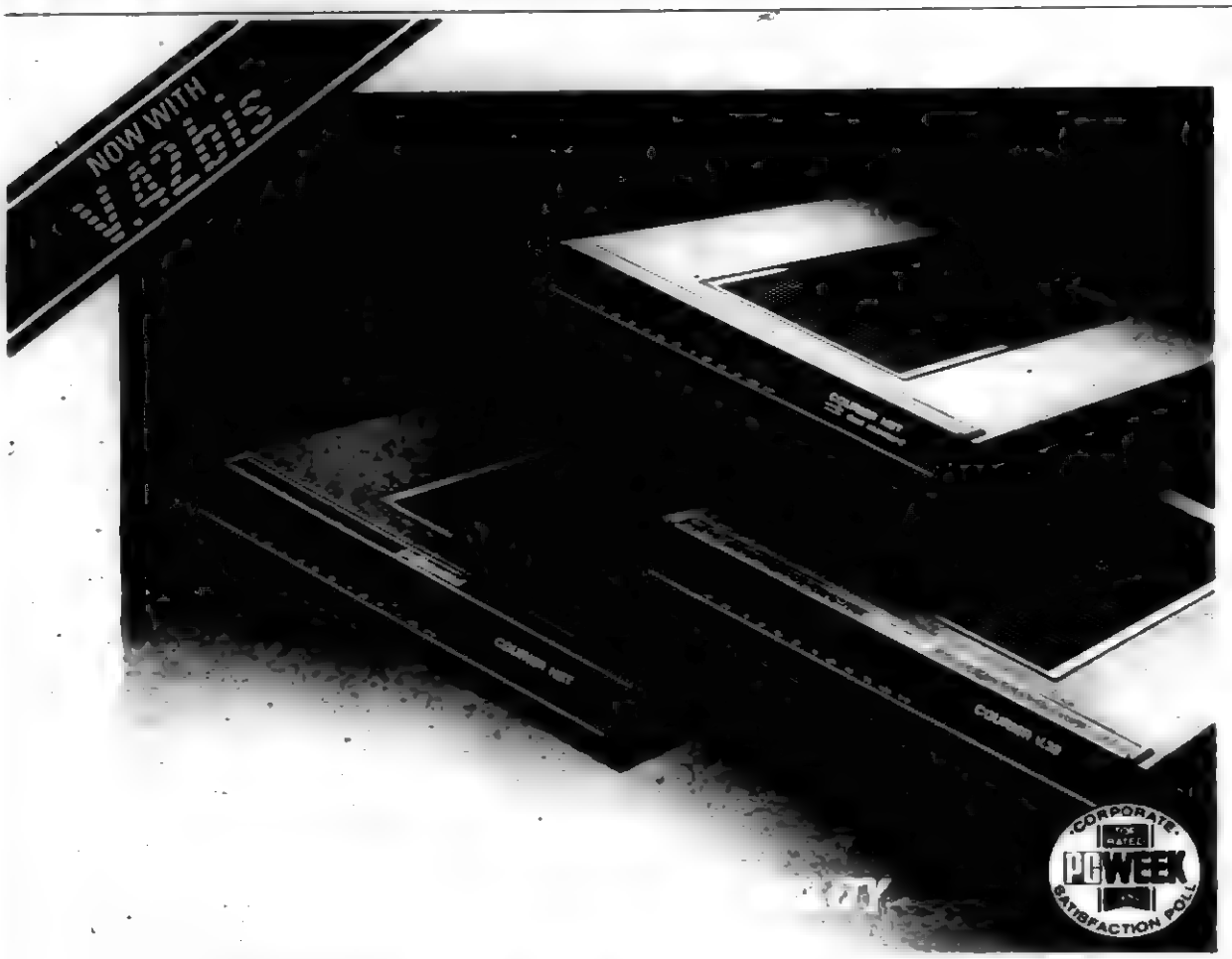
Paradoxically, although shared spaces focus on process rather than product, they are extremely productive places in which to work, Schrage says. IBM, he reports, attests that its decision support centers generate over 50% of person-hour savings in meeting time and reduce project completion time by 92%.

The impact, both good and bad, of all this on the traditional ways meetings are held — who has power, who has control — is explored in some depth by Schrage. Unfortunately, it isn't until the final, and apparently rushed, chapter of *Shared Minds* that he gets down to some real-world advice about how to conduct a shared space session and what existing computer technologies today can be used for this purpose.

Shared Minds is long on theory but short on practical advice. To balance, Schrage should have spent more time exploring how people are using existing computer technologies for creating shared space collaborations and less time on speculative, albeit interesting, questions about media, language and society's collaborative future.

ELLIS BOOKER

Booker is *Computerworld*'s Chicago bureau chief.



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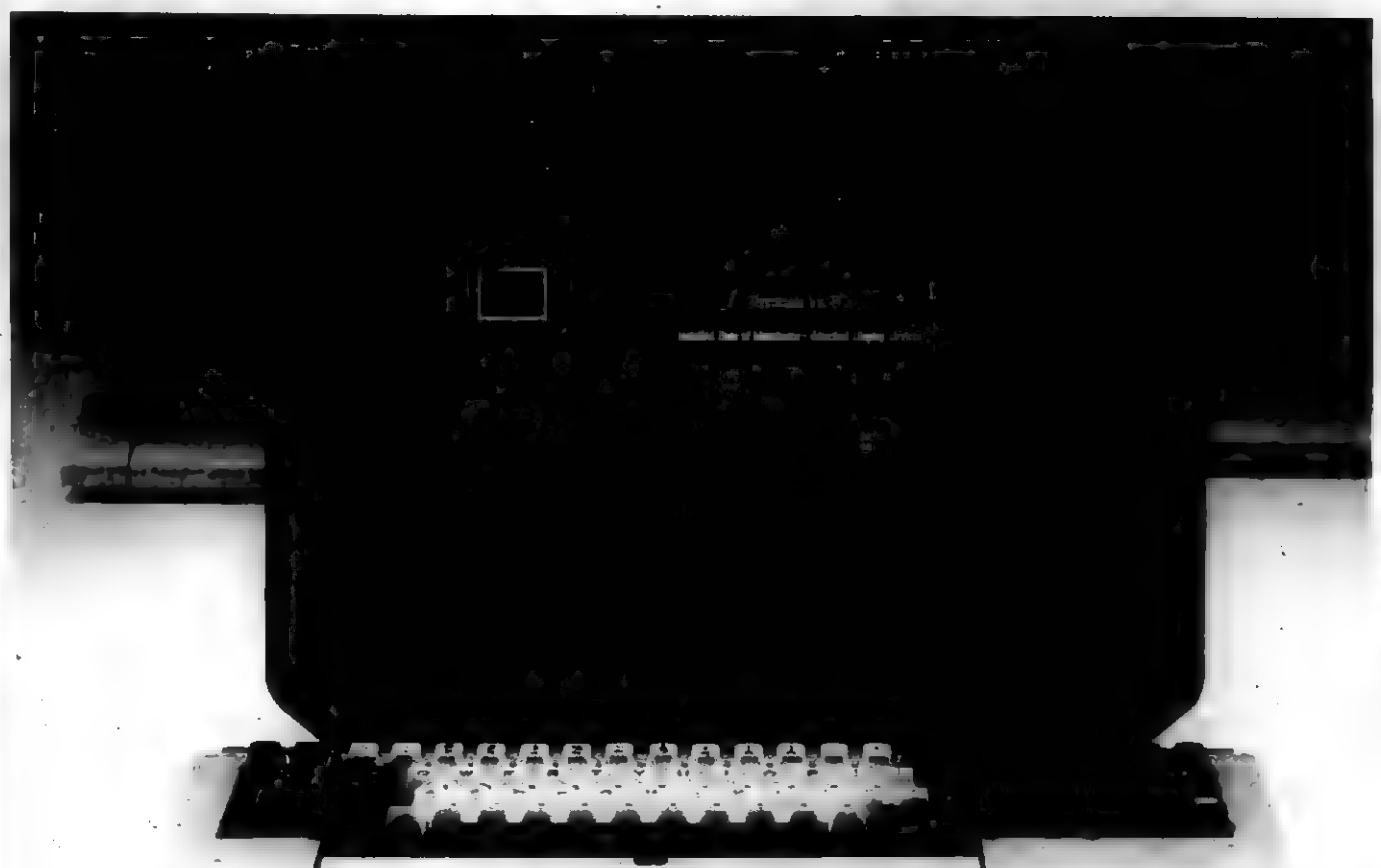

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COMMENTARY

Stephen P. Keider

Avoiding failure

Major systems development projects fail for many reasons. Usually, the reasons provided are technical in nature and rarely reflect upon the management of the project. None of them by themselves are fatal, and each appears, to some degree, in virtually every firm.

Most of the flaws can be corrected through education or counseling. Some cannot, however, and those must be accounted for in the execution of the project.

A fundamental premise, of course, is that a successful project begins with a proposed solution that will, when implemented, provide competitive advantage to the end user. That is, it will result in improved service, greater competitiveness, less cost, more revenue and higher earnings per share.

Assuming that the final application passes this fundamental test, then failure is usually caused by a lack of applying sound management principles to the execution of the project.

These principles can be generally classified into creating the proper culture, providing leadership, planning, organizing properly, , execution, reporting and control.

Hopefully, no major project will experience all of the frustrations outlined in the checklist below. However, if the majority surface in *your* project, it will, indeed, fail.

Culture of the corporation
- A severe penalty for failure exists within the corporation.
- Unrealistic expectations are made by both the user and executive management.
- The project is not supported by adequate resources, whether staff, budget or tools.
- Poor work practices exist.
- Corporate critics attack the project at every opportunity.
- Rivalries exist within the organizations that are attacking the same problem from different viewpoints.
- Overemphasis on "how" vs. "what."
- Implementation of a project that changes the way a company operates.
- Unclear policies.
- The "not invented here" syndrome.
- Project objectives conflict with corporate strategy.
- Hidden agendas.

Leadership
- Inability of project management to motivate staff during stress points of project.
- Lack of executive commitment to the project.
- No sponsor within the executive ranks for the project.

Planning
- An unclear link between the project and the company strategy.
- Inability of the project manager to think abstractly.
- Lack of or incomplete project plan.
- Lack of a clear, definable schedule and milestones.
- Arbitrary scheduling.
- Tasks identified are too long in duration.
- Tasks identified are too short in duration.
- Review times are not included in schedule.
- Lack of a project work breakdown.
- Poor selection of systems platform.
- Lack of estimating standards.
- Lack of development standards.
- Requirement to integrate new project with older systems.

Organization
- No full-time project manager.
- A full-time project manager on his first project.
- Incompetent project manager.
- Use of "worker managers" in key positions.
- Use of "acting managers" in key positions.
- No project administration function.
- A project manager who misunderstands his authority.
- Project not staffed as planned.
- Unclear lines of authority.
- Use of junior personnel in critical areas.
- Attempting to simultaneously provide job fulfillment and achieve superb productivity.
- Lack of delegation.

Execution
- Building development tools concurrent with application development.
- Ignoring reusable code/libraries.
- Treating development as an art, as opposed to a science.
- Drive to "deliver something quickly."
- Moving from global design to development too quickly.
- Providing too many functions in initial release.
- Requirement that the system operate on multiple platforms.
- Different vocabulary between the user and technical staff.
- Myopia regarding availability of resources.
- No prototype or pilot.
- Continual refinement of the system.

Reporting
- No executive reviews of the project.
- Inability to write status reports or to read/interpret a status report.
- Activity-oriented status reports.
- Too much detail in reports, leading to false sense of security.
- Inadequate questioning/challenging.
- Project manager who doesn't know how to run a meeting.
- Too many/few review meetings.
- Lack of a system to track project progress.
- Lack of common sense to balance against reporting.

Control
- No change control or project control mechanism.
- No reaction to major changes in scope, staffing or resources.
- Lack of courage to make difficult decisions.
- Applying solutions before problem is defined.
- Sticking with a project manager who is not doing the job, because the alternatives seem worse.

If it's broke, *fix it now.*

Keider is an independent management consultant and a principal at Keider Associates in Amherst, N.Y.

Jones Day

FROM PAGE 57

but it's disappearing," says Marjorie Pendleton, director of information systems services. "Only a handful of lawyers are left that don't have direct access."

Jones Day made it a point not to force computers on its attorneys, preferring to sit back and let the system speak for itself. Soon, without access to electronic mail and other system features, "the lawyers decided they were missing out on something and were not being as efficient as they could be," Steinbrink says.

The level of automation at Jones Day may also help attract fresh lawyer recruits. "The feedback from the recuiting people is that it has been a distinct advantage" for luring bright new talent, Pendleton says.

However, from a client's perspective, all this automation may not be such a good thing, particularly when sensitive data is involved. Clients have applied "pressure to take extreme steps to ensure security," says Pendleton, who has implemented a combination of store-bought and homegrown security packages on Jones Day's international network.

Although some less sophisticated clients express concern about confidentiality, Steinbrink notes that clients "generally appreciate the way their information is handled."

An X.25 wide-area network links host Wang Laboratories, Inc. VS 10000 minicomputers in Cleveland with smaller Wang minis and about 2,700 IBM-compatible, Intel Corp. 80386SX-based personal computers firmwide.

Attorneys and support personnel use the system to access client databases, litigation histories, word processing documents and electronic mail from any office location.

Over here to over there

Besides bringing the firm's far-flung resources together in the U.S., the network is also a pipeline to Jones Day's overseas operations. "The system allows us to integrate those locations more completely in the firm as a whole; the London office is not out there by itself," Steinbrink says, adding that Jones Day is striving to be ahead of the pack in Europe when restrictions fall in 1992.

The foreign offices have posed surprisingly few problems for Jones Day's IS group. "We haven't found any obstacles that couldn't be overcome," Pendleton says. "We replicate there what's available in every other Jones Day office."

The only location that could not accept the X.25 network standard was Saudi Arabia, where dial-up technology was substituted.

While aggressively expanding its operation in Europe, Jones Day is not allowing its automation docket to stagnate.

The IS group is looking at ways to enhance PC sharing, database handling and the employment of imaging technologies. It is also piloting a specially secured token-ring system that gives dial-in access to portable computers.

Though demand among lawyers for portable computing has grown in the last 12 months at Jones Day, the law profession has not embraced the technology to the high degree of other mobile professions such as accounting.

"The theory is that while working on negotiations at a client site, a lawyer can make changes on the portable and produce a document the next day," Steinbrink says. "But we're not seeing that happen. There is not quite the need for overnight turnaround."

Jones Day's systems have also led to a more intangible benefit: harmony. Because the disparate offices are linked to a shared knowledge base, they are not forced to compete with each other in expertise, Steinbrink notes. "There is a better atmosphere in which to work together. We don't compete, and we feel better about ourselves."

CALENDAR

NOV. 25 - DEC. 1

Conference on Software Maintenance. San Diego, Nov. 26-29 — Contact: Michelle Carbone, IEEE Computer Society, Washington, D.C. (202) 371-1013.

Video Expo. Orlando, Fla., Nov. 28-30 — Contact: Debbie Rotolo, Knowledge Industry Publications, White Plains, N.Y. (914) 328-9157.

Technology Management Forum, Client Serving Computing: The Impact. Cambridge, Mass., Nov. 27-28 — Contact: Forrester Research, Inc., Cambridge, Mass. (617) 497-7090.

Cause '90: Challenges and Opportunities of Information Technology in the '90s. Miami Beach, Fla., Nov. 27-30 — Contact: Cause, Boulder, Colo. (303) 449-4430.

OSI 111: The Interoperability Advantage. Arlington, Va., Nov. 27-30 — Contact: Phillips Publishing, Potomac, Md. (301) 340-2100.

Omni User Annual Technical Conference. Itasca, Ill., Nov. 28 — Contact: The Omni User Association, Chicago, Ill. (312) 470-8787.

Microsoft Multimedia Developers Conference. San Jose, Calif., Nov. 28-29 — Contact: Microsoft Corp., Redmond, Wash. (800) 628-1701.

Global Advanced Manufacturing Solutions. Paris, Nov. 28-30 — Contact: Sharon Sutton, National Computer Graphics Association, Fairfax, Va. (703) 698-9600, ext. 336.

Software Improvement Conference. Washington, D.C., Nov. 29-30 — Contact: EFDPMA, Torrance, Calif. (213) 534-3922.

X Window System Forum. Washington, D.C., Nov. 29-30 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

DEC. 3 - DEC. 8

Executive Information Systems '90. Washington, D.C., Dec. 2-4 — Contact: Peggy Kilburn, The EIS Institute, Newton, Mass. (617) 965-8366.

The Dooley Group Executive Conference. Tempe, Ariz., Dec. 2-5 — Contact: The Dooley Group, Hopkins, Minn. (612) 935-8022.

Globecom '90. San Diego, Dec. 2-5 — Contact: Nomi Feldman, San Diego, Calif. (619) 453-6222.

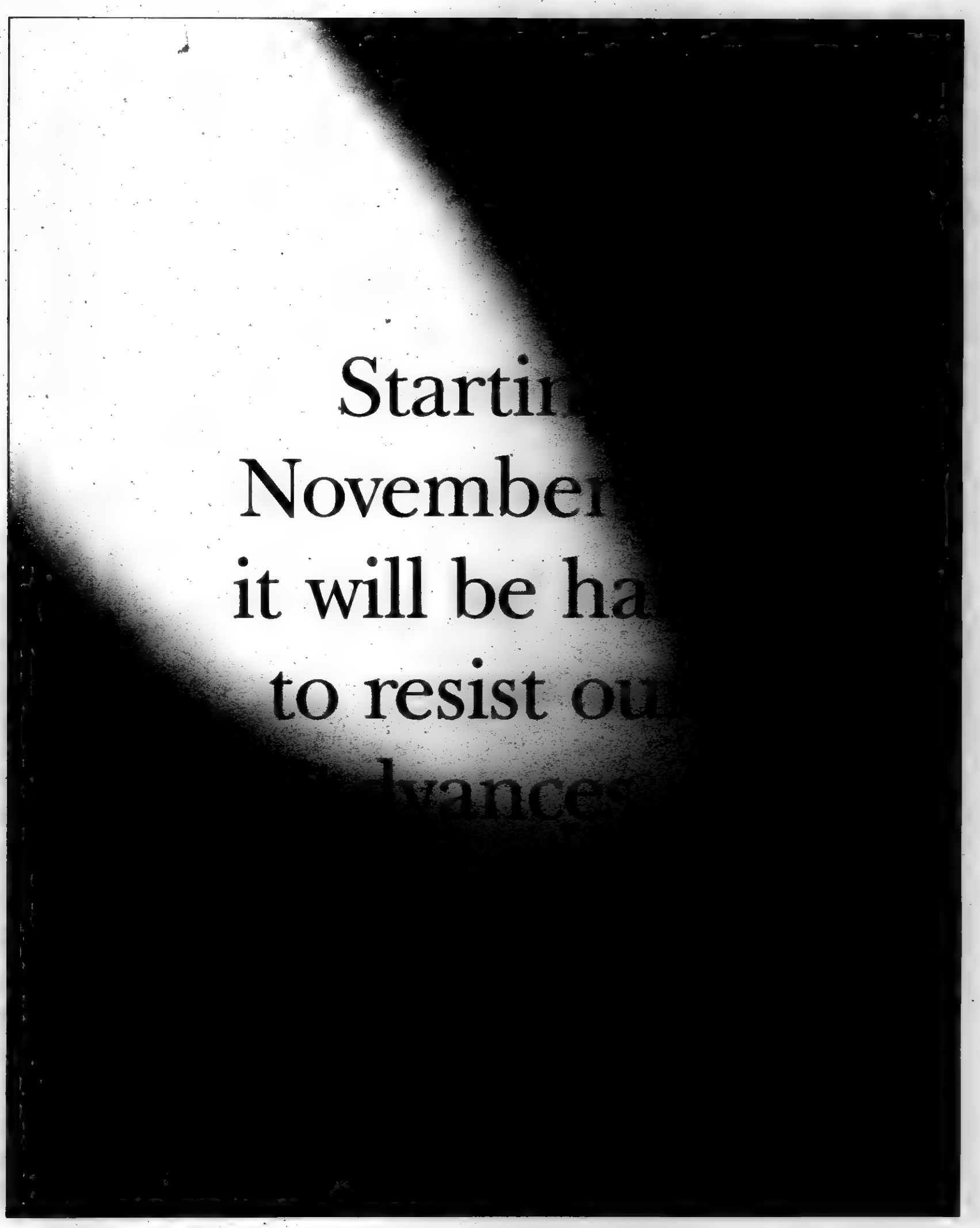
The New Tools: Computer Graphics for Design/Fall '90. New York, Dec. 2-5 — Contact: The Center for Computer Graphics for Design, Briarcliff Manor, N.Y. (914) 741-2850.

IBM Token-Ring & 3Mb: Gateways, Bridges and Network Management. San Francisco, Dec. 3-5 — Contact: Ann Kiddlock, Kaptronic, Haworth, N.J. (201) 709-4250.

Strategic Issues Conference. Cambridge, Mass., Dec. 3-5 — Contact: Conference Registration Office, Boston, Mass. (800) 843-3263.

Automatic Object Recognition Systems. Los Angeles, Dec. 3-7 — Contact: UCLA Extension, Los Angeles, Calif. (213) 825-1901.

IBM 3S Management Conference. Orlando, Fla., Dec. 3-7 — Contact: Gene Bruckowski, IBM, Chicago, Ill. (312) 245-2121.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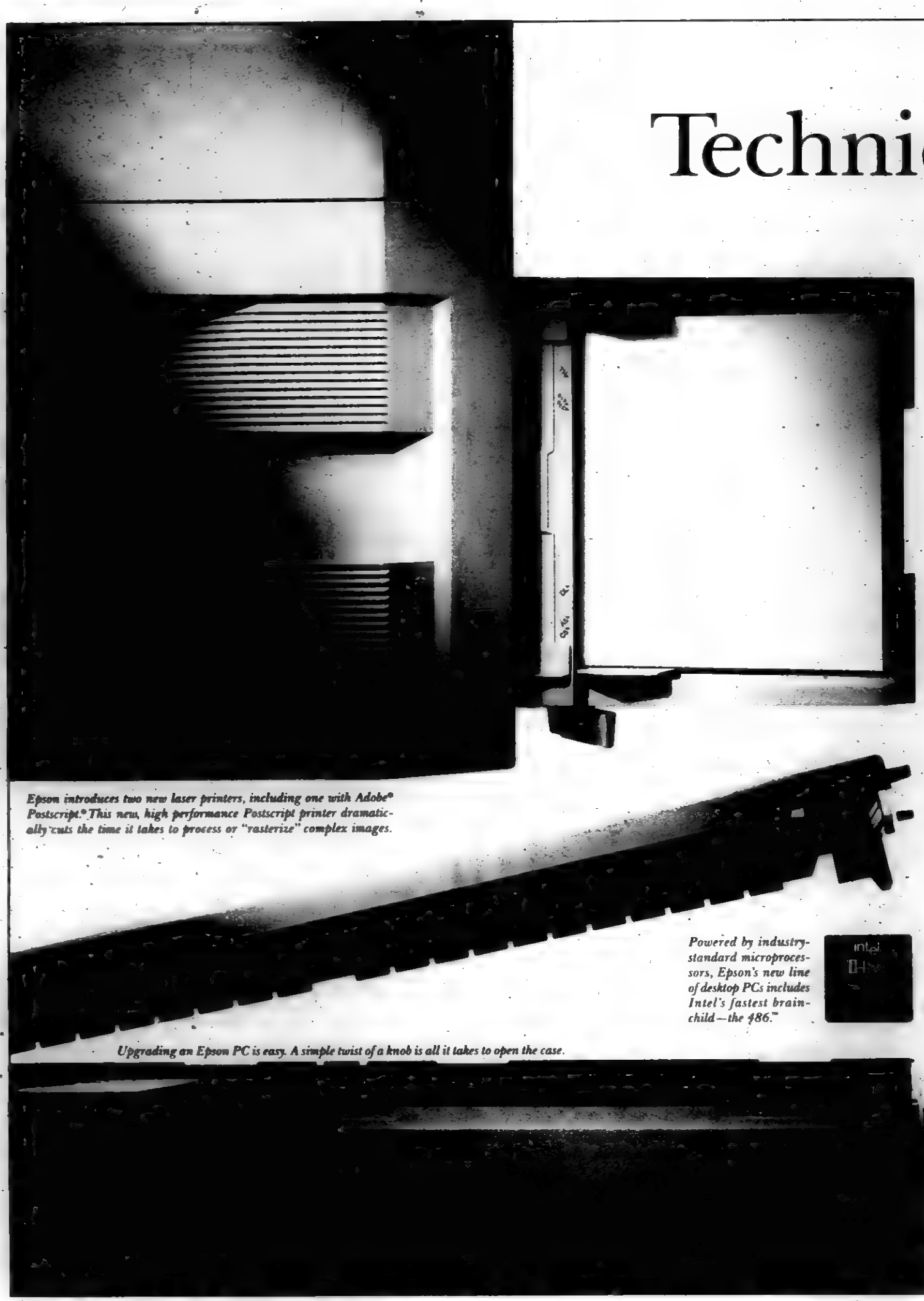

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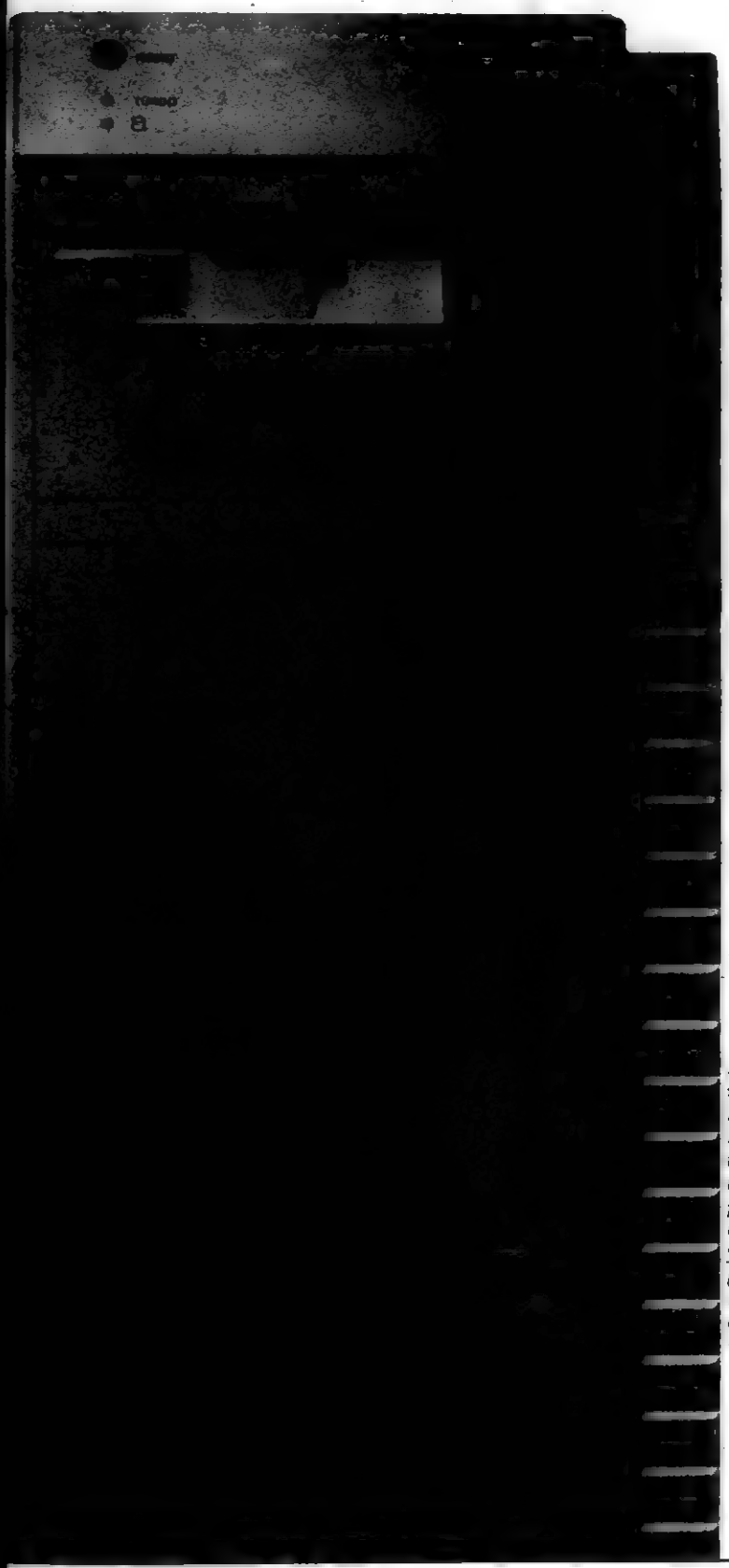

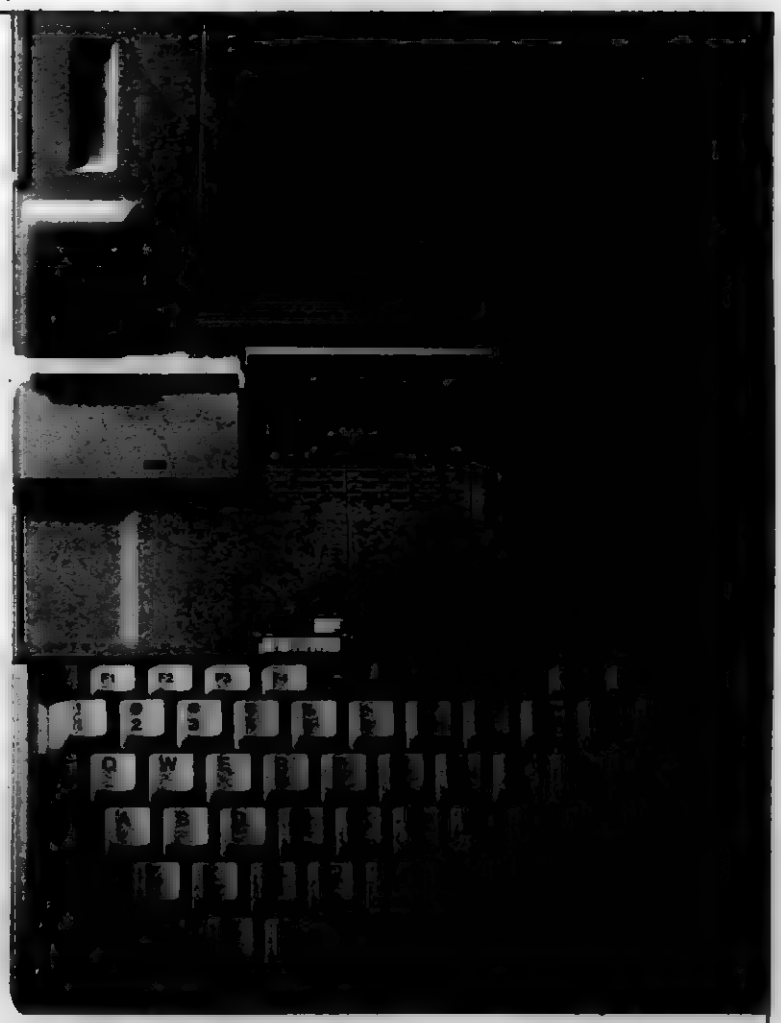

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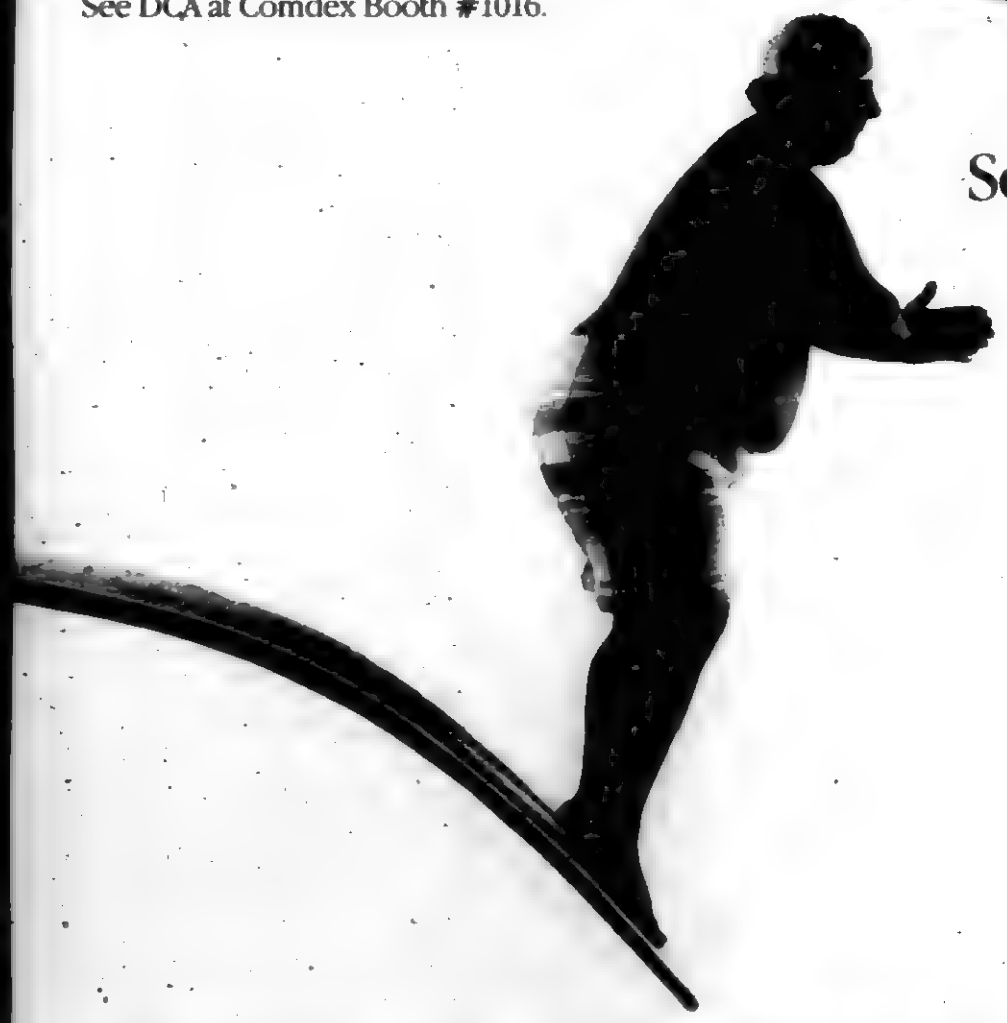

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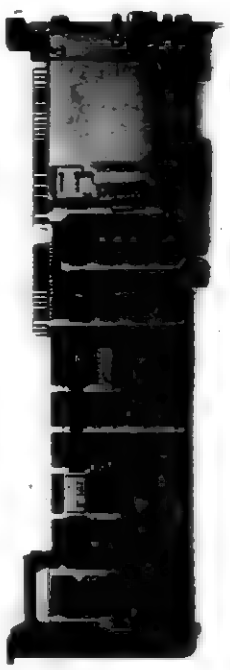

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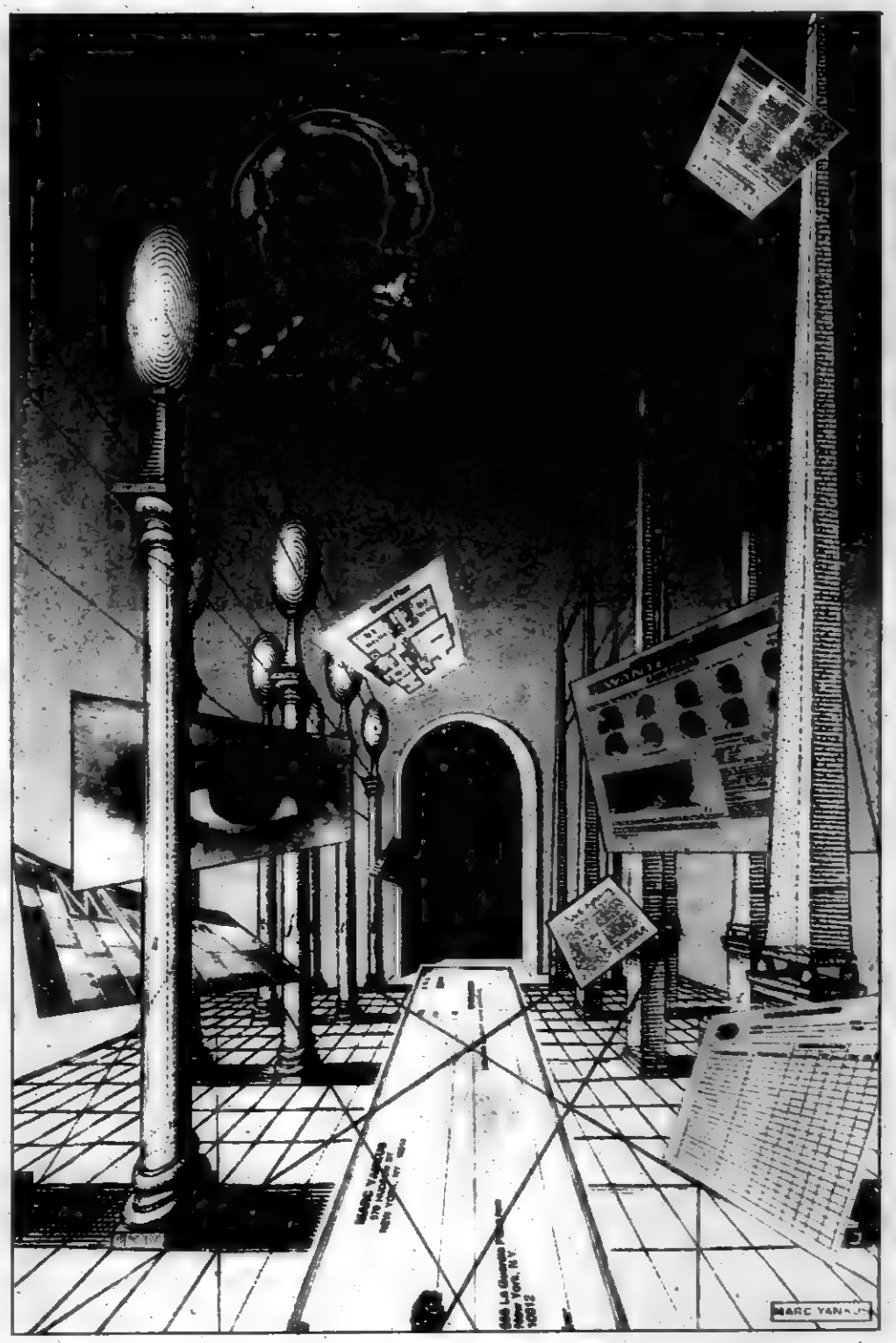

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WHAT IT'S ALL ABOUT

Not as new and strange as it seems

by ELLIS BOOKER

Listening to the rising volume of excited voices discussing imaging systems and picking up rag-tag snatches of conversations peppered with unfamiliar technical terms, it is easy to assume that imaging is a brand-new phenomenon that sprang, somehow, full-blown into the middle of the information systems landscape. That conclusion is easy to reach, but it is mostly wrong.

There are some new areas that fit under the umbrella term "imaging," such as machine vision and medical image creation for diagnostic purposes. There are also some exciting new technological developments, relating primarily to electronic publishing, that are referred to as imaging systems. Xerox's new Docutech Series is the most talked-about example.

"Imaging changes the way you do business because you stop moving paper and start moving data."

Dexter Holt
Federal Reserve Bank

Most of the discussion and activity, however, centers on something quite different from any of the above. What most people mean when they talk about imaging is electronic document processing, which is not so much a new area as it is a long-standing one that has been rejuvenated by a wave of technical developments. Scanning paper documents and then retrieving them onto a computer screen is by no means new technology. Specialized image storage-and-retrieval applications have been sold for more than 15 years.

So why all the excitement now?

There are a number of reasons. Within the past two or three years, several important changes have occurred that have turned this slumbering technology into a hot phenomenon.

One is that both the price and performance of such component parts as scanners, optical storage systems and the personal computers used to access image databases have started to improve.

Another is the that major computer manufacturers have now endorsed the concept and are entering the imaging game.

Apart from helping to legitimize the technology, the entry of these vendors has provided users with a greater choice of interfaces for linking image applications to their existing data processing operations.

Significantly, many of these vendors are beginning to incorporate imaging into their enterprisewide computing architectures. This September, for example, IBM announced a Systems Application Architecture-compliant version of its Imageplus product family.

Finally, the excitement about imaging has been fueled by an increasing number of success stories (see story page 81).

Although the numbers are not overwhelming, there are many organizations that have taken the plunge, and quite a few of the reports they are sending back are very positive. It is not uncommon to hear about increases in transaction volume as high as 30% (with no change in the number of workers) reductions in processing time of up to 50% or a savings in space of even more than that amount.

To understand why some companies — between 1,200 and 1,300 of them, according to market research firm International Data Corp. in Framingham, Mass. — are investing heavily in the technology, contrast the notion that we're living in the "Information Age" with the facts: Only a minute amount — perhaps as little as 2% — of all the "information" handled by companies today exists in digital, computer-manageable forms. The vast untouched remainder — letters, documents, drawings, contracts, shipping information, photos and more — continues to pile up on desks, only to be carted away by the truckload to rows of filing cabinets and micrographics departments.

Marc Yankus

Imaging technology holds the promise of changing all that.

As Dexter Holt, program manager of check image processing system development at the Federal Reserve Bank in Boston, puts it, "Imaging really changes the way you do business, because you stop moving paper the way you've done in the past, and you start moving data."

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Conversational imagespeak

Attribute data Textual data relating to themes or types of information.

Bilayer A recording structure for disks containing two layers.

Bitmap A way of encoding a digital image using one bit per pixel.

Bitonal An image in which the picture elements have only two intensity values, 1 or 0, which usually stand for black and white.

Boolean capabilities A feature of document indexing software that permits the logical coordination of two or more index search specifications.

Browsing A system's ability to find an undefined feature or set of features in a database.

Bubble In optical memory, formations created by a laser in an optical recording medium.

Computer-assisted retrieval Allows index information on stored documents to be held in a database. Software can then be used to search for and retrieve the information.

Compact disc A read-only optical disc available in formats for audio, data and other information.

Compact disc/read-only memory A compact disc used only for storage of digital data, usually relatively unchanging data and/or images.

CD-V The compact disc format that combines analog full-motion video images with digital audio.

Compression The process of reducing the number of bytes required for digitized image storage and transmission through elimination of unused white space.

Data density The ratio of text and graphics to white space on a document. The data density determines the amount of optical storage space required.

De-skewing The adjustment made to an image to make up for physical distortions inherent in the system or the adjustment made to an image to compensate for justification errors in scanning.

Digitize The process of representing images as a matrix of binary code, with 0 representing white space and 1 representing nonwhite space.

Document Storage Processor (DSP) A computer consisting of a processor that manages the storage devices of an electronic imaging system. All database transactions are managed by the DSP.

Erasable optical disc A type of read/write optical disc that permits deletion of information

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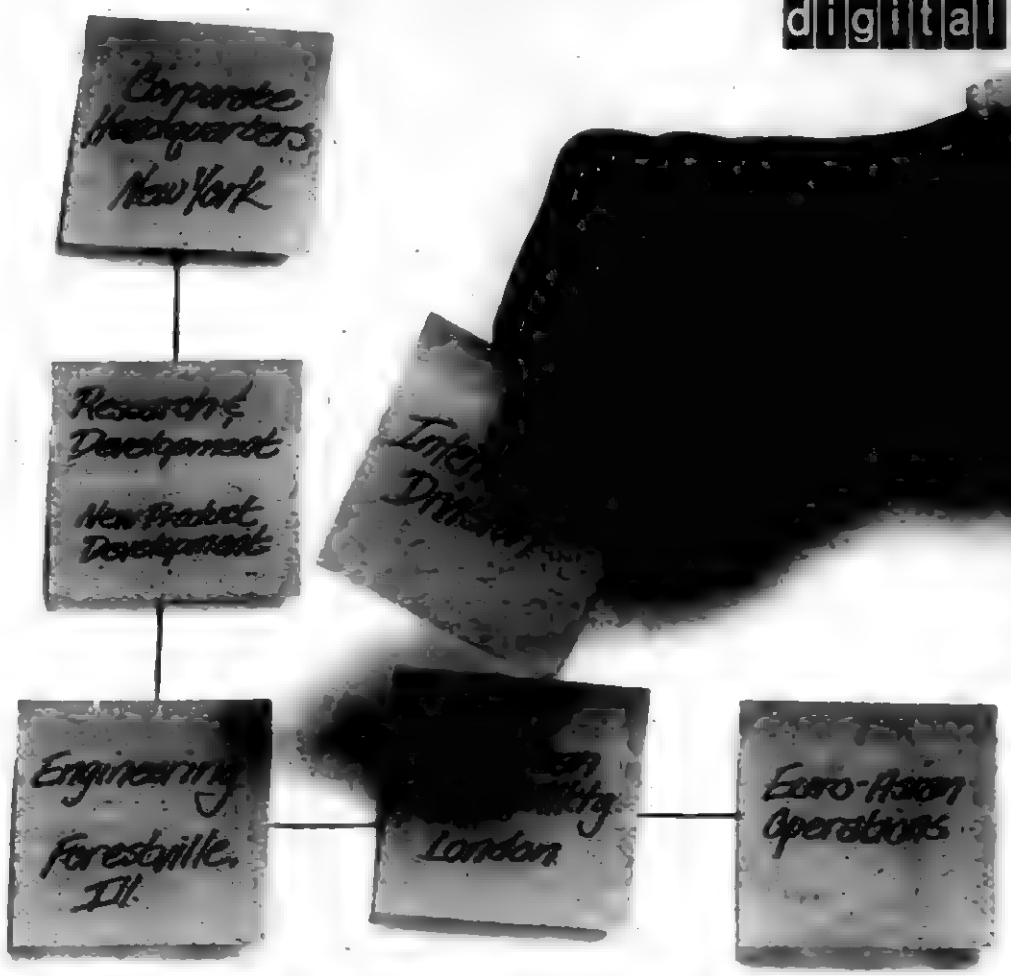

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This journey requires special system wardrobe

by THORNTON MAY

Henry David Thoreau counseled his contemporaries to "beware of any enterprises requiring new clothes." Given that advice, it's safe to assume that the Sage of Concord would have been very wary of imaging, because this is an enterprise that requires a totally new wardrobe.

Imaging is not one technology but a collection of different technologies — each at different stages of evolution. The components of an imaging system typically include input devices, storage devices, display devices, output devices, application/work-flow software and communications networks.

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Input devices

There are a number of possible entry routes to an imaging system. Scanning is one. Others include optical character recognition (OCR), neural OCR, keyboard, facsimile and output from computer systems, such as electronic data interchange. The optically based input devices and the pattern recognition modules that support indexing/intelligence capture are new to most organizations. That being the case, it is difficult to leverage the purchase of new optical technology with the existing ASCII-based components.

• **Optical scanners.** The most common input device for imaging systems, an optical scanner produces a digitized copy of documents fed through it. Scanners look and function like paper copiers and have very similar market profiles — a few very large domestic suppliers and a plethora of aggressive manufacturers located in the Pacific Basin.

These devices range from small, hand-fed units, which are little more than desktop toys, to industrial-strength, industrial-size information factories. Models are available in a variety of speeds and resolutions. Scanners exist that handle different quality images, from black and white to gray scale and half tones (newspaper quality images) to color and high-quality photographs.

Scanners also come in a range that can accommodate documents of virtually any size, including engineering drawings. Document throughput speeds range from a few pages per minute to over 100 pages per minute.

Duplex scanners can scan information on both sides of documents.

Scanners typically operate at 200, 300 and 400 dot/in., with resolution dependent upon the application. Most document management/work-flow applications can be successfully scanned at 200 dot/in. Applications using OCR require higher resolution scanning in order to recognize characters with fewer rejections and fewer errors.

• **OCR devices.** Historically, data entry operators using keyboards captured the intelligence contained in any given document. An alternative to totally manual capture and distribution is the OCR device.

OCR refers to any technology that uses optical means to translate a character-based symbol into ASCII. The bar code on food products is a fairly rudimentary example.

OCR is believed by many to have reached a price/performance threshold that makes it a cost-effective option for some, although certainly not all, commercial applications. Kevin Sharp, technical editor at *ID Systems*, suggests that OCR is economically viable for any organization receiving more than 100 pages of unencoded text per day.

For the most part, however, organizations currently use OCR to front-end their imaging systems only if they have a high degree of control over the quality of the input document.

Most OCR systems today can recognize specially constructed fonts, such as those at the bottom of checks or credit cards designed for ease of recognition, as well as single or multiple fonts on the same document.

The major stumbling block to fully automated data entry is hand-print recognition.

It is important to realize that achieving the 60% to 70% reductions in data entry expenses that are possible with OCR requires partnerships with both the business forms provider and the OCR vendor. Some systems achieve their high rates of efficiencies by employing more than one recognition engine — one for limited hand-print recognition and another for machine-printed information.

• **Neural Optical Character Recognition (NOCR).** This technology, which is a step beyond conventional OCR, holds promise as an eventual solution to OCR's comprehension limits. NOCR uses neural networks' ability to handle contradictory and imprecise data to permit optical reading of handwritten notes with broken figures, variable height and spacing and letters that touch or overlap.

In theory, NOCR is able to recognize patterns of symbols as opposed to individual symbols. In a test environment, NOCR page readers can recognize and process hand-printed characters at a rate of four char./sec. An average keypunch operator can process three to four char./sec.

An array of high-tech (and high priced) boutique vendors operate in the rarified air of the neural net imaging niche. Hecht-Nielsen Neurocomputers recently announced the first commercially available neural network compound document management system. In addition, several financial services firms and at least one government entity have spent significant research and development dollars perfecting NOCR. At this stage, however,

Imagespeak

Continued from page 67

and the reuse of previously recorded disc areas.

Facsimile server A device that supports datafax input and output to a computer system.

Half tone An image that creates the illusion of continuous tone on a bitonal display.

The Initial Graphics Exchange Specification A standard format used for transferring computer-aided design database files between systems manufactured by different companies.

Image board A hardware performance accelerator that, when added to a workstation, supports the rapid compression, decompression and manipulation of images.

Image packet A block of compressed data prepared for transmission.

Journal drive An optical disc drive that records all document database storage transactions, including image and attribute data.

Jukebox An automatic storage, selection and retrieval device that provides rapid, on-line access to multiple optical discs.

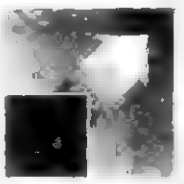
Magnetic disk cache A directory on magnetic disk in the DSP that provides storage for and quick access to frequently used documents.

Magnetic ink character recognition A typeface developed so that information printed on items such as checks can be automatically read and encoded.

Micrographics The technology of capturing, storing and retrieving images on microfilm-based storage media.

Mixed-object document content architecture IBM's strategy for a document architecture.

North American Presentation Level Protocol Syntax A standard for graphical communications that provides a method of creating pictures and compressing them into a relatively short block of digital data for storage or transmission over low-bandwidth channels.



Optical character recognition A scanning technique by which characters printed in a standard typeface can be automatically read and converted to ASCII representation for computer storage.

Office Document Architecture/Office Document Interchange Format An International Standards Organization standard to allow the interchange of documents containing text, image and graphics among systems supplied by different manufacturers.

Optical disc A platter-shaped disc coated with optical recording material on which information is read and written using a light — usually a laser.

Optical disc storage and retrieval A mechanical device that manages multiple write-once read-many discs.

Optical Memory Disc Recorder A device used to write information to an optical disc.

Optical tape Reels, cartridges or cassettes of film used for data storage, coated with an optical recording material.

Pixel Short for "picture element" — the smallest resolvable basic element in a digital image.

Prefetching The process of building a queue of images for subsequent processing.

Reduction rate The degree to which a document is compressed and the associated space savings in memory.

Run-length encoding The transmission of numbers describing the lengths of white and black regions of an image rather than sending each black or white pixel separately. The basis for most of the data compression methods used in digital image representations.

Scaling A technique that enables reduction or enlargement of an image by combining pixels.

Scanner An image input device that interprets the reflected light from a physical image and translates it into a stream of pixels, digitized raster data or a stream of bits.

Write-once read-many A form of optical storage in which information can be recorded once and read many times, but not erased. •

This glossary draws on definitions supplied by Unisys Corp., Wang Laboratories, Inc. and market research firm Ovum Ltd.

the use of neural networks in conjunction with imaging systems still remains the exception rather than the rule.

• **Electronic Data Interchange (EDI).** Probably the ultimate way to reduce data entry costs is to eliminate the paper and its associated scanning costs. One way is through EDI between vendor and supplier.

Storage devices

A variety of storage devices, such as optical discs, optical jukeboxes and magnetic disks, can be used alone or in combination.

• **Magnetic disks.** Although magnetic disks can be used to store the digitized images, the images are so large and take up so much space that most organizations find this option unsuitable for high-volume or long-term applications. Typically, a more practical use for magnetic disks in an imaging system is as a staging area where images can be kept before commitment to optical media.

• **Optical disc.** An optical disc is a write-once read-many device available in 5¼-in. or 12-in. sizes. A single 12-in. disc can store as many as 40,000 8½- by 11-in. pages, while a 5¼-in. disc can store about 8,000 pages. Disc density is improving, and in the future discs will be able to store more data. Optical disc media has a guaranteed life that varies from 10 to 100 years, depending on the manufacturer.

• **Optical jukebox.** An optical jukebox is a mass storage device for optical discs. A jukebox contains several disc drives with up to several hundred discs per drive. Robotics is used to physically load and unload optical discs into read/write drives. Because access time is limited by the speed of the arm, it may take several seconds to retrieve an image from a jukebox.

Display devices

For most image applications, a monitor with 100 dot/in. resolution is sufficient. Monitors with 200 dot/in. are required, however, to display legal documents or insurance claim forms. The increased resolution makes signature verification easier and enhances reading of large documents that have been reduced to fit the screen.

Landscape monitors can display two documents side by side for comparison or show both sides of a two-sided document simultaneously. Image manipulation capabilities at the workstation typically include the ability to scroll, rotate, exchange and invert.

Organizations making decisions on the size and scope of their initial imaging application wrestle with the question of what type of desktop device is appropriate. Image-enabled workstations need capabilities that many traditional personal computer configurations do not, such as larger screens for reading text, image board drivers to drive images and higher communication speeds to get images to and from the workstation. The memory requirements associated with storing and manipulating images are significant.

For departmental solutions requiring only one or two viewing stations, the expense associated with workstations that include all the imaging bells and whistles is tolerable. Extend that cost to 30,000 users, however, and you get a very different response from senior management.

Application software

Application software performs functions such as indexing, storage management, document distribution and work flow

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Sizes and prices may vary

The diagrams on the right, representing possible imaging system configurations and their representative costs, were constructed for Computerworld *by Michael Connor, senior consultant at KPMG Peat Marwick/Nolan Norton & Co., in order to give potential buyers insight into the range of available alternatives. Below, Connor explains the methods that he employed to create these composite purchase scenarios. — EDITOR*

Just as no real family consists of 2.2 children and 0.75 pets, the configurations outlined in this section do not represent real solutions to specific needs. Their purpose is to provide a framework for understanding options and associated costs.

The vendors that consented to provide book-rate prices for these generic configurations represent a sampling; not an inclusive survey of imaging vendors. Some vendors decided not to participate, even though they were given the opportunity. Thanks are due to Digital Equipment Corp., Filenet Corp., Hewlett-Packard Co. and Wang Laboratories, Inc. for their input.

Real-world issues

In the real world, four major considerations determine the sizing of imaging systems:

1) The number of on-line users.

2) The volume of on-line documents.

3) The size and complexity of applications and work flow.

4) The extent and complexity of communications.

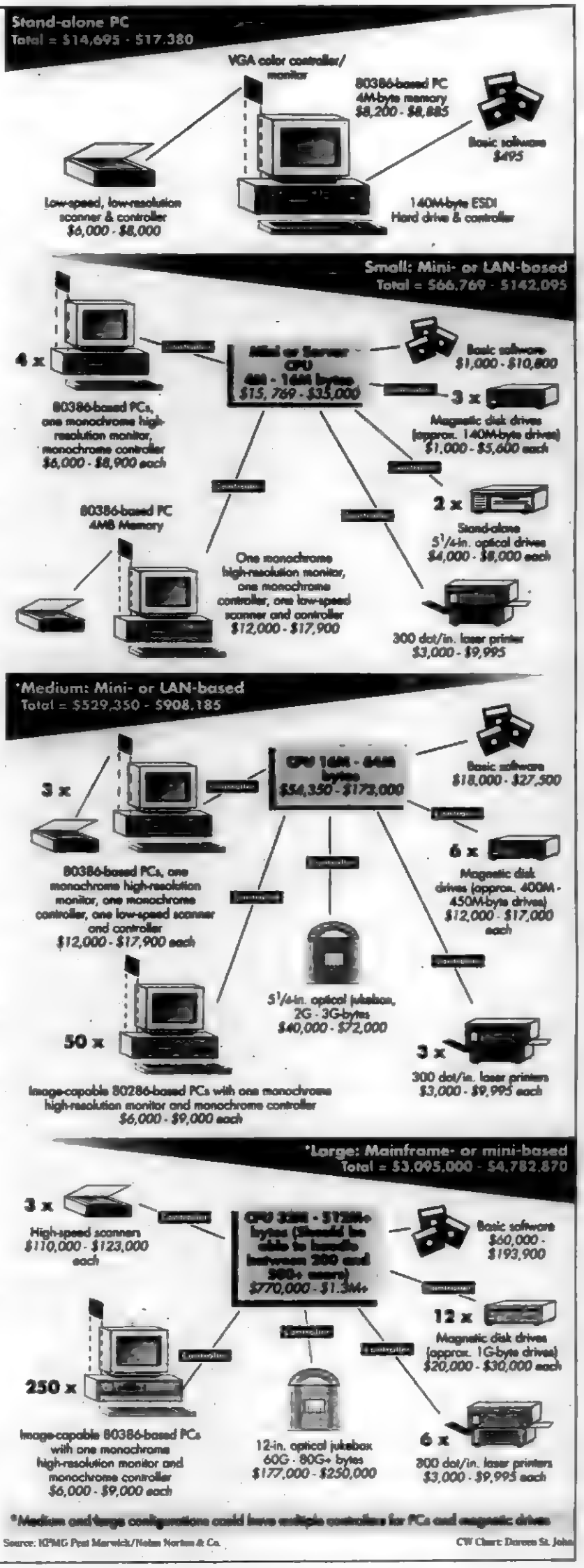
Working on a theoretical level to construct basic configuration scenarios, it is necessary to assume some things and omit or ignore others. We assume, for example, that a relationship exists between the number of users and number of on-line documents and that transaction activity is directly proportional to the number of users. We also assume that, for all configurations, some kind of optical disc storage is necessary.

Component peripheral use, such as scanner rates, are based on a packaged approach, rather than a systems integration approach.

Even though the vast majority of imaging installations involve customization for a given application, these configurations are based on average, rather than specialized, requirements.

All prices are quoted straight from vendor lists and include no discounting or negotiated pricing. Furthermore, prices for necessary pieces such as maintenance, support services and supporting software — such as databases — are not included because of the individuality of the solutions.

For the same reason, communications equipment, an extremely important consideration for any purchaser, is omitted from these pictures. •



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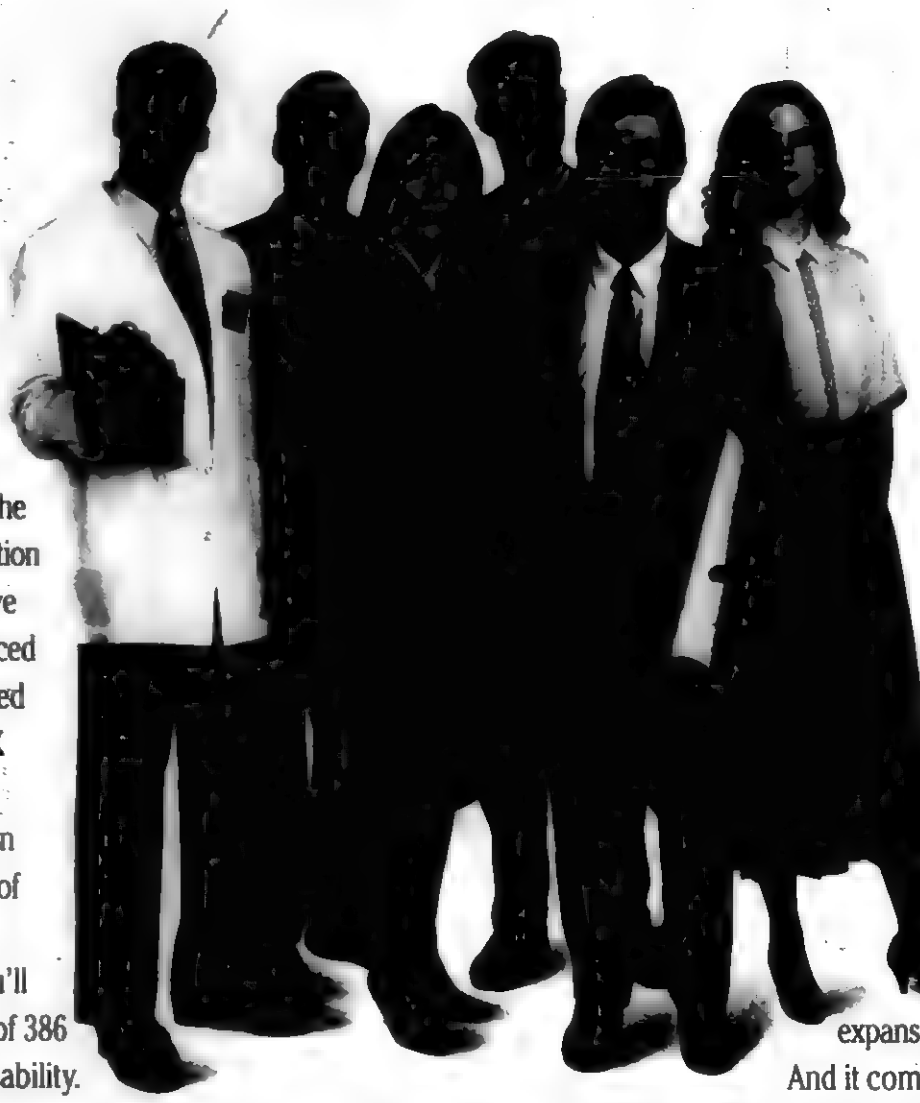

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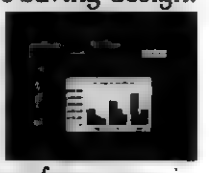

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Wardrobe

Continued from page 71

management. Database management software tracks document indexes.

One of the greatest promises offered by imaging is the ability to find the information you need when you need it. The ability to do so is a function of the flexibility and execution of indexing procedures. You have never lost something until you have lost it on an optical disc.

Once misfiled, that particular document/image will probably never be retrieved. The ability to create indexes that operate in a fashion similar to the way people work has become a critical skill.

Work-flow management software assigns work to users based on processing requirements and priorities established by supervisors and managers.

Besides controlling the movement and processing of image documents, work-flow management software automates tasks such as productivity measurement, report generation and work-load balancing.

Software replaces the sorting, distribution and routing of paper information and provides the administrative procedures and controls at each step of the process. It is used to set up work queues, or In baskets, so the operator handles requests according to an established order. In a well-designed work flow, the system also brings together all of the information the operator will require to process the transaction.

That the skill set required to build imaging applications is different is borne out by the fact that many of the major financial institutions working with imaging technology have changed their systems development life cycle. Not only is imaging development different, but it is also scarce.

Couple that with the dearth of packaged applications, and many companies have had no choice but to create their own customized software.

Communications

The size of images and the transmission of a large number of information packets can overwhelm most mainframe and minicomputer host-terminal networks. Imaging's bandwidth requirements can be shocking. Therefore, telecommunications managers are searching for ways to cost-effectively distribute images. (No, this is not an oxymoron.)

Investing in additional capacity is one possibility. Although this sounds extravagant, the backbone telecommunications infrastructure investment will pay for itself as more users are added to the system. The more users there are, the more the cost of the project can be spread out.

Deploying the right kind of telecommunications infrastructure can make the difference between a business environment populated by stand-alone imaging systems and one in which images are managed to maximum advantage.

For example, one large insurance company with six divisions had a $100 million total investment in telecommunications. When imaging was brought into one division, the increased telecommunications bandwidth requirements equaled the bandwidth requirements for the entire company's other information systems applications combined. The additional cost was $100 million. However, that investment was the proper infrastructure to allow all of the company's other divisions to bring in imaging.

Creative justification

Recognizing that corporate budgets often preclude organizations going out and buying all the bandwidth they need, there is still a variety of things companies can do on the application side that will rationalize bandwidth consumption. These include use of data compression techniques and organization of the storage communications architecture and design.

With the prospect of nationwide fiber networks, it becomes more reasonable to look to a future when firms might be able to cost-justify routine nationwide transfer of images. Given the current economics of transmission, however, companies are well advised to keep the image close to its initial entry point into the system.

Assembling the components of an imaging system is a time-consuming and expensive task. Conservative estimates are that worldwide expenditures for just the systems integration component of imaging will amount to $1.5 billion in 1992.

The constraining variables for seamless interfaces between the imaging workstation, image storage platform and database platform include the bandwidth and the quality of software and routing mechanisms for delivery and indexing of images. Once the restraints are overcome, the systems are as easy to use as a personal computer-to-mainframe linkup.

One reason the tab for integration assistance is so high is that most technology vendors are unable to deliver shrink-wrapped, turnkey imaging systems. Another is that there is no one to copy.

State of the art exists in the user environment, not in the vendor lab, and certainly not in the vendor's support literature. When it comes to imaging technology, installation managers have to discover their own realities on the basis of empirical experimentation.

Although there are hard decisions associated with a move into imaging, many organizations are finding (after an awkward initial cycle of alterations) that the new wardrobe required by imaging technology fits quite nicely. ●

May is director of imaging research at the Nolan Norton Institute, a research branch of IS consultancy Nolan, Norton & Co. in Lexington, Mass.

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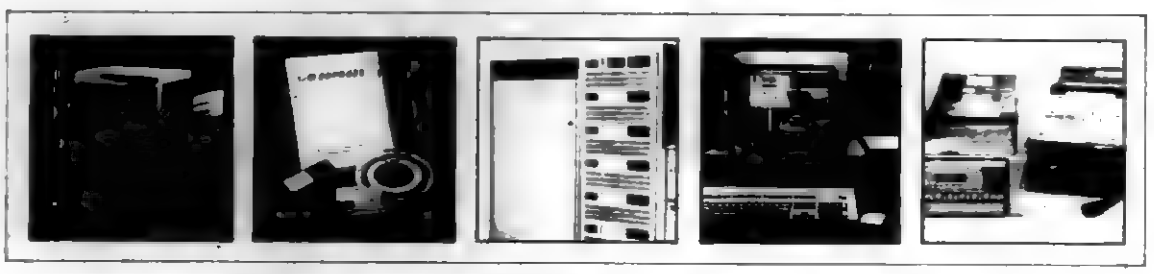

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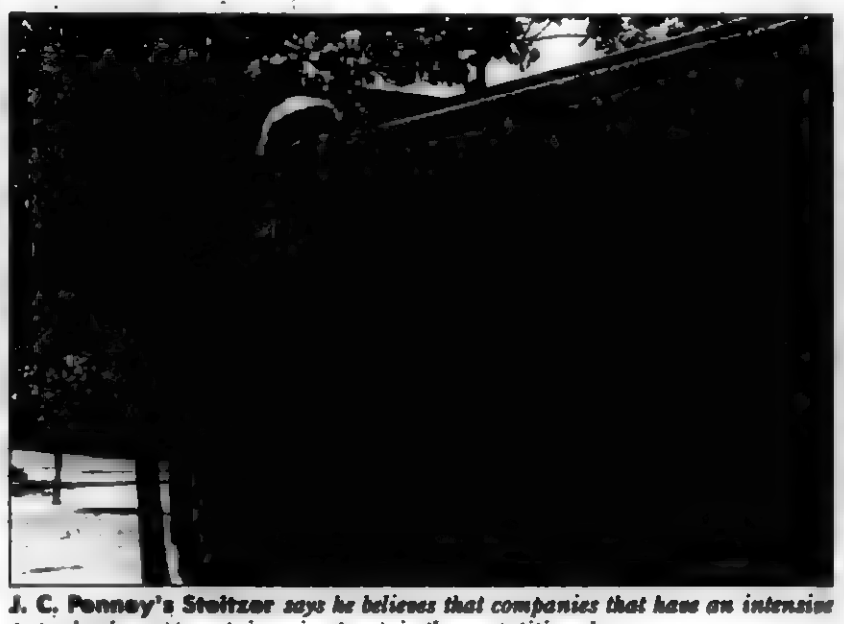


J. C. Penney's Steitzer *says he believes that companies that have an intensive paper load must turn to imaging to retain the competitive edge*

Not as new

Continued from page 67

Companies that have successfully implemented a document image management system return to this point often: They have found a way at last to bring the power and controls of classical data processing to paper processes and in so doing have had the opportunity to rethink the way those processes work and who is needed to do them.

If this is imaging's greatest potential benefit, it is also universally thought to be its most difficult aspect. It turns out that companies where the imaging system works best — in which the "pilot" program has not stalled for a lack of cost-justification data — are those that methodically considered the *implications* of the new technology long before a single piece of hardware was unpacked or computer code written.

When making the move to imaging, "Pick the biggest, not the smallest, application," advises Charles A. Plesums, senior director of image technology at United Services Automobile Association (USAA) Information Service in San Antonio. No one in the world has 20 years of expertise with imaging, he reasons, and so all the project's participants, "from system designers to the terminal installers," will need to learn the ropes. This means a great deal of overhead and makes it virtually impossible to justify cost in small settings.

Tearing business processes apart and putting them back together in new and streamlined ways involves managerial issues as well as technical and logistical ones. Some companies, having unblinkingly reviewed their business processes in this way, have decided imaging is not for them — not yet, at least.

"That's part of the reason the market hasn't taken off like a hockey puck," says Roger Sullivan, president of the Association for Information and Image Management (AIIM) and vice-president of image management systems at BIS CAP International, Inc. in Norwell, Mass. People have begun to realize the implications and potential impact of deploying imaging, "and they're saying they want to understand the effect on the next department and the larger division before they sign a purchase order for a half-million-dollar system," he says.

As Sullivan indicates, companies are not rushing to the technology in huge numbers. A *Computerworld* survey of more than 300 IS managers found only 17% whose companies had purchased an imaging system. The same survey turned up another equally significant statistic, however: Fully 40% of those who said they had not yet invested indicated that they were likely to in the next two years.

There are also other indicators that people are *thinking* in droves about imaging. One is the growth in both membership and conference attendance recorded by AIIM. The 47-year-old association experienced a 47% increase in corporate members between 1988 and 1989, and its annual show and conference has grown 22% annually for the past six years.

In other words, many users are intrigued but wary. In particular, they are concerned about the cost of image processing systems and the fact that the technology is admittedly still implemented around nonstandard architectures.

Another negative consideration for some is the prospect of widespread resistance. For the most part, however, companies that have implemented imaging systems report that their users have adapted to the technology with surprising ease.

This may simply be because documents continue to look the same whether they are held in the hand or viewed on a screen. Or it may be because the streamlining of old business processes that accompanies installation of an imaging system empowers workers, giving more responsibility than they previously had.

Users with narrow expectations — those who want imaging strictly because it will do away with paper filing cabinets and save 1,000 sq ft of space — can still justify the investment in imaging, but it's harder, Plesums and others say.

At Beth Israel Medical Center in New York, the imaging system for patient records will reclaim 2,000 sq ft of a 3,000-sq-ft filing area. Vice-President of Information Systems Martin Bieber says, "Two-thousand feet of space in Manhattan is really precious." But that savings was not the primary reason for purchase. The larger goals, Bieber says, were faster access to critical documents involving emergency care and improved efficiency in back-office insurance processing.

Enterprisewide access to critical documents is the scale-tipper for many organizations. Better responsiveness to inquiries from those outside the organization is also a powerful incentive. Sixty-two percent of the respondents to the *Computerworld* survey said providing better customer service was the second most important benefit of imaging after rapid retrieval of information.

The strength of these interests lends additional weight to the argument now being put forth by both users and consultants that this is not a technology for which piloting makes better economic sense.

Just as it is almost impossible to isolate image processing from existing business processes, it is inevitable that imaging systems be merged with existing information systems to provide enterprisewide benefits.

This is an area where much work remains to be done, however. Application interfaces to classical data processing systems are a neccessity if imaging systems are to be elegantly integrated with existing information systems.

Likewise, although vendors say — and market analysts agree — that standards will eventually arrive, they are currently lacking for such things as optical disc indexing formats. Interestingly, the absence of standards seems to be mostly a prepurchase issue. A number of firms that have happily installed image processing systems say that those who wait for a full suite of standards will be hopelessly behind those who have chosen to forge ahead and explore the technology's potential.

"It is imperative for paper-intensive businesses to investigate image processing technology now," says Neal Steitzer, senior project manager at J. C. Penney Life Insurance in Plano, Texas. Imaging "is a must to be competitive in the world today." ●

Booker is *Computerworld*'s Chicago bureau chief. Alan J. Ryan, a *Computerworld* senior writer, also contributed to this report.

Investment by industry: 1990

Government agencies, banks and insurance companies have been the most aggressive early users of electronic imaging systems

Industry	Sales*	Units
Banking	$165.8	133
Government	$129.9	137
Insurance/other financial	$94.7	102
Discrete and process manufacturing	$121.6	112
Transportation	$36.5	35
Communication/utilities	$35.4	45
Business services	$27.6	49
Retail/wholesale	$13.7	20
Health care	$3.2	8

Source: International Data Corp. * In millions

Out of pocket

Extent of investment in electronic image management varies greatly, depending upon whether a company defines itself as traditional or adventurous. Traditionalists, however, are picking up their spending pace

Electronic image management	Early technology adopters	Traditionalists
Average 1989 expenditures per company	$554,000	$187,000
Expected 1990 expenditures per company	$704,000	$490,000

Source: Association for Information and Image Management — Sample size: 726

Application invasion

Imaging is being used in many application areas, but customer service is considered the most strategic

Financial	Maintenance
Enhanced country club billing	Spare parts inventory
Remittance processing	Repair tracking
Traveller's checks	Vehicle folder management
Stock certificate tracking	
Collections	**Customer service**
Disbursements	New account applications
	Customer correspondence
Records management	Contact maintenance
Insurance folder management	
Database distribution	**Human resources management**
Document distribution and control	Interactive training
Inventory records	Performance measurement
Medical record management	Work-flow management
	Employee records

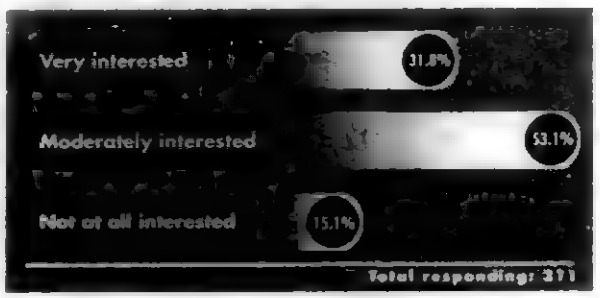
Source: Nolan Norton & Co.

Impressions of Imaging

What more than 300 IS executives think about the technology

INTEREST AND INVESTMENT

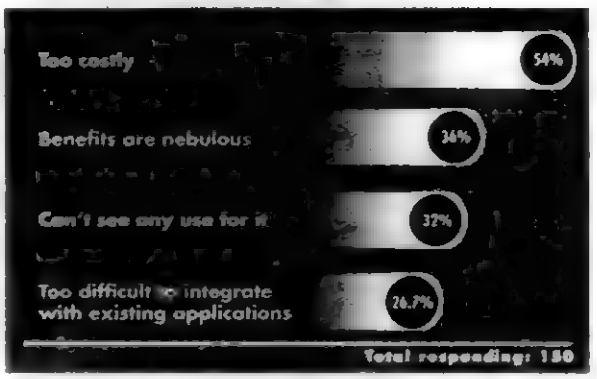
Please select the phase that best describes your level of interest in image technology



Has your company purchased an imaging system?

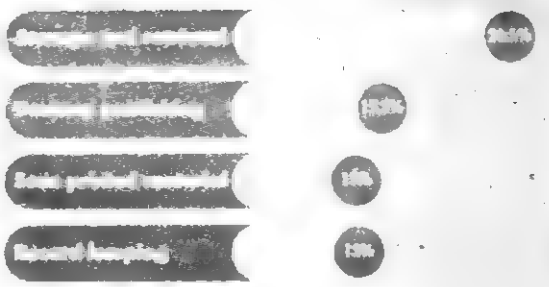
If you are not currently using image processing technology, is it likely or unlikely that your company will purchase an imaging system within the next two years?

If unlikely, why?

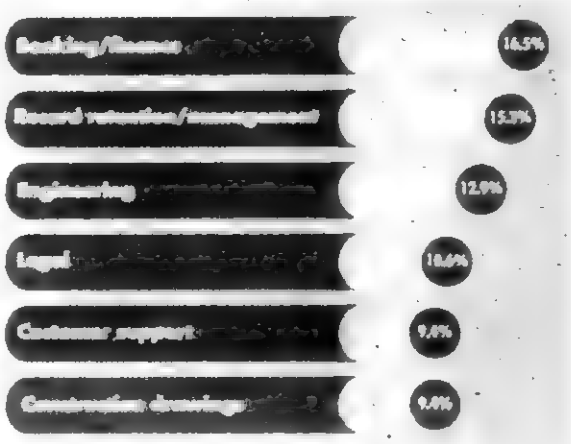


PULL FACTORS

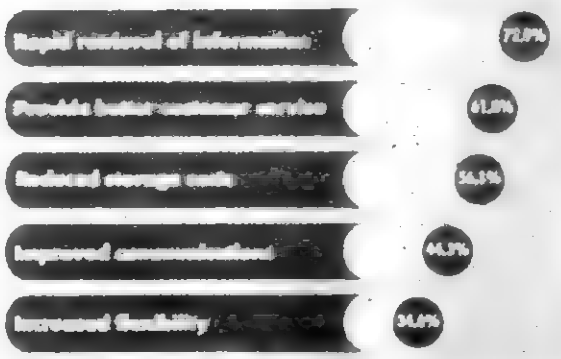
If your company has purchased an imaging system, what was the specific purpose for which the system was purchased?



If it is likely that your company will purchase an imaging system within the next two years, for what one or two specific business applications is it most likely to be used?



What do you see as the most important benefits of image processing?

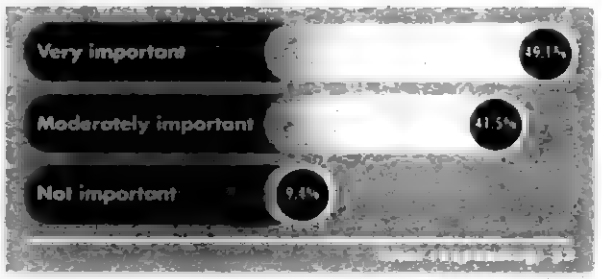


If you aren't at least interested in the possibilities of image processing, you are part of a minority these days. An exclusive Computerworld survey of more than 300 information system executives on the subject of image processing technology found a scant 15% who fit that description. Of course, not many can claim a personal acquaintance with the technology either. However, although it is a small force now, this group has big growth prospects. Survey responses indicate that the number of companies invested in image processing technology may triple over the next two years. It is also worth noting that these high levels of interest and purchase intent come from a population that is largely focused on the storage and retrieval aspects of the technology. When asked to provide their definition of image processing, an overwhelming number of respondents described these capabilities. Few, it seems, have even begun to think about the technology in terms of other document processing possibilities such as work-team exchange.

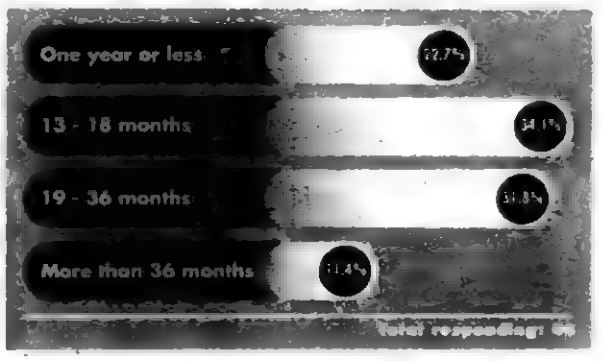
This survey was conducted for *Computerworld* by the IDG Research Services Group. Questionnaires were mailed to a random sample of 1,000 IS executives who are also *Computerworld* subscribers. Total response was 313. Of that number, 54 or 17.4% of the respondents came from companies that have already purchased an imaging system.

MONEY TALK

If your company has made a purchase, how important was it that you were able to justify the cost of the system?

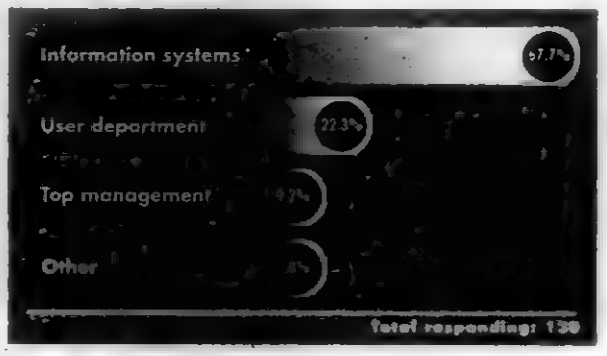


When do you expect payback on the system?



SPHERES OF INFLUENCE

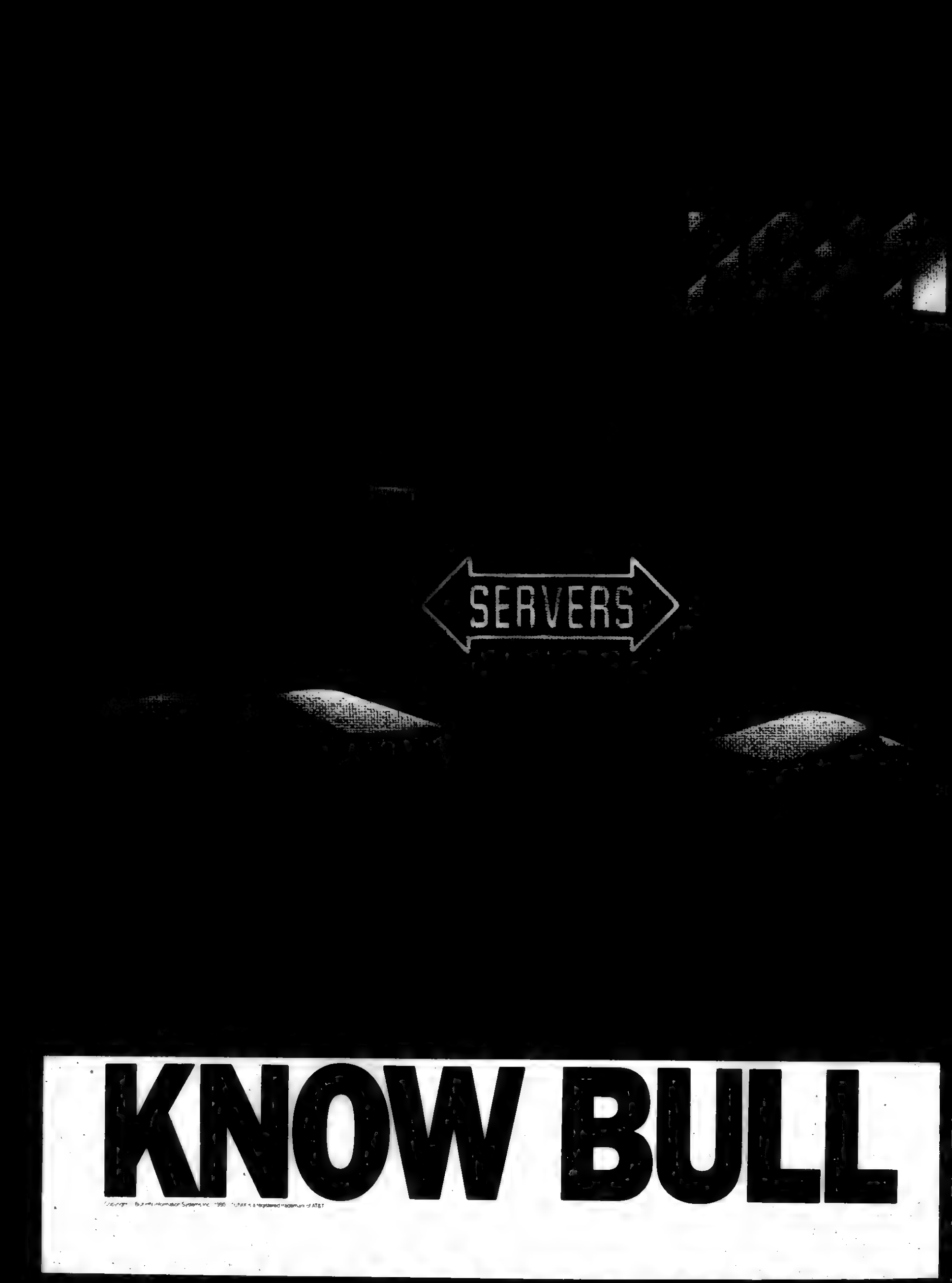
If your company has been contacted by an image processing vendor, who did they first contact?



If your company has purchased an imaging system, who within the company initiated the purchase?

Who was responsible for selecting the vendor and model?

Who has principal management responsibility now that the system is in place?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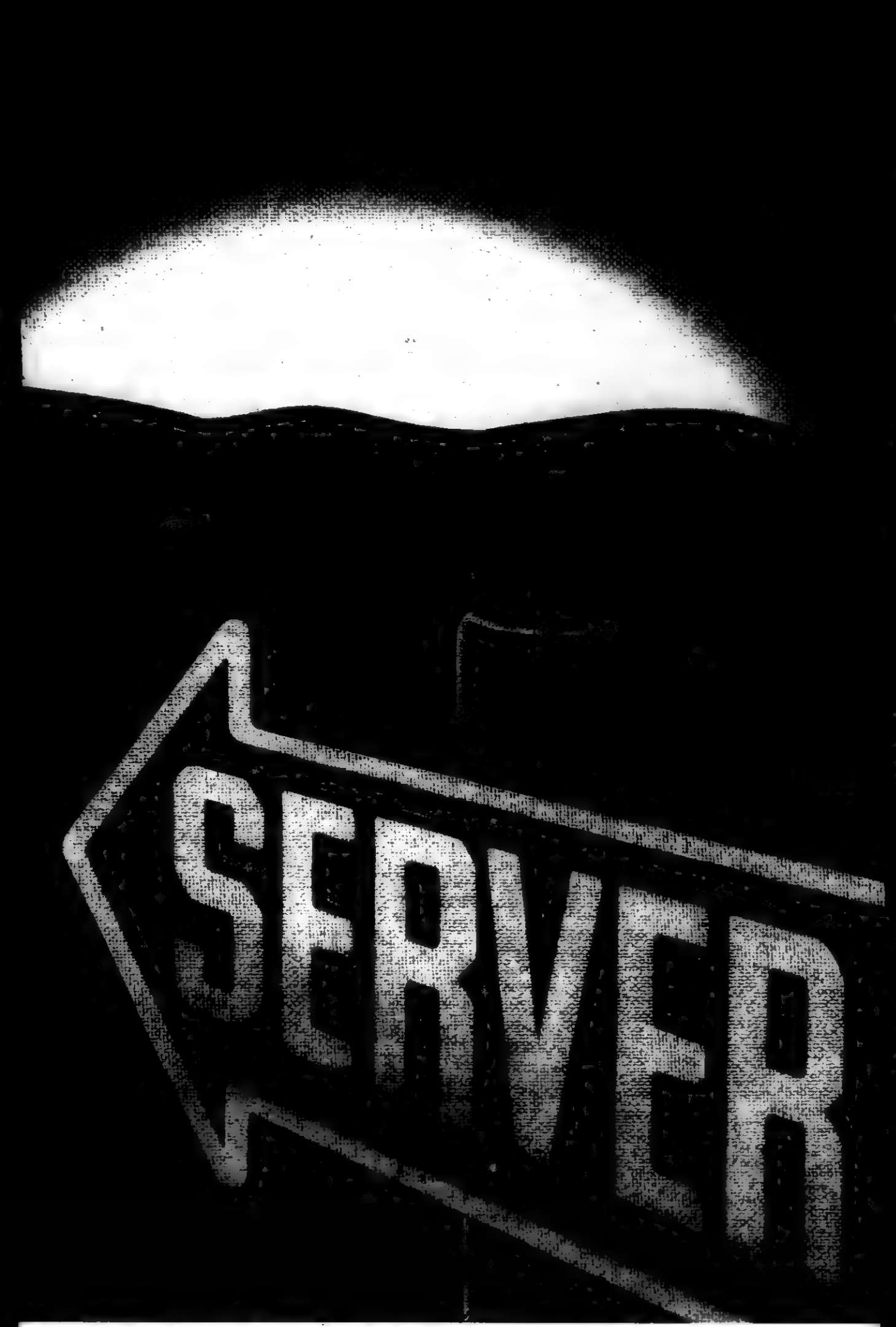

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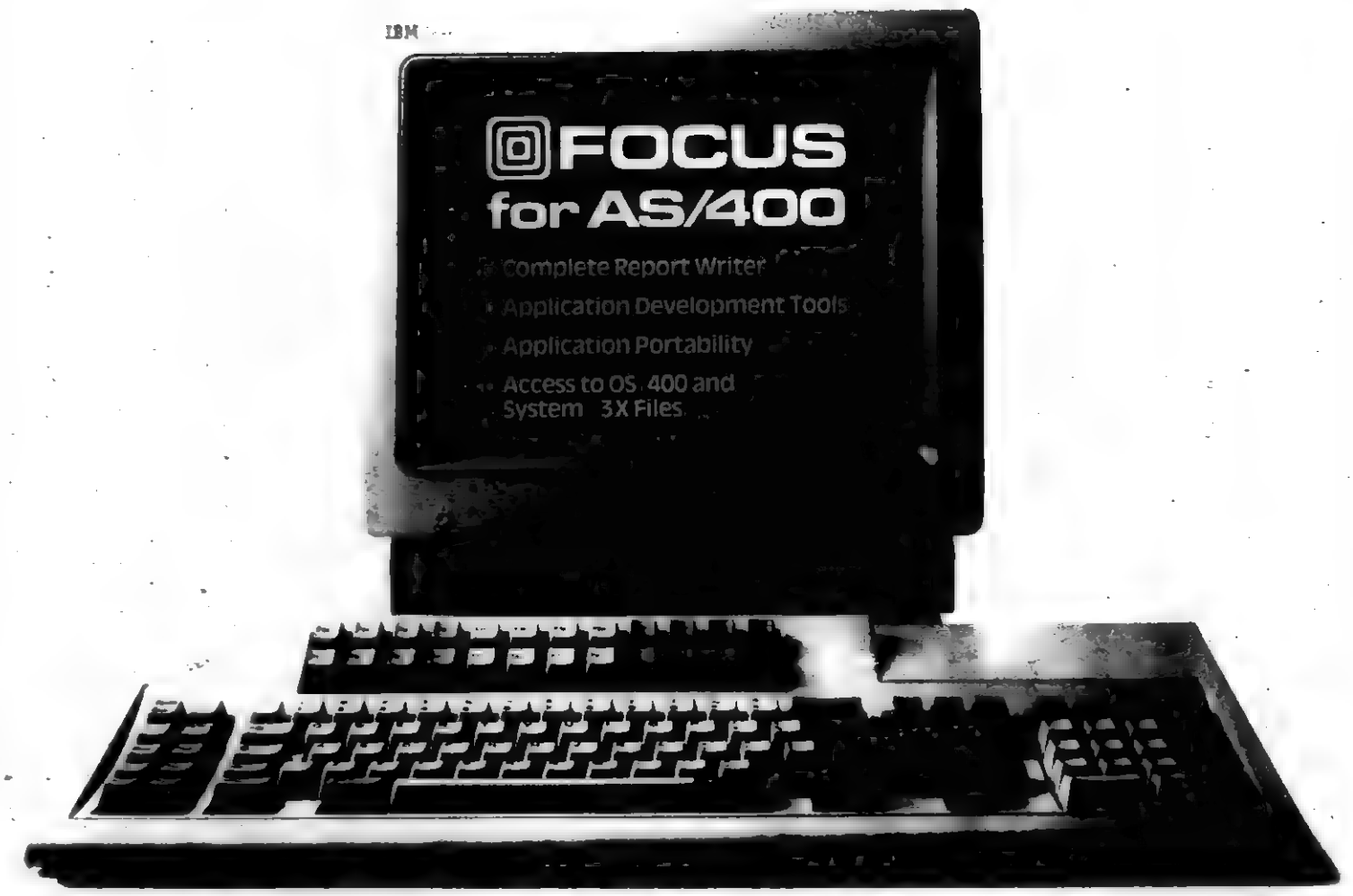

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Paper disposal and a whole lot more

by ALAN J. RYAN
and ELLIS BOOKER

Six months and $2 million dollars into a document imaging project designed to handle residential and small-business customer correspondence, long-distance carrier U.S. Sprint Communications Co. is right on track toward meeting its 15-month payback goal.

Unusual? Not really. While imaging is still considered a rich man's technology because of its high entry costs, companies using electronic image processing say it can and does pay for itself in hard and soft savings and benefits.

Suzette Sitzman, a project manager at Sprint's Dallas National Service Center, says the Filenet system installed there in May will very nearly pay for itself during the next year. The system, she explains, was one of the principal reasons the company was able to consolidate seven regional service centers into one. Because it is possible to handle information more efficiently from a central location, six fewer facilities and 50 to 60 fewer employees are required.

Although Sprint required some outside assistance — Perot Systems Corp. helped with setup and customization — Sitzman says installation was a relatively quick procedure. Integrating the Filenet system with Sprint's existing IBM 3090 mainframe took about a month.

Insurance giant United Services Automobile Association (USAA) has proceeded more slowly to its current megascale implementation of imaging, which involves a multimillion-dollar investment, more than 2,000 users and 1,400 image workstations, scanning more than 100,000 documents — nearly 1 million separate pages — each day.

From 3M to IBM

USAA started with a 3M Co. prototype, which it used from 1984 to 1987. It added a Filenet Corp. system in the first half of 1986 and then issued a request for proposals to handle an increased volume of mail in 1987. At that point, IBM was selected by USAA to be the vendor.

The electronic imaging application now runs on two IBM 4381s, with users working on a combination of IBM Personal System/2s and Personal Computer ATs equipped with Imageplus adapter cards. Traffic through these systems includes 15,000 incoming letters, as well as USAA's outgoing correspondence and policies are not scanned but are captured electronically into the imaging database.

Charles Plesums, senior director of image technology at USAA Information Service in San Antonio, won't disclose the price of the project. Plesums did say, however, that an cost study done at the outset of the project and based on 1,000 workstations came up with a five-year projection of $27 million for hardware, software programming and training costs.

USAA is currently studying productivity improvement from the imaging system. Plesums says early reports from the fellows with "the stopwatches and the clipboards" have tentatively set the productivity gain at 1.3%. That's slightly higher than the original goal of a 1% gain, but Plesums says he believes the final results will be even higher: "I know the system is being used more than that." And what's more, he says, supervisors of the employees are informally estimating a 5%

Continued on page 93

Russell C. Jones

Companies have to be realistic about payback schedules and cost justification. "If you're looking for immediate payback, it won't be there."

Paul McKinnon
Bank of New England

Those who just say no

by ALAN J. RYAN

Electronic imaging systems are not a universal cure for anything, including paper congestion.

The reality of electronic imaging is that, while it is a hot topic and a technology with obvious benefits, the price and relative immaturity of the products make it something many companies can survive without — at least for now.

Linda Black

Some executives believe their companies need imaging technology simply because they see lots of paper when they look around, says Wick Keating, vice-president of consulting firm American Management Systems, Inc. (AMS) which is based in Arlington, Va. But that kind of thinking can be misguided.

In one instance in which AMS was called in to investigate the possibility of imaging for a company, Keating says, "We found we could eliminate the paper at the source, through electronic data interchange with the suppliers."

Imaging is also the incorrect solution to a problem if the perceived benefits do not outweigh the expense, says Mary Rhodes, a senior analyst at New Science Associates, Inc., a Southport, Conn.-based market research firm. For example, she says, unless it causes significant inefficiencies,

Continued on page 82

Watch the slippery spots

by ALAN J. RYAN

If getting there were truly half the fun, more companies would be moving to imaging technology. Both those who have made the journey into imaging and those who have watched many such odysseys from the sidelines report many challenges along the way.

Some of the rough spots that crop up in nearly every account are: index creation; document conversion; expense overruns; automating without improving a process; staff resistance; fitting new equipment into the existing systems environment; and dealing with issues of access and control.

• Indexing

Steven Quattrocchi, senior assistant treasurer at Stone & Webster Engineering Co. in Boston, says that creating the index for the company's new imaging system was the most difficult part of the installation process. "Every single index on our general ledger — every single account number — had to be accounted for on a piece of paper to tie it in the index with the appropriate documents," he remembers.

• Scanning and conversion

Another frequently mentioned sticking point that also gave Stone & Webster some problems was dealing with format variety in document scanning. "We were able to standardize our own reporting of expenses and receipts," Quattrocchi says, "but

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Say no

Continued from page 81

keeping large paper files is not always a bad method from a cost standpoint. "There are lots of companies located outside of the major metropolitan areas where storage and filing charges are not that high," she observes.

Some companies, after taking a close look at the cost, labor or operational renovations associated with imaging, have decided to pass on the technology, at least for the time being.

"We have looked at imaging and are going in a different direction," says James L. Rhodes, assistant director of operations at the Utah State Tax Commission in Salt Lake City. The Tax Commission had been a microfilm-based records center, Rhodes explains, with long-range plans that included moving to imaging to capture its tax documents.

However, Rhodes says, as he explored electronic imaging and realized the capacity necessary to meet his goals, the expense of the project kept climbing.

The Tax Commission estimated that to purchase sufficient equipment to scan, process and store all of the tax returns submitted to the commission during peak tax periods, they would have to invest between $2 million and $2.5 million, Rhodes says. "We already had $700,000 to $800,000 invested in microfilm equipment — not including 10 years worth of microfilm images," which would have meant discarding a significant investment in microfilm and tacking on another $2 million. Instead, the Tax Commission elected to make an additional $200,000 investment to upgrade its microfilm equipment.

Integration of imaging system components with other systems can be difficult

After meeting with Eastman Kodak Co., the Tax Commission decided to go with Kodak's Image Link technology, which takes data from an archival microfilm base, converts it to a digitized ASCII stream and provides the ability to pass that information electronically from one point to another, Rhodes explains. "We have a poor man's version of what you may get with electronic imaging," he says, "but we don't need to have all our data on line."

Sticking with an imaging system based on micrographics also eliminates the need to deal with conversion issues of two kinds — those involving documents and those involving procedural precedent. Conversion of records is an expensive proposition, Rhodes observes, but of equal concern is the fact that "the state courts have developed a level of comfort with microfilm that has taken them at least three decades to achieve." Although there are some imaging systems in the state government, he says, it will likely take many years for document handlers to feel as comfortable with those systems as they do with micrographics.

Priscilla Emery also took a hard look at imaging from a financial standpoint. As manager of the advanced technology group at Blue Cross & Blue Shield of Connecticut, Emery says she realized that to bring in an expensive imaging system for Blue Cross' somewhat outdated systems environment did not make good fiscal sense.

Emery spent nearly eight months studying the imaging issue. For now, the health insurance company will not be moving to imaging, she says, but will continue to monitor the technology.

Deciding to forgo imaging today does not mean it is not on the minds of those who have said no

Both Emery and Rhodes say that if they were starting from scratch and had aisles of paper to contend with, their decisions might be different.

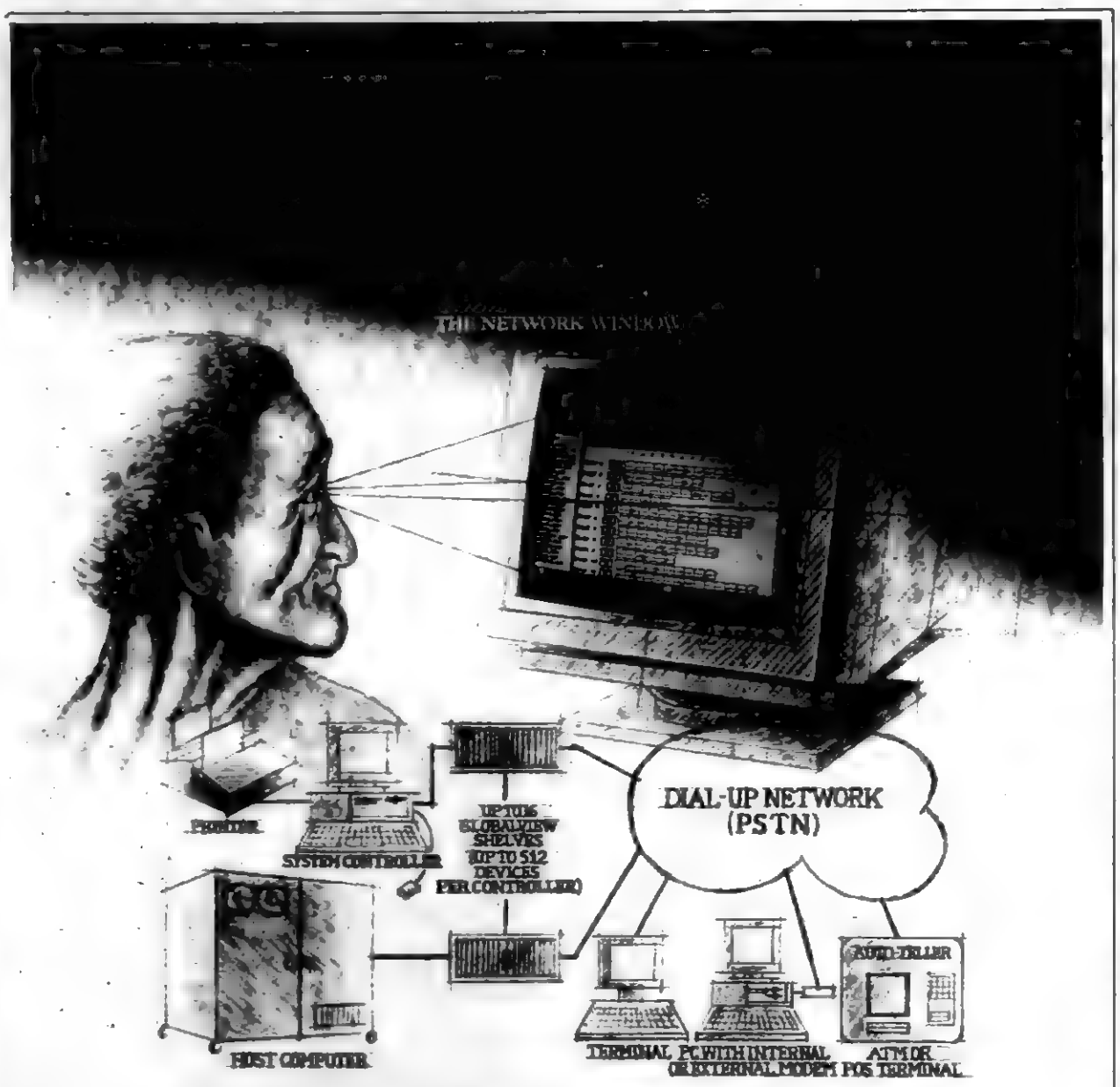
"We don't keep the paper," Emery says. The paper documents are microfilmed and then discarded. "What we have to justify [imaging] on is the improvement in the process, and that's productivity. Productivity is difficult to quantify, and therefore difficult to justify."

While imaging can be used today in practical ways, Emery says the standards have not evolved enough to satisfy Blue Cross. For that reason, she says, integration of imaging system components with other systems can be difficult.

Emery says her firm has not found any imaging systems that can easily coexist with the company's computing environment. "So we either change our current environment or create the interfaces to coexist with our environment," she says.

There are also areas of the technology in need of further development, Emery says. Optical character recognition (OCR) is a case in point. "The ideal is to have OCR, but when 50% of your stuff comes in handwritten, that is difficult," she says. Until more sophisticated OCR is available, or until Blue Cross changes the way it receives forms, OCR will continue to be a sticky point for imaging, Emery says. "Doing imaging without OCR means you still have to have a data entry function."

Still, deciding to forgo imaging today does not mean it is not on the minds of those who have said no. Emery and Rhodes say their current and future systems purchases will be made with an eye toward imaging — for example, they are likely to lean toward the purchase of workstations that could be easily adapted for electronic image processing. ●



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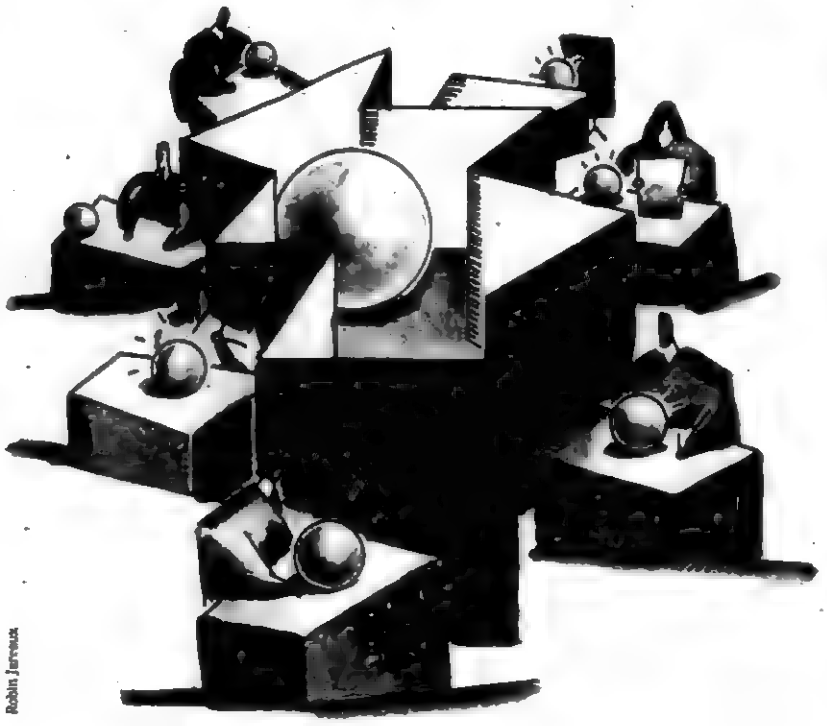
Isolationism doesn't work



Robin Jarvis

by ALAN J. RYAN

It is easy to overlook the larger implications of imaging systems. Presented with a technology that promises an organized and efficient alternative to towering stacks of stored paper, it seems a small matter to insert that marvel into the work process. In the midst of contemplating new uses for liberated floor space or the heights of productivity that might be reached as a result of faster file movement, it may not be obvious that this single new cog could change the way that many company wheels turn.

Ignoring the potential impact of imaging systems on structure, culture and work processes can be a very big mistake, however. Most of the difficulties encountered in implementation stem from that single omission, says Lois Bruss, a socio-technical consultant at Wang Laboratories, Inc. When these issues are not confronted, Bruss says, a company sacrifices its best chance to make maximum use of the technology.

Paul McKinnon, a senior vice-president at Boston-based Bank of New England, agrees. Considering organizational issues "is very important in terms of understanding what imaging will do for your organization and for your back room," he says. "You have to analyze work structures and decide how departments will be structured."

McKinnon says that when imaging was brought into his functional area — which handles item processing and payment systems — in 1984, it brought about a number of significant process changes.

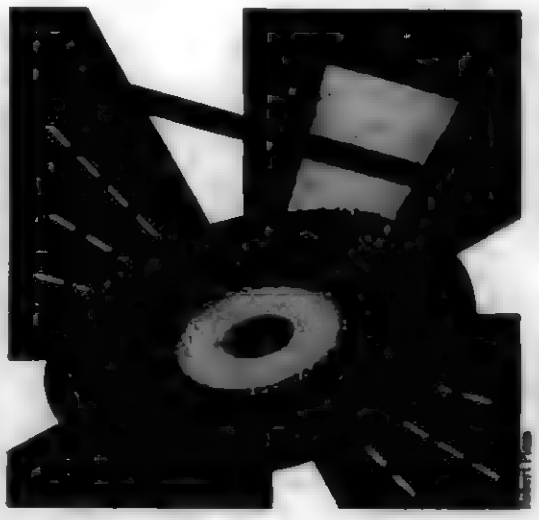
Working around the imaging system required taking considerably firmer control over some work flows, McKinnon says. "We also upgraded a number of jobs and pushed some of the clerical jobs into other functions, like opening mail."

Some of those changes might have been extremely traumatic, McKinnon notes, if the bank had not carefully prepared the way through measures such as a pre-installation training program designed to teach check handlers about the technology and its potential impact on their work.

Another important issue that companies need to consider, says Mary Rhodes, a senior analyst at New Science Associates, Inc. in Southport, Conn., is that while most of the jobs initially affected by imaging systems are clerical, expansion of

Continued on page 86

Avoiding legal gray areas



by DONALD S. SKUPSKY

There's a right time to consider the legal issues that affect optical-disc records — before any commitment is made to developing an optical-disc system. Some forethought in this area can prevent costly mistakes, not only in terms of inappropriate investment but also litigation, fines, penalties and loss of rights.

There are a number of legal questions that should be considered. These include the following:

- Can you legally maintain records in an optical-disc system?
- Can you destroy the original records after they have been scanned, inspected and indexed?
- Can it be demonstrated that optical-disc records are accurate and trustworthy?

Answers will vary depending on whether optical-disc records are being considered in light of evidentiary rules, statutory requirements and regulations or special goverment requirements.

Hard evidence

Optical-disc records are merely electronic reproductions of the originals and will be treated similarly to microfilm, photocopies, facsimiles and even carbon paper in many courtrooms around the world.

The early British Common Law Best Evidence Rule requires that the best evidence be presented in trial. Originally, that meant live testimony as opposed to written records. Once written records became prevalent, the Best Evidence Rule required the originals as opposed to duplicates.

In the U.S., reproductions are now admissible to the same extent as originals. The Uniform Rules of Evidence and the Uniform Photographic Copies of Business and Public Records as Evidence acts have been enacted in most states to reinforce this principle. Because optical-disc records "accurately reproduce the original" — the standard required in both laws — they are admissible in evidence as reproductions.

Other common-law countries, such as Canada and the UK, recognize similar principles for the admissibility of reproductions.

The French Civil Law countries, such as France, Germany, the Soviet Union and most of Latin America, operate under different principles. These countries generally have very rigid and restrictive laws related to records maintained by businesses and admitting records into evidence, which may preclude reliance on optical-disc records. They may, for example, require either paper records or records that have been systematically notarized and approved by public officials.

Statutes and regulations

Most rules and laws governing records maintenance specify the content of the records but not the form. Others specifically permit such technologies as microfilm. Laws rarely mention optical-disc records.

In the U.S., you may perform any activity unless it is specifically prohibited or restricted by law. When the law does not address optical-disc records or other reproductions, you may use optical-disc records and destroy the original paper records. Otherwise, you follow the requirements of the laws.

Regardless of the records system you use, the system must be capable of accurately preserving required information. During a government review, your system must conveniently provide the auditor with the same information generally available with the paper records.

The retention of government records is generally controlled by the state or federal archives. They approve the period of time for keeping records and the format.

Government agencies are generally free to copy the original paper records to any convenient form. The archives, however, may not permit the destruction of the original records after reproduction unless the technology meets the specifications for archival retention. At this time, archivists only approve original paper records and silver halide microfilm for long-term retention. Media such as optical disc, computer tapes and magnetic disc may be appropriate for short-term retention of records (less than 10 years) but may

Continued on page 88

Will it pass the bar?

Although the biggest perceived disadvantages of electronic image management are cost and unseasoned technology, legality of output is also a major worry

Perceived disadvantages of electronic image management	
Expensive: up-front costs	53%
Not compatible with current systems	10%
New technology	32%
New vendors	19%
Output possibly not admissible in court	27%

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Isolationism
Continued from page 83

these systems into new areas is likely to mean that professionals will also have to interact with the technology. At that level, she notes, gaining acceptance for the system can be tougher. "Senior or high-level people might be more resistant to being tied to a workstation," Rhodes says. "And you usually can't force them to work with imaging."

If you can't lick this group, Rhodes suggests, you may have to bribe them — providing incentives such as easy user interfaces, better search engines and easier-to-use indexes.

There are a number of things that a company can do before the fact to ensure that the introduction of an imaging system brings progress and productivity rather than trauma and dislocation.

First and foremost, it is important to get the house in order, which means conducting a careful study of the organization and its work flows.

"I've seen people who have not cleaned up their existing operation, and they think imaging is the panacea," says Stephen McNair, president of FTP Consulting Services, Inc. in Euless, Texas, and a board member of the Recognition Technology Users Association. "But imaging is like anything else," he says. "You have to have the operation cleaned up first."

Bruss says that the move to imaging should start when project teams are being assembled. When the team list is drawn, she explains, there should be an organizational expert on it, in addition to the usual complement of imaging and database experts.

This organizational expert could be drawn from within the company or be an outsider retained for the duration of the project. In either case, Brass says, the job is the same: "To look at people issues and make sure those issues are really tied in tightly with the decisions that are being made around the technology."

The following are specific issues that have to be considered:

• **The importance of job content.** "You want to make sure when introducing imaging that you are using it to enhance responsibility. You don't want to use imaging to routinize jobs."

"Senior or high-level people might be more resistant to being tied to a workstation. You usually can't force them to work with imaging."

Mary Rhodes
New Science Associates

• **The need for productive socialization.** Most people enjoy social interaction with co-workers, and that will still happen even if they do not have to physically pass documents back and forth. "We want to make sure that we can get people to come together and interact in ways that are going to further the goals of the company, rather than just taking more time at the water cooler."

• **The opportunity to improve work flow through job design.** White-collar work has evolved in a piecemeal fashion, Bruss says: "Imaging has allowed us to put those pieces back together and create whole jobs. Not only does that make the job more motivating to the person doing it, but you are also able to provide better customer service."

This kind of analysis of work processes and organizational structures takes a good deal of time and effort. It can be worthwhile, however, not just as a way of preventing problems, but in its own right.

Witness Blue Cross/Blue Shield of Connecticut, which has decided not to make a contemplated investment in an image processing system for now. Even though the company isn't buying the system, it is making some alterations to its operations that were suggested by an organizational review that was conducted in anticipation of the purchase.

"One of the outgrowths of looking at imaging was that it made us re-examine our work processes," says Patricia Emery, manager at Blue Cross/Blue Shield's Advanced Technology Group. •

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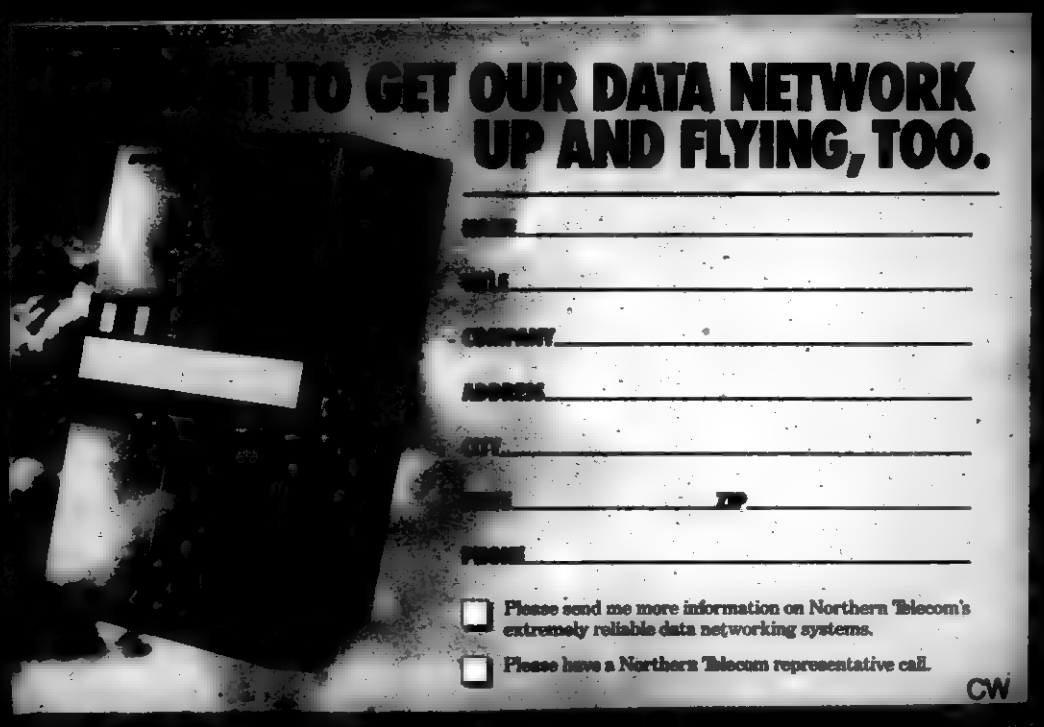
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Slippery spots
Continued from page 81

vendor bills, which also have to be scanned and indexed, come in a variety of sizes, shapes and colors."

• Overlooked expenses
Beyond the hardware and software components of imaging, other costs to consider are training expenses, consulting fees, time expenditures, integration costs, possible pay increases for workers who must learn new skills and severance pay if layoffs result. Conversion also usually winds up being more expensive than anyone expects, in part because companies frequently discover that much of the information they want to convert is misfiled.

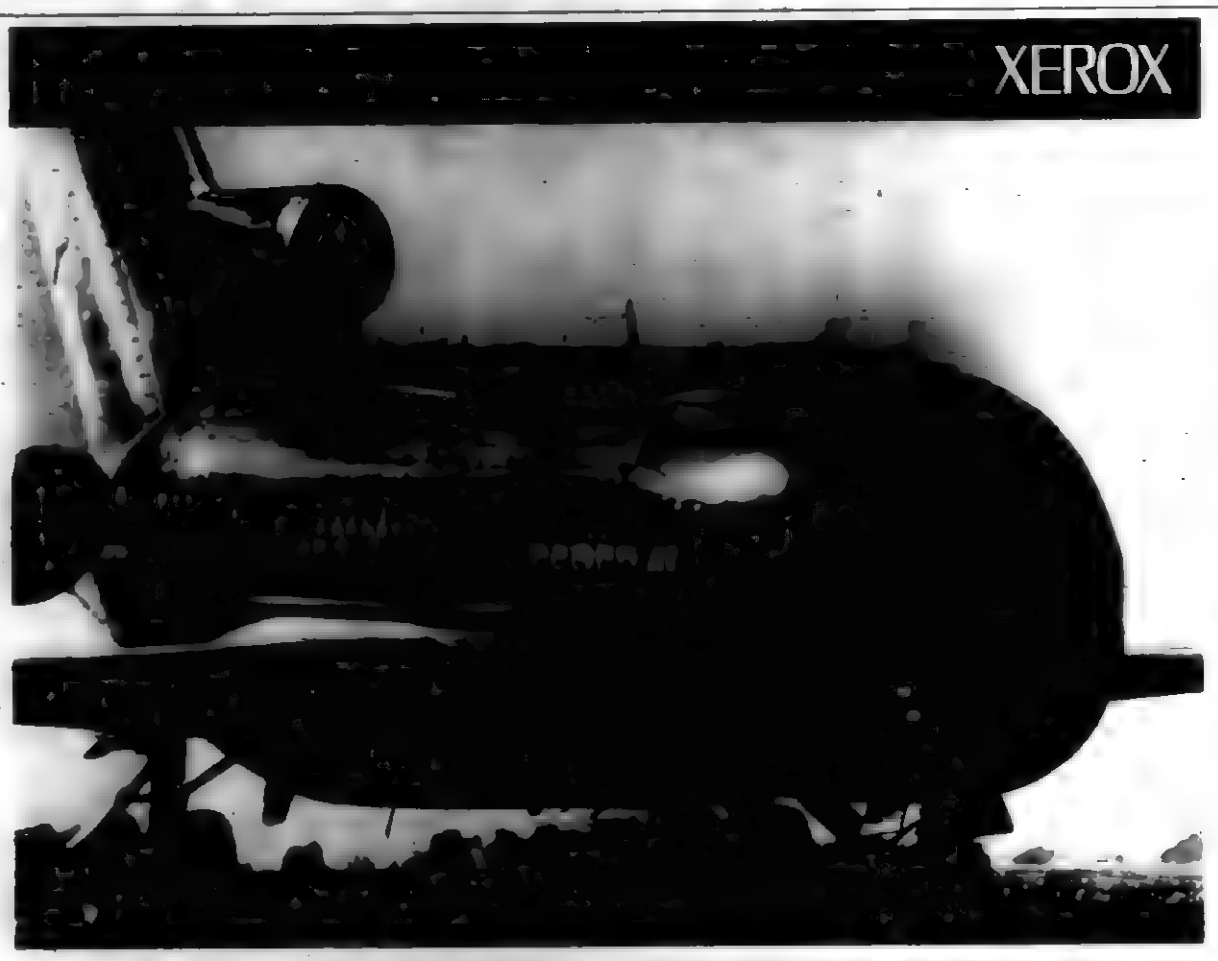
Constructing a realistic cost estimate is a long process. "It takes something like two to three times longer to plan and justify your first imaging application than it does to design and build it," notes Brian Reynolds, a senior manager at Nolan Norton & Co. in Lexington, Mass.

• Inappropriate application choice
There is such a thing as playing it too safe. According to Reynolds, this is one of the most common causes of problems and disappointments with imaging systems. Companies, he says, "pick something that is safe so that if they screw up, nothing bad will happen." But when they do a great job of bringing imaging to an area that has no impact on anything, "everyone says, 'That didn't do anything for us.' " It is much better, he advises, to risk starting with an application that has a significant impact on the business.

• Staff resistance
Like any other kind of change that affects the way people work, the arrival of an imaging system can produce a certain amount of staff resistance and resentment. These feelings can be overcome, however, if those who are are affected are involved in the design process. In the words of one project manager, "When you have to change work-flow methods, some people are always upset to some degree. But once they see how easy it is to get the documents on their screen or print copies, they can see the benefits."

• Integration
Integrating these specialized systems with an organization's existing computer operations is no small feat. While many vendors claim to have "turnkey solutions" to imaging, the reality is that most companies either cannot afford to purchase all the pieces at once or cannot find everything they need from one vendor. Often, either consultants or integrators must be brought in to piece systems together and write the linking software.

• Cross-departmental issues
In many companies, imaging systems have been installed departmentally. In some instances, several departments have committed to systems from several different vendors. If and when it becomes important to share information needs on an enterprisewide basis, organizations that have moved into imaging in this manner find that they are looking at an additional investment for special bridges. •



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Legal
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not be deemed acceptable for long-term retention.

Archivists have expressed concern about the archival quality of the optical disc media, believing that information might be lost over time. The longevity of the media may not be the key issue, however. Recently, some optical disc manufacturers have developed discs that may be capable of storing information for 100 years or more.

A larger remaining question is whether the equipment necessary to read the information stored on the optical discs of the present will be available in the future. Because standards do not currently exist for optical disc images and computer and image technology continues to evolve, we may not have the appropriate readers and printers available to view images stored on optical discs. This may preclude the use of optical disc for long-term retention of records.

Some optical disc manufacturers have developed discs that may be able to store information for 100 years or more

Some people have expressed legal concerns about erasable optical disc records, because they can be modified or erased without detection. The legal status of optical disc systems is not compromised by the possibility of modifying or erasing images.

Non-erasable optical discs can also be effectively modified. To do this, you simply modify and copy selected images to another disc. Furthermore, records maintained on other technologies such as paper, updatable microfiche and computer files can be modified but are still admissible as evidence.

Records are admitted into evidence if they are trustworthy, accurate, complete and reliable. Trustworthiness may often be established by showing that you followed a process or system and that the process or system produced an accurate result.

In the case of an optical disc system, this would mean providing written documentation of the system's development and operation, proof of staff training and audits confirming the accuracy of your system. An adequate showing in these three areas should be sufficient to overcome concerns that the technology is trustworthy. •

Who gets custody?

by SUZANNE WEIXEL

Moving electronic imaging out of back-room data centers was never an issue; the technology got its start in user departments. Yet that quiet entry into organizations raises two of the bigger questions facing imaging today: Who should manage these systems? And who will maintain them?

Whenever there are many departments involved in the care and use of a system, there is potential for conflict, according to Roger Sullivan, vice-president of image management systems at BIS CAP International, Inc., a research and consulting firm in Norwell, Mass.

In this case, "IS looks at imaging and sees a useful technology. The business managers look at imaging and see a way to automate existing records management procedures," he says. Unless the two sides are able to negotiate a common vision that allows them to deal with issues of control, companies will miss the boat on productivity gains and cost-effectiveness.

Some companies opt for a balance of power, dividing control of the technology from control of the information that is stored on it.

Rusty Owen, director of Passenger Revenue Accounting (PRA) Systems at Northwest Airlines, says he believes that conflicts between the business side of PRA and the systems side have been avoided because of clearly defined roles as well as a respect for the other people involved. Owen claims that his group has always understood that its position is to advise and support, not control. "We support the systems that allow the imaging function to occur," he says. "[The business users] control the imaging function."

> **"If the imaging system is going to exchange data with other systems in other departments, IS must be involved on both ends."**
>
> **Walter B. Novinger**
> **Rothchild Consultants**

PRA Systems is not even located at the same site as the user group. Only a few support personnel are stationed on-site to handle daily maintenance of the system, which is used to track tickets and other sales documents. Owens says this arrangement allows the business group the freedom to use and manage the imaging system and the systems group the time to look for new technologies and new applications. "When they need us, they call," he says.

At Grumman Corp. in Bethpage, N.Y., responsibility for the imaging system is shared between the Data Systems Division and the legal department that the system was purchased to serve. Arthur J. Kingfield, program director at Grumman Data Systems, says the legal department establishes the priorities and manages the data, while the systems department concentrates on the technology.

Kingfield admits that at first, the legal department resisted the idea of a partnership. He says he believes that security was a major concern because confidential data was being scanned into the system. Once the attorneys understood that Data Systems' main concern was to keep the imaging system in good working order, they saw the value in the relationship.

"They don't need to worry about it breaking down. We don't need to worry about the data they scan into it," Kingfield says.

However, there are cases in which IS should become involved in managing the information scanned into imaging systems, says Walter B. Novinger, vice-president of the Image Systems Division at Rothchild Consultants in San Francisco. If imaging systems are interacting with a corporate database, Novinger says, it is in the best interest of the company to have IS involved in data management. Not only must someone be responsible for keeping the imaging system up-to-date on changes in the mainframe environment, but someone must also guarantee the integrity of the data brought into the mainframe via the image scanners.

"If the imaging system is going to exchange data with other systems in other departments, IS must be involved on both ends," Novinger says. It has to oversee such everyday security functions as backing up data and assigning passwords.

Elias Safdie, the director of technology consulting at Strategic

Continued on page 90

Harold Stevenson

Some turn back

by ELLIS BOOKER

While electronic imaging does generally produce the benefits proponents claim, not every installation proceeds without bumps or stalls. And, in a very small number of instances, frustrated users have returned to their preimaging ways of handling paper.

Much more common than outright failures, however, are imaging "pilots" that go nowhere.

The problem of pilot project lag is documented in Nolan Norton Institute's recently published "2nd White Paper on Imaging," which includes an analysis of some 600 imaging applications. According to Nolan Norton's count, 17.3% of the pilots had positive momentum, 2.1% had negative momentum and 80.6% had no momentum.

Scott McCready, director of image systems at International Data Corp. in Framingham, Mass., and a principal at Avante Technology, Inc., believes that the whole idea of pilots is flawed. "Pilots show people are wasting money and should be fired," he says.

For an imaging project to work, he advises, a company must commit to something major. "Who ever bought a PC before buying their mainframe?" he asks.

According to McCready, outright failures represent only a tiny percentage of production-level imaging projects. An IDC study of 225 production sites found problems at only 14% of the sites, and only 4% of those had been significantly affected.

Furthermore, McCready says, failures, when they do happen, are usually not attributable to strictly technical problems, but instead result from users "trying to automate something they couldn't really describe."

Probably the best-known failure to date happened at the California secretary of state's office, which installed a $4 million Filenet Corp. system in March 1989 to improve management of commercial filings.

"Our contract was for an integrated computing and imaging system . . . and that, I think, was the crux of the problem," says Assistant Secretary of State Jerry Hill, who believes Filenet did not have a sufficiently powerful server to support his application at the time.

Hill explains that the system, with its one server and 29 workstations, went into production on April 5, 1989, but "we were never able to process a day's work in a day. The best we were able to do was 30% of the incoming volume."

With businesses in the state screaming about delays and a looming two-month backlog of work, Hill decided in late May 1989 to remove the imaging system and return to the semiautomated batch mainframe system he'd had before.

To catch up, he had to hire 250 people on a round-the-clock schedule. That October, the state said Filenet was in default of its contract. Filenet and the state are in negotiations over the contract, Hill says.

A Filenet spokesman maintains that the fault lies with the secretary of state's office, that it was the customer's inability to support and train its staff and its lack of backup computer facilities that led to the difficulties.

Significantly, Hill still wants an imaging system. With the right system in place, he says, the 10- to 14-day turnaround time of the existing batch-entry system could be cut to 48 hours.

The secretary of state's office has completed a new imaging feasibility study. This time, however, it will specify that proposals must include plans for links with the existing mainframe database. "We want to look at imaging as a peripheral part of the system for filing and retrieval of documents, rather than as a stand-

Continued on page 90

Randy Lyhus

Who gets custody?
Continued from page 89

Technologies, a division of DMR Group, Inc. in Wellesley, Mass., places capacity planning high on the list of reasons for IS involvement with any imaging project. Someone technically knowlegeable has to stay on top of increases in volume that could tax existing communications systems beyond their capabilities. "The potential strain on a network could be critical," he says.

According to Novinger, even when the IS department is not responsible for the way an imaging system is used, the user department relies on IS for successful planning and implementation. If IS can accept the role of consultant, the departments should be able to arrive at an amicable balance of responsibility between them.

At American Airlines, Jayne Metz, the AAdvantage customer service department's system administrator, works closely with a technical support engineer assigned to the department from its IS support group. She handles day-to-day problems such as what to do if the images aren't clear or if response time is slow. The support engineer takes care of problems involving software programming. Together, they coordinate communication between the user department and IS for planning purposes.

Metz sees IS playing a greater role as more technologies are integrated into the imaging system. "We hope to add bar-code and fax capabilities by the first quarter of 1991," she says. "We can't do it without our SCS staff to help plan and implement."

At Houston Lighting and Power's Nuclear Division, IS is involved in looking into advanced capabilities such as linking the imaging system to computer-aided design systems or using it to replace direct-access storage devices as a storage device.

The imaging system is run by records management, the same department that was responsible for archiving records before the imaging system arrived. IS becomes involved if there are technical issues to be addressed, such as adding a new workstation to the local-area network or upgrading software.

There is also another player with some say about how the system is used, notes Julie LeBlanc, manager of systems development. That extra presence is the government, which dictates, through federal and state regulations, what must be documented and how long some documents must be retained.

It doesn't matter whether the scanner is located in the mail room, the data center or the business unit, and it doesn't matter to which department the operator reports. What matters, Sullivan says, is that the different departments work together from the outset to determine how to fit the imaging system to the company's business requirements. ●

Weisel is a free-lance writer based in Framingham, Mass.

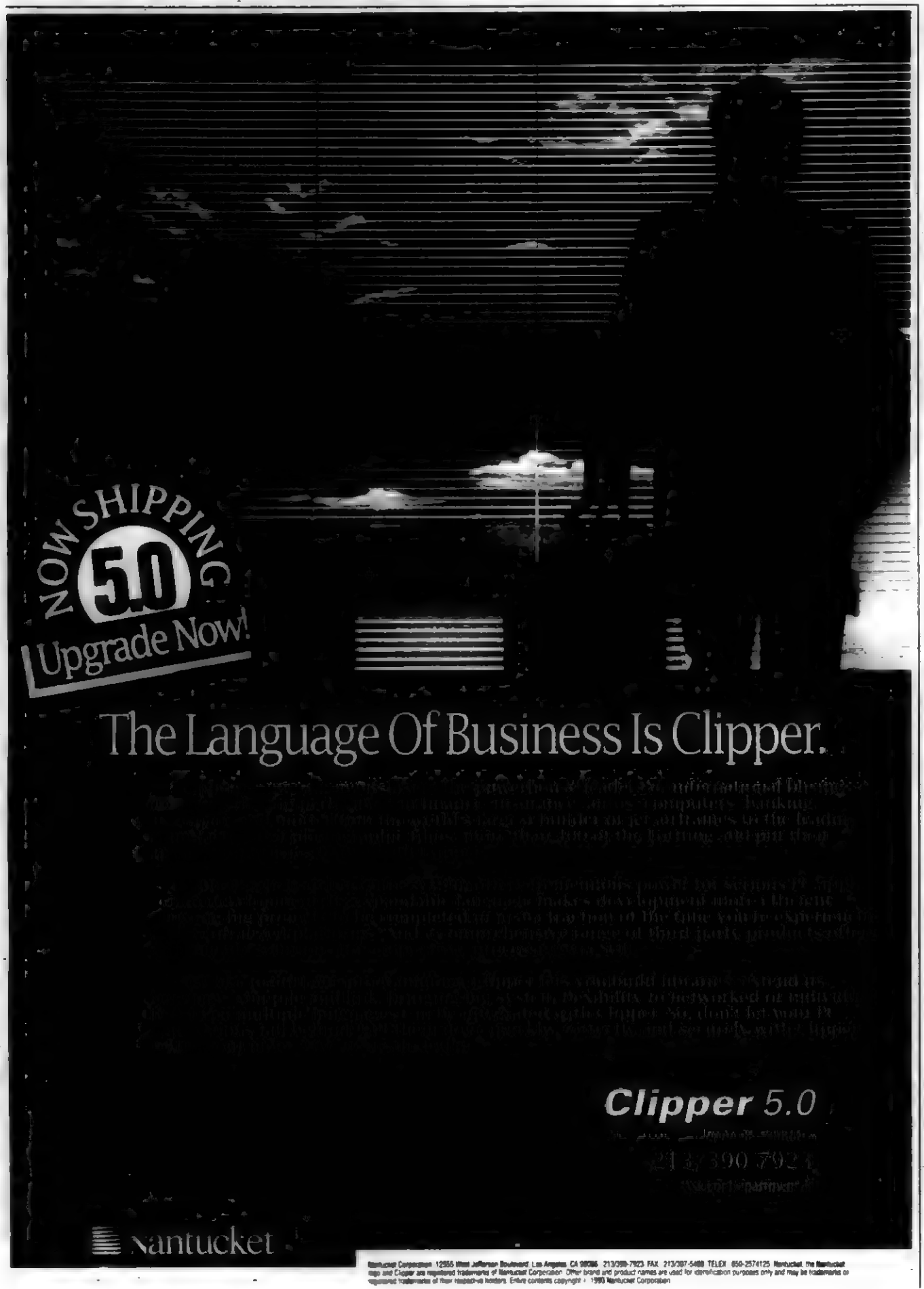
Some turn back
Continued from page 89

alone, integrated approach," he says. Filenet will not be precluded from bidding, he adds.

If Filenet lost a round in California, it won one in Garden City, N.J., where Avis Rent-a-Car System, Inc. encountered problems with its first imaging vendor.

The company, which is now testing a Filenet application, originally contracted with IBM business partner Image Business Systems (IBS) in New York for a system to process insurance claims against drivers who damage Avis vehicles. The problem, according to Steve Adams, Avis' vice-president of data processing services, was that the core system was forthcoming, but the application software was not. IBS, he says, "could not own up to developing software [for the application]."

Terms such as success and failure can also have different meanings, depending on who is making the judgment. For example, is a system that takes four or five minutes to locate a form from an optical disc jukebox a failure? "We'd classify something that slow a disaster," McCready says, "but the users might not." ●



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U.S. Sprint's Sitzman *says imaging increased efficiency and allowed service centers to be consolidated*

Paper

Continued from page 81

improvement.

USAA is planning to add the technology to its property and casualty claims operation sometime in 1992. That Image Plus system, Plesums says, will support 3,000 to 4,500 users and include color photos and the digitization of telephone conversations to speed and improve customer service.

Although neither investments nor paybacks are always as dramatic as those at Sprint and USAA, most companies that have installed imaging systems have based their purchases on paybacks of between one and three years.

Those are fairly average payback timeframes no matter what scale you are working on, says Mary Rhodes, a senior analyst at New Science Associates, Inc. in Southport, Conn., adding that most of the systems in place today are, in fact, departmental implementations of single-vendor offerings.

Other experienced users of imaging systems, such as Paul McKinnon, senior vice-president at the Bank of New England in Boston, say companies have to be realistic about payback schedules and that cost justification is not always a one-shot deal. "If you're looking for an immediate payback, it won't be there," he says. His bank installed a $1.3 million imaging system to handle its lockbox (business deposits) accounts in 1983 and justified the purchase with a 40-month payback period.

"We had to cost justify then and [have done so] several times since," McKinnon says. Among other things, he says, rechecking the numbers helped to confirm that the bank's direction on imaging was still clear.

There are a number of reasons why such caution is warranted. Most of the companies interviewed for this article say they needed at least some outside help to set up their systems, which, almost without exception, incorporated products from a number of vendors. Most also say they have found a lack of readily available, sophisticated software.

Room to grow

Furthermore, as some users can attest from experience, planning and cost justification does not always guarantee a smooth road to success with an imaging system. Systems have to be selected with a careful eye to the future.

Gordon Bloom, vice-president of MIS at Roadway Package System, Inc., in Pittsburgh, knows all about that. The imaging system, which the small-package pickup and delivery company installed in May to handle service documents, such as proof-of-delivery records, is already having trouble keeping up with the rapidly increasing volume of business.

Bloom will not say whose system he is using — only that it utilizes personal computers as workstations and has interfaces to Roadway's mainframe. He also doesn't want to talk about how much the company paid. Bloom is, however, willing to go on the record with an optimistic prediction: "The system will pay for itself in better customer service and reduced manpower requirements once we get past our current problems."

The imaging software, written specifically for Roadway's applications by a systems integrator, can work, Bloom says. "It is just a matter of understanding the technology and the application and getting the right equipment in place to handle it."

Neal Steitzer, senior project manager at J. C. Penney Life Insurance, a subsidiary of J. C. Penney Co., in Plano, Texas, is also something of an expert on the need to plan for growth in imaging systems. He installed a Filenet system with 20 workstations in June for the company's credit insurance line. Payback on the system, which is tied into an IBM mainframe, is expected after 37 months.

During that payback period, Steitzer says, 12 additional workstations will probably be added to the system. And, he adds, as business volume goes up, so will Penney's investment in imaging.

According to Steitzer, the major benefit of the system is cost avoidance: "As we increase our business, we won't have to add much additional staff." That, he explains, is an important point for a business that has grown from its first customer in 1987 to 1.2 million customers in 1989.

Avoiding extra staffing costs was also a large part of the justification for purchasing a Wang Laboratories, Inc. imaging system at the Secretary of State's office in Delaware. In this case the object was to minimize worker overtime. The outlay required to obtain those savings turned out to be higher than anticipated.

The snag came in the initial phase of implementation — the conversion process. Converting existing files to the imaging system accounted for nearly half the final cost of the $2.2 million imaging system, says Jeff Lewis, assistant secretary of state in Delaware. The cost of printing microfilm and fiche reports and then scanning some 3 million documents back into the imaging system was $1 million.

Unfortunately, it's not uncommon for companies to be blindsided by the cost and labor involved in document conversion.

The reality was also a lot bigger than expected for Pennsylvania Power & Light, which installed a Filenet system in March to manage engineering diagrams and documents in its nuclear records department. "We were hoping we could load the system with backfiles without adding manpower," says Deborah DeWalt, coordinator, nuclear records systems and procedures. "But we were forcing our people to work twice as hard."

The solution, according to DeWalt, was to add a second shift for the scanning operation.

The state of Delaware didn't do its own conversion. It hired a subcontractor, Alpha Systems in Huntington Valley, Pa., to handle the work.

Despite the costly start, projected savings still look good, according to Lewis. The department, which handles more than $200 million in corporation filings annually for the state, hopes to save $100,000 per year in employee overtime, thanks to the management reports the system can generate.

"Every morning I get reports, by priority item and by employee," Lewis says, adding that this information will allow him to manage his department's workload far better. The promise of better staff utilization was a big factor in the allure of imaging systems for Chemical Bank in New York, says Finance Vice-President William Lohmann. The bank made a modest investment of $200,000 to $300,000 in Wang imaging hardware and a work-flow manager developed by Computron Technologies Corp. in Rutherford, N.J., and Lohmann says he expects it will likely pay for itself in 1½ years.

Because Chemical Bank was already using Wang Office for electronic mail and word processing in its finance division, it helped bring down the cost of imaging, Lohmann says: "I had a piece of equipment that I would need for imaging in-house already." Computron Technologies Corp. was brought in to develop the imaging work-flow manager and developed the input and routing screens and statistical reports so users can locate any document at any time.

"The typical system's lifecycle is five years," Lohmann says, but he expects that when the system is in place at the bank, it will be able to migrate toward any standards that are developed in imaging.

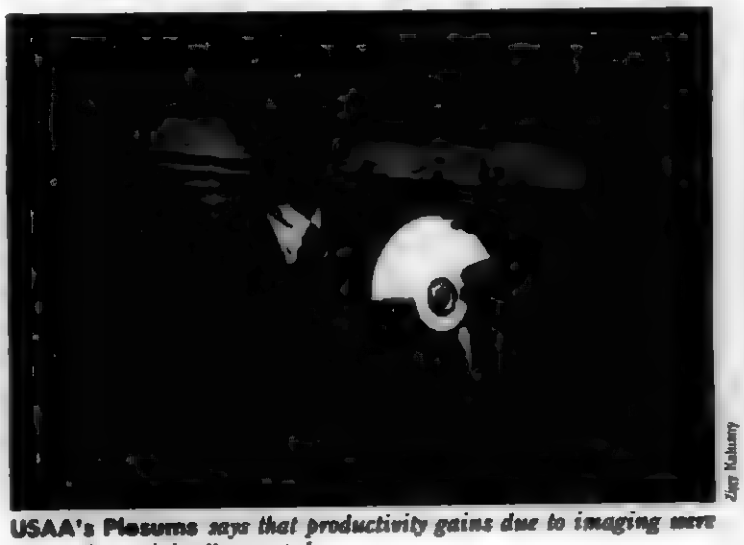
Migration ability is also very imporant to Steve Quattrocchi, senior assistant treasurer at Stone & Webster Engineering in Boston, a subsidiary of Stone & Webster, Inc. The system, put in place for Stone & Webster by integrator Data Image of Glastonbury, Conn., links optical imaging systems from Data Image and Dicore International, Inc. with the company's IBM 3090 mainframe and has the ability to grow with future applications, he says.

According to Marcia Ellis, a principle analyst at Stone & Webster, the current imaging system, which went on-line earlier this year, utilizes two types of optical technology. One is the more traditional imaging system used for scanning and storing paper. "But we also have an optical system for storage of computer output — data that is taken from reports and stored directly onto optical," she says. The benefit of this, she says, is that the information can be put into the system without ever having to be put in paper form.

In the future, what Quattrocchi has in mind is electronic image retrieval from remote terminals. "That will require different hardware at the other end — it won't be just a mainframe terminal at the other end, it will be a personal computer-type terminal tied to the mainframe with special software."

That kind of prior planning is always a good idea, but it is particularly so for imaging systems, which are not a fast build. In most instances, it takes at least a year to bring a full-scale imaging plan to fruition. ●

Imaging remains, for the most part, a rich man's technology, although it appears to be changing

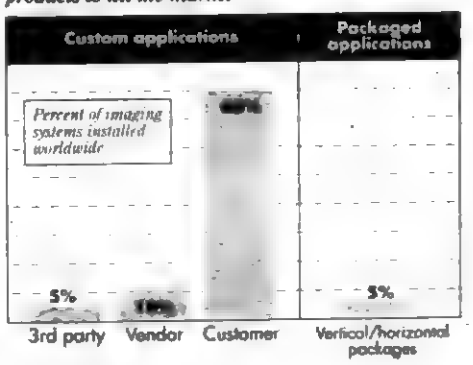


Zoya Kakuway

USAA's Plesums *says that productivity gains due to imaging were higher than originally expected*

Homegrown

Companies are developing their own imaging applications rather than waiting for packaged products to hit the market



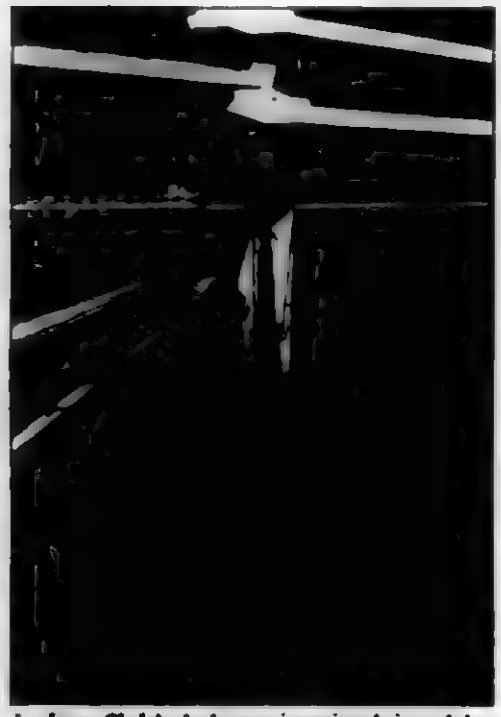
Source: Nolan Norton & Co. Sample size: 200

Other places, other uses

Image processing is by no means a U.S. or even a North American phenomenon. UK and Western European companies are using the technology aggressively. In Asia, Japan is very heavily invested, although observers say most systems there are very basic. Below are a few glimpses into other parts of the imaging-developed world.

Scott Rutherford/Blackstar

Fujita says *a magazine article led him to the supplier of a system to manage 2 million customer records at Japan Telecom*



Jockey Club's Lai *says imaging brings labor savings, reduced storage and peace of mind*

The Royal Hong Kong Jockey Club
by STEFANIE MCCANN

There's no guarantee that your horse will win, but when you place a bet at the Royal Hong Kong Jockey Club these days, you can be assured of speed, accuracy and security.

This elite club, one of Hong Kong's largest employers, handles $5.4 billion in bets each year, using Wang's Integrated Image System (WIIS), based on a Wang 7010 microprocessor.

The system, installed in 1988, is used primarily for signature verification and bet tracking.

The Jockey Club used to rely on record cards, which were stored in large mechanical-assisted file cabinets. "By placing these cards into an imaging system, we no longer have the problem of misfiled cards, damaged cards or space problems," says Daniel Lai, information systems operations manager.

Installing the Wang system cost the club $600,000, and Lai says it has paid for itself in labor savings, reduced storage and security. Customers are better served because fewer people "have access to the system when retrieving signatures," he says.

The most difficult implementation problem the club encountered was the conversion of 500,000 card file accounts to image files. Now, however, all club staffers have to do is press a button to come up with signature cards and customer information.

In the future, the club is hoping to integrate imaging with data processing so that other records, such as payroll and personnel files, can be stored or retrieved with equal ease.

McCann is a *Computerworld* editorial assistant.

Japan Telecom Co.
by YASUKO YOSHIMI

Deregulation of the telecommunications industry in Japan five years ago has brought about fierce competition for new subscribers there. To survive, long-distance carriers need to be able to manage massive swelling in customer records. That's why Japan Telecom Co. turned to Eastman Kodak Co. 18 months ago for a system that helps it to manage 2 million accounts.

Yuzuru Fujita, manager of the information systems group at Japan Telecom, read about Meji Insurance Co.'s use of the Kodak Information Management System (KIMS) imaging system in a Japanese communications magazine and knew it was what he needed.

The need to replace the existing system of hard-copy files had been clear for some time, Fujita says, but he was unsure whether to purchase a system based on microfilm or optical disc. Reading about KIMS made the choice easier: Because the system works with optical disc or microfilm, Fujita was able to choose microfilm without closing his options.

Japan Telecom purchased KIMS in May 1989 for $1.74 million; $357,000 was for the software license alone. Its components include Kodak's Film library and retrieval/reviewing terminal, a RIM-2000 microfilmer, two NEC PC-9801 personal computers, a Digital Equipment Corp. Microvax 3900 minicomputer equipped with a magnetic disk drive, six Vaxstation 3100 image workstations and four laser printers, each connected to four MS-3300 controllers.

The system went on-line in July 1989 and is networked via Ethernet across three floors. Two particularly noteworthy features, according to Fujita, are the system's ability to work with Japanese kanji and its use of bar coding for data entry.

The time savings are significant, Fujita says: The microfilmer can read 200 bar-coded application forms per minute and produce 100 microfilm duplicates — a process that manually takes at least one minute per application. Before the system was installed, customer service personnel needed 10 to 20 minutes to find hard copies of check account information; now it takes 60 seconds to retrieve information on-screen.

Next March, Japan Telecom will launch a self-developed electronic mail system that will allow remote offices to access the main database.

Yoshimi is a Tokyo-based free-lance writer.

Total-CFP (France)
by RAYMOND BOULT

The days when oil exploration teams could plant pipes in the ground and watch oil bubble out are long gone. Today, oil companies expend much effort analyzing geophysical data to help locate pools of oil, which are more and more frequently found in remote locations.

At Paris-based oil company Total-CFP, the process has not been as ponderous as it could be: The firm uses a customized imaging system to help process and digitize the geophysical data collected through satellite photographs. That data is in turn used to enhance exploration maps.

The system, dubbed Ideals, was created for Total-CFP by Intergraph and was installed in 1985. It utilizes a DEC VAX 785 host, supporting five Intergraph workstations. Its home at the oil company is the topography and cartography department, which produces documents and maps relating to petroleum exploration.

There are three stages to Total's image preparation procedure: Radiometric processing, which allows satellite image enhancement on a pixel-by-pixel basis; geometric rectification which allows the three-dimensional effect of the image to be fit to a 2-D map; and multiple image composition by means of mosaic techniques and image-based management.

Each image is stored in a raster file in the image database. The mosaic technique consists of extracting and merging image subsets from each file to create a composite image that can be used as map background.

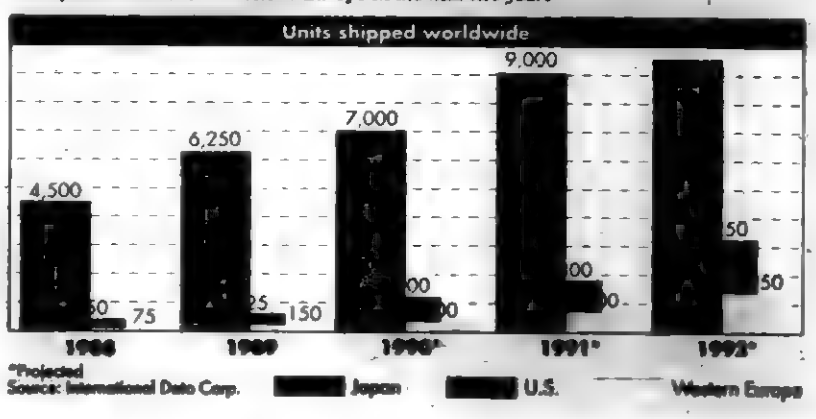
The time involved in processing this much complex data can be considerable. Total, however, has found a shortcut using image-based management. "We prepare several images of reasonable size, which are prerectified to cover the whole area of interest," says topography engineer Jean-Francois Dervieux. "Each time a map is requested, it is just a matter of calling back the pieces involved and merging them together to produce the final document."

The system's benefits encompass various phases of exploration, including assessment of possible drilling sites prior to bidding logistics evaluation and selection of drilling method.

Boult covers European business and technology issues from Paris.

Portraits of three markets

Japan now claims a commanding share of image system shipments, but most orders will come from the U.S. and Western Europe in the next two years



Ken Rutherford/Blackstar

WAYS AND MEANS

First the goal, then the gear

by GREGORY VAN BUREN

Evaluating document imaging systems is a little like trying to find the best restaurant in Paris. There are so many choices, and so much depends on what you are looking for in a meal, or a system.

Imaging systems can be used for a variety of purposes. To begin with, there are four pivotal applications, which may be of interest to potential users in any industry. These are:

- Storage and retrieval, which is a basic function in all imaging systems.
- Work-flow automation, which promises enormous rewards but requires extra effort to accomplish.
- Full-text retrieval, a special option that appeals to select prospects.
- Office automation applications, which integrate imaging into broad information processing schemes.

Document storage and retrieval is a primary imaging application. In its most rudimentary form, digital image storage and retrieval replaces paper- or film-based systems. Such applications offer an inexpensive, compact way to archive information and provide fast access to it. Increased accuracy in fetching records is another benefit.

Storage and retrieval configurations run the gamut from stand-alone personal computers accessing thousands of images to host-based systems accessing millions. All imaging vendors provide basic store-and-retrieve functions. The most important variable to investigate is speed, according to users who have been through the selection process. Significant differences also exist in the amount of flexibility allowed by various products. Some allow you to change fields and set up your own processes for accessing images. Others set up these processes in advance, making alteration more difficult.

Some vendors are very particularly oriented toward storage applications. These are usually firms with heritages in paper and film records management such as Tab Products Co. and Bell & Howell Co. The main cluster of customers for these vendors would be companies trying to solve acute record management problems.

Work-flow applications enhance basic imaging systems by facilitating control over work processes. Beyond storing and retrieving images, work-flow software automates the flow of documents from one processing step to the next, typically eliminating many processing stages and streamlining others.

John B. Woody

The leading vendor of work process applications has been Filenet Corp., developer of a high-level language for this purpose called Workflo. A number of other vendors provide good building blocks, but these are usually general-purpose tools adapted for development of work process automation applications. This is a rapidly developing area, however, and many vendors are learning lessons from Filenet's success. A good example of how far the idea has spread is Viewstar Corp., a vendor working at the personal computer level, which promotes the work process automation capabilities of its imaging software for networked PCs.

The greatest benefits of imaging systems come from improvements in work processes

Full-text retrieval is a burgeoning image application. The chief advantage of full-text retrieval is that a user can locate documents based on any word rather than relying solely on key words in an index.

Furthermore, some installations that didn't initially incorporate full-text capability are adding it now, as price/performance improvements in components make the economics more compelling.

Micro Dynamics Ltd. has been a prominent vendor of imaging systems that include text search capabilities. Between one-fifth and one-quarter of imaging system vendors now offer full-text

Continued on page 98

Imaging Systems Integrators

NAME, CITY, STATE	NUMBER OF PROJECTS COMPLETED	INDUSTRY SPECIALIZATION	SYSTEM EXPERTISE	GEOGRAPHIC COVERAGE	VENDOR RELATIONSHIPS AND/OR PRODUCT PREFERENCES
American Management Systems, Inc. Arlington, Va.	25	Government, financial services, transportation	Large-scale document processing systems	Worldwide	No VAR/OEM relationships. Work with all major vendors, including IBM, Filenet, Wang, Laserdata, etc.
Andersen Consulting Chicago, Ill.	100	Airlines and hospitality, aerospace and defense, manufacturing, utilities, healthcare, government, financial services, telecom industry group	Document storage and retrieval systems, work group automation, professional workstations, engineering document management	Worldwide	VAR for Filenet, Hewlett-Packard, Sun Microsystems
Bell Atlantic Systems Integration Arlington, Va.	Not provided	Finance	Network integration of wholesale lockbox operation	Nationwide	VAR for Kodak 9917-IPS Image Processing System; however, concentration is on the applications and on finding hardware, software, and network components appropriate for business needs
Datalmage, Inc. Glastonbury, Conn.	37	Financial services, insurance (including title insurance companies), manufacturing	Financial services support, library, loss management, medical records, electronic funds transfer	Conn., Fla., Mass., Minn., N.H., N.J., N.Y., Ohio, R.I., Japan	Emphasize open architecture-based solutions which are built on a personal computer platform and typically networked with the customers mainframe. Work with Sony's optical discs, jukeboxes, digital data storage drives, tape based on DAT technology. Tandem Computer's optical Archival and Retrieval System
Electronic Data Systems Corp. Dallas, Texas	50	Manufacturing, healthcare, state and local government, transportation, utilities	All kinds and sizes of systems. High volume, distributed technologies. Multiplatform, vendor-independent, open architecture systems, integrated with information management systems	U.S., UK, Ireland, France, Singapore	No VAR/OEM relationships. Work with multiple vendor relationships at two levels: component/device manufacturers and software vendors and major manufacturers, including Apple, Apollo, DEC, Hewlett-Packard, IBM, Sun
Ernst & Young New York, N.Y.	6	Healthcare, insurance, manufacturing, pharmaceutical, finance	Ranges from mainframe image processing systems software to micro LAN-based systems	Nationwide	No VAR/OEM relationships. Service is both client-focused and independent
Genesis Imaging Technologies, Inc. Valley Forge, Pa.	16	Telephony, federal government, pharmaceutical & chemical, financial services	Technical libraries, laboratory records, records management	Nationwide	Relationships with Sun Microsystems, Sony, Calera, Fujitsu. Emphasize Unix based, open systems
Grumman Infoconversion Woodbury, NY	25	Pharmaceutical, healthcare, financial services, state and local government, manufacturing	Client/server, open architecture systems with Unix servers	Nationwide	Relationships with Cygnet, Hewlett-Packard, Plexus Software, Sun Microsystems, Wyse and others. Use standards-based products. Focus on Plexus XDP as base platform
Litton/Integrated Automation Alameda, Calif.	45	Aerospace, financial services, manufacturing, process, transportation	Technical documentation storage, retrieval and distribution systems, and transaction processing systems; large systems with high transaction rates	Worldwide	Business relationships with a number of vendors supplying products for the incorporation into systems as needed
Science Applications International Corp. San Diego, Calif.	7	Pharmaceutical, insurance, financial services, state and local government, federal government, petrochemical, education	Document storage and retrieval system, work-flow management systems. Primary applications are office automation in elaboratory automation. Client/server architecture on LAN using PC server. Also can use IBM 370, 390 mainframes running VM operating system. Also utilizes MS-DOS-based PCS for workstations	U.S., Europe, Canada	Relationships with IBM, Unisys. Utilize own product platform, called Mosaic, a Windows-based workstation, customizable at low cost and capable of utilizing PCs and VM host computers as servers on a token-ring local-area network.
TRW Financial Systems, Inc. Berkeley, Calif.	25	Banking, financial services, insurance, government	Payment processing, check processing, sales draft processing, insurance application/underwriting, credit applications, customer service	Worldwide	Have many VAR/OEM relationships, but none are exclusive suppliers. Utilize the components that are best suited for the specific project

First the goal

Continued from page 96

capability. This is a recent development, however, and often accomplished through alliances. Several imaging vendors, such as Laserdata, are now enhancing their imaging systems by linking to full-text retrieval software, such as Information Dimension, Inc.'s Basis Plus.

Some businesses are beginning to view imaging as an extension of office automation rather than a stand-alone application. This entails treating images as another data type that is combined with text, tables, graphics and sometimes even voice or video.

While integrating images into a broad office automation architecture is complicated, this strategy can offer significant efficiencies. Among other things, it can eliminate the need for redundant information systems components — one set for images and another for other kinds of data. Although full integration of imaging and office automation is not yet common, it is expected to be widespread by the year 2000.

Wang Laboratories, Inc. and Digital Equipment Corp. are pacesetters in the broad field of vendors moving toward integrated imaging. In 1987, Wang introduced its WIIS system — based on existing data processing and office automation products — its VS minicomputers, Pace database and Wang Office.

Wang has gone on to announce support for a broad set of nonproprietary systems. DEC's Decimage strategy adds image capability to its existing platforms. Decimage fits into the company's Compound Document Architecture and is also compatible with Decwindows and All-In-1 software.

Industry applications

Imaging requirements can also vary with the business needs of particular industries. There are many market segments of this type that demand their own specialized imaging applications, but three of the key ones are government, financial services and engineering.

Government demand for imaging is diverse but stems largely from the need to provide faster access to information at a more reasonable cost. An imaging system that will deliver birth certificates to the public in 15 minutes, rather than two to three hours, is representative of such need.

Almost all imaging vendors aim to sell government applications. Systems integrators such as Advanced Technology, Inc. and EDS are especially significant suppliers to government agencies.

Financial services firms, including banks and insurers, have been leading adopters of imaging technology. Some firms are using imaging as a competitive weapon. For example, Bankers Trust has found that demonstrating the capabilities of its imaging system to prospective customers helps it garner mortgage trust business. More typically, financial service firms use imaging to process checks, control retirement plans and review loan applications.

Unisys Corp. is one of the many suppliers focusing on this industry. Citicorp is an example of a sophisticated user that has become an imaging vendor targeting its own turf.

A myriad of uses

Engineering imaging applications address demands of firms in aerospace, the automotive industry, electronics, information processing, architecture, construction, utilities and so on. To satisfy engineering customer needs, imaging applications handle large-size drawings as well as related drawings in office formats.

For technically oriented businesses, image management systems support myriad departments. In addition, users in core user departments often call for interfaces to related applications such as technical illustration, manufacturing resource planning and shop floor controls. Consequently, technical support requirements for engineering applications can be quite considerable.

Benefits are also considerable. One engineering installation using imaging actually cut drawing retrieval time from three weeks to five minutes, freed up manpower and saved hundreds of thousands of dollars by reducing the length of production line shutdowns.

A host of imaging vendors actively pursue the engineering segment. Some, such as Access Corp. and Alpharel, Inc., focus on delivering specialized software to engineering customers. Others, such as Integrated Automation, Inc. and ABB Engineering Automation, concentrate their efforts more heavily on providing integration services. Meanwhile, many vendors that offer office-oriented systems also configure special solutions for engineering customers.

In addition to evaluating system possibilities from an application standpoint, buyers in any sector must consider other technology issues.

Many decide first on a corporate strategy for relational database management and then select an imaging system that supports their choice. Others find that graphical user interfaces are paramount and look for applications running under Microsoft Corp.'s Windows or whatever environment they prefer. Because of the importance of tailoring systems, support for applications development tools such as applications frameworks and high-level work-flow languages can also be critical. ●

Van Buren is a consultant in the electronics, information and telecommunications systems unit of Arthur D. Little, Inc. in Cambridge, Mass.

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Image Business Systems
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Imara Research Corp.
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Imnet Corp.
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Image Management Systems, Software (45)
$250,000

Laserdata, Inc.
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Laserview (1,000+)
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Metafile Information Systems, Inc.
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Metaview (225)
$3,400

Micro Dynamics Ltd.
(301) 589-6300
Micro Dynamics Mars (135)
$70,000+

Minolta Corp., Document Imaging Systems Division
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MI³MS 1000
(18 end-user, 44 dealer)
$35,000+

Optika Imaging Systems, Inc.
(805) 520-9060
Image Filer (52)
$32,000-$80,000 (4-user)

TAB Products Co.
(415) 852-2400
Laser Optic Filing System Series 2000, 2000SD/2000LD/2000 EXS (300+)
$50,000-$400,000

Viewstar Corp.
(415) 841-8565
Viewstar (40+)
$50,000-$75,000 (system software), $1,000-$2,500 (per user)

Wang Laboratories, Inc.
(508) 459-5000
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$495 per user (Cabinet application), $1,600 (Image Development Toolkit)

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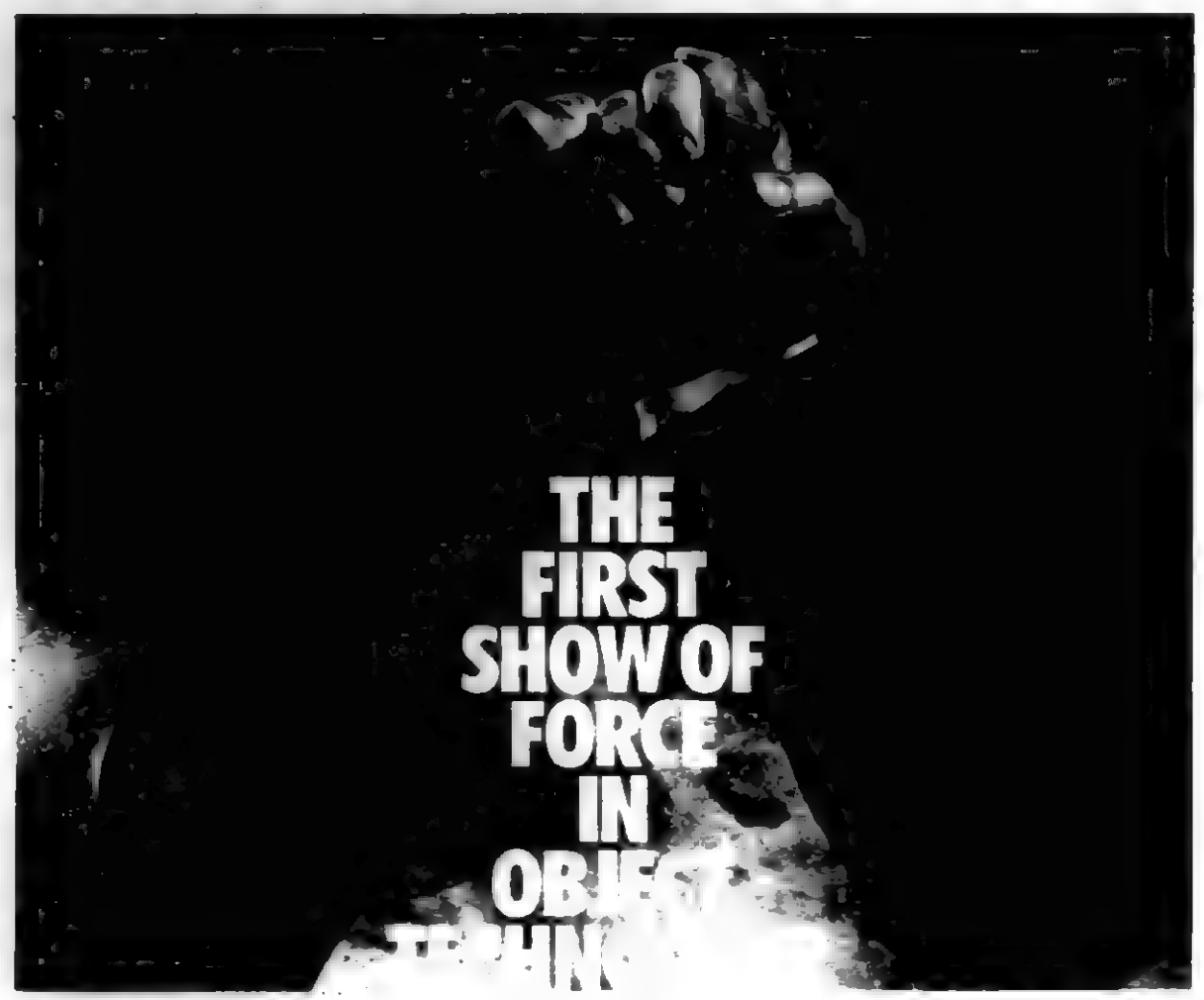

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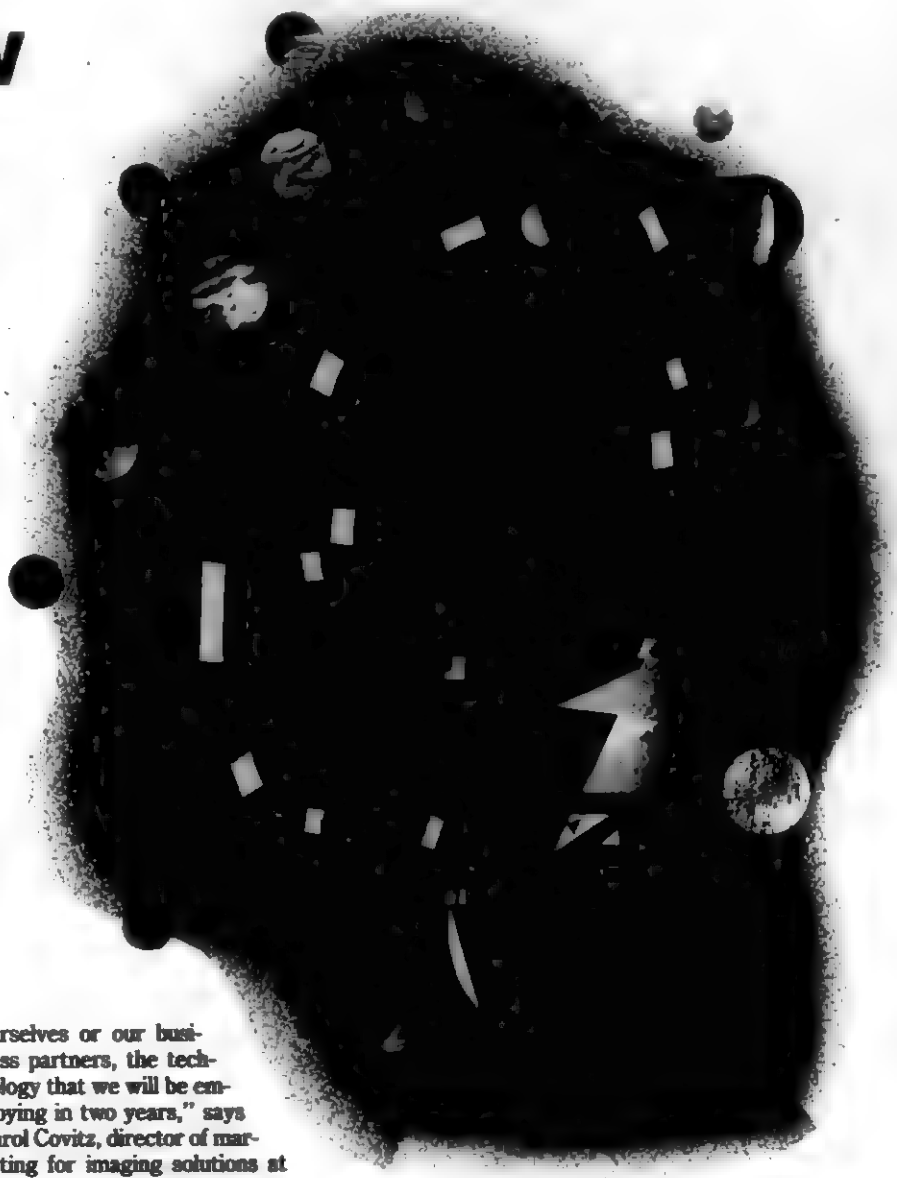
THE LONG VIEW

Between now and ideal



Terry Allen

by ELLIS BOOKER
and ALAN J. RYAN

Ask experienced electronic imaging users and their systems vendors to speculate on the future of this emerging technology, and you'll frequently hear the same themes: Price/performance will improve in scanners; optical storage systems and applications software will make the technology more desirable; and imaging systems will stretch to embrace more territory — both in terms of actual distance covered and areas of use.

Right now, most imaging systems are departmental configurations, targeted at narrowly defined tasks. Over the next few years, more sites will likely install enterprisewide systems to perform more jobs on a larger scale and to satisfy larger goals.

"At the outset, imaging was largely at the department level, and the approach to getting started was 'bottom up,' " says Sam Altiero, a partner at Andersen Consulting in New York.

"Now, many of our clients who focused on specific applications are looking at sharing information across the enterprise" to speed the time it takes to process information and to help improve customer service, Altiero says.

A twofold concern for these customers, Altiero says, is figuring out which applications are worthy of such a cross-enterprise imaging commitment and then ensuring that what they do in year one will be compatible with what they do in year five.

Ensuring forward compatibility is a tall order when a technology is still taking shape, however, and that is very much the case with imaging. While vendors of imaging products say that the technology is at a maturity level that enables it to be used effectively, most agree that imaging today only skims the surface of its potential.

"We know today that we can't picture, for ourselves or our business partners, the technology that we will be employing in two years," says Carol Covitz, director of marketing for imaging solutions at Bull HN Informations Systems, Inc. in Billerica, Mass. "Changes are still happening at a rapid rate," Covitz explains.

Changes are also happening on several levels. The component parts of imaging systems are evolving, and that evolution is already starting to suggest new ways of using other kinds of existing technology.

In addition, it is clear that advances in a number of other technologies will have a major impact over the next few years on how imaging systems are viewed and used.

Here is some of what's happening or may happen in terms of imaging system components:

- Improvements in lasers, the drivers for optical technology, will increase the storage capacity of optical discs 30% to 60% over the next three years, predicts Jim Moore, general manager of the Write-Once Optical Division at Sony Computer Peripheral Products Co.
- Median access times for optical discs are expected to decrease. Today, average access times for rewritable optical discs are about 95 msec; write-once discs are rated at approximately 150 msec. Within the next several years, those numbers could drop to 75 msec and 40 msec, respectively, says Stan Halper, president of New York's Teletrak Advanced Systems, Inc.
- The reading ability of optical character recognition (OCR) technology will improve drastically. The current generation of OCR equipment can recognize machine-imprinted information in certain fonts. In the future, it will handle any font, and work is proceeding toward giving OCR the ability to read handwritten copy.
- Artificial intelligence will become a feature of imaging systems and is expected to help alleviate the need to scan documents in their entirety. Imaging systems will be able to capture and transmit particular data deemed relevant for the job by the user. "In many situations, it's the information, not the document, that needs to be captured."

Most vendors agree that imaging today only skims the surface of its potential

One instance of the potential of imaging technology to alter other technologies can be found in the area of electronic data interchange (EDI).

"Imaging takes EDI the next step," says Thomas E. Turner, director of U.S. sales operations at Wang Laboratories, Inc. For example, he says, EDI now delivers a purchase order for a part "but not the diagram or drawing of that item." Imaging can

Investment by industry: 1993

Most industries will more than quintuple their investments in electronic imaging. For some, the increase will approach tenfold

Industry	Sales*	Units
Banking	$917.7	992
Government	$675.5	1,105
Insurance/other financial	$565.3	769
Discrete and process manufacturing	$469.6	874
Communication/utilities	$185	331
Business services	$169.6	356
Transportation	$168.7	270
Retail/wholesale	$82	158
Health care	$30.1	93

Source: International Data Corp. * in millions

Between now and ideal

Continued from page 103

change that, allowing users to incorporate graphical information into the EDI document.

Part of the natural progression for imaging, says Bob Castle, vice-president of marketing at Filenet Corp. in Costa Mesa, Calif., will be the integration of the technology with other technologies. But equally important will be improvements in other technologies that will have an impact on imaging.

One area where new developments are expected to have substantial impact on the evolution of imaging systems is application development — specifically, nonproprietary computer-aided software engineering (CASE) and object-oriented programming tools that encompass imaging. Such products will make the creation of image-enabled applications easier and faster.

These software tools are even more critical, some believe, than the imaging technology itself. "You won't be talking about imaging next year; you will be talking about work-flow software," says Scott McCready, director of image systems at International Data Corp. in Framingham, Mass.

McCready says he believes there will be two levels of work-flow tools: one that is intended for programmers who are creating production applications and an ad hoc type for end users that will enable them to manage their own work flow in relation to others.

Today's imaging is largely focused on storage and retrieval, says Mary Rhodes, a senior analyst at New Science Associates, Inc. in Southport, Conn. As yet, there is not much emphasis on developing applications that incorporate imaging. However, that's the logical direction of this burgeoning technology.

"We will see more software development efforts that focus on imaging not only for building hooks to existing applications but new developments centered around imaging," Rhodes says. Areas of likely concentration, she suggests, will include transaction processing, decision-support and basic work-flow software applications.

Advances in communications technologies will also play a leading role in the future of imaging.

Because a typical image document requires 10 to 20 times more data than a textual document, the network bandwidth requirements of imaging systems are high. Advances in high-speed local-area and public network communications technologies will eventually make widespread exchange viable. At that point, users will be able to send large, data-dense documents within their buildings and across the country at reasonable speeds.

Large-scale integration

Ultimately, images, voice recordings, graphics and "classical" data processing applications will come under the control of integrated computer systems.

"The challenge then will be managing all this information, harnessing these assets," declares Roger Sullivan, president of the Association for Information and Image Management and vice-president of image management systems at BIS CAP International, Inc., which is based in Norwell, Mass.

In this multimedia environment, Sullivan says, software will help in the decision-making process by packaging information, regardless of its form, and presenting it to users.

Common user interfaces will provide easy access to image data. "A user will click on a graph to see the raw data, or click on the name of a widget and see the widget or a CAD/CAM drawing of the widget."

Expectations and realities

One goal users share for imaging systems is that they will some day be able to pass data back and forth among different computer systems seamlessly.

Advances in communications technology will also play a leading role in the future of imaging

Today, there are some areas where vendors are agreeing on imaging standards — such as image compression. In other areas, such as optical disc sizes or the manner in which information is written to the discs, they continue to disagree.

Further sets of standards are expected to emerge in the next several years, according to the vendors. Until then, entrepreneurial companies and systems integrators will be able to open a potentially lucrative market by creating bridges between various systems.

Users anticipate that the price of imaging technology will drop. And indeed it will. Bull's Covitz says that by the end of 1992, prices of scanners and optical storage devices could drop by as much as 50%.

Still, while the individual component prices of imaging will come down, spending on imaging will no doubt climb, says Brian Reynolds, a senior manager at Lexington, Mass.-based Nolan Norton & Co., an information technology firm of KPMG Peat Marwick.

"Expenditures will go up because people will be moving from technological experimentation and pilots into more automation of the end-to-end business functions," Reynolds says. "Thus, the overall investment is going to go up dramatically." ●

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Papers will be reviewed by the Program Committee on February 23, 1991.

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Final camera-ready papers are to be returned to the AAAI office by April 5, 1991.

Review Criteria

Reviewers will evaluate papers along nine principal dimensions: significance, AI technology, innovation, use, payoff, deployment, maintenance, quality, and clarity. Papers should include technical details about the applications. Authors should try to quantify the development and deployment costs, as well as the benefits of the application.

Questions that will appear on the review form have been reproduced below. Authors should bear these questions in mind while writing their papers and use them to evaluate their papers before submission:

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Innovation: In what ways is the application innovative? Does it demonstrate a new technology? Does the application apply an existing technology to a new domain? Does it apply an existing technology to an old domain in an innovative way? Does the application demonstrate a novel integration of different technologies?

Use: How widely is the application being used? How often is it used?

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TECHNICAL HURDLES REMAIN

Although image processing technology is already producing significant benefits for many organizations, there are still a number of unresolved technical issues. These issues, which include the state of standards for imaging systems, constraints on use of current networks for image transmission, component limitations and even the chaotic condition of terminology, should be given careful consideration by an organization planning to adopt imaging on an ambitious scale

Language confusion and escalating complexities

by TERRY MENTA

Language development is a technical barrier that must be scaled if document imaging is to reach higher application plateaus

The diverse technologies that underpin document imaging have survived the high mortality rate associated with infancy, but that does not mean that they have achieved full maturity or that there aren't more challenges ahead.

These technologies have already given some proof of their ability to improve worker efficiency through the performance of document storage and retrieval functions. Now harder tasks are being set as companies try to integrate these technologies with others of long standing to create robust applications strategic to the enterprise.

At this level, the stakes are higher, and the technical issues are more complex.

The first — and possibly the highest — technical barrier that must be scaled if document imaging is to reach higher application plateaus is language development. Currently, we are working with an imprecise and confusing vocabulary that was born of a fledgling industry preoccupied with inducing a sustaining market base. It is difficult, if not impossible, to have a coherent discussion about either goals or the means to achieve them with so many indefinite definitions in use.

Trying to describe a range of endeavors that includes remote sensing, television and video, microphotography, machine vision, medical diagnostics, electronic publishing, design engineering and business information systems by using words or phrases that are as imprecise as "imaging" or even "electronic imaging" clouds communication. Both technical issues and business considerations vary substantially across these disparate endeavors.

The first step toward clearing up the current confusion has to be the creation and enforcement of delimiting terminology. A good start is to refer to imaging for business purposes as "document image processing."

The term "document" is broad enough to encompass the range of document sizes from bank checks to oversized engineering drawings, yet precise enough to dispose of numerous technical

Continued on page 106

Limitations of existing networks

by SIDHU BANERJEE

Many large user organizations, particularly in health care, financial services and insurance, are now pondering migration of their small, trial imaging applications to enterprisewide production systems. As they consider imaging within the context of enterprise networks, organizations face a number of hurdles relating to architecture, protocol and transmission speed that must be understood and overcome in order to deploy systems that will serve users today and in the future.

Imaging requires consistently high networkwide speeds and throughput, consistent data access and transmission techniques, workstation receptivity to high-speed data and interoperable communications protocols and standards. The traditional corporate enterprise network is not sufficiently flexible to support these requirements.

Current enterprise networks are mainframe-centered, and access to host resources is typically provided through low- to medium-speed (4.8K bit/sec. to 56K bit/sec.) access lines. This architecture limits the speed and effectiveness of imaging applications in two ways:

- Stand-alone imaging applications are limited by server and disk access bottlenecks.
- In a hierarchical network with low-speed access, the low-speed lines and host-based switching represent points of greater congestion that unacceptably limit network performance.

The traditional corporate enterprise network is not sufficiently flexible to support imaging's requirements

Transitional stages

Right now, the enterprise network is in flux because of pressures from technologies including imaging, local-area networks and client/server computing. These technologies exert pressures for higher throughput, "flatter" topologies and increased support for diverse and currently unstandardized protocols.

Enterprise networks being developed today typically consist of a wide-area backbone, high-speed metropolitan-area subnetworks, associated campus networks and local end-user and processor networks.

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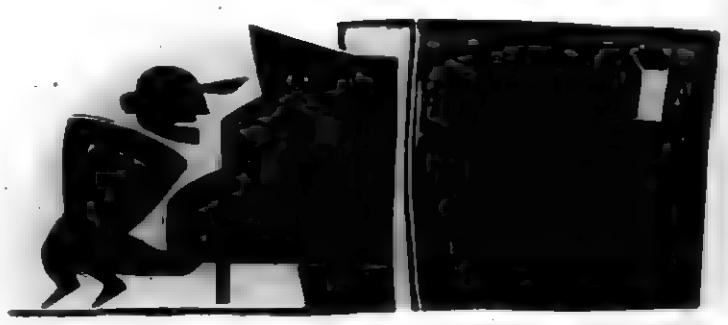
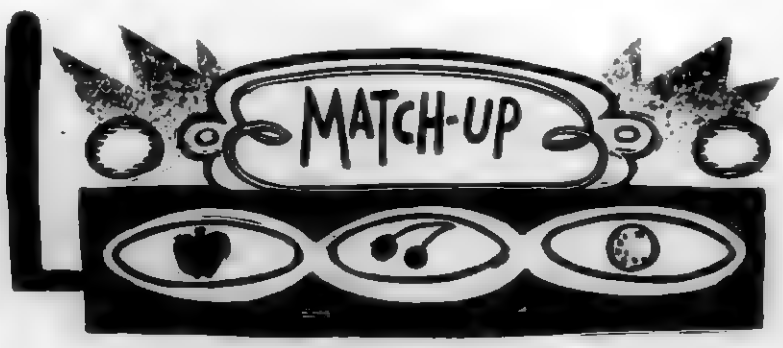




Robert de Michiel

Language confusion

Continued from page 105

issues that are irrelevant in the document context. The addition of the term "processing" helps to differentiate storage and retrieval and work-flow applications from document creation in electronic publishing.

A second and equally necessary step at this point is to approach evaluation of the technology from the perspective of business requirements.

The best starting place is with a grouping of business processes into application sets. For example, it is possible to think of document image processing in terms of five application groupings. The first grouping, document storage and retrieval, is relatively well understood at this stage. The following are other less-known application sets that are just starting to emerge:

- Work in progress (work flow).
- Image-aided data entry.
- Item processing.
- Knowledge-worker augmentation.

In terms of complexity, cost and benefit, each succeeding application set in the list builds on the preceding one. Each application set boundary marks a new price point and a new level of technical risk. Even more important, for cost/benefit analyses of each application, alternatives exist against which document image processing technology can be weighed.

Work in progress. To save time and distribute the high cost of devices over more steps in the process, externally generated documents should be converted into images as soon as they enter the mailroom. Attempting this does make risks associated with the document and index capture subsystem more significant, however. Here, throughput is less a function of per-document scan time than of paper movement and cognition time for determining and entering index values.

Furthermore, although a number of vendors would argue the point, network capacity has to be a consideration if the intention is to have work-in-progress applications share the same network with ongoing office automation applications.

Network protocols and operating systems can be fine-tuned to achieve throughput approaching their physical bandwidth. However, when it is necessary to move a mixture of small, character-encoded files and large image files, a network's effective throughput is greatly diminished.

The complexity and cost involved in using document image processing technologies for work-in-progress applications make it worthwhile to at least consider some competing alternatives.

In situations in which transactions originate from actual or potential trading partners, electronic data interchange is a worthy alternative. Also, where individuals are initiating transactions from predictable locales, they might as easily and as cost-effectively be provided with either personal computers and intelligent forms software or point-of-entry devices that are designed to accept and process handwritten input.

Still another alternative may emerge when the fourth generation of facsimile machines becomes available. That would be to decentralize data capture by having the originator digitize the document using a fax machine.

Image-aided data entry. There are several likely purposes for which a company may consider image-aided data entry. Two of the more common ones are replacement of keystroking as the input step for an existing database-dependent application and reduction of the cost of indexing document images in a storage and retrieval or work-in-progress application.

In the first case, the main technical consideration is the percentage of characters that can be correctly identified without encountering the risk of false substitution by the recognition engine. In some recent cases, the break-even point for use of image-aided character recognition with keyboard intervention as a backup has been as low as a 60% recognition success rate.

Where image-aided data entry is intended to reduce the cost of indexing, the technical issues are not only error probability but processing load and the delay imposed by the recognition step.

Item processing. Item or transaction processing introduces two complicating factors: The volume of incoming documents is incredibly high, and each document has a time value. This means that, in addition to all the technical requirements needed for other types of applications, a document image processing system in this environment must be able to provide both extremely rapid paper movement and absolute system availability.

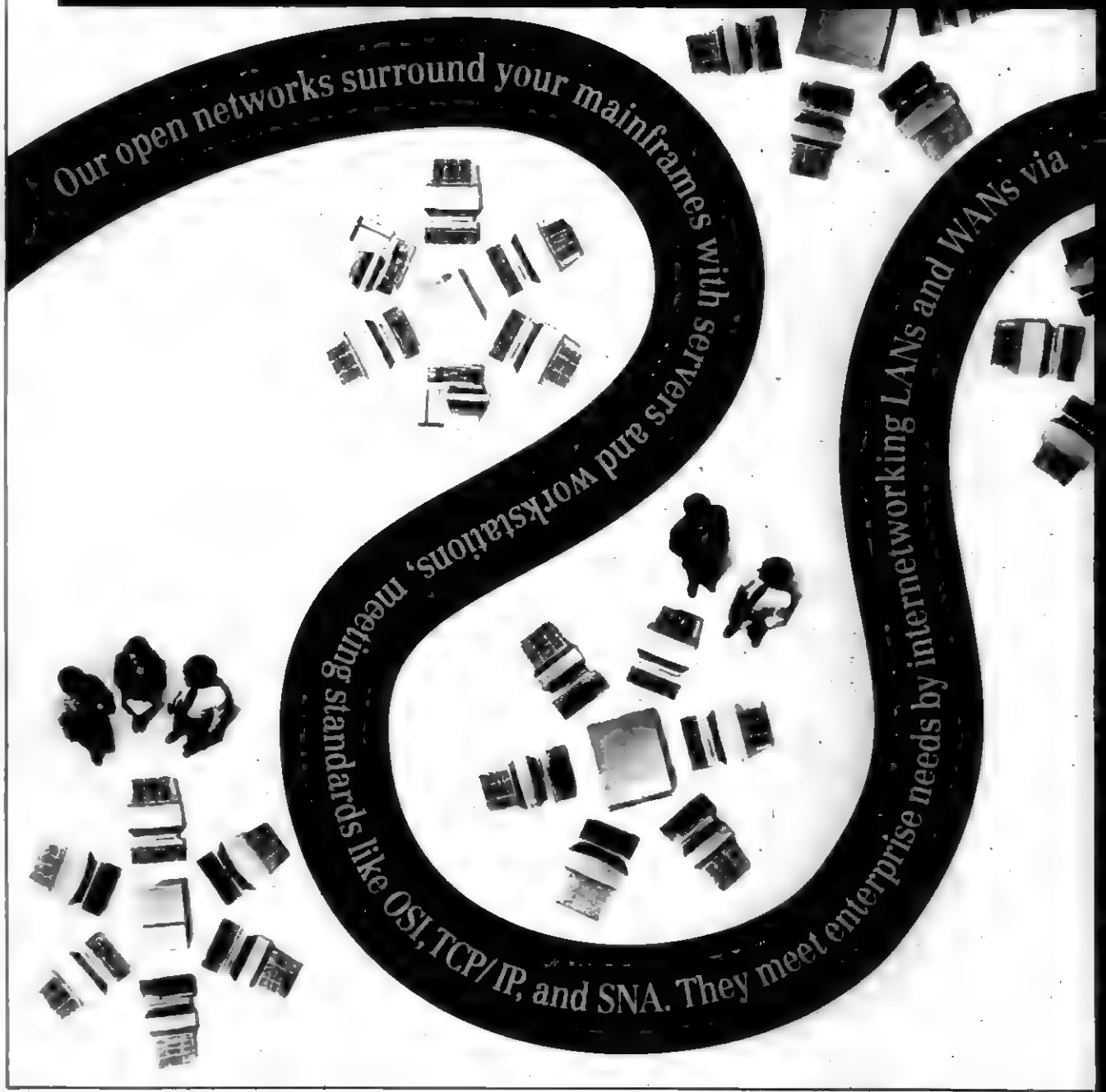
Knowledge-worker augmentation. It is at this level that document image processing and document publishing will intersect.

Although eagerly anticipated by potential users in fields such as litigation support, government policy formulation and medical research, this application of document imaging has not yet been achieved. The way it works, in theory, is that by mapping a document image to its character equivalent, the user could be provided with a sophisticated search path to information using "fuzzy logic."

Although some sophisticated retrieval mechanisms currently exist, none can be used with ease except by those acquainted with Boolean logic or the mysteries of hypertext stacks. ●

Menta is president of Opti-Menta, a consulting firm specializing in image and information resource management.

Networking from Unisys by tying it all together.



Limitations

Continued from page 105

This type of network also generally offers greater throughput and faster transmission technology so that imaging and other bandwidth-intensive applications can be supported. Even so, standards and technologies are in a fluid state. This means that users must work to fit the new technology into an enterprise network that is still evolving. It also means making sure that, in the process, they do not lock themselves into any undesired technological or communications bottlenecks.

To ensure that an imaging application will run with sufficient performance over large, highly utilized networks, planners must consider the size and magnitude of image files being transmitted and plan their choice of networking technologies accordingly.

LAN/campus limitations

Emerging LAN and campus-area technologies such as Fiber Distributed Data Interface (FDDI) provide the raw bandwidth necessary for multimegabit file transmission at subsecond rates. But established protocols such as Ethernet and token-ring are not as efficient at handling large files such as images.

Ethernet supports 10M bit/sec., but associated network management overhead, collisions and access contention can reduce the throughput for data by more than 50% in some circumstances. The average scanned paper document, at 50K to 100K bytes, may take upward of one second to transmit over a fully loaded Ethernet, and medical images or photographs of 2M to 5M bytes can take more than 45 seconds to transmit.

Token-ring networks have a greater overall speed at 16M bit/sec., but actual network throughput is also lower because of network overhead.

Bridging technology has improved markedly in recent years in response to demands for FDDI bridging of Ethernet and token-ring LAN traffic. However, current LAN bridges do not support high-speed bridging such as FDDI-to-FDDI, and all bridges introduce an element of network filtering and forwarding delay that must be considered when planning multi-LAN networks.

To support volume image traffic over a wide area, the backbone portion of the enterprise network requires at least T3 (45M bit/sec.) speeds. T3 technology, although currently available as a dedicated offering, is not as widely deployed as low-speed T1 technology, and T3 private network products, including T3 multiplexers, are still relatively new and expensive.

Emerging offerings, such as AT&T's Switched Multimegabit Data Services, promise to offer high-speed T3 and higher switched access to users in metropolitan environments. At present, however, users' options for high-speed wide-area transmission are limited and expensive.

• **Workstation capacity.** High-throughput transmissions can also become stalled at the workstation level, introducing delays in the process. Data transmissions over Ethernet and token-ring-attached workstations can be limited by interface cards, workstation hardware or application bottlenecks. The transmission of image files over higher bandwidth LANs such as FDDI is also limited by the lack of hardware that permits workstation-to-FDDI connectivity. Commercially available workstations do not have the capability today to directly interface to data at FDDI rates.

As workstation receptivity to higher bandwidth networks improves, users will have a greater range of networking alternatives available from which to choose.

• **Proprietary imaging protocols.** Even with the bandwidth to provide timely connectivity of image resources, interoperability quickly becomes complex without a common imaging protocol.

CCITT Group III and Group IV protocols provide a lowest common denominator format for transmission and receipt of documents, but as the imaging field develops further, industry-standard protocols for financial services, health care and other industries will need to be addressed.

Until the future comes

While there are technical gaps that prevent an easy solution to the use of imaging in enterprise networks, interim solutions can be developed that prepare users for future functionality while providing desired capabilities today.

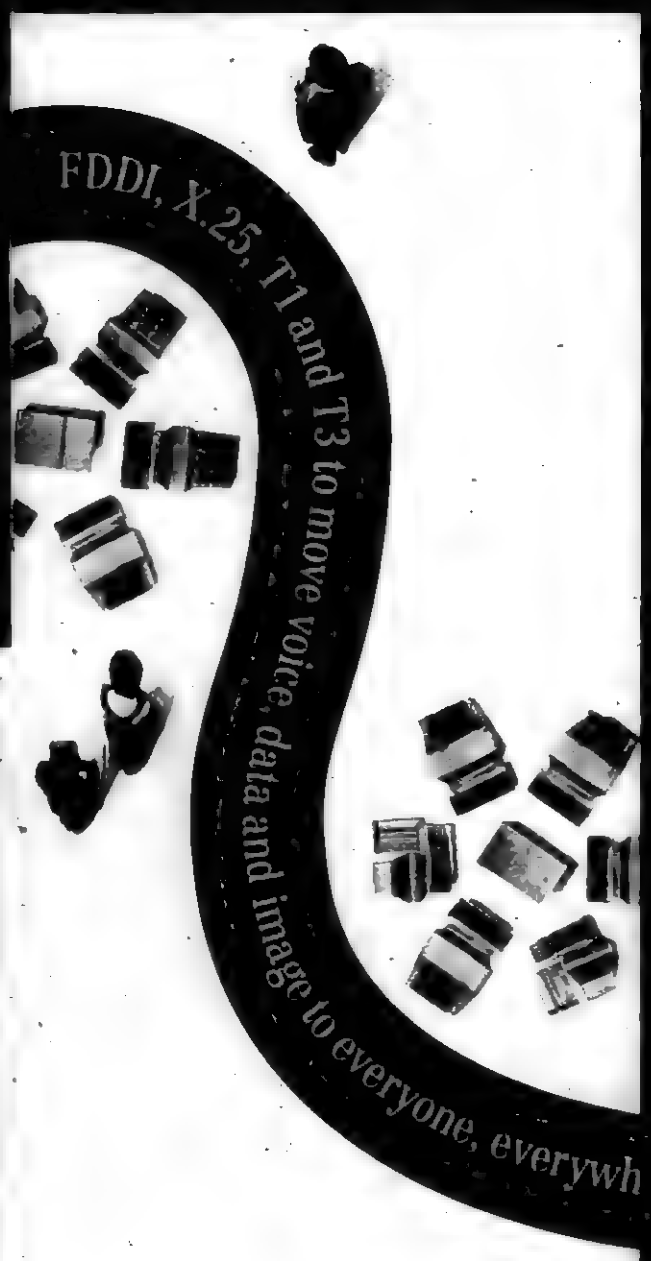
Where response times on the order of seconds are acceptable, high-capacity workstations and fast LANs and wide-area networks are not required. In many cases, it is sufficient to prepare for the faster technology by wiring high-speed fiber media today and using slower protocols and workstations until it is technically and economically feasible to upgrade.

The use of mass storage devices and high-speed LANs to store most locally required images reduces the need for the exchange of images across wide-area facilities, and batch updates of image files ensure the timeliness of information locally. Distributed client/server applications that provide both local access to image data and access to images across an enterprise network also minimize enterprise network activity and response times.

The hitch is that current implementations may not easily migrate to future standards. Careful planning is needed to ensure that what works today will also support tomorrow's requirements. •

Banerjee is a manager of the Network Strategies Practice at Ernst & Young in Vienna, Va. His areas of consulting expertise include enterprise network strategic planning, imaging technology and broadband technologies.

sets information free



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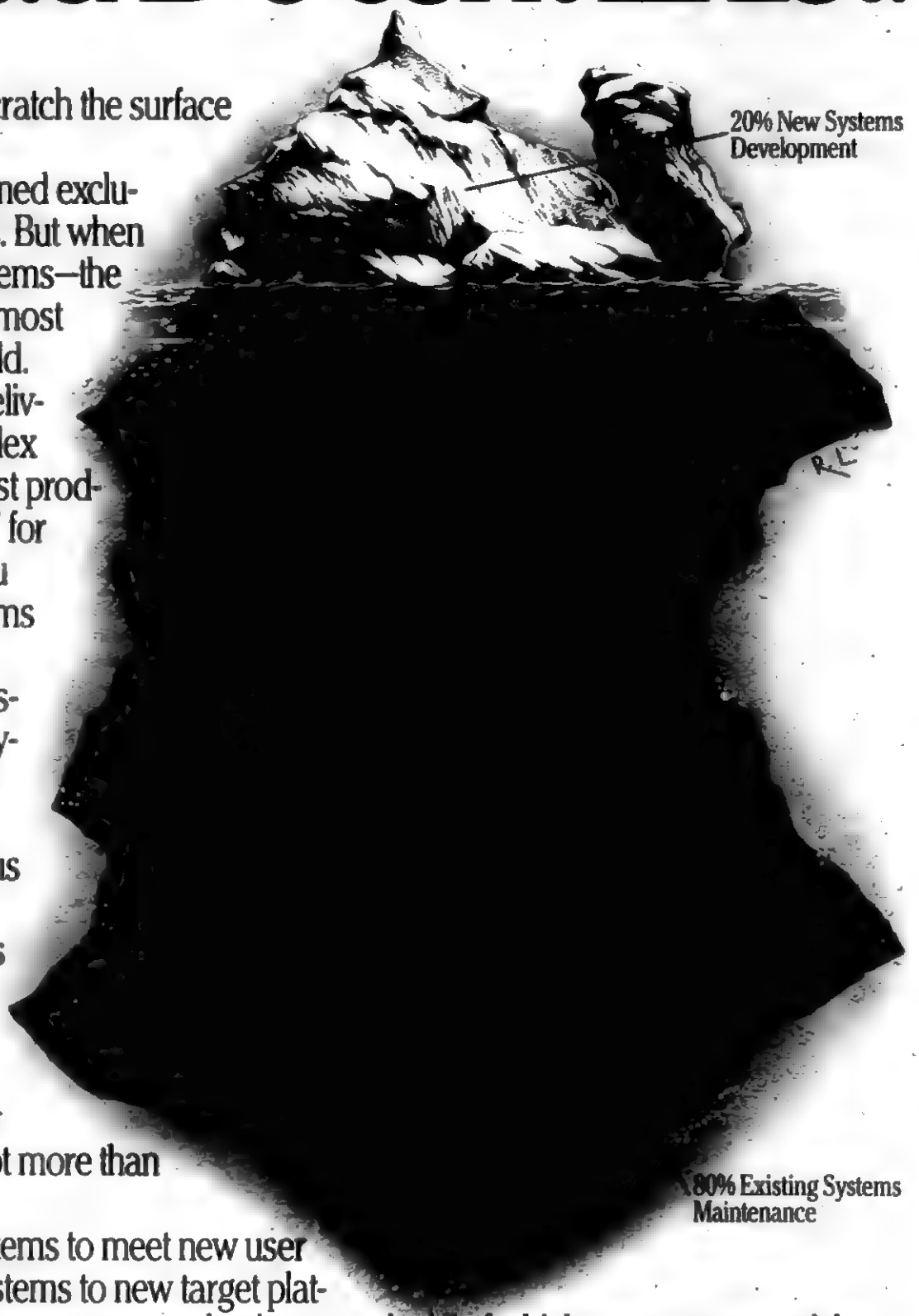

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INTEGRATION STRATEGIES

Group(ware) therapy: Tips for success

BY PAUL GILLIN
CW STAFF

Each day, the 650 employees of The Balcor Co. go to work in 275 locations around the country and begin chatting with each other as if they were right next door.

The conversations consist mostly of key clicks. Balcor employees are linked through an electronic mail network that can channel their discussions along preset lines, file their notes and comments automatically and even remind them when it's time to answer a question.

The key to the whole process is groupware, a small class of software products that takes common single-user functions — such as calendars, word processors, databases and notepads — and wraps sophisticated multiuser communications around them. The idea is that by building on thoughts and actions, the whole group will be better than the sum of its individual members.

"People are focused on producing action, not just sending information," says Stuart Bard, vice-president of office automation at Balcor, a real estate company based in Skokie, Ill. Because groupware forces users to define what they want to say, he adds, "we don't get the kind of unclear communication that leads to miscommunication."

Fans say that groupware's broad-based networking is an ideal fit in flat, decentralized structures.

"The changing culture has mandated [groupware] products," explains Craig Dupler, an automation manager at Boeing Aerospace Electronics in Seattle. Boeing Aerospace uses Higgins, a groupware product from Enable Software, Inc. "If you don't do something like Higgins, you won't be around tomorrow," Dupler says.

A small group

Unfortunately, Boeing and Balcor, which uses a groupware package called The Coordinator from Action Technologies, Inc. in Alameda, Calif., are part of a fairly small cadre of companies that have successfully implemented groupware. Groupware experts say more groupware projects fail than succeed because users frequently do not know how to implement technology that so dramatically affects established communication paths. "Successful groupware is a rare occurrence," says Gerald Michalski, a vice-president at New Science Associates, Inc., a market research firm located in Mountain View, Calif.

James Kaczman

A March 1990 MIT study of 25 groups found that people, not technology, presented the biggest problem.

"We sometimes saw well-designed tools not being used because of lack of group agreement or because the organization didn't support it," says Christine V. Bullen, assistant director of the Center for Information Systems Research at MIT and co-author of the paper with John L. Bennett.

Still, there's hope. Experts point to a number of critical success factors that potential users should consider if they want to get the most out of groupware:

• **Prepare the organization.** Installing groupware without getting the organization ready is a one-way ticket to failure, many agree. Most

Continued on page 110

Playing it safe in Peoria

Careful practices and branch integration keep Talman S&L afloat in trying times

INTEGRATING THE ORGANIZATION

Talman Home Savings and Loan Association

BY MICHAEL FITZGERALD
CW STAFF

The words "thrift" and "collapse" have become the Romeo and Juliet of finance — you can't think of one without the other. But despite the industry's crisis, some healthy financial institutions continue to look to the future and are even implementing major new systems.

A good example is Talman Home Savings and Loan Association in Chicago. Talman, a $6 billion thrift that was founded in 1922, continues to turn a profit despite the current S&L crisis because of careful management, according to analysts.

Talman is now 75% done with an enterprisewide, fully integrated network for its 51-branch operation in the Chicago metropolitan area and Peoria, Ill.

The thrift "is pretty conservatively run," says David Hochstim, equity analyst at Bear, Stearns & Co. in New York. "They don't take risks in lending, and I think they wouldn't take risks with systems."

Conservative does not mean timid, however. A mid-1980s restructuring of the S&L's business strategies prompted a simultaneous study of how information systems could better suppport the planned new business structure.

Now Talman's 85-member IS staff can "deliver to a single point access to disparate systems and storage media [containing information] for existing customers," says Jim Wegmann, Talman's Corporate EDP and Systems Division senior vice-president.

That single point of access is a mortgage specialist or a retail banking specialist who, using a personal computer, can access any customer file in any of Talman's systems.

Customers can also do several transactions themselves, such as account transfers, via Talman's automated teller machines (ATM). Wegmann says Talman intends to expand its ATM services, but the institution is still planning its offerings. These services will be offered through the coming year.

David Joel

Wegmann: *Bringing customer information to neighborhood banks*

Wegmann says he has put a lasting computing architecture in place that will allow Talman to avoid capital-intensive system makeovers.

The driving philosophy behind the IS effort, Wegmann says, keeps with the thrift's unofficial credo: "The only way to survive in the banking world is to aggressively be the best, least-cost provider of the best quality services — that's how you win."

The thrift's networking push has required the IS department to gut its former systems effort. In place at the

Continued on page 116

Continued from page 109

importantly, the people who will be using the system should be predisposed toward working with each other in the first place.

"Companies that have a collaborative attitude will be able to get loads of power out of groupware," New Science's Michalski says.

"Companies that are very competitive internally have a hard time because groupware brings a lot of [negative] stuff to the surface," he adds.

Richardson, Texas-based MCI Telecommunications Corp., a subsidiary of MCI Communications Corp., has long been a heavy user of E-mail and saw groupware tools as a natural extension, according to Brian Plackis, a local-area network manager at MCI. The company says it expects to have 300 users of Lotus Development Corp.'s Notes groupware system by the end of the year.

"Your company needs to realize that there's a need to communicate with other parts of the organization and that the tools it has aren't good enough," Plackis says.

Bullen's *MIT report cites people problems*

Getting that commitment isn't easy, especially when it comes to changing the way people work together. "The technology has to sit in a group where people are all committed to using it, and that's hard to find even with single-user applications," according to George Goldsmith, president of The Human Interface Group, Inc. a consulting firm in Wethersfield, Conn.

"It's clear that unless there's a group commitment to doing this, it's not going to help very much," MIT's Bullen says.

• **Find a pilot project.** Groupware works best when it's implemented in stages. This is true for two reasons: The technology is easier to manage in small groups, and it works best when groups are oriented toward a specific project. In fact, some of the technology's greatest strengths — project management, meeting schedulers and E-mail aids that specify desired actions — are most helpful when everyone is pulling toward a common goal.

Boeing Aerospace installed Higgins when it created a business group to engineer a piece of a defense project. As a result, people didn't come in with a lot of preconceptions about how they should interact, Dupler says. The company also tested Higgins in a five-person group for more than a month before expanding its horizons.

Balcor initially installed The Coordinator in its acquisitions area to improve communications among a widely dispersed group. Now, the company has 650 users in 275 locations.

• **Get top management commitment.** That's important in any computerization

Group effects

Groupware can have unanticipated effects on an organization, especially in the way people deal with each other away from their terminals, users say.

"You're talking about changing the way people interact, affecting the power relationships and making explicit very implicit relationships," says Gerald Michalski, a vice-president at consultancy New Science Associates.

Groupware forces people to focus their statements and be more specific about the actions they expect in return. That tends to expose the laggards in an organization who refuse to participate.

"It makes apparent the already existing communication breakdowns between people, including how people often don't communicate with each other," says Stuart Bard, vice-president of office automation at The Balcor Co., a real estate firm based in Skokie, Ill. "It becomes very clear who tends not to make strong commitments, because they never make requests or offers over the system."

Some users say meetings go more smoothly after an organization gains groupware experience. "When a lot of work is done outside the face-to-face exchange, the meetings can then focus on outcomes," says Christine V. Bullen, assistant director of the Center for Information Systems Research at MIT and co-author of a recent paper on groupware.

Users in general say groupware doesn't cut down on the amount of human interaction in their organization but does reduce the time they spend chasing down co-workers.

"It doesn't replace the telephone, but it makes sure people get the message," says Craig Dupler, an automation manager at Boeing Aerospace Electronics in Seattle. "That whole class of communications is done much more effectively by the system."

PAUL GILLIN

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This application heralds the introduction of a new concept in network management called the NYNEX ALLINK Network Management Solution. It will become a seamless, integrated network

project but absolutely essential with groupware, users say. In most successful groupware installations, it's an executive who decides to install the package in the first place, they add. Once the boss is on line, others follow. Boeing Aerospace, for example, disseminated its Higgins groupware system to 550 people on a defense project team by making its first user the manager of the program.

"We had to make it that executive's No. 1 tool," Dupler says. "Once everybody recognized that this was how their boss was talking to them, [resistance] went away."

At MCI, management was already predisposed toward electronic communications and has pushed the Notes experiment through. Plackis draws an analogy to the organiztion's MCI Mail, which is currently one of the busiest internal E-mail systems in the world. "It wasn't till the executives said, 'we're only going to use MCI Mail to communicate' that people began to use it in force," according to Plackis.

Michalski: *Successful groupware is rare*

• **Don't try to change the process.** You don't want to subject users to an upheaval in their work routine or a blitz of complex new technology, experts say. If the groupware product doesn't mimic the way people already operate, they probably won't learn it.

"People report the most value from tools that parallel their non-electronic activities," according to Bullen's MIT report.

The most popular groupware feature by far is E-mail, because it improves on an existing communciation process that and virtually eliminates missed communications, according to the MIT study. With The Coordinator, "I spend more time planning and managing and discussing and less time playing phone tag," Bard says.

Calendaring, on the other hand, is a mixed bag. Higgins users like the fact that the entire product is oriented around a calendar function. "It really has the right idea," Dupler says. Even so, calendaring can still turn out to be a dud in organizations that aren't as personal computer-intensive.

"Most people have a calendar they carry with them, a calendar on a machine and a group calendar where people can book other people's time," Goldsmith says.

Faced juggling multiple calendars, some users will simply opt not to use the electronic version at all, he adds.

Computer conferencing, which links messages together by topic, is one of the most potentially valuable but least used groupware functions, according to Bullen. The reason is that the process of linking messages often isn't intuitive, so users simply skip the option and revert back to using E-mail.

Groupware experts say you shouldn't worry if all the packaged functions aren't used. A single feature that improves communication could more than justify the expense.

• **Resist the urge to cost-justify.** The benefits of groupware lie in clearer communication, quicker decision-making and faster responses, users say.

Unfortunately, these qualities don't translate well into dollars and cents. That's a problem for software that can run into the tens of thousands of dollars before it shows any real productivity benefits.

Because the benefits are so difficult to quantify, experts say it is doubly important that users and managers sign off on groupware before the IS department goes shopping.

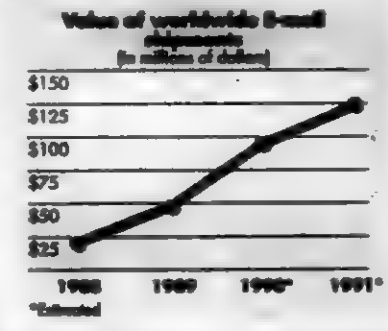
Benefits exist

However, the benefits are there. Users say groupware leads to clearer communication and faster turnaround time. By eliminating telephone tag, "there's an incremental time-savings that's spread over the whole organization," Dupler says. His company has been able to more than halve its secretarial support needs by cutting the need to take messages and manage schedules.

Westinghouse Trading Co., a user of Wang Laboratories, Inc.'s Freestyle imaging system, which has certain features for group document annotation and E-mail, has cut down on the time needed to process an order by reducing the amount of time that papers sit on users' desks. According to Operations Manager Harry Bolan, the cost justification isn't in reducing the cost of processing transactions, "it's in reducing the time. That gives me a competitive advantage, the kind that comes back to you in a lot of other ways." •

Check's in the mail

Electronic mail, which includes groupware applications, is expected to grow at a 21% clip over the next four years



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FYI.

St. Louis-based **McDonnell Douglas Systems Integration Co.** merged two business units. Reason: Both pursued similar markets. Communications Industry Systems and Built Environment Technologies were combined. New $120 million unit has 600 employees.

More Digital Equipment Corp. happenings:
- British retailer **W. H. Smith** and DEC have signed a five-year, $2.8 million outsourcing contract. DEC will supply and run the company's network.
- **Kapiti, Inc.**, UK-based supplier of trading room and wholesale banking systems, will integrate **Financial Information Systems Toolkit** with **Dectrade**, DEC's trading system platform.
- A $2.7 million campuswide fiber-optic DEC network was acquired by **Detroit Oakland University**. System will connect 16 buildings on campus.
- DEC also introduced **Decomni/VMS** network interface, implementation of Open Systems Interconnect Manufacturing Message Specification. Decomni/VMS lets VMS applications speak with various vendors' plant floor devices.

Tex/Con Oil & Gas Co. in Houston awarded Charlotte, N.C.-based **Network Computing Corp.** a 2½-year contract for a computing environment consisting of a high-speed digital T1 link between Charlotte and Houston.

Oracle Systems Corp. announced Preferred Systems Integrator Program. Part of U.S. sales and support organization, effort will focus on client/server integration. More than 46 resellers have joined program to date.

From **Metropolitan Fiber Systems** (MFS):
- New five-year lease with the **Chicago Board of Trade**, largest U.S. commodity exchange.
- **City of Dallas** inked 10-year franchise agreement. MFS will build, operate fiber-optic communications system to serve Dallas business customers and long-distance carriers.

Sales of **high-speed private network equipment** (T3 and higher) are expected to grow fifteenfold by 1995, according to recent study by **The Yankee Group**. Boston-based firm predicts sales will climb from $18.3 million in 1990 to $261 million in 1995. Yankee Group also predicts that customized carrier-based network offerings will become norm.

Network Peripherals, Inc. announced two network interface boards connecting individual workstations or servers to 100M bit/sec. Fiber Distributed Data Interface network.

Market Intelligence Research Corp. in Mountain View, Calif., reports:
- World office local-area network revenue to hit $27 billion by 1996, up from less than $2 billion in 1986. Two causes: Popularity of unshielded twisted-pair cable and need to connect different hardware, operating systems and communications protocols.
- Total market for IBM's **Systems Application Architecture** software pegged at $3.1 billion in 1990.

Hewlett-Packard Co. and **Pacer Software, Inc.** announced Apple Computer, Inc. Macintosh connectivity for HP 9000 Series 300 and 800 workstations and minicomputers with Apollo workstations.

Mentor Graphics Corp. and **Applied Microsystems Corp.** agreed to integrate development tools. Companies plan to integrate Applied Microsystems' EL series emulators and Mentor Graphics' Codelink computer-aided software engineering products.

Softech, Inc. in Waltham, Mass., software and systems integration provider, will acquire **Information Decisions, Inc.** in Grand Rapids, Mich. Privately owned IDI is systems integrator, independent value-added reseller of LAN products and services. Customers include Whirlpool Corp., Amway, Gerber Food Products, General Motors Corp. and Electronic Data Systems Corp. Terms not disclosed.

Telwatch, Inc. in Boulder, Colo., will develop interface between AT&T's Accumaster Integrator and Netexec intelligent network management system. Netexec to support AT&T's Unified Network Management Architecture, a blueprint for management and control of voice and data networks.

New report on open systems by **DMR Group** says standards-based architectures will prevail in 1990s. Most vendors base their product strategies on IBM's Systems Application Architecture and open systems.

Simware, Inc. became first connectivity software company to win government's **Canada Award for Business Excellence.** Ottawa-based Simware honored for **Splitsecond** software, which speeds data communications between mainframes and remote laptops and PCs.

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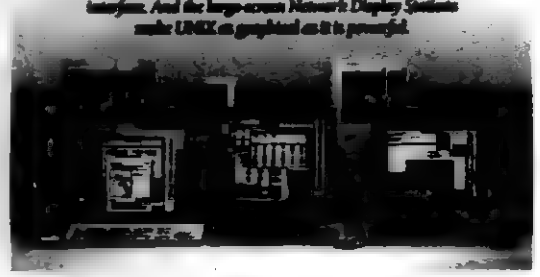

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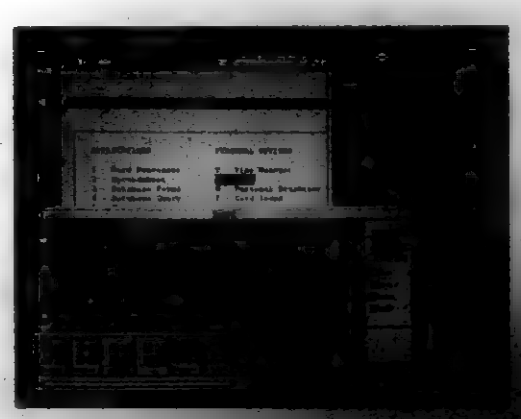

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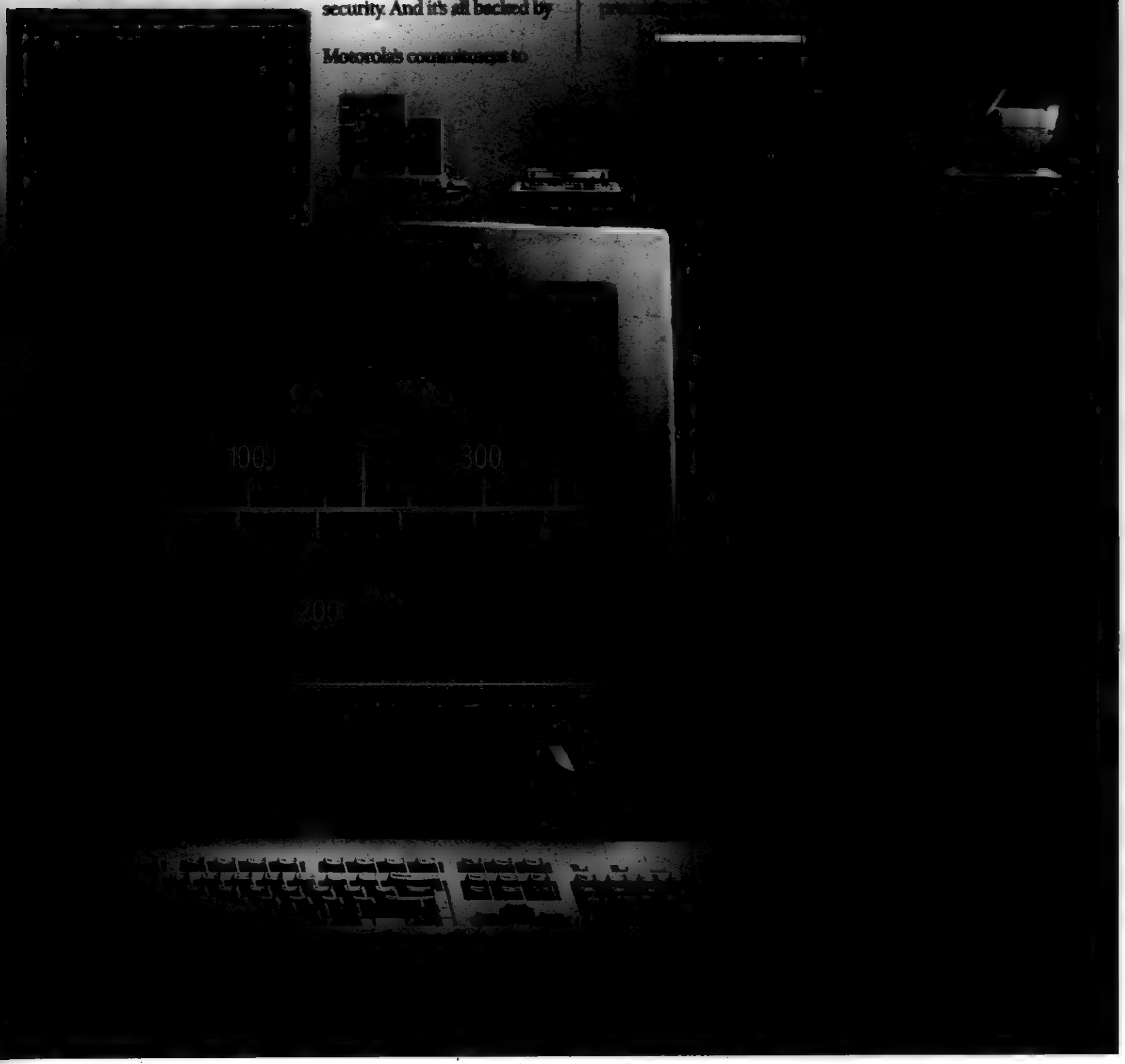

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Computer Group

Continued from page 109

start were four unintegrated batch-oriented service bureau systems, largely IBM 3033s and ISC Systems Corp. 8 Window products. The 3033s supported Talman's retail operations, and the 8 Window products supported teller activities and retail liability platform sales.

Talman also built a new data center within the Citicorp Information Resources (CIR) data center in Arlington Heights, Ill. CIR became Talman's back-office service bureau, and the thrift shut down its on-site data center and closed out contracts with four service bureaus.

Talman has negotiated a special relationship with CIR, wherein "we effectively share facilities costs, disaster recovery costs and administrative costs. But Talman maintains total control" of its applications, which run remotely at the Arlington Heights data center on an IBM 3084 QXC mainframe running MVS/XA under CICS, Wegmann says.

Close-up

Organization: Talman S&L.
Goal: Create an architecture that will avoid costly system makeovers.
Strategy: Establish a network connecting its 51-branch operation to give officials a single point of access for all customer files.
Payoff: Better customer service.

Wegmann and his team (which numbered as high as 240 at the project's peak) also reworked the telecommunications network, ripping out an asynchronous network to replace it with a full Systems Network Architecture bisynchronous architecture. The staff installed redundant T1 lines and built a switching facility to connect Talman to the data center and its branches. Each branch is connected to the system via a 9.6K bit/sec. leased line, which runs to a 56K bit/sec. concentration point and then to the T1 lines into the switching facility.

Within Talman and its branches, tellers and officers use NCR Corp. PCs based on the Intel Corp. 80286 and 80386 chips and using Micro Channel Architecture.

Wegmann says that installation of new hardware will give his systems future flexibility because the architecture is integrated both vertically and laterally. This means that customer information can be shared across business lines. It also means that sales and service business can be conducted in a branch while having full access to host-level systems.

Wegmann says he expects the system configuration will hold up well in the future, because it runs within a Systems Application Architecture-type environment, using the host mainframe as an information repository.

The 18-month shift away from the old system has been a boon, Wegmann notes.

"From a technology standpoint as well as a business standpoint, [the old system] was very constricted and actually damaged the efficient, cost-effective conduct of business," Wegmann says.

"What it basically boils down to is that [we've] restructured operations and systems support architecture to support a more robust sales culture," he says.

Better service from even the smallest branch office clearly increases the potential for happy customers. As for cost savings, Wegmann says, integrating all the systems will essentially pay for itself.

Change of this scope presents a risk for a corporation, and Wegmann is well aware of the consequences.

"If we blow it, Talman has to write off the cost of the mistake," he says.

"What it means . . . is that you'd damn well better understand . . . that the decision you make must be right the first time, because you will not have a chance for a second time," Wegmann says. •

Talman's tech traits

Talman's PCs are hooked into the mainframe via Motorola, Inc. 68040-based NCR Tower 400 and 600 servers running AT&T Unix System V, Release 3. Files are converted from DOS to Unix through NCR's Branch Integration System software bridge.

Talman is standardizing on OS/2 Presentation Manager and Microsoft Corp.'s Windows Version 3.0 on the desktop. It has started installing Windows 3.0 and Presentation Manager running under Microsoft's OS/2 Standard Edition on the administrative side of the operation and will move to IBM's OS/2 Extended Edition for its systems work, where Wegmann says the secured multitasking offered by OS/2 will be valuable.

The thrift is now beta-testing OS/2 Extended Edition Version 1.3 on its systems, and Wegmann says Talman will probably not finish switching to OS/2 until 1992.

Major application packages in use include Computer Associates International, Inc.'s Infopoint/SSI, which is used to track retail banking business and safe-deposit box business, deposit accounts, installment loans, teller activity and customer profitability, as well as its online customer information files. Talman also uses some McCormack & Dodge (now Dun & Bradstreet Software) financial packages.

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TYING IT TOGETHER

Jacklyn Popiul

How good is your image?

Records management has long been considered a poor relation of information systems. And to many businesses and government organizations, it still is.

But that's just not smart. Imaging is popping up all over the IS domain. In fact, some of the new electronic document systems can be so integrated with other information resources that users don't even know whether information is stored as data or a document image. The information appears on the screen — and only the software knows where its been.

The fact is, integrated imaging management needs IS respect. It's sad, but a negative approach to document-based information has kept files in the basement and many records management professionals out of the corner office.

The more complex electronic document management systems require a level of sophistication equal to that found in IS operations.

Companies must leave decision-making and cost approval for integrated imaging systems to the right people — those qualified by knowledge, not by title. Firms can't afford to rely on advice from IS people with little more understanding of the mechanics of the integrated imaging system than they have of its purpose.

In practice, this means that the imaging professional would report directly to the chief information officer or equivalent. In this structure, the following two things will happen:

- The company or government agency will attract the highest quality imaging professionals available.
- They will have a positive impact on the organization's bottom-line profitability.

Imaging systems permit the kind of real-time access to information (and much of the manipulation) that is possible with data systems. The information on those documents — and, therefore, the people responsible for maintaining and providing that information to decision-makers — have a whole new value for the organization.

Imaging systems are only tools. The key to any system is people: those who select, operate and benefit from the system. Electronic imaging systems require a new breed of highly trained and motivated information management professional. Where can you find such people? Frequently, they are right under your nose.

The high productivity of the new image systems — faster access times, lower production costs, timely decision-making — makes it possible to offer higher pay to operators than is traditional in paper or microfilm environments. Paying professional-level wages makes it possible to attract professional people.

One of the more intangible benefits of installing an electronic imaging system is the effect it has on the morale of the corporate records department personnel. They stop thinking of themselves as file clerks and begin thinking of themselves as information professionals.

Usually highly motivated by a desire to meet the information needs of user departments, the self-esteem of these people greatly improves when they are more able to meet those needs.

Even more important than the question of morale and motivation is the fact that image management people understand how information is used. They understand the informational needs of user departments utilizing document-based information, as well as the needs of external users such as auditors, government agencies and the like.

In fact, image management people are ideally placed to assist in the implementation of an enterprisewide solution to document management needs. Frequently, user departments will get fed up with paper and implement a new system on their own. Too often, they assume that their needs are unique and not fully understood by outsiders, but actually, information needs are remarkably similar from one application to another. The experience of information experts can be very valuable in assisting user departments to design a system that is both productive and economical and one that is compatible with other systems throughout the organization.

Of course, the involvement of IS in the design of the system can be helpful, particularly if the document system is to be integrated with other corporate information systems under IS control. The technical expertise of the IS staffers can also be valuable in making certain that hardware and software work toward meeting system requirements. Those requirements, however, are best defined by those with an understanding of the information needs of the user: namely, image management professionals.

These three groups — IS, image management and users, with the cooperation of vendors and upper management — should be able to design and implement the best possible system for the organization. ●

Popiul is a vice-president at First Nationwide Bank in Daly City, Calif.

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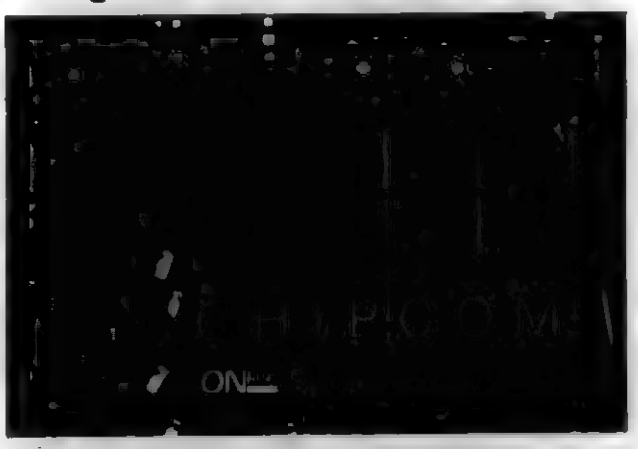

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A 911 for Dallas systems

An emergency with the police dispatching system yields a bonanza for public safety

INTEGRATING NEW TECHNOLOGIES

City of Dallas

BY KATIE CRANE
SPECIAL TO CW

Back in 1984, David Morgan, director of information services for the city of Dallas, was between a cop and a hard place.

The police department's $20 million radio dispatch system routinely jammed, and plagued by transcription errors, the system forced frustrated officers to wait to send and receive important information. A tightfisted city council — under heavy pressure to keep taxes down — was unlikely to spend another $20 million for a second radio system.

"We had to do something," Morgan recalls. "My users carry guns!"

The solution: a five-year, $10.5 million project that integrated several key public safety systems. Today, Dallas boasts a 911 emergency call system, cellular cruiser telephones, mobile data terminals (MDT) in every squad car and a $4 million automated fingerprint identification system (see story below).

Paid for by telephone charges, budget money, taxes, grants and confiscated drug money, the integrated system should be put to good use: Dallas is the seventh largest city in the U.S., but it is the nation's leader in violent crimes.

The integrated system links the city's main dispatching system running on an IBM 3083E mainframe to the phone company's DTI 911 switching equipment via AT&T network interfaces.

Now MDTs ride in every Dallas police car beside a radio and a cellular phone. The terminals, provided by Mobile Data International, Inc. (MDI) in Vancouver, B.C., have automatic access to all incoming 911 and other dispatch information as well as state, regional and federal information files.

One Dallas public safety official estimates the new integrated system has improved police productivity by 40%.

City councilor Jim Buerger, who chairs the Public Safety Committee, says having the patrol cars outfitted with MDTs is "absolutely invaluable" in improving the police officers' response time.

The system has also helped put Dallas on the map in a different way. Morgan and his team recently received the 1990 Society for Information Management (SIM) Partners in Leadership Award.

Tom Morin, vice-president of information services at Medtronic, Inc. and chairman of the SIM award committee, lauds Dallas' dedication to service, enthusiastic user response and the system's impact. "That extra 30 seconds can save lives," Morin says.

The project was the largest ever tackled by a Dallas information systems department — and perhaps the city, Morgan says, adding that there would have been horrendous political consequences if the project had not gone smoothly.

Dallas' Morgan *answers a radio crunch with integration*

In this city of 300 square miles, the 3,000-member police department fields 6 million telephone calls and makes 640,000 runs each year. Citizen contacts are up by 2,000 per month. At the same time, Morgan's IS budget has dropped $2 million (down from $22 million in 1986), and he has shrunk his staff by 32 since 1987.

Selling the system to the city council could have proved difficult — but wasn't. Morgan convinced the council to hold a nonbinding referendum on the 911 system in the 1985 city election to see if the public would pay for it. Eighty percent of the voters said they would pay as much as 25 cents per month on their phone bills for the service. (The actual cost today is 20 cents per month.)

With what they saw as an "overwhelming mandate" for 911, the city manager appointed Morgan to head a steering committee to go forward with the system.

No cop-out

The police department already had a sophisticated dispatch system with two well-established databases of beats and squad cars. Morgan knew it was technically possible, using various protocols and electronic interfaces, to link city computers with Southwestern Bell's computers so that every 911 call automatically displayed the caller's location.

"But the phone location doesn't do much good unless you know what police beat it's in and which police car is assigned to that beat," Morgan explains. "If you put the three together automatically, you've got a big

Close-up

- **Organization:** City of Dallas.
- **Goal:** Integrate various public safety systems.
- **Strategy:** Give police access to information via a mobile data terminal, cellular phone and ties to the 911 system.
- **Payoff:** Police productivity improved 40%, citizen contacts up by 2,000/mo., and suspect identifications doubled to 16,000/mo.

Pointing the fingerprint

The Dallas police department's newest crime fighter is AFIS, a $4 million automated fingerprint identification system from NEC Information Systems, Inc. in Boxboro, Mass. AFIS is an on-line fingerprint image system that runs on an optical disc and produces a short list of suspects for examiners to review by matching prints mathematically with those in Dallas' database.

Since the system went live in July 1989, the police have doubled suspect identifications and tripled the productivity of the department's identification division — all without adding any fingerprint examiners.

Jim Buerger, chairman of the Dallas City Council's Public Safety Committee, speculates that the 16.7% drop in Dallas' burglary rate during the past 11 months may be partially because of AFIS and mobile data terminals in police cruisers.

There have been some dramatic examples of success. For instance, it took less than one minute for the Dallas police to peg the "North Dallas coat-hanger rapist," whose moniker came from the way he bound his victims.

Using AFIS, examiners in the identification division matched a fingerprint found months before at the scene with a suspect's print, one of the 2.8 million individual fingerprints in Dallas' 280,000 fingerprint files. The suspect — who later had 14 other rape and burglary charges filed against him — was indicted, convicted and given a life sentence.

A somewhat less dramatic payoff than this so-called cold search are the searches for pending warrants performed immediately after a suspect is arrested. "Sometimes the patrol officers stop by with the suspect in tow on their way to jail," explains David Morgan, IS director for the city of Dallas.

AFIS, which is fully integrated with the city's other criminal investigation systems, has reduced the time it takes to perform these routine searches by 25%.

For the six-year period before AFIS was installed, detectives averaged about 35 identifications per month; today, they average 120 per month, more than a 300% increase.

KATIE CRANE

bonus," he adds.

Today, a citizen can dial 911 and speak to a dispatcher. The call is traced by a telephone company computer so that the caller's exact location appears on the dispatcher's screen. The dispatcher keys in the caller's complaint, and the mainframe automatically funnels the message via an 800-MHz radio frequency to a terminal in the squad car nearest the caller's location. An officer no longer needs to stop the car to write down any information; it automatically appears on the terminal screen in the car. If there are any questions, the officer en route simply picks up the cellular phone and calls the citizen.

There were other advantages to integrating: giving the 2,500 uniformed police officers direct access to state, regional and federal files, linking an automated fingerprint information system to other criminal information systems and installing a similar system in the fire department at very little additional cost.

> "YOU DON'T FORGET 8½ years in a patrol car. I just kept asking over and over: 'If I'd had this, what would I want?' "
>
> LT. JAKE MOORE
> DALLAS POLICE DEPARTMENT

Once funding had been approved, launching the integrated system was a big technical and political challenge.

Morgan first selected a team to oversee the design, implementation and acceptance of his ideas. He then enlisted the help of Assistant Police Chief Leslie Sweet and Kenneth Knotts, Dallas' deputy fire chief and commander of the communications division, whose department would also be tied into the system.

Morgan selected data, radio and telephone experts from his own department and invited representatives from the city attorney's office, the city auditor's office and Southwestern Bell to participate in the steering committee.

Assembling the project team proved to be a delicate process. "Police officers and firefighters like to take potshots at each other," Morgan says. "The police claim the firefighters are always playing ping-pong at the fire station, while the firefighters complain that the police invent emergencies just so they can play with their lights."

Sweet kept his eyes open for enthusiastic people close to the field officers. Once he made his selections, Sweet handed over all decision-making authority. He reassigned two police lieutenants who had worked in the field and asked only that they keep him briefed.

"You don't forget 8½ years in a patrol car," says Lt. Jake Moore, who worked on the project. "I just kept asking over and over: 'If I'd had this, what would I want?' "

Planners discovered that no single vendor had an overall understanding of radio, telephone and computer integration. "They'll tell you they have the experience," Morgan says, "but they don't have the depth in all three areas to integrate them."

The team approached several contractors and systems integrators hoping to find help, but the cost to build a specialized systems integration team was 35% higher than that of staying with the staff. Morgan concluded that the most cost-effective way to do the job was in-house.

That decision required a massive reorganization of his department. Telephone, data processing and radio groups were combined, but problems remained. "The data people didn't speak radio, the radio people didn't speak data, and the telephone people spoke only a little of each," Morgan says. It took quite a bit of internal effort to get everyone thinking and speaking the same language.

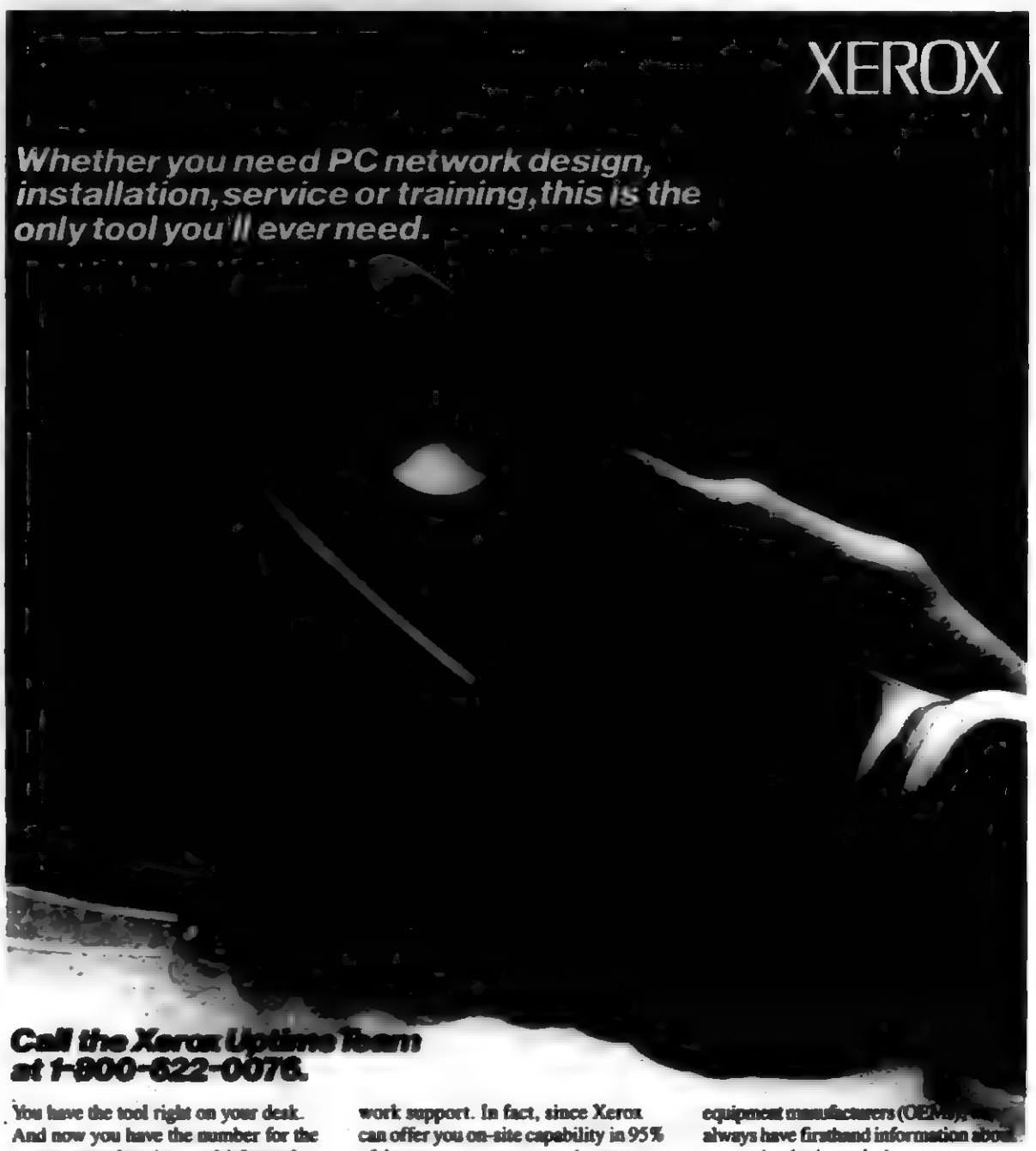
The planners labored over thousands of details and faced hundreds of decisions about the functions and layout of the squad car terminals — even down to the colors of the screen (the officers wanted

Creative funding

In tough fiscal times, especially at the city level, finding money for big IS projects can be tricky. The city of Dallas used several novel funding approaches:

- **911.** It cost Dallas $3 million to implement and $1 million per year to operate. Residents get a 20-cent service charge on monthly phone bills.
- **MDTs.** Cost $3 million — $750,000 came from a state grant, the rest from city budget money. Included in the $3 million was the $50,000 it took to modify the dispatch software and the $50,000 to develop a message switching system between Southwestern Bell and the DPD dispatch computer.
- **Cellular phones.** Cost $400,000 for the first year, $275,000 for the second year. Paid for with confiscated drug money.
- **Fingerprint systems.** Hardware and software cost $4 million but will amount to $5 million over five years with interest. Funded with general tax dollars.

KATIE CRANE



yellow) and the letters on the tab keys (a flat off-white to cut down on the glare).

Personalities clashed from time to time. "We had quite a big fight over terminals," Morgan recalls. The system with the best radio properties was not the most user-friendly, so it forced the group to make some hard choices. In the end, Dallas selected the friendliest terminal, which also happened to be the low bid, he says.

Moore says the MDTs chosen were not only friendly; they were also "downright user-promiscuous." He adds: "It didn't take long for word to spread that these were the greatest things since canned beer."

Morgan remembers the planners meeting five to six hours per week to have the 911 system up on 1 million telephones by April 1, 1988. It took 1,200 hours to modify the police dispatching software for the mobile data terminals (MDI's off-the-shelf software was too expensive at $345,000). Another big challenge was linking the telephone company's computer with the city's state-of-the-art systems.

> "THE DATA people didn't speak radio, the radio people didn't speak data, and the telephone people spoke only a little of each."
>
> DAVID MORGAN
> DALLAS POLICE DEPARTMENT

The only disruption of service during the project came when the system had to be shut down at 10-second intervals, but Morgan says he has documentation to prove that it never lost a call.

At the project's peak, Morgan says, 56 people worked full-time on the integration effort, including programmers, telephone technicians, police officers, firefighters and project managers.

High hurdles

The most difficult technical challenge — and the biggest expense — was making the transition to Dallas' proprietary self-correcting 4.8K bit/sec. system from the phone company's start/stop technology. The latter had very little error recovery and sent at a rate of 1.2K bit/sec. through the city's mainframe to the MDTs.

The challenge that brought the system to its knees, however, was testing the queuing theory, which builds intelligence into the switching software to automatically enable a command terminal to switch to less-crowded radio channels when the first channel it tries is loaded.

"When you have 600 terminals coming in over 20 radio sites, coming down to nine inputs and outputs to the computer, the queuing theory becomes important," Morgan explains.

The team worked long and hard to get the algorithms right — even contracting the help of a university mathematician — to avoid the problem of having all the terminals come in on one channel.

After simulating the problem mathematically, Morgan and his team took 20 patrol cars outfitted with MDTs to a field for testing. The system crashed. With two weeks' more work and some help from MDI gurus, they eventually changed the resource allocation algorithm. "It was a matter of fine-tuning," Morgan says.

Training for the new system was developed by the same police officers who sat on the steering committee. They equipped a car, then developed a videotape, a live demonstration and some hands-on exercises. Moore took his "traveling show" to every substation. After that, the in-service officers were calling him every day begging for MDTs.

Terminal case

Installing terminals in squad cars took some 2,400 hours. The city had to convert to cars with bucket seats to accommodate the console. Luckily, it took very little time for officers to get comfortable with the new system. "You can battle it with one finger," exclaims Moore, who says he doesn't type. "Everything's right there in the span of one's hand."

Included in the total cost of the system was $50,000 to modify the city's existing dispatching software and another $50,000 to develop a protocol and message switching system with electronic interfaces between the city and phone company computers.

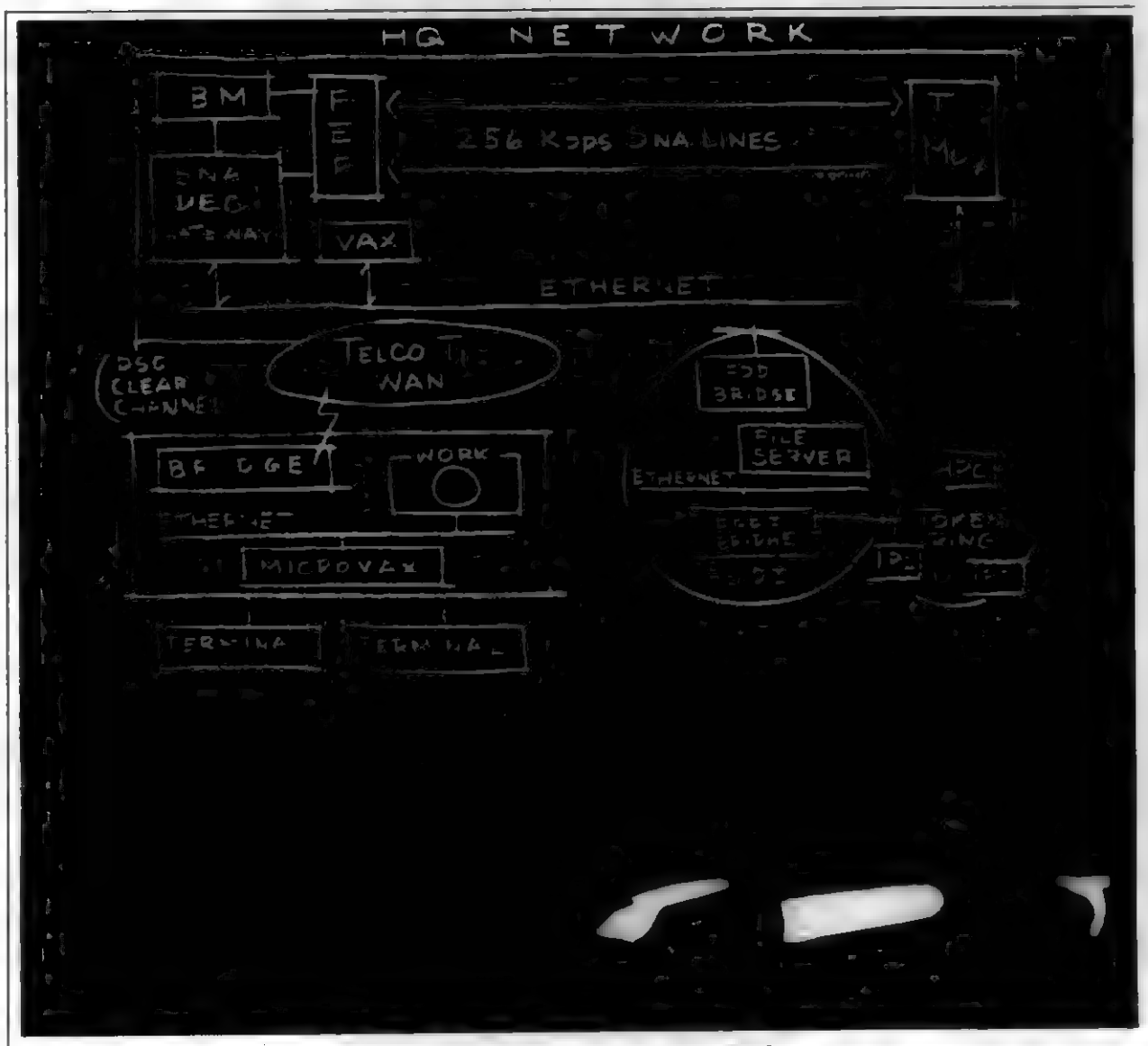
"Our objective was to get the officer through his administrative tasks and back to radio patrol as quickly as possible," he said. A routine check that could have taken as long as 15 minutes before is now completed within five seconds 95% of the time.

Inquiries to the state, regional and federal databases have gone from 240,000 per month to 490,000 per month, while "hits" (identifying a suspect) have doubled to 16,000 per month. Dispatch transcription errors are down 95%. "We've closed the information loop," Morgan says. "We think we're the only city in America that's integrated this process end to end."

Morgan and his team are now installing MDTs in ambulances and fire trucks for the cost of the terminals. "Everything else had been done during the police department installation," he says.

Morgan's users still carry guns, but he sleeps more soundly now, knowing they also have information at their fingertips. ●

Crane is a free-lance writer based in Norwich, Vt.



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INSIDE EDGE

A question of support

"After a systems integration project is completed, what kind of support do systems integrators leave behind?"

BOB JOHNSON
Vice-President
Commercial Systems Integration Unit
Unisys Corp. Systems Management Group
U.S. Information Systems Division (USIS)
Blue Bell, Pa.

The key to a successful post-systems integration project support program is to address it in the original project proposal. That way, there are no surprises for the customer or vendor. The customer has a clear understanding of where the systems design, development and installation phase ends and where the follow-on support program begins. This approach also gives the customer ample time to evaluate the post-project operational issues, including training and system maintenance.

CHUCK GIBFRIED
Corporate Vice-President
Sciences Applications International Corp.
San Diego, Calif.

Ongoing support is determined by the preferences of the customer. What we find works best in many cases — and is preferred by our customers — is for the customer to acquire enough knowledge and detail about the project so that it is self-sufficient when all of the contracted items are completed.

According to our customers, one of the most compelling reasons to learn the system is so they can be independent of the integrator. They can handle their requirements internally and manage their own change control.

GAD J. SELIG
Vice-President and General Manager
Nynex Complex Systems
Integration Group
White Plains, N.Y.

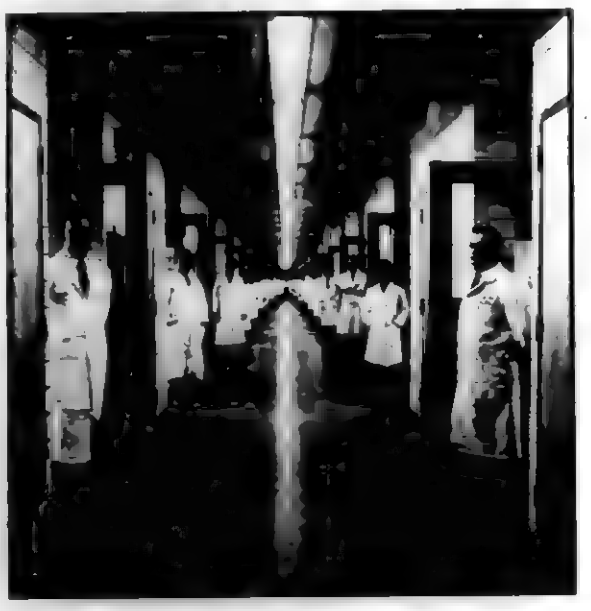
In a turnkey system or network, there is no additional support because the customer does not want to pay for it. If you think of it as a scale, on one side there is no additional support. You implement, you design, you install, you train, and then you walk away. On the other side, the customer wants the system integrator not only to design, implement and train but also to operate or facilities manage the system, data center, voice/data network, control center, etc. Support is a separate contract within the systems integration contract. It is a case-by-case situation; it can go from no support to 50% to 100%.

Generally, customers will write in maintenance support depending on the complexity of the system or the network. If it's a simple (single vendor) system or network, there may not be any maintenance, and the customer may assume responsibility for it. If it's more complicated than that and the customer does not necessarily have the technical bandwidth to perform the maintenance, for example, then the systems integration will do that on a monthly fixed-fee basis. In general, the longer the period, the less expensive it is for the customer.

MIKE LITTLE
Vice-President
Information Services
Boeing Computer Services
Bellevue, Wash.

After a system has been designed, installed and tested, there's a wide range of follow-on services that can be provided as part of the systems integration job. On one end of the spectrum, a systems integrator may provide a complete operations and maintenance function; at the other end, the customer may simply require documentation and training for in-house personnel. Between these two extremes are innumerable options.

But no matter where a customer falls on that spectrum, a primary task after a system has been installed is to ensure that new technology — when cost-effective — can be folded into the existing system. ●



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F.Y.I.

London-based research firm Ovum Ltd. forecasts a rosy future for **electronic data interchange** (EDI) technology. Sales of EDI services and products expected to jump from **$86 million** in 1990 to **$396 million** in 1994.

In another Ovum study, **57%** of U.S. and European firms were found to already have or are considering an OSI strategy.

Dun & Bradstreet Software and **Sterling Software** announced networking deal. Pact lets D&B customers electronically exchange purchase orders and other documents with trading partners via EDI. D&B will supply enhanced applications; Sterling will supply translation software and third-party network service.

U.S. Senate selected **Planning Research Corp.** to replace senate's local- and wide-area data communications networks. System integrator's 10-year contract valued at **$65 million**. PRC's principal subcontractor for WANs is **U.S. Sprint Communications Co.**

The management information center

The new generation focuses on end-user development as well as on personal computer services

BY JIM KERR

"There's one thing stronger than all the armies in the world, and that is an idea whose time has come."
Hugo, 1870 (c.)

The management information center (MIC) is the next evolutionary step up from the information center. And its time has come.

The mid-1980s information center focused primarily on managing the selection and acquisition of personal computers. Although many of the original information centers offered special training and PC software demonstrations, most do little, if any, end-user systems development. And it is end-user systems development that makes MICs different from their predecessors.

In the MIC, chores such as maintaining computing inventories and installing packages are augmented by such responsibilities as designing and integrating end-user systems. "Augment" is a key word here, because the MIC also assumes traditional roles — making it the new and improved information center of the '90s.

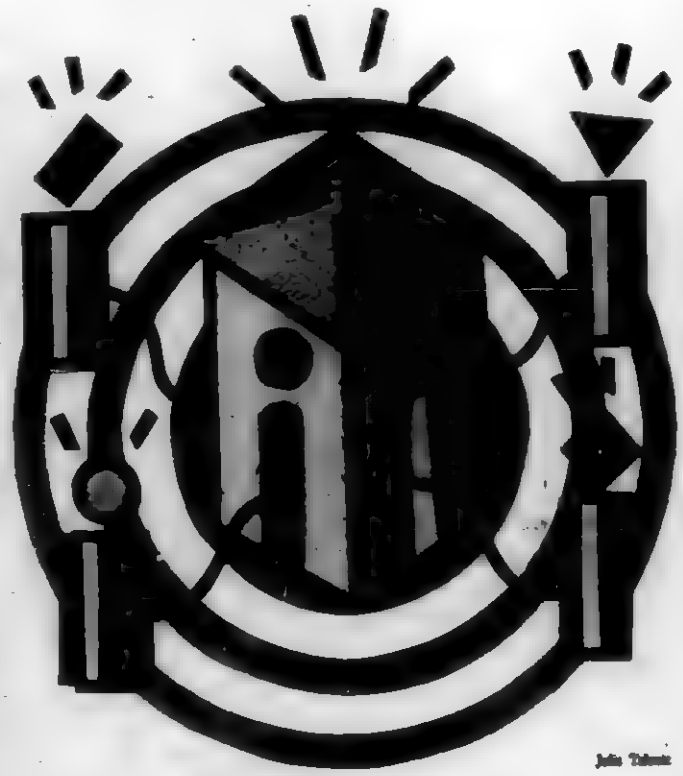
Some history

The information center concept was introduced by IBM Canada in 1982. IBM wanted to improve the level of service that information systems were providing to the user base. The belief was that a separate group supporting end-user computing would lessen the backlog and help achieve fuller automation. End users would in essence be providing for themselves through PC-based solutions.

It wasn't long before the success at IBM spread. Eighty percent of large firms in a recent American Management Association survey reported staffing an information center.

Many organizations take the information center concept seriously. United Technologies Corp. (UTC), for example, sponsors a cross-corporate user group that allows UTC information center personnel to compare notes and strategize future undertakings.

That a major corporation is funding an information transfer across member companies illustrates the importance many executives place on MICs. This kind of support will lead to the further growth and expansion of the MIC charter.



Julie Tabeek

What MICs do

Simply put, MICs help end users define their systems requirements and then recommend and implement solutions. The MIC doesn't replace the IS department; it simply complements it.

Problems that can be solved by gaining access to an existing database — for example, generating a new report or installing workstation software — are directly addressed by the MIC. Problems broader in scope that require the creation of new programs and databases are referred to the conventional IS department staff.

A sample MIC organization (see chart on next page) has four major functions:

- **Training.** This function provides training in new tools and technologies. The MIC schedules regular classes in all the hardware and software that the center supports.
- **Acquisition and administration.** This sector investigates and purchases MIC technology. MIC analysts assigned to this area keep abreast of advances in technology, study trends and make evaluations. Besides arranging the acquisition of hardware and software, this sector also establishes and maintains the end-user computing inventory.
- **Design coordination.** This sector involves the integration and sharing of end-user systems. This area focuses on leveraging MIC solutions across the company. Design coordination analysts consult with the end-user support area to ensure that users take full advantage of the current suite of technologies, products and services available through the MIC.
- **End-user support.** This area assigns staff members to each business unit. "End-user support representatives," as depicted in the organization chart, have dotted-line reporting to both the MIC (which pays their salary) and the business areas (which set their priorities).

The IS role

Problems can arise if the MIC provides better end-user service than the IS department. This can be avoided, however, by placing the directors of both the MIC and IS under the same manager. Any competition that arises concerning responsibilities can be resolved by the executive in charge.

With the competition issue gone, the IS department and the MIC can form a partnership that is mutually supportive.

For example, the MIC can recommend IS involvement in certain business issues (such as a strategy for supporting tax-law changes) because a representative is located in the

Kerr is director of data architecture at The Equitable in New York and an adjunct professor of information systems at Rensselaer Polytechnic Institute in Troy, N.Y.

• A partner for IS

• Defines problems, builds solutions

• A structure for the '90s

business unit when the situation arises. Such opportunities are often missed in existing setups because of a lack of communication between IS and its users.

The flip side of the partnership comes when establishing end-user access to existing databases and file extracts from IS production systems, for example. Without such "access rights," the MIC's ability to respond to most users' requests is impaired. It cannot provide systems development service without the full cooperation of the IS department.

IS needs the MIC, and the MIC needs IS. This relationship can be further enhanced by monthly systems coordination meetings conducted by the MIC. (It is up to MIC members to facilitate the meetings, because IS managers simply don't care in most instances.)

Coordination meetings are held each month and are sponsored by the MIC's design coordinator. The meeting facilitates the sharing of development ideas between the MIC and IS departments.

Each meeting lets MIC representatives share project progress with IS project leaders. It gives IS project leaders a chance to discuss major development activities, as well as their potential role in meeting reported end-user needs, with MIC personnel. This kind of free exchange is imperative to avoiding redundant activity between the two areas.

Furthermore, these monthly meetings help the design coordinator keep track of the end-user applications that each support representative is developing. Opportunities for integration and application reusability can be identified. Coordination strategies are discussed among meeting participants.

Two-headed IS

In the Management Information Center model, conflict is minimized because both the IS director and MIC director report to the same boss

CW Chart: Paul Mock

An MIC environment must be developed to meet end users' needs effectively. It is true that a majority of MIC applications are PC-based, but a strategy is needed to populate these workstations with information from mainframe systems. That strategy can present problems.

The 'right' architecture

A solution to those problems lies in the creation of a two-tiered processing architecture that separates the MIC environment from the transaction processing environment. PC, mainframe and relational tools are used to effect this.

The MIC environment is rooted in subject area databases. Each subject area (e.g., product, client, employee, etc.) is populated by summary information from the transaction processing systems. Relational technologies such as SQL and DB2 are employed to provide MIC users with ad hoc query capabilities to these databases.

Once this environment is established, other end-user tools, such as fourth-generation languages and PC packages, can be used to massage data extracted from the MIC subject area systems.

Data at the core of the workstation environment can be manipulated in a variety of ways. PC tools are used to create reports, and software packages are supplied as necessary. Office systems communicate data to other interested parties across the concern.

Mainframe capabilities are also provided through the workstation environment. Data import/export routines are made available for file transfers across the microcomputer and mainframe platforms. Access to relational query tools and host applications is also facilitated.

The success of the MIC's two-tiered processing environment depends on the data architecture that underpins it.

A comprehensive data management strategy is needed to reap the benefits of the MIC environment. The heart of the strategy includes a systematic way of identifying and maintaining the subject area databases needed to support the end-user decision-makers.

The best way to define these databases is by interviewing key MIC users across the company; this is clearly the role of the data administrator. However, the MIC should coordinate and participate in the process to gain an understanding of the databases as they are defined.

Automated joint application development techniques are a powerful means of gaining insight into the user's data requirements. In most cases, the basic subject areas — product, client and employee — can be identified in a matter of just a few weeks by a team of users and MIC support representatives.

Once the subject areas are identified, the data that is needed to populate each database must be determined, along with a plan for extracting and moving the data from IS production systems to the MIC databases.

Ford Motor Co., for example,

High tech for MICs

Even though the information systems and management information center (MIC) environments are logically separate, shared systems and databases may exist between the two.

For example, consider a multidivision corporation that performs transaction processing at sites across the country and has an MIC at corporate headquarters. Its data distribution scheme would call for a decentralized environment of local processors. Powerful data communication networks pass information to the databases at the home office, where MIC users around the country can have access to it.

Centralized processing is another popular scenario that allows all computing to be done at one location. If that location is running at capacity, then the introduction of MIC processing beckons the need for a new CPU. The additional throughput cannot be supported with the current iron.

Both types of environments can carry some hefty price tags, however, thanks to trunk-line expenses, network and CPU hardware, as well as PC communication boards, just to name a few. Therefore, alternative means of processing are needed.

Among the multitude of technologies available to MICs, compact-disc read-only memory (CD-ROM), database machines and client/server architecture are the most intriguing.

CD-ROM. In a CD-ROM environment, remote data from processing units around the company is fed to a centralized MIC processor. Data in the system is then extracted to tape, and the tape is mastered to CD-ROM. The CDs are then distributed back to MIC users at various company sites.

A variation is to have various MIC subject area databases exist in a centralized MIC environment. Each subject area is then extracted and converted to CD-ROM separately. The CDs are then distributed to users who require access.

Each approach has its advantage. The first simplifies the extract/mastering process and allows all users equal access to all MIC databases. The latter has a more complex extract/mastering scheme but helps to limit data access to those who need to know.

Database machines. This type of technology can become particularly useful in an MIC application. When CPU resources are already tight, the introduction of a high-volume MIC system can wreak havoc. Off-loading the data to a database machine is a nice way out. By doing this, the CPU can handle the bulk processing, while the database machine handles the ad hoc queries.

Database machines are also an excellent way to augment the host processing environment. High-volume databases, such as MIC systems, can be easily supported by these machines. They can accurately handle more than 100 transactions per second, which leaves relational database management system software far behind.

Multiple direct-access storage device (DASD) spindles with dedicated microprocessors compose the basic architecture of the database machine. The actual database is spread across the spindles. When a command enters the database machine, it passes a query to each microprocessor.

In turn, each processor searches through its spindle for information that matches the request parameters. If a match occurs, the data is sent back to the database machine's command center, where it is consolidated and sent back to the user.

In a typical database machine environment, the operational system workstations bang against the host processor, undisturbed by the MIC workstations, which are continually querying the database machines.

Client/server architecture. Client/server architectures will play a role in MICs as well. Most of today's client/server architecture implementations use the mainframe as a server and a workstation as the client. However, an MIC architecture can be created where operational systems residing on a mainframe feed less expensive servers the summary information they need to support their clients, who would have ordinarily accessed the mainframe for the information.

In essence, the client/server architecture moves the information processing out to the least expensive machines — freeing up the centralized CPU to do the number-crunching that it was meant for.

JIM KERR

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has established an on-line information service that is composed of 24 separate databases for some 4,000 of its users. Vehicle specifications, technical designs and automotive industry news are just some of the subject areas maintained in the system. With a little discipline, other firms can establish a data architecture similar to Ford's. This will create an opportunity for MICs to concentrate on supporting the business better through the application of advanced technology.

Metamorphosis

MICs are in a state of transition. Traditional roles are giving way to new end-user computing responsibilities. No longer will information centers be just glorified PC management departments. True solutions to business problems will be created through MICs.

The dispersion of end-user computing specialists into the business units will provide a service base unequaled by today's centralized IS staff. New technology will introduce new opportunities for meeting users' needs more directly.

Adherence to simple guidelines will facilitate MIC transition; success will be determined by the quality of support. The future will bring a new era in departmentalized management computing as MICs take their position beside IS and executive and decision support departments. •

Adapted from "The IRM Imperative," published this month by R. J. Wiley and Sons. (Used by permission.)

Make the MIC work

Using a few of the following simple rules can help an MIC succeed:

1. Staff it with quality people. MIC personnel must understand the business areas they support along with the technology that's employed to meet users' requirements.

It takes a special mix of business knowledge, technical talent and communications skills to be effective in MIC roles. Define ways to hire and train individuals for these positions.

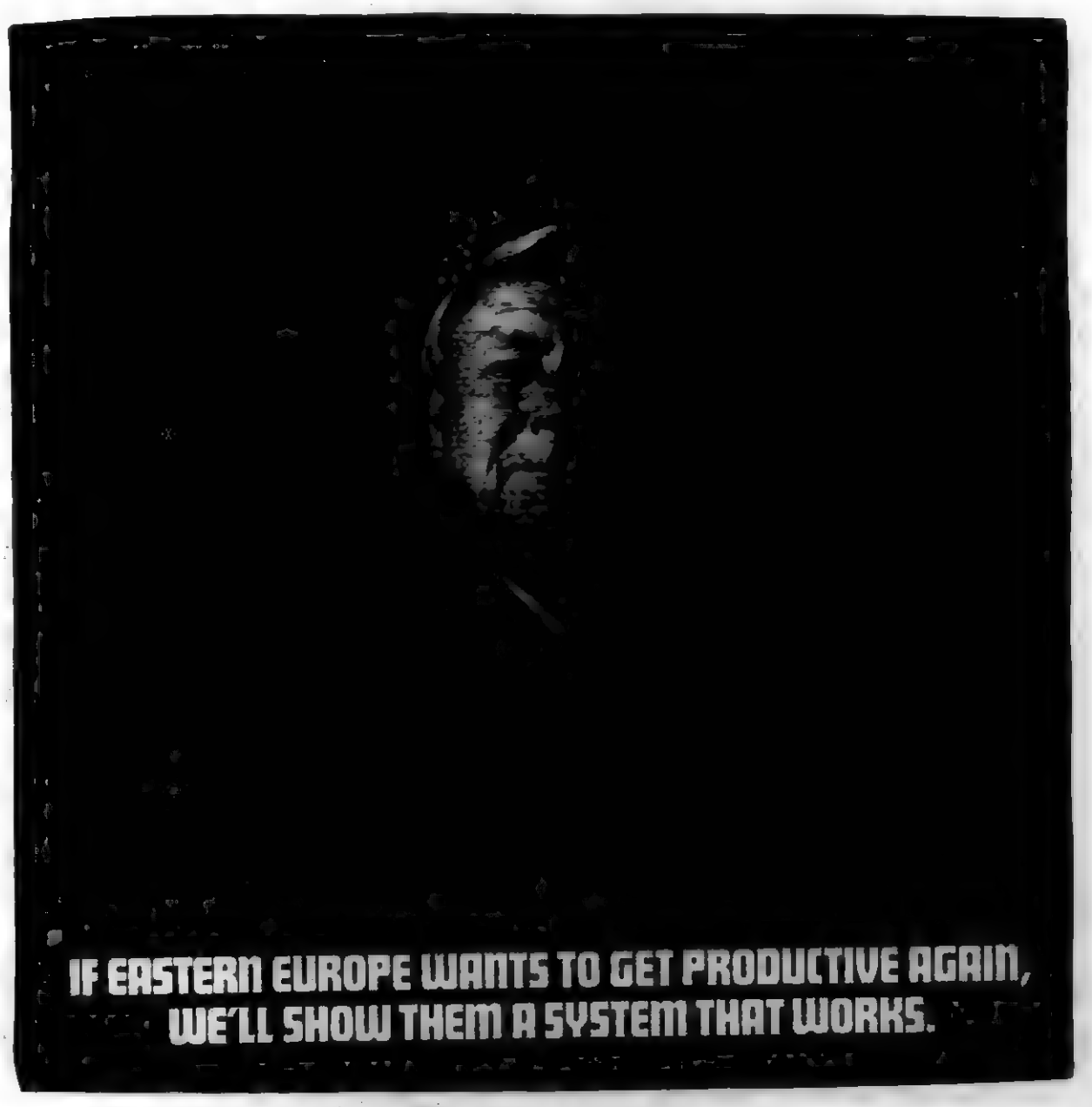
2. Distinguish MIC from IS department responsibilities. Jealousy and competition over end-user support will result as soon as the MIC concept is introduced unless a clear distinction is made between the two by the senior manager in charge. Mission statements will help, but management awareness and recognition of the competitive issues will ensure a smooth start for the center.

3. Distinguish MIC from end-user responsibilities. Both MIC personnel and users play a part in the success of the center. The responsibilities of the two must be clearly delineated.

Little reminders from managers on both sides of the house will avoid problems associated with users attempting to build systems and support analysts defining data needs in a vacuum.

4. Dedicate sufficient resources. MICs are only as good as the people and support they can provide to end users. Financial and personnel resources must be dedicated to grow and nurture the MIC concept into maturity.

5. Keep it simple. MIC personnel will be able to provide better service to end users if they are allowed to work from a simple set of standard tools. Support can deteriorate when the suite of technology changes from business area to business area. MIC resources must be dedicated to managing the tools and techniques supported by the center — otherwise, additional resources will be needed to manage the chaos introduced by dissimilar technology.



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NATIONAL

BRIEFS

More hands on DEC

Digital Equipment Corp. reached across the Atlantic last week to acquire the financial services business of London-based **Data Logic Ltd.** The deal reportedly gives DEC some 100 new employees as well as a corps of Unix-based financial information systems already at work in an estimated 30 banks across Europe.

■

Our object all sublime

Computer-aided software engineering (CASE) products maker **Atherton Technology, Inc.** and **The Software Productivity Consortium**, the Herndon, Va.-based intervendor cooperative effort to spur advances in CASE tools and methods, have joined forces to advance the march on object-oriented software engineering. The consortium will use Atherton's products to speed up the improvement of methods by which consortium members can capture and manage information generation during the creation of software. Sunnyvale, Calif.-based Atherton is no stranger to the alliance route: The firm is an IBM business partner and also has technology exchange agreements with DEC.

More briefs on page 132

Counting sales before they hatch

NET chief combats exaggerated sales figures and shortsightedness to revive firm

BY ELISABETH HORWITT
CW STAFF

Last November, Daniel Warmenhoven left a high-level job at Hewlett-Packard Co. to become chief operating officer and chief executive officer-apparent at what was then the golden goose of the T1 switch industry: Network Equipment Technologies Corp. (NET).

"When I came on board, NET seemed close to achieving its goal of $200 million [in revenue for fiscal 1990] and was hoping to go to $500 million in the next couple of years," Warmenhoven recalled.

Last spring and summer, however, it became apparent that the golden goose had laid several eggs. Because, in part, of some inadequate and inaccurate sales reporting, NET had to drastically revise its third- and fourth-quarter 1990 revenue figures downward in April, causing shareholders to file a suit alleging the release of misleading financial data.

The picture got worse in July, when NET reported a net loss of $13.3 million for the first quarter of fiscal 1991. At the same time, management went through an upheaval, with Bruce Smith resigning earlier than expected from his CEO position. Smith had concluded that "the situation, with a rebuilding problem, better fit my skills than his," Warmenhoven said.

Thus, Warmenhoven took up NET's reins early, but he faces a very different and much more difficult set of challenges than he had originally expected, he acknowledged. "We have to get down to fundamentals, rebuild the underlying business, generate new accounts and get the revenue stream up to where it was."

At the root of NET's troubles was the company's slowness to adjust to its own and the T1 switch industry's maturity, Warmenhoven said. Pressured to keep up 50% yearly revenue increases in a shifting market, he said, salespeople reacted by reporting sales that had not yet been consummated. This practice resulted in the misleading financial report that triggered the shareholders' suit.

Perhaps more damaging to NET's long-term prospects, salespeople concentrated on existing customers in order to make quick profits and neglected the job of generating new accounts, which typically have a nine- to 18-month sales cycle, Warmenhoven said. As a result, the first quarter of fiscal 1991 "was dry — we'd supplied our old customers with everything they needed, and little new [customer account activity] came on board," he added.

Indeed, NET closed only 10 new accounts during that quarter, in contrast with its former rate of 20 to 25 new accounts per quarter. Getting momentum back has been a major priority for Warmenhoven, who said he hopes to see 20 new accounts this quarter.

Warmenhoven's recovery strategy

Continued on page 131

From here to obscurity?

Fall 1989: NET comes within a hair of overtaking Timeplex, Inc. in terms of worldwide market share.
November 1989: Daniel Warmenhoven leaves HP to join NET as chief operating officer.
April 1990: NET revises its third- and fourth-quarter 1990 revenue statements downward. Net income for the year was $13.5 million, down from $16 million in 1989.
April 1990: Roger Hobbs, senior vice-president of sales and marketing, resigns. Warmenhoven brings in new heads of product marketing, corporate communications and corporate architecture.
July 1990: Bruce Smith resigns as CEO; Warmenhoven takes over.
July 1990: Barrett Roach, NET chief financial officer and secretary, resigns, reportedly in order to give Warmenhoven a free rein in selecting his management team.
April to September 1990: Gradual reorganization in which:
- NET decreases staff by approximately 200.
- Four U.S. regions are collapsed into three, and U.S. and international sales and service are put under one vice-president.
- Ten quota-bearing sales representatives are let go.
- No more cutbacks are expected, Warmenhoven said.

October 1990: NET announces $7 million second-quarter loss but generates 25 new accounts.

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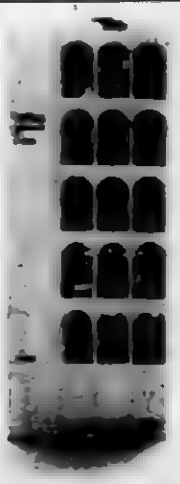

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London financial bridge falling down

Financial center could lose status if $39 billion is not spent on IS in the next five years

ANALYSIS

BY JASON THOMAS
IDG NEWS SERVICE

LONDON — Even as the woes of Wall Street appear to be piling up virtually on a daily basis, recent reports indicate bad news hurtling straight at the UK's financial stronghold if some changes are not made — and soon.

London faces losing its place as one of the financial centers of the world if $39 billion is not spent on information technology infrastructure support during the next five years, according to a report from UK-based market research firm Butler Cox.

"In the end, lack of [information technology] infrastructure support threatens London's competitiveness," said Patrick Murphy, head of Butler Cox's banking division and co-author of the company's 12-month study on the problem.

Murphy suggested that cities such as Frankfurt — which has invested heavily in new buildings with higher specifications, the newest technology and better information technology infrastructure — could take over as Europe's financial center. "We may find international companies, especially the [information technology-intensive] ones, going to places like Frankfurt instead of London," he said.

"The role of [information technology] has changed. It is no longer adopted because it gives you a competitive edge — you need it to survive."

But Murphy said it was not just a case of losing new business. "Unless companies invest in their buildings' infrastructure now, the cost of doing so later may well put them out of business," he said.

The report, which was sponsored by IBM, Digital Equipment Corp., AT&T and British Telecommunications, surveyed 52 new, old and redeveloped buildings and compared them with a set of guidelines drawn up in consultation with the Royal Institute of British Architects.

The guidelines included issues such as raised floors, whether information technology infrastructure support was planned from the start of a project and whether designers and developers were told about information technology needs.

Only 11 of the 52 surveyed sites met the standards. These results and the cost of bringing each one up to standard were extrapolated for the rest of London to arrive at the $39 billion figure.

About $7.9 billion is spent on new buildings every year in the UK. Murphy said most of these buildings end up being attractive but are an "occupiers' nightmare."

He cited the Lloyds building as a classic example of this dichotomy. "Developers did not look at the long-term [information technology] needs when it was built," he said. Almost as soon as it was occupied, it was beyond capacity in terms of cabling.

According to Murphy, information technology needs have to be considered right from the beginning of a project. He said that the Canary Wharf project proved to be a good example.

> "UNLESS COMPANIES invest in their buildings' infrastructure now, the cost of doing so later may well put them out of business."
>
> PATRICK MURPHY
> BUTLER COX

That project was one of the 11 to pass Butler Cox's test, and Malcolm Humpries, who is responsible for communications and information technology on the project, said that the buildings had been designed to cope with all information technology needs for the projected 70-year life of the development.

Thomas is on the staff of PC Business World, *an IDG Communications British Publication.*

French computer forum attracts few products

BY CLARISSE BURGER
and FREDERIC BERGE
IDG NEWS SERVICE

PARIS — Despite the presence of computer and telecommunications heavyweights, France's first computer and telecommunications forum, Forum de l'Informatique et des Telecommunications, or FIT '90, which was held near Paris last month, boasted very few product announcements.

Moreover, according to industry speculation, next year's forum, which is scheduled for Oct. 1-4, 1991, may be even worse, as competition is expected to come from worldwide telecommunications trade fair Telecom '91.

About 80 computer, telecommunications and network exhibitors, including NV Alcatel, British Telecommunications, Groupe Bull, Digital Equipment Corp., Epson America, Inc., France Telecom, Hewlett-Packard Co., IBM, NCR Corp., Netherlands-based Philips N.V. and Wang Germany, attended FIT '90.

Inaugurating the exhibition, Paul Quiles, French minister of Post, Telecommunications and Space, seized the opportunity to speak out on telecommunications reform and regulation.

Despite the roster of heavyweights in attendance, however, the list of actual products displayed remained relatively thin.

The few announcements and presentations of recently launched products came from France Telecom, which displayed an IBM Personal System/2 equipped with an IBM Integrated Services Digital Network (ISDN) card for consultation and transmission of multimedia files, connected to Numeris, France's ISDN network. This application is based on software designed by France's Joker Telerec and developed by France's SGIP.

British Telecom also demonstrated its new value-added Global Network Services offering, which targets private multinational networks. NCR Corp. presented its software package Cooperation, which was designed for cooperative processing on its new NCR 3000 systems. Prime introduced standardized X.400 messaging systems and announced along with Novell, Inc. the availability of server software Netware Portable for Intel Corp. 80386-based EXL machines.

Burger and Berge are on staff at Le Monde Informatique, *an IDG Communications French publication.*

INTERNATIONAL BRIEFS

How do you say 'double-digit increase' in Japanese?

Ask anyone at **NEC Corp.** or **Fujitsu Ltd.** Japan's computer and telecommunications market leaders both saw mounting sales fuel double-digit profit growth in the first half of 1990. Net income at NEC rose 18.5% on six-month revenue up 9.8% to $11 billion. Fujitsu, meanwhile — despite reportedly soft semiconductor sales — reported a 10.8% jump in revenue and profits alike.

■

Baker's dozen at Apple

Apple Computer, Inc.'s 13th European subsidiary, **Apple Computer Oy**, will be open for business in Helsinki on April 3, 1991. Built on Apple's acquisition of Finnish Apple products importer and marketer **Oy Mercantile Ab** late last month, the new firm will focus on providing sales strength and marketing support to local Apple resellers.

■

Recycling, IBM-style

IBM Japan Ltd. and Tokyo-based **Seibu Department Stores Ltd.** last week set up a joint-venture company to sell computer supplies. Called **MSI**, the new store will start selling recycled printer paper, printer ribbons, floppy disks, magnetic tape and other supplies on Dec. 1, according to both companies. MSI is initially capitalized at approximately $538,000 and will be owned 51% by Seibu and 49% by IBM Japan, a subsidiary of IBM.

■

Parlez vous AD/Cycle?

Cap Sesa, a unit of French software and services giant **Cap Gemini Sogeti**, teamed up with the French subsidiary of **IBM** to launch **AD/Consultants SA**, a Paris-based firm created to provide software engineering and consulting services to companies seeking to upgrade computer operations based on IBM's AD/Cycle system, according to both parent firms.

■

Did someone mention David?

When UK-based **HM Systems** took on France's **Groupe Bull**, the UK's ICL Ltd. and U.S.-based **Compaq Computer Corp.** and **Dell Computer Corp.** to secure a $2 million contract from Heathrow Airports Ltd., some observers no doubt noted that the relatively small computer systems vendor was not in the same league as the international giants. They were right. HM emerged in a class by itself: the winner.

Counting

CONTINUED FROM PAGE 129

calls for implementing the "support that is commensurate with a company of NET's size, but not the overhead and bureaucracy" that typically proliferates as a company grows, he said. "We want controlled chaos, not Brownian movement."

Cost control is high on Warmenhoven's agenda. While NET revenue was falling, "expenses were still going right to the moon," he said. The number of people on NET's payroll went down by 200 this past summer through a combination of attrition, functions consolidation and job elimination, an NET spokeswoman said. Of the 200, 80 were layoffs, including those of some low-performing sales personnel, she added.

On the service side, Warmenhoven said, NET is installing a system to track the service calls a particular type of NET switch has generated, for planning and quality control purposes. Also in the works is a "more sophisticated materials management system," he added.

NET's biggest bulwark against adversity, industry experts agreed, is a loyal customer base coupled with an outstanding reputation for quality products, service and support.

"Every time another piece of bad press hits, we go through another round of questioning in our companies: 'What's happening at NET?' " said Tom Calabrese, president of Progressive Users Stimulating and Helping NET, or Pushnet, and assistant director at The Travelers Corp. "But as time goes on," he added, "we're more and more convinced that there is no negative impact" on product quality or support.

"I have no concern at all about Sears' continued commitment to NET as our vendor for both T1 and T3 multiplexing," said Gary Weis, senior vice-president at Sears Technology Services, Inc. "Service has remained up to the usual standard, and their products are keeping pace with our requirements."

Even with a loyal customer base, however, NET faces a long road to full recovery. The company recently reported a $7 million loss for the second quarter ending Sept. 30, compared with a net income of $4.8 million for the comparable period a year ago. On the plus side, second-quarter revenue was up 43%, compared with the first quarter of fiscal 1991, NET said.

Stalled sales

Current financial shakiness is likely to slow sales over the short term among both new and current users, according to Michel Guite, a vice-president at Salomon Brothers, Inc. Guite conducted his own survey of 85 NET users at the Pushnet meeting last June and found that "85% agreed that NET's recent bad news was affecting their purchasing strategy, causing them to either defer purchases or look at other vendors."

And yet, "because so many users spoke well of the company, I still recommended NET's stock," Guite said.

Last week, NET demonstrated that its new product strategy is alive and kicking by announcing its next generation of high-end switches, which were developed by its 1-year-old company, Adaptive [CW, Oct. 29] (also, see story page 132). Sears last week announced that it had signed up to buy three of Adaptive's newly announced Sonet Transmission Managers with the intent of using the switches to connect its three data centers.

Also encouraging is the fact that NET signed up 25 new accounts during the last quarter — about the same number that was standard before the troubles set in. "I think that's a good sign that NET is recovering," Guite said.

Best bet

While NET founder Bruce Smith may not have been aware of the heavy financial weather looming on his company's horizon last fall, he apparently picked the right future chief executive officer to pilot his company out of the mess, according to former and current colleagues.

"Daniel Warmenhoven is one of the strongest managers and leaders I've ever met in the business," said Ed Muns, HP's general manager of systems, who knew Warmenhoven throughout the latter's five-year tenure at HP. "If I had to invest somewhere, I'd put my money in NET; It's the best bet in the industry with Warmenhoven and his team in place."

Warmenhoven said he was hired for two important attributes. One was his "broad experience in data communications — most NET people have a telecom background." A second was his "experience running a large organization," garnered while heading HP's 2,500-person information networks group. NET has approximately 1,130 employees.

NET's Warmenhoven: *Old hands like what they see*

Muns described Warmenhoven as "a person of balanced extremes."

For example, he said, Warmenhoven "listens extremely well in a one-on-one situation, but his style can be very contentious during an internal group meeting."

In fact, Warmenhoven initially kicked up some dust at HP's characteristically laid-back managerial meetings, Muns indicated.

Warmenhoven's style might, indeed, be too strong on a managerial level if he were not prone to "surrounding himself with and depending on strong people," Muns said. The new head of NET has already assembled a strong managerial team at the firm, including three people he hired last April:

- Vice-President of Corporate Marketing Karyn Mashima, former manager of HP's Openview network management program.
- Director of Product Marketing David Owen, formerly of rival T1 switch vendor Stratacom, Inc.
- Vice-president of Corporate Architecture Robert Bressler, formerly a vice-president at 3Com Corp.

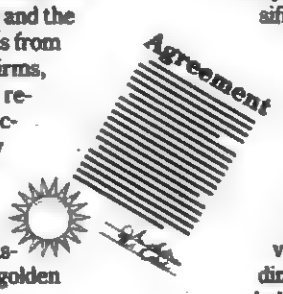
So far, old hands at NET like what they see. "There is no question that Dan is doing a good job," said Audrey MacLean, CEO of NET company Adaptive. "He has strong product financial and management skills and an eye for tracking details to ensure things are on course. He's just what the doctor ordered."

ELISABETH HORWITT

CDLA passes ceremonial baton

BY NELL MARGOLIS
CW STAFF

RENO, Nev. — They are changing guard at the Computer Dealers and Lessors Association (CDLA) — and this time, said CDLA President Kenneth Bouldin, the biennial board shifts go well beyond the ceremonial. Moves such as the election of the first female to a board that has often been labeled an old boys' club and the infusion of younger executives from entrepreneurial leasing firms, Bouldin said, signify CDLA's recognition that the leasing sector's charge into the next few years of brutal competition amid probable recession will have to be led by a new guard whose vision is undistorted by memories of the golden age of computer leasing.



"This was a purposeful, planned attempt to energize the association," Bouldin said. "We've got to refresh this thing."

CDLA's annual meeting last month bore signs of just how earnestly the organization is trying to do that. A seminar on software leasing — a possibly promising concept still in its infancy [CW, Sept. 30] — was scheduled at two different times to accommodate a strong interest. Keening over the devouring of the third-party leasing companies' market by the ever-mightier IBM Credit Corp. — a major feature at many recent CDLA conferences — was virtually absent from this one. Representatives from Amdahl Corp. and Hitachi Data Systems, Inc. gave presentations. Amdahl and HDS rank high on the list of vendors whose wares are appearing with increasing frequency in the portfolios of computer lessors who see diversification as key to growth.

"IBM used to be the star of this show," Bouldin noted. "They're not anymore."

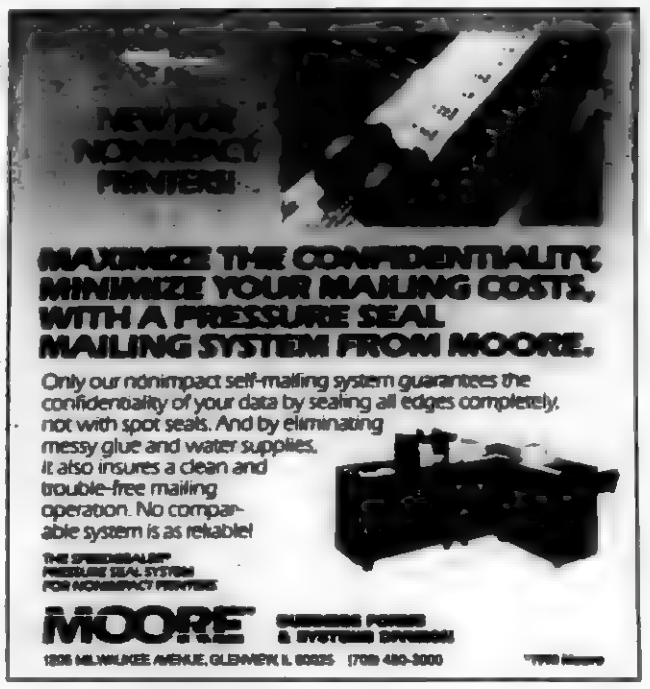
Forging a more open relationship with IBM even as it weaves closer ties with alternative vendors, according to Bouldin, will be one of the principal challenges facing CDLA during the next several years.

New on board are Dean Painter of CLG, Inc.; Hildegarde Beyor of HGB Marketing, Inc.; Richard Nelson of Nelco Ltd.; Robert Neumeyer of Neu-Comp Co.; and Melvin Kleinman of El Camino Resources, Inc. Beyor's appointment for a one-year term gives CDLA its first female director. Heading up the board is newly elected Chairman Joseph B. Kelly Jr. of Davenport Financial Corp.

"What we see here is quietly revolutionary for CDLA," said Charles Greco, president of Framingham, Mass.-based Technology Investment Strategies Corp. "Guys like Rick Forsythe, who have had tremendous — and beneficial — influence, are voluntarily taking on a kind of senior statesman status."

Forsythe, head of Forsythe/McArthur Associates, Inc., received CDLA's 1990 Spirit of Excellence award for exemplary representation of the computer leasing industry to the greater business community.

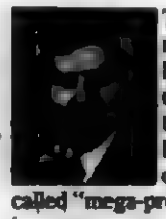
In effect, Greco said, "They're passing on the scepter to leaders from some of the younger, smaller companies — the ones that are going to make it or break it in the battles that are out there now."



COMMENTARY

Andrew Mohr

Dinosaur mega-procurements



The federal government's microcomputer landscape is inhabited by dinosaurs. They live in the form of extremely large, unwieldy microcomputer acquisitions called "mega-procurements." Like all relics, mega-procurements belong in museums, not on the street.

The government buys billions of dollars' worth of microcomputer products every year. Historically, each individual agency, bureau, activity or office that required micros would buy the specific products it needed.

Over the last several years, however, the government began combining an entire agency's needs into a single mega-procurement.

The result has been procurements comprising literally hundreds of hardware, software and peripheral products. The value of just one of these behemoths can total several hundred million dollars or more.

So, what's wrong with a several-hundred-million-dollar contract? Just this: While bigger might be better in many cases — memory comes to mind — the rule doesn't hold for mega-procurements.

These contracts are so cumbersome that it often takes two years or more from issuance of the solicitation to award. By the time the contract is awarded, the equipment proposed is almost always obsolete.

Considering that mega-procurements are usually designed to last for five years, users are badly served when forced to buy 2-year-old equipment at the the beginning of a contract and 7-year-old products five years later.

Also, fewer and fewer micro vendors can afford the expense of bidding on and losing mega-procurements. Because of the cost involved with bidding, vendors are more inclined to protest a mega-procurement award to a competitor. Such protests further delay the procurement.

The contract's size makes it hard for the agency to conduct the procurement properly and evaluate offers correctly. Consequently, the protester frequently wins, often requiring the agency to start the process all over again. In the meantime, the agency's users are left in the lurch.

Mega-procurements arose for two main reasons. First, agencies believed that they would get better, lower prices for large volume purchases of microcomputer products. Second, agencies thought that they could use the huge contracts to help standardize their equipment — a result that would, they thought, lead to efficiency gains.

Perhaps these reasons were valid several years ago. However, both the micro market and the underlying technology have long since changed. Today, the grief caused by mega-procurements exceeds by far any presumed benefit.

First of all, agencies don't need mega-procurements to garner low prices. The federal microcomputer arena has become a cutthroat commodities market. Even for relatively small purchases, the government can buy what it needs for a few points above dealer cost.

Also, there is no guarantee that the low prices obtained will last the life of the contract. Most mega-procurements contain a technology upgrade clause that lets the contractor substitute new products over the contract's life.

This means that the contractor can replace the low-priced junk that won it the contract with higher-priced products at better margins. While users get new equipment, the agency loses any cost savings it might once have had.

Second, agencies no longer need to force compatibility requirements on users. Compatibility may once have been critical, but it is less compelling in an age of coprocessors and local-area networks. Coprocessors enable IBMs to work like Apples, and vice versa. And since the advent and improvement of LANs, different computers can converse, even if they can't swap software.

The government would be better served by breaking mega-procurements into smaller, more manageable acquisitions. These sleeker procurements could be conducted more quickly and would be better positioned to survive protests. They would once again allow a wide variety of vendors to compete for government business, thus increasing competition and improving service.

Users would benefit the most by getting newer equipment faster. And Computersaurus Rex could go back to the museum where it belonga.

Mohr is a partner at the law firm of Cohen & White in Washington, D.C., specializing in the federal procurement of IS goods and services.

Adaptive's unique environs spark development

BY ELISABETH HORWITT
CW STAFF

For a positive sign of NET's continuing product growth, one has only to enter the building that houses Adaptive.

Created to preserve an entrepreneurial atmosphere even as the rest of NET became increasingly mature and corporate-minded, Adaptive houses a group of maverick engineering types whose job is to create the next generation of high-end NET switches.

In contrast to NET's shiny, corporate complex, the Adaptive building's interior is casual, even scruffy. A meeting room near the front door is simply furnished with an upright piano and a white board. The cafeteria, by mutual agreement, has plenty of healthy munchables and no junk-food machines. A room full of toys has been set aside for kids whose parents "inevitably come in during weekends, and who quickly exhausted the possibilities of the white board," said Adaptive Chief Executive Officer Audrey MacLean.

Adaptive was purposefully created "as an incubator start-up, to blend structure with entrepreneurial spirit," said NET CEO Daniel Warmenhoven. Its employees receive lower salaries than prevail at NET proper, but they can expect to own up to 20% of their own company, if they meet management's expectations.

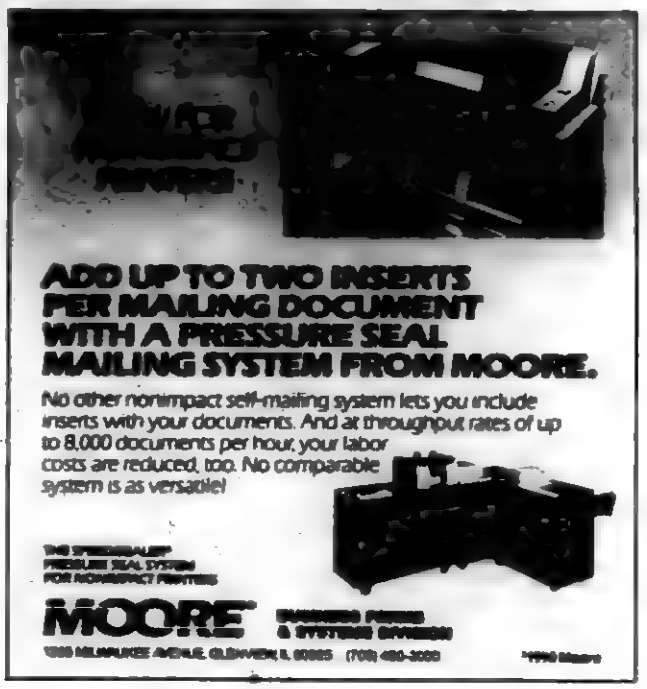
Adaptive's founders hoped that the company's rarefied atmosphere would help spark development of NET's strategically crucial next-generation high-end switches. Last week, Adaptive brought out its first product, a 45M bit/sec. switching platform.

The first of a planned series of high-end offerings, Adaptive's Synchronous Optical Network Transmission Manager, targets two markets considered critical for NET: private network users with rapidly growing bandwidth demands and carriers that want to better meet customer demand for more flexible, cost-effective high-speed network services.

As a start-up within a corporation, Adaptive has also been useful as "an outlet for people we were at risk of losing," Warmenhoven said.

In particular, Adaptive offers an alternative to employees who miss the old feisty, risk-taking atmosphere at NET. MacLean, an NET founder, is one such employee. "My going to Adaptive was not driven by a disdain for big companies or a liking of small ones, but by a desire to change the world," MacLean said.

Adaptive's status as a separate firm, whose funding is buffered from the parent company's ups and downs, has been reassuring to employees during NET's recent financial crises. "There has been no negative implications for Adaptive; we are growing at full speed," MacLean said.



NATIONAL

BRIEFS

Phoenix rising

Cleveland-based computer maintenance player **Phoenix Technologies, Inc.** expanded its reach across the repair and refurbishing market last week with its bid to acquire **TRW, Inc.**'s Customer Service Division. Terms of the deal, expected to close late this month pending regulatory approval, were not disclosed. According to Phoenix, however, the TRW division will maintain both its management staff and its approximately 1,250 employees when the industry's third-largest microcomputer-based maintenance provider takes over as its new parent.

■

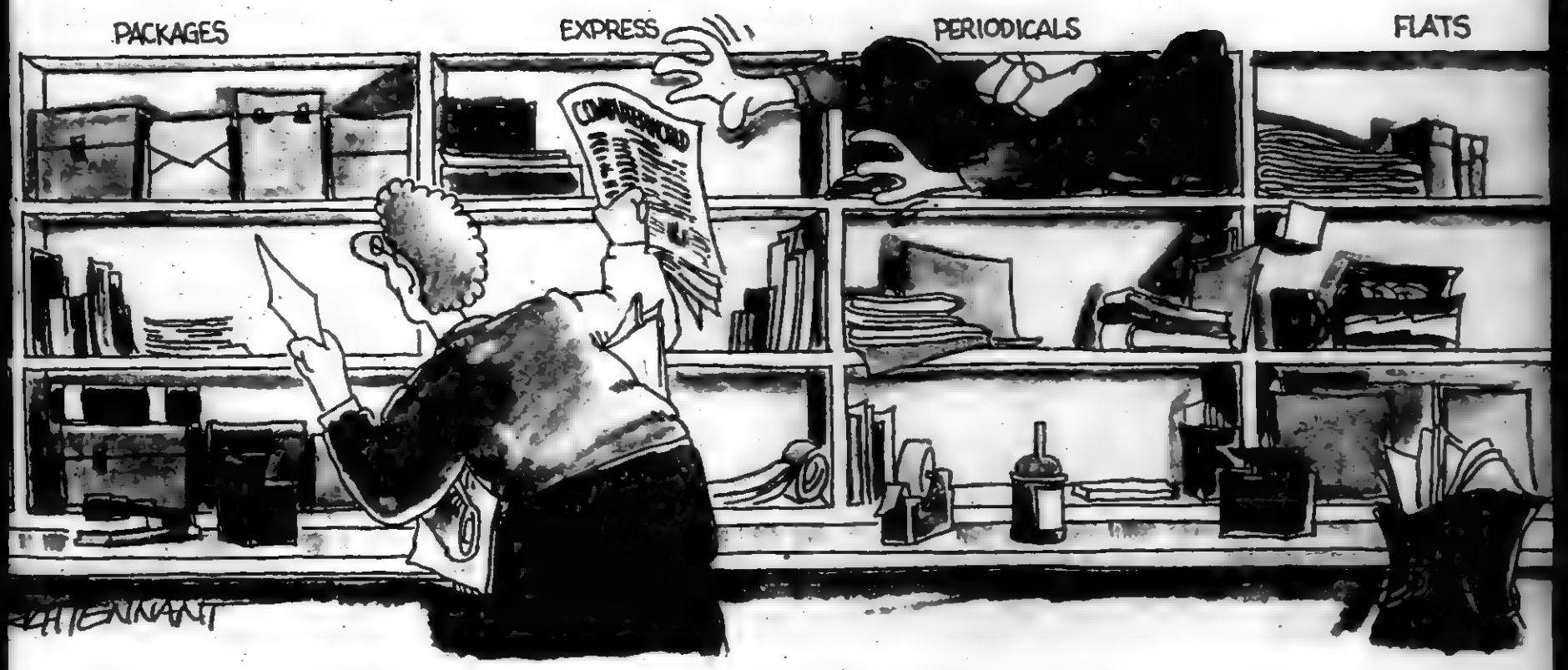
Electronic postman rings

Also on its way to Europe is electronic mail applications vendor **Soft-Switch, Inc.** The Wayne, Pa.-based company plans to use new development facilities and direct sales and support offices in the UK as a springboard for expansion in the coming market. The firm also announced the acquisition of facsimile and telex provider **Systems & Telecoms Ltd.** and a joint development agreement with **Data General Corp.** aimed at bringing the Soft-Switch Central mail backbone to DG's reduced instruction set computing-based Aviion line.

■

Venturing abroad

Two venture capital firms are buying a ticket to Europe for Mountain View, Calif.-based document retrieval software vendor **Verity, Inc.** According to Verity, $3 million in new venture funding from Thomson-CSF Ventures in Paris and New York-based Chancellor Capital Management will be used to get Netherlands-based **Verity Europe** up and running, as well as to finance a wholly owned subsidiary, **Verity Benelux**, also based in The Netherlands. The kitty also boosts total venture investment in the 2-year-old software firm to approximately $12 million.



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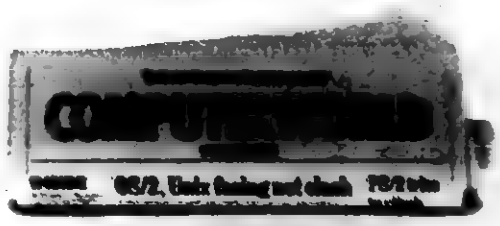

The Newsweekly of Information Systems Management

"Computerworld delivers high quality candidates on a very effective cost-per-hire basis."

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Richard Weiss

The largest software services consulting firm in Wisconsin, Computer People Unlimited, Inc. (CPU) is also listed in *Inc.* magazine as one of the fastest growing privately held companies in America. Together, its Milwaukee headquarters and branch offices in Appleton and Madison employ more than 250 professionals. During 1989 alone, Principals Eric Butlein and Richard Weiss saw the firm hire 98 new consultants. To keep pace with its rapid expansion and maintain its low employee turnover, CPU implements a rigorous recruitment program to hire the right professionals for every position.

"We need to recruit people through what they're reading, and Computerworld *is the most widely read weekly among computer professionals. Primarily we're looking for consultants — programmers, software engineers, and computer scientists with expertise in software development. About half of our consulting entails writing software programs for business, and a full 25% is dedicated to the area of scientific/engineering programming. Another 25% is comprised of technical services, technical writing, and end-user computing, as well as artificial intelligence, and especially expert systems. Recruiting consultants with specialized skills in these specialized markets is where* Computerworld *helps us the most.*

"The talent we need to service all our clients — in banking/finance, insurance, manufacturing, medical technology, utilities, retail, high-tech, and state/local government — isn't always available locally. Also, CPU's policy is not to hire from customers. So it's essential that we look for professionals from outside of Wisconsin. In fact, roughly 80% of the consultants we hire in the scientific/engineering area, as well as up to 30% of our business consultants, come from out of state. Here, the nationwide exposure we get with Computerworld *is crucial to our recruitment efforts.*

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An IDG Communications Newspaper

Biotech: Great expectations, few jobs

BY ALAN RADDING
SPECIAL TO CW

The biotechnology industry may offer exciting opportunities during the coming decade for computer professionals who focus on small, networked systems and enjoy an entrepreneurial environment. But don't pack your bags yet.

The industry has been identified as one of the nation's most potentially lucrative, with expectations that sales will reach $100 billion during the next 10 years.

Product sales revenue for the entire biotech industry hit $4 billion this year — a modest level compared with other technology-based industries — but the rate of growth is accelerating as more products finally reach the market. Revenue from products is increasing at the rate of 25% per year, says Steve Buckley, the East Coast regional director of the high-technology group at Ernst and Young.

Employment in the field is also growing. With a 7.7% increase over the past year, biotech now leads all other technology sectors, according to a survey by market research firm Corptech in Woburn, Mass. However, demand for computer professionals is still modest.

Information systems recruiters say that overall, the biotech industry has been a disappointment in terms of employment. "It's not as dynamic as people thought it would be," says Lee Silver, president of L. A. Silver, a recruitment firm based in Framingham, Mass.

Silver says he placed computer people in the industry a few years ago but none recently. He attributes the slowness to the fact that firms are still focusing on basic research rather than management, production or customer service — factors that drive the need for systems.

The situation on the West Coast, a hotbed of biotech activity, isn't any different. Source EDP in San Francisco finds very little interest in systems people at the area's biotech firms. "The very largest companies might have a [Digital Equipment Corp.] VAX and maybe 15 to 20 computer professionals," says Dave Flansbaum, Source EDP's Northern California managing director.

One of the problems is the size of biotech firms. Even the largest ones are quite small. More than half of the firms in the field have fewer than 50 employees. "The top-tier firms have 300 employees, but only 5% of the companies in the industry are that size," Buckley reports.

From a systems standpoint, "you'll probably find that these companies use a lot of PCs and workstations and networks," says William A. Grady, a partner at Romac Associates.

Biotech profile

San Francisco-based Genentech, one of the largest biotech companies, is typical of the big companies in the field. The company has about 55 people in systems, divided into two major groups: operations and support. Each group is split along two lines: research and business.

From a systems standpoint, the research side is Unix-based, while the business side is a VAX/VMS operation, reports Jack Murphy, a spokesman at Genentech. There is also a network services group that concentrates on Apple Computer, Inc. Macintosh-to-VAX connectivity, he says.

David Thompson, a computer analyst at Genentech, works in the microcomputer support group, spending most of his time helping users with off-the-shelf applications for their personal computers and Macintoshes. Thompson, a liberal arts college graduate, learned micro support functions at Pacific Bell, an engineering-oriented company.

Although much of the work he does is essentially corporate in nature — no different from that of a micro support person at a bank or an insurance company — Thompson was attracted to biotech by the excitement surrounding the industry. "The systems people don't make the discoveries, but it is still a very exciting place to work," he says.

> INFORMATION SYSTEMS recruiters say that overall, the biotech industry has been a disappointment in terms of employment.

While it is not necessary to have a biology or chemistry background, Thompson says he found his prior experience in an engineering organization helpful. Biotech companies look for people who will fit in a fast-paced, entrepreneurial, scientific/engineering environment.

Brian Faldasz, senior data processing engineer at Genmap in New Haven, Conn., had no biotech background when he joined in the founding of Genmap, a tiny company of nine employees that is still in the research stages. Faldasz had an engineering background and put himself through a crash course in biotech. "A lot of the stuff you work on isn't biology-specific," he says.

Faldasz, for instance, spends most of his time working on Genmap's custom database using a Sun Microsystems, Inc. workstation. He also helps other people when they are having problems with their Macintoshes or PCs.

Spreading out

The biotech industry is concentrated in Massachusetts and California, Buckley says, but activity is spreading to the Washington, D.C., Baltimore, New York, New Jersey and Pennsylvania areas.

Typically, jobs are filled by word of mouth and personal networking. The pay scale in biotech is competitive with other industries. For the most part, however, companies don't look beyond the local market to fill a computer job, Grady says: "They want to save money by not having to pay relocation expenses."

While a computer career in the biotech field may be appealing, the future is not likely to be a smooth and steady ride. The industry expects a lot of mergers and consolidations over the next 10 years, Buckley says. "Biotech mergers are an accepted fact of life," he says, because it takes an enormous amount of money — $200 million over 10 years — just to bring a biotech product to market. That is far beyond the resources of a small start-up company.

But as the companies get larger, through internal growth or acquisition, they will require more and bigger information systems, and they will need to hire more IS professionals.

Radding is a free-lance writer based in Newton, Mass.

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For more information about these or other opportunities, call or send resume to Mark Weintraub at:

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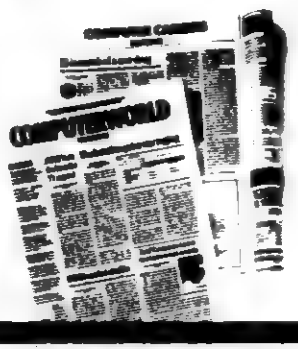

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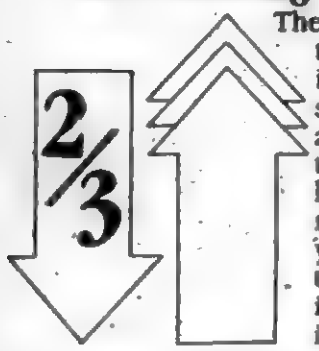
A few important tips on recruiting computer professionals

Finding computer talent isn't as easy as it used to be. In fact, there was a time when you'd just run an ad in the local newspaper and you could make a hire without waiting too long or spending too much.

But times have changed. And like so many facets of today's business, so has the effectiveness of traditional recruiting methods.

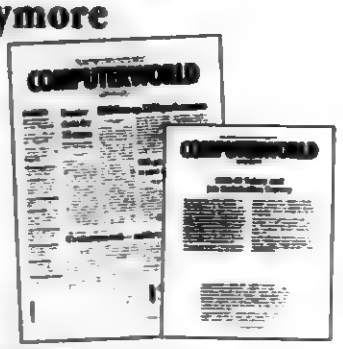
What's more, many of today's recruiters *don't use* today's most efficient methods — methods that save time and money for some widely unknown reasons.

The supply of qualified professionals isn't meeting demand



The American Council on Education reports that the number of college students choosing computer careers is down two-thirds since 1982. To make matters worse, there are more computers in today's business that require the skills of this shrinking market than ever before. And while you may never consider the company next door your competitor, it likely *is* competing for the same computer talent today. The result is a classic supply/demand problem that isn't changing for the better -and that's sure to make your recruiting tougher in the '90s.

Ads in local papers don't reach your major hiring market anymore



That's because they generally reach "active" job seekers — those who actively seek out the local newspaper to find jobs — and who a recent *Computerworld* job satisfaction survey found to represent 2 in 10 of today's computer professionals. The study also found that 7 in 10 of today's computer professionals are "passive" job seekers — those who would *consider* new job options, but likely never look for them in the local newspaper. (The remaining small percentage are "non-movers" content with long-term jobs.)

For every 10 of today's computer job seekers . . .
2 are Active
7 are Passive
1 is a Non-mover

In short, this means that your ad in today's local newspaper reaches no more than 20 percent of today's computer job seekers. What's worse, if you're not using other vehicles that reach far more job seekers, your local newspaper expenses are as inefficient as their limited audience.

More job seekers see your ad in Computerworld than in any other newspaper — Sunday, daily, or trade

That's because *Computerworld* reaches over 612,000 qualified computer professionals every week — the largest audience of its kind, and one that's rich with passive and active job seekers.

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Computerworld gives you regional editions

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Computerworld costs no more than local papers

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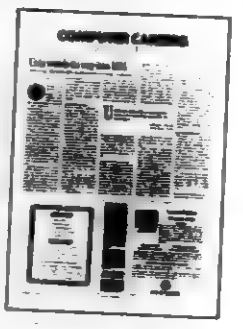
Just look at this week's Computer Careers section. You'll find a career editorial topic that will stir the interest of virtually any computer job seeker — passive *or* active. It's just one of countless reasons *Computerworld* is America's newspaper of choice on computing. No matter how much the times change.



And while times may change, some things won't. Whether you *use* computers, *make* computers, or sell products and services *for* computers, *Computerworld* is still your major source of news today. And your major source of computer professionals tomorrow.

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Catch a career you can fly with by forwarding your resume, with salary history, to: **USAir Employee Relations, Dept. RAMIS, P.O. Box 15866, Arlington, VA 22215. EOE M/F.** PRINCIPALS ONLY.

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Requires 7-10 years' experience in teleprocessing systems programming supporting a large VTAM/SNA network comprised of CRTs, workstations and Local Area Networks. Extensive knowledge in installation, debugging, maintenance of VTAM V3.2, NCP V5, NETVIEW and related products as well as network troubleshooting and design required. Must have good communication skills to support computer operators and end-users, and interact with a variety of vendors for information and problem resolution.

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Requires 7-10 years' experience in IMS, CICS, DBRC, ADF II, and IBM Data Dictionary. Extensive knowledge in DBD and PSB control block generations, data base design, data base backup and recovery using DBRC is required. Good technical writing skills desirable.

COMPUTER APPLICATIONS ANALYST

Requires a minimum of 5 years' related experience working on materials, finance, payroll, or employee relations systems. Requirements include the ability to prepare MPS, DBDs and PSBs. Languages should include COBOL and/or PL1 with hands-on experience using IBM JCL, VSAM and IMS DB/DC support utilities. Telon experience a plus.

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Requires 7-10 years' data storage management experience supporting 3380/3390 and familiarity with DF/DSS, EREP, tape management using CA-1. VSAM support, DFHSM support and catalog/VVDS support required. Must have knowledge of JCL, SAS, ISPF/PDF, Assembler language programming and familiarity with program exits and system managed storage. Good technical writing skills desirable.

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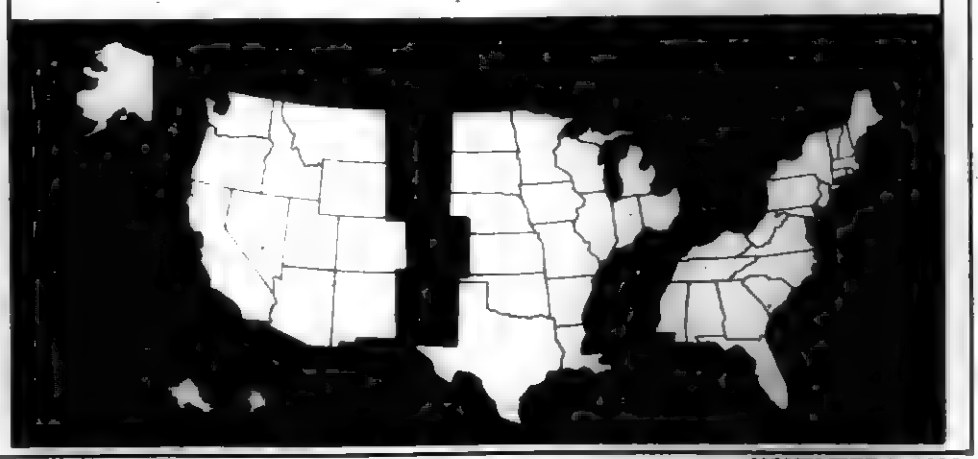

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BY JESSICA KEYES
SPECIAL TO CW

The graphic arts field has long used desktop scanners to transfer images from paper to personal computers. Similarly, and largely because of the urgency of meeting deadlines, the publishing industry often uses scanners to move hard copy to screen as quickly and easily as possible.

Unfortunately, the scanners used in these cases are usually high end and typically require an investment in the $1,000 to $5,000 range. If your budget is limited and you don't have a high volume of copy to handle, you may want to consider buying a handheld scanner.

Handheld scanners are most suitable for those individuals and businesses that have only an occasional need to scan an image or printed page into their computers. Prices for these devices average about $600 (complete with bundled software), but careful shopping can uncover ones for as low as $200 (for hardware only).

However, there's quite a range in the quality of the many handheld scanners in the marketplace today. To save you from some major disappointments, here's a list of several points to check prior to making a purchase:

• **Determine what your scanning needs are.** Handheld scanners are not precise, incapable of handling a large volume and not as accurate as the more expensive stationary models. Therefore, if you're projecting heavy scanning traffic, stay away from handheld versions altogether. You'd be best advised to plunk down the cost of a desktop model.

• **Understand that handheld scanners are slightly difficult to maneuver.** Handheld scanners, which are about twice as wide as a mouse and about twice as long, require manual dexterity. All scanners — high end and handheld — come equipped with a window that displays the image or text you are scanning.

The problem with handheld scanners is that once you have the beginning of the image lined up, you have to manually drag the scanner down or across the page. Meanwhile, you have to press the scan button and eyeball the computer screen to see if you're on target. (It's not uncommon to have to rescan two or three times before you're satisfied.)

Top-selling handheld scanners

- *Logitech's Scanman Plus*
- *The Complete PC's Complete Handscanner 400*
- *Marstek's The Mars 105*
- *DFI's The Handyscanner 3000 Plus*
- *ECA C&C Products, Inc.'s A4Scan AS9000P*
- *Esco Systems, Inc.'s Skyscan D-120*

Source: New Art, Inc.

• **Make sure that the resolution of the scanner can be changed.** This is important. Dots per inch is a handy way of controlling the quality of graphics scanning. For an extremely detailed image, such as a photograph, you'll want the dots-per-inch resolution to be quite high. In addition, the lower the point size of the text you're scanning, the higher the dots per inch must be. Most scanners permit you to modify this setting in increments of 100 dot/in. to a maximum of 400 dot/in. Some scanners let you modify the dot/in. setting to 800.

• **Check to see if the scanner you choose can scan from top to bottom and from side to side.** This may seem trivial, but it's a worthwhile feature to have.

• **Ascertain which file formats images can be stored in.** The general reason for scanning an image (i.e., a picture) is to export it into another software package. Typically, this will be a desktop publishing or paint package. In order to export the image, you must first determine what type of file the software will save. Although there is a wide variety of file types, the two most common are PCX and TIFF, which stands for Tag Image File Format.

• **Ask the vendor if optical character recognition (OCR) software comes bundled with the scanner.** OCR software interprets the scanned image and converts it into meaningful text. If it doesn't come with the package, you'll need to purchase it. OCR software can make a big difference in scanning accuracy. Before making a purchasing decision, you may want to go to a PC dealer and try out the software for yourself. There are several OCR software packages on the market, with an average cost of about $500.

• **Check that the OCR software permits you to train new fonts.** The software will typically be preconfigured with one or more type styles. Problems may arise when you try to scan something with a different typeface or type size. In order for this to work, you need to have the flexibility to scan in the alphabet styled in the typeface and point size of choice. For those who don't possess the patience of training each letter prior to your scan, a training feature lets you scan the "live" document and have the software prompt you to answer questions about the letters it can't read.

• **Determine whether the scanner you are considering has a "text merge" function.** Obviously, handheld scanners can't scan a whole page of text in one try. It may take two or three scans before a whole page is stored on the computer. These scans will be stored in separate files that will then need to be merged.

If you don't have a lot of images to scan, handheld scanning is a bargain. Once you master the intricacies of OCR software and the skill of using a clumsy device for detailed work, you'll find the scanner to be an indispensable device.

Keyes is president of New Art, Inc., a management and computer consulting firm in New York.

Buy/Sell/Lease

The BoCoEx index on used computers

Closing prices report for the week ending October 26, 1990

	Closing price	Recent high	Recent low
IBM PC Model 176	$375	$450	$200
XT Model 086	$500	$550	$450
XT Model 069	$550	$625	$400
AT Model 099	$650	$975	$500
AT Model 239	$875	$1,025	$700
AT Model 339	$925	$1,100	$900
PS/2 Model 30-286	$1,250	$1,300	$1,125
PS/2 Model 60	$1,500	$1,800	$1,400
PS/2 Model 70P	$3,425	$3,450	$3,175
Compaq Portable II	$900	$1,050	$875
Portable 286	$1,375	$1,450	$1,100
SLT 286	$2,500	$2,625	$2,000
Portable 386	$2,600	$2,800	$2,500
LTE 286	$2,000	$2,100	$1,650
Deskpro 286	$1,375	$1,400	$1,200
Deskpro 386/20	$2,900	$3,100	$2,400
Apple Macintosh Plus	$750	$975	$700
SE	$1,200	$1,450	$1,200
II	$3,100	$3,400	$3,050
IIFX	$6,600	$7,100	$6,600

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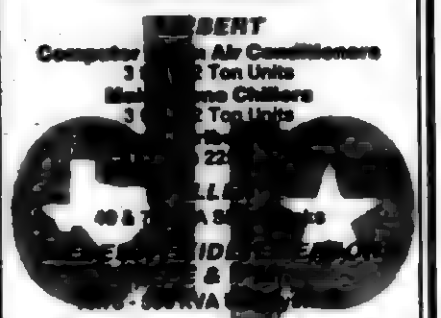

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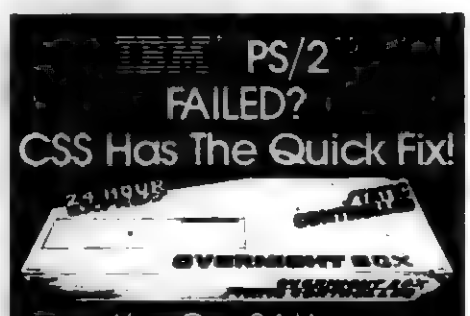

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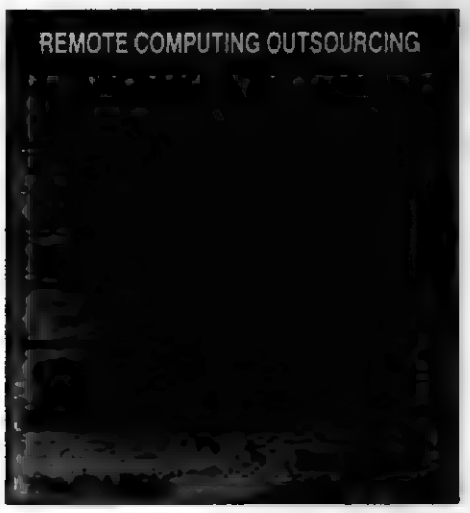

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Managers must learn to share responsibilities with trainers

BY SUE REDKEY
SPECIAL TO CW

Training is not a responsibility that belongs only to trainers. Managers have to pitch in too, if they want to be sure that the right training is being delivered to the right people at the right time. In the same way that information systems managers expect their clients to be involved with the systems being developed for them, trainers need input from IS managers for training effectiveness.

Case in point: When Janet Green and Tom Rebstock, both technical trainers at the Texas Highway Department in Austin, conducted a survey of people who had received personal computer training during 1989, they found that 41% reported little or no productivity gain. Why? Because most of the 41% didn't have access to a PC on the job. Yet their managers had approved their training. This case may represent an extreme, but the point is still valid. What if someone on your staff really needed that training but couldn't get into a class because it was filled with people who didn't need it?

You can help prevent this kind of ineffectiveness and encourage other managers by your example. Here are some ways that you can become more involved in in-house training:

• **Take an active role in planning training for your staff.** Know who needs what training within what time frame, and be clear about priorities. Agree on these points with each staff member, making training plans part of performance expectations where you can [CW, Jan. 29].

If you feel there's no point in this kind of planning because classes never seem to be offered when your staff members need them, remember that trainers can't read minds. It is up to you to speak up and communicate your needs and priorities.

• **Be supportive.** When you send your people to in-house training classes, don't interrupt them to troubleshoot a problem in your department. That will disrupt their concentration and imply that you think training is not all that important.

Maintain an environment that makes it easy for them to apply new skills and concepts in your group. Participants often come back to the job all fired up with enthusiasm for what they have learned, but if that enthusiasm is stifled, much of the learning is lost.

Demonstrate your commitment to their training by showing some interest in the topic. For instance, if you send someone to a computer-aided software engineering class, read a few articles on that subject. That way, you'll put yourself in a more informed position to support the person being trained.

Also, be selective about which classes you send people to. What they can't use, they'll lose, so wait until the time is right.

• **Put yourself into the feedback loop.** One of the most valuable things you can do is assess the effectiveness of training in terms of your needs and expectations — then pass on your findings to the training department. Remember, you are their client, so they need to know how they can be more effective in serving you.

Be clear about exactly what your needs and expectations are so you have some standards by which to measure results. When your employee returns from class, ask for feedback — not just whether he had a good time, but whether he feels the class gave him what he needs in order to meet your performance expectations. You might even request a written report of the experience.

Assess training effectiveness again two to three months after the class. By this time, that person will have a much better idea of whether the class was appropriate to his needs.

Despite the fact that postcourse evaluations provide the most insightful feedback, they're not conducted regularly enough. The best way to know how to make the course more effective is to know how the learners perform within their jobs after training.

• **Take the initiative.** Don't wait to be asked; your training department needs your involvement whether they have had time to formally request it or not. If the system could work better, it's up to you to identify where and how.

Redkey is an independent instructor, writer and consultant and author of The Technical Instructor's Handbook: From Techie to Teacher.

Tailored for changing times

Toni Griskivich at Unum Life Insurance Co. in Portland, Maine, has been responsible for the company's entry-level programmer training program for years. To perform this job effectively, she developed a post-evaluation technique that involved active participation of managers and students alike: Not only did she encourage input from managers on a continual basis, but three months after graduation, she would meet with the manager and the former student to get feedback on various aspects of the program.

With this kind of partnership approach, the structure of the program has evolved. What began as a self-study approach mentored by programmers in their spare time grew into a 14-week program taught by two full-time instructors. Still evolving, the program is now taught on-site by a vendor in 11 weeks with technical consultation from Griskivich.

Based on feedback over the years, the involvement of mentors has increased or decreased depending on current needs. The team project has changed from a live project to a case study and no longer stresses competition among teams in class.

Griskivich is the first to admit that all of this tailoring takes a lot of time and effort on everyone's part, but she and her clients both know that without this kind of involvement, there is no way she can deliver what they need and expect.

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COMPUTERWORLD

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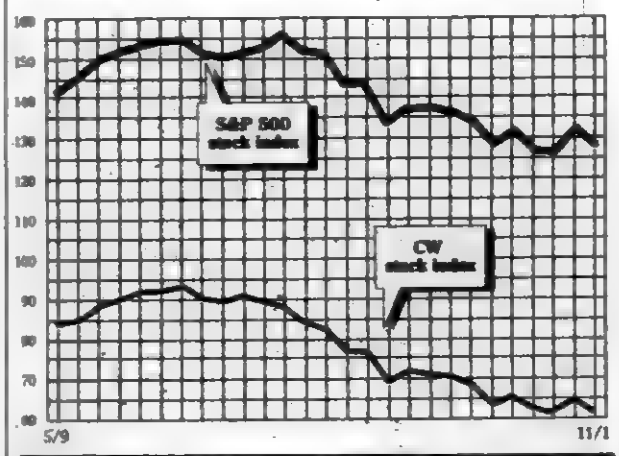
STOCK TRADING INDEX

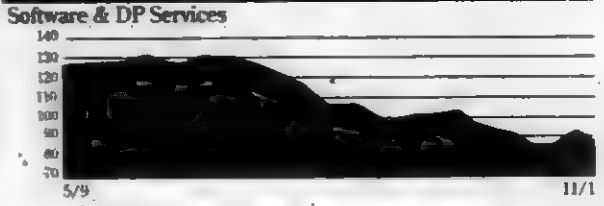


Indexes	Last Week	This Week
Communications	98.8	97.9
Computer Systems	62.9	59.4
Software & DP Services	91.0	87.6
Semiconductors	37.6	36.6
Peripherals & Subsystems	70.8	67.0
Leasing Companies	54.8	50.5
Composite Index	64.2	61.4
S&P 500 Index	132.0	128.4

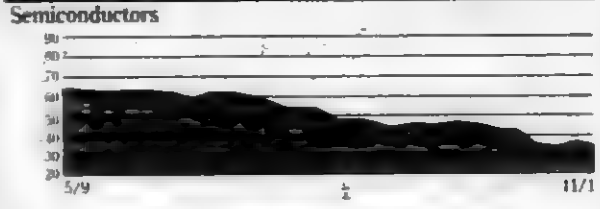
Communications

Computer Systems

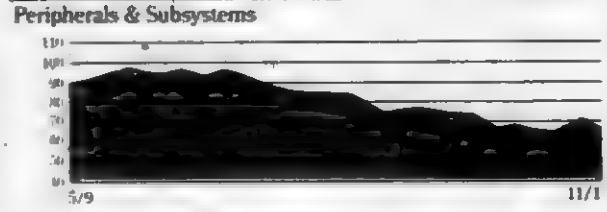
Software & DP Services



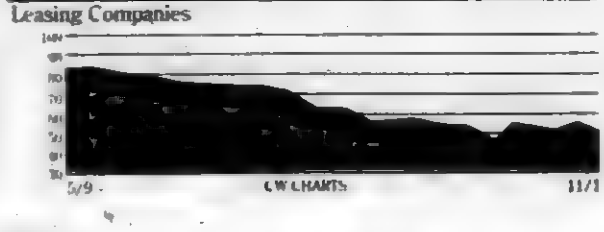
Semiconductors



Peripherals & Subsystems



Leasing Companies



Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, OCT. 31, 1990

EXCH		52-WEEK RANGE		PRICE CLOSE OCT. 31, 1990	WEEK NET CHNGE	WEEK PCT CHNGE
Communications and Network Services						
N	AMERICAN INFO TECHS CORP	88	53	65.75	0.0	0.0
Q	ANDREW CORP	26	16	17	-0.3	-1.4
Q	ARTEL COMM CORP	10	2	2.5	0.4	17.6
N	AT&T	47	30	34	0.6	1.9
Q	AVANTEK INC	5	2	1.625	-0.1	-7.1
N	AYDIN CORP	19	10	10.75	0.3	2.4
N	BELL ATLANTIC CORP	57	40	52.25	1.3	2.5
N	BELLSOUTH CORP	59	49	52.75	0.8	1.4
Q	COMPRESSION LABS INC	16	7	14.25	-0.3	-1.7
Q	CONTEL CORP	36	23	33.5	-0.5	-1.5
Q	DATA SWITCH CORP	4	3	3	0.0	0.0
Q	DIGITAL COMM ASSOC	27	9	9.625	0.1	1.3
Q	DYNATECH CORP	19	12	15	0.8	5.3
Q	FIBRONICS INTNL INC	13	5	7.25	-0.8	-9.4
Q	GANDALF TECHNOLOGIES	6	2	2.375	0.0	0.0
N	GENERAL DATACOMM INDS	5	2	1.625	-0.4	-18.8
N	GTE CORP	38	24	28.25	-0.3	-0.9
Q	INFOTRON SYS CORP	9	1	1.75	0.0	0.0
N	ITT CORP	61	40	43.125	-1.5	-3.4
N	M/A COM INC	9	3	4.375	0.0	0.0
Q	MCI COMMUNICATIONS CORP	48	28	30	-1.1	-3.6
N	NETWORK EQUIP TECH INC	34	5	5.375	-0.5	-8.5
Q	NETWORK SYS CORP	15	7	8.375	0.1	1.5
N	NORTHERN TELECOM LTD	30	21	26.375	0.8	2.9
Q	NOVELL INC	29	12	24.75	0.8	3.1
N	NYNEX CORP	92	67	68	-2.6	-3.7
N	PACIFIC TELESIS GROUP	52	36	45	0.5	1.1
A	PEIRPL CORP	9	5	5.75	-0.1	-2.1
N	PLESSEY PLC	42	39	0.01	0.0	0.0
N	SCIENTIFIC ATLANTA INC	29	9	9.625	-4.0	-29.4
N	SOUTHWESTERN BELL CORP	65	47	54.5	1.0	1.9
Q	3COM CORP	19	5	6.875	1.1	19.6
N	US WEST INC	41	32	37	-0.6	-1.7
Computer Systems						
Q	ALLIANT COMPUTER SYS	9	1	1.375	-0.5	-26.7
Q	ALPHA MICROSYSTEMS	5	1	1.625	-0.3	-13.3
A	AMDAHL CORP	19	10	11.375	0.4	3.4
Q	APPLE COMPUTER INC	48	24	30.75	0.3	0.8
Q	AST RESH INC	26	9	20.75	0.8	3.8
N	BOLT BERANEK & NEWMAN	8	4	4.75	-0.4	-7.3
N	COMPAQ COMPUTER CORP	68	36	46.625	-0.9	-1.8
N	COMMODORE INTNL	12	5	7.375	1.0	15.7
Q	COMPUTER AUTOMATION INC	5	0	1.032	0.2	26.9
N	CONTROL DATA CORP	22	8	8.25	-1.4	-14.3
N	CRAY RESH INC	51	20	23.625	-1.3	-5.0
N	DATA GEN CORP	14	4	4.25	-0.8	-15.0
N	DATAPOINT CORP	5	1	1.25	-0.1	-9.1
Q	DELL COMPUTER CORP	14	5	10.625	-0.4	-3.4
N	DIGITAL EQUIP CORP	95	48	47.5	-4.3	-8.2
N	FLOATING POINT SYS INC	4	0	1.375	0.0	0.0
N	HARRIS CORP	37	14	15	-1.0	-6.3
N	HEWLETT PACKARD CO	50	26	26	-3.4	-11.5
N	HONEYWELL INC	112	71	82.625	-1.1	-1.3
N	IBM	123	93	105.5	-3.1	-2.9
Q	INFORMATION INTL INC	14	8	9.25	0.5	5.7
Q	IPL SYS INC	14	5	8.875	-0.6	-6.6
N	MAI BASIC FOUR INC	4	1	1.125	-0.4	-25.0
N	MATSUSHITA ELEC INDL LTD	166	116	135.75	-5.3	-3.7
Q	MENTOR GRAPHICS CORP	26	9	9.625	-0.4	-3.8
Q	MDI INC	1	0	0.156	0.0	-9.3
N	NCR CORP	72	45	47.25	-4.0	-7.8
Q	PYRAMID TECHNOLOGY	36	13	13.5	-5.0	-27.0
Q	SEQUENT COMP SYS INC	34	13	16	-0.8	-4.5
Q	SUN MICROSYSTEMS INC	37	15	16	0.3	1.6
Q	SYMBOLICS INC	2	0	0.313	0.1	25.2
N	TANDEM COMPUTERS INC	30	9	9.375	-2.6	-21.9
N	TANDY CORP	44	24	23.875	-1.3	-5.0
N	ULTIMATE CORP	10	2	2	-1.0	-33.3
N	UNISYS CORP	17	2	2.25	-1.3	-36.7
A	WANG LABS INC	6	3	2.875	-0.3	-8.0
Software & DP Services						
Q	AMERICAN MGMT SYS INC	20	11	14.25	-0.6	-4.2
Q	AMERICAN SOFTWARE INC	18	8	10	0.1	1.3
N	AMACOMP INC	5	1	2.125	-0.1	-5.6
Q	ANALYSTS INTL CORP	24	10	12.25	-0.3	-2.0
Q	ASHTON TATE	15	5	6.75	-0.6	-8.5
N	AUTO DATA PROCESSING	60	44	50.375	-0.8	-1.5
Q	AUTODESK INC	60	32	38.25	-2.8	-6.7
Q	BMC SOFTWARE INC	30	16	19.75	-3.3	-14.1
N	BUSINESSLAND INC	12	1	1.75	0.1	7.7
Q	COGNOS INC	10	4	6.625	-0.1	-1.9
N	COMPUTER ASSOC INTL INC	17	6	7	-0.1	-1.8
Q	COMPUTER HORIZONS CORP	17	8	13.125	0.6	5.0
N	COMPUTER SCIENCES CORP	59	37	42.625	2.1	5.2
N	COMPUTER TASK GROUP INC	12	7	7.375	-0.5	-6.3
Q	COMSHARE INC	25	14	17	-0.8	-4.2
Q	CORPORATE SOFTWARE	16	4	4.5	-1.0	-18.2
N	GENERAL MTRS (CLS E)	38	24	32.625	-1.9	-5.4
Q	HOGAN SYS INC	7	2	2.125	-0.1	-5.6
Q	GDAL SYSTEMS INTL	18	8	7.75	-2.25	-22.5
Q	INFORMIX CORP	18	4	3.625	-0.8	-17.1
Q	INTELLICORP INC	8	1	1.688	-0.4	-20.6
Q	LEGENT CORP	31	17	18.25	-1.5	-7.6
Q	LOTUS DEV CORP	39	13	17.25	2.0	13.1
Q	MICROSOFT CORP	81	38	63.75	-1.6	-2.5
Q	NATIONAL DATA CORP	35	8	10.125	1.0	11.0
N	ON LINE SOFTWARE INTL INC	11	4	4.25	0.0	0.0
Q	ORACLE SYS CORP	188	5	5.375	-0.6	-10.4
N	PANSOPHIC SYS INC	19	7	7.75	-0.1	-1.6
Q	PHOENIX TECHNOLOGIES INC	5	2	1.75	-0.1	-6.7
N	POLICY MGMT SYS CORP	43	30	37.625	-1.4	-3.5
Q	PROGRAMMING & SYS INC	25	10	10	-1.5	-13.0
Q	RELATIONAL TECH INC	10	3	9.125	0.0	0.0
N	REYNOLDS & REYNOLDS CO	27	12	11.75	-1.3	-9.6
Q	SAGE SOFTWARE INC	16	8	10.5	-1.5	-12.5
Q	SEI CORP	22	15	16	-0.5	-3.0
Q	SHARED MED SYS CORP	17	12	15.25	-0.1	-0.8
Q	SOFTWARE PUBG CORP	28	12	13.5	-2.5	-15.6
N	STERLING SOFTWARE INC	11	6	7	-0.1	-1.8
Q	SUNGARD DATA SYS INC	26	10	10.5	-0.3	-2.3
N	SYSTEM CENTER INC	25	6	7.625	-0.8	-9.0
N	SYS. SOFT INC	29	13	19.25	0.3	1.3
Q	WORDSTAR	2	1	1	0.2	23.0
Semiconductors						
N	ADV MICRO DEVICES INC	11	4	3.875	-0.1	-3.1
N	ANALOG DEVICES INC	10	6	5.75	-0.1	-2.1
Q	ANALOGIC CORP	10	8	8.5	0.1	1.5
Q	CHIPS & TECHNOLOGIES INC	24	5	6	0.0	0.0
Q	INTEL CORP	52	28	33.5	-1.5	-4.3
Q	MICRON TECHNOLOGY INC	16	7	7.875	0.0	0.0
N	MOTOROLA INC	86	51	53.875	-0.5	-0.9
N	NATL SEMICONDUCTOR	9	3	3.375	-0.4	-10.0
N	TEXAS INSTRS INC	44	23	24	-0.9	-3.5
A	WESTERN DIGITAL CORP	15	5	5.625	-0.4	-6.3
Peripherals						
Q	ALLOY COMP	2	0	0.5	-0.1	-20.0
N	AM INTL INC	6	1	1	-0.3	-20.0
Q	AUTO TROL TECH CORP	4	2	2	-0.3	-11.1
Q	BANCTEC INC	24	10	10.5	-1.0	-8.7
A	COGNITRONICS CORP	8	3	5.25	0.1	2.4
Q	CONNER PERIPHERALS	31	11	23.125	-0.4	-1.6
A	DATARAM CORP	22	8	8.25	0.0	0.0
N	EASTMAN KODAK CO	48	34	39.75	-0.1	-0.3
N	E M C CORP MASS	7	3	6.75	0.0	0.0
Q	EMULEX CORP	9	4	4.875	0.0	0.0
Q	EVANS & SUTHERLAND	35	16	16.5	-1.5	-8.3
Q	ICOT CORP	2	0	0.5	0.1	14.2
Q	INTERLEAF INC	8	3	3.25	0.0	0.0
Q	IOMEGA CORP	8	3	4.063	-0.4	-8.4
Q	MASSTOR SYS CORP	3	0	0.563	0.0	0.0
Q	MAXTOR CORP	17	4	4.75	-0.1	-1.3
Q	MICROPOLIS CORP	10	3	6.5	-0.5	-8.3
N	MINNESOTA MNG & MFG CO	91	71	79	0.8	1.0
Q	PERSONAL COMP PRODUCTS INC	5	4	3.75	0.1	3.4
Q	PRINTRONIX INC	15	6	8.563	0.6	7.0
N	QMS INC	21	9	11.875	-1.6	-12.0
Q	QUANTUM CORP	28	9	18.375	-0.1	-0.7
N	RECOGNITION EQUIP INC	8	4	5	0.0	0.0
Q	REXON INC	10	4	6	0.3	4.3
Q	SEAGATE TECHNOLOGY	20	6	7.375	-0.1	-1.7
N	STORAGE TECH CORP	35	11	13.875	-1.1	-7.5
Q	TANDON CORP	4	1	1.688	-0.2	-10.0
N	TEKTRONIX INC	19	12	15.25	-0.3	-1.6
Q	TELEVIDEO SYS INC	1	0	0.25	-0.1	-20.1
N	XEROX CORP	60	28	29.5	-1.1	-3.7
Leasing Companies						
N	CAPITAL ASSOC INTNL INC	5	1	0.875	-0.2	-17.7
N	COMDISCO INC	31	15	16	-0.4	-2.3
Q	LDI CORPORATION	18	10	10.25	-0.4	-3.5
Q	PHOENIX AMERN INC	5	3	4.75	-0.1	-1.3
Q	SELECTERM INC	7	3	3	-0.5	-14.3

EXCH: N—NEW YORK; A—AMERICAN; Q—NATIONAL

Share dance

Tech stocks hit the floor for some quick dips and jumps

Although they were not dancing in the street, technology stocks were up and moving last week. Investors grabbed selected firms for a quick turn around the trading floor, including AST Research, Inc. After rolling out a new Intel Corp. 1486-based personal computer on Monday, AST had its dance card filled for the rest of the week, gaining 2⅛ points to 21¼ by closing time Thursday. IBM's introduction of its 1486 machine evidently tickled fewer traders, as IBM picked up just ⅝ of a point to close Thursday at 107¼.

Lotus Development Corp. had Wall Streeters twisting and shouting about Samna Corp. after Lotus publicized its impending takeover of the word processing software maker. Samna shot up 6¾ points to 7⅝, while Lotus waltzed away with an additional 2 points by Thursday, closing at 17½. Motorola, Inc.'s computer group beat out both Digital Equipment Corp. and IBM for a $55 million contract with the state of Tennessee, then jumped up 2⅛ points to close at 55⅝.

Not everybody joined the party, however. DEC could not sustain the rally started the week before last and dipped one point to 48⅝. Novell, Inc. also lost, down 1⅜ points to 24⅜.

Last week's action was largely a passel of small slips and gains. Hewlett-Packard Co. stumbled ⅜ of a point to close at 27¼, and Sun Microsystems, Inc. eased back ⅛ of a point to 16. Microsoft Corp. moved up just ⅛ of a point to 63½ as Oracle Systems Corp. slid backward by ⅛ of a point to 5½. Autodesk, Inc. jumped one point to 39½.

Disk-drive maker Seagate Technology, Inc., due to release new products today, hopped up ⅝ of a point last week to 7⅜, while rivals Conner Peripherals, Inc. remained steady at 22⅜ and Quantum, Inc. edged up ⅛ of a point to 17⅜.

KIM S. NASH

NEWS SHORTS

DG losses mount

Continuing on its steady losing streak, Data General Corp. posted a net loss of $89.3 million, or $2.93 per share, for 1990 fourth-quarter results. Company President Ronald L. Skates is publicly maintaining a stiff upper lip, stating that although overall revenue is down, DG is realizing "substantial" revenue gains from its Aviion family of Unix-based workstations. The operating loss for the quarter was $88.2 million, which included a $71.7 million restructuring charge. In 1989, fourth-quarter losses totaled $84.1 million, or $2.86 per share, and included a restructuring charge of $80 million.

Getting out the vote, fax style

Sure, every vote counts. But when you are pressed into service and shipped out to Saudi Arabia on a moment's notice, arranging to vote by absentee ballot sometimes gets lost in the scramble. Thanks to facsimile technology, the votes of about 3,000 Operation Desert Shield troops will still be included in the tallies tomorrow night, said Henry Valentino, director of the Federal Voting Assistance Program. AT&T donated service and equipment to set up Desert Fax.

Landmark buys monitor

Landmark Systems Corp. said it reached an agreement in principle to acquire Critique/VTAM, a performance monitoring tool from Highland Research, Inc. Landmark currently offers monitoring tools for IBM's DB2, CICS and the MVS operating system. The sale is scheduled to be completed next month.

Samsung expands PC line

Samsung Information Systems America is expected to announce today an Intel Corp. 80386SX-based notebook computer and three high-end desktop machines designed for use in the networking market. All the machines will begin shipping in December. The notebook, called the Notemaster 386S/16, will weigh six pounds and will come standard with a 20M-byte hard drive, upgradable to 40M bytes — and eventually to 60M bytes. The 16-MHz machine will retail for $4,499. Samsung's three Systemmaster desktop machines include a file server based on Intel's 1486 chip.

AI Corp. maps strategy

AI Corp. last week sketched out some product plans for next year. It plans to begin shipping a Unix version of its Knowledge Base Management System (KBMS) in the first quarter of 1991. Initially, it will provide KBMS for Digital Equipment Corp.'s Ultrix. Also, the company said a version of its 1st-Class expert system software, which will support Microsoft Corp.'s Windows 3.0, will be available in the first half of next year.

Motorola details image system

Motorola, Inc. said last week it will demonstrate a Unix image processing application for its Multi-Personal Computer — announced in March — at next week's Comdex/Fall '90 show. The product, which will not be formally announced until after Comdex, will reportedly integrate scanning, facsimile, graphics and compact disc/read-only memory technologies to cost-effectively bring imaging to the desktop. A spokesman said Motorola is "not out to tackle the high-performance imaging market" but is instead aiming its software at companies that do not need extremely high-performance imaging.

Epoch offers storage package

Network storage vendor Epoch Systems, Inc. last week announced its Renaissance storage management architecture, which encompasses distributed applications for automatic management, backup and archiving of magnetic disk storage on workstations and servers. Priced from $1,500 to $15,000 and aimed at multivendor, client/server environments, the Renaissance Infinite Storage software automatically scans disks and migrates the least-used files to an Epoch-1 server.

Budget battle spares high tech

BY GARY ANTHES and MITCH BETTS
CW STAFF

WASHINGTON, D.C. — Largely obscured by the uproar over the federal budget, the 101st Congress passed a bushel of last-minute bills benefiting the computer community.

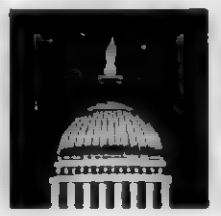
While the bipartisan agreement to reduce the federal deficit by $492 billion over five years imposes painful spending caps overall, funding for computer technology fared surprisingly well in budget bills just passed by Congress for the fiscal year that began Oct. 1.

"Most of what we supported passed, and what we opposed didn't," said Luanne James, executive director of Adapso, the computer software and services industry association. "But, of course, it was a real cliff-hanger."

Congress approved a bill that relaxes restrictions on the export of computer and telecommunications equipment. It requires the government to automatically update the performance-level thresholds for computers allowed for export, and it mandates that the cutoff for export to most countries will not be set lower than 25% of the processing speed of the fastest two commercially available systems.

The bill also provides for largely license-free exports to the 17 Coordinating Committee for Multilateral Export Controls countries, and it adds that hardware and software used in computer networks will not be more tightly controlled than the computers these products interconnect. The Bush administration has expressed reservations about the bill, so a presidential veto is a possibility.

Congress passed, and the president is expected to sign legislation specifying that state institutions and employees are liable for money damages and other remedies for copyright infringement. In another bill, Congress said software copyright owners may bar the rental of their software.



In addition to a bill that exempts many programmers from overtime pay (see story page 1), Congress also took some minor action on the controversial Section 1706, which has prompted many independent computer consultants to become employees unless they meet stringent rules proving their independence. The U.S. Department of the Treasury was ordered to finish its overdue report on the revenue effects of Section 1706 by February 1991.

Supporters and opponents of Section 1706 said the results of the study, originally due in September 1989, will play a major role in determining whether Section 1706 is repealed.

The Senate approved, but the House did not consider, a bill that would create a nationwide research network and foster research in high-performance computer systems. However, $35 million for the initiative was added to the combined budgets of the Defense Advanced Research Projects Agency and the National Aeronautics and Space Administration.

The National Institute of Standards and Technology is to get $11.3 million for its computer programs, a 20% boost. More than half the increase is to go toward the agency's work in computer security. The Advanced Technology Program, which funds private technology consortiums, will get $36 million, $26 million more than last year.

Other computer-related legislation passed in the closing days of the 101st Congress included the following:

- Extension of the business tax credit for research and development expenditures through Dec. 31, 1991.
- Extension through 1991 of a moratorium on regulations that would otherwise require U.S. firms to allocate some of their R&D expenses to foreign income taxes, thus reducing their U.S. tax credit.
- Establishment of chief financial officer positions at all major federal agencies. In addition, the bill establishes a presidentially appointed super-CFO within the Office of Management and Budget.

An effort to modernize the 1984 Computer Fraud and Abuse Act is dead for now. The Senate passed, but the House failed to consider, extending the legal concept of computer "access."

Outsource

FROM PAGE 1

Seltmann, Cobb and Bryant, Inc. in Memphis, to take over its IS management. Nashville Electric said that the pact, valued between $35 million and $45 million, will save it $16 million over the seven years.

Last week's unusual legal action underscores one of the major downsides of the current outsourcing trend: staff uncertainty about involuntarily gaining a new employer or a layoff notice.

"No one had any opportunity to get another job if they don't want to work for [Seltmann Cobb]," said attorney Aleta Arthur Trauger, who in an Oct. 30 filing on behalf of NESEA sought an injunction to prevent the utility from finalizing the contract.

Nashville Electric spokeswoman Teresa Corlew said she did not know if the utility board would proceed despite the lawsuit. "Everyone can see that this is a good move for the electric service," she said. "It's a big change, something that our employees are not used to, and there is a natural apprehension."

The suit also charged that the utility's failure to put the contract out for public bid violates the city's purchasing policies and that Nashville Electric board members held private meetings to discuss the contract in violation of state public meeting laws. The first public discussion, according to Trauger, came during an Oct. 17 meeting at which a public relations representative distributed press releases announcing the intention to outsource to Seltmann Cobb.

Corlew said that Nashville Electric has received legal opinions from its attorneys that "the board does not have to bid professional services contracts."

The letter of intent between Nashville Electric and Seltmann Cobb stated that Seltmann Cobb will offer employment to the utility's IS employees at the beginning of the contract. The press release quoted Nashville Electric board chairman Mike Hampton as saying of the IS employees, "We think these talented individuals will be excited about this new career opportunity."

But Hampton was sorely mistaken, according to Trauger. "All of them should be given the opportunity to find another job in [Nashville Electric]," she said. "Under the city charter, the board must consider their seniority and performance."

Seltmann Cobb has been a major software development contractor to Nashville Electric, helping complete a rewrite of the utility's core applications, such as billing and financial control, to run on its IBM 3090-200J mainframe. However, an Arthur Andersen & Co. audit of Seltmann Cobb's performance earlier this year was highly critical, charging the vendor with questionable costs, missed deadlines and excessive rates.

"Those problems have been solved," Corlew said.

The Andersen audit report also noted that the Nashville Electric contract accounted for 55% of Seltmann Cobb's total revenue for the previous year.

PS/2 server could cost Compaq

BY RICHARD PASTORE
CW STAFF

NEW YORK — The long-anticipated IBM Personal System/2 servers debuted last week to mixed reviews. However, the buying public seems to be applauding the systems, which have arrived none too soon for some and a bit too late for others.

The PS/2 Model 95 has apparently already cost rival Compaq Computer Corp. a Systempro sale. "IBM has a competitive enough product here that we'll probably go with it," said Robert Martin, manager of business systems at Gibson Greetings, Inc. in Cincinnati.

If IBM had been two weeks later with the announcement, "we definitely would have gone with the Systempro," said Martin, who plans to attach 80 personal computer nodes to the server as part of a corporatewide network.

Although IBM made it in under the wire at Gibson, it was too slow for other firms. "If it had been announced and was shipping, we might have considered it," said Bob Jahreis, assistant vice-president of development at Corporate Health Strategies in Westport, Conn. The company broke with its tradition of buying only IBM and Compaq machines last month and ordered an Intel Corp. 1486-based server from Dell Computer Corp.

The desktop PS/2 Model 90 and deskside Model 95, which began shipping last week, are both targeted as servers. However, the Model 90 is also appropriate for graphics work and intensive number-crunching, IBM spokesmen said.

The box's most often-praised feature was the upgradable CPU. The 25-MHz 486 chip can be swapped for a 33-MHz CPU and, eventually, the 50-MHz version and rumored Intel i586, according to IBM.

"The flexibility to upgrade without replacing the entire box definitely has appeal," Martin said. When considering server choices, he decided against the PS/2 Model 80 because it lacked an upgrade option, he noted.

Upgradability is a trend in PC architecture that began among second-tier vendors such as AST Research, Inc. and Advanced Logic Research, Inc. (ALR) and has now been validated by Compaq and IBM, Meta Group, Inc. analyst Frank Michnoff said.

Though they were pleased by the upgrade option, some observers were disappointed with IBM's decision not to employ disk-array technology in the servers.

"We like the disk array of the Systempro and the fact that you don't have to totally mirror your disks transaction for transaction," Martin said. With the PS/2s, "you'll end up spending more for disks if you truly want to mirror your drives."

Expert opinions conflicted on the potential success of the new PS/2s. "I think IBM has direct competitors for the Systempro here. These two boxes will be dynamite for server applications," said Steve Lair, chief PC analyst at Dataquest, Inc. in San Jose, Calif.

Others were not so optimistic. "Except for XGA, nothing about the technology impresses me," said Michnoff, who predicted IBM will lose market share in the next three years despite the debuts.

Compaq does not view the PS/2s as competitors for its multiprocessor Systempro, product marketing manager Lorie Strong said. They are different types of machines, she said, adding that the IBM entries more closely parallel the single-processor Compaq Deskpro 486/33L.

While IBM's prices parallel Compaq's, there are several servers from the likes of Dell and ALR that undercut the IBM price by many thousands of dollars. However, some analysts said IBM need not worry unduly, because superserver buyers have typically been more interested in performance and reliability than in price.

The IBM boxes may find themselves pitted against IBM's own products, analysts warned. Several said the machines could compete for sales with the RISC System/6000 workstation and Application System/400 minicomputer as well as the 486-equipped PS/2 Model 70.

Head to head

IBM is pitting its new servers against Compaq's Deskpro

	IBM		Compaq
	PS/2 Model 95	PS/2 Model 90	Deskpro 486/33L
Processor	486/25 or 33 MHz	486/25 or 33 MHz	486/33 MHz
Bus	Micro Channel	Micro Channel	EISA
Disk	SCSI, 160M or 320M bytes	SCSI, 80M, 160M or 320M bytes	IDE, 120M to 650M bytes
Cache	8K to 256K bytes	8K to 256K bytes	128K bytes
RAM	4M to 32M bytes	4M to 32M bytes	4M to 100M bytes
Graphics	XGA	XGA	VGA
Price	$14,145 to $17,745	$12,495 to $16,695	$13,999 to $19,499

CW Chart: Doreen St. John

IBM dubs XGA as video display 'standard'

BY MICHAEL FITZGERALD
CW STAFF

NEW YORK — Extended Graphics Array, or XGA, the video graphics controller announced last week for IBM's new Personal System/2 Model 90 and Model 95 Intel Corp. 1486-based computers, was called "the new standard" for video display by James Cannavino, IBM vice-president and general manager of personal systems.

While XGA makes immediate sense on the Model 90, which is being positioned as a machine for computer-aided design, some have questioned why the Model 95, primarily a file server, needs such high resolution.

The answer is that IBM wants it to be a desktop standard and bringing XGA in on the high end mirrors its approach to creating its Video Graphics Array (VGA) and Extended Graphics Adapter (EGA) standards.

XGA offers significant improvements over IBM VGA, starting with 1024- by 768-pixel resolution, compared with VGA's standard 640- by 480-pixel resolution. XGA supports 16 bit/pixel color as well, giving it "perfect" video, or color, that the human eye cannot tell from true, 24-bit color. It is also much faster and provides better detail than many third-party Extended VGA boards that feature the same resolution as XGA and far outperforms IBM's current 1,024- by 768-pixel resolution 8514/A card, which IBM said it will position as a high-performance card for Intel 80286-based computers.

IBM also announced a PS/2 XGA Display Adapter/A, a $1,095 add-on card that will allow users of Intel 80386SX-, 80386DX- and 1486-based machines to upgrade, as long as they use DOS 3.3 or higher.

"As graphical user interfaces become more popular, users are going to need this type of resolution," said Tara Sexton, a spokeswoman for IBM.

The problem with XGA, according to Jon Peddie of PC graphics consulting firm Jon Peddie Associates in Oakland, Calif., is that users will have difficulty gaining its benefits without purchasing 19-in. monitors or font-emulation software.

Systempro

CONTINUED FROM PAGE 1

pieces would be available by the first quarter of this year, but customers were not able to evaluate the complete solution until the third quarter," said Michael Swavely, president of Compaq North America.

Though the software snafus — now resolved — delayed sales significantly, Swavely claimed that the Systempro has met sales expectations. To stifle critics who earlier cited slow unit sales (see chart page 1), Compaq has broken with tradition and cited its own numbers. "We expect it to be a $200 million business for us in its first year of shipment," Swavely said.

That figure compares favorably with the first-year revenue of Compaq's successful Deskpro 386 and 386S products, he added. However, since the pricey Systempro requires a more complex, longer sales cycle, "unit volumes are not the same as you see in $3,000 and $4,000 PCs," Swavely said.

Slow start

Yet, even Compaq dealers were disappointed that the machines took off so slowly. "I don't think it sold the way everyone anticipated, but it's just now starting to pick up to the point where people are actually interested in it," said Systempro reseller Pat Calabrese, a sales representative at Tampa, Fla.-based dealer Monterey Waldec.

Part of the reason for the pickup may be the release of the Intel Corp. 1486 version in July, analysts said. Good word of mouth has also helped.

Indeed, early users have high praise for the Systempro's reliability and performance. "They've exceeded my expectations in speed and reliability," said Coca-Cola Foods project director Frank Vander Horst, who claimed to own the very first machine released. "We have not had any downtime related to the Systempro."

Nevertheless, critics have called the design of the dual processors inefficient. All I/O operations flow through the first processor, while only some functions are shuttled to the second processor, noted Ed Bell, a senior systems analyst at systems integrator H.V. Jones Co. Consequently, "What you end up with is not two processors, but really one and a half."

Compaq's Swavely: *Long wait*

Many users who took the early plunge into this technology had initial doubts. "We were very hesitant to leave the IBM fold, but IBM just didn't offer a product that was comparable to the Systempro when you consider dollars spent and upgradability," said Joseph Duane, president of Medical Cost Control, Inc. in Tampa. He acquired a 386-based Compaq unit in February. The company runs its entire business on PC networks.

Duane is running Unix on the system, but he and others are still waiting for the arrival of specific applications to take advantage of the dual processors.

"Operating systems do not applications make," said Steve Lair, chief PC analyst at Dataquest, Inc. in San Jose, Calif. The applications are still a missing element that has kept the product from taking off as a minicomputer replacement, he said.

Swavely offered tacit agreement, noting that Compaq confused the market by initially positioning the machine as a minicomputer replacement as well as a file server.

Indeed, most users are using the machine as a server rather than as a minicomputer replacement, observers said. Faced with a choice, many still favor minis. Coopers & Lybrand in New York evaluated the Systempro but chose a Digital Equipment Corp. VAX 4000 mini for its 2,500-node network.

"I can grow that VAX 4000 to an extremely powerful animal that will outrun any Systempro ever built," said Stephen Rood, microcomputer technology manager at Coopers & Lybrand.

Despite these snags, the Systempro has successfully carved a new niche in its first year, analysts said. "It's succeeded in bringing users' attention to this whole area," Michnoff said. "It's an important precursor to a lot of what we believe is going to happen — faster engines, multiple engines and disk arrays."

OS/2

CONTINUED FROM PAGE 1

Microsoft will provide 1.3 to interested hardware OEMs. Pat Bellamuh, Microsoft's OS/2 marketing manager, agreed with IBM that 1.3 is fully featured but offered a caveat: "It doesn't install in 2M bytes if you have a network installed, and we have found that you can't install OS/2's High Performance File System in 2M bytes." An IBM spokeswoman said that users on a 2M-byte system can take advantage of most HPFS features.

"OS/2 SE 1.3 goes above and beyond our original goal. [It] is the highest quality version of OS/2 ever available," claimed Lee Reisweig, vice-president of programming at the Entry Systems Division. SE Versions 1.2 and 1.2.1 of OS/2 are still on the market.

IBM claims OS/2 1.3 is significantly faster than its predecessors in some cases. Most users will find they can load network programs two to three times faster than under OS/2 1.2, IBM said. Users can expect to see "significantly" improved performance for specific systems management functions in memory-constrained environments.

A practical work load consists of one DOS application and up to two OS/2 programs running in just 2M bytes under OS/2 SE 1.3. A new install utility will make more fixed-disk storage available. With OS/2 Extended Edition 1.3, users can run those same applications, along with Extended Edition components such as LAN Requester, in 3M bytes of memory.

Fully functional

Although Version 1.3 requires less memory to run, IBM claimed it does not skimp on functionality. The so-called OS/2 Lite is an amalgamation of the recently released OS/2 1.2.1 and added features, including Adobe Type Manager, which provides built-in support for scalable Adobe Systems, Inc. Postscript fonts and Procedures Language 2/REXX.

Users also get an open font interface that allows them to choose the font technology best suited to their needs.

Despite these "definite improvements," Russell Baris, an assistant director of pharmaceutical systems at Pfizer, Inc. in New York, said that two "significant" problems with OS/2 remain. "The user interface just isn't friendly enough to give to users as a standard platform," he said, explaining that the Presentation Manager interface "is not nearly as simple and as unambiguous a tool to use as is Windows." Then there's support for DOS applications. While the DOS Compatibility Box under OS/2 SE 1.3 is much better, it is still far from perfect, Baris said.

In the event that the economy worsens, choking the flow of IS funds, users and analysts predicted that sites stymied in their desire to upgrade to more powerful hardware might opt instead to power up their 286 machines with OS/2 1.3. Many analysts and users agreed that Microsoft Corp.'s Windows 3.0 is better suited to a 386 platform.

"I think it helps in the 286 market. It's more highly optimized, and it runs better, so it reduces the need for a 386," said Bill Langlais, who heads up the Boston Computer Society's OS/2 special interest group.

Jude Gartland, a senior vice-president at Shearson Lehman Brothers, Inc., said he is looking for a way to beef up his 286 platforms. About two-thirds of his installed base are 286s, and he said he expects it will stay that way during the next two years, due in part to the economy.

Gartland said he expects to compare both Windows 3.0 and OS/2 1.3 on a 286 but expressed reluctance to abandon his DOS applications or spend a lot upgrading old 286 technology. On the other hand, he said, Windows 3.0 really requires a 386. "So I'm assuming for the moment we may not be able to run any [graphical user interface] on our 286s for [a while]."

Packing more punch

IBM also moved last week to bolster the functionality of its OS/2 Server and Extended Edition products.

OS/2 Extended Edition's Communications Manager now enables Asynchronous Communications Device Interface calls to be redirected over the local-area network, allowing attached workstations to share the modem and line-pooling facilities of a server. Extensions to the Batch Configuration Facility streamline systems configuration for environments such as Systems Network Architecture (SNA) Gateway, SNA/Advanced Program-to-Program Communications and Synchronous Data Link Control.

OS/2 LAN Server now provides a DOS LAN requester that supports Windows 3.0.

Also, Ethernet support has been expanded in OS/2 Extended Edition Version 1.3 and OS/2 Lan Server Version 1.3 for both DOS and OS/2 workstations. OS/2 Extended Edition 1.3 costs $830 and is slated to ship by year's end. OS/2 LAN Server 1.3 costs $1,040 and will ship in March 1991.

PATRICIA KEEFE

Citrix creates first OS/2 multiuser edition

BY JAMES DALY
CW STAFF

CORAL SPRINGS, Fla. — An addition to the OS/2 blueprint was sketched in last week when start-up Citrix Systems, Inc. announced that it would produce the first multiuser edition of the OS/2 operating system by the first quarter of next year.

Multiuser, which was developed under a licensing agreement with Microsoft Corp., is a character-based 32-bit extension of OS/2 targeted at large commercial installations. As such, it will play a key part in exploiting OS/2's new role as a more muscular alternative to DOS, Microsoft officials predicted.

Although OS/2 was originally charged with replacing DOS, the two systems have now been given complementary roles, with OS/2 assigned the task of providing backbone support for mission-critical applications and managing large groups of terminals and servers, according to Steve Ballmer, senior vice-president of Microsoft's Systems Divison. "We don't see OS/2 as a replacement for DOS," Ballmer said. "[Multiuser] will help take OS/2 into a new sphere."

While companies such as France's Memsoft offer multiuser shells that fit atop OS/2, Multiuser represents the first multiuser system that incorporates original OS/2 source code, said Citrix Chief Technical Officer Edward Iacobucci, one of several staff members who served on the original OS/2 design team.

As such, it is completely compatible with the large base of Personal System/2 developer tools, and standard OS/2 applications can run on Multiuser right out of the box, said Roger Roberts, president of 18-month-old Citrix. Multiuser will also come with OS/2 Version 1.2.1 already installed on it, he said. Spokesman Michael Stone said it will step up to the just-announced Version 1.3 when it becomes available through Microsoft.

DOS veterans should quickly feel comfortable with Multiuser, which provides the familiar user interface and look and feel of DOS. The package also comes complete with a variety of shrink-wrapped OS/2 applications and affords interoperability with DOS and OS/2 local-area networks. Multiuser ships on four disks, and Citrix officials claim installation takes less than 30 minutes.

Recommended minimum system requirements for Multiuser include an Intel Corp. 80386-based system, 4M bytes of random-access memory and 10M bytes of storage, Iacobucci said.

Multiuser will cost $995 for a five-user package and will initially be distributed by the Ingram Micro D retail outlet chain.

Second-class postage paid at Framingham, Mass., and additional mailing offices.
Computerworld (ISSN 0010-4841) is published weekly, with a single combined issue for the last week in December and the first week in January by CW Publishing/Inc., 375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171.
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IBM splits service group

WHITE PLAINS, N.Y. — In an apparent effort to boost its outsourcing services business, IBM dismantled its National Service Division (NSD) last week and split outsourcing and related services off from traditional hardware maintenance.

A new Systems Services Division will comprise outsourcing, other facilities management services and disaster recovery support for customers who wish to turn over all or part of their IS management to IBM. Hardware and software service will be part of a new organization, Marketing and Services Quality. Former NSD head David McDowell will oversee the unit.

The new alignment is intended to infuse more marketing muscle into the services area, according to Don Goodspeed, vice-president of services and maintenance strategies at The Meta Group, Inc., a Westport, Conn.-based research and consulting firm. "They have made a lot of investment in services, and it just hasn't paid off," he said. With outsourcing, "you're going against resistance and possibly taking people's jobs away. These are not easy sells."

CLINTON WILDER

Series/1 lands in the grave

BY MICHAEL FITZGERALD
CW STAFF

CINCINNATI — IBM delivered the obituary for its venerable Series/1 minicomputer to members of the Common IBM midrange user group here last week.

Series/1 was introduced in 1976. Figures from International Data Corp. (IDC) show that in 1989, IBM shipped 3,000 of the systems worldwide and had an installed base of 99,890 units — second only to the System/36 among IBM's small systems.

"It was very, very popular — one of those machines that sold without being marketed," said Carolyn Griffin, midrange computer analyst at IDC.

Wayne Kernochen, an analyst at The Yankee Group, said the Series/1's demise means IBM has decided that its RISC System/6000 workstation is going to be a successful product.

"IBM has used [the Series/1] for all it's worth and now has found a new product [the RS/6000] that seems to have replaced it in a lot of customers' minds," Kernochen said.

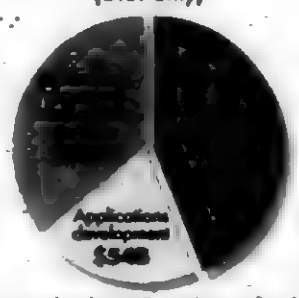
IBM will not officially withdraw the Series/1 from its marketing plan until February 1.

IBM promised that Series/1 hardware and software maintenance would be unaffected for a minimum of five years and added that it was working with Series/1 users to move their applications to other IBM platforms that will support Systems Application Architecture or AIX environments.

TRENDS

Budget expenditures for IS have been earmarked with almost equal emphasis on personnel and services as on product acquisitions, presenting a healthy market for service providers

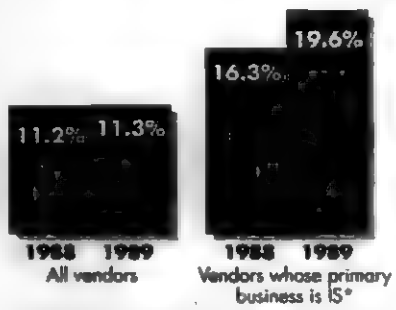
Estimated customers' IS budget
(U.S. only)



Respondent base: Compilation of eight surveys equaling 4,000 responses

Vendors who focus on IS have more employees devoted to service than do vendors in general

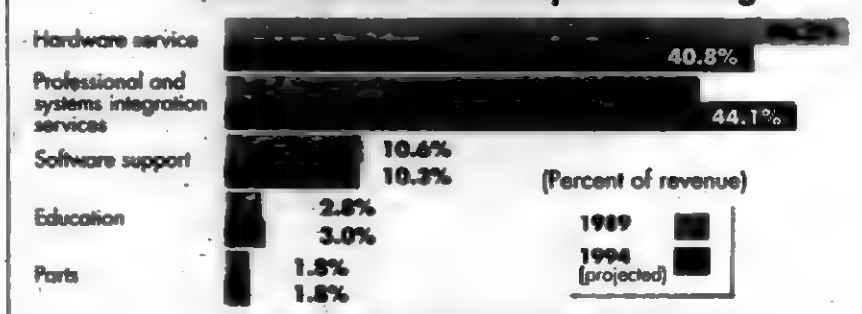
Rising service head count
(% of service employees)



*Not including companies that are heavily dependent on alternate service channels

By 1994, vendors expect a large portion of revenue to be generated from professional, systems integration and other services*

Value-added services: Up and coming



*Including network support, help desk, disaster recovery and planning, data center design, facilities management (outsourcing) and custom application development.

Source: The Ledgeway Group, Lexington, Mass.

CW Chart: Paul Mock

NEXT WEEK

Researchers are pairing computer technology and chemistry to create biochips, which promise to be smaller and faster than semiconductors. One group of researchers has linked neural-network computers with an array of biosensors that detect odors, such as toxic fumes in a factory. Read Advanced Technology for more details.

Information systems professionals today are moving out of the back room and into the forefront of business. With that move comes greater decision-making power, influence and visibility — and more stress, pressure and burnout. Read about the pluses and minuses of IS work as In Depth explores the quality of IS life in the '90s.

INSIDE LINES

Fire sale is Next?

With the new Next models on the way, Businessland stores in the Silicon Valley are reportedly cleaning out their stock of the older black cube machines at fire-sale prices: One buyer picked up one of the $8,000 machines for less than $3,000.

Hindsight is 20/20

Microsoft boss Bill Gates told the Chicago Association of Microcomputer Professionals last week that there was definitely a better way to do it. "If we had it to do all over again, we'd call it all DOS — there would be graphical DOS [Windows], Power DOS [OS/2], Advanced DOS . . . " Gates did promise Windows 3.1 by mid-1991, complete with True Type.

The postman only rings twice

3Com reportedly is following in the footsteps of Banyan Systems. The Santa Clara, Calif.-based networking company may be ready to admit that its electronic-mail application is inadequate. 3Com is rumored to be close to an agreement with CC:Mail that would consolidate user directories, as Banyan did with its Vines system.

Thanks for the feed and quiet

There is such a thing as a free lunch, thanks to Hewlett-Packard. About a dozen journalists showed up for a scheduled HP press conference, only to find an abundance of food and the company's representatives nowhere in sight. HP was due to announce a continuation of its joint initiative with Oracle, including joint development, marketing and customer support. According to a press release issued by HP, all those efforts are still under way.

Getting their act together

Also in the category of virtual press conferences at Unix Expo, Motorola's Technical Systems Division called a meeting to discuss its plans to target the Unix server market and later cancelled it. The briefing was cancelled, according to a Motorola spokeswoman, because of some internal confusion as to exactly what slices of the server market the company is after. Motorola is still planning to introduce its server products — part of the Delta family — next March, she said.

Mirror image?

Wang and Data General may not be merging, as persistent rumors would have it, but the companies would neither deny nor confirm talk that they are exploring the possibility of an alliance that would wed Wang's imaging technology — a strong future hope struggling against stiff present odds — to DG's reduced instruction set computing-based platform — a strong future hope strug . . . you get the picture.

Service driven by customers, or awards?

Merrill Lynch is the latest firm to enter the competition for the Malcolm Baldrige Quality Award, information systems chief DuWayne Peterson told the CIO Magazine/AMR International conference in Palm Springs, Calif. Inspired by the recent "Baldy" award to a services company (Federal Express), Merrill Lynch now has the quality bug, Peterson said.

Ah, to be flying high!

While some chief executive officers are ordering their employees to wake up and fly coach class during these financially tough times, CEO Gordon Campbell of San Jose, Calif.-based Chips & Technologies is encouraging his staff to use the private jet, which seats eight. "Typically, we have a lot of equipment we have to travel with that makes flying with commercial airlines difficult," said a spokesman who also uses the plane. When vacationing, Campbell prefers using his private helicopter "to fly to his ranch," the spokesman added.

After reducing its worldwide work force by 400 employees this year, Dun & Bradstreet Software claims it currently has openings on its books for 130 positions. Customer suggestions on where they should plug the gaps can be phoned to News Editor Pete Bartolik at 800-343-6474, faxed to 508-875-8931 or sent via MCI Mail to COMPUTERWORLD.

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COMPUTERWORLD

Bull cuts gore U.S. group

'Transformation' will trim 5,000 worldwide

BY SALLY CUSACK
CW STAFF

PARIS — The computer industry's economic slump was defined as a "worldwide crisis facing the computer industry" by Groupe Bull last week as it announced that it will reduce its worldwide work force by 5,000 people and restructure internal operations immediately.

"The industry is reacting like lemmings to the sea," said Robert Kidd, an analyst at Dataquest, Inc., a San Jose, Calif.-based market research firm. "The question is, who will safely reach the other shore? Groupe Bull has taken appropriate actions to restructure the organization appropriately, given the economic times."

With about half of the job cuts targeted for North America, analysts speculated that the firm is taking advantage of the tough economy to eliminate lingering overhead from old Honeywell operations centers in the U.S.

"Their profit crunch and the soft computer industry are very real," said George E. Lindamood, a senior analyst at Gartner Group, Inc. in Stamford, Conn. "They haven't hacked away at the deadwood before this, but I think the bean-counters are having their way at this point."

In the U.S., Bull HN Information Systems, Inc. said it anticipates reductions of up to 1,000 employees in Massachusetts, 250 in Arizona, and as many as 350 people will be cut at Bull's field locations throughout the U.S. The firm plans to implement an early retirement plan.

Employee reductions will start immediately and continue through December 1991. These will be in addition to the 2,500-person work force reduction that

Continued on page 8

SPA set to raid business site

BY MICHAEL FITZGERALD
CW STAFF

WASHINGTON, D.C. — The Software Publishers Association will turn up the heat this week in its antipiracy campaign with a new advertising campaign and a planned raid on a major corporation suspected of illegal software duplication.

SPA litigation manager Peter J. Beruk told *Computerworld* last week that a corporation with several hundred personal computers will be raided by federal marshals with a search-and-seizure notice that will allow SPA officials to confiscate all pirated software on the hard drives of their machines. A second company with a similar number of PCs will be raided as soon as possible and likely before the end of November, he said.

The SPA hopes to keep most corporations on the straight and narrow with its new ad campaign, to be unveiled at Comdex/Fall '90 in Las Vegas today, featuring the slogan "Don't Copy That Floppy."

However, the SPA will take stronger action against those it considers to be flagrant violators.

"These companies pretty much have the belief of buying one copy [of a program] and spreading it around on their machines," Beruk said.

In most cases, the SPA sends a letter to the president of a company detailing what software the company is suspected of pirating

Continued on page 142

Comdex pointers

- 386SX-based laptops flood Vegas, but PC managers want more — guaranteed national support.
- Multimedia products will be a hot topic at the show; later this month, Microsoft and allies will capitalize with hardware and software platforms.

Comdex stories, pages 142-145.

Manny Hanny downsizes

BY ELISABETH HORWITT
CW STAFF

NEW YORK — Today is D-day at Manufacturers Hanover Trust Co. as the scheduled switch-over of one of eight data centers to a new facility in Wilmington, Del., kicks off a major downsizing project.

The project, approved by top management last February, calls for the financial company's eight New York data centers to be folded into two: the Wilmington facility and a renovated existing site here, which are expected to be linked and running full work loads by early 1992.

The Wilmington operation will be an almost "lights-out" facility that will back up the New York site. Most IS staffers, such as systems developers, will continue to work in New York.

Personnel reductions will be a significant element of its strategy to save $20 million to $30 million annually in data center operations. Yet so far, Manufacturers Hanover says it has managed to avoid the serious morale problems and mass exoduses that have accompanied belt-tightening measures at some other service firms. IS turnover has been "minimal and controlled," said Executive Vice President H. Edward Nyce.

Bank VP Nyce *oversees changes*

The bank has "made no attempt to shield people" from knowledge of downsizing measures to come, Nyce said.

Last June, Manufacturers Hanover announced that it would be decreasing

To page 14

DEC spins DBMS net

BY MARYFRAN JOHNSON
CW STAFF

BOSTON — Bulking up to get a grip on the corporate database of the future, Digital Equipment Corp. pumped out new object-oriented products, relational database access tools and a long-range strategy for its multivendor distributed database last week.

As its long-range goal, DEC sketched out the "Information Network," a software framework that parallels IBM's Systemview strategy for managing corporatewide information systems. The DEC spin, however, emphasizes multivendor integration through a suite of at least two dozen data management products.

"We want the premier place in integrating everything," said David Stone, vice president of software products at DEC. "The Information Network vision is you can take the data manager to any platform the customer chooses."

During the next six months, DEC will flesh out this distributed software architecture with descriptions of specific products and delivery time lines, in much the same way IBM gradually rolled out pieces of its Systems Application Architecture. But it will be 1993-94 at the

Continued on page 6

Users bemoan upgrade-itis

BY PATRICIA KEEFE
CW STAFF

Inundated with endless software upgrades and fixes, personal computer managers are struggling to come to grips with the increasing burden of hidden costs, support and administrative demands.

To ease the aches and pains of the so-called "upgrade decade," some users at influential corporate sites are beginning to insist that suppliers take a page from mainframe and midrange software developers and provide maintenance contracts. These arrangements typically call for the vendor to automatically upgrade the user with all patches and minor and major upgrades in exchange for a flat, up-front fee.

"We are trying to move toward having a maintenance agreement with all our vendors; we don't want to get nickeled and dimed to death on upgrades," said Price Waterhouse Technology Director Sheldon Laube.

However, it is not yet a common practice. "I have not met one supplier willing to do that or even broach the subject," said

Continued on page 143

Value for the dollar

COMPUTERWORLD BUYERS FORECAST

PC users rate HP's Vectra as the best value. Ratings based on Buyers' Scorecard, page 104

Product	Score
Hewlett-Packard Vectra 80386 series	61
Apple Macintosh II series	59
Compaq Deskpro 80386 series	57
AT&T 6386 series	57
IBM PS/2 (80386 models)	56

(Maximum score: 83)
Response base: 50 per product

CW Chart: Paul Mock

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Product Spotlight: Choose the PC or workstation that fits your needs and your wallet. Page 97.

Report puts NCR, AT&T in negotiations to merge computer businesses. Page 4.

Unisys scoops Ford outsourcing deal, while Unruh warns users of tough choices to be made in R&D. Page 6.

In Depth: For many in IS, life in the '90s is exciting but stressful. Page 113.

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6 Beleaguered **Unisys** marches into the private sector to sign an outsourcing contract with **Ford.**

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Quotable

"If they can keep it working in Ulysses, [Kan.,] then they can make it work anywhere, and if they can't, then we have problems."

RICHARD NELSON
NEW YORK LIFE

On the importance of national support for laptop computers.
See story page 144.

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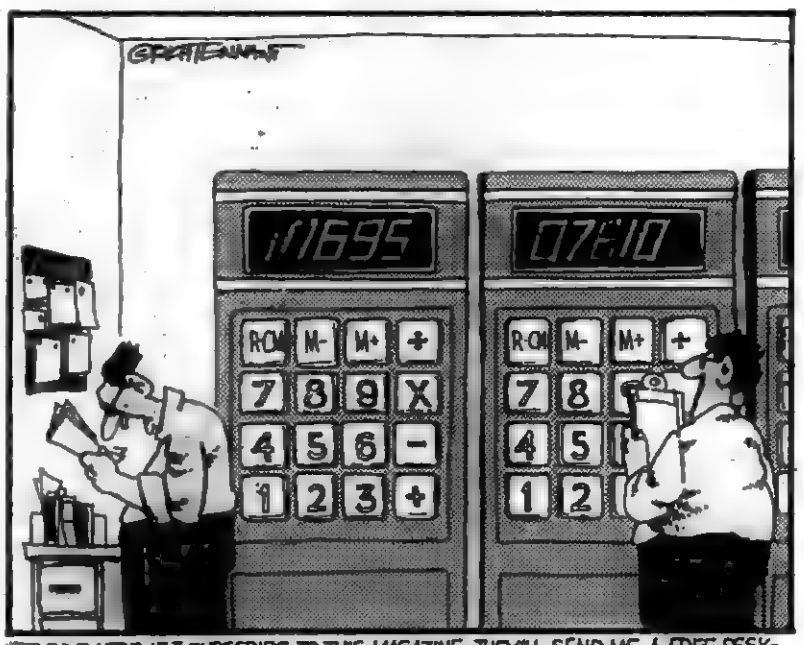
The Fifth Wave



EXECUTIVE BRIEFING

■ **Raid!** The Software Publishers Association said it will bang on the door of a major corporation this week with a search-and-seizure order to confiscate illegally copied personal computer software. The SPA, putting its antipiracy program into high gear, will also unveil a new "Don't copy that floppy" ad campaign at this week's Comdex/Fall '90 in Las Vegas. **Page 1.**

■ **Ford took the outsourcing plunge,** contracting IS in some of its divisions to a new player in the commercial outsourcing market — Unisys. Unisys will consolidate Ford data centers into a new Unisys center in Michigan, for which the vendor will seek other outsourcing customers. The move into outsourcing comes at a point when Unisys faces tough financial times and hard choices that have some users, such as those in university computing, worried about the future of the product line. **Stories, page 6.**

■ **Manufacturers Hanover begins a major downsizing effort** this week. The U.S.' eighth-largest bank is consolidating eight data centers into two to save $25 million per year and is cutting a number of IS jobs as part of a 7% overall work-force reduction. **Page 1.**

■ **The "AT&T will buy a computer company" rumor** resurfaced last week: This time it's NCR. The companies refused to comment, and analysts were skeptical, although some see significant synergies between the two. **Page 4.**

■ **An IBM Credit Corp. lawsuit** may have been the final straw that broke EDS' agreement to acquire the System One airline reservations system. ICC contended that the deal would violate the terms of its computer leases with System One — worth $80 million. ICC withdrew the suit when the acquisition was scuttled. **Page 8.**

■ **Most of the computer industry's friends in Congress** were re-elected easily, with the notable exception of Wisconsin's Robert Kastenmeier, a copyright protection advocate. Independent gubernatorial candidates from the high-tech industry finished far behind in California and Massachusetts, but they claimed they got their messages across. **Page 12.**

■ **A slew of Intel 80386SX-based notebook computers** and a plastic fiber-based Ethernet are among the products to be showcased at Comdex/Fall '90. But Ashton-Tate's long-awaited Dbase IV compiler will be available only in a beta-test version. **Pages 142, 144.**

■ **Plans for re-engineering business processes using IS** were discussed by three firms at a recent conference. Kentucky Fried Chicken, Union Camp and Scudder, Stevens & Clark are undergoing major systems revamps and/or shifts in hardware platforms. **Page 93.**

■ **If software programming is an art,** then so is the job of managing programmers. Doing it successfully requires giving developers enough free rein for creativity while harnessing their talents to ensure that business needs are met. **Page 87.**

■ **Reports on cumulative trauma disorders** are becoming an integral part of life with computers. While human resources departments have handled preventive training issues in the past, ergonomics experts see an important role for IS managers, too. **Page 138.**

■ **On-site this week:** Can IS help control skyrocketing health benefits costs? US West in Englewood, Colo., thinks so and is using OS/2-based software that analyzes a variety of external databases to provide benefits utilization information. **Page 49.** Carnegie Mellon University in Pittsburgh now boasts a 530M bit/sec. fiber-optic network, which it achieved by tailoring a Cisco Systems standard multiport bridge to act as a backbone. **Page 67.**

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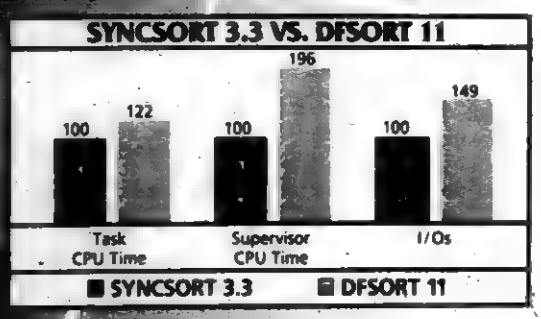

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Merger rumor bubbles to surface

Analysts skeptical of speculation about possible AT&T, NCR marriage

BY ELLIS BOOKER
CW STAFF

A published report that AT&T and NCR Corp. were discussing a merger of their computer businesses was greeted with some skepticism by computer industry analysts last week, who noted that a similar rumor had surfaced before but had failed to materialize.

AT&T and NCR spokesmen refused to confirm or deny the report, published in *The Wall Street Journal*, saying their companies had policies of not commenting on possible mergers or acquisitions.

"I'm pretty skeptical," said Judith Horwitz, vice president of Patricia Seybold's Office Computing Group in Boston. She speculated that the story could have been floated by AT&T as a trial balloon to see the reaction of the financial markets to the news. Initial reaction on Wall Street Thursday sent NCR stock soaring 12%, while AT&T stock fell only 50 cents.

Relatively well suited

However, Harvey L. Poppel, a partner at Broadview Associates, a Fort Lee, N.J.-based mergers and acquisitions company specializing in the information technology industry, said AT&T and NCR make a better match than some of the other companies that have been rumored in the past to be likely suitors of 106-year-old NCR, based in Dayton, Ohio.

"NCR is not a near basket case, like Data General, Wang or Unisys," Poppel said, adding that NCR has a strong presence in banking and retail, two areas that AT&T deems strategically important. Also, there is NCR's commitment to Unix and open systems, which maps to AT&T's computer strategy, he said.

Two other areas of synergy, he said, are NCR Comten, with front-end processor products that would give AT&T an entry into accounts now held by IBM, and NCR's international business. "AT&T has shown a very strong propensity since divesture to sell outside the U.S.," he said, noting that more than half of NCR's sales come from outside the U.S.

NCR, Poppel said, would primarily benefit from AT&T financial muscle, which could push it into the top tier of computer companies, presently occupied in this country by IBM, Digital Equipment Corp. and Hewlett-Packard Co. and in Japan by Fujitsu Ltd.

Income-ing wounded

For the first nine months of the year, NCR revenue grew 5% to $4.39 billion, but net income dropped 3% to $258 million.

AT&T does not break out revenue for its Morristown, N.J.-based Computer Systems Group, which was formed in 1984 during the divestiture of the old Bell System.

The logic of the merger rumor includes new developments at NCR, which has recently made an unprecedented commitment to a new hardware architecture, basing its System 3000 line exclusively on Intel Corp. microprocessors and Unix.

U-nited

Any combination of AT&T's and NCR's Unix computer businesses would have little immediate impact on U.S. and worldwide market rankings

Value of Unix system shipments (in millions)

	U.S.	Worldwide
HP	$805	$1,855
Sun	$980	$1,810
DEC	$540	$1,740
AT&T	$586	$638
NCR	$191	$399
Cray Research	$440	$580
IBM	$260	$530
Other	$2,018	$5,748
Total market	$5,820	$13,300

Source: International Data Corp.

Sun finally fires competing salvo into graphics market

BY J. A. SAVAGE
CW STAFF

In last week's Sparcstation 2 announcement, Sun Microsystems, Inc. finally addressed the point that many users have fingered as its weakest — its lack of graphics hardware.

By themselves, the details of Sparcstation 2 were as predicted [CW, Oct. 29]: It runs at 28.5 million instructions per second, 21 Specmarks (a benchmark of technical applications developed by an industry consortium) and 40 MHz. But user interest appears to lie in the three graphics versions of the workstations and the graphics add-in boards for some of its earlier models.

Buried in the company's rhetoric, which casts Digital Equipment Corp. and IBM as its prime workstation market targets, the latest announcement appeared to be more precisely aimed at relatively tiny Silicon Graphics, Inc. Silicon Graphics markets workstations with proprietary graphics hardware to enhance three- and four-dimensional effects, according to analysts.

"Our guys have been starved for graphics for two or three years now," said Ed Zander, vice president of corporate marketing at Sun. In that time, workstation customers such as Thomas Lasinski, chief of the numerical aerodynamic simulation applied research office, could not wait for Sun and chose Silicon Graphics' workstations. "Their graphics were superior by a factor of three to four."

Analyst John Jones at Montgomery Securities in San Francisco said that while Sun's new graphics capabilities were nice, "they are still nowhere near the capabilities that Silicon Graphics has at the high end." He added that at the high end, Sun lacks applications: "There are about a dozen where Silicon Graphics has over 600."

However, Sun has packaged its Sparcstation 2GX, 2GS and 2GT in much smaller boxes than Silicon Graphics has.

The Sparcstation 2GX is the lowest-end graphics product for basic wire frame renderings. It consists of a board addition in the standard desktop workstation and begins at $17,995. Also in a board addition is the 2GS, capable of rendering solid models at $26,995.

Hefty graphics

The most powerful graphics computer is the Sparcstation 2GT, which has a deskside tower and starts at $49,995.

Analysts such as John Girton, at Van Caspar & Co. in San Francisco, said the prices — beginning at $14,995 for the basic nongraphics workstation — appeared high. Zander said that the company had been "guilty" in the past of advertising an entry-level price that was an unrealistic configuration and added that this time, the base price included enough memory and disk to make it a working model. He said that as such, the workstation is actually close to the price of the earlier Sparstation 1+ models, which listed at a base price of $8,995.

In addition to the new workstations, Sun will upgrade existing Sparcstation 1s and 1+s with its graphics boards and CPU. A Sparcstation 1 or 1+ upgrade to a Sparcstation 2 will cost customers $6,995, according to the company. Users will have to trade in their "pizza box" and receive a new one with 16M bytes of memory (up from 8M bytes) and a new CPU. Putting the GX graphics accelerator on a Sparcstation 1 or 1+ will cost $3,000 and consist of a board swap.

"In most cases, we'd upgrade instead of buying a Sparcstation 2," said Hank Larabell, manager of project control at Stanford University. Larabell has more than one dozen Sparcstation 1s and 1+s. At list price, the upgrade will cost Larabell $1,000 more than what it would cost to buy a new Sparcstation 2.

Zander said that Sun will continue to offer Sparcstation 1s and 1+s but expects demand to be "quite small."

Bundled with each product is a compact disc with a software catalog. Users can peruse available software and, if they wish to purchase it, can contact the software company by phone to find out how to unlock it for use.

Racing form

Sun's Sparcstation 2 almost doubles the speed and performance of Sparcstation 1+

	Sparcstation 1+	Sparcstation 2
Performance	10.0 Specmarks 15.8 MIPS	21 Specmarks 28.5 MIPS
Processor	25-MHz Sparc	40-MHz Sparc
Main memory	8M-40M bytes	16M-96M bytes
Disk capacity	104M bytes - 2.7G bytes	207M bytes - 7.6G bytes
Base configuration	8M-byte memory; 17-in. monochrome monitor; no hard disk	16M-byte memory; 19-in. monochrome monitor; 207M-byte hard disk
Base price	$8,995	$14,995

Source: Sun Microsystems, Inc. CW Chart: Doreen St. John

CORRECTION

The size of a recent network management outsourcing contract between Digital Equipment Corp. and W. H. Smith was reported incorrectly in the Nov. 5 Integration Strategies section. The correct size of the five-year contract is $28 million.

In the Oct. 15 issue of *Computerworld*, Programart's Strobe DB2 Feature should have been referred to as an updated release. The product is part of the Strobe Application Performance Measurement System product family. Free upgrades are offered only to current users of Strobe DB2 Feature.

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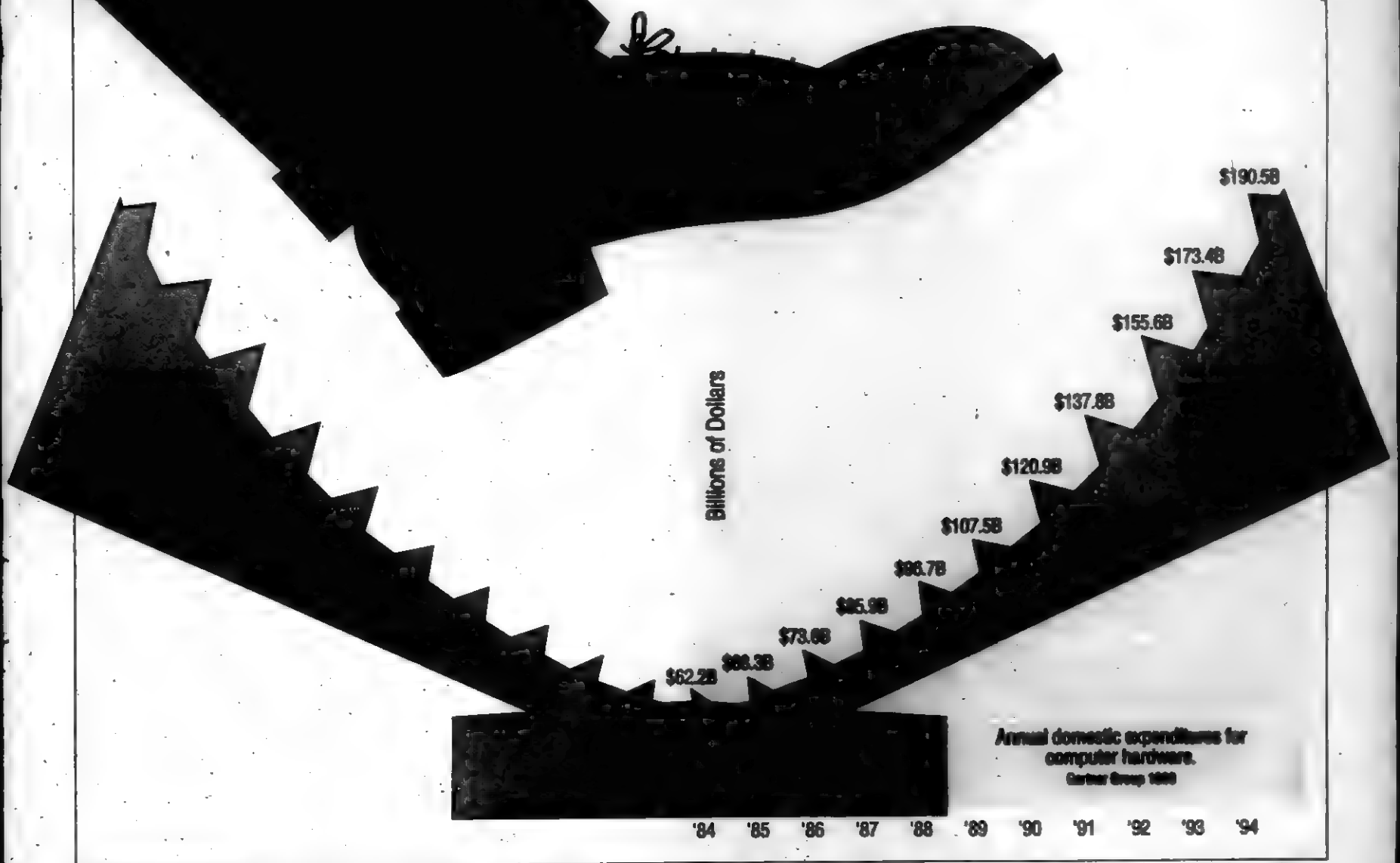

Annual domestic expenditures for computer hardware.
Gartner Group 1990

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Ford drives into Unisys camp

BY ELLIS BOOKER
CW STAFF

DETROIT — Unisys Corp. won its first private-sector outsourcing contract last week, inking an agreement with Ford Motor Co. to handle computer operations from a central data center supporting several of the carmaker's divisions.

The three-year deal with Ford — worth tens of millions of dollars, according to Unisys sources — suggests that Unisys wants to expand its outsourcing business, which up until now has been confined to government work.

Unisys' Slotkin *cites experience*

"Unisys and predecessors have been doing computer facility management and data center services for many years," said Arthur L. Slotkin, vice president and general manager of the firm's Systems Support Division in Unisys' U.S. Information Systems Group.

The Ford deal, while Unisys' first in the commercial sector, is not its largest outsourcing contract. Since 1974, Unisys has held a $25 million-per-year computer facility management contract with the Environmental Protection Agency, and it has run the National Aeronautics and Space Administration's scientific computers since 1967.

"We look at this as part of our overall corporate strategy," Slotkin said. "You can't be in the hardware or software business without providing these services."

Like IBM and other large computer hardware vendors, Unisys has acknowledged that the professional services market is where much of its future growth will be and is aggressively pursuing this opportunity, said Doug Wilder, manager of systems management programs at Input, Inc., a subsidiary of market research firm Input in Vienna, Va.

Another benefit to Unisys, he said, is that systems operations contracts are, by their nature, long-term arrangements. "They can provide very steady and predictable cash flow," he said.

The three-year Ford contract calls for Unisys to provide hardware and systems software maintenance, systems integration, network support and subcontractor management.

Unisys will consolidate Ford data centers that now support Ford's Troy, Mich., center and the Technical Systems and Operations Data Center in Dearborn, Mich., moving them to a new Unisys data center in southeast Michigan.

About a dozen current Ford information systems employees will be hired to help staff the new data center, which will contain Unisys' new high-end A16 mainframe as well as a dual-processor A15 and an A3 processor.

The new data center will be a shared facility, according to Slotkin, who said Unisys is negotiating outsourcing deals with other commercial clients.

Ford, which declined to discuss details of the outsourcing contract, said in a statement that the arrangement will allow it to "concentrate on the development of core information technology systems."

Winnowing out in store for Unisys product lines

BY JEAN S. BOZMAN
CW STAFF

SEATTLE — Unisys Corp. is going to have to make some hard choices about which product development and marketing programs survive its recent economic downturn, Unisys Chief Executive Officer James Unruh told a meeting of 1,000 Unisys mainframe users.

Faced with an economic downturn and the prospect of an unprofitable fourth quarter, Unruh said he would try to protect all vital research and development projects.

The Blue Bell, Pa., firm just announced a $356.8 million loss for the third quarter and said that it would cut its 75,000-member staff by 5,000 by mid-1991 [CW, Oct. 29].

Unisys' Unruh *faces tough choices*

"We will trim [research and development] programs that we don't think are leading to any kind of demand," Unruh said.

The majority of those interviewed in the crowd of users seemed content to stick with their Unisys — formerly Sperry Corp. — 1100 and 2200 proprietary mainframe systems. However, it was easy to find users who are planning to eventually migrate from the proprietary Unisys architectures.

"The federal government won't let Unisys die," said one federal employee based in Maryland, referring to Unisys' strong government systems installed base.

Unruh's remarks about corporate priorities apparently unsettled some longtime users. Following Unruh's speech, several large-site users stepped to the microphone, posing tough questions to the newly appointed top executive — and getting some surprising answers. "There is a perception that the corporation has written off the higher education market," said Rick Miller at the Baylor College of Medicine in Houston. "Unisys has no presence at all in academic research."

Instead of making a promise to strengthen Unisys' commitment to academic markets, however, Unruh responded by saying, "We can't do it all . . . because then we would start to starve everything just a little bit."

Unisys faces a credit crunch, prompting three major credit rating firms to downgrade investment ratings for the company last month. Unruh said that the firm's debt service alone was pushing the company into unprofitability.

Industry observers said they believe the situation may worsen in 1991. Some Wall Street analysts have said Unisys may have already used $300 million of its $1.25 billion credit line, which will be supported by a syndicate of 20 banks worldwide until January 1993.

DEC

CONTINUED FROM PAGE 1

earliest before it is fully in place.

The Information Network will scoop a few existing products — such as DEC's VIDA for DB2 access product and the RDBaccess tools for Oracle Systems Corp.'s database management system — under its umbrella as well.

Ultimately, it is supposed to allow users to transparently access database management systems from IBM, Oracle, Ingres Corp. and other third-party vendors.

While IBM is clearly the contender in this fight, "coexistence" was the word on many customers' lips last week as they watched DEC put its database stake in the ground (see story below left).

"They will have to coexist somehow," said John Brucksieker, director of information systems at Protein Technologies in St. Louis, a new DEC-based manufacturing subsidiary of Ralston Purina Co., a stronghold of IBM and Amdahl Corp. mainframes. "As more and more large companies like ourselves move certain divisions to different platforms, we have to maintain what we have in-house already. IBM and DEC don't want all-out war."

Challenge to IBM

The Information Network plan not only underscores DEC's keen desire to shake off its minicomputer vendor label and be seen as both a system software company and a multivendor network integrator, but it also represents DEC's most ambitious challenge to IBM in the software arena.

"We should call this the Battle of the Imaginary Titans," quipped Elven Riley, vice president of technology planning at the Investment Banking Division of Manufacturers Hanover Trust Co. in New York. "It will be quite some time before DEC or IBM have anything other than the standard kind of bolted-together tool sets that exist today."

Whether corporate customers want to lock into yet another proprietary database system may not become an issue, some users said, if DEC's fervent promises of open standards compliance are met.

"A key issue for me is whether I can develop on a DEC system and then move the [application programming interface] to other platforms independent of DEC," Riley said. "It's just not clear yet if they can do that."

The multivendor nature of today's business computing environment makes the DEC strategy all the more attractive, several users said.

"There are very few major companies that are not mixed shops," said William Anderson, chief information officer at Prudential-Bache Securities in New York City. "In that environment, the easier a vendor makes it to interrelate, the more that becomes an advantage."

Even for companies such as Citicorp, which chose Sybase for its main database two years ago, the notion of interoperability between databases is "clearly attractive and something we would look at," said an IS manager who asked not to be identified. "DEC is definitely going in the right direction."

With the advent of object-oriented technology, database repositories will become far more than warehouses for data, data definitions and screen formats. They will also hold original analysis and design for all of a company's crucial applications.

"Ideally, a company ends up with one repository, or two that coexist happily," said Wes Melling, an analyst at Gartner Group, Inc. in Stamford, Conn. "Either DEC or IBM is going to have to build a really rich bridge between their two repositories — and the likelihood is it will be DEC building it."

In the meantime, DEC will attempt to do for its RDB/VMS relational DBMS what IBM did for DB2 on the MVS mainframe operating system, several analysts and customers agreed.

RDB reach-out

DEC extended the reach of its RDB relational database last week and unveiled object-oriented products for application development and database management. Introduced were the following:

- RDBaccess for Oracle on VMS provides an RDB/VMS SQL gateway that enables direct read access to Oracle databases on VMS systems. Priced from $1,130 to $47,100, it begins shipping this month.
- RDBaccess for RMS (flat files) on VMS includes a non-SQL data server and a VAX RMS driver that contains code for addressing RMS files and obtaining low-level access to VSAM data sets on IBM systems. Priced from $900 to $37,680, it will be available in spring 1991.
- DEC's Trellis Object System for application development features an object-oriented language, tools and compiler support for object-oriented programming. It will be available in December at $5,000 per workstation user license.
- Objectivity/DB, an object-oriented DBMS from Objectivity, Inc. will be jointly offered by DEC and Objectivity in January 1991 for VAX/VMS, VAX/Ultrix and RISC/Ultrix platforms. It costs from $3,000 to $25,000.
- Version 2.2 of VAX Data Distributor, allows users to add data from multiple sources such as Oracle and IBM DB2 databases. It is available this month, priced from $930 to $59,761, depending on the size of the system.

MARYFRAN JOHNSON

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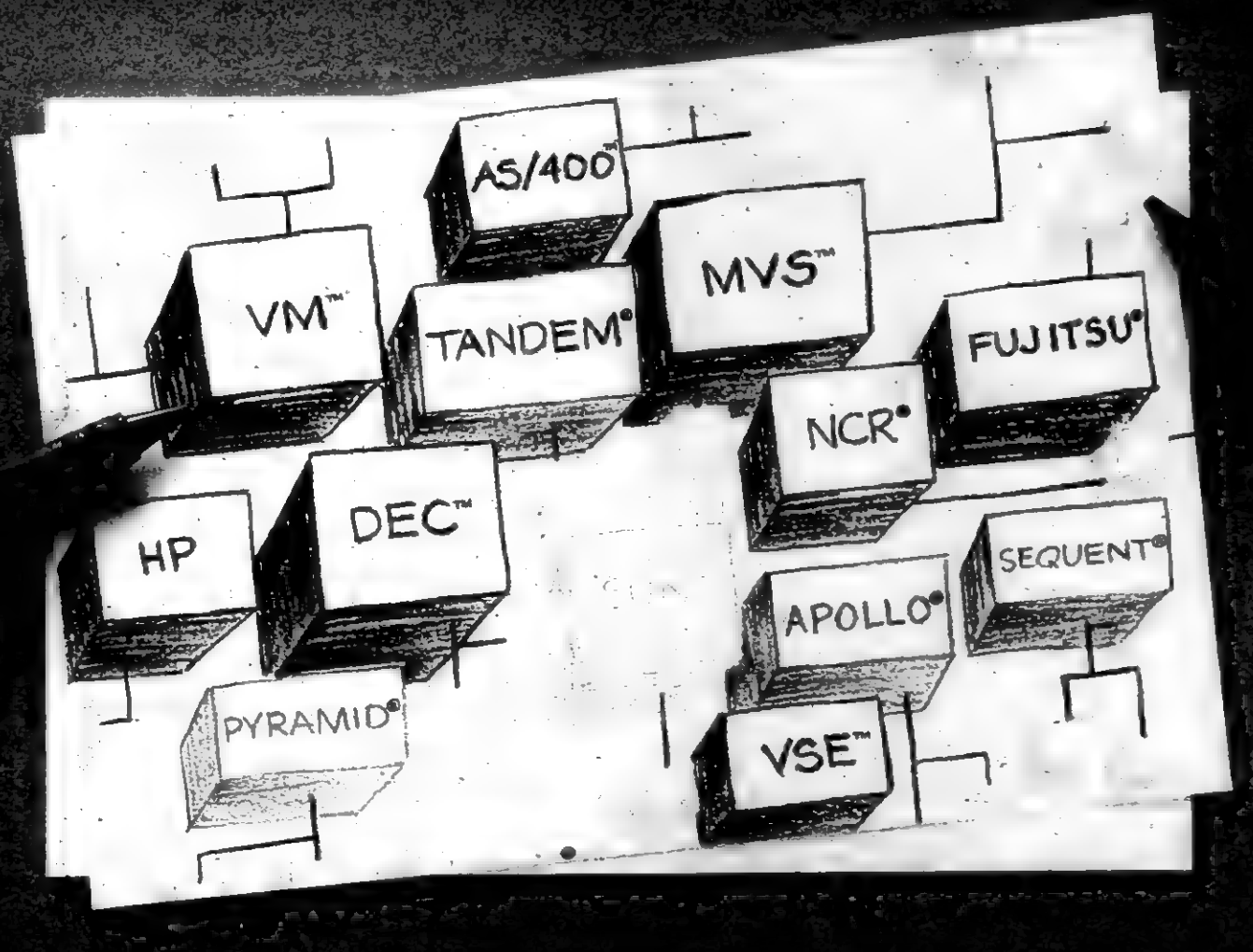
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NEWS SHORTS

Morris appeal due

A federal appeals court in New York will hear arguments on Dec. 4 in the case of Robert T. Morris, convicted of writing and releasing a worm program on the Internet network two years ago. Morris, meanwhile, has been answering telephones at the Boston Bar Association as a court-ordered community service. A federal judge sentenced Morris, who lives in Cambridge, Mass., to 400 hours of community service and three years of probation. He was fined $10,000.

Wang, Banyan sign pact

Lowell, Mass.-based Wang Laboratories, Inc. and Banyan Systems, Inc. in Westboro, Mass., have reached an agreement whereby Wang will market, sell, service and support Banyan's Virtual Networking Software network operating system products on a worldwide basis. This partnership reportedly makes Wang the first global reseller of Banyan's microcomputer networking products.

Integrated telephony testing

IBM, Northern Telecom, Inc., Nynex and Syracuse University will be jointly exploring the feasibility of using Centrex service to extend the benefits of computer-integrated telephony to customers who cannot afford their own private branch exchange, the vendors said. IBM and Northern Telecom have been working on a link between IBM's Application System/400 hosts and Northern Telecom's DMS 100 Supernode switch.

New trans-Atlantic cable planned

MCI Communications Corp. and British Telecommunications PLC said they will build the largest undersea cable ever, a fiber-optic cable to link North America and Europe at rates as high as 2.4G bit/sec. The firms said they will use synchronous optical network transmission technology, which can support 150,000 calls per fiber pair and which provides sophisticated management capabilities, including centralized control of circuit provisioning, maintenance testing and cable restoration.

1-2-3 a la LAN

Lotus Development Corp. last week shipped the server and node network editions to 1-2-3 Release 3.1, which allow users to install, manage and share 3.1 files, data and printers on a network. Features include password protection, file reservations and the ability to seal files with a password so that spreadsheet templates and macros can be easily distributed on the network. Network management tools in the Server Edition reportedly give network administrators greater control over the installation and management of 1-2-3 on the network.

Microsoft sued

A small Pomona, Calif.-based distribution firm has filed an antitrust complaint against Microsoft Corp., charging that the software giant is trying to muscle it out of the mouse input device market. The action was filed by Z-Nix Co., a distributor for Taiwan's Jow-Dian Enterprises, which was in the midst of a deal to bundle its mouse with Microsoft's Windows 3.0 operating environment. Spokesman Frank Yeh said Z-Nix had agreed in principle to a royalty rate and that Microsoft later doubled that rate. Z-Nix claims it has lost more than $1.5 million in business.

Nynex trims subsidiary

Nynex Corp last week announced the sale of Telco Research Corp., which it had acquired in 1986, to several Telco Research officers for an undisclosed amount. Telco Research develops and markets software and services for managing telecommunications and information systems. The sale frees Telco from the restrictions of the Modified Final Judgment, which divested the Bell System. Nynex and Telco have been sued by Scott Rafferty, a former vice president, who claims he was fired after questioning whether some Telco activities overstepped the bounds of a government waiver.

More news shorts on page 142

EDS ponders System One setback

Oil price increases and an ICC lawsuit killed Continental deal

BY NELL MARGOLIS
CW STAFF

Two unforeseen obstacles derailed the potential $4 billion outsourcing and equity partnership deal between Electronic Data Systems Corp. (EDS) and Continental Airline Holdings, Inc., according to spokesmen for both parties last week: Spiraling fuel prices triggered by the hostilities in the Mideast and spiraling legal hostilities from IBM Credit Corp. (ICC).

The latter, several sources said, could force EDS to reassess its recent strategy of taking an equity position in client companies that outsource.

The deal, hailed for its scope and creativity when it was announced last February, began to unravel in its final scheduled days of negotiations as oil price hikes edged struggling, highly leveraged Continental into precarious financial status — the brink of bankruptcy, according to some reports. "The health of the customer was on the line," said Charles E. Taylor Jr., an analyst at Prudential-Bache Research. "EDS had no choice but to back out of the deal as it stood."

According to an EDS spokesman, however, ICC dealt the firms no less of a deal breaker. In a lawsuit filed three days before the contemplated Nov. 2 closing of the EDS/Continental alliance, IBM's computer leasing subsidiary charged that General Motors Corp.'s information systems subsidiary and its would-be partners were attempting to fraudulently transfer beyond ICC's reach some $80 million of IBM hardware that was serving as collateral for financing agreements between System One, Continental's reservation systems division, and ICC.

"The . . . transfers, if made, will constitute defaults under the terms of the [ICC] agreements," said ICC in a suit filed Oct. 30 in Dade County, Fla., that sought to enjoin the EDS/Continental deal and recover monetary damages as well. "The defaults will trigger remedies." Such remedies would include immediate acceleration of the $80 million debt plus repossession of the equipment, ICC said.

Legal shock

The eleventh-hour legal assault came as a shock to System One, said a spokeswoman for the airline reservation organization. ICC, she said, first aired its objections in September before the federal bankruptcy judge sitting on the proceedings involving original System One owner Eastern Airlines. Although the bankruptcy court dismissed ICC's complaint as irrelevant to the issue before it, she said, EDS and System One took the IBM subsidiary seriously indeed.

"We had every intent to go the duration with IBM Credit," she said. "Their interests were not being undermined or abandoned; we spent untold business hours assuring them of that." In addition, both she and an EDS spokesman said, a bankruptcy court stipulation that at least $175 million worth of the proceeds of the proposed deal — which contemplated EDS' purchase of a 50% stake in System One for $250 million in cash — be held in escrow pending resolution of creditors' claims would have protected ICC.

ICC, which formally withdrew the suit when the EDS/Continental deal collapsed, refused to comment. "It's history," an ICC spokeswoman said.

EDS intends to ensure that it remains so. "We still want to get into the airline reservation area, and we still view Continental as the best possibility for a partnership of some kind," said the EDS spokesman last week, as the firms attempted to pick up the pieces of its shattered relationship and assess what could be put back together. "We're not ruling out anything." However, in light of the lawsuit, when the new deal emerges, it is unlikely to cast EDS as a Continental stakeholder.

Even as it continued to explore the remaining options for a move into the airways, EDS advanced its spread across Europe with an approximately $300 million, 10-year contract to manage IS and develop applications for Sweden's Saab Automobile AB. The contract, which sets new outsourcing frontiers for Sweden, will bring some 250 Saab employees to EDS but will involve no equity transfer.

Bull

CONTINUED FROM PAGE 1

occurred during the first 10 months of 1990, the company said. Bull now employs 47,000 worldwide and 7,800 in the U.S.

The company issued a statement saying that it expects the "effect of this crisis" to be a net loss before exceptional charges of about $180 million for the second half of 1990, which follows losses of $331 million for the first two quarters of the year.

Kidd lists the impending 1992 European economic unification, the current oil crisis and the overall computer industry ills as compounded reasons triggering Bull's reaction.

Playing to the global economy and internal needs, Groupe Bull Chairman and Chief Executive Officer Francis Lorentz outlined the firm's transformation plan, which includes first-time restructuring of worldwide research and development with a unified budget under the direction of Roland Pampel, president and CEO of Bull HN, headquartered in Billerica, Mass.

According to Pampel, this is basically a formalization of duties he has been performing for about two months.

Dan Cavanagh, senior vice president at Metropolitan Life Insurance Co. in New York and longtime Bull customer, expressed enthusiasm at Pampel's appointment, adding that he was encouraged to see that the company was increasing research and development spending in the wake of other cost-cutting procedures.

"Pampel is the guy on the hot seat now," said George Colony, president of Forrester Research, Inc., a market research firm in Cambridge, Mass. "He has about 12 to 18 months to make a go of it."

Other elements of Bull's transformation plan include the following:

- Manufacturing operations will be consolidated from 13 plants to six plants by the end of 1992 and will include sites in France, Italy and the U.S.
- Acceleration of its long-term R&D program to implement a unified architecture, combining the GCOS and Unix operating systems. The $2 billion project will be funded through a multiyear contract with the French government.
- The R&D budget for Zenith Data Systems will be increased 25% over current levels.
- A new European management structure, including Italian and British operations, under the direction of Didier Ruffat, president and CEO of Bull SA. French operations will remain under the direction of Jean Claude Albrecht, who will also head worldwide manufacturing.

Colony applauded Bull's consolidations and cutbacks, given that the company "has been too spread out in R&D and has maintained too many manufacturing sites. I think they were oversupplied, and this strategy will give them a more cohesive product line."

According to Lindamood, the big questions remain as to whether Bull will have the staying power to see the transformation all the way through, and, given that, whether they actually have the expertise to blossom in a competitive Unix market.

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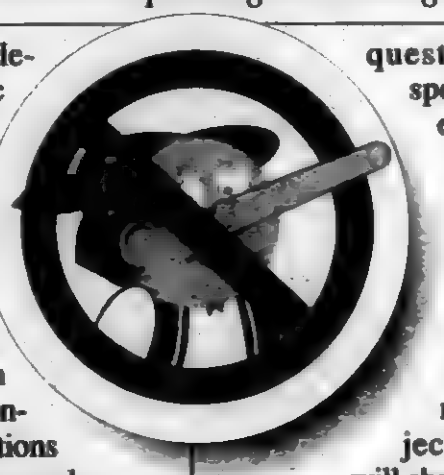

Each seminar features a multi-media presentation containing technical demonstrations, examples of solutions currently working in place, plus open discussions where attendees can question the experts on specific problems. And each session includes a Solutions Kit containing white papers, product information and related research.

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CAD conferencer debuts

BY ELISABETH HORWITT
CW STAFF

DETROIT — A computer-aided design (CAD) conferencing product, which Intergraph Corp. and Databeam Corp. are expected to jointly announce today, reportedly allows as many as eight Intergraph workstation users at different sites to concurrently review, mark up, annotate and sign off on the same CAD image, just as if they were all at the same table.

Databeam's Computer-Aided Design Conferencing Module for Intergraph workstations, to be announced at the Autofact '90 conference here, is said to distribute the same high-resolution image to as many as eight workstations and then synchronize the screens. Each workstation is equipped with a graphics pad and stylus, which can be used to mark up or annotate the image on a screen with changes showing up immediately on the other remote screens, according to Databeam Vice President Neil Starkey.

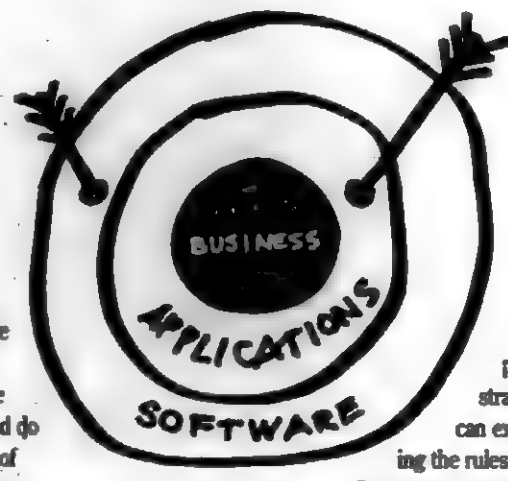
Boeing Defense & Space Group in Huntsville, Ala., is considering Databeam's new product. "In the environment we work in, the designer builds the drawing, and then an engineer marks it up with a red pencil, pointing out errors, making comments and corrections," said Louie Weed, manager of information management for the group. "It would be a gain in productivity if the two could work interactively and the designer could reincorporate [the engineer's changes] in real time, almost like a dynamic update," Weed added.

The Intergraph conferencing module will also interface with Databeam's existing conferencing module for IBM Personal Computers, enabling Intergraph users to interactively work on documents with PCs running graphics software, Starkey said.

Databeam plans to migrate the conferencing module to "all major [graphics and engineering workstation] platforms," Starkey said, declining to name the vendors or an introduction time frame. This would provide the first product to support both CAD conferencing and "lossless" image transfer across different vendors' platforms, he added.

The Databeam conferencing module for Intergraph's Series 300, 3000 and 6000 workstations is available now and is priced at $10,995, including graphics pad, stylus, software and a communications board that supports transmission rates as high as 2M bit/sec. The communications board can interface with a variety of networking devices, including an Integrated Services Digital Network port, Starkey said. A separate unit for synchronizing screen images on as many as eight systems is priced at $25,000.

As long as the aim of CASE vendors is better software, they'll be off-target.



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Siemens U.S. unit merged

BY ELISABETH HORWITT
CW STAFF

BOCA RATON, Fla. — In an attempt to take undisputed third place in the U.S. central office switch market, Siemens AG and GEC Plessey Telecommunications announced last week that they would be merging their respective U.S. central office switch operations into a single, jointly held company.

The 50/50 jointly owned venture, to be named Siemens-Stromberg-Carlson, will merge Siemens Communication Systems, Inc. with Stromberg-Carlson, a GEC Plessey subsidiary whose stock is 40% owned by Siemens. Although final details have yet to be worked out, the two subsidiaries began operating as a single unit last week, according to E. Van Cullens, vice president of marketing and business development at the new venture.

"We accept that AT&T and Northern [Telecom, Inc.] are dominant shareholders of this market and won't be displaced easily," Cullens said. "We want to be undisputable No. 3." While Stromberg ranks third and Siemens fourth in the U.S. market, "no one has been able to break out of the pack," he added.

"Let's put it this way: If they didn't do what they did, I wouldn't like their chances," said Peter Bernstein, a senior analyst at Probe Research, Inc. in Morristown, N.J. "It takes a lot of money to sustain central office switch development, and this gives them economies of scale for both their lines."

The merger should also enhance the companies' appeal to regional operating companies, "who like doing business with people who'll be around," Bernstein said.

Siemens' two major customers are regional holding companies Bell Atlantic Corp. and Ameritech, with "some initial penetration" into Bellsouth Corp. company Southern Bell, while Stromberg-Carlson sells to South Central Bell, Pacific Bell and some independent telephone companies. Siemens' EWSD central office switch is "optimized for the high end," and Stromberg-Carlson's switch targets low- to midrange systems, Cullens added.

While the companies have no plans to merge their two product lines entirely, they plan to "work toward commonality" of their respective switching products "wherever it makes sense," Cullens said.

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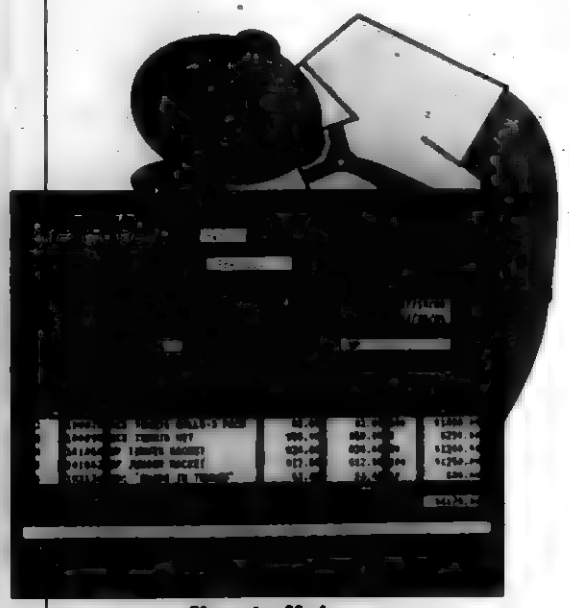
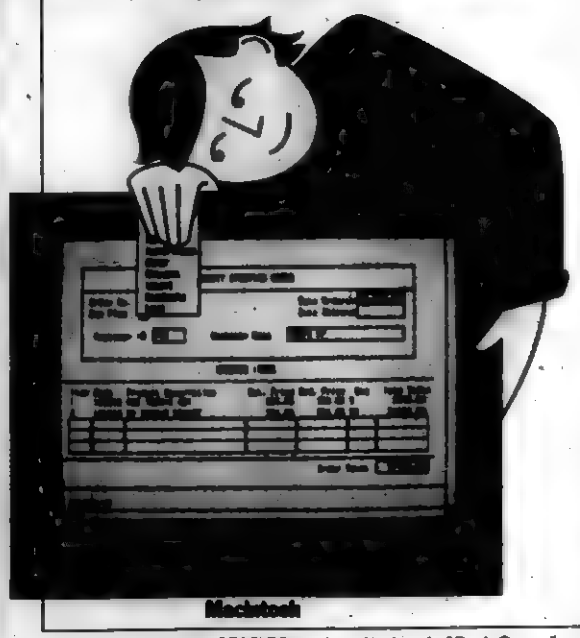


Character Mode

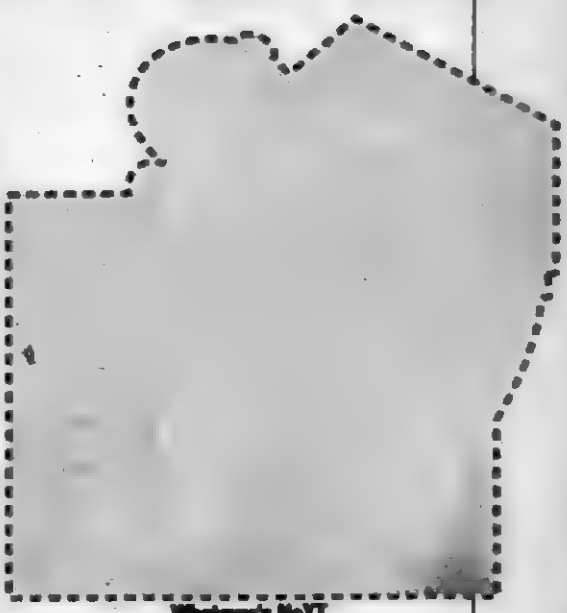
Presentation Manager

DECwindows



Macintosh

3270 Block Mode



Whatever's NeXT

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Many technology industry friends win election

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — Most of the computer industry's friends in the U.S. Congress won re-election by landslide margins last week, but two key subcommittee chairmen were victims of voters' anti-incumbent mood.

Reps. Robert W. Kastenmeier (D-Wis.) and Doug Walgren (D-Pa.), who had been involved in computer-related legislation during the last decade, lost to Republican challengers in Tuesday's elections.

Kastenmeier, who had served 32 years in the House, was the House copyright expert as chairman of the House subcommittee dealing with intellectual property issues. He played a major role in the passage of several industry-supported bills, including the Semiconductor Chip Protection Act of 1984 and the Electronic Communications Privacy Act of 1986.

"We hope the next chairman is as strong a supporter of copyright protection for software" as Kastenmeier was, said Ted Heydinger, vice president of government relations at the Computer and Business Equipment Manufacturers Association (CBEMA).

It is not yet clear who will replace Kastenmeier as the subcommittee chairman, although Rep. Mike Synar (D-Okla.) is next in seniority.

Walgren, a seven-term incumbent, was edged by Republican Pittsburgh lawyer Rick Santorum 51% to 49%, because of the anti-incumbent mood in a traditionally Republican district. He was chairman of the House subcommittee on commerce and competitiveness and an advocate of bigger budgets at the National Institute of Standards and Technology.

Other incumbents considered friends of the computer industry — as winners of CBEMA's Public Policy Award — won re-election last week by big margins. These winners included Sen. Max Baucus (D-Mont.) and Reps. Robert T. Matsui (D-Calif.), Hamilton Fish Jr. (R-N.Y.), Don Edwards (D-Calif.), Frank Horton (R-N.Y.) and J.J. Pickle (D-Texas).

However, industry lobbyists hoping to boost the number of Republicans in the Senate were disappointed by the defeats of Sen. Rudy Boschwitz (R-Minn.) and GOP challengers Lynn Martin in Illinois and Claudine Schneider in Rhode Island [CW, Oct. 29].

The regional Bell holding companies lost one of their most ardent supporters when Rep. Thomas J. Tauke (R-Iowa) lost his hard-fought campaign to win the Senate seat held by Sen. Tom Harkin (D-Iowa). Tauke will not be returning to the House, where he was a sponsor of legislation freeing the Bell companies from court-ordered business restrictions.

Vote IS

While their final vote tally registered a mere blip on the electoral radar screen, a pair of computer company executives who waged long-shot independent campaigns for the governors' seats in Massachusetts and California said they scored an ideological victory because they advanced ideas that will survive well past Election Day.

"I think we did very well for non-politicians getting into politics," said Len Umina, a Digital Equipment Corp. technologist in Maynard, Mass. Umina's Independent High-Tech Party candidacy finished third in a three-person race behind Republican victor William Weld and Democratic runner-up John Silber and claimed to have secured about 3% of the vote. His campaign called for a central governmental information repository that could be accessed by a home computer.

In California, Libertarian Party candidate Dennis Thompson garnered 135,101, or approximately 2%, of the votes cast, finishing third in a five-way race behind Republican winner Pete Wilson and Democratic candidate Dianne Feinstein. Thompson, who heads the Epicom, Inc. software house in San Diego, said he wanted to eliminate all business taxes as a way to foster innovation and regain the U.S.' slipping technological leadership.

Despite the setback, Umina and Thompson have vowed to continue their fight. Thompson had previously entered several political contests, while Umina promised to continue his push for his Public Access Computerization (PAC) database network. "I'd like to one day be known as the father of PAC," Umina said. "That would be a much more important contribution than holding any political office."

JAMES DALY

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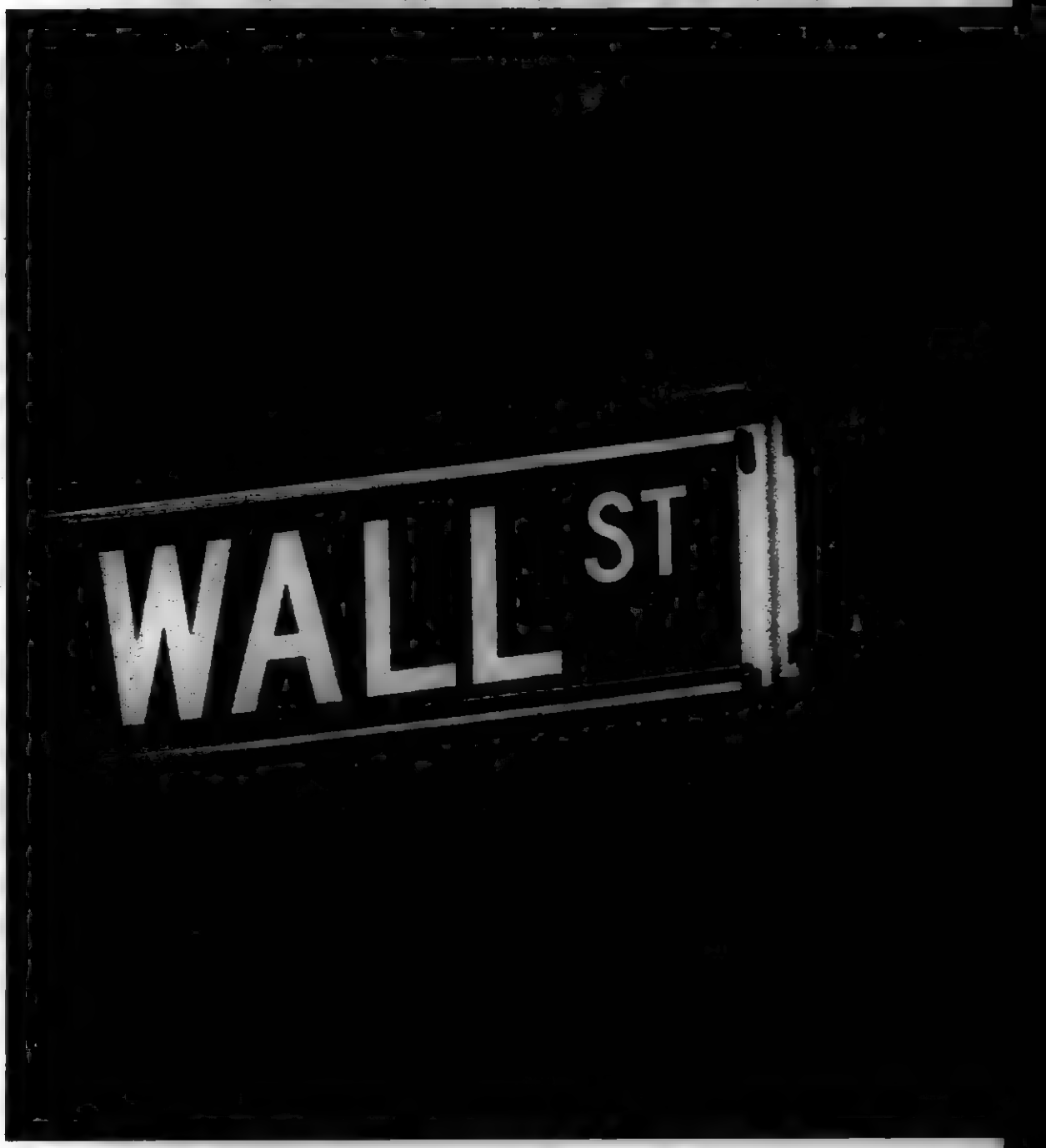

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Database to aid East Bloc managers

NEW YORK — The Berlin Wall may have come tumbling down, but Eastern European nations still need an information bridge to match their management needs with Western services that meet them.

That is the idea behind the World Management Council's plan to develop and run a database to help Eastern Bloc nations educate and train managers for private and public sector organizations. The plan, unveiled last month, calls for the establishment of a "computerized clearinghouse" to match U.S. and Western European management training providers with Eastern European organizations.

The developing economies of Eastern Europe "have identified the critical need for such a database," said George Chall, executive secretary of the World Management Council. The council, currently headed by Diebold Group, Inc. founder John Diebold, is a federation of management institutes in 44 countries.

Issues such as what type of host computer will be used and where it will be located will be decided by a task force being set up now, Chall said. The projected two-year cost to implement the database is about $700,000, to be provided by U.S. government funds earmarked for Eastern Bloc development and private sources.

CLINTON WILDER

Downsizing

CONTINUED FROM PAGE 1

its overall work force by 1,400 people, or approximately 7%, with some of those reductions falling on IS, Nyce said. The actual IS numbers and time frame have not been made public.

Users have experienced little or no impact, either from the present consolidation effort or from an earlier, much smaller scale consolidation of the wholesale banking data center, according to Jack Egan, a senior vice president in charge of global custody who experienced both reorganizations.

"I think they've done a real good job," Egan said. "Support is essentially from the same people, and if my costs go down, I'm all for it."

Initiated in the 1986-87 time frame, the first consolidation "netted us annual savings of $15 [million] to $16 million a year," Nyce said.

That experience has "spurred on" the current effort, which spans the entire corporate data center operation and is "an order of magnitude or two greater" in complexity, Nyce added. It also aims at much higher paybacks.

While data center operations costs should be flat or slightly lower next year, Manufacturers Hanover expects the consolidation to realize savings of $10 million to $11 million in 1992 and $20 million to $30 million per year by 1993, Nyce said.

Minimized effects

Nyce and his people have employed several strategies to minimize the consolidation's ill effects on users and data center employees, he said, including "a tremendous amount of planning," involving management early on and keeping employees informed.

In addition, the "O-word" — outsourcing — was never a serious threat at Manufacturers Hanover, so the firm never had to face the kind of employee panic that cost Merrill Lynch & Co. a number of valuable people during the past year, Nyce said. "We may consider it again in a few years, however."

THE "O-WORD" was never a serious threat at Manufacturers Hanover.

"We discussed outsourcing with IBM, Electronic Data Systems and Perot Systems, but I think management felt we could achieve the same or better results ourselves, and we worked too many years on building up skills to hand it all over to a vendor," said Steven L. Sheinheit, a senior vice president who heads the new structure under Nyce.

In April, two months after top management approved the plan, Nyce set up a project office and brought in various top Manufacturers Hanover managers to take responsibility for studying the project's feasibility and designing the Wilmington data center.

The reorganization will result in a single data center management structure across Manufacturers Hanover. Historically, each business group has had its own data center operations staff.

Manufacturers Hanover actually began a gradual consolidation of its overall operations six years ago, according to Mark Lynch, an analyst at Bear Stearns & Co. From 1984 to 1989, bad debts and other financial troubles caused the firm to shrink its organization by about one third and its assets from $76 billion to $60 billion, he added.

Hand in hand with the data center moves, Manufacturers Hanover plans to get its somewhat chaotic networking house in order by consolidating what is now a hodgepodge of T1, packet-switched, microwave and other types of links into a single network architecture. This network will be managed by a consistent, centralized network management system, database and accounting structure.

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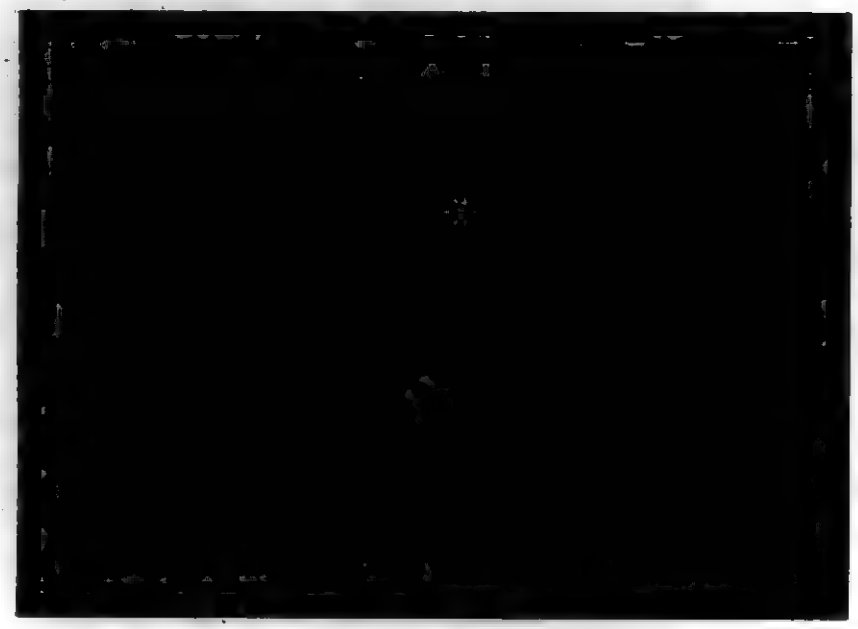

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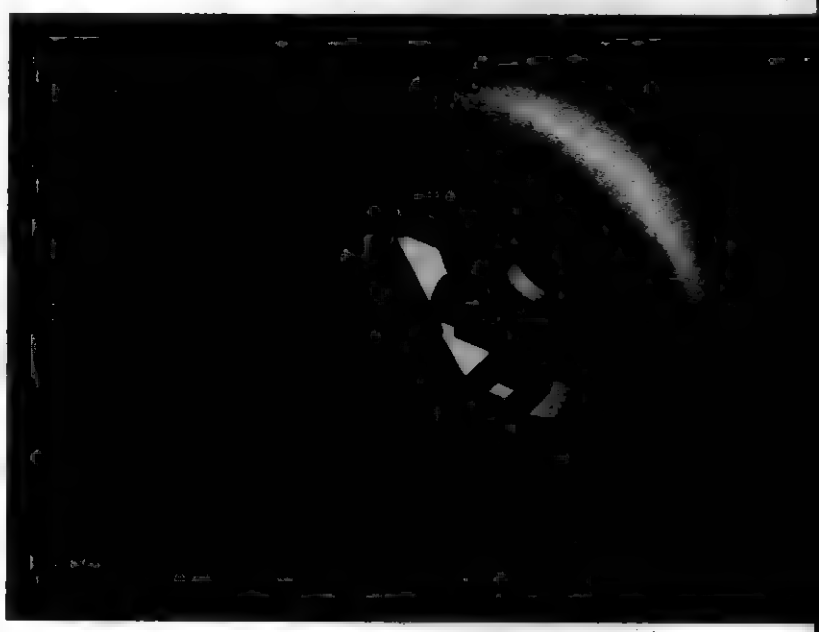

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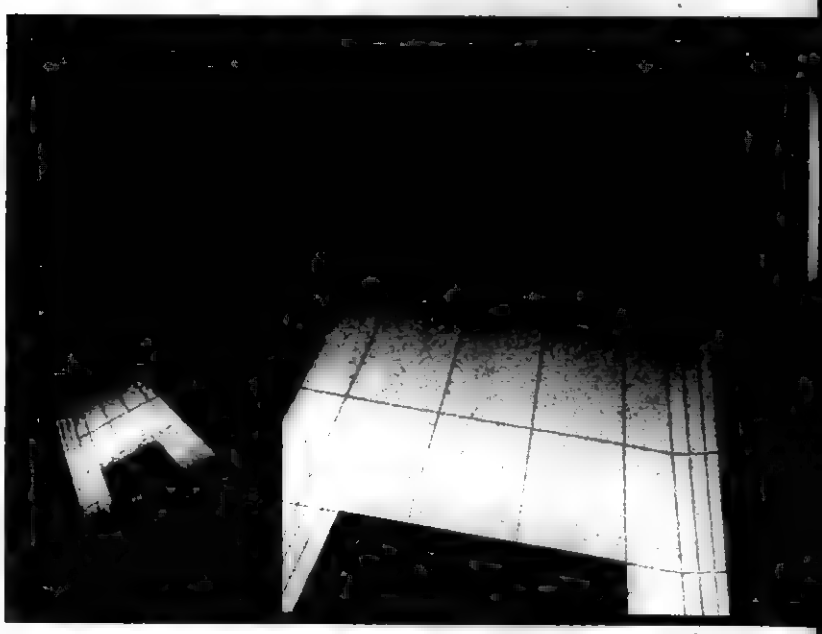

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Model designed and analyzed using PDA Engineering's PATRAN® MCAE system. © 1990 Hewlett-Packard Company CPWG006

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HEWLETT PACKARD

'Finger hackers' charged with voice-mail crime

BY MICHAEL ALEXANDER
CW STAFF

NEW YORK — State police and the U.S. Secret Service arrested a pair of alleged "finger hackers" last week on charges of illegally tampering with a voice-mail system belonging to International Data Group/Peterboro, a sister company of *Computerworld*.

The pair used a programmable memory telephone to repeatedly enter the voice-mail system, change passwords, delete messages as well as leave bomb threats and other harassing messages, according to John Keary, New York state police investigator.

Keary said a two-month investigation led police and Secret Service agents to Daniel Rosenbaum, 17, and a 14-year-old cohort, whose identity was withheld because of his age.

The teenagers, who reside on Staten Island, were charged with computer tampering, unauthorized use of a computer and aggravated harassment.

"Evidently, the 17-year-old initiated the attacks," Keary said. "He apparently subscribed to *Gamepro* [an IDG/P publication for video game players] and was supposed to get a free poster. He became angry when he did not get the poster and felt that he was getting the shaft."

The illegal tampering caused the loss of hundreds of messages, including instructions by clients to place advertisements in IDG/P publications, according to Olga Greenwood, a telecommunications systems analyst and administrator at IDG.

Greenwood calculated that the company lost $2.4 million in revenue as a result of the attacks. She added that the voice-mail system was taken out of commission for 18 days in order to repair the damage caused by the hackers.

The two teenagers were released to the custody of their parents. Rosenbaum is expected to appear in Staten Island Criminal Court on Dec. 17 to respond to the charges. The 14-year-old was charged as a juvenile and is expected to appear in family court next week. If Rosenbaum is convicted of the charges, he could be sentenced to four years in prison, Keary said.

IDG/P publishes *Suntech Journal*, *Portable Computing*, *Run*, *Amiga World*, *PC Games*, *A+/Incider* and *On!* in addition to *Gamepro*.

Extended DOS programs due at Comdex

BY PATRICIA KEEFE
CW STAFF

SANTA CLARA, Calif. — Comdex/Fall '90 attendees this week will get first crack at viewing the initial batch of applications said to comply with the DOS Protected Mode Interface (DPMI) specification.

The demonstrations will include three DPMI servers and five applications. Released in May as Version 0.9, nearly 2,000 copies of the specification have been shipped.

Based primarily on a Microsoft Corp. specification, DPMI defines a standard way for extended DOS applications to cooperate in multitasking-mode DOS operating environments by using the protected-mode features of Intel Corp. 80286, 80386 and I486 chips. It replaces another extended DOS specification that is currently in use.

This means developers can sell a single shrink-wrapped package capable of running on multiple extended DOS environments. In turn, users will no longer have to upgrade their extended DOS applications as they change operating environments, thereby cutting costs.

According to Simon Wieczner, software business manager at Ergo Computing, DPMI will even allow "Unix, [Digital Equipment Corp.'s] VAX/VMS and mainframe applications to be migrated down to [DPMI] platforms without undue fuss or bother."

Among the environments supporting DMPI are Microsoft's Windows 3.0, Quarterdeck Office Systems' Desqview, Unisys Corp.'s CTOS and VP/IX on Unix 386 and VM/386.

IBM on board

The DPMI Committee, which is composed of 12 applications and systems software developers, also announced last week that IBM has finally jumped on the bandwagon.

Other members include Microsoft, Lotus Development Corp., Intel, Borland International, Quarterdeck, Rational Systems, Inc., Phar Lap Software, Inc., Phoenix Technologies, Inc., Ergo and IGC Technology Corp.

The DPMI-compliant products to be demonstrated include Windows 3.0, Lotus' 1-2-3 Release 3.1, Instant C from Rational, Phoenix Page for Windows from Phoenix, a DPMI test suite from Intel, a DOS server from Ergo and two as-yet-unannounced tool kits from Phar Lap.

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ADVANCED TECHNOLOGY

TECH TALK

Hard Drivin'

■ Atari Games Corp., a top maker of arcade video game machines based in Milpitas, Calif., said last week it plans to adapt its best-selling Hard Drivin' game to noneintertainment applications. The game's sophisticated audiovisual effects will be used to develop specialized driving simulators for such applications as driver's education and to test the effects of substance abuse on driving skills. The low cost of the technology enables the company to build an advanced simulator for a fraction of the cost of other products with similar capabilities, Atari said.

Flat color

■ The state of Illinois awarded Zenith Electronics Corp. $1 million last week to develop new manufacturing processes for high-definition color displays. The award will help fund a 2-year effort to uncover new methods of applying phosphors to picture tube screens, Zenith said. The company said that the work is central to a multimillion-dollar effort to develop new production processes for large-screen versions of its patented flat-tension mask, high-resolution picture tubes.

That's Bat

■ The Bat is a two-piece keyboard — each piece has but seven keys — that will allow typists to greatly increase their typing speed, according to Infogrip and China Keyboard Ltd., the makers of the keyboard. Words, phrases, graphics and the like are entered using a combination of chords, much in the same way a pianist plays chords on a piano, said Ward Bond, president of Infogrip. A company name that would usually require 15 or more keystrokes could be entered with a single keystroke, for example. The keyboard, which plugs into a personal computer serial port, is not designed to replace standard computer keyboards, however. The Bat will be available in January, Infogrip said.

Biosensors computerize the canary

Researchers work to develop 'organic computers' that will mimic human senses

BY MICHAEL ALEXANDER
CW STAFF

In the old days, coal miners carried a canary into the mines to detect the presence of deadly, odorless methane. If the unfortunate bird suddenly keeled over, the miners hastily clambered up the shaft.

Today, researchers are looking for a canary of sorts in the field of bioelectronics, intent on developing "biosensors" that could be used to detect not only noxious fumes but everything from the odor of rotten fish to heroin.

Some researchers hope eventually to fabricate so-called biochips that could be the building blocks of "organic computers" several times smaller and faster than silicon computers.

Most research is being directed at developing biosensors containing organic molecules that react to minute changes in temperature, light or other environmental factors and convert those changes into electricity or some other form of energy.

Biosensors now under development or just entering the market include devices for monitoring and controlling glucose levels in a diabetic's blood, for detecting toxins and pollutants and for analyzing the freshness of foods.

Sniffing computer

Researchers at Arthur D. Little, Inc. in Cambridge, Mass., are working on a handheld "sniffer" that law enforcers could use to detect narcotics or explosives. "Our lab prototype can detect materials in less than five seconds," said Richard Taylor, senior consultant and manager of applied biotechnology at Arthur D. Little.

A biosensor has three parts: one layer containing a biological molecule, which functions as a receptor; a second layer containing an electronic or optical transducer to detect changes in the biological layer; and a third layer containing electronics for amplification, storage, memory and other functions.

The biomolecule receptor is often engineered in a laboratory, but researchers have used naturally occurring molecules from enzymes, insects and even exotic fish. One researcher at Washington State University is now testing a biosensor using the neurons from snails' brains.

One challenge that must be overcome: the stabilization of the receptor so that it remains active for several years.

Ultimately, work on bioelectronics technology could lead to the development of biochips and organic computers that could outperform silicon chip computers in several ways. Biochips can be packed more tightly and remain free of cross talk and heat generated by circuitry on silicon.

Environmental sensor

A biochip could also react selectively to environmental changes, thus allowing it to reflect not only on- and off-states but variations in between. In comparison, silicon computers only understand a binary language of zeroes and ones.

Researchers at the University of South Carolina in Columbia are working on developing organic molecules using synthetic materials that could be used to make what is often referred to as a biochip but could more accurately be described as a molecular electronic device, said James Tour, a synthetic organic chemist.

A practical molecular electronic device, still several years away, could be 1,000 times smaller and several orders of magnitude faster than conventional integrated circuitry, Tour said. "It has tremendous potential."

Tom Monahan

The challenge is to fabricate molecules that are large enough to be used in electronic circuitry, which cannot be made much smaller using today's semiconductor manufacturing techniques.

A molecular electronic device is made up of a conducting and a nonconducting polymeric chain joined to each other by a special silicon-containing bridge to form a switch. An electron jumps from the nonconductive chain to the conductive one, changing it from a conductor to nonconductor and back, Tour explained.

The Holy Grail of bioelectronics research is to someday create neuronal interfaces, or "artificial nerves," that could be implanted in humans to correct a variety of ailments. It is more fiction than fact thus far, Taylor said.

Devising matrix-based computer security

BY MICHAEL ALEXANDER
CW STAFF

Earl R. Collins Jr. at the California Institute of Technology in Pasadena says he is not "a computer person." But even so, he has designed what may be a foolproof security scheme for keeping hackers and eavesdroppers out of computer systems.

Collins, a mechanical engineer at the National Aeronautics and Space Administration's (NASA) Jet Propulsion Laboratories, has invented a computer security scheme based on a challenge and password system similar to the method in which a guard asks those approaching an outpost for a password. The challenges and passwords are alphanumeric codes contained in matrices of two or more dimensions.

"Nothing may be totally secure, but I have been told by computer security people that they figure it can't be beat," Collins said.

Jet Propulsion Laboratories recently received a patent for the computer-access code matrices system. Collins has more than 20 patents to his credit for tank tread design, fluid flow controls and other mechanical devices.

Multidimensional matrices

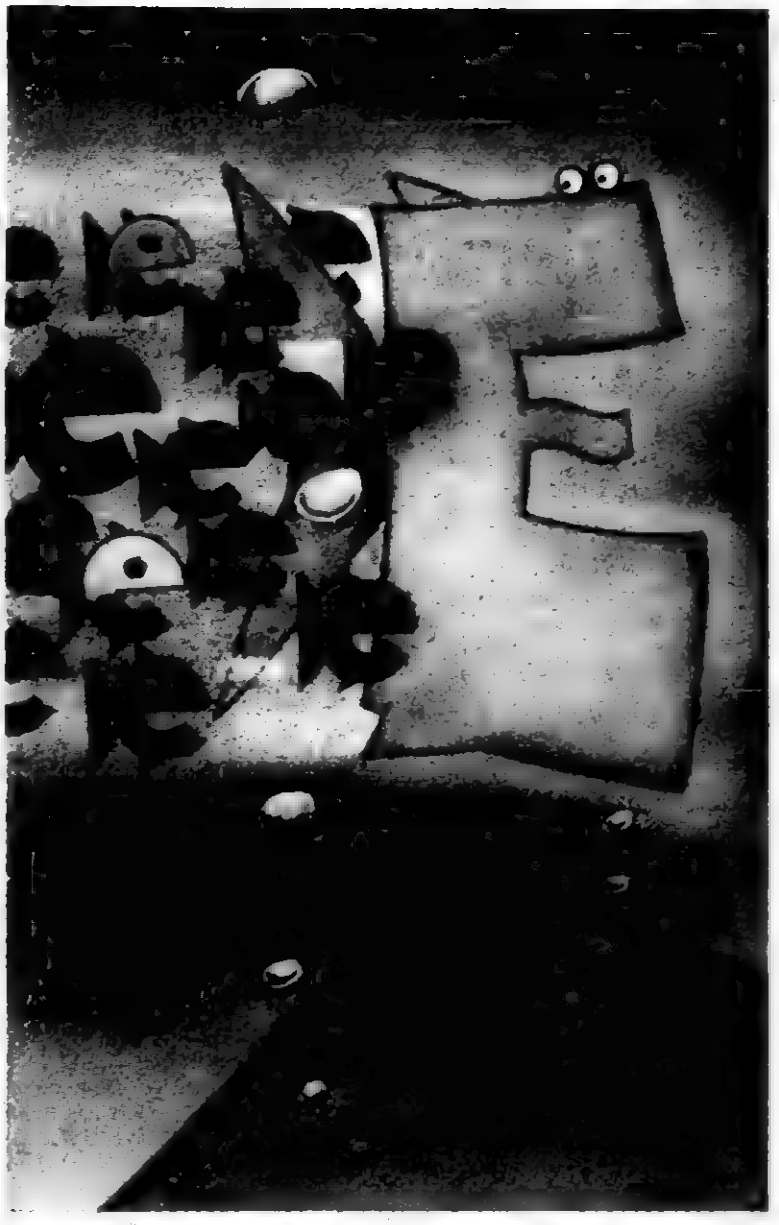
The way the scheme works is that a computer or terminal used to access a host computer and the host computer itself would have identical sets of codes. In a two-dimensional matrix, the host computer would issue a challenge consisting of two codes selected from the matrix. The codes, located in different rows and columns, define two corners of a rectangle, whose size is randomly selected.

The computer or terminal used to access the host must reply with codes taken from the opposite corners of the same rectangle. Assuming that the codes are correct, the host permits the remote user into the system.

The system discards codes that have been used in a successful access and does not allow the same set of codes to be used more than once. As a result, a hacker cannot get into the system by merely repeating the code sequence entered by a valid user.

A three-dimensional (or higher) matrix, with a wider variety of codes, could be used for systems that require higher degrees of security.

A caller who fails to reply with an accurate countersign within a preset number of attempts is automatically disconnected from the system. The next caller is automatically challenged with a new set of codes that are drawn from the matrix.



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EDITORIAL

Better bets

WE'VE WRITTEN, ON numerous occasions, about technologies and products that were unveiled with great fanfare, pregnant with every promise in the world: This will revolutionize the workplace; that will cut system costs in half; these will obsolete mainframes; those will yield that elusive competitive advantage.

Search back in your file of news articles and locate the bulging "videotex" folder. If you had a quarter for every magazine cover story written in the 1980s about the home computing explosion, you'd be able to actually buy a personal computer for the home, along with a disk for the recipes that will never be put on the system. There's a bunch of yellowing news clips on artificial intelligence. Here are some of more recent vintage testifying that OS/2 will outsell MS-DOS by 1991. Another bunch on debit cards.

They all sounded so good at one time. They failed for the same basic reason: Very few customers were interested in buying them. Some were promoted with half-truths, such as the myth of how easy home computers are to use. Generally speaking, they were technologies and products in search of a market.

Today, we have a technology that is being promoted heavily by some of the biggest computer companies in the business, as well as by systems integrators. What is unusual is that a rapidly growing cadre of customers are also singing the praises of image processing.

Is imaging destined to become a fixture in information systems? Or will we be including it in our editorial on four-flushers five years hence?

To try to answer that question, let's look at the facts — and the conjecture. Are there valid applications for the technology? Yes, absolutely. Our special report last week demonstrated this beyond a shadow of a doubt.

Is there a significant market out there? Are most businesses burdened with paper that travels painfully slow and inefficiently among parties that need it? Yes, again.

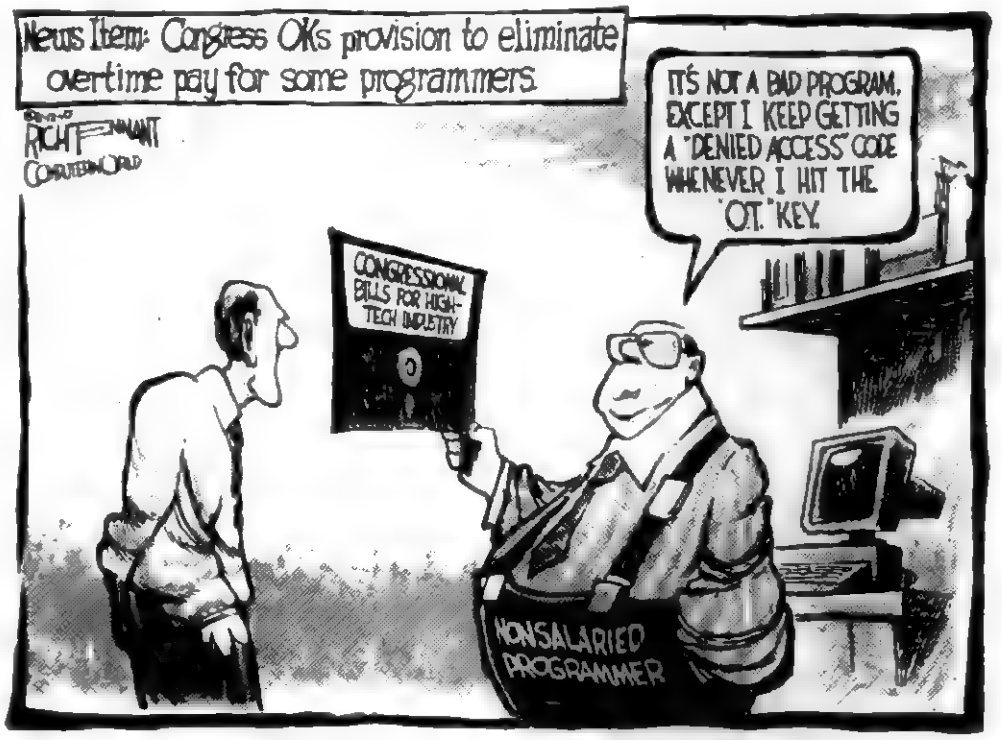
Is the technology cost-effective? In most cases where imaging implementations beyond the pilot stage exist, payback has been in the six- to 40-month range. Yes, again.

Are users flocking to the imaging concept? Our survey of 300 IS managers says no, but they are certainly migrating toward imaging in an orderly (read: nonfaddish) fashion.

Add to these considerations the fact that the costs of the enabling tools of imaging are plummeting, and you've got a compelling case for a promising technology.

If there is one potentially major obstacle, it is not the technology at all, but the management of it. Already the idea of "who owns it and who's responsible for it" has arisen between the user departments that ostensibly pay for imaging tools and central IS, which is called in on almost any intradepartmental implementation.

But this obstacle will be overwhelmed by the benefits of imaging, which is one of the surer technology bets to come along in some time.



LETTERS TO THE EDITOR

Where are they?

I'm too far away from the American scene to comment on most aspects of your massive *Computerworld Premier 100* [CW, Oct. 8], but there are curious omissions.

Where was General Electric? I realize its enormous diversity makes it difficult to rate, but other diversified and decentralized outfits are included.

And above all, where was IBM? You say "firms that make the majority of their revenue from the sale of information systems and related products are not included in the ranking." Why not? And since communications, and information itself, are certainly "related products," why did you nevertheless rate MCI, GTE, AT&T, the Little Bells and Dun & Bradstreet?

I suggest next year you introduce information systems as an industry category, move the above companies into it and include at least IBM and DEC. And squeeze GE in somewhere!

Herb Grosch
Mies, Switzerland

Clear RISC

The future of reduced instruction set-computing (RISC) is not blurred as your article titled "Lack of Unix unity blurs RISC future" [CW, Oct. 8] leads readers to believe. While the article focused on RISC-based Unix workstations, it did not adequately report on vendors that offer full lines of multiuser RISC-based systems.

Although not named, Hewlett-Packard is the one exception to offer commercial customers a choice of RISC-based platforms. Your Buyers' Scorecard [CW, Sept. 24] showed the HP 3000 Series 925 rated highest in "13 of 15 categories, outscoring IBM's AS/400 and DEC's VAX by a full five points" and second highest in the remaining two categories. RISC is the main differential.

The scorecard noted that HP "set the pace" in the area of price/performance. HP achieved those results because of the strength of our PA-RISC technology. Those benefits include offering customers mainframe-class performance at a minicomputer's price.

Rich Sevcik
General Manager
HP 3000 Division
Hewlett-Packard Co.

C++ = Hype

Regarding your recent C++ object-oriented language series of articles in the "Unix on the desktop" Product Spotlight [CW, Oct. 22], I have the uncomfortable feeling that someone is trying to get a bandwagon started and desperately trying to find people with titles who will say something exciting or maybe good but at least not bad. It is put forth as "vital improvements" that C++ provides function prototyping; doesn't ANSI C? It is also stated that "overloaded" function prototypes are allowed. I can have two functions with the same name, and the compiler will choose the "right" one. That doesn't give me a warm feeling. Call by reference is allowed. I can pass the argument "1"; the function can set the argument equal to "2"; and from then on 1 = 2. Whoopee! This is almost as much fun as Pascal.

One noteworthy statement is that C++ makes you pay attention to your data. Good programmers have always designed data first, especially those who grew up with machines where 64K bytes was a luxury and assembly language was the only game in town.

I don't know enough about C++ to either slam it or extol it, but it seems that it is being promoted as another language that will make bad programmers look competent. You guys aren't telling me anything I didn't know 30 years ago — i.e., good programs are designed by good programmers, and there aren't enough of us.

Jim Murray
Another Software Co.
Madeira Beach, Calif.

Irresponsible

In this age of environmental concerns, I consider AT&T's advertisement printed on "indestructible" paper [CW, Oct. 8] irresponsible and offensive. In very small print we are advised to remove the ad before recycling the magazine.

And do what with it? I have a suggestion: Mail it to AT&T with a message expressing your objections. Let AT&T dispose of them in their landfill, not ours.

Emily Johnston
Westminster, Md.

Computerworld *welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor In Chief,* Computerworld, *P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701. Fax number: (508) 875-8931; MCI Mail:* COMPUTERWORLD. *Please include a phone number for verification.*

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Business must fill educational gap

If the U.S. is to remain globally competitive, industry needs to aid the educational process

JOHN AKERS

Most businessmen and women I talk to believe that our primary and secondary educational system today is foundering, whether measured by declining SAT scores, dropout rates or comparisons that show American children outperformed by children in Japan, Thailand, Hungary and Poland.

I recently visited two IBM operations — one in this country and one in Japan. I was reminded once again that IBM often does better in Japan than in the U.S. Same company, same management system, same processes, but yields, turnaround times, development cycle times and costs — are all frequently better in Japan.

Why? A good part of the answer is education.

We recently tested 700 manufacturing people at that U.S. plant and found that 67% measured below the sixth-grade level in reading comprehension. In Japan, we discussed the way newly hired graduate engineers — many with master's degrees — spend their early months working on the shop floor. The manufacturing people teach the engineers about the work being done. What a telling comparison!

Weakened education means a weakened work force, weakened international economic competitiveness, a weakened U.S. standard of living and a weakened democracy. Business is prepared to do whatever it can to help, to add to its already extensive record of assistance to education.

In IBM alone, for example, some 20,000 men and women have been participating in partnerships in more than 750 communities across the U.S. to improve education in grades kindergarten through 12. IBM itself last year contributed $20 million for primary and secondary education grants. But given the challenge we face, business must do even more.

The Business Roundtable — 200 chief executive officers of major U.S. companies — has launched an effort toward the educational goals set by President Bush and the governors of all 50 states.

Some of you may be thinking: We've heard this before. Business comes in with a lot of fanfare, undertakes some initiatives — often amateurish — and then runs out of gas.

Akers is chairman of IBM. This piece is excerpted from a speech he gave on Nov. 1 to the College Board National Forum in Boston.

Let me just say that we expect this time we'll do better. In the first place, our companies have signed onto a 10-year effort — personally by each chief executive, and with increased resources from each company.

Aiming for the heart

We have agreed to focus on state educational policy — the heart of the engine, where many of the policy decisions are made and most of the money comes from. And we are aimed at thoroughgoing reform — at the building of a transformed educational system, with nine components aimed at reaching each student:

1) Such a system should rest on some underlying assumptions: that *all* students in our culturally diverse society can learn both the basics and high-order skills; that we know how to teach *all* students successfully; that curricula must reflect high expectations; and that ***every*** child needs an advocate — someone who cares.

2) The system should be judged not by the processes it prescribes but by the results it produces.

3) In such a system, we need to do a better job of assessing students' ability to think and solve problems. We must set high standards for everyone in the educational process and devise effective measurements against those standards.

4) Schools should receive rewards for success and penalties for failure.

5) Each school's staff should have a strong voice in running that school — selecting its personnel, setting its curriculum and writing its budget. How else can we hold staffs accountable for schools' performances?

6) In this new system, we must put more muscle into staff development, including teachers' mastery of subject content and teaching methods and a strong program for preservice and in-service training for both administrators and teachers.

We should hire stars, free them from excessive regulations, reports and bureaucracy and let them teach.

7) We must do far better with prekindergarten programs to get children ready to learn. For openers, we need full funding for Head Start — a program that incontrovertibly has proven its efficiency and effectiveness.

8) We must reduce impediments to learning and do all we can to ensure that children do not come to school ill-nourished, sick and ground down by poverty.

9) We should make constructive use of technology to raise the educational productivity of both teachers and students.

A few weeks ago, I visited an inner-city primary school in New Haven, Conn., one of the most poverty-stricken and drug-devastated cities in the U.S. I met with teachers, administrators, students and parents.

I learned how, despite enormous difficulties, New Haven has sharply cut its dropout rate in the past seven years; how the school district pays to help needy students prepare for and take the SAT test and visit college campuses and how a strong and rising percentage of the district's graduates now go on to postsecondary education.

Leadership, from the superintendent, principal, teachers and parents, was obvious. The kids were all in uniform. Computer technology was in use. Every child goes through [IBM's] Writing-To-Read program.

It was an emotional morning for me, and I shared everyone's pride in what was being accomplished. If it can be done in New Haven, it can be done anywhere in America.

But can we stop here — stop with the transformation of our educational institutions alone? The answer is no.

Our shortfall in education is only a part of a much larger shortfall, a failure in the most basic responsibility any society can have: to honor the bedrock compact that runs from one generation to another.

Thomas Paine phrased it simply: "If there must be trouble, let it be in my day, that my child may have peace."

In recent years, what have we done with that commonsense idea? I think we've turned it upside down to read: "If there is to be affluence and good living, let it be in our day and let our children have the trouble."

We have cannibalized the compact, stolen from the future for the present, stolen from our descendants for ourselves.

We have lived it up with automobiles and TV sets and VCRs from Japan, Germany, Korea and other countries. We haven't paid for these by selling them American products of high quality and low cost, because we don't produce enough of them. Therefore, we have had to sell them things they *will* agree to accept — U.S. Treasury bonds at high rates of interest and land and buildings from Honolulu to Pebble Beach to Manhattan — the patrimony we might otherwise pass on to our children.

Look at the way we've raised our gross national product over the past 15 years. Did we do it primarily by saving as our competitors do, investing in new plants and equipment and increasing our productivity? No, we took another route to increase our GNP. We put more people into the labor force — millions of them, largely women formerly in the home. Women have made an incalculable contribution to our economy. But that contribution, coupled with the work-time absence of men from the home, exacts a price. Who has been paying that price? Our children. Our children and their education.

Education must begin in the home, with parents — mothers *and* fathers — getting children ready to enter kindergarten, reading to them, listening to them, answering their questions, making sure they do their homework, rationing TV, getting involved at school, working with their teachers and extending learning experiences.

I was shocked to read recently the results of a survey of schoolchildren conducted by Professor Robert Coles at Harvard, who asked how many would try to cheat on a test. Among elementary children, he found that 21% would. Sixty-five percent of high school students said they would.

What's going on? We cannot tolerate this moral erosion.

There are many obstacles: single parents with full-time jobs; families with two parents who both work — many ***having*** to work to make ends meet; illiterate adults, adults on drugs or adults who have simply abandoned their children. Because of these problems, business and government must do all they can: with day care centers, programs like Head Start and encouragement of employees to work with children and schools.

But this plain fact remains: If we as parents don't have the time, energy, ability or inclination to do these things, we as a nation have our priorities wildly wrong.

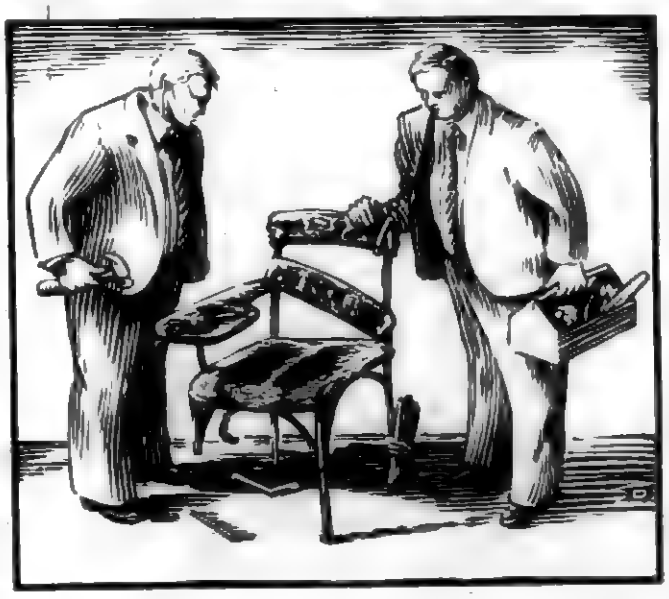
We can't go on like this. We can't go back to a bygone world of all-male wage earners. We have only one alternative that makes sense: We *must* find a way to organize our society to assure, simultaneously, vigorous economic productivity, abundant career opportunities for both men and women and plentiful child-nurturing time for parents.

The time has come for all of us — in government, education and business — to launch a sustained, intensive examination of this most significant national problem, to recommend specific steps our schools, work places and homes can take to accomplish those three ends and to follow through with action.

For this and all the challenges we face, what do we need?

Two things, I believe. First, realism — unflinching resolution to face facts, ask tough questions, major on the basics.

Second, discipline. Discipline that leads parents to put their children first; schools to commit themselves to turn out winners; corporations committed to eliminating shoddy work and achieving world class efficiency and quality; and discipline that leads federal, state and local politicians to look beyond today's comforts and next week's elections to the enduring good of this country.



Bob Dolan

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COMMENTARY

Sally Cusack

An absence of hand-holding

It was a Kodak moment. A fantasy come true. Or, if one prefers to view it from the opposite end of the spectrum, an unsettling event.

From his position behind the podium, the president of a major international software company slowly shook his head while making apologies to his audience for the product's shortcomings.

Hasso Plattner, co-founder and president of SAP AG, kicked off his opening remarks by assuring the 350 customers at the annual user conference that the next generation of the company's MRP II-based software would not be available for three years.

Having established that happy fact, he nonchalantly proceeded to tick off a laundry list of big and small problems that required immediate attention in the company's current offering.

Pausing periodically to think, Plattner methodically described each and every difficulty users could expect to encounter with the mainframe package, and in some cases, was even kind enough to provide overhead illustrations.

No lights, no lasers, no hype. No vague references to "areas of leadership" or promises of "continuing to support our customers' needs." Just lots of low-key information coupled with actual delivery dates and performance expectations.

It was the type of thing that

Continued on page 37

Shearson looks at S/390 option

BY ROSEMARY HAMILTON
CW STAFF

NEW YORK — Shearson Lehman Brothers, Inc. is on its way to the IBM System/390 platform, a plan that will both deliver new functions and reduce the pieces of hardware on the data center floor, according to Hank Hamilton, senior vice president of information systems.

The company installed an Enterprise System/9000 Model 720 in September. Tied into its ES/9000 strategy are plans to add the fiber-optic-based channel architecture, Escon, to test the system coupling capability, Sysplex, and to take a close look at the security processor, the Integrated Cryptographic Feature, for future implementation.

Hamilton said he expects to reduce his installation from six 3090s to four bigger ES/9000s by moving to the new high-end models.

"Our strategy is to have fewer hardware systems with the same number of images," he said. "The thrust is to collapse the logical images into fewer physical images."

Replacing 3090S

The ES/9000 Model 720 was brought in to replace a 3090S model. Hamilton said it has run without a hitch and offers the performance of a 3090 600J, which is the heart of a Model 720.

While the mainframe has the frame and environmentals of the new generation, it is based on a J-model engine.

"It has multiple power supplies," Hamilton said. "We took one hit, and it automatically switched over to a backup. We didn't lose a heartbeat."

Shearson expects to begin moving to the Escon architecture next year. Escon represents a major departure for the I/O process because it provides both a new physical medium and method for transmitting data to and from the processor. With Escon, which will be made available in phases of the next year, a user can set up devices more than five miles away from the CPU and get transfer rates of up to 10M bit/sec.

"We're starting to investigate it," he said. "We're trying to understand the software components and the facilities issues, like how to run the fiber cable under a raised floor."

At the same time, the company is "on the verge of experimenting" with the IBM Sysplex capabilities, Hamilton said. Sysplex is another IBM offering that will be delivered in phases. It will provide a coupling capability to link a complex of processors.

Looking at security

Finally, Shearson is evaluating the IBM security coprocessor device against its own internal security system. "We are working to understand the benefits [of IBM's product] against our own security system," he said.

The Shearson system, which is closely tied into IBM's RACF security software, does not contain an encryption/decryption facility.

"It's missing that," Hamilton said. "That's why we are looking to pick up [the IBM product]. We aren't the [U.S.] Department of Defense here, but we have a keen interest in this."

Vendors integrate Unix offerings, cite demand

BY JOHANNA AMBROSIO
CW STAFF

Users' demands for more Unix business software are being heeded. Not only is the number of Unix applications growing almost daily, but some vendors are also integrating the different packages into a coherent whole.

This trend was apparent at the Unix Expo trade show, held in New York earlier this month. At the show, a group of vendors announced a consortium to integrate Unix application packages, and Unisys Corp. touted its integrated software environment.

Taking a different tack to providing Unix software, start-up company Hunter Systems, Inc. based in Palo Alto, Calif., has ported several popular DOS applications to Unix, including Multimate Advantage II, Dataease and Quattro Pro. More are in the works, and Hunter is also licensing its porting tools to companies that want to convert home-grown DOS applications to Unix.

The vendor consortium, called the X.desktop Software Initiative, will allow users to start a package by simply pointing and clicking on an icon that represents the package. Ultimately, the consortium will provide a common set of functions that users can perform in all supported applications — again through the use of icons.

So far, some 16 vendors have joined the group, including Ashton-Tate Corp., Oracle Systems Corp., Lotus Development Corp. and Wordperfect Corp. The program's organizer and lead developer is IXI Ltd. based in Cambridge, England.

The program and function icons will be implemented within IXI's X.desktop interface, which vendors including IBM, NCR Corp. and The Santa Cruz Operation are shipping as part of their user interface environments.

Unisys is also selling its own framework for integrating different software packages. Called the Value Added Platform or VAP, it consists of 50 different software and networking components that Unisys guarantees will work together. Currently available for Unisys hardware only, the VAP may eventually be available for other Unix systems as well, a spokesman said.

Users can mix and match among the VAP's components, which include Unisys and third-party software such as the Oracle and Informix Corp. database management systems and programming tools from Ryan McFarland Corp. in Austin, Texas, and Micro Focus in Palo Alto, Calif. VAP pricing depends on which components are selected.

Also at the show were new and improved shrink-wrapped Unix applications, including the following:

- Version 4.0 of a family of manufacturing, accounting and distribution software from IBES Corp. in Richardson, Texas.
- New modules for cash management and job costing in the Great Plains Accounting series from Fargo, N.D.-based Great Plains Software, Inc.

Spotlight

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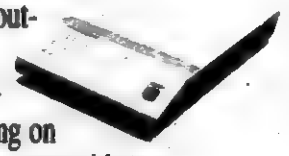

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UPI swaps antique systems for agility

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — It is hard to turn around a troubled company quickly when its computer systems are about as nimble as concrete shoes.

That was the problem faced by United Press International (UPI), the perennial No. 2 news wire service, when it was taken over by New York-based Infotechnology, Inc. in 1988. UPI's data center in Dallas held two ancient systems: a Univac 9080 mainframe for its news wires and an RCA Corp. Spectra 70 for its stock tables.

Making any changes to those 1960s-era systems meant a month-long project writing in assembly code, so changes were not made very often. "That was a concrete system. It virtually could not change," said William J. White, president of the company's information systems unit, Infotech Data Resources, in Vienna, Va.

Furthermore, UPI had made custom changes to the Univac 9080's operating system, "which made it even more difficult to support," said Kevin Hipps, vice president of Infotech Data Resources. "In fact, the people who made those modifications 10 years ago are no longer around."

At a time when other companies were using IS for competitive advantage, UPI's computer system was a "competitive impediment," UPI spokesman Milt Capps said.

But that was before UPI switched, on Aug. 29, to its new data center in Vienna, Va., which houses a Digital Equipment Corp. Vaxcluster, including two VAX 6000 Model 310s and two VAX 8550s. System changes that once took months of programming can be accomplished in one day using system commands, Hipps said.

Breaks a logjam

"The new system gives us vastly more flexibility and speed in communicating with an increased number of news sources and breaks a longstanding communications logjam that hampered efforts to provide reports tailored to individual clients' needs," said Pieter VanBennekom, UPI's executive vice president for editorial operations, in a company statement.

UPI's new managers said they believe flexibility is just what the news service — which was losing about $2 million per month several years ago — needs to help it return to profitability. UPI lost $3.3 million in 1989.

The wire service's latest strategy is to make big cuts in general news areas and focus on specialized information reports about business, sports and regional news. That means culling the appropriate tidbits from a variety of news reports and directing them to specific customers.

For example, UPI news clients in the Pacific Northwest could ask to have all stories dealing with the fishing industry routed to them as part of their custom service, officials said. The new computer system will be able to flag those stories for UPI editors.

"We're going to help the editorial process by electronically sorting through the news stories. Before, they might have had to wait for a call or depend on someone knowing they even wanted this stuff," White said.

Perry W. Miles, senior vice president for operations at UPI, said the system will also make it

Continued on page 35

Prime Computer keeps the midrange faith

BY SALLY CUSACK
CW STAFF

NATICK, Mass. — "Never say die" is becoming the war cry of the proprietary midrange industry, where Prime Computer, Inc. recently added two entry-level computers to its 50 series family of products.

The 5310 and 5330 systems are self-contained, desk-side units based on CMOS architecture, and both run the Primos operating system. The units replace the company's 2850 and 2950 boxes and are designed to function as stand-alone units or as nodes on a network.

The announcement was seen as a sign of Prime's resolve, and users backed the vendor's efforts to support the proprietary installed base. However, those users appeared to be in no hurry to sign up for the new systems offerings.

"Companies are giving their proprietary bases headroom by expanding their product lines," says Robert Kidd, an industry analyst at Dataquest, Inc., a market research firm based in San Jose, Calif.

Citing Data General Corp.'s recent MV computer addition and Digital Equipment Corp.'s recent VAX 6000 Model 500 system announcement, Kidd noted that vendors with sizable proprietary bases are dead set on keeping them.

No immediate upgrade

Colonial Freight Systems in Knoxville, Tenn., currently depends on a Prime 2950 for load entry, accounts payable, accounts receivable and payroll applications. According to programmer Gary Bebout, the company is not looking to upgrade the system immediately but will be considering the possibility in the next year or two. Colonial Freight moved to the Prime platform in 1987 when replacing an older IBM System/3.

Another Prime user, an employee at Pioneer Valley Transit in Springfield, Mass., said the company recently upgraded from the Prime 2250 to the 2850 box — a move that doubled computing performance. She added that another system purchase is "not something we would consider at this point in time."

The 5310 supports up to 64 users and can be configured with 8M to 64M bytes of memory. Pricing ranges from $36,858 to $65,305. The 5330 supports as many as 128 directly connected users and offers memory configurations from 24M to 128M bytes. It is priced from $85,247 to $100,492.

Both systems are said to support more than 2,500 software applications, as well as Prime's Information commercial database management system and Oracle Systems Corp.'s Oracle database management software. The systems are available now.

Wang Unix introductions show open systems loyalty

BY SALLY CUSACK
CW STAFF

LOWELL, Mass. — Strengthening its commitment to the personal computer market and open systems, Wang Laboratories, Inc. recently unveiled multiuser Unix-based systems.

The DX100 and DX200 are the company's first microcomputers preconfigured for the Unix community. They extend the vendor's Dynamix series of multiuser systems, which run The Santa Cruz Operation's SCO Unix V/386 Release 3.2.

"Wang users are certainly interested in the Unix platform," said Wes Strickland, systems consultant for the U.S. Society of Wang Users (USSWU), based in Chicago.

Strickland said that USSWU has sponsored several Unix-oriented seminars and workshops during the past year, and all have been "well-attended."

Neil Boisseneau, assistant director of distributed systems at Hartford Insurance Group in Hartford, Conn., noted: "We aren't really doing a lot of Unix at the micro end at present, but we certainly haven't ruled it out."

He added that the company is in the process of determining what workstation platform best meets its next-generation application developer needs. Hartford now has a mix of PCs from Wang, Digital Equipment Corp., IBM and Compaq Computer Corp., many of which operate in a local-area network environment.

Wang's DX100, priced at $8,995, is based on an Intel Corp. 80386, 33-MHz processor and supports as many as 16 active users. The DX200, ticketed at $10,995, is based on a 25-MHz Intel 1486 processor. It can support as many as 32 users, the vendor said.

Both units include standard memory configurations of 4M bytes, expandable to 16M bytes, and offer cache memory and a 16-bit intelligent small computer systems interface-based controller.

They are slated for a December delivery.

In other announcements, WLT Systems, Inc., a wholly owned subsidiary of Wang, last week introduced a 33-MHz Intel 80386-based machine as the most recent addition to its PC Express product line.

The WLT AT333C-6 is targeted at computer-aided design and manufacturing, scientific databases and compute-intensive engineering applications.

The machine is priced from $2,640, which includes three years of free on-site warranty service, according to the company.

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Sales of Delta 3000 grow

BY MAURA J. HARRINGTON
CW STAFF

CUPERTINO, Calif. — Motorola, Inc. has been hit hard with criticism from analysts lately for its delay in volume shipments of its 68040 microprocessor. Yet it has had an upswing in sales of its 68030-based Delta Series 3000 product line in the past month, thanks to a recent onslaught of sales to large user sites.

Among those signing multimillion-dollar contracts for Motorola's Delta Series 3000 multiuser Unix-based systems are Service Merchandise Co., a catalog showroom retailer, the New York City Department of Human Resources Administration (HRA) and the state of Tennessee. United Airlines is also expected to close a contract with Motorola to purchase the Delta Series 3000 systems today, a Motorola spokeswoman said.

The Delta Series 3000 systems have been around for about two years, and the company started shipping a 50-MHz version of some of its Delta products in November 1989, the spokeswoman said. Both the Model 3840 and 3640 have the capability to run at 50 MHz, she added.

Service Merchandise has a five-year contract to purchase 500 Delta Series 3000 systems, with the first 100 of those to be shipped by the end of third-quarter 1991, the company said. The Delta Series 3000 systems will serve as back-office systems in 350 locations, hooked up to a local-area network, to support point-of-sale terminals for the company's inventory control, merchandise selection and order processing, the company said.

The state of Tennessee has agreed to purchase up to $55 million in Delta Series 3000 Model 3840 high-end systems and 3640 midrange systems during a 12-month period, according to Motorola.

Also, the city of New York's HRA will accept delivery of 51 Delta Series Model 3640 systems, which are the basis of a $4.5 million contract.

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The Press goes on to mention that because DR DOS 5.0 is fully DOS compatible, you can run all your current DOS applications. And because it is easy to install and requires no hard disk reformatting, upgrading to DR DOS is simple. Since DR DOS 5.0 also includes ViewMAX™, a graphical interface, DOS is easier than ever to use.

Now if we could just get a word in edgewise, we would simply like to add that DR DOS 5.0 is available now. Call your local dealer today.

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For Laptop and Notebook manufacturers, DR DOS 5.0 is fully executable from either RAM or ROM. And, it's available with BatteryMAX™, a battery-saving feature that can increase battery life 2–3 times (dependent upon OEM implementation).

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Migration aid for DEC users

BY MARYFRAN JOHNSON
CW STAFF

The president of Smartstar Corp. found himself thinking of Andy Warhol's prediction about fame last week, as this small software tools vendor enjoyed its own 15 minutes of acclaim during Digital Equipment Corp.'s database announcements.

"This was like a coming-out party for us," said John Markel, president of the Goleta, Calif.-based company that will supply new database migration services from Oracle Systems Corp.'s RDBMS and DEC RMS to DEC's premier relational database, RDB.

This week, Smartstar will announce its own migration tools, which allow users to move data and applications in either direction between the Oracle and DEC databases. The DEC products can convert data in only one direction: from Oracle or RMS to RDB.

Independent application

The Smartstar products convert data, data definitions and complete applications, which are then portable among SQL-based relational databases.

Their particular claim to fame is a low-maintenance "database-independent" application development technology, which reduces coding requirements and allows software designers to postpone (until the physical design phase) the choice of which relational database will run the application.

The privately held company recently secured venture capital funding from Boston-based Advent International, Inc. and has launched a consulting service as well.

"In the past, we were in the mode of the total products company, and we bowed out of service," said John Shackleton, vice president of Smartstar Consulting Services in Oak Brook, Ill. "But as the technology gets more complex, there's no way to drop your product on somebody and expect them to be able to use it without some help."

Burst of growth

Shackleton, who left a consulting position at Oracle two months ago, said every dollar of revenue at Oracle is matched by at least $4 in professional services. The consulting business there grew from nothing to $125 million in four years, he added.

Staffed now with 16 consultants and claiming expertise in building worldwide corporate relational database systems, Smartstar has signed on Du Pont Co. as one of its first clients. DEC has also referred another 18 potential clients, Shackleton said.

Smartstar is a longtime marketing partner privy to DEC's planning and development. About half of the DEC shops with fourth-generation language (4GL) tools are using the Smartstar products, according to market researchers at Computer Intelligence in La Jolla, Calif.

As a software vendor inexorably tied to DEC's multivendor networking strategy, Smartstar officials said they plan to follow DEC's lead and move Smartstar products onto DEC's Unix-based platform and later to other Unix-based systems.

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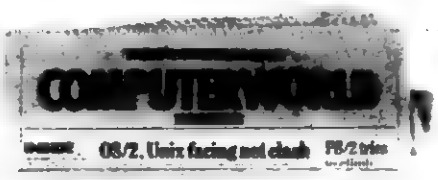
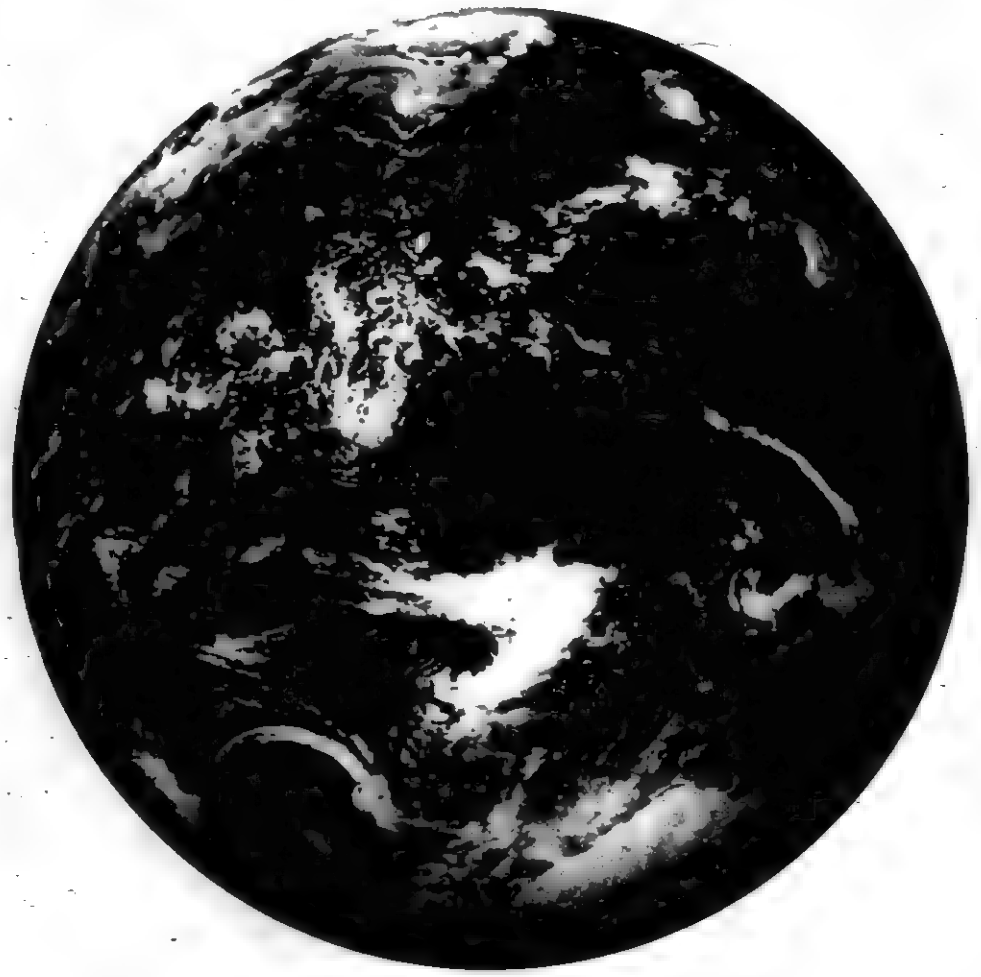


The Newsweekly of Information Systems Management

What to expect from our new gateway products.



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Software firms collaborate, develop CAE framework

BY JOHANNA AMBROSIO
CW STAFF

NEW YORK — Ten software companies banded together recently to develop an integrated environment for computer-aided engineering (CAE).

Taking the lead on the project is Interact Corp., a New York-based vendor of a framework product called The Integrator. The company will be encapsulating software products from nine other software vendors into that framework. Users will then be able to select any of the encapsulated tools from the framework.

"It's analogous to an interface," said Matt Goldstein, Interact product marketing manager. "Once a tool is encapsulated, a user can immediately plug in that tool and use it." Interact's encapsulation program will be completed by the end of the calendar year.

Other companies participating in the program include Zycad Corp. in Mt. Olive, N.J.; Interleaf, Inc. in Cambridge, Mass.; Beaverton, Ore.-based Test Systems Strategies, Inc.; and Meta-Software, Inc. in Campbell, Calif. The tools involved run the gamut from electronic publishing to schematic capture, code generators and design analysis.

However, Goldstein said, the encapsulation process does not guarantee that the tools will work with each other, only that they work with the framework. Although The Integrator will help to standardize the output from each of the tools, it will not automatically ensure that the output from one tool flows into another. The tools will be integrated with each other only if the vendors have done that integration work prior to the tools being encapsulated into the framework.

The encapsulation program will help automate some of the tasks that users have had to perform themselves up until now, Goldstein said. For example, a user of software development tools can simply edit the source code; the compile and link steps are done "under the hood," he said.

Interact is rushing to beat other companies, including Mentor Graphics Corp. in Beaverton, Ore., which are undertaking similar projects. However, Goldstein said, "unlike the other framework vendors, we sell no software tools or hardware platforms, so we have no biases toward anything."

Arm's-length relationship

Even though IBM holds a 40% stake in Interact, Goldstein said, it has been a "fairly arm's-length" relationship, and Interact is "free to determine our own technology strategies." The Integrator framework runs on Sun Microsystems, Inc. workstations; a port to the IBM RISC System/6000 is expected by the end of the year.

Also, he said, it is easy for users to encapsulate their own homegrown tools or tools that are not yet part of the formal project.

Still, the encapsulation project might be a little too late for users who have already invested in large CAE programs. "We're already working with systems integrators and software vendors to help integrate all the tools we have," said the information systems director of a Midwest manufacturing company who did not wish to be identified. "So we're just not interested in any other kind of program."

INTERACT WILL be encapsulating software products from nine other software vendors.

UPI

CONTINUED FROM PAGE 29

easier for UPI to take news feeds from various state news services and newsletters, an important development because UPI's turnaround strategy is big on alliances with other news media.

One of the biggest technical challenges was moving the stock listings off the RCA Spectra 70, because over the years, UPI clients had come to depend on the exact format of the stocks feed. In fact, they had built pattern-recognition programs allowing them to automatically reformat the tables for their own pages.

Consequently, Infotech had to undertake a complete reverse-engineering process to duplicate the Spectra 70's stocks output — right down to the column spacing — and conduct extensive testing with customers, Hipps said.

On the news side, Infotech had to make sure that UPI's editors did not lose any of their beloved editing commands. Now that all of the old functions have been duplicated, "we can do some things that will knock their socks off in terms of on-screen Help . . . that can improve the journalists' productivity," Miles said.

"This [transition] has been work," White added. "Now, we can really start doing the fun things for our editors and customers."

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Cusack

CONTINUED FROM PAGE 27

would give typical company marketing managers nightmares or ulcers.

A product marketing director at a competing corporation, established both here and abroad, scoffed at the German company's methods. "It's just another form of attention-getting reverse marketing," she said. "They're just saying 'look at us — we're the humble, honest company.' That's crap."

Could be. If so, is this a wise strategy for a corporation trying to establish a strong presence here in the U.S., where the average consumer has grown accustomed to daily forced feedings of direct and indirect advertising, media glitz and hyperbole?

U.S. companies are spending billions of dollars each year on advertising campaigns, and in the increasingly competitive computer industry, many millions are spent on suave marketing and public relations personnel — whose sole purpose in life is to supply customers with soothing words and reassuring promises while writing carefully crafted, noncontroversial speeches for chief executive officers.

Obviously, a company like SAP, boasting clients such as Mobil Oil, Dow Chemical, and Du Pont, can afford to imitate its competitors in that respect, but what happened at this year's user meeting?

"Oh, they're always like this," commented an analyst who has been following the company's progress for several years. "It's a bit unnerving, isn't it?"

Plattner's speech that morning was peppered with statements guaranteed to freeze any warm fuzzies the users might be feeling about the product.

Among them were announcements that the next-generation product will have "weaker performance" than the current offering, reportedly a trade-off to accommodate the world of open systems. He also made a flat-out declaration that the customer user interface would definitely *not* follow the American tradition of icon-based menus; it would be character based. Period.

Actually, the users didn't seem surprised. It was as if they expected to be presented with the sort of perverse exercise in logical deduction that was played out before them: State the problem; illustrate the problem; define the solution; target a resolution date.

An SAP representative defended his company's approach: "One has to understand the mind-set here," he said. "These executives are also engineers, and they truly believe that their technology is superior and have no qualms about addressing any defects — real or potential — as they are confident they will resolve them."

That was perhaps the only recognizable marketing statement forthcoming that morning.

Cusack is a *Computerworld* staff writer.

NEW DEALS

Ralston group signs DEC pact

Protein Technologies International, a wholly owned subsidiary of St. Louis-based Ralston Purina Co., has signed an agreement with **Digital Equipment Corp.** on a $1.9 million project to integrate Protein's manufacturing facilities with Ralston headquarters on a Vaxcluster with local- and wide-area networks.

Stratus Computer, Inc. last month announced a $3.5 million contract with **Sistemas Technicos de Lotterias del Estado S.A.** in Madrid to provide five Stratus XA2000 fault-tolerant systems for a fully automated nationwide lottery system. The Spanish national lottery is one of the largest in the world, with annual revenue of more than $6 billion. The Stratus boxes will act as communications processors for the newly automated lottery system, which is expected to be fully on-line in 1992.

Bull UK, a subsidiary of Groupe Bull, has scored two major contract wins during the past several months — a $12.6 million contract with the UK's **Royal Air Force (RAF)**, and a $2.28 million agreement with the **Leicestershire Health Authority**. Bull UK will be supplying 42 DPS 6000 midrange computers and 1,700 terminals and printers to automate administrative functions at 42 RAF stations during the next two years. A Bull customer since the early 1980s, the RAF is reportedly banking on the Unix coprocessor found in the DPS 6000 systems to facilitate a gradual move to open systems. The Leicestershire order will involve the installation of three Bull DPX/2 340 and 13 DPX/2 210 Unix-based systems. Additionally, 13 DPX/2 210 systems for associated clinical information systems will be installed to assist doctors in routine administrative and clerical functions. The order also calls for more than 100 Zenith 386 SX PX terminals. Zenith Data Systems is a subsidiary of Groupe Bull.

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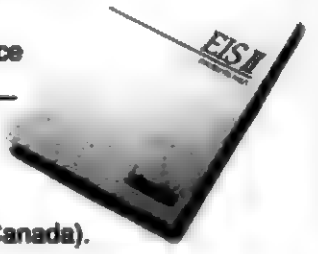

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*David W. DeLong, co-author of "Executive Support Systems: The Emergence of Top Management Computer Use."

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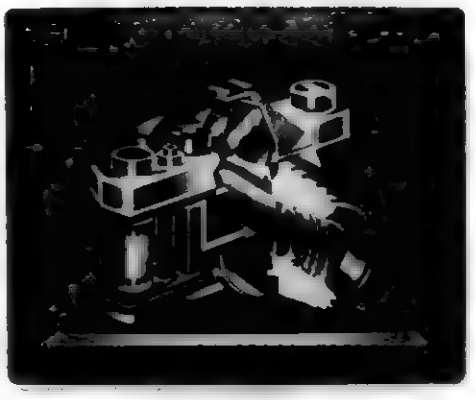
IBM lets the Now 486 technology

Without the proper venue, dazzling ability often falls short of expectations. That's certainly been the case with the Intel 486™ microprocessor, a processor that hasn't been utilized to its full potential. So that's what IBM set out to do. Just as it takes a seasoned jockey to turn a thoroughbred into a champion, it took IBM to give the 486 processor every opportunity to work its genius. Introducing IBM Personal System/2® Model 90 XP 486 and Model 95 XP 486.

From speed and storage capacity to graphics capabilities and upgradability, the new PS/2® Models 90 and 95 are designed to optimize the power of the Intel 486 processor and deliver a truly balanced performance—equipping you with solutions for today and providing a platform of growth for tomorrow.



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Right out of the starting gate, the Models 90 and 95 will astound you with their power and sophistication. Featuring a 33 MHz processor and a 25 MHz processor that's easily upgraded to 33 MHz, they deliver blazing speed and balanced performance, expanding your capacity for computer-intensive applications like CAD/CAM, financial modeling and multimedia. The course between your data and your processing has also been strengthened—the Micro Channel™ 32-bit data path, combined with a lightning-quick data-transfer rate, not only optimizes the present power of the 486 processor by feeding it a steady stream of information, but also provides for processor enhancements and will allow you to benefit from advanced operating systems to come. Plus these other innovations: a wider 64-bit data path which optimizes the 486 processor's access to system memory; 4MB memory standard (expandable to 32MB); and a 256KB cache option for even greater speed. All in all, it's easy to see how the concept of computer "power" has been enhanced, and how IBM helps you take full advantage of every second of computing time.

BRILLIANCE ON DISPLAY.

With increased power comes increased capabilities—the most visually stunning of which is Extended Graphics Array (XGA), standard on the PS/2 Models 90 and 95, and the heart of IBM's spectacular new display presentation.

With high resolution (1,024 x 768 pels) and execution that's significantly faster than VGA, XGA's sharper, clearer picture, coupled with the IBM 8515 color display, gives you swifter performance in windowed environments, and provides graphics-intensive applications such as desktop

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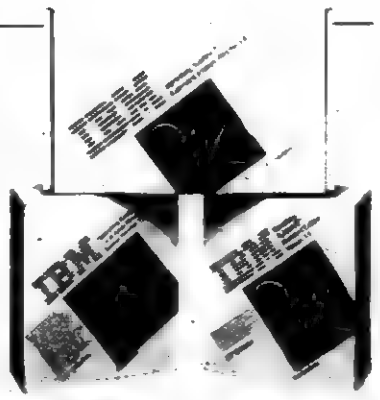
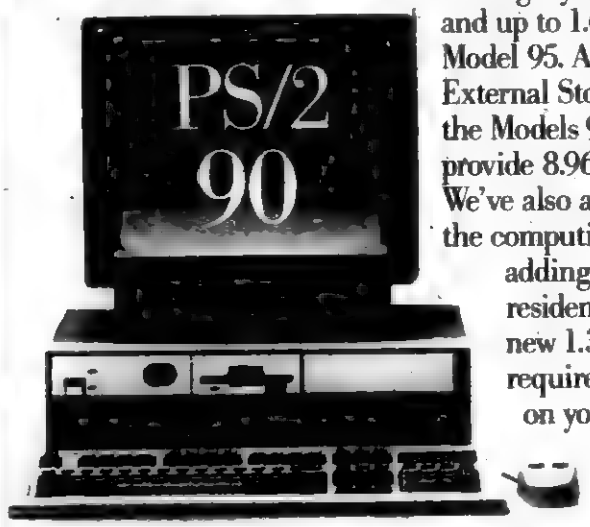
To satisfy even the most demanding storage needs, from LAN systems to data base management to numeric-intensive applications like financial analysis and modeling, IBM has one of the most advanced solutions available. IBM's super-fast SCSI hard disks are pure state-of-the-art performers. With additional hardfile expansion bays, the PS/2 Models 90 and 95 have enormous storage potential—up to .96 Gigabytes on the Model 90 and up to 1.6GB on the Model 95. And with the PS/2 External Storage Enclosures, the Models 90 and 95 can provide 8.96GB and more. We've also augmented the computing power by adding more flexibility to resident memory—our new 1.3 version of OS/2® requires as little as 2MB on your system. With this streamlined version you not only get more room for applications, but some users will experience a substantial performance increase in system functions as well. So when you need to make great strides with your computing power, you can count on IBM to give you terrific storage capability wherever you may need it.





Features	IBM PS/2 Model 90	IBM PS/2 Model 95
Microprocessor		
Standard	80486	80486
Clock speed	25-33 MHZ	25-33 MHZ
Optional upgrade	33 MHZ	33 MHZ
Memory		
Standard	4MB (70ns)	4MB (70ns)
Maximum	32MB	32MB
Integrated Functions	Extended Graphics Array (XGA) and display port, dual DMA serial ports, DMA parallel port, pointing device port, keyboard port, diskette controller support for three drives, SCSI adapter with Cache.	
Fixed Disk Storage		
Standard	80-320MB	160MB-320MB
Display Modes		
APA Modes	XGA (includes all VGA modes) 640 x 480 x 256 colors/64 gray shades; 1024 x 768 x 16 colors/gray shades; hardware support for 132 column text mode; 16-bit direct color mode at 640 x 480 x 64K colors	
Available Expansion Slots	three 32-bit	six 32-bit
Bus Architecture		
Data path	MCA 32-bit	MCA 32-bit

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With optimized performance in balance, power, speed and adaptability, the new PS/2 Models 90 and 95 are designed to keep you ahead of the pack. To find out more about the new leader in 486 computing, contact your IBM Authorized Remarketer or IBM marketing representative. For a remarketer near you, call 1 800 272-3438.

How're you going to do it?

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IBM

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NEW PRODUCTS — SOFTWARE

Software applications packages

Software Creations, Inc. has announced a retail management software package that can be installed in a single cash register.

The Electric Merchant 2000XL can be used for register management, inventory control, order processing operations and a broad array of business review options. It is targeted at small gift and card shops, museums and food and liquor stores.

The product runs on IBM Personal Computer XTs, ATs or compatibles. It is priced at $295.

Two midrange versions are also available for use on Novell, Inc. Netware- or DOS-based networks: Electric Merchant 2000XL-Plus, which costs $595, and Electric Merchant 2000XL-Plus w/Net, which costs $895.

Software Creations
10035 Adamo Drive
Tampa, Fla. 33619
(800) 767-3279

Westland Software House, Inc. has announced Version 12 of its Medical Management System, which features pop-up windows, dynamic reporting and integration with Hewlett-Packard Co.'s Laserjet printers.

The system is based on AT&T's Unix System V combined with Informix Corp.'s database management system. It runs on HP 9000 Series 800 computers under HP-UX and HP Vectra personal computers.

Software costs between $7,500 and $40,000. Complete hardware and software systems range from $25,000 to $250,000. Pricing is based on configuration.

Westland Software House
23901 Calabasas Road
Calabasas, Calif. 91302
(818) 992-0081

Scientific Software, Inc. has announced the Alert CAD fault-tolerant computer-aided dispatch system and the Interswitch front-end fault-tolerant message-processing switch.

Alert CAD runs on Stratus Computer, Inc. or IBM fault-tolerant hardware and features a multithreading architecture and event-driven no-wait coding.

Interswitch was designed to enable users of computer-aided dispatch systems to pass messages among compatible or incompatible devices.

Both products require a Stratus XA2000 with a VOS operating system. License fees for Alert CAD and Interswitch begin at $250,000 and $175,000, respectively.

Scientific Software
600 Embassy Row
Atlanta, Ga. 30328
(404) 551-2546

Utilities

Macro 4, Inc. has announced that its Synchro CICS resource manager software package is available for users of IBM's VSE mainframes.

Synchro allows resources to be automatically switched from CICS and batch regions. In addition, CICS systems do not have to be terminated to run batch applications. CICS resources can reportedly be controlled by other CICS systems within a network via the LU6.2 protocol.

Leasing rates for Synchro range from $235 to $610 per month, depending on CPU size.

Macro 4
P.O. Box 187
Brookside Plaza
Mount Freedom, N.J.
07970
(800) 223-0414

Schumann Software, Inc. has announced a product designed to create IMS image copies.

Quick Image Copy uses execute channel program level processing and supports Full Function and Fast Path databases. It is integrated with Schumann's DBC for DL/1, a tool set designed to automate DL/1 database management.

A universal CPU license is priced at $8,000.

Schumann Software
433 Hackensack Ave.
Hackensack, N.J. 07601
(201) 488-8688

Continued on page 42

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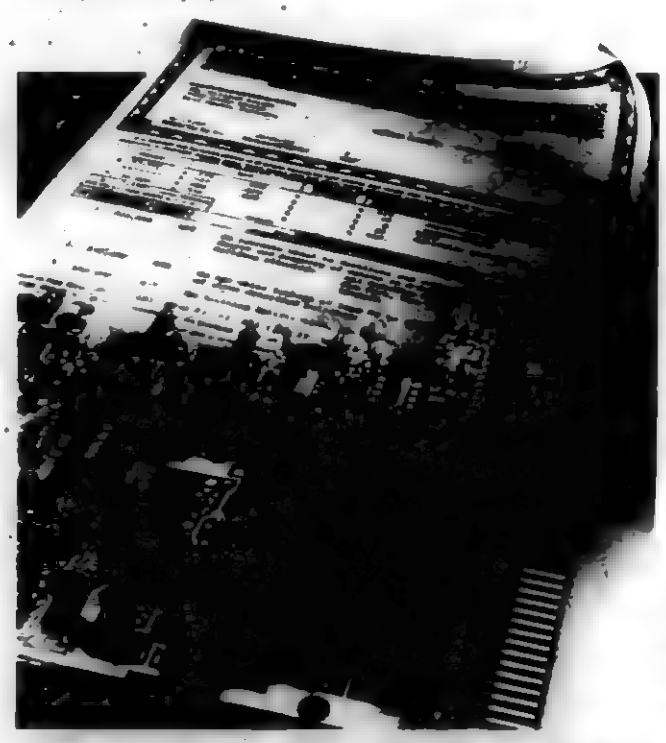

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Amongst all their Business Partners only Multi Soft has the depth of experience in Front-end Development, Human Factors, Communications, Software Distribution, & Cooperative Processing necessary to solve the myriad of problems facing corporate America's migration to IBM's Enterprise Systems.

Multi Soft's Products

EasySAA™ is an advanced Object Oriented CASE tool for rapidly creating SAA/CUA-compatible interfaces in minutes and integrates them into existing mainframe applications.

INFRONT/DS™ (Development System) is a PC-resident developer's toolkit which includes a 4GL designed for cooperative processing, communications, and local file & database access.

INFRONT/HPO™ (Host Processing Option) provides peer-to-peer communications between a PC and a host. It handles the low level communications tasks, allowing the developer to concentrate on the functional requirements of the application.

INFRONT/SDF™ (Software Distribution Facility) automates the distribution and maintenance of PC software and files. INFRONT/SDF ensures that PC users always have the correct version of their PC applications and editing tables.

INFRONT/DB2 lets application developers use INFRONT to code SQL statements that execute against DB2 on the mainframe, or to create an ad-hoc query and download data to a PC in a completely menu-driven manner. Complete application development accessing DB2 data can be implemented purely from the PC.

OpenAPI provides a high-level API verb set and INFRONT communications modules so that the developer can create cooperative processing applications without having to learn low-level API's like HLLAPI or APPC. OpenAPI supports applications written in almost any language, such as C, COBOL,and dBASE.

Is it only "what's up front that counts?"

IBM doesn't think so. Do You?

At first glance, some products look great. But it takes more than a slick interface and a mouse to build cooperative processing applications. It also takes mainframe & communications knowledge and an extensive background in human factors and ergonomics. And, you need tools which embody that human factors expertise.

Tools like the INFRONT products from Multi Soft. Tools that are easy to learn and easy to use. Tools that leverage your programming resources so that you can build cooperative processing applications quickly.

Tools that support the development of applications that are portable. Build your program once and then run it under DOS, Windows, or OS/2 without making any changes to your code. Build your program once and run it over asynch, LU2, and LU6.2 links - again, without changes.

The successful implementation of cooperative processing requires in-depth knowledge and the experience gained from developing systems for six years. Multi Soft gives you that and more.

IBM knows it - they selected Multi Soft as one of the few IBM Business Partners to participate in the System 390 introduction.

IBM even produced a video tape and a 'demo' diskette to show how the Multi Soft products complement the new IBM Enterprise Systems.

Call today and let us show you why IBM chose Multi Soft. We will send you a free IBM-Produced Video Tape & Demo Diskettes. Then, let's talk. You'll be amazed at the difference that experience and expertise can make.

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Multi Soft, Inc.

123 Franklin Corner Rd.
Lawrenceville, NJ 08648
800-888-4973
609-896-4100
Fax # 609-895-0072

Banner Software, Inc. has announced a source-code security system for Rexx, a procedures language for IBM's Systems Application Architecture.

Rex/Guard secures Rexx Exec commands so that data cannot be viewed and ensures that only one copy of an Exec is used.

According to the vendor, it can be used on any Rexx Exec and is available for systems operating under VM/CMS.

Pricing begins at $2,995.

Banner Software
9719 Lincoln Village Drive
Sacramento, Calif. 95827
(916) 364-0900

BMC Software, Inc. has announced an IMS database product designed to recover DL/1 databases.

Recovery Plus reportedly needs to make only one pass of change accumulation and recovery log data sets while recovering multiple databases concurrently.

Perpetual license prices begin at $17,500.

BMC Software
P. O. Box 2002
Sugar Land, Texas 77487
(800) 841-2031

Cybra Corp. has announced a software package designed to interface IBM midrange systems with Monarch Marking's Monarch 9400 series of thermal transfer printers.

Markmagic enables users of IBM System/36s, System/38s or Application System/400s to create label formats, change parameters and print on-line, bar-coded labels and tags. These tasks can be performed without a need for any programming and without a need to download data to a personal computer, the vendor said.

Pricing ranges from $2,395 to $4,595, depending on type of hardware platform.

Cybra
One Riverdale Ave.
Riverdale, N.Y. 10463
(212) 601-7100

Computer-aided software engineering

Release 3.0 of Michaels, Ross & Cole Ltd.'s MRC-Productivity series of fourth-generation language and computer-aided software engineering tools for the IBM Application System/400 features an adaptable reporting facility designed for shops with a constant demand for information.

End users and programmers can modify reports before and after completion, and users can add or delete files and fields or resequence fields, the vendor said.

Prices range from $5,000 to $39,500, depending on model.

Michaels, Ross & Cole
450 E. 22nd St.
Lombard, Ill. 60148
(708) 916-0662

Cadware, Inc. has announced a personal computer-based computer-aided software engineering (CASE) product line that features multiple entry points.

Smartcase is a documentation tool that provides an entry point for customers to gain experience with CASE techniques. MS-DOS and OS/2 versions are priced at less than $300.

System Developer I is an analysis and design tool kit that features a rule-based editor. Pricing ranges from $499 for a single-user MS-DOS version to $1,999 for a multiuser network package.

System Developer II includes Metabase, a PC-based customizable repository that is based on an extended entity attribute relationship technology. A single-user MS-DOS version costs $3,499, and a multiuser network package is priced at $9,999.

Cadware
50 Fitch St.
New Haven, Conn. 06515
(203) 387-1853

Training

AMT Corp. has released CBI-Quick, a computer-based instruction generator that can be used to create realistic product demonstrations and interactive on-line user training for Unix and Digital Equipment Corp. VAX applications.

The product provides users with the ability to simulate real applications and port them across Unix- and VAX-based systems as well as MS-DOS-based IBM Personal Computers and compatibles.

CBI-Quick is priced at $16,000 for VAX and Unix versions. A one-year lease with a three-month initial training period costs $6,000.

AMT
183 Guggins St.
Boxboro, Mass. 01719
(508) 263-3030

Compilers

Telesoft has announced an Intel Corp. 80386-based cross compiler version of its Telegen2 Ada development system.

The product runs on Unix-based 80386 machines and can be used to produce embedded 80386 code.

It is compatible with AT&T's Unix System V, Release 3.0 and supports host and target boards in Multibus II configurations, the vendor said. A version for Digital Equipment Corp. VAX systems is also available.

Pricing for the product ranges from $13,000 to $85,000, depending on configuration.

Telesoft
5959 Cornerstone West
San Diego, Calif. 92121
(619) 457-2700

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For more information on the future of MultiMate, call 1-800-437-4329, Ext. 1909. Or upgrade to MultiMate version 4.0 now for only $75 by calling 1-800-2ASHTON.

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NEW PRODUCTS - HARDWARE

Data storage

Matrix Corp. has announced a Motorola, Inc. VMEbus-based rugged memory board that includes up to 4M bytes of battery-packed random-access memory.

Mr-Ram was designed for use in harsh environments with extreme temperatures and vibrations. The board can operate as a 32- or 24-bit address slave, and it supports 8-, 16- or 32-bit data transfers, the vendor said.

The product is available in three versions that range in price from $895 to $2,995.

Matrix
1203 New Hope Road
Raleigh, N.C. 27610
(919) 231-8000

Cambex Corp. has announced a ¼-in. cartridge subsystem designed to be used with IBM RISC/System 6000 machines.

The Certainty 6800 Model 60 complies with the QIC-320 and QIC-525 tape standards and is read-compatible with smaller QIC-compatible devices.

The product is scheduled to begin shipping in November. The list price for a single unit is $3,455, and users who have Cambex tape drives on their RS/6000s can upgrade to the Model 60 for free.

Cambex
360 Second Ave.
Waltham, Mass. 02154
(800) 325-5565

I/O devices

Barco, Inc. has announced two 20-in. imaging color display monitors designed for use in process control, high-end computer-aided design applications and image processing applications.

The ICD 651 and ICD 751 can display source material with respective horizontal scan frequencies of 46.5 to 66 KHz or 66 to 78 KHz, the vendor said.

The ICD 651 is priced at $3,995, and the ICD 751 costs $4,095.

Barco
1000 Cobb Place Blvd.
Kennesaw, Ga. 30144
(404) 590-7900

Printer Products has introduced its PCPOS 2000, an open terminal designed for general retail applications.

The unit comprises a standard IBM Personal Computer AT-compatible motherboard, an AT- or register-style keyboard, a three-station receipt/journal validation printer, a 9-in. monochrome monitor and a steel cash drawer. Its motherboard provides Intel Corp. 80286-based processing with a maximum of 4M bytes of random-access memory. The product can print 40 columns at 3.4 line/sec. on 3½-in. paper or 80 columns on 4½-in. paper, the vendor said.

A basic unit costs $5,495.

Printer Products
25 Denby Road
Boston, Mass. 02134
(617) 254-1200

Power supplies

Exide Electronics Corp. has introduced a continuous, on-line power protection system designed for multiple workstations, high-end computer-aided design and manufacturing systems, local-area network systems and low-end Microvax and Application System/400 environments.

The Powerware Personal 2000 features 1.5- and 2-kVA power ratings, and for entry-level configurations, the product's standard internal battery provides up to 10 minutes of battery backup support.

Pricing on the product begins at $1,900.

Exide Electronics
3201 Spring Forest Road
Raleigh, N.C. 27604
(919) 872-3020

Computer Accessories Corp. has announced the next generation of its Proxima Power Directors line of power control centers.

The latest generation includes the Compact Power Director Model P25, which provides four outlets and a small footprint for floor-standing computers; the Power Director Model P3, which features five-outlet protection and a disk-storage pocket; and the Power Director Plus Model P15, which provides protection for Underwriters Laboratory-rated modem or facsimile lines.

Pricing ranges from $99.95 to $159.95.

Computer Accessories
6610 Nancy Ridge Drive
San Diego, Calif. 92121
(619) 457-5500

Liebert Corp. has added 150- and 225-kVA-rated models to its Series 600 line of uninterruptible power supplies.

The two models feature a 57-in. footprint and were designed for use during nonlinear load and overload conditions. A text-and-graphics LCD and four push-buttons enable users to access and manipulate menu-driven operations or call up a system's data, the vendor said.

Pricing ranges from $65,000 to $150,000, depending on kVA capacity.

Liebert
P.O. Box 29186
1050 Dearborn Drive
Columbus, Ohio 43229
(614) 888-0246

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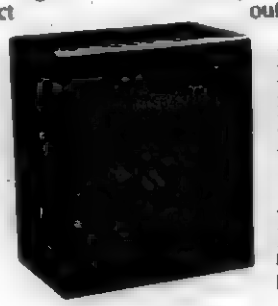

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*Digital Review. Reprint available.

The SAS System runs on the entire family of VAX minicomputers and workstations under VMS. Mainframes, personal computers, and UNIX-based workstations from other vendors are also supported.

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MI	Detroit	Sept
MN	Minneapolis	Oct
NC	Cary	Oct, Nov
	Charlotte	Oct
	Winston-Salem	Oct
NE	Omaha	Sept
NJ	Edison	Nov
	Saddle Brook	Oct
NM	Albuquerque	Sept
NY	New York	Sept
	Poughkeepsie	Oct
OH	Cincinnati	Sept
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TN	Nashville	Nov
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	El Paso	Sept
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CW1112

HP introduces another first.

20,000 PC Magazine readers can't be wrong.
HP personal computers ranked #1 for reliability (9/25/90).

Frankly, we weren't surprised. We've always built PCs for people who demand the highest quality for their most important applications.

Ten years ago, we instituted a Total Quality Control program to reduce failures in all HP products by a factor of ten. We reached that target three years early. Then set ourselves the same goal all over again.

One result is that our hard disks have a 17-year MTBF—*over three times the industry average.* And our PCs were described in this survey as "bulletproof." Which makes them perfect for such mission-critical tasks as LAN servers.

Overall, HP had the highest combined score in PC Magazine's four Service and Reliability categories.

Our broad line of industry-standard 286, 386SX, 386 and 486 PCs come in desktop or desk-side models.

For more information, including a reprint of the PC Magazine article, call **1-800-752-0900, Ext. 1861.** Or see us at Comdex. You'll see why we're Number One in their book.

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COMMENTARY

Patricia Keefe

Sticky Windows

Time is money. Wordperfect — which one published report quotes as suggesting that delays in getting its own Windows word processor out the door may have pushed Lotus into buying Samna — expects to go into beta testing with that product next month. Delivery is slated for the first quarter. "I think Lotus paid quite a bit for a company [Samna] that does $20 million and barely breaks even," Wordperfect Vice President W.E. Pete Petersen said.

"Oh won't you show me the way?" Another source tells us that Wordperfect hired Guy Kawasaki, formerly at Apple and author of *The Macintosh Way*, to help design Wordperfect for Macintosh Version 2. The source claims that part of the deal calls for Kawasaki to "clandestinely" help promote the product as well. Kawasaki, of course, is no stranger to product endorsements. In fact, at a charity auction held during the the recent Agenda '90 conference, he donated a product endorsement that he quipped had a value of $9.99. It was purchased for $10,000 by Dave Weiner from Outlan.

Continued on page 56

Word gets better definition

Users find more intuitive commands, visual appeal in Microsoft update

BY JAMES DALY
CW STAFF

REDMOND, Wash. — Microsoft Corp. last week continued its efforts to shift its leading character-based applications to a more intuitive and visually appealing setting with the introduction of Word Version 5.5 for DOS systems, the latest version of its popular word processing application.

The updated application will adopt many of the graphical interfaces found in Microsoft Windows, OS/2 and Apple Computer, Inc. Macintosh environments, company officials said. For example, several features that were previously accessed solely from the keyboard can now be accessed through pull-down menus and pop-up dialog boxes.

Better commands

Early evaluators said they were most pleased with the elimination of sometimes archaic commands. For example, opening files is now done by typing in "File Open" instead of the older "Transfer Load."

"Commands just make a whole lot more sense, and I think that's going to really help sell it to new users," said Ronald Houck, senior systems designer at Marion Merrell Dow in Indianapolis.

Additionally, many common formatting commands will now be presented visually at the top of the screen through a ruler and ribbon, visual tools that allow users to apply common formatting preferences by a click of the mouse or a single keystroke. "The older formatting structure was a bit of a pain," said Sharon Brittingham, a member of the information center at Du Pont Co. in Wilmington, Del. "It's much cleaner to work with; it's more like Word for Windows."

The revamped application will also allow users to crop training time by sporting a common interface with Word for Windows, Word for OS/2 and Word for Macintosh. File transfer across the various platforms will also be available.

Special tools and options have been designed to ease the transition to Version 5.5. All files, glossaries, styles and dictionaries that were created in Version 5.0 can be used in Version 5.5 without modification, while a utility will be provided to help with the conversion of macros created with Version 5.0 so they can be used with Version 5.5. Users also have the option of choosing either Version 5.0 or 5.5 function keys.

Version 5.5 is available immediately at a suggested retail price of $450. Licensed users of Version 5.0 may upgrade for $50, while users of Version 1.0 through 4.0 may upgrade for $75.

FEATURE: CD-ROM ACCEPTANCE

Problems cloud bright promise

BY ALICE LAPLANTE
SPECIAL TO CW

David Pillsbury

For some time, proponents of compact disc/read-only memory (CD-ROM) technology have boasted that all desktop computers — both personal computers and their more powerful siblings, Unix workstations — would soon ship with CD-ROM drives attached. However, there is not yet a CD-ROM drive on each desk, nor is there likely to be in the immediate future.

In fact, experts and users say, CD-ROM suffers from the same malaise formerly affecting other new technologies: Although promising and exciting in theory, it has some shortcomings that make it impractical for the majority of corporate end users. Cost and standard issues are said to be holding it back, but there are breakthroughs in these areas that may help CD-ROM in the long run.

"CD-ROM is an extremely immature market today: The baby has been conceived but is not yet born," says Bob Holmes, manager of systems evaluation at Southern California Gas Co. in Los Angeles. "The confusion in the market makes it difficult to make a wise strategic commitment to the technology," Holmes adds.

Confusion isn't the only difficulty. "The prices are still a bit steep," says Edmond Hamann, the library director of the Sawyer Library at Suffolk University in Boston, which has invested in a number of CD-ROM titles to help

Continued on page 58

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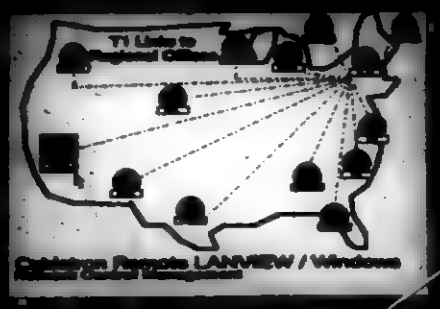

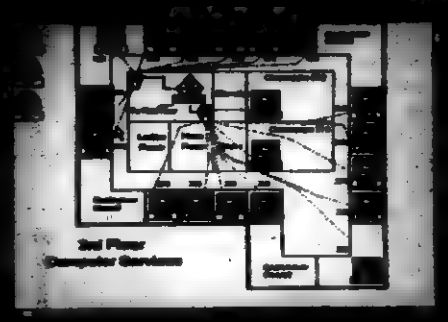

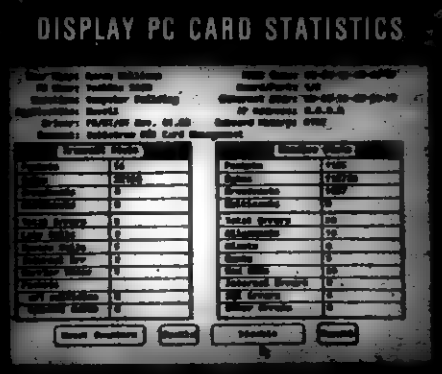

Ethernet *Token Ring*

CIRCLE 105 ON READER SERVICE CARD

OS/2 system keeps tabs on health costs

ON SITE

BY RICHARD PASTORE
CW STAFF

ENGLEWOOD, Colo. — With health care costs ballooning like a battered ankle, firms are continually looking for some salve to temper the crippling effects. One answer is computer-assisted tracking of medical benefits use. With a handle on utilization data, companies such as US West can get a leg up on managing employee coverage costs.

Patricia Barry Levy

US West's Woods: *Goal is better data*

"To tailor a [health care] plan, you need to know which pieces are utilized and how efficiently they're being utilized," said James Woods, manager of benefits data support at US West.

To track four health care plans serving 64,000 employees and 130,000 dependents would be next to impossible to do internally, Woods said. The insurance carriers themselves could provide ad hoc utilization reports — but the fees would quickly add up. Turnaround would take a lengthy two weeks as well, he noted.

Instead, US West turned to Chap 2, a micro-to-mainframe system that analyzes and reports on data from multiple remotely located health care databases. The OS/2-based package, from Corporate Health Strategies in Westport, Conn., will handle an average large user's 2.5 million claims per year for a contract fee of $50,000 to $100,000.

The price seems hefty, but not in comparison to per-person benefit expenditures. These costs have risen 93% to nearly $1,400 since 1983, according to New York-based Metropolitan Life Insurance Co. Woods, who has been using the software for five months, said it is too early to tell what the payback will be, although it has allowed US West to do work internally that once was contracted out.

"The goal is to provide better data to our medical plan administrators," Woods said. With that data, the administrators can determine what portions of the plans could benefit from changes. For example, US West used Chap 2 data to determine that the number of psychiatric and substance abuse claims were excessive. Subsequently, a new limit was placed on reimbursement levels for these claims.

The company also uses Chap 2 data to support its benefits proposals when negotiating with trade unions. "It's easier to negotiate when both parties understand what's driving a particular change," Woods said.

Chap 2 also facilitates the firm's annual medical program review, which looks back over the year's claim data to determine a use baseline. "This is a fairly high-ticket item to get done," said Woods, noting that Chap 2 makes it possible to do the review in-house in one-third the time it took previously.

The ad hoc reports that once took two weeks now take two hours, he added.

The software's front end resides on an IBM Personal System/2 Model 55SX Running OS/2 Version 1.2. Here the user enters requests for reports on specific variables — for example, the cost of outpatient claims at a particular hospital, such as a comparison between the number of mental health claims from one plan vs. another.

The personal computer portion of the system then dials up the Hitachi Data Systems Corp. mainframe at Corporate Health Strategies, where complete claim data has been collected from tapes sent in by US West's insurance carriers. There the requested data is retrieved, sorted, tallied and downloaded to the PC for further manipulation.

Woods said the software is speedy and has worked out well despite the inherent difficulties of its OS/2 environment (see story below). "It has been excellent," he said, but added that the process for creating a report could benefit from shortcuts. He said the vendor could also make it easier to transfer report templates between databases. As it is now, templates must be rekeyed for each database.

Security has also been tightly monitored, he noted. "They have acted very appropriately in handling that," Woods said, adding that he has signed legal security contracts with Corporate Health Strategies to ensure protection.

He had the fever

When US West chose to use OS/2-based software to get a handle on health care costs, James Woods came down with a case of OS/2 disease.

"I was expecting the worst," said Woods, manager of benefits data support. Hoping an early start would help, Woods bought his first copy of OS/2 Version 1.1 six months before installing the health care data monitoring application, Chap 2 from Corporate Health Strategies.

Woods had little chance of getting any OS/2 advice in-house. "I could think of only two other people in the whole organization who use it," he said.

The symptoms began immediately. "All my existing software was DOS. Just getting things I could run under OS/2 was a problem" said Woods, who could not justify a separate system for an application that makes up only 30% of his duties.

The so-called DOS box or window included in OS/2 was too limited in memory to run most of Woods' software. It was also cantankerous to work with, he added.

Then came the support chills. "There weren't a lot of people knowledgeable about the products," he said. "I had to fumble with it until I got it to work."

Even IBM failed as a first-aid source. "I asked IBM for an upgrade from Version 1.1 to 1.2 in June and still haven't gotten a response," Woods complained. When it comes to questions, "They don't respond as promptly, if at all. They just don't seem to be giving it the support I'm accustomed to expecting from IBM."

Corporate Health Strategies chose to develop Chap 2 for OS/2 because it needed the memory management, multitasking and multithreaded capabilities of OS/2. Though he said few customers hesitated to accept OS/2, Director of Software Engineering Peter Sparago admitted that one potential customer refused the product partly because the customer lacked in-house support for OS/2.

Corporate Health Strategies has had to go out of its way to help some customers with the operating system. "They're the best knowledge base [on OS/2] I have access to," Woods said.

Study sees big year for Windows

BY PATRICIA KEEFE
CW STAFF

SAN DIEGO — Predicting that 1990 will be remembered as "the year of Microsoft Windows," Computer Intelligence has released the results of a survey that supports expectations of burgeoning acceptance of Microsoft Corp.'s Windows 3.0 in corporate America.

"The package is clearly the talk of the industry as users scramble to understand the nuances of implementing Windows in their organizations," said the report, which is based on interviews at sites with 500 or more employees.

The Windows tidal wave has hit the beaches so hard that, in some cases, users who were committed to OS/2 have backed away from that decision or pushed migration plans further down the road.

Even the release last week of IBM's 2M-byte OS/2 Standard Edition Version 1.3, which IBM concedes will have some overlap with Windows, is not expected to draw users away from Windows to OS/2 in great numbers [CW, Nov. 5].

However, based on its numbers, Computer Intelligence's prediction may be a bit premature. In the July interview period of its survey of user sites, Computer Intelligence found that 3% of corporate personal computers were running Windows. By year's end, these same users said that figure would rise only 1% to 4%. And by the end of 1991, that growth will have increased only to 6% of these users' PCs.

Until the May release of Windows 3.0, the 7-year-old Windows was hardly a smashing success. According to Computer Intelligence, Windows purchases had remained relatively constant during the last two years. The arrival of the radically revamped Version 3.0 changed all that.

In its first five months of sales, Windows has easily topped the million-units-shipped mark and quickly became the year's No. 1 seller for Egghead Discount Software. It should be noted that Microsoft has consistently declined to differentiate between units shipped and actual sales to end users.

Even an initial flurry of technical problems — despite one of the longest and largest beta tests of micro software — which at one point swamped Microsoft support lines, did not dampen sales.

During July interviews with users, Computer Intelligence's PC Market Monitor service found that Windows purchases increased to more than two times its 1989 average level. In August, after most of the problems with Windows had been addressed, or at least acknowledged, purchase levels jumped to five times 1989 levels, increasing the index to 5.7.

> UNTIL THE May release of Windows 3.0, the 7-year-old Windows was hardly a smashing success.

"While we don't expect this growth rate to continue at this pace, the rapid surge of acceptance is unprecedented," the report said.

In addition to tracking end-user purchases, Computer Intelligence also watched Windows growth by monitoring sales of four Microsoft applications that are directly affected by Windows' success: Word, Excel, Project and Powerpoint.

According to the report, of the four packages, Word has been the key beneficiary. Purchase levels have increased markedly in the last few months, increasing two to three times their 1989 levels during July and August interviews.

The other three applications have enjoyed a surge in sales in July but have since slipped to lower purchase levels, the study found. Excel purchases increased briefly to nearly two times its 1989 level in July, only to fall back to the 1989 level in August.

Windows versions of both Project and Powerpoint were first released in May. Project received quick acceptance, then increased slightly to more than 1.3 times the July sales level. Powerpoint doubled its June level, only to later fall 20% from its June purchase level.

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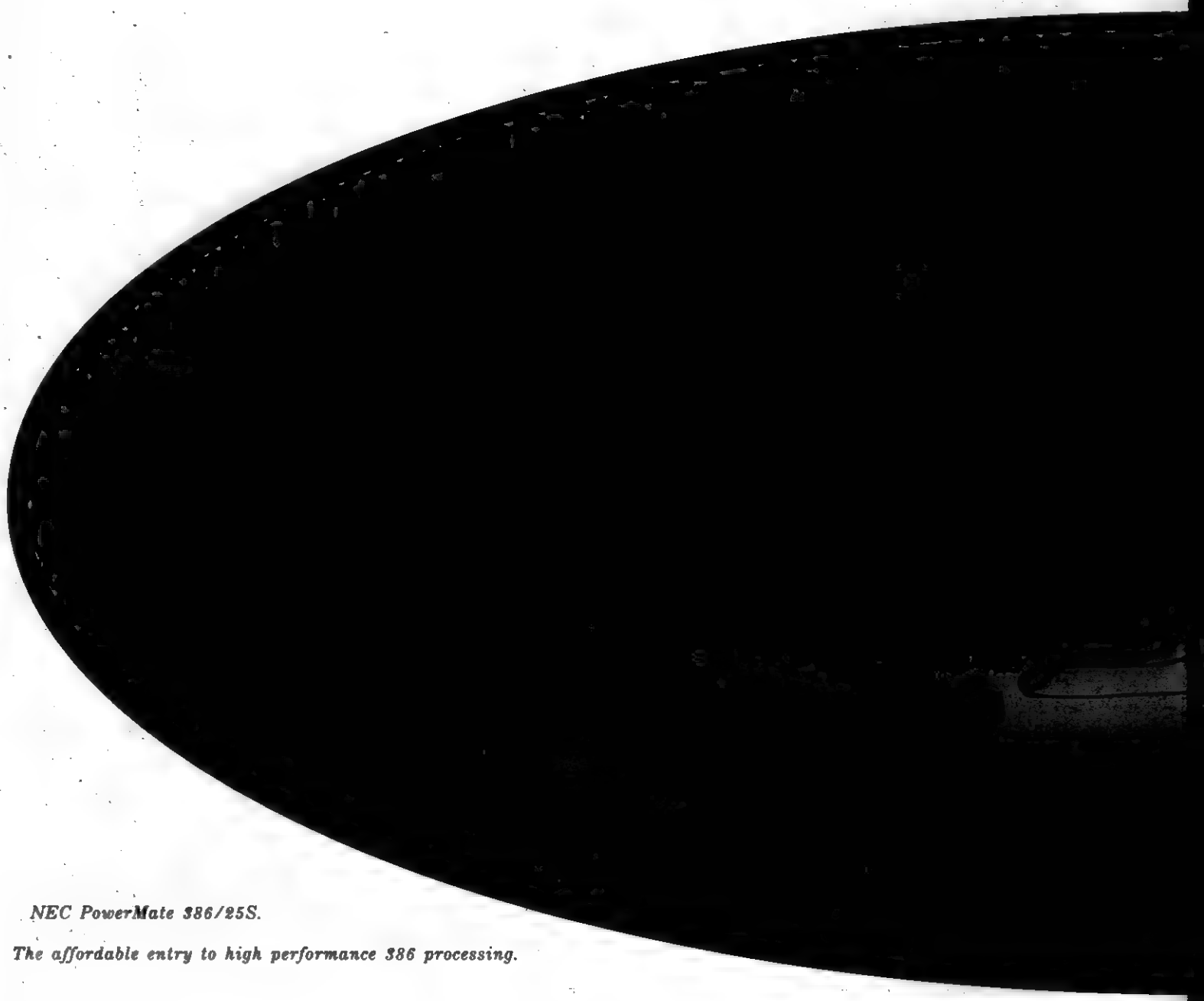

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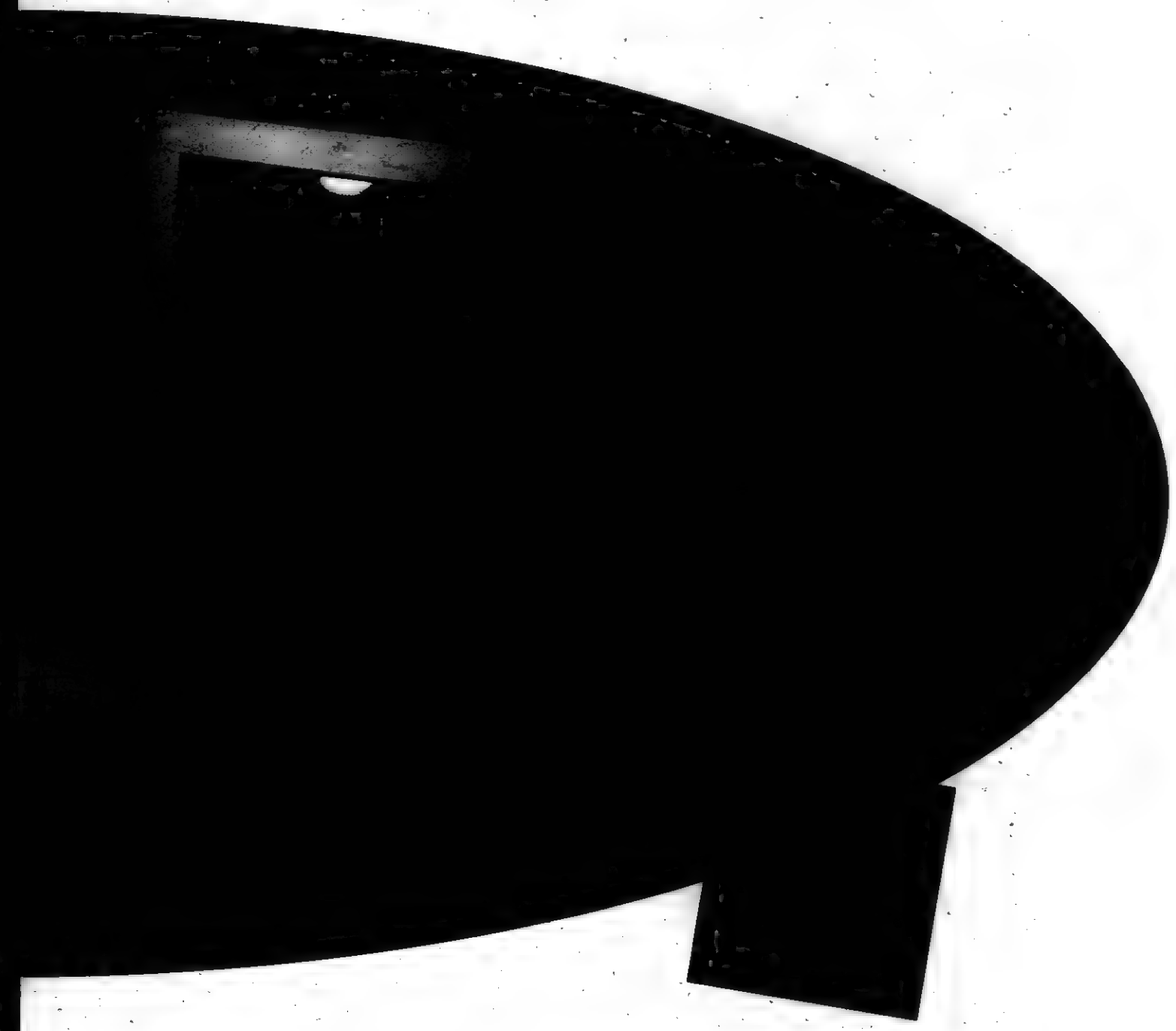

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Epson tries new design

BY MICHAEL FITZGERALD
CW STAFF

Epson America, Inc. announced a new product strategy on the desktop: It added several models to its lines and completed the phaseout of several older models.

The first of its new machines, the Equity 386/25 Plus, a 25-MHz machine based on the Intel Corp. 80386 chip, offers 32-bit Industry Standard Architecture that can hold up to 16M bytes of random-access memory on the system board and will support 1,024- by 768-pixel resolution. It will also feature a new case design that will be carried throughout the line, which will include an "easy accessibility" case that has no screws. This machine is scheduled to be available today.

The rest of Epson's new line will not be available until the first quarter of 1991. The new machines will include the Equity 286 Plus, based on Intel's 80286 chip, and several high-end computers that feature Extended Industry Standard Architecture and will be based on Intel's 80386/33-MHz or I486/25-MHz microprocessors. Epson expects to release these models in a variety of configurations and prices. The company only released prices on the Epson 386/25 Plus, which costs $3,499 with a single floppy disk drive and $4,999 for one with a 100M-byte hard disk drive.

Epson claims that all the new models will be easily upgradable.

Epson's Equity 1 Plus and 2 Plus machines were both phased out in late summer, followed by the 3 Plus at the end of October, as well as the 386SX and 386/20 machines. Epson continues to sell its Equity 1E and 2E computers, the 286E, the 386SX Plus introduced in July, as well as its NB3S notebook-size PC.

In addition, Epson is releasing a new monitor that will support Extended Video Graphics Array 1,024- by 768-pixel resolution for $689.

MICRO BITS

NCR gets drives

NCR Corp. tapped **Quantum Corp.** last month as its supplier of 105M-byte hard disk drives for various models of NCR's high-end desktop series. The Quantum Prodrive LPS is a small computer systems interface device with an average seek time of 17 msec.

National Semiconductor Corp. broke into the personal computer chip-set market recently with two single-chip controllers for the Intel Corp. 80286- and 80386SX-based market. PC vendor **Acer, Inc.** extended its previous alliance with National Semi to sell the chip sets.

Burlington, Mass.-based **Alpha Software Corp.** last week appointed **Fusion International** in Toronto as its sales, marketing and support services partner for the Canadian market. Fusion will act as Alpha's base of operations north of the border, marketing Alpha Four, the firm's relational database management and application development software.

HP aggressively cuts PC prices

BY J. A. SAVAGE
CW STAFF

At the end of each of the last three months, Hewlett-Packard Co. has announced rounds of price cutting on its Vectra personal computers totaling about a 25% decrease on its basic models. While the company said users should not expect more cuts this month, it indicated that prices have yet to bottom out.

Noting that the price reductions are a signal that HP is dropping its timid marketing pace and becoming increasingly aggressive, Marc Lowe, HP's North American product marketing manager, said, "We're basically duking it out with IBM and Compaq [Computer Corp.]" He added that those two companies had made a few cuts in list prices but were recently cutting prices through promotions. "In the last few months, action in market has been much heavier than usual."

Price sensitive

The monthly reductions have not been interpreted as a sign of weakness by analysts. Mark Levitt, an analyst at International Data Corp. in Framingham, Mass., said HP is simply being more price sensitive than other companies. "They're evaluating prices every month. Most companies will only adjust prices once or twice a year."

HP's Lowe said the reductions have been great for business, but he would not say just how many units have been shipping. "People who never considered HP before are now considering us," he said.

Price cuts have affected computers based on both Intel Corp. 80286 and 80386 processors. For instance, since July, the Vectra 286/12 base model dropped 25%, from $2,399 to $1,799. The price of the OS/16S — based on the 80386 processor — dropped from $2,799 to $2,099 in the same time period. In addition to the competition-driven cuts, HP is also passing on savings it is realizing in materials, such as less-costly memory chips, Lowe said.

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Itasca DBMS promises power kick for Aviion

BY SALLY CUSACK
CW STAFF

MINNEAPOLIS — Data General Corp.'s Unix-based Aviion workstation received a potential power boost recently in the form of an object-oriented database management system from Itasca Systems, Inc.

According to Will Cappelli, vice president at New Science Associates, Inc., a market research and consulting firm based in Southport, Conn., "DG is very interested in the object-oriented programming paradigm. They see it as essential in supporting network and distributed computing environments and moving their proprietary customers to open systems platforms."

The Westboro, Mass.-based minicomputer vendor initially entered the world of object-oriented technology back in 1989 with the announcement of CEO Object Office. That integrated office automation product incorporates DG's implementation of Hewlett-Packard Co.'s New Wave and Microsoft Corp.'s Windows Version 3.0 and serves as an object-oriented interface for local-area network-based personal computers connected to MV hosts.

The Itasca Odbms is a distributed, multiclient, multiserver system designed specifically to support highly complex workstation applications. According to the vendor, it is targeted at computer-aided design, manufacturing and engineering and computer-aided software engineering applications.

The DG Aviion/Itasca software port, completed earlier this month, rounds out Itasca's presence in the workstation marketplace. The package currently runs on Sun Microsystems, Inc., Silicon Graphics, Inc. and HP platforms.

All single-version copies of Odbms are priced at $3,995 for the first client/server configuration. To date, no orders have been placed for the Aviion version.

New breed of management

BY ELLIS BOOKER
CW STAFF

MOUNTAIN VIEW, Calif. — Consilium, Inc. believes that its new, workstation-based factory-floor management system establishes a new category: straddling the business planning systems used by manufacturers to process customer orders and make long-term schedules and the stand-alone systems and real-time controllers and sensors that sit on the factory floor.

Consilium unwrapped Flowstream last week and will demonstrate the product, jointly developed with Digital Equipment Corp., this week at Autofact '90 in Detroit.

Defined as an integrated execution system, Flowstream takes orders released from a manufacturing resource planning (MRP) system and optimizes their scheduling through the factory.

"Our system looks at performance against perfection and tells where the areas of improvement are," said Jonathan Golovin, Consilium's chairman and founder.

The product also breaks up categories by using workstations (DEC Vaxstations) as its platform. Most factory management systems use minicomputers; a few use personal computers.

Appearances deceiving

Golovin estimated that the U.S. market for factory-floor management systems is about $2 billion. "But at least three-quarters of that are internally developed solutions," Golovin said. So the market for vendor-provided systems is actually less than $500 million, with only about $120 million of that being for integrated factory systems such as Flowstream.

According to Martin Piszczalski, director of the manufacturing automation planning service at The Yankee Group in Boston, MRP systems do not typically monitor how the factory is performing, which can cause the factory and the grand plan to get out of whack. "People work from the paper schedule generated by the MRP for days or weeks, but this plan is not responsive to problems on the floor or new customer orders," he said.

In addition, customers are increasingly insisting on quality statistics from their manufacturers, but existing methods for getting this quality data from the factory floor to the MRP "are pretty feeble," Piszczalski said.

Flowstream has been implemented on the Vaxstation workstations under the VMS operating system and uses many of DEC's Network Application Support tools.

Interfaces between the Decwindows-based Flowstream and other systems are provided through DEC's Decnet/OSI network, object-oriented programming, the VAX RDB/VMS relational database and the CDD Repository.

Consilium and DEC began their relationship in 1982, when the latter funded development of Consilium's first product, Workstream. Last year, DEC bought [redacted] million of Consilium's common stock to take a 5.8% equity stake in the company.

Flowstream is currently available. Prices start at $30,000.

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IBM fills in 386-based PS/2 line, lowers prices on several versions

BY RICHARD PASTORE
CW STAFF

While new OS/2 features and server versions of the Personal System/2 were the main courses at IBM's announcement party late last month, the company put plenty more on the table.

IBM filled out the PS/2 Model 80 line with one 25-MHz Intel Corp. 80386-based system with a 160M-byte small computer systems interface (SCSI) hard disk drive and two 20-MHz 386-based systems with 160M-byte and 80M-byte hard disks. The Model 80-A16, 161 and 081 are priced at $10,195, $7,495 and $6,845, respectively.

The firm also unveiled the PS/2 Model 65, a 16-MHz Intel 80386SX-based unit with a 320M-byte hard disk. The machine costs $7,945.

In the storage arena, the company added a 2.3G-byte SCSI tape drive and an external storage tower to house up to seven SCSI storage devices. The units cost $6,550 and $6,500, respectively.

Both of the new server models [CW Nov. 5], the PS/2 Model 90 and 95, offer the option of a 256K-byte, level-two disk cache in addition to the built-in 8K-byte cache. The cache controller costs $1,995.

The 33-MHz Intel I486 upgrade board for PS/2 Models 90 and 95 was announced at a price of $2,500, while the Extended Graphics Array adapter (an option for all PS/2s based on the 386SX or greater) costs $1,095.

IBM cut prices between 8% and 25% on several versions of the PS/2 Model 70 as well as the Model 80 A21. The 486 Power Platform upgrade price for the Model 70 dropped to $1,900 from $3,995.

All new products are now shipping, IBM said.

Keefe

CONTINUED FROM PAGE 47

Report from the front. Lotus, meanwhile, continues to play coy on the delivery of 1-2-3/W, its fully Windows 3.0-compatible spreadsheet. But a user source, who saw 1-2-3/W two months ago, says his understanding is that 1-2-3/W will go beta in the second quarter and ship in the third. Needless to say, the longer Lotus takes, the better for Borland and Microsoft.

An ounce of prevention. The Lotus copyright infringement suit may be having more of an impact on Borland than it wants to admit. An attorney specializing in copyright law suggested recently that Borland might consider dropping the 1-2-3 menu option offered under Quattro Pro Version 1.0 until the suit is settled. Two weeks ago, Borland execs out making the rounds with Quattro Pro Version 2.0 pooh-poohed the idea. Yet two users who have loaded Version 2.0 report that during the initial installation, you no longer get the option of loading up the 1-2-3 menu. You can go back later and add the Lotus menu. In Version 1.0, during the initial installation, users can choose between two Quattro Pro interfaces and the 1-2-3 menu.

Defensive offensive. One interesting take on the Lotus buyout of Samna comes from Wall Street contrarian Bob Therrien at Paine Webber. He points out that Lotus is filing suits left and right for alleged copyright infringement. Lotus has already forced one offender off the market, and a win against Borland could cut down Quattro Pro as well. Meanwhile, Lotus is turning up the jets in the Windows market, the future of which ironically hinges on the outcome of the *Apple v. Microsoft* copyright infringement trial. This amuses some, given Lotus' general position on intellectual property rights. Therrien doubts Windows will come off the market, although he says the price may shoot up. Either way Lotus is safe. It now has a Windows word processor and some products in development if Windows sails forward; and if it doesn't, well, Lotus was always betting that way anyhow.

Attention Manuscript users. Lotus and Samna have said they will support, but neither enhance nor merge, their respective character-based DOS word processors. Microsoft, however, has just shipped the latest version of Word for DOS. As for Symphony, one user was quick to note that Lotus has been strangely quiet on the topic of porting Symphony to Windows. "I have the feeling it's a dead product, that their last upgrade was it," he said.

Bring the No-Dos. Many industry observers are expecting Comdex/Fall '90 to be something of a yawner this year. For example, so few press conferences have been scheduled for the five-day show that sponsor Interface Group was able to fit them all onto one page. Ordinarily, the list goes on for pages. A spokesman says there will be plenty to see. He claimed preregistration of attendees is up well over 100% over last year.

Keefe is Computerworld's senior editor, PCs and workstations.

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Problems

CONTINUED FROM PAGE 47

students research more efficiently. Prices for CD-ROM drives range from $500 to $1,000.

Although prices for commercial CD-ROM titles have been diving, the costs for a corporation to design and make its own CD-ROM applications for internal use remain prohibitively high. Software licensing costs remain a strong deterrent to internal CD-ROM development.

But by far the biggest cost, says John Nairn, vice president of research and development for CD-ROM tool kit maker Reference Technology, Inc. in Boulder, Colo., is getting the desired information into electronic form, such as transferring textual information into an ASCII file or graphic information into electronic form.

The task is enough to discourage many organizations from moving data to CD-ROM. Southern California Gas, for example, has put on hold a project to equip trucks with CD-ROM readers that would replace the huge instruction binders now in use. The reason for the delay is that much of this information is in graphical form. "There is currently no consensus on the right way to handle this," he says.

The fragmentation of the PC world into DOS, Macintosh, Unix and OS/2 segments hasn't helped CD-ROM acceptance. Vendors cannot reach all potential customers, thus reducing the number of titles available on any given platform.

What would help? Standards. But each CD-ROM title now comes with proprietary search-and-retrieval software, and there is a bewildering array of tools available for those corporations that want to create their own CD-ROM offerings.

"There is still no standard front-end interface across CD-ROM products," says Mark Margevicius, a consultant in the new product review department at the Society National Bank in Cleveland.

Potential nightmare

For people using only one CD-ROM product, this is not a problem; but for those who need to access a variety of titles from different vendors and publishers, it can be a severe handicap.

"Our librarians have to learn 10 to 15 different systems," says Marilyn Grant, coordinator of computer search services in the main library at Boston University. "Often we get bogged down trying to remember what system we are on and what the proper command or keystroke is."

"Most CD-ROM publishers assume that their disks will be used exclusively, and so don't take into account that other titles from other vendors work differently," says Bill Perry, director of research at Helgerson Associates, Inc. in Falls Church, Va., which publishes the "CD-ROM End User" newsletter.

Moreover, the retrieval software can take up as much as 5M bytes on a user's hard drive. Although on a 100M- or 200M-byte drive this is not a problem, it can be for users with 40M-byte hard drives.

"That is an issue that individual users need to consider if they want to use CD-ROM," says Bob Martin, manager of executive support systems at Eaton Corp., where company executives use several CD-ROM subscription services.

Others say this is not a problem.

"To take 4M or 5M bytes in order to get access to 600M bytes is not a bad trade-off," Margevicius says.

While drive space may not be a problem for some users, learning new retrieval software may be. According to recent research by Helgerson, a whopping 79% of CD-ROM users surveyed were either somewhat (22%) or very (57%) bothered by having to learn new retrieval software with each new package (see chart).

Evans says that once his firm begins widespread distribution of CD-ROM applications through a local-area network, this could become an issue.

The lack of standards remains the chief obstacle to the proliferation of CD-ROM applications, users say.

Map maker Jeppesen Sanderson in Englewood, Colo., has embarked on an ambitious project, called the Electronic Library System, to convert to CD-ROM its mapping information for airlines and pilots. Jeppesen, the airlines and aircraft manufacturers are having trouble agreeing on a format, says Gary Porter, project coordinator for electronic data services.

CD-ROM is being considered for ground-based chart information that pilots could hook into via a network; rewritable optical technology is being considered for a cockpit-based database.

Down but not out

Such barriers as a lack of standards may keep CD-ROM down for a time (some analysts say as long as two years), but factors are at work that may speed CD-ROM acceptance in the corporate environment.

E. J. Jerry McFaul, a computer scientist at the U.S. Geological Survey in Reston, Va., says he expects CD-ROM hardware prices to drop dramatically in the next few months. McFaul is chairman of the Special Interest Group on CD-ROM Applications and Technology, a group he founded four years ago to provide a forum for people interested in developing or using CD-ROM technology.

"We expect drive prices to drop within 90 days," McFaul says. "We'll see the magic $500 — if not $400 — limit broken within that time."

The reason: The U.S. Department of Defense (DOD) recently awarded Sony Corp. a $12.1 million contract for a two-drive unit to sell for $576. DOD will buy 22,000 drives in 1991 with options to extend the contract in 1992 and beyond.

"This is a significant price drop and should signal a big breakthrough because other companies are bound to follow suit," McFaul says.

Furthermore, the cost of the CD-ROM titles themselves are already decreasing in the government arena, and private sector prices are likely to follow, he says.

The U.S. Geological Survey puts out a $28 CD-ROM disc called the Digital Line Graphic, a mapping disc based on a USGS database. "The equivalent magnetic version costs $1,400," McFaul says.

Private publisher Quanta Press has a $99 offering that is based on a government database called Agricola, which contains federal research data on agricultural issues. The product includes a more than 400M-byte database.

Getting it together

Most significantly, however, vendors are finally getting together to discuss standardizing on retrieval software and consistent user interfaces. According to Nairn, one proposal is based on a client/server model.

In this model, software can be used in a modular fashion; users can pick the interface (the client) they like, and vendors can choose the retrieval engine (the server) that suits their needs.

McFaul points to three committees working on defining CD-ROM standards:

- The client/server model is being proposed by a committee formed by 15 agencies in the U.S. intelligence community, including the FBI and the CIA.
- One effort, organized by the U.S. Air Force, is working on specifications for a common index algorithm to be used with text databases.
- A group headed by the Library of Congress is standardizing the user interface so that basic commands or key words are consistent across vendors' products.

However, whether CD-ROM vendors will adhere to these standards remains to be seen, McFaul says.

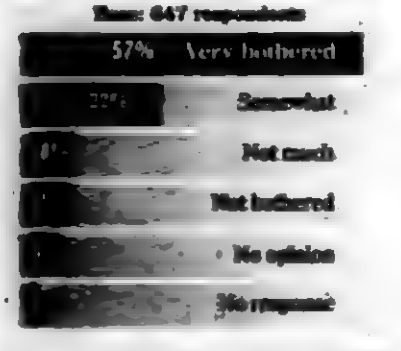
For its part, Microsoft Corp. is promoting the High Sierra specifications in an attempt to define a universal standard that all vendors must adhere to in writing their software.

Moves such as these have CD-ROM market forecasters optimistic. Freeman Associates, Inc., a Santa Barbara, Calif.-based market research firm, predicts that in 1990, over 400,000 CD-ROM drives will ship to the U.S. market. Market research firm Infotech in Pittsfield, Vt., puts that number even higher: In 1990, it projects that 766,324 will be sold, and in 1991, it expects that number to be 1.7 million.

LaPlante is a free-lance writer based in Palo Alto, Calif.

Does CD-ROM interface switching bother you?

Switching from one CD-ROM disc to others that use different retrieval software and user interfaces is irksome for a majority of users



Source: Helgerson Associates, Inc. CW Chart: Paul Mach

CD-ROM: Right to not write

Until fairly recently, many analysts predicted that optical discs would not be in widespread use until they were rewritable. However, most experts now say that was a misleading red herring.

Instead, these are two different technologies for two different markets. CD-ROM is best used for storing and retrieving information that remains static; rewritable drives are just another form of mass storage.

"It is actually an advantage that you cannot write to the disks in CD-ROM," says Shahzad Bashir, a senior manager at Arthur Andersen & Co. "If you are sending out important information, you'd like to preserve the integrity of that information."

E. J. Jerry McFaul, a computer scientist at the U.S. Geological Survey, says that once it is understood that CD-ROM is a publishing medium, the confusion between it and rewritable drives vanishes.

Another reason that the rewritable technology is no longer seen as the Holy Grail of optical storage is that it is too expensive.

The drives are five to 10 times more expensive and the media from 50 to 100 times more expensive than CD-ROM disks.

There is also a disadvantage in replication: Rewritable is slow and must take place in real time. Thus, if it takes an hour to make one duplicate of a rewritable CD, it would take 100 hours to make 100 duplicates.

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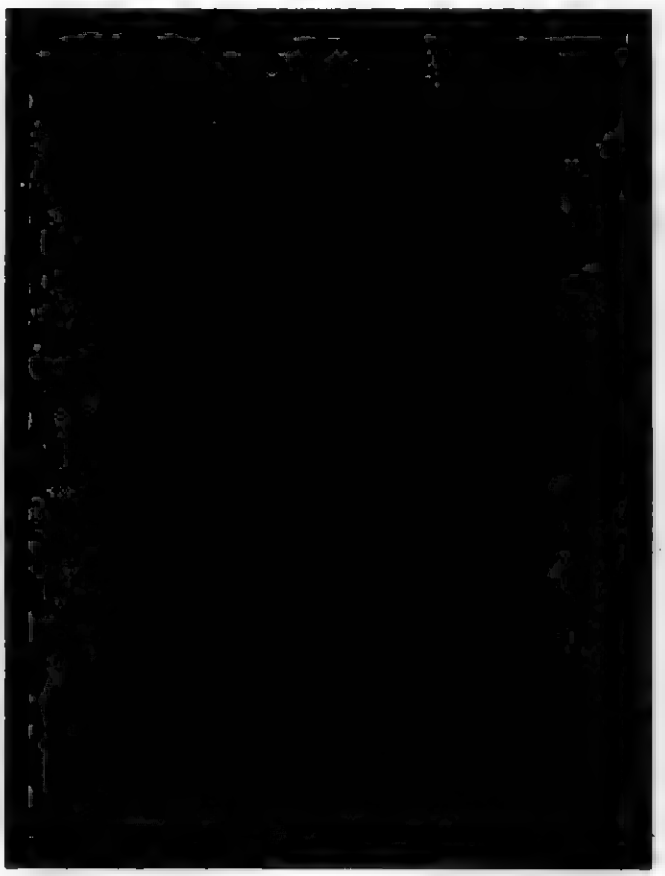

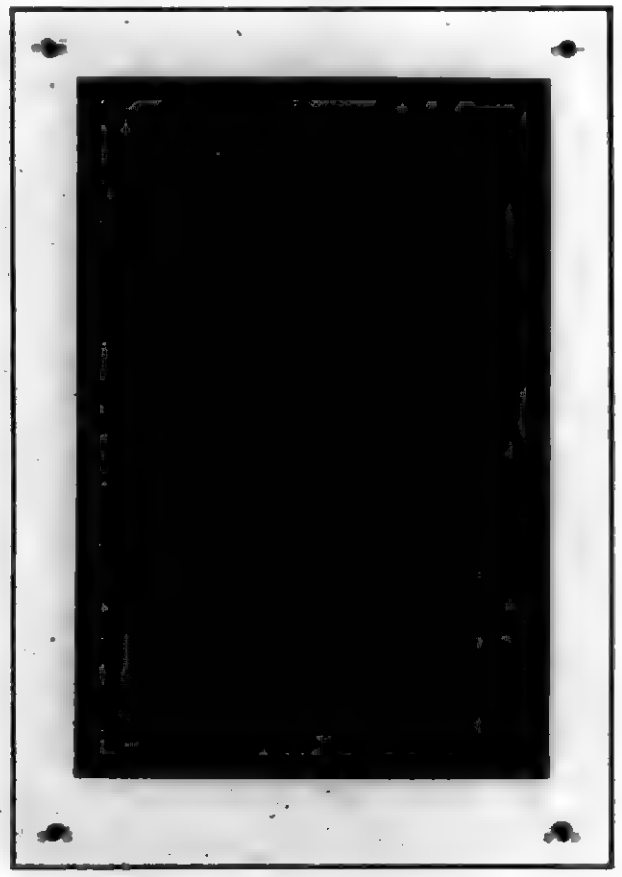

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NEW PRODUCTS

Systems

Topline Technologies, Inc. has added a 25-MHz tower chassis system to its line of IBM Personal Computer AT-compatible computers.

The stand-alone system can be expanded to a multiuser configuration or used as a file server. The Intel Corp. I486-based unit includes 8K bytes of internal cache with an optional 128K-byte burst-mode direct-mapped secondary cache. The system's board supports 256K-, 1M- and 4M-byte dynamic random-access memory chips for memory configurations of up to 64M bytes, the vendor said.

The list price for a basic system is $5,395.

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Placentia, Calif. 92670
(714) 524-6900

Software applications packages

Cad Technology Corp. has announced the ML2-HST data library, a set of symbols used in mechanical drafting and design applications that require high-strength fasteners.

The library includes graphic representations of parts defined and made by SPS Technologies for hexagon and double hexagon nuts and bolts hardware. The product contains top and side views for more than 140 component types and more than 3,100 database files.

Single-user pricing is $375.

Cad Technology
P.O. Box 034089
Indialantic, Fla. 32903
(407) 773-5142

Version 2.0 of Zsoft Corp.'s Publisher's Paintbrush, an image editing and paint program that is designed to operate in Microsoft Corp.'s Windows real-, standard- and enhanced-mode environments, is scheduled to begin shipping in the first quarter of 1991.

The product includes word-search capabilities and a glossary, explanatory pictures and graphics and a histogram equalization feature that assists users in constructing detailed images.

Version 2.0 is priced at $495, and registered users of previous versions may upgrade their systems for $75.

Zsoft
450 Franklin Road
Marietta, Ga. 30067
(404) 428-0008

Group Technologies, Inc. has announced an interactive real-time document conferencing software package designed for Apple Computer, Inc. Macintoshes.

Aspects Version 1.0's collaborative computing capabilities enable users in multiple locations to simulate a conference room environment by using networked or modem-linked Macintosh systems.

The program is priced at $299.

Group Technologies
1408 N. Fillmore St.
Arlington, Va. 22201
(703) 528-1555

Reference Software International has released Grammatik Mac Version 2.0, an upgrade of its grammar-checking software package for Apple Computer, Inc. Macintoshes.

The product includes a proofreading rule base and a Help system. Users are able to make their own writing style guides, and a rule/Help editor allows writing rules to be added, modified or deleted, the company said.

Grammatik Mac Version 2.0 is priced at $99. Users of Grammatik Mac Version 1.0 can upgrade their systems for free.

Reference Software International
330 Townsend St.
San Francisco, Calif. 94107
(415) 541-0222

Software utilities

Geographic Data Technology, Inc. has released an updated version of Zone Ranger, a personal computer software package and geographic database utility designed to automate map-zoning applications.

The product enables users to create and modify custom zones directly on a computerized map and to record streets and addresses within specified boundaries.

A one- to five-user package is priced from $2,000 to $20,000, depending on type of geographic database included.

Geographic Data Technology
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HDC Computer Corp. has announced a pop-up utility designed for Microsoft Corp. Windows environments.

HDC Icon Designer includes more than 125 icons, and users can create their own icons from the product's 16-color palette. The product can be accessed from within any Windows application running on a Windows-compatible personal computer. HDC Icon Designer is scheduled to begin shipping in the middle of this month at a price of $59.95.

HDC Computer
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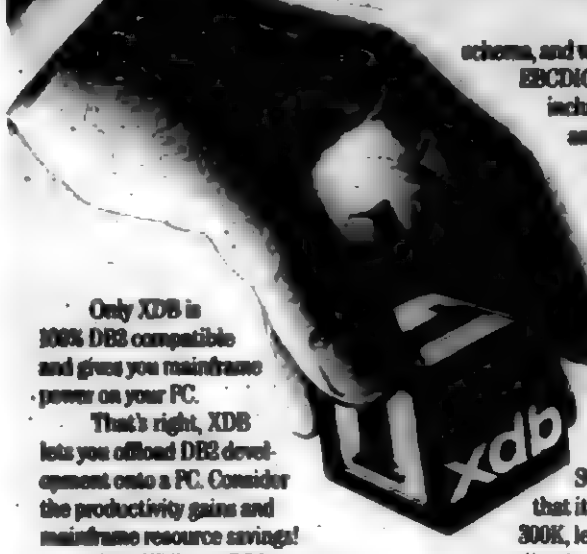
Continued on page 66

XDB Stacks Up As A DB2 Development Tool.



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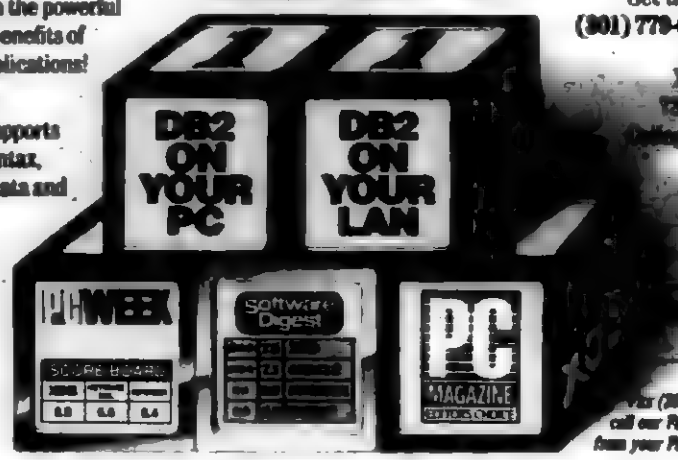

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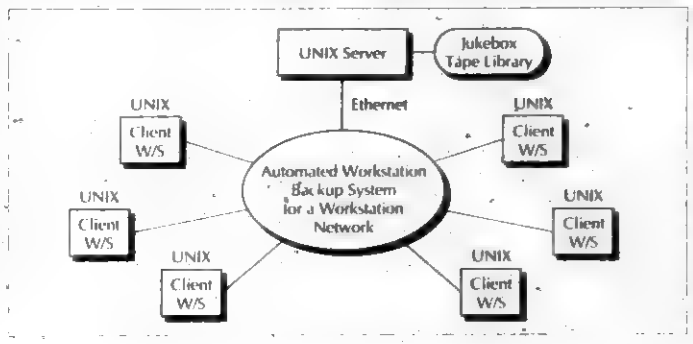

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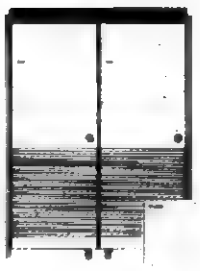

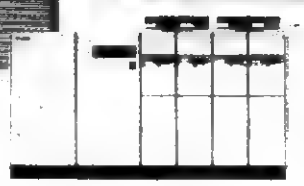

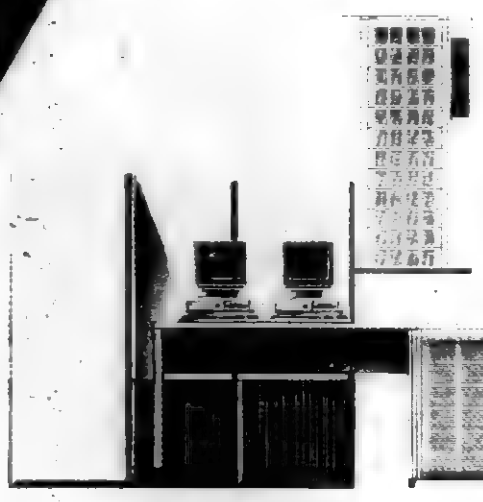

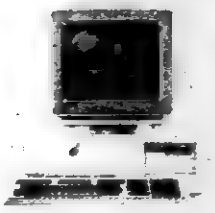

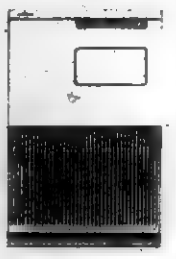

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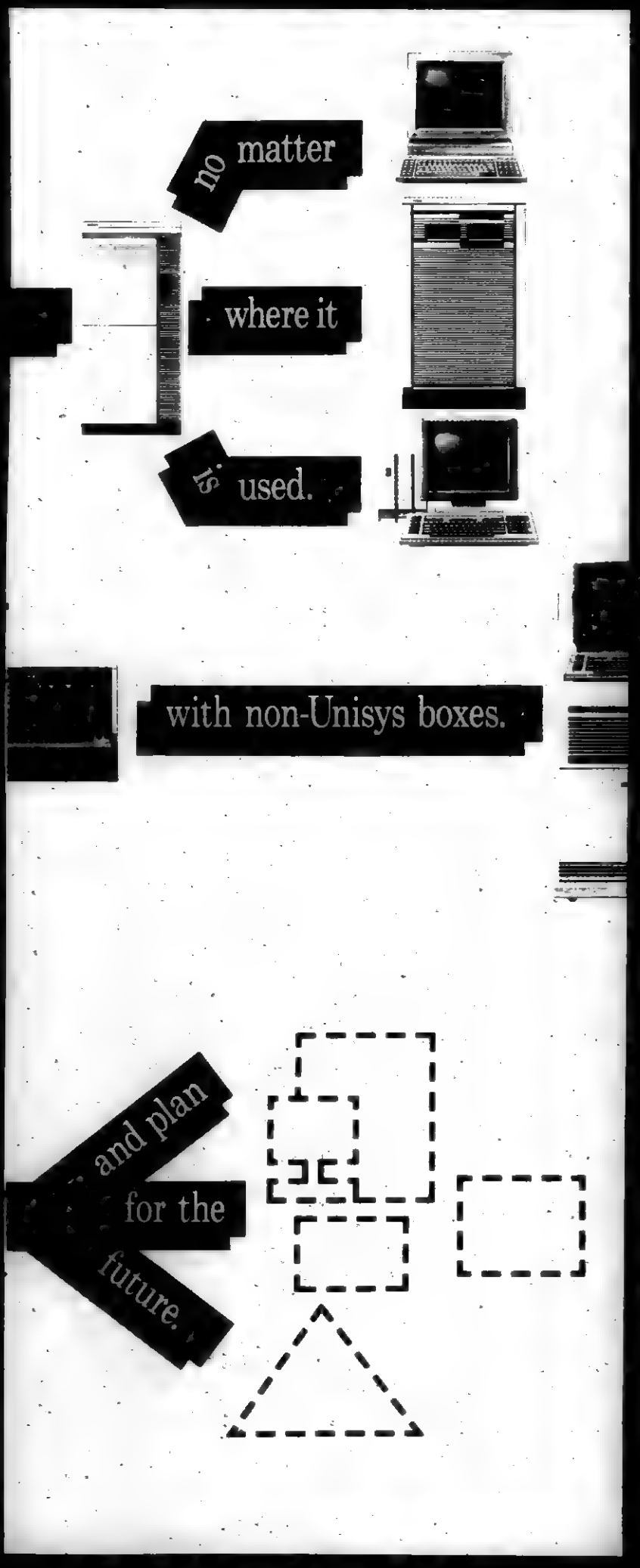

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We make it happen

Merrill & Bryan Enterprises, Inc. has announced an enhanced version of Infospotter, a software program that features memory analysis and a range of diagnostic capabilities for IBM Personal Computer XTs, ATs, Personal System/2s and compatibles.

Infospotter 2.5 can be used to analyze a PC's operating system, memory and devices and then display the data on-screen or send it to a printer for a user to view. Other features include a batch file editor, a programmable option select device library editor and a print-by-menu option.

The product costs $79.95.

Merrill & Bryan
9770 Carroll Center Road
San Diego, Calif. 92126
(619) 689-8611

Bitstream, Inc. and Laser Tools Corp. have announced a font-scaling program for building soft fonts for Hewlett-Packard Co.'s Laserjet printers.

Facelift for Wordperfect is based on the second generation of Bitstream's Speedo technology. The product enables users to generate type in sizes ranging from two to 500 points without exiting from a Wordperfect Corp. Wordperfect application. It also allows more than 360 characters from Bitstream's International Character Set to be accessed.

The program is priced at $99.

Bitstream
Athenaeum House
215 First St.
Cambridge, Mass. 02142
(617) 497-6222

EMS Professional Shareware Libraries has begun shipping the WIN Utility Library, a collection of more than 100 public domain and shareware programs and files designed for users of Microsoft Corp.'s Windows Version 3.0.

The product includes a disk manager, file compression, text processing and other utility programs. It also features a database and search program that permits users to search files by name, type or vendor or perform free-text searches, according to the vendor.

The library costs approximately $50.

EMS Professional Shareware Libraries
4505 Buckhurst Court
Olney, Md. 20832
(301) 924-3594

Bloc Publishing Corp. has announced a memory management utility program designed for IBM Personal Computer XTs, ATs, Personal System/2s and compatibles.

Pop Drop Plus combines two memory management utility programs: Popload, which enables users to load as many as 50 random-access memory-resident programs into expanded memory, and Popdrop, which can be used to load RAM-resident programs into removable layers to facilitate their manipulation.

The product requires 1K byte of RAM and is priced at $99.95.

Bloc Publishing
Executive Tower Penthouse
800 Douglas Entrance
Coral Gables, Fla. 33134
(305) 445-0903

Peripherals

Psion, Inc. has added two bar-code systems to its family of handheld computers.

The Welch Allen Switched Bar Code Scanner ($279.95) and the Dynasys Dynabar-232 Bar Code Reader ($350) were designed for use in various application environments. The Welch Allen scanner is well suited for industrial, office and retail bar-code applications. The Dynabar-232 can be used in data collection environments in which single-hand operation is needed.

Psion
118 Echo Lake Road
Watertown, Conn. 06795
(203) 274-7521

Personal Computer Products, Inc. (PCPI) has announced an enhanced version of its Imagescript cartridge, a product designed for Hewlett-Packard Co.'s Laserjet printers.

The product's port-sharing feature enables users of IBM Personal Computers and Apple Computer, Inc. Macintosh systems to be connected to the same printer via parallel and serial ports. Its input buffer allows data to be transferred to the printer's input buffer at a rate of 10K to 15K bit/sec., the vendor said.

The product requires a Laserjet printer equipped with 1M byte of random-access memory.

It is priced at $299.

PCPI
10865 Rancho Bernardo Road
San Diego, Calif. 92127
(619) 485-8411

PC systems software

Tally Systems Corp. has announced the PC Census Software Recognition Module, which was designed to work with the PC Census Hardware Recognition Module to provide microcomputer and system auditors with a complete inventory of all hardware and software installed in their organizations.

PC Census enables users to automatically identify the brand names and version numbers of more than 250 popular commercial personal computer software packages installed on a hard disk, the vendor said.

The product is priced at $5.50 to $10 per PC. The software and hardware module can also be purchased together for $7 to $10 per PC.

Tally Systems
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COMMENTARY

Thomas L. Nolle

Networking for 1991

It's traditional to do predictions on the coming year in December. December is still a few weeks away, but there isn't much chance of anything really good happening before then. Maybe we'll all need a little more time for thought and planning this year.

We asked 50 network users what they thought they would be doing and buying. This is the result.

Uncertainty about the economy will be the big factor in 1991. Lack of confidence in the future tends to make business raise target returns on investment (ROI), forcing projects that require capital outlays to pay back before something awful happens. Target ROI in the 45% range will pose a challenge to both users and vendors. Some projects won't make it.

The biggest gains in 1991 will be scored by technologies that can save users money on relatively low investments; particularly those technologies that the users are already familiar with.

Both the equipment and carrier services that support T1 and fractional T1 links are getting cheaper. This will continue to fuel user migration to T1, mak-

Continued on page 80

Frame relay showing its stuff

Though few products exist, private users find it an effective X.25 replacement

BY JOANIE M. WEXLER
CW STAFF

Although frame-relay technology has spawned only a couple of shippable products to date, users and analysts seem to think that it will soon represent much more than lip service.

Unlike Integrated Services Digital Networks, which were prematurely hyped and dependent on service rollouts from the public carriers, frame relay can be implemented in both private and public networks. Efforts toward incorporating the technology in private equipment are leapfrogging those in the public arena.

"I'm excited about frame relay because it appears to be an effective, high-speed replacement for X.25 packet switching," said Phil Evans, director of telecommunications at FMC Corp., a Dallas-based conglomerate.

Frame relay is both an interface and transport service that is faster than X.25 packet switching. It takes advantage of today's highly reliable transport media, such as fiber-optic cabling, by eliminating error-checking and correction at each network node. FMC installed a fiber wide-area network about four years ago.

X.25 for copper

In contrast, the X.25 standard was designed for more error-prone wiring, such as unshielded copper. The X.25 protocol carries overhead required for error checking at each node, which is rarely needed on today's reliable media.

Modular frame-relay interfaces are now shipping for Cisco System, Inc. routers and Stratacom's IPX T1 multiplexers, which primarily benefit users with both vendors' products in their networks. Most T1 vendors said they have intentions to support the emerging frame-relay standard on their multiplexers — including General Datacomm, Inc., FMC's primary T1 vendor — in an announcement last week. However, the majority of vendors, including General Datacomm, have not committed to ship dates.

Codex Corp., however, which has a 20% investment in Stratacom and resells the IPX as its 6290 T1 multiplexer, has gained frame relay by default on its IPX-compatible 6290. It has also said it will support frame relay on both its 6525 X.25 packet switch

Continued on page 76

Campus recasts net for 530M bit/sec. rate

ON SITE

BY ELLIS BOOKER
CW STAFF

PITTSBURGH — Carnegie Mellon University recently performed major surgery on its campuswide network. It did so by replacing the backbone without touching the extremities, and in the process increased the bandwidth on the fiber-optic network from 10M bit/sec. to 530M bit/sec.

To understand how the university achieved this feat, some background is necessary.

Six or seven years ago, Carnegie Mellon started using a star-shaped Ethernet and then moved to a backbone-shaped Ethernet.

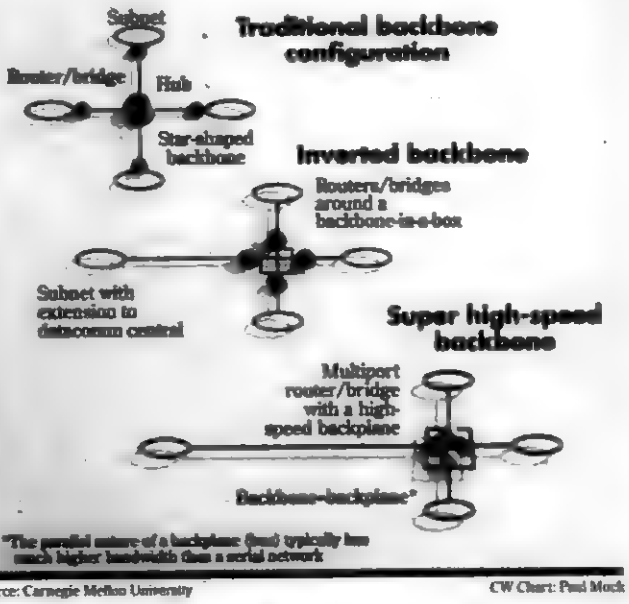
While the backbone's 10M bit/sec. bandwidth fully satisfied the university's data traffic at the time, the new topology caused administrative headaches; because network router technology at the time was more or less nonexistent. "When we had a problem, we constantly had to have technicians go out and fix the problems," explained John Leong, the university's director of networking and communications. "It was very inconvenient."

The solution was found in a

Continued on page 84

Strong backbone

Carnegie Mellon University has migrated from a star topology to an intelligent bus backbone



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CW Chart: Paul Mock

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TECHNOLOGY THE WORLD CALLS ON

Global players winning with EDI technology

BY ELISABETH HORWITT
CW STAFF

NEW YORK — Information systems applications such as electronic data interchange (EDI) have played a key role in U.S. manufacturers' positioning of themselves as global competitors, according to a joint report published recently by Coopers & Lybrand and Louis Harris.

Based on a survey of 150 large manufacturing firms, 60% of which said they were emphasizing product globalization, the report points to the need "to put plants where the major overseas markets are and then build in flexibility through just-in-time and EDI so that they can respond quickly to market signals," said Grady Means, Coopers & Lybrand's chief economist. "That's the winning strategy for the next decade."

Just-in-time techniques enable plants to handle short product cycles rather than large batch jobs. "EDI is geared to control information from point of sale to the supplier and plant, then to the customer."

Such techniques build flexibility into the system "so that as market conditions change, you can change faster than the competition," Means said. "Forecasting accurately is hard, but if your system can respond to new trends and changes quickly" without loss of plant resources and materials "and without your having a lot of inventory to get rid of, you win," he added. "The trick is to do it globally," matching market demand with available production capacity and inventory, regardless of national boundaries.

A number of U.S. companies are already using such techniques to improve their global competitive stance. Since the spring of last year, for example, Mattel, Inc. has been working toward more interactive links between its U.S. data center and overseas plants, affiliates and distribution centers so that the toy maker can more effectively match changing market demand to existing plant and warehouse capacity. Links between manufacturing plants in Europe and the Far East allow Mattel to meet increased demand in one country using excess inventory from another.

Benetton Group S.p.A., an Italy-based garment manufacturer with broad U.S. distribution, broke ground in its industry several years ago by developing a networking application to track product movement at its outlets on a daily basis, according to a global networking report released last summer by KPMG Peat Marwick and its Nolan Norton & Co. unit.

Indeed, Coopers & Lybrand found many positive signs that U.S. firms such as Procter & Gamble Co. and Philip Morris, Inc. were "moving just right in framing global strategies to meet global market conditions," Means said. "A lot of economists were surprised" at the U.S. Department of Commerce's recent announcement that the U.S. annual growth rate reached 1.8% this quarter, he added. "They don't understand the new strategic moves corporations are making; they won't have a lot of inventory to move in the next two quarters, and they have become a lot more flexible and responsive."

The positive trend toward more flexible, global manufacturing is expected to accelerate "as companies get better at creating logistic systems that can support faster movement of smaller lot sizes around the world," Means said.

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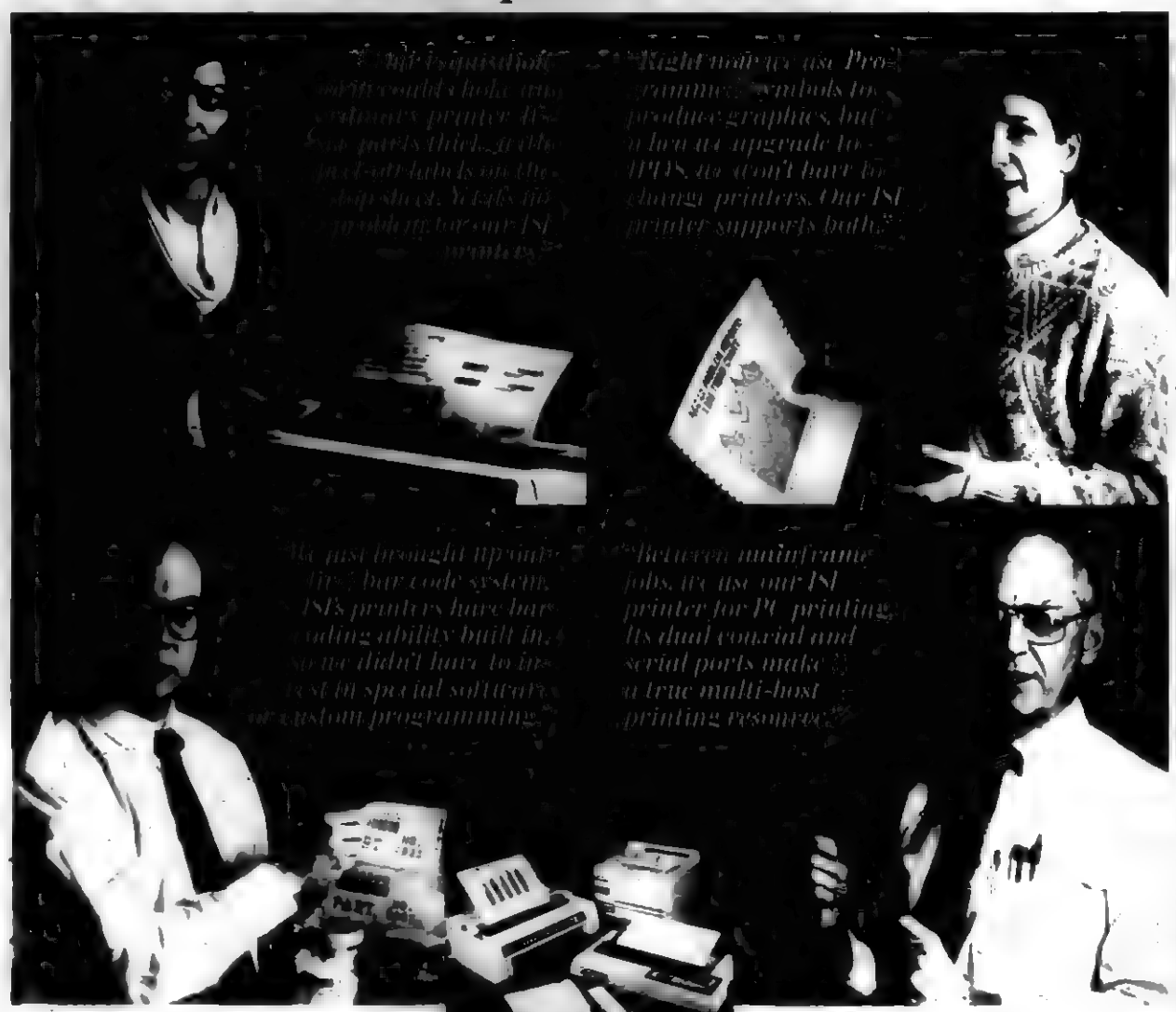

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Token-ring net monitors on tap

BY JIM NASH
CW STAFF

MENLO PARK, Calif. — Network General Corp. recently expanded its network monitoring and analyzing product line by adding token-ring monitoring capabilities.

Network General announced that monitoring software for 4M and 16M bit/sec. token-ring will be shipped as a free upgrade next month for both the Sniffer analyzer and Watchdog monitor.

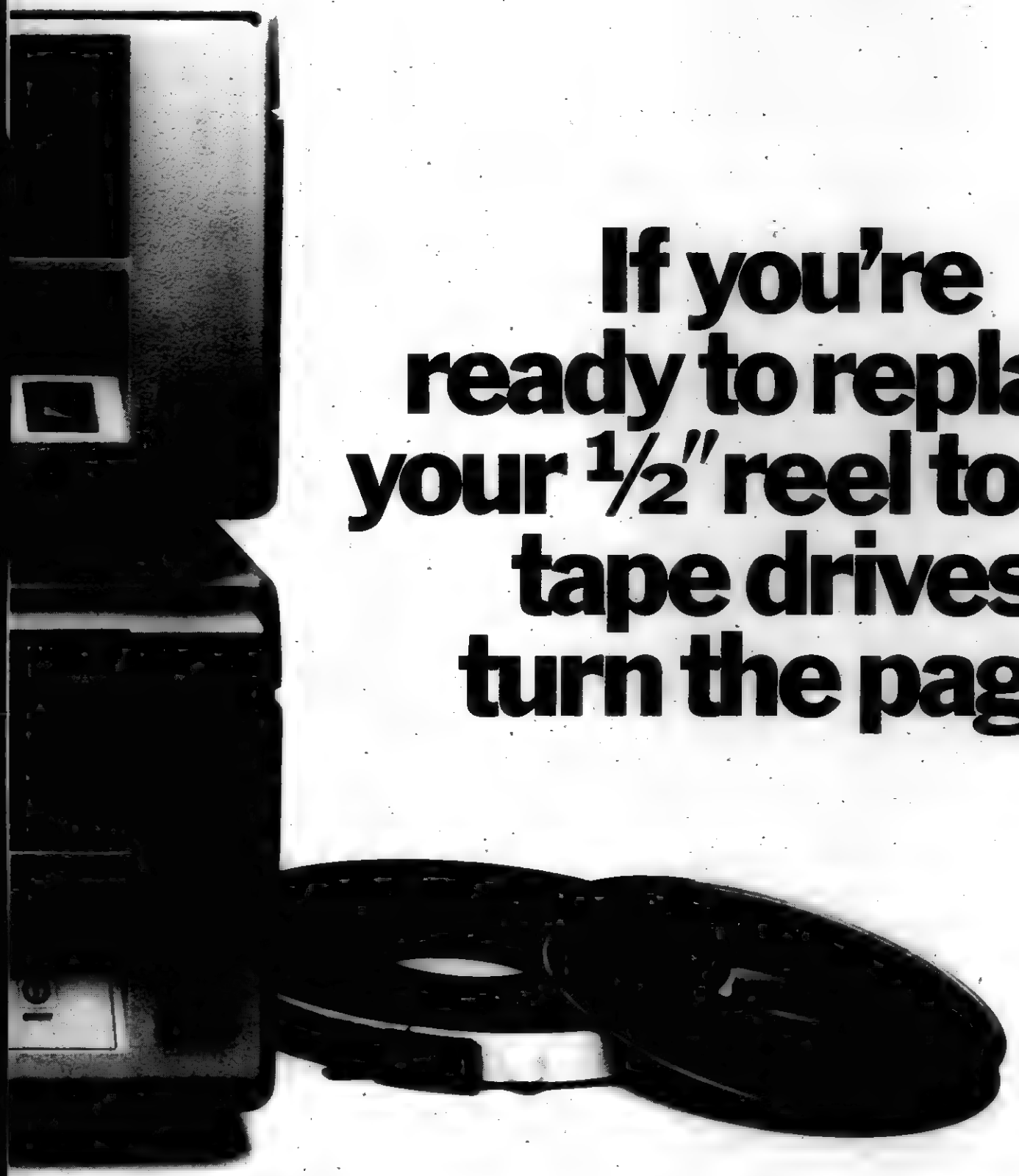
Competitor Novell, Inc.'s Lanalyzer works only on 4M bit/sec. token-rings, and Lantern, Novell's monitor, does not work with token-ring. IBM devices analyze both 4M and 16M bit/sec. systems.

At Blockbuster Entertainment Corp. in Dallas, Rick King said he has performed beta tests on the token-ring Watchdog. King, manager of corporate networks, said he was able to learn how to use the Watchdog in about a week. After about five months, he is still learning how to use the more complicated Sniffer, he said.

Before the testing, King said, he was unable to monitor his 4M bit/sec. token-ring networks. Watchdog allows him to spot "soft errors," or those traffic activities hitting preset limits, he explained.

Jay Weil, director of marketing at Network General, said administrators can use the company's tools to reconfigure networks and bridges as well as redistribute files to decrease internetwork traffic. He admitted, however, that the company has yet to break from its standard character-based interface.

Weil also acknowledged that Network General's products lack the remote alarm feature recently promised by Novell for Lantern.



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X terminal users: Don't hesitate to evaluate

BY JOANIE M. WEXLER
CW STAFF

NEW YORK — Just because a company has boiled down its myriad Unix networking options to X terminals does not mean it can relax. The X terminal market is glutted with suppliers, models and price ranges that users must evaluate.

This scenario became further muddied on the Unix Expo floor two weeks ago. NCR Corp. announced that it has bundled the Open Software Foundation's Motif graphical interface window manager into its display stations. By running OSF/Motif locally — rather than on a host — the stations do not have to continually communicate with the host to use OSF/Motif.

"This is clearly an advantage, because it reduces network traffic," commented Stephen Auditore, president of The X Business Group, a research and consulting firm in Fremont, Calif.

Network Computing Devices, Inc. (NCD) broadened its already extensive X display line with a $1,495, 15-in. monochrome terminal slated to ship this month. The NCD15B offers screen resolution of 1,024 by 800 pixels and is based on the Motorola, Inc. 68000 chip.

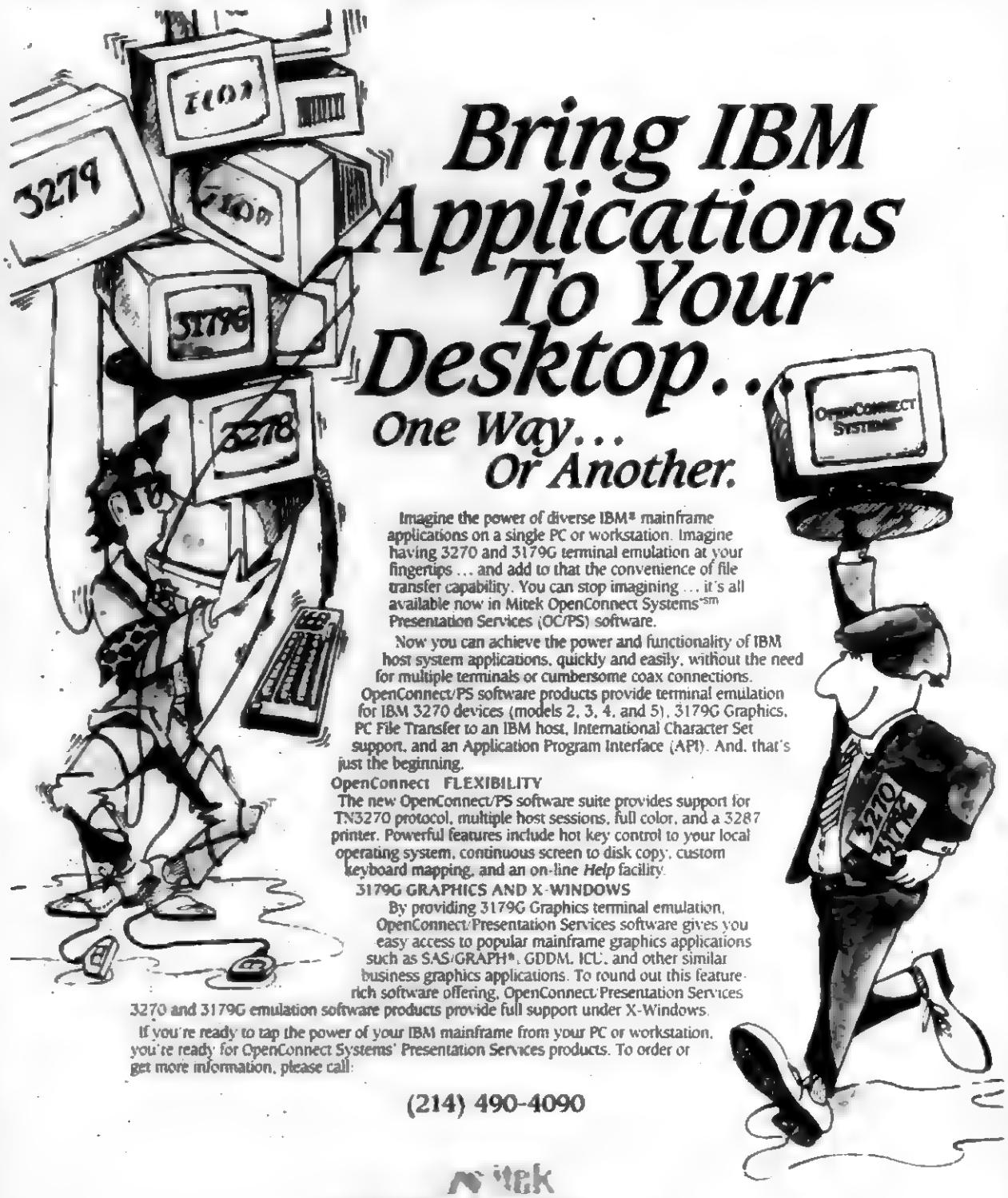
X terminals are diskless, somewhat intelligent stations that capitalize on the X Window System protocol developed at MIT. X Window System allows terminal users to access multiple hosts across a network and simultaneously display applications and files in various windows on one screen. X terminals, which offer the high-resolution benefits of a workstation, compete with personal computers and workstations — diskless or otherwise.

While the terminals give up the local application and file processing ability of personal computers and workstations, they are generally considered less expensive than the other two options and can relieve data management headaches for companies wishing to keep their computing centralized.

Auditore said that X Business Group's research shows that the main criteria users are employing to sort through today's broad X terminal offerings are company reliability, stability and experience.

Stephen Beck, a member of the technical staff at Princeton University, which has 68 NCD terminals installed, said, "There's no magic in making a selection; you basically use the same criteria as you would in choosing a workstation. A big part of that is the way you feel about the people behind the sales."

More than 25 vendors offer X terminals today, including many major computer manufacturers, and Auditore acknowledged that this is too many for the market to ultimately sustain.



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EDI could save defense dollars

BY GARY H. ANTHES
CW STAFF

BETHESDA, Md. — A study by the Logistics Management Institute (LMI) says the U.S. Department of Defense (DOD) could save $1.2 billion over a 10-year period by investing just $79 million in document processing automation, a payback of 15-to-one.

LMI chose 16 high-volume documents — used by the DOD in procurement and contract administration, transportation, supply, maintenance and fuels — and computed the direct and indirect savings from converting paper processing to electronic data interchange (EDI).

LMI, a federally funded research and development center, said the results are conservative. It said it computed an average savings per document of $2.40, compared with savings of $10 to $50 per document routinely claimed by the private sector. LMI also figured that every dollar of direct cost savings would be matched by $1.80 from reduced inventories, streamlined operations, reduced interest expenses and other indirect costs. It said the private sector looks for indirect benefits three to five times the direct benefits.

But where the cost savings per document may be relatively low, the DOD makes it up in volume. The basic order form for supplies tops the list of 2,100 documents that are candidates for EDI, flowing at the rate of 11 million annually.

Direct and indirect savings over a 10-year period from automating the 16 forms would total $1.2 billion, rising to an annual total of $213 million in the 10th year, LMI said. To get that, LMI said, the DOD would need to make a onetime investment in computer hardware, software, telecommunications and procedures of about $79 million, spread over 11 years.

Thomas P. Hardcastle, a research fellow at LMI, said most of the EDI initiatives at the DOD so far have been relatively small but the agency is gearing up for a big push in electronic commerce. The first phase will take place at the Defense Logistics Agency's Finance Center in Columbus, Ohio, where annual procurement is approaching $100 billion.

Hardcastle said EDI is at the heart of the giant automation effort, but related tools, such as electronic mail, electronic bulletin boards and electronic funds transfer are important, too.

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Frame relay

CONTINUED FROM PAGE 67

and a new product — the 6507 multiprotocol packet assembler/disassembler — during the first quarter of 1991. The frame-relay product line will reportedly be manageable by Codex's 9800 network management system.

Rosemary Cochran, a principal at Vertical Systems Group, a consulting and research firm in Dedham, Mass., pointed out that "what Codex hasn't mentioned is the LAN internetworking issue. Codex offers a bridge, and I assume it intends to add frame relay to it. But that has not been part of the announcement."

To make use of a frame-relay network, interfaces are needed on both the access side — such as a bridge or router — and on the wide-area side, such as a T1 multiplexer.

"Unless you have both types of products, there's nothing that can be accomplished," Cochran said. Steven A. Taylor, president of Distributed Networking Associates, a consultancy in Greensboro, N.C., concurred: "Frame relay will be tough to implement on a trial basis. Users will have to evaluate it, then go into it heavy-duty."

Time out

Gary Ragsdale, assistant vice president and chief engineer at Fedex International Transmission Corp. (ITC), a division of Federal Express Corp. in Memphis, predicted that the industry will have "to wait a year before it sees a lot of products in the field."

Fedex ITC is looking forward to frame-relay capabilities on the Netrix Corp. •1-ISS, which will support a mix of frame-relay, T1 multiplexing and X.25 packet-switching capabilities. The •1-ISS technology will also be blended into Infotron Corp.'s SL25 T1 multiplexer during the first quarter of 1991, according to Infotron.

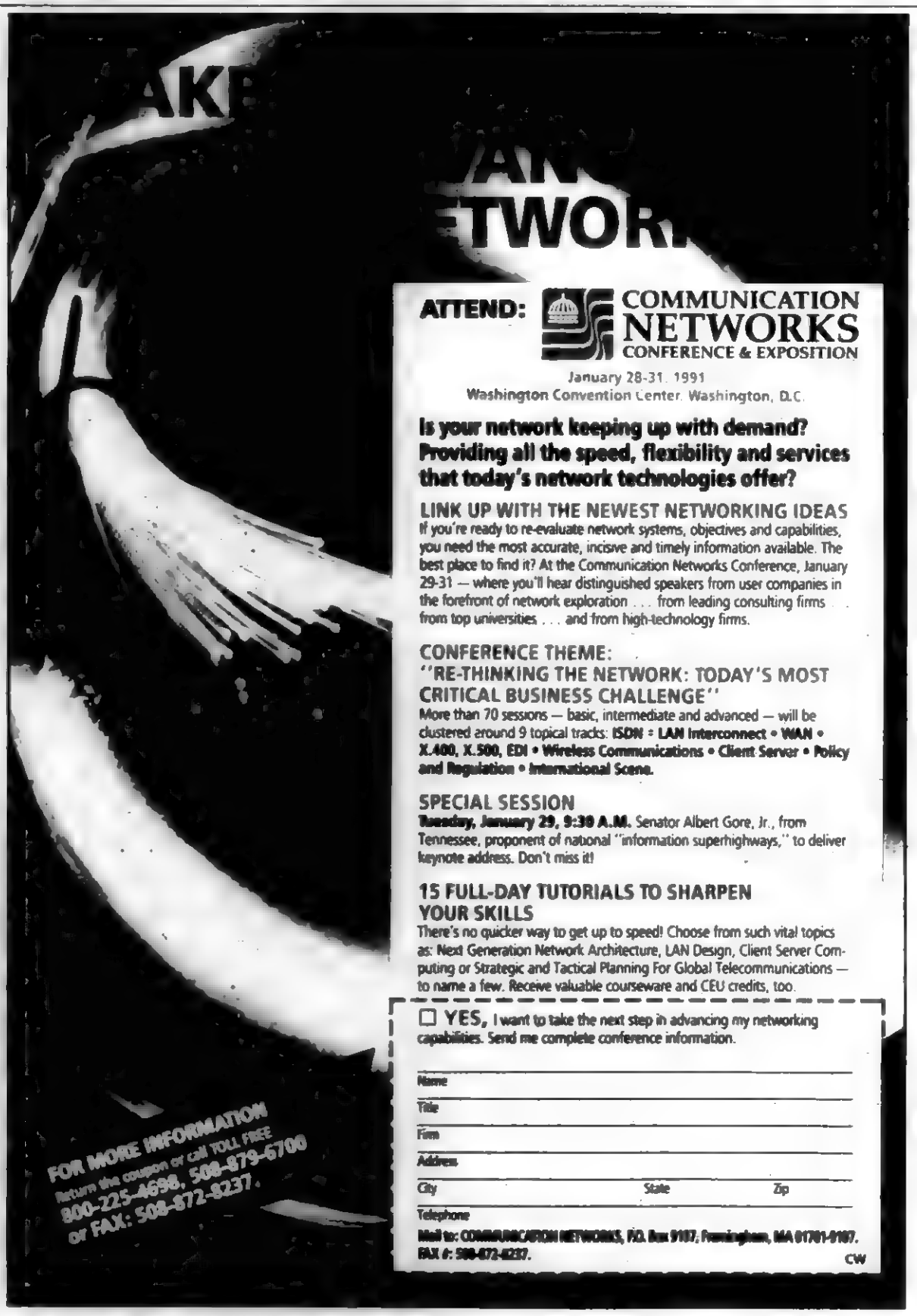
"Our applications are becoming more distributed," Ragsdale explained. "We acquired the Netrix product for packet switching but also because we were looking ahead to frame relay for very high-speed LAN interconnections." Ragsdale added that slow response times for sending inter-LAN traffic "are already a big problem" at his company.

Formation, Inc., in Moorestown, N.J., may have stumbled on a solution to the piecemeal frame-relay concern. When responding to a federal bid for a communications interface, the firm developed a product that it said maps to frame relay, as well as to the emerging Switched Multimegabit Data Service and metropolitan-area network standards. Vendors and users incorporating the Formation interface into their equipment could theoretically have interoperable products supporting all these services.

"Our multimegabit interface is almost universally adaptable and can attach to public networks," said Roger Wyer, Formation's director of marketing.

Cochran and Taylor agreed that one loophole in frame-relay technology is lack of accommodation of IBM equipment. IBM speaks Systems Network Architecture protocols, which are packetized but not frame relay-compatible.

"It's not an inexpensive technology," Taylor noted. "We're talking $50,000 to $200,000 per node, not a couple of $2,000 boxes. But it's a new technology that allows the entire world to perform as if it were on a LAN."



Defining options

The terms frame relay, cell relay and fast packet have about as many definitions circulating as Ben Franklin had children. Generally speaking, however, frame relay and its sister technology, cell relay, fall under the "fast packet" technology umbrella. Both are intended to improve on traditional packet switching by speeding up packetized transmissions.

Vertical Systems Group, a research and consulting firm in Dedham, Mass., defines fast-packet switching as "an architecture that supports both voice and data at T1 speeds [1.544M bit/sec.] and above and switches at least 50,000 packets per second. Unlike X.25 technology, it provides no error detection in retransmission."

Frame relay transmits data packets of variable lengths, in contrast to cell relay, which accommodates fixed-length packets of 53 bytes. This fixed-packet nature makes cell relay more suited to voice transmissions than frame relay, because voice is less tolerant of reassembly delays at the receiving node caused by the variable length of the frame-relay packets.

Cell relay is being pursued aggressively by public carriers — which have traditionally made voice their business — while frame relay is initially invading private networking equipment. The cell-relay standard specifies higher speeds — 45M bit/sec. and above — because its designated packet-length nature requires less processing.

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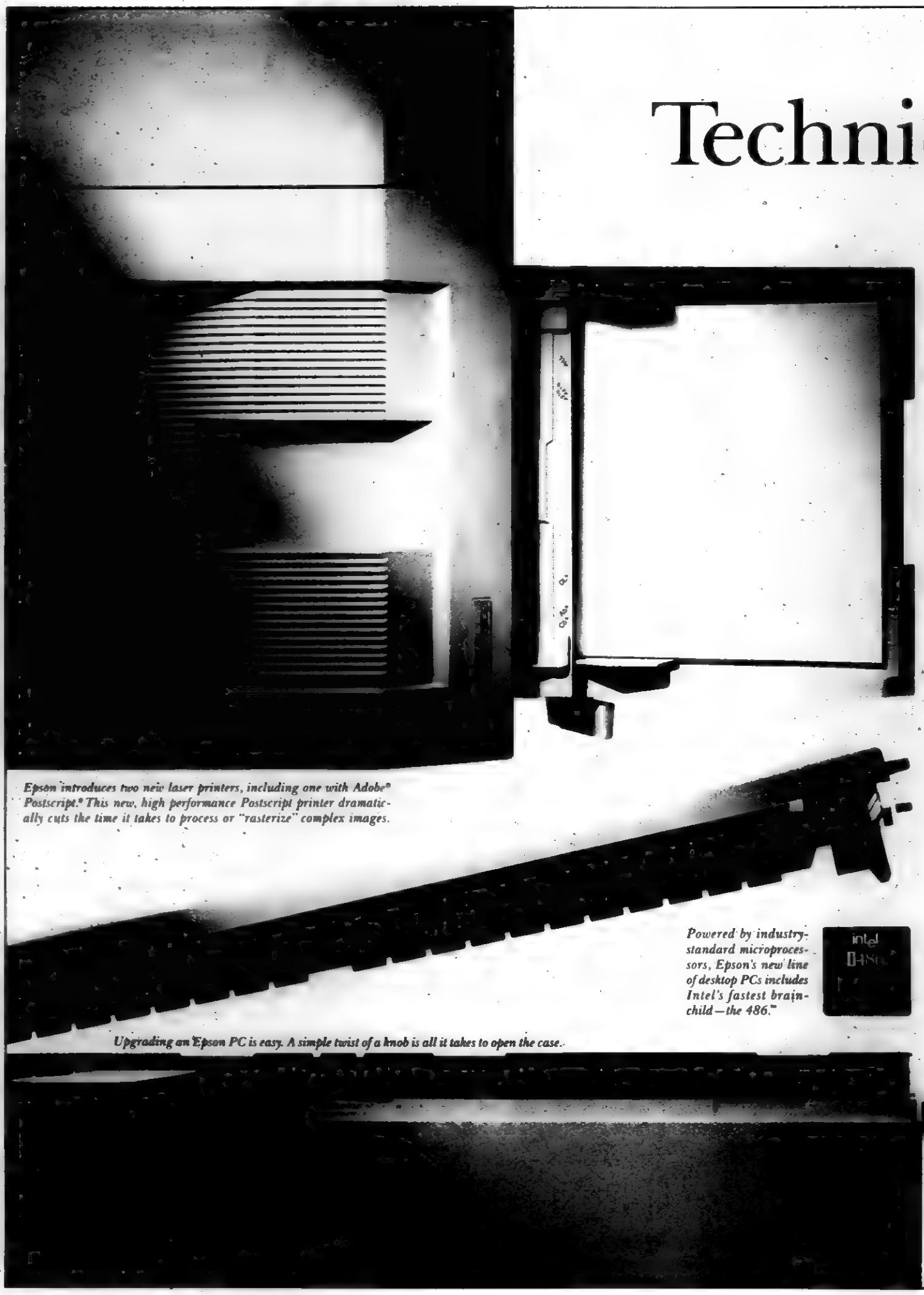

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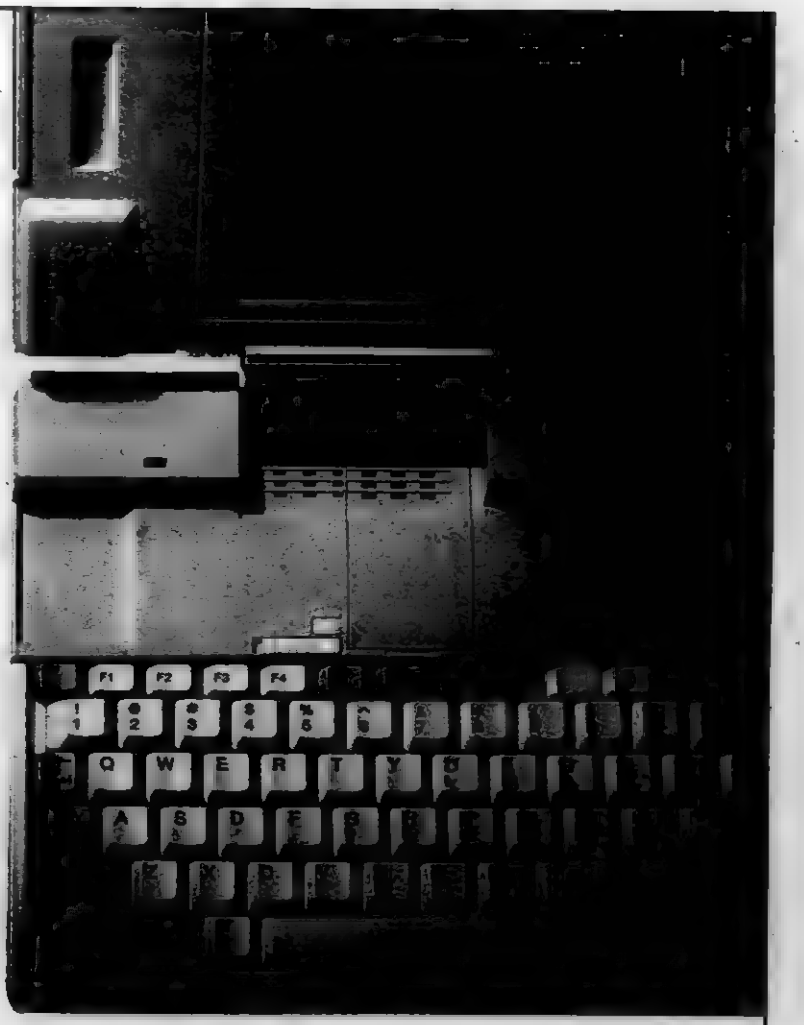

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Nolle

FROM PAGE 67

ing it likely that 1991 sales will probably outpace this year's sales both in services and equipment.

The vendors who bet on T3 may find redemption in 1991 as well, according to larger network users. Rates are stabilizing and falling, and customer premises equipment is also getting cheaper. Initial cost will still scare away some users, but more T3 should be sold than in 1990, possibly 60% more.

Virtual network services will gain popularity, inside and outside of special Tariff 12-type arrangements. Virtual networks can provide many of the benefits of private networking at lower cost because the carriers provide the nodal facilities. Some users will find that expansion of private networks through a conversion to virtual services will provide better savings at little or no additional hardware cost.

Local-area network linkage is also a hot application for 1991, but users say they expect most of the dollars to go into traditional technologies like fractional T1 and X.25, not into new ones such as frame relay. It will be cheaper at first to use 64K bit/sec. circuits on existing private networks to link LANs, or to support basic message and file transfer services between LANs through packet networks.

Probably the hardest hit technologies in 1991 will be those that are both new to the user and require a substantial capital investment. The latter will make the financial officer resist unless something really credible can be put together.

Fiber Distributed Data Interface (FDDI) probably won't gain much ground in 1991, despite the popularity of LANs and LAN interconnection. Cost per attachment for FDDI is still high, and users perceive a sharp drop during the next two years. This, according to our research, tends to string out the buying cycle. The applications that do best will be those that create FDDI backbones to facilitate wide-area linkage of LANs.

Another technology that could be affected by high investment is frame relay. Where the technology can be retrofitted to existing equipment at a low marginal cost, frame relay can participate in the overall increase in LAN interconnection. But business still hasn't come to terms with the benefits of the new technology, and most frame-relay opportunities will fall toward year's end.

Open Systems Interconnect (OSI) is a third loser, according to users. It is difficult to adapt existing applications to OSI, because it tends to have a different set of application programming interfaces than other communications architectures already in use. The incremental cost of those first few OSI lines still tends to be higher than users expected, and this higher entry threshold discourages experimentation.

Then there's Integrated Services Digital Network (ISDN). Like OSI, ISDN requires some changes in applications to employ effectively on a large scale. But ISDN does not share the positive user attitude that OSI enjoys. Most users say they believe OSI is necessary and valuable; fewer than half believed that of ISDN. Users also have an interesting cross-polarization with carriers on ISDN. Users want to apply ISDN to applications that save money, and carriers think they are going to *make* money on these same applications.

All of this doesn't mean users have lost faith in technology. Business makes it clear they're not forever closed to those technologies they believe are less likely to be financed in 1991. In fact, the technical area that received the second-greatest expression of strategic commitment was OSI, and that which received the third was integrated network management, an area that fell into "neutral territory" in financial commitment. But to business, the problem is obvious — we've got to live within our means next year. A scary thought, but somehow refreshing.

Nolle is president of CIMI Corp., a communications consulting company based in Voorhees, N.J.

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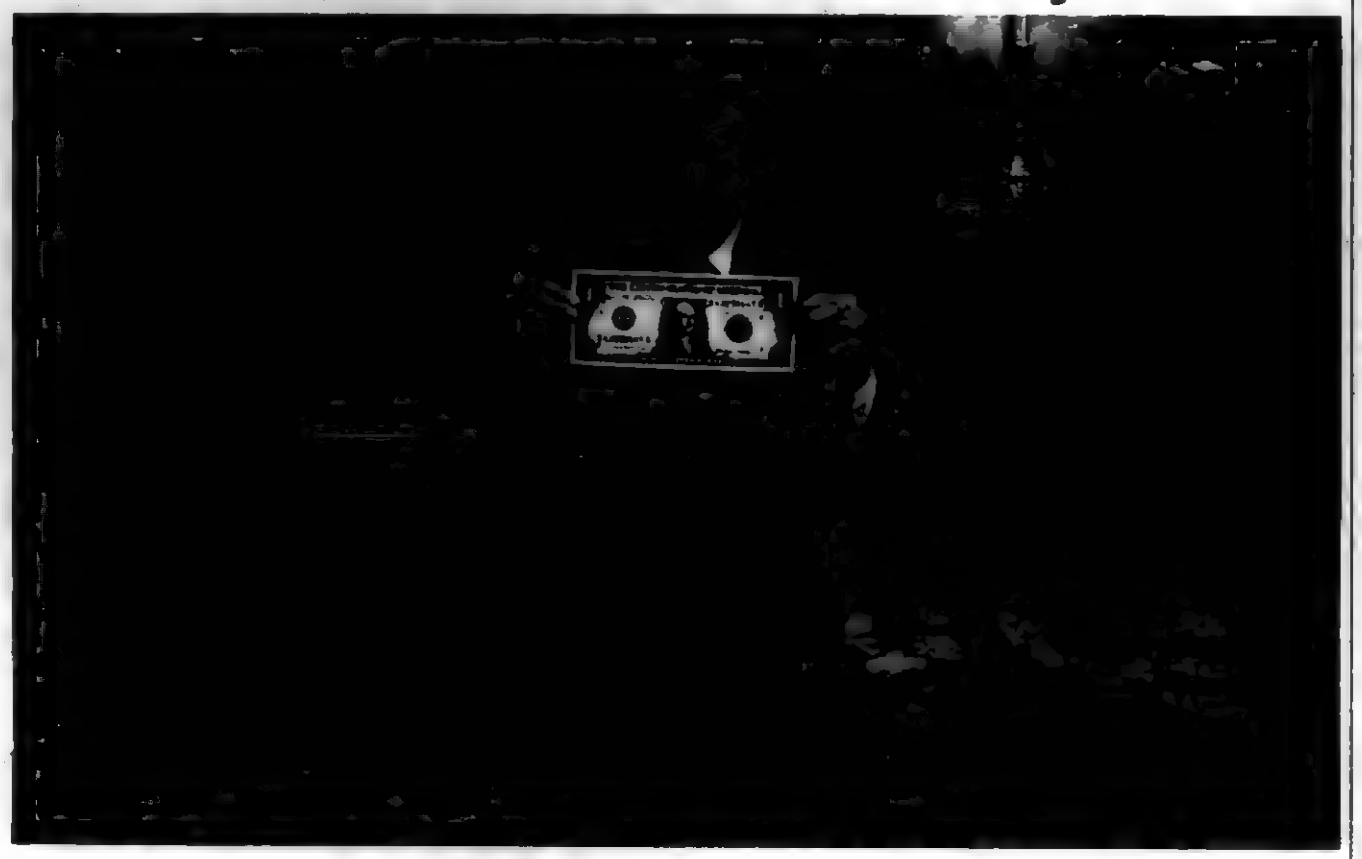

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Campus

CONTINUED FROM PAGE 67

so-called inverted backbone, whereby the routers were located centrally but attached to the remote subnets in a loop.

"From a maintenance standpoint, technicians no longer had to travel to the remote subnets to service the routers," said Leong, adding that the 10M bit/sec. inverted backbone was used for four or five years.

Inevitably, however, Carnegie Mellon's bandwidth requirements began to grow; network utilization, thanks in part to a greater amount of distributed processing, began to grow 20% a year. "A year or two ago, the [utilization] on the backbone was 40% to 50%," Leong said. "That's when you start getting a little nervous."

Leong and his team looked at solutions including Fiber Distributed Data Interface (FDDI) 100M bit/sec. networking but decided that their existing network topology looked like "a backbone in a box, like a bunch of Ethernet cards connected into a backplane."

Backplane devices use a parallel bus and therefore are very fast. However, those backplane devices on the market at the time required more maintenance than Carnegie Mellon was able to justify.

Finally, a solution

After six months of looking, Leong stumbled onto a product from Cisco Systems, Inc. The AGS Plus router was being marketed as a standard multiport bridge or router, not as a backbone, but Leong saw how he could use the product for his application.

The first AGS Plus was installed in August — and a second will be deployed for backup purposes shortly.

Ordinarily, if four subnets enter an Ethernet box, each cannot run at 10M bit/sec. because the box itself is capable of only 10M bit/sec. However, if each network comes into an interface card, which is on a 530M bit/sec. bus, then the bus distributes the bandwidth.

Carnegie Mellon has 60 local-area networks connected to 30 bridges in the central data communications center; all the routers are in turn connected to the Cisco box.

The Cisco router can accommodate 24 Ethernet interfaces through the unit's four card slots. Each interface card can support a single FDDI interface or six Ethernet interfaces. Currently, Carnegie Mellon has three Ethernet cards running, and an FDDI interface card arrived from Cisco.

Leong, however, has not forgotten the management issues that compelled him to move to an inverted backbone network several years ago.

"This [Cisco box] is perfect for management," he said. "It uses uses a very powerful [Simple Network Management Protocol]-based sofware." He noted that the university has used SNMP for some time.

If there is a complaint or a downside to the backplane approach, according to Leong, it is its single point of failure. Indeed, in the second phase of the project, Carnegie Mellon will acquire a second router to act as a redundant facility should the first one fail. He plans to use Ultranet's to the two Cisco boxes. Ultranet will offer gigabit speeds between the two routers.

AT&T jumps into 486 arena

BY ELLIS BOOKER
CW STAFF

MORRISTOWN, N.J. — AT&T announced a new communications server last week and discreetly tossed its hat into the uniprocessor I486 marketplace.

AT&T already had a server using the Intel Corp. high-end processor, but its symmetric multiprocessor Starserver E can take one to four 33-MHz I486 boards.

In addition to the server introduction, AT&T enhanced its IBM connectivity tools for its Stargroup LAN Manager Server networks, adding a Systems Network Architecture (SNA) gateway that allows MS-DOS workstations in a Stargroup LAN to emulate IBM 3270 terminals and printers and connect to SNA mainframes. Among other improvements, the latest version of AT&T's Host Connectivity Software now supports AT&T's Unix System V Release 4.0, the latest version of the operating system.

The new server, the Starserver S, is a uniprocessor I486 machine with an Extended Industry Standard Architecture bus, a clock speed of 33 MHz and a 26.5 million instructions per second rating. AT&T's latest server also features a small computer systems interface.

"They need the additional performance [of a 486]," said analyst John C. McCarthy at Forrester Research, Inc. in Cambridge, Mass. McCarthy noted that because AT&T's servers run a version of Microsoft Corp.'s LAN Manager as an application on top of Unix, they require more processor overhead than servers from Novell, Inc. or 3Com Corp.

The Starserver S joins AT&T servers based on the 80386 and reduced instruction set computing platforms. Like the other Starservers, the S model can be used as a server, a multiuser system or as both simultaneously. It can support as many 64 clients as a server, 32 to 80 users as a multiuser system or 32 clients and 48 asynchronous users as a combination host. The Starserver S will range in price from $14,995 to $24,395.

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NEW PRODUCTS

Local-area networking hardware

Net-Source, Inc. has announced an Arcnet entry-level local-area network that is based on Server Message Block (SMB) technology.

Silvernet features two Arcnet adapters that have been certified as compatible with Novell, Inc.'s Netware and IBM's Netbios; the Silvernet-OS SMB protocol network operating system, which requires less than 40K bytes of memory; Silvernet Control Center software; and all necessary cables and manuals for a two-user LAN.

The product's average price is $204 per node for nine users.

Net-Source
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The Multi-Media Hub and Dual-Raven were recently announced by Kodiak Technology. Both were designed to provide users of Novell, Inc. Netware-based Ethernet networks with configuration and cabling flexibility, according to the vendor.

The Multi-Media Hub ($699) is a single board that serves as an Ethernet adapter, a repeater and a media converter. It can be used to connect coaxial local-area networks to 10Base-T networks.

The Dual-Raven ($649) provides the equivalent of two independent Ethernet channels on one IBM Personal Computer AT-compatible board.

Kodiak Technology
1338 Ridder Park Drive
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Local-area networking software

Hayes Microcomputer Products, Inc. has announced an asynchronous communications software program designed for use in stand-alone or networked personal computers.

Smartcom Exec Version 2.0 allows single or multiple modems to be shared on asynchronous communications servers. It also includes a text editor equipped with word processing capabilities.

The product costs $129 and is scheduled to be available in mid-January. Current owners of Smartcom Exec Version 1.0 can upgrade their systems for free until March 31, 1991.

Hayes Microcomputer Products
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Atlanta, Ga. 30348
(404) 449-8791

US Sage, Inc. has announced an Ethernet-based peer-to-peer network system that enables users of connected personal computers to transmit data at 10M bit/sec.

Mainlan Ethernet requires 30K bytes of random-access memory in conventional PC workstations or 15K bytes of RAM in Lotus/Intel/Microsoft Expanded Memory Specification-based workstations.

The system is compatible with Novell, Inc.'s Netware and IBM's Netbios. It is priced at $499 for a starter pack that connects two PCs. Additional packs cost $199 apiece.

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Gateways, bridges, routers

Network Systems Corp. has announced a router designed to enable users to connect pairs of Fiber Distributed Data Interface rings to each other.

The FE649 supports the Transmission Control Protocol/Internet Protocol and Digital Equipment Corp. Decnet routing protocols.

The product is priced at $54,000.

Network Systems
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BICC Data Networks, Inc. has announced Isolan Etherconnect System/4 (ECS/4), part of a range of managed Ethernet systems designed for use in structured wiring multimedia environments.

The ECS/4 is a multimedia intelligent hub designed for small local-area networks. It supports up to four line cards and provides local management functionality without a dedicated microcomputer and remote management capabilities.

The product is priced at $1,595 for just an enclosure.

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Retix Corp. has announced an Ethernet bridge that provides filtering rates of 29,000 packet/sec. and forwarding rates of 13,650 packet/sec. while running the IEEE 802.1 Spanning Tree Protocol.

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MANAGER'S JOURNAL

EXECUTIVE TRACK

Jan M. Connolly has been promoted to the new position of assistant vice president of corporate operations at **Ameritas Financial Services** in Lincoln, Neb.

She is responsible for the development and maintenance of Ameritas' long-term strategic direction and reports to the company's president and chief executive officer.

A 16-year Ameritas employee, Connolly was most recently director of marketing systems. She is a graduate of the University of Nebraska at Lincoln, chairman of the Association for Systems Management's Division 17 and member of the *Journal of Systems Management* editorial review board.

.....

Larry Wester, formerly director of computing and information systems at East Carolina University, has been named a partner at **Pace, Wester and Associates** in Savannah, Ga. The firm specializes in banking, information management and general business advisory services.

.....

Glenn Larson, chief information officer at **First National Bank of Chicago,** was elected to the board of directors of the Electronic Funds Transfer Association in Alexandria, Va.

Larson currently manages systems and operations within First Chicago's community banking group. Before joining the bank in 1983, Larson was vice president in charge of West Coast operations at Visa USA.

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Who's on the go?

Changing jobs? Promoting an assistant? Your peers want to know who is coming and going, and *Computerworld* wants to help by mentioning any IS job changes in Executive Track. When you have news about staff changes, be sure to drop a note and photo or have your public relations department write to Clinton Wilder, Senior Editor, Management, *Computerworld*, Box 9171, 375 Cochituate Road, Framingham, Mass. 01701-9171.

The art of managing programmers

Managers must balance egos, eccentrics and a desire for freedom

BY PATRICIA KEEFE
CW STAFF

Jessie Hartland

Good programming is considered an art, so practitioners are often compared to artists and musicians. Often unconventional or egocentric, these "creative types" pose unique challenges to another art — that of managing them.

Good programmers are hard to find and hard to keep. If thrust into a corporate straightjacket, some, like Vadim Yasinovsky, now president of Clear Software, Inc. in Brookline, Mass., may flee to smaller, more entrepreneurial organizations. But if allowed to thrive on the image and mystique of the eccentric and all-knowing software guru, programmers can lose sight of the real reason behind their creative endeavors — solving problems for users.

"I think there's been some amount of programmers not being managed," says June Rokoff, the senior vice president at Lotus Development Corp. who is widely credited with taking over the troubled 1-2-3 Release 3.0 project and getting the product to market last year.

"What tends to happen in those cases is that they are taught to believe eccentricities are good, that 'You are bright and creative, and we don't want to impede that.' I think that is a management flaw," she says.

On the other hand, applications development tends to require more ambiguity about how to achieve the mission, observes Doug Underhill, assistant vice president for technical services at CSX Technologies, Inc. in Jacksonville, Fla. Programmers, he explains, are often doing things that are new: designing new systems or trying to resolve first-time problems. In these situations, he suggests, operating with a rigid plan or specific dates may get in the way of productivity.

The trick then lies in striking a balance between nurturing the creative spirit while keeping the programmer grounded in the reality of day-to-day business needs. But too often, programmers are left to wander off into some corner, isolated from the rest of the company. The key to breaking this pattern is constant communication, managers say.

There are many opinions as to the best way to achieve this, but few will quibble with the proposition that programmers, and the way they work, *are* different.

"People program because they love the intellectual challenge," says Price Waterhouse technology director Sheldon Laube. As such, they are motivated by "tremendous technical challenges," along with the freedom to explore possible solutions, maintains the former head of the New York-based audit and consulting firm's advanced technology group.

Programmers "want rational, logical explanations in a democratic fashion," Rokoff adds. "If you order them, they'll do it, but unless they understand it and get their hearts and minds behind it, you won't get their creative juices." To get that, she says, management must be more demanding — but

Continued on page 88

Trying to bridge the Asian language gap

BY CLINTON WILDER
CW STAFF

Doing business with the Pacific Rim? There are few hurdles greater than trying to enter, process and transmit text written in the complex character-based languages of the Orient. But a growing number of people believe that technology can come to the rescue — if the will exists.

A weekend-long symposium last month at the University of Pennsylvania brought together 150 attendees from business, government and academia to discuss the issue and view some of the latest relevant technologies, such as conversion programs. The Philadelphia conference concluded that the language barriers will remain formidable as long as nationalist and traditionalist attitudes persist.

"The reality right now is that no one wants to talk about it," said conference organizer Victor Mair, a professor of Chinese literature at the university. "Most business applications simply use English."

Earlier this year, a group of computer vendors formed the Unicode Consortium to promote a standardized way of coding Japanese, Chinese and Korean characters. The consortium includes Xerox Corp., Apple Computer, Inc., Sun Microsystems, Inc., Microsoft Corp., Hewlett-Packard Co., Next, Inc. and IBM.

"If you're going to have networks back and forth among countries, you have to have standard codes back and forth," Mair said.

The inputting problem is particularly acute in mainland China, where some fear that the time-consuming task could be a major hindrance to the developing economy. Apollo Wu, a United Nations translator, told the conference that Chinese documents are 2½ times more expensive to process at the United Nations than any other language. In Taiwan, the growing computer industry is virtually 100% English-based.

"They go where the market is," Mair said. "[Computer vendors] say they just can't make machines that work for Chinese. But you can't avoid language problems."

Programmers

CONTINUED FROM PAGE 87

in a positive way.

Providing the best toys and technology enables programmers to work at the edge, Laube says, citing the development atmosphere in the early years at Data General Corp., which was detailed in Tracy Kidder's *The Soul of a New Machine*. "It was true then, and it's true today," he says. "Money is not enough if [these people] are bored."

It's also not enough if the programmer feels slighted. Chris Mitchell, a systems manager at RFC Intermediaries, a reinsurance brokerage in Atlanta, points out that because programming is a creative process, people tend to be more possessive of their work. "So if you try and take

John Martin

Price's Laube: *Money is not enough*

a project away or reassign it, it's [seen as] an insult. Programmers take their work very personally," he says.

Programmers are often afforded a more flexible work environment than their fellow employees, and this can cause resentment, Mitchell adds. He said other departments often do not understand that his staff is on call 24 hours per day and may be leaving early because they spent the previous night coding. Closer relationships between the information systems staff and its clients can help resolve this.

Yasinovsky maintains that programmers need that greater degree of freedom. It's important for them to have enough free time to attend trade shows, read industry publications and play around with software, he says. He says he believes they need to be able to look around and explore different ideas.

Still, things can get out of hand, which can delay application delivery. Developers are often so caught up in what they are doing that they don't know when to stop and ship the final product. When that happens, Yasinovsky sits down with his team and spells out the reality of business life.

"I explain that yes, we can put 50,000 things into the product, but here is our financial situation," he says. "I let them suggest what sacrifices to make."

Sometimes it can be hard to create a sense of responsibility. If necessary, Yasinovsky will resort to guidelines and dates, but he prefers to avoid that route if possible.

All workers need recognition, but it seems especially true for programmers, managers agree. There is a reason why commercial suppliers such as Microsoft Corp. and Apple Computer, Inc., make a point of introducing their technical teams at splashy product introductions. Corporate IS departments can achieve the same celebratory glow on a smaller scale by taking programming staffs out to dinner or by touting their achievements in some other internally recognized manner.

"A good programmer is definitely a prima donna, and they have to have a significant amount of recognition," Yasinovsky says. A former programmer himself, Yasinovsky claims top programmers justifiably have very big egos. "They are not workers, they are creators — artists."

But other managers, such as Underhill, scoff at what he calls "the manufactured myth about the creativity of programming." He maintains that if people are treated as prima donnas — where care is taken not to ruffle their feathers — then they will act that way.

It is better to reinforce a view of programmers as part of the corporate team and to make sure they understand not only that their work is valued, but how it benefits the company.

> ALL WORKERS need recognition, but it seems especially true for programmers.

Rokoff and Yasinovsky agree that most programmers really want to know the why of what they are doing. "I have found that if you explain why it is important and how it fits in with what the company or division is doing, if it makes sense, that's where the motivation comes from," Rokoff says.

This level of openness leads to programmers who are more likely to come up with solutions vs. merely reducing someone else's solution to machine code, Underhill says. He is in the process of sending his entire staff of approximately 40 people through a multiweek course covering the fundamentals of CSX Technologies' business of railroad transportation.

"It helps them understand how what we do has a direct impact," Underhill says. It also moves his programmers closer to understanding end-user needs by helping them develop relationships with people in other business units.

Without AT&T, a problem down

Inmates gain computer skills

BY J. A. SAVAGE
CW STAFF

IONE, Calif. — Tim Fabianowicz, juvenile delinquent, did not want to be sweating on the side of the road busting rocks for the government. "I want a nice job in an air-conditioned office," he said.

Fabianowicz, 20, is one of nine wards of the state in the Preston School of Industry who started a job late last month using Bureau of Automotive Repair computers to help California motorists find autoparts to pass their smog inspections. Fabianowicz is one of the luckiest of the 800 inmates at this institution for youthful offenders in the dry foothills near Sacramento. He is not only able to learn his way around a keyboard, but he will be paid for it and at the same time, help save taxpayers money.

Yet Fabianowicz and the others were first denied this opportunity. Earlier this year, the state legislature put language in a budget bill that stopped the program. Legislators were afraid the kids would have access to personal information about drivers — their addresses and phone numbers, for instance. The fear was sparked by a 1989 incident in which Hollywood actress Rebecca Schaeffer was slain after her attacker found her address through the Department of Motor Vehicles.

Ed Kashi

Free Venture Program's Dominguez *wants to eventually go to college*

However, Gov. George Deukmejian vetoed that particular language, and the project is revving up.

Under the aegis of the California Youth Authority's Free Venture Program, private — and in this case, public — industry can hire young inmates at low wages to do real work. The wages, usually between $4 and $5 per hour, are divvied up. Fifteen percent goes to a restitution fund for crime victims, 20% to the state for room and board, 40% into a savings fund for after the inmates' release, and the remaining 25% belongs to the inmate.

The young men in the program are "serious about changing their behavior," said Jim Coan, supervising casework specialist. "We recruited them and then held job interviews."

"It's something you can use," said Eduardo Dominguez, 20. "I want to go to college."

Julio Calderon, private industries specialist at the Free Venture Program, said the overall recidivism rate for the state's juvenile institutions is about 60%. Those working in the program were returned to institutions only 8% to 10%.

The program has only one other project in which inmates work on computers, a 4-year-old program with Trans World Airlines in Los Angeles where inmates work making reservations. Most of the other dozen Free Venture programs in other institutions are more physical, with jobs such as fashioning sheet metal or sewing women's undergarments.

The Bureau of Automotive Repair work is not as complicated as that for TWA. Using a Digital Equipment Corp. Microvax II with an Ingres Corp. Ingres relational database management system, the inmates use menu-driven screens to find parts for cars' exhaust systems.

"We put in the vehicle weight, what kind it is and the location of the caller and get a parts tracing number," said ward Kenny O'Neal, 21. From there, inmates can find a listing of parts dealers in the motorist's local area. It is all part of a state program designed to help drivers get their cars through smog inspection.

To keep them from learning personal information about the caller, if a follow-up is needed, it is referred to the supervisor of the operation.

Five layers of security are built into the application, called Smog Parts Tracking and Reporting, and inmates are only able to access the first level. Additionally, the VAX is a stand-alone operation, not linked to the Department of Motor Vehicles' main database.

The Bureau of Automotive Repairs figured it is saving $69,000 initially by using inmates and at the same time expanding its service. Prior to the program, private contractors did the work.

Regarding the concern they might use personal information improperly, Fabianowicz said, "They have a lot of reason to be uptight. We are criminals." He added that when outsiders see the inmates are not abusing the information, then they will be entrusted to do more with the system.

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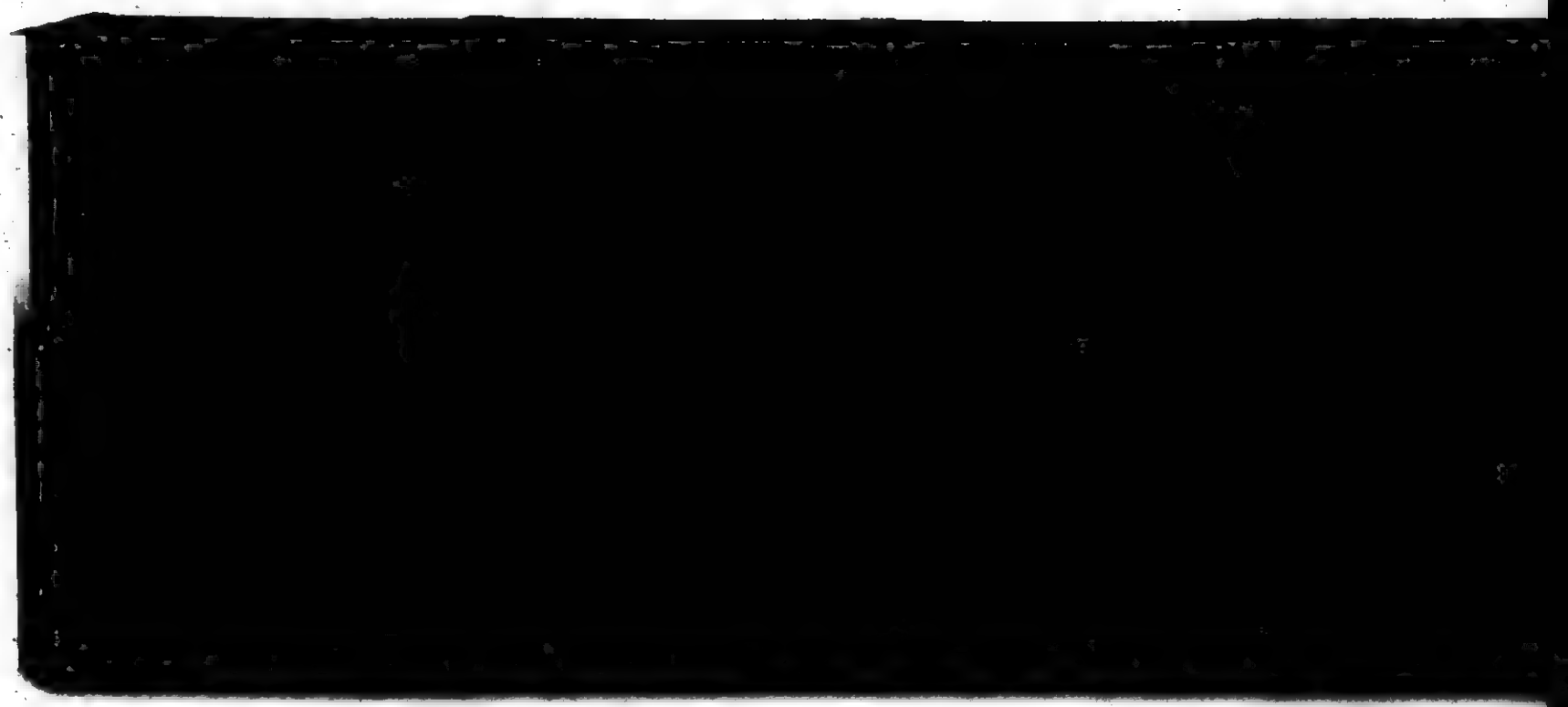

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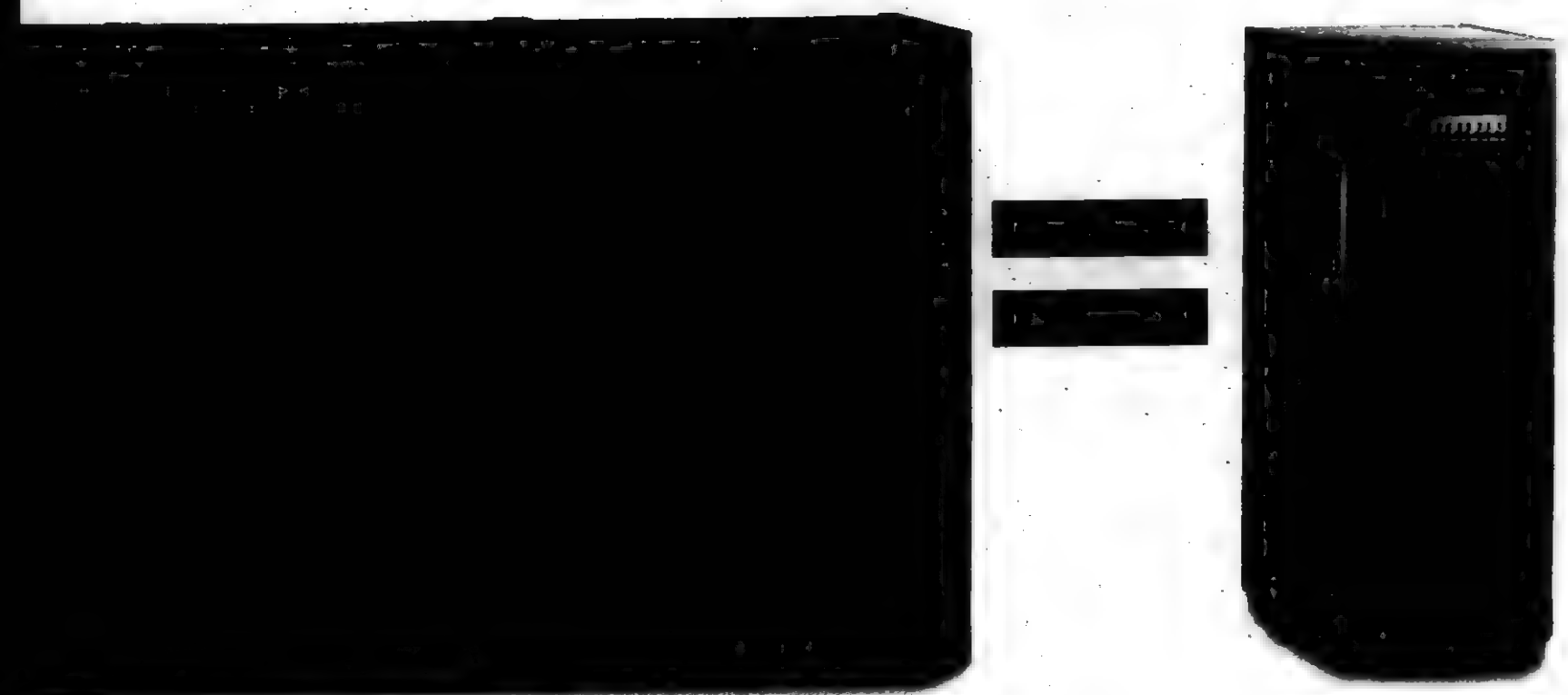

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America West having a rough flight

BY JIM NASH
CW STAFF

TEMPE, Ariz. — It was just this summer that America West Airlines seemed to have found a comfortable cruising altitude. Now, however, not-so-clear air turbulence is jolting the billion-dollar national airline.

Although Carl Faulkner, America West's chief information systems officer, could not confirm wire reports that America West lost $22 million in the third quarter and has announced it will leave up to 300 vacancies unfilled, he said he will have to cut in half his staff growth this year.

Faulkner had planned to augment his 240-person IS staff with 25 new employees in the last quarter of 1990 — on top of the 20 he will be forced to hire when the airline brings processing for its Flight Fund frequent-flier program in-house this year. Now, he explained, he intends to hire just five new employees for existing programs.

Contractor bows out

Another 20 employees must be hired regardless of economic considerations, Faulkner said, because America West's frequent-flier contractor, United Airlines subsidiary Marketing Process Innovators, Inc., will end all its contracts and return to being a division of United.

Faulkner said no projects planned at this time are being cut or curtailed as part of the hiring freeze, because the 20 new positions were to be spread over many departments and projects.

Faulkner said he still expects to increase spending for IS in real terms in the next fiscal year.

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Innovator wins award

BY SALLY CUSACK
CW STAFF

NASHVILLE — Publishing giant McGraw-Hill, Inc. has been named as Xplor International's annual "Innovator of the Year" for its customized textbook publishing system.

The ceremony recognizes McGraw-Hill's Custom Publishing System, an educational publishing system introduced by McGraw-Hill in 1989 and developed with Eastman Kodak Co.

CEO Dionne *accepted award*

and R.R. Donnelly & Sons Co.

The system relies on electronic databases to customize individual textbooks, bringing together information from several sources, including journals, newspapers and magazines.

According to Robert D. Lynch, director of custom publishing at McGraw-Hill, the system operates on the Sun Microsystems, Inc. Sparc 4 platform, and the database comprises a series of Unix file structures that adhere to the Adobe Systems, Inc. Postscript standard. The system also utilizes a Kodak Ektaprinte Model 24, 92-page/min. LED printer for copy output. A second version of the database is due out the first quarter of 1991.

The award was presented to McGraw-Hill Chairman and Chief Executive Officer Joseph L. Dionne at Xplor's 11th annual conference last week.

Xplor International serves the electronic document printing industry. Previous award recipients include Automatic Data Processing, Inc. and American Express Co.

Re-engineering with IS: Three companies' intentions

BY CLINTON WILDER
CW STAFF

PALM SPRINGS, Calif. — Re-engineering business processes with information technology is easy to say and hard to do. However, at the recent *CIO* magazine/AMR International conference, three companies in three different industries described their plans to do just that.

Union Camp Corp., Kentucky Fried Chicken and Scudder, Stevens & Clark, Inc. all have ambitious plans to significantly change the way they do business in the next two to three years. They plan to do it with technologies ranging from computer-integrated manufacturing to Pepsi-pouring robots.

Kentucky Fried Chicken, a Louisville, Ky.-based fast-food subsidiary of Pepsico, Inc., plans to install a system called Merit in each of its 8,000 restaurants. Using point-of-sale terminals, personal computers and links to host databases, the company hopes to create the "computer-integrated restaurant," said Monte Jones, vice president of information resources.

The company is developing a series of standardized applications for managers to help run almost all of their restaurant functions more efficiently — among them order processing, labor management and sales reporting. The system will produce daily and weekly "report cards" for each restaurant manager and provide electronic data interchange links to Pepsi's captive food supply business for more efficient food ordering.

The chain also plans to use robotics for some operations, such as soft drink service, which can save labor costs and produce better portion control. "We have goals like getting a Pepsi to the customer in less than three seconds with no foam," Jones said.

To justify the $25 million project to senior management, Jones said, he relied on project cost savings and "softer" benefits such as potential marketing advantages. But, he added, "We quantified everything that we could to move the project forward."

Jones is no stranger to selling big technology projects to the Pepsico board. As a director in information systems at Pepsico's Frito-Lay, Inc. unit, Jones headed the project to provide handheld computers to all Frito-Lay route sales representatives. The $45 million project, highlighted at the conference by Frito-Lay President Robert Beeby, has been highly successful and won a Society for Information Management Partners in Leadership Award.

At Wayne, N.J.-based Union Camp, being able to standardize on Unix is the key to a project integrating corporate IS with the process control systems in its paper mills. "To this point, we've been kept out of the mill itself, but now industrywide standards are helping," said John Ineson, director of corporate IS.

The technology challenge is to share Unix-based information between the corporate Hewlett-Packard Co. 9000 Model 870 and two Fischer Controls, Inc. process controllers, which are based on Digital Equipment Corp. VAXs. Also tied into the network will be two HP 3000s running Union Camp's logistics and cost accounting databases.

The goal is to provide more information — on materials, production scheduling, costs and market prices — to help the mill operator make better decisions. The millwide information system will also enable more on-line training of manufacturing employees. Future plans call for the development of expert systems for use in mill operations.

Ineson said his small IS staff (220 people for a $2.7 billion company) could not develop the system on a customized basis without industry standards. "I'm not sure if standards *are* technology, but they are allowing a company with a small IS budget to do things we never did before," he said.

Jones *wants a computer-integrated restaurant*

Scudder, Stevens & Clark, a New York-based mutual funds management firm, has commenced a three-year project to replace all of its core applications with a new suite that integrates marketing, portfolio accounting and back-office functions. "Nothing should stand by itself," said Michael Petitweiss, Scudder's technology planning advisor.

Petitweiss said many of Scudder's VSE-based applications were so old that selling the software revamp project to the firm's old-line management was easier. "We already knew we had to get out of the old technology," he said.

Scudder plans to implement a three-tiered technology architecture with IBM's DB2 running on a 3090 mainframe. The firm is leaning toward the RISC System/6000 as its mid-range choice for cooperative processing, Petitweiss said.

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CALENDAR

The increased role of the Apple Computer, Inc. Macintosh will be the focus of the MACIS fall conference "Networking with Macintosh" to be held Dec. 9-12 in Orlando, Fla.

The conference features presentations by MACIS members from user companies such as Procter & Gamble, Inc., Eastman Kodak Co., The Nutrasweet Co. and Union Carbide Corp. Technical topics are scheduled to include imaging, client/server development, executive support systems and networking in an IBM-dominated environment.

For more information contact MACIS, Chicago, Ill. (312) 644-6610.

DEC. 2 - 8

Executive Information Systems '90. Washington, D.C., Dec. 2-4 — Contact: Peggy Kilburn, The EIS Institute, Newton, Mass. (617) 965-8366.

The Dooley Group Executive Conference. Tempe, Ariz., Dec. 2-5 — Contact: The Dooley Group, Hopkins, Minn. (612) 935-8822.

Globecom '90. San Diego, Dec. 2-5 — Contact: Nomi Feldman, San Diego, Calif. (619) 453-6222.

The New Tools: Computer Graphics for Design/Fall '90. New York, Dec. 2-5 — Contact: The Center for Computer Graphics for Design, Briarcliff Manor, N.Y. (914) 741-2850.

Dr. E.F. Codd's Relational Model: Version 2. San Francisco, Dec. 3-5 — Contact: Codd and Date, Inc., San Jose, Calif. (408) 441-6400.

IBM Token-Ring & SNA: Gateways, Bridges and Network Management. San Francisco, Dec. 3-5 — Contact: Ann Kielblock, Kaptronix, Haworth, N.J. (201) 769-4250.

Decision Support Technology Strategic Issues Conference. Cambridge, Mass., Dec. 3-5 — Contact: Decision Support Technology Conference Registration Office, Boston, Mass. (617) 482-3596.

Sun User Group Conference and Exhibit. San Jose, Calif., Dec. 3-5 — Contact: Joanne M. Lee, Sun User Group, Mountain View, Calif. (415) 336-0564.

National EDI Systems Conference and Exhibit. Washington, D.C., Dec. 3-5 — Contact: EDIA, Alexandria, Va. (703) 838-8042.

Automatic Object Recognition Systems. Los Angeles, Dec. 3-7 — Contact: UCLA Extention, Los Angeles, Calif. (213) 825-1901.

Casanpo. Santa Clara, Calif., Dec. 3-7 — Contact: Casanpo, Arlington, Va., (703) 845-8188.

IBM IS Management Conference. Orlando, Fla., Dec. 3-7 — Contact: Gene Brucinkowski, IBM, Chicago, Ill. (312) 245-2121.

Object-Oriented Systems Development. Orlando, Fla., Dec. 3-7 — Contact: Barnett Data Systems, Rockville, Md. (301) 762-1288.

ABC EXPO Conference. New York, Dec. 4-6 — Contact: Expoconsul International, Princeton, N.J. (609) 987-9400.

DATA '90: The Information Systems Show for South Florida and Latin America. Miami, Dec. 4-6 — Contact: International Solutions, Washington, D.C. (202) 363-4628.

Sigsoft '91. New Orleans, Dec. 4-6 — Contact: Mark Moriconi, SRI International, Menlo Park, Calif., (415) 859-5924.

Macintosh/LA. Long Beach, Calif., Dec. 6-8 — Contact: Peter Kimpton, (617) 290-0412.

DEC. 9 - 15

Virtual Reality: Theory, Practice and Promise. San Francisco, Dec. 10-11 — Contact: Kim Devan, Westport, Conn. (203) 226-6967.

Fed Unix '90. Washington, D.C., Dec. 10-11 — Contact: Fed Unix '90, Bethesda, Md., (301) 229-1062.

Global Networking Conference. New York, Dec. 10-11 — Contact: Telecommunications Report, Conference Dept., Washington, D.C., (202) 347-2970.

CMG '90 International Conference. Orlando, Fla., Dec. 10-14 — Contact: General Chairman, CMG '90, CMG Headquarters, Chicago, Ill. (312) 938-1228.

Comforum. Orlando, Fla., Dec. 10-14 — Contact: Comforum, Chicago, Ill. (312) 938-3500.

Annual Flat Information Displays Conference and Exhibition. Santa Clara, Calif., Dec. 11-12 — Contact: Murray Disman, Information Associates, Menlo Park, Calif. (415) 322-0247.

DEXPO West '90. Las Vegas, Dec. 11-13 — Contact: DEXPO Registrar, Boston, Mass. (617) 730-5708.

Database World Conference & Exposition. Boston, Dec. 11-13 — Contact: Digital Consulting, Andover, Mass. (508) 470-0528.

JAN. 13 - 19

Pacific Telecommunications Conference: Accessing the Global Network. Honolulu, Jan 13-16, 1991 — Contact: PTC, Honolulu, Hawaii (808) 941-3789.

National Retail Federation Retail Industry Convention and Exposition. New York, Jan. 13-16 — Contact: NRF Convention Registrar, New York, N.Y. (212) 563-5113.

Technical Conference on the X Window System. Boston, Jan. 14-16 — Contact: MIT Laboratory for Computer Science, Cambridge, Mass. (617) 253-8861.

Telecom Skills Workshops. Waikiki, Hawaii, Jan. 17-18 — Contact: Pacicific Telecommunications Council, Honolulu, Hawaii (808) 941-3789.

NOMDA East Regional Convention. Orlando, Fla., Jan. 17-19 — Contact: Katy Dunn, NOMDA, Kansas City, Mo. (816) 941-3100.

JAN. 20 - 26

Data Visions '91. San Francisco, Jan. 20-23 — Contact: Earle Speranza, Wordtech Systems, Orinda, Calif. (415) 254-0900.

The Downsizing Conference. San Francisco, Jan. 21-22 — Contact: Digital Consulting, Andover, Mass. (508) 470-3880.

Unix Technical Conference. Dallas, Jan 21-25 — Contact: Usenix Conference Office, El Toro, Calif. (714) 588-8649.

Infotext '91. Las Vegas, Jan. 22-23 — Contact: Bob Dale, Infotext Publishing, Capistrano Beach, Calif. (714) 493-2434.

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Benchmark execution speed	**4 min. 11.4 sec. (4.3 times faster)**	18 min. 17.2 sec.	18 min. 17.2 sec.
Benchmark executable file size	**104,713 bytes (2.6 times smaller)**	282,288 bytes	282,288 bytes
Benchmark source available for review	**YES**	NO	NO
DOS memory extender included	**YES**	NO	YES
No-charge run-time for DOS memory extender	**YES**	NO	NO
No-charge EBCDIC support under CICS and IMS	**YES**	NO	NO
OS/2 Presentation Manager support	**YES**	NO	YES
Dynamic Link Library support under DOS and OS/2	**YES**	NO	NO
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CLIPS

Tim Lewis

Summaries from leading scientific and management journals

"Making the technology investment decision"

By Eric Clemons and Bruce Weber

University of Pennsylvania's Wharton School
Working paper

■ Investing in strategic information systems is a high-stakes decision that carries enormous risk and potentially large rewards. In fact, the investment decision is so daunting that management may err on the side of conservatism and risk aversion.

The danger is that if a firm decides not to initiate the strategic system, competitors most likely will.

IS investments for competitive advantage or strategic necessity are not well suited to traditional cash-flow analysis because of long lead time and the prospect that the strategic system will totally alter the business environment in surprising ways.

Despite the obstacles to evaluating strategic IS investments, it can be done using a more qualitative approach. The analysis should include consideration of the not-so-obvious benefits of the system, the business cost of *not* implementing the system and ways to reduce or manage the risks.

For example, a firm can deploy a prototype and gauge the marketplace response before a full-scale rollout.
— Mitch Betts

"An asset-based systems development approach to software reusability"

By Jahangir Karimi

MIS Quarterly
June 1990

■ On average, half of all code in a given application can be reused. Firms employing software reuse gain a significant increase in productivity as well as cost savings In the future, it may become necessary for companies who want to ensure their competitiveness.

Effective reuse is preplanned and occurs at the design level. Ad hoc reuse — attempting to reconstruct design elements from the code of an existing application — is both difficult and time-consuming. Further, design information is seldom sufficiently recorded in the actual code.

To build a collection of reusable parts, all applications tasks of the company's business are charted and then grouped into categories. The processes common to all tasks within a given category are defined in general terms; the general semantic knowledge associated with each process in the task category is called a data asset. A library of data assets is the basis for a successful reuse program. A data asset will be designed once and then adapted for use in each particular application, rather than be redundantly designed in multiple applications.

A successful reuse program requires management emphasis on increasing the productivity of the software development process rather than the quantity of code delivered. Programming incentives can be based on the number of design elements that are accepted for the reuse library. Establishing a library of reusable design components requires up-front investment before long-term cost benefits appear. — Derek Slater

"Technology in higher education: The big yawn?"

By Linda Fleit

Cause/Effect
Fall 1990

■ To many heads of colleges and universities around the country, information systems technology is no big deal. The very institutions that teach computing theory to a slew of future IS managers do not think of applying much of that knowledge to their own technology centers.

Why not? Fear.

Too many college presidents and vice presidents think that to make decisions about technology they have to know how to program a computer.

IS management on campus, however, can quell those fears. This may mean never discussing baud rate. It may mean making a business case, not a technical one, for the next project. It may mean providing reassurance that a technical background is not necessary to be well-informed about technological issues.

IS people need to educate these leaders in what IS needs, as well as what these leaders can expect from IS. Delivering what has been promised, being service oriented, setting realistic expectations and keeping a lid on costs will help establish IS credibility. — Lory Zottola

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PCs AND WORKSTATIONS:

Get what you need with the budget you have

BY JEREMIAH CARON

Given a blank check, most personal computer purchasers would aim for the stars and choose a 33-MHz Intel Corp. I486-based system for their next purchase. But real budgets (for real applications) will not allow this indulgence.

Analyzing price/performance on the machines, therefore, is essential, because certain applications require certain performance capabilities to be truly effective, while others call only for the modest hardware expenditure associated with a lower end PC.

Many people still buy PCs based on Intel's early chips — the 8088 and 80286. But today's resource-intensive applications have most experts recommending PCs that are based on the 80386SX at a minimum.

Intel 386SX-based systems are very popular because they combine very good performance in all general business applications with support for 32-bit applications in a very affordable package.

The reason the 386SX can support 32-bit CPU-specific software is that its internal architecture is identical to that of a true 80386.

Its 16-bit data path also allows it to make efficient use of unenhanced 16-bit, IBM Personal Computer AT-style memory and I/O bus architectures, which in turn allows PC vendors to offer 386SX-based desktop systems at a relatively low price.

Indeed, 386SX-based PCs can be had for under $1,500 from many vendors, with brand-name 386SXs (such as the best-selling IBM Personal System/2 Model 55 SX) selling for approximately $3,000.

For this minimal price increase, purchasers get a 35% to 50% performance jump over the 16-bit 80286.

For a little more money, the newer 20-MHz 386SX PCs provide a 25% to 50% increase in speed over 16-MHz 386SXs for about $5,000. This is barely noticeable in most business applications but is significant in processor-intensive applications.

In some cases, the decision to purchase 32-bit CPUs has already been made for the system buyer.

If, for example, an organization plans to standardize on Lotus Development Corp.'s 1-2-3 Release 3.1 spreadsheet, any OS/2 application or an advanced graphics application, 386-based

Continued on page 99

Caron is senior editor of "The Faulkner Reports on Microcomputers and Software" and "Microcomputer Communications," published by Faulkner Technical Reports, Inc. in Pennsauken, N.J.

BY DAVID S. MARSHAK

The new crop of low-cost, low-end workstations has added another color onto the palette for corporate purchasers looking for a desktop system.

Users considering this route will find list prices ranging from less than $4,000 for machines from Data General Corp. to more than $12,000 for IBM's RISC System/6000.

While some entry-level features are standard, such as 8M bytes of random-access memory and built-in Ethernet, purchasers need to look very carefully at other features to ensure that they're comparing oranges to oranges, particularly in the areas of performance, expandability and availability of applications. While many users tend to look at price first and then deal with the issues in this order, the best approach is to reverse the order.

The seven most prominent vendors are Sun Microsystems, Inc., Solbourne Computer, Inc., Next, Inc., IBM, Hewlett-Packard Co.'s Apollo division, Digital Equipment Corp. and DG. In the next few months, a large number of Sun's Scalable Processor Architecture (Sparc) clones will enter the market, mostly from the Far East, which will change the landscape [CW, Oct. 29].

The single most important factor in the workstation purchase decision is which workstation runs the user's desired applications. This also means those additional personal or group productivity applications to which the user has become accustomed.

The question of availability will likely come down to when — rather than whether — an application will hit the market. Most major Unix and some major PC applications are being written for all of the popular workstation platforms. The more popular the platform, the better the likelihood of an early appearance of a given application.

There are two aspects to consider when evaluating popularity: operating system and processor family. While Unix is the most popular choice of operating system, there is still a large base of applications available for proprietary systems, particularly DEC's VMS.

In addition, all Unix is not the same. When buying a Unix workstation, a user will generally get a vendor-specific version of Unix — AIX from IBM, Ultrix from DEC, DGUX from DG, etc. At

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Marshak is a senior consultant at Patricia Seybold's Office Computing Group in Boston, Mass.

INSIDE

Sources Revealed
The places to buy a workstation are quickly changing. Page 101.

Buyer's Scorecard
Users rank HP's Vectra highest in PC ratings. Page 104.

Product Guide
A comprehensive list of entry-level workstations. Page 110.

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this time, there are no "shrink-wrapped" applications to run across these systems.

Processor type also plays a role. While the same processors in different vendors' workstations are not necessarily binary compatible, a number of consortiums have been formed to ensure that applications will run across all implementations of a single processor type.

Binary compatibility is beginning to spawn a whole new industry of Sparc clones that could begin to affect users' buying decisions in the near future.

While workstation vendors like to play numbers games about how many applications are available for their systems, it is clear that among the reduced instruction set computing systems, most applications will be written first for Sun and Sparc, with the other architectures fighting for second place. In the overall Unix market this is really third place, because Intel Corp. 80386-based desktop Unix systems are continually fighting Sparc for the lead position.

THE KEY question — particularly for those who are bowled over by the prospect of a workstation for less than $5,000 — is: How low is low end?

In the short run, some purchasers may find that a specific application runs only on a less popular system, such as Lotus Improv running on the Next workstations. This kind of discovery may put an end to any further debate. Luckier shoppers, whose applications currently run on a number of systems, will probably want to pursue the investigation into issues such as expandability and performance.

The key question — particularly for those who are bowled over by the prospect of a workstation for less than $5,000 — is: How low is low end?

Users can quickly find themselves in the upgrade trap — paying a lot more than expected as they discover that they have to add a hard disk, a faster processor, more memory or color. Price increases in this kind of situation can be rapid and sometimes astronomical.

For example, additional memory to run much more than the basic applications can cost almost as much as the base machine itself, typically ranging from $3,000 to $4,000 to build up a $5,000 to $6,000 machine from 8M to 16M bytes.

The way to avoid the trap is to be knowledgeable about the reason for purchase. The lowest end machines are just not for power workstation users.

The major decision is usually disk-full vs. diskless workstations. Most of these entry-level offerings are diskless, although some permit the addition of internal drives.

Diskless workstations can only run on a network. They access the operating system, applications and data files from network servers.

The problem is that every time a diskless workstation needs to get an application or any data, there is a simultaneous decrease in the workstation's performance and an increase in network traffic.

In addition, workstations usually run operating systems that support virtual memory, which means that when the workstation runs out of RAM it pages memory onto disk.

In the diskless environment, this paging is to a disk on the network, potentially creating even more performance problems for both the workstation and network.

A potential purchaser must evaluate this price/performance trade-off, particularly when choosing a diskless workstation that cannot have an internal hard drive added at a later date, leaving significantly slower external drives as the only upgrade option.

The major advantage of diskless workstations is price. Leaving out the internal drive is the only way that the less than $5,000 workstations can be achieved (with the exception of Next, which includes a 105M-byte internal hard drive in its $4,995 Nextstation).

There are, however, other reasons to consider these machines. One is that centralization of data on the server makes it easier to administer and assure security and data integrity, says Warren Mootrey, product manager for DG workstations.

Adding disk, either internally or externally through the small computer systems interface port, can be very expensive, however, and users who know that they will need a local drive may want to look at configurations that include it in the base price — such as the Sun Sparcstation IPC or the IBM RS/6000. Adding a disk can range from $1,500 for the Solbourne S4000, to $2,500 for HP/Apollo workstations, to more than $3,000 for an external disk for the DG Avion, to over $5,000 for two internal drive configurations for the DEC workstations.

While millions of instructions per second (MIPS) and other performance numbers abound in workstation-to-workstation comparisons, and entry-level systems range from 10 MIPS to 27½ MIPS, processor speed is perhaps the least important factor in selecting a workstation. Other factors, particularly the amount of memory, disk storage and where the data resides, contribute a great deal more to the user's perception of system performance.

The choices

- Sun actually has three entry-level systems, each based on the popular Sparc RISC architecture.

At the low end sits the Sparcstation SLC, which provides 15.5 MIPS at $4,995. For low-end color, Sun offers the Sparcstation IPC. The third — the Sparcstation 2 — is aimed at power users who need more expansion capabilities and the ability to use higher level graphics.

- Solbourne, which also produces workstations and servers based on Sparc, has tried to play Compaq Computer Corp. to Sun's IBM — that is, providing high-level compatibility without falling into the clone role.

The firm just unveiled the S4000, an entry-level workstation that runs at more than 25 MIPS for less than $9,000. Adding a 200M-byte hard disk increases the cost to $10,495, and adding color increases the cost of a diskless or disk-full system by $2,500.

- The low end of the IBM RISC workstation family is the high end for entry-level systems. IBM's RS/6000 Powerstation 320 is rated at 27½ MIPS with a base price of $12,995. A similarly configured color system with 16-in. monitor is priced at just over $15,000.
- After acquiring Apollo, HP integrated the HP and Apollo 68000-based workstations to offer an entry-level machine at less than $5,000. The HP/Apollo entry-level offerings consist of three models. At the low end, the HP/Apollo 9000 Series 400 Model 400DL provides 12 MIPS for a base price of $4,990. The more expandable HP/Apollo 9000 Series 400 Model 400T provides 12 MIPS at a base price of $6,890.

The third HP/Apollo workstation, the HP/Apollo 9000 Series 400 Model 425T, provides 20 MIPS at $8,990, with upgrades to color and internal disk drives priced the same as those on the 400T. These HP/Apollo workstations will run either HP's Unix or Apollo's own Domain operating system.

- DEC offers workstations based on the VAX architecture and the RISC chip from Mips Computer Systems, Inc. The Vaxstations run VMS or Ultrix, while Mips-based Decstations run Ultrix only.

The VAX-based entry-level workstation is the Vaxstation 3100 Model 30 with a base price of $6,950. A similarly configured color system with 15-in. monitor is priced at $8,950, and a system with two 104M-byte internal disk drives is priced at $11,100 (monochrome) and $14,700 (color). The lower end of DEC's two entry-level RISC-based workstations is the Decstation 2100, which is rated at 11 MIPS and priced from $4,995.

A step up is the Decstation 3100, which provides 15 MIPS at a base price of $8,900. A diskless color workstation with 15-in. monitor is priced at $12,340, and a system with two internal disk drives (104M and 209M bytes) and a 19-in. color monitor is priced at $21,300.

DEC's Vaxstations running VMS have the advantage of running a lot more software, particularly commercial and business applications. The Decstations, however, offer better price/performance measurements.

- DG, which now boasts the lowest priced RISC workstation,

Continued on page 100

Use benchmarks to your best advantage

BY PHILIP MAGNEY

Contrary to what is often suggested, benchmarking computer systems is not a black art, but caution is urged when evaluating them.

One issue is understanding which benchmarks to look at for your intended application. The benchmarks listed (see chart) measure various aspects of performance:

- **The Khornerstone benchmark** is representative of computer performance for a mix of business and scientific applications. It is based on the results of 22 tests measuring CPU, disk I/O and floating-point performance.
- **The transaction processing benchmark** measures performance in a multiuser setting of 20 users. The test is very disk-intensive and is representative of commercial applications.
- **The Ghraphstone (graphics) benchmark** is based on 122 tests measuring drawing rates for a variety of graphics elements. The results shown for workstations represent graphics performance within an X Window System environment.

Benchmarks cannot tell you everything, however. For example, notice that the presence of a dual processor on the Compaq Systempro does not result in performance improvement. To measure the advantages of a multiprocessor system, you need to modify the benchmarks.

An extended use of benchmarks is to use them to determine price/performance. The simplest way is to divide the list price of the system by the appropriate benchmark, obtaining a dollar-per-benchmark figure. Lower values represent a better price/performance. ●

Magney is general manager at Workstation Laboratories, an independent hardware testing lab in Irving, Texas.

Finish line

Representative system benchmarks show the ALR and Mobius machines to be nearing – and meeting – workstation price/performance

System	CPU/MHz	Khornerstone	Ghraphstone	Trans. Proc.	Price/Perf.**
IBM RS/6000/320	IBM RISC/20	54,661	29,384	35.64	.53
Decstation 5000	R3000/25	26,456	31,940	18.29	.79
Decstation 3100	R2000/16.7	15,285	15,493	12.85	1.31
Sun Sparcstation 1	SPARC/20	12,899	26,935	19.15	1.84
Mips Magnum	R3000/25	29,636	20,542	11.96	1.86
Compaq DP486/25	1486/25	13,513	8,232*	18.71	1.68
Compaq Sys. Pro	1386/33 (2-CPU)	9,289	n/a	26.3	4.21
Compaq DP386/33	1386/33	9,272	7,939*	17.69	2.27
ALR Powercache	1486/33	18,644	11,760	26.3	1.08
Altos 486/5000	1486/25	12,953	n/a	20.22	3.24
AST Prem. 486/25	1486/25	11,754	6,484*	23.32	1.37
Mobius PWS-425	1486/25	11,169	18,226	21.53	1.16
IBM PS/2/5551	3865X/16	2,714	2,090*	n/a	1.92
IBM PS/2-70	1386/25	6,800	4,476*	n/a	1.94
Acer 1100	1386/16	3,094	3,343*	n/a	n/a
Televideo 386	1386/16	2,817	1,624*	n/a	n/a
Compaq DP 286	286/12	1,295	n/a	n/a	n/a
Epson Eq. III +	286/10	833	n/a	n/a	n/a
IBM PC/XT	8088/4.77	321	n/a	n/a	n/a

*Graphics conducted using VGA graphics, all others have 1024- by 768-pixel or higher resolution displays
**Price/performance in this case was determined by dividing system price by the Khornerstone rating. The resulting figure is dollars per Khornerstone
All ratings are linear
The Khornerstone rating is expressed in Khornerstones per second; the Ghraphstone is expressed in Ghraphstones per second; the Transaction Processing test is expressed in transactions per second for a system with 20 users

Source: Workstation Laboratories — CW Chart : Doreen St. John

Continued from page 97

PCs are a must.

Using 25- and 33-MHz 386-based PCs provides roughly twice the speed of 16- and 20-MHz 386SX-based machines. From a price/performance view, 386-based computers from lesser known vendors are actually less or slightly more expensive than the 386SX-based computers from name-brand vendors.

PERSONAL COMPUTERS

Intel 386-based PCs now represent the broad midrange of the market and are suitable for virtually any low- or high-end application. They range from as low as $2,000 to as high as $20,000, depending on random-access memory, clock rate and hard disk storage provided.

These PCs are suitable for power users running multiple business applications or single, compute-intensive applications, such as advanced desktop publishing or computer-aided design, that will significantly benefit from the performance increase of 32-bit 386 computing over 386SX computing. They are also the best platform for Microsoft Corp.'s Microsoft Windows operations.

When deciding between a 25- or 33-MHz 386, pricing is the key. Thirty-three-MHz 386 systems are generally $1,000 to $4,000 more than similarly equipped 25-MHz 386 models.

Users can expect something on the order of a 30% performance increase when moving from a 25-MHz PC to a 33-MHz PC (depending on factors such as I/O performance and memory caching), but this does not necessarily translate into a 30% productivity increase. In fact, it is likely that users recalculating fairly large but routine spreadsheets will hardly notice the difference — this operation will be very fast with either CPU.

Pricing for 33-MHz PCs is close enough to that of 25-MHz PCs to warrant their purchase for power users but far enough apart to make 25-MHz boxes a better choice for the majority.

The performance increase of I486-based computers over 386-based systems is, on the other hand, rather tremendous. This boost is primarily because the highly integrated I486 includes both an on-chip 8K-byte RAM caching system and a built-in floating-point arithmetic coprocessor.

Twenty-five- and 33-MHz I486-based PCs can perform as much as three to four times faster than their 25- and 33-MHz 386 counterparts, providing throughput capabilities that can truly be compared with that provided by much more expensive minicomputer systems.

The prices of these machines, however, are correspondingly prohibitive. Dell Computer Corp., for example, which is known for its very low prices, sells the base configuration of the 33-MHz 386-based System 333D for $3,349 and offers its 33-MHz I486-based System 433E for nearly $8,000.

As far as single-user applications are concerned, I486-based PCs enter the picture only for those few who are maxxed out on the 386 (very rare) and for those who consider money to be no object (even rarer). Actual and projected sales bear this out, as the market for I486s remains tiny compared with the markets for 386SX and 386 PCs.

Now and then

Performance, disk capacity are likely to jump on both hardware types while price will stay essentially the same

	1990		1995	
	PCs	Workstations	PCs*	Workstations*
System price	$1,000 - $15,000	$8,000 - $100,000	$1,000 - $15,000	96,000 - $100,000
Performance range (Rhurestones)	1,000 - 15,000	10,000 - 90,000	10,000 - 60,000	20,000 - 300,000
Memory size	0.5M - 8M bytes	4M - 64M bytes	16M - 64M bytes	32M - 256M bytes
Disk capacity	20M - 160M bytes	100M - 1G bytes	200M - 1G bytes	600M - 6G bytes
Microprocessor	386, 286, 486	RISC, 68030	486, 386, 586	RISC, 68040, 68050
User interface	MS-DOS Several GUIs	Unix X-Window	Presentation Manager, Windows	Motif Open Look
Leading models' yearly sales (units)	100,000 - 1M	5,000 - 50,000	100,000 - 1M	10,000 - 100,000

*Projected

Source: Computer Industry Almanac

CW Chart : Doreen St. John

Serving as a LAN

More often, the I486-based machine is used as a local-area network server, and justifiably so. Many vendors, including IBM, Compaq Computer Corp., Hewlett-Packard Co. and AT&T, offer 25-MHz and 33-MHz I486-based "super" PCs with very large I/O support capacities specifically designed for the LAN server market.

The majority of these systems fall into the $12,000 to $18,000 price range for base configurations, with the Compaq Systempro, which supports dual processors, topping off the charts with a $25,000 model.

But the 486 is not the only choice for servers. Many businesses implementing relatively small networks have had great success using 286-based servers, such as the IBM PS/2 Model 60, if a high-performance disk storage system is employed. Similar systems based on the 386SX can provide even better performance at a price that is only slightly higher than that of a 286-based server.

A 20-MHz 386SX-based LAN file server with 4M-byte RAM and a high-speed 300M-byte hard disk drive will cost between $5,000 and $6,000, for example, while a similarly equipped 25-MHz 386-based server will run at least $1,000 to $2,000 more. There will be a performance increase with the 386 system, but the cost savings of the 386SX may more than offset this benefit for many users.

Server systems based on the 80386 processor, including computers such as the IBM PS/2 Model 80 386, AT&T Workgroup System 6386/33 and the Compaq Systempro, are priced higher than 386 systems intended for single-user applications and are better equipped to handle mid- to large-size networks than are 386SX-based servers.

These systems are usually equipped with a number of expansion slots and with room for at least two internal hard drives and a tape backup subsystem.

Average pricing for the powerful 386 PCs hovers around the $10,000 mark but varies according to vendor, hard disk storage provided and bus architecture.

If you do opt for the 486 machine, you can't forget the various types of bus architecture. Most of these computers, including Compaq's Systempro (with 486 CPU card), HP's Vectra 486 PC and Advanced Logic Research, Inc.'s Businessveisa, are based on the 32-bit Extended Industry Standard Architecture (EISA) bus design.

Others, including the recently released IBM PS/2 Model 95 XP 486, ALR Powercache 33/4 and NCR Corp. PC486/MC, are based on IBM's Micro Channel Architecture (MCA) bus design.

Right now, there is little to distinguish the performance of

Continued on page 100

The true cost of owning PCs, workstations

BY THOMAS JOHNSON

When you calculate the cost of personal computers and workstations in a local-area network, hardware and software represent only 30% of the true cost.

The other 70% consists of items such as training and development, support, data communications and other miscellaneous factors (see chart).

Nolan, Norton & Co. has devised an algorithm to help get a handle on the true annual cost of PCs and workstations in an organization.

First, determine the number of potential PC/workstation/LAN users in the business. Next, categorize all potential users into five levels of maturity:

- **Not automated** (off the chart). These are people who do not have or use PCs or workstations. ***Multiply the number in this category by $0.***
- **Midpersonal phase.** These are people using one or two applications to automate personal tasks, usually word processing and spreadsheets. The use is spotty and incidental to the business. They know where the information center is, get basic training and ask for simple help. ***Multiply the number of users in this category by $3,400.***
- **Late personal phase.** These are people reaching the limit as personal task automaters. They have many individualized applications, are regular users, are connected into basic mail systems and do simple upload and download of data.

They know about as much as there is to learn in the information center and are frustrated because they aren't connected to the right resources. ***Multiply the number of users in this category by $5,800.***

- **Midconnected phase.** These are people who are now doing work as part of an organization. They have applications for the department or business that someone built for their client/server infrastructure. They spend a lot of time on the PC or workstation and are connected with others.

These people are usually found only in departments with at least one PC or workstation per person. Business processes and organization structures have been streamlined and are more teamwork-oriented. ***Multiply the number of users in this category by $14,100.***

- **Late connected phase** (off the chart). These people work in organizations that are client/server-based and have a culture of dynamic, growing organizations with good management practices in place.

Some examples of these organizations are fully configured trader rooms in Wall Street firms, fully operational computer-aided design units and customer service units with imaging, data and voice infrastructure. ***Multiply the number of users in this category by $25,000.***

One company we work with has 3,000 employees, with 2,000 potential users. Three hundred are "not automated," 900 are "midpersonal," 400 are "late personal," 300 are "midconnected," and 100 are "late connected."

Once you do the calculations, the total comes to $12,110,000. We estimated that the firm is spending about $11.5 million on PC/workstation LANs per year. They had estimated their cost at $4 million, but that was primarily budgeted hardware and software costs. An in-depth total spending analysis showed they were spending $10.3 million annually.

The figures listed are compiled from studies conducted by Nolan Norton in the past three years in more than 100 organizations in North America and Europe. •

Cost of ownership

Using these figures, you can calculate how much it will cost to do business with a PC/workstation/LAN infrastructure

	Dollars per user per year		
	Mid-personal phase	Late-personal phase	Mid-connected phase
Hardware	$800	$1,100	$3,300
Software	$380	$550	$1,800
Development and training	$900	$1,400	$3,500
Support	$780	$1,800	$2,000
Data	$90	$200	$1,200
Communications	$100	$400	$1,500
Other	$370	$550	$800
TOTAL	$3,400	$6,800	$14,100

Source: Nolan, Norton & Co.

CW Chart : Doreen St. John

Johnson is executive director at Nolan Norton Institute in Lexington, Mass.

Continued from page 99

EISA systems from MCA systems. In fact, there has not been a lot of proof that either MCA or EISA, when used in conjunction with 386 or I486 CPUs, gives users a lot more than the standard IBM PC AT, or Industry Standard Architecture, bus (when enhanced by memory caching and fast I/O) in single-user applications.

There has been evidence, however, that both EISA and MCA prove very effective at handling the complex I/O demands of mid- to large-size networks, which accounts for the emphasis given to LAN applications by 386- and I486-based EISA and MCA PC vendors.

When bus-mastering LAN adapters and disk-drive controllers are utilized, such as the Compaq Intelligent Drive Array controller and the IBM MCA small computer systems interface, adapter network performance can be significantly improved. It is in such environments that the I486-based PC as a LAN server can, indeed, be very cost-effective.

PERSONAL COMPUTERS

Apple's hanging in

And what about Apple Computer, Inc.? Motorola, Inc.'s CPU-based Apple Macintosh II systems are very popular in the corporate market for graphics-intensive applications such as desktop publishing, drawing or design.

They can be seen as competitors to any 386SX-, 386- or I486-based computer that is used with a graphical user interface such as Microsoft Corp.'s Windows or OS/2 with Presentation Manager.

The 25-MHz 68030-based Macintosh IICI computer provides performance comparable to 25-MHz Intel 80386-based PCs in similar applications, such as Microsoft Word, Aldus Corp.'s Pagemaker and Autodesk, Inc.'s Autocad. The 40-MHz 68030-based Macintosh IIFX's speed can be compared with Intel I486-based systems performance.

The problem comes in with price. Although Apple products are priced similarly to IBM and Compaq high-performance systems and carry a reputation for ease of use and learning, corporate users generally perceive the Macintosh investment to be more costly than the Intel CPU-based personal computer investment.

This is largely because of the lack of Macintosh system competitors and the higher prices associated with Apple Macintosh add-on products and peripherals.

Every personal computing platform has its price/performance advantages and disadvantages, so the issue essentially boils down to preference and money.

The general rule of thumb in most businesses is to purchase the most PC affordable, and various buying trend analysis reports indicate that 386SX-based PCs are poised to take over the low-end market, while 25- and 33-MHz 386 PCs will be the general-use platform of choice for quite some time.

Additionally, 386 systems with 32K- or 64K-byte RAM caching systems and fast hard disks based on the IBM PC AT bus architecture are clearly outselling both EISA- and MCA-based computers. The 32-bit bus architectures are, however, finding a home in LAN server applications, which is likely to be the case until more bus-mastering I/O boards that take advantage of EISA and MCA enhance single-user applications enough to affect the buying habits of business users. ●

WORKSTATIONS

Continued from page 98

offers three entry-level Aviion machines — AV 100, AV 200 and AV 300 — based on the Motorola, Inc. 88000 RISC family.

At the lower level is the recently announced Aviion AV 100, priced at $3,995 for 17 MIPS. Next is the more expandable Aviion AV 200, priced at $5,590. A similar configuration with a 179M-byte external disk is priced at $8,950.

The Aviion AV 300 provides 17 or 20 MIPS, depending on which processor is chosen, at a base price of $8,650. A similar configuration with a 322M-byte external disk is priced at $14,095, and a diskless color configuration with a 19-in. monitor is priced at $11,995 — including 332M bytes of external drive at $17,390.

These prices are for a 16.67-MHz CPU. For the 20-MHz CPU, add $2,000 to each price. The Aviion workstations have a reputation as price/performance leaders.

● Steve Jobs recently introduced Next's workstation family based on the Motorola 68040 CPU. Next machines are particularly appealing to application developers because of the Nextstep object-oriented application environment.

Business users have tended to shy away because of the lack of applications. However, there has recently been a slew of products announced for Next from companies such as Wordperfect Corp. and Lotus Development Corp., the latter debuting Improv, a spreadsheet package, on the Next platform.

Due to ship this month are the new "pizza box-style" Nextstation and the Nextcube. The latter machine retains its famous cube style and provides more expendability and more storage options, including a 256M-byte rewritable optical drive.

Next has also announced new color options due in the first quarter of 1991.

Ultimately, the users who make the most successful choice will have concentrated on the applications and expandability issues, having left the performance numbers game for those who want to brag about snagging "15 MIPS for under $5,000." ●

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Cost-cutting measures can rechannel reseller routes

BY ALAN RADDING

The price drops that are turning the heads of people who purchase high-performance personal computers and workstations have also begun restructuring and multiplying the paths through which these machines are sold.

The biggest news is on the workstation side, where users will ultimately be able to choose among the same channels as high-end PC purchasers, including direct sales forces, value-added resellers (VAR), retailers and mail-order companies.

Until now, customers in search of a reduced instruction set computing (RISC)-based Unix workstation had two choices: buy through a specialized VAR or the manufacturer's direct sales force.

While there was competition among different manufacturers, it was rare to encounter it between two VARs representing the same manufacturer or between a manufacturer's VAR and the direct sales force.

Reshaped

The new sales channels are still evolving, but the outline is already apparent. In addition to the direct sales force and a few selected VARs, workstations will be available through a growing number of computer retailers. RISC workstations will even be available through direct response (mail-order) marketers. "Eventually, they will be sold by everybody," predicts Steven Hess, executive vice president at Creative Strategies Research International in Santa Clara, Calif.

There are two reasons these lower priced machines open up the selling channels: For one thing, manufacturers want to target their low-end models at a wider market than the scientific/engineering segment.

For another, a $5,000 workstation offers a lower rate of return than a $20,000 one. "At these prices, the companies just can't afford to sell direct," says Tom Farre, associate publisher of *Reseller Management*, a monthly magazine in Morris Plains, N.J.

Sun Microsystems, Inc. in Mountain View, Calif., has taken its first step toward wider availability. The firm has signed two computer retail franchisers — Intelligent Electronics and Microage — to be outlets for Sun products.

Digital Equipment Corp. has also established a channel into the computer retail market by teaming up with Merisel, a California-based wholesale distributor.

Such arrangements give rise to something workstation sellers have not yet experienced: competition among channels as well as between sellers within a channel. Price wars may not be far off.

Resellers are already expressing fears that the increased competition will reduce profit margins to the slimmest of levels, as it has in the PC market.

"My No. 1 concern is that it may open a Pandora's box," says Mike Shook, president of CAD Systems of Carolina, Inc., a Sun reseller in Raleigh, N.C.

Some manufacturers will try to control sales by limiting the number of retail outlets carrying workstations, says Joan Reagan, director of computer distribution channel service at Gartner Group/Infocorp in Santa Clara, Calif. But no matter what steps vendors take, she says, within three or four years, workstations will be a commodity product available anywhere high-end PCs are.

Sun is one of the manufacturers trying to maintain a measure of control. The company plans not only to limit the number of franchisers but also to choose them carefully, based on the training and support they can provide, says Xavier Candia, manager of channel development. Even with tight control, however, there is always the possibility of channel conflict, Candia concedes.

In the meantime, resellers are taking steps to ensure they've got the right cards for the newly competitive game. Two aces, Shook says, are the service levels provided by resellers as well as the utility software they can provide.

"For the first 90 days after we install one of these, we're in constant contact with the customer," he says.

"The higher up you go [in the reseller hierarchy], the greater the service component," says Bob Brown, president of R. G. Brown & Associates, an Atlanta-based vendor research firm.

As the new sales channels take shape, however, these distinctions may lose their clarity.

"Forty percent of our retailers proclaim themselves VARs," says John Venator, executive director of ABCD: The Micro Computer Industry Association in Schaumberg, Ill. Most of these retailers already sell high-end PCs and networks and will increasingly sell RISC-based Unix workstations.

The strength of the local retailers, Venator says, is the nearby support and service they provide. "People don't want telephone support or even third-party, next-day service. They want same-day local service."

The investment in staff and training to sell workstations will be high, however, and Venator predicts a shakeout. "RISC is going to require more training and more money," Venator says. "Some won't survive."

The added investment will also play into resellers' hands by reducing the retailer's ability to wage aggressive price campaigns.

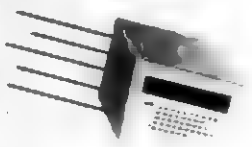
As the new channels evolve, established workstation resellers will have to find solace with a smaller slice of a much larger pie, while buyers will find that they can shop for the combination of price and service that's right for them. ●

Radding is a free-lance writer in Newton, Mass.

Mail-order currents

There are fewer ripplings in PC sales channels, but more than one new wave is cresting in the direct-response mail-order market.

Many corporate purchasers have avoided this channel because of the apparent seesaw-like trade-off between low price and little — if any — support. The only people who would risk sticking their toe into the direct-response channels were those with a considerable in-house support staff and "some sophisticated buyers who might go to direct response to pick up a couple more machines and low-ball it," says John Venator, executive director of ABCD: The Micro Computer Industry Association in Schaumberg, Ill.



Many mail-order firms, including Dell Computer Corp. in Austin, Texas, Northgate Computer Corp. in Eden Prairie, Minn. and Gateway 2000 are working to change that picture, however, boosting their service and support, providing toll-free, 24-hour telephone service and establishing relationships with nationwide on-site service organizations. Northgate recently teamed up with Sorbus to service its clients, and Dell has aligned with Xerox.

The beefed-up service has some analysts predicting that corporate purchasers will begin taking a more serious look at this channel. "There are some very good mail-order houses that provide as much or better support than retailers," says Steven Hess, executive vice president at Creative Strategies Research International in Santa Clara, Calif. The only thing they lack, he continues, is vertical-market expertise.

Clashing with the new support offerings is a move by some of the direct-response sellers to place their machines in retail-store shelves. For instance, Dell has started selling its product line through Soft Warehouse, a PC mass merchandiser, says Dell spokesman Brian Fawkes.

To blur the distinction between direct-response and other channels even further, Dell and Northgate are starting to offer RISC-based products. Dell already offers a RISC-based disk drive array through Soft Warehouse and mail-order, and Northgate will soon offer a Sparcstation at "a very competitive price," says Art Lasere, chairman of the firm.

Such a machine may be the death knell for the higher margins currently found in the workstation business.

ALAN RADDING

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The charts shown use figures included in a 1990 study conducted by Diagnostic Research, Inc. among Fortune 1000 MIS managers familiar with Macintosh and MS-DOS or Windows systems. Call and we'll send you logo. Mac, Macintosh, and "The power to be your best" are registered trademarks, and SuperDrive is a trademark of Apple Computer, Inc. MS-DOS and Windows are registered trademarks of Microsoft

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BUYERS' SCORECARD

Vectra rates highest in PC satisfaction

Personal Computers

Total scores reflect all criteria and their user-assigned importance
Response base: 50 users per product
(Scores are rounded)

Product	Three highest ratings	Three lowest ratings
Hewlett-Packard Co.'s Vectra 386 series SCORE 66	Reliability Ease of use Availability of application software	Value for the dollar Quality of documentation Availability of upgrade options
Compaq Computer Corp.'s Deskpro 386 series SCORE 65	Availability of application software Compatibility with installed hardware Reliability	Responsiveness of vendor service Vendor service and support Value for the dollar
IBM's PS/2 (386 models) SCORE 65	Availability of application software Compatibility with current software Ease of use	Quality of documentation Value for the dollar Effective disk speed
Apple Computer, Inc.'s Macintosh II series SCORE 63	Ease of use Ease of installation Availability of application software	Responsiveness of vendor service Vendor service and support Value for the dollar
AT&T's 6386 series SCORE 62	Availability of applications software Compatibility with current software Ease of use	Quality of documentation Value for the dollar Availability of upgrade options

BY MICHAEL L. SULLIVAN-TRAINOR
CW STAFF

For all their differences, personal computers and larger systems share one similarity: the way potential purchasers judge them. This is especially true when buyers are charged with investing in large numbers of PCs for an entire division or firm.

Whether large system or PC, the product that performs best in areas such as reliability, service and support and value receives the highest ratings. Reliability was rated as the most important criterion by 250 PC purchasers surveyed in *Computerworld*'s Buyers' Scorecard survey on popular PC systems from five vendors.

The system that claimed the highest ratings from its users in this category was Hewlett-Packard Co.'s Vectra 386 line of PCs. Vectra garnered the highest satisfaction ratings overall, giving it a slight edge over Compaq Computer Corp.'s Deskpro 386 and IBM's Personal System/2 Intel Corp. 80386-based models. Rated fourth overall was Apple Computer, Inc.'s Macintosh II family, while AT&T's 6386 line placed fifth.

Buyers at large installations within Fortune 1,000 companies rated only the family of PCs they are currently using. Fifty respondents were surveyed for each product family. Overall scores were derived by multiplying the ratings each respondent group gave its own product family by the importance factors all users assigned to the criteria (see methodology next page).

Vectra also topped the service and value categories, which were seventh and eighth in importance to users who ranked 17 criteria.

When attention turned to technical performance, however, it was Compaq's turn to shine. Compaq users gave the Deskpro the highest rating in three out of the six key ratings: overall performance, hardware compatibility and applications availability. The Deskpro also rated highest in processor and video speed.

IBM's PS/2 came out ahead in a mix of categories, including compatibility with current software, ease of maintenance and ability to configure.

The Macintosh II series rated above its competitors in ease of use and documentation quality. Apple users also gave it a slight edge in availability of upgrade options. But last-place finishes in compatibility, service and availability of software categories lowered its ratings overall.

AT&T's systems finished last in eight of the 17 areas but mustered third-place finishes in software availability and responsiveness of vendor service.

The results are consistent with the market positions of each system. AT&T is a relative newcomer to the 386-based commercial PC arena, while IBM and Compaq have been battling in a near-even contest for some time.

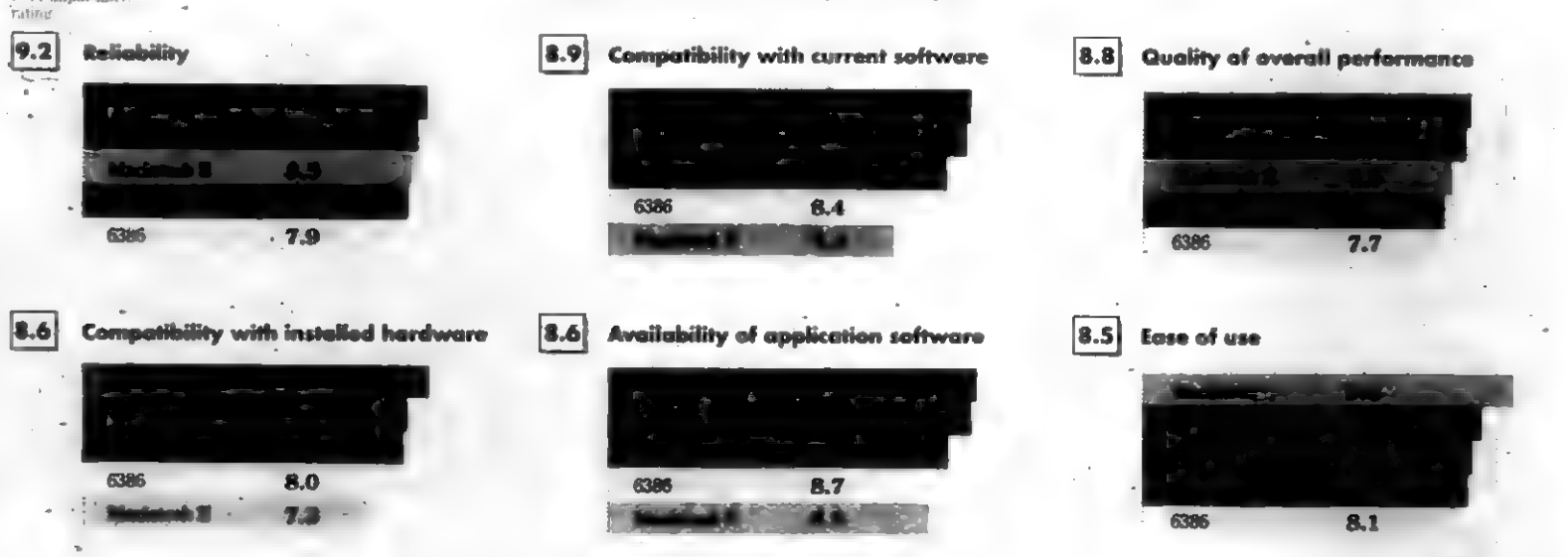
HP has made it a practice to emphasize service, support and reliability even when its PCs are sold through indirect channels.

The thorn in Apple's side has been a lack of software compared with the vast array of IBM Personal Computer-compatible software, and indirect sales make service and support difficult. ●

KEY RATINGS

HP's Vectra users give it the highest ratings in five categories as well as reliability – the most important criterion to all users surveyed – but Compaq's Deskpro wins top accolades for overall performance, hardware compatibility and availability of application software categories
(Ratings are rounded to one decimal place)

User importance rating



CW Charts: Paul Mock

A CLOSER LOOK

IBM's PS/2 ties with HP's Vectra for ease of maintenance and ability to configure. Apple's Macintosh II tops ease of installation and quality of documentation categories. AT&T's 6386 captures second in effective disk speed, but places last in 5 of 11 categories

User importance rating:

8.3 Responsiveness of vendor service

8.2 Vendor service and support

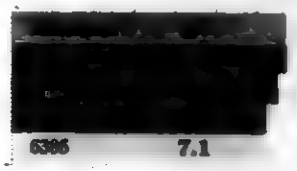
8.0 Quality of documentation

7.5 Ease of installation

7.4 Effective processor speed

8.3 Value for the dollar

7.7 Availability of upgrade options



7.4 Effective disk speed

8.3 Ease of maintenance

7.6 Ability to configure

7.4 Effective video speed

Loyalties

Would you buy the product again?
(Reasons based on most frequently stated responses)

Vectra
Response base: 50
Likely — The reason: Reliability
9 — Unlikely — The reason: Overpriced
Number of respondents

Deskpro
Response base: 50
Likely — The reason: Reliability
4 — Unlikely — The reason: Support
Number of respondents

PS/2
Response base: 50
Likely — The reason: Reliability
6 — Unlikely — The reason: Better value available elsewhere
Number of respondents

Macintosh II
Response base: 50
Likely — The reason: Ease of use
6 — Unlikely — The reason: Other systems more productive
Number of respondents

6386
Response base: 50
38 — Likely — The reason: Price
12 — Unlikely — The reason: Lack of compatibility
Number of respondents

Verbatim

What do you like best/least about this product?
(Responses are based on most frequently stated answer)

	Likes	Dislikes
[redacted]	Reliability Quality Speed	Price Hard drives Service and support
[redacted]	Reliability Speed Compatibility with hardware/software	Price Lack of compatibility with other systems Service and support
[redacted]	Reliability Compatibility with hardware/software IBM reputation	Price Lack of expansion slots Slow
[redacted]	Ease of use Graphical interface Ability to interface with LANs and printers	Price Lack of compatibility with IBM products Slow processor
6386	Reliability Speed Price/performance	Breakdowns/downtime Limited compatibility with other hardware/software Documentation

METHODOLOGY

Products rated in *Computerworld*'s Buyers' Scorecard on personal computers were selected in the following manner: The products had to be from one of the five leading PC vendors in the commercial Fortune 1,000 marketplace, based on installation base and revenue.

Within that sample, they also had to be the largest capacity, most widely installed systems that were comparable in terms of size and capabilities.

The following made up the installed market share of the top five vendors at Fortune 1,000 sites: IBM — 60.6%, Compaq Computer Corp. — 8.4%, Apple Computer, Inc. — 6.7%, AT&T — 3.1% and Hewlett-Packard Co. — 2.4%, according to Computer Intelligence in La Jolla, Calif.

The survey was done by telephone interviews conducted by First Market Research in Austin, Texas, using names selected randomly from non-vendor sources. A minimum of 50 users was required for each product set.

Total weighted scores were computed by multiplying the mean scores that users assigned to the importance of each criterion by the mean scores each user group gave its own product.

RESPONDENT PROFILE

Most of the 250 respondents (44%) purchase their PCs through dealers. One quarter purchase the bulk of their PCs directly from the vendor, and another 20% buy either through a value-added reseller or retailers.

Seventy-four percent of the respondents buy the majority of their applications off the shelf, and the remainder develop their own customized applications.

The respondents say that an average of 40% of their PCs are connected to local-area networks. They say that percentage will grow to 66% in the near future.

In addition, 46% of the respondents have moved mission-critical applications from larger systems to PCs and PC networks.

ACKNOWLEDGEMENTS

Computerworld would like to acknowledge the assistance provided by the following individuals and organizations in the preparation of this edition of Buyers' Scorecard: Dan Ness, Computer Intelligence; Dataquest, Inc.; Bruce Stephen, International Data Corp.; and Tom Wilmott, Aberdeen Group.

There are some pitfalls to avoid on used route

BY ALEX RANDALL

If you are about to plunk down $10,000 for the computer of your dreams, shouldn't you consider an option that could almost halve that figure?

That option is one that purchasers are only now starting to take seriously: the used computer. With hundreds of rungs on the computing ladder, from toys to supercomputers, the chances are fairly good that the system of your dreams is someone else's throwaway — and an inexpensive one at that.

As soon as the wrappings are undone, the dealer's premium over the manufacturer's price evaporates, thus reducing the computer's value by 40% of its purchase price.

There are no guarantees on the used route, of course; you could drop a lot of cash and end up with a lemon. In addition, corporate buyers accustomed to purchasing new equipment will need to stay flexible to shift with the new business ground rules. The key is to educate yourself before entering the used computer market. Here are some dos and don'ts:

• **Know what you want before you shop.** The variety of machines found in the new computer market is amplified a hundredfold in the used market.

Not only are all the new models available at used discounts, but also all manner of former hits, discontinued models and relics of earlier eras. With all the choices, it is best to have a specific system and configuration in mind.

• **Thoroughly research the available channels before making a purchase.** Used computer buyers are frequently guilty of insufficient research. If you think a quick perusal of the newspaper want ads is enough to find a great deal, you may throw away a lot of money on the wrong system. Buying a computer is about consuming information. It is smart to check a variety of sources — stores, trade-in centers and computer brokers — before making a purchase.

In general, the newspaper seller is to be avoided. For one thing, you will have to handle all the details of the deal, leaving yourself open for the "busted-box ripoff."

Used computer brokers or used computer stores are safer routes. A professional broker will hold your funds in escrow until the system is in your hands and has been tested.

• **Pay attention to pricing.** Prices of used computers vary widely, but there are a few purchasing guidelines to follow. In general, brand-name computers from the standard-setters hold their resale value better than inexpensive clones, and fully configured systems are valued higher than machines that are off-standard.

There is also an active worldwide used computer market, and — like stocks and commodities — there is a "fair market price." The Boston Computer Exchange, Exsel, Inc. in Rochester, N.Y., Century Computer Brokers in California and the National Liquidators Association all currently offer indexes that provide a yardstick of what consumers should be paying for various models.

• **Consider getting an appraisal on the system.** Staying on top of prices can be a full-time job, so another route is to get an appraisal from a professional. An appraiser can also get you a firm idea of the value of your current equipment as well, making it easier to decide whether to keep or sell what you own.

• **Test equipment before you commit funds.** Before you buy, you need to make sure that the system will operate correctly. Unscrupulous sellers will try to sell systems that never worked or gear that they broke.

A test upon arrival is worth more than a 30-day warranty. Warranties are actually not worth very much in the used computer business. Most computer equipment that works on arrival will operate without a problem for many months more than the warranty covers.

Moreover, most warranties on used gear are depot warranties that amplify the downtime of a failing machine.

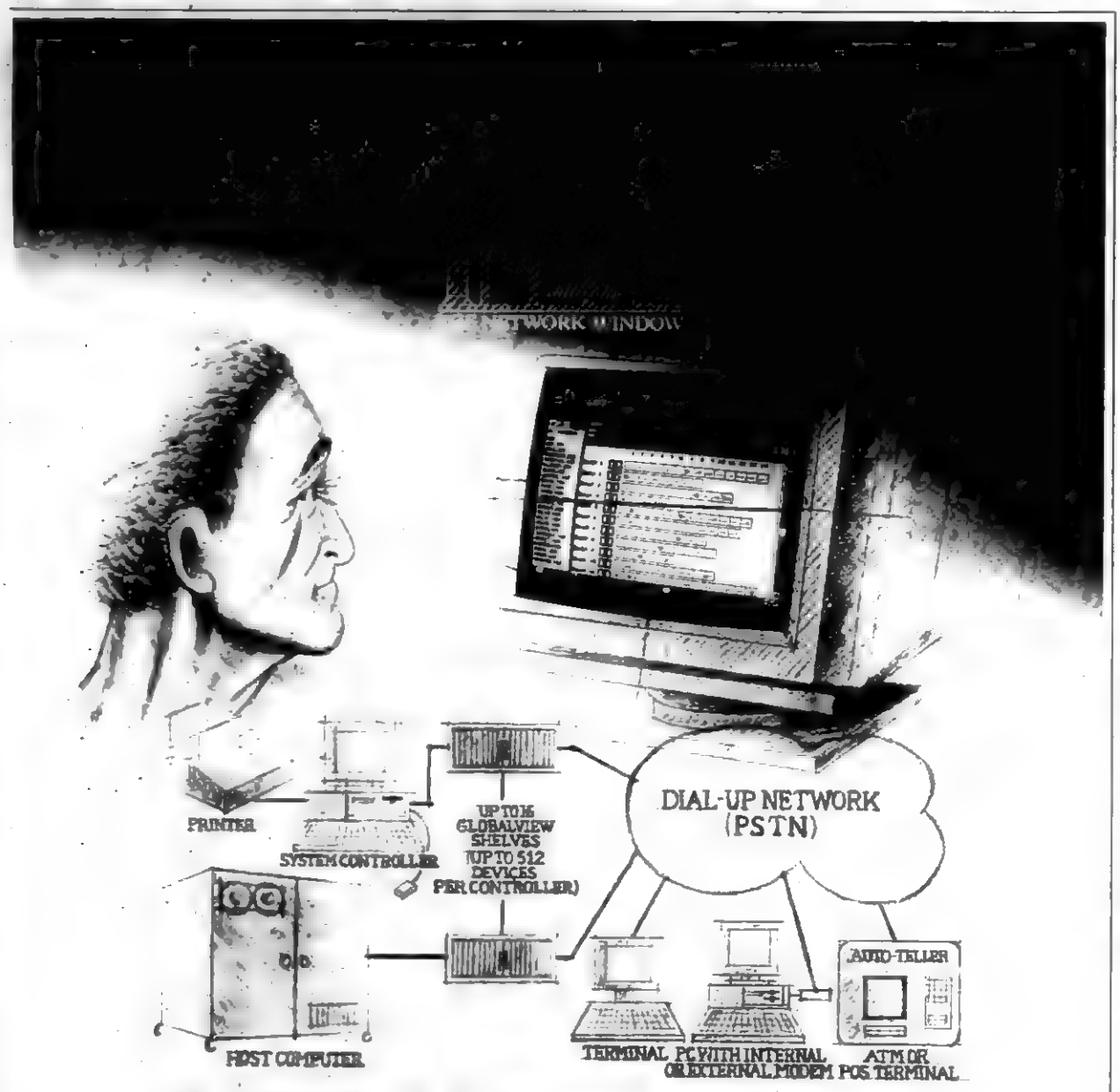
As a final fallback route, make sure that an inoperative system can be returned.

• **Inquire about the computer's former owner.** Avoid buying a system that's been used in a smoke-filled environment or an industrial setting. Dust and smoke are hard on computers, and if the system was not ruggedized, it may well have been damaged by the exposure. The same is true for computers that have been used in high temperatures or damp areas.

• **Don't buy outmoded equipment.** Avoid systems that are no longer attracting software developers' interest. Antiques from the early 1970s with old operating systems can be purchased for petty cash, but there are few new pieces of software for really old machines. You have not saved any money if you buy an over-the-hill system.

Continued on page 107

Randall is the author of Alex Randall's Used Computer Handbook and the president of the Boston Computer Exchange.



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UDS
MOTOROLA

ASK THE VENDOR

I use two microcomputer add-in boards — the AT-Super for Personal Computer AT compatibles and the Nusuper for Macintosh IIs — to develop applications such as a Postscript-like interpreter and a color separater.

How fast can I expect print throughput to be? What would be the average number of text pages and average number of graphics pages per minute?

Patrick Wood
Vice-President of R&D
Pipeline Associates, Inc.
Morris Plains, N.J.

YARC SYSTEMS CORP.: The speed depends on the application. Our fastest implementation of a Postscript-compatible interpreter can run 10 to 40 times quicker than an MC68020 Apple Laserwriter NTX.

In addition, multiple Yarc coprocessor systems may be placed on the bus of your microcomputer, enabling multiple Postscript interpretation jobs to run at the same time, thus further increasing throughput. This would be useful, for example, for a PC network printer server controlling a departmental laser printer.

I'm using the Mach² personal computer controller board, which is an accelerator board coupled with a tape drive and software. Is there any way I can save files directly to the tape drive without having to go through your software?

Hermine Kryza
System Manager — Data Processing
Wright City College
Chicago, Ill.

MOUNTAIN COMPUTER, INC.: This is not possible with the current software application. The Mach² controller and its software are what allow the high-speed data transfer rates for Mountain's File Safe 8000 Plus.

The Mach² works with the File Safe tape software application to format the data mini-cartridges on the fly, as data is written. With other mini-cartridge tape drives, the tapes must be formatted before they can be used.

Continued from page 106

• Try to get extra software and peripherals in the deal. Ask the seller what particular programs are being sold with the machine. It is common for a seller to include software and peripherals while charging only the value of the core system. If the fit is a good one, you may get a really good deal on the whole package.

• Make it legal; get a bill of sale and all copies of any software. Make sure that you legally transfer the software licenses with the computer. The old owner should deliver *all* copies of the software as well as the originals. The new owner should write to the licensors and inform them of the license transfer. Not only is this legally correct, but it allows the software maker to update the new owner with the latest releases.

• Keep redundant machines for backup. If your used computer is performing a critical task, then maintain redundant systems and keep a service contract on them for the long term.

• Keep in mind the resale. Computers are like baby clothes: You outgrow them before they wear out. In order to keep resale value high, purchase quality goods with well-known brand names that will hold their value.

In addition, keep all the boxes, pieces and manuals that came with the machine. When it's your turn to sell the system, the next owner will likely pay more for a complete system than one that's missing all the details. •

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PC purchases: Much more than just buying a box

FIRST PERSON

BY JACQUELINE A. BYNSDORP

One of the biggest lessons I have learned as a personal computer coordinator at Jockey International, Inc. is that to treat any request for a new PC as a simple purchase decision would be to shortchange the user, the department and the organization.

Bynsdorp is personal computer coordinator at Jockey International, Inc., an apparel firm in Kenosha, Wis.

There are 200 PCs at my firm, including machines from IBM, Compaq Computer Corp., ITT and various clone makers, as well as Toshibas and NEC portables. These are typically used by one or several people within a department.

When someone requests a new PC, I interview each person who would use the new equipment to find out what they expect to gain from the machine.

During these interviews I also analyze the business problem at hand. If it seems to be addressable via a hardware/software solution on existing PCs, I verify this by examining machines in the department for a variety of things.

First, I determine whether there is available time. Installed on each PC is a usage tracking utility, which I use to run a report indicating the amount of time used for each application.

I also check the amount of hard disk space available by running CHKDSK.

I calculate the amount of hard disk I'll need by checking the hardware specification sheets and then estimating the additional space I'll need for data by looking at similar applications already in use. By examining existing configurations, I can determine whether the new use can be incorporated in an existing unit.

I also keep a fully configured unit in stock as a replacement unit. If I determine that a PC cannot be justified, or if there isn't enough time on existing computers, this PC can be used.

After conducting the interviews, I either install canned software packages, additional hardware or both or put together a new configuration list.

With turnkey systems, the contractor often supplies the hardware and software. Keep in mind, however, that if the vendor supplies hardware support, the price will be higher. This is money well spent, although the vendor may object to the PC being used for other purposes.

When purchasing a turnkey system, hardware requirements must be checked thoroughly — looking beyond spec sheets. I always discuss worst-case scenarios with my technical representative and contact businesses with similar installations, taking advantage of their experience and knowledge.

If installation needs are not met, the end result could be a potential upgrade and lost time.

When purchasing hardware, I refer to a spreadsheet that I maintain, stating prices of supported hardware and listing various vendors. I also maintain a list of specials offered by the manufacturer to keep me informed of where the largest quantity discount is available.

If time frames on the specials coordinate with a purchase need, I may purchase several PCs, buying only the basics on the extras, so that they can be upgraded when specific requirements are clear.

Looking ahead

When making the purchase decision, a couple of key factors come into play, above and beyond the users' needs. These include future expansion, compatibility with existing systems and establishing corporate standards for hardware and software.

When buying strategies are defined, equipment interchange is easier, service disruptions are minimized, and opportunities for quantity discounts are maximized.

Sticking as much as possible to one brand of PC makes coordination and upgrading easier.

However, all our PCs are not from the same manufacturer. I base the decision of which vendor to use on price, necessary technical support and service reputation, when applicable.

I also need to ensure that purchases align with the technical skills and existing systems within our current computer operation. For example, if a proposed PC is needed to access data in the host computer, I must coordinate this with operations. I therefore purchase emulation boards of the same manufacturer type as the mainframe, PC and PC support to the mainframe, allowing better support.

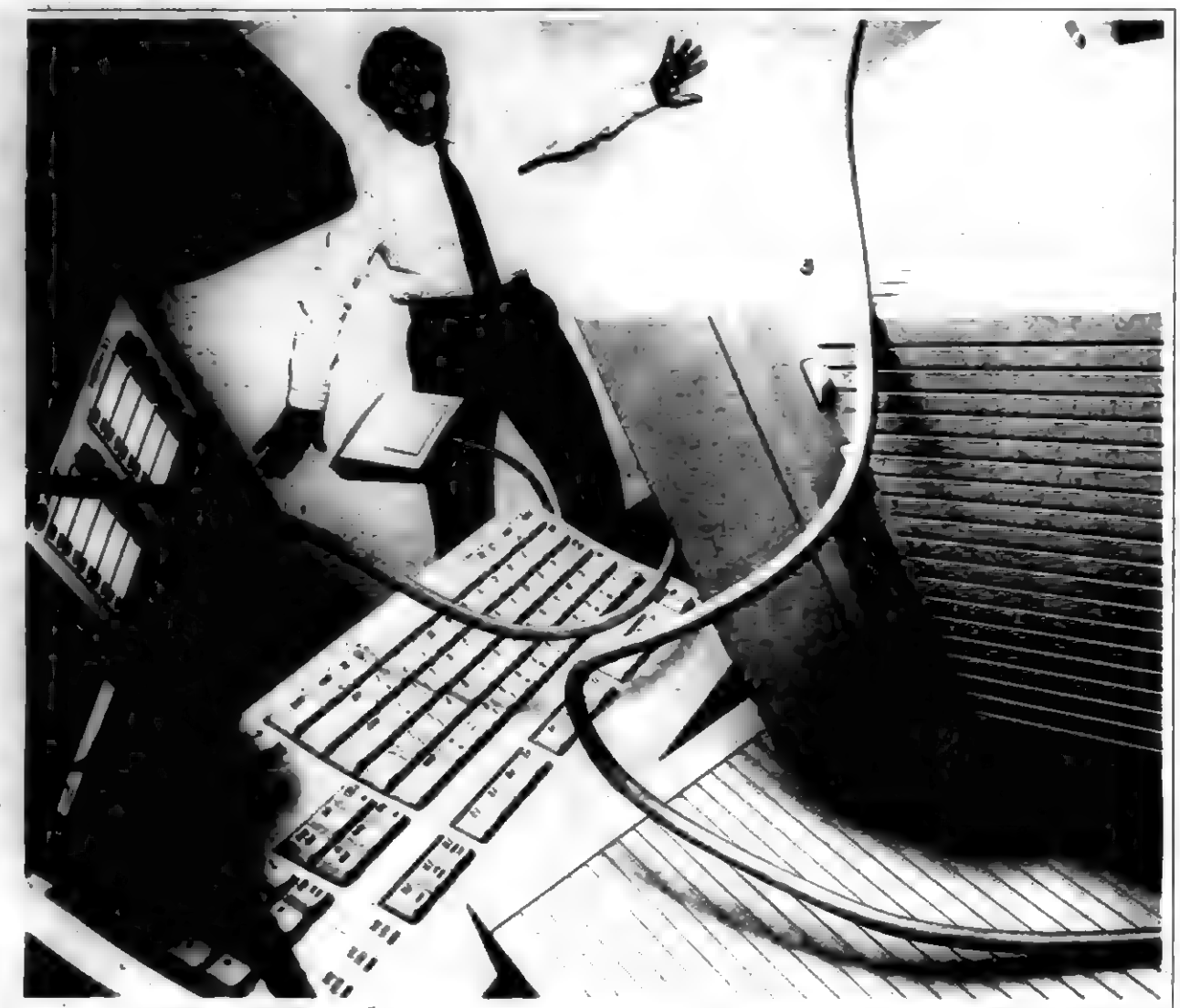
Even if a PC being installed in a user's area does not require emulation, that need may change. Consequentially, purchasing consistent PC brands allows for configuration changes as necessary.

It is very important to be familiar with hardware and corporate-standard software throughout the company.

Just because I decide to make a purchase does not mean it will be justified by the finance department. With budgeting constraints, it can be difficult for me to justify the need for an extra expenditure.

If the PC being considered is the first

Continued on page 109



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Continued from page 108

system in a department, it is a good idea to develop an application to verify justification. This also familiarizes someone within the department with the new computer.

Sometimes, no matter how much I would like a particular application, I just can't justify it. For instance, I am currently looking at desktop publishing. However, the desired hardware/software combination does not fall into my list of corporate standard equipment.

When it comes to deciding between an upgrade and a new system purchase, I need to weigh a couple of factors. For instance, if I am installing a unit with a low-end configuration requirement — such as an Intel Corp. 8088-based system running at 8 MHz with a 20M-byte hard disk and no graphics — I could simply take an old IBM Personal Computer XT out of storage. However, if the PC will serve a critical function, I'd rather install a new unit, because the machine may someday need to be integrated with other systems.

I HAVE PURCHASED units from all sources: dealer, retailer and mail-order, with the latter offering the best pricing for quantity purchases.

I determine this by interviewing senior department representatives and evaluating the source of input, the complexity of the data manipulation and the distribution of the output.

Keep in mind that support for older units is often more difficult to obtain, even with service contracts. Accelerator boards and other methods of upgrading are not appealing to me, since upgrade costs are high compared with the decreasing costs of new technology.

At times, I need to make quantity purchases, such as when we automated our sales force. In that case, I put a project out for bid.

I prefer to see several manufacturers' models at the same time and test read/write speeds, features and available options. Vendors are usually happy to accommodate this type of request.

I have purchased units from all sources: dealer, retailer and mail order, with the latter offering the best pricing for quantity purchases.

Participating in manufacturers' warranty programs and having a national service contract, these types of purchases are cost-effective if there are no configuration issues to satisfy.

However, for more sophisticated configurations, particularly networks requiring addressing of cabling, uninterruptible power supply, a variety of printers and quality-control devices, I am most comfortable working with retailers who offer on-site service and research.

To help with sourcing, I check the spreadsheet mentioned earlier. I am also contacted regularly with updated price lists from various vendors. I offer a limited group of PCs, peripherals and software programs, which allows for better support service.

All of this sounds like a lot of work, but when managed properly, PC operations can be an integral partner in achieving corporate goals. •

If you want a Super VGA, here's how to buy

BY JON PEDDIE

Recalling the adage: "If it ain't broke, don't fix it," some people may wonder why they should opt for Super Video Graphics Array (VGA) when regular VGA has already established itself as the de facto standard in personal computer and workstation displays.

The answer depends on the type of applications you are using, your budget and your technical competence.

In general, popular applications such as spreadsheets, terminal emulation, word processing and database systems can take advantage of higher-resolution displays, but these users typically have small budgets and little technical interest or competence in Super VGA.

Applications more often associated with higher-resolution capabilities are computer-aided design, desktop publishing, desktop presentation and slide generation.

IBM first introduced VGA in 1987. At its highest resolution — 640 by 480 pixels — it displays 16 colors. Its analog output allows a much wider range of colors at lower resolutions as well. For example, VGA can display 256 colors at 640 by 240 pixels.

Clone manufacturers proceeded to play around with the basic design of VGA, increasing memory size and clock rate. Eventually, they extended the resolution to 800 by 600 pixels, and thus was born "Super VGA."

With very few exceptions, almost every company that makes a VGA card (more than 85 at last count) also offers a Super VGA version.

There are differences among them — some offer the lowest possible cost (and minimum features), some have greater speed, some can work with more applications, some are especially well suited for a particular application, some have very high resolution and some are even capable of capturing a television image and displaying it.

You shouldn't choose a VGA card without knowing what application, or applications, you want it for. Users can be defined in the following three categories:

- Amateurs, or those who use an application fewer than three hours per day.
- Professionals, or those who use one or two applications four or more hours per day.
- Power users, or those who may be either an amateur or a professional but have to have — and can afford — the best or the fastest.

An amateur needs the most flexible, versatile system. If he has to use word processing one moment and then switch to a spreadsheet and then maybe a communications or database program, he usually can't afford to optimize his system for just one of those applications.

In addition, there are few applications that support the Super VGA mode. When a VGA card is turned into a Super VGA by the manufacturer, it no longer has the universality of a generic VGA. Because it has a high-resolution display, a special software program called a driver is needed for each application.

Application developers don't want the burden of writing special interfaces to all the display cards available. They typically offer IBM's Enhanced Graphics Adapter (EGA), Hercules, VGA and one or two special products such as IBM's 8514/A.

To get a Super VGA card to work with an application, the card manufacturer has to write the driver. However, even though a Super VGA card manufacturer may offer a driver for your favorite application, it may not be for the version you want to use.

So, when considering a Super VGA, the first thing you have to do is find out if the card you are interested in comes with a driver for your applications.

The physical size of your characters is something else that will change with a Super VGA card. As resolution goes up, the physical size of the pixels on the screen goes down.

Therefore, if a character in seven- by nine-pixel resolution looks good on a standard 14-in. VGA screen, that same character will be 40% smaller at 1,024- by 768-pixel resolution and 20% smaller at 800- by 600-pixel resolution.

Another cost factor is the monitor. If you have an EGA display now and want to move up to a Super VGA display, you are going to also have to buy a new monitor.

If you have a fixed-frequency VGA monitor and want to use a Super VGA card, you will still need to get a high scan-rate monitor. This is one of the reasons the multisynchronous monitors have been so popular.

If you're trying to get a lower cost Super VGA, you can play around with the different refresh rates. Refresh rate is the speed at which the screen is updated, and the higher the refresh rate, the greater the cost of the monitor.

You can also choose between interlaced and noninterlaced. If every other line of the screen is refreshed every other screen update, it is interlaced, like a TV.

A 30-Hz interlaced monitor will cost a lot less than a 60-Hz noninterlaced one.

And then there is Extended VGA, which the vendors can achieve by adding additional memory (up to 1M byte). These cards offer 256 colors at 1,024- by 768-pixel noninterlaced mode. •

Peddie is president of Jon Peddie Associates, a consulting firm in Oakland, Calif.

Top-selling VGA boards

	Genoa Systems Super VGA	Grundbog Graphics Shadow	Paradise Systems 1024	Video Seven VRAM	Hercules VGA Card
Displayable colors at a resolution of:					
640 x 480	256	256	256	256	16
800 x 600	256	256	256	256	NA
1,024 x 768	16	256	16	16	NA
VGA chip used	Genoa	Tseng 4000	WD90C11	LIA4190	Chips & Technologies
Memory on card (bytes)	512K	1M	512K	1M	128K
Refresh rate available*	30I to 70NI	60NI	50NI to 72NI	60NI	60NI

*I stands for interlaced; NI stands for noninterlaced

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1090/2090, 1290/2290

AT&T's Composite Cable is constructed with two 4-pair 24 gauge copper inside wiring cables combined with two 62.5/125 micron fiber cables. In combination with AT&T baluns and adapters, this cable provides the means to serve multi-vendor data systems for distances that meet or exceed those normally encountered from workstation to closet.

Multi-Media Outlet

AT&T's Multi-Media Outlet terminates the cable at the workstation and is easily assembled into a compact telephone and data information outlet. The outlet accepts standard copper and fiber connector parts (including FDDI) and is ideal for baseboard, raceway or wall installations.

ST® II Connector

The AT&T ST II Multimode Lightguide Connector is specifically designed for distribution applications and for use in cable-to-cable or cable-to-equipment multimode individual fiber connections. In addition, it is easy to terminate, having only a single crimp sleeve.

AT&T
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PRODUCT SPOTLIGHT

Entry-level commercial workstations

VENDOR PHONE	WORKSTATION	COMPARABLE SYSTEMS	TYPE OF PROCESSOR	OPERATING SYSTEMS SUPPORTED	CLOCK SPEED (MHz)	PERFORMANCE IN MIPS[1]	PERFORMANCE IN MFLOPS[2]	CACHE (BYTES)	PORTS	MEMORY RANGE (BYTES)	MAXIMUM DISK CAPACITY (BYTES)	SCREEN SIZE	COLOR OR MONOCHROME MONITOR (INCHES)	GRAPHICS CAPABILITIES	SUPPORTS ETHERNET OR TOKEN-RING	NETWORK PROTOCOLS SUPPORTED	PRICE
Compaq Computer Corp. (800) 888-0220	Compaq 386/33	Sun Sparcstation 1+	Sparc (proprietary)	SunOS 4.1	20	12.5	3 - 5 single precision; 1.4 double precision	64K	Two serial	8M - 64M	1.3G	19	Monochrome	2D	Ethernet	NFS,TCP/IP	$5,995+
Data General Corp. (800) 328-3436	Aviion AV300	Sun Sparcstation SLC	Motorola 88000	DG/UX	16.7	17	2.25 single precision; 1.27 double precision	16K	Two serial	8M - 16M	4G	20	Monochrome	2D	Ethernet	BSC, HDLC, SDLC, HASP, OSI, NFS, SNA, TCP/IP, X.25	$3,995+
	Aviion AV280	Sun Sparcstation SLC	Motorola 88000	DG/UX	16.7	17	2.25 single precision; 1.27 double precision	16K	Two serial	8M - 28M	4G	20	Monochrome	2D	Ethernet	BSC, HDLC, SDLC, HASP, OSI, NFS, SNA, TCP/IP, X.25	$5,950+
	Aviion AV300, AV310	Decstation 3100, Sun Sparcstation 1+	Motorola 88000	DG/UX	16.7 for Model 300; 20 for Model 310	17 for Model 300; 20 for Model 310	2.25 single precision and 1.27 double precision for Model 300; 2.7 single precision and 1.5 double precision for Model 310	16K	One serial, one parallel	8M - 28M	4G	19 or 20	Either	2D	Ethernet	BSC, HDLC, HASP, OSI, NFS, SNA, TCP/IP, X.25	$8,650 - $14,995+
	Aviion AV400 series	Decstation 3100, Sun Sparcstation 1+, IBM RS/6000	Motorola 88000	DG/UX	16.7 - 20	17 - 40	1.8 - 2.17 single precision; 1.06 - 1.27 double precision	16K	Two serial, one parallel	8M - 32M	4G	19	Color	2D, 3D	Ethernet	BSC, HDLC, SDLC, HASP, X.21, NFS, SNA, TCP/IP, X.25	$14,995+
Digital Equipment Corp. (800) 344-4825	Decstation 2100	Sun Sparcstation SLC, HP Apollo 9000 Series 400	MIPS	Ultrix	12.5	11	2.8 single precision; 1.2 double precision	128K	One SCSI	8M - 24M	4.4G	15, 16 or 19	Monochrome	2D, 3D	Ethernet	NFS, Decnet, TCP/IP	$4,995
	Decstation 3100	Sun Sparcstation SLC, HP Apollo 9000 Series 400	MIPS	Ultrix	16.7	15	4.0 single precision; 1.6 double precision	128K	One SCSI	8M - 24M	4.4G	15, 16 or 19	Monochrome	2D, 3D	Ethernet	NFS, Decnet, TCP/IP	$6,995
	Vaxstation 3100 Model 76	HP	CMOS VAX	VMS	20 mhz	2.0 VUPs[3]	6.4 single precision; 3.7 double precision	128K	One SCSI	8M - 32M	21G	19	Either	2D, 3D	Ethernet	NFS, Decnet, TCP/IP	$11,899
Hewlett-Packard Co. (800) 752-0900	HP Apollo 9000 Series 400 Models 400t and 400s	Sun Sparcstation 1+, Decstation 2100 and 3100	Motorola 68030	HP-UX, Domain OS	50	12	0.5 single and double precision	256K internal; 32K external	Five	8M - 32M for Model 400t; 8M - 128M for Model 400s	1.3G	16 or 19	Either	2D, 3D	Ethernet, Token-Ring	OSI, SNA, TCP/IP, X.25, RJE	$6,990 - $22,990 for Model 400t; $11,990 - $20,000 for Model 400s
	HP Apollo 9000 Series 400 Model 400dl	Sun Sparcstation SLC	Motorola 68030	HP-UX, Domain OS	50	12	0.5 single and double precision	256K internal; 32K external	None	8M - 16M	1.3G	16 or 19	Either	2D, 3D	Ethernet, Token-Ring	OSI, SNA, TCP/IP, X.25, RJE	$4,990 - $6,990
	HP Apollo 9000 Series 400 Model 425t	Sun Sparcstation IPC, Decstation 3100, IBM RS/6000 Powerstation 320	Motorola 68040	HP-UX, Domain OS	25	20	3.5 single and double precision	4K internal	Five	8M - 64M	400M	16 or 19	Either	2D, 3D	Ethernet, Token-Ring	OSI, SNA, TCP/IP, X.25, RJE	$8,990 - $24,990, based on 68030-based model plus $2,000 upgrade
	HP Apollo 9000 Series 400 Model 433t	Sun Sparcstation, Decstation 5000, IBM RS/6000 Model 530	Motorola 68040	HP-UX, Domain OS	33	26	4.5 single and double precision	4K internal	Up to five	8M - 128M	1.3G	16 or 19	Either	2D, 3D	Ethernet, Token-Ring	OSI, SNA, TCP/IP, X.25, RJE	$13,990 - $25,000, based on 68030-based model plus $2,000 upgrade
IBM (800) 426-2468	RISC System/6000 Powerstation 320	Sun Sparcstation IPC and 1+, HP Apollo 9000 Series 400	IBM RISC	AIX 3.0	20	20.5	8.5 double precision	8K instruction; 32K data	Two serial, one parallel printer	8M - 32M	644M	19	Either	2D, 3D	Ethernet, Token-Ring	BSC, SDLC, NFS, SNA, Decnet, TCP/IP, X.25, NCS	$12,995 - $20,695
Micro Microsystems (412) 854-1040	Meridian 4i	Sun Sparcstation 1+	Sparc	DOS, Unix	25	16.8	1.8 single precision	64K	Four	8M - 96M	2G	17 or 19	Either	2D	Ethernet, Token-Ring	BSC, HDLC, SDLC, NFS, TCP/IP	$5,995 - $11,995
Silicon Graphics Systems, Inc. (800) 326-1020	Iris Indigo 3000	Sun Sparcstation 1+, IBM RS/6000 Model 320	MIPS	IRIS/OS (Unix-like)	33	17.9 specmarks[4] (26 MIPS)	6.0 single precision, 3.6 double precision	64K	2 - 34	8M - 128M	8G	16 or 19 color, 17 mono-chrome	Either	2D, 3D	Ethernet, Token-Ring	HDLC, SDLC, X.21, OSI, NFS, SNA, Decnet, TCP/IP, X.25, X.29, TTY, XNS, Modem, OSC	$8,900 - $36,500

Products listed are single-user, multitasking workstations aimed at the commercial business applications market. Scientific, engineering and graphics workstations were excluded. Most machines use traditional workstation processors, such as the reduced instruction set computing (RISC)-based Mips Computer Systems, Inc., Sun Microsystems, Inc. Sparc or Motorola, Inc. 88000 chips. However, the machines listed that are based on Intel Corp. processors, which are not traditional workstation chips, are targeted directly to the workstation market and are comparable in performance levels to workstations.

[1]MIPS = millions of instructions per second.
[2]MFLOPS = full-precision millions of floating-point operations per second.
[3]Specmark = rating given by Spec, an industry consortium, based on testing a technical application suite.
[4]Specifications on the Digital Equipment Corp. Vaxstation 3100 Model 76 were compiled from both *Computerworld* sources and the vendor.
[5]One VUP (VAX unit of performance) = the performance of the DEC 11/780.
[6]Information on this product was not provided by the vendor, but gathered from other published sources.

The companies included in this chart responded to a recent survey conducted by *Computerworld*. When a vendor is unable to provide specific information about its product, the abbreviation NP (not provided) is used. When a question does not apply to a vendor's product, the abbreviation NA (not applicable) is used. Further product information is available from the vendors.

VENDOR PHONE	WORKSTATION	COMPATIBLE SYSTEMS	TYPE OF PROCESSOR	OPERATING SYSTEMS SUPPORTED	CLOCK SPEED (MHz)	PERFORMANCE IN MIPS[1]	PERFORMANCE IN MFLOPS[2]	CACHE (BYTES)	PORTS	MEMORY RANGE (BYTES)	MAXIMUM DISK CAPACITY (BYTES)	SCREEN SIZE	COLOR OR MONOCHROME MONITOR (INCHES)	GRAPHICS CAPABILITIES	SUPPORTS ETHERNET OR TOKEN-RING	NETWORK PROTOCOLS SUPPORTED	PRICE
Holden Computer Corp. (800) 669-6873	Prestige Series PWS/425 MX and 433 MX	DG Aviion, DRC 3100	Intel 80486	Unix System V.3.2	25 or 33	11.1 for Model 425 MX; 16 for Model 433 MX	1.33 single precision, 1.08 double precision for Model 425 MX; 1.56 single precision, 1.21 double precision for Model 433 MX	8K	Two serial, one parallel	4M - 96M	1.6G	16	Monochrome	2D	Ethernet	NFS, TCP/IP, X.25, OSI	$7,495 for Model 425 MX; $9,795 for Model 433 MX
	Prestige Series PWS/425 CX and PWS/433 CX	Sun Sparcstation 1+, DRC 3100	Intel 80486	Unix System V.3.2,	25	11 for Model 425CX; 16 for Model 433CX	1.33 single precision, 1.08 double precision for Model 425CX	8K	Two serial, one parallel	4M - 16M	2.4G	16	Color	2D	Ethernet	NFS, TCP/IP, X.25, OSI	$8,895 for Model 425CX; $10,795 for Model 433CX
Next Computer, Inc. (415) 366-0900	Nextstation	Sun Sparcstation	Motorola 68040	MACH	25	15	Two double precision	None	Five	8M - 32M	340M	17	Monochrome	2D	Ethernet	NFS, TCP/IP	$4,995
	Nextcube	Sun Sparcstation 1+	Motorola 68040	MACH	25	15	2.0 double precision	NA	5	8M - 64M	1.6G	17	Monochrome	2D	Ethernet	NFS, TCP/IP	$7,995-$13,250
Opus Systems (408) 446-2110 or (415) 986-6040 (after Nov. 18)	5120 Personal Mainframe	Sun Sparcstation 1+	Sparc	SunOS 4.1	25	18	1.7 double precision	64K	Two serial, one audio	8M - 64M	4G	19	Color	2D	Ethernet	NFS, TCP/IP	$34,495 - $35,495
	8110 Portable Mainframe	IBM RS/6000, Sun Sparcstation 1+, DG Aviion	Motorola 68040	Unix System V.3.2	16.7, 20, 25 or 33	16.5 - 44	1.69 single precision, 1.03 double precision	16K instruction, 16K data	Two	8M - 32M for Model 8110	330M	Monochrome, 13	Nb	2D	Ethernet	NFS, TCP/IP, SNA, X.25	$21,995 - $27,995
	8120 and 8130 Personal Mainframe	IBM RS/6000, Sun Sparcstation, DG Aviion	Motorola 68040	Unix System V.3.2	16.7, 20, 25 or 33	16.5 - 44	1.69 single precision, 1.03 double precision	16K instruction, 16K data	Two serial, one parallel	8M - 32M for Model 8120; 8M - 96M for Model 8130	330M	19	Monochrome	2D	Ethernet	NFS, TCP/IP, SNA, X.25	$15,395 - $20,090
	8140 Personal Mainframe	IBM RS/6000, Sun Sparcstation, DG Aviion	Motorola 68040	Unix System V.3.2	25 or 33	22.2 - 44	1.69 single precision, 1.03 double precision	16K instruction, 16K data	Two serial, one parallel	8M - 96M	330M	19	Monochrome	2D	Ethernet	NFS, TCP/IP, SNA, X.25	$20,895 - $22,890
Solbourne Computer, Inc. (800) 356-6765	S4000	Sun Sparcstation 1+, Mars Mariner 4i, Tatung, Decstation 3100	Panasonic MN10501 (Sparc-based)	OS/MP (SunOS-like)	33	25.5	1.7 double precision	8K	Two RS-423A, one audio	8M - 104M	400M	19	Either	2D, 3D	Ethernet	NFS	$8,995 - $40,000
Sony Microsystems Co. (408) 432-0544	Sony News 3710	Sun Sparcstation 1+, IBM RS/6000	MIPS	News-OS (Unix-like)	20	17	2.3 double precision	128K	Two serial, one parallel, one SCSI, one audio	8M - 28M	660M	19	Color	2D	Ethernet	OSI, NFS, TCP/IP, XNS	$8,000 - $14,500
Sun Microsystems, Inc. (415) 336-7700	Sparcstation SLC	HP Apollo, Decstation 2100	Sparc	SunOS, Unix System V	20	8.8 specmarks (12.5 MIPS)	1.2 double precision	64K	Two serial, one SCSI, one audio	8M - 16M	2.7G	17	Monochrome	2D	Ethernet	NFS, TCP/IP	$4,995
	Sparcstation 1+	Decstation 3100, IBM RS/6000 Powerstation Model 320	Sparc	SunOS, Unix System V	25	10 specmarks (15.8 MIPS)	1.7 double precision	64K	Two serial, one SCSI, one audio	8M - 64M	2.7G	17	Monochrome	2D	Ethernet	NFS, TCP/IP	$6,995
	Sparcstation IPC	Decstation 3100 and 2100, HP Apollo 9000 Models 345 and 400	Sparc	SunOS, Unix System V	25	11.8 specmarks (15.8 MIPS)	1.7 double precision	64K	Two serial, one SCSI, one audio	8M - 24M	207M - 2.7G, depending on disk	16	Color	2D	Ethernet	NFS, TCP/IP	$8,995
	Sparcstation 2[3]	NP	Sparc	SunOS	40	21 specmarks (28.5 MIPS)	4.2	16M	NP	Up to 207M	7.6G	19	Monochrome	NP	NP	NP	$14,995
Tatung Science & Technology, Inc. (408) 438-8160	TWS 8000	Sun Sparcstation 1+	Sparc	Sparc OS 1.0 (SunOS-like)	20	12.6	1.4 single precision	64K	Three RS232, clock, two serial, one mouse, one Ethernet, one SCSI, one audio	8M - 64M	414M	19	Color	2D, 3D	Ethernet	NFS, TCP/IP	$8,000
Unisys Corp. (215) 986-4011	U6000/WS	Sun Sparcstation, Decstation 2100 and 3100, IBM RS/6000	Intel 80386 or 80486	Unisys System V (Unix-like)	33 or 25	11 or 20	1.0 single precision; 1.4 double precision	64K for 386 model; 8K for 486 model	3	8M - 16M for 386 model; 8M - 32M for 486 model	1.3G	20	Color	2D	Ethernet	BSC, HDLC, SDLC, X.21, X.25, OSI, NFS, SNA, Decnet, TCP/IP, RJE	$10,995-$16,495

PRODUCT SPOTLIGHT

Intel-based accelerator boards

VENDOR	PRODUCT	ON-BOARD MICROPROCESSOR	PROCESSOR SPEED (MHz)	MACHINES UPGRADED	OPERATING SYSTEMS SUPPORTED	SYSTEM MEMORY INCLUDED/ EXPANDABLE TO (BYTES)	CACHE SIZE (BYTES)	CACHE ACCESS SPEED (NSEC)	PERFORMANCE BENCHMARKS[1]	BUS SIZE	SOFTWARE INCLUDED	SIZE OF BOARD	REPLACEMENT OR COPROCESSOR	LENGTH OF TRIAL PERIOD	LENGTH OF WARRANTY	PRICE
Ann, Inc. (800) 232-1200 (617) 868-6468	Micro Master 386	386	20, 25 or 33	IBM PS/2 Models 50, 50Z, 55, 60, 65	DOS, OS/2, SCO Xenix, AIX	8M/Uses system memory	20- and 25-MHz boards have 8K; 33-MHz has 32K	19 - 35	Landmark speed: 14.5 - 18.3; Norton SI: 23.4 - 29.3	16 or 32 bit	Disk caching, installation	Full	Coprocessor	14 days	1 year	$1,495 for 20-MHz version; $1,795 for 25-MHz; $2,495 for 33-MHz
	Micro Master 486	486	25	IBM PS/2 Models 50, 50Z, 55, 60, 65, 70, 80	DOS, OS/2, SCO Xenix, AIX	8M/Uses system memory	128K	15 - 35	NP	16 or 32 bit	Disk caching, installation	Full	Coprocessor	14 days	1 year	$4,695
Applied Reasoning Corp. (617) 483-0760	PC-Elevator 386	386	16	8088, 8086, 80286 IBM PC and compatibles	DOS	1M/16M	None	NA	Norton SI: 18.7; 3.5 MIPS	32	Diagnostic, disk caching, installation, RAM disk	Full	Coprocessor	15 days	1 year	$1,295
AST Research, Inc. (714) 727-4141	AST Pentium/386	386	16	AST Premium/286, AST Pentium	Any that run on IBM PC	1M/8M	64K	35	NP	32 bit	Diagnostic, installation, expanded memory manager	Full	Coprocessor	None	1 year	$995
	AST Pentium 386/25	386	25	AST Premium 386 SX/16, AST Cupid	Any that run on IBM PC	4M/Not expandable	32K	25	NP	32 bit	Diagnostic, disk caching, installation, print spooling, RAM disk	Full	Replacement	None	1 year	$1,995 - $2,395
	AST Pentium 386/33	386	33	AST Premium 386 SX/16, 386/25, AST Cupid	Any that run on IBM PC	4M/Not expandable	32K	25	NP	32 bit	Diagnostic, disk caching, installation, print spooling, RAM disk	Full	Replacement	None	1 year	$2,495 - $3,395
	AST Pentium 486/25	486	25	AST Premium 386 SX/16, 386/33, 386/25, AST Cupid	Any that run on IBM PC	4M/16M	8K	25	NP	32 bit	Diagnostic, disk caching, installation, print spooling, RAM disk	Full	Replacement	None	1 year	$3,495 - $4,895
	AST Pentium 486/33	486	33	AST Premium 386 SX/16, 386/33, 386/25, 486/25, AST Cupid	Any that run on IBM PC	4M/16M	8K	25	NP	32 bit	Diagnostic, disk caching, installation, print spooling, RAM disk	Full	Replacement	None	1 year	$3,395 - $6,295
CMS Enhancements, Inc. (714) 220-0660	Fast-Trak 286	286	8 or 12	IBM PC XT and compatibles	Any that run on IBM PC XT and compatibles	Uses system memory	8K	NP	NP	8 bit	Installation	Half	Coprocessor	Depends on dealer	1 year	$299
Intel Corp., PC Enhancement Div. (800) 538-3373 (503) 629-7000	Inboard 386/PC	386	16	8088-based IBM PC XT and compatibles	DOS	1M/5M	None	NA	Norton SI version 4.0: 16.6	8 bit	Disk caching, installation, memory manager	Full	Replacement	None	5 years	$795
Micro Way, Inc. (508) 746-7341	Super Cache-286	286	12	80286-based IBM PC and compatibles	DOS	Uses system memory	32K	55	268 single precision kilowhetstone	8 bit	Diagnostic, disk caching, print spooling, RAM disk	Half	Coprocessor	30 days	1 year	$349
	Number Smasher-386	386	20 or 25	Same as above	DOS, Unix, Xenix, OS/2	None/8M	64K (optional)	25 or 35	7,692 single precision dhrystone; 5,378 single precision kilowhetstone	16 bit	Diagnostic, installation	Full	Replacement	30 days	1 year	$995
	Number Smasher-860	i860	33 or 40	80286-, 80386-, 80486-based IBM PC and compatibles	DOS, Unix, Xenix, Sun OS	8M/32M	None	NA	4.2 double precision MFLOPS; 80 single precision MFLOPS; 22 megawhetstone	16 bit	Diagnostic, NDP 860 compiler for Fortran, C, C++ or Pascal	Full	Coprocessor	30 days	1 year	$6,995, with 8M bytes of memory and compiler
	Fast Cache-SX	286 SX	16 or 20	80286-based IBM PC and compatibles	DOS, OS/2	Uses system memory	32K	35	Landmark speed Version 2.0: 21.3; 1,183.5 single precision kilowhetstone	16 bit	Diagnostic, installation	3/4 length	Replacement	30 days	1 year	$495 for 16-MHz version, $595 for 20-MHz
NCR Corp. (800) 544-0800	1486 Technology Upgrade	486	25	NCR PC3450/3X/3SC 20	DOS, OS/2	Uses system memory/ 16M	8K	25	AIM Technology desktop publishing: 237 - 333.6 seconds, depending on workload; AIM Technology financial applications: 198.6 - 291.8 seconds, depending on work load	32	Installation	Half	Replacement	None	1 year	$3,000
Orchid Technology (415) 683-0300	Tiny Turbo 50/60	386	20	IBM PS/2 Models 50, 50Z, 60	DOS, OS/2, Unix	Uses system memory	32K	55	Norton SI: 22	16 bit	Installation, cache enable/disable program	Full	Replacement	None	4 years	$399, plus $99 for appropriate PS/2 adapter
	Tiny Turbo AT	286	16	IBM PC AT and compatibles	DOS, OS/2	Same as above	32K	125	Norton SI: 18.7	16 bit	None	Full	Replacement	None	4 years	$599
	Tiny Turbo Xtra	286	12	IBM PC XT and compatibles	DOS	Same as above	8K	45	Norton SI: 8.2	8 bit	None	Half	Coprocessor	None	4 years	$449
	Tiny Turbo 286	286	8	8088-based IBM PC XT and compatibles	DOS	Same as above	8K	45	Norton SI: 6.6	8 bit	None	Half	Coprocessor	None	4 years	$349
Q/Cor (800) 548-8439	Quad 286 XT	286	16	IBM PC XT and compatibles	DOS	1M/5M	None	NA	3,871 dhrystone	8 bit	Diagnostic, installation, print spooling, RAM disk	Full	Replacement	None	1 year	$1,195
Seattle Telecom & Data, Inc. (206) 883-8440	STD 286 Accelerator Board	286	10 or 12	8086- and 8088-based IBM PC XT and compatibles	DOS	640K/2M	None	NA	NP	8 or 16 bit	Diagnostic, installation, print spooling	NP	Replacement	10 days	1 year	$595 - $695
	STD 386/16 Accelerator Board	386	16	IBM PC AT and compatibles, Compaq Portable II, Zenith 248/251	DOS, Unix, SCO Xenix	1M/16M	None	NA	NP	16 bit	Print spooling	Full	Replacement	10 days	1 year	$995
Sota Technology, Inc. (800) 553-7682 (408) 748-1111	Sota 286i	286	12.5	8088-, 8086-based, 8-MHz IBM PC XT and compatibles	DOS	1M/4M	16K	100	Norton SI: 13.4; Landmark speed: 13.2	8 bit	Disk caching, print spooling, RAM disk	Half	Replacement	None	5 years	$595 - $1,195
	Sota 386si	386	16	Same as above	DOS	1M/4M	16K	100	Norton SI: 12.8; Landmark speed: 10.2	8 bit	Same as above	Half	Replacement	None	5 years	$695 - $1,790
	Sota Hyperus/386	386	16	IBM PC AT, PS/2 Models 30, 50, 60 and compatibles	DOS	MP/8P	16K	45	Norton SI: 10.8; Landmark speed: 22.4	8 bit	Disk caching, installation, print spooling, RAM disk	Half	Replacement	None	5 years	$595
Verified Technology Corp. (619) 489-9336	VT 286 Accelerator Board	286	12	8088 IBM PC XT and compatibles, Compaq Portable	DOS, Thoroughbred	Uses system memory	8K	55	Norton SI: 9.6 - 11.2	16 bit	Diagnostic, installation	Half	Replacement	30 days	1 year	$299

[1]Performance benchmarks were provided by vendors and are based on industry-standard measurements. Norton Speed Index was developed by Norton Computing to measure the speed of a processor relative to an IBM XT. Landmark Speed is a similar measurement developed by Landmark Systems, Inc. AIM Technology is a rating, measured in seconds, of application processing in an OS/2 single-user, multitasking environment.

The companies included in this chart responded to a recent survey conducted by *Computerworld*. When a vendor is unable to provide specific information about its product, the abbreviation NP (not provided) is used. When a question does not apply to a vendor's product, the abbreviation NA (not applicable) is used. Further product information is available from the vendors.

Movers, shakers, pressure makers

For many, IS life in the '90s is exciting but brings extra stress

BY ALAN J. RYAN

First in an occasional series.

For Jean Straehl, it's the sheer volume of work. "I'm always buried," says Straehl, manager of distributed information systems at COM/Energy Services Co. in Cambridge, Mass. "I always have mail on my desk from two years ago that is still unopened."

John W. Owens, vice president and chief information officer at Sara Lee Hosiery in Winston-Salem, N.C., is energized by the "major opportunities" in IS today. He finds the global opportunities "extremely intense and exciting."

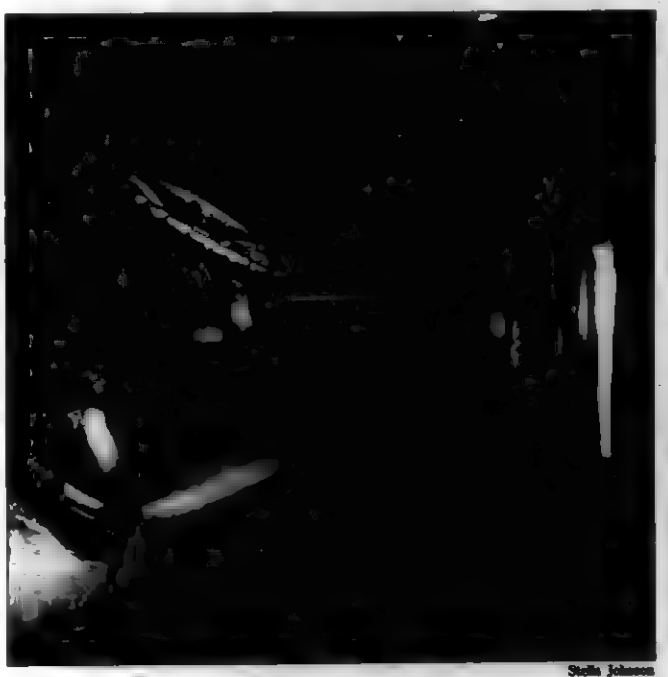
For Brian Camenker at Dynamics Research Corp. in Wilmington, Mass., it's family and personal pressure. Ten years ago, Camenker — now a senior systems analyst at the government consulting firm — thought little of working from 8 a.m. until midnight. "Our whole lives revolved around it," he recalls. "But now we're all a little older; we have families, and my body can't take those kinds of hours."

The 1980s transformed many parts of everyday life in IS. Changing corporate structures, rapid technological advances, globalization and a host of other social and economic forces created a new daily reality in the 1990s that IS workers and consultants say is both more stressful and more exciting than before. Not all of the change has been bad, they note.

"In the past 10 years and even more recently, [IS] people felt they were part of a support service like heating systems or janitorial service," says Christine Bullen, assistant director of the Center for Information Systems Research at the Sloan School of Management at MIT in Cambridge, Mass. "Now, with information technology creeping into the business in so many ways, the people supporting it feel more valuable and wanted."

Indeed, for many IS chiefs, the 1980s meant vacating their windowless back rooms for sunny corner offices, private parking spaces and six-figure salaries. Even at lower levels, technological developments such as computer-aided software engineering and fourth-generation languages have helped alleviate some of the more mundane and tedious aspects of programming. The result has been that many IS workers at all levels have gone from being nondescript background employees to decision makers, movers and shakers.

These improvements in stature and job responsibilities carry a high price tag, however: Today's IS work force faces demands a previous generation did not experience.



Stella Johnson

COM/Energy's Straehl: *Her IS group is "here late every night"*

The following are some of the biggest issues and pressures IS people say they face today:

• **Business mainstreaming.** At one time, it was not uncommon for IS workers to think of themselves as "isolated specialists," Owens says. Today, in many organizations, IS is more actively involved in many aspects of business planning and decision-making.

Increasingly, information technology is seen as an important contributor to the firm's bottom line. This means IS chiefs and workers today have to have more business savvy and must completely understand the business of the company they are supporting.

"People residing in IS today are more bottom-line results-oriented than they were five or 10 years ago," says James C. Miller, vice president of information technology at James River Corp. of Virginia in Richmond.

For many IS workers, having to learn the business has added new job pressure. "Being strategic and important to the business means there is more pressure to perform," Bullen says.

"We are no longer just a support group," says Karl Swanseen, director of MIS at Trump Plaza Hotel and Casino in Atlantic City, N.J. His group often works side by side with top executives on direction, planning, creativity and marketing. "Our successes and failures are directly related to the company's profitability. Driving revenue and cutting costs is part of the process now."

• **Fuzzier organizational structures.** One way firms help computer professionals learn more about the business is by placing IS workers in the user departments or business units. These new organizational structures and alliances are a far cry from the old glass house days, when IS ruled its own kingdom and challenged traditional IS identities.

According to Miller: "Five or 10 years ago, every MIS organization was a fairly stand-alone, separate, distinct entity that had requirements thrown over the wall and threw systems back at it. Now IS organizations that are effective . . . are matrixed to a set of user communities."

In many cases, IS groups are adopting consulting roles within their own organizations, creating new identity and stress issues. For example, at Echlin, Inc. in Branford, Conn., structural change followed a downsizing from mainframes to networked personal computers.

Explains Richard Hock, director of MIS at Echlin: "We have pretty well decentralized completely, and so the role of corporate management information systems is to consult with the divisions, set policy and standards, review and approve systems plans and

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Ryan is a *Computerworld* senior writer.

expenditures and attempt to guide them. That was not the case 12 years ago."

While such moves might make organizational sense, IS workers say the migration into business units and blurring of lines of authority often create new stress. Mixed allegiances can make IS workers uncomfortable because they are being pulled in two directions.

"In the old days . . . it was clear who you worked for, where your bread was buttered," says Steve McMahan, managing director at placement firm Source EDP. "Now, with more and more people working in decentralized departments or for an end-user group dotted-lined to IS or vice versa, people find themselves between competing constituencies."

He continues, "On one hand, you've got the IS department saying, 'Get this system done on this time table, at this cost and in this manner,' and on the other, an end user who may have a very different agenda."

• **Greater user pressures.** A decade ago, the "customers" of IS were generally happy to get what they ordered and said little else. Today, a new generation of computer-literate users is demanding much more from IS professionals.

"They look at us like we're stupid if we don't have all the answers," COM/Energy's Straehl laments. Dynamics Research's Camenker notes: "You have to ask the right questions and be able to derive from that exactly what they want from you. That's the pressure."

• **Shorter deadlines.** Moving into the business mainstream has another consequence: less time to complete projects.

"Deadlines have shortened dramatically," MIT's Bullen says. "In the past, a major IS project might have had a two- to five-year horizon from plan to delivery. Now, people are talking two to three months."

Echlin's Hock agrees that tighter deadlines are one of the biggest stress inducers for IS. "The problem is that people start with unrealistic target dates, or they fail to bring management on board to help with the problem assessment and to be part of the project," he says.

When that is the case, workers find themselves working long hours, and consequently, their work can become sloppy and the turnover rate increase, he says.

An unfortunate side effect, Bullen adds, is that projects come and go much more quickly, which can give IS workers the message that their work is less valued. "People who have grown up feeling they are building these monuments for their existence are not as happy in a world where they throw things away in six months," she says.

• **Longer hours.** Never famous for its short work weeks, computing is now even more of a time-consuming task for many IS professionals. Downsizing is a big reason. Observes McMahan: "Companies in which there are maybe 20% fewer workers aren't necessarily reducing the work load by 20%."

"The people I talk to are working later and harder," says placement specialist Brian D. Leary, vice president of IS placement at Robert Kleven and Co. in Boston and Lexington, Mass. "Companies tend to get a lot more out of their people now."

Of course, "info systems people worked 60 and 80 hour weeks 10 years ago," James River's Miller notes. The difference, he says, is that "work today has more consequence as far as business is concerned."

At COM/Energy, for example, Straehl says that IS puts in longer hours than other departments. "This is a typically regulated environment, and most workers leave on the dot every day with no exceptions," she says. But her group is "here late every night," and for some, the day often stretches until midnight.

Even when they are home, IS workers are not typically able to shut out work completely. "It's a hard line to say when you stop work," says Pat Wallington, vice president and chief information officer at Xerox Corp.'s U.S. Marketing Group in Rochester, N.Y. "You might be thinking of ideas while watching TV."

IS workers "are never quite free from the job," agrees Paul Berger, president of Paul Berger Consulting and PBC Management Video Programs in New Jersey. "People aren't working fewer hours — but with personal computers, they can control the location where they work, which can mean going home at a decent hour and putting in a couple of hours of work after the kids have gone to bed."

Many people are also working harder, employment recruiters add, because increased job competition makes it more difficult to move than it used to be. Fear and uncertainty about further layoffs, mergers and restructures tend to make people work even harder, Leary explains.

Still, not everybody is necessarily laboring longer and harder. Technological advances have actually made some drudgery go away, Wallington says. "In the past, you might be here doing testing at 2 a.m. or fixing a system in the middle of the night. Today, we have a different environment. Technology is readily available, and people get all their work done during the day and can do things from outside the office. The hours might not be longer and, in some cases, might be shorter."

• **Family pressures.** The long hours required in many IS shops has strained

All eyes on IS

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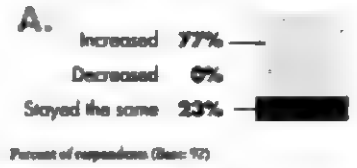
Q. During the past year, do you believe that the degree of scrutiny by top management and shareholders has increased, decreased or stayed about the same?



Source: *Computerworld* Survey of Premier 100 Winners
CW Chart: Doreen St. John

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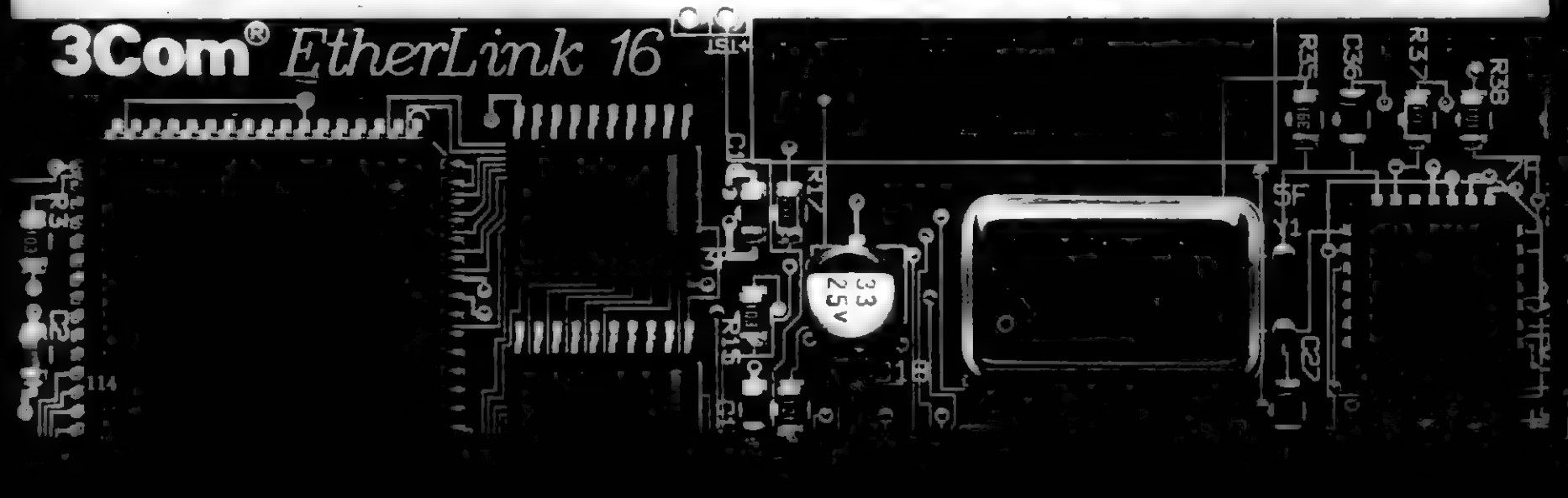


many a family relationship. While work vs. home has been a struggle for many IS professionals, tougher economic times and an increase in two-earner families have pushed the issue into the forefront.

Many IS professionals are facing difficult new choices between work and family. Dynamics Research's Camenker, for instance, would like to learn more about object orientation but can't seem to find the time during normal working hours. "I can't stay late at work," he explains. "I have a wife and two kids — I can't go home and start pecking away at that like I would have before."

Camenker, 37, says his wife "has laid down the law that I have to be home at 6 and have to spend some time with the kids." So he leaves for home at 5:15 and logs in two hours at his terminal once his children have gone to bed.

Many firms have recognized the strains IS workers face and have implemented flex time, day care and other options aimed at easing the burden. Of course, the work vs. family debate is not a problem for everyone. MIT's Bullen notes that many entrants into the work force are motivated by money rather than family.

"We are seeing a new generation of Alex Keaton types — another generation of workaholics coming down the pike. I don't know what it is going to take for them to realize that there is a life outside of work," she says.

• Technology and information overload. Another big stress factor, interviewees say, is keeping apace of technological change and making tough technological decisions. Buy or lease? Local-area networks or minicomputers? CASE tools? Downsizing?

"Anybody tied to the traditional mainframe computing is feeling overwhelmed because they can't stay there and stay comfortable, Bullen says. They have to keep changing."

"I'm getting to the point where I can't grasp the stuff as fast as it is coming at me, and I can't change as fast as the world is changing," Camenker says. Like many IS professionals, he desperately tries to keep up with the latest advances but finds it nearly impossible. "You read the trade journals, and it sort of scares you to even read them because there is always something new. Nobody I know has the time to explore these new things, because you're too busy doing your job."

• Complex career decisions. A more subtle pressure facing many IS professionals is an uncertain career path and the complexity of career decisions. "Ten years ago, the bulk of IS professionals worked in IBM mainframe environments that were . . . pretty generic," Source EDP's McMahan notes. "Now that world is much less homogeneous. You can go from being very marketable to very unmarketable very quickly."

Moreover, workers who are slow to adapt to the changing technologies and methodologies affecting today's IS may find themselves seemingly unemployable. Workers who don't stay on top of new technology can find themselves becoming obsolete or swept into a pigeonhole.

As if that isn't bad enough, IS workers also have to worry about an often uncertain general business climate and its inevitable mergers, buyouts and restructuring that can put jobs in jeopardy, placement officials say.

Along with greater technical demands is the pressure to learn more about business disciplines. The need to learn a whole new language and reality can be daunting, recruiters note.

Yet the push for business knowledge is a two-edged sword. Increasingly, IS can be viewed as a stepping-stone to jobs in other parts of the firm. According to the 1990 *Computerworld* job satisfaction survey of 755 IS professionals, nearly one in four said their IS department provides them with the right opportunities to advance to non-IS management positions.

Indeed, during the past two years, several high-profile IS executives have moved to other management positions.

"In the successful corporation of the future, it will be difficult to tell if you're talking to a business person who is technically savvy or a technical person who just knows the business," Wallington says.

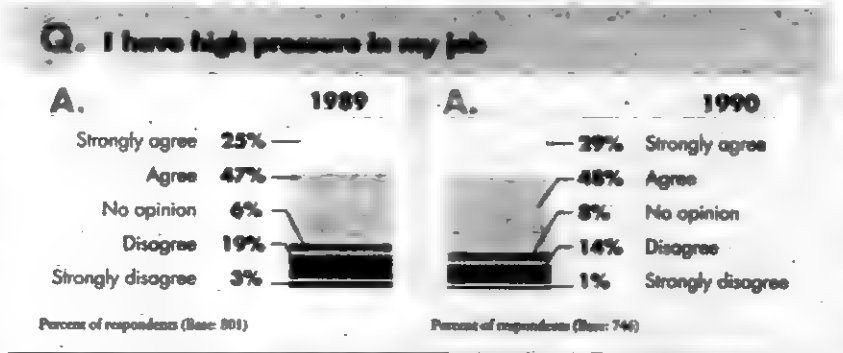
In the face of such changes, younger IS professionals wonder what their next step will be. Camenker says the changes in his lifestyle may lead him to a career change during the next several years.

"I'm not 25 and can't drink coffee 24 hours a day and soak all of this stuff up. I don't want to continue to sit in front of a computer designing and programming when I'm 50," Camenker says. •

In next week's issue: ***Handling the pressure.***

Pressure cooker

During the last 12 months, information systems managers report an increase in work pressures



Source: *Computerworld* Job Satisfaction Survey

CW Chart: Doreen St. John

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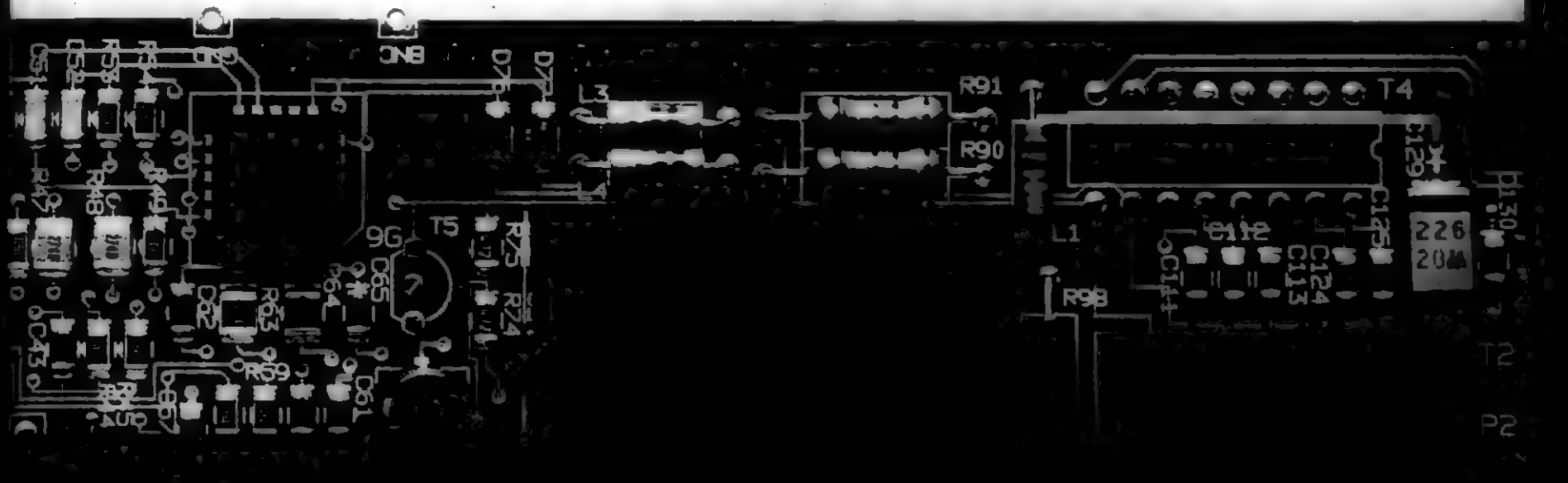

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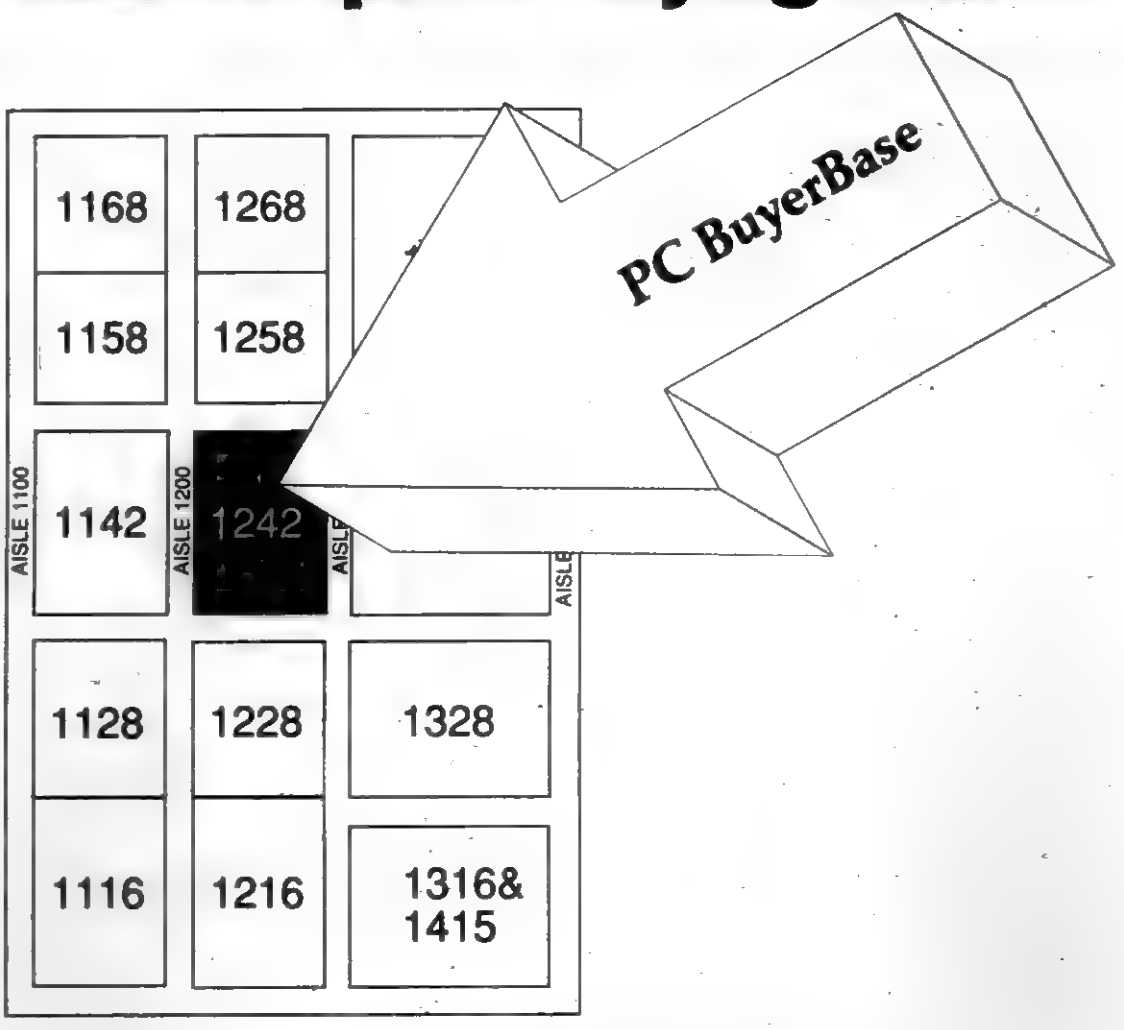

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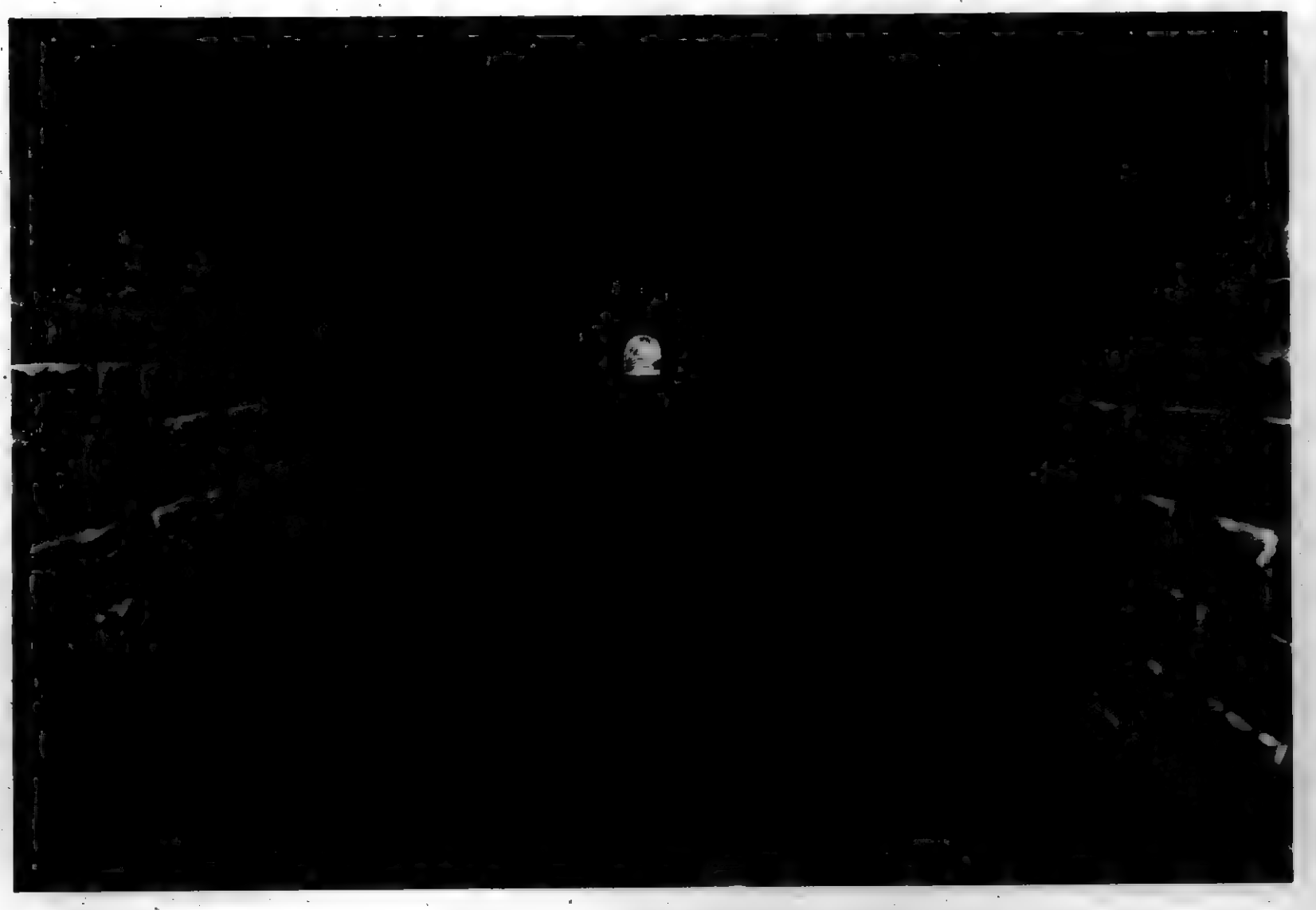

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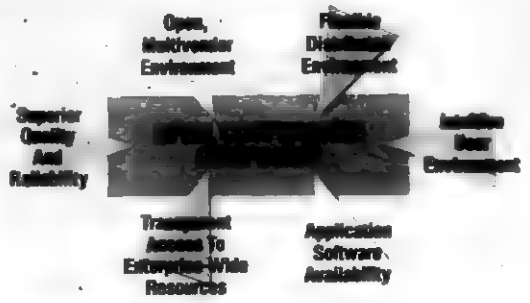

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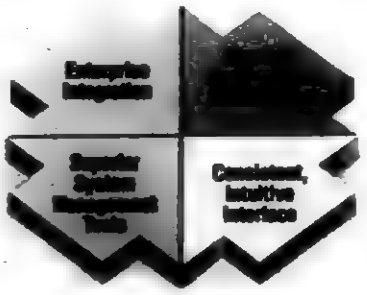

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NATIONAL BRIEFS

All together now

When **The Software Business Practices Council** kicked off its campaign to promote ethical software industry ways and means from within, several key players declined to sign on. This was a reluctance, said executives from such powerhouses as **Computer Associates International, Inc.** and **Dun & Bradstreet Software**, that could fade if the fledgling activist group were to join forces with the already established cleanup campaign of industry association Adapso. Last week, at Adapso's fall management conference in Phoenix, the two watchdogs announced official merger plans.

Ultimate sacrifice

In an effort to stanch its flow of red ink, **The Ultimate Corp.** is laying off what so many other firms are piling on: worldwide staff. Cutting its work force by some 25%, or 175 jobs, will allow the East Hanover, N.J., firm to speed up a shift to software and services already under way, according to Ultimate. The cuts, all but 40 of which will come from international operations, will leave customer service and applications software development unscathed.

No joy in businessland

Businessland, Inc.'s string of quarterly losses has stretched to four, with the latest a $19.9 million drop for the quarter that ended Sept. 30. The personal computer dealer's earnings totaled $308.9 million, 2.2% lower than the corresponding quarter last year. In view of the numbers, Chief Executive Officer David Norman said last week that he has increased his layoff target from 10% of the work force to 20%. The company has closed 21 facilities since June 30.

Am I blue?

For some 22% of Bedford, Mass.-based **Atex Publishing Systems'** work force — including President David Monks — the answer will be "no." Within weeks of a 200-person layoff, Atex reportedly informed remaining employees last week that Chief Financial Officer **John Le Tourneau** will replace Monks and serve as acting president to oversee the implementation of the company's publishing systems alliance with **IBM**, which was announced last summer.

Looking for Mr. Good Boss

BY SHERYL KAY
SPECIAL TO CW

If you had your druthers, where would you like to work? *Computerworld* posed that question to 800 information systems, computer science and electrical engineering students throughout the country and came up with a list of their top 10 choices. Applying criteria such as opportunities for further education and training, a global corporate outlook and meaningful responsibilities, they came up with the following Top 10:

No. 1: IBM — Well over half of the students listed Big Blue as their top choice. "IBM is the pacesetter," explained Angel Mays, currently working toward a bachelor's degree in computer science at Franklin University in Columbus, Ohio. "When it takes the lead, everyone else follows," she said.

"Students coming to work for us will work with leading-edge technology, in small teams and with a diversity of assignments," said Lee Covert, manager of IBM's Purchase, N.Y.-based national recruiting organization. For Mays, that job description sounds just right. "I love making that bucket of bolts do what I want it to do," she said.

No. 2: AT&T — While earning a master's degree in business management at Central Connecticut State University last year, Raymond Papp wrote a paper on AT&T's signaling system. Now he would like to work at the firm. "I found AT&T to be an international pioneer in the field," he said.

Recent graduates are attracted to AT&T because of its worldwide product and services reputation, said Gale Varma, manager of corporate college recruiting. "We are a global company with projects of international scope, and global is in with the students today," she said.

No. 3: Hewlett-Packard Co. — Students who seek a team-oriented environment, yet want an opportunity to express individual creativity would feel right at home at HP, said Kathy Burke, the company's national college relations and recruiting manager. According to Burke, HP is marked by informal management and community commitment. That suits Eli Robinson, a first-year MBA student at the University of Vermont, perfectly, he said. Robinson, who is interested in sales, says that he would like to work for "a company that puts out quality products, because I'll be selling directly to the end user, and it's important to represent something that won't come back to haunt me."

No. 4: Digital Equipment Corp. — DEC's presence on campus leaves a lasting impression, according to college program personnel consultant Deann Sklenak. Many students who have worked on VAXs at school turn to DEC upon graduation, she said.

Alec Berenbaum agreed. Having worked with DEC equipment and service personnel, Berenbaum, who is currently pursuing a master's degree in computer science at the Rochester Institute of Technology in New York, ranks the firm among his top choices for employment.

No. 5: Apple Computer, Inc. — The "Apple campus" in Cupertino, Calif., is described as casual and laid-back, "an easy transition from college," said Apple college relations staffing specialist Ron Jennings. In addition, Rob Sabey learned from friends who were interns at Apple that new hires were given project responsibility from day one.

Continued on page 122

The Top 10 places students want to work

1. IBM	497
2. AT&T	342
3. Hewlett Packard	191
4. DEC	134
5. Apple	101
6. General Electric	95
7. Motorola	85
8. Arthur Andersen/ Andersen Consulting	65
9. Microsoft	64
10. Intel	51

Total responding: 773

(Students were asked for their top five choices; the list reflects the total number of responses of each company.)

Source: Computerworld survey — CW Chart: Paul Mach

Survey of software firms taps industry's hot buttons

BY PATRICIA KEEFE
CW STAFF

NEWTON, Mass. — Two unlikely bedfellows, graphical user interfaces and quality assurance programs, are the hot issues at software companies these days. Also soaking up developer energy is support for multiple operating systems — whether by choice or not — and a general shift toward networking, according to the Massachusetts Computer Software Council's second annual Business Practices Survey.

The council is a nonprofit industry association of some 160 chief executives of Massachusetts companies. Jointly sponsored by Price Waterhouse, the survey asked participants a host of questions about all aspects of the firm's business, including management, growth, technical strategies and products and pricing issues. Approximately 500 software companies responded to a mailing of 2,700 surveys.

The profile of the typical software company depicted a profitable, $7.5 million outfit, dependent on the international sector for 25% of its revenue.

At 45, the average chief executive officer stands at the helm of a 7- to 8-year-old firm, typically focused on the utilities, accounting, database and development tools markets.

With the shadow of a recession, war or both hanging over their heads, it is not surprising that financial concerns topped the list of common concerns that emerged. More than half of the respondents, 57%, are concerned about profitability, even though all those who responded are profitable now. "Most software companies are small; if they don't worry about being profitable, they won't be here next year," said Lotus Development Corp. Vice President Frank Ingari.

Yet the economy is not the chief issue, he said, adding that software tends to require a higher overhead in order to support multiple platforms, integration projects and networking.

A slightly smaller number, 47%, noted concern about short-term cash flow, an issue brought to the fore in recent months as a number of companies, notably Oracle Systems Corp., have stumbled.

With profits and cash availability weighing heavily on minds in the executive suite, it appears that marketing efforts may come in for close scrutiny in 1991. Cost-effect marketing was an issue for 47% of all respondents, as was recruitment of quality employees (43%).

Despite the money worries, software investors appear to be relying less on public offerings and venture capital and more on their own private funds to pay the bills. The number of plans to go public have plummeted as acceptance of a slower growth model has grown, Ingari said. "For some period, like 18 months, the striking-it-rich aspect of software will be a bit slower," he predicted.

Strong regional affiliations also popped up, Ingari said. As might be expected, West Coast companies placed a far greater emphasis on Apple Computer, Inc.'s Macintosh platform, whereas Massachusetts companies were much stronger on the Digital Equipment Corp. VAX.

The study also revealed a dramatic difference in the commitment to quality assurance between this year and last year. More than 40% of the companies with 10 or fewer employees have formal testing programs, and nearly 90% of the firms with 60 or more employees do.

Bottom-line importance

At most software companies, profitability is a top concern

AVERAGE COMPANY PROFILE	
Revenue (millions)	$8.0
International revenue	26%
Profitability? Yes	71%
Number of products	9
Company age (median)	8 yrs
Number of employees	106
Average age of CEO	45

Base of 466 respondents

HOW IMPORTANT IS ...	
Profitability	57%
Short-term cash flow	48%
Cost-effective marketing	47%
Recruiting quality employees	43%
Long-term financing	23%
Domestic competition	23%

Percent of respondents
Base of 466 (multiple responses allowed)

Source: Massachusetts Computer Software Council — CW Chart: Marie Haines

Directive threatens EC computer industry

BY MARK HAMILTON
SPECIAL TO CW

LONDON — Major users and computer companies say the entire European computer industry is under immediate threat from the UK government's amendments to the proposed European Community Directive on the legal protection of computer programs. If ratified by the Council of Ministers and adopted by the member states, it will, for example, prevent companies from making personal computer-compatible hardware, according to UK-based computer industry executives.

The amendments, sponsored by the UK Department of Trade and Industry (DTI), have been spurred by the Software Action Group for Europe (SAGE), which includes such firms as IBM, Digital Equipment Corp. and Lotus Development Corp. SAGE wants to strengthen existing copyright legislation by making it illegal to decompile programs for the purposes of creating competitive products.

A DTI spokesman explained that the law would allow computer companies to reverse-engineer a product to the extent needed to enable such companies' own creations to connect to the reverse-engineered technology. Decompiling to make the new product compatible with the original would be prohibited.

The European Committee for Interoperable Systems (ECIS) argued that the proposals effectively prohibit the creation of truly compatible, competitive products. "The European Community is on the verge of putting its computer users at the mercy of IBM, DEC and a couple of other multinationals, none of whom have shown much interest to date in providing their customers with products acknowledged as being the best value for the money," said Alan Sugar, chairman of UK-based Amstrad PLC.

"It spells disaster both for manufacturers and users," said Peter Horne, managing director of UK-based Apricot Computers PLC. "If the amendment is incorporated into the EC Directive, Europe will lose its own [information technology] industry and become merely a marketplace for non-EC manufactured products." If the amendment goes forward, Horne said, "We will have to review our long-term investment for research and development and manufacture in Europe. And we will by no means be the only ones to do so."

ECIS numbers over 50 major manufacturers of computer hardware and software as well as large corporate users, including the Automobile Association, Safeway, Coopers & Lybrand, Deloitte Touche and Securicor.

France's Groupe Bull, another ECIS member, said these proposals are inconsistent with the DTI's publicly stated strategy toward open systems. "The directive will slow the movement toward open systems," said George McNeil, chief executive of Bull in the UK. "It is a serious threat to the European computer industry, and the proposal should be emphatically rejected."

Neither IBM, DEC nor Lotus would comment in defense of SAGE's position.

Hamilton writes for PC Business World, *an IDG Communications British publication.*

ICL exec: Fujitsu takeover won't alter firm's identity

AUCKLAND, New Zealand — ICL, Inc. said it does not believe its recent $1.9 billion takeover by Fujitsu Ltd. will result in major cultural or directional changes, and it will continue to compete on the open market with its new parent.

"We'll preserve the identity, strategies, structures and skills, which have worked so well for us," said ICL International President Richard Livesy-Haworth, during a recent tour of New Zealand. Livesy-Haworth is responsible for the profitability and growth of ICL outside the UK.

"Since 1981, ICL has increased both revenue and profit year in and out, along with productivity and return on capital. We are the most profitable computer company in the world, even ahead of IBM, [Digital Equipment Corp.] and Fujitsu," he claimed. The reason for that success, he said, has been ICL's clear objectives and strategy, "outstanding staff and classy management. We know where we are going and how to get there."

Livesy-Haworth said Fujitsu has the money to expand globally and add companies with complementary skills that are well run and sound investments.

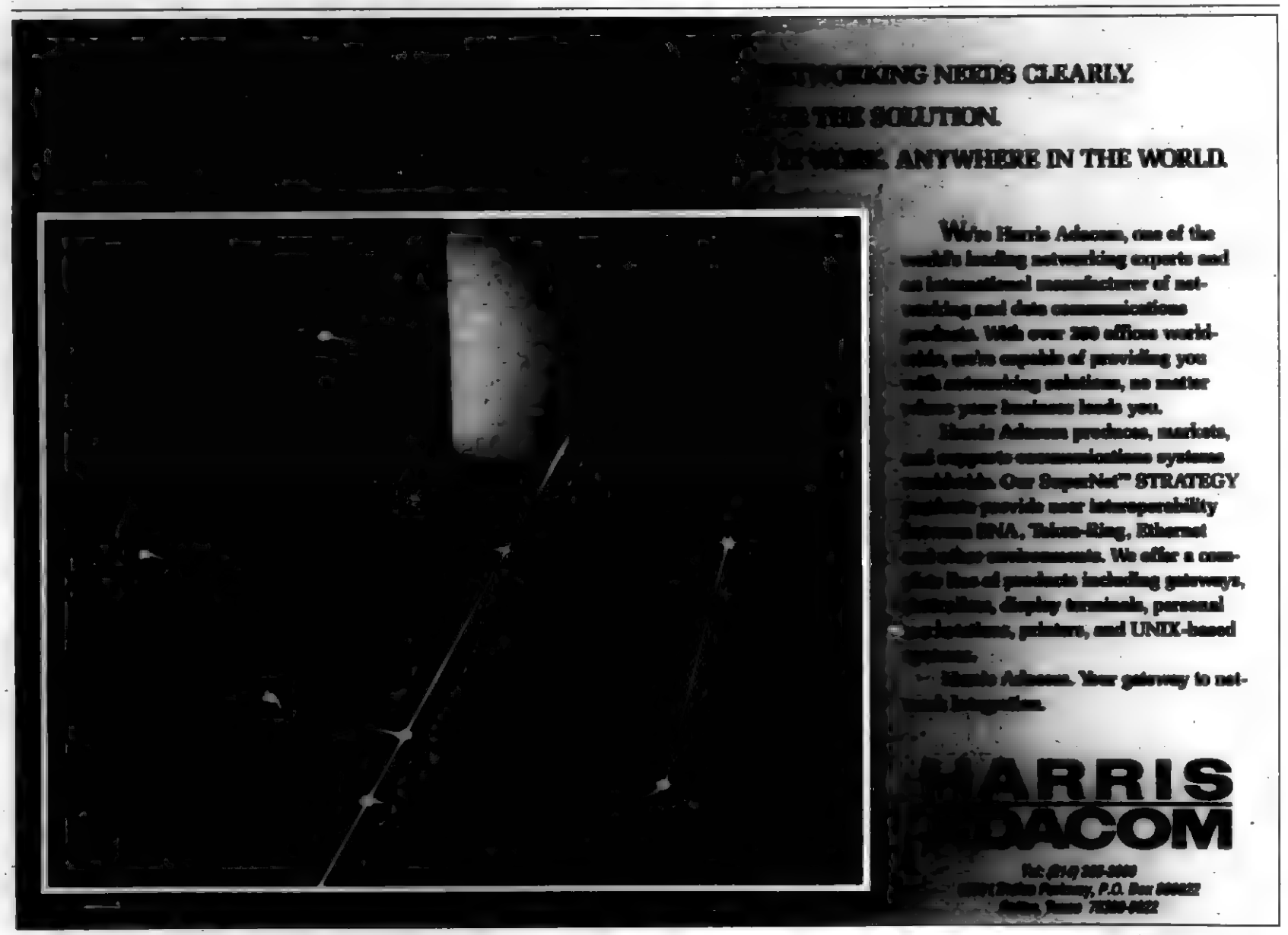
The aim is different than the classic U.S. takeover or merger, he said. "The Fujitsu concept is to have a loose set of companies competing but with different skills grouped together for volume."

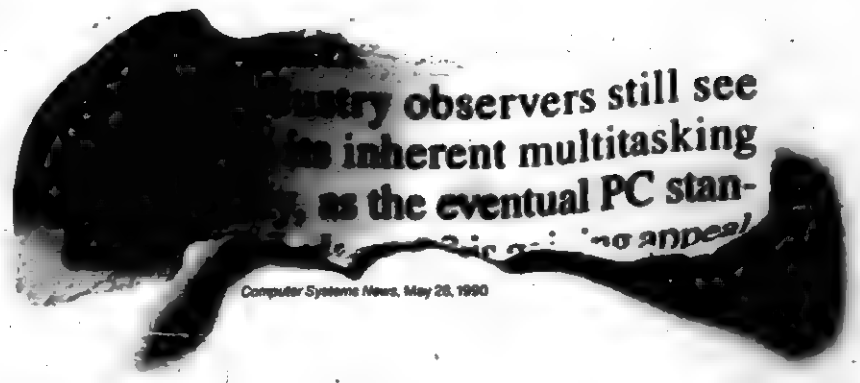
If Fujitsu is significant to ICL, Livesy-Haworth said, ICL is also significant to Fujitsu. "We effectively doubled the size of Fujitsu overnight."

Fujitsu derives 80% of its revenue from Japan, and ICL gives it an opportunity to spread its wings, he said. One of the chief advantages perceived by ICL in the takeover is the scale of research and development.

"What we face is bigger and better R&D," according to Livesy-Haworth.

"It takes more to get to market with shorter payback and less margin, and life is getting hairier. You need huge volumes to get there because computers are now a commodity market," he added.





"Eventually" is here.

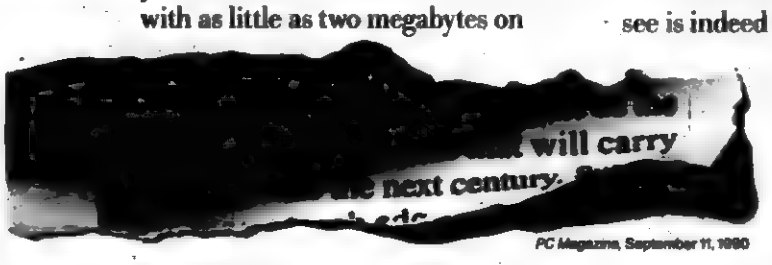
Announcing The OS/2 You've Been Waiting For.

For quite some time, the press has been writing about the move everyone will want to make to OS/2.® Eventually.

Well, all at once OS/2 1.3 has made OS/2 the operating system it was meant to be—the one you'll want to move to right here and now.

OS/2 Loses A Little Weight.

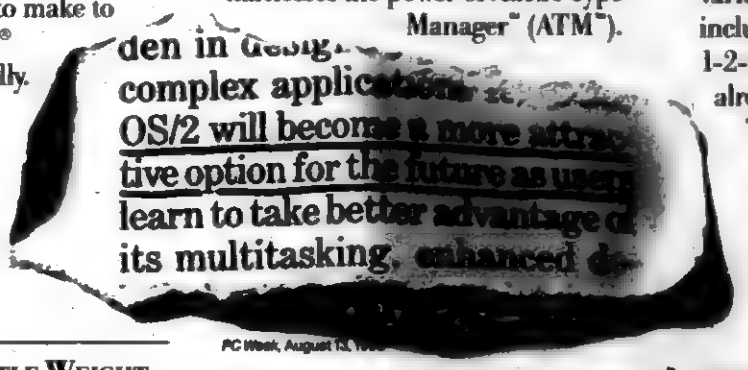
For starters, OS/2 has lost some of its appetite for memory. In fact, now you can make the move to OS/2 1.3 with as little as two megabytes on your system. What's more, this streamlined version leaves more room for applications and will offer some users a substantial performance increase in many system functions.



Functionality. Functionality. And Did We Mention Functionality?

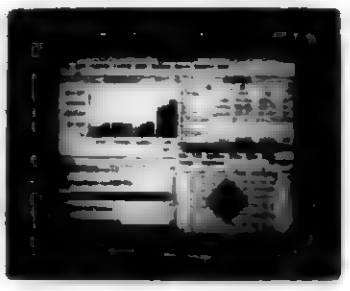
Multitasking. Seamless connectivity. The ability to run applications larger than 640K. DOS® compatibility. All these features have made OS/2 appealing in the past, but new features have catapulted OS/2 into the here and now.

For instance, now OS/2 1.3 harnesses the power of Adobe Type Manager™ (ATM™).



With this new feature, the quality of screen fonts has improved dramatically, giving you a true WYSIWYG capability so what you see is indeed what you get. ATM also gives OS/2 more flexibility in document creation by supporting a wide range of outline fonts.

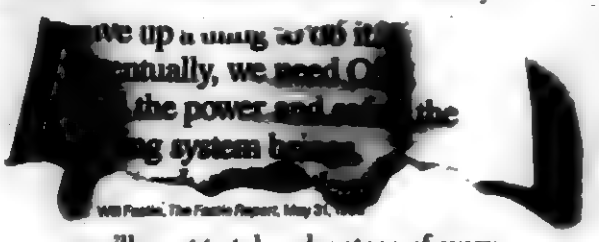
Of course, what good is all this without printer support? Not much. So OS/2 1.3 has improved and expanded its printer support to include drivers for almost all popular printers.



Business Is Booming.

Now that OS/2 is moving forward, so are software developers. Every day, more and more applications are joining the growing pool of available OS/2 software. In fact, a variety of major business programs, including Aldus® PageMaker,® Lotus® 1-2-3/G® and Microsoft® Excel, have already made the transition to OS/2. These, along with many others, have been redesigned to go beyond DOS memory limits and take advantage of OS/2's intuitive graphical interface—Presentation Manager.™

It's been said that eventually



you'll want to take advantage of everything OS/2 has to offer. Well, wait no more because "eventually" is here.

For more information on what OS/2 can do for you here and now, or to get details on a no-charge upgrade to Version 1.3, contact your IBM Authorized Remarketer or marketing representative.

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Sweden revises VDT standards

BY J. A. SAVAGE
CW STAFF

Under pressure from manufacturers and unions, Sweden's National Board for Measurement and Testing recently decided to expand guidelines on electromagnetic emissions from VDTs.

Since 1987, Sweden has had guidelines for mechanical, optical and emission characteristics of VDTs. Under the earlier guidelines, only one magnetic field — very-low frequency — was under consideration. However, in re-evaluation last month, the board noted that emission characteristics were the most important to users. With the new regulations, both very low and extra low frequencies are considered.

However, ergonomic properties, such as pressure needed to depress keys and the monitor's height and weight, were dropped from consideration.

As in the U.S., where local, state and federal governments have clashed over the question of who has the right or responsibility to regulate VDTs, Sweden's Board for Testing attempted to leave workers' health regulation to another government body. "If VDTs were proven health hazards, it would be up to [another government agency] to issue regulations on limits of exposure," a board spokesman said. However, the board acknowledged that "any decision to exclude [electromagnetic] limits was met by a very strong reaction from users' organizations and manufacturers."

EXECUTIVE CORNER

Vitalink ends search, finds CEO

Fremont, Calif.-based local-area network interconnect processor vendor **Vitalink Communications Corp.** announced the appointment of former 3Com Corp. executive **Leslie G. Denend** as chief executive officer and president. Denend replaces **Donald J. Herman**, who came out of retirement to man the front office during Vitalink's CEO search. Herman will complete his term as chairman of the board.

Legent Corp. has a new post and a new executive to fill it. **Robert Yellin**, who has spent the past five years heading up product development for Legent's Westboro, Mass.-based software management division — formerly Business Software Technology, Inc. — is now Legent's vice president of technology.

Yellin, 37, will report to Legent president and fellow BST alumnus John Burton.

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THE EXPERIENCE FOR A LIFETIME

Tech transfer program succeeds

BY J. A. SAVAGE
CW STAFF

California's Department of Commerce Competitive Technology Program late last month announced the first fruits of its 2-year-old plan to transfer basic research to fuel the state's industry. If successful, however, the plan will yield its initial rewards to established big businesses, such as IBM and Hewlett-Packard Co., while start-ups wait for a second harvest.

Currently under development and funded by grants ranging from $194,000 to $483,000 are a cross between a VDT and a flat-panel LCD, several superconductors and a processor meant to increase storage density through digital signal processing.

Charles Spindt, director of the vacuum microelectronics program at SRI International, is combining the active brightness of the CRT found in VDTs with the thinness of an LCD. Spindt said a monochrome display could be on the market in "three to five years."

Paving the way for superconductors in computers is a project headed by John Clarke, senior scientist at the Lawrence Berkeley Laboratory. The superconductor project, which is still in its early development stages, is being carried on in conjunction with Conductus, Inc., a private company funded in part by HP. Thomas Walters, director of the Office of Competitive Technology, said he expects that Conductus will have an exclusive license on the technology.

John Cioffi, assistant professor of electrical engineering at Stanford University, is trying to increase storage capacity by at least 50% on disks by developing a coprocessor to digitize signals coming from the read head. Digitizing, according to Cioffi, results in a reduced error rate and thus can increase data density. Cioffi is conducting his research in conjunction with IBM.

These projects were funded in order to help grow California's economy, Walters explained. Although California leads the nation in industrial research, according to the National Science Foundation, it has little infrastructure to transfer basic research to revenue-generating industry.

While the current competitive technology programs are more likely to help big business than fledgling industry, Walters defended the gambit. "You don't want to say we only help little companies," he said. "Big companies provide a lot of employment in state."

INTERNATIONAL BRIEFS

Hands across sea

Hewlett-Packard Co. President **John A. Young** may have his work cut out for him when it comes to shoring up his administration at home, but he is winning plaudits across the Pacific. Earlier this month, Young was the sole representative of both the U.S. and the computer industry to win the **Japanese Prime Minister's Award** for outstanding work in fostering mutual understanding on trade issues.

Aarrrgghhh!!!

Japan's **Ministry of International Trade and Industry** (MITI) was not tardy in spotting the potential of artificial intelligence; neither has MITI missed the frustrating barrier posed by artificial stupidity. After an MITI poll of 180 electronics makers fingered incomprehensible user manuals as the leading complaint among an average 880 customers phoning the vendors for help each month, the ministry said that it plans to establish guidelines for manufacturers that will enable them to write clearer manuals.

Seeking Seoul mates

Trigem Computer, Inc., which claims status as South Korea's only dedicated computer maker and leading microcomputer vendor, has been searching for an alliance to boost its fortunes in the U.S. market. Earlier this month, Trigem found its candidate. The Seoul-based firm's U.S. subsidiary, Santa Clara, Calif.-based **Trigem Corp.**, announced a long-term alliance with neighboring **CMS Enhancements, Inc.**, a $187 million PC enhancement products vendor. Terms of the agreement were not disclosed.

Mining for silver linings

Hard times in the **European electronics industry** show scant prospect of near-term improvement, according to a study released last week by Electronics International Corp., a New York-based research firm. The European electronics sector reported a $34.2 billion deficit in 1989; according to the report, the figure could reach $50 billion by 1995. The best hopes of reversing the downward trajectory, Electronics International said, lie in concentrating on telecommunications, computing and semiconductors — the three electronics sectors that bucked the trend and showed increases last year.

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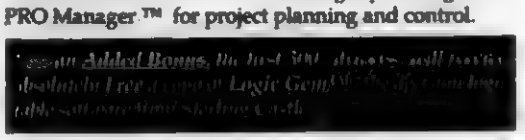

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Boss

CONTINUED FROM PAGE 117

"If the opportunity were right," said Sabey, who just completed his MBA at Brigham Young University, in Provo, Utah, "I'd want to work with [Macintosh] networks in corporate MIS."

No. 6: General Electric Co.: For Dahong "David" Qian, working for "the best" is a major reason he'd like to work for GE. Now studying for a master's degree in mechanical engineering at the University of Texas at Austin, Qian learned of the firm from his uncle, who is currently employed as a chemical engineer at GE in Albany, N.Y.

"He described it as an exciting place to work, where you are teamed up with senior employees, so you learn a lot. He says you are given the chance to achieve personal ambitions," Qian said.

No. 7: Motorola, Inc.: Anna Dorfman, a recent graduate of the University of Illinois, now works at Motorola as a programmer/analyst in the firm's Manufacturing Business Systems Division. Motorola's educational opportunities and international status were key for Dorfman.

Tuition reimbursement was high on Dorfman's list when looking for an employer. "I want my master's degree, and Motorola offers 100% paid tuition," she said. The global nature of the organization also attracted Dorfman's interest. "With different operations around the world, I would have the ability to move around," she said.

> "HE DESCRIBED [GE] as an exciting place to work, where you are teamed up with senior employees, so you learn a lot."
>
> DAHONG 'DAVID' QIAN
> UNIVERSITY OF TEXAS STUDENT

8: Arthur Andersen & Co./Andersen Consulting: Continued training is what Alan Yong was looking for in a new employer. In fact, Yong, a 1990 graduate with a bachelor's degree in business administration in MIS from the University of Oklahoma, said it is what he had in mind when he put Andersen Consulting on the top of his list.

"A good friend of mine working there, as well as a recruiter who came to our campus, described Andersen's training program as being the best in the business," Yong said.

Andersen's diverse business also attracted Yong. "Consulting," he said, "would provide me with the challenge of solving a variety of systems problems."

No. 9: Microsoft Corp.: "I've heard [that Microsoft has] a very laid-back technical environment where you get thrown right into a project, and it's easy for bright computer engineers to advance," said Victor Gerule, a 1990 University of Colorado computer science graduate.

"Each new student hire does have a tremendous amount of responsibility from day one," said Julie Walker, senior technical recruiting manager at Microsoft. "New employees can make an impact right up front, knowing that the product they've worked on will reach a market of millions of people," Walker said.

No. 10: Intel Corp.: The ability to blaze your own trail, said John Moore, program coordinator for corporate college recruitment at Intel, is luring students to Intel. "Supervisors may watch what you do, but you're given the opportunity to succeed, rather than looked upon as taking a risk to fail," he said.

Students are put to work on "very live projects," sometimes in the first week of employment, Moore said.

For Suber Patel, who is working on a master's degree in electrical engineering at the University of Wisconsin, attending an Intel open house brought that point home. He listened to speaker Ming Ling, who had graduated from the university the year before. "He was already one of the main product design engineers for the I860 chip," Patel observed.

Top 10 big in technology biz

Interestingly, all of the top 10 companies targeted by the surveyed students are in some way directly involved with the business of technology. No banks, insurance firms or retail companies even made it to the Top 20. Hal Sullivant, president of system recruiting firm Linn-Truett, Inc. in San Antonio, said he believes this may be largely because of name recognition: Students, he said, are constantly bombarded with these companies' names and reputations while in school.

Ironically, well-known economic woes that have dogged the nation in general and the technology industry in particular are putting a crimp in recruitment at some of the very firms most avidly sought by students. That setback, however, appears to be both limited and temporary. For example, while No. 1 choice IBM has been

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hiring fewer college students this year to maintain its policy of no layoffs; college recruiting will be back up in 1991, according to Lee Covert, manager of IBM's national recruiting organization in Purchase, N.Y. The company is looking for hirees with bachelor's degrees in computer science, electrical engineering, mathematics, accounting and business.

AT&T's Gale Varma forecasted approximately 2,000 new college graduate hires in 1991, with an even mix of undergraduate and advanced degree students to be aimed at software development and systems engineering. Most college recruiting is done on campus; however, Varma said her office receives more than 200,000 inquiries per year.

At HP, Kathy Burke estimated that in 1991, 600 college students with degrees in computer science, electrical engineering, mechanical engineering, industrial engineering and MBAs will be hired.

Meanwhile, at GE, Randy Johnson anticipates that her company will hire approximately 80 students for the IS management program, the majority of whom will have bachelor's degrees in computer science, business or math.

GE's Edison engineering management program in Bridgeport, Conn., which requires students to have a degree in electrical or mechanical engineering, will have at least as many openings for graduates.

John Moore at Intel estimated that the company will look to hire approximately 400 students in 1991, half with undergraduate degrees and the rest with masters' degrees and Ph.D.s. Moore said he will be looking for graduates who have specialized in several disciplines, including electrical engineering, computer science, material science, chemical engineering, physics, finance and accounting.

SHERYL KAY

NCPA rates 100 best

Purveyors of computer hardware, software and services fared well in the latest annual update of "The 100 Best Companies to Work for in America," compiled by the National College Placement Association (NCPA).

In a diverse list that ranges from Massachusetts General Hospital to Taco Bell to the Tennessee Valley Authority, NCPA ranked 20 computer industry firms, such as Automatic Data Processing, Inc. and Teledyne Systems Co., as superior places to work.

Based on written questionnaires and telephone follow-ups, NCPA rated companies excellent, very good, good, average or below average in five categories: pay, benefits, job security, advancement potential and ambience. Pay and benefits were assessed relative to other companies in the same industry.

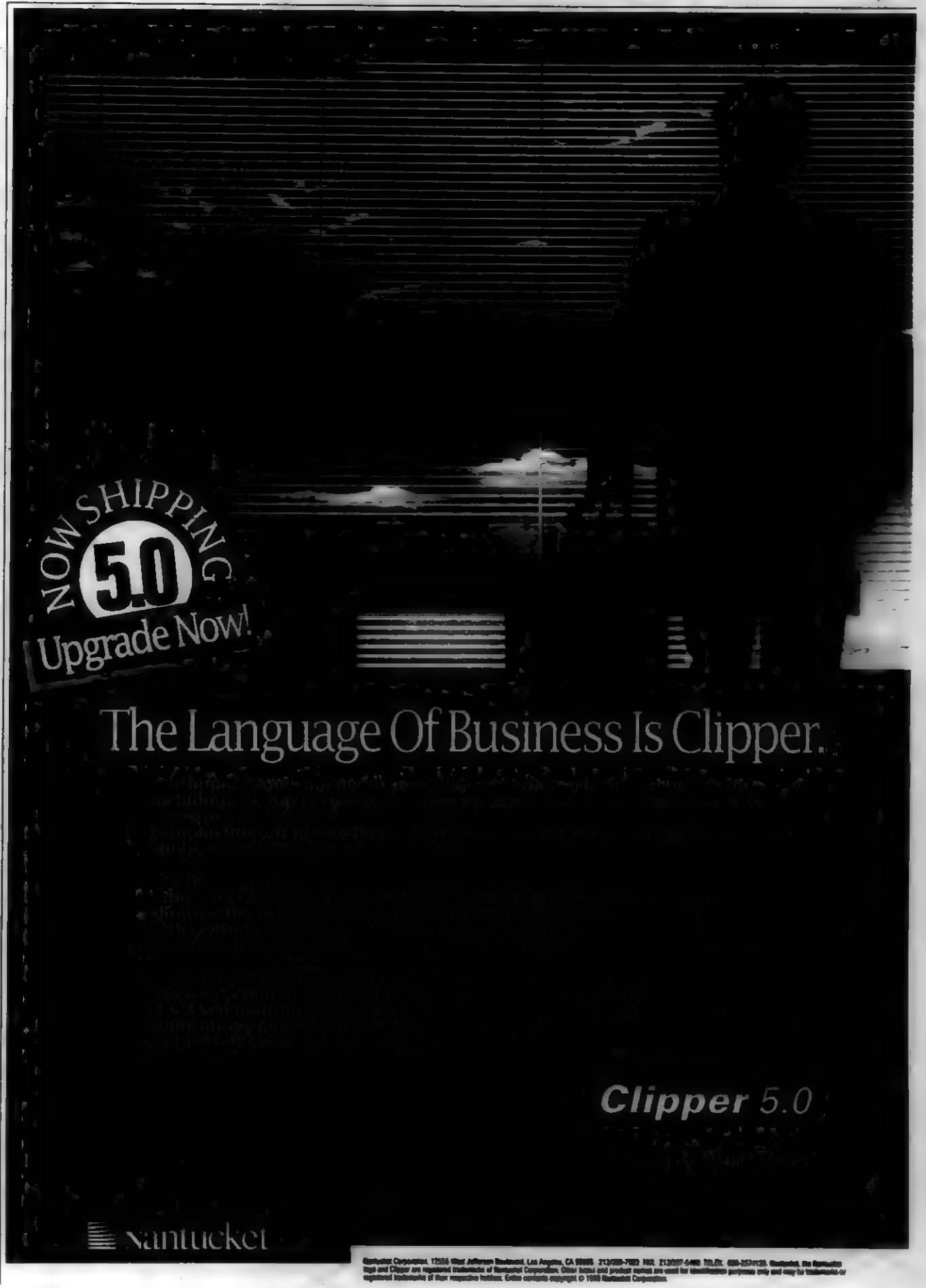
No computer firm rated at the top in all categories, but Microsoft Corp. came close with a very good rating in pay and an excellent in the other categories. And no computer firm ranked below good in any category except Intel Corp., which earned a below average rating for pay but balanced that with good or very good ratings in the other areas.

Small companies were found to be especially attractive. Computer Based Systems, Inc., a professional services firm with 400 employees, made the list, as did Cylink Corp., a maker of data encryption products that has 130 employees; KMS Fusion, Inc., a government contractor and rugged-computer maker with 230 employees; and Summa Four, Inc., an 85-person supplier of value-added systems.

Industry giants included Computer Sciences Corp., with 22,000 workers; National Semiconductor Corp., with 32,000 employees; and Tandy Corp./Radio Shack with 38,000 workers.

Others on the list included the business management services unit of Control Data Corp.; GE Consulting Services; Information International, Inc.; The Orkand Corp.; PRC Realty Systems, Inc.; Rolm Systems; Software Alternatives, Inc.; and Symantec Corp.

GARY ANTHES



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Taking a gamble on the way to the top

BY SHERYL KAY
SPECIAL TO CW

Phyllis Singer moved from business analyst to corporate vice president at New York Life Insurance Co. in just two years — an impressive accomplishment for anyone. But Singer's dramatic career growth would not have come about without her willingness to risk challenging the status quo.

During Singer's stint as a business analyst, New York Life wanted to offer its clients new options across the board on its life insurance policy. What this meant for the information systems group was a complete system redesign — a task projected to take 120 man-months.

Singer spearheaded the solution. She met with all of the departments involved, took note of their concerns and recommended a system redesign that would take 30% less development time than the original IS estimate.

Her redesign involved using some of the existing programming fields and instituting some manual processing to get the system off the ground. The proposal was subsequently approved and implemented.

Singer is among a growing number of IS professionals who are recognizing that risk taking, individual initiative and independent research are keys to growth. In fact, professionals who exhibit these qualities may even zoom up the career ladder, attaining high-level positions well ahead of normal promotion cycles.

Kay is a Tampa, Fla.-based business consultant and free-lance writer specializing in emerging technologies and human resources.

For example, Jim Welborne took a gamble several years ago that led him to a higher position within IS. He proposed a plan to automate Crowe, Chizek & Co., a Top-20 certified public accounting firm based in South Bend, Ind., by installing personal computers throughout the organization. He faced some high-level opposition, however: "The partner in charge was not turned on by the idea, especially because the initial outlay was $15,000, which constituted a full 15% of the IS budget for that year," Welborne says.

Thirteen years and 100 PCs later, however, Welborne is director of administrative services in IS and a senior manager at the firm — a position he credits in large part to the acceptance of his PC proposal.

In another example, the winning factor for Ken Anderson, formerly a systems analyst at Affiliated Computer Systems, Inc. in Dallas, was doing his homework. When the data communications department presented him with a rough draft for a new data center, he detected several shortcomings.

In response, he presented an alternative layout to upper management. Anderson's configuration called for discarding the original plan and putting in place a new one that would take two months and cost $35,000.

As a result, the proposal was accepted, and the data center was built according to Anderson's plan in October 1989.

"Because of Anderson's design, we now have total symmetry between the network, systems and operations — and a much better balanced system across all of our software nodes," says Royce Green, vice president of technical support and software systems at Affiliated Computer.

Anderson's reward? Greater credibility within the company and a promotion to manager of on-line systems and performance tuning.

Ivan Loffler at GTE Service Corp. in Tampa, Fla., also donned a creative cap to his company's benefit. As a senior technical analyst at the firm for several years, Loffler concluded that vendor press releases didn't always reflect accurate CPU power factors. "We were seeing a plus or minus 50% inaccuracy rate, which gave us great problems, particularly in capacity planning," he says.

After generating the needs analysis and the system's specifications, Loffler developed a representative benchmarking system in-house.

GTE offices across the nation still use this tool. "We've saved ourselves many times from vendors who might have overstated the power factor," says Loffler, currently the manager of technical evaluation at the company. Loffler says the benchmarking project advanced his career to where he is today.

The stories of these IS executives have a common theme: risk taking. Each of these people achieved career growth because they chose to be creative or challenge the way things were presented to them even though failure might have meant disaster.

To minimize risks, Anderson advises that IS professionals conduct careful research before suggesting something radical or different to management: "Make sure your idea will improve performance, efficiency and reliability and that, in the long run, it will be cost-effective," he says.

Once you have your idea thought out, Welborne suggests planting the first seed in the mind of the ultimate decision maker. Show the appropriate person a pertinent newspaper article, or bounce the idea off him or her casually. Then plan a lengthier meeting where you can present all the reasons that your idea is timely and appropriate for the company.

Finally, present a written proposal to the manager. "You don't want to start with the written proposal, because it's too impersonal," Welborne says. However, he adds, putting the plan down in writing will document your idea.

"If you're seen as being a forward thinker, it can only help your career, because technology is changing so rapidly every day. IS doesn't want to be caught up in doing things the same old way," Singer says.

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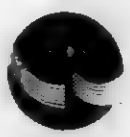

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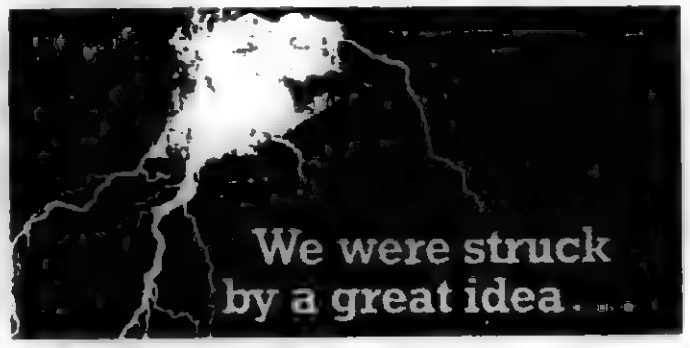

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MARKETPLACE

Data encryption a vital step in keeping data secrets safe

BY SIMSON L. GARFINKEL
SPECIAL TO CW

If you think secret messages are just for James Bond and international spies, think again. If you are not using data encryption to protect financial or medical records or other confidential information stored in your computer, you may be putting that information at risk of tampering.

An encryption system is effective in protecting data on a disk and data being transmitted around the world. Encryption also reduces the chances of data being altered without your knowledge.

Encryption systems work by transforming a message into another message using a mathematical function and a special encryption password called the "key." If you encrypt the same message with two different keys, you get two different encrypted messages. If the encryption system is good, it is nearly impossible to translate the encrypted message back into the original message without knowing the key.

"Oil companies use it for transmitting oil exploration data from the oil well back to the main computer," says Samuel S. Wagstaff, a professor of computer science at Purdue University. "They don't want [their competitors] to benefit from the information."

Layers of protection

Encryption provides additional layers of protection for computers shared by many users. Unauthorized users may be able to access files, but if they don't know the key used to encrypt the files, it won't do them any good.

For this reason, encryption also protects data from being tampered with, says Dorothy Denning, a computer security expert at Digital Equipment Corp.'s Software Research Center in Palo Alto, Calif. Even if attackers manage to bypass your computer's security system, they won't be able to view confidential information without the encryption key. Although the attackers may be able to delete files, they can't forge encrypted documents because the forged documents won't decrypt properly.

Because encryption thwarts data tampering, it's also used for financial transactions transmitted over vulnerable channels, Denning says. Furthermore, she says, encryption can protect programs from attack by viruses. A virus that modifies an encrypted program won't run after the program is decrypted.

There are currently two basic types of encryption systems in use: "private key" and "public key" systems. Private-key encryption uses the same password to encrypt and decrypt the message. One of the most common private-key encryption systems is the Data Encryption Standard, better known as DES, developed by IBM in the 1970s.

Public-key encryption uses one key to encrypt a message (called the public key) and another key to decrypt the message. One of the most popular public key systems is RSA (for its creators, Rivest, Shamir and Adleman), which uses keys calculated from prime numbers that are hundreds of digits long.

There are a variety of encryption products on the market today. Some are programs that automatically encrypt data when it is saved onto disk and that decrypt it when the data is loaded back into an application program. Other programs are stand-alone and must be run in a separate step, leaving the decrypted data on the computer's hard disk. Some systems use special-purpose encryption hardware to speed the encryption process. Encrypting modems are also available and can be set to automatically encrypt everything sent over a telephone line.

Picking an encryption system is complicated by the fact that none is perfect: every system can be broken, according to Wagstaff. "Some of them can be broken in one or two days, some may take 100 years. Some can be broken for $1,000, while some of them might cost a billion dollars to break. You have to estimate the power of your enemy and how much power your enemy is willing to spend to break your cipher," he says.

Extra power needed

Encryption is not without its problems, however. It takes time and computer power to encipher and decipher a message. Generally, the more secure the encryption system, the longer it takes.

Another danger is forgetting your key. If your encryption system is any good, losing your key means that you've also lost your data.

Encryption software is fundamentally different than other applications. With a spreadsheet or a word processor, it's easy to tell if the program is functioning properly. But if you're not a cryptography expert, how do you tell if a proprietary encryption algorithm is easy to break?

Cryptologia magazine published articles in 1987 demonstrating the ease of cracking the encryption systems used by several popular IBM Personal Computer programs. "I've seen enough encryption schemes cracked that I would be very suspicious of a proprietary one," Denning says. Instead, she adds, companies should rely on well-known and well-tested systems such as DES and RSA.

Garfinkel is a free-lance writer and computer consultant based in Cambridge, Mass.

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The BoCoEx index on used computers

Closing prices report for the week ending November 2, 1990

	Closing price	Recent high	Recent low
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XT Model 089	$550	$625	$400
AT Model 099	$650	$975	$500
AT Model 239	$875	$1,025	$750
AT Model 339	$925	$1,100	$900
PS/2 Model 30-286	$1,250	$1,300	$1,125
PS/2 Model 60	$1,500	$1,800	$1,400
PS/2 Model 70P	$3,425	$3,450	$3,175
Compaq Portable II	$900	$1,050	$875
Portable 286	$1,275	$1,450	$1,100
SLT 286	$2,500	$2,625	$2,000
Portable 386	$2,800	$2,800	$2,500
LTE 286	$2,000	$2,100	$1,850
Deskpro 286	$1,175	$1,400	$1,100
Deskpro 386/20	$2,900	$3,100	$2,400
Apple Macintosh Plus	$750	$975	$700
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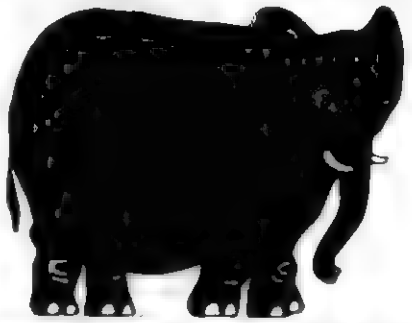

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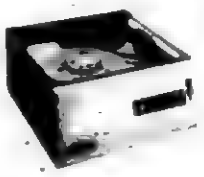

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Ergonomics awareness piques

But should IS be more involved in preventive training?

BY LISA GUISBOND
SPECIAL TO CW

After a decade of conflicting claims and confusing data regarding computer-related ailments, one thing is clear: Even the most costly "ergonomically correct" equipment and furniture are of little help if users are not trained to use them properly.

While human resources departments have traditionally handled ergonomics issues, ergonomics experts see an important role for information systems in formulating preventive training programs.

Undeniably, everyone who works with computers is paying attention to reports on cumulative trauma disorders (CTD), which occur in occupations such as data entry and journalism, where repetitive tasks such as keyboard strokes place stress on the hands and wrists.

Pain in the keyboard

Carpal Tunnel Syndrome — the most well-known of these disorders — often begins with burning, aching pains at night and can cause paralysis and atrophy of the thumb muscles in later stages. Less dramatic but more common are back and neck injuries — caused not only by repetitive tasks but also by improper height of desks, chairs, keyboards and screens — which cause serious discomfort but do not usually disable the sufferer.

Examples such as Mountain Bell (where 140 cases of CTDs have been reported among 500 directory assistance operators) and the New York newspaper *Newsday* (where as many as 40% of employees have complained of CTD symptoms, and a liability suit has been initiated against the maker of their keyboards) are causing many businesses to take notice. Beyond these examples, there are estimates from a variety of medical experts for treating CTD injuries beginning at $3,000 per worker per year — double that if surgery is required.

Gary Niekerk, director of health and safety at Apple Computer, Inc., sees a strong role for IS in ergonomic issues. While IS personnel are not yet involved in this area, he says that they could enhance their value to their organization if they could offer some guidance and counsel on how to set up an ergonomically correct work area.

Although Apple had just a few reported cases of CTD-related injuries, it decided to create its own training program, Niekerk says. The company began identifying key user groups before bringing in a consultant to help establish a training program.

The program includes a 20-minute general talk for new employees on environmental health and safety that emphasizes the importance of setting up a work area properly. If workers request additional information, they are given the opportunity to take a class that focuses on issues of cumulative musculoskeletal problems and eyestrain. The class also deals with VDT radiation, a specific concern for many people, particularly pregnant women.

Niekerk is now developing a training video to sensitize managers to the work patterns that can lead to or exacerbate CTDs. "You don't want a manager to say, 'Hey, I'm interested in any problems you have physically, but we do need you to work 15 hours a day for the next week, every day, and Saturday and Sunday.' There's some kind of conflicting message there," he says.

Tom Signore, an occupational ergonomist at Raychem Corp. in Menlo Park, Calif., and an independent consultant, says he also believes there should be more of a connection between IS and ergonomics. "If you are designing a computer system, you had better take a look at the people who interface with it and make sure that the interface is a smooth one — both from an efficiency standpoint and a health and safety standpoint. If [IS is] not looking at it, they're missing the boat," he says.

However, IS hasn't quite hopped on that boat yet. Gerald Siddons, director of scientific computing at the division of biostatistics and epidemiology at Dana-Farber Cancer Institute, sees a lack of initiative on the part of IS to participate in ergonomics issues — and he includes himself in that assessment. "I'm a good example of someone who pays lip service but then doesn't do anything about it," he said. Nonetheless, Siddons thinks ergonomics is a genuine area for IS concern.

While IS isn't yet dedicated to the ergonomics effort, other people in health and safety positions are. Mike Manfro, safety and environmental affairs manager at *The Los Angeles Times*, has been engaged in a six-year effort to reduce VDT-related injuries and is now participating in a comprehensive National Institute of Occupational Safety and Health study of the problem involving 1,000 *L.A. Times* workers. He agrees that training is key to preventing injuries.

With the help of an ergonomics consultant, the *L.A. Times* has developed a training video and instructional booklet on setting up equipment and injury-prevention exercises. The video and booklet direct employees on how to adjust their screens, keyboards, chairs and tables to the appropriate heights for their bodies and details stretching exercises.

Professional help

For those interested in more information on ergonomics, Signore recommends contacting a university with an established ergonomics department, such as the University of Michigan (where Signore obtained his master's degree in industrial engineering), to ask for referrals.

Other resources include the American Industrial Hygiene Association and the Human Factors Society in Santa Monica, Calif.

Computer-related ailments have also spurred the growth of an ergonomics consulting industry. These consultants can be brought in to help companies evaluate and correct working conditions that can lead to costly injuries and staff downtime.

Guisbond is a free-lance writer based in Cambridge, Mass.

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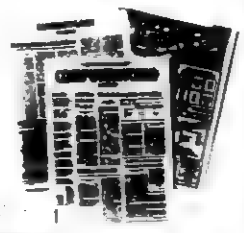

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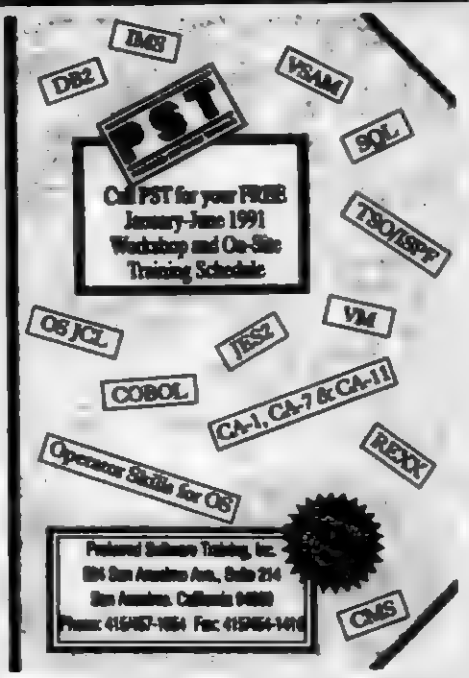

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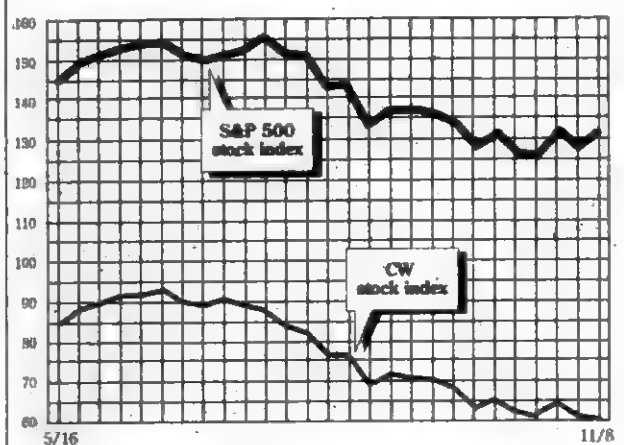
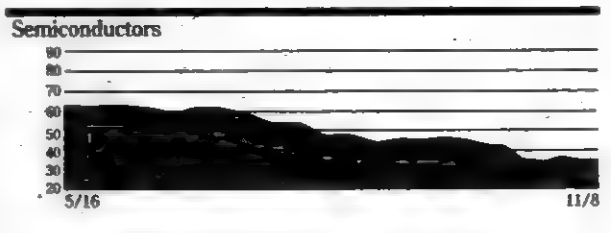
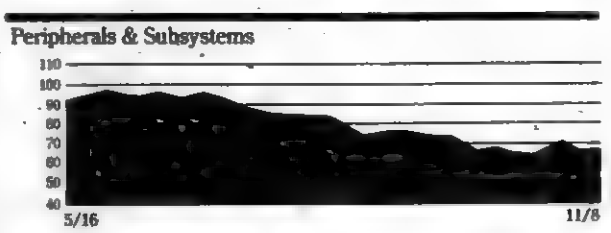
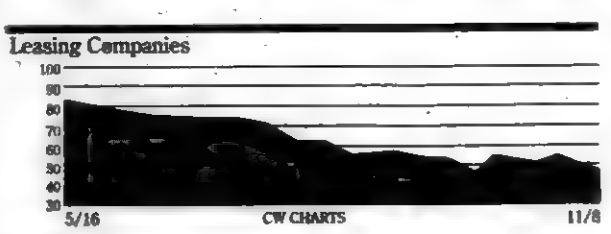
STOCK TRADING INDEX



Indexes	Last Week	This Week
Communications	97.9	98.8
Computer Systems	59.4	60.3
Software & DP Services	87.6	89.0
Semiconductors	36.6	36.8
Peripherals & Subsystems	67.0	68.2
Leasing Companies	50.5	44.7
Composite Index	61.4	60.9
S&P 500 Index	128.4	131.6







CW CHARTS

Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, OCT. 7, 1990

EXCH		52-WEEK RANGE		PRICE CLOSE OCT. 7, 1990	WEEK NET CHNGE	WEEK PCT CHNGE
	Communications and Network Services					
N	AMERICAN INFO TECHS CORP	68	53	64.25	-1.5	-2.3
O	ANDREW CORP	26	18	17.5	0.5	2.9
O	ARTEL COMM CORP	10	2	2.75	0.3	10.0
N	AT&T	47	30	33.625	-0.4	-1.1
O	AVANTEK INC	5	2	1.875	0.3	15.4
N	AYDIN CORP	19	10	10.25	-0.5	-4.7
N	BELL ATLANTIC CORP	57	40	50.375	-1.9	-3.6
N	BELLSOUTH CORP	58	48	52.875	0.1	0.2
O	COMPRESSION LABS INC	16	7	11.875	-2.4	-16.7
O	CONTEL CORP	36	23	33.375	-0.1	-0.4
O	DATA SWITCH CORP	4	2	3	0.0	0.0
O	DIGITAL COMM ASSOC	27	9	10.125	0.5	5.2
O	DYNATECH CORP	19	12	15.75	0.8	5.0
O	FIBRONICS INTNL INC	13	5	7.25	0.0	0.0
O	GANDALF TECHNOLOGIES	6	2	2.75	0.4	15.8
N	GENERAL DATACOMM INDS	5	2	1.875	0.3	15.4
N	GTE CORP	36	24	28.125	-0.1	-0.4
O	INFOTRON SYS CORP	9	1	1	-0.8	-42.9
N	ITT CORP	61	40	48	2.9	6.7
N	M A COM INC	6	3	4.5	0.1	2.9
O	MCI COMMUNICATIONS CORP	48	28	30.125	0.1	0.4
O	NETWORK EQUIP TECH INC	34	5	5.375	0.0	0.0
O	NETWORK SYS CORP	15	8	8.625	0.3	3.0
N	NORTHERN TELECOM LTD	30	21	25.875	-0.5	-1.9
O	NOVELL INC	29	12	27	2.3	9.3
N	NYNEX CORP	92	67	89.625	1.8	2.4
N	PACIFIC TELESIS GROUP	52	36	44.625	-0.4	-0.8
A	PENRIL CORP	9	5	6.25	0.5	8.7
N	SCIENTIFIC ATLANTA INC	29	9	9.5	-0.1	-1.3
N	SOUTHWESTERN BELL CORP	65	47	56	0.5	0.9
O	3 COM CORP	19	5	7.125	0.3	3.6
N	US WEST INC	41	32	38.625	-0.4	-1.0
	Computer Systems					
O	ALLIANT COMPUTER SYS	9	1	1.25	-0.1	-9.1
O	ALPHA MICROSYSTEMS	5	1	1.625	0.0	0.0
O	ALTOS COMPUTER SYS	8	5	8.25	0.0	0.0
A	AMDAHL CORP	19	10	11.875	0.5	4.4
O	APPLE COMPUTER INC	48	24	33.25	2.5	8.1
O	AST RESH INC	28	9	23.5	2.8	13.3
N	BOLT BERANEK & NEWMAN	9	4	4.625	-0.1	-2.6
N	COMPAQ COMPUTER CORP	68	36	48.375	-0.3	-0.5
N	COMMODORE INTNL	12	5	6.875	-0.5	-6.8
O	COMPUTER AUTOMATION INC	8	0	1.125	0.1	9.0
N	CONTROL DATA CORP	22	9	9.25	1.0	12.1
N	CRAY RESH INC	51	30	25.25	1.6	6.8
N	DATA GEN CORP	14	4	4.125	-0.1	-2.9
N	DATAPOINT CORP	5	1	1.375	0.1	10.0
O	DELL COMPUTER CORP	14	5	11.25	0.8	5.9
N	DIGITAL EQUIP CORP	95	46	47.5	0.0	0.0
N	FLOATING POINT SYS INC	4	0	1.25	-0.1	-8.1
N	HARRIS CORP	38	14	16.5	1.5	10.0
N	HEWLETT PACKARD CO	50	25	25.125	-0.9	-3.4
N	HONEYWELL INC	112	71	86.75	4.1	5.0
N	IBM	122	93	106.5	1.0	0.9
O	INFORMATION INTL INC	14	8	8.75	-0.5	-5.4
O	IPL SYS INC	14	5	9.125	0.3	2.8
N	MAI BASIC FOUR INC	4	1	1	-0.1	-11.1
N	MATSUSHITA ELEC INDL LTD	169	116	128.5	-8.5	-6.2
O	MENTOR GRAPHICS CORP	28	8	10.75	1.1	11.7
N	NBI INC	1	0	0.141	0.0	-9.6
N	NCR CORP	72	45	48	0.6	1.6
O	PYRAMID TECHNOLOGY	28	12	14.5	1.0	7.4
O	SEQUENT COMP SYS INC	34	13	17	1.0	6.3
O	SUN MICROSYSTEM INC	37	15	17.625	1.6	10.2
O	SYMBOLICS INC	2	0	0.281	0.0	-10.2
N	TANDEM COMPUTERS INC	30	9	10.25	0.9	9.3
N	TANDY CORP	44	24	24.375	0.5	2.1
N	ULTIMATE CORP	18	2	2	0.0	0.0
N	UNISYS CORP	17	2	2.875	0.6	27.9
A	WANG LABS INC	8	3	2.75	-0.1	-4.3
	Software & DP Services					
O	AMERICAN MGMT SYS INC	20	11	14.625	0.4	2.6
O	AMERICAN SOFTWARE INC	18	8	10.375	0.4	3.8
N	ANACOMP INC	5	1	2	-0.1	-5.9
O	ANALYSTS INTL CORP	24	10	12.5	0.3	2.0
O	ASHTON TATE	15	5	7	0.3	3.7
N	AUTO DATA PROCESSING	60	45	51	0.6	1.2
O	AUTODESK INC	60	32	40.75	2.5	6.5
O	BMC SOFTWARE INC	30	17	19.625	-0.1	-0.6
N	BUSINESSLAND INC	12	1	1.5	-0.3	-14.3
O	COGNOS INC	10	4	7.5	0.9	13.2
N	COMPUTER ASSOC INTL INC	17	4	7	0.0	0.0
O	COMPUTER HORIZONS CORP	17	9	12.75	-0.4	-2.9
N	COMPUTER SCIENCES CORP	69	37	44	1.4	3.2
N	COMPUTER TASK GROUP INC	12	7	7.125	-0.3	-3.4
O	COMSHARE INC	25	14	17.25	0.3	1.5
O	CORPORATE SOFTWARE	16	4	4.75	-0.3	-5.8
N	GENERAL MTRS (CLS E)	38	24	32.5	-0.1	-0.4
O	GOAL SYSTEMS INTL	18	8	8.50	0.8	10.4
O	HOGAN SYS INC	7	2	2.375	0.3	11.8
O	INFORMIX CORP	18	4	4	0.4	10.3
O	INTELLICORP INC	3	1	1.75	0.1	3.7
O	LEGENT CORP	31	17	19.375	1.1	6.2
O	LOTUS DEV CORP	39	13	18.625	1.4	8.0
O	MICROSOFT CORP	81	38	63.75	0.0	0.0
O	NATIONAL DATA CORP	35	8	11	0.9	8.9
N	ON LINE SOFTWARE INTL INC	11	4	4	-0.3	-5.9
O	ORACLE SYS CORP	108	5	5.625	0.3	4.7
N	PANSOPHIC SYS INC	19	7	7.375	-0.4	-4.8
O	PHOENIX TECHNOLOGIES INC	5	2	1.625	-0.1	-7.1
N	POLICY MGMT SYS CORP	43	30	36.25	-1.4	-8.7
O	PROGRAMMING & SYS INC	25	9	10.75	0.8	7.5
O	RELATIONAL TECH INC	10	3	9.125	0.0	0.0
N	REYNOLDS & REYNOLDS CO	27	12	13	1.3	10.0
O	SAGE SOFTWARE INC	16	8	9.875	-0.6	-6.0
O	SEI CORP	22	15	16	0.0	0.0
O	SHARED MED SYS CORP	17	12	16.25	0.0	0.0
O	SOFTWARE PUBG CORP	28	12	15.25	1.8	13.0
N	STERLING SOFTWARE INC	11	6	6.875	-0.1	-1.8
O	SUNGARD DATA SYS INC	26	10	11.375	0.9	8.3
N	SYSTEM CENTER INC	25	6	7.125	-0.5	-6.6
N	SYS. SOFT INC	29	13	20.5	1.3	6.5
O	WORDSTAR	2	1	1.063	0.1	6.3
	Semiconductors					
N	ADV MICRO DEVICES INC	11	4	3.75	-0.1	-3.2
N	ANALOG DEVICES INC	10	6	5.75	0.0	0.0
O	ANALOGIC CORP	10	6	6.375	-0.1	-1.5
O	CHIPS & TECHNOLOGIES INC	24	6	6.25	0.3	4.2
O	INTEL CORP	52	28	34.5	1.0	3.0
O	MICRON TECHNOLOGY INC	18	7	7.375	-0.5	-6.3
N	MOTOROLA INC	68	51	56	1.1	2.1
N	NATL SEMICONDUCTOR	9	3	3.75	0.4	11.1
N	TEXAS INSTRS INC	44	28	28.75	1.8	7.3
A	WESTERN DIGITAL CORP	16	6	6.125	-0.5	-8.9
	Peripherals					
O	ALLOY COMP	2	0	0.25	-0.3	-60.0
N	AM INTL INC	6	1	1.5	0.5	50.0
O	AUTO TROL TECH CORP	4	2	2.063	0.1	3.2
O	BANCTEC INC	24	10	11	0.5	4.8
A	COGNITRONICS CORP	7	3	5.375	0.1	2.4
O	CONNER PERIPHERALS	31	11	21.875	-1.3	-5.4
A	DATARAM CORP	22	8	8.188	-0.1	-0.8
N	EASTMAN KODAK CO	44	36	38.875	-0.9	-2.2
N	E M C CORP MASS	8	3	7.25	0.5	7.4
O	EMULEX CORP	9	4	5	0.1	2.6
O	EVANS & SUTHERLAND	35	14	15.5	-1.0	-6.1
O	ICOT CORP	2	0	0.563	0.1	12.8
O	INTERLEAF INC	8	3	3.25	0.0	0.0
O	IOMEGA CORP	6	3	4.063	0.0	0.0
O	MASSTOR SYS CORP	3	0	0.313	-0.3	-44.4
O	MAXTOR CORP	17	4	4.625	-0.1	-2.6
O	MICROPOLIS CORP	10	3	5.75	0.3	4.5
N	MINNESOTA MNG & MFG CO	91	73	73.875	-0.1	-0.2
O	PERSONAL COMP PRODUCTS INC	5	4	3.625	-0.1	-3.3
O	PRINTRONIX INC	15	6	8.375	-0.2	-2.2
N	QMS INC	21	9	11.25	-0.6	-5.3
O	QUANTUM CORP	25	9	18.25	-0.1	-0.7
N	RECOGNITION EQUIP INC	8	4	5	0.0	0.0
O	REXON INC	10	4	5.625	-0.4	-6.3
O	SEAGATE TECHNOLOGY	20	6	8.75	1.4	18.8
N	STORAGE TECH CORP	35	11	15.875	2.0	14.4
O	TANDON CORP	4	1	1.688	0.0	0.0
N	TEKTRONIX INC	19	12	16	0.8	4.9
O	TELE VIDEO SYS INC	1	0	0.25	0.0	0.0
N	XEROX CORP	60	29	31.125	1.8	5.5
	Leasing Companies					
N	CAPITAL ASSOC INTNL INC	5	1	0.625	-0.3	-28.6
N	COMDISCO INC	30	15	15.625	-0.4	-2.3
O	LDI CORPORATION	18	10	10	-0.3	-2.4
O	PHOENIX AMERN INC	5	3	4.625	-0.1	-2.6
O	SELECTERM INC	7	3	2.75	-0.3	-8.3

EXCH: N—NEW YORK; A—AMERICAN; O—NATIONAL

War spoils

Rumors of action in the Middle East stifle trading

Forget that image of Wall Street as a near-riotous mass of people screaming above the din of money-changing hands. Wall Street responds best to whispers. And hazy government statements sure fan the fires of hearsay. Reports of a stepped-up offensive in the Middle East — but no declaration of any change in policy — made traders nervous last week, an apprehension reflected in the bitsy movements of technology stocks.

Take semiconductor firms, for example. After Intel Corp. put out its new multimedia chip, its share price crept up just ¼ of a point last week to close Thursday at 35¼. As it let customers preview its new 16M-bit memory chip, Texas Instruments, Inc. dipped ½ of a point to 25½. Scuttlebutt from analysts last week put Motorola, Inc. in poor financial standing for the quarter and drove the company's shares down 3½ points to 54¼.

Reported closed-door talks between AT&T and NCR Corp. had traders abuzz with stories of acquisitions, mergers and every other kind of possible agreement between the two hardware makers. AT&T dropped 1⅛ points to 33⅛ as NCR zoomed up 5½ points to 53⅝.

After introducing its new Sparcstation 2 workstation, Sun Microsystems, Inc. improved its standing by 1 point, closing at 17⅞. Apple Computer, Inc. shot up 2¼ points to 34½. Bellwethers IBM and Digital Equipment Corp. slipped slightly: IBM lost ⅛ of a point, falling to 107½, while DEC was down ⅝ of a point to 48⅜.

Among software concerns, Microsoft Corp. fell 1½ points to 63¾, as Autodesk, Inc. and Oracle Systems Corp. each advanced by ½ of a point, to 41½ and 5⅜, respectively. Boole and Babbage, Inc. posted quarterly revenue up but profit down; its stock price slipped ½ of a notch to close at 12⅜. Lotus Development Corp. remained unchanged at 19½.

KIM S. NASH

NEWS SHORTS

Corrigan heads IBM Entry Systems

IBM named Robert J. Corrigan as president of IBM Entry Systems Division late last week. Corrigan, former president of the IBM Systems Technology Division's technology products line of business, will report to James A. Cannavino, IBM vice president and general manager of the Personal Systems line of business. In a related announcement, IBM Vice President Lutz F. Hahne was named to succeed Corrigan.

Encryption for FTS 2000

The U.S. General Services Administration (GSA) won approval from an interagency panel last week to proceed with an ambitious plan to offer data encryption services to more than one million users of the new Federal Telecommunications System 2000. GSA plans to offer two levels of end-to-end encryption over packet-switched networks, one for sensitive but unclassified data and another for classified traffic.

3Com eyes optics

Networking company 3Com Corp. is hinting that a new alliance could result in a write-once read-many device bundled into 3+Open systems. 3Com announced last week that it will co-develop memory backup systems with Naperville, Ill.-based Palindrome Corp. The products will run on Microsoft Corp.'s LAN Manager network operating system. Gordon Smith, product line manager for 3Servers and 3Stations, refused to say whether 3Com will work on optical media. Smith did say that "the next logical step would be to move beyond tape."

Leasing push at Amdahl

Amdahl Corp. said last week it will step up the use of an in-house leasing group to provide financing for Amdahl mainframes in the U.S. The move is not intended to stem third-party leasing of Amdahl machines, the firm said. The news came at Amdahl's quarterly meeting with industry analysts. However, some Amdahl customers were notified of the change several weeks ago. The leasing arm, Amdahl Capital Corp., was created in 1978 but has been relatively quiet in recent years.

Ask, Ingres job cuts

As expected, Ask Computer Systems, Inc. terminated 15% of its work force at Ingres Corp. last week. Ingres is an Alameda, Calif.-based database software company that Ask acquired on Oct. 29. Ask said it had eliminated 270 positions from the combined company's work force, including an unspecified number of positions at Ask. Before the merger, Ingres had 1,200 employees; Ask had about 900 employees.

Gupta with multiple introductions

Gupta Technologies, Inc. last week announced that it will ship Version 2.0 of its SQL Windows product along with its SQLbase Server Version 4.1 on Nov. 30. The company confirmed earlier reports that SQLbase 4.1 will address bugs users found in Version 4.0. For example, it will offer cursor context preservation, allowing developers to create multiwindowed browsing and scrolling applications more easily. Gupta also announced a version of SQLnetwork for IBM DB2 that does not require IBM CICS.

Tiger attacks Adapso attendee

An elaborate prank turned ugly at last week's Adapso conference in Scottsdale, Ariz., when an attendee was injured by a 450-pound Bengal tiger. Adele S. Kalis was listed in good condition at a local hospital after she was scratched and bitten in the leg by a tiger that was to have been used by John Imlay, chairman of Dun & Bradstreet Software, in a roast staged in his honor that evening. In business news at Adapso, the association announced plans to merge with the newly formed Software Business Practices Council [CW, Oct. 22], which is working to improve the ethical standards of the software industry. Adapso's directors also voted to rename their organization the Information Technology Association.

Dbase IV fast losing credence

BY JAMES DALY
CW STAFF

LAS VEGAS — Many Ashton-Tate Corp. users attending this week's Comdex/Fall '90 trade show will pound the pavement looking for a product, that, although it has been continually promised, remains harder to get your hands on than a royal flush.

Two years ago, Ashton-Tate officials announced Dbase IV Version 1.1's Professional Compiler, a device sorely needed by users anxious to port the best-selling Dbase IV database application to a variety of different processors and operating systems within their shops.

Since then, however, Ashton-Tate officials have been poker-faced about an arrival date for the compiler — and users are getting frustrated. "I need it, and I'm ready for it. I just haven't seen it," said Jack Bradford, a programmer at the Minnesota Department of Natural Resources in Minneapolis.

Ashton-Tate will give an advanced peek at the compiler at the show, and beta-test versions have been promised by President Bill Lyons by the end of the year, but the delay is not sitting well with users who need the product now.

Particularly antsy are those who hung tough with the company between the time it released the bug-laden Dbase IV Version 1.0 two years ago and the release of the improved Version 1.1 in late July. They feel the company owes them an explanation and has not done a good job of clearing the air about the increasingly mysterious compiler.

"It's very unsettling. What can be that wrong with it to cause this delay?" asked Bill Campbell, systems consultant at South Carolina Water Resources in Columbia, S.C.

Some industry analysts said the wait for a general release of the compiler could still be another eight months or a year away. Why the holdup? Ashton-Tate officials were unavailable for comment on this point, but some users said they were told that early Microsoft Corp. software libraries originally targeted for the compiler were scrapped for libraries of Ashton-Tate's design.

To satisfy their compiler needs during the waiting game, some users headed over to products such as Fox Software, Inc.'s Foxbase and Nantucket Corp.'s Clipper, which are actually interpreters but can also perform compiler duties.

"If I sat here and waited for Ashton-Tate to give me a usable product, I would have been out of business," said Pat Adams, president of DB Unlimited, a consulting firm in Brooklyn, N.Y. "My loyalty is to my business and my clients, not any particular company."

SPA

FROM PAGE 1

and explaining the legal consequences of not buying registered software. In some cases, the SPA will request permission to audit a company.

Lawsuits are only filed against large companies or particularly egregious offenders. In the case of the company that will be raided this week, Burek said, "We feel that the company may make an attempt to clean up their act [if we notified them], and we'd rather nail them."

A search-and-seizure notice can only be granted by a judge when a suit is filed alleging software piracy. During the past two weeks, the SPA has filed six cases against companies it accused of pirating software. This week it may file two more.

With last month's actions by the U.S. Congress to create a new law banning software rentals and lifting a shield that had exempted institutions and employees of the 50 states from copyright infringement damages [CW, Nov. 5], the SPA's litigation folder could expand greatly in the near future.

Although the SPA has conducted fewer than 10 search-and-seizure efforts in its two-year battle against software pirates, they have been fruitful.

In May, the SPA raided the three campuses of the National Business Academy, a software training school headquartered in Van Nuys, Calif., that teaches classes on Microsoft Corp.'s DOS, Wordperfect Corp.'s Wordperfect and Lotus Development Corp.'s 1-2-3.

That raid netted 600 allegedly pirated copies of software worth $250,000 from just one location. The SPA said it is negotiating a settlement with the Academy over the $2.5 million in software it believes the school has pirated.

The May raid stemmed from evidence found in four affidavits, including those of two students and a teacher at the school, and represents the single biggest action the SPA has taken in its two-year crackdown on software pirates.

Raids obviously have the potential to disrupt an entire company's business while it attempts to replace its software, but SPA executive director Ken Wasch defended the policy.

"We reserve hardball tactics for those people who deserve it," Wasch said. "By and large, our program is pro-user, and thousands upon thousands of large corporate users apparently appreciate our efforts" in providing such antipirate kits as Spaudit, a package that clearly details what pirating is and helps MIS directors ensure that their machines are clean.

"Our greatest ally in all this is the MIS manager," Wasch said. "They're stuck in the middle, and they tell me that we're a godsend, that we help them get the message through to their management or their end users."

Julian Horwich, executive director of the Chicago Association for Microcomputer Professionals (CAMP), agreed with Wasch that microcomputer managers do appreciate the SPA. CAMP members, he said, "have talked about it and I think favorably."

The MIS director at a firm that settled with the SPA and the president of a small company that recently received a cease-and-desist letter from the SPA both said that the SPA was doing something positive.

The company president, who requested not to be identified, did say that "we have to spend five or six grand, and that's a lot of money. This would've killed us if it had happened a couple of years ago."

It would cost far more if the SPA came calling, Wasch said, noting that within the next month, it is likely that a 20-PC site will be raided as well.

Audit trail

Since 1988, the Software Publishers Association has taken the following actions in its campaign against illegal copying

1. Sent more than 300 cease-and-desist letters
2. Conducted more than 50 audits (program started in 1989)
3. Collected $1 million-plus in penalties
4. Generated $5 million to $10 million in additional sales from court cases
5. Distributed 10,000 copies of self-auditing kit
6. Filed 60 suits
7. Received an average of 20 calls per day on its toll-free line

Source: Software Publishers Association — CW Chart: Doreen St. John

Upgrade-itis

CONTINUED FROM PAGE 1

Ron Adinolfi, vice president of enterprise decision support at Swiss Bank Corp. "A maintenance contract would sure make life a lot easier."

Alternatively, support for an industry-standard upgrade policy of some stripe has emerged among some users and at least one distributor.

"I'd like to see a fill-in-the-blank upgrade announcement sheet where the developer is compelled to say, 'These are the major and obscure fixes and bugs,' " said Brian Illari, an assistant vice president at Citicorp Global Finance NA.

Users have long complained that some upgrades are actually bug fixes. Now they are finding that controlling and managing a constant stream of upgrades for multiple systems is time-consuming and usually expensive.

In part, what is driving the trend toward upgrades is the tendency of developers to release products they know have problems, expecting to ship a maintenance disk a month later, complained Brian Livingston, an independent network consultant, echoing similar comments from other users.

It can take six months to a year to thoroughly test, approve, purchase and install an upgrade (see story below), Livingston said. "This causes intense problems for sites with hundreds or thousands of PCs."

With that in mind, most of the users agreed on the following caveats:

- Major upgrades should be a minimum of one year apart and as far as two years apart.
- Users should not have to pay for any bug fixes nor should they have to pay for minor upgrades released, at a minimum, within six months after the initial ship. A large number of users would extend that period to a year.
- Users should be given fair warning before support for a specific version is withdrawn.
- Acceptable upgrade costs would range from $10 to $50. "At user group meetings, when someone mentions a new product, the first question is, 'How much is the upgrade?' It's an issue," said David Blumenstein, a spokesman for the New York PC Users Group.

Vendors, however, are increasingly forced to rely upon upgrade sales to fill their coffers, and many view their individual upgrade policies as part of their competitive mix.

Reaping upgrade revenue

Jeffrey Tarter, publisher of the "Soft Letter" newsletter, said many developers, especially in mature markets, are already generating 20% to 30% of their revenue from upgrade sales.

He predicts a shift in emphasis during the next few years from new product rollouts to upgrade strategies, as users who are moving to more powerful platforms demand souped-up versions of their favorite applications.

Recognizing that a good chunk of future revenue will come from upgrades, software reseller Corporate Software, Inc. not only tailors services to a user's needs but also claims it has been after key developers for about a year to come up with a standard upgrade policy.

Paul Grayson, president of Micrografx, Inc., said that vendors had better get their houses in order. "If customers think you are making money off the upgrade, it makes them mad. They feel like they already paid you once."

Micrografx once offered a $149 upgrade to Draw Plus, which retailed at $395, but was forced by customer complaints to drop the price to $99. These days, Micrografx offers its buyers six months' free protection and after that, charges $49 for minor upgrades, $99 for major ones.

The happiest users tend to be those on networks, particularly those using diskless workstations. These users say upgrades are a snap, typically taking a couple of hours.

Swiss Bank can upgrade overnight on its network of diskless workstations. It's a different story for its stand-alone workstations. "I don't have the manpower to keep 400 workstations at the same [application] level," Adinolfi said.

However, not even the "LAN-locked" are safe, Illari warned. He estimated that he handles about 300 networkwide upgrades per year, adding that his group spends at least one-quarter of its time dealing with upgrades. So much so that Illari not only has a separate local-area network dedicated to testing new releases, but his group has also developed an automated system to deal with network system software upgrades.

Another critical issue revolves around upgrade compatibility with other desktop applications. Each upgrade must be checked against each piece of system software. It is time-consuming, and inconsistencies are inevitable.

Microsoft Corp.'s Windows 3.0 may be the key here, said users, who are hoping that if enough developers write to specific Windows application programming interfaces, then upgrade compatibility issues will diminish.

Developers can also kill the customer with kindness. Blumenstein, who is also a corporate consultant, said he is on Wordperfect Corp.'s automatic update list. He now has more than 100 Wordperfect Version 5.1 disks, along with three sacks full of upgrade and update disks from the service-oriented developer.

"Wordperfect's approach is that they will go out of their way to fix [problems] and make everything as perfect as possible. It's a great ethic, but there is a thin line between reality and madness," an exasperated Blumenstein said.

To release or not to release?

Here is one example of upgrade policies. The installed base of Lotus Development Corp.'s 1-2-3 spreadsheet for DOS is made up of seven different versions. Lotus offers another five versions spanning as many platforms and is working on a sixth version — this one for Windows 3.0.

1-2-3 Release 3.0 — Shipped June 20, 1989

- Retail price: $595 for Standard Edition, $685 for Server Edition and $395 for Node Edition.
- Release 3.0 of 1-2-3 is priced at $495 through 1989.
- Registered buyers of Release 2.01 from Sept. 6, 1988, until 30 days after Release 2.2 shipped may upgrade free to Releases 3.0 or 2.2.
- Other users could upgrade for $150.

1-2-3 Release 2.2 — Shipped July 27, 1989

- Retail price: $495 for Standard Edition, $595 for Server Edition and $295 for Node Edition.
- Registered buyers of Release 2.01 between Sept. 6, 1988, and Aug. 31, 1989, could upgrade free to Releases 2.2. or 3.0 until Dec. 31, 1989.
- Other users pay $150 to move to Release 2.2.

1-2-3 Release * * *

1-2-3/G — Shipped March 26, 1990

- Retail price: $695
- 1-2-3 Release 2.2 users can upgrade to G for a special price of $75 from Lotus.
- Master Agreement customers with proof of purchase may upgrade for $75 through participating Lotus resellers.
- All other 1-2-3 users can upgrade to G for $150.

1-2-3 Release 3.1 — Shipped Sept. 10, 1990

- Retail price: $595 for Standard Edition, $795 for Server Edition and $495 for Node Edition.
- Users who buy or have bought Release 3.0 on or after May 7, 1990, are entitled to a free upgrade to Release 3.1 through Dec. 31, 1990. Free network upgrades can be redeemed through March 31, 1991.
- Customers who bought Release 3.0 before May 7, 1990, can upgrade to Release 3.1 for $35.
- 1-2-3 Release 2.2 users can upgrade for a suggested retail price of $75 through Dec. 31.
- Users of 1-2-3 Releases 1, 1A, 2 and 2.01 may upgrade to Release 3.1 for a suggested retail price of $150.

PATRICIA KEEFE

Numbers hold true

Besieged by what its members saw as a wave of often unnecessary software upgrades, Microcomputer Managers Association, Inc. (MMA) issued a white paper three years ago that took a hard look at upgrade costs, among other issues.

The report went on to outline the time and steps required to upgrade 100 copies of a typical package. What follows is a condensed version:

- Purchase a single copy of the new version or obtain an evaluation copy (1-2 weeks).
- Test for bugs, functionality, hardware, software and file compatibility (4-8 weeks).
- Get management approval to purchase package (4-8 weeks).
- Collect systems disks from users (4-10 weeks) and order upgrades (2 weeks).
- Develop training courses (2-5 weeks).
- Begin installing upgrades. A total of 300 man-hours is required, assuming four people work full-time for nine working days.

If all goes well, the process takes an estimated 17 to 32 weeks and close to 450 man-hours to complete. Users must further add labor costs to the out-of-pocket cost of the upgrade.

Interviews with MMA members who developed the 1987 report said these numbers hold true today.

PATRICIA KEEFE

Intel to raise the curtain on fast parallel supercomputer

BY J. A. SAVAGE
CW STAFF

BEAVERTON, Ore. — Intel Scientific Computers will unveil a parallel supercomputer tomorrow that may be the fastest machine available, according to developers and analysts.

The computer will have more than 500 Intel I860 reduced instruction set computing processors in a hypercube architecture and will run at a theoretical 20G floating-point operations per second (FLOPS), according to Jeff Canin, an independent consultant in San Francisco. Intel's earlier machines were capable of a theoretical peak of 7.6G FLOPS with 128 processors. The older machines were also rated at 4,224 million instructions per second (MIPS). No MIPS rating was available for the new computer.

"No applications will be able to harness all that power, but they are constructing the computer," Canin said.

The difficulty with harnessing the potential power is that at this point, nearly all applications for parallel computers must be custom-made to break up a problem so that a part of it runs on each of the processors. Efforts to write such code are being undertaken at Intel as well as in academic settings.

The computer will be owned by a consortium of academic, private and government users and will reside at the California Institute of Technology in Pasadena, Calif., analysts said.

Intel has said it is working on technology to allow speeds of one trillion FLOPS. It is growing out of the $27 million Touchstone project, which derives approximately one-third of its funding from the Defense Advanced Research Projects Agency and the remainder from Intel, according to Benjamin Peek, associate director at the Oregon Advanced Computing Institute.

Buyers may stem laptop flood

User concerns over service and support may stymie smaller vendors

BY MICHAEL FITZGERALD
CW STAFF

LAS VEGAS — Laptop computer vendors lining up to place their Intel Corp. 80386SX chips on the table may find corporate buyers unwilling to gamble with anyone other than well-heeled suppliers able to bankroll national support and service.

"Comdex is going to be swamped with notebooks from people you've never heard of before," said Robert Charlton, an industry analyst at Dataquest, Inc., a San Jose, Calif.-based market research firm.

However, while introductions of speedier, lighter portables may generate the most excitement at Comdex/Fall '90, managers responsible for putting the machines out in the field said they need more than the latest technology.

Support is the key issue for New York Life Insurance Co., which has more than 10,000 agents in the field, including more than 4,000 who use NEC Technologies, Inc. Prospeed 386SX portables.

"When I'm dealing with 10,000 agents across the country in places like Ulysses, Kan., I need a company behind me that I know can deliver quality service," said Richard Nelson, vice president at New York Life Insurance Co.'s Agency Systems Group. "If they can keep it working in Ulysses, then they can make it work anywhere, and if they can't, then we have problems."

Bruce Erickson, marketing and administrative systems manager at Gerber Products Co., said, "We want [vendors] with some proven experience before we'd really think about them."

Gerber plans to outfit its 530-strong sales force with notebook computers and either a Grid Systems Corp. Gridpad or a Norand Corp. handheld terminal in 1991.

"We're looking for a nationwide support contract — because this is a national thing — and company stability, as well as the durability of the machine," Erickson said, adding that the company was leaning toward Compaq Computer Corp.'s LTE.

Those concerns could mean problems for no-name and new-name vendors such as Sanyo Business Systems Corp. or Nippon Steel's Librex Computer Systems, which have not established distribution channels or support organizations. Sanyo and Librex are just two of the vendors scrambling to enter the sizzling notebook market, which is expected to grow at 30% for at least the next three years, said Tim Bajarin, executive vice president at Creative Strategies Research International, Inc.

Breaking tradition

Gilbert Hoxie, who runs a portable computing consulting firm in Los Angeles, says that individuals have traditionally been the buyers of cutting-edge portables. He said he thinks the 386SX chip will change this.

Low-ball pricing may not be much of a factor for corporate users, despite the vast difference between the $6,499 Compaq LTE 386S/20 and the $2,699 machines distributed by Austin Computer Systems, Inc., in Austin, Texas, and Northgate Systems, Inc. in Eden Prairie, Minn. Dan Ness Jr., a personal computer analyst at Computer Intelligence in La Jolla, Calif., said he expects the market to split, with corporations buying from name vendors and individuals purchasing from smaller, less established vendors.

Not all corporate users are wedded to a well-known name. Caisse Nationale de Credit Agricole's U.S. operations, for instance, currently keep libraries of Compaq portables in their Chicago headquarters and New York, San Francisco and Los Angeles offices. However, the company is both interested in the new SX machines and open to new vendors, said Arthur Claudio, first vice president and head of U.S. data processing.

"If something came out that was better [than Compaq], we'd go with that," Claudio said. His only concerns center on any new vendor being able to also maintain the Compaq machines.

Having a relatively well-known name could help companies such as AST Research, Inc. and Texas Instruments, Inc. overcome a lack of presence in the market.

"We pretty much will stick with the laptops from Compaq and AST, if AST meets the requirements," said Enrique Crespo Jr., corporate manager of user computing services at The Torrington Co., a $2 billion division of Ingersoll-Rand.

Lighten up

Notebook and laptop PC sales are projected to have strong growth in the U.S. during the next three years

[illegible]	[illegible]	[illegible]
Notebook	15%	398,000
Laptop/luggable	75%	1,700,000
Luggable	10%	197,000
[illegible]	Percent of market	[illegible]
Notebook	43%	2,000,000
Laptop	55%	2,500,000
Luggable	2%	97,000

*Projected

Source: Workgroup Technologies, Inc.
CW Chart: Paul Wash

Pick your portable

The following is a partial list of Intel 80386SX-based notebook computers that were announced last week or will be announced today:

- Toshiba American Information Systems, Inc. released on Wednesday the T2000SX, a 6.9-pound, 16-MHz computer with IBM Video Graphics Array (VGA) display, a 20M- or 40M-byte hard drive and a 2,400 bit/sec. internal modem. It also uses a new nickel hydride battery technology. The T2000SX will retail for either $4,999 or $5,499.
- AST Research, Inc. will announce the Premium Exec today, a 6½-pound, 20-MHz notebook with VGA display and a 20M- or 40M-byte hard drive. Prices will be $2,995 or $3,395.
- Nippon Steel subsidiary Librex Computer Systems, Inc. will unveil a 6.6-pound, 20-MHz box with VGA display and a 20M- or 40M-byte hard drive. Pricing will start at $4,100.
- Boulder, Colo.-based start-up Astarte Computer Systems, Inc. will offer Quest, a 6.6-pound, 16-MHz machine with VGA display, a 20M-byte hard drive and a 2,400 bit/sec. internal modem with an integrated phone for voice communication. The keyboard will feature a "keymouse," a key that operates as a pointing device. Retail price will be $3,950.
- Keytronic Corp., a 20-year-old Spokane, Wash.-based company known mostly for keyboards, will introduce a 6.6-pound, 16-MHz box with VGA display, 2,400 bit/sec. modem, an internal facsimile modem and the option to use lithium or alkaline batteries. It will be available only to OEMs.

Noticeably absent from the ranks will be NEC Technologies, Inc. and Zenith Data Systems, both of which are reputed to be waiting to release an SX notebook.

Sparc-based laptop aired

BY MAURA J. HARRINGTON
CW STAFF

With much of the DOS-based laptop market dominated by a handful of computer vendors, it is difficult to introduce a truly competitive laptop computer as a start-up company.

Nevertheless, San Diego-based Research, Development & Innovations, Inc. and Trigem Corp., a subsidiary of Seoul, Korea-based Trigem Computer, Inc., introduced Britelite, their first reduced instruction set computing (RISC)-based laptop computer, last week.

Britelite is an 8½-pound battery-operated computer running Sun Microsystems, Inc.'s Unix operating system Version 4.1. However, the RISC-based machine, based on Scalable Processor Architecture, also has the capability of emulating complex instruction set computing processors.

This will enable it to run applications for MS-DOS and Apple Computer, Inc.'s Macintosh, according to a spokesman at Trigem.

"Although the machine does not run as fast when it is in emulation mode, it is a very powerful machine and has the capability to run the three most popular operating systems," said Young Kimm, chairman at Trigem.

Steve Ferguson, manager of systems development support in the exploration department at Amoco Corp. in Houston, cited a potential market barrier for a Unix-based laptop: "I know of very few technical people that I would expect to carry around a Unix workstation. Most of what we need for portable computing can be done on the DOS-based machine."

The laptop will be priced from $8,000 to $12,000 when it becomes available in volume in the first quarter of 1991.

Plastic-cable vendors tout lowered installation costs

BY JOANIE M. WEXLER
CW STAFF

Citing the potential for 50% savings on cabling costs with their plastic optical-fiber products, Codenoll Technology Corp. and the Packard Electric Division of General Motors Corp. said they will roll out a complete line of products at this week's Comdex show in Las Vegas that will allow Ethernets to communicate over the virgin medium.

The companies demonstrated the technology in September at Networld '90 but had not announced product availability or pricing.

The potential price savings come mainly in labor costs for installing the plastic fiber, which is more flexible than glass fiber and easier to connect than glass or copper, Codenoll marketing executive Brian Ramsey said.

"Plastic fiber can be installed in about a minute by a novice and in under 30 seconds by a technician," he said.

"If the company can demonstrate that this technology really is cheaper than unshielded twisted-pair, it is certainly something Ethernet users should look at for adding on Ethernet segments," said Michael Howard, president of Infonetics Research Institute, Inc., a market research and consulting firm in San Jose, Calif.

The initial products will be available during the first quarter of 1991 and will support distances of 50 meters between stations, in contrast with the 100 meters specified by the 10Base-T standard for running 10M bit/sec. Ethernets over unshielded twisted-pair.

Codenoll said, however, that the companies plan to extend the distance to 100 meters during the next few months.

Aimed directly at the work group local-area network market rather than at backbone applications, the product suite includes a $495 POF Multistar Concentrator Module. The module contains ports for Ethernet segments running over thin or thick coaxial, unshielded twisted-pair and glass- or plastic-fiber network segments.

The mix-and-match nature of the concentrator allows users to position new network segments for Fiber Distributed Data Interface LAN speeds of 100M bit/sec., which will be required for the to-the-desktop multimedia applications that are on the horizon, according to Ramsey.

The product suite also includes network adapters for personal computers based on Industry Standard Architecture ($495), IBM's Micro Channel Architecture ($795) and Extended Industry Standard Architecture ($1,295).

Multimedia age not due 'til '95

BY MAURA J. HARRINGTON
CW STAFF

LAS VEGAS — While multimedia is expected to be a hot topic of conversation at this week's Comdex/Fall '90 show, information systems managers do not have to worry about having to spend a lot of money on the technology just yet.

Intel Corp. turned up the heat in the multimedia development market last week with the announcement of its I750 Video Processor family. This second-generation product is one of few "true multimedia" chip sets, incorporating multiple digital video components such as text, graphics, video stills and motion video capabilities into just two chips, according to Intel.

IBM announced a product last week that it said will allow users on systems as small as 640K-byte Intel 8088-based machines to play back audio and video without additional hardware. Storyboard Live is a multimedia software package said to provide entry-level DOS users with animation, motion video, sound and enhanced on-screen presentation capabilities. The package is expected to be available Nov. 30 and costs $120.

However, analysts agreed that it will be at least 1995 before any true multimedia machine is available in volume, complete with applications that address the needs of business managers in corporate America. Such applications include full-motion video training applications with sound, motion video teleconferencing applications and videoconferencing programs that allow users to send voice electronic mail with a video or picture of themselves simultaneously in one application.

"IS managers are still wrestling with imaging, and they have to do that before they even begin to wrestle with multimedia," said Thornton May, director of imaging research at Nolan, Norton & Co., a market research firm based in Lexington, Mass. May added that IS managers in particular have too much on their minds this year to think about the latest and greatest technology that is almost here.

May added that multimedia is still rather ambiguous in terms of products and applications. "So far, multimedia is a creative and expensive thought that is difficult to turn to a product during an economic downturn," he said.

Despite the financially hard times that IS managers and many vendors have been faced with of late, many companies specializing in multimedia technology — particularly semiconductor companies — have introduced digital multimedia chip sets or portions of digital multimedia chip sets.

Unlike many other multimedia chips, the chip set that was introduced last week by Intel incorporates compression/decompression technology onto the chip, which analyst Jay Bretzman at International Data Corp., a market research firm based in Framingham, Mass., said is an important component of multimedia.

> "IS MANAGERS are still wrestling with imaging."
>
> THORNTON MAY
> NOLAN, NORTON & CO.

Other companies that have introduced multimedia chip sets or portions thereof include AT&T's Microelectronics Division and San Jose, Calif.-based Chips and Technologies, Inc.

There are several companies already incorporating these chips and other similar chips into personal computer-size boards or directly into their products.

For example, Avtex Research Corp., a multimedia software firm based in Campbell, Calif., is working with Intel "on several multimedia applications, including a video electronic mail package, which would allow a user to compile all sorts of reports from servers on a local-area network, including voice, video, images, graphics and text," said Avtex President Mark Bunsel.

Picturetel Corp., based in Peabody, Mass., announced an agreement with Intel to make its visual telecommunications boards compatible with Intel's third generation of Video Processor products, due out in 1993.

"We are designing a board that will allow a PC user to convert his or her PC into a videoconferencing station," said Robert Mitro, Picturetel's vice president of sales and marketing.

Microsoft, Tandy pitch multimedia standard

BY PATRICIA KEEFE
CW STAFF

Microsoft Corp. and Tandy Corp. will team up on Nov. 26 — along with IBM, Zenith Data Systems and Fujitsu Ltd. — to unwrap "an affordable, deliverable, multimedia computing platform with strong manufacturer and developer support." The target delivery date is 1991.

Microsoft said it intends to pitch the Windows/M blueprint — consisting of mostly existing standard hardware, systems software, development tools and "definitive titles" — as a standard on which developers can build interactive, mostly event-driven, multimedia applications.

Hardware manufacturers are expected to announce that they will adopt Windows/M and discuss plans for mostly Intel Corp. 80386SX-based multimedia machines, said Tim Bajarin, an analyst at Creative Strategies Research International, Inc. Tandy is expected to upgrade its Model 2500XL, Fujitsu announced a machine, and IBM will reportedly discuss a new version of the Personal System/2 Model 60.

Users will be able to upgrade to a multimedia system by spending $600 to $1,000 on a compact disc/read-only memory (CD-ROM) and an audio card.

Microsoft's systems software will support audio, enhanced image manipulation and animation, as well as a control device for such external sources as videodiscs and videocassette recorders, a recent issue of the "Information and Data Base Publishing (IDP) Report" said.

Windows/M consists of various drivers, hooks to a CD-ROM and extensions based on technology from Macromind, Inc. Users will be able to play animation, text, graphics and audio sequences under Windows, calling up sound and image from CD-ROM drives.

The Tandy/Microsoft announcement precedes by a day the Microsoft Multimedia Developer Conference slated for Nov. 27 and 28. Attendees there will receive Windows 3.0's software development kit and a prerelease version of the Windows/M multimedia development kit.

"After attending this conference, [developers] will be equipped with all . . . [they] will need to begin immediate development," hinted Rob Glaser, general manager of Microsoft's Multimedia Systems Group, in a letter to attendees.

Tandy is key — both as a manufacturer and a distributor — to Microsoft's drive to position Windows-based multimedia in the home, school and business markets, Glaser said last week.

According to the "IDP Report," Tandy's multimedia computer is said to include a built-in CD-ROM drive, an Intel 80286 or 80386 chip, at least 2M bytes of random-access memory, a 30M-byte hard drive, an IBM Video Graphics Array monitor, audio capabilities and various I/O devices, including controllers and joysticks.

Tandy has been demonstrating the unit, several sources said. But Ed Juge, director of market planning at Radio Shack, said that if Tandy had a multimedia box, it would be shipping one.

Systempro-compatible bows

BY RICHARD PASTORE
CW STAFF

IRVINE, Calif. — Advanced Logic Research, Inc. (ALR) gave an ego boost to Compaq Computer Corp. and a price break to users last week when it announced a "Systempro-compatible" dual-processor machine called the Powerpro. The Powerpro reportedly runs some of the same software adapted for the multiprocessor Systempro at 30% lower cost.

"The Systempro has been on the market for about a year, and nobody really has challenged it," said ALR Vice President of Marketing Dave Kirkey.

ALR's marketing tack bestows the aura of an industry standard for multiprocessor technology on the Systempro and its software, observers said. Even Compaq seems happy about it. "If someone wants to develop products that utilize our software, that's fine with us," said Compaq product marketing manager Lorie Strong.

ALR described the Powerpro as a server for users who want to start out on a budget and buy off-the-shelf software. ALR's previous multiprocessor offering, the Multiaccess 3000, uses a proprietary Unix version.

The Powerpro's pricing may not have much impact on the buying public, however. Users and analysts said price is not a key consideration when buying high-end servers for critical applications. They rate vendor reliability and functionality higher.

The Powerpro features one or two 33-MHz Intel Corp. I486 processors that process 14.7 to 40 million instructions per second. Unlike the Systempro, the Powerpro supports small computer systems interface disk drives.

The system will be demonstrated at Comdex/Fall '90 in Las Vegas and is slated to ship in the first quarter of 1991.

Face-off

Advanced Logic Research's Powerpro takes on Compaq's Systempro with claims of greater storage options and lower prices

	Bus	Hard disks	Graphics	Price
ALR Powerpro 486/33	EISA	ESDI SCSI 150M byte 330M byte 650M byte 1.2G byte	Super VGA (optional)	Single processor: $12,495 to $19,995 Dual processor: $17,595 to $24,595

Source: Advanced Logic Research, Inc. and Compaq Computer Corp.

Second-class postage paid at Framingham, Mass., and additional mailing offices.
Computerworld (ISSN 0010-4841) is published weekly, with a single combined issue for the last week in December and the first week in January by CW Publishing/Inc., 375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171.
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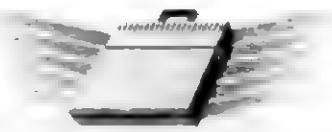


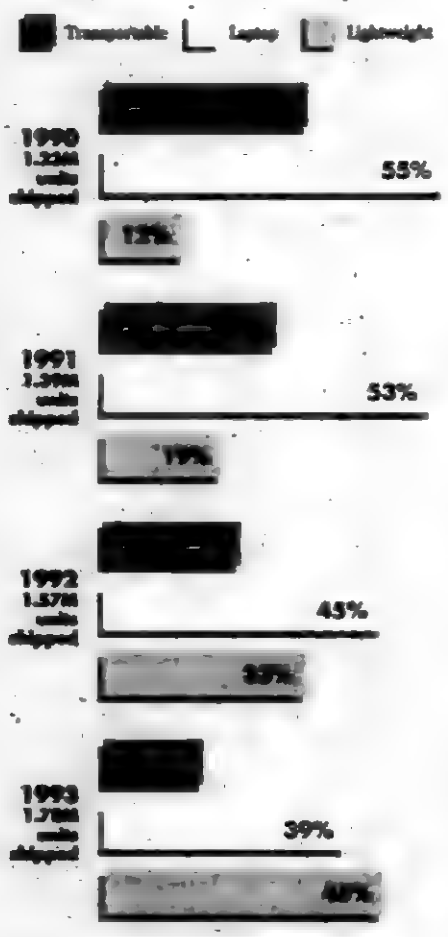
PORTABLE COMPUTERS

The miniaturization of portable computers is ongoing. Users have never lacked choices, but there has always been a trade off between size and functionality. Three segments struggle for user preference, with the lightest machine making the most headway.

Portraits of three portables

(Percent of total U.S. unit shipments)*

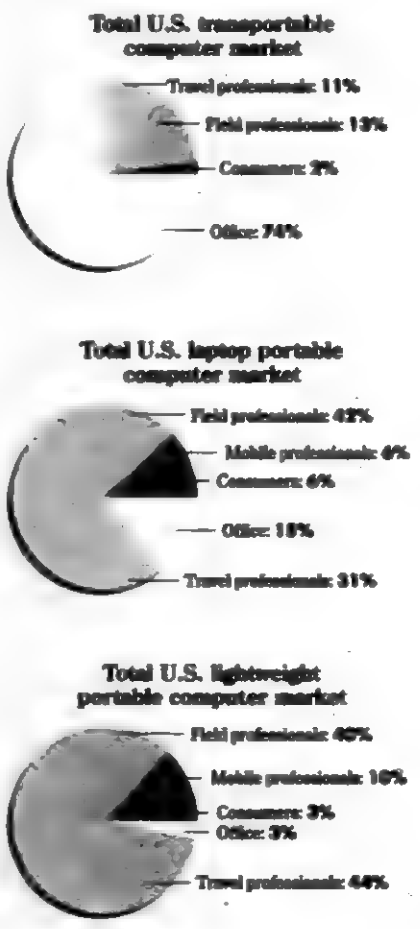
Overall, smaller machines with longer lasting batteries will abound starting in 1992. Laptops in the middle will parry both low end transportables and light weights for market share



Projected 1993 use

(Percent of units shipped)

By 1993, each segment will have found a niche. In terms of units shipped, transportables will find themselves in the office, laptops in the field, and lightweights will be traveling first class



*Projected

Source: Market Intelligence Research Corp., Mountain View, Calif.

CW Chart: Tom Monahan

NEXT WEEK

Longer hours. More responsibility. Demanding users. For many, life in information systems, which is never easy, is getting tougher. How do you handle the extra pressures of the '90s and keep smiling? In Depth talks to IS veterans like **James C. Miller** of James River Corp. for their tips on how to reduce stress in their professional lives.

Marcello Pignatelli

Unrealistic expectations can thwart efforts to improve productivity through investment in information systems. Such expensive disappointments can be avoided. Sometimes all it takes is more careful diagnosis of process problems. Take a look at Executive Report to find out more about what works, what doesn't and why.

INSIDE LINES

U.S. Sen. Ed Zschau (R-Silicon Valley)?

With Sen. Pete Wilson (R-Calif.) winning the election as governor and Sen. Alan Cranston (D-Calif.) not running for reelection in 1992, California politics is even more interesting than usual for the computer industry. Wilson will appoint a Republican to fill his Senate seat, and one of the leading prospects is Ed Zschau, the computer industry's favorite Republican (who lost to Cranston in 1986). Whoever is appointed will have to run for election in 1992. Possible Democratic candidates for either 1992 Senate race include Rep. Robert Matsui — the computer industry's favorite Democrat — as well as Dianne Feinstein, Jerry Brown and Rep. Mel Levine.

The dwarf and the sumo

Look for Poqet Computer to offer a notebook-size machine with a full-featured keyboard for the U.S. market starting in April 1991. A source close to Poqet said April is the target date for releasing something very similar to the 2.2-pound, 8.½- by 11-in. form-factor computer that Poqet's sugar daddy, Fujitsu International, announced in Japan last month (a machine designed and licensed by Poqet). A Fujitsu exec, meanwhile, hinted that the company was readying a U.S. version of the machine and that April wouldn't be an unreasonable date to see it here.

Really bad reviews

Stupid Mac Tricks by Bob Levitus, a book and disk compendium of 14 inane Apple Macintosh programs, which is now making its way into bookstores, has some security experts fuming. Among the programs is one that causes any application on screen to start to disintegrate as if hit by a computer virus. The idea is that you're supposed to install this on an unsuspecting colleague's Mac and sit back while he or she has a heart attack (simulated, we hope). "As a practical joke, this is not too funny," said noted security expert Harold Highland.

IS will have its day

Merrill Lynch's massive reorganization into six divisions a few weeks ago has had no effect on the company's corporate information systems group so far. "But that doesn't mean it won't," a spokeswoman said. "We just haven't done that group yet." DuWayne Peterson, the generally outspoken Merrill IS chief, declined comment.

Multiuse for PS/1?

Could the Personal System/1 live a double life as a multimedia machine? Mark Bunzel, a consultant at Awtex Research, thinks so. He points out that the PS/1 comes with a high-quality video display and adds that buried in the announcement was a promise to provide a sound board. IBM is expected to detail plans for a sound board in a few weeks at the same announcement where Microsoft will try to convince the public that you can too run multimedia on as low as a 10 MHz, Intel 80286-based machine.

Memphis Law

What do Elvis Presley's doctor, the *Exxon Valdez*, film director John Landis and the Nashville Electric Service outsourcing proposal have in common? The same defense lawyer. Last week, the Nashville Electric board voted to retain high-profile defense attorney James Neale for its defense against the recent suit filed by Nashville Electric employees seeking to prevent outsourcing IS to a Memphis services firm. Nashville native Neale, who was involved in the above cases, is probably not available, however, as he remains active in Exxon's defense in the ongoing *Valdez* litigation.

Steamed by Microsoft Office, Lotus is in a lather, says Bill Bluestein at Forrester Research. He points out that Microsoft has the monopoly on the operating environment (Windows), and for $900, is bundling four related applications into the same box. Lotus reportedly is looking into coming out with a similar pack, including G and Freelance, for OS/2. Bill "Mr. Windows" Gates must be shaking in his boots. If you can think of better things to do with OS/2, call News Editor Pete Bartolik at 800-343-6474, zip us a fax to 508-875-8931 or message COMPUTERWORLD *on MCI Mail.*

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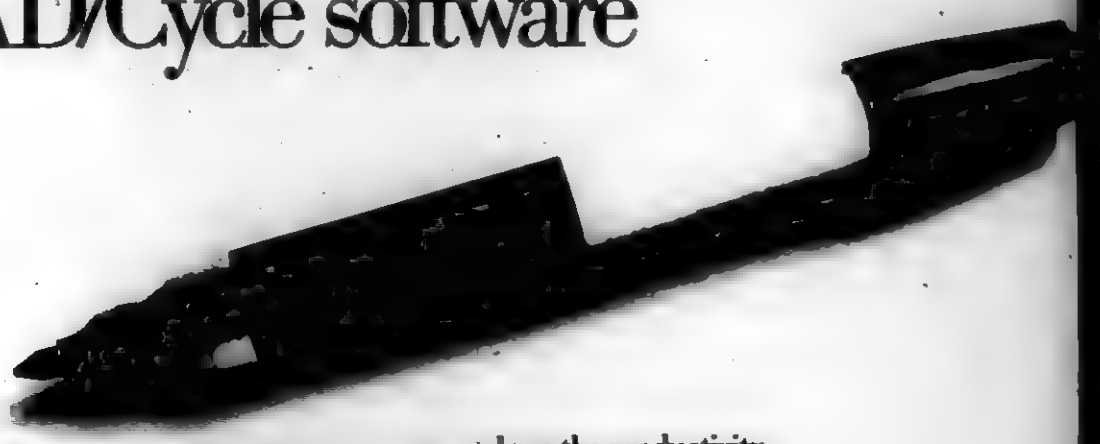

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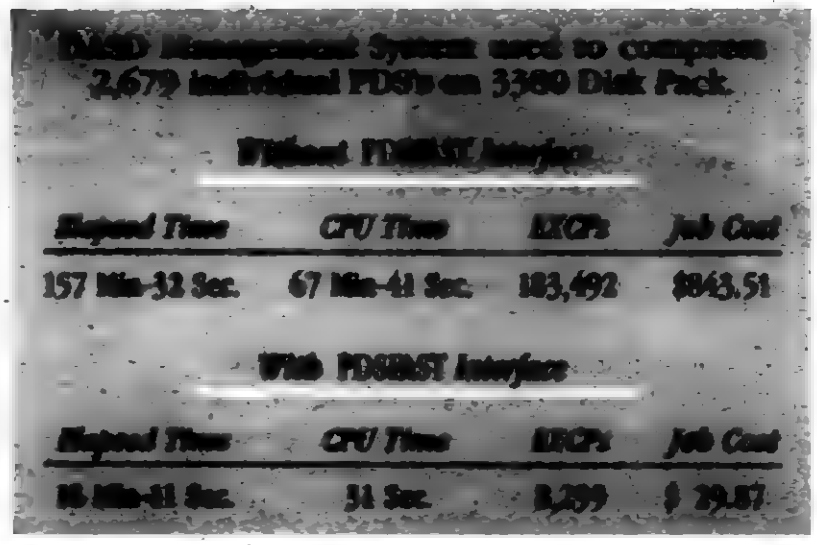

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VOL 24
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NO 19 1990

UMI

THE NEWSWEEKLY OF INFORMATION SYSTEMS MANAGEMENT
November 19, 1990 · Vol. XXIV · No. 47 · 154 Pages · $2/Copy · $48/Year

COMPUTERWORLD

D&B defies naysayers

Merged rivals ride out first-year bumps

BY NELL MARGOLIS and SALLY CUSACK
CW STAFF

NATICK, Mass. — When the deal was announced a year ago this week, many industry observers said it could not be done.

But done it is — and successfully, by most accounts. Once-bitter software rivals McCormack & Dodge Corp. and Management Science America, Inc. are now a $450 million applications giant called Dun & Bradstreet Software. The new entity appears to have retained the loyalty of the merged firms' customer bases — at least for now.

Getting there "wasn't easy," said D&B Software Chairman and Chief Executive Officer John P. Imlay Jr. last week, "and it wasn't always fun." Turning onetime adversaries into a team was the year's most daunting challenge, he said.

The challenge was compounded by the reality of laying off some 380 employees — representing approximately 9.5% of its combined worldwide work force — in its first nine months and fighting nasty legal battles with M&D's founder and former president, Frank Dodge.

CEO Imlay *pulled D&B team together*

However, the challenge the firm faces on its first anniversary could be even more formidable: that of moving beyond survivor to become a player in software markets where the competition is

Continued on page 8

Repetitive stress claims soar

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — Claims for repetitive motion disorder, including the painful ailments suffered by intensive computer keyboard users, increased by 28% in the private sector last year, the government said last week.

A U.S. Bureau of Labor Statistics report on 1989 injuries said repetitive motion injuries now account for slightly more than half of all the nation's job-related illnesses.

The agency said the injuries are most prevalent in the automobile manufacturing and meatpacking industries. Although no specific data for office environments was reported, independent studies indicate complaints from keyboard users are significant and are drawing the attention of service industries.

Occupational hazards
Repetitive motion disorders, often linked to intensive keyboard use, accounted for 52% of all occupational illnesses in 1989

	[illegible]	
Total occupational illnesses	240,000	294,000
Repetitive motion disorders	115,000	147,000

Number of reported illnesses

Source: U.S. Bureau of Labor Statistics

The injuries are leading to lost productivity and higher worker's compensation costs, as well as lawsuits against computer systems vendors and expensive workplace renovations, experts said.

US West, Inc. responded to government and union complaints by embarking on an eight-year ergonomics program that is expected to cost $13.5 million, according to spokeswoman Robin Baca.

Baca said the regional telephone company has spent $1.6 million since 1986 on medical costs associated with 240 cases of repetitive motion disorders

Continued on page 142

Software trails server rocket

BY RICHARD PASTORE
CW STAFF

IBM entered the fray last month with its Personal System/2 Model 95. Then came Advanced Logic Research, Inc. with a machine that is supposedly compatible with Compaq Computer Corp.'s Systempro. Last week, a battalion of new recruits joined up, including Grid Systems Corp. and Zeos International Ltd.

But if this is the launch of a high-end personal computer server war, then the troops are inadequately armed, according to industry observers.

"Until the software comes along and we get a good multiprocessor operating system, there's nothing in the software driving us" to buy high-end servers, said Melvin Boyer, director of MIS at Louisiana-Pacific Corp. Boyer is using AST Research, Inc. servers based on the Intel Corp. 80386 chip.

"We still use the 386 servers because, so far, there's been relatively small advantage for going to the 486," added Claude Rankin, MIS manager at Deloitte Touche in New York.

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- **Joining a small group, IBM unveils a 486-based portable. The pricey model seems likely to attract a small group of demanding users.**
- **Microsoft's Bill Gates offers his vision of a new age of more useful and more usable computer products.**
- **A variety of writeable optical disc products was rolled out onto the show floor.**
- **IBM exec talks up the company's multimedia game plan.**

Full Comdex/Fall '90 report on pages 143-145

Factory integration a hedge against economic pressures

BY ELISABETH HORWITT
CW STAFF

DETROIT — The economy may be in the pits, but a growing number of manufacturers believe improved use of coordinated information systems has left them better prepared than they were during the last recession and more able to catch, if not surpass, foreign competitors.

Several attendees at last week's Autofact '90 show said they have moved beyond talking about coordinating information sharing across different stages of the product cycle to actually doing it. As a result, they said, they have been able to boost quality and reduce product development cycles.

One such success story comes from Federal-Mogul Corp.'s oil seal operations. Two years ago, the group discovered from its own research that its two largest competitors — one

Continued on page 4

Deep-sea cable failure reroutes users

BY JOANIE M. WEXLER
CW STAFF

A trans-Atlantic fiber-optic cable has been out of commission for several weeks, although many of its users may be unaware of the disruption.

The low profile of the dysfunctional TAT-8 fiber link — victim of an angry Mother Nature — is a tribute to the suppliers' disaster recovery prowess. But it has been an inconvenience for S. C. Johnson & Son, Inc., commonly known as Johnson Wax, which unfortuitously timed the start of a TAT-8 trial to coincide with the outage, according to Nick Cottrell, director of network services. Cottrell said Johnson Wax is looking to replace its overseas satellite communications with fiber and that "TAT-8 is dead, and AT&T isn't telling us why."

TAT-8 is a trans-Atlantic fiber-optic cable owned by a consortium of 22 carriers and vendors, including 35% interest holder AT&T. MCI Communications Corp., IBM and the Deutsche Bundespost are among the other partners.

The consortium shares TAT-8 support and repair responsibilities, and AT&T was on call at the time of the outage. In addition to satellite, TAT-8 backup is provided over copper lines and bandwidth on PTAT-1, a competing fiber link from U.S. Sprint Communications Co. and the

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Quotable

"The general feeling at this point is that there has been more talk than actual change."

SCOTT DAVEY
FAIRCHILD
FASTENER GROUP

On D&B Software one year after its formation.
See story page 1.

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The 5th Wave

"ALRIGHT, WHICH ONE OF YOU CLOWNS IS RESPONSIBLE FOR THURSDAY'S DOWN TIME?"

EXECUTIVE BRIEFING

■ **Repetitive motion injuries are skyrocketing,** forcing companies to implement involved and often expensive programs to prevent them. The injuries, commonly associated with frequent keyboard use, now make up more than half of all job-related illnesses. But experts say an ounce of prevention is worth a pound of cure, and ergonomic improvements have productivity benefits as well. **Page 1.**

■ **Buying new systems** does not automatically improve productivity unless the right problem is being fixed. Companies are finding that technology's benefits are becoming more elusive, and some expensive failures have dampened management's enthusiasm for the computerized magic bullet. Experts say companies need to concentrate on analyzing processes more completely than ever and applying new kinds of cost/benefit criteria to justify the solution. **Page 101.**

■ **Some AT&T customers still aren't aware** that the carrier's TAT-8 transatlantic fiber-optic cable has been out of commission since the end of October. That's partly a tribute to the effectiveness of backup alternatives, but some users are reporting increased response times. **Page 1.**

■ **Cornell University is testing** an "electronic library" that lets users retrieve and combine computerized text and images as easily as they would pull books off of library shelves. **Page 18.**

■ **1486-based servers are hot,** but a lack of software to exploit the more powerful chips has some users biding their time in the 80386 camp. **Page 1.**

■ **What-you-see-is-what-you-need-to-get** will be the next stage in PC software evolution, Microsoft Chairman Bill Gates said last week. He said the industry has to build standard architectures for combining objects from multiple sources and applications into a single, transparent user view. **Page 143.** Microsoft will take its shot at leading the charge on Dec. 10, announcing details of an object-oriented compound document interchange architecture. **Page 144.**

■ **It's been a rocky year,** but generally a successful one, for D&B Software. Customers say support and enhancements have been solid, but D&B Software still faces the thorny issue of carrying out a major product redesign in the future. **Page 1.**

■ **Outsourcing is not cheap,** as Navistar found out. The company decided not to outsource after learning the concept wouldn't save it money. **Page 12.**

■ **Mind numbed by meetings?** One software authority advises picking up the pace by focusing on what could go wrong rather than what's going on in general. **Page 77.**

■ **A lot of responsibility** falls on IS shoulders when it comes to prosecuting computer crime. The steps you take to snag your suspect will influence the outcome of the case. **Page 134.**

■ **Small banks are saving** as much as $2,000 per month in archiving costs by using an optical disc-based alternative. Instead of printing out reports, banks can store data on the disc and retrieve only what they need. **Page 47.**

■ **The mainframe baptism of fire** doesn't suit some DEC VAX 9000 customers, who are complaining they were not prepared for up to a 10-fold increase in software license fees. **Page 6.**

■ **On-site this week:** Missouri S&L sidesteps the industry crisis and focuses on using technology to better manage its loan payments. **Page 36.** It's client/server to the rescue as a global broadcasting service downsizes its scheduling application from a mainframe to OS/2-based PCs. **Page 31.** Boston investment firm turns to high-speed scanning to put paperwork on-line. **Page 41.**

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Integration

FROM PAGE 1

German, one Japanese — "were bringing new sealants to market in less than half the time of our best efforts," said Larry Smith, a technical services manager at the Detroit-based, global automotive parts manufacturer.

The competitors were able to respond to a new customer query with a product prototype within six to 10 weeks, while Federal-Mogul was taking 18 to 20 weeks, Smith said.

The company's $200 million oil seal division found that much of its product development inertia stemmed from the fact that incoming product design specifications were being passed from sales to engineering to production in paper form, said Alan Johnson, the division's general manager.

Too often, when the specifications reached manufacturing, "they'd say, 'We can't make what you designed,' " he added.

To the rescue

Ernst & Young was brought in to help develop an information system based on Informix Corp.'s relational database management system that would "give everyone immediate access" to the latest information about a product, including the latest changes, Johnson said.

The new system enabled the division to cut its product development cycles by 75%, from 20 weeks to 20 business days or less in most cases, Federal-Mogul spokesmen said. As a result, the oil seal division once again leads the industry in customer responsiveness, according to recent customer surveys, Smith said.

"Our competition has moved, too, but we plan to keep our edge by cutting the time down to 10 business days in the 1992 time frame," he added. Federal-Mogul plans to start evaluating the system for other divisions next year, Smith said.

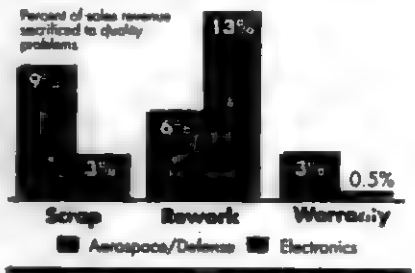
Quality control is another key competitive area where U.S. manufacturers cannot afford to continue lagging behind overseas competition, according to Armand Feigenbaum, president of General Systems Co. and an originator of the "total quality control" concept. Research by the Pittsfield, Mass.-based firm shows that in 14 major industrial countries, eight out of 10 buyers "put quality at equal to or greater than price" in their purchasing decisions, Feigenbaum said.

The General Systems Quality Improvement Index, measured in 1990 gross national product (GNP) terms, indicated that "widespread implementation of total quality throughout the United States economy" would result in an increase of approximately 7% in the U.S. GNP, according to Feigenbaum.

Here again, IS integration is enabling some leading-edge U.S. companies to clean up their act. For example, Allied Signal Corp.'s Autolite Spark Plug Division has used Netwise, Inc.'s object-oriented networking software to send real-time production data from factory control units to Oracle Systems Corp. RDBMS servers. Various users can then access the data they need using SQL forms and Lotus Development Corp.'s 1-2-3, according to Autolite project engineer Richard Sturgeon.

Getting it right

Quality problems generate high costs, according to a survey of 30 manufacturers



Source: Coopers & Lybrand CW Chart: Doreen St. John

The system helped the spark plug division realize a productivity increase of 13% in 1989, making it the most productive unit in Allied Signal's automotive sector, Sturgeon said.

Sikorsky Aircraft was plagued by "high scrap and rework rates," a "flat quality curve" as well as customer dissatisfaction until it implemented a quality management system with the help of Digital Equipment Corp. that has reduced product defects by 26% during the past year, according to Sikorsky statistical process control supervisor Tony Lawrence.

The resulting system uses Salerno Industries' SPM+ software to monitor production in real time and capture data on out-of-control conditions and defects. Historical data is stored on DEC's RDB/VMS database, where it can be accessed by engineers and designers.

Worth the cost?

Implementing better manufacturing information systems can be costly. Federal-Mogul's project is expected to take about 2½ years and will cost thousands of internal man-hours in addition to $1 million to $1.5 million in fees to Ernst & Young, said Reuben Slone, a spokesman for Ernst & Young.

The toughest technical problem, several implementors agreed, is identifying what information various user groups need and then figuring out where that information resides.

"We had to model the current [production] process, then find out where the information is stored — which could be on a mainframe or a personal computer database that one person has owned for years but no one knew it," Slone said.

Another potential stumbling block is gaining the cooperation of various systems groups, particularly between IS and engineering and manufacturing systems. Those two sides "often don't communicate well" at Allied Signal, Sturgeon said: "They have different problems, priorities and time frames and use different acronyms."

Lotus consulting unit offers a CIM-plification service

BY ELISABETH HORWITT
CW STAFF

DETROIT — Computer-integrated manufacturing (CIM) for the masses was the banner under which Lotus Development Corp. rode into the CIM marketplace last week.

The company announced at the Autofact '90 conference here that it had formed a Lotus Consulting Services Manufacturing Practice Group whose target will be companies that have put off implementing CIM because of "war stories, lack of user-friendliness and high costs," group director Nick Losole said.

"We're already on the engineering, inventory management and financial desktops; now we're going for the factory floor," Losole said. Lotus can put together a production CIM system within three months and then turn it over to users, together with Lotus' 1-2-3 macros to maintain and modify the system on their own, he added.

However, some industry sources questioned whether the new Lotus organization has the breadth and depth of experience, as well as the right products, to become a full-scale CIM systems integrator.

Easy audience

Lotus could well find an audience among "people distributing [programmable logic controllers] who don't have a clue how to operate PC-based data collection and control systems for simple data analysis," said Bruce Richardson, a vice president at Advanced Manufacturing Research, Inc. based in Cambridge, Mass.

However, the group "will operate at the Lego, not the Brooklyn Bridge, level" of a full systems integrator that "could compete with [companies] like Arthur Andersen," Richardson said.

Allied Signal Corp.'s automotive sector hired Lotus to develop an "activity-based cost system," based on 1-2-3, that determines costs "not just on the basis of production, but also on support and administration" and other activities that are assigned to each product, according to David Priestley, director of cost management at the firm.

The firm chose Lotus primarily because the vendor was quick to understand the concepts and requirements of the application, Priestley said. Contributing to the decision was the fact that "virtually all of our operations use 1-2-3, particularly in finance," and the fact of the package's global availability, he added.

While Lotus has yet to provide Allied Signal with a factory-floor-based CIM system, the automotive parts maker is discussing with Lotus' manufacturing group the idea of co-developing a factory-floor information management system based on Lotus' @Factory, according to Gilbert Steffand, the division's manager of CIM.

Announced at last year's Autofact, @Factory interfaces with a variety of factory-floor devices using Manufacturing Automation Protocol 3.0 and other standard and proprietary protocols. The product has been available only through value-added resellers until now. Lotus announced last week that it will now be selling @Factory directly.

The Manufacturing Practice Group is the first offshoot of the Consulting Services Division that Lotus announced last March. A company spokeswoman refused to say how big the new group's staff is but added that "there are over a dozen in the consulting services group" and that several Manufacturing Practice staff members are from General Motors Corp.

CORRECTIONS

A headline in the Nov. 12 issue incorrectly referred to Dbase IV. The headline should have referred specifically to the Dbase IV Professional Compiler.

An article in last week's edition erroneously identified Sybase, Inc.'s relational database product as the "main database" for Citicorp in New York. While Sybase has been chosen as the standard for one of the bank's financial divisions, relational database management systems from Oracle Systems Corp., Informix Corp. and Ingres Corp. are used in various other divisions.

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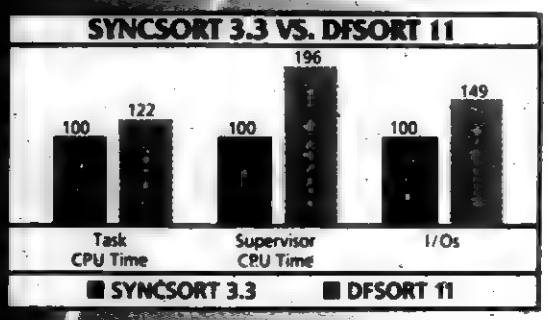

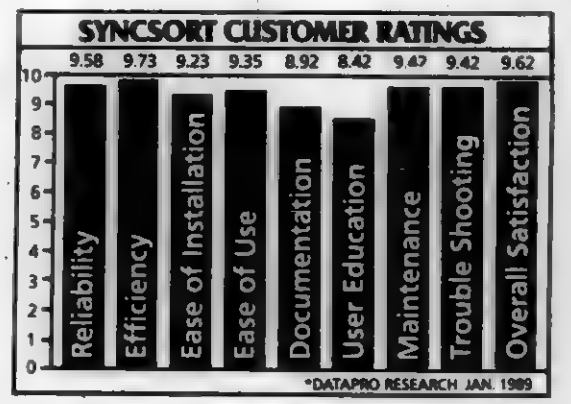

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NEWS SHORTS

SPA moves ahead on piracy raids

The Software Publishers Association (SPA) filed requests for search-and-seizure permits against two corporations in federal district court last week. Mary Jane Saunders, general counsel for the SPA, said it was unlikely that action would be taken on the search-and-seizure requests until this week, although she added that the Thanksgiving holiday could delay action until the following week. The SPA also filed suits against the two corporations claiming copyright infringement, in the event that the judge should refuse to grant one or both of the search-and-seizure orders. Saunders declined to identify the companies accused of pirating software or where the cases were filed.

Prime gets stay of injunction

A federal judge in Detroit entered an injunction against Prime Computer, Inc. last week prohibiting the company from continuing to enact a long-standing software distribution "tying" arrangement. However, Prime got an emergency stay of the injunction and said it would file a motion to reverse the verdict. The agreement at issue required purchasers of certain computer-aided design and manufacturing software packages to also procure computer hardware maintenance agreements from Prime. Last month, a jury awarded the plaintiff, Virtual Maintenance, Inc., a computer services company, $25.3 million plus attorneys' fees.

Comdisco to expand network

The Midwest Division of MCI Telecommunications Corp. in Chicago and Rosemont, Ill.-based Comdisco Disaster Recovery Services, Inc. signed a five-year, $20 million agreement by which MCI will help Comdisco expand its coast-to-coast data network for business continuity services. Earlier, the firms announced they would bundle their respective services in a marketing alliance. They also announced earlier that Comdisco would provide business continuity services for MCI's data centers.

Aldus delays Windows package

Seattle-based Aldus Corp. has delayed the arrival date of its Persuasion for Windows presentation program from the end of this year until the second quarter of 1991. Vice President of Engineering Dick Mathews blamed the delay on several factors, including gaining familiarity in working with a new code base and extensive compatibility testing.

Ticket agency seeks power relief

Pacific Gas & Electric has switched Bass/TM Tickets to a new power circuit after repeated power outages have brought the ticket agency's computer network crashing down seven times since early May. A spokesman said Bass/TM, which has 120 outlets in Northern California and Nevada, has lost $75,000 in revenue from the outages, which have taken the firm's $10 million Digital Equipment Corp. VAX-based computer system down for as long as one hour with each occurrence. Bass/TM has moved to cover its bases with the installation of a $144,000 backup power generator and a $50,000 uninterruptible power supply system. Ironically, Bass/TM moved to the new building after the Oct. 17, 1989, earthquake. "But that earthquake did less damage than all of these outages," said frustrated spokesman Doug Levinson.

NMI on acquisition trail

Network Management, Inc. (NMI) of Fairfax, Va., said it will acquire the assets of Norcross, Ga.-based Net-Tech, Inc. Net-Tech provides systems integration and networking products and specializes in the design and installation of local-area networks for commercial and government customers. NMI, with sales approaching $60 million this year, seeks to become a nationwide network management firm through acquisitions, and Net-Tech is the sixth networking firm it has acquired since 1987.

More news shorts on page 142

VAX 9000 users hit by software shock

BY MARYFRAN JOHNSON
CW STAFF

The backburner issue of mainframe software pricing is heating up for some of Digital Equipment Corp.'s VAX 9000 owners, who are finding their licensing fees and software prices multiplied by as much as 10 times as they migrate applications from smaller machines to their new mainframes.

A C language compiler license that costs $2,500 on a Microvax 3900, for example, costs $25,000 on the VAX 9000. A full-function Decnet license priced at $2,000 for a midrange system is tagged at $9,000 on the mainframe.

"I can sympathize with DEC's need to make a profit, but this is a bit excessive," said John Jones, assistant coordinator of information services for Paws, Inc. in Albany, Ind., which installed a VAX 9210 in August.

"You may have the same five people using the software, but your costs have increased quite a bit for those same five to run it on the bigger machine," Jones said.

He and other customers said they would prefer a wider range of individual user charges, capped at a certain amount per seat, plus more creative "value packs" of software tools and applications.

A DEC spokesman said last week that all software pricing and licensing fees are now under review by the recently established software products group, headed by DEC Vice President David Stone.

Company officials are also well aware of the VAX 9000 customers' concerns about software pricing, which was a key issue discussed at an Oct. 29 meeting of mainframe customers in Palm Beach, Fla. A dozen VAX 9000 users formed a customer advisory board to provide DEC with feedback on their experiences with the machine.

Guider: *DEC's prices unacceptable*

"DEC's software pricing is not acceptable," said Michael Guider, vice president of network and information services for Litel Telecommunications Corp. in Columbus, Ohio. The firm has one VAX 9210 now and will install a 9410 in mid-December.

Guider said his objections to DEC software pricing have sharpened in the past two years as Litel moved into larger Vaxclusters to meet the firm's rapid growth.

"I've consistently told DEC that we're happy with their overall architecture and direction, but if the software pricing strategy does not meet our needs, that can have serious consequences," he said. "I feel strongly that DEC needs to allow its 9000 customers to improve their price/performance ratios, not just maintain them."

DEC has traditionally priced its software licenses by the size of the processor and the number of users, reasoning that the same application running on a faster CPU will be more productive.

George Kerns, vice president of information services at Contel Cellular, Inc. in Atlanta, said he is experiencing less "sticker shock" than longtime DEC customers because Contel has been an IBM mainframe customer for years before the recent addition of its VAX 9410.

"This kind of comes with the turf. The more you buy, the more it costs," Kerns said. "We're not finding DEC's prices that much different from IBM's."

At the advisory board meeting last month, Guider said, he and the other customers gave the VAX 9000 excellent marks for its sheer performance and I/O capabilities, and users have been generally delighted with the quick response from DEC field engineers when a problem arises.

Yet an eager response to a call does not necessarily mean the problem is solved, Jones pointed out.

"Our 9000 was down for two days with a bad cable, and that's unacceptable," he said. "This machine is much more complex than a Microvax, and I don't think our local field people have been provided with the tools they need to diagnose the problem."

Faulty components caused some VAX 6000 outages

BY MARYFRAN JOHNSON
CW STAFF

A flawed board component in Digital Equipment Corp. VAX 6000 computers has caused intermittent and unexplained system crashes at roughly 45 sites, DEC officials acknowledged last week.

"An extremely small percentage" of the installed base of some 12,000 VAX 6000s would potentially be at risk, said Daryl Long, midrange systems product manager at DEC.

"The important thing is we have a fix for the problem if it occurs," Long said.

Evidence that the defect had caused system crashes surfaced last week with publication of a survey of 250 VAX 6000 sites, conducted by Reliability Ratings in Needham, Mass., an independent rating analysis service for DEC equipment.

The survey found that 3% of those VAX 6000 sites had experienced intermittent failures that defied routine diagnostics. Most of the machines experiencing the problem were Model 400s, and users were generally able to restart their systems within 30 minutes.

The defect was traced to a faulty chip on the DWMBA/B board, a bus adapter card that is half of a two-board set connecting the BI bus to the XMI bus.

This is the most serious hardware problem to crop up on the VAX 6000, which industry analysts and customers alike praise as a highly reliable machine. The Reliability Ratings report also noted that the VAX 6000s it tracked during 1.8 million field run hours had 99.8% uptime.

DEC will not recall the problem board or replace it, Long said, unless customers detect trouble.

If the chip does cause a problem, it should show up on a user's error log with the message "Interrupt 60 Errors," Long said. The chip defect is now on a "hot list" at all 800 of DEC's service locations worldwide.

DEC buys this particular chip from several suppliers, but only one of those suppliers apparently did not meet the correct timing specifications, which led to the intermittent failures.

"Once we identified the problem, we purged all our manufacturing stock and field service stockrooms and replaced them all," Long said.

The first customer to discover and report the problem was a manufacturing division of National Semiconductor Corp. in South Portland, Maine, where three VAX 6000 Model 420s joined a Vaxcluster last April.

Operations manager Hal Kolp found that his newly installed 6000s were crashing every three to four days. Even after the suspect board set had been swapped out, the machines would go down again a few days later.

Finally, DEC sent in a team of three engineers to diagnose what had become six weeks of frustrating work stoppages at the semiconductor manufacturing plant.

Supercomputers vie for commercial IS market

BY JOHANNA AMBROSIO
CW STAFF

NEW YORK — Supercomputer manufacturers are vying for a piece of the general commercial information systems market with computers that address concerns such as networking with standard data processing hosts.

This emphasis was evident at the Supercomputing '90 trade show held here last week. Amid the typical conversation about which architecture is best and which computer is fastest — dubbed by one observer as the "macho-flops" debates — were signs that supercomputers are learning the language of IS.

Vendors are concentrating more on providing data management software, high-speed data storage devices, networking and standard versions of Unix instead of relying on proprietary operating systems. Still missing, however, are off-the-shelf general business applications that are written to take advantage of massively parallel architectures.

This attention to commercial IS is driven by survival. "Most of the [supercomputer] suppliers are getting money from the government, either directly or indirectly through contracts," said Michael P. Burwen, an analyst at Superperformance Computing Service in Mountain View, Calif. "With the budget cutbacks, the money is drying up. Some will be put out of business unless they can find enough money to sustain their growth."

Ncube, a vendor in Belmont, Calif., is taking that tack. "Our goal is to make increasing inroads into the commercial market to fund our research and development," said Bill Woo, director of marketing.

One way the company hopes to attract commercial customers is through its relationship with Oracle Systems Corp., also in Belmont. Though Ncube is not owned by Oracle itself, a group of Oracle executives recently invested in Ncube. An outgrowth of that relationship is a version of the Oracle database management system that runs on the Ncube supercomputer at 300 transaction/sec., the same speed as on an IBM 3090, Woo claimed. He said Ncube will also unveil channel connections to IBM and other computers.

Fast as they are, most supercomputers are built to process large chunks of information and are not especially well suited to handle applications that require many transactions going back and forth between a computer's main memory and a data storage device.

To remedy that, vendors are incorporating high-speed data storage devices and data-access schemes. At last week's show, IBM announced a joint development deal with San Jose, Calif.-based Maximum Strategy, Inc. to design a high-speed disk array system for the System/390. The scheme will be based on the High-Performance Parallel Interface (HIPPI) standard. Maximum Strategy's disk-array product family has sustained data-transfer rates of 20M byte/sec.

IBM said it will also develop a HIPPI networking interface with speeds up to 100M byte/sec. The company did not specify when either the disk array or the networking interface would be ready.

In another announcement made at the show, Convex Computer Corp. in Richardson, Texas, and Beaverton, Ore.-based FPS Computing said they will offer Unitree storage-management software with its systems. Unitree, from General Atomics in San Diego, migrates files among different storage devices.

Convex also announced its Application Compiler, which can compile both C and Fortran applications.

Courtin'

Although vendors at Supercomputing '90 are trying to woo more commercial customers, they are not neglecting their bread-and-butter technical users.

Among the announcements for this group were the following:

- Cray Research, Inc. in Eagan, Minn., said buyers of its brand-new XMS minisupercomputers will be able to apply that price as a credit toward Cray's next-generation minisuper, which will be available in the second half of next year.

Ed Masi, senior vice president of marketing, said the pricing incentive will "kick-start our entry into the under-$1 million market."

- Thinking Machines Corp. in Cambridge, Mass., announced an 8G-byte supercomputer with 64,000 processors. It can compile Fortran and C. A version of the High-Performance Parallel Interface network is being developed for the new and existing Connection Machines.
- "Visualization" is the key buzzword for scientific users who want to do exciting things with computer graphics. Virtually every supercomputer vendor on the show floor sported software to help create three-dimensional color graphics and other forms of visualization.

JOHANNA AMBROSIO

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D&B

FROM PAGE 1

ferocious, the demands are relentless, and customer budgets are shrinking.

The combined company has taken a number of steps in that direction. It has released more than 20 product enhancements, pledged to enhance and maintain both the M&D and MSA product lines in parallel, instituted four new customer support programs, announced a grand future strategy (see story at right), and mounted a generally successful effort to get two warring sales forces marching in sync. It is not enough, the firm's users said, but it is a promising start.

D&B Software has done a "credible" job of getting organized, defining combined goals and stating direction in the wake of the merger, said Scott Davey, assistant controller of systems and planning at Fairchild Fastener Group in Carson, Calif.

"I've been seeing signs that they are doing the right thing. Account reps are now calling people and asking how they can help," said Davey, who is also national chairman of the M&D Accounts Receivable/Millennium user group. "However, the general feeling at this point is that there has been more talk than actual change."

Reebok International Ltd. is "pretty comfortable with everything that has happened," said Mike Cote, MIS project leader at the Stoughton, Mass.-based company, a three-year M&D customer.

"It seems that the individual companies had complementary strengths and weaknesses," said Roger Heeslau, financial and administrative assistance manager at Walgreen Co. in Deerfield, Ill. Saying he's "generally positive" since the merger, Heeslau noted that the technical strength seems to reside with the former M&D product line, while support seems to have improved because of the MSA influence.

"D&B Software is looking good," said Stuart Woodring, an analyst at Cambridge, Mass.-based Forrester Research, Inc. "They've managed to do some impressive things — not the least of which was not blow up in the face of what could have been a violent merger."

But the occasional smoldering resentment lingers at D&B Software. One sensitive item is the way in which Dodge departed from the firm in April. It is not just M&D employees who believe that Dodge was unceremoniously dumped by D&B. A former MSA executive who asked not to be identified said that while the right ends were attained when D&B opted for Imlay to head the new firm, the means left much to be desired.

"The strengths that made Frank Dodge great in the early days of M&D — his brilliance, creativity, nonconformity, personal involvement with the company — turned into weaknesses when it came to running a large company," the executive said. "Like many another entrepreneurial founder, he didn't have the objectivity or the toughness to do what had to be done." However, the executive added, "[D&B] took away Frank's baby, and they didn't even tell him they were going to do it. It shouldn't have happened that way."

Even more disquieting to some industry observers and D&B Software employees is the widely held view that the former M&D is being subtly dismantled.

Touted as a merger of equals, the deal that created the current firm "wasn't a merger of anything — it was the acquisition of M&D by MSA, funded by D&B," said a former M&D executive who asked to remain anonymous. That is not just a sour grapes view from the M&D side, a former MSA executive said: "Absolutely — that's exactly what happened."

While Imlay and other D&B Software executives insist that balance between the two founding firms was sought at all times and is being maintained wherever possible, only two members of the nine-member executive committee came from M&D, and the trickle of M&D talent continues.

"It's unfortunate that M&D hasn't had more impact on the products," said the former MSA executive, who for the first time last year attended a user group meeting of M&D Millenium customers. "In all my years at MSA, I had never seen users so committed to a product."

A busy year at D&B

A year in the life of D&B Software:

- Nov. 20, 1989: The Dun & Bradstreet Corp. says it will buy MSA and merge it with archrival M&D.
- January 1990: MSA President John P. Imlay Jr. named head of merged firm, D&B Software.
- Winter 1990: At user group meetings, D&B Software promises to keep and enhance all M&D and MSA software lines.
- March 1990: Former M&D President Frank Dodge leaves and sues D&B, claiming he was forced out. D&B Software countersues in April and Dodge withdraws suit.
- Winter, spring, summer 1990: D&B Software cuts worldwide work force by about 9.5%; deploys united sales force.
- Autumn 1990: Firm shows Future Architecture blueprint.

Creating a leader

In the earliest days of D&B Software, CEO John P. Imlay Jr. was asked what he considered the most daunting challenge ahead for the new firm. "Technology," he answered without a moment's hesitation. "Finding out where the new software market is going to be and getting ourselves there."

Getting there involves enhancing and maintaining both M&D's and MSA's largely competing product lines while simultaneously developing a new generation of applications that will, by 1993, make up the company's single product line.

The so-called "Future Architecture" D&B line will come with computer-aided software engineering tools built in for user customization.

While it looks to the future, D&B Software plans to shore up its present by plumbing approximately one-third of its resources into strengthening customer service and support.

The success of Future Architecture would topple two of the bigger obstacles standing between D&B Software and its growth goals, said Forrester Research analyst Stuart Woodring. Those barriers are the fact that the company is "still living in a mainframe world" while the users are flocking to the desktop and the waning viability of fielding overlapping, redundant product lines. D&B confirmed that approximately 95% of its current applications portfolio is mainframe-based. "They've got the customer base, the sales force, backing from a parent with a *lot* of money and a concept that the industry is going to go wild for," Woodring said.

The downside, Woodring said, is that the firm is banking on a client/server concept that is not catching fire as rapidly as industry observers thought it would. It's an area foreign to the firm's management, developers and sales force alike, he said.

NELL MARGOLIS

HP earnings decline in fourth fiscal quarter

BY SALLY CUSACK
CW STAFF

PALO ALTO, Calif. — Despite a 10% growth in orders and a 6% increase in net revenue, Hewlett-Packard Co. posted an 18% decline in net earnings for the fourth quarter of its 1990 fiscal year, ended Oct. 31.

"To my mind, this wasn't real surprising," said Jay Ritter, an analyst at Duff & Phelps Investments Research in Chicago. "HP's backlog going into the fourth quarter wasn't all that large, and much depended on how orders went this quarter."

Fourth-quarter net earnings totaled $202 million, or 83 cents per share. This compares with net earnings of $246 million reported in the fourth quarter of 1989, or $1.04 per share.

John A. Young, president and chief executive officer at HP, indicated that the company achieved record orders overall, and growth was broadly based across the HP businesses.

"In addition to year-over-year order growth of 10% for the quarter, orders for the period were also 5% higher than for the third quarter of our fiscal year," Young said. He also noted that, given current industry trends, HP's order growth rate was "particularly notable."

Ritter added that he has had concerns about the firm for some time now, one of the reservations being that HP has been dependent on revenue growth. "If revenues do not increase next year, my concern is that they will not be able to cut expenses fast enough," Ritter said.

Net revenue for the fourth quarter totaled $3.6 billion, compared with $3.4 billion in the corresponding 1989 quarter. U.S. net revenue rose 1%, while net revenue outside the U.S. rose by 10%. As a percentage of net revenue, HP's operating expenses were 37.5%, down from 38.8% from the third quarter of fiscal 1990. Operating expenses rose 11% for the year.

HP's net earnings for fiscal 1990 totaled $739 million, compared with $829 million earned in 1989.

MCI eyes consolidation, 1,500 layoffs

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — Citing the economic downturn, intense competition and the cost of the recent acquisition of Telecom USA, Inc., MCI Communications Corp. said last week it will consolidate its seven domestic divisions into four and will lay off approximately 1,500 employees, or about 6% of its work force, during the next six months.

A spokesman declined to elaborate on a written statement from MCI President and Chief Operating Officer Bert C. Roberts that referred to "negative constraints on the company's financial performance over the next several quarters."

MCI recently reported a quarterly loss of $176 million, its first loss in four years, resulting from a $550 million charge associated with the conversion of its network to digital technology.

Kenneth McGee, program director at Gartner Group, Inc., said the layoffs were not unexpected and did not seem likely to affect service.

The second-largest provider of long-distance voice and data communications services also said it is forming two new units: one devoted to network services for business customers and one to concentrate on sales and service to MCI's residential market.

The new Network Services Division, based here, will be headed by Daniel E. Crawford, previously president of the firm's Southwest Division. An MCI spokesman said the new network service unit will be engineering-oriented and will provide technical support to voice- and data-network operations, primarily for mid-size and large business customers.

Crawford said his network service unit would have operational and maintenance responsibility for the entire network but customer support responsibility for business customers. "We will continue to provide the type of support that our customers expect and deserve," he said.

A new business markets unit, to be headed by Kevin Sharer, will consist of four divisions:

- The Eastern Division, based in Rye Brook, N.Y., will be headed by Jonathan Crane.
- The Southern Division in Atlanta will be under Douglas Maine.
- The Central Division in Chicago will be run by Greg LeVert.
- The Western Division in San Francisco will be under Barent Wagar.

The spokesman said layoffs would come from all MCI units, but Denver and St. Louis would be most affected.

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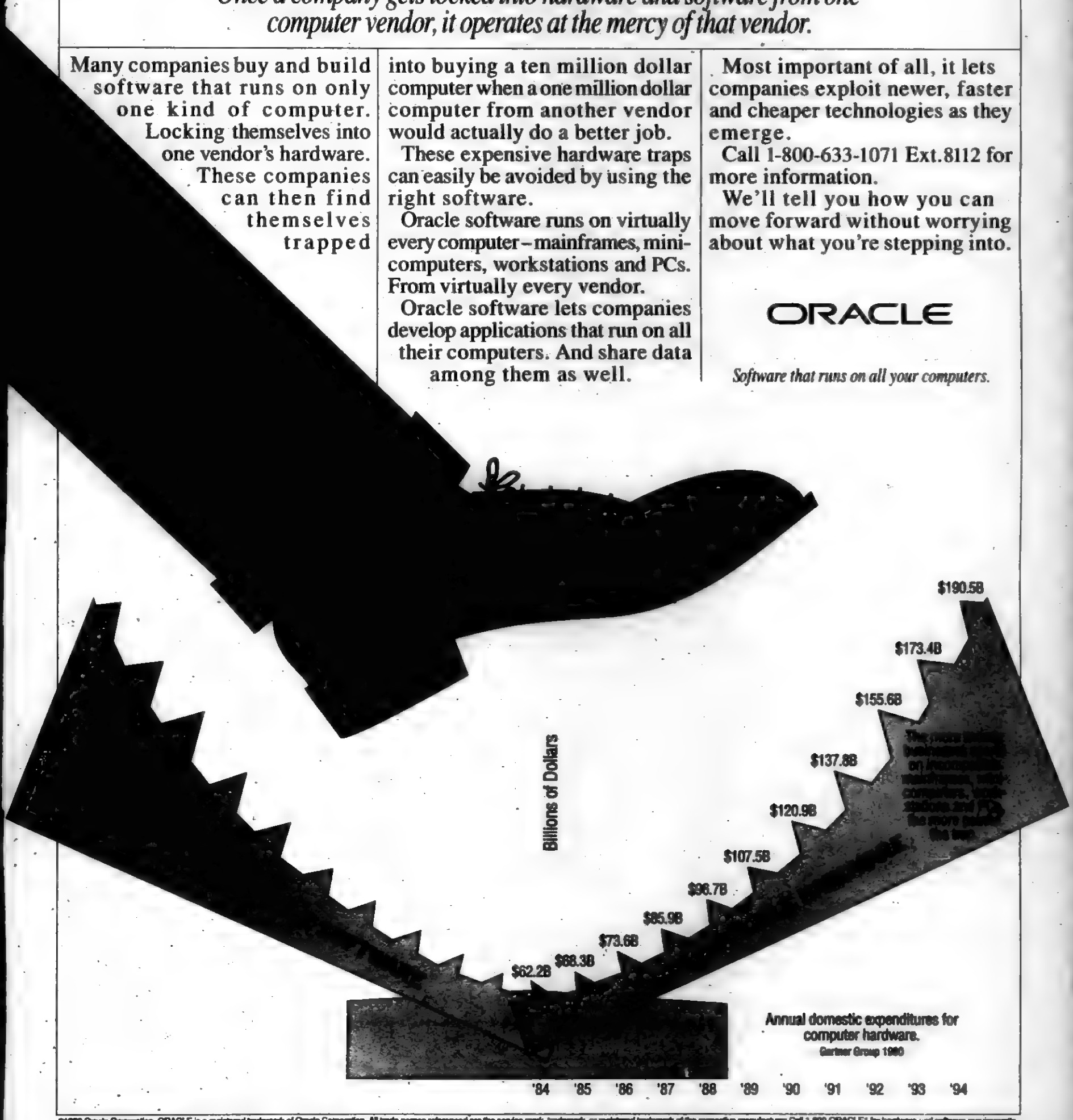

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AT&T beats competitors to switched T1 service

BY ELLIS BOOKER
CW STAFF

BASKING RIDGE, N.J. — AT&T raised the ante for high-speed, wide-area networking last week, becoming the first carrier to announce a switched T1 private-line service.

Among the major applications for high-speed switched services are full-motion videoconferencing, bulk data transfers and on-line access to very large data files such as digitized documents and pictures.

Accunet Switched 1536, which will be available in the second quarter of 1991, provides a 1.536M bit/sec. pathway for customer data. The service follows Accunet Switched 384, a 384K bit/sec. facility AT&T launched at the International Communications Association show in May [CW, May 28]. AT&T said last week it had several unnamed customers beta testing the 384 service.

AT&T tested both services six months ago but is releasing them sequentially because "they are still looking for market demand," said Steve Sazegari, a senior industry analyst at Dataquest, Inc. in San Jose, Calif.

"They also knew they were ahead of the competition and didn't want to price it too high," Sazegari added, noting that AT&T was also the first with a switched 56K bit/sec. service but had cut its price following introductions by MCI Communications Corp. and U.S. Sprint Communications Co. of their own 56K bit/sec. services.

According to Sazegari, the break-even point for AT&T's switched offering as an alternative to a standard T1 will probably be approximately four hours of continual use per day. Above that, he said, customers are probably better off buying a standard private line.

The 1.54M bit/sec. product is more than 27 times faster than AT&T's 56K bit/sec. switched Accunet service but will cost less than 20 times that service's price, according to an AT&T spokesman. Specific pricing is unavailable, however, because a tariff for the Accunet Switched 1536 has yet to be presented to the Federal Communications Commission.

Customers will obtain access to Accunet Switched 1536 from designated AT&T central offices — the same AT&T toll offices supporting the 384K bit/sec. service. AT&T said last week it hopes to have 73 of those locations for the tariffed 384 service by the end of the year.

Like the 384K bit/sec. service, the 1536 offering requires the use of an Integrated Services Digital Network (ISDN) access line; customers will also need a private branch exchange that supports the ISDN Primary Rate Interface.

MCI will be right behind AT&T with its own switched T1 and a switched T3 service, scheduled for availability in the third quarter of 1991. MCI actually announced its Virtual Private Data Services first, at the September Tele-Communications Association show in San Diego, Calif., where it demonstrated a switched T3 circuit connecting a Cray Research, Inc. supercomputer and a Sun Microsystems, Inc. workstation. MCI said its service will not initially require a Primary Rate ISDN access line.

Sprint, which said it is considering such a switched service, currently offers an integrated T1 access partitioning capability that allows users to allocate each of the 24 channels in a T1 line to different circuit-switched services.

Switched 1536, like all of AT&T's Accunet Switched Digital Services, is supported by a dedicated AT&T network control center in Chicago.

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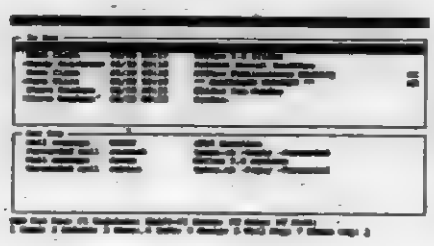

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Prime posts $58.3M income

NATICK, Mass. — Prime Computer, Inc. posted an operating income of $58.3 million last week, compared with a loss of $7.7 million at this time last year, according to DR Holdings, Inc., the company that acquired Prime in June 1989.

DR Holdings reported a net loss of $34.3 million for the third quarter, which ended Sept. 30, 1990.

According to a statement by James F. McDonald, Prime's vice chairman and chief executive officer, the company has reduced its operating debt by $145 million since January through prepayments and other debt reduction actions.

Prime's revenue for third-quarter 1990 was up 5.8% over revenue for the same period last year, and net income was $20.1 million for third-quarter 1990.

Prime said that it submitted a $25 million payment to its senior bank lenders last month, effectively saving the computer vendor $450,000 in cash interest expense for the fourth quarter of 1990. The bank lenders had originally scheduled the payment for Dec. 31, 1991.

In related news, Robert A. Fischer, president and general manager of Computervision, a division of Prime, quietly left the Bedford, Mass.-based computer-aided design and manufacturing firm last month. Fischer's responsibilities have been assumed on an acting basis by John J. Shields, Prime's president and chief operating officer.

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How IBM, Perot lost out

BY CLINTON WILDER
CW STAFF

HOUSTON — It pitted IBM and H. Ross Perot's new company against Perot's old company for a billion-dollar contract — and it might have been the biggest outsourcing deal that never happened.

In June of this year, Chicago-based Navistar International Transportation Corp. ended a nine-month evaluation of outsourcing with the decision to keep its information systems function in-house.

For different reasons, Navistar rejected the bids of Electronic Data Systems Corp. (EDS) and an alliance of IBM and Perot Systems Corp., which were rumored to be discussing merger possibilities during the same time frame.

Navistar dropped EDS from consideration before IBM/Perot, but in the end, neither vendor offered significant enough advantages to justify outsourcing, said E.O. "Skip" Stout, vice president of IS and services at the $4 billion truck and components manufacturer.

EDS offered only 10% annual savings and inadequate applications development direction, according to Stout. IBM/Perot, which did meet Navistar's goals for outsourcing applications development, would have actually increased Navistar's annual IS costs by $10 million.

"If it was level [with current IS spending], we would have done it," Stout said at an outsourcing conference held here last week by Profit-Oriented Systems Planning Program (POSPP), a Carrollton, Texas-based IS executive research consortium.

Navistar was also not comfortable with IBM's "people plan," which would have transferred half of Navistar's IS operations' employees to a new IBM/Perot subsidiary devoted to the contract.

The employee transfer would have been similar to IBM's much-publicized arrangement with Eastman Kodak Co., and it was the Kodak deal that partially motivated Navistar to consider outsourcing. Other motivations were corporate clamps on capital spending, a need to better coordinate business units' IS and a letter from one vendor claiming it could cut the firm's $80 million annual IS budget in half.

In an effort to simplify the process, only IBM and EDS were considered. IBM brought Perot Systems in as a partner in response to Navistar's concerns that IBM was fairly new in the facilities management business.

Despite initial management attempts to keep the outsourcing consideration under wraps, word leaked out to Navistar employees within three weeks after the process began in late 1989. Stout joked that the "quality" of the rumor mill could qualify for the Malcolm Baldrige Quality Award. "We should apply for the Baldrige on our grapevine," he said.

Stout said Navistar's experience proved what many POSPP conference speakers said: The outsourcing evaluation process itself can lead to dramatic improvements in IS effectiveness.

He said the evaluation resulted in better cooperation among analysts, programmers and users. Most advantageous of all, the magnitude of the decision focused the attention of senior management on the importance of IS as never before, Stout said. Stout now reports to Navistar's president and chief operating officer instead of to finance.

EDS signs $90M deal with CCIS

BY CAROL HILDEBRAND
CW STAFF

DALLAS — In a move aimed at expanding its presence in the transportation industry, Electronic Data Systems Corp. (EDS) has augmented its outsourcing role at Cummins Engine Co. by signing a 10-year, $90 million facilities management contract with subsidiary Cummins Cash and Information Services, Inc. (CCIS).

According to CCIS President Leo Krulitz, although the firm hopes to realize some cost savings in the future, that was not the driving factor behind the decision. "We've been having a hard time keeping up with computing capacity," he said. "Our principal interest was to make sure that we have all the capacity we need to serve our customers."

CCIS, which provides electronic funds transfer and fuel services for trucking firms, is the second-largest firm in the industry after Comdata Holdings Corp.

The contract strengthens the ties between EDS and Cummins Engine, a manufacturer of diesel engines and other components for the trucking industry. EDS took over the management of the company's Columbus, Ind.-based computer operations center about one year ago.

Computer operations, programming and telecommunications efforts will be handled by EDS, Krulitz said, but he does not anticipate any big changes. "EDS' data processing center for CCIS will remain right here in our offices," he said.

Roger Still, an EDS spokesman, said the agreement represented another step in the firm's attempts to target the transportation industry. "We don't have much in trucking so far, but we are definitely working toward expanding our role in the entire transportation industry."

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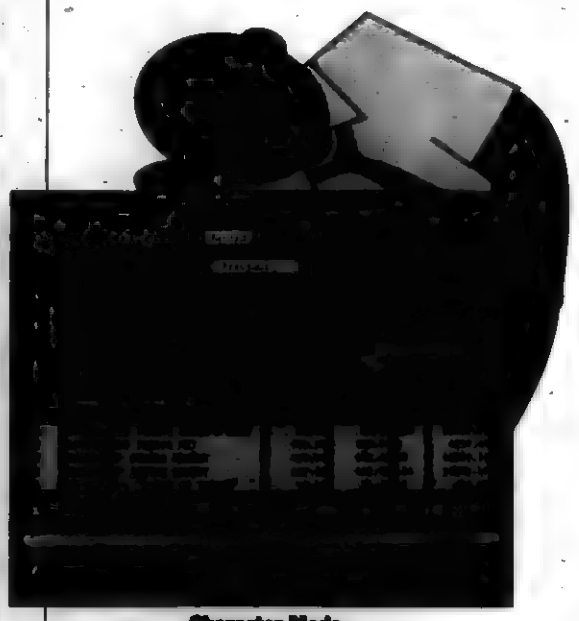

Character Mode

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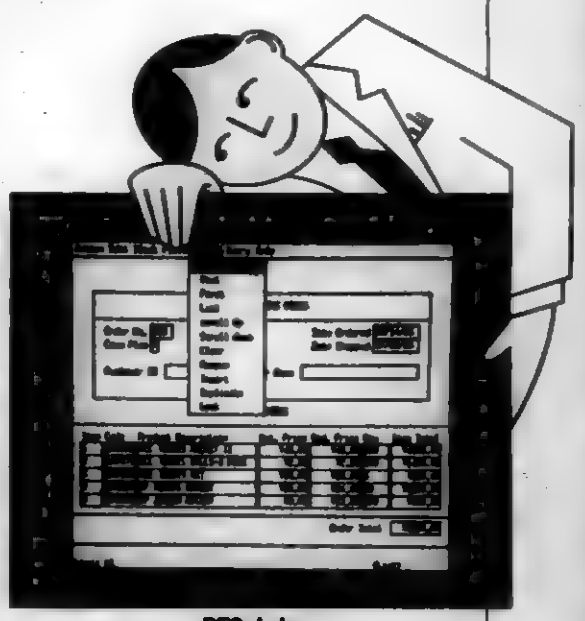

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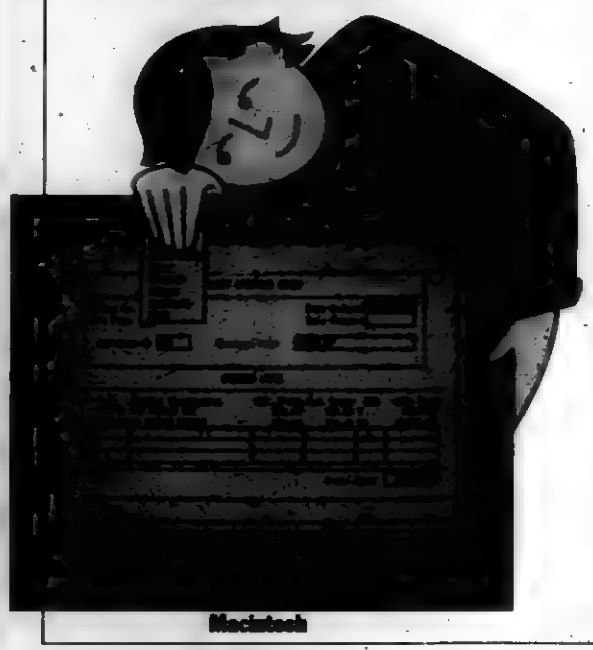

Macintosh

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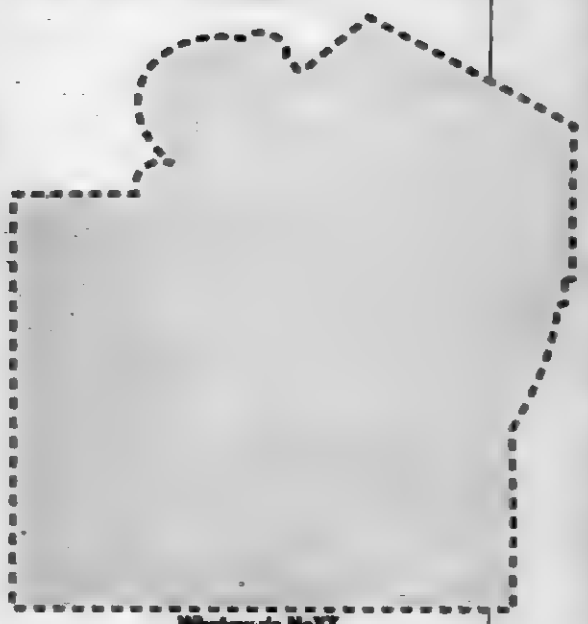

Whatever's NeXT

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Outstanding innovators lauded

BY MAURA J. HARRINGTON
CW STAFF

WASHINGTON, D.C. — The U.S. Commerce Department last Tuesday honored 10 "outstanding technologists" and one company with the nation's highest honor bestowed by the president for technological achievement.

The 1990 Medal of Technology has been awarded to only 50 people since its establishment in 1980 by the Stevenson-Wydler Technology Innovation Act, according to Commerce Secretary Robert Mosbacher.

First awarded in 1985, the award recognized contributions made by scientists, engineers and companies in improving "the well-being of the U.S. through technological innovation and commercialization," according to the Commerce Department.

Among this year's recipients are John Atanasoff, for inventing the electronic digital computer; Gordon Moore, co-founder and chairman of Santa Clara, Calif.-based Intel Corp., for his leadership in microelectronics innovations of large-scale integrated memories and microprocessors; and Dallas-based Texas Instruments, Inc.'s Jack St. Clair Kilby, for inventing and contributing to commercialization of the integrated circuit and the silicon thermal print head.

Atanasoff is considered by many to be the founder of the computer industry. In 1939, he created a working prototype of a nonprogrammable electronic calculator at Iowa State College.

That prototype was viewed by John Mauchly, who, with J.

Kilby's discoveries *helped build electronics industry*

Presper Echert in 1940, built the Electronic Numeric Integrator and Calculator (ENIAC) computer. In 1972, Atanasoff's creation was the basis of a court decision invalidating the patent for the ENIAC.

Moore, now 61, worked with William Shockley, co-inventor of the transistor, on semicooductor process technology before co-founding Fairchild Semiconductor Corp. in Mountain View, Calif., in 1957.

Moore became director of research and development at Fairchild, where the first commercial integrated circuit was produced, and in 1968, he moved on to co-found Intel in order to develop and produce large-scale integrated products, beginning with semiconductors.

Kilby, 77, is well-known for his invention of the integrated circuit, which he developed in 1958, shortly after he arrived at TI to work as an engineer and manager.

He worked at TI from 1958 until 1970, when he took a leave of absence from his job as assistant vice president to become an independent consultant and further explore the use of silicon technology for generating electrical power from sunlight.

Additional honorees

Others honored with the 1990 Medal of Technology include the following: Marvin Camras, for developing and commercializing magnetic recording; Donald Frey, for a range of commercial applications of new technologies and research on technology commercialization; John Mayo, for providing a technological foundation for information age communications and overseeing conversion of the national switchboard network to digital-based technology; and Chauncy Starr, for innovations in energy production, risk assessment, technology transfer and organization of research consortiums.

Unisys announces DCP line modules, front end

BY ELLIS BOOKER
CW STAFF

BLUE BELL, Pa. — Unisys Corp. launched a new family of line modules for its distributed communications processors (DCP) last week, featuring a top-end model capable of T1/E1 data rates.

The high-speed intelligent line module (ILM-20-HS) card is the first from Unisys to support T1 (1.544M bit/sec.) and E1 (2.048M bit/sec.) transmission speeds. It is also the first to sport a four-line interface. The new line modules can be used with Unisys' DCP/30, DCP/35 and DCP/50 front-end processors.

Unisys also announced a new entry-level front end — the DCP/25 — for its 1100/2200 and System 80 mainframes.

The latest front end, which can handle up to 184 lines, is capable of about 30 transactions per second, which is about twice as fast as its predecessor, the DCP/15. By comparison, the top-of-the-line dual-processor DCP/55, which Unisys plans to have out by the second half of next year, will be capable of 230 transactions per second and will handle 750 lines.

A key difference between Unisys' DCPs and IBM's products is Unisys' emphasis on Open Systems Interconnect (OSI) protocols, according to Kevin O'Neill, vice president of network research and consulting at Newton, Mass.-based Business Research Group. "IBM's front-end processor support is very [Systems Network Architecture]-centric," he said. O'Neill estimated that about 20% of Unisys' 7000 front-end processor sites use Transmission Control Protocol/Internet Protocol instead of Unisys' own proprietary Distributed Communications Architecture (DCA).

"At the heart, we still run the DCA architecture, supporting on top of that other protocols," said Brian Pickeragill, DCA program manager. "But in about 1992, we will be native OSI with DCA on top of that." Since its appearance in the late 1970s, DCA mapped to layers one to four of the International Standards Organizations's OSI Reference Model.

Unisys goes on to argue that unlike the hierarchical IBM SNA, its DCA was designed originally for peer-to-peer, multiprotocol networks and so can function even when connections to the mainframe are lost.

Prices for the DCP/25, currently available, start at $31,000; the four-line ILM-20-HS card costs at $12,500.

Failure

FROM PAGE 1

UK's Cable and Wireless PLC.

Steve Wolff, director of the networking division of the National Science Foundation (NSF) in Washington, D.C., uses the service and was unaware of the outage. He ran a test connection to Helsinki, Finland, during a *Computerworld* interview.

"It looks as if they're backing us up with a satellite link, because I'm getting one- to three-second response time," he said. "Over TAT-8, we can connect in a couple hundred milliseconds."

Scandinavian connection

Wolff is linked to the NSF's NSFnet international data network for supercomputer-based research projects. He has a direct link over TAT-8 into Nordunet, a network connecting the five Scandinavian countries.

According to AT&T spokesman Rick Brayall, "Some users may not be aware of the outage, but it's our standard policy to inform customers about service problems. This is because sometimes when you reroute, service degrades. We're upfront about the causes of the problems and we let them know that we're getting to the situation and taking care of it as soon as is humanly possible."

TAT-8 has been inoperable since Oct. 30 because of an electrical fault located in a regenerator — a device placed every 50 miles along the cable to amplify the communications signals, according to AT&T. Restoral has reportedly been delayed by heavy seas and violent winds, which make it difficult for a ship to get to the cable and make the necessary repairs, AT&T said.

The slower response time caused by using copper and satellite technology as backup can inhibit the productivity of some users.

Delays inherent in satellite technology are not good for interactive communications, said Sergio Heker, director of the John Von Neumann Computer Network (JVNCnet) at Princeton University.

"For example, researchers who work on collisions of galaxies need to see them colliding in their time frame," he said. "Supercomputers can process the data fast enough, and the workstation can display it fast enough, but the network speed must keep up with the computers."

Heker added that because of this, JVNCnet is considering a plan to split its load between TAT-8 and PTAT-1 and put Cisco Systems, Inc. routers at each end of the cables. Cisco routers contain the intelligence required to balance traffic loads and reroute traffic in case of failure. The 2-year-old TAT-8 carries 40,000 simultaneous phone calls, outmoding its predecessor, TAT-7, which supported 8,000 calls.

PTAT-1, introduced earlier this year, reportedly carries 80,000 calls. The TAT-8 consortium is currently digging ditches for TAT-9, which will match PTAT-1's capacity and is expected to go live in mid-1991, according to Brayall.

Bell Labs is also reportedly working on the successor to TAT-9, which will use optical amplifying technology instead of electrical power. Though the underwater glass fiber is protected by several layers of polyethylene plastic, Brayall noted that copper sheathing lies beneath the plastic for powering the amplifiers. "An underwater earthquake could cause a rock to break through the plastic. When you have water on copper, you're going to short out," he said.

When the optical amplifying technology emerges, according to Brayall, TAT-9's successor will be capable of carrying "several hundred thousand" telephone calls.

Loren named Covia CEO

Former Apple exec joins travel systems firm

BY ELLIS BOOKER
CW STAFF

ROSEMONT, Ill. — Allan Z. Loren, who left Apple Computer, Inc. early this year, will become president and chief executive officer of Covia Corp., the travel and reservations systems company said last week.

Loren's appointment, which goes into effect on Jan. 1, fills the vacancy created in late June when Barry A. Kotar left Covia to join Minneapolis-based Northwest Airlines as its executive vice president and chief information officer.

Loren *will try his wings at Covia*

In January, Loren resigned as president of Apple USA, where he had reportedly come into conflict with several other top Apple executives [CW, Feb. 5].

Prior to joining Apple in 1987, the 52-year-old Loren had been with Cigna Corp. for 16 years, where he held a number of executive appointments, including president and chief information officer of Cigna Systems, the company's information systems arm.

"Allan brings with him an impressive breadth of experience that includes general business, marketing and technical skills," said John C. Pope, chairman of Covia and executive vice president of marketing and finance at Covia's majority stockholder, United Airlines.

Covia, which is best known as the developer of the Apollo on-line travel reservations system, is jointly owned by several companies, including United (which holds a 50% stake), British Airways PLC, USAir, Inc., Swissair, KLM Royal Dutch Airlines, Alitalia and Air Canada.

Paul Blackney, who had been Covia's acting president and chief executive officer, will resume his previous duties as vice president of business development.

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HEWLETT PACKARD

ADVANCED TECHNOLOGY

TECH TALK

Robot brain surgeon

■ Brain surgeons at Johns Hopkins Hospital in Baltimore are experimenting with a computer-controlled robotic arm that allows them to make smaller and more precise incisions during brain surgery. The arm, which consists of a six-jointed mechanical sensor, works in sync with a computer that creates three-dimensional images of a patient's skull and brain. The surgeons make an incision in the patient's skull using the computer images as a guide. Once the brain is exposed, the robotic arm cuts to the brain surface and is used to define the tumor that is to be removed.

A look around

■ Scientists at Texas Instruments, Inc. have devised an autostereoscopic display called Omniview that projects color computer graphics in three-dimensional form inside a glass bubble. The prototype display, which is inside a 2-foot-diameter sphere, can be viewed from any angle without the need for special glasses. The images are created from a translucent double-helix disk spinning at 600 rpm while being scanned by a low-power laser in two dimensions. The display has a picture resolution of 750 by 750 pixels. The display could be used for air traffic control, military battle systems, modeling and several other applications.

Fractals in motion

■ Iterated Systems in Norcross, Ga., demonstrated a fractal image compression system that enables an Intel Corp. 80286-based personal computer to process full-motion video. As much as two minutes of full-motion video can be stored on a 1.4M-byte floppy disk, the firm said. The compression process is done using a reduced instruction set computing (RISC)-based processor board and custom fractal transform chips — both developed by Iterated — and an Intel 80890 RISC processor.

But can you read it like a book?

Cornell tries to make electronic database information as easy to use as a library

BY MICHAEL ALEXANDER
CW STAFF

Even though electronic databases contain massive amounts of information, they are more like warehouses than libraries. While all of the information is contained under one "roof," it may not be readily apparent where and in what form the information is stored. Walk into a library, on the other hand, and you have a pretty good idea what aisle contains the information you are looking for, and you can expect it to be contained in a book.

That is the basic premise of an "electronic library," which aims to combine the massive amounts of information in an electronic database with the logic and facile use of a library.

About 150 chemistry students and faculty members at Cornell University in Ithaca, N.Y., are experimenting with such an electronic library, an on-line system that enables users to retrieve information contained in thousands of articles published by the *Journal of the American Chemical Society*. Unlike on-line databases, the electronic library is not limited to textual information: Users are also able to retrieve graphics, illustrations and other images.

It is the first test of its kind, according to officials at Cornell's Albert R. Mann Library, where the Chemistry On-Line Retrieval Experiment (CORE) is being conducted, and Bellcore, where the system's experimental Superbook software interface and database engine was developed.

"Chemists tend not to use or find on-line services that useful because the graphical components are key to understanding," said Howard Curtis, head of the information technology section at the Mann Library. "Take away the schematics, photos, illustrations, and there's not much left."

Steve Lyons

One objective of CORE will be to determine whether on-line text and image retrieval and reading the material on screen is more practical than actually scouring the shelves for chemistry articles.

"It is not just a question of how willing researchers are to search and browse electronically but also whether they will want to read on their screens," Curtis said.

In the current test phase, which began three weeks ago, students and faculty can retrieve text and images from 1,000 articles. By the end of next spring, the database is scheduled to contain 70,000 articles, or about seven years' worth of articles from 20 scientific journals.

The database consists of four parts: text stored as ASCII files, an index, graphics that have been extracted from the articles and 300 dot/in. reproductions of complete pages. Text, the index and graphics are stored on magnetic media; the page reproductions are stored on optical discs. Although little of the information contained in the publications is in color, the 70,000 articles and related graphics will take up about 160G bytes of storage space.

"We need to figure out exactly what is required in the database structure, especially the storage of graphics," Curtis explained. "To what degree do we have to replicate the printed page and to what degree is the electronic journal a new entity?"

Students and faculty are using Sun Microsystems, Inc. and Digital Equipment Corp. workstations during the test. Eventually, other workstations and operating systems will be used.

Cornell plans to test three electronic library user interfaces: Superbook and Pixlook, developed at Bellcore, and Diadem, developed by OCLC. It's too early to determine what interface users will prefer, mainly because the initial testing has been limited to Bellcore's Superbook, Curtis said.

"We launched the Superbook project to try to make the screen presentation of text better than paper rather than worse," said Tom Landauer, manager of Bellcore's cognitive research division in Morristown, N.J. "We believe that Superbook is the first and only on-line hypertext application that makes it easier to use than harder."

Wyoming tests smart-card benefits program

BY MICHAEL ALEXANDER
CW STAFF

The Department of Health for the state of Wyoming is preparing to launch a nine-month pilot project using smart cards to help administer the state's Special Supplemental Food Program for Women, Infants and Children (WIC).

A number of states are experimenting with on-line electronic benefits programs, but this is the first that makes use of smart-card and off-line technology, said Peter Ognibene, vice president of corporate development at Applied Systems Institute, Inc. The Washington, D.C.-based company will design, install and administer the project, which will be officially launched in March.

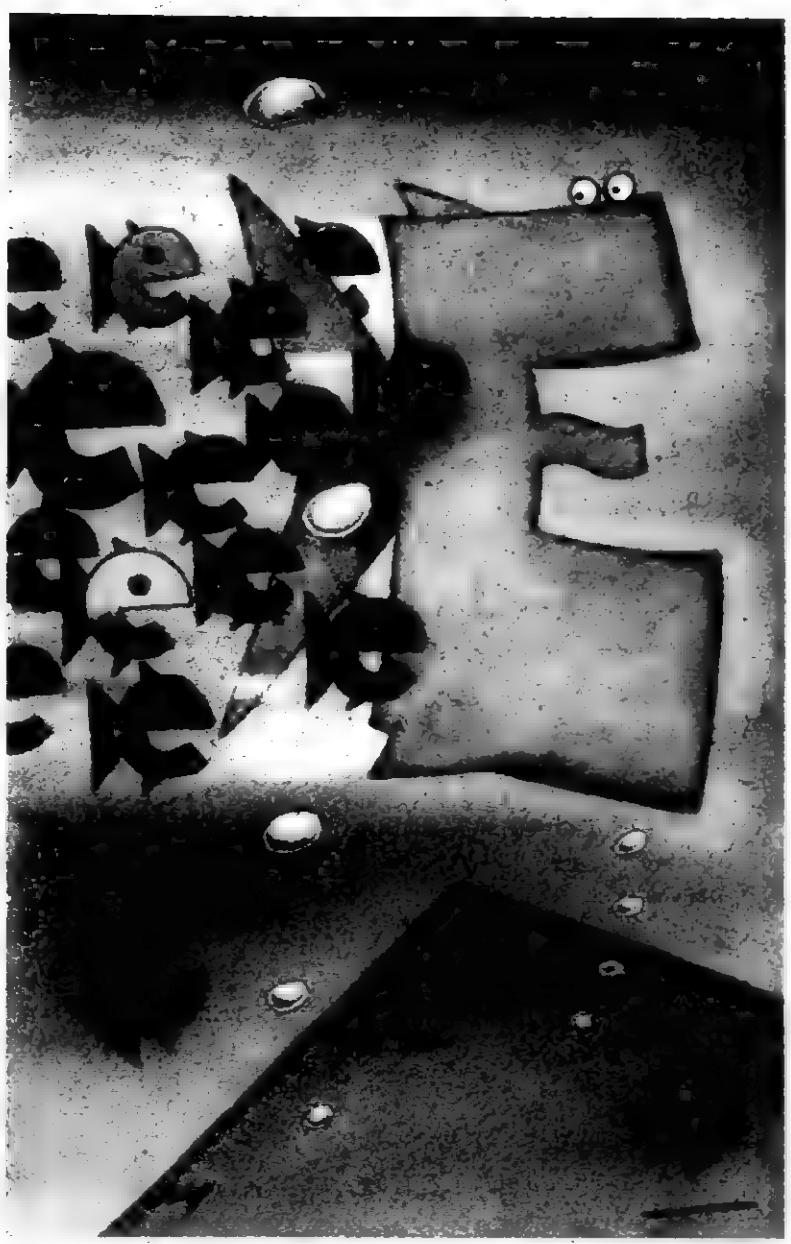
The WIC program provides dietary counseling and vouchers for nutritionally rich foods to low-income pregnant women, nursing mothers and children under five years old. Six hundred participants in Natrona County will receive smart cards containing personal and benefits information that they can use to shop for WIC-authorized foods at four grocery stores in Casper and the rural community of Edgerton.

Wyoming opted to use a smart card system because installing on-line electronic benefits systems, especially in the state's sparsely populated "frontier counties," was simply too high, Ognibene said. It will cost $200,000 to implement the project.

Smart cards will replace paper vouchers, outline types of foods and track the amounts to which the benefits recipient is entitled. The card is plugged into a small point-of-sale terminal that notes the universal product code of each item, compares it with items listed in an electronic code book to ascertain that it is among the approved foods and deducts the amount from the smart card's database.

"One disadvantage of the voucher system is that you can't split the voucher," Ognibene said. "It's a must use it or lose it situation. We'll be giving [participants] the ability to shop as often they need to."

At the end of each business day, the transactions recorded by the terminal will be uploaded to an Intel Corp. 80386-based personal computer in Cheyenne. Later, the information will be used to trigger electronic funds transfers from the American National Bank of Cheyenne to the four participating grocers.



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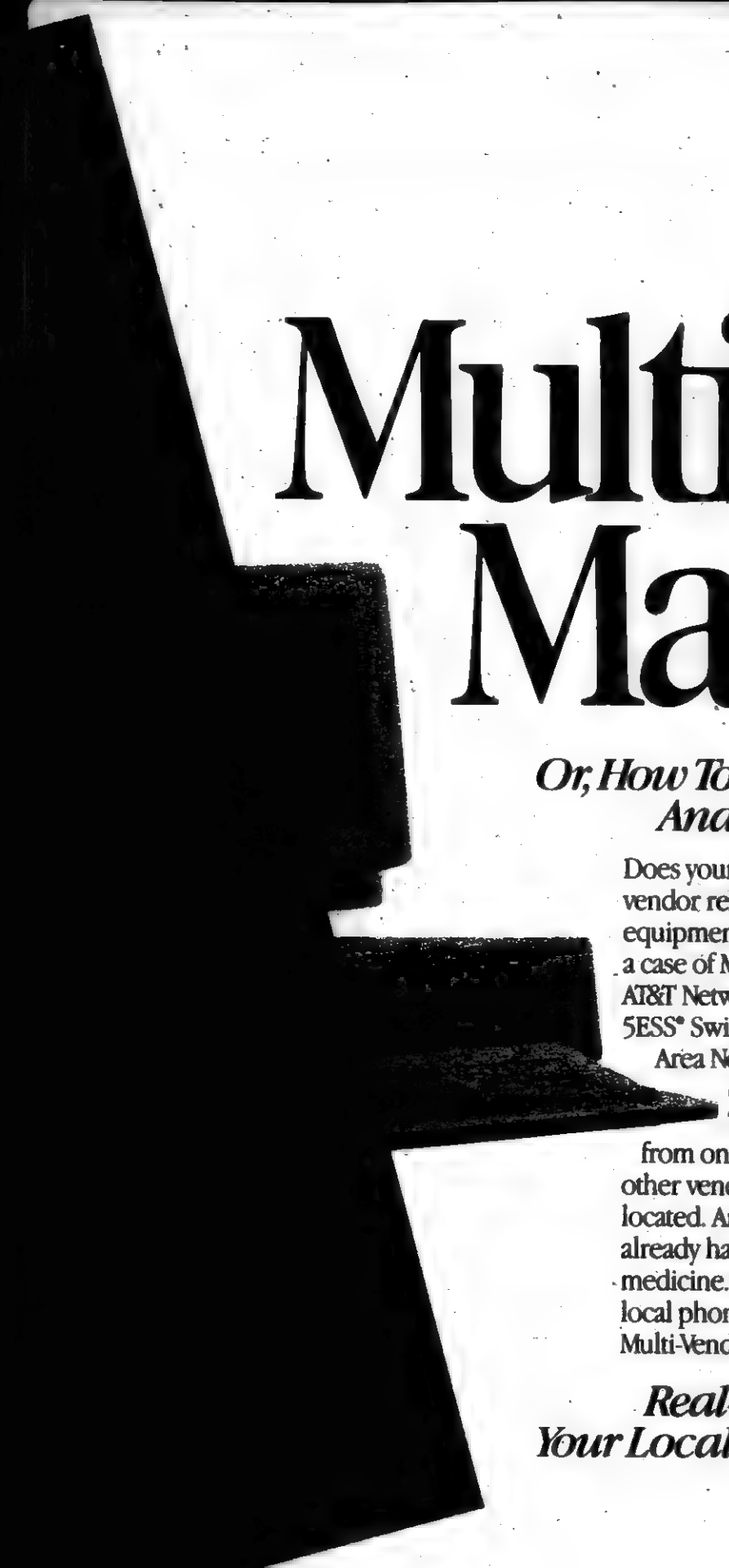

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EDITORIAL

Ad lib

REMEMBER THAT VACATION advertisement a few years back that referred to a tropical paradise as "a state of mind?"

That same phrase can be applied to the debate over whether the U.S. economy is mired in a recession. The debate has spilled out of the economists' offices — where doctors of the dark science are assessing whether the GNP has actually declined the recession-requisite two quarters in a row — to the general media.

Conclusive data is not in. But that doesn't matter. If you look at the headlines in the newspapers, they are gradually shifting from the "yes we are in a recession/no we're not" tenor to one questioning how long the recession will last and how deep it will be.

In other words, as a nation, we are becoming firmly rooted in a recession state of mind, in the same way we accept cooler weather and shorter days as the onset of winter. Just as bleakly, too.

You don't have to get sophisticated to observe the recession state of mind in action. Two weeks ago (eight weeks prior to the post-Christmas sales), a major Boston retailer held a 30% off everything sale. Salespeople often outnumbered customers during the day. Check out the cabin seating of your next business flight. You'll find it much easier than in past months to locate three empty seats across to stretch out. And you can make dinner reservations for just about any time at your favorite restaurant.

For most people and for most sectors of the economy, this will be the first recession in nearly a decade. But for information systems, it will be the first since the big crunch brought on by the original oil crisis of 1974.

That is because the information sector and the computer industry continued to boom along during the 1981-82 recession while the rest of the economy hobbled. While interest rates and unemployment soared, programmers and systems analysts demanded and received double-digit raises, and high-paying data processing jobs went begging for talent to fill them.

This time, however, IS departments are catching the recessionary wave as well. With so many large corporations as well as the U.S. government burdened by heavy debt, senior management is sparing no departments in the effort to pare costs and boost short-term profit.

As attendees at a recent IS management conference were told, the most important task to complete in these times is to (privately) prepare a set of contingency plans that assume varying levels of departmental cuts, such as 10%, 20%, etc. Critical to this process is categorizing IS projects from mission-critical on down and then preparing to make cuts accordingly.

Who knows, if the situation in the Middle East were to be resolved expeditiously, the recession state of mind could disappear like a desert mirage, and all would be well with the economy again. But here and now, people are thinking more along the lines of another ad, the one for Calgon bath oil that beckons to "take me away."

LETTERS TO THE EDITOR

Doctor suits

Regarding your article "New federal database aims to snag problem doctors" [CW, Sept. 17], the article emphasized that access to the data would be strictly controlled. But there was no mention of how the data may be used by authorized organizations.

Medicine is a risky business, which cannot succeed every time. Thus, all medical practitioners have some small probability of being successfully sued. In a situation like this, simply saying that because a practitioner experiences more suits than the average *does not* imply that the doctor is incompetent.

As an example, take a group of 9,683 JUA-insured doctors. Between 1975 and 1983, these doctors had 2,131 malpractice cases. Assuming that all doctors are equally competent and, as a result, have the same probability of experiencing a suit, it can be statistically calculated that 80.25% of the doctors will have no suits, 17.66% of the doctors will have one suit, 1.94% of the doctors will have two suits, and .15% of the doctors will have three or more suits. We would observe that 3% of the doctors are responsible for 24.1% of the suits. It would be tempting to "reduce the likelihood that incompetent practitioners can avoid detection by moving from one state to another" by disciplining all doctors with more than a particular number of suits. Recall, however, that we started out by saying that all doctors had the same chance of a suit — they are equally competent.

Designers of such systems should be careful to provide the information needed to make good decisions.

In the case of malpractice suits and other rare events, the most that can be said is that there is some probability that the number of suits against a particular doctor is not due to chance. It is this probability that should be provided to the end user, not the number of suits. The possibility of litigation makes it especially important to be careful when providing decision-making information from databases such as this.

Trevor Nyatsold
Yale School of Organization and Management
New Haven, Conn.

Aye, Captain

Regarding "High hopes for home PC market" [CW, Oct. 29], I, an IS professional, do not want a PC at home. I want a system that does domestic tasks (checkbooks, food inventories), but I want it to work like an appliance, not a PC. I want my bank statements processed electronically. I want my bills managed via computer as well as my air conditioning, lights and security system.

The needs of a home computer are not just watered-down versions of commercial software. Computers in business help control the huge "paper shuffle" generated by people. That's not my problem at home. The problem with today's home computers is that they are not designed or programmed for the home environment.

A home computer should have the look and feel of household items, not a typewriter. I hate keyboards. Touch-sensitive and voice-recognition inputs are what I want. "Computer! Prepare a shopping list — and include items for a steak dinner for six for next Friday!" "Computer! Remind me to watch the Dolphins play the Jets next Saturday at 1:00 p.m." That is what a "home computer" is all about!

Count Darling IV
Vice President of Operations
Rally Accessories, Inc.
Miami, Fla.

C the errors

Having read your Product Spotlight article entitled "A programmer's view of C++" [CW, Oct. 22], I am reminded of those pictures wherein you were supposed to find all the mistakes. Here is a list:

1. Function prototypes are added by ANSI C. C++ is not needed for these.

2. Call-by-reference: C++ does *not* pass parameters by reference. A reference operator is added to allow more convenient pointer usage.

3. Class definitions are contained within curly braces, not square brackets. The example will not compile.

These inaccuracies, along with confusing sentences such as, "An in-line function is better than a C #define because . . .", make me worry about the level of truth and precision you bring to your readership.

Tony Holderith
Xerox Corp.
El Segundo, Calif.

Computerworld welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor In Chief, Computerworld, P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701. Fax number: (508) 875-8931; MCI Mail: COMPUTERWORLD. *Please include a phone number for verification.*

IS: A tough road for minorities

VIVIAN G. WILSON

For blacks, the information processing industry has evolved greatly since the early 1960s, but there is still a long way to go. Computer careers appear to be anything but color-blind.

In the mid-1970s, there was considerable upward mobility for blacks in information systems. But this upward mobility has not kept pace with the increases in speed and power of the technology.

Until that first surge, blacks had been employed at the lower end of the information systems ladder. They were hired as computer operators, console operators, tape librarians, data entry and/or electronic data processing equipment operators. Somewhere along the way, perceptive managers realized that blacks were intelligent and decided that they could help fill a human resource void in the IS personnel arena.

Blacks who were at the right place at the right time were given opportunities to move up into the more specialized areas of IS. They became programmers, data entry supervisors and sales personnel as openings were made available on a limited basis. Only after affirmative action programs were put into place were many higher-level management positions opened to blacks.

In many cases, those managers were known as "tokens" — blacks who enabled companies to meet their quota of minority employees in management positions. This reputation remained even though the minorities had the experience and education to get the work done.

Blacks, of course, must give 110% capacity compared with their "majority" counterparts and often feel that whatever they do is simply never going to be enough.

The deficiency in the number of blacks in management positions persists. Rarely will you find a "majority" manager who will push the super-intelligent, business-minded black manager into a position to be promoted to a high-level position.

More frequently, the "majority" manager is insecure and intimidated by the black manager's abilities. He will step in and halt a black manager's climb up the career ladder. The reasons are numerous and too subjective to be discussed here. However, those blacks who have been fortunate enough to even be considered as managerial material have heard all of the excuses.

As head of the Black Data Processing Associates (BDPA), a national organization of blacks in IS, it is clear to me that many young minorities entering IS may be heading for a dead end.

BDPA believes strongly that one of the key needs in this area is for role models for blacks in IS.

It is rare in black households to find college-educated men or women trained in the sciences or technology. This must change in order for IS to become a more viable profession for blacks. Mentors are critical to give young blacks guidance in how to fashion rewarding careers in this field.

In my opinion, there is a list of things that must happen for blacks to find satisfaction and growth in IS:

- More mentors must be developed for blacks in the corporate structure.
- Black IS professionals must commit to continue a sense of giving 110% to accomplish the same as our "majority" counterparts.
- They must be determined to participate in certification and accreditation organizations, despite the perception that they are biased in their processes.
- Those on the way up must resolve not to let one door closing stop them from pushing another door open, even if it means starting their own businesses.
- Those blacks who have made it must remember to keep the doors open for those who follow them. They must network with other professionals, give back time and energy to youths following in their footsteps and share their business knowledge.

Wilson is the national president of the Black Data Processing Associates.

And now for the moral of our story . . .

MICHAEL COHN

Our director recently dragged us in at 7 a.m. for his annual motivational breakfast. Now I'm not all that cheerful at 7 a.m., and to make things worse, our speaker opened with a children's story about this irritating little engine that said "I think I can" every 15 seconds.

Perhaps it was because I'd heard that story 100 times before. Or perhaps it was because the woman beside me had spilled cocoa in my lap. I suddenly felt tremendously motivated . . . to nail the upbeat guy with the remainder of my lemon jelly doughnut. Unfortunately, I was all the way in back, and the pastry landed well short of the podium, grazing our tape librarian (who was sound asleep, anyway).

I feel pretty bad about the whole thing now. Those old stories aren't as childish as they seem. There are pearls of wisdom in the fables you heard as a kid. I've dragged up a few of my favorites . . . the ones that might still apply to information systems today.

The Ant and the Grasshopper. There once was an ant and a grasshopper who were best of friends. The ant was prudent and industrious and one day decided to build himself a warm winter home. The grasshopper, however, was not concerned about the future and spent most of his time on the couch watching the *Home Shopping Network*.

It soon began to grow cold. The ant, who had been planning, designing and building his home for months, was all nice and cozy. Meanwhile, his long-legged friend had done nothing about the rough times ahead. But just when it looked like curtains for the grasshopper, he marched over to the ant's house, reverse-engineered the whole thing and built his own version in 20 minutes.

The ant thought this was terribly unfair but was so much smaller than the grasshopper, he really couldn't do anything about it. So the ant just sat and pouted, while the grasshopper went inside and watched *The Simpsons*.
Moral: It's good to be first. But it's better to be bigger.

The Careful Squirrel. One morning, a squirrel came upon an abandoned nest high up in a tree. "What a perfect place to store my food," thought the lucky squirrel. "But can this tiny nest support the weight of all my acorns?"

The squirrel wisely decided to test this acorn repository. He put large rocks in the nest. He even climbed into the nest and jumped up and down. Still, the nest proved acorn-worthy. Exhausted but satisfied, the squirrel gathered his stash and loaded the nest. But as he placed that last acorn atop the pile, he noticed something was wrong. The branch beneath him quivered, then gave way . . . and the squirrel, the nest and the acorns all fell to the ground.
Moral: No matter how much you test, it just takes one nut to screw things up.

The Three Little Pigs. Once upon a time there were three little pigs, who received an RFP from the Big Bad Wolf. But the pigs could not agree on what system to propose, so they split up, each trying to win the contract for himself.

The first little pig's system was dirt cheap; he cut corners on the chip technology. He called his system "Straw-286" and demonstrated it for the Big Bad Wolf. However, when the wolf loaded his data, it blew away Straw-286, and the first little pig was mortified.

The second little pig proposed speedy "Sticks-386," which cost a little more but was worth it. But when Sticks-386 tried to handle the wolf's connectivity requirements, it huffed, and it puffed, and it fell apart. The second little pig filed for Chapter 11.

But the third little pig was smarter and more patient. After several months, he came up with "Bricks-486," which was a high-priced, yet leading-edge solution. He proudly called the Big Bad Wolf to schedule his demo. When he did, the secretary informed him that Mr. Wolf had cash flow problems and had to settle for "Straw-286" for now but would consider upgrading in three or four years.
Moral: What it costs is more important than what it does.

Mr. Rabbit's Garden. Mr. Rabbit was tired of foraging for food. One day he decided, "Why not plant a garden? I'll grow all I need, with enough left over to make my killer gazpacho."

Mr. Rabbit sat down and carefully planned his garden. He did a needs analysis of sun and shade. He constructed a resource list of seed and tools. He built a harvest Gantt Chart. He outsourced his fertilizer requirements to the horse up the road.

After days of prepping his garden project, he selected a shady spot under a big oak tree. He planted according to his Soil Timing Study and managed his critical tasks so that, by early autumn, he had a bountiful garden.

On the scheduled morning, Mr. Rabbit put on his overalls and went to the oak tree to harvest his garden. He stood there for a moment, admiring the ripe tomatoes, abundant carrots and crisp cucumbers. But just as he bent down to pluck his first pea, he heard a horrible racket . . . and Mr. Rabbit looked up just in time to see this squirrel, nest and swarm of acorns fall from the sky and wreck his whole garden.
Moral: Even the best managed project can get screwed up by someone else's nuts.

The Racing Roosters. A hen was hopelessly attracted to two roosters and was having quite a time choosing between them. The pair decided to have a race, with the loser agreeing to fly the coop. As the love-struck hen breathlessly watched, her suitors lined up at the edge of a field, then off they went . . . each determined to be the faster fowl.

For a few seconds they ran neck and neck. But one rooster was quite a bit younger and quickly began to pull ahead. It soon was evident that the young rooster ran much faster . . . so fast, in fact, that he ran right onto a southbound lane of I-95 and was flattened by a Ford Taurus with Missouri plates.
Moral: Winning the benchmark is one thing; winning the contract is another.

Cohn is trying to be a computer salesman in Atlanta.

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COMMENTARY

Rosemary Hamilton

An OOP object lesson

Object-oriented technology sure is a hot topic. Several information systems managers contacted recently said they are investigating it.

Meanwhile, you would be hard-pressed to find a vendor that does not promote it or endorse it. What's more, there's already debate in the market. On the programming side, some folks suggest that "pure" object-oriented programming (OOP) is superior to a hybrid language that is a mix of conventional and OOP methods. A similar split exists on the database side, with many vendors saying they will build object-oriented attributes into existing relational DBMSs, while other vendors are selling new object-oriented DBMSs as the next and better generation.

It can give you a headache, huh? For some IS managers, object-oriented technology must seem like just one more item they need to figure out. It must make them weary.

Before getting caught up in vendor promotions or market debates, however, a look to a user site such as the Brooklyn Union Gas Co. could be helpful. The company got started on an object-oriented project a few years ago, before there was all sorts of noise in the market about this technology. As a result, it didn't get tugged in different directions, and today it is running a customer information system based on object-oriented techniques.

It is important to note that Brooklyn Gas plans to sell this software to other utilities, so it has an interest in promoting its OOP success story. Still, the company's user experience with the technology might prove helpful to some IS managers.

Brooklyn Gas was drawn to OOP for the same reasons that many other IS managers may now be checking it out. It holds a promise of more efficient programming and maintenance. But OOP methods, not any particular product, became the focus of the Brooklyn Gas project.

The company didn't set out in search of OOP, said William

Continued on page 33

Bull users weathered by storms

After millions invested in sales and support, reviews remain mixed

ANALYSIS

BY SALLY CUSACK
CW STAFF

BILLERICA, Mass. — Since its acquisition by Groupe Bull in 1988, Bull HN Information Systems, Inc., the stateside operations for the international company, has been struggling with massive reorganizations, sweeping employee cutbacks and restructured product lines. Bull customers, having weathered the hurricane, have not necessarily emerged unscathed.

According to Steve Gardner, Bull HN's vice president of U.S. marketing, the company conducted an internal satisfaction survey with its customers in 1988, after the acquisition, and received a "dismal" response.

It was evident that the company's sales and support needed an overhaul, particularly in the small systems arena, Gardner said. "Frankly," he admitted, "we were getting sloppy."

Since then, Bull HN has invested millions of dollars in retraining its sales force, but the company is still playing to mixed reviews.

Groupe Bull announced earlier this month it will be cutting its U.S. employee payroll by almost 2,000, but according to a Bull HN spokesman, the layoffs will "absolutely not" affect customer service. "The purpose of the restructuring is to more closely align our organization with our customer's needs," he said.

Customers would certainly welcome further improvements. "The sales force has been spread too thin in the past," said Lou Rinaldi, operations supervisor at the Connecticut Department of Public Safety. "When we have inquired about certain products — things as simple as laser printer fonts — we would call a number of times and receive no response."

Rinaldi said the low point in customer service came in the summer of 1989, when the department was upgrading from a DPS 6 to a DPS 6 Plus computer, and the sales manager, who has since been replaced, was not conducting the proper follow-throughs with reference to system specifications and installation procedures.

Unfortunately, according to Gardner, servicing small systems provides the potential pitfall of establishing uneven performance patterns. "The demographics and service must be constantly evaluated," he said.

Rinaldi noted that Bull HN has recently supplied him with two new local sales representatives, one each for hardware and software, and he said he thinks that this may be an indication that the vendor is upgrading its service.

"Seeing will be believing," he added.

Commenting on Bull HN's approach to customer sales and service, William C. McCusker, director of the computer center at Citrus College in Glendora, Calif., observed that "it really is a mixed bag out there. Quality seems to depend on the site itself, its location and individual requirements."

Flatlands

Growth has been a rare commodity in Bull HN's market share during recent years

Percent of worldwide market by value of shipments	1986 ($M)	1986 Mkt. %	1987 ($M)	1987 Mkt. %	1988 ($M)	1988 Mkt. %	1989 ($M)	1989 Mkt. %
Large-scale systems	410	1.9	410	1.7	390	1.4	380	1.3
WORLDWIDE TOTAL	22.020		24.660		28.230		28.910	
Medium-scale systems	400	2.0	400	1.8	430	1.8	410	1.7
WORLDWIDE TOTAL	19.930		22.06		23.890		24.300	
Small-scale systems	270	1.5	290	1.3	250	1.1	280	1.2
WORLDWIDE TOTAL	18.350		21.180		22.980		23.31	

Source: International Data Corp. CW Chart: Doreen St. John

McCusker, former president of the now defunct Honeywell Large Systems User Association, also pointed out that some areas of the country have actually seen increased sales and service support in the past six months.

For the most part, managers at Bull HN mainframe sites said they have traditionally benefited from strong sales and service support, and most seem to have never experienced any major problems with the vendor. However, there are still a few areas that the company must satisfy.

"It takes too long to get things done," said one IS director at a large Midwest manufacturing company that has a Bull mainframe and several Bull minicomputers for maintaining operations. "Sales reps are usually out of town or in meetings. I've complained several times over the past six or seven years."

Gardner promised that these last organizational wrinkles will be ironed out soon. He indicated that in 1990, sales training expenses alone have exceeded $2 million. "We have hired a number of new salespeople and have also invested heavily in leadership training and established management programs on a nationwide basis."

"They seem to be in a constant state of reorganization," said Dale Good, director of IS at the Minnesota Supreme Court.

The court has seven Bull DPS 7000 computers installed and is currently in the process of phasing out several DPS 6 minicomputers. Good says that, prior to the 1988 merger, a customer really "had to climb the ranks" to bridge the sales and marketing divisions of Bull.

McCusker noted that the vendor is grappling with much the same problems besetting other large companies that are trying to change the product and distribution channels.

Stating that Bull HN's new approach to sales and service is supported internally from "top management on down," Gardner said that the company is refocusing its sales force toward "solution" sales.

"We have to break away from the traditional iron mentality," he concluded, adding that results from the company's 1989 satisfaction survey yielded a "dramatic" improvement over the previous year's response.

Oracle expands CASE tools repertoire

BY JEAN S. BOZMAN
CW STAFF

REDWOOD CITY, Calif. — Oracle Systems Corp. has ported a series of computer-aided software engineering (CASE) tools, originally announced last spring, to the OS/2, MS-DOS, VAX/VMS and Unix operating systems. The CASE tools include a CASE data dictionary, a graphical workbench called Case*Designer and a fourth-generation language called Case*Generator for Oracle's SQL*Forms.

As first announced, the tools were available only for the Sun Microsystems, Inc. Scalable Processor Architecture machine, which Oracle developers used to design the CASE software packages. "We brought the versions on all these platforms to the same level," said M. R. Rangaswami, director of Oracle's CASE marketing in the U.S.

The Case*Dictionary product is actually more than five years old but has been enhanced, said Richard Barker, senior vice president in charge of Oracle's CASE products. The graphically oriented Case*Designer tool, which allows developers to draw entity-relationship diagrams and data flow charts, was announced last spring.

"The data dictionary and the Case*Designer aren't entirely new," said Paul Winsberg, a principal at San Jose, Calif.-based Database Associates, who is evaluating the software. "The Case*Generator is new, though. It gives them a lower CASE capability that fills out their product line, although it has a ways to go compared with more mature products like Texas Instruments, Inc.'s IEF [CASE tools]." Upper CASE tools are meant for planning and analysis, while lower CASE tools are intended for code generation, he explained.

Winsberg said Oracle's set of CASE tools appeared to be not as tightly integrated as TI's Information Engineering Facility tool set. He added that they would only generate Oracle-based applications, although those applications could be made to run on different hardware platforms.

Oracle began shipping the CASE tool set for multiple software systems early this month, although the Sun version had been shipping for months. Among the Unix platforms now supported are Sun 4 workstations, several Hewlett-Packard Co. 9000 machines, Sequent Systems, Inc. computers, Data General Corp. Aviion workstations and Amdahl Corp. mainframes that run the UTS Unix operating system.

Pricing ranges from $13,000 for a single OS/2 copy to $100,000 for a large-scale VAX machine, according to Rangaswami.

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Maintenance productivity gains of up to 10-to-1.

In this same study, developers were asked to compare IEF maintenance productivity with their former methods. Of those responding, *more than 80 percent had experienced gains of from 2-to-1 to 10-to-1.* (See chart.)

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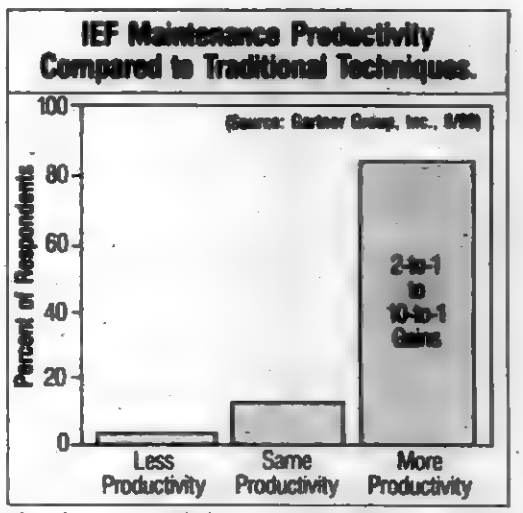

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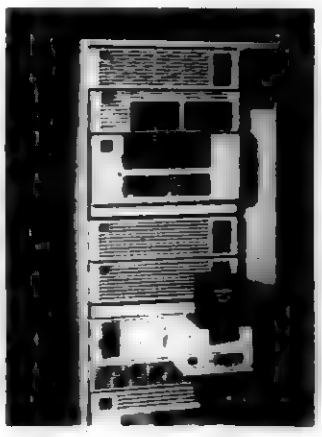

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Banks taking on Unisys image

BY ELLIS BOOKER
CW STAFF

BLUE BELL, Pa. — Unisys Corp. is starting to see a payback from its 1-year-old imaging system for banks, signing up the sixth customer for its Infoimage Item Processing System (IIPS) last week.

The $15 million sale to Barnett Banks, Inc., the largest commercial bank in the state of Florida, is the latest successful effort by Unisys to leverage its role as a provider of bank item processing systems and get its foot in the door before IBM's image-enabled item processing product hits the streets.

The dilemma for banks that are IBM check processing shops today but want an imaging component immediately "is the necessity to convert from IBM's check processing to [item processing system] first, before going to IIPS," said Stanley E. "Ned" Miltko, a senior vice president and head of image consulting at Littlewood, Shain & Co. in Exton, Pa.

Miltko said IBM, the leading provider of high-speed check processing to commerical financial institutions, has been delivering hardware for its bank imaging system, but software is still under development and will not be ready until next year.

The Chase Manhattan Bank N.A. in New York is trying to convert from IBM to Unisys's item processing approach to get the latter's imaging system, Miltko said.

In addition to Chase, other IIPS banking customers include Huntington Bancshares in Columbus, Ohio, The Northern Trust Co. in Chicago and Commercial Bank in Detroit. The most recent sale was late last month to Signet Bank, the second largest commercial bank in Virginia, which purchased a $7.5 million Unisys system.

Unisys claimed more than 200 customers for its IPS, which was first offered in the late 1960s. Both IPS and the image-enabled IIPS use the Unisys V series mainframe platform.

In addition, the balance recently tipped in Unisys' favor among Federal Reserve System institutions, which had split their traditional check processing business more or less equally between Unisys and IBM. Unisys now enjoys business from 26 of the 47 Federal Reserve check processing sites — most recently adding the Federal Reserve Bank of Philadelphia under a $6 million contract. Eventually, these could be significant imaging customers, Unisys sources said.

"The Fed's imaging strategy is to try and facilitate a merger between IBM and Unisys [technology]," said Thornton May, director of imaging research at the Nolan Norton Institute, a research branch of information systems consultancy Nolan, Norton & Co. in Lexington, Mass. The Federal Reserve already has a pilot with IBM's system under way, said May, who suspects Unisys is being tested as well.

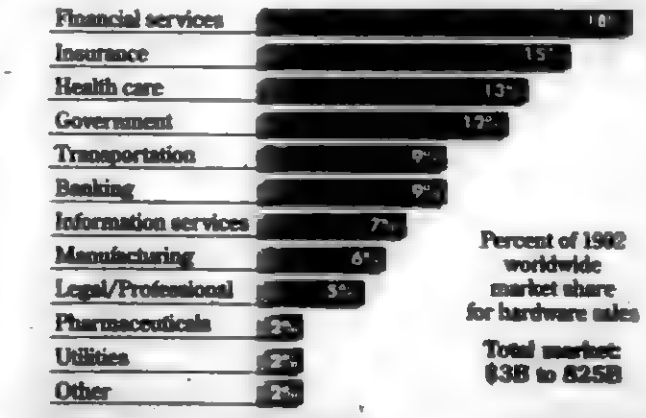
While it rushes to fill the market before IBM arrives, Unisys has to deal with a lingering legal dispute over its rights to the high-speed imaging technology. In May, TRW Financial Systems filed suit, alleging willful infringement of its patent. Unisys formally denied the charge in July and last month said it was confident it would prevail in the litigation. Unisys maintained that its own technology represents a substantial advance over what is contained in TRW's 10-year-old patent.

IIPS was announced in October 1989 along with Infoimage Engineering Document Management System for technical documents; Unisys launched Infoimage Folder, a general-purpose imaging system for office environments, in April.

Barnett, a $31 billion bank holding company based in Jacksonville, Fla., and the nation's 20th largest commercial bank, will use IIPS on the more than three million checks it processes daily.

Money market

It's the financial sector — insurance, banking and financial services — that will combine to buy more than 40% of the imaging systems sold in 1992



Source: Nolan, Norton & Co
CW Chart: Doreen St. John

Intelsat takes quantum leap to OS/2

BY MARYFRAN JOHNSON
CW STAFF

WASHINGTON, D.C. — From its front-row seat on modern world history, the International Telecommunications Satellite Organization has become accustomed to the kindness of technology.

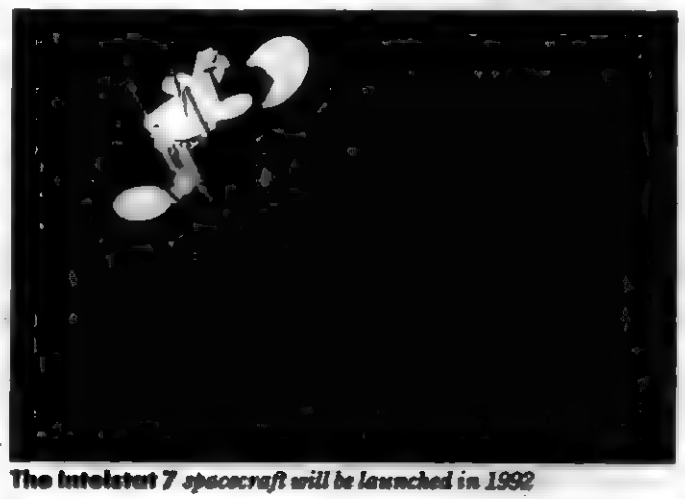
Since Intelsat's 1964 launch of Early Bird, the first communications satellite, to its present flock of 15 geosynchronous satellites orbiting 22,000 miles above the earth, the organization has played host to worldwide broadcasts of everything from the first lunar launch to the collapse of the Berlin Wall.

Yet the overwhelming complexity of scheduling access to the world's most advanced communications satellites is driving Intelsat's operations center to shift away from its aging IBM 4381 mainframes toward a classic example of client/server distributed processing on IBM Personal System/2 workstations, running the latest release of the OS/2 operating system.

"This will give our operations people a quantum leap in flexibility over the current mainframe-based environment," said Gordon MacLean, manager of the operations planning department. "At the same time, one of the staff is trying to update the frequency plan for a satellite, another member may be working on a different aspect and extrapolating data to do other things."

Fueling the drive to a distributed system are two major applications now in the testing phase by Intelsat's MIS department, with consulting help from Logica Data Architects in Waltham, Mass., and General Electric Co.

The Operational Planning System (OPS) and Operations Frequency Planning System (OFPS) applications both address the complex planning process behind distribution of service throughout the global satellite network. Both will use information pulled out of the server database through OS/2 Presentation Manager at the workstations, and both will be written in the portable C language.



The Intelstat 7 *spacecraft will be launched in 1992*

As the core pieces of OPS go on-line in early 1991, they will be used to configure the network and allocate predicted traffic to satellites. The front end of the application will be an expert system — Art/IM from Inference Corp. in El Segundo, Calif. — which simplifies and automates routine changes in satellite configurations.

"From the MIS point of view, the challenge we had in designing (the applications) was finding a cost-effective platform for high graphics, multiple databases and an expert system for a large number of users," said Tony Salmon, MIS director for Intelsat. "This is a very good example of where PC technology and micro-based servers are very cost-effective, compared to a mainframe."

At least 180 countries and territories clamor for satellite access from Intelsat, which now manages nearly 120,000 full-time communication channels and more than 100 full-time leases for television, domestic and specialized business applications.

MacLean said the process of scheduling a "clean" satellite with traffic now takes as long as three weeks — "assuming the phone doesn't ring and nobody walks in the front door" — but once the OPS software is on-line, that process can be handled in less than eight hours.

Planning has always been the special forte of the operations center, which manages a system controlling 2,200 separate communication pathways for international telephone, television, facsimile and data communications.

The actual operation and control of the satellites is handled by a separate engineering group, which relies mainly on minicomputers from Digital Equipment Corp. and Hewlett-Packard Co.

Aside from the member and nonmember countries served by Intelsat, its customers include all the major telecommunications firms and broadcast companies. "We needed to be able to respond to this large customer base more rapidly, and our current process on the mainframe was too labor-intensive and slow," MacLean said.

The move to a client/server architecture is intended to allow the operations center to take greater advantage of its corporatewide IBM Token-Ring network, which connects nearly 900 workstations and personal computers. The database server for the new applications will be a Compaq Computer Corp. Systempro, running Oracle Systems Corp.'s relational database management system, with multiple copies of Oracle on the workstations and PCs.

"We needed applications that would give the users more powerful tools, without the cost of making them so sophisticated that you need to be a technical wizard to operate them," said John Gulka, an MIS section manager for operations and engineering applications. "Over time, the functionality on the mainframes will go away and be replaced by these two distributed applications. But we still have to interface with existing components that won't migrate right away."

Data now held in an IBM DB2 database on the 4381s will eventually be moved to Oracle on the server.

This downsizing project has presented some daunting hurdles for MIS. Retraining the staff to use OS/2 in the application mode was a "significant technology transfer," Gulka said.

"I don't think anybody going into this understands it until they're in up to their eyeballs. It's not a cake walk," Gulka said. He noted that "a number of housekeeping functions" standard on the mainframes are now missing, and concerns have also risen over software version control on the server, plus overall security and backup issues.

"We rely heavily on network management and the technology specialty group that run our software integration lab to do crash-and-burn on the new stuff before it goes to the development team," Gulka said.

Discovering the benefits of recycling software

BY JOHANNA AMBROSIO
CW STAFF

In these green-minded times, recycling is starting to make its mark on software. Increasingly, information systems shops are designing software with reusable components that can be applied to many different programs.

Software reuse is not a new concept; the idea has been kicking around for a decade or longer. But it is only relatively recently that IS managers have started making it a reality.

Those who have started down this path say that it is well worth the time and effort, and it results in lower programming costs, greater freedom to develop creatively instead of having to reinvent the wheel and cleaner code that is much more manageable and maintainable.

The goal is to develop libraries of well-designed and tested software components for widely used functions such as file input and output.

There is a huge difference between this and what IS shops traditionally do, according to Rob Figiulo, president of SPR Inc., an Oak Brook, Ill., firm that helps companies develop reusable code. Taking old code and putting it wholesale into a new system is not the same as developing new and tested code or cleaning up the old code to make sure it really works.

"People reuse the code they've been using for 10 years. But some of that is filled with bugs and was designed with the constraints of the technology of the time," Figiulo said.

The decision of whether to use old code or new code to start a reusability library boils down almost to a religious debate. But either way, there are tools and techniques to help (see story below).

Some shops opt to do it manually. Cheryl Catanach, manager of data systems at A.M. Best Co. in Oldwick, N.J., said her company began developing reusable modules about four years ago. Catanach's group has responsibility for one of Best's product lines, an on-line database that contains information about insurance trends and companies.

She estimated that between 15% and 20% of the code for that system is currently in a modular form that has been reused in different parts of the application. At The New Brunswick Telephone Co. in Canada, about 10% of all lines of code are reused, systems architect Donald S. McLean said. "It does help a lot; we can reuse similar code and build systems in modules so we can throw out a piece of the system instead of having to rewrite the whole thing."

Still, McLean acknowledged, his system may not work at huge shops that may not even know what is in their several million lines of code.

Nor is software reuse appropriate for everyone. "I came here with the prejudice of having canned modules because that's what we did on my old job," said Nathan Lowell, manager of IS for Exchange Insurance in Buffalo, N.Y. "But my old shop was using all IBM equipment, so it was necessary. Here we're using Wang [Laboratories, Inc.] VS, which has a lot of code-generation facilities, so we don't really need a library of reusable functions."

Tools for reuse

Everything old can be new again. So say the proponents of reusing software components that are based on the existing code in an IS shop.

Some of the tools available to help do this include those that fall under the rubric of re-engineering packages. Included in this category are analysis tools for figuring out what code already exists and how to restructure it to make it better [CW, Oct. 22].

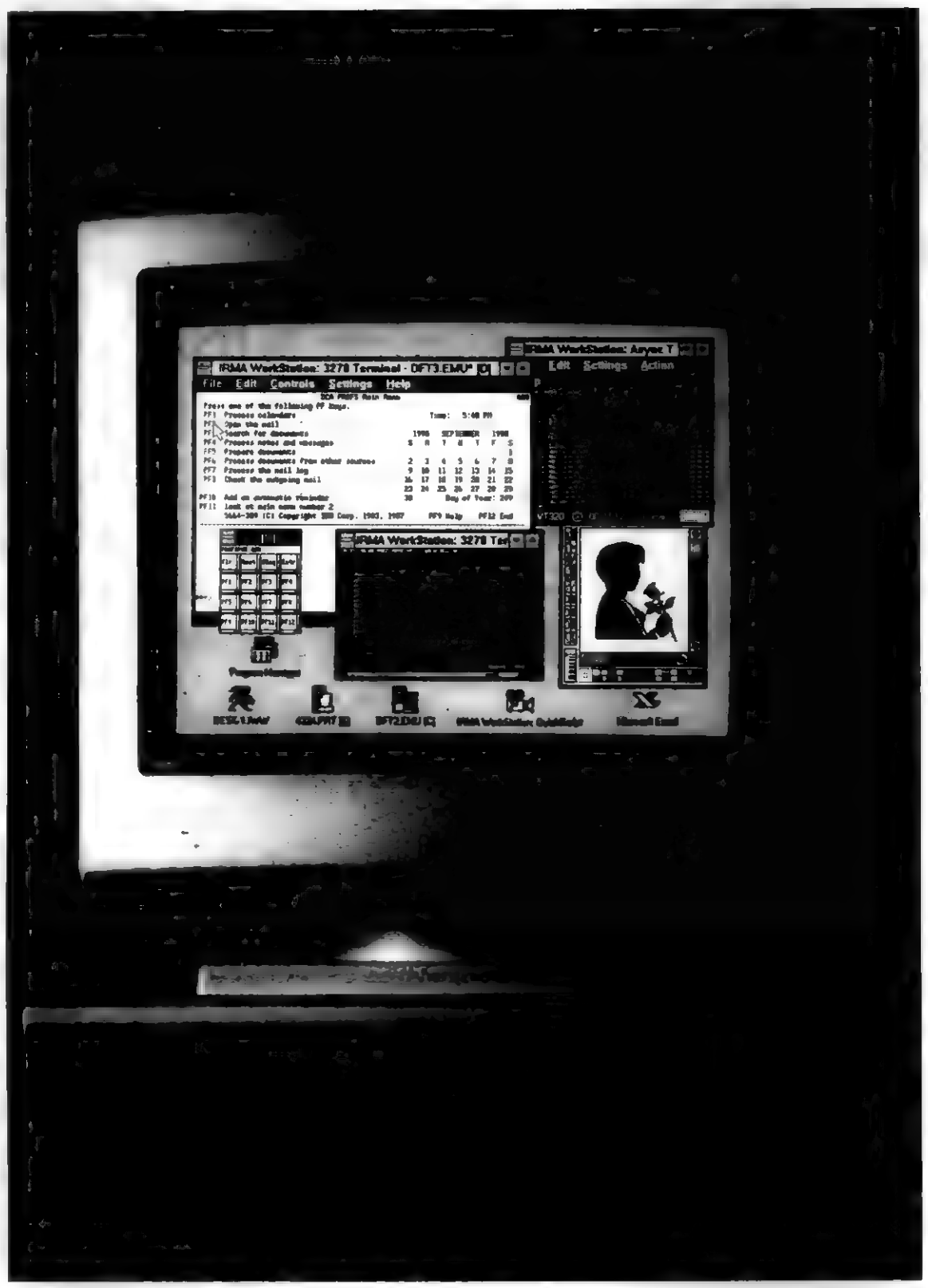
Vendors of these kinds of packages include Viasoft, Inc. in Phoenix; Language Technology, Inc. in Salem, Mass.; and XA Systems Corp. in Los Gatos, Calif.

Another tack is the methodology sold by Netron, Inc. in Toronto. Called Netron/CAP, the system provides for reusable code stored in structures known as "frames." These can be stored and recopied in whole or in part and then reassembled into Cobol programs. Users can write their own frames or modify existing ones to customize the program.

Or, if you'd rather buy the components already partially assembled, Software Architecture & Engineering, Inc., located in Arlington, Va., will provide them. The company sells approximately 100,000 lines of C code that users can customize with the firm's Snap tool kit.

The code is segmented into five generic modules, including data modeling, graphical user interface, communications and a knowledge-based component for building "smart" systems.

JOHANNA AMBROSIO



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UK firms leery of object-oriented DBMSs

BY JASON THOMAS
IDG NEWS SERVICE

LONDON — UK companies are not yet rushing to embrace the heavily touted object-oriented database systems as the alternative to the traditional relational model, users and observers said.

While most firms are aware of the technology, they are not yet convinced that it is sufficiently advanced. But most are in no doubt that object-oriented databases are the way of the future.

Paul Harper, a technical analyst at UK chemical giant ICI, said the company had decided to adopt a "wait and see" approach. "We will be keeping an eye on it," he said, "but we are aware that it is not going to solve problems like easy maintenance, speed of production and easy understanding."

UK-based IXI's sales and marketing director, Anil Malhotra, said of the technology, "It's a bit 'sci-fi-ish' at the moment, but it is unquestionably the way databases will go in the future."

Hewlett-Packard Co. and Borland International are investing large amounts of money and reputation in the technology, with no guarantee of immediate commercial success.

A spokeswoman at UK-based Royal Insurance — which beta-tested HP's object-oriented-based New Wave 3.0 — said the firm has not looked seriously at object-oriented databases.

WHILE MOST firms are aware of the technology, they are not yet convinced that it is sufficiently advanced.

"We have gone for the SQL model," the spokeswoman said. She added that since the independent relational database industry has recently been getting bad publicity, it may have rubbed off on object-oriented-based systems.

Harper added that the system his company was trying out is not currently meeting expectations. "We are having great problems just keeping it up and running at the moment," he said. "The technology is just not advanced enough yet."

Thomas is on the staff of PC Business World, *an IDG Communications British publication.*

Hamilton

CONTINUED FROM PAGE 27

Feraudo, vice president of IS. It was looking for help, period. In 1986, a decision was made to perform major surgery on the customer information system, which was built in the mid-1970s and had become a huge maintenance burden. Feraudo said the company looked at "CASE, AI, 4GLs, etc., and in the course of the research, we came across object-oriented [technology]."

The most appealing parts of object-oriented technology were its claims of reusability, easy modifications and less maintenance. While the other technologies promised some of those benefits, OOP seemed to be a combination of the three.

Feraudo and his team decided to give it a shot, which seemed like an odd choice. After all, Brooklyn Gas was at the time and is today a big IBM mainframe shop. In 1986, OOP was used mostly on an experimental basis and was strictly a PC tool. But Feraudo said he believed he could transfer the object-oriented methods to his mainframe environment.

The first step was to mess around with an OOP. The company selected Smalltalk, an obvious choice because this is the original OOP language, developed in the 1970s at Xerox Corp. Brooklyn Gas "tested it extensively on a PC" and then decided it was ready for a pilot project on the mainframe.

The problem was that there was no OOP for mainframes. Feraudo maintained this wasn't a significant issue. Again, the idea was to use OOP techniques.

Brooklyn Gas did its mainframe programming in PL/1. The pilot, designed for a caching process, was completed in 1988. The company was now ready for the customer information system. Feraudo had 200 programmers working on the project. The idea was to isolate the business processes related to customer management, be it billing or meter reading. Each was reduced to a single object, which included the related data and processes associated with it.

Feraudo said the objects are typically only 20 lines of code. But it took the 200 programmers 2½ years to complete this. While the end result of OOP is a more simplified software, the process is tremendously difficult. It required an entirely new way of thinking about data and its functions, Feraudo said.

Earlier this year, Brooklyn Gas went live with its object-oriented-based customer information system and reports no major problems. The software serves as the company's primary system to manage all customer-related business.

Hamilton is a Computerworld senior editor, systems and software.

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Software streamlines S&L's task

BY SALLY CUSACK
CW STAFF

NEVADA, Mo. — While the savings and loan crisis is making headlines in the national news, Farm and Home Savings Association here in the Midwest has committed to a software package designed to make loan collections a little bit easier.

According to Michele Stubblefield, manager of systems liaison, acquisitions and training at Farm and Home, the bank has survived the S&L crisis intact.

Farm and Home has approximately 50 branch offices located in Missouri and Texas. It employs 600 people and reported $3 billion in assets for 1989. The bank relies on an IBM 3090-120E mainframe for processing savings account information and runs all mortgage and mortgage-related services on an IBM Application System/400 B50 midrange computer.

Earlier this year, Farm and Home contracted with Stockholder Systems, Inc., a financial software company based in Norcross, Ga., to provide a loan servicing system and a bankruptcy module to replace the outdated software the bank had developed in-house.

Midrange move

The in-house package had been running on the mainframe for several years when the bank decided it was time to move the mortgage services to a commercial package on a midrange platform.

"We're doing a lot of loan acquisition, and we really needed something with good reporting capability," Stubblefield said.

There are 76 employees routinely accessing the Loan Servicing Accounting Management System (LSAMS) and the Bankruptcy Management System via AS/400 terminals.

Stubblefield characterized the purchases as "very beneficial" for the bank.

"With any bankrupt organization, you want to get them out of bankruptcy and either into foreclosure or a reinstate status," she said, noting that the bankruptcy module "gets things to court much faster" via event tracking reporting functions.

Before the bank installed Stockholder Systems' LSAMS software in April, employees manually typed out all necessary forms, including monthly credit reports, tax information and U.S. Department of Housing and Urban Development reports.

With LSAMS, the system calculates data and holds it in files until it is put out in hard copy or tape formats, Stubblefield said, adding that savings in employee production hours has been "increased dramatically."

The software offers loan set-up, file maintenance and payment processing facilities in addition to a word processing module that automatically sends letters to delinquent accounts.

The Bankruptcy Management System tracks all attorney

Farm&Home Savings

activity and all applicable dates, as well as providing event tracking functions with automatic document generation. The software automatically generates delinquency reports and allows on-line, real-time updating of all information.

Prior to purchasing the bankruptcy module, employees at Farm and Home tracked bankruptcies on index cards. According to Stubblefield, when the bank was cleaning out the old card system and entering the data into the computer, they found 82 outdated cases that were never purged from the files, a situation "that would have never happened with the event tracking module," she said.

Stubblefield, who has been with Farm and Home for 11 months and has worked in bankruptcies for six years, said she feels that Stockholder Systems has offered excellent training and support throughout the entire endeavor.

The bank sent eight of its supervisors to Stockholder Systems' headquarters for training, she said, and the company spent three weeks on-site at Farm and Home.

She also indicated that the vendor devoted time to one-on-one training within the various departments, working both with users and systems programming personnel.

Servio tools extend 4GL bridges to 'outside world'

BY JEAN S. BOZMAN
CW STAFF

ALAMEDA, Calif. — Servio Corp. says it has built a better way for users to access its Gemstone object-oriented database management system. A new collection of fourth-generation language (4GL) tools called Facets will create object-oriented code in Parcplace Systems, Inc.'s Smalltalk-80 programming language.

The arrival of the new tools is seen as a lifeline to other vendors' products, industry analysts said. That is because 8-year-old Servio's database engine is a unique design and can only be accessed through database-specific interfaces. In order to grow beyond its small installed base, Servio must "break out" into the larger world, said Tom Sawyer, a database analyst based in San Jose, Calif. So far, Servio developers have built software bridges to Sybase Corp.'s relational DBMS and to Neuron Data, Inc.'s Nexpert Object expert system.

Crossing boundaries

Servio developers acknowledged the need to break out of proprietary-software boundaries. "Since Facets is written in Smalltalk-80, our [Servio] product is portable to the extent that Smalltalk-80 is portable," said Richard Auslander, Facets' product manager. "In theory, we run on every platform they do."

The new Facets modules are intended to speed development of Gemstone-based applications — boosting programmer productivity by 10 times or more in some cases. The product suite has been tested at 15 customer sites in recent months, Servio said.

The 4GL code generator turns out object-oriented code based on user selections from menus and user specifications. Training, however, is expected to be minimal. "No Smalltalk programming, as such, is required," Auslander explained. "Users can draw forms and paint on-screen elements by selecting items from a menu. The goal is to have a tool that allows the end user to participate in the development process."

Special hypertext features allow programmers to create Help features as they write their Gemstone-based programs, Auslander said. The programmers themselves can use the 200-plus hypertext statements included in Facets to get a running start on end-user documentation.

Facets modules include Schema Designer, which creates new classes of objects; Forms Designer, which allows users to create icon-based or forms-based screens by example; Report Writer, which specifies printing formats for output; Menu Builder, which helps programmers create pop-up windows and pull-down menus; and a "Help author," which aids the creation of Help features with hypertext. Users can click on the bold-faced hypertext words to find additional, nested explanations. The entire Facets package is priced at $1,000 per copy.

Insurer tests integrated claims system

BY SALLY CUSACK
CW STAFF

HARTFORD, Conn. — An application integrating text, data, image and voice processing components into a single transaction environment will soon be pilot tested at the 42-person Pittsburgh claim office of ITT Hartford Insurance Group.

Scheduled to begin early next month, the six-month pilot project is the result of a strategic alliance between The Hartford and Wang Laboratories, Inc. in Lowell, Mass.

The work management application was jointly developed by Wang and The Hartford, and the system runs on the Wang Integrated Image System, which is based on Wang's VS-based midrange computers and uses the Wang Pace database management system.

According to Robert R. Lukas, assistant vice president of information systems at The Hartford, the new system will provide a better opportunity to examine the entire claims processing work flow and will offer benefits both internally and to customers.

Paper in, data out

Using the integrated, image-based application, incoming paperwork, such as customer correspondence, standard insurance forms, doctors' reports and repair estimates, can immediately be scanned into the system and entered into electronic files.

Application features include a work measurement facility designed to allow end users to measure the exact time spent on individual tasks.

Referring to cost justification for the project, Lukas indicated that "part of our pilot exercise is to validate our cost benefits." He added that while the company expected dramatic increases in productivity, no job cuts were anticipated.

Using the new system, claims handlers and supervisors can simultaneously access electronic files via image-capable personal computers equipped with Wang's Freestyle PC software program. Freestyle allows users to insert handwritten, spoken or typed annotations to be added to the images during the claim handling process.

In addition, field agents can access the claim information database and receive voice message updates on claim activities by using a Touch-Tone telephone.

Foreign intrigue buoys midrange vendor

BY MARYFRAN JOHNSON
CW STAFF

WALTHAM, Mass. — IPL Systems, Inc., a storage and peripherals vendor for the IBM midrange, will announce $45 million worth of distribution agreements with seven Western European systems vendors this week.

Ing. C. Olivetti & Co. accounts for at least half of the distribution deals, IPL officials confirmed.

IPL President Robert W. Norton said the European deals — ranging from one to three years — should sew up the company's position as IBM's largest competitor abroad in the memory, tape-drive and disk-array market for IBM's Application System/400 and other midrange systems. In 1990, IPL sold $23 million in peripherals to IBM midrange customers.

IPL has found the European climate quite hospitable since 1988, when it sold $3 million worth of peripherals abroad. This year, the company expects its direct sales to exceed $12 million in Europe, according to Norton.

"The distributors we have agreements with are the largest and most powerful group of distributors in Western Europe, and some will carry IPL on an exclusive basis," Norton said. He added that IPL is reaping the benefits of a continued strong demand in Europe for the AS/400, where IBM ships about 60% of the AS/400s currently on the market.

Norton said the clearest difference between IPL's U.S. and European customers is that the Europeans are getting "more product for the same money" because of the weak U.S. dollar.

Last September, IPL introduced its 7636 Disk Array, a 1.8G-byte array for AS/400 Models B30 through B70. It features IBM-manufactured disks that are faster and roughly 25% cheaper per 1M byte than IBM's own 9336 disk products. Norton said IPL will announce enhancements to the 7636 array in the first quarter of 1991.

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HARD BITS

EMC offers another DASD alternative

EMC Corp. continued the rollout of its mainframe direct-access storage device alternative with last week's announcement of a lower-end model in its Symmetrix Series of Integrated Cached Disk Arrays.

Model 4204 offers 4G bytes of disk storage, up to 1.5G bytes of cache and an IBM 3880/3990-type storage controller within a 3½-sq-ft cabinet. The Symmetrix series, which was introduced by the company in September, is an initial implementation of the redundant arrays of inexpensive disks storage concept.

IPL Systems, Inc. announced a service contract last month with Richard Besner & Associates Ltd., one of Canada's larger computer maintenance firms, for support of IPL products on IBM midrange systems. Besner & Associates will provide maintenance and on-line diagnostic services to more than 3,000 Canadian sites.

Convex Computer Corp. will provide its users with a tape library interface that allows C2 series supercomputers to connect to a Storage Technology Corp. 4400 Automated Cartridge System. Availability is scheduled for next year.

Sentinel Computer Services expanded its hardware support services to include water-cooled IBM mainframes. The company has been servicing air-cooled IBM mainframes as well as lower-end equipment and peripherals.

Distributed Logic Corp., or Dilog, in Anaheim, Calif., has been granted an unlimited VAXBI license by Digital Equipment Corp., which allows the company to use DEC's VAXBI interconnect technology in host computer adapters for attaching disk and tape storage subsystems to DEC computers. The first product marketed under the new agreement is Dilog's RTS 3480 series of IBM 3480-compatible cartridge tape subsystems for use with VAX computers.

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SOFT NOTES

Interleaf, DG make a match

Interleaf, Inc. has announced an OEM agreement with **Data General Corp.** to port Interleaf's publishing software to the DG Aviion line of Unix-based reduced instruction set computing (RISC) workstations. Interleaf software for the Aviion platforms will ship in spring 1991.

Objectivity, Inc. in Menlo Park, Calif., has announced it will market its engineering database management system, Objectivity/DB, for the **IBM** RISC System/6000 line during the first quarter of 1991. The move extends Objectivity's support for distributed networks of heterogeneous workstations. The product currently supports Sun-3 and Sun Sparcstations from **Sun Microsystems, Inc.** and **Digital Equipment Corp.** RISC-based Decstations.

Sales of geographic information system (GIS) software shifted sharply to workstation-based systems in 1989, growing by 82% to more than $123 million, **Daratech, Inc.** in Cambridge, Mass., reported recently. For overall GIS software revenues, workstations now make up 55% of the total $223 million for 1989, with personal computers accounting for 23%, and midrange or mainframe hosts accounting for 22%.

DEC will become a marketer of MAC-PAC/D, an integrated manufacturing planning and control system from Chicago-based **Andersen Consulting**, DEC said last week. A $200,000 version of MAC-PAC has been ported to DEC's VAX systems.

Computervision releases long-awaited Medusa revision

BY SALLY CUSACK
CW STAFF

DETROIT — Computervision, a Prime Computer, Inc. company, rewarded approximately 9,500 eager customers last week by unveiling the long-promised Revision 12 of Medusa at the Autofact show.

The latest version of the computer-aided design and manufacturing (CAD/CAM) software package, two years in development, features full 32-bit integer and double-precision storage as well as a proprietary database. It unites the two pre-existing versions: CIS Medusa Revision 7, which runs on the Digital Equipment Corp. VAX platform; and Prime Medusa Revision 5, developed to run on the Prime 50 series, Tektronix, Inc. workstations and Sun Microsystems, Inc. Sparcstation platforms.

According to Gisela Wilson, an analyst at International Data Corp., a market research firm in Framingham, Mass., Medusa is a "very solid and very widely respected product," and the latest announcement reinforces the package as a strong, midrange CAD contender.

Bob Manning, senior CAD analyst at AMP, Inc., a Harrisburg, Pa.-based electrical and electronic connection device manufacturer, said the latest release delivers on several promised enhancements essential to the manufacturing company's CAD/CAM procedures. AMP, a Prime customer for 10 years, has a sizable Prime Medusa population operating on Prime 50 series and Sparcstation computers.

"Our biggest concern was the double-precision accuracy. Prior to this release, we were losing accuracy down at the third decimal level in geometric applications. Now we have accuracy down to the 10th decimal when transporting the numbers to our Prime GNC CAM package," Manning said.

Gene Daniels, Medusa system administrator at Genrad, Inc. in Concord, Mass., has been beta-testing Revision 12 since July in a CIS Medusa Revision 7/DEC Vaxstation environment. Genrad, a supplier of integrated software systems and automatic test equipment, uses the product primarily for two-dimensional engineering drawings and 3D modeling.

Daniels noted that while Genrad is pleased with the double precision accuracy included in the latest release, the company was especially interested in the geometry transformation enhancement, which allows the user to copy geometry within a sheet.

Slated for delivery next month, Medusa Revision 12 runs in VMS, Primos and Unix operating environments. The average price per seat, including both hardware and software, ranges from $30,000 to $35,000.

Computervision also announced Medusa Design, an integrated software that runs on the Sparcstation platform and was designed to provide users with an interactive 3D design modeling system for mechanical design applications.

Transform Logic offers CASE tool

SCOTTSDALE, Ariz. — Transform Logic Corp. recently made its second big move to expand beyond the application generator market by announcing a reverse-engineering tool for both Cobol and IBM JCL code that runs on a personal computer.

Last year, the company acquired Nastec Corp., a supplier of front-end computer-aided software engineering tools.

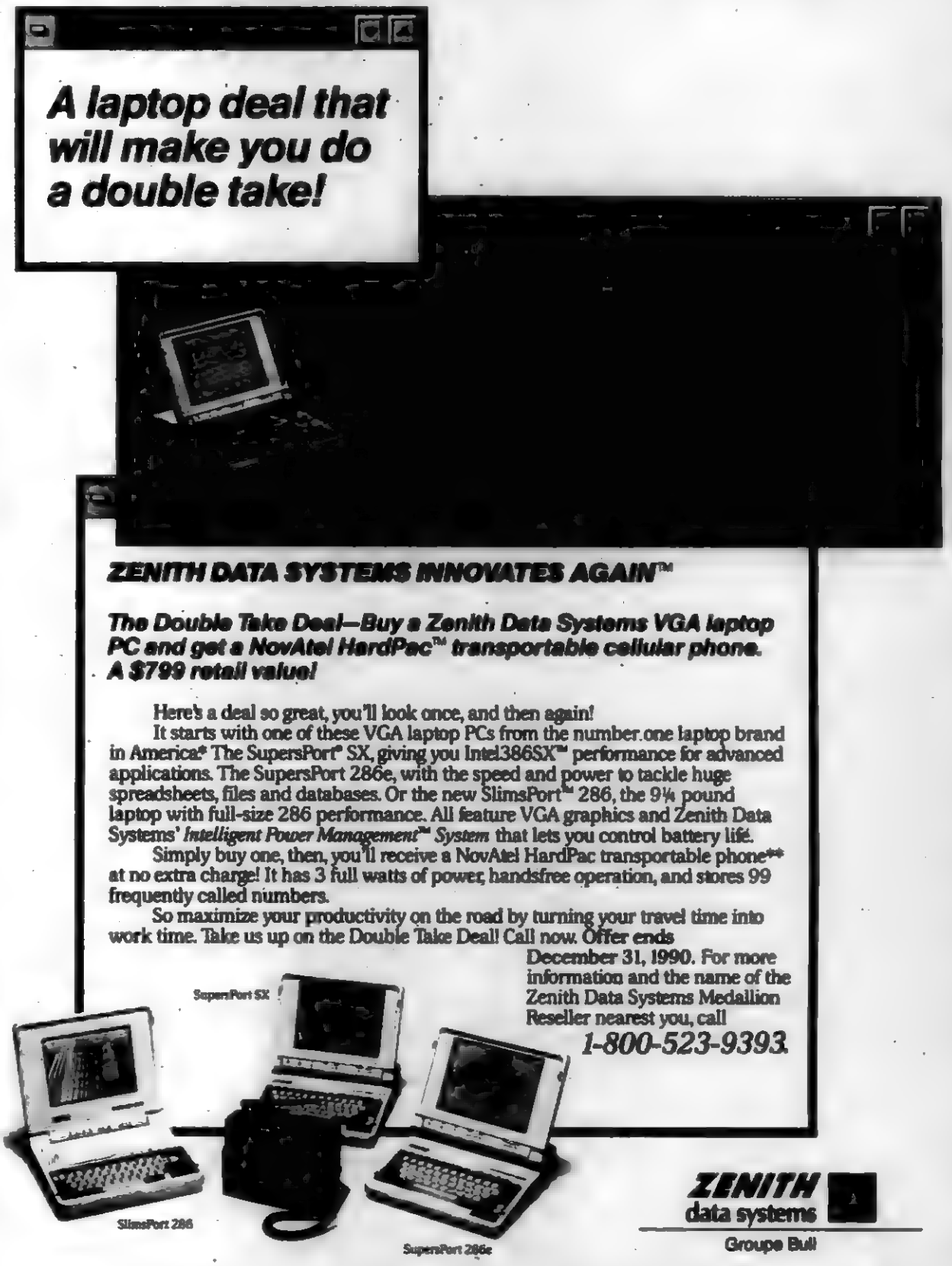
Touting itself as a work-group tools company, Transform Logic earlier this month released its reverse-engineering tool, Source/RE, which will initially hook into the Nastec product, Design Aid II. The company also plans to provide hooks to its own application generator as well as IBM's Cross System Product (CSP) in 1991. Transform Logic has been developing CSP with IBM for two years.

Source/RE, which will eventually be offered for the IBM OS/2 platform in addition to Microsoft Corp.'s MS-DOS, is intended to help users maintain and rewrite existing applications.

The company said Source/RE reduces the amount of time required to figure out a Cobol program module by representing its logic with graphics and reports. The software can also produce summary reports that would give an overall snapshot of a program, including the total number of code lines and blank lines.

Initially, users will be able to incorporate Source/RE data into Design Aid II. For example, a user could use Source/RE reports on existing code to determine what changes are needed and create those extension codes with the front-end design tools. Next year, users will be able to load Source/RE data into either the Transform Logic application generator or IBM CSP to produce Cobol code.

Transform Logic will offer Source/RE as a stand-alone PC product with a license fee of $3,800. A local-area network license is also available for $9,600.



NEW PRODUCTS — SOFTWARE

System software

Sequoia Systems, Inc. has announced a multilevel security option for Unix that is available for multiprocessor fault-tolerant computers.

Secure Topix was designed to provide data security for on-line transaction processing environments in which access to sensitive data needs to be strictly controlled. The product was developed with AT&T Bell Laboratories' Security Systems Division and complies with AT&T's Unix System V Release 3. The product is scheduled to begin shipping next month. Pricing starts at $30,000.

Sequoia Systems
300 Nickerson Road
Marlboro, Mass. 01752
(508) 480-0800

Applications packages

DK Systems, Inc. has added an enhanced time and materials billing support feature to DK Inventory Manager, a Wang Laboratories, Inc. Professional Application Creation Environment database application that helps information systems managers and operations support staff manage and control their multivendor computing environments.

The time and materials billing support feature facilitates the immediate reconciliation of maintenance invoices with their related service calls and automatically totals maintenance costs directly against the specific hardware items for which they were incurred.

The product costs $10,000.

DK Systems
1455 N. Sandburg Terr.
Chicago, Ill. 60610
(312) 943-7744

Unitech Systems, Inc. has announced Release 2.8 of its Unitech Audit and Control Reporting System (U/ACR), a product that enables users of IBM MVS and VSE machines to automatically capture, verify and reconcile data from report and data files and application programs.

The product is a batch application that enables users to capture data directly from DB2 tables without having to make any program changes or code any SQL queries, the vendor said.

License fees for U/ACR Release 2.8 range from $29,950 to $52,000, depending on operating system and CPU size.

Unitech Systems
3030 Warrenville Road
Lisle, Ill. 60532
(708) 505-1800

EPS Software Consultants has launched Version 2.8 of its FCS financial support software for IBM System/370 mainframes operating under VM and MVS.

The product supports direct data transfers between FCS and Pilot Executive Software's Command Center. Other features include Databuild, a facility that guides users through the process of building multidimensional models; Optimize, a linear programming module for solving simultaneous equations that contain indefinite rules; and Builder, which enables novice users to create simple reports.

Pricing starts at $40,000.

EPS Software Consultants
Mississauga Executive Center
Two Robert Speck Pkwy.
Mississauga, Ont.
Canada L4Z 1H8
(416) 279-8711

Geoscan Corp. has begun shipping an upgraded version of its David Plot Server, designed for performing network applications on Digital Equipment Corp. VMS and VAX systems.

The new version, called the Master Plot Server system, can be used to drive plotters at a rate that yields 200 to 800 dot/in. black-and-white, color and single-pass color outputs, according to the vendor.

The product's price ranges from $10,000 to $30,000, depending on CPU size and options purchased.

Geoscan
Lake Pointe Plaza
One Fluor Drive
Sugar Land, Texas 77478
(713) 263-4196

Software Components of Colorado, Inc. has announced an updated version of its Window Management System, a software package designed to allow programmers to build windows-based applications on VAX/VMS computers.

Version 3.0 includes default programmer setups, a VMS object library interface and a VMS text library interface. It also features 11 programmer-defined function keys and rewritten Help libraries.

Pricing ranges from $1,500 to $7,500, depending on configuration.

Software Components of Colorado
6575 Denim Drive
Colorado Springs, Colo. 80918
(719) 531-6940

Utilities

System Industries has introduced a disk performance monitoring tool designed for Digital Equipment Corp. VAX/VMS systems.

The Diskview Performance Monitor can be used to collect and report disk activity data by file, device or process.

It enables systems managers to disperse data equally across a group of disks and eliminate bottlenecks caused by disk overuse, the vendor said.

A single-node VAX license is priced at $1,490.

A Vaxcluster license sells for $3,790.

System Industries
560 Cottonwood Drive
Milpitas, Calif. 95035
(408) 432-1212

Cincom Systems, Inc. has announced a software interface designed to link Cincom's Control: Manufacturing business application software package with external systems.

Control:Link enables users to link Control:Manufacturing with computer-integrated manufacturing applications without making it necessary to modify current Control:Manufacturing programs.

The product can run on IBM mainframes and Digital Equipment Corp. VAX systems, according to a spokesman.

Pricing ranges from $11,000 to $76,000 for VAX platforms and from $18,000 to $87,000 for IBM mainframes.

Cincom Systems
23000 Montana Ave.
Cincinnati, Ohio 45211
(513) 662-2300

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NEW PRODUCTS — HARDWARE

I/O devices

Aptec Computer Systems, Inc. has announced the latest member of its I/O Computer (IOC) product family.

The IOC-100 is a midrange system that features a sustained bandwidth of 100M byte/sec. and support for up to 256M bytes of memory. Other features include support for 16M-, 64M- or 256M bytes of shared dynamic random-access memory and nine slots for user interfaces or special-purpose processors. It also supports Digital Equipment Corp. VAX/VMS environments.

Pricing is $74,500 for a 16M-byte version, $110,950 for a 64M-byte unit and $252,150 for a 256M-byte model.

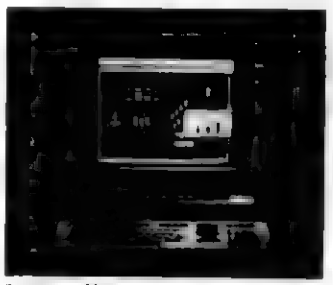
Aptec Computer Systems
P.O. Box 6750
Portland, Ore. 97228
(503) 626-9000

Digital Equipment Corp. has announced a terminal equipped with an interface that lets users access over 6,000 VMS applications and over 1,000 Ultrix and Unix applications.

The VT 1300 Color X Window terminal features a VR320 19-in. color monitor that provides 1,280- by 1,024-pixel and 100-dot/in. resolution at a 66-Hz refresh rate. It includes 8M bytes of memory and a built-in switch for connecting to thin- or thick-wire Ethernet networks.

The terminal is priced at $7,495. VMS host versions began shipping in mid-October, and Ultrix host versions are slated to ship in mid-December.

DEC
146 Main St.
Maynard, Mass. 01754
(800) 344-4825



DEC's *VT 1300 Color X Window terminal*

Sigma Information Systems has announced an updated version of its Q-bus to ESDI disk controller that features 16M-byte cache/random-access memory capacities.

Model SDC-RQD11-EC Plus is a quad-height controller designed to interface up to four enhanced small device interface drives to Digital Equipment Corp. Microvax II, Microvax III and LSI-11 systems. It can also support data transfer rates of up to 24 MHz, according to the vendor.

The product lists at $1,923 for a Microvax II/LSI-11 version and $2,175 for a 2M-byte Microvax III version.

Sigma
3401 E. La Palma Ave.
Anaheim, Calif. 92806
(714) 630-6553

Univision Technologies, Inc. has introduced a single 6U-size board graphics controller designed for VME-based systems.

The UDC-6000-TI, the latest member of Univision's Piranha family, includes a Texas Instruments, Inc. TMS34020 graphics controller and an optional TMS34082 floating-point unit. The board features 40 million floating-point operations per second and a vector drawing speed of 200,000 vector/sec.

The product can also display 1,600- by 1,200- by 8-bit images from a display memory of 2,048 by 2,048 by 8 bits, the vendor said.

Pricing begins at $4,895.

Univision Technologies
Three Burlington Woods
Burlington, Mass. 01803
(617) 221-6700

Data storage

NER Data Products, Inc. has announced Qwikscan, an OS/2-based management system designed for controlling daily tape operations.

The product enables users to scan 4,000 to 6,000 tapes per hour and quickly track off-site tape movements. It also facilitates vault processing and library or vault audits.

A basic unit comprises two intelligent visible laser diode guns, a programmable data collection device and a Qwikscan system software package. The product is priced at less than $15,000.

NER Data Products
412 S. Delsea Drive
Franklinville, N.J. 08322
(609) 694-2764

Putnam 'goes live' with Imagelink

BY SALLY CUSACK
CW STAFF

BOSTON — The addition of a sophisticated scanner from Eastman Kodak Co. is allowing The Putnam Companies of Boston, a national investment management firm, to realize 20% to 40% productivity gains with its IBM Imageplus System.

According to Gavan Taylor, senior vice president at Putnam Investor Services, the company "went live" with the Kodak Imagelink Scanner 900 a few weeks ago, effectively quadrupling the number of documents scanned by achieving a production rate of almost 500 pages per hour.

Putnam, which has more than $42 billion in assets under management in mutual funds and pension accounts for many Fortune 1,000 companies, was the first company to install the Kodak scanner.

Coincidentally, the firm also claims to be the first financial services institution to install the IBM Imageplus System. In this case, first appears to be best, as Taylor indicated that the combined technology has dramatically increased customer service levels by eliminating paper handling and turning data entry personnel into "decision-makers."

"IBM and Kodak worked together with us to interface the Imageplus software with the scanner," Taylor said. "Now our mailroom people scan in all documents between 4 a.m. and 8 a.m. each day, and when the customer service staff arrives, all data is on-line, ready for resolution."

Putnam has been running the Imageplus in an IBM 3090-200S environment, with over 200 IBM Personal System/2s, for more than a year. The company is upgrading to a 300J-class mainframe and plans to increase the workstation count to 350 by first-quarter 1991. Before acquiring the Kodak scanner, the company relied on scanning equipment from Bell & Howell Co.

"The technology has provided job enrichment for our employees and better service for our customers," Taylor said. He added that the firm is conducting a review process to translate productivity gains into cost-savings.

HP attempts to meet Apollo OSF1 migration request

BY J. A. SAVAGE
CW STAFF

Hewlett-Packard Co. recently unveiled its plans to migrate workstation and Unix-based minicomputer users to the Open Software Foundation's (OSF) OSF1 operating system late last month, but HP's path is not what its Apollo division users had requested.

The first upgrades to OSF1 will be available to users who upgrade or buy computers with the merged HP and Apollo reduced instruction set computing (RISC) chip. Both the new computers and OSF1 are expected to be out in the first quarter of 1991, according to Jan Silverman, marketing manager for system software at Apollo.

Next in line will be Apollo Series 400 users who upgrade to workstations based on Motorola, Inc.'s 68040 processor. Those products are expected in mid-1992, Silverman said.

At the same time, Apollo users of the DN 10000 series with a 68040 upgrade will be able to use OSF1. Eventually, OSF1 will be available on multiprocessor products, and some of its features will be available on HP's proprietary operating system, MPE.

At the annual Apollo users group meeting early last month, users lobbied the company to allow them to migrate to OSF1 across the entire Apollo product line and not just at the high end. Recently, HP responded that users would have to upgrade their systems to run on a Motorola 68040-based processor before they can migrate to OSF1.

OSF1 is a version of the Unix operating system on which HP, among other vendors, has agreed to standardise. HP's version is set for release in 1992.

"They are starting to make some movement, but it's just one step," said Doug Eltoft, president of the users group. He added that while users always want "the biggest muscle car on the block" and will probably be initially upset that they cannot have it, "when they see OSF1 in the cold light of day, they probably won't be so eager to migrate, because it will take so much extra effort to port software."

To enable users from each architecture to migrate to the merged products, Glenn Osaka, open systems software planning manager at HP, said components of both the Apollo version and the HP version of the Unix operating system will coexist on OSF1. He added that all versions will have the same application programming interface to allow software portability.

"The last people to move will be the precision architecture multiprocessor users at the high end," Osaka said. He predicted that that version of OSF1 will be available "nine or 10 months" after the one for merged RISC.

Silverman said HP had not yet decided which functions, such as the Motif graphical user interface, to bundle with the new operating systems and which ones will be offered at a premium.

After moving all its Unix-based systems to OSF1, HP plans to offer some of OSF1's standards on its MPE proprietary operating system. "We're targeting to create as much software portable interfaces as possible," Osaka said. He added that it will probably include Posix, Motif and components of a distributed computing environment.

EC to adopt copyright directive

Protects software for 50 years, sets limits on reverse engineering

BY ELIZABETH DE BONY
IDG NEWS SERVICE

BRUSSELS — A directive guaranteeing 50-year copyright protection for software programs throughout the European Community (EC) is expected to be adopted at the Dec. 13 meeting of the EC's internal market ministers.

To meet this objective, the commission and national experts will have to make a major effort during the coming weeks to draft a provision on reverse engineering. This provision should establish the right balance between protecting authors' rights and ensuring interoperability of programs and equipment throughout the EC, Internal Market Minister Martin Bangemann explained earlier this month following an EC council meeting.

Reverse engineering permits a manufacturer to decompile or dismantle a competitor's program into its component parts with a view to writing compatible software or building compatible equipment. The optimism about a December adoption, expressed by Bangemann, Italian Minister Pierluigi Romita, UK Trade Secretary John Redwood and French sources, stems from the fact that during this month's meeting, the ministers seemed to have found solutions for two minor problems concerning rental rights and the duration of copyrights.

More important, however, ministers said there is a consensus that the directive should authorize reverse engineering by way of a derogation to copyright protection. That would be permitted in certain well-defined circumstances — either to promote interoperability or for certain maintenance purposes.

According to Bangemann, the drafting exercise will entail finding the right definitions for maintenance and the limits of interoperability.

The key questions concern whether maintenance should be limited to simply a correction of errors, as proposed by the commission, or whether it should have a broader definition and whether the interoperability justification can be used by manufacturers to enable them to write competing programs that would simply act as a substitute for the original program.

According to Redwood, there was a wide range of opinion concerning these two issues based on whether a member state has an existing software or hardware industry that wants to protect its creations or whether it has an emerging industry that wants access.

Industry reaction remains mixed. Philippe Wacker, a consultant for the European Committee for Interoperable Systems (ECIS), said any limits on the definition of maintenance would be unacceptable, and a ban on competing programs would have "dramatic consequences for compatible personal computer makers" in Europe.

ECIS represents roughly 70 software and hardware manufacturers, including Italy's Ing. C. Olivetti & Co. S.p.A., France's Groupe Bull, Amdahl Corp., Netherlands-based Tulip Computers International, Unisys Corp., Sun Microsystems, Inc., NCR Corp. and UK-based Apricot Computers PLC. Sage, the alternative lobby representing 80% of the computer industry and led by IBM and Digital Equipment Corp., had no immediate comment on the council's discussions.

Commission officials pointed out that lobbying efforts will remain intense, and during this month's meeting, 75% of the ministers indicated that they had been contacted by lobbyists. In response to criticisms about the ardent efforts, one lobbyist explained, "What do they expect — they are on the verge of ruining European industry, and they expect us to keep quiet about it?"

Regarding maintenance, in an amendment presented to the council, the UK had argued that no derogation should be authorized, but following the meeting, Redwood said the UK would accept the replacement of the term "maintenance" with "correction of error." However, other member states, including France and Greece, said that such a definition was too restrictive.

Following consultation with its manufacturers, Germany is also expected to argue that the text must recognise a broader definition, industry sources explained.

On competing programs, Redwood said there was an evolving consensus that competing programs would not be permitted. Industry sources revealed that France, Greece and possibly Germany have found this too restrictive.

Left to the courts

Whatever the final outcome, Redwood said no text will eliminate all uncertainties, and "it will be left to the courts to determine the limits to reverse engineering." Although commission officials admitted that no text can eliminate all uncertainties, they insisted that the final text "will detail all the major parameters" by which derogations to copyright protection will be authorized.

Regarding the question of copyright duration, the commission has agreed to redraft the text to allow Germany to maintain its 70-year protection from the death of the author "until EC copyright rules are harmonized," a commission official explained. He pointed out that, since most people will not buy even a 10-year-old program, the commission and other member states agreed to go along with what is perceived as a largely theoretical German reserve — at least for now.

Regarding rental rights, the official explained that both the Dutch and the German governments have accepted the commission's view that these rights must be exclusive. This means that only the original author can rent out his copyrighted program in addition to selling it. In other words, any firm that licenses the copyright cannot turn around and rent it to someone else.

De Bony is a Brussels-based correspondent at the IDG News Service.

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Gupta update passes muster

BY JIM NASH
CW STAFF

Beta-test users of Gupta Technologies, Inc.'s SQL Windows Version 2.0 said the product's enhancements have filled some of the gaps they perceived in an earlier version.

Menlo, Calif.-based Gupta announced that it will ship Version 2.0 of the product with its SQLbase Server Version 4.1 on Nov. 30.

Eric Bloom, program manager at Dun & Bradstreet Software, said Gupta "filled a gaping hole in its Windows product" by folding a symbolic debugger into it. The debugger "lets me step through Gupta proprietary code a line at a time to . . . spot bugs in our own programs." He said the capability has been standard in C language compilers.

The line-by-line code inspection feature gives developers more control, said Steve Hlavacek, technical manager at Arthur Andersen & Co.'s Advanced Computer Audit Techniques Group in Chicago.

However, Bloom said, he would like to see Gupta move closer to Unix with both its SQL and server lines. "I would like to take what I have developed and port it to a Sun workstation."

SQL Windows Version 2.0 will be priced at $1,295. Those who bought Version 1.3 after Oct. 1 will receive the new version free. The OS/2 version of SQLbase Server Version 4.1 will cost $2,495, and DOS versions will be $1,995.

PC buyers test new channels

BY RICHARD PASTORE
CW STAFF

As the economic vise tightens and margin pressures mount in the personal computer dealer channel, many corporate PC buyers are reconsidering their source of supply. Buyers are shifting a significant share of unit purchases to other channels, including superstore and mail order, observers indicated.

The shift away from PC dealers is expected to equal 9% of units purchased over the next four years, according to Doug Kass, senior analyst at Dataquest, Inc. in San Jose, Calif.

This movement could spell further trouble for traditional storefront dealers such as Businessland, Inc., which earlier this month recorded its fourth consecutive quarterly loss.

The biggest motivators for channel-changing are better price and availability, according to observers.

"The superstores offer good pricing and inventory to the corporate customer," said Ty Hendricks, purchasing agent at Hughes Training Systems, a division of Hughes Aircraft Co. in Arlington, Texas. Hendricks said superstore chain Soft Warehouse, Inc. consistently underprices other bidders by 5% to 10%.

The cost issue made Steve Price a repeat customer of mail-order vendor Compuadd Corp. "For what you get, Compuadd has the best price," said Price, a technical analyst at steel fabricator FMC Corp. in Anniston, Ala.

Longtime IBM and Compaq Computer Corp. loyalist Corporate Health Strategies recently made its first purchase through the mail from Dell Computer Corp.

"We've been considering [mail order] for a while, but we were afraid to make the move" because of support concerns, said Bob Jahreis, assistant vice president of development at the Westport, Conn., firm.

Finally, price won out, and

Continued on page 52

Cleaning out the shelves

PC dealers are under assault from many directions, including mail-order firms

Percent of hardware and software unit purchases by business

	1989 Hardware	1989 Software	1994* Hardware	1994* Software
PC dealers	17%	13%	15%	8%
Mass merchants	6%	8%	18%	18%
VARs	13%	10%	20%	12%
Mail-order (third party)	13%	19%	11%	22%
Direct (vendor)	16%	16%	10%	9%
Other	5%	4%	3%	3%

*Projected

Source: Dataquest, Inc. CW Chart : Doreen St. John

Wang offers 'nontechie' expert system

BY SALLY CUSACK
CW STAFF

LOWELL, Mass. — Elbowing its way into the world of expert-based systems, Wang Laboratories, Inc. released a decision support tool designed specifically for "nontechies" using IBM Personal Computer ATs and compatibles and Micro Channel Architecture-based platforms.

Dubbed Commonknowledge, it allows users to create, distribute and maintain decision-making and/or problem-solving applications within a work group or companywide.

According to George Watters, principal at Watters and Associates, a software consulting firm in Spokane, Wash., the product employs a Socratic methodology in helping to clarify parameters in applications and overall goals.

Watters, who has worked with the program since its alpha-test days, has used the software to develop knowledge bases to help the Social Security Administration determine disability issues and has created several psychological testing and matching programs for job placement firms.

Using a conversational method, Commonknowledge assists the application developer in organizing the knowledge and building a complete knowledge base. In turn, the user running the subsequent application is asked for information as needed to solve the problem. The user may also ask why the information is needed or how the solution was reached.

Transparent logic

"The logic is transparent to end users," Watters said. "It has a close relationship to word processing — a developer has simply to block the text and build the technology."

Watters runs the software on Intel Corp. 80386-based machines. The software requires 2M bytes of extended memory on the 386-based systems and hard disk storage capacity, the vendor said.

Applications built with Commonknowledge can be integrated with MS-DOS files as well as with a variety of standard image files, including Tag Image File Format and Wang Image File Format. Applications can also be integrated with user-written subroutines.

Commonknowledge is available in two packages. One package includes both runtime and development components and is priced at $950. A runtime-only version is priced at $150 per user or $750 for a site license.

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- The BMS screen development facility can design and paint CICS transaction screens or import BMS mapsets.
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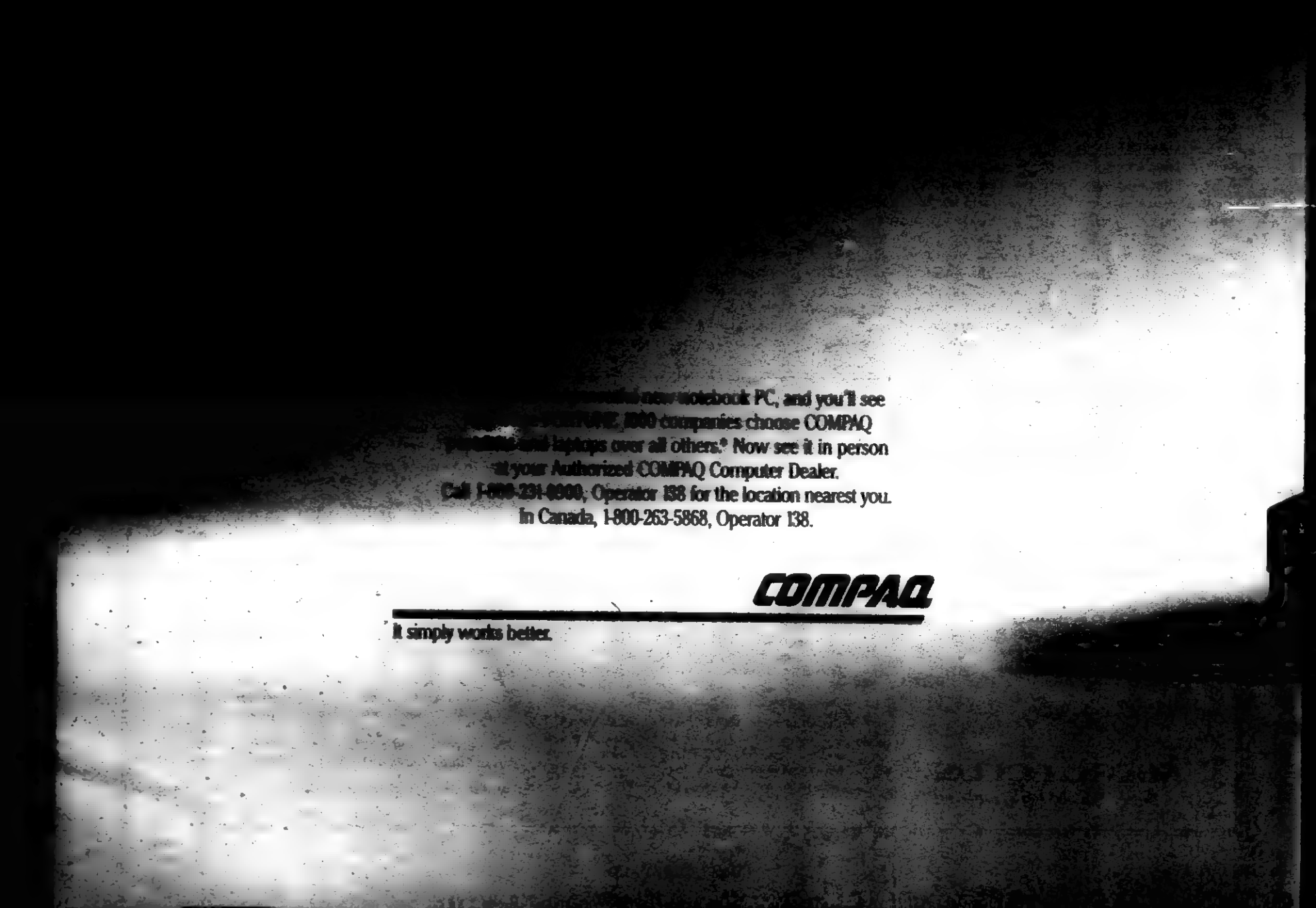
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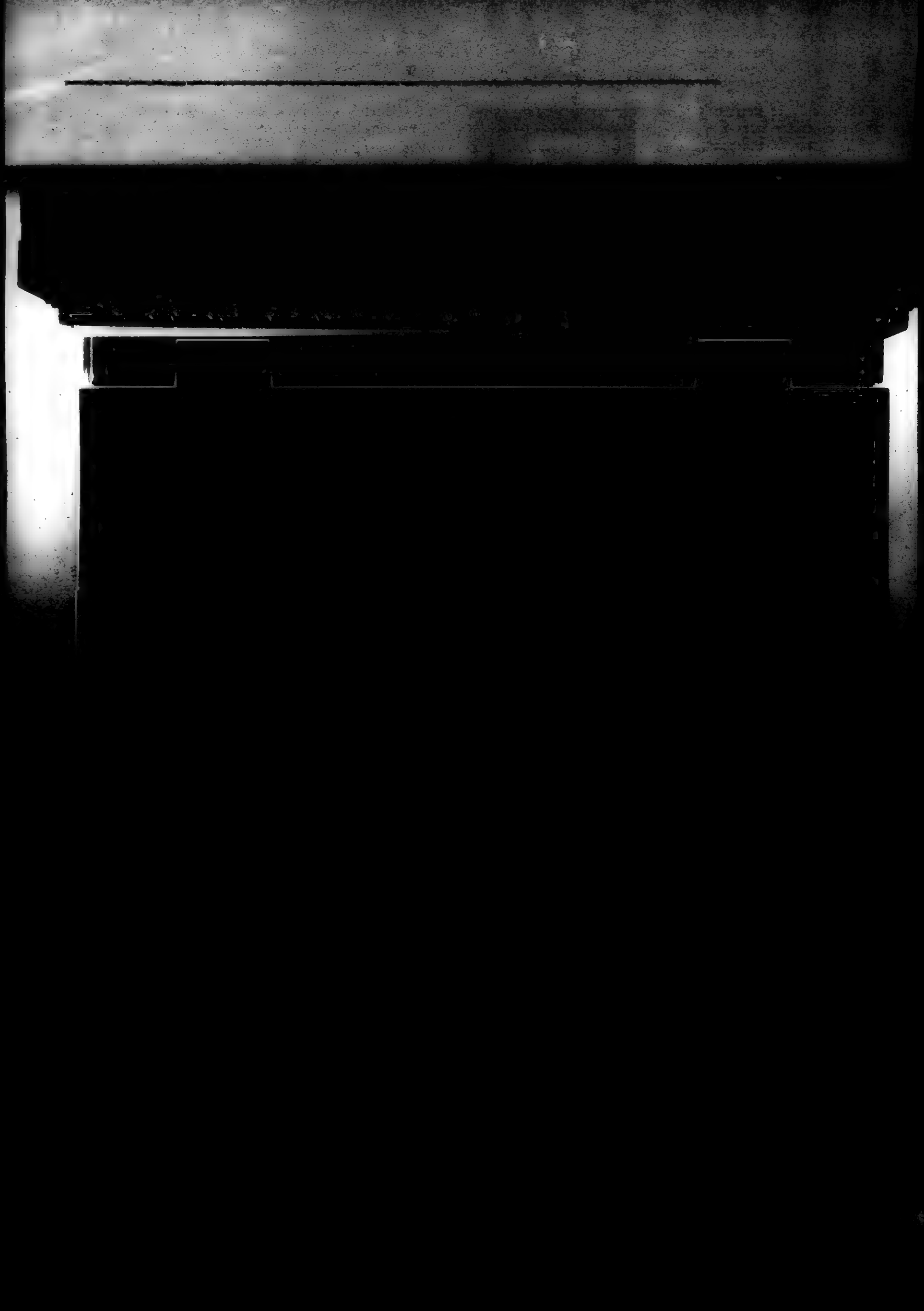

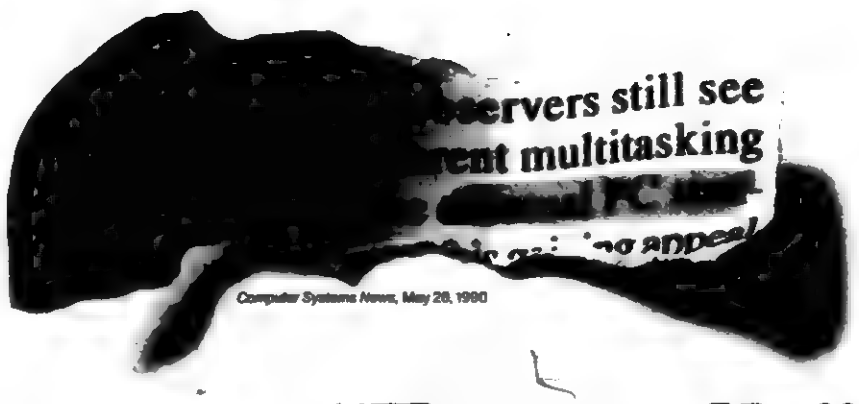

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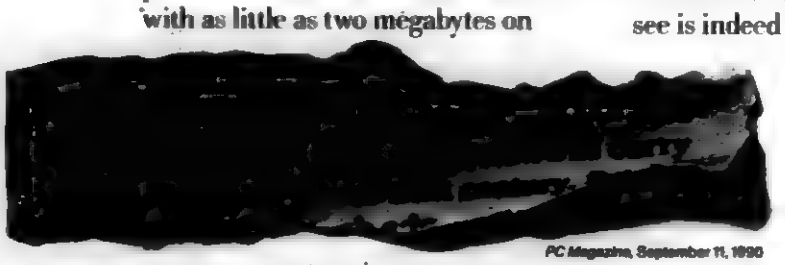
For starters, OS/2 has lost some of its appetite for memory. In fact, now you can make the move to OS/2 1.3 with as little as two megabytes on your system. What's more, this streamlined version leaves more room for applications and will offer some users a substantial performance increase in many system functions.



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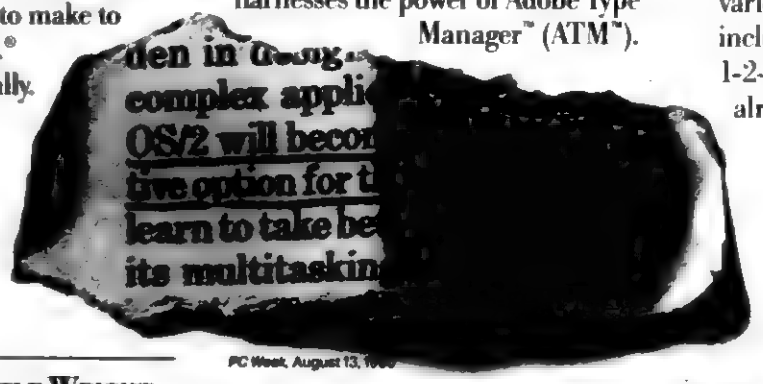
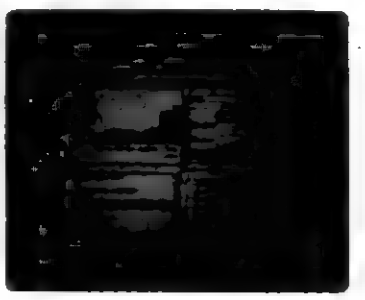
For instance, now OS/2 1.3 harnesses the power of Adobe Type Manager™ (ATM™).



With this new feature, the quality of screen fonts has improved dramatically, giving you a true WYSIWYG capability so what you see is indeed what you get. ATM also gives OS/2 more flexibility in document creation by supporting a wide range of outline fonts.

Of course, what good is all this without printer support? Not much. So OS/2 1.3 has improved and expanded its printer support to include drivers for almost all popular printers.



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Now that OS/2 is moving forward, so are software developers. Every day, more and more applications are joining the growing pool of available OS/2 software. In fact, a variety of major business programs, including Aldus® PageMaker,® Lotus® 1-2-3/G® and Microsoft® Excel, have already made the transition to OS/2. These, along with many others, have been redesigned to go beyond DOS memory limits and take advantage of OS/2's intuitive graphical interface—Presentation Manager.™

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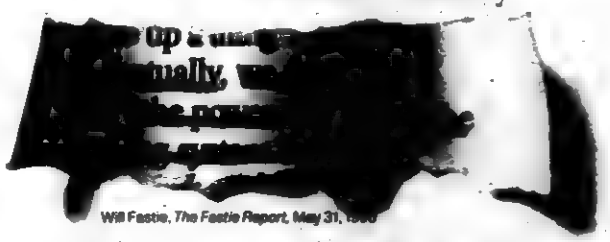

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COMMENTARY

James Daly

Is the pen mightier?

Whoever said silence is golden certainly wasn't trying to make a buck in the computer industry, where those making the loudest noise often have the least to say.

Nowhere is that unfortunate trait more sharply evident — and nowhere is the potential negative user backlash greater — than in the fledgling area of pen-based computing. This nifty little technological wrinkle uses a stylus instead of a keyboard to enter data.

In the handful of years since the concept has been publicly trumpeted, everyone — from billion-dollar leviathans such as Microsoft to basement start-ups — has said they're building products that can recognize handwriting.

The repercussions of such an advance could be staggering. Everyone from police officers reporting an accident scene to store clerks taking inventory could quickly and easily enter data into a computer, thus greatly streamlining productivity. Naturally, there would also be a king's ransom for the company that first made a name for itself in this market.

As a result, a heated game of verbal one-upmanship has developed among many of the players in the embryonic market, particularly the smaller ones that are not yet household names. It doesn't matter that only three companies — Grid

Continued on page 57

Optical option yields savings

BY RICHARD PASTORE
CW STAFF

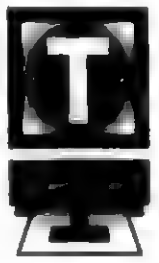
A do-it-yourself alternative provided by an optical disc-based personal computer application is saving some small and medium-size banks at least $2,000 per month in archiving charges.

Many smaller financial institutions pay outside service bureaus to process and summarize daily banking transactions. After receiving and crunching the numbers, these bureaus transmit the data to the banks' PCs, which are then tied up for hours printing the reports. For an extra charge, the banks also receive microfiche archive copies of the data.

Some early user banks have sought to save time and reduce charges with an optical disc-based information management system announced last month by Ceisar Systems, Inc. in Franklin, Mass.

The application takes data from the bank's minicomputer, service bureau or direct input via PC keyboard or scanner and stores it on optical disc for retrieval, analysis or archiving.

Once data is on optical disc, the software's retrieval utilities allow users to access only the parts they want and print only the reports they need. Managers can also duplicate the optical discs for off-site storage.



Users who have tested Ceisar Plus for the past six months said these features have eliminated the cost and clutter of microfiche, cut down on paper use and saved time.

"It has replaced our fiche for archive purposes and eliminated a cost of roughly $2,000 per month," said Larry Hartwell, a comptroller at Kennebunk Savings Bank in Kennebunk, Maine. The bank has $175 million in assets.

Hartwell estimated the system, which costs from $18,000 to $25,000, will pay for itself from microfiche savings alone in less than 12 months. "It's really easy to make those types of investments when you have paybacks like that," Hartwell said.

The Brockton Credit Union in Brockton, Mass., expects a payback in 15 months and has reduced its report-paper use by 75%, comptroller Albert Antinellis said.

"We used to print everything that came down [from the service bureau]," Antinellis said. "With the optical disc, we're able to print only what we want."

Once the data is on optical disc, most users simply pull up what they want and view it on-screen, Antinellis noted. This was not easily done before because of the format in which the bureau downloaded the data.

Although optical discs do not come cheap, their million-page capacities make up for the relatively high cost of the medium, users said.

Ceisar Plus' ability to operate on a local-area network gives banks the added flexibility of supporting multiple simultaneous users. Previously, bank employees wanting to check a transaction had to retain a paper report or fetch the single copy of the microfiche. "Then you could only have one user at a time," Hartwell said.

But this week, Hartwell will incorporate the optical system into a 15-user network. "Now they don't have to leave their work area, and you can have multiple inquiries at the same time," Hartwell said.

Early users reported few problems with the application, which they bought directly from the vendor. "It was one of the first [such applications] out there working and working well," Antinellis said.

The Ceisar system operates on IBM Personal Computers and compatibles and comes with a write-once read-many optical drive. Optional packages add a PC, printer, desktop scanner and network interface.

Big little PC group hatches memory plan

ANALYSIS

BY MICHAEL FITZGERALD
CW STAFF

There is a secret association brewing up big things for the computer industry.

Well, not exactly. But the Personal Computer Memory Card Industry Association (PCMCIA) just might be the biggest little association nobody has heard of.

The PCMCIA's membership list reads like the Who's Who of microcomputing, with 82 companies ranging from IBM to Microsoft Corp. The PCMCIA was formed in June 1988 to develop a standard interface for flash memory cards.

For what, you ask? Flash memory, an integrated circuit about the size of a credit card that could well replace traditional read-only memory and random-access memory.

"It's embryonic now, but I expect that in five years everyone will know what a memory card is," predicted John Riemer, director of marketing at Fujitsu International and chairman of the PCMCIA.

However, there are almost no users, and the only true commercial application for memory cards at the moment is in Poqet Computer Corp.'s Poqet computer, as well as some scattered embedded controllers in specialized industries. So why all the interest?

"We see it emerging as a key technology," said Yogi Singh, manager of system design and analysis at IBM's Entry Systems Division. Other vendors, ranging from Lotus Development Corp. to Polaroid Corp., agreed with IBM.

They said the reason they expect so much from the memory card is its nature. Memory cards are small, lightweight, durable and have no moving parts, which means they use almost no power. This makes them very attractive to makers of portable computers who are searching for ways to improve power use and reduce machine weight.

"It's a significant improvement [over floppy disks]," Singh said.

Despite the number of members, some of which traditionally have not agreed on much of anything — like Lotus and Microsoft — the PCMCIA was able to develop a software standard quite quickly. The standard was

Continued on page 48

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IBM releases Storyboard Live to match multimedia promises

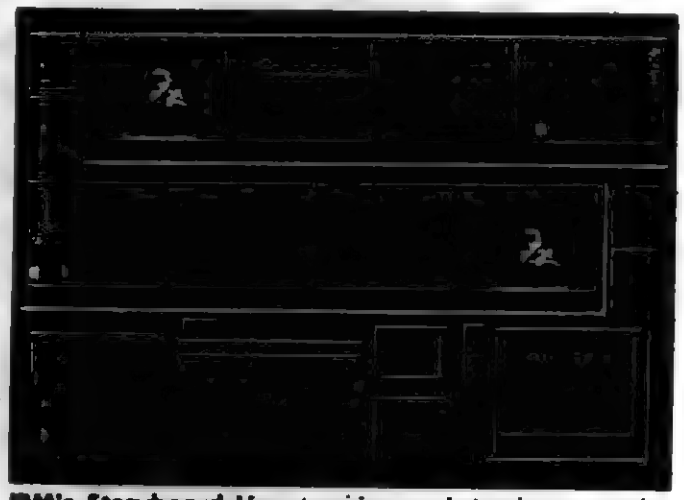
BY PATRICIA KEEFE
CW STAFF

WHITE PLAINS, N.Y. — With the recent release of Storyboard Live, IBM delivered an enhanced version of its 6-year-old desktop multimedia software for low-end DOS-based systems just as multimedia developers are beginning to fulfill promises.

The $495 package reflects efforts by industry leaders such as IBM and Microsoft Corp. to bring multimedia to users at minimal cost. Next week, the two will be joined by Tandy Corp., Zenith Data Systems and Fujitsu Ltd. at a press conference to introduce multimedia extensions to Windows 3.0 and pitch a low-end hardware platform as a standard (CW, Nov. 12).

However, only certain modules of Storyboard Live will run as full-screen Windows applications. It does not exploit Windows conventions, said Jay Sherry, manager of graphics products at IBM's Desktop Software in Milford, Conn.

Storyboard Live is said to allow users to create on-screen presentations that incorporate drawing, painting, animation, motion video and voice on entry-level machines. IBM defines that hardware as an IBM Personal Computer XT with 640K bytes of random-access memory. "It does all this with 640K and no extended memory. It's a technological tour de force," Sherry said. Storyboard Live uses 512K bytes of RAM.



IBM's Storyboard Live *provides an electronic presentation module that allows automatic frame sequencing*

The electronic presentation feature contains background templates and automatic frame-sequencing capabilities. There are 34 sprites, or canned animation routines; a video editor; Realsound Corp.'s Realsound technology; and support for key file and image formats and IBM's Linkway, OS/2 and Audio Visual Connection (AVC).

Users can also play back AM-quality video without adding hardware, enabling them to distribute Storyboard Live presentations on disks. Black and white presentations can be viewed at 20 to 25 frame/sec.; color video is viewed at 12 to 15 frame/sec.

"What [an] author's on-screen presentation really needs is the ability to reproduce stories on diskette for distribution and know they will be able to be played on mass-market PCs," Sherry said.

The new release also supports IBM's M-Motion Video Adapter/A and will exchange files with Version 1.03 of IBM's AVC software announced at the recent unveiling of the OS/2 Models 90 and 95. Priced at $544, AVC Version 1.03 provides touch-screen capabilities for authoring and viewing multimedia presentations. Users can play back presentations on a videocassette recorder or television. Other improvements include:

- Audio — Higher fidelity sound and the abilty to play Musical Instrument Digital Interface.
- Imaging — Allows airbrushing, tilting and 360-degree rotation.
- Authoring/Runtime — Simplifies authoring and retrieves a variety of drawings from other applications.

Memory plan

CONTINUED FROM PAGE 47

announced Aug. 22, 1990.

It did not hurt that a hardware standard for memory cards already existed. The Japanese Electronic Industry Developers Association (JEIDA) adopted a 68-pin interface in 1988. Once the PCMCIA was formed, it moved over to adopt the 68-pin interface for software.

"It was an unprecedented cooperation with JEIDA, between Japanese and American groups," Reimer said. Having the standard could speed product development — memory card technology is not new — but prior to the announcements, there were 10 vendors making them.

Even with the standard, memory cards are not cheap and will not be until the market comes down. Intel Corp. sells its 1M-byte flash memory cards at $298 each. The largest card on the market contains 4M bytes.

"It's an emerging technology, and still too expensive for consumers, but in a year or two, pricing will be down enough to see all kinds of mass market users," said Daniel Sternglass, president of Databook Technologies, Inc. in Princeton, N.J. Databook displayed its own disk drive for memory cards at last week's Comdex/Fall '90 show in Las Vegas.

Reimer said he expects the cards will find a wide use outside of the personal computer market. Sternglass offered this example of a possible use: "You'll be able to plug one of these cards into the [Associated Press] news file in a train station, download the sports and read it on the train," he said.

KEDIT 4.0
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KEDIT™ is a text editor for DOS and OS/2 that supports most commands and features of XEDIT, IBM's editor for VM/CMS. But KEDIT goes beyond XEDIT compatibility with special PC-based features for a first-rate combination of mainframe power and PC flexibility.

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PC Magazine, 10/31/88

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Seagate offers line of hard disks to laptop, supercomputer markets

BY MAURA J. HARRINGTON
CW STAFF

SCOTTS VALLEY, Calif. — Seagate Technology, Inc., a disk drive manufacturer here, recently filled out its product lines on both the high and low ends with a slew of new hard disk drive introductions designed for computers ranging from notebook-size laptops to Cray Research, Inc. supercomputers.

In the gigabyte arena, the company introduced two 8-in. disk drives with data transfer rates of almost 10M byte/sec., the company said. The Sabre ST83050 and the ST83220 use Seagate's Head Disc Assembly design, which conforms to the ANSI Enhanced Intelligent Peripheral Interface, the company said.

Also on the high end, Seagate unveiled a 2.3G-byte disk drive, designed with a data transfer rate of up to 27M byte/sec., according to the company.

This drive, called the Sabre Parallel Transfer Disc (PTD), was codeveloped with supercomputer company Cray Research, which said it will incorporate its proprietary version of the drive into its new supercomputer, the Y-MP2E, which will be designed for high-end processing for markets such as high-performance computing, graphics, imaging, animation, broadcast video and data acquisition.

The Sabre PTD drive uses nine read-write heads simultaneously and has an average seek time of about 12 msec, the company said. It also conforms to the ANSI Enhanced Intelligent Peripheral Interface specification, which calls for the use of a single cable to simplify systems integration, according to Seagate.

In the 5¼-in. high-end market, the firm introduced its Elite 1.6G-byte drive family, including two full-height small computer systems interface drives, one with a dual-ported interface that allows two computer systems to share access to common disk drives, the firm said.

Saving on rotation

Seagate also recently introduced a high-end drive for multiprocessing and other systems that require data sharing or multiple access to data. The Seagate ST8167 incorporates Solid State Disc technology instead of rotating disks and is designed to give users access to their data up to 100 times faster than standard rotating disk drives, the company said.

On the personal computer front, Seagate introduced a low-power consumption, 107M-byte formatted 3½-in. disk drive with an average seek time of 18 msec and an internal data transfer rate of up to 12M byte/sec.

Designed for the laptop personal computer market, the ST3120A was made using Seagate's patented Zone Bit Recording technology, which is designed to maximize disk capacity by recording more bytes on a drive's outer tracks, resulting in a faster I/O rate.

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   - 65. Communications Systems/Public Utilities/ Transportation
   - 70. Mining/Construction/Petroleum/Refining/Agric.
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   - 85. System Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
   - 90. Computer/Peripheral Dealer/Distr./Retailer
   - 75. User: Other _____
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PC Tools: More than a shell for a minimal price

Technology Analysis is a roundup of expert opinions about new products. This week we examine the two leading DOS shells: PC Tools Deluxe 6.0 and Norton Commander 3.0. Summaries were compiled by Susanne Weixel.

Even though it is categorized as a shell, Version 6.0 of Central Point Software, Inc.'s PC Tools Deluxe may be the most comprehensive package of DOS utilities available, reviewers at leading personal computer labs and publications.

The package includes utilities for system management, data recovery and protection, file viewing, desktop management, fax management and telecommunications. Users can also employ Version 6.0's applications menu to load one application while they are within a second one.

Such features have made PC Tools Deluxe popular with users: It holds 41% of the market share for DOS utilities, according to Dataquest, Inc. (Share includes all versions of the product.) Version 6.0 was introduced in March 1990.

Despite its size — it takes up almost 3M bytes of disk space and comes with nearly 1,000 pages of documentation — and depth of functionality, PC Tools Deluxe offers an intuitive, consistent interface that makes it easy to learn and use. It accepts commands from the keyboard or a mouse. The DOS command line is always on the screen.

In fact, everything is almost always on screen, which most reviewers call a mixed blessing. While it is easy to access the functions you want, the screen is so full that it may be hard to find them. To alleviate this problem, Version 6.0 provides variable user levels.

If you're looking for a complete utility package, PC Tools Deluxe is a good value at $149.

Central Point responds

Matthew Mosman, product manager:
The size is in no way a limitation. Every new feature adds value.

The documentation is organized so users can read only what they need. The technical support staff has been beefed up so that callers don't have to wait.

Product: PC Tools Deluxe 6.0

score:

Points	Category	Methodology*
22	Reviews	Average of available numeric scores from reviews multiplied by a factor of 3
16	Analysts	Average of 1-to-10 rating from three product analysts multiplied by a factor of 2
13	Users	Average of 1-to-10 rating from three major users multiplied by a factor of 1.5
15	Costs	Average of users' and analysts' ratings of cost to get product up and running multiplied by a factor of 2
14	Financials	Average of 1-to-10 rating from three analysts on health of company and product sales; factor: 1.5
81 (Maximum score: 100)		**The 1-to-10 scale: 1 equals poor, and 10 equals excellent. Maximum points per category: Reviews – 30; Analysts – 20; Users – 15; Costs – 20; Financials – 15*

Reviews Summary

Criteria	[illegible]	[illegible]	[illegible]
Ease of use	Very good	Fairly easy	Excellent
File manager	[illegible]	[illegible]	[illegible]
File viewer	Very good	NC	Excellent
Documentation	[illegible]	[illegible]	[illegible]
Technical support	Poor	NC	NC
Value	[illegible]	[illegible]	[illegible]
Reviewer's score	7.5*	Editor's choice	Best buy

**Ratings are based on weighted scale of 1 to 10 where 10 is excellent. Only the Infoworld rating is included in score chart above. These are excerpts of the reviews. Refer to actual articles for details. NC: No comment*

Ratings

Product performance
- 600,000 copies of Version 6.0 sold.
- Ratings by selected users (product, cost): 8/8; 9/7; 9/10; analyst ratings: 9/10; 10/9; 5/7.5

Financial performance
- Company revenue: $30.4 million, first half of fiscal 1991
- Financial analyst ratings (company and product sales): 9; 8; 10

Commander: Strong viewer, but only a fair manager

Symantec responds

Alicia Thompson, product manager:
Our features address novices and experts. 3.0 has context-sensitive help.

File management is adequate for how it's used — making it easier to work, but not getting in the way.
The booklet gets the user working in 30 minutes.

Product: Norton Commander 3.0

score:

Points	Category	Methodology*
21	Reviews	Average of available numeric scores from reviews multiplied by a factor of 3
12	Analysts	Average of 1-to-10 rating from three product analysts multiplied by a factor of 2
12	Users	Average of 1-to-10 rating from three major users multiplied by a factor of 1.5
10	Costs	Average of users' and analysts' ratings of cost to get product up and running multiplied by a factor of 2
13	Financials	Average of 1-to-10 rating from three analysts on health of company and product sales; factor: 1.5
68 (Maximum score: 100)		**The 1-to-10 scale: 1 equals poor, and 10 equals excellent. Maximum points per category: Reviews – 30; Analysts – 20; Users – 15; Costs – 20; Financials – 15*

Reviews Summary

Criteria	[illegible]	[illegible]	[illegible]
Ease of use	Very good	May confuse novices; variety for experts	Excellent
File manager	[illegible]	[illegible]	[illegible]
File viewer	Very good	Commander shines	Excellent
Documentation	[illegible]	[illegible]	[illegible]
Technical support	Very good	NC	NC
Value	[illegible]	[illegible]	[illegible]
Reviewer's score	7.5*	Powerful features	Best buy

**Ratings are based on weighted scale of 1 to 10 where 10 is excellent. Only the Infoworld rating is included in score chart above. These are excerpts of the reviews. Refer to actual articles for details. NC: No comment*

Ratings

Product performance
- Commander's installed base: 200,000
- User ratings (product features, cost): 8/5; 7/6; 10/2. Analyst ratings: 8/8; 4/5; 6/5

Financial performance
- Norton products represent 30% of Symantec's $110 million revenue
- Financial analysts ratings (company health and product sales): 8; 9; 9

Symantec Corp.'s Norton Commander 3.0 offers strong features, particularly at the interface level, making it a popular choice among the leading DOS shells. Commander works with the well-known Norton Utilities to make a complete operating system management package. Norton products provide 30% of Symantec's revenue. With 5% of the DOS utilities market, Norton Commander (all versions) is second in the shell category to PC Tools Deluxe.

Commander offers such niceties as the ability to display one or two directory tree or file listings, execute a file in a file listing or launch applications and load specific files. However, the lack of certain file management features and disk utilities is considered a drawback by most reviewers. For instance, Commander cannot deal with files from more than one directory at a time. It also cannot copy, delete or move an entire directory or wipe deleted files clean.

Though critical of the file manager, most reviewers praise Commander's interface for its logical, well-organized structure. It even supports extended Enhanced Graphics Adapter/Video Graphics Array (EGA/VGA) modes so users can see more files on the screen at once than in standard mode. Commands can be issued via point-and-shoot, pull-down menu selection, function keys, single-letter keys or the DOS command line. Novices may be confused by so many choices, says *PC Magazine*, but higher-level users will appreciate the flexibility. The program's file viewers and MCI Mail interface also impress reviewers.

In sum, reviewers say, Norton Commander is worth the $149 price for users with at least 256K-byte random-access memory and who want a reliable package that offers strong interface features to MCI Mail and other functions.

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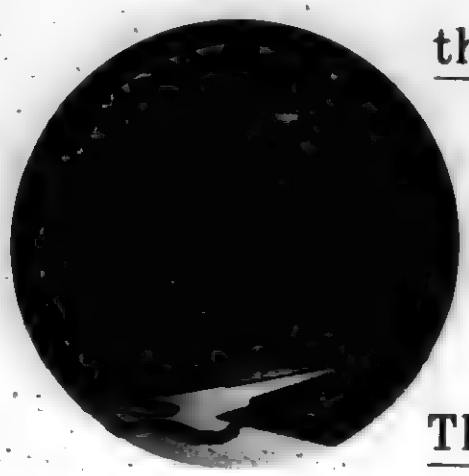

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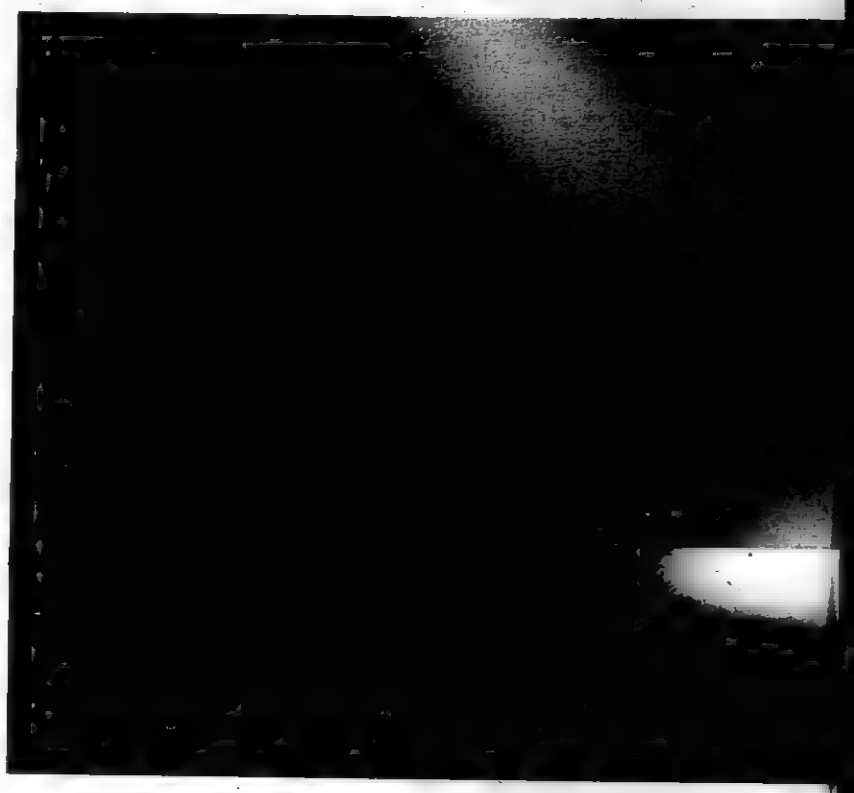

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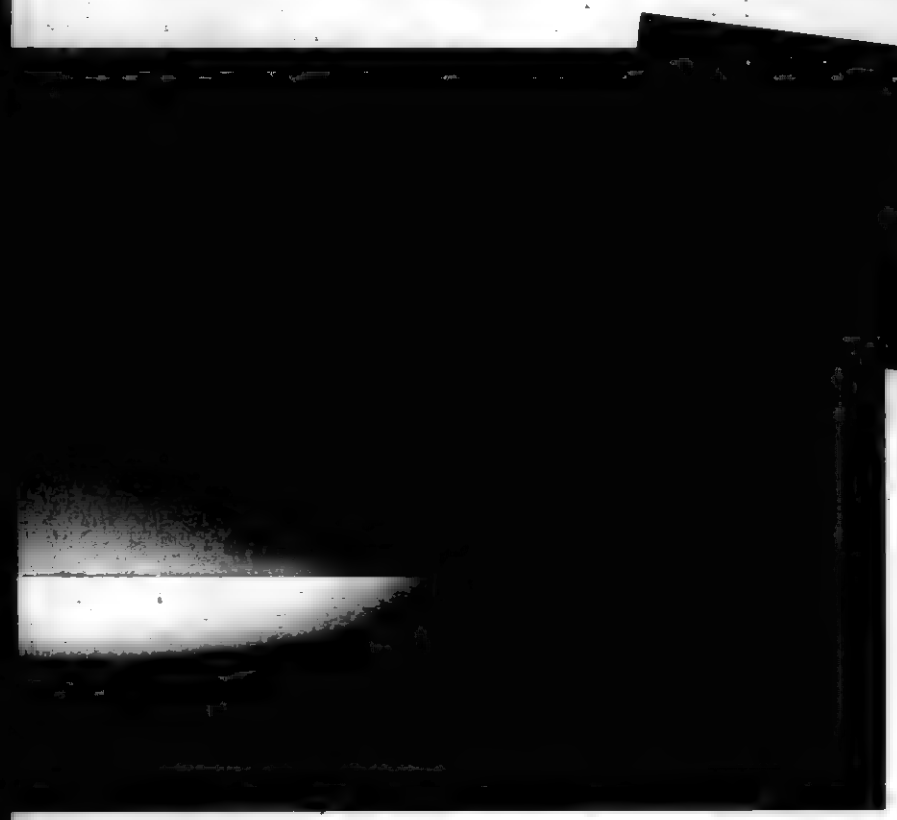

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PC buyers

FROM PAGE 43

Jahreis approved a server purchase from Dell at half the cost of a Compaq machine. Dell also offered a better delivery time than the local Compaq dealer, he added.

While many corporate buyers still doubt the support capabilities of alternative channels, some vendors are gaining word-of-mouth accolades. In a Dataquest survey released late last month, U.S. businesses rated two mail-order firms among the top three PC vendors in more than all customer satisfaction.

In the survey of nearly 5,000 users, Dell and Compaadd outscored the likes of Compaq, IBM and Apple Computer, Inc. in quality, value/price, product features, delivery, documentation and commitment to customers.

Cheaper channels

Companies that handle their own support are also increasingly opting for the cheaper channels rather than paying extra for services they do not need.

"We have on-site expertise that I'll put up against any local store's tech support," said Terry Bryan, special project manager at Hudson Foods, Inc. in Rogers, Ark. Bryan has switched all of his business to mail order.

James Montgomery, vice president of Reliance Insurance Co. in Philadelphia, rejected the notion of mail order as recently as eight months ago, steadfastly insisting on the advantages of face-to-face supplier/customer contact. However, those advantages are gone now, he said, and he and other buyers like him are defecting to mail order.

"There was a general deterioration in the quality of the service from the dealers," Montgomery said. Warrantied maintenance became slipshod. Shipments arrived incomplete.

Businessland Chief Executive Officer David Norman, announcing his firm's quarterly earnings earlier this month, claimed he was not losing share to alternative channels.

The superstores "are focusing on a different segment. I don't see them in the corporate Fortune 500 market at all," Norman said.

However, Soft Warehouse CEO Nathan Morton claimed his firm's 30% corporate clientele has grown 4% to 5% in the last two months. "We are seeing a lot of companies asking for bids that we've not done business with before," Morton said.

Morton attributed the increased number corporate clients to the recession economy as well as dealer woes. "Businessland's problems are making a lot of companies diversify to more than one supplier," he said.

NEW DEALS

AST scores $1M deal

On its largest sale of Intel Corp. 1486-based personal computers, **AST Research, Inc.** will supply the **Tokyo Grain Exchange** with more than 70 Premium 486/33 PCs. The contract is reportedly valued at more than $1 million.

Sizzler Restaurants International has chosen to implement **NCR Corp.**'s 2760 Food Service System and PCs nationwide. The contract is valued at approximately $2.5 million over the next several years.

Datamedia Corp. has secured a contract valued at more than $2 million with the United Nations' Rome-based **Food and Agriculture Organization.** Datamedia's Netmate/SX workstations will be used for both administrative applications and access to operation and project information residing on IBM, Digital Equipment Corp. and other manufacturers' equipment.

Separately, **Datamedia** was awarded a subcontract under the **Baltic and International Maritime Council** Maritime Community Network contract. Datamedia will supply workstations and act as the manufacturing and materials integration company for a systems integrator working on the project.

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Three Zeniths for the desktop

BY MICHAEL FITZGERALD
CW STAFF

MOUNT PROSPECT, Ill. — Zenith Data Systems released three new desktop machines earlier this month — including its first based on the Intel Corp. I486 chip — and a new laptop. It also announced price cuts on two existing laptop models.

The Z-486/25E Model 170 features a 64-bit memory bus and a Texas Instruments, Inc. Graphics Architecture display card that retains IBM Video Graphics Array (VGA) compatibility and provides a 1,024- by 768-pixel resolution.

Rated at 11.7 million instructions per second, according to Zenith, the system includes 4M bytes of random-access memory, expandable to 64M bytes, and a 170M-byte hard drive. It has three slots for Extended Industry Standard Architecture cards and a 1.44M-byte floppy drive. It is scheduled to be available in the first quarter of 1991 and will retail for $9,999, which is less than Zenith's current high end, the $10,599 Z-386/33E with a 150M-byte hard drive.

The Z-486/25E Model 80 uses standard VGA and an 80M-byte hard drive. It will be available next month and will retail for $8,599.

"Zenith has been satisfying high-end customers for some time, so I expect this product to be well tested and well run, and I expect that this will be able to satisfy those high-end users," said Robert Charlton, high-end systems analyst at Dataquest, Inc. in San Jose, Calif.

Zenith also announced the Z-386SX/20, which will offer VGA, 2M bytes of RAM (expandable to 16M bytes), a 32K-byte memory cache (expandable to 128K bytes) and a 40M- or 80M-byte hard drive. Retail prices will be $3,499 or $3,999. Both will be available this month.

On the laptop front, Zenith introduced the Slimsport 286, a nine-pound portable that runs at 16 MHz and has a 9½-in. backlit VGA screen and a 20M-byte hard drive. It retails for [illegible],699.

In addition, Zenith cut $300 from the price of its 286-based Supersport 286E Models 20 and 40 and $500 from its 386SX-based Supersport SX Models 40 and 120.

Zenith also announced that it will introduce the ZCM-1650 monitor to support TI's card in the first quarter of 1991. The ZCM-1650, a 16-in. display that switches between VGA and TI's card, will retail for $1,999.

No more Z-1000

Zenith Data Systems, the Groupe Bull subsidiary, has begun telling its resellers it will no longer make the Z-1000, its multiprocessor dedicated Unix machine.

When the company introduced the Z-1000 in 1988, it was possibly the first multiprocessor system to be based on an IBM Personal Computer AT bus. Zenith began shipping the Z-1000 in 1989, with a two-processor base model and a six-processor top-of-the-line machine.

Glen-Eric Nelson, Zenith's spokesman, said the decision was not made because of sales figures but rather was "based on the belief that Bull HN is in a better position to address the market for dedicated Unix systems."

Robert Charlton, a high-end systems analyst at Dataquest, Inc., said he was not surprised by the move. "[Zenith] and Bull are simply concentrating on aiming to make what they're profitable in," he said.

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e Epson DFX-8000
nted 52 more.

There is an elite group of high-volume printer users for whom speed is measured not in hundreds of characters per second, but in thousands. For those of you, the quick minds at Epson have created the new DFX-8000. It is, quite simply, the fastest printer Epson has ever made.

It is also compelling proof that an inspired piece of engineering need not be accompanied by an inflated price tag.

At 1066 characters per second, Epson's fastest printer ever.

Through a highly innovative two-in-one print head design, the engineers at Epson were able to double the speed of the DFX-8000—at a cost significantly below that of the average line printer.

While few printers can match the sheer speed of the DFX-8000, even fewer can match the ease with which it handles. Productivity-enhancing conveniences include Epson's advanced Smart-Park™ paper handling, dual paper feeds and an optional automatic paper cutter, plus other useful features rarely found on line printers.

As with every Epson, compatibility and reliability are a foregone conclusion. The DFX-8000 will easily connect to your PCs, minis and mainframes, and will run day after day without the least bit of trouble.

The combination of speed, features and reliability offered by the DFX-8000 is enough to accelerate the pulse of the most demanding high-volume printer user.

That is why, when you finish reading, we encourage you to watch it print a few hundred pages, in person.

It will only take a few minutes of your time.

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Software tracks neural networks

BY JIM NASH
CW STAFF

For those professionals who resent working with computers, it might be heartening to know that machines are increasingly under the same pressure to get along and to justify their actions.

Neural networks are being asked to work better with other computers and to explain to humans why they did what they did. It is the price that neural network manufacturers are paying to reach the coveted mainstream environments.

Neuralware, Inc. announced updates to its Neuralworks Professional II Plus software recently. The Pittsburgh-based company said it is adding Flashcode, a subprogram that translates its computations directly into C source code.

Industry observers said it may be the first neural network company to embed that ability in its own software. Neuralware is also adding a subprogram that explains why it came to its conclusions, a task few such applications offer, according to Neena Buck, an analyst at market research firm New Science Associates, Inc. in Southport, Conn.

Jeff Lin, a systems analyst at Texaco, Inc. in Houston, said he has been frustrated using neural networks to help develop in-house artificial intelligence tools. Lin said most neural networks have been unable to take the programs they have written and translate them easily into C source code for use in conventional production computers. It has also been difficult to discern how and why decisions were made by the networks.

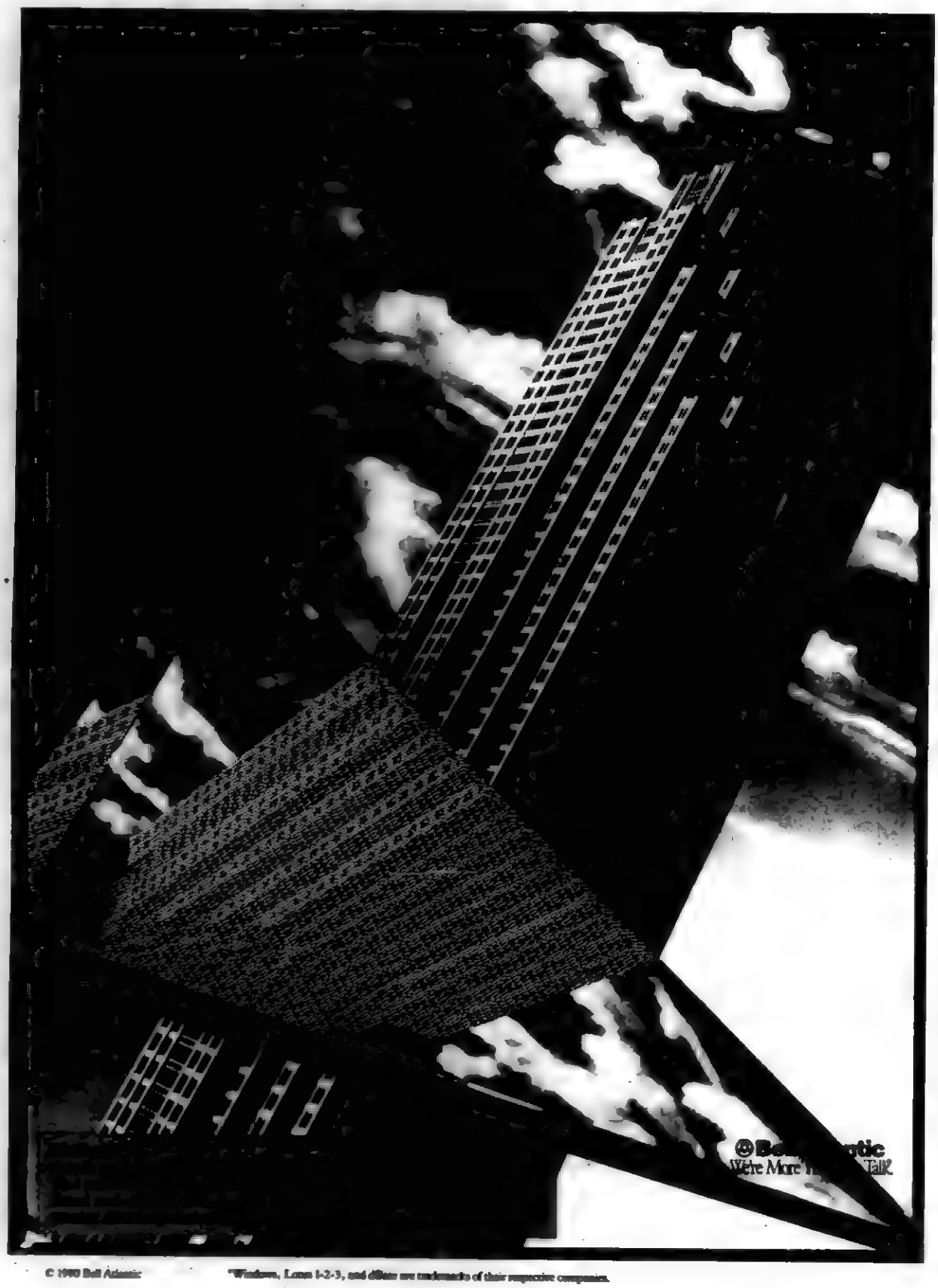
Using complicated algorithms and architectures, neural networks are able to "learn" how to do assigned tasks better as they do their work. But, Lin pointed out, "leaving neural networks to do standalone processes in a proprietary language is not acceptable." They must be able to tell conventional machines how to do what the neural network has developed.

He and several information systems professionals have been testing a beta version of Neuralware's II Plus. "Before, we had to interpret what the neural network had come up with and reconstruct the new processes in C," said Tom Wright, senior vice president of research and development at Frontier Financial Corp. in Houston. Frontier uses neural networks to decide when to buy and sell in futures markets such as currencies, crude oil and U.S. Treasury Bonds. The system spots key patterns in data and present conditions to predict future situations.

Lin explained that there are in-house and commercially available programs that perform the translation, but they are clumsy add-ons for systems that by definition have nimble reflexes. Texaco uses neural networks running on IBM Personal System/2s, reduced instruction set computing workstations and minicomputers. Neural networks use II Plus, he said, to work with AI programs. And, according to Bill Davis, a software design engineer in Texas Instruments, Inc.'s defense systems unit, II Plus explains how it came to its conclusions.

While the market for neural networks currently hovers around $15 million to $20 million in the U.S., analyst Les Hellenack at International Data Corp. in Framingham, Mass., said it should double each year for the foreseeable future as long as manufacturers continue to make the networks more interoperable.

II Plus, running on DOS, OS/2, Unix and Apple Computer, Inc.'s Macintosh OS is expected to be shipped later this month for $1,895 to $4,995.



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SQL server library debuts

SAN JOSE, Calif. — Automated Design Systems, Inc. has introduced Windows Workstation SQL Server Library, a Dynamic Link Library that translates Gupta Technologies, Inc.'s SQLwindows function calls into Microsoft Corp. SQL Server calls.

Steven Bachman, Automated Design's president, claimed developers have been waiting for a Windows-based front end for SQL Server.

Noting that many corporations are moving toward standardizing on Windows for all their end-user computing needs, Bachman said Windows Workstation SQL Server Library will enable these users to provide a Windows database solution using the SQLwindows fourth-generation language programming language in concert with SQL Server.

The library is a set of functions that can be embedded in Gupta's SQLwindows-based applications. Programmers reportedly can modify existing SQLwindows applications to run with SQL Server or build new Windows programs from the database from scratch. In addition, Automated Design's library permits SQLwindows to support a number of SQL Server database management extensions.

Dwayne Walker, Microsoft's product manager for SQL Server, said the Windows Workstation SQL Server Library will give Gupta users a migration vehicle to SQL Server.

The Windows Workstation SQL Server Library Developer's Kit costs $2,495 until Dec. 15 and $3,495 thereafter. Runtime licenses are available for $95 per user.

Daly

CONTINUED FROM PAGE 47

Systems, Sony and Canon — have actually delivered a system. Everyone else keeps saying that when their products arrive, they will make the others seem like Tinkertoys.

Recently, the thin ice of outlandish promises finally cracked and gave way underneath Go Corp., a Foster City, Calif.-based start-up that still hasn't delivered a product one can lay a hand on.

Founder Jerry Kaplan frankly admitted that in the three years since his company planted its flag, some of the biggest names in the computer industry have been drawn to the technology like bugs to a barbecue.

In addition to what has already arrived, companies such as Apple, Hewlett-Packard and Compaq have all indicated that they are working on pen-based technology, while Microsoft is reportedly preparing pen-based computing software called Windows H for release next fall. A few other start-ups are also crafting pen-based systems.

You think Kaplan wasn't suddenly sitting up ramrod-straight in the middle of the night in a cold sweat? Think again. "It didn't make any sense to compete with them," Kaplan said recently.

Instead, Go quietly decided to develop the operating system software that drives the hardware.

Go intends to take the Microsoft approach of widely licensing its operating system software in order to establish a de facto industry standard. It has already had one stellar client: IBM.

While there is no ignominy in admitting your limitations, the act of publicly backpeddling before you even have a product out the door doesn't make for a great image.

I'm not here to fault Go. Far from it. Being first to market is important for gaining recognition as a leader, but it's not necessarily the best place for success in an emerging market.

The Apple Lisa, for instance, was one of the pioneers of graphical user interfaces but failed miserably with customers. It took the Macintosh to succeed, and even that took time.

Being first to market is a bit like surfing: Catch the wave too soon and you'll spend a lot of energy paddling for little effect; catch it too late and you'll wipe out as it breaks on top of you.

But the vendors are playing a dangerous psychological game with their users — or I should say, their potential users. No matter how good the much-hyped machines are, they probably won't be as good as many envision.

While insiders say that Go has many irons in the fire, the painful lesson learned from Go should be that companies need to be careful about talking about things they don't have.

Most analysts agree that it will probably be some time before pen-based computers arrive in earnest — perhaps a year or more.

If the concept of pen-based computing matures, if potential users begin to understand its capabilities more fully and if technology makes the devices more versatile, then sparks could fly. Until then, however, please spare us the hot air.

Daly is a Computerworld West Coast senior correspondent.

Microsoft opens developer vault

BY JAMES DALY
CW STAFF

REDMOND, Wash. — Microsoft Corp. opened its arms to a wider range of Windows Version 3.0 software developers earlier this month by unveiling a strategy that adds more options to the Windows development environment and offers an inside peek at publishing documentation on internal Windows formats.

The strategy, called Open Tools, will support a wider range of programming languages and offer more powerful internal features, including the ability to add more sophisticated performance analysis devices and a spruced-up debugger to the kernel. "Debugging under Windows has always been difficult," said Mansour Safai, president of development firm Multiscope, Inc.

Microsoft officials said that although they have sold tens of thousands of their Windows Software Development Kits, the kits appeal primarily to more advanced programmers who want to broaden the scope of programming options. "Whatever some clever programmer can dream up, we want to make sure that tools are available to make it happen," said Brad Silverberg, vice president of systems software.

Silverberg added that developers typically write to Windows in the C language, but Open Tools will allow a wide range of programming language options, including Pascal, LISP or C++.

Microsoft officials said such additions were necessary to accommodate the diversity of programmers who want to write specifically to the 3.0 environment but have not programmed for Windows before. Many of the earlier Windows 3.0 applications were simple rewrites of earlier programs.

Products exploiting the Open Tools strategy are expected from Microsoft and other vendors during the first half of 1991, Silverberg added.

"WE HAD TWO CHOICES: BUILD A NEW DATA CENTER OR GET SOME PCs AND REALIA COBOL."

Michael Abrahamson
Wagner Stott Clearing Corporation
subsidiary of Merrill Lynch

"Our mainframe overload was severe, and there wasn't room to bring a larger, water-cooled mainframe into the existing data center," Abrahamson explained. The solution was PCs with Realia COBOL and RealCICS.

"One program took 50 minutes to execute on our high-end 4381," said Abrahamson. "The same program, with the same file, ran in 4:03 minutes after being downloaded to the PC.*

"We're very satisfied with the PC as a workstation environment. CICS COBOL programs compile in seconds, not minutes. Realia's done an excellent, very faithful mainframe emulation.

"The software is robust and the technical support is very good. It's worth a lot to know that you have somebody knowledgeable to deal with."

Call Realia for a free evaluation of the Realia programming environment.

*PC was a 20 MHz 80386 AT clone with an ESDI-controlled hard drive. Average access time of hard drive was rated at 23 milliseconds.

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NEW AT COMDEX/FALL '90

The following were among the products announced at Comdex/Fall '90, which was held last week in Las Vegas.

Board-level devices

Aview Technology, Inc.'s Desktoptv was designed to convert an Intel Corp. 80286- or 80386-based IBM Personal Computer XT, AT or compatible into an enhanced television.

The add-on board can receive 119 channels, including VHF, UHF and cable. Television controls are operated from a keyboard, and sound is provided by an external speaker, the vendor said.

The product is available in multifrequency and IBM Video Graphics Array versions, which are scheduled to be released in January and March, respectively.

Both versions are priced at $395.

Aview Technology
The Davidson Building
255 W. Julian St.
San Jose, Calif. 95110
(408) 287-1700

Peripherals

Chinon America, Inc. has designed an IBM Personal Computer-compatible desktop color scanner that runs under Microsoft Corp.'s Windows 3.0.

The DS-3000 includes a color converter and Colorset software that enables users to scan full-color images and three-dimensional objects, according to the vendor.

The product lists at $995 and is scheduled to be released in January. The color converter and Colorset software can be purchased as a separate add-on package that costs $395.

Chinon America
660 Maple Ave.
Torrance, Calif. 90503
(213) 533-0274

Konica Business Machines U.S.A., Inc.'s LP-3110, a laser printer that operates at 10 page/min., includes 24 fonts and 512K bytes of memory.

It features 300 by 300 dot/in. resolution and is compatible with software emulation packages for Hewlett-Packard Co.'s Laserjet Series II, Epson America, Inc.'s FX-850, Diablo Systems, Inc.'s Diablo 630 ECS and IBM's Proprinter.

The product is priced at $1,995.

Konica Business Machines
500 Day Hill Road
Windsor, Conn. 06095
(203) 683-2222

Princeton Graphic Systems, Inc. has announced a 1,280- by 1,024-pixel color monitor that supports autosynchronous resolutions of 1,024 by 768 pixels to 1,280 by 1,024 pixels and multisync scanning that ranges from 50Hz to 150Hz.

The Ultra 2000 provides users with a clear screen image with a 70-Hz refresh rate. It can be used for performing desktop publishing applications as well as computer-aided design, engineering and software engineering tasks.

The monitor lists at $3,395.

Princeton Graphic Systems
1100 Northmeadow Pkwy.
Roswell, Ga. 30076
(800) 221-1490

Viewsonic 5 is a color monitor developed by Viewsonic that features 1,024- by 768-pixel image resolution and a 0.25mm dot pitch.

The 14-in. noninterlaced screen includes linear tracking circuitry that automatically scans horizontal frequencies between 31 KHz and 55 KHz, according to the vendor.

The monitor can be used in IBM Personal Computer XTs, ATs or compatibles, Apple Computer, Inc. Macintosh IIs or Sony Corp. C1304s. It is priced at $999.

Viewsonic
12130 Mora Drive
Santa Fe Springs, Calif. 90670
(213) 944-9559

Data storage

Disk Technologies Corp.'s RHD 60, a 60M-byte removable hard disk drive designed for IBM Personal Computer-compatible portables, laptops and desktop systems, features an average access time of 21 msec. and a data rate of 7.5M bit/sec.

The drive is priced at $865.

Disk Technologies
147 W. Lyman Ave.
Winter Park, Fla. 32789
(800) 553-0337

Version 1.2 of Flagstaff Engineering's Papertamer document storage and retrieval system features removable media and multiple storage devices.

The product enables users to scan document images into an IBM Personal Computer and store the images on a hard or optical disc drive.

Papertamer is available in three versions: a personal edition ($195), a professional stand-alone version ($795) and a professional network version ($2,995).

Flagstaff Engineering
1120 Kaibab Lane
Flagstaff, Ariz. 86001
(602) 779-3341

Prairietek Corp.'s Prairie 242 is a 42.8M-byte hard drive designed for notebook and laptop computers.

The product is the first of five 2½-in. hard disk drives that the company plans to roll out within the next year.

It includes a single-source power supply that requires +5 volts to operate, and a patented ramp head loading mechanism parks the heads off the media when a drive is shut down, the vendor said.

Prairie 242 is priced at less than $500.

Prairietek
1830 Lefthand Circle
Longmont, Colo. 80501
(303) 772-4011

Sytron Corp. has announced the third member of its Sytos Plus family of file backup management systems.

The Sytos Plus for Windows File Backup Manager enables users of Microsoft Corp.'s Windows to schedule continuous automated backups that operate as background tasks, the vendor said.

The product supports 80M-byte mini data cartridge and logical devices, including erasable magneto-optical drives. Support for floppy disk and 40M-byte to 2.3G-byte tape drives is also featured, according to the vendor.

The product, scheduled to ship in April 1991, costs $225.

Sytron
117 Flanders Road
Westboro, Mass. 01581
(508) 898-0100

Systems

Modgraph, Inc. displayed a line of portable personal workstations equipped with Intel 80386 33-Hz and I486 25-Hz caching models.

Both color and monochrome models include two 16-bit expansion slots, an internal hard disk drive with a maximum capacity of 200M bytes and built-in 5¼-in. 1.2M-byte and 3½-in. 1.44M-byte disk drives.

The monochrome Model GX-2286M-12 is priced at $3,195, and the GX-2486C-25 color model costs $11,500.

Modgraph
149 Middlesex Tnpk.
Burlington, Mass. 01803
(617) 229-4800

NEW PRODUCTS

Database management systems

Raima Corp. has announced three products that can be linked with its Db Vista III database management system.

Db Query for Microsoft Windows can be used as a stand-alone reporting tool or built into an application. It is included with a Microsoft Corp. Windows version of Db Vista III ($1,495).

Easy Query ($99) is a querying and report-writing tool that enables users who do not understand SQL to generate reports from Db Vista III applications.

Powercell ($695) enables C language developers to embed integrated spreadsheet functionality into their applications.

Db Query for Microsoft Windows and an MS-DOS version of Powercell were released last month. A DOS version of Easy Query is scheduled to be released later this year.

Raima
3245 146th Place S.E.
Bellevue, Wash. 98007
(206) 747-5570

Pioneer Software Systems, Inc. has announced Version 2.5 of Q+E, a database query tool that provides a single graphical user interface for various database systems.

The product is completely integrated with Microsoft Corp.'s Windows Version 3.0 and can be used as a stand-alone database query tool or with Microsoft's Excel or other Windows applications.

System requirements include an IBM Personal Computer or compatible with a minimum of 640K bytes of memory and a 20M-byte hard disk. Q+E Version 2.5 is priced at $149.

Pioneer Software Systems
5540 Centerview Drive
Raleigh, N.C. 27606
(919) 859-2220

Concentric Data Systems, Inc. has announced that a version of its R&R Report Writer report writing tool has been designed to work with Version 2.3 or higher of XDB System, Inc.'s XDB-SQL Database Manager and XDB Database Server software packages.

R&R Report Writer for XDB-SQL enables users to create various types of reports without any need for programming. It automatically generates SQL queries and provides a what-you-see-is-what-you-get screen painting feature for making calculations and sorting records.

The product is priced at $299 per copy. A six-pack local-area network version costs $1,499.

Concentric Data Systems
110 Turnpike Road
Westboro, Mass. 01581
(508) 366-1122

Odesta Corp. has announced a new version of Double Helix, a multiuser relational database software package designed for Apple Computer, Inc. Macintosh and Digital Equipment Corp. VAX environments.

Version 3.5 of Double Helix includes an enhanced user interface equipped with pop-up menus, check boxes and radio buttons. The product runs on Macintosh Plus, SE or II series computers.

The product is scheduled to be available in the fourth quarter and is priced at $595.

Odesta
4084 Commercial Ave.
Northbrook, Ill. 60062
(708) 498-5615

PC systems software

Eighty Six Works has announced a product designed for Intel Corp. 80386-based personal computers.

The ECP3 features multitask support for applications done on systems operating under Digital Research, Inc.'s DR-DOS, PC-DOS or MS-DOS. Each task has a private system configuration with 128K to 896K bytes of memory. The product is priced at $49, and a full evaluation version costs $10.

Eighty Six Works
P.O. Box 36272
San Jose, Calif. 95158
(408) 978-8027

Peripherals

Xante Corp. and Phoenix Technologies Ltd. have announced Powerscript, a printer-resident, Adobe Systems, Inc. Postscript-compatible controller that features reduced instruction set computing technology based on an Advanced Micro Devices, Inc. 29000 microprocessor.

The product increases the processing of Apple Computer, Inc. Laserwriter printers.

In addition, it provides enhanced resolutions of 300 by 300 dot/in., 300 by 600 dot/in. or 300 by 1,200 dot/in., according to Xante.

Powerscript was jointly developed by both companies and is priced at $1,695. It is scheduled to ship this month.

Xante
23800 Highway 98
Montrose, Ala. 36559
(205) 990-8189

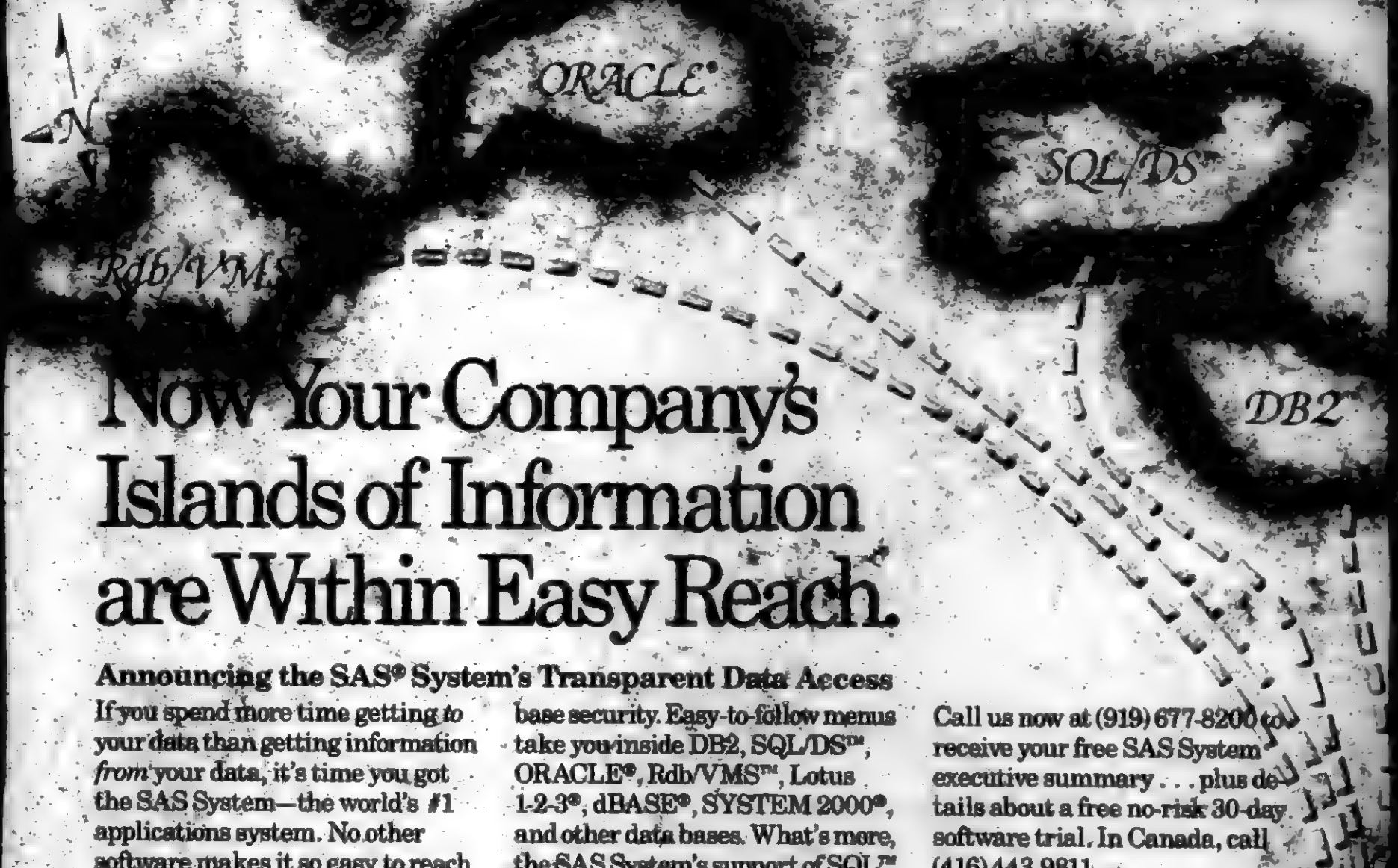
Focus Information Systems, Inc. has announced a Super Video Graphics Array card designed for IBM Personal Computer XTs, ATs or compatibles.

The 2 the Max VGA 4000 incorporates Tseng Laboratories, Inc.'s ET4000 graphic chip set and features memory configuration that can be expanded to 1M byte.

The product provides 1,024- by 768-pixel resolution and 256 displayable colors in standard and extended graphic modes, according to the vendor.

Pricing ranges between $295 and $395, depending on memory configuration.

Focus Information Systems
42840 Christy St.
Fremont, Calif. 94538
(415) 657-2845



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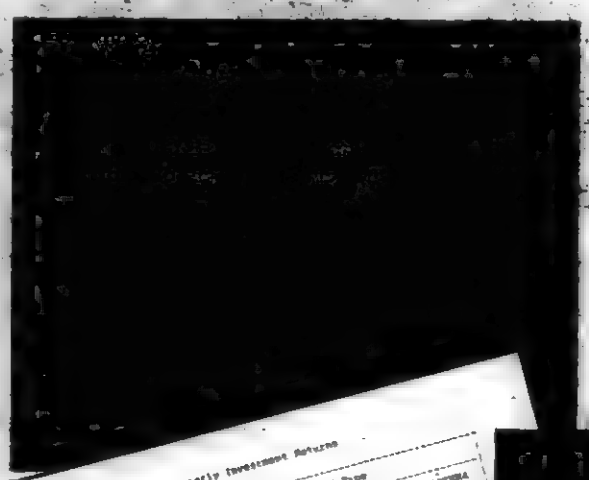

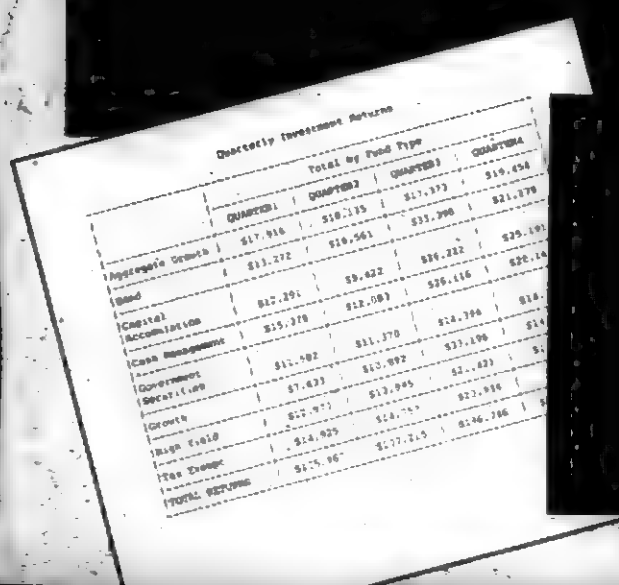

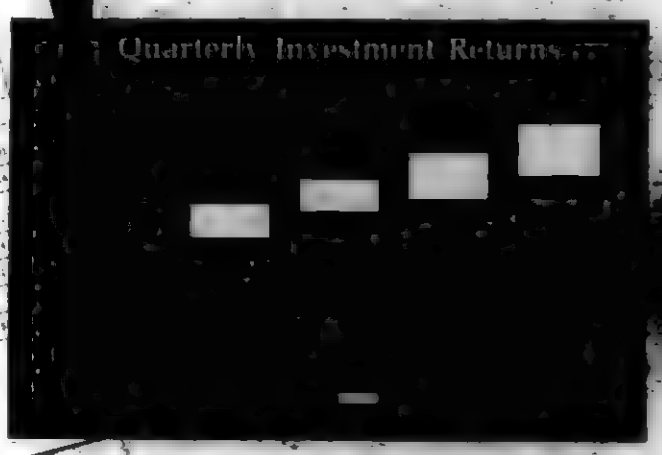

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Unlike some Mac-to-mainframe connections, MacMainFrame enhances the benefits of the Macintosh user experience.

Since MacMainFrame is completely IBM 3270 compatible, it has no impact on normal mainframe operations. The result? An integrated working environment that increases productivity and reduces headaches.

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COMMENTARY

Ellis Booker

Babel in the battlefield

If the U.S. and the multinational force it has assembled in the Saudi desert go to war against Iraq, battlefield communications among ourselves and our allies will revert to a surprisingly low-tech procedure.

According to military experts familiar with the situation, liaison officers with mobile radios will be dispatched among the various forces and entrusted with the job of keeping their own commands informed about the position of allied troops.

Military planners would be the first to admit that knowing the location of one's own soldiers during the haze of battle is at least as important as knowing the same about one's enemy.

For the millions spent on command, control and communications — known at the Pentagon as C3 — something more elegant than the military equivalent of a sports commentator would seem both preferable and possible.

"But you have to realize, too, the ability to interoperate with other forces is not just a matter of compatible radios," explains Kirby Lamar, a retired army brigadier general and vice president and treasurer of the Armed Forces Communications and Electronics Association (AFCEA) in Fairfax, Va. "Procedures and languages are different . . . you'd need a human being in either case."

In fairness, NATO has worked for some time to ensure the technical interoperability of field communications equipment within the alliance.

The French company Thompson PLC, for example, developed a mobile terminal — a sort of battlefield version of a cellular phone — that was adopted for U.S. operations and is now being built for U.S. forces by GTE Corp.

However, it is not clear how much of the interoperability work has gone beyond voice radios and involves battlefield data communications such as the sophisticated, satellite-based Global Positioning System that U.S. forces use to pinpoint their positions.

Continued on page 68

GSA to launch encryption plan

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — The U.S. General Services Administration (GSA) has won approval from an interagency panel to proceed with an ambitious plan to offer data encryption services to more than 1 million users of the Federal Telecommunications System 2000 (FTS-2000).

The GSA plans to offer two levels of end-to-end encryption over packet-switched networks: one for sensitive but unclassified data and one for classified traffic.

The approach was demonstrated in a two-week test earlier this year in which encrypted files and messages were sent over and between networks operated by AT&T and U.S. Sprint Communications Co., the prime FTS-2000 contractors.

The contract won two years ago by AT&T and Sprint was for a multibillion-dollar overhaul of Uncle Sam's aging, expensive and patchwork telecommunications system, the largest private telecommunications system in the world.

The companies are to provide six basic services — switched voice and data services, packet-switched service, video transmission service, dedicated transmission service and switched digital integrated service.

The basic offerings include a number of supporting services, but data encryption is not among them. However, a recent government study showed that 70% to 80% of the traffic carried over the FTS-2000 networks should be encrypted to protect confidentiality and ensure integrity. "Use of FTS-2000 is mandatory, but encryption is not," said Richard J. Kemp, a senior official in the GSA's Information Security Management Division. "And because of the budget situation, security is often the first thing to go."

According to Kemp, any of the 90 federal agencies now using FTS-2000 could go its own way with data security, attaching its own encryption devices to network hosts. "But one problem is you have to have a bucket of money to do it on your own," Kemp said. The Blacker front end, a device developed by Unisys Corp. for the National Security Agency (NSA) and approved by the NSA for use on FTS-2000 for data that is classified confidential or secret, costs about $8,000 for each user device and requires a $160,000 control center.

"[The Department of Defense] is always saying FTS-2000 doesn't meet their national security needs," said Michael Goldstein, director of communications technology at Vienna, Va.-based Information Strategies Group. "Now this will give them some added flexibility, some capabilities in locations where they may not have their own [classified] networks."

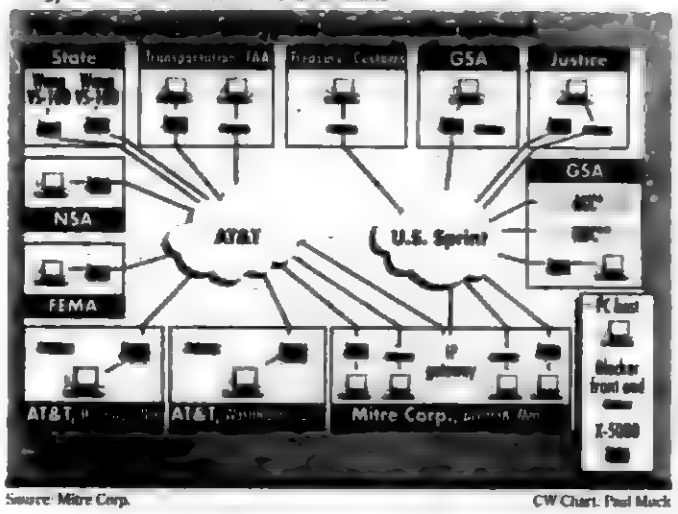
The GSA wants to offer a standard, turnkey service that users can request by checking a box on a form. The service would offer encryption for electronic mail, file transfer, interactive communications and interactive access to remote hosts. The GSA will provide installation, maintenance and support services and will recoup its front-end investment through a monthly user charge, which has not yet been determined. "We want to help user agencies implement security solutions at a reasonable cost," Kemp said.

The plan is timely. A number of reports from government auditors and congressional committees, particularly in the past year, have faulted agencies for

Continued on page 72

Cryptic

The General Services Administration (GSA) will allow all agencies to add encryption devices to their FTS-2000 links



Source: Mitre Corp. CW Chart: Paul Mack

IBM and Northern Telecom push host-to-Centrex link

BY ELISABETH HORWITT
CW STAFF

NEW YORK — IBM and Northern Telecom, Inc.'s recently announced host-to-Centrex link is being positioned as a potentially lower-cost vehicle for computer-integrated telephony applications that now run on host-to-private branch exchange (PBX) links.

The two vendors will be working with Nynex Corp. on a trial of such a service using Syracuse University's 711 emergency calling service as the test bed.

A growing number of Fortune 500 companies, such as American Express Travel Related Services Co., have meshed their hosts and PBX systems to support telemarketing and customer service and other intelligent networking applications.

However, said Frank Skidmore, director of telecommunications network systems at IBM, "The capital, people and skills investment involved in a private network is less attractive to some companies than paying incrementally through a public network."

Centrex service would put computer-integrated telephony applications within the reach of the smaller companies that typically use the local telephone service, agreed Tom Nolle, president of CIMI Corp. in Voorhees, N.J. However, such companies may still balk at having to set up the host as a telecommunications system that automatically responds to incoming calls, he added.

What is really needed is a service bureau that can set up and maintain the customer databases and applications for such companies, he said.

Initially, computer-to-Centrex applications will require that the user install an IBM Application System/400 host and that the local telephone company's central office be equipped with a Northern Telecom DMS 100 Supernode intelligent central office switch. However, IBM has announced plans to migrate its Callpath host-to-network switch interface to both System 390s and Personal System/2s, although no time frame has been given for availability.

In addition, IBM said that it is open to linking its hosts to other vendors' central office switches, and Northern Telecom said it would be looking at linking its switches to other types of hosts.

IBM and Northern Telecom also plan to make their connections fully compatible with Switched Computer Application Interface, the emerging standard for linking hosts and switches, vendor spokesmen said. This opens up the future possibility of users freely mixing and matching the two types of systems.

Nynex is committed to offering the type of service it will be testing at Syracuse University, a spokesman said. However, the three vendors still have to work out issues such as pricing, servicing and support, as well as how the offering will be packaged, Skidmore said. "Does IBM charge a quarter to add the extra feature on the AS/400 or does Nynex charge X for the whole thing, or does a systems integrator put the parts together?"

The trial is scheduled to start in the fall of 1991. Syracuse University's 711 service responds to calls from all over the school's campus relating to medical problems, fires and other emergencies. The application being tested will notify service operators automatically of the location where the call originated, "which can be important because the caller often doesn't know where he is," Syracuse University spokesman John Harvith said. The university is also considering other applications for the link in areas such as admissions and registration.

Northern Telecom and IBM are talking with all seven regional holding companies about using their connection as the basis for a Centrex service, according to Northern Telecom spokesman Michael Doss. IBM is open to connecting its hosts to other central office switch vendors, while Northern Telecom will be discussing links between the Supernode and other host systems besides IBM's, the vendors said.

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Sonet moves to private sector

BY JOANIE M. WEXLER
CW STAFF

MIDDLEBURY, Conn. — The high-speed benefits of Synchronous Optical Network (Sonet) may start seeping into very large private networks early next year. By virtue of a deal recently struck with Alcatel Network Systems, General Datacomm, Inc. has become the first T1 vendor to throw its hat into the Sonet ring.

General Datacomm's Megamux TMS T1 multiplexers are set to ship with Alcatel's Sonet interface, and existing Megamux nodes can be upgraded. The upgrade price, according to General Datacomm, ranges from $10,000 to $80,000, which buys a range of bandwidth from 51M to 600M bit/sec. The bundled price for a new Megamux with a Sonet interface box ranges from $28,000 to $180,000.

"Our customers were pushing us hard to get this capability," commented Dan Young, General Datacomm's vice president of marketing. "And we're seeing many companies trying to negotiate with their carriers for Sonet capability on an individual case basis."

Optical standards

Sonet is an emerging standard for a fiber-optic networking infrastructure that defines channelized bandwidth in multiples of 51M bit/sec. up to 2.4G bit/sec. In addition to offering a wealth of bandwidth, Sonet provides for network management overhead and employs a standard optical interface. Use of a standard interface should allow public telecommunications carriers — which currently represent the majority of the Sonet equipment market — to interoperate with private vendors' gear, giving users more flexibility in their network configurations.

Companies in areas where Sonet services are available from public carriers or those running "dark" fiber — their own fiber, not cable leased from a phone company — could use the Sonet-interface capability to multiplex several T1s over the broadband transport vehicle.

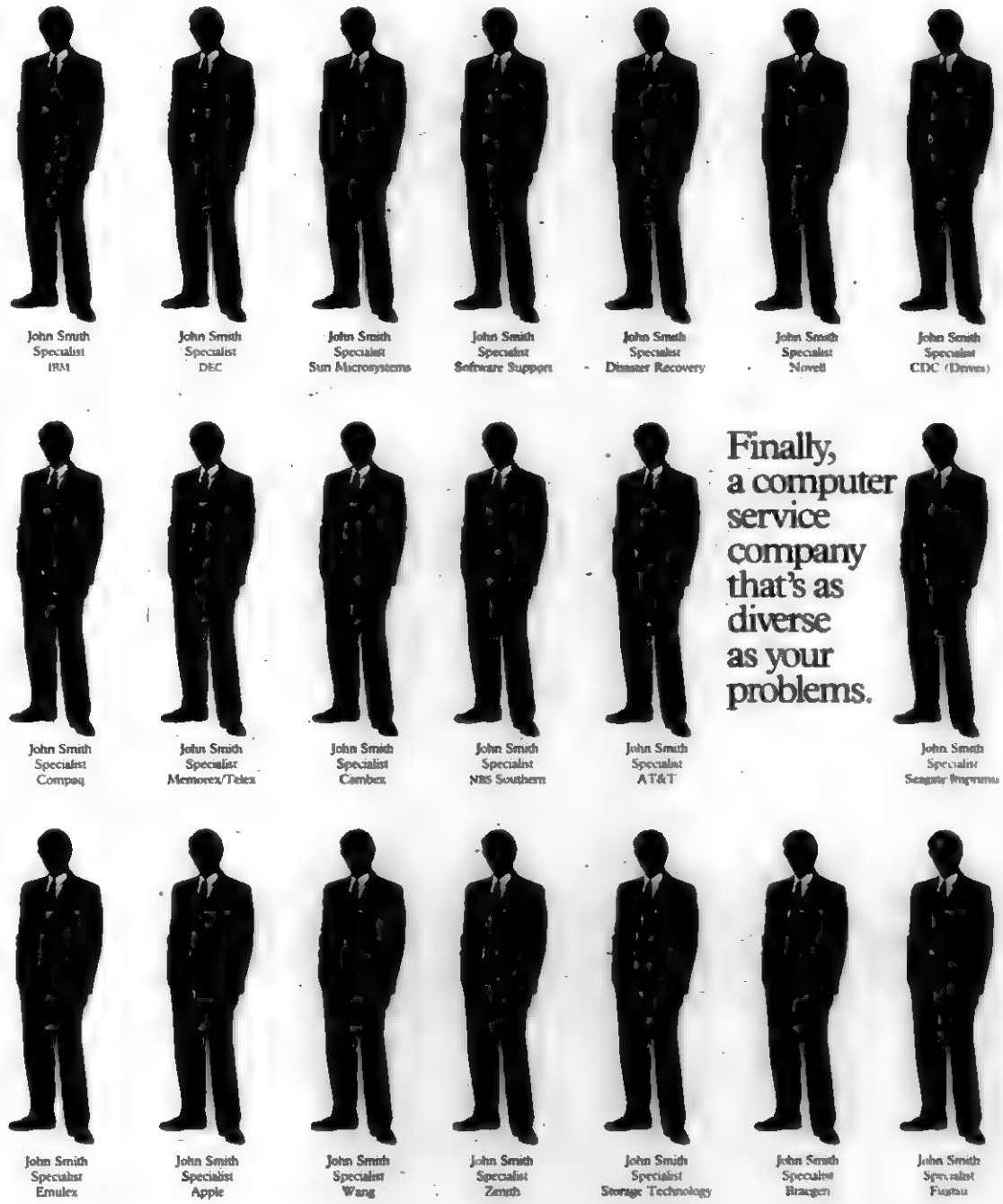
Such companies will be scarce for a couple of years, however, according to Rick Malone, principal at Vertical Systems Group, a market research firm in Dedham, Mass. Malone said that "in 1990, there has been no real dollar market for Sonet" and added that he expects early Sonet adopters to be "large companies that have been operating T3 networks for three or four years" and need to go beyond those networks' 45M bit/sec. speeds.

He cited imaging as the main application that will emerge to drive users to the high-bandwidth promise of Sonet. Vertical Systems Group estimated that the industry's bandwidth requirements are doubling every three years on average.

Growth in remote local-area network interconnection and distributed processing applications will join imaging in forcing firms into the Sonet hierarchy in droves by 1994, Malone said. According to Vertical Systems Group, the remote LAN internetworking market grew 42% to $373 million from 1989 to 1990.

In the meantime, Malone cited such existing T3 users as The Boeing Co., General Electric Co., IBM and Electronic Data Systems Corp. as likely Sonet candidates for 1991. "These companies also happen to have a lot of clout with the carriers," he said, explaining that Alcatel's strategy for getting its Sonet interface into the private sector is to spur users to pressure the carriers to pick up their pace with Sonet deployment.

Commented Bill Hogan, director of Sonet product line management at Raleigh, N.C.-based Alcatel, "The Sonet product handles all of today's network needs. It will convert all of today's electrical signals [such as T1 and T3] and incorporates mapping for [Fiber Distributed Data Interface] and other optical signals of the future."



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Netware virus threat disputed

BY MICHAEL ALEXANDER
CW STAFF

Jon David, an independent computer consultant, calls it a case of "David against Novelliath." Novell, Inc., publishers of the Netware local-area network operating system, says it's more a case of a "crackpot without a cause."

The two are locked in an escalating debate over whether a variant of the Jerusalem virus can bypass Netware read-only access, infect the server and allow nodes to write to and delete files on the server without either write or delete privileges.

"This could be totally disastrous to any organization," said Harold Highland, noted computer security and virus expert.

The Jerusalem B, the most prevalent of personal computer viruses, deletes every file executed on any Friday the 13th and on all other days that the virus attaches itself to .COM, .EXE and .SYS files as they are executed and slows down the system by a factor of 10.

A Netware LAN at the Institute of Social Research at Indiana University was shut down for four days after being hit with the Jerusalem B virus in September, said Steve Gribble, systems manager at the university.

The virus appeared to bypass the read-only privilege and infected dozens of workstations in addition to the server, he said.

The viral outbreak seemed to confirm David's claims, however, Gribble said: "If you follow Novell's suggestions and recognize that file attributes can be modified, you can make the network secure, at least up to now." He attributed the outbreak more to operator error than an inherent security flaw.

In a "Netware Applications Note" to its customers this past July, Novell said Netware has security extensions to file and directory attributes that not only help protect the server from being corrupted but also protect executable files and data files from becoming infected by a virus.

"The best flag for preventing a virus from infecting an executable program is the read-only attribute," a Novell spokesman said.

Not so, David responded. Read-only is a DOS attribute and has been proven to be ineffective protection against viruses. That is precisely how the Jerusalem B is able to bypass Netware security extensions — by altering the read-only attribute to a read-write attribute, he said.

"DOS is totally vulnerable to a virus like this, but it is very possible to protect against it," said Richard King, vice president of software development at Novell. "If the files are set up properly in the right directories, you cannot infect those files."

The battle between David and Novell started last June when David received disks from a Novell distributor in Canada containing what was claimed to a variant of the Jerusalem B virus that had been retooled to specifically attack Netware.

David, along with Jay Nickerson, president of On Disk Software, and Greg Drusdow, then president of Netware Users International, ran tests at Novell sales offices in Paramus, N.J. David said that the tests confirmed that the virus gave nodes privileges to write to the server and delete files that the nodes had not been assigned. Drusdow and Nickerson did not return telephone calls seeking comment. However, Drusdow corroborated David's assertions in an article in the September-October issue of *Netware Connection*, a user group publication.

Lack of enthusiasm

David said that he also notified Novell officials, "whose response was less than enthusiastic."

Novell's software engineers "spent considerable time and money trying to replicate the problem," King said. "A disassembly of the virus did not uncover any Netware-specific knowledge; it is just a DOS virus. We were unable to confirm that you could bypass any network security."

Still, concerned Novell officials flew David out to Novell's headquarters in Provo, Utah, in August to see if he could duplicate the infection.

When he failed using the same configuration as the one in Paramus, "that is when David began to lose his credibility," King said.

David maintained that Novell must have somehow altered the software to prevent his replicating the tests in an effort to cover up the system's security loopholes.

"There are a million Netware users out there, and potentially all are at risk," David said. "Novell should be investigating this, not stifling it."

Instead, David said he has received a letter from Novell's corporate counsel. Based on the language of that letter, he said it seems that, "if I don't shut up, they're going to sue my butt off."

King said that, as a paid consultant, David had an implicit agreement to maintain confidentiality on work he did for Novell. Since David's claims were unjustified, King said, he asked Novell's corporate counsel to insist David refrain from making negative comments about Netware.

Standard developed to unite EDI with X.400

BY ELISABETH HORWITT
CW STAFF

GENEVA — A draft standard for integrating electronic data interchange (EDI) with X.400, allowing business partners to use the same standardized electronic "envelope" to exchange both EDI documents and electronic mail messages, is expected to be approved by the end of the month.

The X.435 standard, being reviewed by a Consultative Committee for International Telephony and Telegraphy (CCITT) study group, would potentially save a lot of cost and trouble for companies that have to set up a different set of protocols for EDI exchanges with each of their business partners, and often maintain a separate network system for E-mail, according to David Taylor, vice president and director of interenterprise systems at Gartner Group, Inc.

The standard would enable such users to support interenterprise EDI exchanges on their existing corporatewide E-mail network, he added.

More than meets the eye

"This is significant because when one company has a business relationship with another, that relationship is more than exchanging purchase orders and invoices; it also includes lots of messages," Taylor said.

A recent Gartner Group survey, conducted through interviews with the Stamford, Conn., research firm's customer base, found that "for every EDI message sent, from five to 10 other types of communication also took place, such as calling up to make sure the message or file got there," Taylor said.

"If you're going to have a business relationship that consists of a lot of documents," Taylor said, "why not use the same transport network to send other related messages, at the same time if possible?"

Another advantage of wrapping EDI inside X.400 is that EDI users then have access to the message management capabilities the E-mail standard offers as well to the capabilities of the CCITT X.500 directory standard, Taylor said.

The lack of such amenities "was fine as long as only 10 or 20 companies were doing EDI, but now we see about 12,000 companies doing it, with the number of EDI systems over 10 at some large companies," he added. "It's becoming difficult to keep track of which system receives what," particularly when the same documents are being broadcast to more than one destination or through intermediate nodes, Taylor said.

Already an X.400 user, Du Pont Co. "envisions in the future moving a lot of EDI transactions over X.400, but that is years away in the future because trends show that it takes that long for vendors to deliver compliant software and go through conformance testing," said Gordon Preston, Du Pont's E-mail manager.

Du Pont will also have to wait "for the people we trade with over EDI to have the X.400 capability," Preston said. He predicted that it will take two years for the standard to become commercially viable but added that "it will greatly simplify everyone's environment and greatly reduce the cost of EDI" to have one exchange protocol instead of several.

Not-so-distant future

Taylor predicted, however, that users would not have to wait long for X.435-compliant products to start appearing. Several vendors that now serve on the CCITT study group have been keeping pace with the standard's development in their own products and plan to announce such offerings within six months after the standard is approved, he said.

AT&T, Digital Equipment Corp., IBM and major value-added network vendors now serve on the committee. Both DEC and AT&T now provide proprietary methods for wrapping EDI documents inside X.400 and plan to migrate to the standard, Taylor said.

Checking the cost of checking

Software shortens check processing path

BY GARY H. ANTHES
CW STAFF

The Federal Reserve System and two trade associations are testing new software this monthhat is intended to significantly reduce the cost to banks and corporations of processing paper checks.

Assisted by the National Automated Clearing House Association (NACHA) and the National Association for Check Safekeeping, the Federal Reserve will send 20,000 specially encoded test checks through the national check clearing system.

Checks with the digit 3 in the 44th position of the magnetic ink character recognition line at the bottom of the check will be earmarked by the system for "truncation," which means the paper check will not travel beyond the bank of first deposit.

Checks normally flow from the bank of deposit to the paying bank back to the check writer in a slow and expensive process. Truncated checks will instead trigger the creation of an Automated Clearing House file that can be transmitted instantly and at low cost.

An official at NACHA said the test is the first step in a more extensive pilot project to begin next spring.

She said the pilot is expected to show reduced check processing costs and faster flow of payment information. Corporations should eventually see lower bank fees and check storage costs, she said.

The Arizona Clearing House Association is also involved in the pilot project, and it is working with five credit unions that will issue consumer and rebate checks eligible for truncation in that state.

THE PILOT IS expected to show reduced check processing costs and faster flow of payment information. Corporations should eventually see lower bank fees and check storage costs.

According to NACHA, the Automated Clearing House system processes more than 1 billion transactions per year for more than 15,500 financial institutions serving more than 100,000 corporations.

NACHA invites groups interested in participating in the pilot project to call Karen Lyter at 703-742-9190.

Hewlett-Packard delivers on FDDI promise

BY JOANIE M. WEXLER
CW STAFF

PALO ALTO, Calif. — Hewlett-Packard Co. has said it is the first to fully deliver on a Fiber Distributed Data Interface (FDDI) multisourcing agreement struck over a year ago by a trio of big-name vendors.

HP, Siemens AG and AT&T shook hands in mid-1989 [CW, Aug. 21, 1989] to ship in volume FDDI transceivers that conform to a de facto standard that builds on the formal standard sanctioned by the American National Standards Institute (ANSI).

The agreement is intended to allow vendors of FDDI products, such as network adapter cards, workstations, bridges and routers, to have several supplier sources for volume quantities of their optical components.

The ultimate goal of the deal is reportedly to spur competition and lower prices for would-be users of the costly 100M bit/sec. FDDI local-area networks.

Feasible strategy

"HP is an established vendor for supplying optical components for other networks, such as Ethernet," commented Richard Mack, an analyst at Kessler Marketing Intelligence in Newport, R.I., "so the strategy is feasible. Sharing specifications with AT&T and Siemens also tells computer manufacturers that if they can get the same part from several sources, they and their customers are not going to be left in the lurch if one company drops the product line or goes out of business."

Transceivers convert electrical signals to optical signals and vice versa. FDDI LANs, which run at 100M bit/sec. over fiber-optic cabling, support up to 500 stations on a single network, with each station requiring at least one transceiver. The transceiver is reportedly the most costly component of an FDDI network adapter. The HPBR-5125 transceiver lists for $550 in quantities of one to nine, with volume prices negotiable, according to the company.

Efforts are also under way by two ANSI working groups to create lower-cost 100M bit/sec. networking. They include relaxing the performance specifications of the optical components and running the high speeds over twisted pair.

The current Physical Media Dependent (PMD) component of ANSI's FDDI standard defines optical performance and guarantees interoperability among products at the physical layer.

The HP-Siemens-AT&T plan is to create a de facto standard that takes PMD a step further and addresses PMD implementation. This allows vendors to also standardize on a "footprint" — the width and depth of the package and number of pins for a standardized "plug-in" of the components onto a board.

"We felt that with vendors out there creating their own proprietary footprints, costs weren't coming down because volume of any one implementation couldn't come up," explained Nate Walker, marketing section manager at HP's Optical Communications Division.

Mack countered, "I don't see anyone delaying a purchase to wait for something to come down in price — if they really want it. For example, people who need more [random-access memory] just go out and buy it, regardless of what it costs. FDDI is no longer just a buzzword technology; now that it's recognized as a standard, it has become really important to information services people."

According to Walker, seven manufacturers are currently committed to supporting the de facto standard, but HP is the first to deliver compliant transceivers in volume.

Booker

CONTINUED FROM PAGE 61

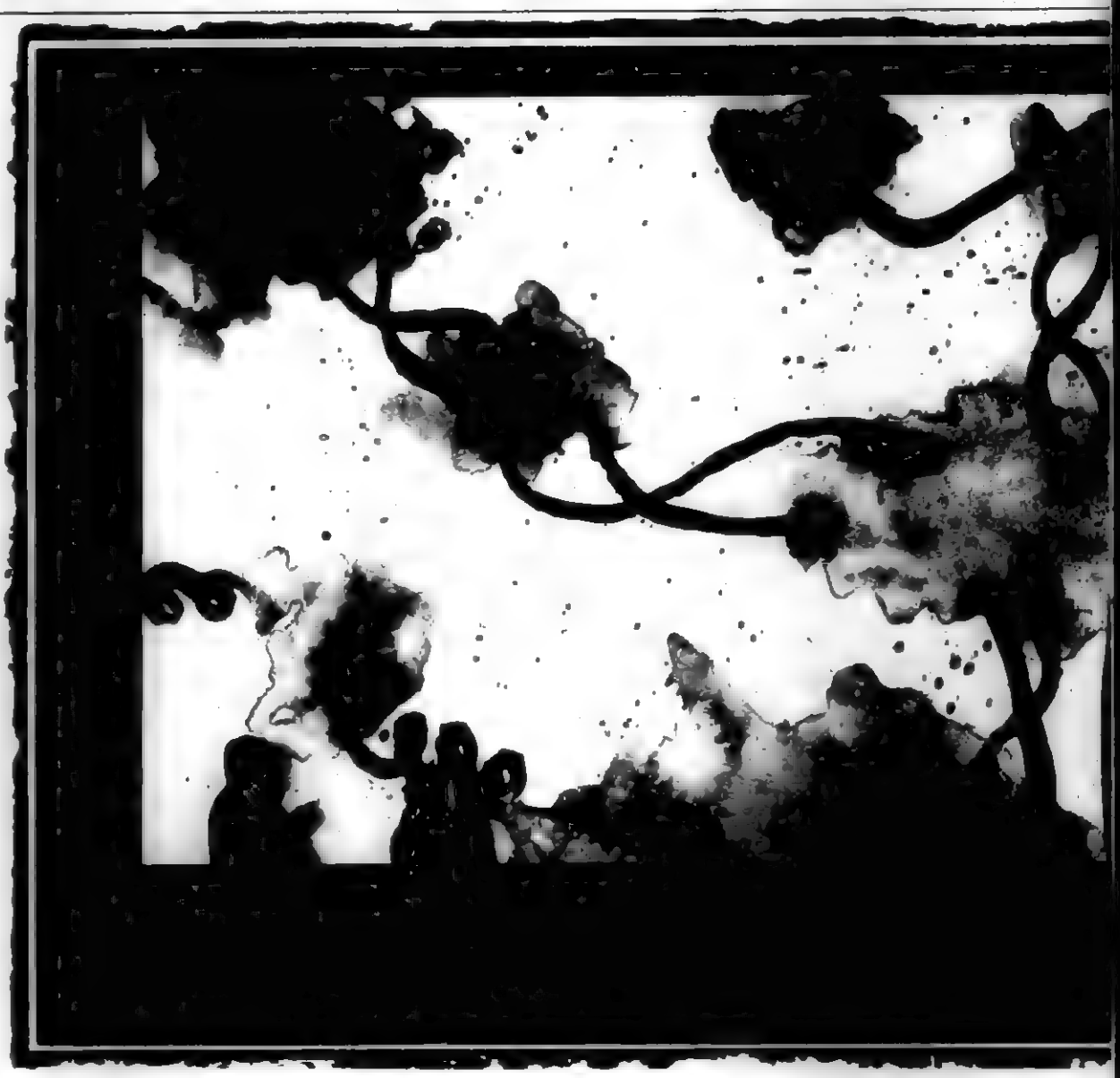
Even within the U.S. forces, there have been some problems with C3. Following the Grenada operation, reports surfaced that the four branches of the U.S. armed forces had trouble talking to one another. There was even a widely circulated — although never confirmed — story of a soldier who, unable to get through to his command via radio, dialed back to the U.S. mainland from a pay phone with an AT&T calling card to request air support.

Add to all this the fact that some of our Desert Shield allies are very recent friends, cooperating in the Gulf for their first joint military exercise with a Western force, and the potential for a Tower of Babel looms.

In the biblical story, God, angered by Nimrod and his people for their arrogance in trying to build a mighty tower that reached to Heaven, goes among the people, "confounding their language that they may not understand one another's speech" and scattering them throughout the world.

At the very least, miscommunication and accidents on the battlefield are more likely because of the mixed force now gearing up for war in the Gulf. Let us hope war is averted because diplomacy — the preferred method of communicating between nations — prevails.

Booker is *Computerworld's* Chicago bureau chief.



"That reminds me, now that we've managed to network everything, who's going to manage our network?"

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Protolyzer combines LAN analyzers and monitors

BY JIM NASH
CW STAFF

An almost unknown start-up company is making a run at the leading makers of network analysis and monitoring equipment by aiming at their Achilles' heel: user interfaces.

Protools, Inc. in Beaverton, Ore., a spin-off of consulting firm DWB Associates, began shipping its Protolyzer in September. Billed as a cross between local-area network analyzers and monitors, the hybrid is aimed at network administrators who only rarely need to analyze actual packets.

According to consultant Craig Burton, the company is banking on people needing to know less about what is in each packet than the broader view of what is happening on the network in general. Burton is a principal at Clarke Burton Corp. in Salt Lake City.

And, indeed, some LAN managers are willing to trade reams of data for ease of use. "Everybody's got their differentiating points," said Ben Ruiz, senior director of advanced engineering at Lansystems, Inc. "Network General can decode protocols superbly."

Ruiz, in the LAN systems integrator's New York office, said Protolyzer's differentiating feature is its graphical interface, which he said was a "breeze" to use.

The Protolyzer is based on Microsoft Corp.'s OS/2 Presentation Manager, runs on a 32-bit engine and costs about $15,000. It analyzes protocols including Microsoft's LAN Manager, Banyan Systems, Inc.'s Virtual Networking Software, Novell, Inc.'s Internet Packet Exchange and Transmission Control Protocol/Internet Protocol. Protolyzer straddles the fence between analyzer, which has a relatively modest analysis of protocols, and monitor, with its built-in compiler and report generator.

Ruiz said he would like to replace the single Network General Corp. Sniffer analyzer that Lansystems shuttles around its offices with Protolyzers. He expressed reluctance about doing so before Protools beefs up its protocol decoding abilities.

Jeff Erwin, president of Protools, said that OS/2 is the only operating system with the capacity to run Protolyzer, given the tool's multithreaded nature. "Users said they needed a real operating system, not something pasted on top of DOS."

It is that multitasking capability, said Steve Waldbusser at Carnegie Mellon University in Pittsburgh, that allows him to "scope in on several protocols or on several types of packets within a protocol" simultaneously. That way, said Waldbusser, manager of network development at the university, he can better track his 140-subnet network.

"You can have multiple virtual analyzers running at the same time," Waldbusser said.

Eric Cox, a network engineer at Compaq Computer Corp. in Houston, said he tested a beta version of Protolyzer and was impressed. Cox said he used it to record and play back activity on a LAN set-up to test Compaq components. The result was a game film of sorts that helped determine how components reacted to different stresses.

> PROTOLYZER "IS LIMITED by running only OS/2. We would be buying more of the product if it were running Unix or even DOS."
>
> STEVE WALDBUSSER
> CARNEGIE MELLON UNIVERSITY

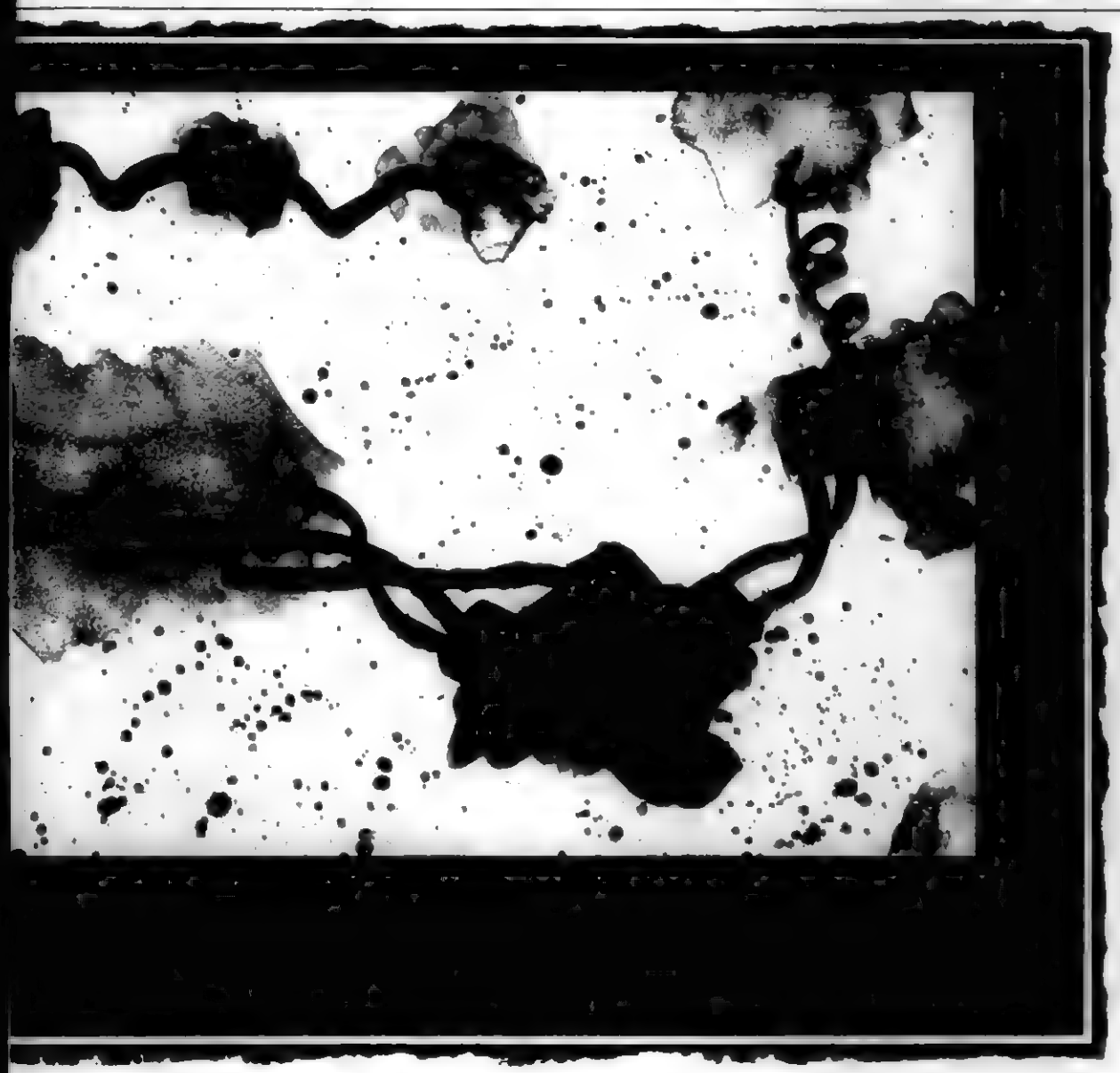
However, Waldbusser pointed out, Protolyzer "is limited by running only OS/2. We would be buying more of the product if it were running Unix or even DOS." And, he said, "the price means it won't be on everybody's desk. We couldn't afford to put one Protolyzer on each subnet."

"I know this sounds shallow, but [the employees who need to oversee networks] are not exactly packet-accounting engineers," said Cheryl Currid, director of applied information technology at Coca-Cola Foods in Houston.

The Protolyzer's icons, Currid said, make it easier for nontechnical employees to understand the data it produces. "They give an old tool a face-lift," Currid said. The "old" face is the "old, ugly character interface" that intimidates users.

Currid said the interface alone might be enough to make Protolyzer a big success, despite its limitations. Its competitors, Sniffer and Novell's Lanalyzer, have proven easy to use but not easy to understand, she said.

Burton said the company is moving in the right direction with its "commitment to making these things more user-intuitive instead of gearing it for the technician." Noting Network General's lack of easy-to-discern icons, Burton said users might be willing to give up Sniffer's detailed analysis for less daunting graphic interfaces.



enhanced, making it easier than ever to use, monitor problem alerts, and "talk" with IBM and non-IBM systems.

Of course, there are other attractive features of NetView to consider.

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The way it cuts down network costs.

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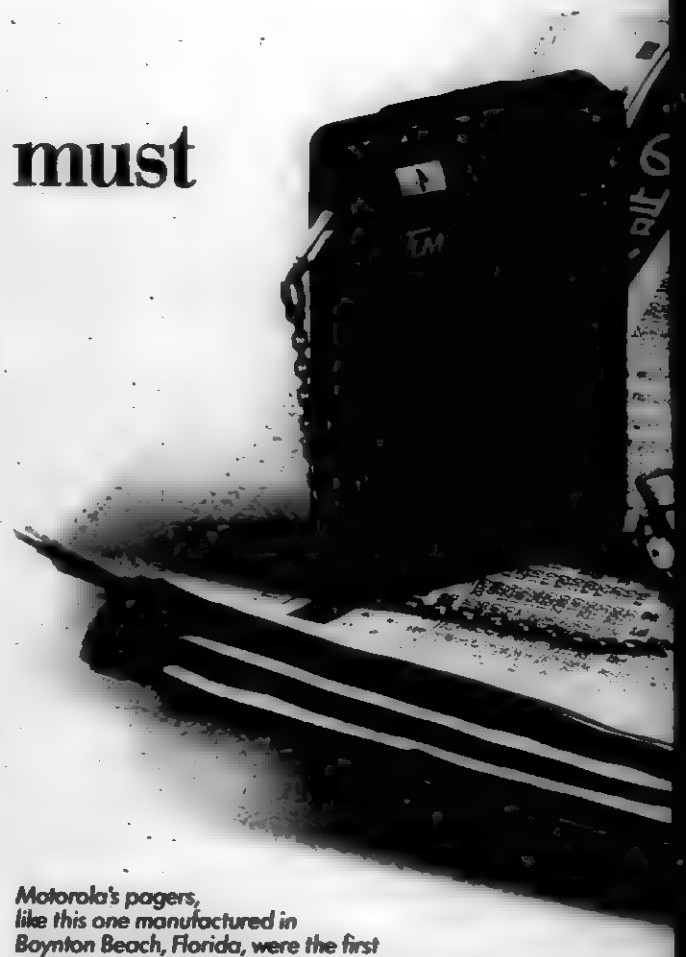
management on both sides must play a role. We build unique products for each market, and strive to make the best in the world. ■ We fought for the right to sell radio pagers, cellular telephones and two-way radios in Japan. Motorola benefits. So do its customers. So do the Japanese consumers who use Motorola's products. Nobody on earth succeeds alone.



Motorola's pagers, like this one manufactured in Boynton Beach, Florida, were the first pagers imported to the Japanese paging market.

Building On Beliefs

MOTOROLA

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GSA

FROM PAGE 61

failure to protect confidential information in computer systems generally and in particular for failing to comply with provisions of the Computer Security Act of 1987.

At one recent hearing, Congress threatened legal action against agencies that fail to implement their existing security plans.

The Blacker systems will be used for access control and for encryption of classified data, and Cipher X-5000 from Technical Communications Corp. will be used for encryption of unclassified data.

That is an interim approach, said Michael Corrigan, assistant commissioner in the GSA's Office of Telecommunications Services. He said the NSA is augmenting the Government Open Systems Interconnect Profile to allow communications protocols to make subroutine calls for encryption and key management from within the host operating system.

That will eliminate the need for the Blacker front ends and will mean that all data sent by the host will be encrypted automatically. "There's not much traffic that doesn't need encryption," he said.

The GSA will maintain a computerized access-control list that determines which hosts can talk to which at what levels of security. For example, it might say that a certain IBM Personal Computer at the U.S. Department of Energy in New Mexico may pass secret data to a Wang Laboratories, Inc. minicomputer at the Department of State here.

That would require the GSA system to assign both hosts the same keys for encryption and decryption based on an agreement between the two user agencies.

The GSA hopes to have its encryption and access control service available on a limited basis in one year and on a full production basis in two years.

NEW PRODUCTS

Local-area networking hardware

Network Computing Devices, Inc. has recently announced the NCD15b, a 15-in. monochrome X Window System-based terminal that features 1,024- by 800-pixel resolution and a noninterlaced screen.

The product includes a 16-bit processor for driving text, windowing applications and two-dimensional graphics and 2M bytes of dynamic random-access memory.

The NCD15b is priced at $1,495.

Network Computing Devices
350 N. Bernardo Ave.
Mountain View, Calif. 94043
(415) 694-0650

Digital Communications Associates, Inc. has begun shipping a token-ring local-area network hardware adapter that supports Novell, Inc. Netware 286 and 386, IBM's PC LAN Program and its own 10Net Plus program.

Irmatrac Token-Ring Adapter/Convertible ($895) includes ring interface modules that can support 4M- or 16M bit/sec. token-ring LANs from a single adapter. The company plans to add software drivers that will enable the product to support Microsoft Corp.'s LAN Manager and other OS/2-based products. The drivers are scheduled to be available by first-quarter 1991.

DCA
1000 Alderman Drive
Alpharetta, Ga. 30202
(800) 241-4762

Gandalf's Mini MAU *lets users connect to 10Base-T LANs*

Gandalf Data, Inc. has announced a miniaturized 10Base-T media access unit transceiver that permits devices to be directly connected to 10Base-T local-area networks via unshielded twisted-pair wiring.

The Mini MAU transceiver enables users to connect to 10Base-T LANs by using IEEE 802.3 or Ethernet network interface cards. It can be connected to the 15-pin attachment of an IEEE 802.3 or Ethernet network interface card.

The product is available for $189.

Gandalf Data
1020 S. Noel Ave.
Wheeling, Ill. 60090
(708) 459-9348

Western Telematic, Inc. has introduced a peripheral and data sharing system designed to enable personal computer users to transfer files and network printers, plotters, modems or facsimile machines.

Lasernet Multi-Link includes eight concurrent serial and four parallel ports. Up to 32 Multi-Link units can be connected via a data-link port. A standard unit equipped with 256K bytes of field-expandable memory costs $1,195. The product is slated to be released next month.

Western Telematic
5 Sterling
Irvine, Calif. 92718
(714) 586-9950

Asante Technologies, Inc. has announced two Ethernet products designed for Apple Computer, Inc.'s Macintosh IISI and Macintosh Classic systems.

The Maccon+ 30i is a small Ethernet card that fits into the IISI's Direct Slot 030 bus without requiring an extender card or any additional hardware.

It is available in two versions: one that contains thick and thin ports and another equipped with thick and twisted-pair ports. Both models are priced at $495.

The EN/SC ($595) is an external small computer systems interface box that provides Macintosh Classic users with thick, thin or twisted-pair Ethernet connections.

It is scheduled to be available next month.

Asante Technologies
405 Tasman Drive
Sunnyvale, Calif. 94089
(408) 734-4844

Local-area networking software

Synexus, Inc. has announced a software package designed to protect Novell, Inc. Netware servers in the event of a power failure.

Pwrmon can work with any uninterruptible power supply (UPS) system equipped with an RS-232 interface. It runs in a file server's operating system and communicates with a UPS via the server's RS-232 port.

The product is priced at $175.

Synexus
3 Osage Road
Canton, Mass. 02021
(617) 828-9390

Atlantix Corp. has announced a software package designed to run on an Intel Corp. 80386- or 1486-based personal computer running The Santa Cruz Operation's Unix operating system.

Atlantix Access enables a standard Unix-based PC to operate as a network server that supports new or existing local-area networks. It provides users with a Unix-based, Microsoft Corp. LAN Manager-compatible LAN that supports Unix, Xenix, DOS, OS/2 and Apple Computer, Inc. Macintosh machines.

The product costs $4,595 for a 32-user version.

Atlantix
5401 NW Broken Sound Blvd.
Boca Raton, Fla. 33487
(407) 241-8108

Emulex Corp. has announced Version 2.1 of its multiprotocol software package designed for its family of local-area network communications and printer servers.

The upgraded release includes enhanced Transmission Control Protocol/Internet Protocol features and provides Serial Line Internet Protocol point-to-point connectivity.

The product can be used on the Emulex Performance 4000 line of terminal servers, the Emulex 8000 fault-tolerant communications server and the Performance 3000 printer servers. It is priced at $500, and volume shipments are scheduled for the first quarter of 1991.

Emulex
3545 Harbor Blvd.
Costa Mesa, Calif. 92626
(714) 662-5600

Network management

David Systems, Inc. has introduced David Expressview, a software system designed to provide users of its Expressnet Intelligent Concentrators, workstations, bridges or routers with single-workstation network management capabilities.

The product uses in-band Simple Network Management Protocol signaling to enable users to manage a network from one management station. It runs under Microsoft Corp.'s Windows 3.0 on an Intel Corp. 80386- or 1486-based IBM Personal Computer AT or compatible. Expressview is slated to be available at the end of the month.

The price of a single Ethernet application is $1,495.

David Systems
701 E. Evelyn Ave.
Sunnyvale, Calif. 94086
(408) 720-8000

Hewlett-Packard Co. has introduced HP 495X PC Utilities Software, a set of application programs designed for use with its wide-area networking protocol analyzers.

The programs enable users to remotely control and analyze test data from a central site without using dedicated protocol analyzers at central and remote test sites, the vendor said.

The product is included with the HP 4951C ($3,980), HP 4952A ($7,040) and HP 4954A ($16,470) WAN protocol analyzers. Owners of any HP WAN protocol analyzer can purchase HP 495X PC Utilities Software as a stand-alone product for approximately $250.

HP
3000 Hanover St.
Palo Alto, Calif. 94304
(800) 752-0900

The Wollongong Group, Inc. has announced Management Station Release 2.0, a software product that is based on the Simple Network Management Protocol, which enables network managers to monitor and control complex internetworks.

The product includes a set of tools, including an X Window System-based Open Software Foundation Motif graphical user interface, a network map and an interface to Ingres Corp.'s Ingres relational database management system.

A single-user license is priced at $10,000, regardless of platform.

The Wollongong Group
1129 San Antonio Road
Palo Alto, Calif. 94303
(415) 962-7100

Zaron Software, Inc. has announced LAN Watch, a system designed to provide personal computer and network security while running on IBM Personal Computer ATs, Personal System/2s or compatibles.

The product can be used to prevent unauthorized downloading or copying of programs to floppy disks, PCs or networks. A file server version can monitor up to 99 connected workstations, according to the vendor.

LAN Watch is priced at $95, and the file server version costs $495.

Zaron Software
13100 Dulaney Valley Road
Glen Arm, Md. 21057
(301) 592-3334

Tekelec has announced the Chamelan 100, a test system designed to provide complete monitoring and statistical analysis for high-speed Fiber Distributed Data Interface networks.

The product can be used to continually test and diagnose problems and evaluate performance, regardless of the type of traffic loads on the network, according to the vendor.

The Chamelan 100 is scheduled to begin shipping in the first quarter of 1991. Pricing starts at $36,000.

Tekelec
26580 W. Agoura Road
Calabasas, Calif. 91302
(800) 835-3532

Gateways/ Bridges/Routers

Cisco Systems, Inc. has introduced the Cisco Protocol Translator, which was designed to allow intercommunication among networked machines via Transmission Control Protocol/Internet Protocol X.25 and Digital Equipment Corp.'s Local Area Transport (LAT) protocols.

Pricing starts at $7,925 for a LAT/TCP translator with an Ethernet interface. An LAT/TCP X.25 version can be purchased with two types of serial interface options, depending on type of line speed required.

A unit that provides maximum serial communication of 64K bit/sec. costs $9,400. A 4M bit/sec. version costs $10,125.

Cisco Systems
1525 O'Brien Drive
Menlo Park, Calif. 94025
(415) 326-1941

"At St. Jude, we're caring for children with cancer. We need a network that can care for itself."

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From an interview with Albert Herrington, St. Jude Children's Research Hospital.

"We don't want a big network administration staff. We're a research hospital dedicated to catastrophic childhood diseases, and that's where the money goes."

What problems did you face?

"The worst problem was the conglomeration of hardware to be tied together. Everything from PC ATs to DEC VAXs and an IBM AS/400. That, and continuous moves as we remodel and expand the facilities."

Whose network operating software did you evaluate?

"Everyone's, it seems. IBM's, AT&T's, Novell's, Banyan's and 3Com's."

How does St. Jude feel about choosing Banyan's VINES® now?

"We're extremely pleased. VINES' StreetTalk® feature has made moving people easier because you can reach them anywhere, anytime on the network without having to know their specific server. And since VINES is so reliable, we can concentrate more time on application development and helping our users take full advantage of the network."

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Banyan's VINES network operating software can make organizations of all sizes more productive, while minimizing operating costs. For a further description of St. Jude's networking problems and real-life solutions, write or call us at 800-828-2404 (in MA 508-836-2828).

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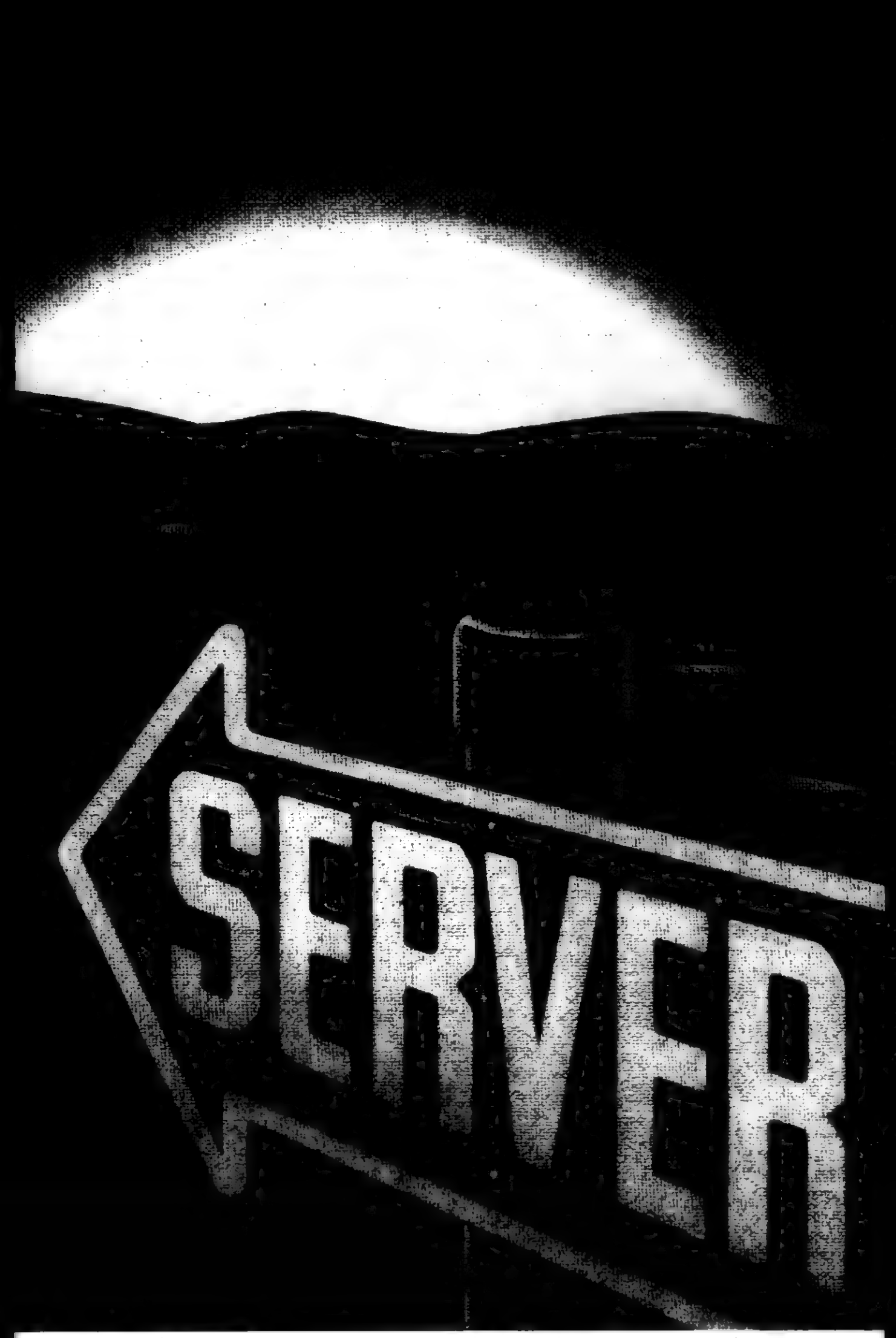

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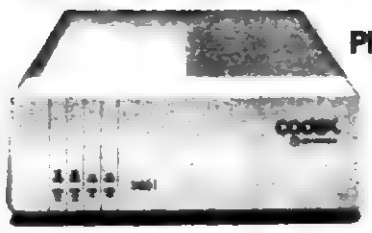

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MANAGER'S JOURNAL

EXECUTIVE TRACK

Donald G. Liedtke has been appointed chief information officer at **Valcom, Inc.**, a nationwide chain of franchised and company-owned computer stores based in Omaha.

Liedtke formulates and supervises information strategies to facilitate communications between Valcom and more than 300 dealers in 46 states. He is a member of the firm's executive management committee.

A 15-year information systems veteran, Liedtke has been vice president of corporate product development at First Tennessee Bank for the past three years. Before that, he was president and owner of Don Liedtke, Inc., an IS management consulting firm specializing in the air freight and distribution industries.

.....

William E. Kelvie has been named senior vice president and chief information officer at the **Federal National Mortgage Association (Fannie Mae)** in Washington, D.C.

Kelvie was formerly a senior partner at IS consultancy Nolan, Norton & Co. He opened the firm's New York office in 1986 and served as managing principal there, developing IS strategies for investment and money center banks in the U.S. and Europe. Before that, he designed and implemented large applications at The Dexter Corp. and The Travelers Corp.

As Fannie Mae's first CIO, he will lead the congressionally chartered company's effort to use advanced technology to improve service.

Kelvie holds a master's degree from Trinity College.

.....

Gary S. Lynch, formerly vice president and manager of corporate information security at Prudential-Bache Securities, Inc. has been appointed **Northeast regional sales manager at Pyramid Development Corp.**, a West Hartford, Conn.-based vendor of personal computer-based computer security software. Lynch was previously manager of data security at Martin Marietta Data Systems in Orlando, Fla.

The hidden costs of open systems

Managers find that freedom to choose brings new responsibilities and up-front costs

BY J. A. SAVAGE
CW STAFF

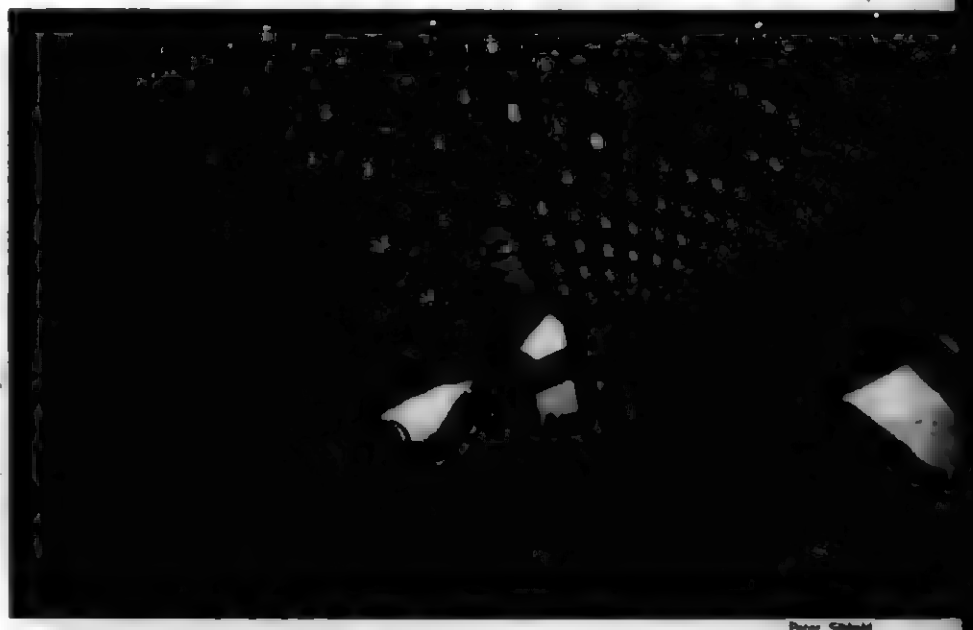
When service stations were *service* stations, many drivers did not even know how to work a gas pump. With self service, the price of gas dropped, but drivers had to learn to pump gas, find the crankcase and carry a tire pressure gauge in the glove compartment.

As information systems managers begin to adopt open systems in this era of not quite standards, they too find that full-service vendors no longer fully service the systems. The responsibility of maintenance — and much more — is now falling on their shoulders.

"Open systems gives customers freedom of choice, but the price of freedom is responsibility," says David Ticoll, director of emerging technologies at DMR Group, Inc., a Montreal-based consulting firm that recently completed in-depth interviews with 100 IS employees in organizations with open systems.

In taking on more responsibility, managers cite several common points: They learned to go for the vendor's jugular in demanding support by making veiled threats to switch suppliers. They also have to spend more time on homework, and more money on training.

"It does complicate things," says Charlie Hamlett, who is the vice president of IS at La Quinta Motor Inns, Inc. in San Antonio. "In the vendor-dependent world, you have to pay for that support, but eventually, you get a body out there to solve problems. In the generic world you get, 'You're on your own, Jack.' "



Peter Stilbell

Four Seasons Hotels' McDowell: *The onus is on the open systems customer.*

La Quinta was previously in the hands of vendor Texas Instruments, Inc., with its DX 10 hardware and proprietary operating system.

Most IS managers who have opted for open systems conclude that the management headaches are worth the cost savings and technology benefits. But they do feel strongly that their colleagues should be aware of the additional training and maintenance needs before taking the inviting open systems plunge.

"It's much more than Unix," says Geoff McDowell, manager of technology and research at Four Seasons Hotels Ltd. in Toronto. "It includes standard communications protocols, standard ways of accessing databases, standard graphical user interfaces and standard development and productivity tools."

To the extent that open systems vendors can answer basic questions such as configuration, they have been reasonably supportive, McDowell says. "But the onus really falls back on us, the customer," he says.

McDowell formerly had support from a turnkey package based on Data General Corp.'s Nova hardware from the 1960s. He said that the first changeover to open systems, with Intel Corp. 80386-based desktop systems and Hewlett-Packard Co. minicomputers, was "traumatic."

Continued on page 84

Risk management: As easy as 1 through 10

BY MITCH BETTS
CW STAFF

You've been through dozens of meetings like this. The manager of a big software development project stands in front of a flip chart and drones on about the project's monthly status report, carefully accentuating the positive and glossing over the problems.

This takes up 50 mind-numbing minutes of the hour-long meeting, leaving the information systems executive only 10 minutes to ask probing questions and find out the *real* status of the project.

But there is a better way, according to Barry W. Boehm, an authority on software risk management. At a recent lecture sponsored by the National Institute of Standards and Technology, Boehm said that one of the most effective ways to monitor software projects is to convert the typical "progress review" into a risk-management meeting, which focuses on the Top 10 items that could jeopardize the whole project.

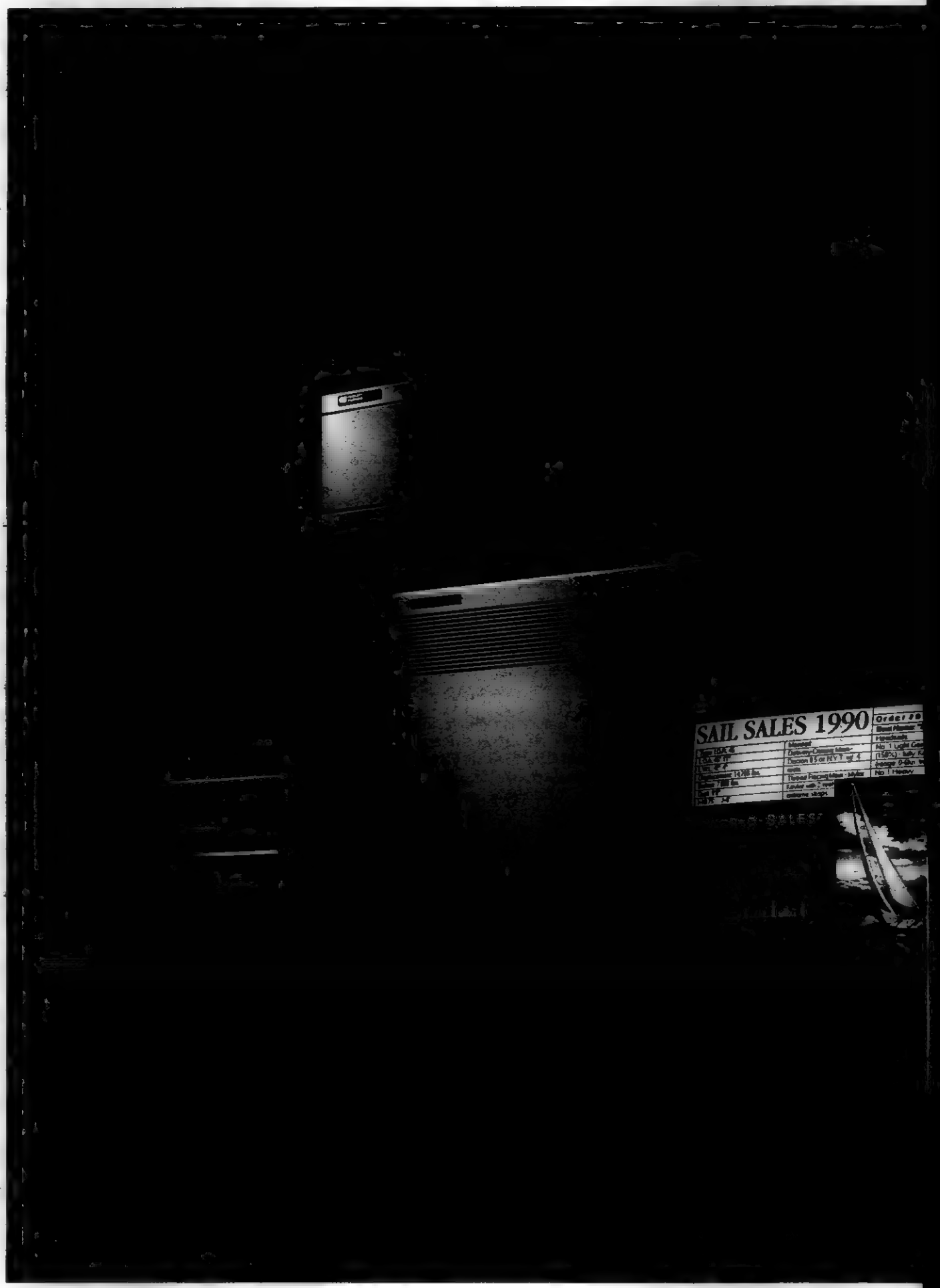
"Focus the review on things that can really make a difference and the manager can really do something about," said Boehm, director of information science and technology at the Defense Advanced Research Projects Agency in Arlington, Va.

He said the risk factors tend to fall into the following categories: personnel shortfalls; unrealistic schedules and budgets; developing the wrong software functions or interface; a continuing stream of requirements changes; and real-time performance shortfalls.

Software developers should calculate the risk exposure for each item, using the following equation: risk exposure equals probability of unsatisfactory outcome times loss from unsatisfactory outcome. For example, if a software feature has a 20% chance of failure and that failure would totally ruin a $20 million scientific experiment, the risk exposure is $4 million.

Even if the loss cannot be stated in dollar terms, users can score the items on a scale of one to 10 so that the IS manager can give attention to the items with the highest risk exposure, Boehm said. Unfortunately, many managers instead focus on minor programming errors that have a high probability but low losses, he said, neglecting the portions of the software that could produce a catastrophe.

HP's RISC puts unprecede
HP's NewWave Office puts



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37 computers give you the choice of power you need.
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Beyond this, HP NewWave Office incorporates an extraordinary new "agents" capability. Agents can handle a wide range of sophisticated tasks. For instance, they can automatically gather data, analyze it, generate a report and distribute it.

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HEWLETT PACKARD

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Port Authority on tight ship

New IS director reorganizes units for efficiency and cost-effectiveness

BY MAURA J. HARRINGTON
CW STAFF

NEW YORK — After more than six months of intensive study and review of the Port Authority of New York and New Jersey's information services department, Director Wilma Horne is reorganizing the department into four separate divisions.

Horne, who came to work at the Port Authority last March from Blue Bell, Pa.-based Unisys Corp., said things were "in order" when she arrived, but they were not quite as organized as she would like them to be to run such a large operation with the necessary efficiency and cost-effectiveness.

So Horne went to work reshuffling the 270-person department to help the Port Authority's 23 other divisions run a tighter ship in these economically difficult times.

"Part of my reasons for establishing these units is to find out all of what is out there. The business units take advantage of hardware and software solutions, and some business units have gone out and bought full solutions from vendors that fit their individual unit's needs," Horne said.

"That doesn't mean that we will change those solutions," she added, "but we have to understand what is going on in each department. The challenge is to take a central resource and establish which business unit gets prioritization for certain applications or services."

Horne explained, "Our basic charter is to provide information services for all the individual business units in the most efficient and effective manner."

Charter with a mission

The charter is also not without a mission, she added. That mission, according to Horne, is "to ensure that the potential of information technology is fully and effectively utilized by the business units of the Port Authority in the achievement of their missions, strategies, business and operational objectives."

The four new divisions of the information services department, which will be developed and refined as needed during the next several months, include: applications services, telecommunications services, technology services and strategic and financial planning.

The applications services division, which was officially announced to the public late last month, was developed to take over the tasks that were formerly provided for a business unit within the Port Authority by the management/systems analysts, client consultants and systems designers and programmers, according to Horne.

This division will also act as a single point of contact between distraught users and the information services department and will provide end-user application support, project management and consultating.

An information center, which was formerly called the client services division, and a development support services subdivision will also fall under the applications services division, Horne added.

The information center division will continue to be responsible for facilitating end-user computing and will maintain office information systems as well as provide end-user software support and training.

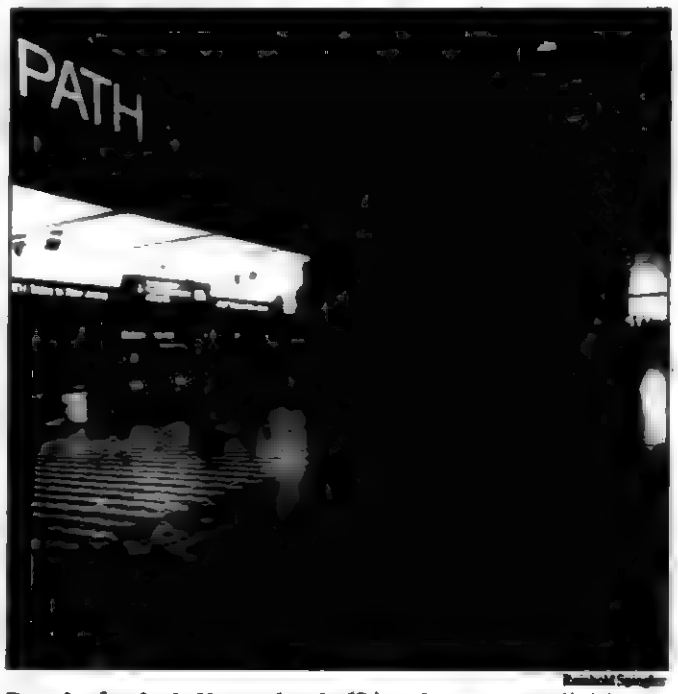
Development support services, according to Horne, will be responsible for ensuring that the tools and processes used by the divisions are appropriately selected and consistently used throughout the Port Authority to avoid overlap or redundancy in problems.

Blueprint maintenance

Development support services will coordinate, document and maintain a blueprint of the Port Authority's applications architecture for the various business units.

That department will also be responsible for all computer-aided software engineering strategies, for the quality assurance processes for all applications and for recruiting and training development staff members, according to a report written by Horne.

"From a financial purpose, we have to run the Port Authority under one budget and one division, but from a business perspective, we will assess each department and run them somewhat separately," Horne said.



Reinhold Spengler

Port Authority's Horne *breaks IS into four separate divisions*

Decentralization easier said than done

BY CLINTON WILDER
CW STAFF

Few can argue with the benefits of decentralized systems development — lower costs, faster turnaround and more business-responsive applications. But many information systems departments trying to get to that point are reaching the same conclusion: easier said than done.

Although moving some development to business units and smaller platforms may make infinite organizational and technological sense, some IS departments are meeting strong cultural resistance from veteran mainframe programmers and analysts. That resistance may result in increased training costs and lower morale — and put the brakes on decentralization plans.

"It's not clear that the same people doing glass-house development will want to do decentralized development; it's a very different mind-set," said Stuart Woodring, author of a report on decentralized development for Forrester Research, Inc. in Cambridge, Mass. "The staff of software development today is not necessarily the right staff to run it in the future," he said.

James River Corp. encountered initial opposition to converting the business applications at its Kalamazoo, Mich.-based paperboard packaging unit from an IBM 4300-class mainframe to Application System/400 midrange systems.

"The resistance at the front end was, 'We've always done it this way. We know these systems inside and out — why do we want to change?'" said James Miller, vice president of MIS at Richmond, Va.-based James River. Miller said about half of the employees at the Kalamazoo mainframe data center were retrained to work in the midrange environment, but the other half transferred to non-IS jobs or left the company.

At International Multifoods, Inc. in Minneapolis, Vice President of Information Services Paul Taylor credited a successful 4381 to AS/400 migration to project teams focused tightly on each business unit's applications — and a lot of retraining.

"There are three elements to being successful: the technology, how it relates to the business process and making sure we appreciate the human aspects of bringing the technology to bear," Taylor said. "Top-flight technology won't overcome difficulties in the other two; if anything, it would exacerbate the situation."

Taylor said his department carefully chose the mainframe developers for the midrange project teams. Those who participated successfully in International Multifoods' migration from Burroughs Corp. to IBM a few years ago were not necessarily selected.

"Burroughs to IBM was a substantive change but within a similar structure and environment," Taylor said. "Some of those people might not have done as well going to the midrange."

A Forrester survey of 50 companies in the Fortune 1,000 found that only 12 have successfully shifted centralized development staff out to departments or business units. More often, Woodring said, the IS department hires new programmers and analysts while reducing the central mainframe development staff through attrition.

However, that "new blood" in decentralized IS can be a problem for end users, Miller said. "The bulk of the resistance [to James River's conversion] was voiced by people who used the applications," he said. "When you bring in midrange people, the average age drops about 20 years, and all of a sudden the comfort level [for technical support] isn't there."

Cultural resistance by users also occurs when formerly decentralized development functions are centralized. CBS, Inc. in New York is consolidating its programmers [CW, Dec. 18, 1989], and Vice President of MIS James L. Halsey III said he is sensitive to the disruption.

"We will sacrifice transition time for project continuity in order to avoid damaging client relations," he said. "Clients that had their own complete IS organizations tend to be less thrilled [with the centralization]. They see an increased administrative component up front, but we have to win them over with more efficient prototyping and development."

William M. Walsh dies at 54

William M. Walsh, 54, executive vice president of the New York Clearing House Association, died of cancer on Nov. 10.

Walsh, a 1958 graduate of Franklin and Marshall College, joined the Clearing House in 1983 as senior vice president and director of data processing. He was promoted to executive vice president this past May.

Walsh *specialized in funds transfers*

In his most recent position, Walsh was responsible for overseeing paper-based exchange and settlement processes averaging $33 million daily. He also supervised two electronic funds-transfer systems, the Clearing House Interbank Payments System and the New York Automated Clearing House, which are responsible for the exchange and settlement of nearly $1 trillion daily.

Walsh had previously worked at Burroughs Corp. from 1962 to 1969, then served as a management consultant at Booz, Allen & Hamilton, Inc. He was also assistant vice president of systems services at the Federal Reserve Bank of New York until 1976, when he became senior vice president of corporate services at Carteret Savings and Loan Association. From 1981 to 1983, Walsh was senior vice president/executive officer of the Data Services Division at Connecticut National Bank.

Walsh resided in Pleasantville, N.Y. He is survived by his wife, Irene, and two sons.

COMMENTARY

Les Gilliam

Developing an information security policy

Your company, like so many others, may be dependent on electronically stored and transmitted information. If so, the growth in the use of telecommunications networks, electronic data interchange, personal computers, off-premises terminals and dial-up access has caused the protection of corporate information to become a high-priority issue.

Many senior managers are concerned about the risk of loss or diversion of vital data as well as the possibility of a damaging or embarrassing incident occurring.

To address these potential risks, many corporations are developing an information security policy to assure senior management that line managers and employees are taking all reasonable steps to protect the corporation's information assets.

An information security policy should state that all information resources are corporate assets and that they should have appropriate security protection, as would any other corporate asset. These information resources include hardware, software, data, images, text, graphics, networks, voice information and supporting facilities.

Further, the policy should express management's concern over the risk of loss and unauthorized access to corporate computers and electronic information.

The policy should emphasize responsibility and accountability regarding information resources: Every information asset must have an owner; the owners are responsible for providing appropriate security for the assets under their jurisdiction and are accountable to management for the use and protection of those assets.

The policy should also make the point that protection must be appropriate for the value of the asset at risk.

The information security policy should cover all aspects of protection, such as physical security, disaster recovery, password management, backup and restore, applications design and development, program testing, controls, documentation, copyright and patent protection, copyright compliance, telecommunications security, dial-up restrictions and security administration.

In addition, the policy should address local-area networks, facsimile machines, answering machines, radios and mobile and cellular phones.

The policy should be organized in a logical fashion, grouping general standards together with specific areas following. For example, the policy will likely begin with an introduction or a letter from senior management explaining the current business risks that warrant the development of the information security policy and the expectations for compliance with the policy. It should state that the auditing department will report known violations.

Next, the section on general standards that are relevant to all types of computing will be presented. Included in this section should be topics such as physical security, disaster recovery, asset ownership, password management and security administration.

The sections that follow should cover the various types of computing resources in the company, such as mainframes, departmental computers, PCs, process control and telecommunications.

The policy should also address other relevant issues, such as nonemployee personnel and the responsibilities of the policy committee. A glossary may also be desirable.

Developing a corporate information security policy can usually start with the appointment of an information security policy committee. It is important for the committee to represent both information systems and users.

The team can begin by writing the project objectives, developing work plans and making assignments. It is helpful for team members to research similar policies of other companies and to conduct interviews within the company to establish requirements and parameters for the policy and to develop the master outline.

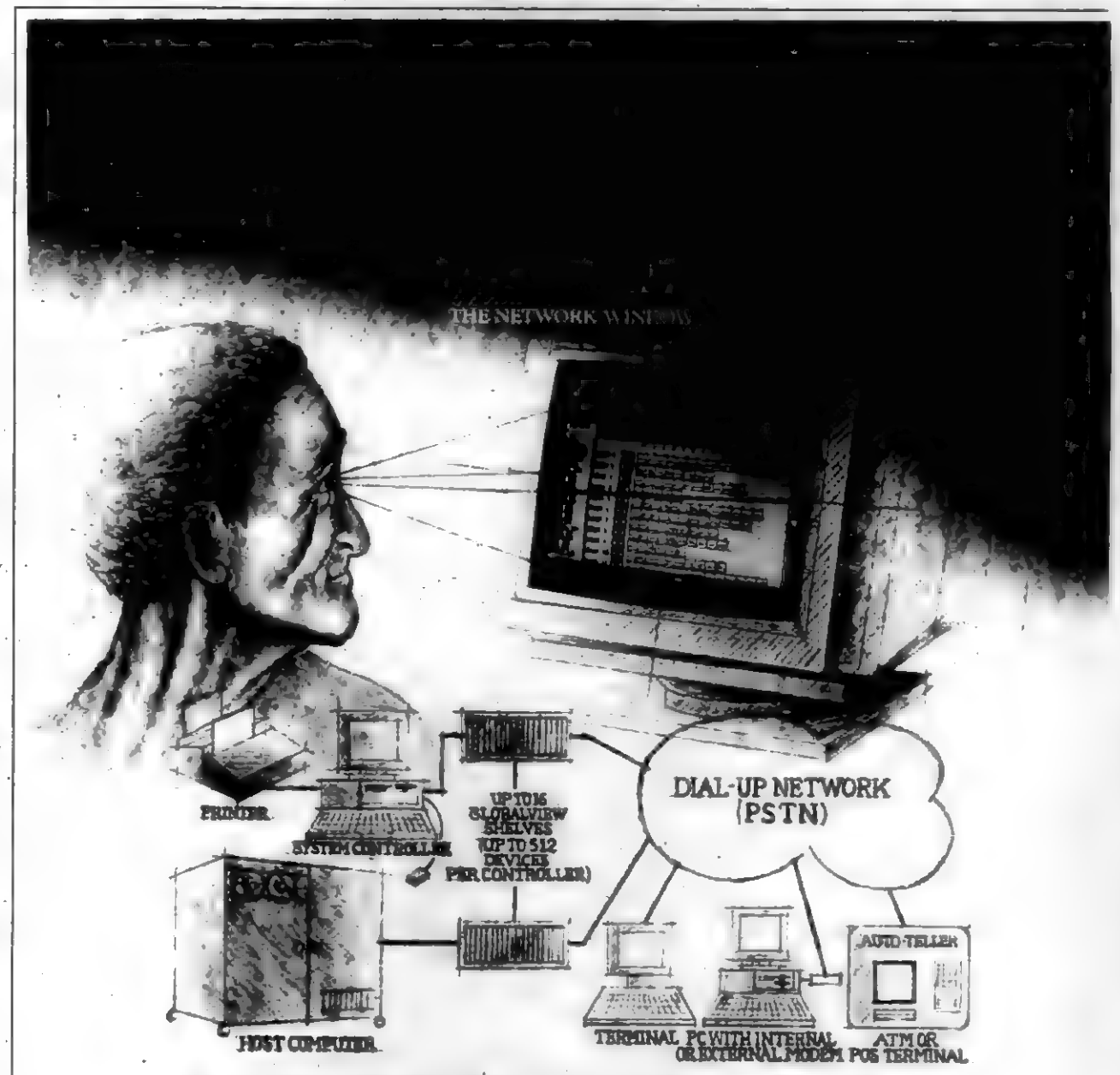
Next, the team will write drafts of the various sections of the policy, review and revise the drafts and distribute to key individuals for editing.

The final draft can then be sent to senior management for review and approval, after which the policy can be published.

Thereafter, the auditing department will look for compliance in the normal course of auditing the various departments and will report to management.

The policy committee should meet periodically to discuss issues relating to the policy, circulate revised versions of the policy as appropriate and keep senior management informed of the status of and compliance with the policy.

Gilliam is president of Gilliam Associates, a computer management consulting firm in Ponca City, Okla.



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BOOK REVIEW

A hopeful look at The Big Picture — and how IS fits into it

G-FORCES
By Frank Feather
William Morrow and Co., $22.95

Information systems professionals are often advised to stretch beyond their own technical worlds and "take a broader view." You can't get much broader than *G-Forces*.

The "G" stands for "global" — and that's no overstatement. The author, Canadian futurist Frank Feather, takes readers far beyond the usual IS approach to expanding horizons through "learning the business." In neat, enthusiastic prose, Feather describes 35 major "geostrategic" forces, including information technology, that are reshaping tomorrow's world.

"Great," you're probably thinking. "Another future book telling me that I need to learn Japanese, move to Arizona, get a telecommuting job and begin eating seaweed." But wait, there's something here beyond the usual Pollyanna vision of techno-uptopian bliss.

What makes Feather different — and relevant for IS readers — is his ability to credibly tie technology into a wider, longer view of world development.

Feather sees computers, telecommunications and other modern inventions not as devices that sprang from nowhere and took on a life of their own but as catalysts and evolutionary stages on the way to a new 21st century leisure society based in outer space. It sounds gee-whiz and a bit far out, but Feather makes it all seem plausible.

The so-called G-Forces can be grouped into four categories: social, technological, economic and political. Greatly simplified, the basic idea is that social and human needs spark technological innovations. These, in turn, are harnessed to restructure and modernize the planet, with an eye toward producing worldwide wealth for all. Finally, this new economic order produces political and governmental reform.

The common agent of change and wealth creation, according to Feather, is information.

While few IS professionals may feel like they are creating a new world order in their everyday work, Feather says that, bit by bit, they are doing precisely that. He concludes that technology will be instrumental in ushering in the "Fifth Wave" leisure and tourism economy by 2020. He is particularly hopeful about supercomputers, Next, Inc. workstations and Integrated Services Digital Network and predicts that Japan will be *the* superpower of the information age for the next 30 years.

An appealing aspect of *G-Forces* is a belief that the future doesn't just happen, it is made. The book builds on the ideas of futurists Buckminister Fuller, Alvin Toffler, Marshall McLuhan and Jonathan Schell and suggests that gloom and doom scenarios are not inevitable. "By 2050," Feather boldy asserts, "we can reinvent the world."

Some readers might tire of Feather's mighty and unflagging optimism. But in the gray, post-Reagan 1990s, a little *realistic* positive thinking might not be all that bad, and *G-Forces* manages to get away with it most of the time.

Not that it matters: the author, a self-described "pragmatic business man" — seems almost unconcerned about his ideas being seen as practical — or even feasible. He is content, Feather writes, "to disturb . . . to change some minds . . . to reject doomsday attitudes."

Feather brings impressive credentials to the task. A 22-year veteran of world banking, the English-born author has advised the International Monetary Fund, the World Bank and the United Nations. Since 1981, he has been president of a Toronto firm that consults on a wide range of topics — including global economics, technology transfer and strategic planning. *G-Forces* is his first book.

For IS professionals, *G-Forces* can help lend perspective and meaning to an increasingly complex and abstract technological working world. It does so by shattering the deep-seated — and often unconscious — belief of many in IS that technology exists for and unto itself.

As recent business history has shown, technology exerts a profound influence on the company that deploys it. It follows, Feather argues convincingly, that this effect will also be felt by the whole human race magnified a billionfold.

At 438 pages, *G-Forces* is hefty but modular. It's packed with charts, diagrams and lists. It also features an extensive bibliography.

If you feel that your work life is buried in Cobol debugging or downsizing planning, and you want some perspective, *G-Forces* offers an interesting version of The Big Picture. If you love drowning in your daily minutiae, that's all the more reason to read it.

JOSEPH MAGLITTA

Maglitta is a *Computerworld* senior editor, In Depth/Integration strategies.

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Open systems

CONTINUED FROM PAGE 77

David Carlson, senior vice president of corporate IS at K Mart Corp. in Troy, Mich., has not found vendor support to be quite so hostile, but neither have open systems vendors been entirely helpful. He says he has used the freedom of vendor choice to coax more help out of them.

"If it's proprietary, the vendor might pinpoint the problem, but resolution doesn't get done any faster because they think they won't get kicked out," he says. Managers must often pinpoint the areas in which vendors will help, while developing in-house expertise in areas where they will not help. Carlson says that he uses a third-party maintenance organization for hardware. For the operating system, he either gets the vendor to fix any problems or switches vendors — exemplifying the leverage that customers can have in the open systems world.

Carlson says K Mart switched from IBM's AIX to The Santa Cruz Operation's version of Unix because of support issues.

"But if it's the application, that's our own doing," he adds. "We have to take the responsibility for fixing it."

Most managers agree that software is the most aggravating and costly aspect of vendor independence. Before migrating to a new release, "you have to go back to your package suppliers and make sure the packages and the development tools will run on the new operating system," McDowell says.

Peter Tobia

K Mart's Carlson *uses 'freedom of choice' for leverage*

Jeff O'Neil, director of advanced systems at Arco Research and Technical Services in Plano, Texas, says that developing software in-house for the new Unix environment is getting better, but it's still "nasty." He is looking into better graphical user interfaces to protect his developers from the vagaries of the various versions of Unix. "It will get better as we raise the abstract from Motif and Open Look to object-oriented programming," O'Neil notes.

While portable software should be cheaper than proprietary, it usually is not, McDowell adds. He says there are layers of software that are necessary to buy with open systems, such as an interpreter between the databases of Sybase, Inc. and Oracle Systems Corp., even though they are both Unix-based.

"Say you have two databases you want to run on a machine. I have to spend an incredible amount of money on an interpreter to make them work together," O'Neil says. "On the positive side, though, the scalability is great."

While managers involved with open systems agree they have to trade in more responsibility for the advantageous economies of open systems, they said that in general, it is worth it.

MOST MANAGERS agree that software is the most aggravating and costly aspect of vendor independence.

"You have to do a lot of training, and it's a big up-front cost," says Roger Cooper, deputy administrator for management at the Farmers Home Administration. But, he says, once the training is done, staff will have transferable skills, and "you'll make your money back in a year or two."

Money is indeed the reward for indulging in open systems. Carlson estimates that, since 1985, his company has saved more than $100 million over proprietary-based systems.

"By putting hardware out to bid, there's an implied threat that we'd switch hardware vendors," he says. "We use that leverage. We buy in large lots, and the pricing is extraordinary." The last bid Carlson put out was for 1,000 workstations.

"You have more control," Cooper agrees. "You can really ratchet on the vendors. But there are no free lunches. It takes up-front time."

It is the early adopters of open systems who are facing the management issues head-on.

Open systems vendors "will not advise you in a way that you will go buy other vendor's products," Ticoll says. "The leading-edge users are fighting the battle for the rest of us."

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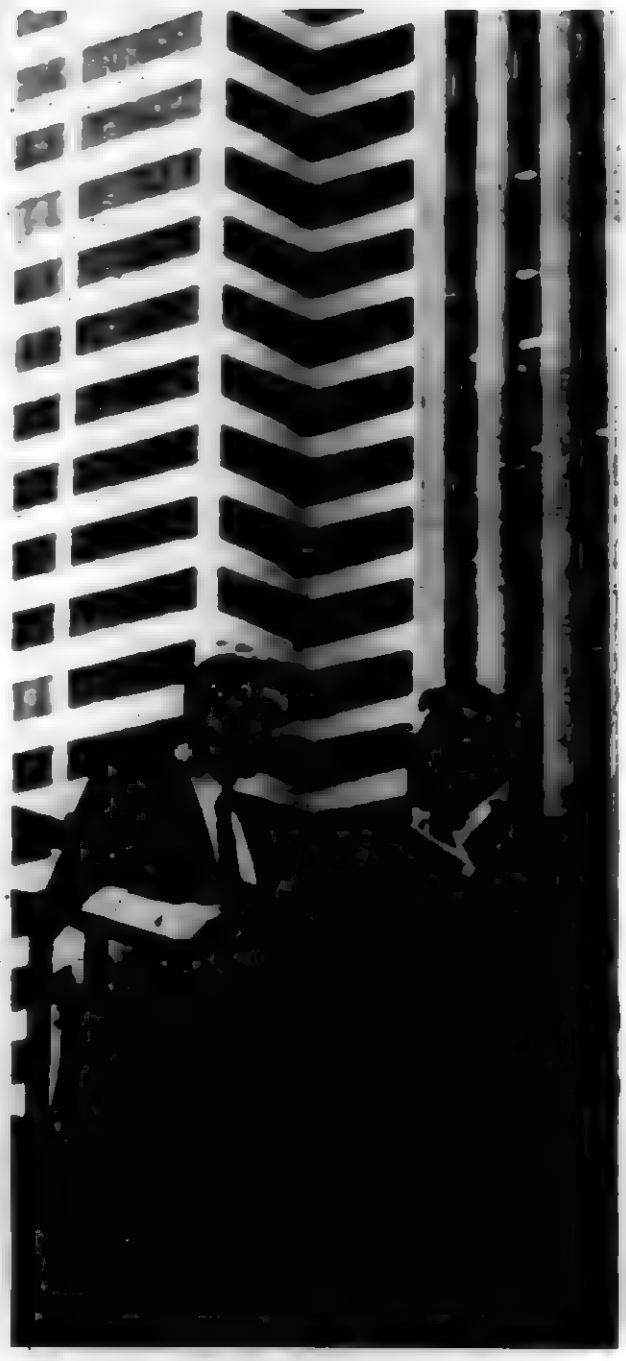

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For more information, contact Digital Consulting, Andover, Mass. (508) 470-3880.

DEC. 9 - 15

Networking with Macintosh. Orlando, Fla., Dec. 9-12 — Contact: Pam Schur, MACIS, Chicago, Ill. (312) 644-6610.

Bring Technology to Market. Palo Alto, Calif., Dec. 10 — Contact: Jeanette LeVert, Regis McKenna, Palo Alto, Calif. (714) 858-4420.

Virtual Reality: Theory, Practice and Promise. San Francisco, Dec. 10-11 — Contact: Kim Devon, Westport, Conn. (203) 226-6967.

Fed Unix '90. Washington, D.C., Dec. 10-11 — Contact: Fed Unix '90, Bethesda, Md. (301) 229-1062.

Global Networking Conference. New York, Dec. 10-11 — Contact: Telecommunications Report, Conference Dept., Washington, D.C. (202) 347-2970.

CMG '90 International Conference. Orlando, Fla., Dec. 10-14 — Contact: General Chairman, CMG '90, CMG Headquarters, Chicago, Ill. (312) 938-1228.

Comforum. Orlando, Fla., Dec. 10-14 — Contact: Comforum, Chicago, Ill. (312) 938-3500.

Annual Flat Information Displays Conference and Exhibition. Santa Clara, Calif., Dec. 11-12 — Contact: Murray Disman, Information Associates, Menlo Park, Calif. (415) 322-0247.

Despo West '90. Las Vegas, Dec. 11-13 — Contact: Despo Registrar, Boston, Mass. (617) 730-5708.

Database World Conference & Exposition. Boston, Dec. 11-13 — Contact: Digital Consulting, Andover, Mass. (508) 470-0526.

JAN. 6 - 12

International Security Conference and Exposition West '91. Anaheim, Calif., Jan. 9-11 — Contact: Cahners Exposition Group, Des Plaines, Ill. (708) 299-9311.

Mathematica Conference. San Francisco, Jan. 12-15 — Contact: Maury Kendall, Wolfram Research, Champaign, Ill. (217) 398-0700.

JAN. 13 - 19

Pacific Telecommunications Conference: Accessing the Global Network. Honolulu, Jan. 13-16 — Contact: PTC, Honolulu, Hawaii (808) 941-3789.

National Retail Federation Retail Industry Convention and Exposition. New York, Jan. 13-16 — Contact: NRF Convention Registrar, New York, N.Y. (212) 563-5113.

Technical Conference on the X Window System. Boston, Jan. 14-16 — Contact: MIT Laboratory for Computer Science, Cambridge, Mass. (617) 253-8861.

Telecom Skills Workshops. Waikiki, Hawaii, Jan. 17-18 — Contact: Pacific Telecommunications Council, Honolulu, Hawaii (808) 941-3789.

NOMDA East Regional Convention. Orlando, Fla., Jan. 17-19 — Contact: Katy Dunn, NOMDA, Kansas City, Mo. (816) 941-3100.

JAN. 20 - 26

Data Visions '91. San Francisco, Jan. 20-23 — Contact: Earle Speraus, Wordtech Systems, Orinda, Calif. (415) 254-0900.

Unix Technical Conference. Dallas, Jan 21-25 — Contact: Usenix Conference Office, El Toro, Calif. (714) 588-8649.

Infotext '91. Las Vegas, Jan. 22-23 — Contact: Bob Dale, Infotext Publishing, Capistrano Beach, Calif. (714) 493-2434.

Uniforum 1991. Dallas, Jan. 22-24 — Contact: Bob Linke, PEMCO, Des Plaines, Ill. (708) 299-3131

JAN. 27 - FEB. 2

Communication Networks '91 Conference and Exposition. Washington, D.C., Jan. 28-31 — Contact: Michael Sullivan, World Expo Corp., Framingham, Mass. (508) 820-8268.

Network Computing Forum and Exposition. Washington, D.C., Jan. 29-31 — Contact: Christine Krajewski, World Expo Corp., Framingham, Mass. (508) 820-8126.

FEB. 3 - [illegible]

Macapp Conference. Phoenix, Feb. 4-8 — Contact: Macapp Developers Association, Everett, Wash. (206) 252-9946.

Macintosh/N.Y. '91. New York, Feb. 5-7 — Contact: Peter Kimpton, Exposition Management, Waltham, Mass. (617) 290-0612.

Florida Educational Technology Conference. Tampa, Fla., Feb. 5-8 — Contact: Barbara Ann Cox, Office of Educational Technology, Tallahassee, Fla. (904) 488-0980.

NOMDA West Regional Convention. San Diego, Feb. 7-9 — Contact: Katy Dunn, NOMDA, Kansas City, Mo. (816) 941-3100.

FEB. 10 - 16

Video Expo. San Francisco, Feb. 11-15 — Contact: Debbie Rotolo, Knowledge Industry Publications, White Plains, N.Y. (914) 328-9157.

Managing Information Technology when the Going Gets Tough. London, Feb. 12 — Contact: Suzy Mayhew, London, England 071 236 4080.

FEB. 17 - 23

Northwest Computer Show. Minneapolis, Feb. 19-20 — Contact: Judy Koch, Plymouth, Minn. (612) 420-5376.

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BOTTOM LINE COMPUTING:

The Challenge for the '90s

"After spending millions of dollars on computing, corporations now must find ways to make their investments pay off. Downsizing corporate systems, client/server computing and outsourcing have emerged as the key issues companies must face to thrive in the '90s."

Richard A. Shaffer
Editor and Publisher of Computer Letter

A SPECIAL ADVERTISING SECTION SPONSORED BY BUSINESSLAND, INC.

"Downsizing" Corporate Applications

The concept of "downsizing" has attracted much attention from the IS community recently and has generated even more controversy. At one extreme, there are those who argue that we will be able to "throw away the old dinosaur" as soon as we port the application down to the PC. At the other extreme, there are those who argue that the PC will only add "cosmetic" value to the corporate data processing function. The truth is obviously somewhere in the middle. Systems of all sizes will have full citizenship in the distributed enterprise environment—and "downsizing," as a type of distributed processing, can be used to "distribute the workload" throughout the environment.

This downsizing, or rearchitecting selected corporate computing jobs to run on distributed systems, is an exciting new option for MIS—a result of continuing improvements in computer systems technology. Distributed networks involving powerful servers and intelligent workstations are now helping mainframes cope with the growing information requirements of the '90s. Downsizing can offer the savvy MIS manager some new options:

- in managing systems, support and maintenance costs;
- in applications development;
- in managing technology turnover; and
- in optimizing data access throughout the organization.

Just as the IS executive "managed the business" in the past by leveraging all available technology and systems resources, so too will they be applying this expertise to these new tools in their portfolio of technology options.

Many of the nation's largest PC users have already moved some of their mission-critical applications from minicomputers or mainframes to distributed servers on PC LANs. But while the lure of less expensive hardware is strong, downsizing is not a simple or risk-free venture—it requires careful planning.

Companies wanting to distribute their applications must consider the new demands that this will place on their existing host mainframes or minicomputers. Large system manufacturers such as IBM are preparing for the change.

"We're working aggressively to address customer requirements for total integration of the enterprise-wide network," says Ellen Hancock, vice president and general manager of IBM's Communication Systems business organization. "We see large host computers acting as high performance servers for multivendor networks." To facilitate this new role, IBM and other companies are developing sophisticated connectivity and network management capabilities that allow access to and management of such multivendor networks—including wide area networks that link remote sites—providing users anywhere in the world with access to the data and resources needed to do their jobs.

Expanding functionality of large host computers to have them act as file servers lets MIS leverage large existing bases of applications and services. In most cases, this could lead to greater efficiencies for in-house programming and support used to maintain the corporate computing environment. "The users' overriding need is for systems capabilities that enable them to respond quickly and cost-effectively to the constantly changing business environment," says Charles E. Exley, CEO and chairman of NCR Corporation. "The microprocessor-based architectures and industry-standard operating systems support this need by providing access to thousands of packaged applications and a universe of consulting and support services."

Effectively implementing distributed systems may require expertise your company might lack, however. For use in a distributed environment, host computer applications would have to be modified and companies would have to develop effective means of managing data resources across distributed networks. In many cases, firms form close partnerships with outside service providers with specific expertise in downsizing. Standardized entities, such as database engines based on Structured Query Language (SQL), can ease the transition by allowing companies to maintain a smooth information flow throughout the corporation while allowing hardware diversity.

In those situations where downsizing is appropriate, the option of distributing the application load among the various computing devices in the enterprise network can prove to be another effective tool in managing your information technology investment toward achieving your business goals.

"Downsizing" at Pillsbury

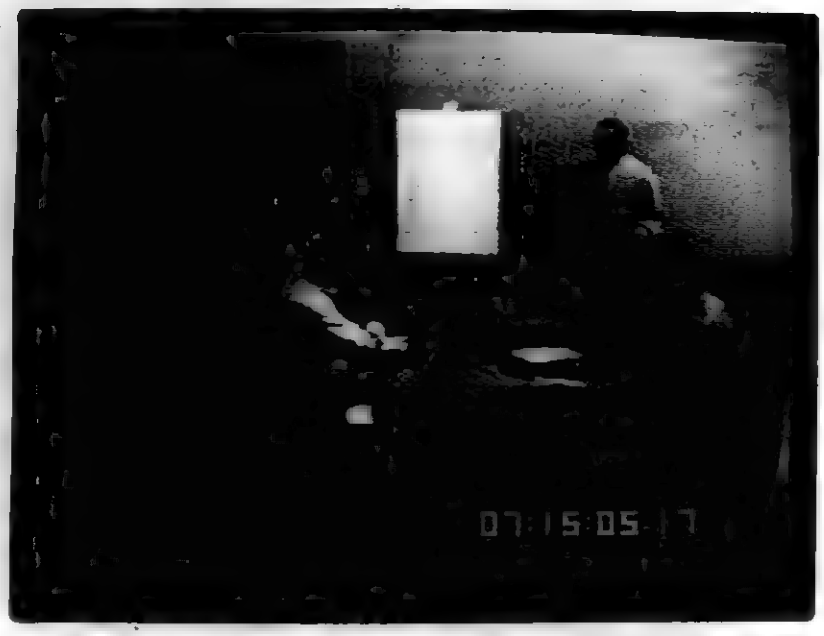
At Pillsbury Brands, a part of the Food Sector of Grand Metropolitan PLC, downsizing led to new applications, lower costs and better management control.

The decision to downsize was made after an analysis of Pillsbury's aging mainframe system revealed a critical need for better communication between the company's Minneapolis headquarters, plant sites and sales offices.

"Companies of every size are constantly looking at ways to cut costs while improving information management systems," says Irene Stecher, MIS manager at Pillsbury Brands. "Large organizations are now planning microcomputer-based, enterprise-wide network solutions to improve their competitiveness in the '90s. We decided that was the right way to go."

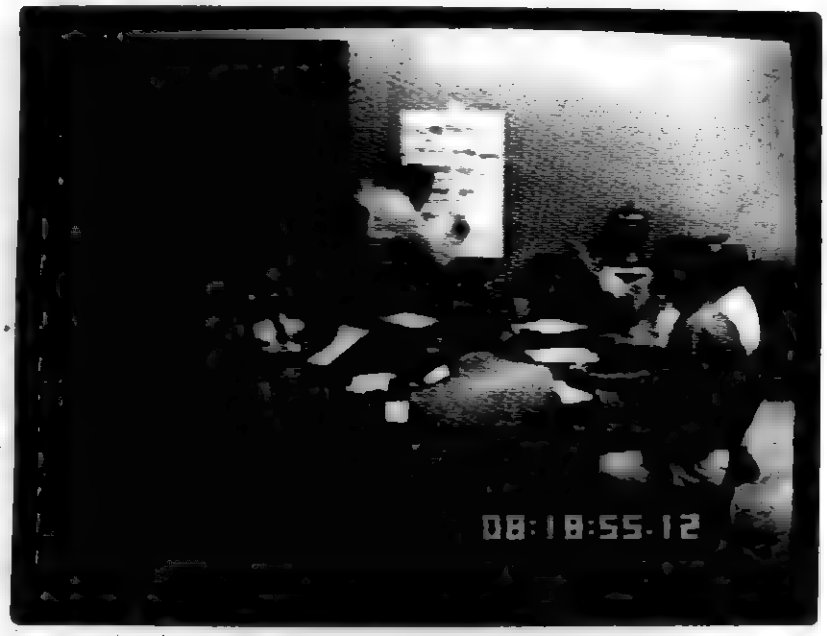
Downsizing to PC LANs allowed Pillsbury to distribute processing power where it was needed, and to implement a company-wide electronic mail network. PC LAN servers handle critical database applications at headquarters and plant sites, while users at individual PCs in Pillsbury sales offices can enter orders directly via modem.

By downsizing to more cost-effective, accessible LAN servers, Pillsbury streamlined its information flow while improving network manageability. PC LAN servers now running common operating systems and applications throughout the organization make the system easier to support and manage than ever before.

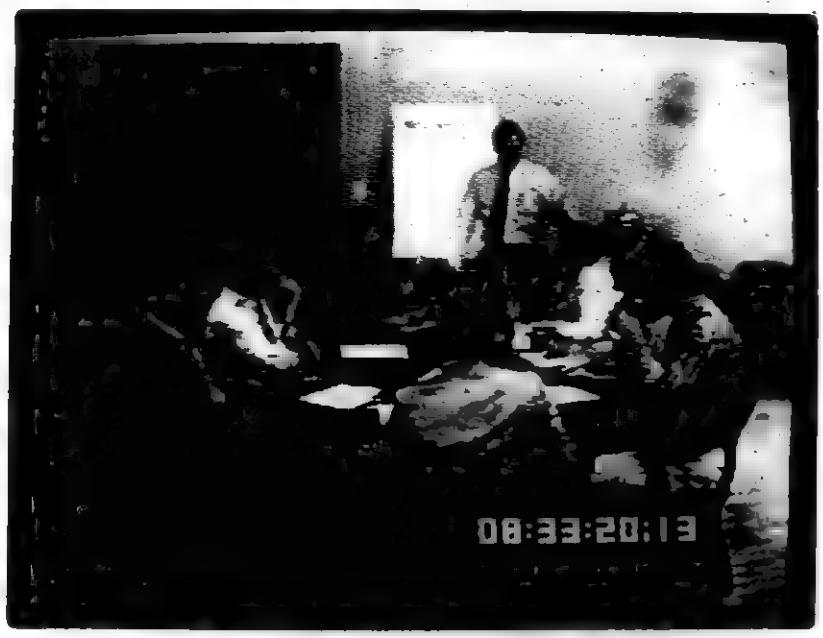


"My ultimate PC system? Well, for starters, it's got to be compatible with everything I've got already... so you can take a floppy from an old PC, pop it into a new one, and it will work."

"Networking PCs is a major pain. I'd like to see PCs designed to do networking without lots of configuration work... and still connect with all the networks I've already installed."



"We've got plenty of data... the challenge is to put it in the hands of decision makers in a form they can use. The perfect PC would be an ideal client to all my information systems."



"Every time I turn around, vendors change the operating system or interface. I want to be able to drop the hottest new box on my executives' desks and know their software will run."

Hidden camera reveals the se

Not long ago, we invited hundreds of IS managers to talk about their wildest desires in a personal computer system.

They talked. We listened. We videotaped. And when we got those tapes back to Silicon Valley, popped them in the VCR and started watching, it confirmed what we knew all along.

They wanted a personal computer system that was compatible enough with their existing PCs to trade files on floppy disks. Like Macintosh.®

They wanted a system with the power and flexibility to run thousands of business programs and almost any kind of operating system: MS-DOS, Macintosh and UNIX.® Like Macintosh.

They wanted a graphical user interface with no compromise in performance. Like Macintosh.

And they wanted all their software to have a single way of working, so training and support costs could be dramatically lower. Like Macintosh.

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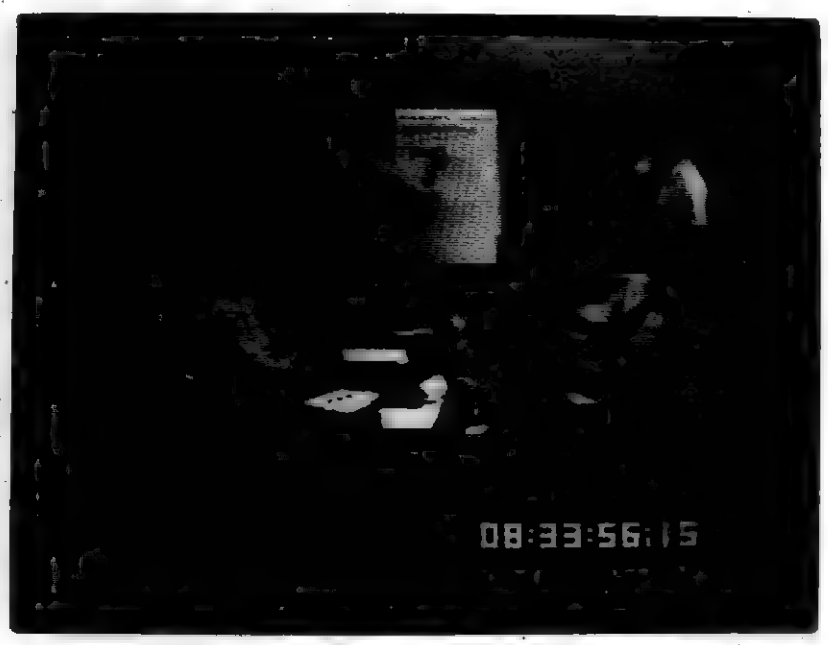
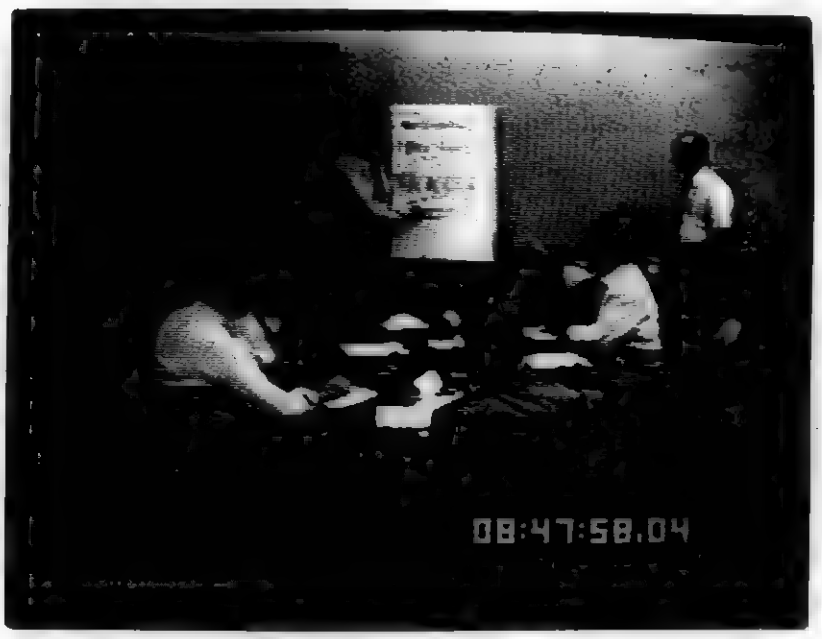
"A graphical interface is clearly important... users love 'em. But the architecture has to be designed to handle it or the performance compromise is unacceptable."

"I'd like to see more discipline from software developers. Commands should be consistent for every application... it would eliminate the cost of constantly retraining."



"My company's needs go way beyond off-the-shelf software. I need serious development tools my existing programming staff can use to develop custom apps quickly and easily."



"Macintosh? No kidding?"

cret desire of 200 IS managers.

They wanted a system with sophisticated networking capabilities built in, that could let users access almost any host or file server via any kind of network. Like Macintosh.

They wanted all these things in a wide range of personal computers. That would all work the same way and run the same software. Like Macintosh.

And they wanted powerful development tools that would let their existing programming staff build applications quickly and easily. Like Macintosh.

In short, they wanted everything that Macintosh offers. But they just didn't realize they could have it today.

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The power to be your best.™

Client/Server Computing

In the rush toward personal computer productivity during the 1980s, many companies leapt from the proven security of centralized time-sharing systems to the relative chaos of early PC networks. In this explosive environment, technologies and standards evolved quickly. Unfortunately, this runaway evolution of diverse computers on divergent LANs created a technological Tower of Babel. Within its walls, corporate data stored on one computer could not easily be accessed by or managed from another. Client/server computing bridges these differences, providing corporate-wide data access and control. In this new environment, data may be stored on different servers from different manufacturers. These servers run the gamut from mainframes to microprocessor-based LAN servers. Now, the entire corporate computing plant becomes a data service network allowing individual users—also known as "clients"—access to the data they need. And because of new cross-platform data and network management tools, corporate information managers gain improved control over the system.

Client/server computing makes the departmental server the new point of standardization in the corporate data system. It allows end-users to choose hardware or software that makes them most productive. It gives departments exactly as much computing power as they need in small, cost-effective packages. Collectively, it gives corporations a streamlined system of information management that places data and computing resources where they are needed most.

MIS managers converting to multivendor client/server systems face the challenge of architecture control. In this complex environment where different applications require different hardware solutions, server and network architectures are required to support uniform corporate data standards. In order to succeed at this task, they must allow all data to be exchanged across their networks as smoothly and transparently as possible.

"Moving to a client/server architecture creates the opportunity to significantly improve the corporate information flow," says Michael Spindler, chief operating officer of Apple Computer, Inc. "Along with lower costs and more flexibility, the client/server model creates a peer-to-peer data interchange environment that allows people to work together more productively."

"Today's technology enables us to build network computers that combine the high reliability, data integrity and centralized administration features of mainframes, with the simplicity, flexibility and cost-effectiveness of personal computers," notes Enzo Torresi, president and CEO of NetFRAME Systems Incorporated. "For business-critical applications, a network computer system, or server, makes much more sense than continued investments in minicomputers and mainframes because it's compatible with existing PC standards

and is easier and more efficient to maintain, upgrade and support."

While PC LANs solve many departmental computing needs, selecting their hardware components from the wide variety of available suppliers can be a perplexing problem. With so many applications to accommodate, finding

hardware and software that maximizes local productivity is a true challenge. Fortunately, the client/server computing model allows companies to integrate diverse hardware forms without interrupting the corporate information flow. With the server as the new point of standardization, incompatible hardware can now be integrated through the use of data access standards, like SQL.

"Most companies have a mix of hardware platforms," says Michael Hallman, president of Microsoft Corporation. "Ideally, you want to allow users to work with the desktop system that makes them most productive, while still giving them transparent access to corporate data. Today, there are applications for Windows, MS-DOS, OS/2, Macintosh and other operating systems that all support SQL database access."

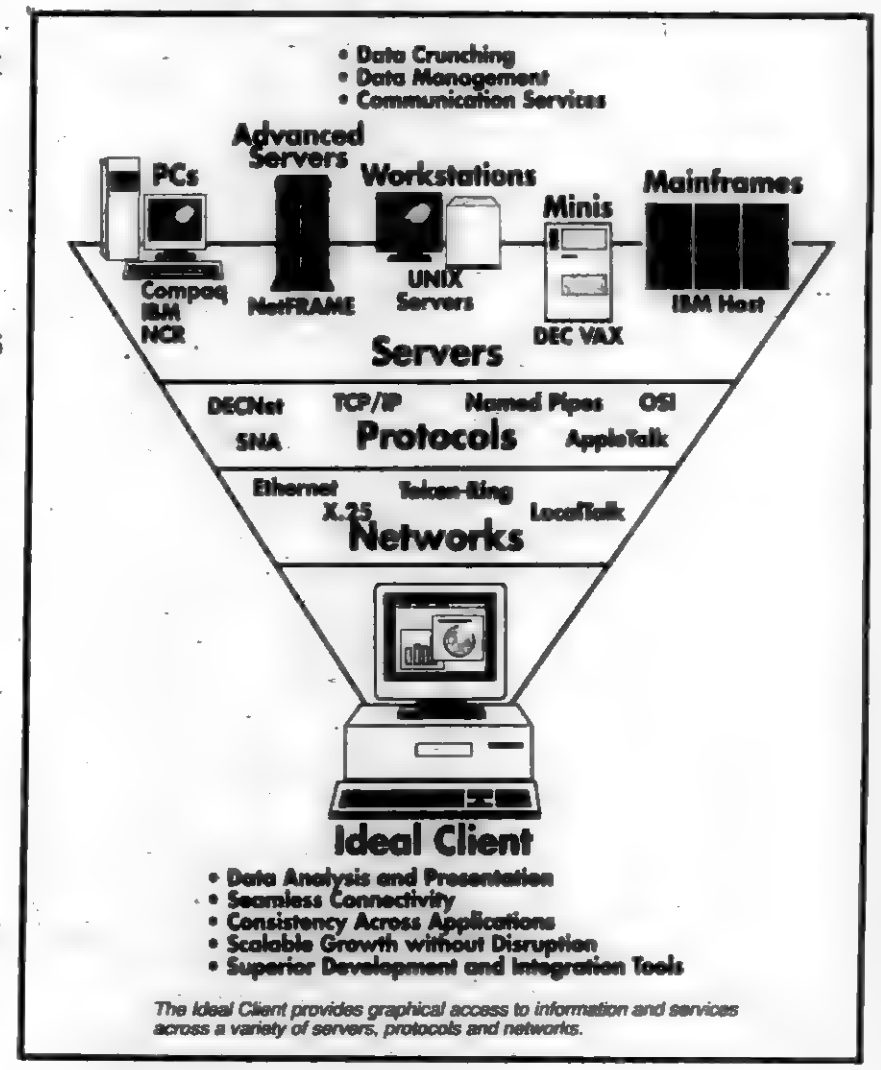
In addition, the client/server model allows companies to maximize previous investments in computer hardware by reconfiguring it for new roles. Mainframe or minicomputer systems that once served as centralized processing centers can be reassigned as high-speed data servers on a client/server network.

In this evolving client/server architecture, the focus moves to using the right tool for the job. Information and services will reside on multivendor platforms—minicomputers, mainframes and workstations—across the network, all acting as servers. The client, the desktop computer, becomes the key point of access to these diverse systems. This places new demands on selecting desktop systems.

"To function as a universal client in a multivendor, client/server environment, the desktop computer must meet four criteria," adds Michael Spindler. "It must offer multivendor connectivity. It should operate consistently across applications, operating systems and network services. It must foster growth without obsolescence of hardware or software, and it must provide a range of applications, as well as powerful development tools."

In considering a mix of hardware and software solutions, however, MIS managers must consider the need for comprehensive network management. Client/server computing can make data manageable from anywhere in the corporate network only if the selection of network management tools is made with the same diligence and planning used to select servers and network software.

Properly implemented, the client/server computing model bridges the gap between the centralized formality of mainframes and the flexibility and individual productivity offered by LAN servers. Ultimately, client/server computing is destined to become the dominant corporate computing model.



The Ideal Client provides graphical access to information and services across a variety of servers, protocols and networks.

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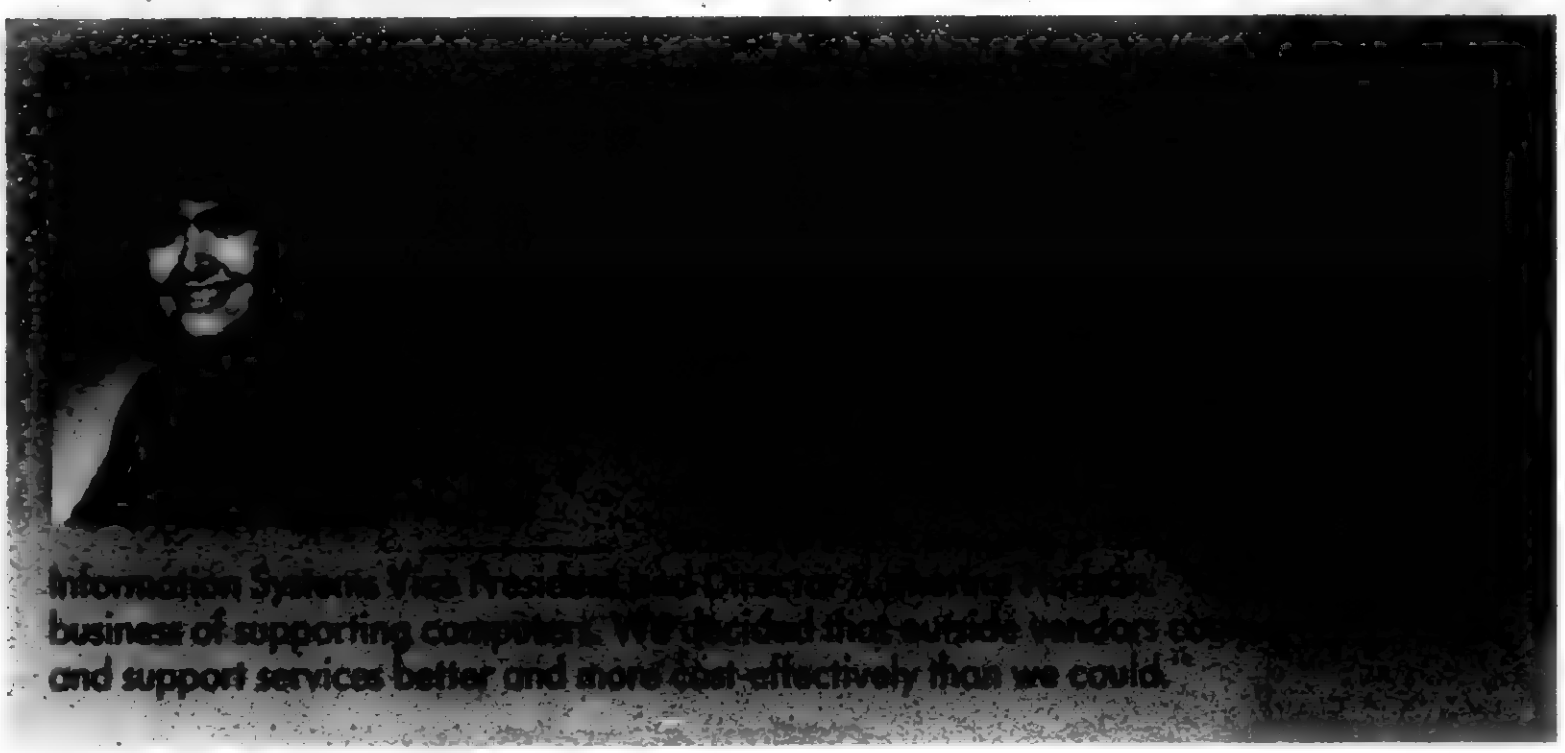
The Outsourcing Issue

These days, trying to manage and support a rapidly diversifying computing environment has become a business in itself. But it is a business your company may not want to be in. Outsourcing—shifting most of the information systems management burden to an outside provider—is increasing as companies seek to cut costs, improve support and remain competitive.

"Corporate computing environments are getting more powerful and complex," says Gary Sorkin, vice president of Corporate Accounts at Businessland. "We feel our customers can be far more competitive by focusing internal resources on strategic or business-specific applications. These add real value, improve performance of support services and decrease associated costs by offloading the delivery of generic or product-specific support services to outside professionals."

Computer support is a burgeoning business. National firms like Businessland offer a wide range of services including systems sourcing (purchasing, order processing, configuration and installation); support services (help lines, LAN/WAN implementation, customized training, product evaluations, on-site maintenance and asset management); and consulting (design and integration, project management, applications design and operational reviews).

Outsourcing can bring a fresh perspective to the overall MIS operation by making people take a business view. "Cost review is just good management practice anyway," says Glenn Miller, director of Business Development at Businessland. "Simply analyzing a potential need for outsourcing can show you how to streamline your services, how to get the most for your money and how to increase competitiveness."



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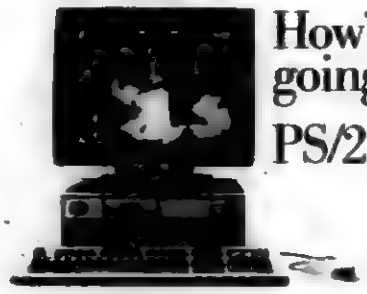

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There's no magic genie in a new system

BY LARRY STEVENS

It happens over and over again in business and industry. A company invests in technology expecting to increase productivity. It spends hundreds of thousands or even millions of dollars on equipment, months installing hardware and software and weeks training staff members. But the end result is an insignificant gain — far too little to pay for the equipment and installation costs.

Is the technology at fault? In most cases, no. The problem is more likely to be bad aim than a bad system.

Take the case of Northern Telecom, Inc.'s San Diego plant. Four years ago, it tried to increase productivity by installing an expensive and complex chip-handling station capable of receiving and processing on-line data from upstream equipment. Last year, plagued by increased time and expense to train operators to use the new station and seeing no change in productivity levels, the company ripped it out.

Problem identification

John Rolph, system specialist at the plant, explains that the workstation seemed to offer a temptingly easy way to eliminate the bottlenecks that were keeping productivity at the plant low. Unfortunately, the company hadn't analyzed the flow of materials before purchasing the equipment. Had it done so, it would have discovered that the bottlenecks resulted from other sections of the plant. Replacing a workstation that was one of the better-functioning pieces of the factory didn't help products move out the door any faster.

"We had a problem, and we had a solution," Rolph says. "The trouble was, the solution wasn't the right one for our particular problem."

Unfortunately, says Paul Berger, president of Paul Berger Consulting in Lawrenceville, N.J., that's not an uncommon predicament. In fact, it's minor compared with what can happen if the overlooked process problems are really serious.

Mark Green

Schlumberger's Peiser *says scattershot improvements fail*

What many companies fail to understand, he says, is that "information technology is not magic. If you have a poorly run company that puts technology in place, you'll end up with a poorly run company with expensive technology."

Most companies are finding that information systems investments are more likely to have a beneficial effect on productivity when the changes are carefully calibrated with improvements in work processes and organizational structures.

Schlumberger Well Services in Houston figured that out a few years ago, when it had to deal with the competing pressures of reduced profits and a more demanding market. During the mid-1980s, the Schlumberger Ltd. division, which builds oil well monitoring equipment, was facing losses resulting from a drop-off in oil exploration and decided to compensate by reducing its staff.

Recognizing that this kind of a move would be difficult at a time when both product complexity and the number of product introductions were increasing, the company decided to institute concurrent engineering, supported by a heavy investment in new computer-aided design and manufacturing (CAD/CAM) equipment.

According to Buddy Peiser, the company's CAD manager, the new equipment did increase productivity. It just wasn't enough, all by itself, to compensate for the loss of manpower.

Although the concurrent engineering effort had tightened the loop between engineering and manufacturing, there was still a breach between the business and manufacturing sides of the operation. With fewer hands to process the paperwork, engineering changes for special orders and new products were taking far too long to make their way from sales and marketing into the manufacturing process.

The missing link

Once the organizational deficit was identified, the company was able to fit an information system into the gap and achieve the kind of systemwide streamlining that was required. Working in concert with two vendors, Schlumberger developed a system called Engineering and Manufacturing Business Operating Systems (Emboss), which combined a Cullinet Software, Inc. MRP II system with a product information management system from Sherpa Corp. based in San Jose, Calif. Emboss merges the engineering bill of materials, associated product definition data and change process for product information.

Peiser says the number of engineering changes the plant can handle has quadrupled since the system was installed. "If you know what the problem is, technology can fix it," he says, "but you can't just go around installing equipment until you know how it's going to help you."

Possibly because of the pressure from foreign competition, most experts say that manufacturers have actually been more successful at analyzing organizational problems and installing appropriate technologies than other types of business.

Michael Rosow, executive vice president at the Work In America Institute, says that technologies such as CAD/CAM, inventory control systems in support of just-in-time manufacturing and MRP II systems have resulted in an average increase in productivity of about 4% per year in the manufacturing sector

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Stevens is a free-lance writer based in Springfield, Mass.

INSIDE

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Personal managers: Pros/Cons

BY SCOTT KRAMER

The search for personal productivity through better organization is assuming the proportions of a crusade for many businesspeople struggling to stay ahead of deadlines and on top of expanding lists of responsibilities.

Hollywood even got a script out of the phenomenon: The recent movie *Taking Care of Business* is the story of how a lost Filofax changes a power executive's life. And software companies have carved a substantial market out of personal computer packages that help individuals organize their working lives.

"I've been using Sidekick Plus for a total of three years now," says Mel Dittmann, president of Dittmann, Ryan and Associates, an executive search firm in Laguna Hills, Calif. "I rely on it 100%. I don't use paper at all."

Ciba-Geigy's Kantor *used to lose papers until he started filing them electronically*

Dittmann says the product, which features a calculator, a telephone autodialing feature, a DOS directory and an alarm system that goes off to remind him of appointments, provides him with everything he needs to organize his work life.

One of the most popular products of this type is Agenda from Lotus Development Corp. Ron Unger, chief executive officer of Intelligent Controls Corp. in Detroit, swears by Agenda, which he says has increased his productivity significantly. "The great thing about it for a person in my position is that there are an awful lot of balls in the air at one time. This package allows me to put them all in one place," Unger says.

Time gain is the biggest benefit as far as Bob Kantor is concerned. Kantor, manager of technology research at the pharmaceutical company Ciba-Geigy Corp. in Ardsley, N.Y., says since he started using Agenda, he no longer wastes precious minutes searching for meeting times or reminder notes on elusive scraps of paper. "Once I throw something in there, I know it's not going to get lost," says Kantor, who admits that he used to lose papers trying to manually file them into the appropriate slots.

Judy Housman, a Cambridge, Mass.-based consultant who leads the Boston Computer Society's Project Management Information Personal Management Club, says that many business people who think they need a project management package really need a personal information manager.

"A lot of people come to me and say they need a project management package," Housman says. "In fact, they don't, because they don't have a big project. They have lots of little things."

Although such products offer substantial benefits, there is still some room for improvement.

Housman says that although some products can run as programs within other programs, the toggling back and forth can become cumbersome. What users would really like, she says, is the ability to pull up information from these programs in pop-up windows within other applications.

Memory constraints can also be an issue. Some of these products work only in DOS and take up considerable portions of the operating system's limited memory capacity.

Yet another complaint is that some of these packages are too complex for relatively untutored computer users to figure out on their own.

Housman: *Pushes personal managers*

"We have not done a good job of providing easy, powerful tools for new users," says Bob Woolbert, a PC consultant based in Laguna Niguel, Calif. "I would suggest that they focus on putting the complexities of these packages in the background and making the ability to use that power more transparent to the users. We're beginning to see some of those things, but we're still not there."

In the meantime, it is best not to let users struggle in isolation, because enthusiasm can evaporate rapidly without some orientation. Unger, for example, although now a fervent convert, says that his initial reaction to Agenda was frustration. After trying to read through the manual, he gave up for a while until others in his office also bought the package and showed him just how easy it was to use.

Woolbert, like many others, uses several packages for both himself and his clients. He says they all have good points, but none can perform all the functions that may be desired.

One function Woolbert does find particularly useful is a computerized address and telephone directory from Day-Timers, Inc. in Allentown, Pa., which is essentially an on-line version of the company's popular organizer books. Not only does it do a good job of formatting names and addresses, he says, but it also allows you to import, format and print out files from Dbase on Day-Timers' forms.

One major group of users for personal productivity software is in the sales area.

Jerry Domagala, an account executive at Intelligent Information Systems, says the package he uses — ACT from Contact Software International — has had a positive impact on his sales effectiveness.

"Instead of having to worry about tickler files, I just push one button, and the program tells me what I need to do, what calls need to be made and when a person was called last," Domagala says. "I can also set up the software to prompt me to call certain people in a week, two weeks or a month," he adds. "It gives me sort of a paperless filing system, and that's great, because I hate to file." •

Kramer is a freelance writer based in Irvine, Calif.

Helper technologies for today and tomorrow

Although it is a mistake to regard information systems as a panacea, the right kind of systems in the right places can make a major difference in productivity. *Computerworld* asked four people who have spent a considerable amount of time working at the intersection of IS and business/industrial productivity to tell us what they regard as the best examples of current productivity enhancing technologies and which technologies they expect will have the greatest beneficial effects over the next few years.

Toby Choate
Arthur D. Little, Inc.

Present: The whole voice-response area has proven very effective, both in IS and for end users. It allows service organizations to respond to customers better. For companies such as banks and insurance companies, it's a good productivity tool. Routine calls such as address changes can be dealt with through voice response, while the person who would have handled those calls is free to handle more complicated requests.

Future: I see a lot of promise in imaging, not necessarily because of the storage issue, but because it allows you to reconstruct your work flow. When you can look at restructuring work processes, you start making real gains.

Another technology that I think will bring big gains is local-area networks. It's not a sexy technology, but it brings you into information sharing and allows your groups to work in different ways.

William A. Ruch
Arizona State University
Co-author of *Productivity and Quality: Measurement as a Basis for Improvement*

Present: While doing some work on productivity measurement, we dealt with operations centers in some commercial banks, where checks are sorted, processed and accounted for. One fellow told us that, working with what they had for equipment 10 years ago, there wouldn't be enough people in the U.S. labor force to process all the checks they now handle. The equipment allowed them to go from sorting several hundred checks per hour to sorting many thousands per minute.

Future: I don't really know. We've all read many times about the great claims made for technologies that would increase productivity, and they're frequently disappointing. Take a secretary with a typewriter who moves to a workstation with word processing and editing capabilities. Of course, she finds that she can do many more things. But now, her boss also feels freer to make corrections or additions, knowing that she can do that so much more quickly. In the clerical or informational area, it's difficult to measure output and thus very hard to tell if productivity and quality have gone up.

Paul Berger
Paul Berger Consulting, Inc.

Present: Rent-a-car companies such as Avis, Inc. and The Hertz Corp. have had success equipping attendants in return lots with handheld [computers]. The old process required the customer to record the mileage and gas, stand in line to report those figures and then wait while someone went to verify the figures. Now, someone goes out there with a handheld terminal as soon as the customer drives in and accomplishes the same thing in half the time.

Future: I'd have to say imaging. If you look at what you can do with direct entry of documents, it has to make a difference in how you use people. Also, machines such as handhelds and laptops hold tremendous possibilities.

Glover Ferguson
Andersen Consulting

Present: I know of an insurance company that got into cooperative processing. They were able to reduce the amount of time they spent processing applications from four days to less than one and cut the average time spent handling phone calls from 30 minutes to four. And that wasn't all: They also cut their error rate on misquotes by 70%.

Future: In terms of the future, I'd still pick cooperative processing, with the ability to support multimedia. When you're still doing linear processing, you have to structure your organization hierarchically and spend a lot of time passing a task through the various levels. With cooperative processing, what you end up with is a flatter organization and thus a lot of people with enriched jobs — more to do.

Continued from page 101

throughout the '80s. However, the U.S. as a whole has not fared as well. Rosow estimates that the service sector has declined in productivity at a rate of about 1% each year.

Because the service sector represents a larger share of our gross national product, productivity losses in that sector have dragged down the overall picture of U.S. productivity.

According to Rosow, the main problem with service companies is that, unlike manufacturing companies, "most service companies are organized with structures that were developed 50 or more years ago."

One service company that tried, and basically failed, to improve productivity using technology alone is IDS Financial Services, Inc. in Minneapolis.

As this insurance and financial services firm grew during the 1980s, it tried to use systems and software as a substitute for staffing increases. Although volumes were swelling, the company thought it could compensate for much of the added work load by adding new systems to increase the productivity of existing personnel. According to Susan Fagrelius, organization development consultant at IDS, when a department became overwhelmed with work, it often tried to solve its problems by computerizing another function or buying a newer version of software or hardware.

Although there were marginal productivity gains from these superficial fixes, Fagrelius says, the company was really playing a game of catch-up against impossible odds until it recognized its real handicap: a segmented functional structure that required too many people handling each piece of business. With that kind of structure, she says, delays, errors and service degradation were inevitable when the volume of business increased.

Three years ago, the company decided to change its organizational structure from function-driven to regional. Now, regional offices are capable of handling each piece of business from beginning to end.

The only system change required to support this change of structure was to provide the regional offices with access to the company's database and to expand the number of users who had access to various parts of it. Before, for example, only the underwriting department would have had access to underwriting data. Now the entire office has to have access to most of the company's database. For the most part, this was a relatively simple matter of altering security procedures.

Fagrelius says that immediately after the changeover in September 1988, the company started finding out from customers and salespeople that their questions were being answered more quickly and more accurately. Furthermore, she says, the company is now able to process 17% more policies with 11% fewer employees — a productivity increase of about 30%.

Now that the organizational problems have been fixed at IDS, managers are again looking at IS for productivity improvement. The difference, Fagrelius says, is that this time computers won't be expected to do more than make a workable structure more efficient.

Aiming true

Technology can actually make structural changes possible, Berger notes. The trick, he says, is to make sure that you are looking in the right direction for the possibilities.

As an example, he points to a client who was trying to increase productivity by purchasing ever more sophisticated order-entry systems but to no avail. However, when the client eliminated the order department and instead placed a computer in the truck so that the driver could take and enter orders directly into the order-entry software, productivity increased.

When deciding whether to apply technology to a productivity problem, cost is always an important consideration. But David Adler, vice president of information services at AT&T American Transtech in Jacksonville, Fla., warns that strict adherence to traditional return-on-investment formulas may obscure the advantage a company gets from offering better service.

American Transtech provides telemarketing services for client firms. Recently, the company purchased Outbound Call Management (OCM) from its parent, AT&T. The system downloads telephone numbers from the client's lists and automatically dials the numbers at a rate based on the number of telephone salespeople on hand. When the phone is picked up at the other end, OCM immediately routes the call to the next available salesperson.

Time saver

Because salespeople do not have to dial the numbers manually, wait for the phone to be answered and deal with wrong numbers or busy signals, the system would obviously improve productivity. In fact, using a traditional measurement — number of calls divided by number of salespeople — productivity at American Transtech increased by between 30% and 50%.

The big question mark was cost. Not only was OCM expensive, but it also required a radical restructuring of the firm's computer system to allow downloading of telephone numbers and installation of new telecommunications equipment. If the company could make calls in half the time and still charge clients the same fee as before, the system would quickly pay for itself. Unfortunately, that wasn't the case. "We knew clients would insist on being charged less when a job that formerly took one month was reduced to only two weeks," Adler says.

This complication muddied the return-on-investment calculations, and it almost led American Transtech to delay buying the system. However, the company eventually decided to purchase it because, as Adler says, "providing better service to clients by getting their lists completed in half the time has to have long-term beneficial effects to our bottom line, even if we can't predict the exact payback period."

Investing in systems for productivity improvement has to involve more faith these days, says Joseph Izzo, vice president of the technology group at consulting firm A. T. Kearney, Inc. in Chicago. Most of the easy gains from automation have already been accomplished, and eking out further efficiencies requires a more sophisticated yardstick than the old formula: number of products divided by number of man-hours. Now, Izzo says, companies must adjust to the idea of productivity as a "gain from any means, including technology, that enhances your relationship with customers or shareholders."

These kinds of improvements, Izzo stresses, are less likely to be achievable by technology alone. "You can squeeze out a few percentage points of productivity increase by automating your accounts payable system," he says, "but if you reorganize your company's structure and then enhance that reorganization with technology, you might be able to raise the level of service to your clients. Sales will increase and so will productivity."

Jerry McAdams, vice president for performance improvement resources at Maritz, Inc. in St. Louis, agrees that the traditional labor-ratio view of productivity is no longer applicable to all situations. "If you improve service to your customer base, how much is that worth to your company? Everyone says 'a lot,' but you can't always measure the exact worth in terms of immediate profit and loss," he says.

McAdams says he believes that companies sometimes have to be willing to be less dependent on quarterly figures. "Our nation is full of companies that are now in trouble because they decided they couldn't invest in a new technology unless managers could prove it would pay for itself in two years," he says.

There is little doubt that, in most cases, companies do derive some productivity benefits from technology in any form. But to become more competitive, companies have to be smarter than others using the same technology.

"Technology in itself will just keep you even," McAdams says. "If you could really solve all your problems by throwing money and technology at them, the richer companies would always win. It's not how much you spend on technology, it's how you use that technology that counts." ●

Recent reverses

Growth in U.S. labor productivity showed initial signs of recovery in 1988 but eroded during October 1988 to September 1989

Source: U.S. Bureau of Labor Statistics and American Productivity Quality Center
CW Chart: Doreen St. John

Catch-22

When productivity is lagging, time is a luxury few companies can afford. Unfortunately, when outmoded systems are part of the problem, the job of fashioning a fix often falls on an already struggling systems staff.

Bob Hunter, vice president of data processing at Max Federal Credit Union in Montgomery, Ala., says his company was caught in a catch-22 situation with an antiquated system that hampered staff productivity and kept programmers so busy, they had no time to think about writing new code.

He found his way out of the dilemma by purchasing Linc, a fourth-generation application generator marketed by Unisys Corp. that allowed him to create a new system in nine months. With the new, easy-to-maintain system in place, Hunter says, programmer productivity has increased by 25%.

Improvements in programmer productivity don't always translate into immediate productivity gain for the company as a whole, however. At John Deere Engine Works, Inc. in Waterloo, Iowa, for example, the struggle to overcome system deterioration caused by the Farm Belt economic troubles of the 1980s took roughly 2½ years.

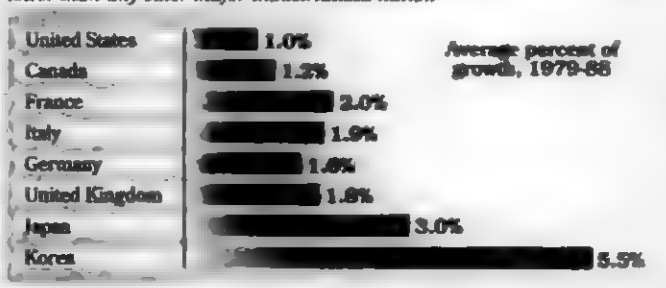
Carlo Pensyl, manager of computer systems, says during that period, staff cuts in the IS area impaired ability to keep factory and business systems up to date. Acquisition of a VAX Cobol generator from Digital Equipment Corp. helped the systems staff considerably, producing an overall productivity gain of 20% for the department. That departmental gain eventually translated into improved productivity in other areas. Those results, however, took considerably longer to achieve than improvements in systems department output.

Why? Systems had already deteriorated to a point where many were falling to pieces, Pensyl says. "If we had more control over the order in which we developed new systems, we would have introduced them in a more logical manner."

LARRY STEVENS

World view

Although the U.S. continues to lead the industrialized world in labor productivity, its average growth in this area for the period 1979-1988 was lower than any other major industrialized nation



Source: U.S. Bureau of Labor Statistics
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Grading IS performance

Precise measures of systems staff productivity still elusive

BY KATIE CRANE

"Do more with less" is a chant echoing through information systems departments across the country, says Robert Rouse, assistant dean of the School of Technology and Information Management at Washington University in St. Louis. Systems departments are under intense pressure to increase productivity and produce clear evidence of that increase, he says.

Although he says the most telling measure may well be "a blood pressure test of the people doing the work," Rouse acknowledges that this reading probably wouldn't pass muster with senior managers and end users. Something more convincingly quantifiable is needed.

Finding a yardstick that is realistic and convincing is difficult. "Everyone is talking about measuring productivity, but virtually no one has succeeded in finding something that is both useful for the people doing the work and effective in demonstrating improvements to senior managers and end users," Rouse says.

Tom DeMarco, a principal at the Atlantic Systems Guild in Camden, Maine, says the pressure is resulting in some unhealthy productivity messages.

DeMarco suggests, for example, that slogans such as "work smarter, not harder" are usually productivity improvement gimmicks aimed at persuading IS to buy some methodology or tool. "Do it faster" (that is, meet an impossible deadline without spending any extra money) is another message that he says he believes costs dearly in the end, both in burned-out IS staff and sloppy results.

> "EVERYONE IS TALKING about measuring productivity, but virtually no one has succeeded in finding something that is both useful for the people doing the work and effective in demonstrating improvements to senior managers and end users."
>
> ROBERT ROUSE
> WASHINGTON UNIVERSITY

However, senior managers who have authorized millions of dollars for information technology for IS want to know if they are getting their money's worth, and that is not always possible.

Wayne Burkan, president of Alternative Visions in Farmington Hills, Mich., says he believes that "at least 90% of IS organizations have no productivity measure at all. And when they do measure it, they measure it in all the wrong places."

Too many IS organizations still measure things that are easily assessed — such as number of lines of code written, cost per CPU cycle or hours worked per project — instead of trying to evaluate how well they support the needs of the organization, Burkan says.

Therein lies the problem. How can IS professionals measure the productivity of essentially nonmeasurable areas, especially when their bosses are demanding a purely quantifiable response? Most agree that it can't be done, at least not perfectly. The new measures are immature and imperfect at best, but, says MIT's Chris Kemerer, criticizing such measures is not an excuse to avoid measurement. Burkan agrees: "We have to dump the old paradigm 'If it can't be measured accurately, we won't report it.' "

Thus, virtually everybody in this arena — academicians, consultants, professional associations and beleaguered IS executives — is searching for new ways to measure IS productivity.

Jerald Lauer, vice president of information services at Certified Grocers of California Ltd. in City of Commerce, Calif., uses a long list of "key measures" to assess the performance of the data center, support services, systems development and information planning. He uses an off-the-shelf software product called Microman II from POC-IT Management Services to plan, manage and assess the performance of his systems development staff and measures the data center on its service levels.

Kay Redditt, president of Cognitech Services Corp., an Easton, Conn.-based IS management consulting firm, suggests that such measures are good internal gauges but adds that IS must also weigh what she calls "business contribution" to answer the question, "Are we doing the right things?"

Cognitech is currently developing a measure of IS' ability to contribute to business goals, based on a variety of factors: architecture, IS management, day-to-day CPU operations, end-user support and the development, maintenance and enhancement of systems.

However, Burkan says he worries that too many IS organizations will jump into developing a huge reporting system to measure performance. Instead, he

Crane is a free-lance writer based in Norwich, Vt.

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suggests organizing an in-house brainstorming session with IS and business users to devise unconventional measures and what he calls "intentional Band-Aid solutions," which he describes as "down-and-dirty" measures rather than refined ones.

John Musa, supervisor of software quality at AT&T Bell Laboratories, says he believes that any measure of IS productivity should factor in quality. A lot of people agree with him, he says, but no one has yet devised a concrete measure of the ratio of quality to cost with an eye toward achieving a proper mix of cost, delivery date and reliability.

For those who insist on more quantifiable approaches, John Henderson, professor of MIS at Boston University, is among a group of academicians researching a productivity modeling approach called Data Envelopment Analysis, and MIT's Kemerer has just finished a study on function points, which he calls "a more user-understandable output measure" originally developed by Allan Albrecht at IBM in 1979.

All in all, DeMarco estimates there are probably a half-dozen perfectly good ways to measure productivity, but all are expensive, which is why IS avoids them.

Avoidance of measurement may not be a viable option for much longer, however. Between the rising tide of executive interest in outsourcing and tightening budgets, Burkan and others say the pressure is on IS to prove what it does and how it delivers benefits. •

Working in the here and now

Merrill Lynch takes street-wise approach to IS measurement

Raj Nigam, chief scientist in the Management Science Group at Merrill Lynch & Co. in Somerset, N.J., regards himself as a "street fighter" when it comes to trying to measure what information systems really accomplish.

Unlike academicians, who can spend time mulling large theoretical concepts such as IS productivity, Nigam says his approach is nitty-gritty tactical. "We're just measuring input and output, not whether that amounts to productivity," he says, "but my feeling was that we needed to get something done, get something simple in place."

Nigam was handed the task of devising a means of measuring the IS contribution at Merrill Lynch just over one year ago and quickly decided that simplicity should rule the process.

"If you put 10 applications developers into a room and let them brainstorm the factors that could be used to measure them, you would very quickly generate hundreds of measures," he says. "A manager can get lost in that. You can draw graphs until you're crazy — color graphs, three-dimensional graphs — and not know what they mean."

Nigam decided instead to assemble a small team of seven systems managers to look for no more than 12 variables that could be measured. He limited the project to three months.

After three months, the team had accumulated 15 measures. Bending his numerical limit, Nigam decided to keep all 15, breaking them into what he describes as a "Chinese menu" consisting of one list of measures that could apply to many groups and another list to accommodate the different styles and emphases of some departments.

The idea, Nigam says, was for departments to be able to pick and choose from the two lists but to also be encouraged to select more of their measures from the first "core" list to ensure some consistency.

Categories for everyone

There are six basic categories of measurement that carry across both lists, according to Nigam. They are the following:

- Bottom-line measures — percentage of commitments met on time and on cost, dollar value of benefits received and percentage of projected benefits received.
- Data orientation — how much data is shared across multiple applications (with the idea that data sharing is an indicator of productivity).
- User satisfaction measures.
- Technical quality measures, such as whether good practices were used in coding or whether documentation meets industry standards.
- Technology penetration — the kinds of tools being used and how often they are used.
- Staff-support-level measures, such as code lines per developer (by language), code lines per maintenance person, skill inventories and staff satisfaction.

Heavy debate broke out during the planning process over use of function points vs. lines of code, Nigam says. "We ended up choosing lines of code by language, acknowledging that we would probably argue another day over whether or not to switch to function points. For the time being, however, there are programs that will do this automatically, and both cost and getting the program going were issues," he says.

Expediency also influenced the decision to stick to measures that focused on departments rather than individual application developers and programmers. "As time goes by, we will have a set of measures tailored to each group," Nigam says, "but right now, we're looking for partial coverage — not to solve the whole problem at once." •

KATIE CRANE

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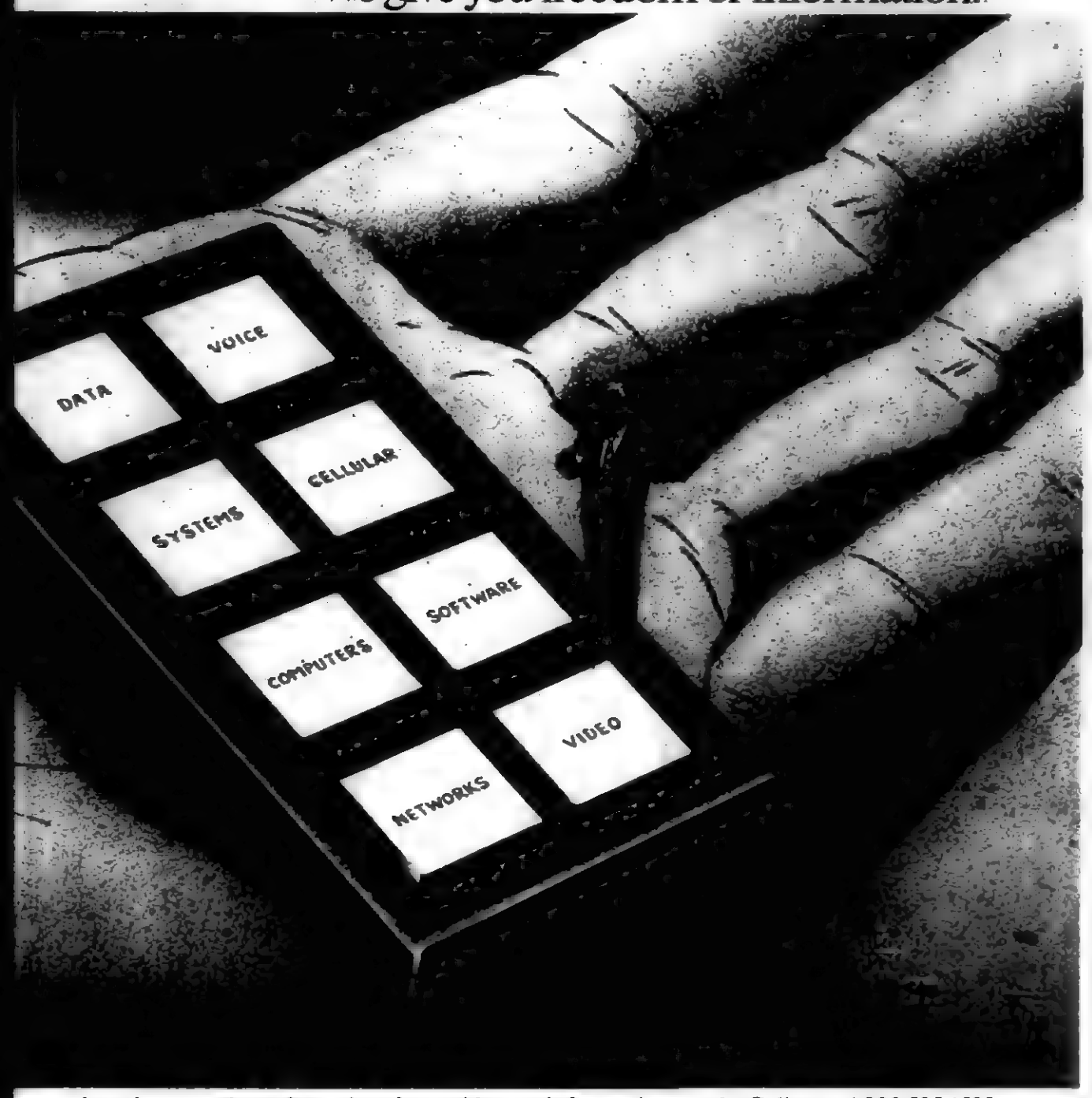

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Why take chances?

The Newsweekly of Information Systems Management

Before you burn out, chill out

Ward off IS stress by kicking back, accentuating the positive and being a good communicator who's open to change

BY ALAN J. RYAN

Second in an occasional series.

Thinking about taking a dive off the top floor of corporate headquarters? Why not do a double gainer in the company swimming pool instead?

To help employees — including information systems professionals — deal with stress, more and more companies are offering programs such as physical fitness centers or discounted health club memberships, stress and time management seminars, rotation of assignments, counseling and support services.

For instance, Trump Plaza Hotel and Casino in Atlantic City offers managers a health spa, as well as stress reduction classes and executive development seminars. Paine Webber, Inc. offers a corporate health club at its new IS and operations headquarters in Weehawken, N.J. Other firms have similar programs.

"Some companies have traditionally paid more attention to the health of their workers through stress management programs," says Christine Bullen, assistant director of the Center for Information Systems Research at MIT's Sloan School of Management in Cambridge, Mass. "But we don't yet have all the answers on how to manage stress."

Computerworld asked IS professionals other ways in which they handle new pressures to supplement corporate services and programs. They give the following advice:

• **Learn to play politics.** The first step toward dealing with stress is finding its cause, says Steve McMahan, managing director at Source EDP, a placement agency in Boston. For IS personnel, in many cases, the cause of stress is interpersonal communications.

"Systems people have often had the attitude of 'If I do good technical work, I don't have to play politics, and it is not that important that I get along with my boss,' " McMahan says.

But as systems work becomes more a means to an end — like any other business tool — and less of an anomaly unto itself, McMahan says, workers will have to start learning to deal with political stress. His advice? "Work with user constituencies; develop relationships with your managers. That is the way to deal with the external, organizationally induced stress."

Marcello Pagnelli

James River's Miller *says IS people often put pressure on themselves to reach unrealistic goals*

• **Be open to change.** As any experienced IS professional knows, in technology, nothing stays the same for long. Accepting almost constant change as a fact of life can go a long way toward reducing daily pressure, interviewees say.

"People who do not handle change well are prone to burnout," notes Karl Swanseen, director of MIS at Trump Plaza. "In the MIS field, you have to be wide open and ready to change at a moment's notice. You have to be extremely flexible and open-minded, and you can't treasure the works of the past."

The real test is to keep a chin up in the toughest situations.

"The hardest part is when you invest a lot of time and energy in a project and hit the specs right on, but then the market changes, and the industry changes so that your work becomes obsolete," Swanseen says.

• **Be realistic.** Deadlines are often cited as a big stress inducer. To avoid that, "we try to stress good problem definition on large projects," says Richard Hock, director of MIS at Echlin, Inc. in Branford, Conn.

• **Remember, you're not a solo act.** Unlike in the old days, teamwork is now more common in many IS shops, notes John W. Owens, vice president and chief information officer at Sara Lee Hosiery, a division of Sara Lee Corp. in Winston-Salem, N.C. That's good news.

Owens says the IS profession has matured substantially in terms of leadership and teamwork during the last decade.

"Hopefully, it is no longer an

Ryan is a *Computerworld* senior writer.

individual who is in the hot seat and under intense pressure to produce something over an extended period of time," Owen says. "The person has at his disposal support resources and linkage to other parts of the team or other departments within the organization to help alleviate that."

• **Accentuate the positive.** While downsizing, globalization and the greater prominence of IS can all create stress, IS veterans point out that many benefits accompany such pressures.

> "PEOPLE WHO DO not handle change well are prone to burnout."
>
> KARL SWANSEEN
> TRUMP PLAZA

A bit of new pressure is not necessarily bad, Trump Plaza's Swanseen notes: "It just adds a lot of color and excitement to the work; it makes you that much more energetic in achieving your goals."

It's also important to realize that life in IS is less stressful in many ways than it was 10 years ago, Owens adds. "Things today generally are better, from the standpoint of having a clear vision of what needs to be done and being better at producing the result."

Patricia Wallington, vice president and chief information officer at Xerox Corp.'s U.S. Marketing Group in Rochester, N.Y., adds: "Many people in the past were frustrated by the ability to really have that direct value added to the business. That's changed."

• **Cut yourself some slack.** Ten years ago, many pressures on IS came from the outside, such as users asking how long the backlog for new applications might be, says James C. Miller, vice president of information technology at James River Corp. of Virginia in Richmond.

Today, Miller says, IS workers often pressure *themselves* — often in the name of helping the business. "Now, it's more like, 'If I can get this done six weeks early, I'll be able to help my business in Detroit get this product out,' or 'I can do this for the bottom line and get more earnings per share.' "

Keeping a realistic, balanced attitude about what you can do is key, Miller and others advise.

• **Realize that you've got plenty of company.** Sure, being in IS sometimes means 10-, 12-, 14-hour and longer work days. But, for whatever consolation it's worth, so do many other professions.

"There are still extremes, but overall I doubt that our profession has to work more hours than most other business disciplines," Owens notes.

"I don't think that we experience any different pressures than the rest of business," Wallington adds. "Everybody has to learn different things."

• **Take time off.** "The best release is taking time off and getting away," Swanseen says. "I think there should be more vacation time or free time available to limit the stress."

• **Know your limits.** Brian Camenker, a senior analyst at Dynamics Research Corp. in Wilmington, Mass., says that most systems workers know their limits, and if they work within them, they will not face job burnout.

• **Get more training.** IS professionals say that two of the biggest sources of stress are not knowing enough to get the job done and the fear of falling behind technologically.

As a result, they advise taking as many continuing education courses and seminars as time permits and encouraging companies to support them. "Companies need to be willing to give more time to train people," MIT's Bullen says.

Learning the business and dealing with attendant pressure *increases* your value as an employee, reminds Paul Berger, president of Paul Berger Consulting and PBC Management Video Programs in Lawrenceville, N.J. Learning new areas is "an opportunity to add value," he says.

• **Do better career planning.** For many IS professionals, stress comes from unhappiness with their career paths.

In the late '70s and early '80s, people flocked to the IS field because there were jobs, Source EDP's McMahan says. "Those are the people who tend to be in our office after they have been in the field for two to five years saying, 'I'm sick of what I do. I don't want to program any more.' "

McMahan says many of those workers want to remain in the computer field but move out of technical work. "That might be burnout," he says, "or maybe just call it people who were doing something they never liked in the first place."

It's a tough question, but it might be valuable to ask yourself: "Is IS really the field for me?"

Stella Johnson

COM/Energy's Strachl *sees her staff struggling to keep work/home balance*

• **Look for the "right" company.** If possible, finding a culture that matches your own personality and managers who reflect your values can eliminate a great deal of friction, IS veterans say.

"Take a good hard look at yourself and the environment you're working in, and make sure the environment, department and company are consistent with who you are," McMahan says.

• **Keep in touch with users.** Since a lot of stress comes from interaction with end users, IS managers advise nipping potential pressure and conflicts in the bud.

"It is important that managers at all levels get out and find out what users want and what they are looking for," Echlin's Hock says. "Whenever I have a meeting," he adds, "I make it a point to go to see the user rather than have him come to my office." •

Struggling with juggling IS career and family life

BY ALAN J. RYAN

It's 8 p.m. Have you seen your children today?

If you answered no, you are not alone, unfortunately. Of the numerous stresses on information systems life today, among the greatest for many professionals is the conflict between job and family.

While IS workers are not alone in facing these issues, several factors — including work that often requires long hours and a comparatively young work force in or approaching child-bearing years — make the pressures for many even more acute.

"A lot of employees are in a balancing act between the issues of advancement and compensation and their personal lifestyle, professional life, family life and social life," says Patricia Wallington, vice president and chief information officer at Xerox Corp.'s U.S. Marketing Group in Rochester, N.Y.

The 1950s' — or even 1970s' — vision of domestic life no longer exists, a fact to which any IS worker can attest.

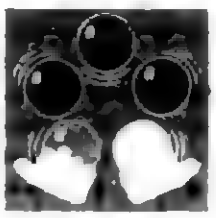
Jean Strachl, manager of distributed IS at COM/Energy Services Co. in Cambridge, Mass., for instance, tells of an employee who got a call from his child's day care center. The message was: *Come pick up your sick child.*

"He had to go home because his child had chicken pox and then had to come back in later when his wife got home from work," Strachl recalls.

Any working parent can relate similar stories. All of this begs the question: What do people do to balance their careers and family lives? Do companies help? Must there be a trade-off between work and family?

More flexibility

Fortunately, more U.S. companies are finally realizing that domestic peace and worker productivity are closely linked and are therefore offering part-time positions, telecommuting options and job sharing, which IS workers are increasingly taking advantage of.



"To a great extent, having productive people on the job is a function of keeping their family happiness intact," says James C. Miller, vice president of information technology at James River Corp. of Virginia in Richmond, Va.

Many companies also offer flexible work hours to accommodate working parents and others who simply do not want to work the traditional nine to five. At Xerox, for example, a study is now under way to examine relationships of work and family and how they affect individual workers.

"Empowerment is a big piece of the management policy here," Wallington says. "It's up to the manager to work with the employee." She says many of the Xerox IS workers are on flex time. "We try to help them to balance their lifestyles but not to make those decisions for them."

Miller says that James River tries to be flexible in order to meet the needs of the workers. Some options at James River — done on a case-by-case basis — include giving workers personal computers to work on from home doing applications development, allowing full-time workers to reduce their hours so they can spend more time with their young children and allowing some workers to move into less demanding jobs where they will not need to put in extra hours on a regular basis, Miller says.

For example, Miller explains: "If you're a technical manager today and you want to work part time, you may have to become a technician again, and we can put you on three days a week."

Things get tricky, he adds, because family happiness means different things to different workers. "There are individuals who can work 60 hours a week and maintain family happiness and there are others who look at 40 hours and cannot go beyond that."

The key, he says, is that management must respect all types of workers. "You'll find good [information technology] people at both ends of the spectrum," he adds. "We don't tell people to do this or behave this way. We have a constructive tolerance for diversity."

In companies without formalized programs, IS employees make their own decisions about the best ways to strike the right balance between work and family.

In the case of Karl Swanseen, director of MIS at Trump Plaza Hotel and Casino in Atlantic City — and father of three children, including a newborn — the choice is to break up the work day.

Swanseen works between 9 a.m. and 6:30 p.m. every day. "When I go home, I play with the kids for a couple of hours, and I put them to bed," he explains. "I may work after that." But he makes it a point to spend quality time with his family on weekends.

Is there a parent track?

While many workers may like flexible working options, placement officials say having a flexible firm is anything but a guarantee for a high-paying job.

"The firms that often pay the best salaries and have the biggest bonuses — such as brokerage firms — have the longest hours," says Steve McMahan, managing director at placement firm Source EDP in Boston.

At the same time, a laid-back, family-oriented company is not likely to pay as well as the brokerage firms, McMahan says. Workers looking for new jobs must understand the trade-offs and prioritize what is important to them, he says, "because you don't get it all." •

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Pardon my pleadings

Whether the threat of war can serve to hasten peace in the Middle East remains to be seen, but the strategy certainly worked last week in the Pacific Northwest. In one of the quickest revolving-door circuits in recent memory, **Microsoft Corp.** and **Z-Nix Co.** last week settled the Windows-based licensing dispute that Z-Nix made a federal case of only days earlier [CW, Nov. 12]. The out-of-court accords provide Z-Nix with a Windows license through 1991 and Microsoft's pledge to good-faith discussions of renewal this time next year.

Shape of things to come

Cost-cutting measures announced and implemented earlier this fall at Los Angeles-based database vendor **Teradata Corp.** will not go far enough to keep the company from a work force reduction it hoped to outrun, according to company Chairman and Chief Executive Officer Kenneth Simonds. Following a series of meetings during which board members and executives took a long look at the looming recession, Simonds said that the firm will escalate its assault on expenses to include, among other moves, a 10% to 12% work force cut. "We believe these actions are necessary to return us to profitability," Simonds said, adding that hopes for the company's near-term growth would be overly optimistic.

More briefs on page 117

CALS makes impact on imaging technology

BY GARY H. ANTHES
CW STAFF

An image processing and document management program conceived by the U.S. Department of Defense is sending ripples through the computer industry, giving momentum to a host of new standards, technologies and products. And the Computer-Aided Acquisition and Logistic Support (CALS) program is beginning to shape the future of computing in industries far removed from the Pentagon.

CALS was launched in 1985 in response to the skyrocketing volume and cost of paper used in the design, manufacture, acquisition and maintenance of weapons systems. The program was intended to implement existing standards — and to foster the development of new ones — for the electronic transfer and integration of technical data.

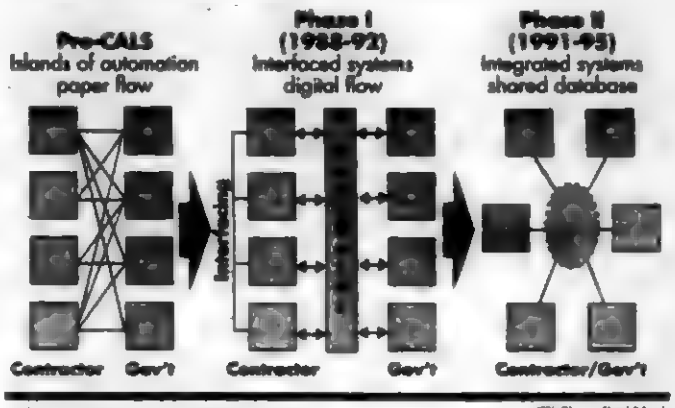
Now, well into the first phase of the two-phase, 10-year program, that effort is beginning to yield results. Defense contractors, whose paper problems mirrored the military's, embraced the concept, as did a host of computer hardware and software vendors eager for a new piece of the multibillion-dollar weapons business. And for users, CALS promises a long-sought benefit as its standards lead vendors to create interoperable products at competitive prices.

By one estimate, the government and its contractors are currently spending $2 billion per year to make their systems CALS-compliant. In addition, as the program has built up momentum, it has begun to spin off products and know-how into the commercial sector. "CALS is spurring the development of tools and methodologies no single company can afford to do by itself," said John Bottoms, president of Avalon Systems, Inc.

Interleaf, Inc., for instance, introduced a suite of products to support so-called "information publishing," including documents that can access, evaluate and act on information.

Beyond the paper chase

An imaging initiative 10 years in the making could revolutionize government information management – and spawn a mini-industry



Source: National Computer Graphics Association — CW Chart: Paul Mock

Now, according to Paula Angerstein, program manager for publishing standards, Interleaf is getting requests for the same capabilities from commercial air-

Continued on page 116

SPSS fuels growth with outside funding

BY MICHAEL FITZGERALD
CW STAFF

CHICAGO — For the first time in 20 years of funding its own growth, $34 million statistical software vendor SPSS, Inc. has gone outside for capital, selling more than 30% of the company to an investor group headed by Morgan Stanley Venture Capital Fund L.P. Terms of the deal were not disclosed. However, observers estimated that it brought $6 million to SPSS.

Norman Nie, president, chief executive officer and co-founder of the company, said that the deal, which was in the "multimillions" of dollars, would let SPSS do three things: build a new set of "visually-oriented" products across its product line; develop statistical applications for large, specific markets such as manufacturing; and help SPSS expand its support efforts.

Nie also said that SPSS would likely use some of the funds to acquire another company or develop new strategic business partnerships.

Growth critical

Gary Madden, an analyst at Dataquest, Inc., speculated that SPSS hit the point at which growth was more critical than total control.

"I think they're seeing that the applications for [statistical] software have become much broader, and they probably need to do a lot of investment to support the [product]," Madden said, adding that moving toward a visual or graphical user interface will be important for SPSS because of the intensive alphanumeric nature of its package.

Nie will remain the firm's largest single shareholder, and the SPSS senior management group will remain its largest equity holder. SPSS will add four seats to its board: two for Morgan Stanley, one for Cooke & Andrews Investments, Inc., an affiliate of SPSS' Japanese partner, Japan Systems Engineering Corp., and one that will be filled by Bernard Goldstein, head of Broadview Associates, an affiliate of Geocapital Partners, which contributed approximately $1 million to last week's fund. Westinghouse Credit Corp. provided the bulk of the funding for the deal.

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A new lease on life for Leading Edge

BY RICHARD PASTORE
CW STAFF

WESTBORO, Mass. — One year out of Chapter 11 reorganization, Leading Edge Products, Inc. has remade its dealer channel and appears to be on target in products and profitability, according to analysts. Former users, in the meantime, seem willing to give the firm a second chance.

"Leading Edge has come a long way," said Mark Levitt, an analyst at International Data Corp. in Framingham, Mass. Acquired last year by South Korean conglomerate Daewoo Telecom Co., the company has made the rebuilding of its dealer base its highest priority, Levitt said. Starting the year with as few as 400 dealers, the firm has 2,300 today.

Leading Edge used to rile dealers by demanding advance payment for undelivered equipment, analysts said. New Chief Executive Officer Albert Agbay, in contrast, handles dealers with kid gloves. One example is his cautious approach to the superstore phenomenon.

"We have to pick a channel and be loyal to it," Agbay said, noting that the fast-growing cut-rate superstore channel is attractive, but the firm will not participate at the risk of souring its dealer relationships.

Agbay has other concerns — mainly, how to follow the profitable month of September (its first in 18 months) with a profitable fourth quarter and 1991 fiscal year. "We'd like to be profitable for 1991 and surpass Leading Edge's best year in revenue," which in 1987 was $150 million, Agbay said. This year will see $100 million in revenue and unit sales of 65,000 to 70,000, he predicted.

Agbay said he hopes to get there with, for instance, lower priced products that will sell in a sluggish economy: Intel Corp. 80386SX- and 386DX-based desktop and portable computers.

Users who have bought from Leading Edge in the past seem

Leading Edge's Agbay: *Pick a channel and stay loyal*

receptive to the new lines. "The main reasons we stopped buying them is because they went out of business for a while, and we had problems with their 30M-byte disk drives," said Richard Norlin, data processing manager at TSI Mason Research Institute in Worcester, Mass.

Norlin said he would reconsider Leading Edge, but the company would have to beat the price and performance of the NEC Technologies, Inc. machines he is currently buying.

In addition to profits, Agbay's main goal for next year is to close some of the gap between Leading Edge's time to market and that of its competitors.

"We accept the fact that Leading Edge will not be leaders in technology," Agbay said, but he wants to reduce the present nine- to 12-month lag time to market to three months or less. Products late to market must attract attention with shockingly low pricing, cutting deeply into profit margins, Agbay said.

The average price for a Leading Edge PC was running about $1,100 in September. The company has labored this past year to build a little more margin into the higher end products and has succeeded in raising the average system price tag from January's low of $600. However, despite the price boost, the firm still heavily undercuts its competitors. Leading Edge's 386SX-based Model D3M10WV sells for about $2,000 less than a comparable IBM Personal System/2 Model 65 SX.

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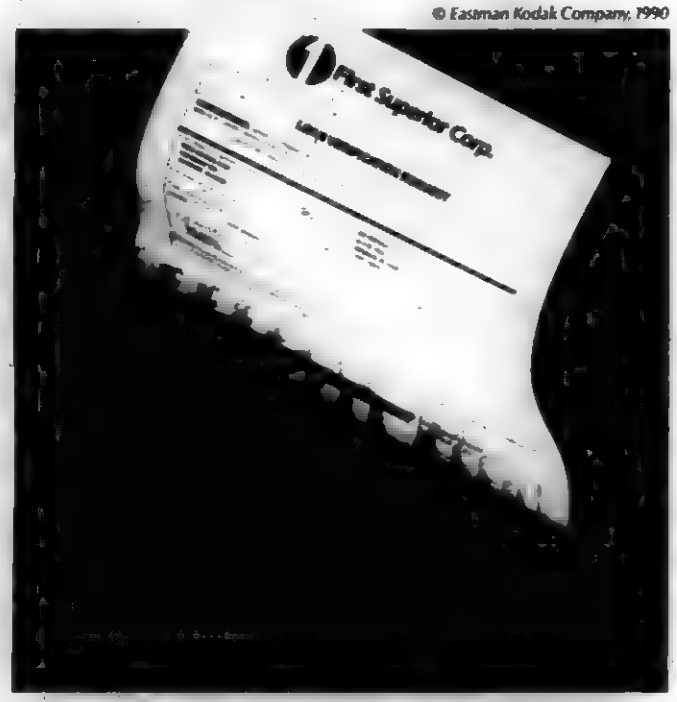

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Get ready for a rough ride

Analysts predict difficult move to client/server computing

BY JOHANNA AMBROSIO
CW STAFF

STAMFORD, Conn. — Get ready for a teeth-gnashing, roller-coaster decade as users make a painful transition to a networked, client/server computing environment. Also prepare for massive confusion among users and vendors alike over what choices to make and when to make them.

Such was the vision painted at a press conference last week by Gartner Group, Inc. analysts, who offered their prognostications about what the coming 10 years will bring.

By far, the biggest single influence in the industry will be the adoption of a new "master platform" — IBM's System/390 mainframes, said Bruce Rogow, Gartner Group's executive vice president. "This will evolve over the next five years and will be extremely crucial to everyone in the industry," he said.

However, because "maybe we waited a little too long" for this new platform, the information technology industry may only grow in the single digits during the next two years as user organizations assimilate the 390, Rogow said.

BY FAR, THE biggest single influence in the industry will be the adoption of a new "master platform" — IBM's System/390 mainframes.

BRUCE ROGOW
GARTNER GROUP

Information technology's status as the single largest component of capital expenditures will decrease as the economy worsens, Rogow added. "I don't see the executives I've talked to, given the economics of 1990 and 1991, ready to increase [information technology] expenditures," he said.

Another negative factor, at least from an industry point of view, is the move toward open systems.

"Unix is bankruptcy spelled in Esperanto," Rogow said. Because vendors' margins are so low on nonproprietary systems, a big demand for them might "create a bloodbath," he said.

As an alternative, Rogow said, vendors are likely to use new applications such as imaging and cooperative processing to provide "a proprietary approach to openness."

Jim Cassell, a Gartner Group vice president and IBM mainframe analyst, said that the 390 is also critical for helping information systems managers "regain control of enterprise computing." Currently, he said, as much as 50% of electronic information is on the desktop and out of the purview of IS.

IBM will build on the 390's newly announced Sysplex architecture to become a "megaplex" — connecting all the mainframes and client/server computers throughout an organization. The mainframe will essentially become a "superserver," Cassell said.

Still, he added, "for a long time the legacy is on mainframes. It will take quite some time for client/server to become the predominant model." Mainframe capacity will continue to grow 30% per year, he said.

Cassell also said that he expects IBM's 390 base processor to run at least as fast as Hitachi America Ltd.'s does — a reported 45 million instructions per second (MIPS). The 390 was announced at 40 MIPS because IBM was being overly cautious, he said.

Other points made by Gartner Group analysts at the press conference included the following:

- A well-mapped strategy for connecting with hosts and other workstations will keep Apple Computer, Inc. a major desktop player.
- Companies with a high reliance on information as a competitive weapon will probably be best off going directly from DOS to OS/2 and skipping the Microsoft Corp. Windows stage entirely. Adopting Windows will only delay the systems integration and other benefits companies can get from OS/2 and will require supporting Windows virtually "forever," according to Jonathan Yarmis, a vice president at Gartner Group.

Other companies that are less technology-driven might want to go to Windows for a transition period before adopting OS/2, Yarmis added.

- Local-area networks will continue to be installed at a high rate, with Novell, Inc. and Banyan Systems, Inc. as the market leaders. Although LAN hardware standards will remain relatively stable, software standards in this areas are just beginning to develop.
- In the area of wide-area communications, companies will continue the trend of relying more on the public networks and less on the private ones. An especially important emerging standard in this area is frame relay, which allows voice, data and other forms of information to share the network.

XEROX

Motorola wrote the book on cellular phones. A Xerox system lets them rewrite it in minutes.

Motorola is the world's largest producer of cellular phones. Not to mention cellular phone manuals. For which they turn to a company called Rich Graphics.

But when Motorola decided they wanted to be able to revise and reprint their manuals on a "just-in-time" production schedule, Rich Graphics turned to Xerox.

Working with Rich Graphics, Xerox developed a solution that integrated both hardware and software, Xerox products and other suppliers' products. And the resulting phone manual production is something to talk about—to say the least.

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CONTINUED FROM PAGE 113

lines, telecommunications companies and manufacturing firms. "They've all heard of CALS, and they all understand it," she said. "They all want centralized databases of information that can be selectively combined into different kinds of documents, seen on a screen, printed or sent to someone electronically."

Advanced Technology, Inc. (ATI) was an early beneficiary of CALS, winning a $160 million job to automate the U.S. Navy's storage and retrieval of engineering data and drawings. ATI's parent company, Black & Decker Corp., is evaluating the scanning, optical storage and retrieval technology developed by ATI for possible use in its power tools manufacturing operation, which it claims is the largest in the world. "Black & Decker wants to see what we're doing for the government, then see how that can be commercialized for the private sector," ATI executive Paul Lombardi said.

Lombardi said that ATI plans to leverage its CALS know-how into other markets — public utilities and health care, for example — which, in total, are expected to be larger than the defense market.

The U.S. government is about to give CALS its own official push into the commercial world. At CALS Expo '90, to be held next month in Dallas, the U.S. Department of Commerce will announce a DOD/Commerce/industry partnership intended to boost the competitiveness of U.S. business by encouraging the widespread adoption of CALS-based technologies and standards. In particular, the partnership will promote the development and adoption of the Product Data Exchange Specification — a way to completely define a product electronically.

CALS Phase I is intended to replace paper flow with digital document and file exchange between vendors and the DOD and within those organizations. The goal is to create data once and paper not at all.

In Phase II, just getting under way and not yet well defined, integration is to take a giant step forward, with the bridged islands of automation replaced by distributed databases accessible by the DOD, contractors and subcontractors via networks linked by intelligent gateways. Instead of transferring files, the files are to be accessed in place by any number of different organizations using different hardware and software. The defense community refers to an "integrated weapon system database" — which would actually be hundreds or thousands of logically linked databases — while in commercial environments, the database would contain any kind of product information.

Phase II has also come to be associated with the concept of concurrent engineering (CE), by which the normally serial phases of design, prototyping and manufacturing are tightly integrated and overlapped. In fact, the overall program is now often referred to as CALS/CE.

While Phase I is mostly an exercise in software, Phase II raises tough issues for hardware vendors, said John F. Leahy, strategic marketing manager for Sun Microsystems Federal, Inc. The controversial concept of sharing databases of the most sensitive information could require much work to improve security, including extensive work to build multilevel secure operating systems, he said. Phase II may also spur development work in Tempest-protected hardware, secure networking and secure databases, he said. "No one can tell you the impact," he said. "Phase II is still a big question mark."

But for vendors with huge investments in proprietary systems, it is not a trivial question. "Does it mean I'll lose out if I can't afford to upgrade to standards?" Bottoms asked. "Yes, that will happen."

THE U.S. Department of Commerce will announce a DOD/Commerce/industry partnership intended to boost the competitiveness of U.S. business by encouraging the adoption of CALS.

Partners in CALS

While CALS is said to bridge islands of automation, it is also bridging some islands in the computer industry. The multidisciplinary nature of design and manufacturing, and hence of the computer tools needed to support it, makes the CALS arena a natural for intra-industry partnerships.

In 1988, Hewlett-Packard Co. established the HP CALS Solution Group: 16 software vendors, including Interleaf, Inc., Mentor Graphics Corp. and McDonnell Douglas Systems Integration Co., all with off-the-shelf CALS-compliant products for HP and HP's Apollo division workstations.

In July, Wang Laboratories, Inc. announced its CALS/CE strategy for providing Wang-based tools for converting text, graphics and document images into CALS-compliant data streams and for creating native-mode CALS/CE information. Wang teamed up with Avalanche Development Co., Softquad, Inc. and Rosetta Technologies, Inc. to develop these capabilities, which will be the cornerstone for a planned major push into the CALS marketplace.

PDES, Inc., a consortium consisting of IBM, HP, Digital Equipment Corp., the Computervision unit of Prime Computer, Inc. and several aerospace and defense contractors, works closely with the government to accelerate the development and implementation of product data exchange standards needed in CALS Phase II.

Of PDES, DOD CALS Director Michael F. McGrath said, "A few forward-looking companies are playing an active role in the development of PDES. These vendors will be one step ahead in getting their products out."

GARY H. ANTHES

Getting down to basics

BY GARY H. ANTHES
CW STAFF

CALS is alternatively described as a methodology, a philosophy and a discipline. While it is all of these, at its most basic, it is a set of standards. The DOD tries to pick standards that will be winners in the marketplace, not just on the battlefield.

In some cases, CALS adopts an existing standard, thereby giving it a stamp of approval that accelerates its marketplace acceptance.

But in other cases, CALS leads the market and the standards-setting community by officially blessing one of several proposed standards or by sponsoring the establishment of new ones.

For example, the DOD is now evaluating proposed optical disc standards and recently sponsored the establishment of an industry group to develop a standard for creating and reassembling subunits of raster images.

Key CALS standards adopted so far include the following:

- Standard Generalized Markup Language, which is a standard for device-independent exchange of data prior to document composition. The language uses markup tags to explicitly define every element of a document.
- Initial Graphics Exchange Specification, which describes vector graphics used in engineering drawings and technical illustrations in computer-aided design systems.
- Computer Graphics Metafile, which is another description of vector graphics.
- CCITT Group 4 for facsimile, which describes compressed bit-map, or raster, graphics.

"CALS says what the standards should be, so we don't have to decide," said Janis Kerrick, CALS program manager at Hewlett-Packard Co. "We in industry and government could have met on this for years, but CALS makes it happen faster."

The DOD works with the National Institute of Standards and Technology (NIST) to get the standards it needs. According to David Bettwy, an official at NIST, some 30 to 40 standards have been picked by CALS so far.

"But eventually there will be a huge number. Ultimately, virtually everything in the information automation world will be covered," he said.

GARY H. ANTHES

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Women losing ground in IS

Several studies show dwindling number of females heading into IS

BY J. A. SAVAGE
CW STAFF

Although more women are working in the computer industry now than in the past, that trend could be short-lived, according to a collection of studies published by the Association of Computing Machinery this month.

Statistics indicated a fall-off of female interest in the computer industry overall, and a decline in the number of women who are positioning themselves as crucially needed role models by pursuing academic careers in computer science.

In addition, the studies included evidence that indicated gender bias at every educational level could be quietly directing females away from the computer industry.

The number of bachelor's degrees awarded to women in computer science peaked in 1986, and the number of master's degrees peaked in 1987, according to statistics compiled by Betty Vetter, executive director of the Washington, D.C.-based Commission of Professionals in Science and Technology.

Last year showed the highest number of women with computer-related Ph.D.s since 1980, but that number was still minuscule — a total of 72 in the U.S.

Lack of role models

Henry Etkowitz, associate professor of sociology at the State University of New York at Purchase, studied women within academic institutions in such fields as computer science, electrical engineering, chemistry and physics. In general, he said, he found that the lack of women as academic role models propagates an absence of women in academia.

Additionally, at least one researcher found discrimination to be affecting women's ability to advance along the paths that traditionally lead to computer industry careers.

Lesley Klein, instructor of information systems at Pace University in Pleasantville, N.Y., reported that in grade schools and high schools, computer education is spotty at best, with few resources available.

In addition, Klein said, "The computers are always consumed by the boys, who rush in" and dominate them. Girls "practically need interference from the heavens to gain access."

If computers are indeed more alluring to boys than to girls, why is that so? Researchers who sought an answer found a gender bias in software, which they attributed to software engineers who are predominantly male.

Women who get past all the hurdles in academia usually opt out of a career in the ivory tower and choose a career in industry, according to the Association of Computing Machinery's studies. One reason, according to Etkowitz, is the desire for a family: The so-called mommy track made available by many businesses affords flexibility that the tenure track does not.

Once in industry, the corporate culture of short-term profits keeps women from advancing, said Shari Lawrence Pfleeger, who holds the chair of the Status of Women and Minorities at the Association of Computing Machinery.

"Corporations looking from year to year or quarter to quarter won't invest in training for the long term," she said.

Organizations in need of an employee with a particular skill profile, according to Pfleeger, will simply find a person who already fits into the job description — nearly always a man — rather than spend the money it would take to train a woman for the particular job.

Women in computing

The generally increasing number of women employed in computing may be a temporary phenomenon

	Computer systems analysts	Operations and systems	Mathematical and computer scientists (total)
1990			
Total	56,000	239,000	805,000
% women	36%	41.1%	35.7%
[illegible]			
Total	242,000	246,000	488,000
% women	26.4%	31.7%	29%

Source: U.S. Bureau of Labor Statistics

CW Chart: Paul Mock

Bringing women back to IS

What can educators and employers do to make sure that women arrive — and thrive — in the computer industry? The Association of Computing Machinery urges the following:

- Ensure equal access to computers for young girls and boys and develop educational software that is appealing to both.
- Establish programs to encourage high school girls to continue with math and science, for example, science fairs and scouting programs.
- Develop programs to pair undergraduate women with women graduate students or faculty members who will serve as role models.
- Provide women with opportunities for successful professional experiences such as involvement in research projects, beginning as early as the undergraduate years.
- Establish more re-entry programs that enable women who have stopped their scientific training prematurely to retrain as computer scientists.
- Increase awareness of, and sensitivity to, the use of a variety of communications styles, especially those that are less aggressive.
- Develop effective grievance policies to deal with overt discrimination and sexual harassment. Implement studies of existing policies to determine what makes policies effective.
- Expand parental leave policies to allow both fathers and mothers to participate actively in the rearing of small children.
- Maintain lists of qualified female computer scientists to increase the participation of women in influential positions such as program committees, editorial boards or policy boards.

J.A. SAVAGE

INTERNATIONAL BRIEFS

Equal technology

IBM Germany GmbH and Germany's **Robotron Ascota AG** are joining forces to speed the creation of a technologically modern information infrastructure in the former East Germany. A joint venture firm called **Computer-Systemdienste GmbH**, held 51% by Ascota and 49% by IBM Germany, will offer software and services aimed at enabling access to a broad range of both computers and international standards. Details of the new firm's capitalization were not disclosed.

Lovely Rita maid

Gas consumers in Scotland now have **Victor U.K.** to thank for their bills. For an approximate half-million dollars, **British Gas Scotland** is gearing up with some 80 of the British computer vendor's handheld models. The deal, struck last month, will put pay to the old method of whiting out gas meter readings on paper: In the future, each meter's figure will be keyed into a handheld Victor M1000 and downloaded via modem to British Gas' ICL, Inc. mainframe in Edinburgh.

Eye on a prize

British electronics player **Racal Electronics PLC** last week did an end run around looming outside acquirer-hopefuls when it spun off its telecommunications and securities divisions and transferred the remainder of the company in a management buyout. The spun off units were aggregately valued at some $6 billion. Racal's move, however, may have merely shifted the center of acquisitive action: Analysts reportedly are already eyeing the lucrative **Racal Telecom** as an attractive acquisition candidate in its own right.

Further East

Stratus Computer, Inc.'s Asia-Pacific operations have grown from $2 million to $50 million since the firm opened in Hong Kong four years ago. Small wonder, therefore that the Marlboro, Mass.-based online transaction processing systems vendor last week expanded its Far East territory with a Singapore-based sales subsidiary and distributorship agreements covering Thailand, Indonesia and the Philippines.

Parlez-vous francais?

Where does a Japanese powerhouse plant its first European flag? **France, Hitachi Ltd.** said early this month, as it announced plans to open a disk drive plant near Orleans by April 1992.

NATIONAL BRIEFS

Goodfellas

Hewlett-Packard Co. early this month enacted a new slate of benefits likely to ensure the Palo Alto, Calif.-based computer vendor continued tenure on the slew of "Best Companies To Work For" lists on which it has become a fixture. Beginning Jan. 1, HP's 57,000 U.S.-based employees will enjoy a dependent-care resource and referral service, a four-month parental leave benefit — twice the current two-month provision — and $2,500 toward defraying the costs of adopting a child.

Prime interest rate

The firm that industry observers once feared would buckle under the staggering debt load it acquired in last year's leveraged buyout last week made another in a series of early payments on its outstanding debt. **Prime Computer, Inc.** forwarded $25 million to its senior bank lenders that was not due until Dec. 31. According to Prime Chief Executive Officer James McDonald, the company — still in comeback mode and aiming at front-rank computer-aided design and manufacturing and computer systems market status — will save some $450,000 in interest payments by getting the money in early. So far, McDonald said, Prime has reduced its debt by $145 million; the firm reportedly has approximately $1 billion left to go.

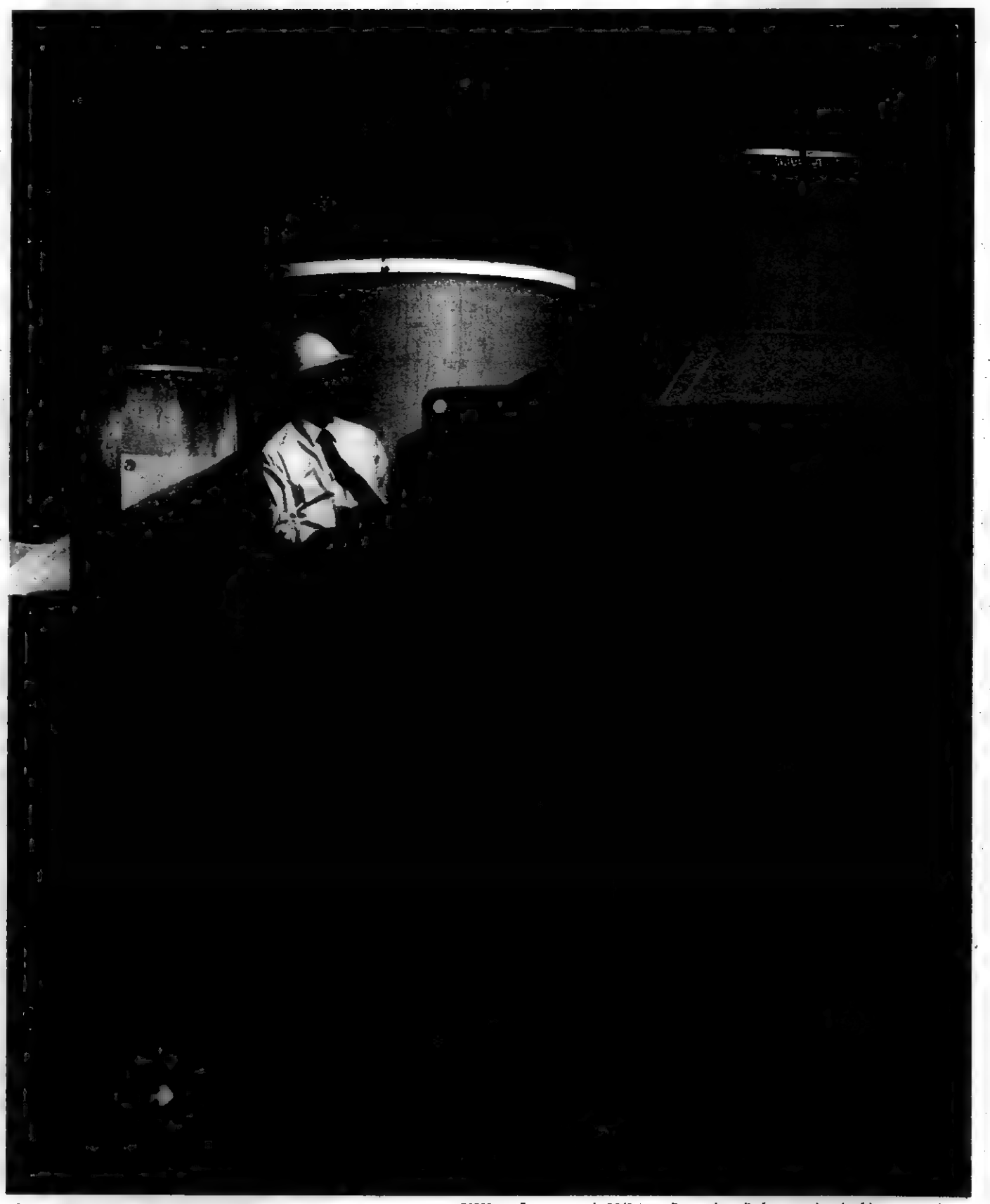
Mapping a strategy

IBM is already all over the map. Now the company will help its customers get there, too, with the aid of business ally **Utility Graphics Consultants.** One year ago, IBM made an equity investment in the Englewood, Colo.-based geographic information systems (GIS) consulting firm. This month, IBM reinvested — again, in an unspecified amount — and the firms tightened their ties, as well as their resolve to help IBM customers set up and support IS with integrated GIS elements.

Ultimate savings

The Ultimate Corp. last week quantified the savings it expects to reap from the massive corporate restructuring and layoffs announced earlier this month [CW, Nov. 12]. The cost-cutting, Chief Executive Officer Michael O'Donnell said, should put an annual $20 million back in the company coffers — and restore black ink to the balance sheet.

NetWare Solves Issues At



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Environmental The EPA.

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But open connectivity is only one consideration. After all, the EPA can't afford to test the waters with an unreliable network. So they use the only PC-based network operating system that's in its eighth generation. According to Stoneman, "We use NetWare for its reliability, advanced capabilities and functionality. It's easy to maintain, and we are very pleased with the security that NetWare provides."

In addition to sharing information and accessing several host systems, the EPA tracks cleanup efforts and communicates through E-mail over its NetWare network. All of which make for a very productive office environment. In fact, Stoneman attributes some significant cost savings to NetWare, "We no longer need a laser printer on every desk or 12,000 copies of dBase, Lotus and WordPerfect."

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The Past, Present, and Future of Network Computing.

Beware: Accounting rules may change

BY JEAN S. BOZMAN
CW STAFF

Do your eyes glaze over when you see the word "accounting?" If you work for a software firm, don't let it happen this time. Software firms that are already facing the prospect of an economic downturn may find 1991 doubly trying if proposed revisions to accounting procedures for revenue recognition are approved.

The rules, which are slated to be circulated by the American Institute of Certified Public Accountants (AICPA) early next year, would provide a common set of accounting rules for software firms that could specify how companies report receivables from new sales and perhaps slash at those firms' earnings reports for at least one year.

Under the current rules, practices for software accounting vary widely in the industry, software executives said. Some contracts allow firms to recognize revenue from a long-term contract all at once, while others account for revenue as products are shipped throughout the year. The new rules appear to favor revenue recognition as products are shipped, according to industry sources.

"These rules will push a lot of revenue out over [a company's financial] quarters for the first year the AICPA rules go into effect," said Jeff Papows, president of Cognos Corp. in Burlington, Mass. The rules, he said, could have a strong impact on many companies. However, he added, it should be a onetime impact, with an immediate benefit for users who track the corporate health of their suppliers.

"If everyone implements the rules at the same time, you'll be able to make apples-to-apples comparisons between software companies, perhaps for the very first time," Papows said.

Barring major complaints, the rules will pass into "generally accepted accounting practice" by late 1991. That means they will become the law of the land and be enforced by the Securities and Exchange Commission (SEC). Furthermore, the accounting firms that audit software companies will have to abide by them, because the AICPA wrote the rules and the Financial Accounting Standards Board (FASB) approved them.

Separate findings

"The SEC is strongly encouraging everyone to get this document out the door," said Paul Wilde, chief financial officer of Viasoft, Inc., who chairs Adapso's Software Business Practices Committee. In the absence of official standards, the SEC has had to make separate findings for each instance of questionable accounting. In fact, the FASB reviewed a final draft last week.

The new rules will affect every firm that gains revenue from software licenses or software maintenance contracts. "Up to now, there just hasn't been a single set of accounting standards in the software industry," Wilde said. "New firms would study the way that major software firms accounted for their revenues, and there were several ways to do that. Now there will be a written set of rules, rather than historical precedent, to go by."

Publicly held firms will have to comply with the new accounting rules as soon as they go into effect. Privately held firms do not need to comply right away but may be told by their auditors or financial backers to comply, Wilde said. Accordingly, CFOs across the country have been giving the AICPA draft document a close second look. "Some companies hoped to hell it wouldn't happen," said Jeanne Wohlers, CFO of Sybase, Inc. The most controversial issue in the AICPA proposal appears to be the way in which software maintenance fees are recognized. The new rules would spread out all maintenance renewal fees over 12 months and would "break out" the first year's maintenance fee — often included in the original license fee — for similar treatment.

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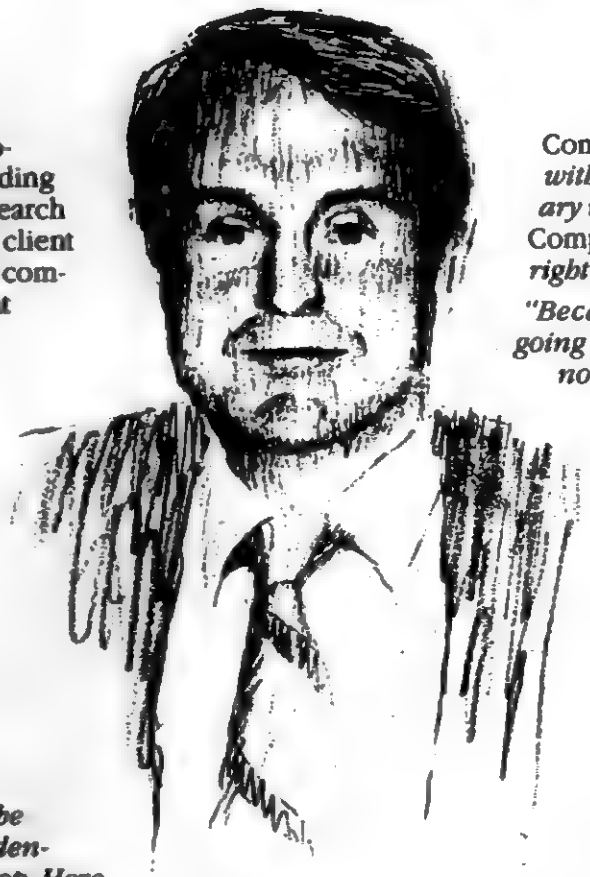

For over a decade, Bill Young & Associates of Fairfax, VA, has been providing cost-effective contingency and retained search services to companies nationwide. With a client base of small, mid-sized and Fortune 500 companies, the firm specializes in recruitment for data processing, engineering, communications, consulting, manufacturing, financial services and defense. On-site consulting and complete administrative/office support placement are offered by other company divisions as well. As explained by President Bill Young, they have a product to sell — and that product is people.

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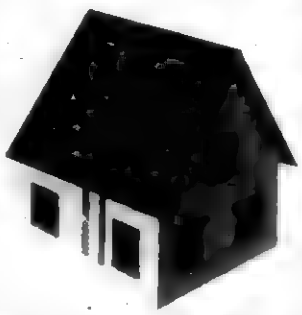
An IDG Communications Newspaper

Teach yourself to be a good manager

BY JANET RUHL
SPECIAL TO CW

We've all heard about the problems technical people face when making the transition to information systems management: weak communication skills, a tendency to become overwhelmed with details and difficulty delegating responsibility. Fortunately, would-be managers can overcome these stumbling blocks with a little self-education.

One of the best places for them to start is at the library. Wilford Miles, professor of management at the Barney School of Business and Public Administration at the University of Hartford in Connecticut, suggests that management hopefuls read some of the time-tested business classics.



For an overview of what management is all about, Miles recommends two Peter Drucker books: *Managing for Results* (Harper & Row Publishers, Inc., originally published in 1964 and reprinted in 1986), and *The Effective Executive* (Harper & Row, 1986).

Miles' recommendation is echoed by Wayne Cannon, a technical support manager at Hewlett-Packard Co., who made the transition from engineer to manager six years ago. Cannon describes *The Effective Executive* as "an inspirational book for the new manager that helps to draw the line between what is truly important and the hundreds of other issues that vie for a manager's time."

To understand what is driving other managers, Miles encourages new managers to learn something about strategic planning and high-level decision-making. To get started in this direction, he recommends reading *The New Corporate Strategy* by H. Igor Ansoff (John Wiley & Sons, Inc., 1988 — a revision of his earlier classic *Corporate Strategy*, now out of print) and *Developing Business Strategies* by David Aaker (John Wiley, 1988, second edition).

For an understanding of some of the specific management techniques used by IS project managers, Cannon recommends reading *Peopleware: Productive Projects and Teams* by Tom DeMarco and Timothy Lister (Dorset House Publishing Co., 1987).

Cannon says he also benefited from reading both Frank O. Milo's *How to Get Your Point Across in 30 Seconds — or Less* (Simon and Schuster, Inc., 1986) and Stephanie Wilson's *The Organized Executive* (Warner Books, 1985). The latter, he says, "helps reduce the time spent on administrivia and busywork and provides ideas for being more efficient in the vital tasks."

While books are a great place to begin, management hopefuls should supplement their education with some interactive learning activities, such as seminars and workshops tailored to the needs of new managers.

Roger Loeb, who began his career as a programmer and later spent seven years as vice president of MIS at a large Colorado corporation, recommends taking "Effective Speaking and Human Relations," a course offered by Dale Carnegie Training.

Loeb confesses that he was skeptical at first about the Carnegie course, thinking that it would be a waste of time for him. But after being forced to attend by his employer, Loeb became an enthusiastic proponent of the course, which he says taught him to communicate in a much more focused way.

> **WHILE BOOKS ARE a great place to begin, supplement your education with seminars and workshops tailored to the needs of new managers.**

Barry Schrager, president of SKK, Inc. and manager of 160 employees, found the seminars given by the American Management Association useful in helping his technical people make the transition to management. He says the company spent a considerable amount of money on seminars to help its policy of promoting from within succeed.

Project management workshops

For seminars that address the specific needs of IS managers, such as managing personnel and hardware and software projects, IS management consultant Carl Brown recommends IBM's "Project Management Workshop" and "Project Management for Executives."

Managers or potential managers who prefer to take a more structured approach in learning about management — such as college courses — may be surprised to learn how the past decade's technological explosion has revolutionized the delivery of off-campus college courses.

Emerging satellite technologies and technology-delivered instruction enable more college attendance than ever before. Even those who live far from a major university can participate in formal academic MBA programs.

One organization that promotes the use of high-tech in delivering instruction is National Technological University (NTU), which is based in Fort Collins, Colo. NTU is a nonprofit cooperative venture of 29 leading universities including Rensselaer Polytechnic Institute, Boston University, Purdue University and the University of Notre Dame, as well as a host of major state universities and institutes of technology.

NTU works in association with employers to offer credit and noncredit graduate-level courses to employees at their work sites. These courses originate at member campuses and are taught by university faculty. They are transmitted to the employer sites over satellite hookups.

Currently, NTU offers course work in engineering management and management of technology. Short, noncredit management courses are also available. NTU reports that in the 1989-90 school year, 3,600 people were enrolled in its graduate courses at 302 work sites in North America.

Ruhl is a consultant and programmer in Connecticut and author of *The Programmer's Survival Guide: Career Strategies for Computer Professionals.*

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BY SHERYL KAY
SPECIAL TO CW

While strong gusts of economic caution move across the nation, Chicago-based information systems recruitment firms report that the employment situation there has been able to hold strong and keep the wind at its back.

Chicago's greatest strength is its diversified industry base, says Doug Fumagalli, director of human resources at Andersen Consulting. "Unlike New York City, which is experiencing problems because of Wall Street, or Dallas, with its oil crunch, Chicago is somewhat recession-proof," he says.

However, while IS professionals in Chicago aren't panicking, Fumagalli says, they are carefully watching current national and global financial events and preparing themselves for the possibility of an economic blow. A ripple effect from these concerns, recruiters say, is that IS professionals are a little skittish about leaving the security of their current jobs for new opportunities.

Consulting boom

One of the healthiest IS employment sectors in Chicago is the consulting industry, which has grown tremendously over the past five years. This has been demonstrated in part by Andersen Consulting's record: Five years ago, its consultant roster numbered 300; now it stands at 1,500.

The need for consultants will remain strong even if a recession does hit Chicago, says John Mengelt, a partner at the Chicago Search Group in Buffalo Grove, Ill. "But the word from the top is to keep the head count down," he adds.

Other industries with vigorous IS opportunities are retail (Sears, Roebuck and Co. and Amoco Co.) and manufacturing (Abbott Laboratories, Motorola, Inc., Kraft, Inc. and Baxter International, Inc.).

Furthermore, recruiters predict that Chicago's IS job market will remain strong for years to come, particularly for professionals with a combination of top-notch business and technical skills. "Even if we do go through bad times, there will still be companies that need and want qualified people," says Timothy Wujcik, a director at Source EDP's Chicago office.

Skills wanted

IS professionals wanting to take advantage of Chicago's current stability should take note of the technical skills most in demand. Cobol and on-line database systems such as CICS, DB2, IMS, IDMS and Adabas are used the most under the programming language and software umbrella, says David Fybrie, also a director at Source EDP.

The hardware environment is dominated by IBM, which accounts for approximately 70% of all systems installed in Chicago companies; other popular environments are those from Digital Equipment Corp., Sun Microsystems, Inc., Apollo Computer, Inc., Hewlett-Packard Co. and Tandem Computers, Inc., he says.

Wujcik adds that IS employers are also looking for business systems analysts who are knowledgeable in a particular industry, such as manufacturing or accounting.

Mengelt takes the list further, saying that retail, banking, securities and trading firms also seek business systems analysts with top-notch industry knowledge.

Stephen Zerkis, manager of systems development at transportation and financial services conglomerate Gatx Corp., predicts that as a result of companies putting core business applications on personal computers, there will be an upswing in the demand for professionals who can convert mainframe applications to PCs.

Partly because there is an abundance of talent and partly because IS salaries in Chicago are among the highest in the nation, companies are more selective than ever before. But they're willing to pay a premium for the right person, says Robert Tannura, vice president at the search firm Wood/Sprau/Tannura, Inc.

Professionals wishing to relocate to Chicago — particularly those from the South — might be a little wary of its infamous winters and stormy winds, Fumagalli says. "A couple of months out of the year, it's very cold, the snow may be abundant and transportation may become a bit more cumbersome," he adds.

On a more positive note, Chicago is an attractive cultural area. The city boasts a symphony, an opera house and an assortment of museums, sports teams and restaurants — not to mention its famous deep-dish pizzas.

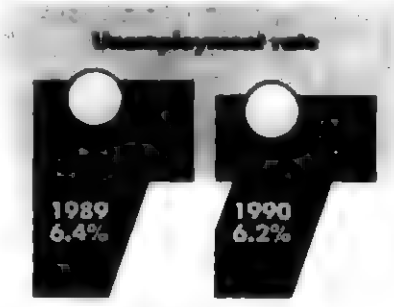
"We also have some top universities here for IS professionals who wish to further their studies, such as Northwestern, DePaul, Loyola, University of Illinois and University of Chicago," Tannura says.

One misconception Tannura has run into is that Chicago is "crime-ridden." "Chicago is absolutely not a gangster mob town," he says.

Like any major metropolitan area, Chicago has its good spots and its less attractive areas. For those who do not prefer city life, the transportation system offers full service and easy access to and from downtown.

Kay is a Tampa, Fla.-based business consultant and free-lance writer specializing in emerging technologies and human resources.

Source: National Association of Realtors



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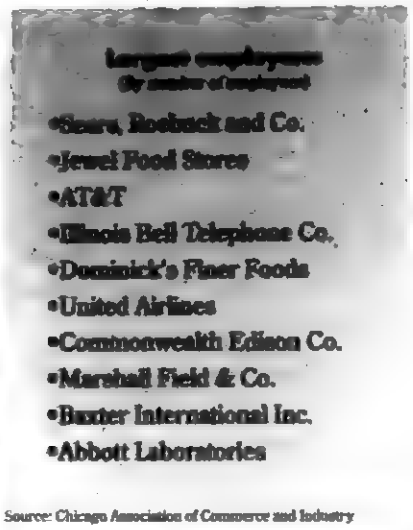

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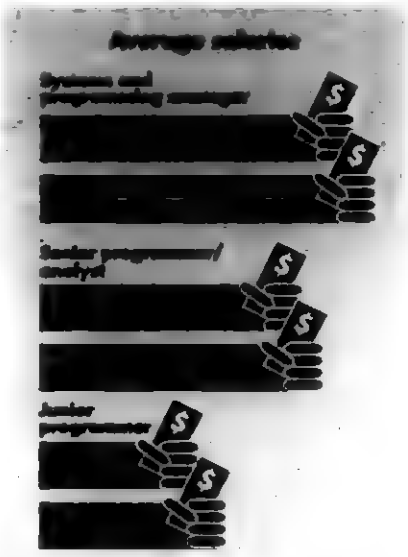

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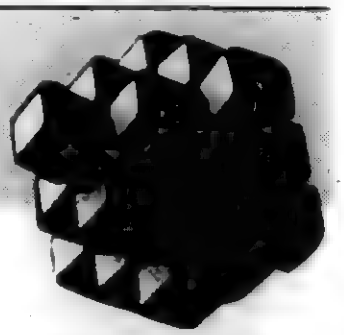

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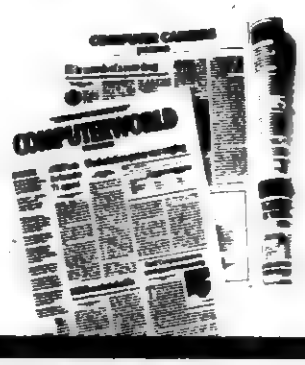

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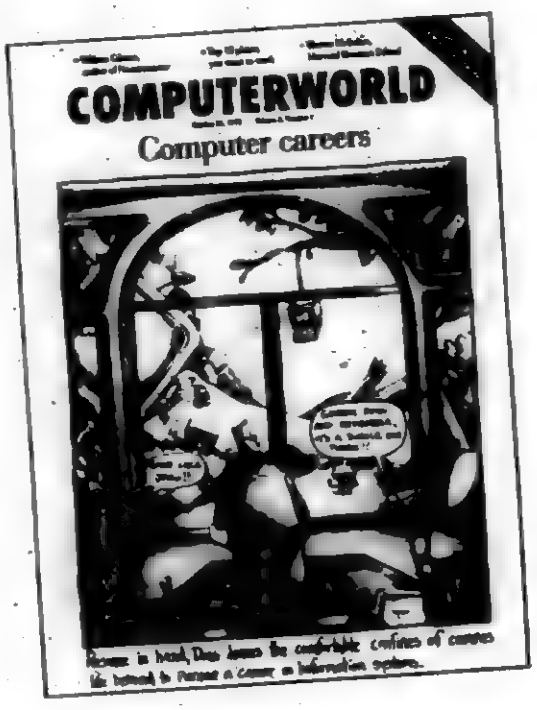

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Planned Editorial Features:

(subject to revision)

- Companies where computer career students want to work. And their top choices for: Information Systems, Engineering, Sales & Marketing, Technical Support, Research & Development.
- Prospects for minorities in computing.
- Merits of an Electrical Engineering degree for a computer career.
- Information Systems salaries from Computerworld's annual survey with the Data Processing Management Association.

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System Software Engineer, Entry Business Unit Group. By 12/19/90 please send resume to: Employment Security Department, ES Division, Att: Job #238046-O, Olympia, Washington 98504. Job Description: Designs, implements and tests complex and high level systems and software for micro computers. Works with other engineers to design Works applications software utilizing MS-DOS, OS/2 and Windows operating systems and "C", 8086 Assembler Series and Postscript languages. Designs graphical user interface and real-time, interrupt driven software, including serial communications. Assumes major project responsibility including: 1) requirements and analysis of project specification; 2) product design; and 3) implementation schedules. Requirements: B.A. or B.S. in Electrical Engineering, Computer Science, Mathematics or Physics. Six months of work experience in computer design or programming utilizing MS-DOS, multitasking and Windowing operating systems, "C", 8086 Assembler Series and Postscript languages and designing graphical user interface software. 20 course hours in real-time programming and software control of low-level hardware devices. Must have proof of legal authority to work in the United States. Job location: Redmond, Washington. Salary: $29,000-38,000 per annum, depending on experience. 40 hours per week, flex time. EOE

Engineering Systems Engineer

Executes software development life cycle for computer systems, which includes designing, coding, testing and validating software programs that solve engineering/manufacturing-related problems using computer-aided technologies. Performs work which involves solving engineering system problems through the development of algorithms based on engineering theory. Applies an understanding of engineering/manufacturing processes, standards and task controls to devise solutions through analysis, design and implementation of computer software as well as integration of software with CAD/CAM and other third party engineering software. Performs porting of engineering software to computer workstations used in the design, engineering, tooling and manufacturing operations.

Education Required:
Bachelor of Science in Mechanical, Civil or Aeronautical Engineering. Academic course work must include 3 credit hours in each of the following: numerical methods, finite element structural analysis, computer optimization.

The minimum working hours are 40 hours per week, with a starting salary of $37,200 per year. This ad is employer paid.

Please send resume in confidence to: Michigan Employment Security Commission, 7310 Woodward Avenue, Room 415, Detroit, Michigan 48202.
Reference No. 73090.

An Equal Opportunity Employer M/F/V/H

Software Project Engineer to work in Manufacturing Automation Protocol (MAP) development, responsible for design, implementation, and test of software for an International Standards Organization (ISO) Directory Client/Server System. This position involves development of Directory System Agent (DSA), Directory User Agent (DUA), and Directory Access Protocol (DAP) to form a complete ISO Directory system. Implementation must conform to existing ISO specifications for Open Systems Interconnect (OSI) including Abstract Syntax Notation One (ASN.1), Remote Operations Service Element (ROSE), Association Control Services Element (ACSE), and Directory Services (X.500) implementation will be required on both MVS and UNIX platforms and include development of an Application Programming Interface (API) and user command language interface (CLI) for access to Directory Services. Duties include developing documentation including functional specifications, engineering plans, project status reports, technical manuals, and test methodologies. Participate in new product planning with engineering groups. Use C language to develop Directory components in modular architecture. Implement test suites to verify product conformance to X.500. Requirements for this position are: A Master of Science in Computer Science with specialization in OSI networking; knowledge of ISO OSI specifications for ASN.1, Abstract Service Definition Conventions (X.407), Remote Operations, The OSI Directory (X.500), and ACSE; background in OSI Application protocol design and development; knowledge of VMS and UNIX operating systems and C programming language. Salary: $38,291, 40 hr/wk, 8:15-5pm. No exp. req. If you are interested in, and qualified for the above position, please forward (2) resumes to: Attention: Job Order #11041, Massachusetts Department of Employment and Training, Special Programs Unit, Charles F. Hurley Building, 19 Stanford Street, Government Center, Boston, MA 02114

Systems Consultant for firm in NE Ohio. To design, develop, and implement computer software and computer systems for use in computer networks, particularly Local Area Networks (LAN) and data communications, for company clients. Must have M.S. in Computer Science and academic program must have included one course each in: Network Engineering, Mini-Micro Computers, Data Communications, and Intelligent Systems. Must have one year of experience in software engineering and experience must have been in designing and developing software systems for data communications; including Local Area Networks. 40 hrs/wk., 8:30am-5pm, $36,500/yr. Must have proof of legal authority to work permanently in U.S. Send resume and course transcript in duplicate (no calls) to J. Davies, JO#1255629, Ohio Bureau of Employment Services, P.O. Box 1618, Columbus, Ohio 43216.

Specialist - College of Education for state university to coordinate information processing systems for College of Education research, teaching and service activities; consult with college personnel on support needs for research, instructional programs, student advisement/affairs and outreach to public school districts; design, develop, maintain and upgrade complex computer communication and network systems, consisting of 400+ workstations, including links with public school sites for professional development and research; identify, evaluate and recommend network and personal computer hardware and software systems; develop and implement group-productivity systems using local area networks; design and oversee research and operational database systems related to bibliographic inventory, accounting, student/personnel records and mainframe computer accounts; supervise support personnel in installation and maintenance of computer facilities; teach one or more graduate courses each year in educational systems development; develop and implement user-training materials, short courses and workshops for database, word processing, electronic mail, office automation and desktop publishing; develop computer support expenditure budget documents; perform policy, procedural, organizational and/or operational studies. Min. Qual.: Masters-Education; Masters-Computer Science; graduate program in Computer Science must include at least one course each in Network Design, Large Database Theory, Accounting Information Systems; one (1) year related occupation of Research Assistant/Graduate Research Assistant; one year related experience in a programmatic/educational R&D center, involving design, execution and publication of research under standards established by relevant professional/scientific organizations (e.g., American Psychological Association (APA). $40,000/yr. 8am-5pm, M-F. Resume to: Michigan Employment Security Commission, 7310 Woodward Ave., Rm 415, Detroit, MI 48202. Ref. No. 79990. AN EQUAL OPPORTUNITY EMPLOYER PAID AD.

Software Engineer for NE Ohio computer software development firm to design & analyze system schema for software system; develop software in C Language & SQL database language for use on IBM mainframe, VAX, & IBM-PC; maintain & update existing systems; develop advanced optimization package using mathematical algorithms & operation research. No exp. req. In position above, 18 mos. exp. as a Systems Analyst (1 yr. exp. as a systems analyst must be in IBM mainframe, VAX, & IBM PC, using C Language, & 6 mos. exp. must be in SQL database language) & a B.S. in Computer Science (must have taken at least 2 courses in Operation Research & 3 courses in mathematics) required. M-F 8:00AM-5:00PM. $2,846/mo. must have proof of legal authority to work permanently in U.S. Send resume in duplicate (NO CALLS) to J. Davies, JO# 1255629, Ohio Bureau of Employment Services, PO Box 1618, Columbus, OH 43216.

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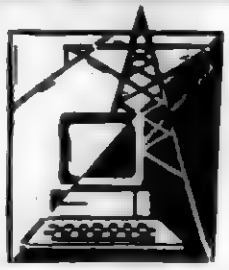

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Along with wide use of personal computers, we're operating one IBM 3090-300, one IBM 3090-200, and one Amdahl 5890-300. The CICS on-line environment has been growing at the rate of 40% per year. Recently, we have expanded to a new Data Center. We're operating under MVS/XA and VM/CMS utilizing an SNA/SDLC network consisting of over 3,000 terminals and printers. Our programming languages are COBOL, SQL and DATACOM's IDEAL. We have adopted DB2 as our standard for new application development and are aggressively expanding our use of PC-based and mainframe-based CASE tools.

We have recently completed a large strategic planning study and have a significant backlog of technical and application development projects. We are currently seeking the following:

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Positions require 4+ years of structured coding experience. Highly desired experience would include COBOL, CICS, DB2 and DATACOM. A four-year degree is preferred.

SYSTEMS ANALYSTS

Positions require 4+ years experience in a development environment versus a maintenance environment. Highly desired experience would include structured design techniques, data modeling experience, prototyping and Method/1 knowledge. A four-year degree is preferred.

DATABASE ANALYST

Position requires 4+ years experience utilizing a relational database engine, preferably DB2. Desirable experience includes formal participation in the physical DB design activity of development projects. A four-year degree is preferred.

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Requires 3-5 years of technical experience in personal computer support, including a minimum of 1-2 years in the design, implementation and support of Local Area Networks, preferably in a LAN-to-LAN or wide area connectivity environment. Banyan network operating system experience strongly desired. Candidates must possess strong verbal and written communication and client consulting skills. A four-year degree is preferred.

There are few areas in the country as attractive as the Carolinas. The landscape is famous for its rolling hills and magnificent fall colors. The capital city of Raleigh, location of our headquarters, is known for its nationally recognized university programs, sports and proximity to both beach and mountain resorts. Despite its growth the region has maintained a moderate cost-of-living and its southern charm.

CP&L offers competitive salaries, excellent benefits, and opportunities to advance. If you're interested in becoming part of our important team of professionals, send resume with salary requirements to: **Mary Anne Lynch, Senior Recruitment Representative, Dept. CW11990, CAROLINA POWER & LIGHT COMPANY, P.O. Box 1551, Raleigh, NC 27602.** An Equal Opportunity/Affirmative Action Employer

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GIS Software Designer - perform conceptual & function design & implementation of software for geographic info. systems (Vector & Raster). Ph.D in Geography + 3 yrs on job or in research positions in remote sensing and comp. cartography. Know Comp. image processing, spatial & statistical analysis, ARC/INFO programming, VAX/750, 780, 785, Primer, UNIX/C, F77 & LISP. $59,000/yr. Job & interview at Redlands. Send this ad & your resume to Job #NOF1038, P.O. Box 9560, Sacramento, CA 95823-0560 not later than 12/4/90.

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Systems Analyst for firm in central Ohio. The Investment Product Operations (IPO) area is responsible for administering all the firm's annuity and pension business. Within IPO, the Systems Programming area coordinates all components of the computer hardware and software systems which administer the firm's complex annuity and pension business. The Systems Analyst is responsible for analyzing problems which may arise anywhere within the computer systems dealing with annuity and pension matters, providing recommendations as to how to resolve them, and implementing the resolution of those problems which are highly complicated and/or complex (such as modifying existing programs or correcting invalid data). The position also involves theoretical analysis and design of the entire systems, as well as training the programmers and other technicians involved in the day-to-day running of the system. An important responsibility is to consult with senior management and recommend ways to improve all aspects of the firm's annuity and pension business. Must have B.S. in Computer and Information Science and academic program must have included one course each in: Principles of Programming Languages, Introduction to Operating Systems, Introduction to Data-Base Systems, and Data Structures. Must have 2 years experience in computer programming and must have extensive knowledge of annuity and pension business and be able to analyze, design, and implement complex pension programs using the software packages PAS, PAS GID, and PAS LOANS as evidenced by academic and/or employer testimonials. Must pass standard prescribed programming proficiency test. 40 hrs/wk, 8am-5pm, $31,500/yr. Must have proof of legal authority to work permanently in U.S. Send resume and course transcript in confidence pro cdas to J. Deems, JO#12802B, Ohio Bureau of Employment Services, P.O. Box 1618, Columbus, Ohio 43216.

System Software Engineer. Networking Group. ISV Account Manager. By 12/1/1990 please send resume to: Employment Security Department, ES Division, Attn: Job #230438, Olympia, Washington 98504. Job Description: Designs, implements and tests complex and high level systems and software for micro computers. Responsible for strategic marketing of networking software (including OS/2 LAN Manager, SQL Server and Mail Server) to Independent Software Vendors (ISV's) in the United States and foreign markets. Works with other engineers to design, modify and adapt networking software for use with software applications manufactured by ISV's. Utilizes MS-DOS And UNIX Operating Systems And "C", SQL And Smalltalk Languages. Assumes major project responsibility including: 1) requirements and analyses of project specifications, 2) product design, and 3) implementation schedules. Requirements: B.A. or B.S. in Electrical Engineering, Computer Science, Mathematics or Physics. Six months of work experience in computer design or programming utilizing networking systems software, MS-DOS and UNIX Operating Systems, and "C", SQL and Smalltalk Languages. 20 course hours in business/marketing analysis or six months of work experience in business marketing. Must have proof of legal authority to work in the United States. Job location: Redmond, Washington. Salary: $34,000 per annum, depending on experience. 40 hours per week, flex time. EOE.

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The following information will help you determine the size ad you'd like to run and when you'd like to run it.

CLOSING DATES: To reserve space, you need to call us by 5PM (all continental U.S. time zones), 6 days prior to the Monday issue date. We need your ad materials (camera-ready mechanical or copy for pub-set ad) by 5PM, 5 days prior to the weekly issue.

AD COPY: We'll typeset your ad at no extra charge. You can give us copy via phone, U.S. mail, or FAX. To typeset an ad for you, we need clean, typewritten copy. Figure about 30 words to the column inch, not including headlines. (There are seven columns on each page.)

LOGOS AND SPECIAL ARTWORK: Any logos or special artwork should be enclosed with your ad copy. For best reproduction, please send us either a stat of your logo or a clean sample on white bond paper.

COLUMN WIDTHS AND MINIMUM DEPTHS: Your ad can be one of seven different widths. There is a minimum depth requirement for each width. You can also run larger ads in half-inch increments. The chart below can serve as a reference.

NUMBER OF COLUMNS	WIDTH	MINIMUM DEPTH
1 column	1-1/4"	2"
2 columns	2-5/8"	2"
3 columns	4-1/16"	3"
4 columns	5-9/16"	4"
5 columns	6-15/16"	5"
6 columns	8-3/8"	6"
7 columns	9-3/4"	7"

RATES: Your rate will depend on the size of your ad and whether you choose to run regionally or nationally. The national rate is $14.85 per line or $207.90 per column inch. The regional rate (Eastern, Midwestern or Western editions) is $10.80 per line or $151.20 per column inch. You can run your ad in any two regions for $13.50 per line or $189.00 per column inch. In all cases, you can earn volume discounts.

The minimum ad size is two column inches (1-1/4" wide by 2" deep) and costs $415.80 if run nationally. A sample of this size appears below. You can run larger ads in half-inch increments at $103.95 per half inch. Box numbers are available and cost $25 per insertion ($50 if foreign).

Programmer Analyst

This is a sample ad for Computerworld's Computer Careers section. It will help you decide what size ad you'd like to run. Remember that you can run your ad either regionally or nationally in our recruitment section and that the minimum ad size is one column (1 4/16 inches wide) by two inches deep (like this sample). This ad would cost $415.80 in our national edition, $302.40 in the Eastern, Midwestern, or Western edition, and $378.00 in two regions; volume discounts apply.

SAMPLE AD SIZES AND PRICES: To assist you in planning your recruitment advertising, the following shows common ad sizes and their respective costs.

	One Region (East, Midwest or West)	Two Regions (East/West, East/Midwest, Midwest/West)	National Edition
1 column x 2"	$ 302.40	$ 378.00	$ 415.80
2 column x 2"	$ 604.80	$ 756.00	$ 831.60
3 column x 3"	$1,360.80	$1,701.00	$1,871.10
4 column x 5"	$3,024.00	$3,780.00	$4,158.00
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PAYMENT: If you're a first-time advertiser or if you haven't established an account with us, we need your payment in advance (or with your ad), or a purchase order number. Once you have established an account with us, we'll bill you for any ads you run as long as your payment record is good.

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Telecopier Extensions: 739 or 740

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— Rogers Faden
President
cfSOFTWARE

Having enjoyed 40 per cent growth the past couple of years, cfSOFTWARE has found its niche marketing two unique communications solutions in the IBM and IBM-compatible arena. Across-the-Boards, a standard application programming interface, and pcMAINFRAME, a file transfer system, both enable mainframes and microcomputers to talk to one another. According to Rogers Faden, President of this Chicago-based company, targeting users whose applications require this type of cross-communication is key to their continued success.

"Computer and applications managers within mainframe shops, as well as developers at software companies and mainframe installations, are our primary audience. We know that Computerworld is the publication that delivers our message to the greatest number of mainframe sites we need to reach. That's why we advertise in Computerworld Response Card Decks.

"Overall, card deck advertising is a cost-effective way to generate inquiries with fast, easy turnaround. And we've found that especially true with Computerworld Response Cards. In fact, in terms of leads generated per dollar spent, Computerworld Response Cards give us the greatest cost efficiency.

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MARKETPLACE

Systems managers crucial in computer crime prosecution

Editor's note: Legal Eye is a monthly series exploring legal issues in the computer industry.

BY LOU OLENICK
SPECIAL TO CW

If you were to witness a crime, you would call the authorities to arrest the criminal. But with computer break-ins, a different scenario unfolds.

Computer crime falls into a gray area because witnesses are scarce. And unfortunately, break-ins are usually detected well after the fact. Sometimes discovery is accidental; in other situations, systems administrators or auditors notice subtle changes in accounting usage records. Whatever the case may be, information systems managers are key to apprehension, prosecution and civil damage recovery of computer break-ins.

Recent stories of computer crime illustrate the vulnerability of computer systems to fraud, data leaks and tampering. Consider the Californian who used a $200 home computer to break into Citibank NA's New York credit accounts to buy $11,000 worth of mail-order goods; the New Yorker who broke into Grumman Aircraft Systems Division computer systems and copied government files to his home personal computer for a month before getting caught; or the Oklahoma travel agent who altered the American Airlines Frequent Flyer database to receive free flights based on unused frequent flyer points he then resold to unsuspecting customers.

Each of these break-ins is prosecutable because it is defined by federal or state laws: computer activity that causes damage across state lines; the unauthorized use of U.S. government data, equipment or facilities; or activity that threatens the security or commerce of the U.S.

In addition, IS managers should be aware that each state has its own laws to govern computer crime. New York law, for example, requires that all elements of the following list be satisfied before computer tampering is prosecutable: that a person uses a computer or computer service; that a person uses a computer or computer service without the right to do so; that a person intentionally alters data or programs.

IS managers who suspect employees of computer crimes and wish to prosecute can take some of the following steps:

• **Build a case.** Once IS managers are confident that a break-in has occurred, they should bring it to the attention of upper management. Then, the company would be wise to form a team ideally made up of a lawyer and an investigator who both have experience in prosecuting cases in this area. As extravagant as this approach may seem, companies will go to these lengths if the stakes are high enough.

If the firm decides to prosecute the suspect, the IS manager will have to install the necessary tools and procedures to prove that a crime has been committed — before the event. Audit trails of callback procedures, telephone records or reports of account use by access-identification must be preserved.

• **Produce solid evidence.** To search an employee's home or car, an affidavit is required showing probable cause before the judge will allow a search.

For example, the audit trail tracing unauthorized accesses from a phone at a suspect's residence may be necessary before a court-ordered search is allowed. In addition, before police can search, they, too, require probable cause. Without it, they may not conduct searches of an individual, and any evidence they collect illegally is not admissible in court.

• **Enlist the help of experts.** Poorly prepared cases will not make it to court, so use experts to help fill in any gaps. If any element of the law is missing, the prosecutor may refuse to file a complaint.

Experts can strengthen the company's case through their testimony. For example, an ex-employee of the Federal Reserve System broke into the computer to get economic data that allowed him to anticipate the Federal Reserve's interest rate announcements. The expert presented evidence of the Federal Reserve's dial-and-answer-back software, which provided a detailed log of phone calls and led to the tamperer's conviction.

• **Prevent computer access.** If there is concern that an accused employee (or former employee) may break into the system during the several months that the case is prepared for trial, a temporary restraining order should be obtained. If the suspect violates this order, he or she can be sent to jail for contempt of court.

• **Handle termination issues sensitively.** Once an employee is suspected of a computer crime, most companies' policies require termination. This duty falls on the systems manager or the end-user department. The manager should take care to conduct termination and exit interviews according to company policy. To avoid any clashes, a wise manager will have a second person witness the firing. In addition, managers must minimize their company's risk from false arrest. Companies may have to defend themselves against lawsuits for ruining a reputation or for wrongful firing.

Because of all the difficulty and pain associated with prosecution, companies should take steps to avoid the problem in the first place. The most effective measure is to conduct a thorough review of installation security procedures and then take deliberate steps to eliminate the areas of greatest risk.

Olenick is a partner in the New York law firm Olenick and Yarnell, which practices extensively in computer law, commercial transactions and taxation.

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IBM PC Model 176	$375	$450	$200
XT Model 086	$500	$550	$450
XT Model 089	$550	$625	$400
AT Model 099	$650	$975	$500
AT Model 239	$875	$1,025	$750
AT Model 339	$925	$1,100	$900
PS/2 Model 30-286	$1,250	$1,300	$1,125
PS/2 Model 60	$1,500	$1,800	$1,400
PS/2 Model 70P	$3,425	$3,450	$3,175
Compaq Portable II	$900	$1,050	$875
Portable 286	$1,275	$1,450	$1,100
SLT 286	$2,500	$2,625	$2,000
Portable 386	$2,600	$2,800	$2,500
LTE 286	$2,000	$2,100	$1,850
Deskpro 286	$1,175	$1,400	$1,100
Deskpro 386/20	$2,900	$3,100	$2,400
Apple Macintosh Plus	$750	$975	$700
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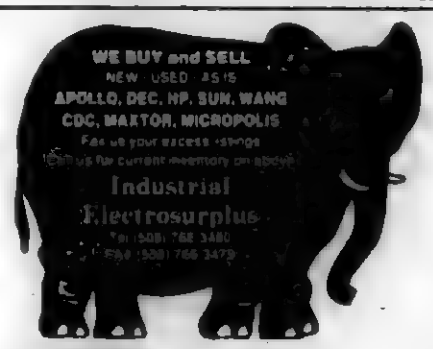

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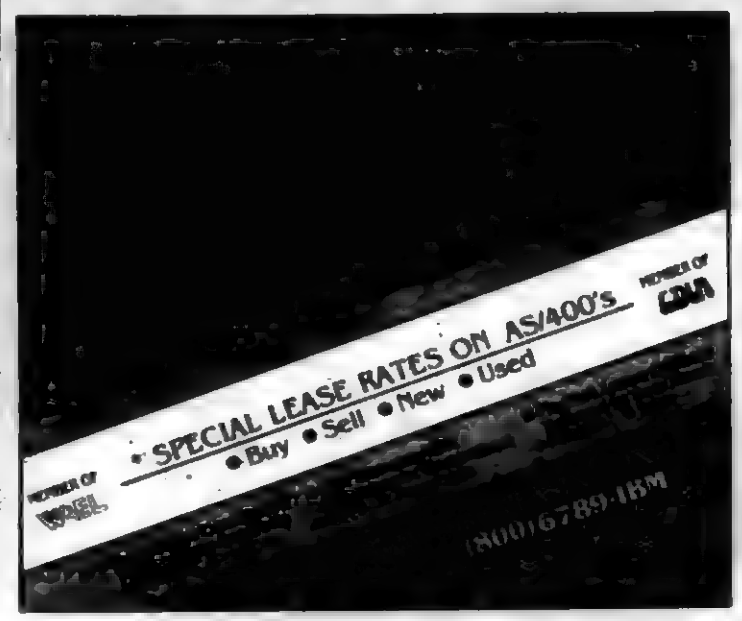

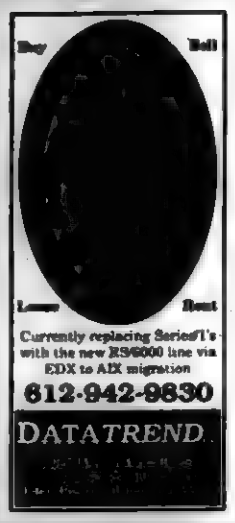

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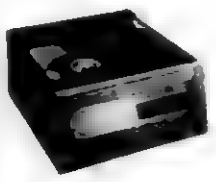

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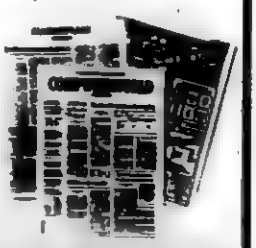

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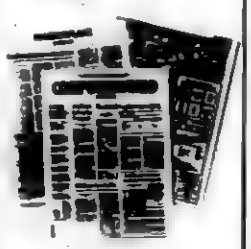

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Softening 'manual' labor

IS trainers can add zip to custom-developed documentation

BY JON WILLIAM TOIGO
SPECIAL TO CW

Have you ever sat through a five-hour lecture on Cobol compilers, slept on a bed of nails or assembled a Nintendo set without directions? If you answered yes to all of these questions, then you know what it's like to read custom-developed hardware and software manuals. Boring, painful, impossible.

This documentation, mainly developed by programmers and analysts, often depicts system use from the point of view of the data technician rather than the user. What results is a document that describes the system rather than a manual that explains its use.

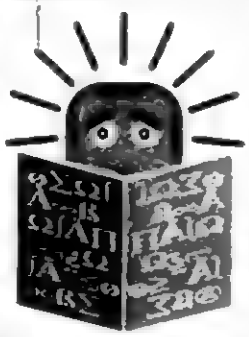
Of course, to insist that all programmers develop effective end-user documentation writing skills or become better communicators by developing an awareness and appreciation of the principles of adult education is an anathema — like asking a SWAT team to sit for a class in sensitivity training.

Power of the pen

One logical solution, then, is to put the power of the documentation pen into the hands of a group accustomed to teaching: your information systems training department.

The same methods trainers bring to course development materials may be useful in end-user documentation development as well: text handouts, presentation graphics, computer-based training (CBT) and animated demonstrations and even videotape programs. The IS trainer can then shape the presentation based on the principles of how adults learn and a knowledge of the population being trained.

While IS trainers may certainly lack the technical knowledge of programmers and systems analysts, they are generally accomplished researchers. For high-level systems documentation, such as data flowcharts or entity-relationship models, the trainer can consult with the systems experts to develop a firm grasp of the new application.



After consulting with the systems specialists, the IS trainer can then translate that information into terms that the user would need in order to perform a certain function on a system that is unfamiliar to them. Whatever is too complicated for a trainer to comprehend probably does not belong in an end-user manual in the first place.

As a safeguard against content errors, at least one technical expert should participate in a review of lessons and documentation drafts before they are presented to end users.

By assigning the responsibility for end-user documentation to corporate trainers, several efficiencies can be achieved:

• **Straightforward presentation.** Training course developers are attuned to the learning needs of their trainees and possess some insight into how text should be organized for ease of understanding. Instead of creating a reference manual that must be absorbed by users through osmosis before they can begin to use a system, the wise trainer will likely organize information by task.

Average users don't particularly care about the wondrous programming achievements embodied in the applications they must use. They only want to know what steps to take or which keys to press to accomplish specific tasks and log out of the system as quickly as possible. This is an attitude to which IS trainers have always catered: Keep it simple, and tell the trainees only what they need to know. The rest is superfluous.

• **Learning stimulation.** In line with the principles of adult education, IS trainers always attempt to stimulate as many trainee senses as possible to achieve the most effective levels of communication and information retention. The visual sense is primary among these learning senses.

In text treatments, CBT, animated demonstrations and video, the object is to teach with pictures and support the pictures with words.

Given responsibility for user-manual development, training developers can integrate pictures into text matter via desktop publishing to produce texts that are visually attractive as well as informational.

As an added advantage, graphics created for the user manual can be readily converted to new formats and reused in classroom or self-study training materials and multimedia.

• **Potential cost savings.** Technical professionals are typically paid more than training developers. Thus, giving end-user documentation responsibilities to IS training personnel is actually more cost-effective than having technical professionals perform the work. Even if training professionals are paid on a par with technical professionals, the company will save money. Why? Assuming that the trainers will do a better job, user productivity and system acceptance will be much higher.

Bottom line

Delegating user documentation development to the corporate training organization is both cost-effective and training-effective. The training organization can streamline the training development process if they have already created and illustrated user documentation. For a fairly straightforward system, the user manual may be all of the training that is required.

However, for companies that do not have a formalized training function, the lessons of effective user manual development need not be lost. The next time a systems professional is asked to develop a user manual, he should guide the effort with a simple question: What are the five or 10 or 20 tasks that a user is going to perform most often using the system? A simple step-by-step procedure or "cheat sheet" for accomplishing each task is better than 500 pages of eloquently written and overdescribed documentation.

Toigo is a free-lance writer based in Clearwater, Fla., who specializes in business computing topics.

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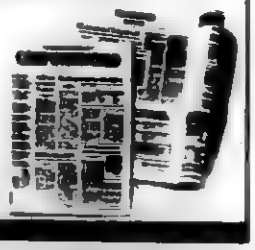

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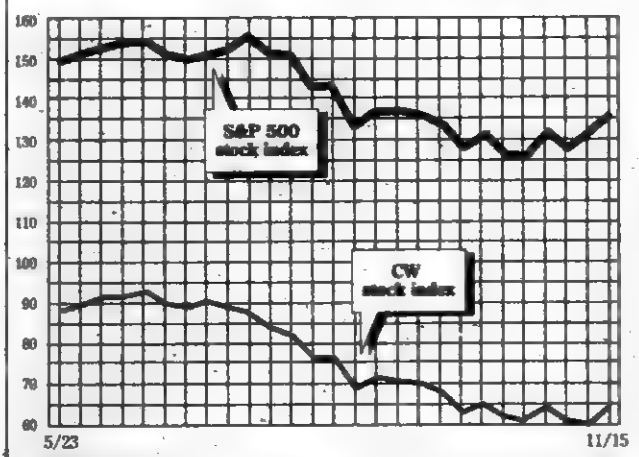

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Software & DP Services	89.0	94.7
Semiconductors	36.8	40.1
Peripherals & Subsystems	68.2	70.7
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Composite Index	60.9	64.7
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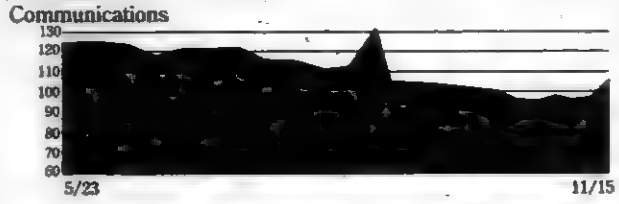

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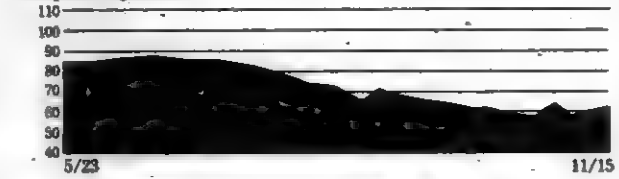

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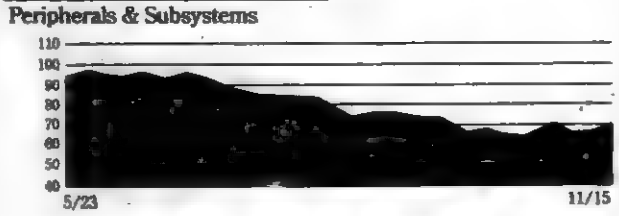

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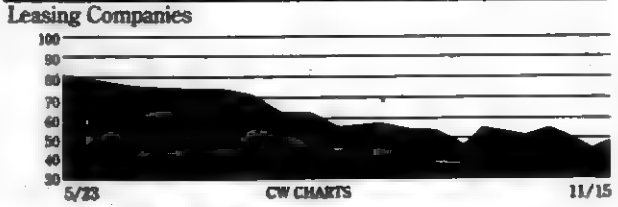

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Communications and Network Services						
N	AMERICAN INFO TECHS CORP	68	53	65.625	1.4	2.1
Q	ANDREW CORP	28	16	18.75	1.3	7.1
Q	ARTEL COMM CORP	10	2	2.5	-0.3	-8.1
N	AT&T	47	28	33.75	0.1	0.4
Q	AVANTEK INC	3	2	2.375	0.5	28.7
N	AYDIN CORP	17	10	10.875	0.8	8.1
N	BELL ATLANTIC CORP	57	40	53.25	2.9	5.7
N	BELLSOUTH CORP	59	46	53.125	0.3	0.5
Q	COMPRESSION LABS INC	16	7	14	2.1	17.9
Q	COMPUTER NETWORK TECH	0	0	0.01	0.0	0.0
Q	CONTEL CORP	36	23	33.75	0.4	1.1
Q	DATA SWITCH CORP	4	2	2.875	-0.1	-4.2
Q	DIGITAL COMM ASSOC	27	9	11.875	1.8	17.3
Q	DYNATECH CORP	19	12	16.25	-0.5	-3.2
Q	FIBRONICS INTNL INC	13	5	9	1.8	24.1
Q	GANDALF TECHNOLOGIES	6	2	2.75	0.0	0.0
N	GENERAL DATACOMM INDS	5	2	2.125	0.3	13.3
N	GTE CORP	28	24	28.875	0.8	2.7
Q	INFOTRON SYS CORP	9	1	1.125	0.1	12.5
N	ITT CORP	61	40	48	2.0	4.3
N	M A COM INC	6	3	5	0.5	11.1
Q	MCI COMMUNICATIONS CORP	46	28	31.875	1.8	6.8
N	NETWORK EQUIP TECH INC	34	5	6.125	0.8	14.0
Q	NETWORK SYS CORP	15	8	10.375	1.8	20.3
N	NORTHERN TELECOM LTD	30	21	25.625	-0.3	-1.0
Q	NOVELL INC	30	12	30	3.0	11.1
N	NYNEX CORP	92	67	71.375	1.8	2.5
N	PACIFIC TELESIS GROUP	52	38	46.25	1.6	3.6
A	PENRIL CORP	9	5	6.5	0.3	4.0
N	SCIENTIFIC ATLANTA INC	29	9	11.125	1.6	17.(
N	SOUTHWESTERN BELL CORP	65	47	53	-2.0	-3.6
Q	3 COM CORP	19	5	8	0.9	12.3
N	U S WEST INC	41	32	38.875	0.3	0.7
Computer Systems						
Q	ALLWAIT COMPUTER SYS	9	1	1	-0.3	-20.0
Q	ALPHA MICROSYSTEMS	5	1	2	0.4	23.1
A	AMDAHL CORP	19	10	13.375	1.5	12.6
Q	APPLE COMPUTER INC	48	24	37	3.8	11.3
Q	AST RESH INC	26	10	25.375	1.9	8.0
N	BOLT BERANEK & NEWMAN	8	4	4.5	-0.1	-2.7
N	COMPAQ COMPUTER CORP	68	36	51.625	5.3	11.3
N	COMMODORE INTNL	12	5	7.875	1.0	14.5
Q	COMPUTER AUTOMATION INC	6	0	0.938	-0.2	-16.6
N	CONTROL DATA CORP	22	8	10.375	1.1	12.2
N	CRAY RESH INC	51	20	27.875	2.6	10.4
N	DATA GEN CORP	14	4	4	-0.1	-3.0
N	DATAPOINT CORP	5	1	1.5	0.1	9.1
Q	DELL COMPUTER CORP	14	5	12.125	0.9	7.8
N	DIGITAL EQUIP CORP	68	46	52.25	4.8	10.0
N	FLOATING POINT SYS INC	4	0	1.25	0.0	0.0
N	HARRIS CORP	36	14	16.28	1.8	10.6
N	HEWLETT PACKARD CO	50	25	28.25	3.1	12.4
N	HONEYWELL INC	112	71	90.5	3.8	4.3
N	IBM	123	93	113.5	7.0	6.6
Q	INFORMATION INTL INC	14	8	8.75	0.0	0.0
Q	IPL SYS INC	14	5	10.25	1.1	12.3
N	MAI BASIC FOUR INC	4	1	0.938	-0.1	-8.2
N	MATSUSHITA ELEC INDL LTD	186	116	126.25	-0.3	-0.2
Q	MENTOR GRAPHICS CORP	26	9	11.25	0.5	4.7
N	NBI INC	1	0	0.156	0.0	10.6
N	NCR CORP	72	46	58.625	8.8	18.0
Q	PYRAMID TECHNOLOGY	26	12	15.375	0.9	6.0
Q	SEQUENT COMP SYS INC	34	12	19.625	2.8	16.4
Q	SUN MICROSYSTEM INC	37	15	18.625	1.0	5.7
Q	SYMBOLICS INC	2	0	0.25	0.0	-11.0
N	TANDEM COMPUTERS INC	30	8	12.5	2.3	22.0
N	TANDY CORP	44	24	28.875	4.5	18.5
N	ULTIMATE CORP	10	2	1.75	-0.3	-12.5
N	UNISYS CORP	17	2	3	0.1	4.3
A	WANG LABS INC	6	3	3	0.3	8.1
Software & DP Services						
Q	AMERICAN MGMT SYS INC	30	11	14.875	0.2	1.7
Q	AMERICAN SOFTWARE INC	18	8	11.375	1.0	9.8
N	ANACOMP INC	5	1	2.25	0.3	12.5
Q	ANALYSTS INTL CORP	24	10	12.75	0.3	2.0
Q	ASHTON TATE	15	8	7.875	0.9	12.5
N	AUTO DATA PROCESSING	60	46	54	3.0	5.9
Q	AUTODESK INC	60	32	46.75	5.0	12.3
Q	BMC SOFTWARE INC	30	17	22.5	2.9	14.6
N	BUSINESSLAND INC	12	1	1.75	0.3	16.7
Q	COGNOS INC	10	4	7.375	-0.1	-1.7
N	COMPUTER ASSOC INTL INC	17	4	7.625	0.6	8.9
Q	COMPUTER HORIZONS CORP	17	8	14.375	1.6	12.7
N	COMPUTER SCIENCES CORP	59	37	45.875	1.9	4.3
N	COMPUTER TASK GROUP INC	12	7	8.875	-0.3	-3.5
Q	COMSHARE INC	25	14	18	0.8	4.3
Q	CORPORATE SOFTWARE	16	4	7	2.3	47.4
N	GENERAL MTRS (CLS E)	38	24	34.875	2.4	7.3
Q	GOAL SYSTEMS INTL	18	8	9.25	0.8	8.8
Q	HOGAN SYS INC	7	2	2.375	0.0	0.0
Q	INFORMIX CORP	18	4	4	0.0	0.0
Q	INTELLICORP INC	8	1	2.063	0.3	17.9
Q	LEGENT CORP	31	17	23	3.6	18.7
Q	LOTUS DEV CORP	39	13	17.75	-0.9	-4.7
Q	MICROSOFT CORP	91	28	68.5	5.6	9.0
Q	NATIONAL DATA CORP	35	8	13.875	2.9	26.1
N	ON LINE SOFTWARE INTL INC	11	4	4.125	0.1	3.1
Q	ORACLE SYS CORP	188	5	6	0.4	6.7
N	PANSOPHIC SYS INC	19	7	7.75	0.4	5.1
Q	PHOENIX TECHNOLOGIES INC	5	1	1.75	0.1	7.7
N	POLICY MGMT SYS CORP	43	20	20.25	3.0	8.3
Q	PROGRAMMING & SYS INC	13	5	5.5	-3.3	-48.6
Q	RELATIONAL TECH INC	10	3	9.125	0.0	0.0
N	REYNOLDS & REYNOLDS CO	27	12	14.5	1.5	11.5
Q	SAGE SOFTWARE INC	16	8	10.125	0.3	2.5
Q	SEI CORP	22	15	16.75	0.8	4.7
Q	SHARED MED SYS CORP	17	12	15.25	0.0	0.0
Q	SOFTWARE PUBG CORP	28	12	17.5	2.3	14.8
N	STERLING SOFTWARE INC	11	6	7.125	0.3	3.6
Q	SUNGARD DATA SYS INC	26	10	13	1.8	14.3
N	SYSTEM CENTER INC	25	6	8.75	1.8	22.8
N	SYS. SOFT INC	28	13	22.5	2.0	9.8
Q	WORDSTAR	2	1	1.125	0.1	5.8
Semiconductors						
N	ADV MICRO DEVICES INC	11	4	4.75	1.0	26.7
N	ANALOG DEVICES INC	10	6	5.875	0.1	2.2
Q	ANALOGIC CORP	10	8	8.375	0.0	0.0
Q	CHIPS & TECHNOLOGIES INC	24	5	7.125	0.9	14.0
Q	INTEL CORP	52	28	37.875	3.4	9.8
Q	MICRON TECHNOLOGY INC	16	7	9.625	2.3	30.5
N	MOTOROLA INC	68	51	56	1.0	1.8
N	NATL SEMICONDUCTOR	9	3	3.875	0.1	3.3
N	TEXAS INSTRS INC	44	23	27.75	2.0	7.8
A	WESTERN DIGITAL CORP	15	4	5.25	0.1	2.4
Peripherals						
Q	ALLOY COMP	2	0	0.344	0.1	37.6
N	AM INTL INC	6	1	1.75	0.3	16.7
Q	AUTO TROL TECH CORP	4	2	2.063	0.0	0.0
Q	BANCTEC INC	24	10	12	1.0	9.1
A	COGNITRONICS CORP	7	3	5.625	0.3	4.7
Q	CONNER PERIPHERALS	31	11	25.375	3.5	16.0
A	DATARAM CORP	22	8	8.75	0.6	6.9
N	EASTMAN KODAK CO	44	34	42	3.1	8.0
N	E M C CORP MASS	16	3	9	1.9	24.1
Q	EMULEX CORP	9	4	5.25	0.3	5.0
Q	EVANS & SUTHERLAND	35	14	16.75	0.3	1.8
Q	ICOT CORP	2	0	0.375	-0.2	-33.4
Q	INTERLEAF INC	8	3	3.5	0.3	7.7
Q	IOMEGA CORP	6	3	4.375	0.3	7.7
Q	MASSTOR SYS CORP	3	0	0.188	-0.1	-38.8
Q	MAXTOR CORP	17	4	4.75	0.1	2.7
Q	MICROPOLIS CORP	10	3	6.375	0.6	10.9
N	MINNESOTA MNG & MFG CO	91	74	80.5	1.9	2.1
Q	PERSONAL COMP PRODUCTS INC	5	4	3.625	0.0	0.0
Q	PRINTRONIX INC	15	6	9	0.6	7.5
N	QMS INC	21	9	13.25	2.0	17.8
Q	QUANTUM CORP	26	9	20	1.8	9.6
N	RECOGNITION EQUIP INC	8	4	4.625	-0.4	-7.5
Q	REXON INC	10	4	5.5	-0.1	-2.2
Q	SEAGATE TECHNOLOGY	20	6	9.125	0.4	4.3
N	STORAGE TECH CORP	35	11	19.5	3.6	22.8
Q	TANDON CORP	4	1	1.719	0.0	1.8
N	TEKTRONIX INC	19	12	17.125	1.1	7.0
Q	TELEVIDEO SYS INC	1	0	0.28	0.0	0.0
N	XEROX CORP	60	28	34.125	3.0	9.6
Leasing Companies						
N	CAPITAL ASSOC INTNL INC	5	1	0.75	0.1	20.0
N	COMDISCO INC	29	15	16.5	0.9	5.8
Q	LDI CORPORATION	18	10	9.5	-0.5	-5.0
Q	PHOENIX AMERN INC	8	3	5.25	0.6	13.5
Q	SELECTERM INC	7	3	3.25	0.5	18.2

EXCH: N—NEW YORK; A—AMERICAN; Q—NATIONAL

Back on track

Investors take a chance again and test high-tech waters

They're baaaaaack. Or at least they are attempting to return. Although technology stocks suffered a down day on Thursday, many closed on the upside for the week, thanks to early-week jumps.

The glitz and hype of the Comdex/Fall '90 show in Las Vegas last week must have inspired investors to gamble on microcomputer-related stocks. Traders dropped a bundle on Compaq Computer Corp., which picked up 2 points to close Thursday at 51⅛. Lady luck was with IBM, apparently, as the firm moved up 2⅜ points to 112⅝. Even Apple Computer, Inc. got into the act, rising ½ a point to 36. Cautious-cum-confident investors pushed Microsoft Corp. up a hefty chunk to 67⅛ — a gain of 3⅛ points for the week.

Other personal computer product makers seemed like shrewd bets as well. Adobe Systems, Inc. ballooned 3⅛ points to 29⅝, while Conner Peripherals, Inc. won ⅝ of a point, finishing Thursday at 24¼.

Rumors flew again last week about the deal in the works between AT&T and NCR Corp., with NCR coming out the favorite. While AT&T inched up just ⅛ of a point to 33¼, NCR soared 3⅜ points to 58½.

Not everyone was making happy talk, however. Motorola, Inc. sagged under weighty doubts about its hold on the cellular phone business, losing 2⅜ points to 52¼.

And how low can they go? Unisys Corp. and Wang Laboratories, Inc. are neck and neck — or maybe it's ankle and ankle. Each closed at 3 points, floating just above 52-week lows — and this after an ⅛-point gain for each last week. Fellow large systems maker Digital Equipment Corp., however, copped a 1¾-point gain to 51⅛.

Most software action was unspectacular. Oracle Systems Corp. grew by ¾ of a point to 6⅝, and Lotus Development Corp. fell ⅝ of a point to 17⅛. Novell, Inc., however, climbed up 1⅛ points to 28¾.

KIM S. NASH

NEWS SHORTS

Sabre, Amadeus to link up

American Airlines' Sabre Travel Information network and Europe's Amadeus Global Travel Distribution network will link up in an effort to expand business outside of their home markets, according to Max Hopper, senior vice president of information systems at AMR Corp., American Airlines' parent company. The alliance reportedly involves no equity ownership by either party. Phase one will establish multiaccess connections from the Sabre computerized reservation system to Air France, Iberia, Lufthansa and Scandinavian Airlines System. The linkage will take approximately five to six months to implement. The second phase will add ticketing to the scheduling and availability information-sharing capabilities.

Sabre currently has 85,000 travel agent stations installed worldwide. Amadeus supports about 40,000 terminals.

Calling Europe to get cheaper

The UK's ministry of trade and industry broke new ground last week by announcing that it will permit the resale and shared use of international circuits between Britain and other countries. This will open the way for a whole new networking industry that will buy bandwidth from British Telecom, Inc. and other UK carriers and resell it to cost-conscious global users, according to Len Elfenbein, president of market research firm Lyax Technologies. The UK's move will put pressure on other European administrations to follow suit, Elfenbein said, because U.S. users will increasingly use shared links to England to get to the rest of Europe rather than set up the more expensive direct dial lines to other countries.

System tamperproofs on-line work

Two researchers at Bellcore will show off today a tamperproof new process of affixing a time-stamp seal to an electronic document, much in the same way a notary stamps paper documents to certify their authenticity. "With electronic documents, there is no way to know what part of the document is authentic and what part has been altered after the fact," said Stuart Haber, who devised the time-stamp process along with Scott Stornetta. The researchers said that subscribers to an "electronic notary" service could submit documents electronically for time-stamping and would receive a "digital receipt" that could be used to prove when the document was created.

DEC ports software to RS/6000

Digital Equipment Corp. will port its Powerframe engineering-tool framework to IBM's RISC System/6000 family, DEC said last week. This marks the first time that DEC has made its applications software available on an IBM platform. While DEC has provided networking software from its computers to IBM machines for some time, the announcement positions it as a competitor to IBM in the area of technical computer-aided software engineering (CASE) tools. Powerframe already runs on Apollo and Sun Microsystems, Inc. computers, as well as on Decstations and Decsystem servers.

Businessland names president

Belabored Businessland, Inc. has taken on a No. 2 man to fight beside Chief Executive David Norman in the battle of the margin squeeze. Edward R. Simon Jr. takes over the chores of president from Norman and the vacated post of chief operating officer, the personal computer dealer chain announced last week. Simon, 51, spent 20 years at international office furniture maker Herman Miller, Inc., where he started as MIS manager and worked his way up to president.

Microsoft blinks on LAN support

Microsoft Corp. announced 30 days of free support for its LAN Manager network operating system, effective immediately for all current and future customers. After the 30-day period, said a spokeswoman for the Redmond, Wash.-based company, support can be purchased from Microsoft, a network specialist or a combination of the two. The move comes amid complaints by network managers about poor support for both hardware and software from such vendors as Microsoft and Novell, Inc.

Claims

FROM PAGE 1

among telephone operators at its Denver-area offices.

The Denver offices spent $2 million on European ergonomic chairs, adjustable workstations, soft-touch keyboards, training videos on work breaks, exercises and even wristband "ergometers" that beep when wrist muscles are too tense.

Baca said the number of current repetitive trauma cases at the Denver offices is down to three, but further improvements in the area of job design are possible. She said a joint labor/management committee is considering a job-sharing program so that operators could do other office work away from their terminals.

Repetitive motion disorders include a wrist ailment called carpal tunnel syndrome, tendinitis and other arm and back problems caused by the "cumulative trauma" of doing repetitive work in uncomfortable positions [CW, June 26, 1989]. The illness — usually a shooting pain or numbing sensation in the hand, wrist or arm — afflicts assembly-line workers and keyboard users such as data-entry clerks, newspaper editors and cashiers.

Repetitive motion syndrome accounted for only 18% of all job-related illnesses in 1981, but that share rose steadily to 33% in 1986, 48% in 1988 and 52% in 1989, the government said.

Until research provides more information about the problem, ergonomists support a "shotgun approach" of job redesign to provide variety, adjustable chairs, rest breaks, training computer users on posture and placing keyboards, screens and paperwork in comfortable positions.

"The worker's compensation costs are spiraling and sometimes ridiculously so when you see how simple some of the solutions are," said Kathryn G. Parker, director of ergonomics at Health & Hygiene, Inc. in Greensboro, N.C.

Studies have shown that proper ergonomics can boost the productivity of office workers by 25%, according to Marvin Dainoff, director of the Center for Ergonomic Research at Miami University in Oxford, Ohio.

The syndrome apparently is widespread in the newspaper industry. A recent survey by The Newspaper Guild, based in Silver Spring, Md., found more than 1,500 union-represented newsroom employees with symptoms of the illness. Also, seven journalists have filed lawsuits seeking $288 million in damages against Atex, Inc., alleging that the vendor's computer terminals are responsible for their cumulative trauma disorders [CW, July 2].

The Occupational Safety and Health Administration (OSHA) has begun to focus on ergonomics in meat-packing and manufacturing industries, but official guidelines for office environments may be a few years away. The agency does not plan any office raids, but an OSHA inspection of office environments could be triggered by employee complaints or could be included in a facilitywide inspection, according to speakers at a recent conference on ergonomics.

Ergonomics experts such as Marilyn Joyce, president of the Joyce Institute in Seattle, caution against going overboard on superadjustable workstations and strap-on wrist splints.

Joyce said total adjustability is needed if different people will use the workstation, but in most cases, a flat surface with an adjustable chair can produce the ideal, the flat wrist. "You don't really have to buy a lot of expensive work surfaces if you get good chairs" and train people how to use them, she said.

NEC expected to increase stake in Bull

BY NELL MARGOLIS
CW STAFF

Reports surfaced in Europe last week that NEC Corp., the Japanese telecommunications and electronics conglomerate, is poised to increase its stake in struggling French state-owned computer vendor Groupe Bull, possibly to majority level.

Computerworld Norge, the Norwegian sister publication of *Computerworld*, said "reliable sources" indicated that ongoing confidential negotiations between NEC and Bull are expected to result in closer working ties and a probable infusion of Japanese capital.

Bull Chairman Francis Lorentz declined to comment.

Bull's recent reorganization included plans for a 5,000-person worldwide layoff and closing seven of its 13 plants by the end of 1992. The firm's soon-to-be-released financial report for 1990 is expected to show losses in the $551 million ballpark.

"Given the rather substantial losses that Bull has posted, and given the large government share, it wouldn't be at all surprising to learn that the [French] government wants to spread the risk by having NEC buy further in," said Paul Zorfass, an analyst at The Yankee Group in Boston.

NEC, which also supplies Bull's 9000 line of large systems, currently holds a minority stake in Bull's U.S. subsidiary.

"When Fujitsu bought ICL [CW, July 23], we figured NEC had to do something to counter," said Sheridan M. Tatsuno, president of Neoconcepts, a Fremont, Calif., consultancy specializing in the Pacific Rim technology market.

Computerworld *staff members Sally Cusack and Ellis Booker contributed to this story.*

Information Builders focusing on Focus

Information Builders, Inc. announced new products at its international users' conference in Vienna last week. Among the additions are Unix versions of its Focus fourth-generation language.

Also, Information Builders said it will support graphical user interfaces on Focus, including IBM's Presentation Manager, Microsoft Corp.'s Windows 3.0 and Apple Computer, Inc.'s Macintosh. Furthermore, the company will extend Focus' abilities to support cooperative and distributed processing and will deliver a new, more modular language. Another direction is to provide its Level5 object-oriented expert system across more platforms, including mainframes and minicomputers.

The New York-based firm will pursue these goals during 1991, company executives said.

In the meantime, users will be able to get the following new versions of Focus:

- PC/Focus Plus, which runs in extended memory on Intel Corp. 80286- and 386-based personal computers. This version, available now, frees up the 640K bytes of standard memory to run memory-resident programs instead of Focus, the company said.
- Focus for Unix platforms, including System V Release 4 and Digital Equipment Corp.'s Ultrix/SQL, which is the database management system DEC bundles with its Ultrix Unix-like operating system. Information Builders is also making Unix graphical user interfaces available, including the Open Software Foundation's Motif and AT&T's Open Look, in the first quarter of 1991.
- Focus for Groupe Bull platforms, running either the Unix or GCOS operating systems. These are available now, except for Focus running under GCOS8, which is expected to be ready early next year.
- Focus for Tandem Nonstop computers, available now.

COMDEX NOTEBOOK

Blame it on fallen arches or just fallen promises, but several users reached the flashpoint and got a chance to wag a finger at one industry heavy. At one conference session, a user asked Leland Reisweig, IBM's vice president of programming, when Microsoft's LAN Manager and IBM's OS/2 LAN Server would be merged. "In the future," Reisweig replied with a smirk as fellow panel members tittered. Another frustrated user shot back to scattered applause: "That's exactly the kind of evasive answers that we're always getting from you people and which drive us all crazy."

"Shapely shenanigans shake up the show." That campaign earns Sys Technology what is fast becoming the annual Comdex award for sexist promotions. The vendor, which manufactures network equipment, invited attendees to its booth to ogle a scantily clad "Miss Sys" during her "eye-catching debut" in a "live aerobic" session, after which they were to be treated to an autographed poster of the sweaty Miss Sys.

Just a few months down the road from his winning the fight over the patent for the microprocessor on a chip, inventor Gilbert Hyatt claimed a new victory. Hyatt said he was recently awarded a patent for a technology that enhances the performance of dynamic random-access memory chips so greatly that it can boost system throughput by an average of 300% through changes to the memory controller and system motherboard.

Comdex attention-getters are of no use if attendees see only empty seats at the booth. So minutes after the Las Vegas Convention Center's doors opened on Monday morning, the first attendees saw a Wang Laboratories, Inc. pitchman already in progress with his presentation and an audience of a dozen people on the edge of their seats. However, the audience, like all of Wang's booth staff, happened to be dressed in the uniform of the day — white shirts and dark slacks and skirts.

Everex Systems, Inc. had a 50-MHz version of its Stepcube on display at Comdex [CW, Oct. 8]. Arche Technologies, Inc., based in Fremont, Calif., was the other hardware vendor to use Santa Clara, Calif.-based Velox Computer Technology, Inc.'s Icecap solid-state technology to jack up the performance of an Intel Corp. 1486 33-MHz chip to 50 MHz.

AOX, Inc. blazed a trail with the demonstration of its OS/[bus] Master software, which enables multiple operating systems to execute simultaneously in IBM Micro Channel Architecture computers based on the Intel Corp. 80286 and 80386 chips. Available in the first quarter of next year, the software runs with AOX's Micromaster 386 33-MHz and 1486 bus master system upgrade cards. AOX said it will support DOS, OS/2, The Santa Cruz Operations' SCO Unix System V, IBM's AIX, Novell, Inc.'s Netware 386 and Microsoft's LAN Manager.

AST Research, Inc. managed to attract the attention of one small group at Comdex that it probably wished it hadn't. Show-goers zipping through the main gate to the Las Vegas Convention Center were met by a tiny but determined group of picketers. Waving signs saying "AST unfair," and "AST, you have powerful attorneys," the picketers carried other signs implying that AST had walked away from a warehouse lease and has not paid the balance of its contract. The picketers were reportedly hired and transported to Las Vegas by the irate warehouse owner. An AST spokeswoman would say only that the contract in question had been "invalidated" by the other party.

IBM's multimedia demonstration of an "aging" application added years to the visage of one well-known and seemingly ageless industry figure: Microsoft Chairman Bill Gates. After viewing his baggy and wrinkled visage, the boyish Gates stood up and suggested Cannavino pick on someone "your own age." To which Cannavino replied, "Bill, working with you has already aged me 10 years." Whispered one IBM business partner: "He's not kidding." The application is used by the National Center of Exploited and Missing Children to create up-to-date representations from photos of children who have disappeared years earlier.

Compiled by Patricia Keefe, James Daly, James Connolly and Michael Fitzgerald.

Gates heralds next generation

BY JAMES DALY
CW STAFF

LAS VEGAS — As the economic slowdown begins to take its toll, Microsoft Corp. President Bill Gates assumed the role of the Moses of the personal computer industry last week and waved vendors and users away from myopic old habits and toward a promised land of increased product usefulness.

Gates blamed corporate feudalism and the obsessive concerns of providing incremental product advances for five straight years of slipping PC sales during his 45-minute keynote address at Comdex/Fall '90. "We need a common vision," he said. "The driving notion for hardware and software technology must focus on making things easier . . . We must go beyond thinking about developing smaller and faster computers or about developing software applications that have better features."

Although Microsoft remains one of the few industry giants that has been immune to the crunch of a slowing economy, Gates used his speech as a model of industry unanimity, eliminating any direct references to Microsoft products and often blowing verbal kisses at rivals such as Apple Computer, Inc.

Gates called his blueprint "Information at Your Fingertips," a concept in which the act of working within a specific application is supplanted by the notion of integrating applications. "The first phase of making life easier was what-you-see-is-what-you-get," said Gates from the stage at the Las Vegas Hilton Showroom where, in 1969, Elvis Presley made his comeback to live performance. "The next phase is what-you-see-is-what-you-need-to-get."

Andy Freeberg

Gates issues call *for "a common vision"*

Today, if workers need to create a document composed of text, spreadsheets and graphics, they must often pull together separate applications that sometimes involve different nonconforming data formats. Additionally, they must explicitly direct an application to do something by typing commands or clicking on a menu.

An architecture must be created, Gates said, that treats data and applications as intelligent "objects" that interact and exchange data. In an object-oriented system, everything is a self-contained entity that is aware of the actions that are appropriate to it, he said.

Applications will also employ an "embed and link" philosophy in which data can be combined from several applications into one document and live links can update all of the elements of the document when data changes.

Gates illustrated the data linking concept with a series of short illustrative film clips that parodied the television program *Twin Peaks*.

Microsoft is still struggling to provide such an interactive product, although an object-oriented Windows Version 4.0 is reportedly in the works. Additionally, Microsoft officials said much of the technology Gates outlined in his address will emerge in upcoming products from both Microsoft and third-party vendors.

Software

FROM PAGE 1

"The power and rich functionality of the minicomputer proprietary software environment is the thing that's missing," said Tom Willmott, vice president at Aberdeen Group, a consulting firm in Boston.

"You now have this gigantic plethora of [hardware] alternatives, but you don't have any software to take advantage of it," agreed Frank Dzubeck, president of consultancy Communications Network Architects in Washington, D.C.

Minicomputer software developers have not been eager to port their proprietary applications over to PC platforms, according to George Thompson, an analyst at Datapro Research Corp. in Delran, N.J.

The reasons: not enough of an installed PC server base to make it profitable, and the scope of the task means a plodding pace at best, Thompson said.

Even Compaq finds it tough to sell its Systempro as a replacement for minicomputer networks — primarily because of a lack of comparable PC-based applications. Product marketing manager Lorie Strong said, "If [users] are developing a new project and writing the application themselves, then we're in a good position to sell Systempros."

But all this may soon change. The growing number of lower-priced PC server rollouts will soon entice minicomputer software makers to migrate their applications over to lower-cost PC platforms, Willmott said.

The first of these will arrive next year and will likely be versions of integrated office applications like IBM's Officevision, analysts said. But the big year for hardware and software sales will be 1992, they agreed.

Even if the applications start arriving in force, the operating systems for the highest level multiprocessor PCs still pose a concern. Less than a year ago, there were no multiprocessor operating systems available. Today there are only a handful, and these are modified for specific machines.

"You can't move an operating system tooled for the Systempro over to a different architecture like Parallan [Computer, Inc.]," Daubeck said.

ALR hopes to capitalize on the dearth of platform-independent operating systems with its Systempro-compatible Powerpro. ALR engineered it to use some of the Systempro operating systems [CW, Nov. 12].

Some users do not seem to mind the proprietary conditions. Citibank NA is testing two Netframe Systems, Inc. servers running a specialized version of Novell, Inc.'s Netware. "The machine had enough hackers by large companies," systems officer Louis Arena said.

Still, even users such as Arena who have joined the PC battle have a few objections. "The client/server software is just not out there," Arena said. Like most superserver users, Citibank developed its own applications, in this case built around Fox Software, Inc.'s Foxbase.

SX-based laptop flow begins

LAS VEGAS — Comdex/Fall '90 was awash with the first wave of a coming deluge of Intel Corp. 80386SX-based notebook-size computers. One indication of things to come was the Intel Corp. booth at the show, which was sprinkled with no less than 14 unannounced prototypes of SX-based notebooks.

Irvine, Calif.-based AST Research, Inc. unveiled what may be the first CPU-upgradable notebook on the market. Users can replace the Intel 80286 chip in the Premium Exec 286/12 with a 20-MHz 386SX chip. AST will also sell the Premium Exec with the SX chip installed.

Sanyo's 16-MHz SX-based entry, the MBC-18NB, weighs 6.9 pounds and features an IBM Video Graphics Array display, bundled DOS 4.01, 1M byte of random-access memory, a built-in floppy and a 20M-byte hard disk with 23 msec access time.

RICHARD PASTORE

Microsoft: At your fingertips

BY PATRICIA KEEFE
CW STAFF

LAS VEGAS — Microsoft Corp. once again took to the helm of an industry problem, busying itself last week at Comdex/Fall 90 touting its latest standards effort, this time for object-oriented compound document interchange.

Microsoft and other major developers will hold a briefing on Dec. 10 to describe the architecture, reveal plans for the code and provide copies of the documentation.

The proposed standard is a key piece of Microsoft's "Information at Your Fingertips" campaign, which purports to make computing easier in part by bringing together DOS, Windows and OS/2 under a graphical system and by expanding upon that combination to create a more powerful environment.

Eventually, applications themselves would be redefined by this process, according to Microsoft executives, whose vision calls for turning a host of operating system elements into objects, including the file system, advanced computer languages, tools for building application interfaces and user shell.

For example, by turning the prompt, file manager and program selector into objects under the user shell, functions such as moving, copying and linking information within and between documents will no longer have to be included in individual applications, Microsoft claimed. Developers would then be free to concentrate on adding expanded features to their applications, said Russ Werner, a Microsoft general manager.

Microsoft said it will license the specifications to developers at no charge. To be successful, the standard must be used by all vendors across all platforms and by every application, Microsoft Vice President Mike Maples said.

"We are working with a number of developers who have agreed upon a relatively tight specification," he said.

Users today tend to work closely with three or more applications, often switching back and forth between each while building a document in one. The process involved can hardly be considered smooth computing.

One of Microsoft's goals is to simplify the relationship between different applications and between the user and those applications.

As proposed, the object-oriented document interchange standard would reportedly eliminate the need for a user in one application to have to boot up a second package in a separate window, cut the data needed, store it, close the window and then paste it into a document in the first application. Today, the user must explicitly ask the computer to do something, typically by typing in commands or clicking on a menu.

What Microsoft is proposing instead is to allow the user to retrieve data behind a chart simply by double-clicking on the icon representing the chart, and all the opening and closing would happen behind the scenes. The user would never need to know in which application data resides. In other words, in an object-oriented environment, everything is a self-contained entity that is aware of the actions that are appropriate to it.

Eventually, the lines between all applications would "decompose," streamlining desktop computing, Werner said.

This is achieved in part by object linking and embedding, which Werner described as an evolution of the Dynamic Data Exchange protocol.

Embedding means that objects in a document are stored with it. Linking ties together related data stored in two separate applications.

Also, embedded objects are automatically updated, and as the document moves around the system, so will all of its components.

Multimedia seen clearing standards, cost hurdles

BY PATRICIA KEEFE
CW STAFF

LAS VEGAS — Viva Multimedia! That theme resounded throughout IBM's booth, presentations and briefings at last week's Comdex/Fall '90 show. Despite copious efforts by IBM and Microsoft Corp. to portray multimedia as alive and well, the emerging market is hobbled by a perception that it is too expensive, IBM multimedia czar Michael Braun lamented in an interview at Comdex last week.

Two weeks ago, Braun was appointed to the newly created post of vice president of the Multimedia and Educational Division. Despite the hubbub about the emerging market, he said it is "premature" to discuss too many details about IBM's multimedia strategy.

Multimedia is not only affordable, but it is here today, Braun claimed. An investment of about $300 for an audio card and related software will bring sound to desktop users, he said. Audio-only applications have the most potential, followed by audio combined with still images, he said.

Cost becomes less of an issue where there is clear justification for a system that will live many years to perform a task. But where enterprisewide decisions are concerned — for example, putting voice annotation across all desktops — careful deliberation is required, according to Braun.

The standards issue, which has presented problems, is fading fast, he said. The industry has reached general agreement on the J-Peg still-image capture standard and is moving quickly toward cementing the M-Peg, or motion picture standard, Braun added.

And despite a claim that software developers are beginning to "really go after" multimedia, Braun said the following changes in software are needed to boost multimedia acceptance:

- Certain multimedia features need to be extended to the operating systems, i.e., OS/2 and the Microsoft Corp. Windows environment. Today, a variety of tools exist that seek to solve certain technical issues, each in different ways. Extensions to the operating system would alleviate the need for separate tools.
- Agreement on a data standard that will store audio integrated with still formats so that all tools could deal with them interchangeably.
- More software titles.

Braun also outlined the following options available to Personal System/2 users:

- Audio Capture and Playback card, which lists at $370.
- Video Capture Playback card, which lists for $750. It can be used to capture still images.
- M-Motion analog video card. Listed at $2,200, it requires the Enhanced Control Program software, which costs $150.
- Action Media digital video card, which comes in two pieces. The card that does the digitizing costs $2,250; the card that does the playback costs $1,995.

Multimedia vision

One of the attractions drawing industry attention to multimedia products is the wide array of markets targeted for applications

Source: Information Workstation Group — CW Chart: Doreen St. John

Optical options increase

Growth of disc storage evident at show

BY MAURA J. HARRINGTON
CW STAFF

LAS VEGAS — Comdex/Fall '90 attendees seeking out an affordable optical storage subsystem for an environment where performance is key may have been encouraged by the increase in optical disc storage options since last year.

Several vendors displayed the latest state-of-the-art compact disc read-only memory (CD-ROM), write-once read-many (WORM), rewriteable eraseable optical disc subsystems and multifunction subsystems at last week's show.

The following were among the introductions:

- Iomega Corp., the manufacturer of removeable storage systems, announced a 650M-byte eraseable magneto-optical storage system that it said will operate in the Unix, OS/2 and Novell, Inc. Netware 286 environments.
- Toshiba America Information Systems, Inc. demonstrated a CD-ROM product for extended technology applications — called XA technology — that can compress and record audio alternately with related graphics and text on the same track. Toshiba's XA drive is due out by the second quarter of 1991 and will include a small computer systems interface drive and application development tools, according to Jerald Higgins, vice president of marketing/optical disc drives for the Toshiba division.
- Pioneer Communications of America announced last week it was decreasing the access time and increasing the storage capabilities of its CD-ROM minichanger, an optical disc jukebox that allows users to access multiple discs.
- Panasonic Communications & Systems Co.'s Office Automation Group introduced a 5¼-in. rewriteable magneto-optical disc drive that is designed to allow a user to store up to 652M bytes of information on a single double-sided disc and change the information as necessary, the company said.

Priced at $4,500, with the discs costing $250, the product is scheduled to begin shipping in January 1991.

- JVC (Victor Company of Japan Ltd.) announced an internal, 5½-in., WORM drive and said the discs used in the system can be played on standard CD-ROM drives.
- Sony/Publishers Data Service Corp., a division of Sony USA, introduced three CD-ROM premastering systems that produce output in write-once, rewriteable and digital audiotape formats.

Video storage

IBM showed a 3½-in., 128M-byte read/write optical disc and disc drive at Comdex/Fall '90 last week and said that it had applied to the American National Standards Institute to have it adopted as a standard format.

IBM Vice President Robert Carberry said the disc had the same capacity as 85 floppy disks but would cost "much less than half" the cost of 85 disks. He added that the disc could be used for either full-motion video or for large programs of the sort that multimedia applications are expected to be.

While some competitors and developers said the drive is too slow and too small, especially when compared with hard drives, it runs at the maximum small computer systems interface rate and has the advantage of being able to run full-motion images frame by frame without hardware compression.

Carberry said the drives could be read-only memory as well as read/write, which would allow for economies of scale in the production.

MICHAEL FITZGERALD

AMD wins Round 1 in '386' fight

Right to use nomenclature not the end of Intel chip battle

BY MAURA J. HARRINGTON
CW STAFF

LAS VEGAS — Advanced Micro Devices, Inc. (AMD) has scored at least a symbolic victory in its battle to break Intel Corp.'s lock on the market for 80386 processors. A California judge rebuffed Intel's attempt to prevent AMD from using the "386" moniker in a soon-to-be-released clone chip that was on display here at Comdex/Fall '90 last week.

Senior District Court Judge William Ingram, in a ruling Nov. 16, denied Intel's request for a temporary injunction to prohibit Sunnyvale, Calif.-based AMD from using the nomenclature.

Although the chip, which will officially be called the AM386 when it is introduced, represents an alternative to Intel's monopoly supply of 386 processors, it remains unclear whether AMD will be able to bring competitive pressure into that market, which presumably would bring prices down.

Also last week, AMD announced it will lay off 200 workers by the end of the year. The company has posted losses in its most recent financial quarters.

The 80386, rapidly becoming the microprocessor of choice for personal computers, remains at the center of a long-standing dispute between Santa Clara, Calif.-based Intel and AMD.

Second thoughts

AMD has been able to manufacture the earlier Intel 80286 chip design under a common semiconductor industry practice known as second-sourcing. Computer vendors concerned about a reliable supply traditionally required chip manufacturers to establish alternate suppliers of their products. But, in a hotly contested departure, with the introduction of the 80386, Intel declined to allow AMD to second-source the more powerful microprocessor.

AMD contends that a 1976 agreement between the companies allows AMD to copy Intel's microcode for the 386. The microcode is the software program in a microprocessor that manipulates the hardware and controls the movement of data between the register in the CPU and the other boards in the computer.

Free market pressure

AMD is intent on breaking Intel's lock on the 80386 market in a bid to reap rewards similar to those received from earlier Intel chips

Percent of 1990 worldwide market share by revenue

	80C286	80386
Intel	38%	100%
AMD	50%	
Harris	15%	
Siemens	5%	
Total market	$129M	$700M

Source: In-Stat, Inc. CW Chart: Paul Mock

An Intel spokeswoman said last week that the company was disappointed the judge ruled against it over the naming issue but indicated that Intel intends to take the issue to trial.

The dispute over the use of the numbers 386 began after Intel learned of AMD's new chip when a hotel worker sent a facsimile message — meant to be given to Michael Webb, director of marketing at AMD's Computer Systems Division — to an Intel employee also named Michael Webb, according to an AMD spokesman.

It is AMD's feeling, the spokesman added, that in attempting a temporary injunction, Intel management was trying to block AMD from selling the chip, because AMD feels the name is vital to the chip's success on the market.

"We feel the 386 name describes a function, just like the 80286 and the 8088 do, so we feel we have the right to the use of the numbers, as does the judge," an AMD spokesman said last week.

The Intel spokeswoman countered, "We have worked hard in establishing the identity of the product . . . it is Intel that invested in the technology that developed the product, and this is an infringement on our copyright."

"This is just a decision allowing AMD to use the 386 name until the litigation is solved," said semiconductor analyst Michael Slater, publisher and editor of "The Microprocessor Report."

"I don't think AMD customers would hesitate to buy an Intel clone, but AMD's chip has some features like static control and a plastic packaging that might cause customers to hesitate from buying the chip until the microcode litigation is settled," Slater said.

AMD said it will introduce two versions of its AM386 chip, one an identical clone to the 386DX chip and one with static control and other features, a spokesman said.

IBM backs video standard

BY MICHAEL FITZGERALD
CW STAFF

LAS VEGAS — IBM took a step last week toward providing a map that will lead to a new standard for high-end personal computer graphics display controllers, including a color format that could replace today's de facto standard offered by True vision, Inc.

Currently, users who want high-end graphics (1,024- by 768-pixel resolution) could take four paths: the Video Electronics Standards Association's (VESA) standard, Texas Instruments, Inc.'s Texas Instruments Graphics Array, IBM's new Extended Graphics Array (XGA) or a variety of proprietary offerings.

IBM became a potential mapmaker by joining VESA last week.

"At 1,024 by 768, there is no standard, and if anything, it's gotten worse" since IBM introduced XGA, said Jon Peddie, president of Jon Peddie Associates in Oakland, Calif., a PC graphics consulting firm. "VESA is [the] best hope for stabilizing this, and with IBM's participation, we have a good shot at finally getting a 1,024 by 768 standard."

Peddie said he expects that by Comdex/Fall '91, TI and proprietary vendors will have figured out how to make their current offerings compatible with VESA specifications.

He said he thinks the technology behind XGA will drive the standard, although it is possible that IBM will adapt the board to meet new specifications created through its participation with VESA.

"VGA has to push to get to the level that XGA starts at," Peddie said. "It's a totally different class of design."

IBM 486 portable big on power, price

BY RICHARD PASTORE
CW STAFF

Power-hungry road warriors said IBM's high-end portable, announced last week, would fit their needs and niche applications admirably. But they were confounded by the price of the Intel Corp. I486-based system and said they doubted whether any sizable demand exists for such a powerful, pricey portable.

"Ours is a special application that not a lot of people are going to have," said Steve Leopold, senior software applications engineer at Anritsu America, Inc., a telecommunications test equipment maker in Oakland, N.J. Anritsu engineers travel with 486-based portables to do software recompiling and demonstrations at client sites.

With the Personal System/2 Model 75, IBM joins only a handful of portable 486 personal computer makers. Leopold, who uses $13,000, 25-MHz 486 machines from Dolch Computer Systems, said he is glad to see another player in the market. The 400M-byte hard disk option on the Model 75 (also an option for other PS/2 models) is particularly appealing, he said.

"The 400M-byte [disk] would really come in handy. The 100M-byte disk in the Dolch is practically filled already," Leopold said.

The Model 75, which weighs 22 pounds and is powered by AC only, also comes with a 160M-byte disk option. It ships with 8M bytes of random-access memory, expandable to 16M bytes. The Micro Channel Architecture system supports small computer systems interface (SCSI) devices as well as OS/2, DOS and Microsoft Corp.'s Windows operating environments.

IBM Personal System/2 *Model 75*

The IBM Video Graphics Array (VGA) display offers 16 gray shades in a 10-in. gas plasma screen. The PC also supports IBM's Extended Graphics Array.

The box is set to ship at the end of the month and is priced at $18,890 for the 400M-byte hard disk version and $15,990 for the 160M-byte version.

"It sounds really intriguing, but those prices are putting that thing, for all practical purposes, out of our reach," said Claude Rankin, MIS director at accounting firm Deloitte Touche in New York.

For most of his portable applications, a 486 would be overkill at any price, Rankin said. But the machine's disk capacity and ability to download larger files is attractive, he added.

"I can think of instances in which I might want to put up to 50,000 data records on a portable, so the 486 does have some potential," Rankin said.

Compaq Computer Corp., which does not offer a 486 portable, sees little market potential for the machine.

"The price point is one reason why we haven't done it," said Michael Swavely, Compaq president, North America.

A second vendor to announce a 486 portable at Comdex/Fall '90 was Bitwise Designs, Inc. in Troy, N.Y. Bitwise's new $16,000 machine is distinguished from the IBM model by its weight (16 pounds heavier), color VGA display and 64M-byte maximum RAM. It also adds Intel's I860 processor to the motherboard for processing capability of 47 million instructions per second.

Bitwise started shipping a machine more closely parallel to IBM's this month. The 486-based Model 433/VP weighs 22 pounds and ships with 4M bytes of RAM, a 200M-byte SCSI hard disk and a VGA black and white display. It costs $12,000.

Midwest Correspondent Michael Fitzgerald contributed to this report.

Second-class postage paid at Framingham, Mass., and additional mailing offices.
Computerworld (ISSN 0010-4841) is published weekly, with a single combined issue for the last week in December and the first week in January by CW Publishing/Inc., 375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171.
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TRENDS

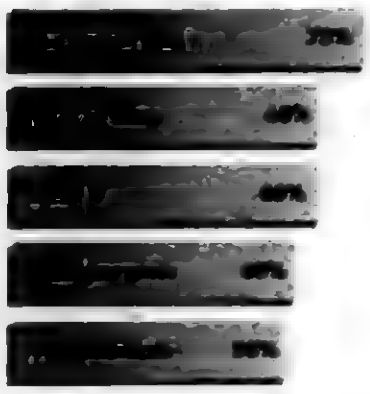
Executive computing is becoming more widespread. Companies in a variety of industries are hopeful and looking forward to getting a return on their investment

EXECUTIVE INFORMATION SYSTEMS

Highly satisfied

A high degree of satisfaction with executive information systems (EIS) is not limited to any particular industry. But the financial services industry proclaims to be the most satisfied with its EISs

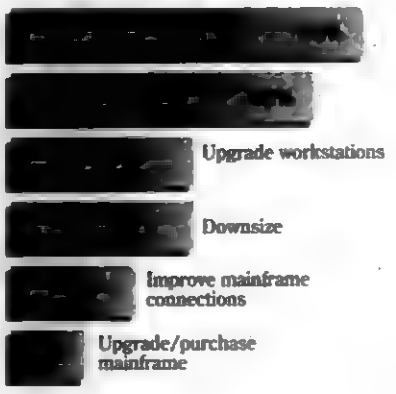
Percent of respondents (base: 132)



Planned hardware improvements

EISs are becoming less centralized, with mainframes playing a smaller role, and interest in local-area network implementation and workstation upgrades is taking up the slack

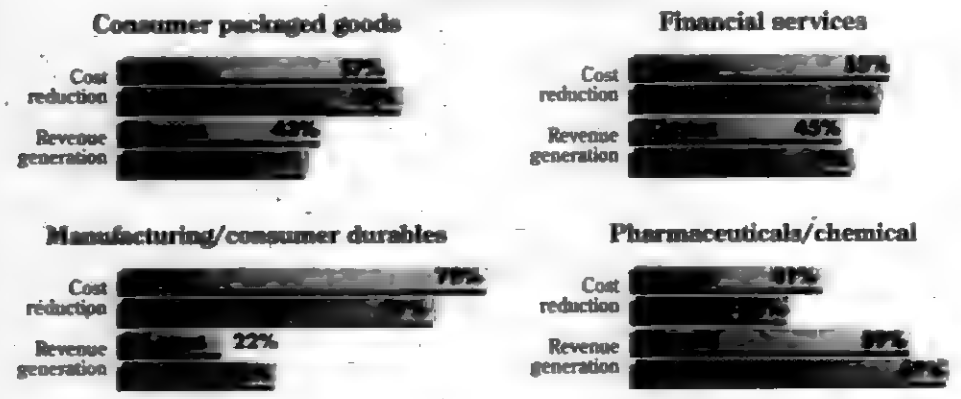
Percent of respondents (base: 132)
(Multiple responses allowed)



Return on investment

Cost reduction is the primary financial justification for executive computing investments in most industries, but increased revenue generation is an emphasis for pharmaceuticals

Percent of respondents (base: 132)

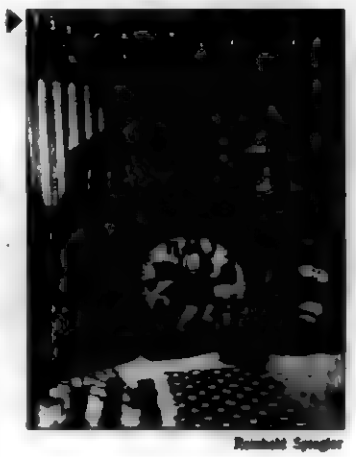


Source: Finnon & Co., Woburn, Mass.

CW Chart: Tom Monahan

NEXT WEEK

A "hands-on" chief executive officer at Spencer Gifts gets as involved with systems as he does with operations. Manager's Journal explains how **John Hacala** and **Eugene Murtha**, VP of information services, are creating an integrated system aimed at giving corporate decision-makers up-to-the-minute information on sales trends.



Reinhold Spengler

What sorts of people will be needed to create the kind of trimmed-down, fast-reflex IS staff most companies seem to be seeking? Sensitive techies should definitely apply. And those who know their way around personal computer programming environments and the stocks page will have an edge. For more detail, check Executive Report.

INSIDE LINES

Not so Excel-lent?

"I'm really surprised at how little Microsoft has done," said a source who has played with a beta-test version of Microsoft's Excel 3.0. Beta Excel remains one-dimensional, sports a hard-to-use solver and still does not allow users to print out a list of formulas. One nice feature, however, is a spreadsheet outliner, which allows users to collapse and expand things.

Who's on first

An information systems staffer for a large West Coast firm explains why they have not been able to fulfill a plan to replace a homegrown personnel system with an off-the-shelf package: "We don't know what's in our system, so we don't know the requirements for what we need. We're looking at the old system line-by-line and trying to figure it out as best we can."

The battleship turns

Earl Wheeler, IBM's programming systems chief, hinted last week that IBM is working hard to connect the diverse worlds of Unix and its proprietary operating systems. At a breakfast to commemorate the publishing of a book about Systems Application Architecture, Wheeler said a sequel about distributed and cooperative processing with SAA and Unix should be done speedily — "or else it might be too late."

Come home to Papa

Dun & Bradstreet Software has put out its vision of the future of software applications, and now it appears the firm may be homing in on a visionary. D&B Software Chief John Imlay and veteran industry developer and executive John B. Landry have confirmed that negotiations are afoot for the return of Landry, whose Millenium software line drove D&B Software forerunner McCormack & Dodge to its early 1980s heights.

In living color

While IBM was officially saying the products in the Future Vision sector of its Comdex booth weren't likely to be available for 12 to 18 months, one of them — the laptop with a color screen — looks to hit the streets in April 1991, according to an IBMer. Furthermore, Will Fastie, editor of "The Fastie Report," said the screens on display were direct from the pilot production line, not the lab, lending strength to an April ship date. Fastie added that a color screen on the Personal System/70 would likely raise the price by less than $2,000.

Friendly adversaries

U.S. Justice Department officials recommended a downward departure from sentencing guidelines in the case of Adam E. Grant, Franklin E. Darden Jr. and Robert J. Riggs, the three hackers sentenced in Atlanta last week for a series of computer crimes, citing their cooperation. The three hackers met with law enforcers and Bellsouth security agents on several occasions and provided evidence to prosecute fellow Legion of Doom members. Late last week, an unnamed security expert warned print and radio media that hackers were preparing to mount an attack on telecommunications systems as a form of protest over the sentencing of the three hackers.

Behind the curtains

Lotus lifted the curtain on 1-2-3 for the Apple Macintosh and 1-2-3/W for Windows behind the scenes at Comdex last week. To reports that Lotus compromised the Windows 3.0 interface to accommodate backwards compatibility with character-based versions of 1-2-3, a mostly mute Frank King responded, "It's an interface that Bill Gates himself would love." A source who got a peek at 1-2-3/W says it's looking good.

Our reporters give the award for cheesiest Comdex promo stunt to disk drive maker Micropolis Corp. The firm enlisted Las Vegas cab drivers to ask passengers: "Who makes the fastest hard disk drive?" No matter what the rider replied, back came the authoritative answer: "Micropolis." If the passenger happened to be a designated Micropolis employee, the cabbie picked up $100. One cabbie reported he'd asked 48 passengers but had yet to strike it rich. If you saw something our guys missed, call News Editor Pete Bartolik at (800) 343-6474, message COMPUTERWORLD on MCI Mail, or fax offending documents to (508) 875-8931.

Look out! It's a monster.

Here it comes.
The IBM RISC System/6000™ POWERstation and POWERserver 550.
Huge performance at a price that won't scare anybody.

Talk about a screamer. The RISC System/6000 POWERstation and POWERserver 550 with AIX® are the newest, most powerful members of the already formidable RISC System/6000 family, delivering 56* MIPS and 23 MFLOPS. That's the kind of number-crunching performance you'd expect from a mini supercomputer costing more than four times as much. And they loom even larger over other UNIX®-based workstations in their own price range.

	Hardware Price	MFLOPS	Cost Per MFLOP
POWERserver 550	$138,000	23.0	$6,000
CONVEX™ C210	$650,000	17.0	$38,235
SPARCserver™ 490	$99,900	3.8	$26,289

Part of what makes this performance possible is a new version of FORTRAN, an innovation for the entire RISC System/6000 family. It's a new FORTRAN optimizing preprocessor that can increase performance up to 25% for users programming in the new FORTRAN version. Couple this with the super floating point performance of the POWERstation/POWERserver 550's .8 submicron CMOS hardware, and the results are almost frightening.

Memory Of Monstrous Proportions.

IBM is now also offering its 4-megabit memory chip for all RISC System/6000 models. It bumps up the maximum system memory up to four times, to increase system throughput, and places the RISC System/6000 family among the industry leaders in workstation memory.

Create Your Own Monster.

And we haven't forgotten people who are already RISC System/6000 users. Model conversions for POWERstations and POWERservers 520, 530 and 540 to the performance of the POWERstation 550 will be available. So those who went for our cutting-edge performance when we introduced the family can continue to enjoy just that, at an enormously reasonable price.

In fact, the only people who should be scared of this monster are our workstation and mini supercomputer competition. And to them, we have only one thing left to say.

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VOL 24
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NO 26 1990

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COMPUTERWORLD

The Unix PC allure

DOS frustration forces R&D to 'open systems'

BY JAMES DALY
CW STAFF

While DOS may still rule the roost when it comes to corporatewide desktop operating systems, personal computer software houses are heeding the call of open systems and are increasingly renavigating their research dollars toward that old standby, Unix.

Many developers, frustrated with what they call the proprietary limitations of DOS and the muddy future of OS/2, are using Unix to cover their bets.

"Unix is no longer just for techies," said Dave Proctor, vice president of the database division at Ashton-Tate Corp. in Torrance, Calif. "Unix is moving rapidly toward the commercial market, and we intend to be ready for it."

Proctor said Ashton-Tate will deliver Unix versions of its Dbase IV database application for Sun Microsystems, Inc. workstations and systems using The Santa Cruz Operation's Unix version by the end of the quarter — before a product for the Apple Computer, Inc. Macintosh even arrives.

A variety of graphical user interfaces offering point-and-click

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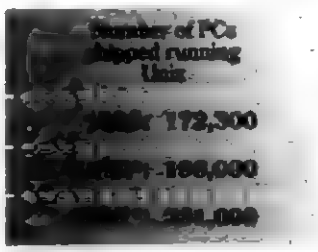
Time of reckoning
Increasing Unix presence on the desktop is attracting software firms



*Projected
Source: Dataquest, Inc.

Bush to push work-at-home

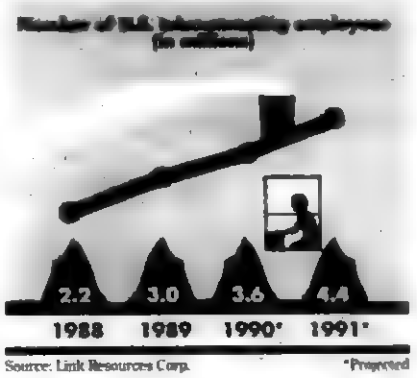
BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — Sometime in the next few months, President Bush is expected to deliver a public endorsement of telecommuting as "good for business" and good for relieving the nation's traffic, energy and pollution problems.

The president's staff has prepared an upbeat, one-page statement about work-at-home arrangements and is just waiting for the right time to go public, according to William Eagle, a staff member at the White House Office of Policy Development.

The White House endorsement may "open some corporations' eyes" and foster a climate in which more companies are willing to try telecommuting on an experimental basis, said Emily Bassman, manager of human resources planning at Pacific Bell in San Ramon, Calif. Pacific Bell has more than 1,000 managers who telecommute at least one day per week.

Home work
The number of company employees working at home during normal business hours is estimated to have increased 20% in 1990



Source: Link Resources Corp. *Projected

An early draft of the presidential statement praised the ability of computer and facsimile technology to move work to the people rather than moving people to the work. "Cars that don't leave the garage don't pollute the air or congest the freeway," it said.

The Bush administration has already launched a pilot "flexiplace" program for the federal government, which will assess the costs and benefits of telecommuting for as many as 2,000 federal employees.

The president's support may turn the federal government into

Continued on page 4

Hackers draw stiff sentences

Jail time sounds sharp note on tampering

BY MICHAEL ALEXANDER
CW STAFF

ATLANTA — The Nov. 16 sentencing of three computer hackers to terms in federal prisons and substantial restitution payments is the long-awaited stern warning that is needed to help quell high-tech tampering, law enforcers said.

Adam E. Grant, 23, and Franklin E. Darden, 24, each received a sentence of 14 months incarceration, including seven months to be spent in a halfway house. Robert J. Riggs, 22, received a 21-month jail sentence. All three were ordered to make restitution payments of $233,000 each.

The three hackers were charged with repeatedly breaking into computers owned by Bellsouth Corp., eavesdropping on telephone conversations and stealing proprietary information, which they shared with other hackers.

The Chicago U.S. Attorney's office prosecuted Riggs on a separate charge for stealing a text file describing the operation of a Bellsouth 911 enhanced emergency system and uploading it to a bulletin board in Illinois. The Atlanta sentence included the Chicago charge.

Continued on page 99

JAPAN'S MAINFRAMERS

Long-term global strategies unfold

BY JEAN S. BOZMAN
CW STAFF
and LORI VALIGRA
IDG NEWS SERVICE

Japanese mainframe manufacturers, who have patiently sold their products through U.S. and European distributors since the 1970s, are preparing to step onto the European and U.S. playing fields to sell their computers directly to information systems managers.

Japanese mainframe makers will weave themselves into the global market fabric starting in the mid-1990s, industry analysts said. "They are expanding at a time when others are pulling back. But taking market share will be a gradual process," said Mike Jeremy, an analyst at Baring Securities Ltd. in Tokyo.

"The international mainframe market should be a big part of our overall business," said Soji Endo, overseas operations manager at Hitachi Ltd. in Tokyo. "But so far, we haven't sold many computers outside Japan. Our overseas mainframe business will be better in 10 years. We're waiting for the end of the current down cycle and for open systems to take hold."

Hitachi and its smaller counterpart, Fujitsu

Continued on page 100

Internet privatization adrift

BY J. A. SAVAGE
and GARY H. ANTHES
CW STAFF

Internet, the giant collage of research-oriented networks used by 3 million people in 35 countries, is evolving — perhaps clumsily — from a government-subsidized entity into a commercial one. Users and observers of the network liken the change to turning around a steamship with no captain to steer it — only tugboats pulling and prodding, sometimes in different directions.

The U.S. Senate recently passed a bill to partially fund a commercial replacement for Internet, but Congress plans to play a limited role in sorting out commercial issues, leaving them to users, commercial interests and the federal agencies that now have responsibility for the Internet backbones.

Internet is about to achieve a critical mass in which growing use attracts commercial interests. "The telephone companies originally perceived no market, so the government has been in market-building mode for years," said Stephen Wolff, a division director at the National Science Foundation. "Now it's beginning to look interesting."

While most observers have no objection to "commercialization" of Internet, they said it raises difficult and troublesome issues that have not begun to be

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INSIDE

Executive Report — The times demand greater versatility from IS staffs. Page 61.

As it did with the 386SX, Intel is expected to bring out a lower-cost, technologically revised version of the 486 chip next year. Page 6.

DEC closing Phoenix plant; may have to target its first official layoffs. Page 8.

Stock exchange automation pioneer Mary Jo Moccia dead at age 55. Page 8.

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8 Pioneer of stock exchange automation **Mary Jo Moccia**, 55, dies of a heart attack.

10 Versatile versions of **Cadre's** expanded set of CASE tools are trickling into the market.

12 25-year **Unisys** customer CSI has confidence in **Timeplex's** ability to support itself should its parent sever the ties that bind.

99 While Midwest data centers aren't exactly quaking in their boots, many are making recovery site preparations in the event a predicted earthquake makes an appearance.

100 Fujitsu Chairman Takuma Yamamoto speaks candidly on the No. 1 Japanese mainframe maker's global strategies.

101 Unix is the equalizer that level's IBM's advantage in the computer market, according to Japanese vendors.

Quotable

"Hackers are trying to use the telecommunications industry as their playground. Well, the playground is closed."

WILLIAM COOK
ASSISTANT U.S. ATTORNEY

On the sentencing of three hackers. See story page 1.

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The 5th Wave

"C'MON BRICKMAN, YOU KNOW AS WELL AS I DO THAT 'NOSE-SCANNING' IS OUR BEST DEFENSE AGAINST UNAUTHORIZED ACCESS TO PERSONAL FILES."

EXECUTIVE BRIEFING

■ **Telecommuting is about to get a boost** from the Bush administration. The White House has prepared an upbeat endorsement of flexible work arrangements to be delivered by Bush sometime in the next few months. As many as 2,000 federal workers are already using telecommuting in a pilot program the government praises for saving energy, reducing air pollution and retaining employees. **Page 1.**

■ **Japan's mainframe vendors are becoming much more aggressive** in the U.S. and Europe. While the overall mainframe market is softening, Hitachi and Fujitsu hope to boost their combined worldwide market share by 10%. Fujitsu's chairman says his company's Unix offering is an important market differentiator. Meanwhile, Bull's chairman denies press reports that Japan's NEC will increase its ownership of the struggling French vendor. **Pages 1, 4, 100 and 101.**

■ **Adaptability has become the most sought-after qualification** in IS employees. Tightening budgets, escalating demands and architectural changes all require a high degree of flexibility in IS personnel. **Page 61.**

■ **Stiff federal prison terms** for three hackers convicted in the Bellsouth case are seen as a long-awaited deterrent to serious computer crime. Legal experts say the sentences show a new focus on the intent of hackers, which in this case was serious damage to Bellsouth computers and data. **Page 1.**

■ **Midwest Stock Exchange IS chief** Mary Jo Moccia died earlier this month on a business trip. Moccia, 55, was considered a pioneer in financial automation. **Page 8.**

■ **Life along the Mississippi** means disaster recovery precautions for data centers in the region, predicted to be the target of a major earthquake next week. Firms from Illinois to Arkansas are playing "better safe than sorry" with hot-site backups at the ready. **Page 99.**

■ **A massive data center consolidation project** is in the home stretch at First Interstate Bank. When completed, the project will have reduced 11 data centers to three, with predicted savings of $40 million per year. **Page 6.**

■ **On-line transaction processing** is much more than hype — it is a technology that meets business needs in a fast-paced marketplace. **Page 29.**

■ **Too many IS departments** are run like a "central Soviet," says one consultant who advocates dispersing more power and planning to consumers. **Page 51.**

■ **Outsourcing has generated a slew** of buzzwords, and many of them are obscuring true motivations and side effects. **Page 56.**

■ **Is telecommuting appropriate** for IS pros? The answer depends largely on the attitudes of firms and managers. **Page 84.**

■ **IS veterans face harsh reality** as their profession calls for more business know-how. The choice is cut-and-dried: Retrain or be replaced. **Page 96.**

■ **On-site this week:** Ethernet is creating happy LANdings at Canadian Airlines International in Vancouver, B.C., and Toronto, where pilots and mechanics train in local-area network-based facilities that cut simulation costs. **Page 45.** The new baby at Gerber in Fremont, Mich., is an IBM AS/400, but the IS staff has found the System/36 replacement to be a mixed blessing. **Page 33.** Remote computing takes on a new meaning on the floor of the Pacific Ocean, where marine biology researchers took a customized Compaq laptop underwater to study the behavior of stingrays. **Page 41.**

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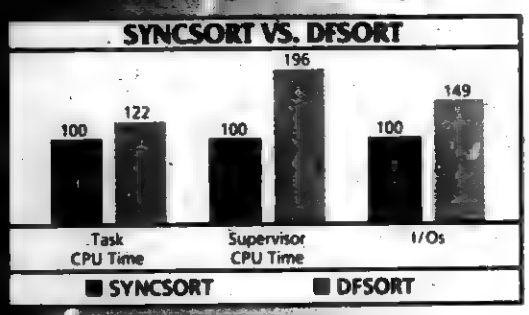

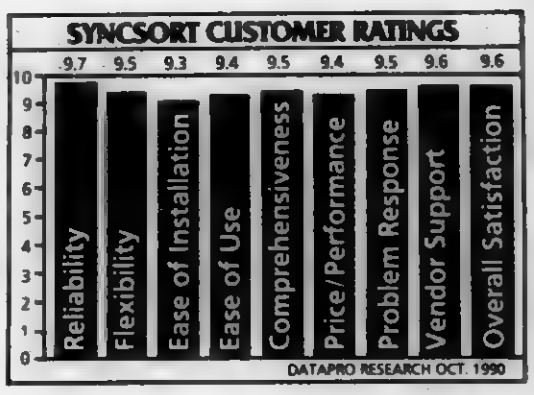

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Bull denies NEC stock rumors

BY NELL MARGOLIS
CW STAFF

Groupe Bull Chairman Francis Lorentz last week unequivocally denied a mid-November European business press report of an increased buy into Bull by NEC Corp.

The troubled state-owned French computer vendor, Lorentz said, is not currently involved in such negotiations. The report said NEC would leverage its 15% stake in Groupe Bull's U.S. subsidiary into a larger, perhaps even controlling, position in the firm [CW, Nov. 19].

The operative word in the Bull disavowal could be "currently," industry observers suggested.

"The sense I've gotten from both Bull and NEC user groups is that the time is not ripe" for an increased NEC/Bull relationship "from a political point of view," said Norman Weizer, a computer industry analyst at Cambridge, Mass.-based management consulting firm Arthur D. Little, Inc.

According to reports in the European press earlier this month, French Industry Minister Roger Fauroux, while not yet threatening Bull with loss of its subsidies, has given Lorentz a deadline to come up with a way to stem the firm's flow of red ink and departing employees.

"I have very strong indications that what the French government wants is a European partner," Weizer said. With few European firms strategically and financially in a position to make a move on Bull, he said, many industry observers tend to take "European partner" as a euphemism for German giant Siemens AG, long rumored to be contemplating a Bull acquisition.

"I don't think any [Bull/NEC] deal will be signed before the end of the year," said Julian Menear, an analyst at the Young Capital Group in Chicago. "Scrambling in the middle of holiday sales cycle is a very hard thing to do."

Charles White, an analyst at Gartner Group, Inc. in Stamford, Conn., said, "The Japanese style is to go for the long haul — NEC could be waiting for the right time to increase its investment."

The right time, Gartner Group analyst George Lindamood said, is likely to be after the rounds of layoffs and corporate reorganizations that go against the European grain and are currently humiliating Groupe Bull.

However, each of these analysts and a host of others agreed that, at the end of the day, a Bull/NEC deal appears probable.

Few, if any, believe that the beleaguered Bull [CW, Nov. 12] has either the resources or the strategy to go it alone as a major player in the worldwide computer industry.

"The company has always lived off fat state contracts that have shielded it from the harsh realities of the marketplace," Edward O'Hara, president of International Data Corp. Scandinavia, told Norwegian publication *Computerworld Norge*. With the French public sector newly awakened to the better deals, based on open standards, available elsewhere, O'Hara said Bull is left with one choice if it wants a shot at player status: Submit to a Japanese takeover.

That prescription is getting to be an over-the-counter remedy for ailing European computer firms: Witness Fujitsu Ltd.'s billion-dollar buy of UK-based ICL PLC and Mitsubishi's recent acquisition of Apricot Computers PLC, also in the UK.

"Bull has never fully exploited the technological potential they have in NEC," White noted. Bull's "underutilized partner," he said, "has very powerful communications and semiconductor technology" to contribute as well as the high-end systems that it currently provides to its French connection.

Eventually, Weizer said, "who else but a Japanese company can afford to buy Bull?" Siemens, speculated to be one suitor of choice, could well be deciding that its recent acquisition of another troubled European computer company — compatriot Nixdorf Computer AG — is enough to occupy its attention and budget. For Bull, Weizer said, NEC might be the only savior in town.

Senior writer Sally Cusack and Computerworld Norge *writer Don Radoli contributed to this report.*

Hanging on

Bull HN's financial difficulties are further complicated by relatively low market share in the main computer industry segments

Source: Dataquest, Inc. CW Chart: Marie Haines

Bush

FROM PAGE 1

a role model or pacesetter for the development of telecommuting, according to Gil Gordon, a Monmouth Junction, N.J.-based consultant on alternative work arrangements.

"It fits in so well with many of the current objectives of the administration, including energy savings, clean air and entrepreneurship," Gordon added.

There are 3.6 million employees who work at home during normal business hours, according to Link Resources Corp., a New York-based research firm, and experts said the ideal arrangement is telecommuting for two or three days per week.

Bush first went on record as an advocate of telecommuting last March. In a speech to California business executives, he said that "if only 5% of the commuters in Los Angeles County telecommuted one day each week, they'd save 205 million miles of travel each year — and keep 47,000 tons of pollutants from entering the atmosphere."

Other federal officials had similar comments at a recent press briefing sponsored by Telecommuting Solutions for America, a fledgling organization based in Washington, D.C. Lewis Crampton, associate administrator of the U.S. Environmental Protection Agency, said his agency supports telecommuting because cars cause about 40% of the nation's air pollution — even more in large cities.

However, the most tangible federal support came from those who manage the federal government's own work force. Officials at the U.S. General Services Administration (GSA) and the Office of Personnel Management (OPM) said that, while the energy and environmental benefits are nice, the real drivers behind the "flexiplace" program are the government's need to retain and recruit skilled employees and to reduce office rents.

GSA and OPM officials released a set of telecommuting guidelines for federal managers, including the following recommendations:

- The flexible workplace concept includes working at home-based offices and at "satellite facilities," such as a government office closer to the employee's home.
- The most suitable jobs are those that mostly involve information processing, such as program analysts, programmers, personnel specialists, technical writers, claims examiners and clerk/typists. It is not practical for supervisors.

Good candidates for telecommuting are those employees with a track record of reliability, time-management skills and high motivation. Telecommuting is an excellent way to attract disabled people to the federal work force. However, studies show that telecommuting and child care are not compatible.

Some of the pitfalls of home-based work can be avoided by using conference calls for important meetings; posting a schedule showing when the telecommuter will be in the office or working at home; and encouraging frequent contact between the office staff and telecommuters via telephone calls, voice mail and electronic mail.

Intergraph gets go-ahead to buy Dazix

BY J. A. SAVAGE
CW STAFF

HUNTSVILLE, Ala. — Intergraph Corp. last week won bankruptcy court approval to proceed with negotiations to purchase Daisy/Cadnetix, Inc. for $14 million.

Daisy/Cadnetix, known as Daxix, has been under Chapter 11 protection in San Jose, Calif., since May. Daisy Systems Corp., a former high-flying Silicon Valley start-up, produced systems for the computer-aided engineering market. In 1988, it took on a hostile takeover of Cadnetix Corp., a Colorado-based maker of turnkey systems for printed circuit boards.

Intergraph sells reduced instruction set computing workstations and its own engineering software to four main markets: architectural and civil engineering, geographical information systems mapping, mechanical design and federal systems. It is approaching $1 billion in revenue for 1990, according to a spokesman, with half of its income from non-U.S. sources.

The original Daisy became a notable Silicon Valley firm when its revenue raced from $7 million to $25 million in 1983. Since the mid-1980s, Mountain View, Calif.-based Daisy has been notable for losses, posting a loss of $140 million last year as Dazix.

Intergraph's $14 million bid consists of $10 million in cash and $4 million in Intergraph stock, the spokesman said. He said there are no plans yet regarding the 550 Dazix employees if the bid is accepted, but he added, "We're looking to merge the intellectual capabilities and properties of the company."

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	PC LAN		✓
STANDARDS	ANSI SQL	✓	✓
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	SAA	✓	✓
	NAS		✓
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Intel readying downscale 486

Company working toward creating affordable multiple-level 486 chips

BY MAURA J. HARRINGTON
CW STAFF

SANTA CLARA, Calif. — Intel Corp. confirmed last week that it is working to expand its I486 microprocessor product line downward next year. Analysts said the company is intent on keeping upcoming 80386 chip makers at arm's length from being serious competitors.

Although a 50-MHz version of the 486 chip has been widely discussed, Thomas Macdonald, Intel's marketing manager for the 386 and 486 product lines, said Intel will introduce new versions of the 486 chip on both a higher and lower level than what is being marketed today.

"We are going to push prices down in a way to make it more affordable to the user to put a 486 on their desktop," Macdonald said, adding that Intel will offer solutions on the 486 level similar to those available today on the 386 level.

In the face of anticipated 386 clone chips from Advanced Micro Devices, Inc. and others, analysts predicted last week that Intel may be developing alternative 486-level chips to move users toward higher-end products, as it did with its 386SX campaign a little over a year ago.

Price comparable to 386

Although Macdonald declined to map out any more specifics on the product expansion plan, semiconductor analyst Michael Slater, editor and publisher of "The Microprocessor Report," a periodical published out of Sebastopol, Calif., said, "Intel will probably make a 486 chip with no floating-point processor" at a price competitive with that of its 386 chip.

In October 1989, Intel began a nationwide, multimillion dollar campaign to introduce its 386SX microprocessor — a hybrid 16- or 32-bit chip at the price of a 16-bit or 286 chip. The campaign, marked by advertisements with a large red "X" painted over the 286 numbers, caused 286-based computer sales to plummet, industry analysts said.

The campaign had an impact on the way users purchased computers, as well as on the decrease of 286-based computer sales, said JoAnn Stahl, president of Dallas-based market research firm Storeboard, Inc.

However, Macdonald said last week, Intel's incentive in introducing multiple-level 486 chips is not to drive out its highest selling microprocessor.

"The 486 will not outship the 386 next year by any means, and there certainly won't be a campaign to wipe out the 386 chip," Macdonald said.

Nevertheless, in order to push users into spending the money on an even higher-level product, the price of 486-based computers still has to drop. This means the price of the CPUs must also drop, according to Dean McCarron, an analyst at In-Stat, Inc., a market research firm based in Scottsdale, Ariz.

"There is definitely a demand for a less expensive 486 alternative . . . and I'm sure that if Intel were to develop one, users would jump to buy it," McCarron said. "I see this as a tactical move for Intel as well," he added.

Joe Brooks, manager of computer operations at the Pacific Stock Exchange in San Francisco, said the price of 486-based computers would have to come down close to the level of 386 personal computers before he would consider upgrading in the near future.

"Currently, we have 386-based PCs installed here, and we have no plans to upgrade to 486 at this time, but we would look at an alternative if it were [a 486-level computer at a 386 price]," Brooks said.

So far, Intel is the only company with the rights or technology to market a 386 microprocessor, but analysts claimed that the situation will probably change over the next few months, loosening Intel's monopoly.

Sales tally

Sales of systems based on Intel's 1486 have barely begun to take off in comparison to the 80386 and 386SX, according to a survey of computer stores

Unit sales

	Q4	1990		
1486	—	498	2,355	3,702
[illegible]	159,804	136,675	[illegible]	[illegible]
386SX	133,694	121,798	161,335	197,201

Source: Storeboard, Inc. CW Chart: Paul Mock

Hitachi 'tunes' low-end EX models

BY JEAN S. BOZMAN
CW STAFF

SANTA CLARA, Calif. — Hitachi Data Systems Corp. repositioned its low-end EX mainframes last week to more closely correspond to IBM's Enterprise System/9000 air-cooled mainframes, which were announced Sept. 5.

HDS changed the computer cycle times to "tune" the existing low-end EX Models 10 through 38, creating a new set of six machines, including four uniprocessors and two dyadic processors. Cycle times on the EX machines were reduced from 20 to 17 nsec, HDS sources said.

"Our enhancements happen to result in a better alignment to IBM's airframe machines," said Chris Worrall, director of intermediate systems marketing. The HDS models were changed only slightly, with performance

> "OUR ENHANCEMENTS happen to result in a better alignment to IBM's airframe machines."
>
> CHRIS WORRALL
> HITACHI

of the EX 11 now just 1.09 times that of the older EX 10; the high-end EX 42 is 1.24 times that of the older EX 38.

HDS is targeting the estimated 30,000 IBM 4300-class sites worldwide, providing the only counterpoint to the air-cooled portion of the IBM ES/9000 family.

"HDS realizes that IBM salespeople are doing a lot of market development for them by talking up the air-cooled ES/9000s," said Peter Burris, director of the IBM Advisory Service at International Data Corp. in Framingham, Mass. "HDS is really the only other game in town, because Amdahl Corp. does not ship equivalents to the low-end ES/9000 computers."

Based on a combination of emitter-coupled logic and CMOS chips, all the HDS machines can be outfitted with a main memory of 512M bytes — twice the standard 256M bytes shipped with the low-end IBM ES/9000 machines, Worrall said.

The revamped EX line includes enhancements in the areas of memory management, capacity and peripherals attachment. The machines support up to eight optical channels; previous low-end EX models supported only four direct-attached optical channels.

The new EX models also support logical partitioning of main memory into real memory and expanded memory or a combination of both. Pricing on the low-end EX models is designed to be about 95% of IBM's list price, Worrall said.

HDS will continue to sell the EX Model 33, a uniprocessor, and Model 44, a dyadic processor.

The new EX models are scheduled for shipment to customers in January; upgrades from installed EX models will be available in second-quarter 1991. Prices range from $315,000 for an EX 11 with 32M bytes of storage and eight channels to $2.6 million for an EX 44 with 512M bytes of storage and 32 channels.

First Interstate nears end of consolidation

BY PATRICIA KEEFE
CW STAFF

HOUSTON — When 80 information systems employees close the doors for good on a First Interstate Bank data center here late next year, the action will also close the books on a three-year effort by the bank's parent to consolidate 11 regional data centers and one backup site.

In addition, the banking group will shutter a warm backup site in California.

So far, the Los Angeles-based parent, First Interstate Bancorp/California, has closed seven data centers, averaging a savings of about $40 million dollars per year, said Hayden Watson, group manager of the Operations Group at First Interstate in Houston and a member of a corporatewide task force on standardization. "It's a staggering annuity, mostly from eliminating redundancy," he said.

Concurrent with the 1991 merger of the Houston-based data center into three other data centers in Arizona, Oregon and California, First Interstate will undertake a series of application conversions as part of a companywide effort to move all 22 affiliate banks to a consistent platform.

Because of the conversions, some affiliates may endure future cutbacks in IS personnel as older applications are jettisoned and replaced with standards, a bank source said.

"When we talk about consolidating, we're not just relocating existing equipment. We're talking about 10 to 12 systems conversions going on simultaneously over the next year," Watson said.

For example, the banking group's policy committee for operations and information services has settled on one consumer loan and one general ledger application standard. The committee is made up of data processing and other senior-level executives.

To pull off the conversions, it is important that First Interstate retain its IS staff until the end of 1991. Watson said the bank hopes to do this via a combination of a generous severance package and a "retention-type bonus." A minimum of 60 days' notice is guaranteed to any affected employee. To ensure that most stay, the size of the severance package is reportedly tied to the length of time the employee remains with the company. So far, only three employees have resigned.

On Aug. 15, First Interstate's 119 Houston-based IS employees were summoned to a luncheon, where they were told about the consolidation plans. Of the 80 affected employees, some will be moved elsewhere within the firm, either locally or to another affiliate.

> "WE ARE CONFIDENT WE will not see a reduction of service or responsiveness."
>
> HAYDEN WATSON
> FIRST INTERSTATE

"No one will be affected before June 1991, and [any layoffs will happen] by December 1991," Watson said.

First Interstate has also taken pains to ensure that the impact from the conversions on customers and user departments is minimal. Committees have been set up to involve end users in the conversion and future upgrade processes.

Watson conceded that users may not be able to do things in quite the same way as they did with a local data center. "It's clear that the process [of working with IS] will need to be more structured, but we are confident we will not see a reduction of service or responsiveness."

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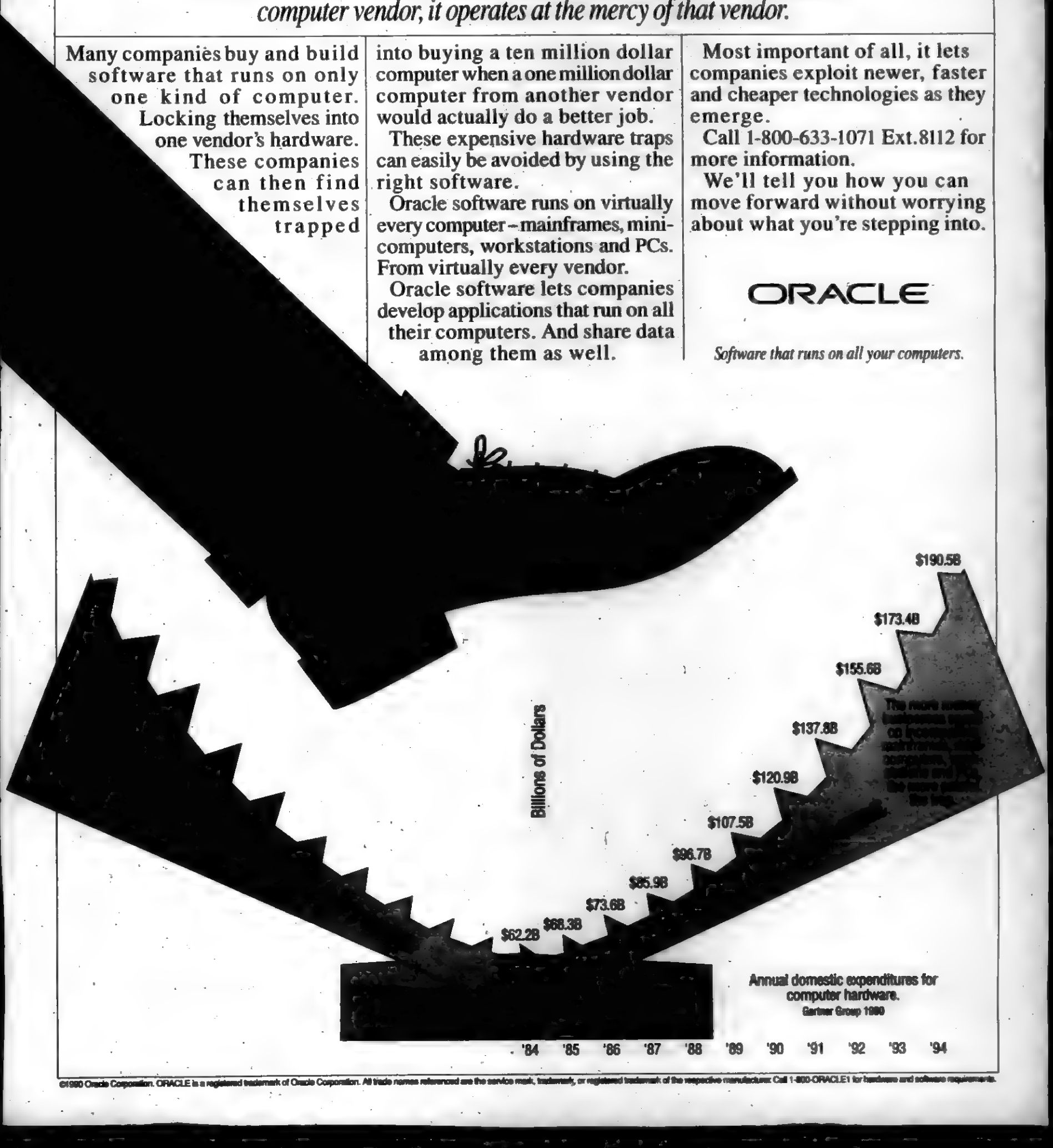

Annual domestic expenditures for computer hardware.
Gartner Group 1990

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NEWS SHORTS

Software sales boom

The Software Publishers Association (SPA) took time out from its international piracy watch last week to spread tidings of comfort and joy: A 34.4% surge in third-quarter 1990 North American retail software sales logged in at an estimated $1.15 billion. Data submitted by 150 U.S.-based software companies showed sales of Microsoft Corp. Windows-based applications up 213%; Apple Computer, Inc. Macintosh-based publishing software increased 91%; and MS-DOS/Windows graphics software sales increased 85%, higher than sales posted in last year's corresponding quarter, according to the SPA.

Aetna reorganization takes shape

Aetna Life and Casualty Co.'s Oct. 26 announcement of a major corporate reorganization will result in the elimination of about 2,600 jobs, according to the company. John Hawkins, a spokesman at the insurance firm, said there were some areas of redundancy in the information systems area and that "it's honest to say that there will be some positions in DP affected," although he was unable to give specific numbers. "It's clear that the majority of them will be job terminations as opposed to attrition," Hawkins said. He added that most of the cutbacks will be at the firm's three Hartford, Conn., area locations, which is where most of Aetna's IS capabilities lie.

Northern Telecom upgrade in place

Southern Bell Telephone & Telegraph Co. last week became the first regional operating company to install Northern Telecom, Inc.'s Enhanced Network, a central office switch add-on that is said to provide an inexpensive upgrade path for carriers with burgeoning customer bandwidth demands. The product, which Southern Bell has installed at its Atlanta-based central office, enables a previously installed Northern DMS digital switch to support as many as 128,000 simultaneous 64K bit/sec. connections, while reducing the extra engineering, provisioning and managing costs typically associated with such an upgrade, Northern said. Later versions will also support fiber-based broadband services.

IBM forms partnership

IBM last week announced a deal with Check Consultants, Inc., a subsidiary of First Tennessee National Corp., to form a partnership to sell image application software and services to the financial services industry. The joint venture, which is subject to regulatory approval, will be called Check Solutions Co.

DEC recasts banking packages

Digital Equipment Corp. repositioned its software and services products for banks in the consumer market as an integrated family last week. Called Decbank, the family encompasses existing DEC hardware and communications products and adds a layer of integration software and a customizable user interface. The integration layer allows banks to plug in their existing applications and bank-specific devices.

Boxing gloves at FDDI meeting?

Though the Fiber Distributed Data Interface (FDDI) local-area network standard was approved and forwarded by the American National Standards Institute FDDI committee last spring, committee members will reportedly duke out a network management tweak to the standard at next week's meeting in San Jose, Calif. Parameter Management Frames are currently an optional component to the Station Management portion of the standard. One segment of the vendor community advocates that the frames be mandatory to ensure network management of all stations in a heterogeneous FDDI network at the lower two layers of the Open Systems Interconnect (OSI) model. Opponents to the mandate, including DEC, generally advocate parameter management functions taking place at the upper layers of the OSI stack, both for security reasons and because of redundancy in FDDI implementations already handling network management.

More news shorts on page 99

Moccia succumbs to heart attack

BY CARL MALAMUD
SPECIAL TO CW

Mary Jo Moccia, senior vice president of the Midwest Stock Exchange and an internationally renowned pioneer in automating financial systems, died of a heart attack on Nov. 16 at age 55.

A versatile executive with wide-ranging interests, Moccia had received much of the credit for the recent performance of the Midwest Stock Exchange, with volume second only to the combined American/New York Stock Exchange.

Moccia was able to convince senior management of the exchange of the benefits of automation. She built a team of programmers and led the implementation of the system.

Moccia then turned her attention to the automation of stock exchanges throughout the world, including the stock exchanges in Amsterdam and Thailand, where she was visiting in connection with the automation of a trading system at the time of her death.

Moccia *was financial systems pioneer*

In a recent interview, she said she viewed stock exchange automation as vital if exchanges were to survive in an increasingly global marketplace.

Moccia's ability to work with senior management and a highly technical staff made her a remarkable person.

"Mary Jo Moccia was the architect and the driving force behind our automated systems," said Charles Doherty, president of the Midwest Stock Exchange. "She demanded excellence, was extremely talented, yet was always willing to give credit to the people that worked with her."

Malamud is a free-lance writer in San Francisco.

Bush vetoes export bill but seeks loosened restrictions

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — After vetoing a bill that would have eased restrictions on the export of advanced computers and telecommunications equipment, President Bush ordered federal agencies to streamline and relax regulations governing the export of such items to U.S. allies.

The president vetoed the bill, which would have reauthorized an export law that had expired Sept. 30, on Nov.16. He said provisions mandating sanctions against countries using chemical and biological weapons would "severely constrain presidential authority in carrying out foreign policy."

Instead, Bush issued an executive order that mandates tighter controls on exports that might be used to produce these weapons and sanctions against countries that do so.

"The president actually listened to some of our concerns and addressed some of our top priorities," said Debra Waggoner, a trade specialist at the American Electronics Association, referring to a Bush memorandum outlining administration plans to ease computer export controls.

The vetoed bill would have required the government to automatically update the performance-level thresholds allowed for export of computers. The cutoff for the strictest controls would have been set at not lower than 25% of the processing speed of the fastest two commercially available systems.

It also would have provided for largely license-free exports to the 16 Coordinating Committee for Multilateral Export Controls (Cocom) countries.

The Bush memo that accompanied the veto directed the government to do the following:

- Remove many items having both commercial and military uses from licensing requirements for export to Cocom countries. It is a step toward the Cocom "license-free zone" urged by industry.
- Shorten the times required to get various export licenses.
- By June 1, in consultation with industry, devise a way to index supercomputer export license restrictions to allow for rapidly changing technology.
- Ensure that supercomputer controls are multilateral so that domestic suppliers are not at a competitive disadvantage.
- Increase the performance thresholds, and update them more often for items that qualify for low-level, mass-distribution licenses.

Anne Urban, director of international policy issues at the Computer and Business Equipment Manufacturers' Association (CBEMA), said she was disappointed the president had vetoed the legislation, which CBEMA had backed. "But we're a little surprised the president is doing something. The legislation caught his attention."

DEC's Phoenix shutdown spells layoffs

BY SALLY CUSACK
CW STAFF

MAYNARD, Mass. — In what may evolve into the company's first official layoff ever, Digital Equipment Corp. announced last week that it will close a plant in Phoenix that employed 460 people.

"We haven't ruled out the possibility of additional plant shutdowns, nor have we ruled out the possibility of layoffs in the future," said Jeffry Gibson, a spokesman for DEC. He added that only the Phoenix facility itself will be shut down and that all employees at the plant are still officially on the DEC payroll.

This may be a year of firsts for DEC. The company posted its first-ever quarterly losses earlier this year and, according to analysts, must consider across-the-board downsizing to ensure a return to black ink in the future. DEC President Kenneth H. Olsen has stated repeatedly in the past that the computer company hopes to avoid layoffs.

"Clearly, if one looks at the total head count at DEC vs. the total volume they do, some adjustments have to be made," said John W. Adams, chairman at Adams, Harkness & Hill, a Boston-based financial consulting firm. "DEC will either have to raise the bridge or lower the water."

According to David Wu, financial analyst at S. G. Warburg & Co. in New York, the company has a structural cost problem that a "little Band-aid won't cure."

He added that traditional engineering companies such as DEC tend to react slower to this type of cost-cutting and change.

The Phoenix plant provided multiple services for the company, including manufacturing, systems integration, property disposal and distribution.

DEC has not announced a timetable for closing the facility so far. The company currently employs 123,500 people worldwide.

Closing Arguments

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Today, some software companies claim that their software products are "open." They may even graft the word onto their product names. It is a confusing situation, but a clear definition of "open" is finally emerging.

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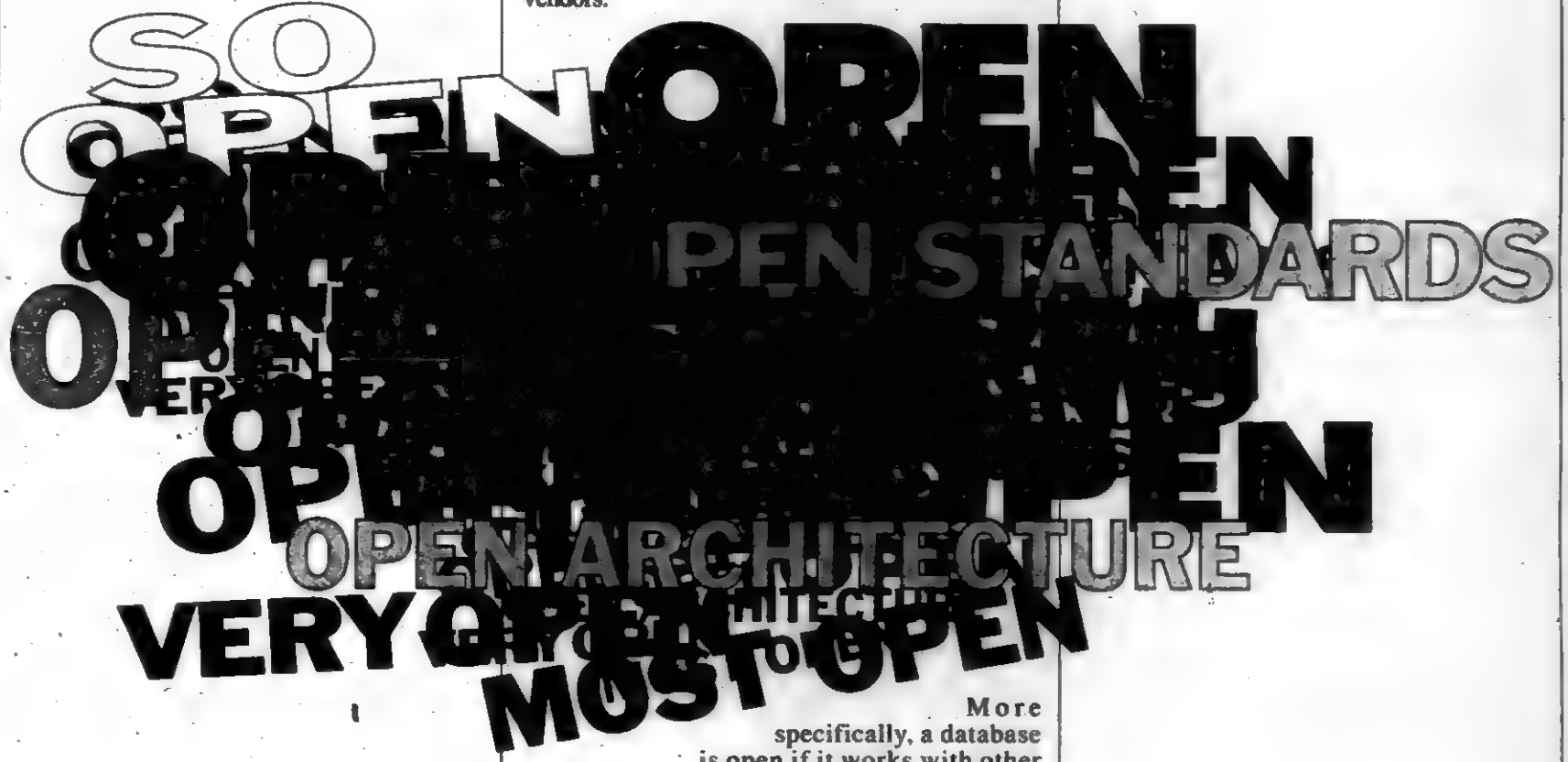

More specifically, a database is open if it works with other vendors' databases. For example, ORACLE provides access to IBM's DB2, SQL/DS and DEC's RMS.

An open database should also work with other vendors' applications. ORACLE works with DEC's All-in-1, DG's CEO, IBI's Focus and SAS. And it supports PC and Mac software like Lotus 1-2-3, WordPerfect, Borland's Paradox and Apple's Hypercard. Even Dbase applications run on ORACLE.

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Cadre to boost CASE suite

BY ROSEMARY HAMILTON
CW STAFF

PROVIDENCE, R.I. — Cadre Technologies, Inc. plans to roll out an expanded set of computer-aided software engineering (CASE) tools for the technical market today.

Teamwork/4.0 will include a reverse-engineering tool for the C programming language as well as an additional design tool for the Ada programming language. The company also expanded its object-oriented analysis support for the C++ language.

The company plans to begin shipping a version designed for Hewlett-Packard Co. Domain workstations in first-quarter 1991. It will follow in the second quarter with versions for other Unix platforms, including Sun Microsystems, Inc., Digital Equipment Corp. Ultrix and IBM AIX, according to Yvonne Cekel, director of product marketing.

The Cadre CASE tool set, first released in 1986, is targeted at technical users running Unix platforms and is typically used for C and Ada development.

Last year, the company released a front-end analysis tool for object-oriented programming (OOP) that focuses on C++. It does not yet provide a full suite of tools for OOP. With Teamwork/4.0, the analysis tool will include new features such as proper syntax search capabilities.

Software redesign tool

The reverse-engineering tool for C, called Teamwork/C Rev, will allow users to build structure charts automatically from C source files, which can be used in redesigning the software.

Teamwork/DSE is a design-sensitive editor for Ada that allows users to keep code consistent with the design representation of a program. The editor enforces the design principles on the code, which helps eliminate errors that can occur when design concepts are translated into actual code.

Cadre will offer both the reverse-engineering tool and Ada design-sensitive editor as separate add-on components to Teamwork. The additional OOP analysis tool features will be rolled into the base price of the tool set, which starts at $7,500 per seat.

Pricing for Teamwork/C Rev starts at $8,000 per seat, and Teamwork/DSE can be licensed for fees starting at $2,775.

Consolidation in PC stores

BY RICHARD PASTORE
CW STAFF

Compucom Systems, Inc.'s offer to buy The Computer Factory, Inc. earlier this month is one high-profile example of a coming dealer consolidation that threatens even giants such as Businessland, Inc.

"I definitely think there's a consolidation here," said Charles Wolf, an analyst at First Boston Corp. in New York.

Plunging profits, an oversaturated dealer market and even slower personal computer sales next year will perpetuate a shakeout and consolidation in 1991, analysts predicted.

For users, a shakeout would lead to fewer choices but may not necessarily mean an end to cutthroat pricing, analysts said. "As long as there are two dealers in a town, there's going to be price wars," one Computerland, Inc. dealer said.

The latest example of consolidation has PC distributor Compucom offering $39 million for Computer Factory's 63 retail outlets. The offer, which awaits stockholder and regulatory approval in January, seems to have discouraged hostile bidder Bay Street Group. This San Francisco banking concern had earlier offered $34 million for the chain.

Computer Factory has been hurting ever since it set up an expensive corporate outbound sales force and pushed its territory beyond its Northeast base, observers said. The firm is expected to lose $13 million this year.

Businessland has also been losing millions, posting four consecutive quarterly losses. In announcing the latest $19.9 million shortfall, Chief Executive Officer Dave Norman said no offers have been made to buy the company.

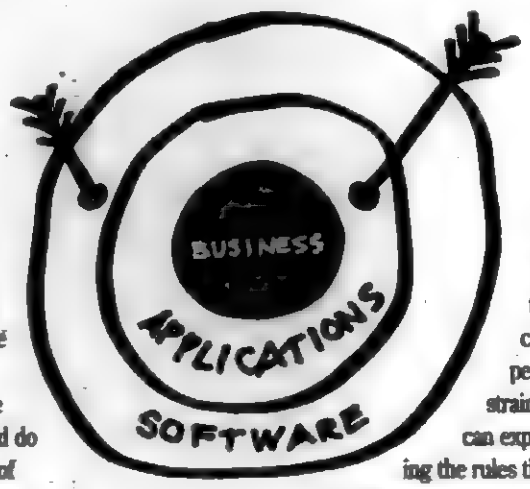
"We have a shareholder-rights program in place and a strong relationship with our vendors," Norman said. "I don't think it would make much sense to come in" with a hostile takeover attempt.

Observers were not so sure. Though Businessland's corporate structure would have to be downsized and reshaped to be profitable in today's market, its name recognition could be a valuable asset, analysts said.

The Computer Factory purchase makes more immediate sense, according to Wolf. "Geographically, this looks like a good fit for Compucom," he said. Computer Factory has already begun changing its selling profile to that of a mass-merchandising "superstore," something Compucom will likely continue, Wolf added.

"As a commodity item, the PC lends itself toward a mass-merchandizing type of approach," Wolf said.

As long as the aim of CASE vendors is better software, they'll be off-target.



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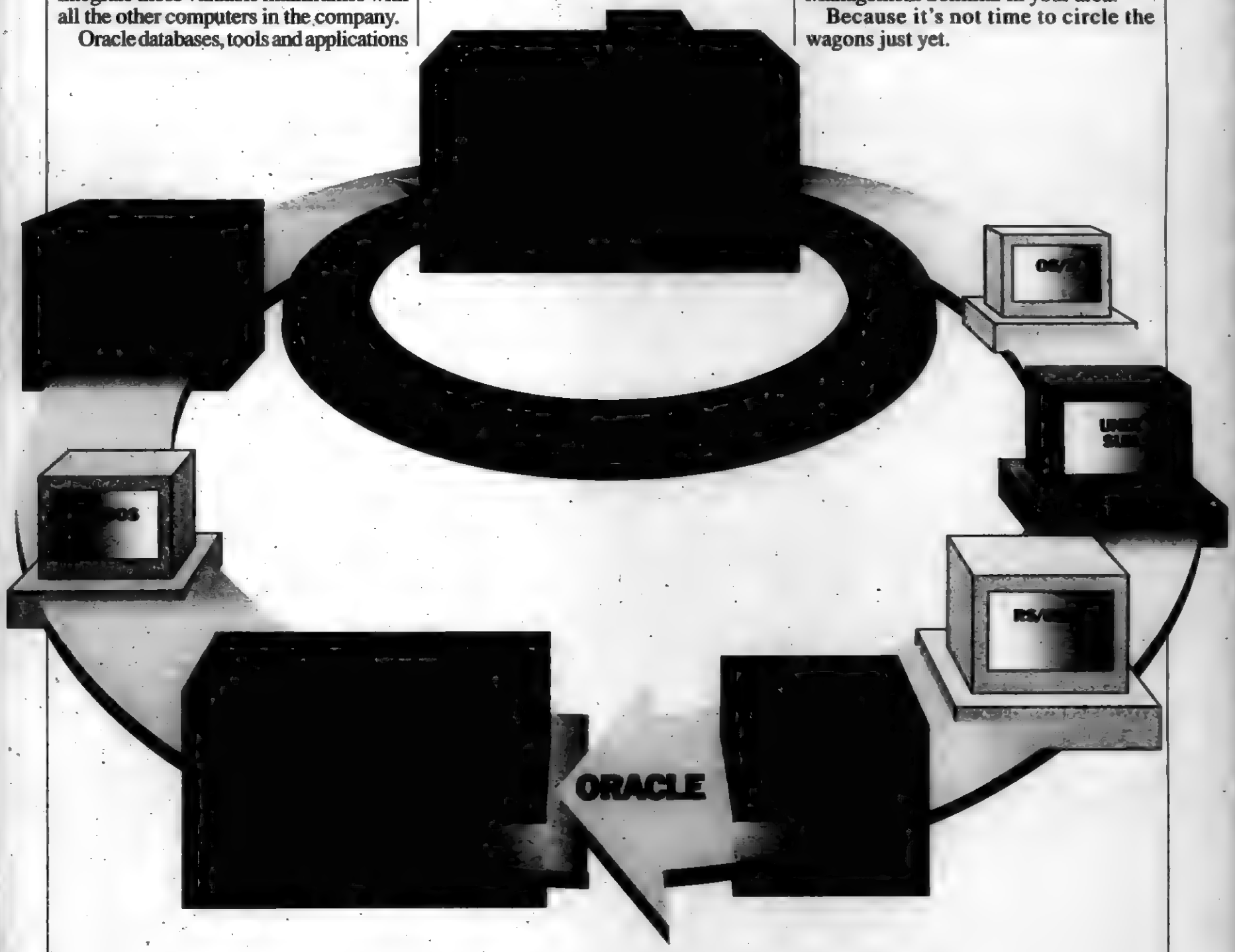

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*1990, Datamation/Cowen & Co. user survey.

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User confident Timeplex will stand tall

BY JOANIE M. WEXLER
CW STAFF

PADUCAH, Ky. — A 25-year Unisys Corp. customer is confident that Timeplex, Inc. can stand on its own two feet as its primary communications vendor — despite Wall Street's speculation that the financially ailing Unisys might sell its Woodcliff Lake, N.J.-based subsidiary.

Computer Services, Inc. (CSI), an independent data processing company serving 170 customer banks, has just brought up a $300,000 T1 backbone network comprising Timeplex Link/2+ System and Microlink System T1 multiplexers. The network, which integrates voice and data, snakes among nine CSI data centers strung through six Midwestern and Southern states.

CSI stores and manages data for customer banks, which are on-line with Unisys hosts in the CSI data centers 24 hours per day. CSI's decision to install Timeplex equipment one year ago was made independently of the Unisys/Timeplex relationship, according to R. Lee Hagan, CSI's vice president of telecommunications.

While he conceded that the vendors' relationship was in a neophyte stage at that time, Hagan said Unisys' subsequent financial woes are not posing any new concerns for him about Timeplex.

"Timeplex is a strong company in its own right, and its strength is not based on its association with Unisys," he commented. He added, though, that having Unisys engineering support on-site has turned out to be "icing on the cake."

What CSI considers icing might seem more like batter to other existing Unisys customers who are considering Timeplex equipment, particularly if something were to happen to the Unisys/Timeplex umbilical cord.

CSI's Hagan enjoys Unisys support

"If I were already a Unisys customer and was investing in the Unisys/Timeplex package, I'd be worried about synergy problems with service and support," commented Rick Villars, manager of computer networking architecture at International Data Corp., a market research firm in Framingham, Mass. "If I were not an existing customer, though, I'd simply judge Timeplex's financial stability on its own merits."

The impetus behind the new CSI network is to accommodate burgeoning growth in electronic activity in client banks and to reduce long-distance voice charges "by about 75%," according to Hagan.

Hagan said he expects a payback on his T1 equipment investment in about 3½ years. The savings will come "primarily in trunk charges and new equipment installations at the banks," he explained.

He said that a major factor prompting CSI to revisit its networking strategy was that the number of terminals in its client banks "has been growing by about 30% per year over the last several years."

Previously, data chugged over low-speed analog channels both from the banks to CSI's data centers and between the centers. Voice traffic traveled over tie lines between the Paducah and Elizabethtown, Ky., data centers and over dial-up lines between the other centers. Voice is now placed on the T1 network via an interface in Timeplex's equipment that links to CSI's AT&T System 75 private branch exchange.

"At this point, we're not envisioning a need for T3 [45M bit/sec.] speeds, but Timeplex is always on the forefront of interfacing with those new services if we need them. In fact, the company is usually one of the driving forces behind the technologies," Hagan said.

Internet

FROM PAGE 1

sorted out. A commercialized network must face issues of fiscal accountability, access rights, type of use and whether it should be regulated as a monopoly, noted a "request for comments" issued on the network this month by a working group of the Internet Activities Board.

Some said a commercialized Internet will grow in scope to rival the voice telephone network, providing all sorts of commercial services, including entertainment — perhaps replacing cable television — transaction processing and information services.

A commercialized Internet could become a national information infrastructure, "a ubiquitous, orderly communications system that reflects and addresses all social needs and market demand without being subject to artificial limitation on purpose or connection," said Brian Kahin, director of the Information Infrastructure Project in the Science, Technology and Public Policy Program at Harvard University in Cambridge, Mass.

What will make commercialization possible is the looming turnover by the government of network control and direct funding to the private sector.

Federal support?

While federal funding has been a small fraction of the total cost of building and maintaining Internet, the government's control has been considerable since the federal agencies that manage the Internet backbones have traditionally barred most commercial traffic (see story this page).

Internet was built on networks sponsored in the early 1980s by government agencies such as the U.S. Department of Defense and the NSF for use by a relatively small number of people involved in government-sponsored research.

However, use has skyrocketed with the availability of personal computers and the sophistication and interoperability of communications gear.

A proposal sponsoring the National Research and Education Network (NREN), the so-called "gigabit net" that is likely to replace much of what is now Internet, stipulates that direct federal support for the network is to be phased out whenever commercial networks are able to adequately support U.S. researchers.

NREN legislation failed to win congressional approval this year but will be reintroduced next year.

Commercial entities such as Performance Systems International, Inc. in Reston, Va., are not concerned that the government will no longer be directly subsidizing the network.

Institutions or companies will buy services from commercial providers, said Marty Schoffstall, vice president and chief technical officer at Performance Systems. It will be up to the service providers to tie into a national network.

Complicating the transition is the fact that there is no formal body to sort out the thorny legal and policy issues that are cropping up as Internet grows and takes on commercial dimensions, according to Lance J. Hoffman, a professor of computer science at George Washington University.

Hoffman said nontechnical people such as lawyers and policy experts should be involved in setting Internet policy. "The essence is, is this a research network or a replacement for the telephone system? These are not technical issues, and we shouldn't be asking the technical folks."

An Internet policy currently limits its use to activities that support research and education. However, in a commercial environment, network users and managers will see many existing restrictions dropped, leaving the network open to a myriad of transmitted junk that could clutter mailboxes and eat up network and host resources.

Some, such as Scott Cokely, systems administrator at Rockwell International in Newport Beach, Calif., complained about solicitations from vendors, but most believe that junk mail won't become an unbeatable problem.

"To some extent, I'm protected because the sender has to pay," said Dave Clark, senior research scientist at MIT's Laboratory for Computer Science. "But if my computer starts using up 50% of its cycles in finding and deleting junk mail, then I'd worry." He added that those who use the Internet would likely be adept at finding electronic ways to foil abuses.

Citizens' arrests

Currently, users can gang up on abusers in a form of citizens' arrests in which abusers are asked to stop disrespectful behavior, said Vinton Cerf, chairman of the Internet Activities Board. "Quite honestly, it's remarkably effective." He said no abuser has been forced off the network.

Other questions include whether the network should be run on a nonprofit basis or for profit and whether, as a commercial venture, it should be regulated like a utility.

The NREN funding proposal simply directs that the network have accounting mechanisms to support user charges. It also directs an interagency committee to investigate and report to Congress on issues relating to how commercial information providers should access the network and pay for that access.

A Senate staffer who worked on the bill said Congress would play a limited legislative role in sorting out commercial issues but had tried to anticipate some of them.

Casting a wide-reaching Internet

Internet is a loosely coupled network of networks — approximately 5,000 of them in 35 countries serving more than 3 million users.

The largest component of Internet is the National Science Foundation's NSFnet, which consists of a 1.5M bit/sec. fiber-optic backbone — now being upgraded to 45M bit/sec. — linking about two dozen regional networks. The regional networks in turn connect hundreds of local-area networks at campuses and government and industrial laboratories. Last month, one terabyte of data flowed over the NSFnet backbone, and use is growing at about 20% per month.

Three other major Internet backbones, sponsored by the Departments of Defense and Energy and the National Aeronautics and Space Administration, connect to the NSFnet backbone as well as to their own subordinated networks. All of these are predominantly Transmission Control Protocol/Internet Protocol networks.

The NSFnet backbone is funded by the NSF, the state of Michigan, IBM and MCI Communications Corp. and is managed by Merit, Inc., a consortium of Michigan universities. The regional networks are partly funded by NSF and partly by its member institutions. The campus-based networks are generally paid for by their respective institutions, although many of their users are doing research funded by NSF and other federal agencies.

Internet has electronic mail gateways into several commercial services such as MCI Mail, Sprintmail and Compuserve. Reston, Va.-based Performance Systems International operates one of the regional components of NSFnet and sells network services that connect to Internet.

Late in 1990, the NSF's cooperative agreement with Merit expires. At that point, the NSF could renew the agreement or adopt some other funding mechanism. In any case, the NSF is likely to eventually end direct funding of the network and instead support it through its research grants to universities or network users who would pay fees to commercial managers of the network.

Meanwhile, work and funding for the NREN is picking up steam. A bill sponsored by Sen. Albert Gore Jr. (D-Tenn.) failed to clear Congress this year but will be resubmitted next year. However, several agencies are moving ahead anyway to beef up the existing NSFnet and to do research for NREN, a nationwide, fiber-optic successor to NSFnet operating at speeds above 1G bit/sec.

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Unix PC

FROM PAGE 1

simplicity, where once there was only hair-pulling frustration, is making Unix more popular. "Unix has drawn a lot more attention because it's become so much easier to use," said Fred Schwedner, director of engineering at Adobe Systems, Inc., a former bastion of Apple applications. Schwedner said Adobe is readying a version of its Illustrator graphics program for Unix because "we've got to play both sides of the fence."

Developers also said they see Unix as the great leveler for users who must juggle operating environments with disparate systems. "It's essential that we provide a package that works on many platforms, not just one or two," said Chris Williams, director of marketing at Fox Software, Inc. in Perrysburg, Ohio. Fox is working with SCO to produce a Unix version of its Foxpro database application next year, Williams said.

Networking software provider and Apple stalwart Farallon Computing, Inc. is readying a combination router and terminal-emulation package that allows Macintosh systems to hook up to and quickly integrate into Unix environments, according to Farallon President Reese Jones. The package will be ready by the second quarter of next year, he said.

Economics is a major factor in the shift to Unix. As the U.S. PC industry begins to slow down, many developers hope to take up the slack by focusing on Europe, where Unix is already very big.

"Europe has firmly embraced Unix, and that's one market we're targeting very deliberately," said Ron Zambonini, senior vice president of research and development at Cognos, Inc. in Burlington, Mass. "Unix still has a long way to go before it offers all the benefits of some proprietary systems, but if the people want it, we'll give it to them." Cognos is working on a version of its Powerhouse fourth-generation language for delivery on Unix in 1991.

Other developers said that as PCs and workstations continue on their price/performance collision path, there will be a tremendous crossover of PC users to workstations. "PC users will want to break through to the more powerful environment Unix offers, but they won't want to leave behind their PC applications," said Aruel Voyer, executive vice president in charge of operations at Ventura Software, Inc. in San Diego, Calif. Ventura plans to make a Unix version of its Publisher application available in stores by the second half of next year, Voyer said.

> "UNIX CONTINUES TO remain the Baskin Robbins of the computer industry: 26 flavors and counting."
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The road to Unix, however, is not without bumps. Although it was designed to promote unity, Unix has sometimes caused more strife than stability. The so-called "standard" system is anything but uniform.

"Unix continues to remain the Baskin Robbins of the computer industry: 26 flavors and counting," said Donald McGovern, director of Unix Desktop Technology at Unix System Laboratories, Inc. in Summit, N.J.

Curiously, some developers said the friction has only heightened interest in Unix. "I think the standards battles have brought it up to the eyes of the business user like never before," said Lisa Landa, a spokeswoman at Lotus Development Corp. in Cambridge, Mass. Landa said Lotus will continue to push its Unix applications; Lotus Chairman Jim Manzi even addressed the Unix Expo last month.

Groups such as the Open Software Foundation are trying to smooth the differences, but the many implementations highlight the fact that the promise of portability is not yet fully realized; the selection of one of these variants can lock the user into a particular hardware platform.

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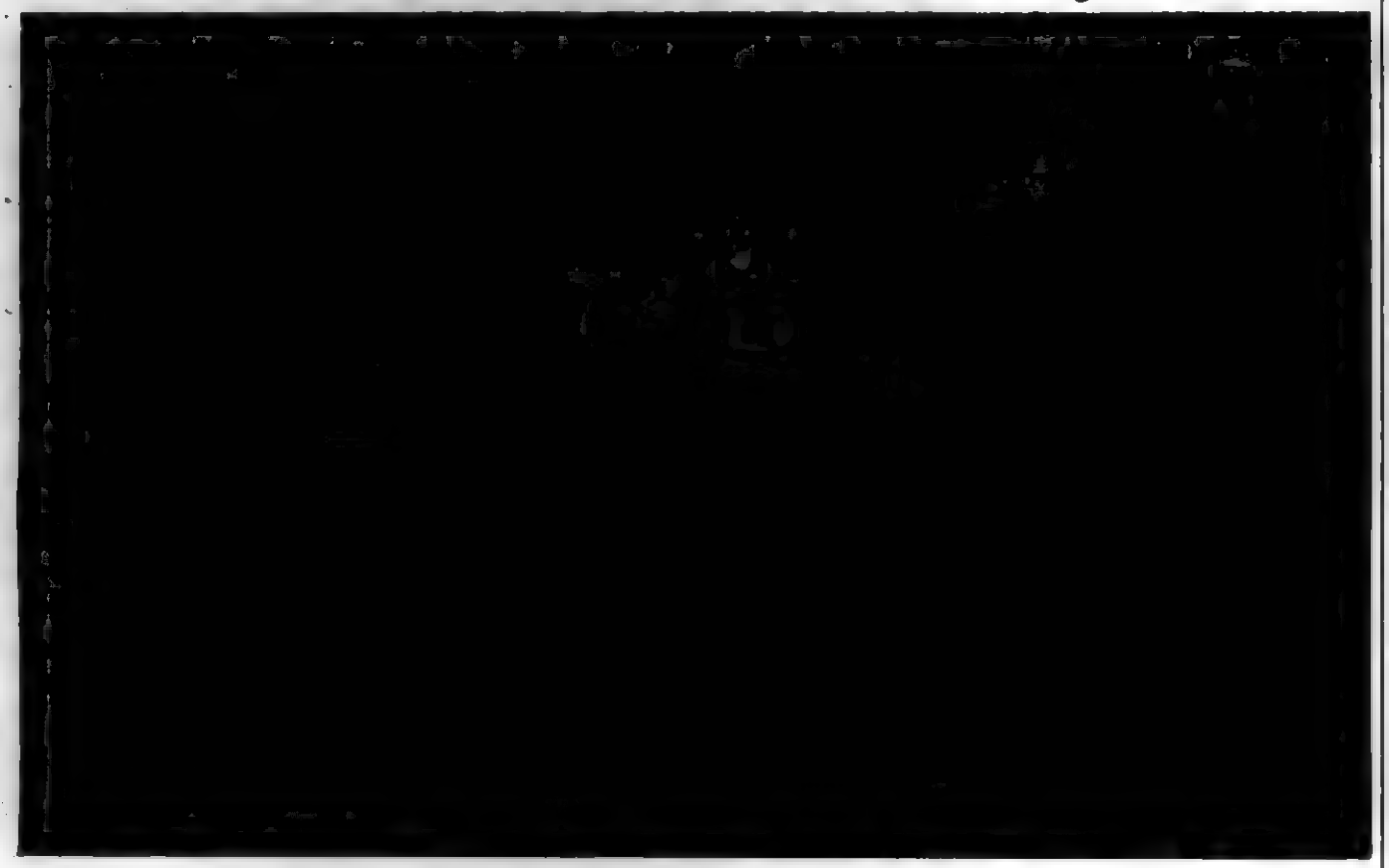

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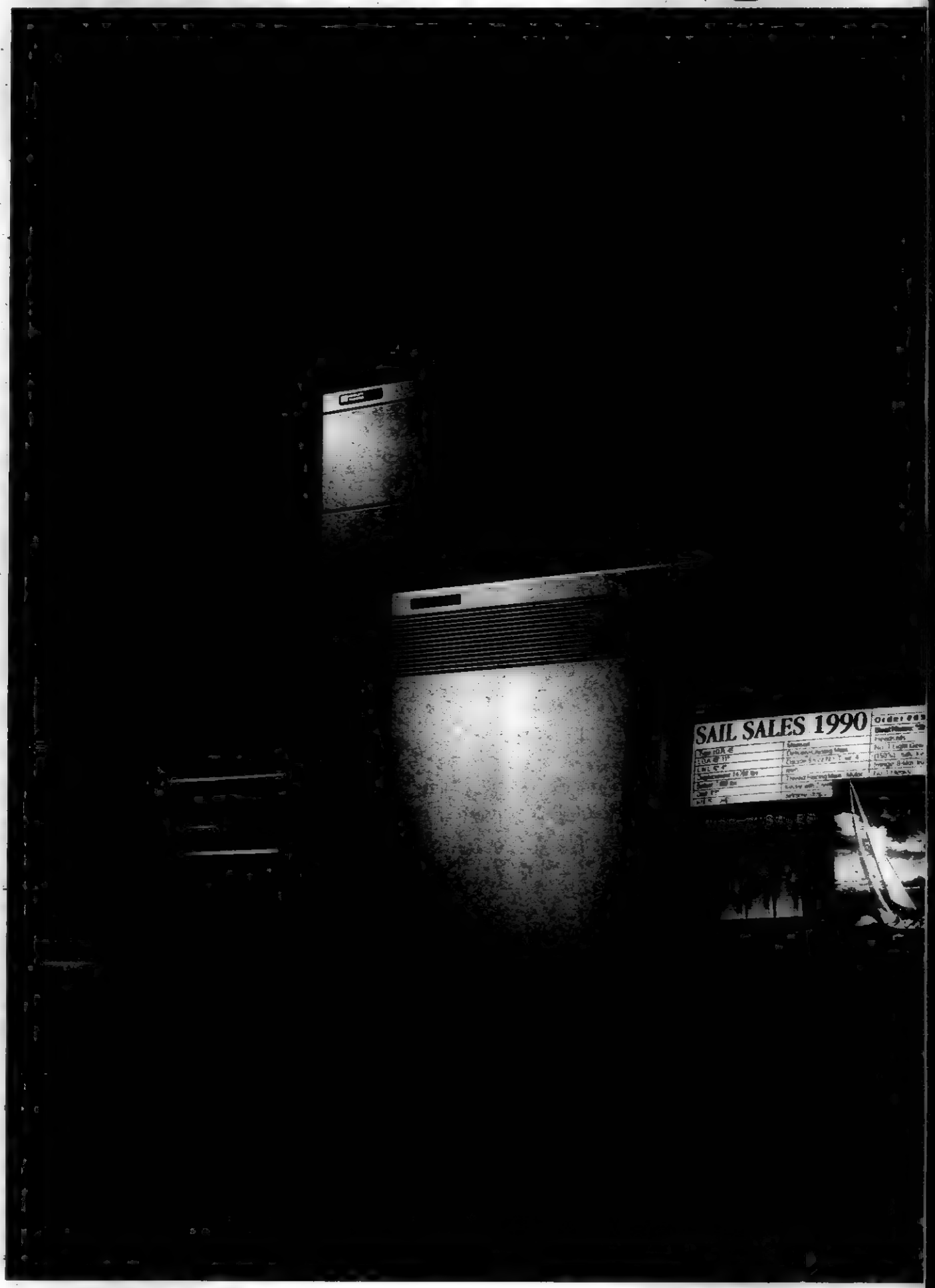

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What, exactly, is the value of MIPS?

Consortiums striving to define single benchmark standard for the computer industry

BY SALLY CUSACK
CW STAFF

Analysts list Amdahl Corp.'s top-of-the-line, eight-way multiprocessor at 350 million instructions per second (MIPS). Hitachi Data Systems Corp.'s megamainframe is rated at 150 MIPS. But while some third-party vendors talk in IBM MIPS, Digital Equipment Corp. speaks in VAX units of performance (VUP), and others have their own rating schemes, leaving users to decipher which machine stacks up best for their needs.

There is no single definition of a MIPS rating, but until flexible benchmarking programs become a reality, it appears that information systems directors at major U.S. corporations will be forced to use the outdated MIPS method as part of their purchasing strategies.

"People are very confused about this whole area," said Kim Shanley, who is serving on two consortiums established to create standard benchmarks within the industry. Spec caters to the stand-alone, technical workstation environment, while the Transaction Processing Performance Council (TPC) targets the commercial transaction-processing market.

According to Svend Hartmann, president of Computer Merchants, Inc. in Hawthorne, N.Y., a MIPS rating is a "crude measure," but it is valuable in its simplicity. "It serves as a raw kind of comparison," Hartmann noted, "but it *does* provide an easy way of comparing the relative power of IBM mainframes."

"It's an important part of the mainframe decision," said Michael W. Byrnes, vice president of MIS at Harcourt Brace Jovanovich, Inc. "MIPS plus memory plus operating system plus application software — they all come together to form the entire picture."

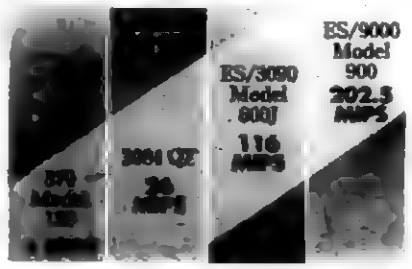
James Vaselek, vice president of data processing at Kay Jewelers, Inc. in Alexandria, Va., concurred that MIPS is "an important part of the overall algorithm." However, he added, MIPS speed in itself becomes less important in a distributed processing environment because of the varied stresses put on the system.

IBM itself does not use MIPS ratings in the traditional sense. The firm has developed the Internal Throughput Rating (ITR). Dick Schardt, IBM's manager of processer performance evaluation at its Washington, D.C., systems center, said the ITR method is simple.

"We take the number of transactions, divide that by CPU utilization, and the result is the ITR," Schardt said. He added that 10 or 15 years ago, the single-number MIPS ratings were an accurate means of measuring CPU performance. However, he said, in the world of real-time transactions, single-number measurements are no longer valid.

Starting point

By today's standards, the IBM 370 Model 158 was anything but hefty, but it did provide the foundation for using MIPS



CW Chart: Paul Mock

Over the years, hardware vendors have developed MIPS in various forms.

DEC developed its own version of the MIPS rating: the VUP, based on the median of a benchmark's results that DEC attained on the VAX-11/780 system, and the VAX MIPS, obtained by running the Dhrystone benchmark and dividing it by 1,757 — the number that is attributed to the VAX-11/780.

Users of Unisys Corp. machines have their own particular ratings to consider when making a purchase decision: the Relative Performance Measurement (RPM). According to a spokesman, the RPM illustrates the relationship between older Unisys machines and newer models. The RPMs are based on benchmarks developed internally by Unisys engineers.

Blake Wilkinson, manager of data processing at Amalgamated Sugar Co. in Ogden, Utah, is converting from a Unisys B series machine to the A series mainframe. He admitted to using a "cheat sheet" card that compares the Unisys RPMs with IBM machines assigned a MIPS rating, but he said while the card is a good guide, it by no means provides a final answer.

Vendors and users agreed there must be a common work load established: "one that everyone has agreed upon and that no one will tinker with," Shanley said. To that end, the TPC, with 36 members including DEC, Hewlett-Packard Co., Control Data Corp., Sun Microsystems, Inc., Unisys and Oracle Systems Corp., has detailed specifications written for two approved benchmarks.

Looking ahead, Shanley conceded that it is going to be a long haul. "We have to look at these groups as ongoing, permanent institutions," he said. "We will never have one benchmark that will represent every dimension of computing."

Definitively speaking . . .

Below are several general definitions of commonly used benchmarks:

- Linpack: Written in Fortran, this benchmark was designed to solve a dense system of linear equations and has become a de facto industry standard measurement of floating-point performance.
- Whetstone: Originated in 1970, this is a synthetic benchmark (meaning it does not solve any real-world problems). Peformance is related to hardware features and performance, the system's math library and the efficiency of the code generated by the compiler.
- Dhrystone: A synthetic benchmark originally developed to approximate program development and office automation applications.
- Transaction processing: A disk-intensive test representing commercial applications that measures performance in a multiuser setting of 20 users.
- Ghraphstone (graphics): Based on 122 tests that measure drawing rates for a variety of graphics elements.
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Version Merger eases strain of upgrading IBM software

BY JOHANNA AMBROSIO
CW STAFF

What do you get when you cross off-the-shelf mainframe software that has been customized with a new version of the same software? Chaos, generally, which is what a new tool aims to reduce.

Version Merger, announced last week by Skillman, N.J.-based Princeton Softech, Inc., was designed to help information systems shops reconcile different versions of IBM mainframe software.

Many large IS departments buy packaged software and change it to meet their unique requirements. Problems arise when a new version of a software package is delivered, because it is often difficult to figure out how to change the upgraded version to reflect previous customization.

That is where Version Merger comes in. It can reduce, by 30% to 50%, the time required to fit site customizations to a vendor's new release, according to Joseph Allegra, president of Princeton Softech.

The tool compares three versions of the software — the original, the one with the user organization's changes and the new release. An "intelligent merge editor" identifies conflicts and differences, makes the changes requested and helps test the results.

Karen Piza, an application support analyst at Warner-Lambert Co. in Morris Plains, N.J., used Version Merger in a feasibility study on upgrading AMAPS, a manufacturing package from Dun & Bradstreet Software. AMAPS contains over 5,000 modules, and Version Merger helped Piza's team determine that they would have to modify about 1,000 modules in order to do the upgrade.

"The time required just to assess the impact of a new release can be days or even weeks. Version Merger shortened the impact analysis to minutes," Piza explained.

Version Merger runs under IBM MVS and is available now for $17,500.

Princeton Softech, a private company founded 14 months ago by former executives of Applied Data Research, Inc., sells two products and has approximately 35 customers, Allegra said. The firm "is profitable," he added.

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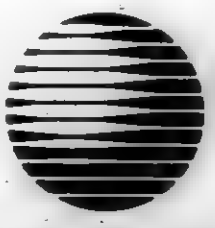

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TECH TALK

Very VGA

■ Definicon International in Placentia, Calif., has introduced a Video Graphics Array (VGA) board that the company claimed delivers high-resolution graphics comparable with those of the IBM 8514/A and adapters based on the Texas Instruments, Inc. TIGA interface specification at one-third the cost. The new CAD Resolution and Color Enhanced board generates two to three times the number of pixels that can be displayed by conventional 1,024- by 768-pixel VGA graphics boards, producing flicker-free color images of near photographic quality, the company said. The board is priced at $495.

A shaky sea floor

■ For the next eight years, a Seafloor Earthquake Measurement System (SEMS) developed by scientists at Sandia National Laboratories will monitor undersea seismic disturbances 10 miles off the coast of Southern California. The SEMS is 50 times more sensitive than earlier versions, and it is expected to detect an average of five earthquakes in the region per year, with Richter scale magnitudes of 3.0 and greater, project leader Gerard Sleefe said. SEMS consists of a sea-floor electronic package that records seismic data and transfers it to a shipboard receiver using underwater acoustic telemetry.

Clean machine

■ Researchers at Sandia National Laboratories are developing robots capable of mapping and removing radioactive waste from leaking underground storage tanks. A robot equipped with ultrasound, active computer vision, ground-penetrating radar and metal detectors makes three-dimensional maps of the surface and subsurface contents of a storage tank. The robot can also be equipped with a variety of attachments to break up hardened waste deposits, cut solids into pieces small enough to be carried by a grabber and suck up materials.

Is the cure worse than the disease?

Scientists mull over wisdom of siccing good viruses and worms on their bad brethren

BY MICHAEL ALEXANDER
CW STAFF

If there are "bad" viruses and worms, why not "good" viruses and worms? Imagine a program that is designed to seek out malicious code and destroy it, perhaps ridding a computer of the problem even before the user is aware of it.

About two years ago, computer scientists at Hebrew University in Jerusalem devised such a "good" virus, which sought out and erased a malicious virus that would have deleted files if left to run unhindered.

Some antiviral products already on the market are able to hunt down and kill viruses, but they may not do a good enough job, according to some experts. "Antiviral software is a disservice to computer security, because it is not securing the device," said Thomas Sobczak, vice president of Application Configured Computers in Baldwin, N.Y., a security consulting firm and antivirus software publisher. Sobczak said that it may be impossible to protect against a virus. "It's like in weapons development — for every weapon, somebody can make a better weapon."

M.E. Cohen

The hunter-killer question

Application Configured Computers, as well as university researchers and other virus experts, are mulling over the wisdom of developing "hunter-killer" viruses and worms that would roam in search of pieces of code that do not behave in predictable ways or alter executable files without authorization.

"We developed a Unix-based worm called a 'tandem cooperative processor,'" Sobczak said. "The program looked for anomalies, and if it saw an anomaly, it would derail the processing stack so it did not get executed."

Whether such programs will actually ever be used is questionable. Even though they are well intentioned, they could end up doing more harm than good. Computer programs are seldom errorfree, for one thing. When a virus is replicating, it attaches itself to other programs, thus changing them. A hunter-killer virus would have to change the programs again to revert them to their original forms. A minor programming glitch could result in a hunter-killer virus that would eat not only the virus but also the good code.

Some experts worry that a good virus or worm could be modified and sent out to do damage. The Den Zuk, or Search, virus was originally created to seek out and eradicate the Pakistani Brain virus, written by a computer programmer who owned a small software store in Lebore, Pakistan. The original Den Zuk will remove the Pakistani virus, but subsequent versions will reformat a hard disk drive and completely wipe out programs and data after the personal computer has been rebooted a preset number of times.

"The question is how to do it in a way that if the program doesn't work like expected, it won't mess up everything else," said Lance Hoffman, a professor of computer science at George Washington University in Washington, D.C. "Not enough study has been done on that. Would I, if I were given the opportunity to, say, write a network worm to do good things? I probably wouldn't because of the liability issues involved."

Even good viruses would interfere with computer systems, spread without users' consent and modify executables. There is simply too much risk involved, said David Stang, director of research at the National Computer Security Association in Washington, D.C. "Virus researchers are unanimously opposed to the concept," he said.

Bellcore steps toward holographic memory

BY MICHAEL ALEXANDER
CW STAFF

A team of researchers at Bellcore recently demonstrated a technique for quickly retrieving single-page video images from a crystal — a step toward developing computers with holographic memory.

The scientists said that the technology could be used in low-cost multimedia computers that could store at least 10 times more information and retrieve it at speeds approximately 1,000 times faster than today's computers. "With expanded capacity, multimedia computers could become as popular as the VCR," said Eung-Gi Paek, a Bellcore researcher. Paek said the research team plans to build a prototype that could be used to retrieve full-motion video images.

Small size, big capacity

Bellcore's three-person research team used an array of ultrasmall lasers and photorefractive crystals about the size of sugar cubes whose optical properties can be altered by light. A crystal measuring one cubic centimeter could store up to one million holographic images, according to Bellcore.

The researchers recovered the equivalent of an 8½- by 11-in. page of text from a prototype crystal storage system in less than 1 nsec, or one-billionth of a second. They estimated that a computer system with holographic memory could store more than 1G byte of data.

The technique involves taking light from a microlaser only 40 millionths of an inch wide and dividing it into two separate beams. Information in the form of an optical image is then carried along one of these beams, while the second beam serves as a reference beam for the first. Light-regulating modulators, powered by electrical current, combine the two beams in the crystal to create three-dimensional holographic images. The images resemble light and dark lines spread in microscopically thin bands.

The stored information, now a holographically recorded memory, is retrieved when illuminated by the original reference beam, comprised of an array of micron-size lasers.

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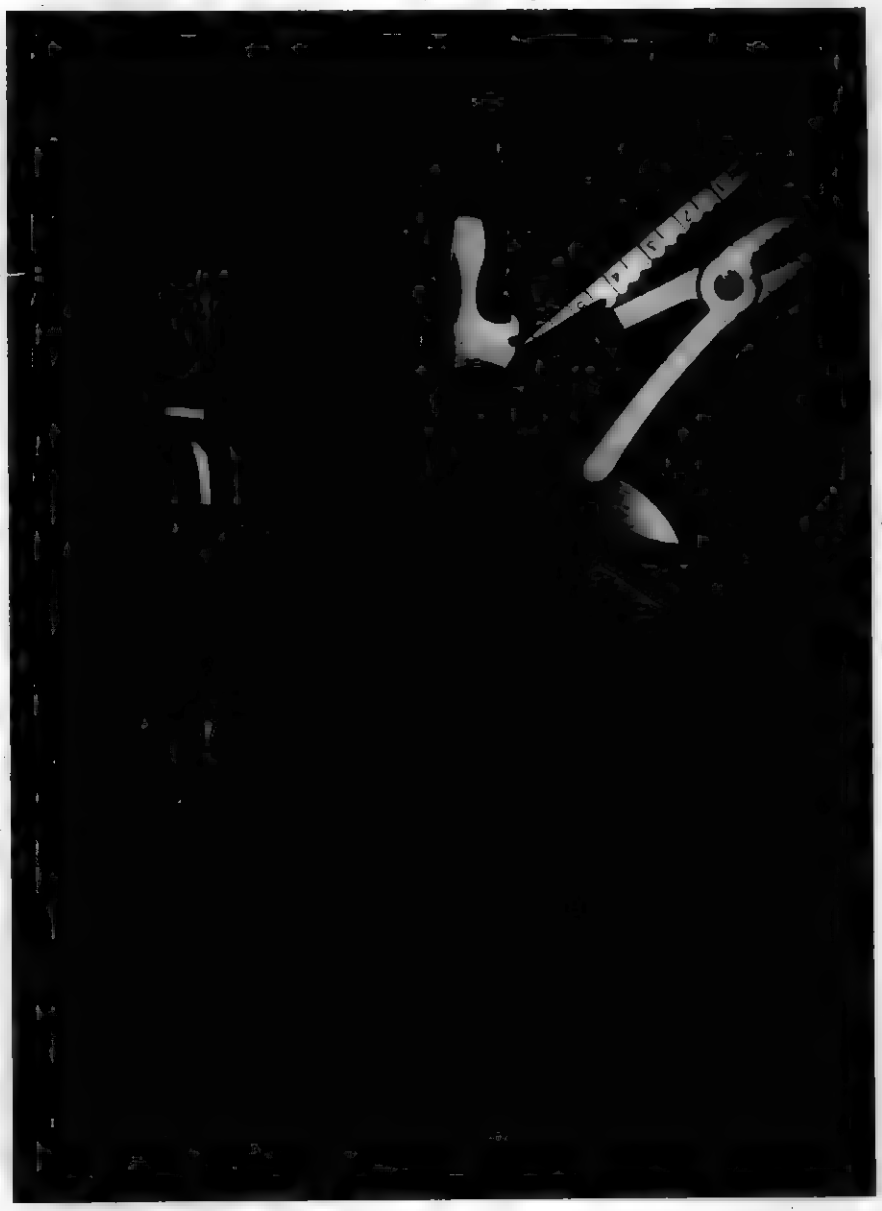

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EDITORIAL

Storm-proofing

Amid the gloom-and-doom recessionary talk comes a glimmer of light: The manufacturing sector appears to be absorbing the economic blows better than at any other time in recent memory. No doubt the painful restructuring of that segment following the 1981 to 1982 recession has a lot to do with that. But there's evidence that information systems are beginning to have a real impact, not only on streamlining the factory floor but also on improving the ways in which products are made.

A lead story in *The Wall Street Journal* last week noted that factory inventories are currently at historic lows, a good thing in times of recession. A *Computerworld* report from Autofact '90 noted that one of the trade show's key themes was using factory integration to speed turnaround times and improve competitiveness. Some industries are poised to enter the unexplored third stage of manufacturing, an evolution that has taken us from the customized, hand-tooled products of the Agrarian Age to the mass-produced homogeneity of the Industrial Age to the threshold of mass-produced, customized products of the Information Age.

We are beginning to see indications that U.S. industry's stodgy, crank-it-out manufacturing mind-set is changing. There is no choice. Buyers are going for the best deals they can get, and the "Buy American" platitudes are ringing pretty hollow when Honda already makes more cars in the U.S. than it does in Japan.

When several of our reporters visited Japan early this year to assess the state of Japanese IS, they were surprised to learn that the Japanese consider themselves to be behind the U.S. in the march toward computer-integrated manufacturing (CIM). How can this be? The answer is that the Japanese approach manufacturing from a completely different perspective. Much more time goes into analyzing the manual process and fine-tuning it before a computer comes into the picture. The Japanese are not heavily into CIM, because they don't think they're ready.

In contrast, U.S. manufacturers have tended to rush into computerization as a cure for problems that are much more deeply rooted. It is that kind of thinking that led U.S. carmakers to install — and later scrap — overly complex, unreliable robots, while Japanese carmakers focused on simple, single-function alternatives. As the consultant Michael Hammer has written, "We have not exploited the power of information technology in our organizations. We have only overlaid it on inherited designs and structures."

But perhaps that is changing. The big-picture management consultants say the 1990s will be a brutal business climate in which the survivors will be those who get to market fastest with the lowest-cost products. Information management has become a vital link in that evolution. U.S. manufacturers who intend to survive will need to listen to the words of Vincent Swoyer, vice president of corporate systems at Sara Lee Corp.: "Information about what's in production is replacing, in value, the inventory on the shelf."

LETTERS TO THE EDITOR

New learning

In today's world, it is wise to consider the global end effects of a nation's programs and activities. Mr. Perelman's exasperations [CW, Oct. 8] appear to eloquently express the negative impact on the U.S. scene of the unfortunate underuse of computer-based instruction.

However, Mr. Perelman's accurate closing resume of the inadequacies of the public school's classroom platform as "11th-century technology" seems to merit special note. For it also describes in a profound way the sad truth about the education situation on a global scale. There, the negative end effects of this are often much deeper and sometimes tragic.

Abbreviating a complex consideration of the end or context effect of what can easily be disputed as a local-to-America-only action, it simply appears to me that the continued misfiring in the educational direction, which Mr. Perelman identifies, will end up having much more serious consequences than merely "shooting yourself in the foot."

Alann L. Meadows
Systems Analyst
Rio de Janeiro, Brazil

Ambiguous need

In "Group(ware) therapy: Tips for success" [CW, Nov. 5], Paul Gillin points out that most groupware projects fall far short of their potential. One common reason not mentioned in the article is the failure of these products to meet the need for ambiguity. People in work groups don't like to be overly precise, especially when transmitting thoughts to unseen receivers.

Ambiguity in a groupware application — scheduling meetings — is illustrated by the Higgins product. Setting up a meeting using Higgins involves a fair amount of give-and-take. That's fine with those invited, who can use the slippage to gracefully avoid meetings they don't want to attend.

Good groupware guides work team members toward being more precise in their questions, directions, statements and commitments. This does boost team productivity. But first, you have to get the team to accept the groupware. As with all other system designs, acceptance comes from taking the users where they're at.

Bruce Sanders
Psychologist
Workgroup Associates
Vacaville, Calif.

Oh, Henry

DuWayne Peterson's article "Getting ready for staffing squeeze" [CW, Oct. 22] touched on an all-too-common problem — companies being dependent on long-serving employees who alone understand antiquated systems. Many of us have worked for companies where Henry is the only person who can get the payroll system restarted in the middle of the night or who understands why the Boca Raton, Fla., office did not get the correct reports this morning. When Henry goes on vacation, the rest of the organization walks around with their fingers crossed behind their backs.

It's not Henry's fault. The Henrys of this world have been taken hostage by their own management and are keeping the old systems running out of fear. They are usually working 60+ hours per week, with little or no time for relaxation.

If the guys at the top care about Henry at all, I suggest to them that by following four easy steps, everyone will benefit:

1. Get honest! Admit and accept the situation.

2. Determine where you would like to be, and formulate a plan to get there. Make Henry an integral part of your plan, as you may need that undocumented knowledge he carries around in his head like a time bomb.

3. Make the necessary changes. You've planned for it. Just do it!

4. As you move forward, be sure you are not breeding another Henry.

M. David Baker
Manager, Financial Systems
Scudder, Stevens & Clark, Inc.
New York, N.Y.

Ye, Codds

I consider *myself* the E. F. Codd of object-oriented systems, although I never thought of the metaphor until I read it in your pages.

Kevin A. Ingram
President
High Biscus Audio Systems, Inc.
Bethlehem, Pa.

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U.S. tech heading for dead end

WILLIAM C. NORRIS

The U.S. high-tech industry is headed toward second-rate status in global competition. If such a disaster is to be avoided, we must manage technology better. At the same time, there must be a substantial increase in funding by the federal government for commercial research and development.

To manage technology better, we must increase technological cooperation at home and abroad. We must utilize available resources more effectively and gain access to foreign technologies. At the same time, more equitable technology flows must be achieved between the U.S. and foreign countries.

Technological cooperation must be expanded in both R&D and manufacturing. In the U.S., we have already seen a considerable increase in cooperation in R&D among larger companies, universities and government agencies (federal and state).

These efforts must be expanded to include more participation by smaller businesses. Small businesses are a major source of innovative products and services. These objectives can be achieved only if the federal government provides more money for commercial R&D. This would stimulate the expansion of cooperation and share the cost and risk of getting next-generation high-tech products into the marketplace.

Foreign governments, especially in Japan and Germany, have assumed a significant portion of the cost and risk of cooperative programs to develop generic technologies with broad commercial applications. This support has been a major factor in helping those countries establish dominant positions in a number of high-tech markets.

A similar approach is called for in the U.S. The federal government must provide information, encouragement and part of the funding for technology development programs such as university and company consortiums, both large and small. Government laboratories should participate when appropriate. The selection of technology to be developed should remain the primary responsibility of the private sector.

Manufacturing should be a critical focus of these efforts. Expanding cooperation in the manufacturing of high-tech products is key because many U.S. high-tech companies are lagging in the use of advanced manufacturing technology. This is especially true for small and medium-size firms that lack affordable access to such technology. As a result, they are at a serious competitive disadvantage in global markets.

We should establish advanced electronics manufacturing service centers, where companies pay for the services as they are used, with no investment required in center facilities.

International technological cooperation must be more broadly based, involving many more organizations. This can be accomplished through interregional cooperation whereby a state or a group of states in the U.S. establishes cooperative activities with counterparts in other countries.

An international, interregional program should have three major components: formation of small-enterprise joint venture companies; cooperation in establishing advanced manufacturing service centers; and cooperation in applied research.

The underpinning for interregional cooperation in applied research is the large number of research centers in many countries. Though they are creating useful results, most do not have funding commensurate with their capabilities and the need for their output. Through cooperation, existing resources are leveraged and output increased significantly.

In addition to increasing returns on research, interregional cooperation can be an important vehicle for establishing more equitable technology flows between the U.S. and foreign countries. By far, the most serious imbalance is with Japan, which has virtually unlimited access to our university research and leading-edge, small-company technology.

The U.S. is not afforded equivalent opportunities in Japan because most of the research in that country is under the control of private companies, and because Japan does not have the same kind of extensive, innovative small-business sector. However, regional efforts are under way there to foster the start-up of high-tech companies.

Considering the support in Japan and Europe for high-tech small-business development and the emergence of high-tech private companies in the Soviet Bloc — and many research centers — there is an unprecedented opportunity for international, interregional technological cooperation. At the same time, equitable technology flows can be achieved.

Implementing such an audacious, comprehensive program on a global scale is not as formidable a task as it might first appear. Every state has organizations and programs for assisting small companies and fostering applied research. Similar activities exist in most other countries. Thus, for the most part, a support infrastructure is in place. With U.S. dedication to the program, the U.S. competitive position can be greatly strengthened in world markets.

Norris is the founder and chairman emeritus of Control Data Corp.

Users ready for Unix; is Unix ready for them?

AMY WOHL

Unix conferences are generally cosy affairs. The clan gathers as Unix folk prepare to talk to one another about the arcane issues they adore. Users leave feeling bruised by all the technotalk.

But at the recent Unix Solutions Conference in Anaheim, Calif., something amazing happened. Almost all of the attendees were at their first Unix conference. Most of them were there to learn something about how to use Unix. They were interested in the benefits of open, portable systems, not the fun of belonging to an exclusive club and meeting for one more opportunity to try out Unix jargon. And they were impatient.

You could hear that as they listened to panels and presentations. Why, they asked, are there so many versions of Unix? How can something be a standard if it's so variable? And if I need to buy a special version of each software package for each hardware platform and operating system version of Unix, then what exactly does portability mean?

In one session, the Open Software Foundation (OSF) and Unix International declined to argue in public over their differing views on open systems (OSF/1, a kind of Unix look-alike vs. Unix International's Unix System V Release 4). They insisted there was plenty of room for more than one player at the table. One disgruntled attendee didn't wait for the formal question-and-answer session after the talk. Instead, he stood up and firmly commented, "OSF and [Unix International] ought to toss a coin and let us know who won. Then we can just get on with this."

Others at the conference seemed frustrated by the continuing division and duplication of efforts between the followers of AT&T and Sun Microsystems (members of Unix International) and those of IBM, Hewlett-Packard and DEC (members of the OSF). They are tired of the delays that result from developers having to choose which version of Unix (or open systems) they'll write software for first and which they'll port to later. This can be an important issue, because the chosen development environment may not only get software sooner — it may get software that is better optimized to its particular features.

Users wanted to see more applications. Unix marketers are famous for talking about how much software there is. An examination of offerings, however, brings the cold light of reality. Of course there is some real, commercial-quality software for standard applications such as word processing, electronic mail, database management, accounting and so forth. But Unix is heavily weighted in favor of technical software for the engineering community, which it has long served. And there are lots of specialty products for niche scientific applications.

Fortunately, the lack of commercial-quality software should be ending soon. Many of the personal computer vendors have decided to move their most popular products (Lotus' 1-2-3, Wordperfect, et al) to the Unix platform. As others follow, more choices will be available. They are joining existing Unix developers and minicomputer and mainframe software publishers who have been moving to the Unix/open systems bandwagon.

Meeting user needs

There's more to giving users what they need than producing software, however. Commercial users are not only accustomed to a considerable product selection, they also expect convenient acquisition routes and strong support.

Getting the product to these users will be a challenge. Unix software doesn't fit through the shrink-wrap channel yet. Direct sales are expensive and a barrier to entering the marketplace for many vendors, further limiting the amount of available software.

An intermediary seems to be required. Certainly not the retail store model that succeeded for early PCs. Perhaps a value-added reseller or systems integrator model is called for.

Users are sometimes surprised at the level of support that Unix systems can require. It is, of course, possible to entirely mask Unix from the user, and small business offerings have often chosen this course. But in larger firms, where companies need to get at the system to add users or tools or to do programming, this would be inappropriate.

This means we need new mechanisms for Unix and open systems support from individual software vendors as well as overall hardware and systems houses. The latter are usually prepared to provide support, but software firms entering the Unix market from the PC market will initially find the additional support requirements daunting and must prepare either to meet them or have dissatisfied users.

Unix and open systems offer users substantial benefits in portability, interoperability and freedom of future choice, but commercial users who are attracted to these benefits and are now strongly interested in the open systems market will become disenchanted quickly if Unix vendors are not prepared to offer sufficient choices and excellent support. There is still a lot of work to do here to get the market ready for the users.

Wohl is president of Wohl Associates in Bala Cynwyd, Pa., and editor of "The Wohl Report on End-User Computing" newsletter.

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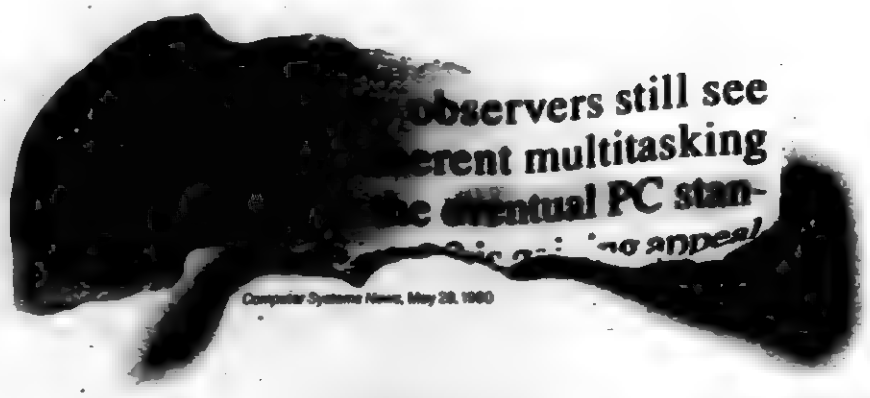

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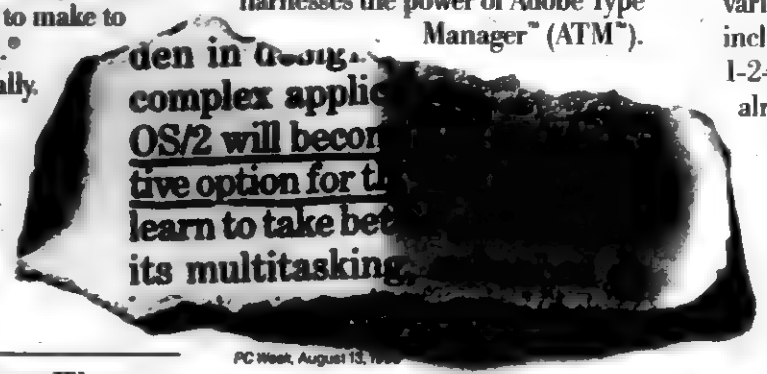

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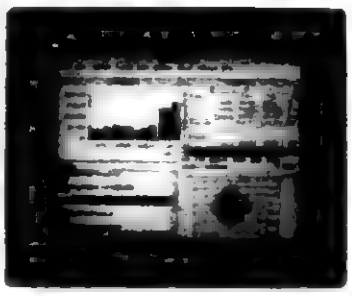

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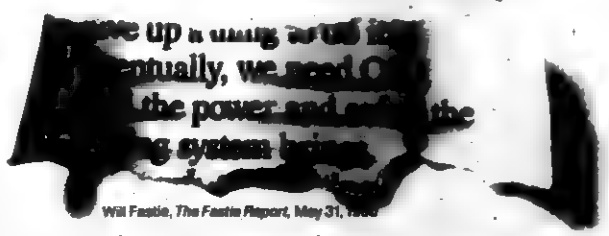

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Bull takes first CASE steps

Plans to make formal product announcements in early 1991

BY SALLY CUSACK
CW STAFF

BILLERICA, Mass. — Bull HN Information Systems, Inc. recently raised the curtain on company plans to enter the computer-aided software engineering (CASE) market, with formal product announcements scheduled for early 1991.

Bull executives, while enthusiastic about the CASE commitment, were tight-lipped about details, indicating only that the software would run on an Intel Corp. I486-based Unix platform and that the entire suite of products would in some specified way cooperate with the IBM Repository concept.

According to Cory Devor, director of U.S. marketing for Unix and open systems products at Bull, the company will rely on its own development team as well as a variety of third-party vendors.

While analysts reacted with surprise to the announcement, most acknowledged it as a necessary move in today's market.

According to Vaughan Merlyn, chairman of the CASE Repository Corp. in Belleview, Wash., most key manufacturers, including IBM and Digital Equipment Corp., are viewing CASE as a strategic marketing component.

Merlyn observed that while the new Bull product line would probably not be a significant revenue generator in the "grand scheme of things, it does get a foot into the door of the IS community." Merlyn cautioned, however, that Bull may be facing a "tough haul" to establish itself in the CASE arena.

"I'm a little surprised; this is a real challenge for them," said Stuart Woodring, director of software strategy research at Forrester Research, Inc. in Cambridge, Mass.

Looking for tools

However, Bull users have been looking for additional tools and software from their vendor for quite some time, according to Shirley Eick, president of the Bull Users Society.

"CASE is a hot button," Eick said, "and the user reaction will be very positive."

Woodring added, "CASE fits into the whole strategy of systems integration, something Bull is pushing. This makes sense for Bull as long as the products are good — the CASE competition is fierce, and the user community is wising up."

Woodring speculated that while there are more than 100 vendors in the CASE marketplace today, less than 10 are doing any significant volume of business, and he said he feels that Bull may be trying to follow IBM and DEC's lead by trying to establish a "mind share" in the CASE market.

Lou Mazzucchelli, chief technical officer at Cadre Technologies, Inc., a major player in the technical CASE arena, said that although he was not surprised at Bull's recent move toward that technology, he questioned its timing. "It's a hard time to get into the MIS CASE market, or any market for that matter," he said. "Differentiation is going to be the key, and the question is, will they have it?"

FEATURE: THE OLTP CRAZE

OLTP's fiery display isn't all show

BY MARY LOU ROBERTS

The on-line transaction processing market (OLTP) is sizzling. Many companies are into OLTP in a big way. At the same time, vendors are providing OLTP offerings, enhancing existing products and introducing new ones. Why all the fuss?

OLTP is more than a solution in search of a problem, users and consultants say. Users find that moving old batch applications to an on-line environment and developing OLTP solutions increases operational ' effectiveness, meets the needs of more competitive information objectives and answers end users' demands to act quickly in meeting market pressures.

The fact that OLTP is aligning itself with smaller platforms and open systems may also make it attractive to many users.

"For us, going to OLTP was purely a business motivation," says Rich Chapman, vice president of information systems at health care giant Humana, Inc. in Louisville, Ky. Humana is working on a pilot project to install a Tandem Computers, Inc. OLTP offering for its hospital patient care system. An OLTP will help Humana be more effective in a deregulated market, Chapman says.

Continued on page 34

Networks get automated storage

BY MARYFRAN JOHNSON
CW STAFF

When Ray Bates talks about his cross-country job of managing network storage for nearly 240 workstations, he calls it "an amusing task."

Yet, the software manager at the University of Southern California's Information Sciences Institute is hardly laughing.

Between 200 Sun Microsystems, Inc. workstations at the Los Angeles-based university and 30 to 40 Sun machines back in Washington D.C., at a U.S. Department of Defense installation, Bates wrestles daily with backup and storage needs that cannot keep up with user demands.

"We have a lot of Sun servers, and backup is becoming a nightmare," Bates said. "Our operators have a hell of a time backing up the tapes in a timely manner, and users are screaming about them doing this in the daytime."

So when Epoch Systems, Inc. came along with the first pieces of its Renaissance client/server software for automated storage last month, the Westboro, Mass.-based vendor had a ready customer in Bates.

The most welcome news for users such as Bates was Epoch's extension of its automated network management software beyond its own fairly pricey hardware and onto Sun Sparcstations and Sun 3 machines. Epoch servers range in price from about $60,000 to $700,000, providing on-line access to high-capacity disk storage over an Ethernet network.

Epoch's specialty since it be-

Continued on page 35

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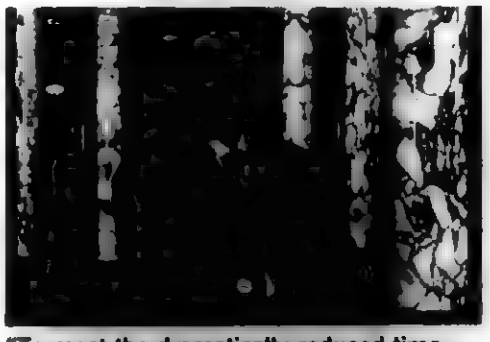

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John Pajak
Executive Vice President
Mass Mutual Life Insurance

"The strengths of the IEF are clear-cut. One obvious quality advantage is that application changes are made to diagrams, not code. This ensures ongoing integrity —the specification always matches the executing system."

Paul R. Hassinger
Chief Technology Officer
Computer Task Group

"I've seen other CASE tools fail, so I raised the bar high when we evaluated the IEF. It passed with flying colors. I could not be happier with my decision to adopt the IEF company-wide."

John F. Mott
President
AMR Travel Services

"Our users were extremely pleased when we finished our first project—a 60-transaction system—in one-half the budgeted time. We had tried interfaced CASE tools without success. IEF integration makes the difference."

Giorgio Serani
Division Head – MIS
Lubrizol

"We are using the IEF to develop a new generation of manufacturing systems replacing over 300 existing systems. We estimate that IEF will increase our productivity by between 2-to-1 and 3-to-1 for new systems development.."

Wal Budzynski
Head of Operations, Systems/Computing
Rolls-Royce

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"Our first IEF system was completed faster, and with fewer errors, than any system I've ever seen. If I had to go back to the old ways, I'd find another job...outside the DP world. It means that much to me."

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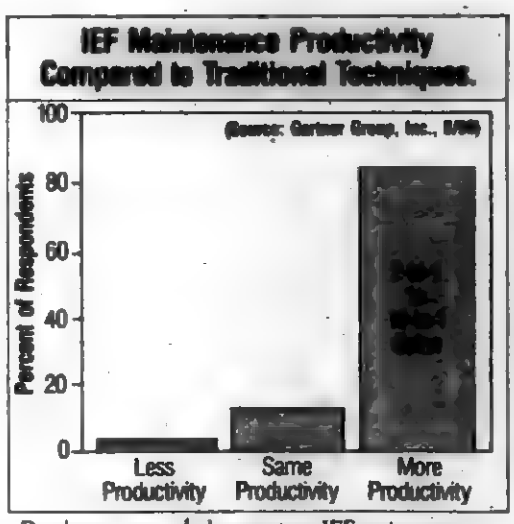
Maintenance productivity gains of up to 10-to-1.

In this same study, developers were asked to compare IEF maintenance productivity with their former methods. Of those responding, *more than 80 percent had experienced gains of from 2-to-1 to 10-to-1.* (See chart.)

Specifications always match the executing application.

With the IEF, application changes are made to diagrams, not code. So, for the life of your system, specifications will always match the executing application. The Gartner Group research showed that *all* IEF users who reported making application changes made *all* changes at the diagram level.



Developers were asked to compare IEF maintenance to former methods. Of those responding, more than 80% reported productivity gains of from 2-to-1 to 10-to-1.

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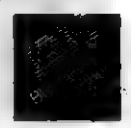

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Gerber's bumpy road to AS/400

IS group spends twice as long as expected migrating from System/36

ON SITE

BY MICHAEL FITZGERALD
CW STAFF

FREMONT, Mich. — At Gerber Products Co., the information systems group has traditionally favored mature technologies over those born yesterday. But the last year has seen IS go through the process of bringing up baby — "baby" being an IBM Application System/400 Model B40.

Last year, Gerber installed the AS/400, replacing the IBM System/36 minicomputer that ran the Gerber plant here.

Switching over to the AS/400 hasn't been easy. Gerber has configured its factories in hierarchical fashion, with System/36s sitting between the mainframe host and its personal computers.

Two circa-1981 IBM 3081Ks are linked together and hooked to a 3725 communications controller — all purchased in the aftermarket. There are roughly 100 terminals and PCs (primarily IBM Personal System/2 Model 55SXs) in each of its four manufacturing facilities. The PCs are directly attached to the minicomputer and can pass through it to the host and sign on as a terminal. The mainframes also serve as host for the company's administrative needs.

Gerber brought in the AS/400 to replace the System/36 because it wanted the AS/400's relational database capabilities and needed the extra disk space and memory.

Although the company considered the System/38, "I really felt that System/38 technology was too old to deal in the aftermarket," said John Kraley, director of corporate MIS. "Since we're on the front end of the AS/400, it looked like a good investment that we could hold onto for a while."

Kraley is not as happy being a new "father" as he thought he would be, though.

"Price/performance is a real issue," he said. "I'm not sure of the throughput I'm getting, and leftover capacity is not as great as I would have expected. There's a lot of room for us to grow, but it's real expensive in comparison to the System/36."

Kraley and his staff have also spent twice as long as expected getting up to speed on the AS/400. The problem has not been in porting applications from the System/36 to the AS/400, which required little more than a weekend, or in converting to native AS/400 code in cases where System/36 emulation mode was not performing well.

Rather, the problem has been learning to program the system while developing a new warehouse inventory locator and management system, written in-house in RPG 400. "It was a bigger learning curve going from the 36 to the AS/400 than I had been led to believe," Kraley said. "IBM worked hard at supporting us, but I'm not sure that they understood the machine, either. They seemed to be learning along with us."

Kraley said the new system represents a fundamental change in the way Gerber's warehouse employees are used to working. Where workers once were assigned jobs in somewhat random fashion, their forklifts now have terminals that direct them every step of the way.

Yet the application has smoothed out, and Kraley said his staff is developing a new plant management application slated for installation in six months.

This month, Gerber is installing an AS/400 Model B45 in its Fort Smith, Ark., plant, upgrading its Fremont AS/400 to the Model B45. The company will install another Model B45 in its Asheville, N.C., plant before the end of the year.

Gerber has also begun new projects on the AS/400. It licensed Lotus Development Corp.'s 1-2-3/M on one of its 3081s. Kraley is pleased with the way users have reacted to it and says the software "really simplifies the mainframe."

Peter Yates

Gerber's Kraley *helped make the midrange switch*

The company is also undertaking a major effort to redesign its sales data warehouse system, using a DB2 application that will run under the Data Interpretation System product provided by IBM through Metaphor Computer Systems, Inc., an IBM business partner, under OS/2.

The project aims to make external and internal sales data more readily available to the marketing and sales departments. Kraley said he expects the application to be implemented in the middle of 1991.

One thing Gerber does not like to do is charge into new projects. With the sales data warehouse system, for instance, the company is studying the benefits of the application and what it will take to develop.

"Our management is planning-conscious," Kraley said. "They want you to define what you're going to do — the benefits to be gained from it — and establish milestones that you can measure your progress against."

For instance, Kraley said, Gerber is looking to implement a sales information system in January. The system was designed to allow the company to regularly collect information it has in the past only collected once every six months. Gerber's 530-person sales force will carry portable computers on sales calls and retrieve information, such as product sales, on the spot. At the end of each day, the representatives will feed their information via modem into the mainframes.

"It will allow us to capture a higher quality of data about our products on the shelves, what our competitor has on the shelf, what's changed since the last visit," said Bruce Erickson, Gerber's marketing and administrative systems manager. "It's also used as a notepad to prompt the rep to set up displays, present a new item, that type of thing."

Software plans shop-floor schedules

Product also feeds information into high-level D&B Software system

BY ELISABETH HORWITT
CW STAFF

DETROIT — A finite scheduling product announced this month by Dun & Bradstreet Software's Advanced Manufacturing International Division can determine optimal scheduling on a detailed level for the shop floor and can also feed work-center scheduling information into the more long-term, high-level scheduling system provided by D&B's AMAPS manufacturing resource planning (MRP) II software, the company said.

D&B's new AMAPS Finite Scheduling System uses rule-based algorithms to come up with optimal schedules that balance a "complex array of parts and processes across machines" at multiple work centers, D&B spokesman John Lischefska said.

The system calculates schedules on the basis of available machine and human resources, scrap and other production information that it collects through D&B's Factory Control and Management System.

It can also take into account business objectives such as quality, on-time delivery and maximizing capacity, which can be weighted by the user, Lischefska said.

"D&B has identified a hot market segment — factory-floor management — which sits between factory control and [manufacturing resource planning]," said Bruce Richardson, a vice president at Advanced Manufacturing Research, Inc. in Cambridge, Mass.

"That area has been a void, but it is becoming important" — particularly as companies move toward "pull-based manufacturing," where production is driven by customer orders, not by "push-based systems," which are driven by the need to reach a predetermined inventory level, Richardson said.

Traditional MRP systems, which were designed for push-based manufacturing, do not provide the detailed, up-to-the-minute scheduling that pull-based manufacturing requires, Richardson said. "Thus the need for an MRP front end like D&B's finite scheduling product."

Through rule-based algorithms incorporated into the software, Finite Scheduling can come up with "the optimal scheduling solution" for a given set of parameters, Lischefska said.

This is in contrast with other products, which require that users try a succession of "what-if" scenarios for optimizing work loads, he added. "We also provide the capability for the user to move things around as things change, but no user can figure out how to allocate 4,000 to 6,000 open orders across six centers."

> "WITH THE SAME SCHEDULING engine, you get the same answer; before, answers [that were] gotten on the shop floor conflicted with the high-level answers" generated by MRP.
>
> JOHN LISCHEFSKA
> D&B SOFTWARE

The link between finite scheduling and D&B's AMAPS MRP II ensures that short-interval, detailed scheduling for the shop floor is synchronized with master production scheduling for an entire plant or product division.

"With the same scheduling engine, you get the same answer; before, answers [that were] gotten on the shop floor conflicted with the high-level answers" generated by MRP, Lischefska said.

While the initial package only supports sequential files, it will be hooked to relational database management systems at an unspecified future date, Lischefska said.

AMAPS Finite Scheduling System is based on a product developed by Manufacturing Software, Inc. in Cambridge, Mass. It will be initially offered on Digital Equipment Corp. VAX/VMS systems.

D&B plans to migrate it to IBM-compatible workstations based on Intel Corp. 80386 and 1486 workstations at an undisclosed date. It is priced between $100,000 and $300,000, depending on system configuration, and it will be available next month.

OLTP

CONTINUED FROM PAGE 29

"Companies that surpass their competitors in providing better, faster, more responsive information [through OLTP] will gain a first strike advantage," adds Tom Willmott, a principal at the Aberdeen Group in Boston.

This kind of demand for ready access to up-to-the-minute information has helped make OLTP the fastest growing computer market segment, according to Ray Schulte, program director at Stamford, Conn.-based Gartner Group, Inc. Schulte estimates that the OLTP market for hardware and software (not including application software, services or support) will grow from $35 billion in 1989 to $72 billion in 1994.

What's new?

In some ways, OLTP is nothing new. It is an evolution of mainframe CICS, a proprietary transaction manager first implemented by IBM in the 1960s. With 40,000 installed sites today, CICS remains the most used OLTP monitor in the industry.

OLTP, as defined by many industry analysts, is different from the old time-sharing on-line monitor technology. "OLTP implies the existence of a database that is available for on-line access with update and inquiry for remote users," says Omri Serlin at Itom International, a Los Altos, Calif.-based OLTP consulting firm. Serlin says classic examples of OLTP include the airline reservations systems of the '60s and the on-line banking applications of the '70s and '80s.

OLTP is differentiating itself further from CICS by evolving to smaller platforms and open systems, primarily distributed systems on a Unix platform. In fact, several vendors are betting their lives on the fact that smaller midrange systems will be an increasingly attractive choice for OLTP users in the future.

Digital Equipment Corp., Hewlett-Packard Co., AT&T, Sequent Computer Systems, Inc., Sequoia Systems, Inc., Tandem and Stratus Computer, Inc. all offer midrange OLTP options and will be trying to steal those transactions off of IBM CICS mainframes.

For its part, IBM came out in September with a statement of direction to make CICS available under AIX, its Unix offering. And industry watchers say it is likely that CICS will become available for OS/2 and the Application System/400 platforms. But IBM has yet to announce any dates.

Going down

Hyatt Corp. in Chicago recently joined the ranks of the open and downsized. It replaced its IBM mainframe that performed OLTP with four Unix-based processors from AT&T to operate its on-line customer reservations system, according to Joan Lowell, vice president of telemarketing and reservations services at Hyatt.

"We made the change to an open sys-

EIS

If You're Thinking About It...

A nicety

System availability has always been a major issue in the operation of on-line systems. For most users, ensured continued operation is a matter of degree.

Tandem Computers and Stratus Computer have carved a market niche out of users who demand round-the-clock availability.

Availability at K Mart Corp. is tied closely to the bottom line, so its Stratus systems must operate without interruption. "We move about 50,000 credit authorizations per day through the system, and it has to be up," says David Carlson, senior vice president of information systems at the Troy, Mich., retail company.

But other users, while they are concerned about availability, do not see the need for adding the cost of full fault tolerance. Michael Prince, director of information services at Burlington Coat Factory Warehouse, notes, "We have the luxury of being able to store and forward some transactions."

Vendors are taking advantage of this sliding scale by offering degrees of what Aberdeen Group's Tom Willmott calls "fault resilience."

New microprocessing and disk mirroring technologies have been unveiled that can provide a high level of system reliability without the price of full fault tolerance, Willmott adds.

Fault tolerance is seen by many users as a nice-to-have but not critical capability, Gartner Group's Ray Schulte says. But in a competitive OLTP market, fault tolerance may be an option that differentiates vendors.

Several of the traditional mainframe vendors are now actively addressing the fault-tolerant requirement.

So, if Gartner Group is correct in its prediction that the fault-tolerant systems market is only $1 billion and not growing significantly, then Tandem and Stratus are likely to find themselves with some heavy competition in a small but crowded niche.

MARY LOU ROBERTS

tems environment so we can have greater on-line connectivity to our properties and receive more reservations electronically from various distributed sources including airlines and travel agents," she says.

Companies such as Hyatt are responding to what Floyd Hale, general manager of the Software Platforms Division of Blue Bell, Pa.-based Unisys Corp., says are the two forces driving OLTP: "First, worldwide business interests dictate that an 8 a.m.-to-5 p.m. business environment is no longer appropriate. Second, there is great focus on decentralization with a requirement for seamless transaction processing in an open environment."

For its part, Unisys is developing standard OLTP applications based on X/Open Co.'s Distributed Transaction Processing model.

Modified Unix

Unix's role as the platform of choice for OLTP is not without its problems, however. Current complaints about Unix's shortcomings include the fact that its file system is not geared to support transaction processing, its networking protocols are not reliable, it can't handle multiple interactive users well, and, above all, it was designed as a general-purpose time-sharing system.

According to Serlin, "Unix is really a poor vehicle for implementing OLTP. It lacks the facilities that are required by any serious database-driven application." He admits, however, that database vendors and terminal handlers have been able to bypass some of Unix's limitations to date.

What Unix does offer is a standard platform, the portability of open systems and, as Serlin notes, "the interchangeability that users want. That's important in an OLTP environment."

Burlington Coat Factory Warehouse is one user that demanded a Unix open systems OLTP platform (AT&T's Tuxedo), says Michael Prince, director of information services at the firm. The company's application, an on-line national distribution system that tracks sales and inventory and manages the flow of data between systems in the network, operates on Sequent computers.

Whatever the weaknesses of Unix, it is clear that it will be a key player in the OLTP drama, judging by the commitment to it by virtually all the OLTP vendors.

"Users are saying, 'That's how we need [Unix OLTP]. Change the rules.' So the vendors are," says analyst John Rymer at Patricia Seybold's Office Computing Group in Boston. •

Roberts is a free-lance writer and consultant in Glenside, Pa.

Networks

CONTINUED FROM PAGE 29

gan shipping its storage servers two years ago is a technology that combines optical and magnetic storage and backup, giving users the illusion of endless disk space. The automated software moves little-used files and data out to magnetic disks, but users can recall the information in less than 15 seconds.

The same software that Epoch has been using on its own platform is now being sold as Renaissance Infinite Storage, ranging in price from $1,500 to $15,000. The Infinite Backup software is scheduled to be available in the first quarter of 1991.

The debut of the Renaissance products signals the storage hardware vendor's first move toward becoming a storage *software* company. The intent is eventually to run its network management software on any computer platform on the network, company officials said.

Along with the Sun agreement, Epoch announced alliances with Mips Computer Systems, Inc. and Hewlett-Packard Co. to move the client portion of its client/server software onto their platforms in 1991.

"Two years ago, the only real way for us to bring storage management to a heterogeneous environment was to build the platform ourselves," said Ken Holberger, chairman and vice president of business development at Epoch.

Bates noted, "Management of network storage is pretty haphazard, and managing it centrally would solve a lot of problems for us."

An Epoch-1 server in Washington, D.C., is now "the single point of failure for our whole system," Bates said, explaining that all of the university researchers using the Sun network store both active and inactive files on the Epoch machine. While it has never crashed, he added, "I try to be very conservative. If that machine breaks, they can't get to their data."

Holberger said Epoch's server and storage management software is now positioned as an archive-level repository of storage, providing services through the Network File System protocol.

"With Renaissance, we'll be providing that capability directly to the end users of the service," Holberger said.

Not easily defined

While the definition of on-line transaction processing is debatable, most analysts agree on a few key characteristics:

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- Fast response times.
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*David W. DeLong, co-author of "Executive Support Systems: The Emergence of Top Management Computer Use."

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PRODUCT REVIEW

Oracle fields a solid player

Oracle Systems Corp.

This is the sixth in a monthly series of performance benchmarks that for the next several months will focus on the integration of computer-aided software engineering (CASE) and fourth-generation language (4GL) products. The benchmarks are monitored by an independent team headed by David Whiteside, managing director of Computing Futures Ltd. and his associate, Prof. Eberhard Rudolph, formerly of the University of Auckland, for exclusive publication in Computerworld.

Each product is observed in action over a three-day period during which a vendor team solves the case study project costing system, an application that is familiar to most information systems professionals. The team's mission is to demonstrate the capability of the major CASE/4GL environments to deliver complete and complex business solutions under "live fire" conditions. In this issue, we look at Oracle Systems Corp.'s Oracle development tool set, which is based on the SQL language.

•

Carried out by Oracle in Bracknell, England, its team of three people provided a comprehensive and attractive solution to the benchmark and fully earned the rating of "excellent" for the level of completion.

DEVELOPMENT WORLD PRODUCT BRIEFINGS

•

Held back slightly by a Personal System/2 environment that struggled with the application, the team still completed the benchmark and its enhancement in 16 hours and 30 minutes. The overall effort of 40 hours and 45 minutes was one of the best so far. Thus, we rated speed of development "very good."

•

The most telling element of the benchmark came at the end, when the team had to enhance its solution. They could have gained the top mark but lost time by an unfortunate implementation decision. Still, the speed of maintenance was "very good."

•

The Documentation also had to be rated "very good." The CASE tool presented clear entity diagrams and program descriptions. The detailed documentation at the lower levels was well structured and readable. The differences between design and implementation were highlighted, however, they had to be addressed manually.

•

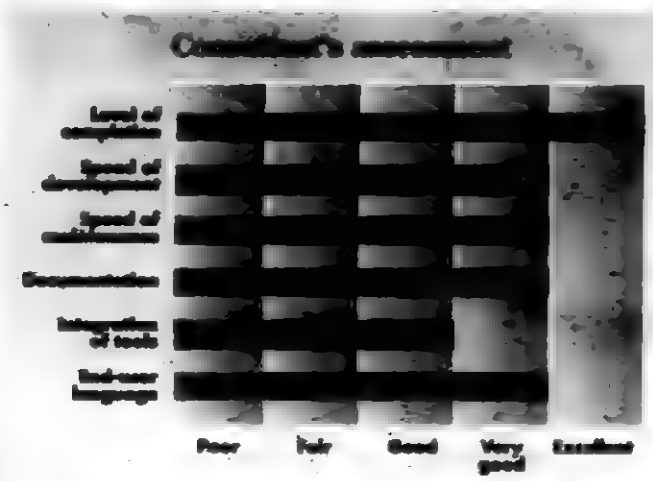
With a number of different tools, integration is important and requires considerable support. On the positive side, most of the implemented system was directly generated from the CASE environment. However, any low-level changes were not automatically reflected back in the design. At the high level, business rules were entered but were taken as comments only. Finally, two data dictionaries were used for design and production. Under the circumstances, they bordered on "good."

•

The end-user language SQL*QMX was very powerful and produced excellent results without much effort. While simple file displays were easily handled by the untrained end user, more sophisticated presentations required an understanding of relational logic. Nevertheless, the end-user language had to be rated "very good."

•

When looking at the marks of this assessment, Oracle's results are consistently very good, lacking any significant weak spots. For the first time in the series, the benchmark was completed well before the end of the third day. While it is a very flexible solution that can be ported to many environments, attention has to be given to avoid being lost in unnecessary complexities.



Development and maintenance report card

ANALYSIS AND DESIGN: C
Sound foundations were set for the database structure and program architecture. Running on OS/2, the Case*Designer is unidirectional but can pinpoint differences between designed and implemented data structures.
Strength: It generates data structure and program logic.
Weakness: Business analysis is not integrated.

DATABASE SETUP: B
This stage was fully automated. However, the database initially generated contained only the basic data structure with most editing rules left to be implemented at the program level.
Strength: Automatic and very fast.
Weakness: A secondary data dictionary had to be generated.

FILE MAINTENANCE TRANSACTIONS: B
Very efficient screen user interface with an automatic inquiry facility on every field. Single-file logic required little effort. Yet much time was needed when multiple files had to be maintained by a single transaction.
Strength: It has powerful screen painting.
Weakness: The going gets harder in multiple file logic.

COMPLEX TRANSACTIONS: A
Despite the elaborate screen layout, most of this transaction could be automatically generated, which contributed to the fast implementation time. The presentation was nicely laid out but numeric data had to be entered left justified.
Strength: Generated transactions can be easily refined.
Weakness: No support for time data handling.

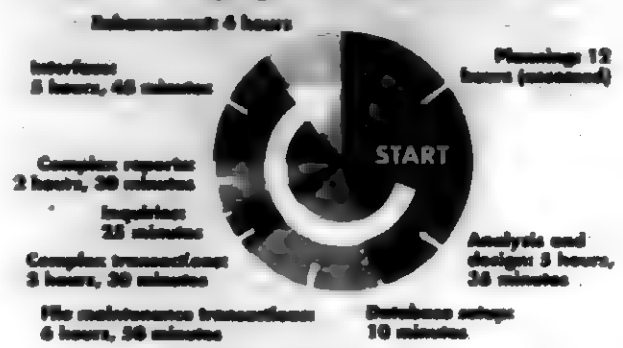
INQUIRIES: A
The 'query-by-example' style tool was very efficient. The task was completed in good time and very well presented. Providing access to the data dictionary, the programmer simply selected the necessary fields to answer the two inquiries.
Strength: It is very fast.
Weakness: Presentation is somewhat rigid.

COMPLEX REPORTS: B
Although the results were obtained quickly, the implementation required tedious detail work when defining the report layout. Some minor rounding errors occurred because of substandard time handling.
Strength: It is a flexible reporting tool.
Weakness: It has no report painter.

INTERFACE: B
The Ashton-Tate Corp. Dbase file was converted into an Oracle database using the DB3PREP function of SQL*Loader. This part of the interface was easily accomplished, but the batch editing process that followed took longer than expected to develop.
Strength: It is an integrated conversion tool.
Weakness: Batch processing is not as well automated as online transactions.

ENHANCEMENT: B
The selected enhancement required changes in the data structure, screen layout and all reports. These were handled fast with the exception of the complex report, which required considerable debugging. The design documentation was not updated.
Strength: It is an environment that supports maintenance effectively.
Weakness: It is not automatically reflected in the design documentation.

Staging the benchmark



Total effort: 40 hours, 45 minutes
Elapsed time: 16 hours, 30 minutes
Team size: 3

The solution was initially developed on a PS/2 IBM Token-Ring network with three stations dedicated to the development team. The completed Oracle solution was then transferred and tested on an IBM 4381 mainframe under MVS/XA.

Details of the product can be obtained from Oracle World Headquarters, 500 Oracle Pkwy., Redwood Shores, Calif. 94065, (415) 506-7000.

***Development World** product briefings are based on a series of full solutions to the case study. They are prepared by leading vendors and published along with in-depth product analyses and consultants' test reports in Development World Libraries. Please see business reply card between pages 76 and 77 or fax (508) 820-0146 for a brochure.*

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COMMENTARY

Richard Pastore

Upgradable imprint

When IBM introduced its high-end Personal System/2 late last month, it put the ultimate endorsement on the concept of personal computer CPU upgradability. By joining the first proponents of this technology, IBM has served notice to the industry that this is truly the way to go for high-end PCs.

The ability to swap processors in Intel-based PCs was first promoted by so-called second-tier vendors in the mid-1980s. AST Research, Advanced Logic Research and some others have offered 80286-based boxes that users could boost to an 80386 or even an I486.

Many analysts thought of these upgradable designs merely as mildly interesting gimmicks. Vendors who didn't offer it ridiculed the concept as technologically inefficient.

Users have also been cool to upgradable boxes. One reason has been that businesses preferred to hand down old 286 machines to neophyte users and buy powerful units for their hotshots. Others opted to buy more powerful PCs than necessary and "grow" into them.

But the tightening economy and the approaching saturation

Continued on page 44

A plethora of high-end server choices

ANALYSIS

BY RICHARD PASTORE
CW STAFF

The recent rash of rollouts in the high-end personal computer server arena may have many users reeling over the diverse assortment of brands, designs and capabilities. More than ever, trying to sort one from another means understanding your network's needs and matching them to the server's capabilities, observers said.

Applications and the number of users are the first considerations for most shops planning a purchase.

"If you're talking about a small work group with a high degree of emphasis on electronic mail, you'll want something configured as a communications server," said Tom Willmott, vice president at Boston consulting firm Aberdeen Group.

Deloitte Touche's *Rankin*

For file and communications servers, lower-end Intel Corp. 80386- or 80386SX-based systems are generally adequate, analysts said. Many users agreed, saying they are content with these low-end configurations.

"Last year, we considered a [reduced instruction set computing] machine, but we didn't think we needed that much horsepower," said John Carroll, vice president of MIS at Cumberland Farms, Inc. IBM 386-based Personal System/2 Model 80s "have done a fine job for us to this point," he said.

On the other hand, if the network must serve multiple departments, then 32-bit I/O machines with upgradable processers should be considered, said Frank Dzubeck, president of Communications Network Architects in Washington, D.C. The same recommendation holds for servers that must perform compound functions — act as a gateway to outside services as well as a file or database server, Dzubeck noted.

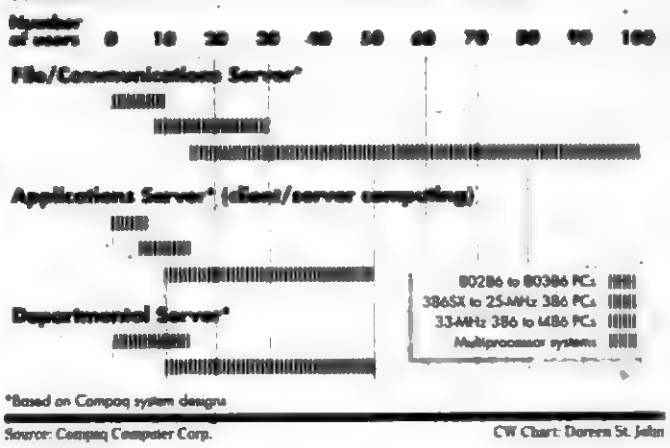
Once they have established a need for high-end servers, users come face to face with a barrage of platform choices. "During the last 12 months, you've had a filling out of the marketplace," Dzubeck said.

Many vendors are jostling for sales potential. Demand for high-end PC servers will increase by 40% per year through 1993, said Workgroup Technologies, Inc. in Hampton, N.H.

When sorting out this crowd of vendors and machines, users say their key considerations are I/O, systems flexibility, technical design, brand name and price.

But which server?

PC servers span a broad power range and determining which is appropriate depends on the number of users and desired application



Source: Compaq Computer Corp. CW Chart: Doreen St. John

Accounting firm Deloitte Touche, happy for now with 386-based servers, is studying IBM's new 1486-based PS/2 for future possibilities. For the large data sets moving across Deloitte's networks, throughput is the key to platform choice.

"We're looking to get data to and from the file server by the fastest possible means," said Claude Rankin, MIS manager at the New York office.

Flexibility key

Other users say flexibility is the key to their buying decisions. Mike Purcell, manager of technical planning at Baxter Healthcare Corp., said he chose a Compaq Computer, Inc. Systempro because of the ability to add users "fairly smoothly without running into a wall."

"I needed a system where I could always grow," said Louis Arena, systems officer at Citibank NA in Plainview, N.Y.

Arena acquired a dedicated PC server from Netframe Systems, Inc. to replace 286-based machines. "A regular 386 or 486 server wouldn't have given us that advantage," he said.

Many users view such upgradability as investment protection — a prime consideration with system prices starting at $15,000 and running up to $70,000 or more.

Cox Cable, Inc. in San Diego recently added a second 420M-byte hard disk to its Systempro. "I didn't lose any of my existing investment," systems analyst Mark Olsen said.

The enormity of the hardware investment and the critical role of the server pushes brand-name reliability above price on many users' criteria lists.

"Our experience with Compaq and IBM have shown they have viable, attractive products," said Michael Ball, data processing coordinator at the Federal Reserve Bank in Baltimore. "We know we could save money by looking elsewhere, but we don't feel the need to."

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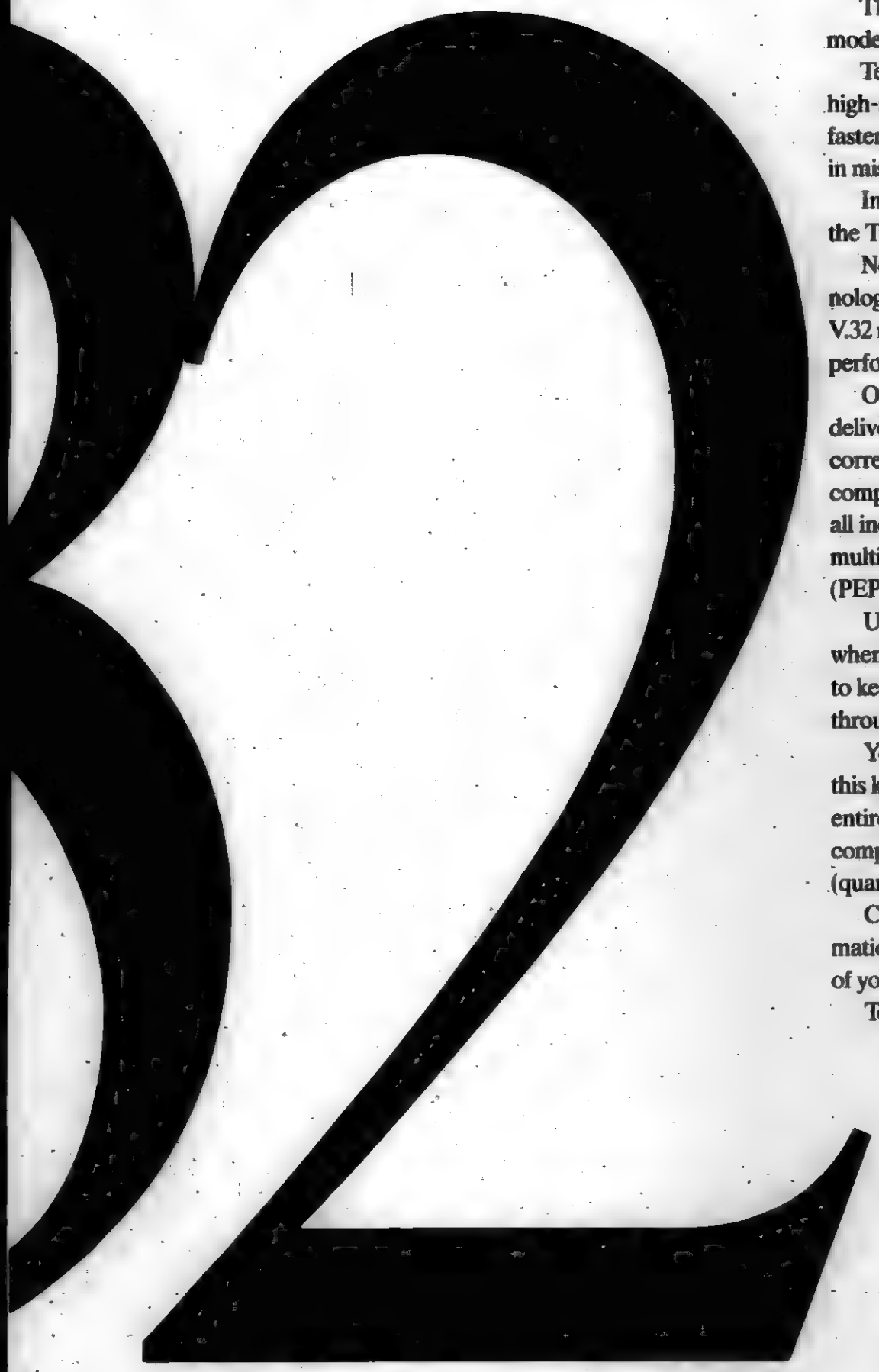

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A laptop sinks to new depths

Researchers dive with Compaq device to watch stingrays' mating rituals

ON SITE

BY PATRICIA KEEFE
CW STAFF

In the shallows of the Gulf of California last spring, neurobiologist and researcher Timothy Tricas spent 10 days diving with a waterproofed laptop used to track part of the ordinarily secretive stingray's mating ritual.

Tricas, who is a research associate at Washington University's School of Medicine in St. Louis, and Scott Michael, a student at the University of Nebraska, wanted to test whether the bioelectric field produced by stingrays is sufficient to attract potential mates. "Would male stingrays dig up the females using electrosensitivity to find mates?" Tricas asked.

While British Broadcasting Corp. and *National Geographic* cameras rolled, Tricas and Michael put a customized Compaq Computer Corp. SLT 286 through its paces in a remote bay off the coast of Sonora, Mexico.

Shielded in a fortress of Plexiglas and weighted down with 40 pounds of ballast, the laptop was used underwater to play back digitized waveforms through electrodes buried in the sand. (Females attempting to avoid mating-minded males often bury themselves on the ocean bottom.)

The waveforms were collected and digitized from stingrays back at the lab and then synthesized for playback. Tricas used the laptop to adjust waveform frequency and amplitude.

The experiment's success resulted in male stingrays zeroing in on the buried electrodes from many feet away, displaying the first phase of courtship. Some were so fooled that they attempted to dig up nonreceptive females, drawing slaps for their trouble.

The project has resulted in the first look at the sensory neurobiology of an electrosensory receptive system as it relates to the biology of a natural population of elasmobranches.

Tricas spent three to four months building his system from the ground up with donated equipment. "I looked at every laptop that exists, but only one — Compaq's — could accommodate 16-bit external data acquisition and digital-to-analog cards in a portable mode," he said.

Compaq's SLT 286 *collected bioelectric field data from stingrays*

He selected the 14-pound SLT 286 because it was fast, held an internal coprocessor and offered access to the motherboard bus. "This is important [in order] to bring these peripheral boards in contact with the system. Most laptops have proprietary buses," he said.

Tricas wrote the application driving the project in the DOS-based Asyst high-level language, in part because it supported the data acquisition and playback cards he purchased from Metrabyte in Taunton, Mass. Keithley Instruments, Inc. also supplied Tricas with the electronic equipment he needed to make preliminary measurements of stingrays' electrical fields.

"Asyst allows you to get hands-on with the data acquisition to manipulate files for analysis and output," Tricas said. "We had superb technical support. This project would have been impossible without conversations with Compaq's engineers and isolation amplifiers from Analog Devices, [Inc.]," Tricas said, explaining that he had to go into the bowels of the computer and insert a specialized attachment to support the full-size cards. Some vendors will not allow users to root around inside their hardware. Apple Computer, Inc., for example, used to seal its Macintoshes.

"[Compaq's engineers] had concerns, but they were totally supportive," he said.

Tricas compared the housing wrapped around the laptop to that used to protect underwater cameras. A chunk was cut out of the Plexiglas to make room for a membrane that protects the keyboard yet still ensures typeability.

"You can do anything at 100 feet that you can do in an office, but obviously a lot slower," Tricas said.

The internal battery was supplemented with a 10-A, 12-V external battery pack attached to the laptop via an underwater cable.

How well did the system work? "I'm the first man to play Pac-Man underwater at 30 feet," Tricas quipped.

COMDEX NOTEBOOK

Depressed because you missed Microsoft Corp. honcho Bill Gates' keynote at Comdex? Well, fret not! Microsoft is already a step ahead of you, assuming you've got 10 bucks to spare and four to six weeks to wait. Last week, Microsoft ran a large ad with headache-size type offering a choice of a free white paper on Bill's speech, "Information at Your Fingertips," or, for a measly $10, a 45-minute VHS video of Gates' flashy (and mega-expensive) presentation. How thoughtful. We have one quibble, however: In tiny type, the ad says, "Offer good only in the 50 United States." We thought there was only *one* United States, but perhaps cloning has reached new heights.

■

Asymetrix Corp. unwrapped a version of its Toolbook for OS/2. Toolbook is used to build graphical applications without traditional programming languages. "The OS/2 development environment is much more complex. Users are developing more sophisticated applications, and there aren't many off-the-shelf packages," President Paul Allen said. By empowering users to develop their own applications more easily, Toolbook allows them to become productive under OS/2 much faster, he claimed.

■

The recently formed Multiuser DOS Federation unveiled its viewpoint on standards, which focused on application programming interfaces that control record-locking, access to files and communications ports, intertask communications and operating systems identification. The aim is to identify existing standards that simplify the interconnection and use of multiuser DOS components. The 20-member group also distributed "Understanding Multiuser DOS."

■

Over at the Wordperfect Corp. booth, attendees received both cowboy hats and the news that Wordperfect for Windows and a major upgrade to Wordperfect for the Macintosh will ship in the first quarter. On a less urgent note, the company also announced that Wordperfect for Next is slated to ship before the end of this year.

■

Comdex/Fall '90 was reportedly the largest trade show ever in the U.S. More than 120,000 crammed into the five-day show. The total acreage of the show floor was as great as 40 football fields. There were more than 22 miles of aisles. If all the copies of the show programs were piled atop one another, they would rise 1½ miles high. More than 1,800 reporters from around the world covered the event.

■

You know things are getting slow when a vendor puts out a press release hyping the fact that its edge over the competition is a hologram of its computer on the show guide cover — not the computer itself. Everex Corp. is so taken with the hologram of its latest computer (sorry, no model number was included in the release) that the company plans to incorporate the hologram into "commemorative" key chains, buttons and paperweights. Must have been a slow day in corporate P.R.

■

At least one vendor tried to bring the Green Revolution to Comdex. Magee Enterprises, Inc., which "likes to consider ourselves the company with an environmental conscience," sent out party invites packed with little green facts. For example, "In the time it takes to read this invitation, more than 20,000 trees will fall in the world's rain forests. Within the next minute alone, another 50 acres will be destroyed. Forever. Think about it." Invitees were invited to kick in ideas on improving the environment. Meanwhile, Magee ticked off its contributions: paper, glass, plastic and aluminum recycling; the elimination of plastic trays; swapping Tyvex sleeves to paper; and, in some cases, eliminating outer packaging altogether.

■

Compiled by Patricia Keefe, James Daly and Michael Fitzgerald.

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Older technology: Good to last drop

BY JAMES DALY
CW STAFF

Populist heroes seem as rare as hen's teeth these days, and the computer industry is no exception. Customers frequently complain that many company leaders seem willing to provide only the latest and greatest widgets for leading-edge users and never go to bat for those trying to squeeze the last drop of functionality out of older technologies.

That may soon be changing. If the reception he received at a Comdex/Fall '90 panel discussion exploring the battle over graphical standards is any indication, Geoworks Chief Executive Officer Brian Dougherty could soon lay claim to the position of the personal computer industry's voice of the common man — or at least the voice of anyone who has a shop full of older PCs and workstations.

Dougherty's Berkeley, Calif.-based firm is in the final stages of putting out Ensemble, a graphical user interface that requires only a fraction of the system resources of Microsoft Corp.'s Windows 3.0 operating environment, runs on IBM Personal Computer XT-class systems and offers the Open Software Foundation's Motif user interface. While Ensemble still has a way to go before a full suite of applications is available, if it is all it's cracked up to be, it could emerge as the savior of millions of DOS users who crave the point-and-click simplicity of Windows but feel cut out by the environment's ravenous system requirements.

Early Windows 3.0 users complained that it must be used with at least an Intel Corp. 80386-based PC and about 4M bytes of random-access memory, or it's a waste of time.

Runs on anything

Ensemble is designed to run on anything from the now-ancient IBM PCs and XTs to leading-edge I486-based workstations. Ensemble requires only 512K bytes of RAM, a hard disk, a mouse and a graphics display, and it will run on 8088- or 8086-based systems. It will be priced at $200 and is scheduled to ship early next month.

Geoworks trimmed the system requirements through efficient coding techniques, said Vice President of Marketing Lee Levano. The firm also employed programmers who crafted Ensemble in assembly language, which requires less RAM and disk capacity, Levano said.

Microsoft officials, meanwhile, have maintained that Windows was specifically designed to be a next-generation product, and they have warned users to stay abreast of new developments or be prepared to suffer the consequences.

Some analysts said this logic is flawed. "Corporate buyers can't be happy that Windows won't run on any of the PCs they've purchased over the past five years," said Jeff Tarter, editor and publisher of "Softletter," an industry newsletter.

With the economy slowing down, Dougherty said, it is also increasingly unlikely that users will have the spare cash for expensive upgrades. "You don't want to give every clerk in your office a 386-based PC with 6M bytes of memory," he said. "But you do want to give them a graphical environment that makes their job easier."

Is Ensemble too good to be true? In some ways, yes. Like Tandy Corp.'s Deskmate user interface, developers must write specifically for Ensemble to take advantage of its features.

Meanwhile, users must satisfy themselves with the applications that are bundled with Ensemble. These include a word processing program, a file manager and some rudimentary communications and drawing programs. There is no spreadsheet program available yet.

However, analysts said, when and if those deficiencies are eradicated, Ensemble could become a serious player. "This isn't just a beauty contest," Tarter added. "Ensemble has long-term potential in the graphical environment."

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Autodesk heeds end users' suggestions

BY CAROL HILDEBRAND
CW STAFF

When Autodesk, Inc. started to work on the latest upgrade to Autocad, its popular computer-aided design (CAD) software package, the company did something many firms only pay lip service to: It listened to its users.

"They're changing, which is great," said Vijay Parikh, a systems engineer at Compaq Computer Corp. in Houston. "They didn't listen to their users [before], and now they do, and that's a big improvement."

Autocad, which dominates the market with an installed base of 400,000, has several important enhancements in Release 11. Users in particular cited Paper Space, enhanced network support, reference files and text editors, as well as the speed achievable with the new release.

"We expect Release 11 to be the most significant upgrade since Autocad was first introduced," said Malcolm Davies, an Autodesk senior vice president.

Bob Callori, CAD manager at Hornberger & Worstell, Inc., an architectural firm in San Francisco and a Release 11 beta-test user, agreed. "It is [the most significant upgrade], more because of its speed than anything else. It's more like a blink of the eye as opposed to watching that hard drive blink."

Parikh was particularly impressed with the networking support available in Release 11, which he said will save on the time necessary to upgrade Compaq's 350 users and lost data.

"Until now, it was the end user's responsibility to back up all the drawings," he said. "Now it's tension-free, because it becomes the network administrator's responsibility, and whatever he does, he's always 100% sure that the drawings will be backed up every night."

The text editor was another feature that flowed from user discontent. "We've been asking for a text editor for years," Callori said. "Now I can get rid of some of the [third-party software] on my hard drive," he added, "and start using the things that should have been part of the program from Day 1."

> "THEY DIDN'T listen to their users [before], and now they do."
>
> VIJAY PARIKH
> COMPAQ

Other features cited by users included reference files and a function called Paper Space. According to a beta-test user in a manufacturing company who asked not to be named, Autocad previously allowed only plotting, or printing of hard copies, of one view of a component at a time. With Paper Space, "you can put more than one view on one hard copy," the user said. Paper Space also allows a user to resize and reconfigure the different views, as well as plot them with a single command.

Parikh was also impressed by the annotation abilities available in Paper Space. "If you have a 3-D model, you don't want to write anything on top of your model in your design file. But when you actually plot it, you want to annotate that or put some text on it. That can be done now through Paper Space," he said, adding that it was also useful for adding comments on drawings, which is rather like writing in the margins of a manuscript.

Parikh also praised the reference file function. He compared it with overlaying a drawing done on transparent paper onto the design in progress. So, for example, "you can reference a plumbing drawing and then make the electrical layout without having the plumbing objects in your drawing," he said.

Autocad Release 11 is priced at $3,500, according to the vendor. Release 10 users can upgrade for $500, and upgrade costs for Release 10 for 386 users is $200.

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Pastore

FROM PAGE 37

point for desktop PCs at many companies should make upgradable PCs more attractive. This is particularly true at the high end, where server-type boxes are starting at $10,000 to $20,000.

Probably picking up on these changes, the big-name vendors have finally followed the upgrade trail blazed by the second-tier vanguard. In mid-1990, NCR and Compaq introduced PCs specifically marketed as upgradable.

And now IBM's PS/2 Model 90 and 95 come to market designed with the ability to swap 25-MHz 486 chips for 33-MHz 486s. That's a narrow upgrade range, but coming from IBM, it is still significant for the industry.

Some of the early criticism of low-end IBM-compatible upgradable machines seems to be valid. What's the point of sticking a 486 chip in a 286-style chassis? An AT-style bus and slow disk drives just can't do justice to the top-of-the-line processor.

But at the high end, buses, drives and other components will serve a 386 or 486 virtually as well as they served a 20-MHz 386SX CPU.

High-end PC shoppers are beginning to base their brand selections to a large extent on upgradability. For example, most Compaq Systempro owners you talk to will say upgradability was the chief reason they bought the machine and is the thing they like best about it. The ability to boost the processor from a 33-MHz 386 to a 33-MHz 486 is more immediately valuable than the option to add a second CPU, many say.

However, users inclined to snatch up any PC with an upgrade option should remember that these vendors aren't offering upgradability just to be nice. One of the benefits for the vendors is that upgrade boards are proprietary. You have to buy IBM's upgrade from IBM and pay whatever price IBM charges. The same is true for the other makers.

Therefore, users would be wise to shop around. Prices for upgrade boards vary wildly from vendor to vendor, depending on how many component chips and controllers are included with the CPU on the upgrade board.

Vendors also benefit from upgradability because when users run out of juice on an upgradable box, they are likely to stay with the same vendor rather than shop the competition. It's sort of repeat-customer insurance for the manufacturer.

Users, in turn, must size up their vendor as if they are entertaining a long-term relationship, because that's what it's likely to be.

And now that IBM has added its Midas touch of legitimacy to the concept, there will be more upgradable-PC vendors than ever to choose from.

Pastore is a Computerworld senior writer.

Grid unwraps I486-based network server

BY SALLY CUSACK
CW STAFF

FREMONT, Calif. — Grid Systems Corp., a Tandy Corp. subsidiary, made its first foray into the network server market recently with the announcement of an Intel Corp. I486-based system tailored around the Extended Industry Standard Architecture (EISA) bus.

Christened the Grid 486EI-25/ASVR Tower, the 25-MHz server system was demonstrated for the first time at Comdex/Fall '90 in Las Vegas earlier this month.

According to Grid, which made its reputation in the portable computer sector, the server includes nine expansion slots designed to offer users up to 4G bytes of hard disk storage capacity.

The system comes with a standard configuration that includes 8M bytes of random-access memory, which is expandable to 64M bytes, and the availability of seven 32-bit EISA expansion card slots.

System extras

An extended IBM Video Graphics Array-compatible adapter, one parallel and two serial ports and a 1.44M-byte 3½-in. floppy disk drive are also included with the system.

Users have the option to choose from a variety of peripherals, such as tape drives, hard disks, compact disc/read-only memory or write-once read-many optical disc drives, the company said.

Slated for delivery in December, the product is priced from $11,999.

NEW AT COMDEX/FALL '90

The following is a second listing of some of the products and technologies announced at the Comdex/Fall '90 show in Las Vegas.

Software applications packages

Penncomp Software Development has announced a literary quote retrieval software package available for Micro oft Corp. Windows environments.

Quotemaster Plus for Windows enables users to access more than 3,000 literary quotes on-screen.

The product uses between 2.9M and 3.9M bytes of hard disk storage and requires an IBM Personal Computer or compatible. It costs $89; additional quote bases are $25 each.

Penncomp Software
4660 Beechnut
Houston, Texas 77096
(713) 669-0965

Version 3.1 of Inner Media, Inc.'s Collage Plus image management and screen-capture program for MS-DOS environments includes a functional screen capture program for Microsoft Corp.'s Windows 3.0.

The product costs $129.

Inner Media
60 Plain Road
Hollis, N.H. 03049
(603) 465-3216

Manzanita Software Systems' inventory control module is now being included with its Businessworks Integrated Accounting System.

Features of the module include purchase ordering, ready pricing information, flexible product tracking, multiple costing methods, general ledger updating and tracking of back orders.

The product runs on IBM Personal Computer XTs, ATs, Personal System/2s or compatibles and is priced at $295.

Manzanita Software Systems
2130 Professional Drive
Roseville, Calif. 95661
(916) 781-3880

Orcad Systems Corp.'s ESP Framework is a graphical user interface that has been integrated with the company's Release IV range of DOS-based design automation tools.

Electronic designers can use the product to perform tasks that were previously nonintuitive or time-consuming, the vendor said.

ESP Framework includes an enhanced version of the company's schematic design tool set and is priced at $595.

Orcad Systems
3175 N.W. Aloclek Drive
Hillsboro, Ore. 97124
(503) 690-9881

Textware Corp. unveiled a version of its Textware text indexing and retrieval package that was designed for Apple Computer, Inc. Macintosh users.

Textware for the Macintosh is compatible with Version 3.0 of Textware for MS-DOS and local-area network platforms. It enables text and image databases to be created, indexed and used for retrieval on any of the three platforms, the vendor said.

Single-user pricing is $495; for an unlimited number of users on a LAN file server, the price is $2,995.

Textware
P.O. Box 3267
Park City, Utah 84060
(801) 645-9600

Roykore, Inc.'s Instant Orgcharting is an organizational chart program designed to enable users to manage information graphically.

Instant Orgcharting enables users in government or corporate environments to create and immediately update changes pertaining to employees, owners, shareholders or military personnel.

Users can choose an unlimited number of chart styles, fonts, colors and patterns, according to the vendor.

The product is available on 3½- and 5¼-in. disks. It supports Microsoft Corp.'s Windows 3.0 and is priced at $149.

Roykore
2215 Filbert St.
San Francisco, Calif. 94123
(415) 563-9175

Peripherals

Unisys Corp. demonstrated three dot matrix printers designed for workstation environments.

The AP9210 ($2,395) operates at 10 page/min. and features emulations for Hewlett-Packard Co.'s Laserjet II, IBM Proprinter XL and HP Graphics Language Plotter.

The 80-column AP1337 and 136-column AP1339 are both 24-pin devices that feature eight resident fonts and provide emulations for the Epson America, Inc. LQ-2550 and IBM Proprinter X24E/XL24E machines.

List prices for the AP1337 and AP1339 are $699 and $949, respectively.

Unisys
2700 N. First St.
San Jose, Calif. 95150
(408) 434-2848

Facit, Inc.'s Facit P8100 is a 10 page/min. printer that is compatible with Hewlett-Packard Co.'s Laserjet II and Adobe Systems, Inc. Postscript machines.

The product enables users to design fonts, forms, logos, signatures and other graphic or text elements according to their specifications, the vendor said.

The P8100 is available in four configurations. Pricing begins at $2,399.

Facit
400 Commercial St.
Manchester, N.H. 03108
(603) 647-2700

Personal Computer Products, Inc. has an enhanced version of its Imagescript cartridge for Hewlett-Packard Co. Laserjet printers.

The upgraded version enables users to take advantage of all ports on an HP Laserjet device. It also features multiple paper size support and front-panel control.

The product lists at $299.

The company also displayed a series of desktop laser printers that can be configured four basic ways for specific applications.

The Laserimage 2500 series features emulation for various HP Laserjet II models and operate at 11 page/min., according to the vendor.

Pricing ranges from $3,995 to $4,995, depending on model.

Personal Computer Products
10865 Rancho Bernardo Road
San Diego, Calif. 92127
(619) 485-8411

Nissei Sanyo America Ltd.'s 14-in. multiscanning monitor was designed for business graphics applications.

The 14MVX low magnetic field color monitor includes ergonomic features such as a silica-based antiglare screen, a tilt/swivel base and front-panel controls. The monitor also provides IBM Video Graphics Array compatibility to 1,204- by 768-pixel resolution and compatibility with Apple Computer, Inc. Macintosh II machines.

The product is priced at $995.

Nissei Sanyo America
800 South St.
Waltham, Mass. 02154
(617) 893-5700

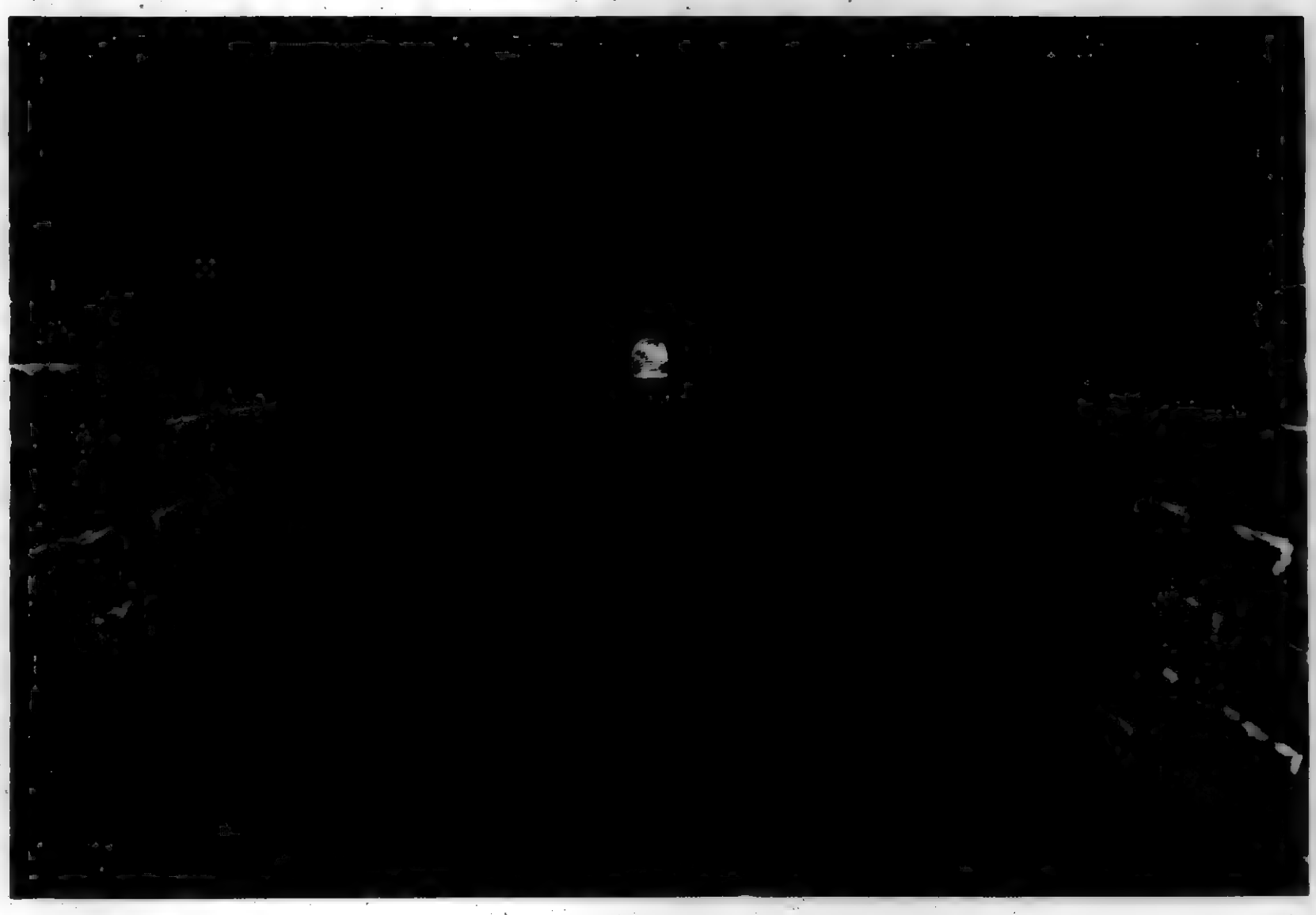
Data storage

Micronet Technology, Inc.'s Micro/DAT MD-3300 Backup System was designed for IBM Personal Computer XTs, ATs or compatibles, Apple Computer, Inc. Macintoshes and Sun Microsystems, Inc. workstations.

Micro/DAT MD-3330 is based on the Wang Laboratories, Inc. Wangdat 3.3G-byte tape drive. The product includes a 16-bit small computer systems interface host adapter for use with PC systems and features an access time of 20 seconds, the vendor said.

Pricing starts at $4,295.

Micronet Technology
20 Mason
Irvine, Calif. 92718
(714) 837-6033



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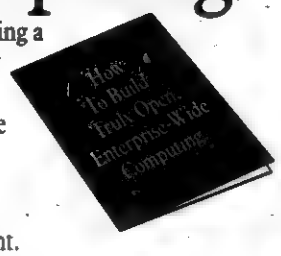

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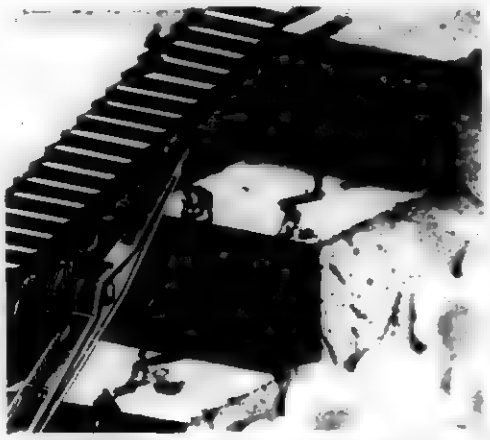

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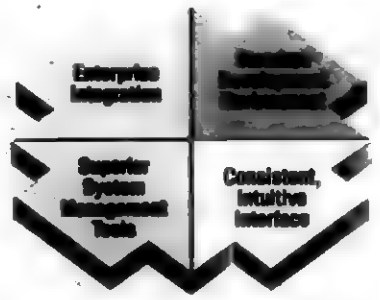

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It also interconnects varied LANs and WANs to help leverage your existing investment and save money by sharing communications resources. Its extensive SNA capabilities let you coexist with conventional networks while moving to an open environment.

The Open Networking Environment also includes the powerful network management capabilities of NCRNet Manager. Also OSI-based, NCRNet Manager provides centralized management of both the internetworking environment and its attached systems.

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The new NCR WaveLAN uses radio waves to let you build an industry-standard LAN without wires. So you can put people and PCs wherever you need them. Without the time and cost of installing or moving a wired LAN.

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AT&T boosts T1, T3 user control

BY ELLIS BOOKER
CW STAFF

BASKING RIDGE, N.J. — AT&T recently gave users of its high-speed lines a better way to manage their private networks, announcing a service that allows customers to reconfigure and reserve T1 and T3 circuits from a personal computer.

The Accunet Bandwidth Manager (ABM) works with AT&T's T45 (45M bit/sec.) and T1.5 (1.54M bit/sec.) Accunet services and is a follow-on to AT&T's Customer Controlled Reconfiguration, an on-line provisioning service AT&T has offered since 1982.

ABM fits with several other high-bandwidth network services — increasingly seen as essentially for imaging applications, disaster-recovery applications and LAN-to-LAN connections, among other uses — that AT&T and its competitors have been announcing during the past few months.

Two weeks ago, for example, AT&T announced plans for a switched T1 option for its Accunet private-line service. Combined with ABM, users could conceivably arrange for T1 traffic to go over the switched facility, in the event a network outage disrupted their conventional T1s. Users could also redirect downed circuits over alternative AT&T T1s or the public network. In addition, ABM alerts customers to faults and downed links, setting off an alarm on the user's terminal.

AT&T, which hopes to have ABM in 50 cities by mid-1991, said the provisioning changes made through the software occur in less than three minutes and that a T1 circuit requested through ABM can be provided in less than one day.

Bandwidth can be reserved at 56K bit/sec. or 64K bit/sec. increments up to a T1 channel, including intermediate rates of 128K, 256K and 512K bit/sec.

Operator bypass

Regarding the provision of T3 circuits, AT&T said customers will, for the time being, need to reserve these lines through a call to an AT&T operator. But this, too, will be handled by ABM in the future, said AT&T, which hopes to have the T45 Reserved available by the first quarter and ready in 90 cities by the middle of 1991.

Through the ABM software — which requires an MS-DOS PC running Microsoft Corp.'s Windows 3.0 — users connect over a 9.6K bit/sec. dial-up or dedicated line to an ABM controller in one of AT&T's facilities. The controller, a Sun Microsystems, Inc. Sunserver 490, in turn sends commands to a digital access and cross-connect system in AT&T's network to reconfigure users' circuits.

Bear, Stearns & Co. in New York already has bandwidth and reconfiguration on demand through its internal system, according to managing director of communications Jeff Marshall. He said that if Bear, Stearns migrates to a packet-switched backbone, the ABM service (designed for circuit-switched networks) would be even less applicable to his situation.

Meanwhile, Jim Williams, manager of network engineering at Mervyn's, the Hayward, Calif.-based department store chain, definitely wants flexible bandwidth on demand and would take advantage of the new AT&T service but said he is limited by the front-end processor in his Systems Network Architecture backbone.

"The computer program in the [front-end processor] that has our net configuration would have to be taken down and reloaded," said Williams, who monitors the logical portion of his network with IBM's Netview and the physical links with an AT&T Dataphone II controller.

Britain OKs sharing lines to other nations

BY ELISABETH HORWITT
CW STAFF

LONDON — Opening the way to less-costly global connections, the UK Ministry of Trade and Industry became the first such body to permit the sharing and reselling of lines between the UK and other countries. The ministry also announced that it will permit two-way very small aperture terminal satellite communications.

"This is a watershed event that changes the whole economics of telecommunications for corporate users," said Leonard Elfenbein, president of Lynx Technologies, Inc., a Little Falls, N.J., market research firm.

A corporation will be able to realize significant savings on U.S.-to-European transmissions by leasing lines from the U.S. to the UK and then either reselling or sharing the cost of those links with other firms, according to Elfenbein.

In addition, a whole new industry will spring up as private corporations and network service vendors "can get a large chunk of bandwidth and parcel it out to users," said Douglas Fields, manager of telecommunications at United Parcel Service's Information Services Division. Such providers "can make some money and still sell at lower costs" than traditional direct-dial and leased-line rates, he added.

Fields said UPS will look very closely at all three options that the UK ministry's decision has opened up: purchasing circuits from resellers, leasing its own lines and reselling them and sharing lines with other companies. "We could resell lines to our customers; we can have business relationships with them that go beyond sending packages."

Follow the leader

Other European administrations, particularly those in France, Germany, Spain and Italy, are likely to quickly follow the UK's lead, Fields said.

"Those countries are in the throes of deregulation and hungry for business; they don't want people moving all their traffic through the UK," Fields added.

As long as the UK is the only country that permits sharing and reselling of bandwidth, it will be much more cost-effective for U.S. businesses to route their traffic over a shared link to a UK gateway to other countries than to set up separate connections to European nations, Elfenbein said.

Airline training takes flight with LANs

ON SITE

BY JIM NASH
CW STAFF

VANCOUVER, B. C. — In a darkened room, the pilot trains, mouse in hand. Next to the aviator, in another cubicle, sits a mechanic who is brushing up on maintenance procedures.

They and 10 or so other hushed Canadian Airlines International employees are using the company's new training facility here. Three identical facilities are located in the airline's Toronto center.

Each center resembles an elegant airport control room. Each trainee sits wearing headphones in front of large color VDTs, pointing and clicking through multimedia video courses.

Canadian Air's training program is heavily dependent on local-area network technology. In fact, said Don Gerke, one of the program's creators, after looking at the mainframe solutions other airlines used for training, he concluded that LANs alone offer the throughput and flexibility to teach individual employees efficiently.

Gerke, project pilot for the airline's advanced training systems, said Canadian Air's 5-month-old Ethernet LAN allows trainees to move at their own pace through government-mandated lessons stored on a shared database. The system replaces a low-tech training program that included audiovisual classroom instruction.

He explained that the more rigid mainframe systems other airlines use can hold the progress of an entire class to the pace of the slowest trainee. Allowing trainees to move through their courses independently gives Canadian Air flexibility in scheduling.

This, according to Jean Pierre Deshaies, manager of Canadian Air's simulator systems development, is expected to save $10 million in personnel costs over four years compared with what executives expected to spend by using mainframe-based training. Deshaies said the firm's training program so far has cost $4.5 million and is under budget. Delayed schedules, a fact of life when teaching groups in unison, can cost $20,000 per day for a class of 20, he explained.

Canadian Air relies on LANs to individualize training

Just as important as savings, said John Lok, a consultant on the project, is trainee acceptance, which has been high.

The mechanics and pilots are using simulators in training for the "glass cockpits" of The Boeing Co.'s 767 and 747-400 and Airbus Industrie SA's A320 — planes in which pilots monitor an increasing number of VDTs as computers fly the aircraft. Virtually every portion of many flights today is done by computers using data keyed in by pilots.

The Hewlett-Packard Co. workstations that trainees use display simple computer graphics and high-quality videotaped snippets of airliners. The graphics represent each component, switch and keyboard in a plane that is serviced by mechanics or used by pilots. Employees use a mouse to answer questions about their functions and perform tasks such as extending flaps.

"You don't need a plane to train anymore," Gerke said. What Canadian Air did need before installing the new hardware and software, was a standards-based network with enough throughput to distribute data and digital audio simultaneously to a group of independent courseware users.

"We have a real hodgepodge of technologies in the training world, a lot of which is proprietary and poses compatibility problems," he said. "Canadian Airlines wanted to be hardware independent."

Wicat Systems, Inc. in Orem,

Continued on page 50

Tools offer way to save internetworking costs

Enterprise Router is bridge/router alternative

BY JOANIE M. WEXLER
CW STAFF

IBM users can buy themselves a little time for making large investments in internetworking equipment, thanks to a couple of recent innovative announcements from Micro Tempus Corp. and Micro-Integration.

Waltham, Mass.-based Micro Tempus is shipping the Enterprise Router, a software product that sits in VTAM on an IBM MVS-based mainframe and serves as a bridge/router alternative for connecting multiple Microsoft Corp.-based local-area networks through the mainframe. VTAM is IBM's front-end access control program.

Enterprise Router allows an existing Systems Network Architecture (SNA) network to serve as a LAN internet with one investment — $20,000 to $100,000, depending on mainframe processing capacity — instead of buying multiple source-routing bridges for linking each local area network.

The trade-off is that the software gobbles processing power, "so candidates for the product are organizations not running heavy-duty applications — such as transaction processing — through the software," said Tucker McDonagh, president of South Norwalk, Conn.-based consultancy Tucker Network Technologies, Inc.

ENTERPRISE Router allows an existing Systems Network Architecture network to serve as a LAN internet.

Southern Illinois University in Carbondale, Ill., has been using the Enterprise Router for six months and was previously a beta-test user.

"We had extensive SNA networks that we needed to tie into our LANs," explained Larry Hengehold, director of computing affairs. Hengehold explained that SIU's data center contains an IBM 3090 mainframe, and the university runs more than 50 LANs "of all shapes and sizes."

According to Hengehold, the router software is beneficial in that "not all organizations can afford to buy all the bridges they need at one time. This has been a lifesaver for us by allowing us to build a general-purpose 'bridge' for a while and control our expenses."

Hengehold added that the mainframe has burned "negligible" processing power because of the Enterprise Router, "though we're only six months into it."

SIU fits McDonagh's user profile, as it uses the software for light applications, including electronic mail; nighttime backup and recovery; and the exchange of small to medium-size data files.

SIU does run some Apple Computer, Inc. Appletalk and Novell, Inc. LANs, which are not yet supported by Enterprise Router. Those LANs link to the SNA network over a campus Fiber Distributed Data Interface backbone network using Cisco Systems, Inc. AGS+ routers, Hengehold said.

Micro-Integration in Friendsville, Md., is shipping software — dubbed Blue Lynx — that allows four gateways to be combined into one Intel Corp. 80286-based personal computer to interface multiple IBM Netbios-compatible LANs running 5250 emulation with IBM's Application System/400 midrange computer.

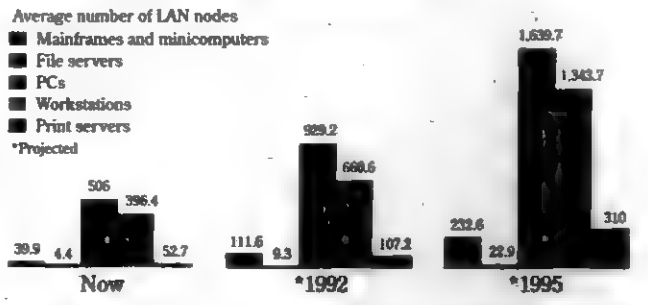
"The more equipment you can connect to the AS/400, the better," McDonagh said. "The AS/400 is a strategic platform, and it has been difficult to gateway into it from nonnative protocols, such as Novell. Users have been frustrated by this."

Doug Goldstein, LAN administrator at Vyvx Telecom, Inc., a long-distance carrier in Houston, is using the previous version of Blue Lynx to tie his Banyan Systems, Inc. Vines LANs into two interconnected AS/400s. He said he is eager to receive his $595 upgrade.

"Being able to put four gateway cards into one dedicated PC means I won't have to tie up a PC per gateway," he said. "Right now I'm running two gateways on one PC and another gateway on another. This will free up a $2,000 PC for me."

LAN booster

Projected LAN growth spurts will naturally drive the market for equipment to interconnect networks to each other and to hosts



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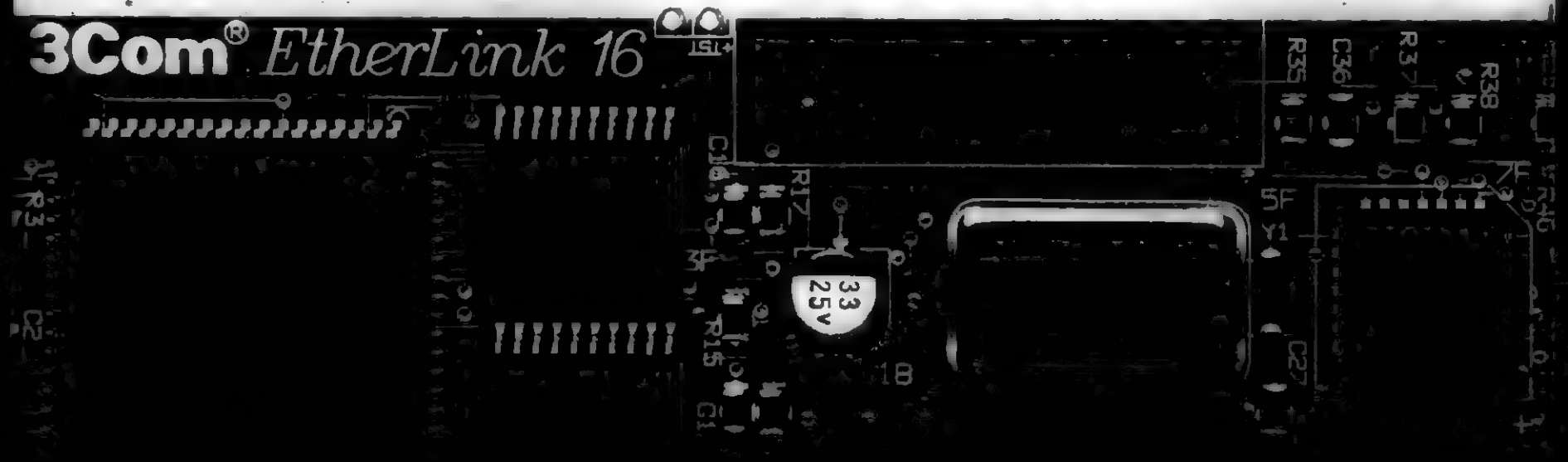

Net managers look with favor on 3Com alliance

BY JIM NASH
CW STAFF

Network administrators expressed optimism about 3Com Corp.'s announcement this month that it will ally itself with Palindrome Corp., a third-party manufacturer of tape backup devices.

The partnership is expected by some network managers to result in a write-once read-many (WORM) device bundled into 3Com's 3+Open network operating systems. However, the political implications of the Santa Clara, Calif., networking company establishing third-party relationships has also sparked enthusiasm.

Palindrome, in Naperville, Ill., now builds tape backup devices exclusively for networking giant Novell, Inc. A spokesman for the 2-year-old company said the two firms are co-developing memory backup systems to run on Microsoft Corp.'s LAN Manager network operating system, which underlies 3+Open.

Don Barry, network administrator at Ochsner Medical Institutions in New Orleans, said 3Com users are likely to be more heartened by the news of third-party support than by the possibility of WORM backups.

"It means we won't be running in a vacuum," Barry said. He pointed to the myriad third-party relationships that Microsoft and Novell cultivate. The relationships, he explained, give users confidence that a vendor's product has staying power. They also sometimes mean greater affordability.

Attitude problem

"For the longest time, 3Com had this big attitude: 'We have the best, and no one can come close to us,' " said Fred Skrotzki, supervisor of software development and hardware integration at Jam, Inc. "But if you couldn't afford a 3Com [backup device], you had to go to another vendor, like Novell." Jam is a software developer in East Rochester, N.Y. Skrotzki said 3Com users whose budget could not absorb the approximately $7,000 system purchased other vendors' backups, which often did not work fully with 3Com networks.

Skrotzki, who is the leader of a New York 3Com user group, said strong third-party relationships also mean a better chance for parts and service if a local 3Com reseller closes or changes stripes.

Users seek Novell bridge options

BY JIM NASH
CW STAFF

With Novell, Inc.'s protocol bridge lurking someplace in beta testing, network managers are turning to third-party solutions to unify heterogeneous computer environments.

Some administrators said they are frustrated by frequent updates to Novell's internet packet exchange (IPX) networking protocol. Those acutely affected are managers who are required to have the company's network operating system, Netware, work closely with machines using Transmission Control Protocol/Internet Protocol (TCP/IP).

Provo, Utah-based Novell told users when it announced Netware 386 in May 1989 that IPX-based Netware 386 had been architected to accommodate a bridge between the two protocols. The company has yet to say when it will deliver such a tool.

Out of beta

However, according to a manufacturing sector user of Netware who requested anonymity, Novell executives said a bridging device is out of beta testing and will be distributed to a select number of users before the end of the year. Analyst Craig Burton at Clarke Burton Corp. in Salt Lake City said he, too, had heard that the product has been in beta testing.

The user said his peers dislike being at the mercy of frequent IPX updates and would rather run TCP/IP packets on Netware networks via a bridge.

One firmware product that addresses the problem, SK-Net by Schneider & Koch in Karlsruhe, Germany, is gaining grudging endorsement.

At the moment, SK-Net is one of the few answers available to test managers who must reconcile heterogeneous environments enough to share files and electronic mail.

David Walker, network services manager at the University of California at Irvine, said he purchased several SK-Net smart Ethernet adapter cards. The cards "know how to tunnel IPX inside TCP/IP," Walker said. The cards, which cost $1,500 each, wrap TCP/IP packets in IPX envelopes in order to transmit them to Netware servers or other TCP/IP systems such as Unix, where they are unwrapped again.

Though the process of wrapping and unwrapping packets is prone to degradation, he said, SK-Net beats other alternatives. Walker said he rejected gateways between the two protocols because of the performance hit the system took.

Rebooting is necessary, Walker said, when switching between protocols.

The SK-Net itself is not without problems, Walker noted. He explained that he has been unable to get the boards to recognize more than one other board on the network, making distributed processing difficult beyond pairs of servers.

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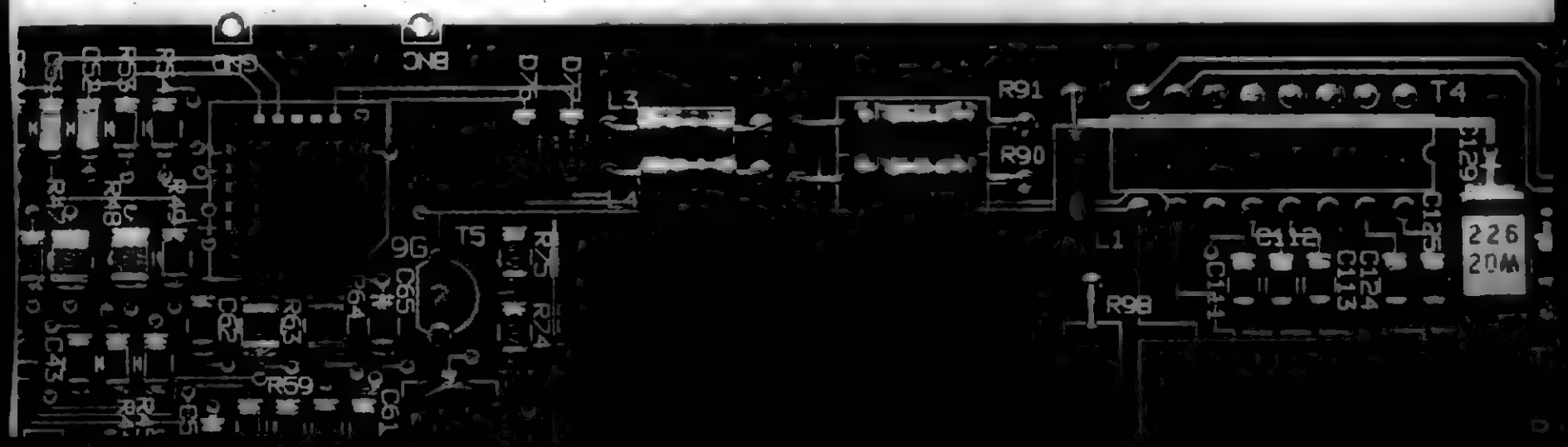

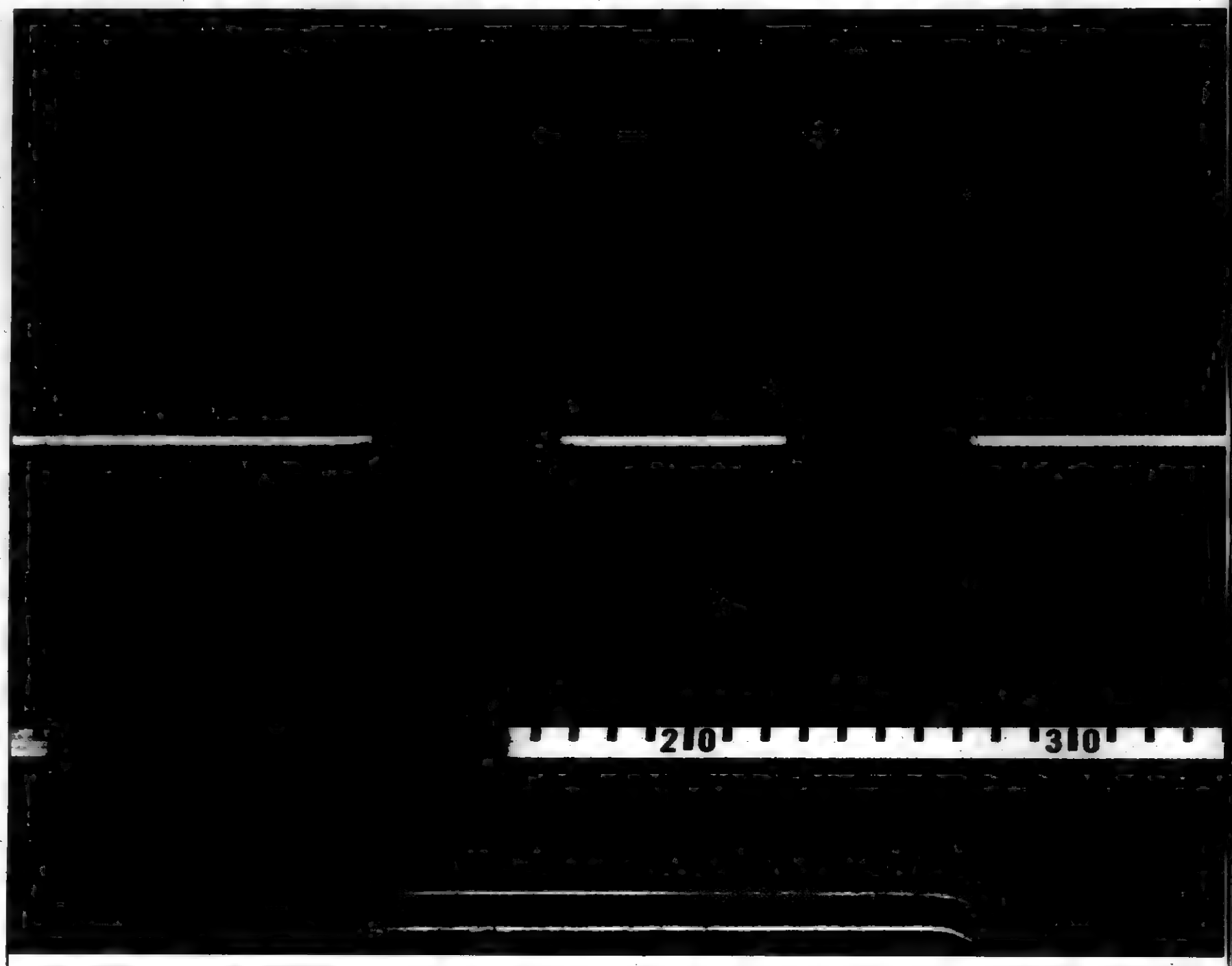

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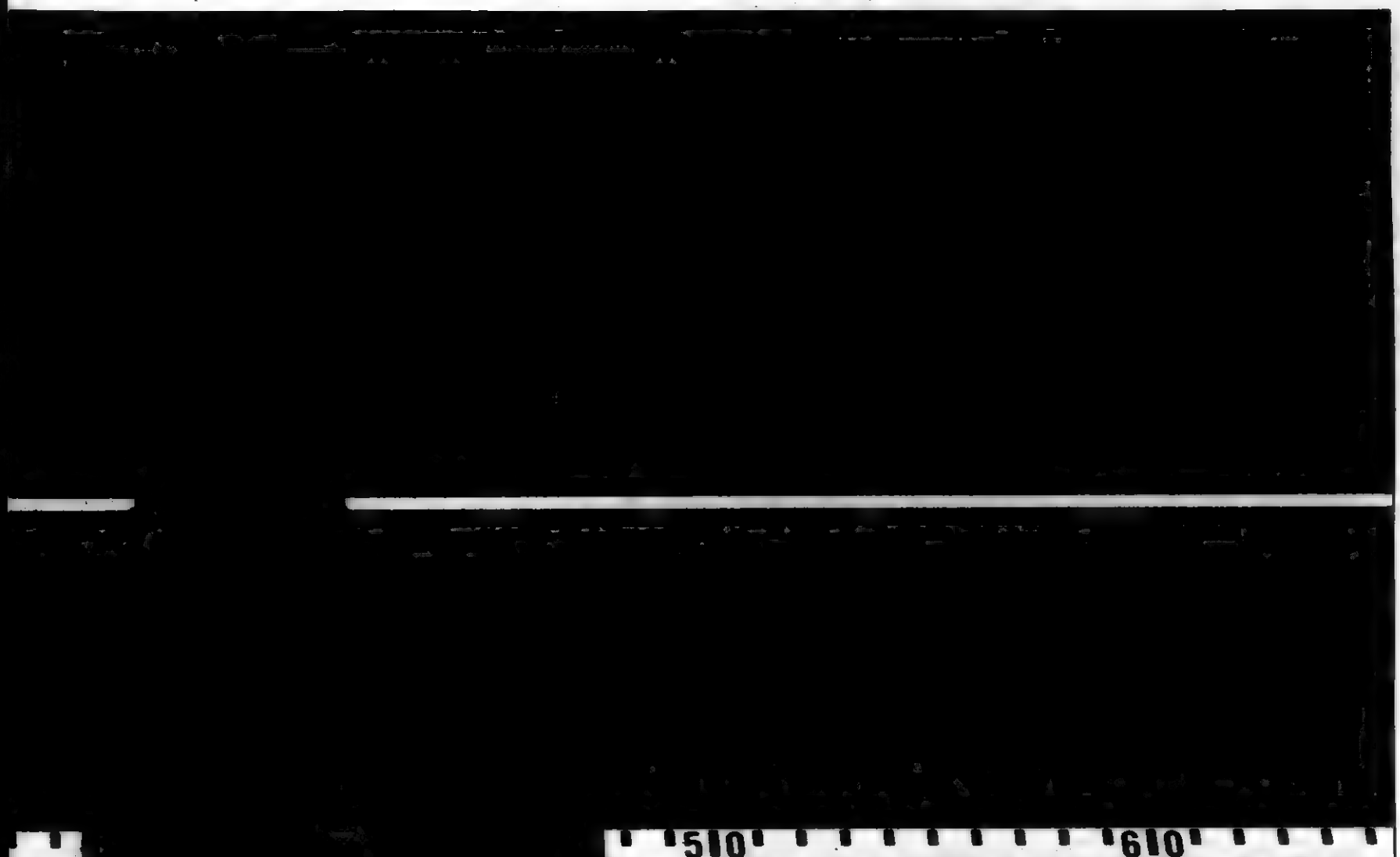

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PC software melds four telecom tasks

BY JOANIE M. WEXLER
CW STAFF

Many diversified global companies still must deal with the realities of seemingly old-time technologies — Telex and TWX — as the premier mode of communications in some corners of the world.

One user recognized the need for combining those methods with facsimile and modem communications, and the result is an integrated personal computer software package that IDR Unicom, Inc. in Plymouth Meeting, Pa., is now shipping.

The product, Via PC Telecommunications Software, runs on IBM PCs and compatibles — including laptops — and uses one common user interface for the four communications modes. It includes such menued items as a list of country codes from Albania to Zimbabwe, as well as time zone differentials for all countries. Installation time is five to 10 minutes, the vendor said.

The product, which is available for DOS platforms only, requires 640K random access memory. Thus, an Intel Corp. 80286-based PC must be dedicated to running the software.

The product was functionally designed by users. The impetus for it came when Ingersoll-Rand's Engineered Pump Division said it was looking to streamline its Telex procedures.

"We had a full-time Telex operator who would retype messages scribbled by users," explained Greg Stauffer, PC coordinator. "We were handling each message several times, and this was inefficient."

Stauffer explained that with the company doing business in the U.S., Europe, the Middle East and the Far East, its primary overseas form of communication is Telex, and in the U.S., it is fax. He said the company could not find anything commercially available on the market to integrate these functions, so it approached Gary Edling, then founder and president of International Data Refile, a store-and-forward Telex and TWX switching service. Edling is now president of IDR Unicom.

The result was a product that "scans for any type of document in a specified directory every 15 minutes," Stauffer said. "When it finds one, it dials a modem automatically and directs the document to a fax, Telex or TWX number."

He added that 180 of his 300 PCs are attached to a network, and "any one of those 180 can use the software" through the dedicated Via PC server. He added, though, that his site license allows 10 users to simultaneously activate the software; others trying to transmit at the same time have to wait in a queue.

Larry Cynar, an analyst at San Jose, Calif.-based research firm Dataquest, Inc., said, "I would think there would be a pretty good market for such an integrated package. However, some services, such as Western Union's Telex, will perform this function for you already. What happens if the user already subscribes to such a service independent of the software?"

More modems

Cynar said that while he sees a lot of fax replacing Telex and TWX, "modems are everywhere." He estimated a 1 million-node-per-year worldwide growth in modems from 3 million in 1989 to 5 million in 1991, particularly at the low end, which is not yet saturated. "However, there's virtually no continuing development of large networks on analog modems," he said, citing the home market as the biggest target for the products.

Edling estimated that Telex and TWX will be around for at least 50 years "because of the billions of dollars needed to upgrade telecommunications systems in Third World countries." He said a version of Via PC for Novell, Inc. Netware networks is planned by year's end. "We will also be developing the package for other network operating systems."

BIT BLAST

Nynex group explores digital radio technology

Nynex Science and Technology has applied to the **Federal Communications Commission** for an experimental license to test and evaluate the feasibility of using digital radio technologies as an alternative for existing wire methods of transmitting telephone calls. Deployment of wireless services could potentially lower the cost of local loop connections, Nynex said.

Open systems vendor **The Wollongong Group, Inc.** has reportedly signed a value-added reseller (VAR) agreement with **Walker Richer & Quinn, Inc.**, a developer of data communications software, to allow Wollongong's Transmission Control Protocol software to MS-DOS machines to be incorporated in the VAR's networking products.

Connections in Fullerton, Calif., has published a Network Product Guide, a 150-page compendium of 400 products in the areas of **Apple Computer, Inc.** Macintosh local-area networks, Macintosh links to **Digital Equipment Corp.** VAXs, Macintosh-to-Unix connections and Macintosh-to-IBM connections. The guide is priced at $19.95, plus $2 shipping.

The midyear edition of *EDI Yellow Pages*, published by **EDI, Spread the Word** in Dallas is now available. The publication contains listings of electronic data interchange vendors, service companies, users, consultants and other organizations worldwide.

NEW PRODUCTS

Local-area networking hardware

Commtex, Inc. has introduced a fiber-optic interface designed for use in multimedia local-area network environments.

The CX-80 acts as a central controller for connecting audio, video and data resources, which can then be distributed to attached personal computers. A complete Integrated Services Digital Network Primary Rate Interface for voice and data, as many as three television channels and one channel from each PC are linked to the fiber-optic connection via a multiplexer.

Pricing begins at under 10,000 per workstation.

Commtex
1655 Crofton Blvd.
Crofton, Md. 21114
(301) 721-3666

Puredata Inc. has announced three Ethernet cards that feature support for 10Base-T.

The products, part of the 8023 series of Ethernet cards, include the PDI8023-T1 ($345), an eight-bit interface card designed for IBM Personal Computer XTs and ATs; the PDI8023-16T1 ($395), a 16-bit card for AT- or Intel Corp. 80386-based file servers and workstations; and the PDUC8023-T ($475), a 16-bit interface card for IBM Micro Channel Architecture-based file servers and workstations.

All three models are compatible with the IEEE 802.3 Ethernet standard.

Puredata
1740 S. I-35
Carrollton, Texas 75006
(214) 242-2040

Ancor Communications, Inc. has announced a local-area network system based on fiber-optic technology.

The CXT for LAN-based systems was designed for personal computer-based LANs. It runs transparently under Novell, Inc.'s Netware 386 and enables each workstation on a LAN to communicate at 44M bit/sec. The list price is approximately $2,000 per connection.

Ancor Communications
6130 Blue Circle Drive
Minnetonka, Minn. 55343
(612) 932-4000

Front ends, multiplexers

Teleprocessing Products, Inc. has introduced a fractional T1 multiplexer that can be configured with one to eight channels.

The TP-9000 can be used as a point-to-point T1 multiplexer or as a fractional T1 multiplexer when used with a common carrier's fractional T1 service.

The product provides as many as eight V.35 terminal interface channels in a 56K bit/sec. constant or controlled carrier as well as 64K, 128K, 256K, 384K, 512K and 768K bit/sec. configurations.

Pricing ranges from $3,365 to $6,380.

Teleprocessing Products
4565 E. Industrial St.
Simi Valley, Calif. 93063
(805) 522-8147

Customer-premises equipment

Network Equipment Technologies, Inc. has announced a product that allows companies to extend public, private or hybrid networking services from central to remote company locations.

The Adax/48 Integrated Access Manager can be used to multiplex voice and data applications onto T1 facilities for access into a public carrier network or into a company's private backbone network. It supports public carrier service offerings ranging from fractional T1 to fully loaded T1 lines, the vendor said.

Pricing ranges from $3,100 to $4,200 for eight-, 12- and 24-slot models.

Network Equipment Technologies
800 Saginaw Drive
Redwood City, Calif. 94063
(415) 366-4400

Timeplex, Inc. has announced an intelligent networking system that enables customers to connect remote sites to backbone networks.

The TX1/Access System was designed to handle AT&T Dataphone Digital Service switched 56K bit/sec., fractional T1 and T1 requirements. It provides two- and four-wire connectivity and is available in three models: the eight-slot TX1/S for small access sites, the 12-slot TX1 version for intelligent channel bank applications and the 24-slot TX1/E for large access sites.

Pricing ranges from $3,150 to $16,500, depending on type of model.

Timeplex
400 Chestnut Ridge Road
Woodcliff Lake, N.J. 07675
(201) 930-4607

Airline

FROM PAGE 45

Utah, and Seattle-based Boeing have created much of the market's software and hardware. Wicat's proprietary setup, however, makes running any other vendor's software almost impossible, Gerke said. It also limits the number of Intel Corp. 80386-based personal computers that can log on to a central mainframe or minicomputer simultaneously.

In each of Canadian Air's four training rooms sits a Compaq Computer Corp. Systempro as a file server. The Systempro stores audio data and controls the videodisc players on each trainee's desk. A Cogent Data Technologies, Inc. E/Master II 16-bit adapter card is slotted in the server, which also ports an Extended Industry Standard Architecture (EISA) bus for added throughput. The network operating system is Novell, Inc.'s Netware Version 3.1 on Ethernet, which was installed in July.

Both Deshaies and Gerke said they were surprised by the Cogent card's performance. "It blew the socks off Novell's NE3200 32-bit card," Deshaies said. The Cogent card takes control of the EISA bus to guide data flow without having to go through the CPU, Gerke added.

One card on a server, Deshaies said, can support up to 16 users concurrently. "We were worrying that we would have to go with [Fiber Distributed Data Interface]" in order to put that many trainees on one server, each of them accessing data, video and audio. Now, he said, the only talk of FDDI is in running a backbone between the existing training room with the second one being built down the hall.

MANAGER'S JOURNAL

EXECUTIVE TRACK

Virginia M. Alster has been named manager of systems and programming at the **South Carolina State Port Authority** in Charleston, S.C.

Alster was previously associate director of information resource management at Colgate-Palmolive Co. She managed a 15-person strategic planning group and led the development of domestic and international systems.

She holds a bachelor's degree from St. John's University and an MBA from Adelphi University.

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Nader Kury has been named principal systems analyst for the **city of Berkeley, Calif.** He will be responsible for implementing a financial management system.

Kury was formerly a programmer/analyst at the Alameda County Water District in Fremont, Calif.

.....

Ariel Sharon at Argonne National Laboratory in Argonne, Ill., has been elected vice president of industry at the **Society for Computer Simulation (SCS).**

SCS is a professional technical society devoted to applications of computer simulation. SCS members include employees of computer simulation firms, military and defense contractors and hardware and software vendors.

Sharon is group leader for experiments in Argonne's Reactor Engineering Division. He develops software for training nuclear power plant operators.

.....

Who's on the go?

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Exploring uncharted waters

Spencer Gifts develops SIRIS, a $5 million integrated database system, from scratch

BY JOANIE M. WEXLER
CW STAFF

There's a credo that the best managers are those who work their way up from the trenches, because they understand precisely what their subordinates' jobs entail. Spencer Gifts, Inc. is betting the success of a five-year business overhaul project on that very premise.

With a total of 45 years of retailing experience between them, Spencer's chief executive officer and vice president of information systems are managing their current Spencer Integrated Retail Information System (SIRIS) project with a dose of realism.

CEO John Hacala and Vice President of Information Systems Eugene Murtha say their experience allows them to take an idea and visualize it running through the entire Pleasantville, N.J.-based corporation. That ability helped them conceive and appropriately design SIRIS, an integrated database system aimed at giving buyers and merchandising managers up-to-the-minute information about sales trends.

"I've been a buyer and a merchandising manager, and I understand what information these people need to do their jobs," Hacala explains. "The quicker you can pick up on a trend, the more you can maximize the benefit of that trend."

Hacala gets actively involved with IS planning decisions at the $260 million specialty retail chain. Spencer Gifts has been owned by MCA, Inc. since 1968 and operates about 550 stores in shopping malls nationwide.

"We have a formal structure for keeping John constantly involved," Murtha says. "He is the type of manager who walks around the building and talks to people; he keeps his pulse on everything, including IS."

Hacala's hands-on involvement with IS is "unusual, particularly in the retail industry," according to John Chay, former vice president of IS at the National Retail Federation, Inc., sponsor of the Retail Information Systems Conference (Riscon).

Rosenfeld Spengler

Spencer Gifts' *Hacala (left) and Murtha managed SIRIS' development*

Hacala spoke about Spencer's SIRIS project at Riscon's annual conference in mid-October in St. Louis.

"You'd never hear a CEO say he wasn't going to get involved in site selection or operations, and the computer is another strategic tool," Hacala says. "You don't have to be a hardware or software expert, but you should know the benefits of different kinds of systems and what questions to ask."

Continued on page 56

Perhaps IS needs a dose of *perestroika*

BY CLINTON WILDER
CW STAFF

Looking for a role model for redesigning your information systems organization to meet user needs? Try the Soviet economy.

That unconventional wisdom comes from Dean Meyer, president of NDMA, Inc., an IS management consultancy in Ridgefield, Conn. Meyer argued that in the spirit of the lifting of the Iron Curtain, some IS departments would do well to emulate *perestroika*, or restructuring.

According to Meyer, "Most IS organizations are run by a central Soviet that determines how time and money will be spent." He added, "It didn't work in Eastern Europe, and it isn't working in today's corporations."

The IS department should change from a centrally planned economy to a market-driven economy, Meyer said, by giving users more say in what IS services they want and pricing them accordingly.

Implementing chargeback and managing IS as a profit center are important pieces, but they are part of a larger philosophy.

IS activities "should be planned by the customer instead of by the provider," Meyer said. "Then IS will only do what the clients are willing to pay for. The way things work now, we have surpluses [of IS services] in some areas and shortages, or backlogs, in others."

Meyer advocated a process of what he calls shadow budgeting, or distributing the projected IS budget among users so they each know what they are paying for. To reach that point, the IS department should take steps, including the following:

- Identify the IS department's "product line."
- Identify all suppliers, external and internal.
- Determine a "fair market price" for IS services based on their cost of delivery and what prices are offered in the open market (i.e., by outsourcing vendors).
- Design an invoicing process so users will "start to get a feel for what their decisions cost," Meyer said.

If successful, the process will reinvigorate IS and transform the users from supplicants to "well-informed buyers who want quality," according to Meyer. And perhaps their role models will be the customers at the McDonald's restaurant in Moscow's Red Square.

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CALENDAR

The changing nature of telecommunications vendor/user relationships is the theme of the International Communications Association (ICA) 1991 winter seminar to be held Jan. 13-16 in Houston.

The evolution of outsourcing and global networking partnerships will be covered by speakers from both the user and vendor communities. Speakers from user companies will include Bruce Turkstra of Merrill Lynch & Co., Bud Turner of McKesson Corp. and Woody Randall of Citizens & Southern National Bank. The keynote speaker will be University of Minnesota Prof. James C. Wetherbe.

For more information, contact the ICA in Dallas, Texas at (214) 233-3889.

JAN. 6 - 12

International Security Conference and Exposition West '91. Anaheim, Calif., Jan. 9-11 — Contact: Cahners Exposition Group, Des Plaines, Ill. (708) 299-9311.

Mathematica Conference. San Francisco, Jan. 12-15 — Contact: Maury Kendall, Wolfram Research, Champaign, Ill. (217) 398-0700.

JAN. 13 - 19

Pacific Telecommunications Conference: Assuming the Global Network. Honolulu, Jan. 13-16 — Contact: PTC, Honolulu, Hawaii (808) 941-3789.

National Retail Federation Retail Industry Convention and Exposition. New York, Jan. 13-16 — Contact: NRF Convention Registrar, New York, N.Y. (212) 583-5113.

Technical Conference on the X Window System. Boston, Jan. 14-16 — Contact: MIT Laboratory for Computer Science, Cambridge, Mass. (617) 253-8861.

Telecom Skills Workshops. Waikiki, Hawaii, Jan. 17-18 — Contact: Pacific Telecommunications Council, Honolulu, Hawaii (808) 941-3789.

JAN. 20 - 26

Data Visions '91. San Francisco, Jan. 20-23 — Contact: Earle Spearman, Westtech Systems, Orinda, Calif. (415) 254-6900.

The Downsizing Conference. San Francisco, Jan. 21-22 — Contact: Digital Consulting, Andover, Mass. (508) 470-3880.

Unix Technical Conference. Dallas, Jan. 21-25 — Contact: Uniforum Conference Office, El Toro, Calif. (714) 588-8640.

Infotext '91. Las Vegas, Jan. 22-23 — Contact: Bob Dale, Infotext Publishing, Capistrano Beach, Calif. (714) 493-2434.

Uniforum 1991. Dallas, Jan. 22-24 — Contact: Bob Lisbe, PEMCO, Des Plaines, Ill. (708) 299-3131

JAN. 27 - FEB. 2

Communication Networks '91 Conference and Exposition. Washington, D.C., Jan. 28-31 — Contact: Michael Sullivan, World Expo Corp., Framingham, Mass. (508) 820-8268.

Network Computing Forum and Exposition. Washington, D.C., Jan. 29-31 — Contact: Christine Krajewski, World Expo Corp., Framingham, Mass. (508) 820-8126.

FEB. 3 - 9

Macapp Conference. Phoenix, Feb. 4-8 — Contact: Macapp Developers Association, Everett, Wash. (206) 252-6046.

Macintosh/N.Y. '91. New York, Feb. 5-7 — Contact: Peter Kimpton, Exposition Management, Waltham, Mass. (617) 290-0412.

Florida Educational Technology Conference. Tampa, Fla., Feb. 5-8 — Contact: Barbara Ann Cox, Office of Educational Technology, Tallahassee, Fla. (904) 488-0980.

NOMDA West Regional Convention. San Diego, Feb. 7-9 — Contact: Katy Dunn, NOMDA, Kansas City, Mo. (816) 941-3100.

FEB. 10 - 16

Video Expo. San Francisco, Feb. 11-15 — Contact: Debbie Rotolo, Knowledge Industry Publications, White Plains, N.Y. (914) 328-9157.

Managing Information Technology when the Going Gets Tough. London, Feb. 12 — Contact: Suzy Mayhew, London, England 071 236 4080.

FEB. 17 - 23

Northwest Computer Show. Minneapolis, Feb. 19-20 — Contact: Judy Koch, Plymouth, Minn. (612) 420-5376.

FEB. 24 - MARCH 2

IEEE Conference on Artificial Intelligence Applications. Miami Beach, Fla., Feb. 24-28 — Contact: IEEE Computer Society, Washington, D.C. (202) 371-1013.

Communications Connections (Commcons '91). San Diego, Feb. 25-27 — Contact: Dimensions, Redwood City, Calif. (415) 591-0183.

Sun Open Systems Expo. Boston, Feb. 25-27 — Contact: Sun Open Systems Expo, Austin, Texas (512) 331-7761

Compcon Spring '91. San Francisco, Feb. 25-March 1 — Contact: Roger Anderson, Livermore, Calif. (415) 422-8572.

EDI and the Law '91. Washington, D.C., Feb. 26-27 — Contact: Data Interchange Standards Association, Alexandria, Va. (703) 548-7005.

Financial Market Data Conference. New York, Feb. 26-27 — Contact: Waters Information Services, Binghamton, N.Y. (607) 772-8086.

Strategic Planning Systems Conference. Tempe, Ariz., Feb. 27- March 1 — Contact: Pete Asbey, Conference Coordinator, Nardoni Associates, Lebanon, N.J. (201) 730-9444.

MARCH 3 - 9

Communication Technologies Conference '91. Washington, D.C., March 6-7 — Contact: Jess Seiple, Technology Interchange Group, Clifton, N.J. (201) 478-3606.

East Coast Oracle User Resource Conference. Washington, D.C., March 6-8 — Contact: Dale Lowery, Oracle User Resource, Washington, D.C. (202) 254-4864.

Open Systems Explained — The Management Issues. London, March 7 — Contact: Suzy Mayhew, London, England 071 236 4080.

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CLIPS

Tim Lewis

Summaries from leading scientific and management journals

"The elusive silver lining: How we fail to learn from software development failures"

By Tarek Abdel-Hamid and Stuart Madnick

Sloan Management Review
Fall 1990

■ When software projects go awry, we either hide the mistakes or never discover them. The important lessons to be learned from failures are usually not readily apparent; they need to be extracted from deep within the project experience.

Many managers rely on conventional wisdom to explain failures, such as Brooks' Law, which says that adding manpower to a late software project delays it further. But reliance on these intuitive explanations may prevent managers from identifying the real problems.

The authors have developed a postmortem diagnostic tool that simulates the software development and testing process. For example, it can determine whether the project was understaffed or whether quality-assurance testing continued beyond the point of diminishing returns.

The result is a set of ideal cost and schedule estimation benchmarks for the finished project that can be used to improve estimates for future projects. The payoff from an effective postmortem is a smarter organization that truly learns from its mistakes. — Mitch Betts

"Systems architecture: Identifying strategic strikes"

By Randall Latham

Journal of Systems Management
October 1990

■ "Strategic strikes" are competitive advantages gained through new uses of information technology. However, such advantages are fleeting if the technology can be quickly replicated by the competition.

New strategic strikes can be discovered through systems architecture. Systems architecture involves comprehensive analysis of the company's current and long-term needs and resources. It deals with all aspects of technology — business function, application, data, communications and hardware. Through systems architecture, needs can be anticipated and provided for in advance; it is active rather than reactive. Information technology can thus be more effectively and efficiently employed.

For competitors that are not employing similar analyses, strategic strikes made through this type of planning are more difficult to replicate and neutralize.

The greatest barrier to implementation of systems architecture lies in the resistance of any organization to technological change. The strikes enabled by a well-thought-out systems architecture must be put in place at a rate acceptable to the employees. — Derek Slater

"Why be honest if honesty doesn't pay?"

By Amar Bhide and Howard Stevenson

Harvard Business Review
September-October 1990

■ Is honesty the best policy? That is a question that has long plagued society, and never more so than now. We know honesty is a moral choice. Most people tell themselves that in the long run, honesty will pay, and those who are dishonest will get their just desserts. But the truth is, there is no evidence to prove such a belief.

In fact, there is greater reason to believe deception pays. For example, in an interview with *Inc.* magazine, Philippe Kahn explained how his firm, Borland International, got off the ground by deceiving an ad salesman for *Byte* magazine. The then-broke company was able to secure good credit terms for an ad by appearing as a busy, venture-backed company. That ad sold $150,000 worth of software.

As morally conscious people, we hope that when someone cheats, steals or breaks contracts or promises, the result will be alienation. Getting even would seem to satisfy the slighted, but it takes valuable energy to retaliate while incentive for doing so is nonexistent. In other words, it is a good business practice to turn the other cheek.

Given this, we would expect breaches of trust to be rampant, but that's not the case. Businessmen keep their word because they want to, not because honesty pays. It is the absence of predictable financial rewards that makes honesty a quality prized in the business environment, and as long as the rest of us live by this, the system will be fine. — Jodie Naze

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COMMENTARY

Clinton Wilder

Obfuscating outsourcing

How can you tell when a new direction in information systems management has turned into a full-fledged trend? The number of conferences, market research studies and consultants specializing in the topic are all good indicators, but best of all is the Buzzword Test.

If a new phenomenon has developed at least five new cliches or buzzwords around it, it can be officially considered a trend. I'm defining buzzword as something that sounds nice when you say it but either oversimplifies an issue to a great degree or goes so far as to hide the truth. Examples are "solutions," "standards," "open systems" and "no new taxes."

Well, outsourcing has officially passed the Buzzword Test. I'm not sure exactly when this occurred or what particular press release put it over the top, but what follows is one observer's annotated list of the Current Five Greatest Outsourcing Cliches — culled from the ranks of companies who have outsourced some or all of their IS operations. This is not a criticism of the trend, which has been and will continue to be used very effectively by many firms. Just consider it a vote for telling it like it is.

This arrives just in time for the holiday season. Watch for the sequel next summer.

1. **"We're in the widget business, not the data processing business. So it makes strategic sense to focus on widgets and let the DP experts [outsourcing vendor] worry about DP."**

This may be true if you're talking only about fairly mundane data center operations. But if you mean large pieces of applications development and strategic IS planning, doesn't this fly in the face of integrating IS with the business instead of relegating it to traditional back-office status?

2. (corollary to #1) **"We wouldn't outsource if we were in an information-intensive business like airline reservations. But our business is making a better widget; worrying about computers is not a strategic focus for us."**

Hoo boy, are these guys missing the point. There is not a business on earth that does not rely on information. Many of the most impressive leaders in the use of IS — Benetton, Frito-Lay, Du Pont, Otis Elevator, Wal-Mart Stores — are not in the traditional "information business" — or are they? They have *made* information strategic in their respective industries and have proven that you don't have to be Dun & Bradstreet or Covia to do so.

That doesn't mean outsourcing and strategic information use are mutually exclusive. At a recent Profit-Oriented Systems Planning Program conference, H. J. Heinz IS consultant Phil Lichtenfels took issue with a previous speaker's slide that implied outsourcing was more appropriate to noninformation businesses. "Information is important to all companies," he said. Heinz has outsourced IS operations to Genix.

3. **"Our IS employees clearly don't have much of a career path in the widget industry. We think they'll be very excited to transfer to the outsourcing vendor and have the opportunity to advance in their own field."**

This particularly bothersome idea comes after all the talk about how IS technologists must better understand their company's business and feel like they really do work for Widgets, Inc. and not for IBM. It sure sounds like the old, "we'll worry about the business, you go play with your Cobol and DASD" to me. And then they wonder why systems don't meet business needs.

Transferring employees to the outsourcing vendor is tough stuff. Uncertainty, clashing corporate cultures, new bosses and a highly productive rumor mill will be constantly battering morale. To make it work, management had better be sensitive to the above concerns, not thinking that they're doing their IS employees a big career advancement favor — especially the IS director who gets the new title of "vendor liaison."

4. **"We're looking forward to this relationship with our strategic partner."**

I've addressed this one in this space before. Maybe it's just semantics, but the bottom line is that outsourcing is a vendor/customer relationship: One party is paying the other for services. Can it be nonadversarial, cooperative and beneficial to both parties? Yes, absolutely. But never forget that your "partner" is in the outsourcing business to make money.

5. **"The outsourcing vendor's resources will give us access to the latest state-of-the-art technology."**

If you're easily wowed by the latest and greatest MIPS cruncher, it's no wonder you thought your IS wasn't up to snuff and you wanted to outsource. State-of-the-art technology can help, but it's the use of the information that makes the difference.

You may have noticed that not one of these five themes mentions the cost savings of outsourcing. That's because it's not a buzzword — it's usually the truth. In these recessionary times, I would think more companies would want to highlight that. But many would rather keep mum about the money, since there are so many trendy buzzwords available.

Wilder is *Computerworld*'s senior editor, management.

Uncharted

FROM PAGE 51

Hacala "prods and provokes his managers to gain the necessary knowledge to use IS strategically," Choy says. "Usually, the process is the reverse."

About 500 of Spencer's decision makers, including buyers, merchandising managers, distributors and other managers, will have access to SIRIS. The system's goal is to provide one updated copy of corporate information by continually polling individual personal computers at each store and integrating the information into the corporate relational database. The firm can then monitor sales trends for a few days and project a year's worth of sales for an item.

"If a [supplier's] factory can produce just 20,000 items a week and we order 100,000 units, we effectively lock up the sales of that item if we're quick," Hacala says.

Phase one of SIRIS includes a purchase order management system, merchandising controls and a system that allows buyers to track their spending money. It is set to go live in early January.

Phase two will include an automatic item reordering and distribution system and other operational systems. It will take another two years to complete.

The $5 million SIRIS project required a heavy investment in educating the IS staff about IBM's DB2 relational database system and Must Software International, Inc.'s Nomad fourth-generation language (4GL) tool. "The staff also had to learn how to work in a new MIS/user relationship environment," Murtha says.

SIRIS has been under way for three years, and Murtha estimates that the firm has spent $100,000 to $150,000 in outside classes and in-house training for the 80-person IS staff. "We didn't expect our staff to work miracles," he says. "When we conceived SIRIS, there were no development tools available for DB2." So the company developed its own set of database management tools and is positioning itself to sell them and SIRIS itself.

Murtha notes that a couple of the staffers who were initially chosen for the SIRIS team "were enamored with their old ways" and elected to leave the firm rather than invest the time and effort in gaining necessary technical skills for the 4GL development that the project demanded.

Those on the SIRIS team "didn't know the swamp was there, and the bridge was washed out," Hacala says. He describes SIRIS as "a real Lewis and Clark expedition," which involved designing the database, writing code, converting existing data to the new system, testing the database and producing documentation.

In addition, Hacala and Murtha created an all-or-nothing incentive program for SIRIS developers. If the team delivered on time, staffers would receive 10% to 25% of their salary as a bonus — depending on position. The project came in on time, the executives say, because in part of "recognizing quality people."

SIRIS should also help Spencer Gifts keep administrative head count down. SIRIS will initially provide new point-of-sale software to reduce paperwork and allow more administrative tasks to be performed electronically at the individual stores.

"The home office will need fewer people to handle batch reports," Murtha says. "When you're hiring 8,000 employees at Christmastime, that's a lot of payroll information that previously had to be delivered on paper to human resources and processed."

The last generation

Spencer Gifts may be leading edge in designing retail systems for business benefit, but the company does not claim to be leading edge in technology. Hacala prefers to go with "the last generation of technology. It'll do 85% to 95% of what the new generation will do, and it's a hell of a lot cheaper."

For example, Spencer currently houses an IBM 3081K mainframe in its headquarters, and SIRIS "will be a real resource hog," Murtha says. But Hacala figures that once IBM's new-generation Enterprise System/9000 mainframes start shipping in droves, he'll be able to pick up a 3090 for a comparative song.

Murtha also points to Spencer's recent purchase of now-discontinued portable Epson America, Inc. PCs with integrated modems for its buyers.

"We've quadrupled our processing capacity but are paying less in equipment leases than we were five years ago," Hacala says.

SIRIS-ly speaking

Projects with narcissistic origins can sometimes snowball into unexpected business opportunities. When Spencer Gifts began to develop its SIRIS around IBM's DB2 relational database, it discovered that there were no commercially available development tools that were both DB2- and specialty-store-oriented. So the firm developed its own.

Now, Spencer is looking to commercially market the development tools in a joint venture with Must Software, vendor of the Nomad 4GL that Spencer's used to develop its Development Management Tools (DMT). Spencer also plans to market SIRIS itself. SIRIS is being designed, however, specifically to allow Spencer to integrate sales trends and other key information from the firm's 550 nationwide specialty chain stores.

While Spencer Vice President of Information Services Eugene Murtha emphasizes that "we're not getting into software as a primary business," he notes that "at least five or six parties" are interested in the DMT package. Murtha describes DMT as a "utility that administers and supports DB2 and also enables some productivity gains in computer operations."

He says that "the situation is sort of analogous to how American Airlines' reservation system came to be a separate business. But this is uncommon in retailing and is an aside for us." Bill Buoni, the IS design consultant who helped develop DMT and SIRIS, will lead the team of several programming consultants to do most of the commercial support for DMT.

"While whatever revenues we take in will be considered gravy, they will help start the payback on our investment in SIRIS and training," Murtha acknowledges.

Buoni and Must Software will handle the DMT marketing and packaging, and Spencer will receive an as-yet-unnegotiated royalty.

JOANIE M. WEXLER

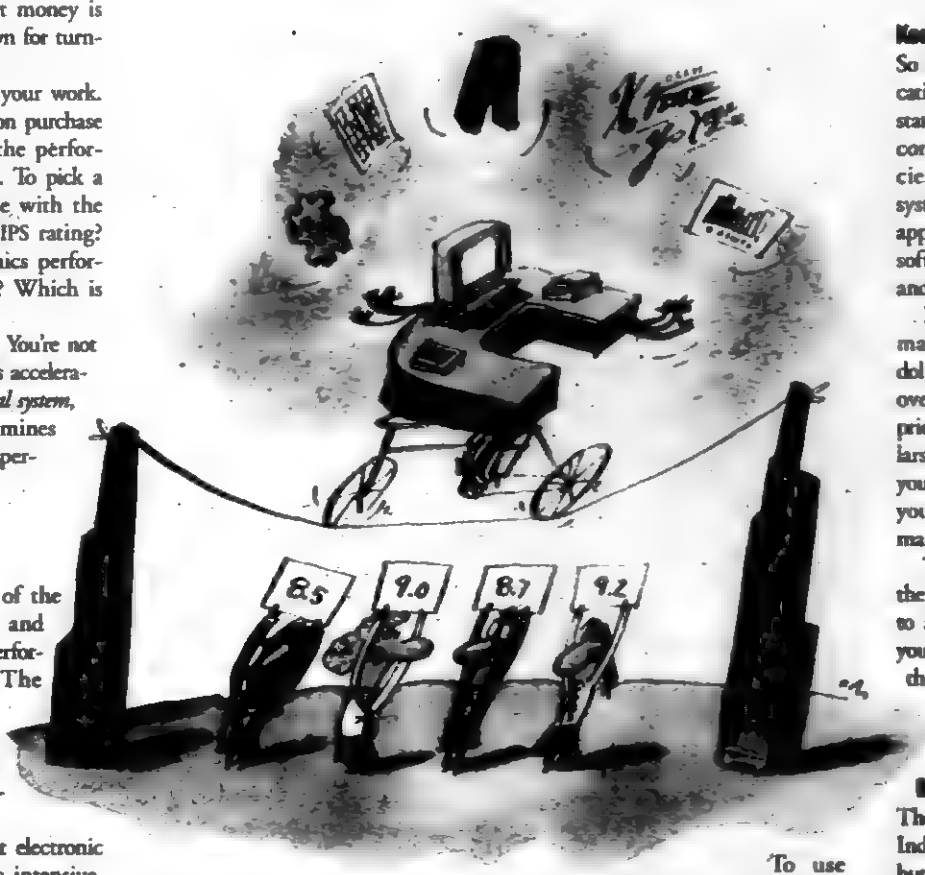
Evaluating Workstation Performance:

It's a Question of BALANCE

If you were to try to pick a triathlon winner, would you go with the best marathoner? The champion bicycle racer? The Olympic swimmer? Or would you choose the athlete known for being very good overall? The smart money is riding on the all-around athlete known for turning in a *balanced performance*.

Think about how this applies to your work. Say you're wrestling with a workstation purchase decision. You're dazzled by all of the performance claims you've seen and heard. To pick a winner, do you choose the machine with the highest integer or floating-point MIPS rating? Or the machine with blazing graphics performance? And what about I/O speed? Which is more important?

The answer: they're *all* important. You're not buying a CPU chip, or even a graphics accelerator. You're buying a *system*. It's the *total system*, with all of its attributes, that determines whether the machine will be the best performer for the jobs you need done.



How to Identify the Balanced Performer

As an example, let's look at a few of the applications you may want to run, and how the different aspects of system performance affect the applications. The following chart shows five typical workstation applications and the approximate degree to which each is dependent on CPU, I/O, and graphics performance.

From this chart, you can see that electronic publishing applications are graphics intensive, CASE applications are CPU intensive, and mechanical and electronic design applications are both graphics and CPU intensive. Business and financial modeling applications, because of their reliance on database access, are extremely I/O intensive.

APPLICATION PERFORMANCE MIX

Application	CPU	I/O	Graphics
Business/Financial Modeling	20%	60%	20%
CASE	60%	20%	20%
Electronic Design	30%	20%	50%
Electronic Publishing	20%	20%	60%
Mechanical Design/MCAE	40%	20%	40%

Percentages represent averages of ranges.

To use these numbers in your workstation decision, you'll need to factor them against known performance figures for the workstations you're considering. Different applications will produce different run times based on their performance mix and the specifications of the tested workstations.

Now you've got data that shows how *individual* applications perform on different systems you're considering. But in the real world, you don't use a workstation to run a single application. Most likely, you'll run a set of related tools, and in many cases, you'll be running them *at the same time*.

This introduces a new selection criteria, because multitasking places significant demands on operating system efficiency, especially in terms of task scheduling. An efficient, mature operating system will allocate CPU resources to the competing applications and keep all of them running smoothly. Less mature operating systems can cause some applications to bog down, or even stall; graphics may be slow or choppy; CPU-intensive jobs can become severely I/O bound.

Keeping a "Total System" Perspective

So now you've evaluated how two or three applications run individually on your potential workstations. You've tested the applications running concurrently to judge operating system efficiency. And you've certainly looked at the systems in terms of your own unique needs—applications; industry standards for hardware, software, and communications; the availability and quality of post-sale service and support.

Next you arrive at the big question: Which machine offers better value for your dollar? Based on what you've just learned about overall balanced performance, do traditional price/performance measures really count? Is dollars per MIPS a valid measure on which to base your decision? Or are you better off developing your own measure that judges *system* performance?

The point of this exercise is to demonstrate the need to take a *total system* view, as opposed to focusing on certain system attributes. When you evaluate systems, you need to look closely at the job at hand (and the applications you'll be running), and evaluate systems based on actual working conditions.

Be an Informed Consumer

There are tools to help you in your evaluation. Industry-standard benchmark tests are useful, but be aware that even these are limited. Current SPECmark tests, for example, measure only integer and floating-point performance—basically raw CPU performance. (In the near future, SPEC tests will cover CPU, I/O, and multiuser performance.) The X11perf test is an accepted measure of graphics performance. Remember, these are all single-stream tests that do not measure operating system efficiencies. You'll have to do that yourself—with your own set of applications running in your environment.

All vendors seek to present the most attractive aspects of their workstation products. Take the performance claims for what they're worth—as indicators of specific system capabilities. Your questions should be: Are these performance specifications relevant to *my* job? What about next week? Or next year?

In today's changing business environment, a system with balanced performance will stand the test of time.

STRAIGHT TALK
on
VAX and VMS

With the October introduction of new VAX, MicroVAX, and VAXstation products, Digital set forth new directions for VAX and VMS. The focus of this recent announcement was on enhancing VMS openness via standards as well as enhancing VAX performance and price/performance.

Speaking directly to you, our customers, William Demmer, Vice President of the VAX VMS Systems and Servers Group, answers questions designed to offer further insight into the strategies at work behind this very important announcement.

Question: *Can you explain the new VMS statements of direction?*

William Demmer: We have presented our intention to further open VMS with the incorporation of X/Open Branding, POSIX, and Open Software Foundation (OSF) standards.

Digital, along with most standards organizations, defines the benefits of open computing in two ways: ease of interoperating our products with other vendors' systems, and ease of moving or porting applications to other vendors' systems.

Thanks to our Network Application Support (NAS) program, we believe that VMS-based systems already lead the industry in ease of interoperating with other vendors' systems—from MS-DOS-based PCs to Apple Macintosh systems, UNIX workstations, IBM mainframes, and CRAY supercomputers.

Recently, we detailed our plans to enhance VMS applications portability, also through the NAS program. We believe that the key to portability is standards—not standard operating systems, but standard interfaces.

NAS, as you may know, is Digital's program for delivering these standard interfaces. Over the years, as part of the NAS program, we have added a variety of standards to VMS, such as SQL and the X Window System. Now we intend to add two additional key standard interfaces to VMS—making it an open operating system in the eyes of the world's key standards bodies *and* making it easier for you to implement an open computing environment with VMS.

"Digital is committed to protecting your investment in VAX and VMS—now and well into the future."

William Demmer
Vice President
VAX VMS Systems and Servers Group

X/Open Branding, POSIX, and OSF standards will make it easier to port most UNIX applications to VMS. This means you will have the tremendous functional advantages of VMS with dramatically new levels of portability.

Question: *What X/Open, POSIX, and OSF standards will be incorporated into VMS, and when will they be available?*

William Demmer: As I've just mentioned, we have already added a variety of standards to VMS. Other standards are forthcoming, including OSI and OSF/Motif.

In addition, we have previously described our intention to add the first IEEE POSIX standard (1003.1) to VMS. Now we have announced our intention to add all defined POSIX standards (1003.1, 1003.2, 1003.4). All three will go to field test next quarter and be delivered in 1991.

As you are no doubt aware, X/Open and the Open Software Foundation (OSF) are both non-profit organizations developing widely accepted specifications for open systems. X/Open's Portability Guide (XPG) and OSF's Distributed Computing Environment (DCE) describe environments built upon standard interfaces and designed for open computing. We have announced our intention to provide extensive support for many of these standards. We also intend to add many of the OSF/DCE standards to VMS. Digital has, in fact, already donated four of the eight technologies chosen by OSF to compose the DCE.

We have already added key X/Open standards to VMS, including SQL, FORTRAN, Pascal, C, ADA, and the X Window System. Now we intend to add the other necessary components of XPG3 to VMS in order to receive X/Open Base System Branding.

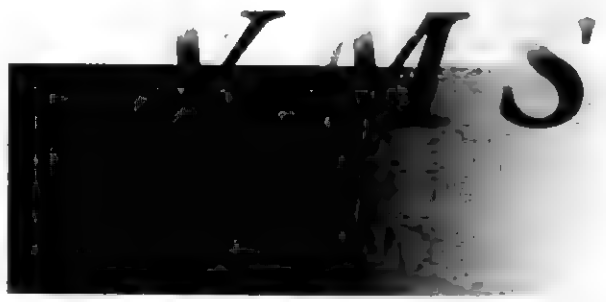
Until now, the only software systems which have been XPG3 branded are UNIX systems, including Digital's ULTRIX, IBM AIX, and HP UX. XPG3 branding for VAX/VMS will dramatically level the playing field for VMS in terms of openness.

Question: *Why are you adding these capabilities to VMS?*

William Demmer: We are opening VMS for several reasons.

First, you have asked for it. You have always liked the functionality and leadership multivendor integration capabilities of VMS. Now, enhanced openness will bring even more flexibility to your VAX system investments.

Secondly, today there are thousands of Digital applications for VMS-based VAX systems. By opening VMS, hundreds of emerging new applications originally written for UNIX-based systems can be added to the list. Using POSIX and XPG3 portability features, you will be able to mix and match hardware to the requirements of a specific application or project—and not have to worry about rewriting or retraining. For example, many applications written initially to run under UNIX will be usable in projects requiring the greater data integrity and security that VMS provides via clustering, disk shadowing, automatic system and device failover, and data journaling.



"We'll utilize the best available technologies to enhance VAX performance and price/performance."

Question: *If VMS is open, what unique advantages will it offer?*

William Demmer: Besides bringing new levels of openness and portability to Digital-based computing, VMS will continue to offer the same unique advantages—data dependability and high availability, networking capabilities, and superior multivendor support. Not to mention over 10,000 superior applications, plus tools designed to cut software development time in half.

From the first VAX to the VAX systems of the next century, VMS will always support compatible system growth, from desktop to data center, without rewriting software. That translates into investment protection for you.

Question: *What are the new statements of direction for VAX computers?*

William Demmer: In terms of VAX system capabilities, we will be utilizing the best available technologies to enhance VAX performance and price/performance, as we have been doing ever since the VAX was introduced.

Specifically, we will be phasing in high-performance RISC technology to further accelerate VAX performance. Today's major I/O performance gains in the VAX 6000 Model 500 are made possible by new RISC I/O technology, which we have also recently incorporated into the new VAX 4000 and VAX 9000.

We also plan to incorporate leadership RISC CPU technology into VAX systems over the next two to three years. VAX/VMS systems based on RISC will be compatible with today's VAX/VMS systems.

Question: *Are we looking at a major shift in VAX and VMS strategy?*

William Demmer: No. VAX and VMS are based on hardware and software architectures that are inherently designed for growth. We're always adding additional features to VMS. We're also continually moving the VAX hardware architecture to high-performing technologies—from ECL to CMOS, and now to RISC.

We've often stated our commitment to improving VMS software, as well as moving VAX hardware to better performance platforms.

Consequently, it should not be a major surprise when Digital announces its intention to further enhance these extremely feature-rich hardware and software technologies. You should continue to understand that Digital is committed to protecting your VAX investment now and well into the future. This recent announcement offers further proof of that.

Question: *How does this affect Digital's plans for future RISC/UNIX developments with the DECsystem product family?*

William Demmer: Our commitment, as always, is to offer leadership in products and technology.

Our DECsystem products have brought leading RISC/UNIX capabilities to desktop computing, graphics, and servers. We're now expanding that leadership tack to our VAX/VMS products.

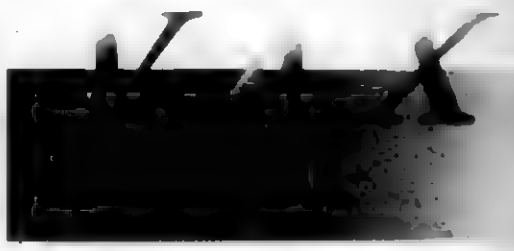
At the same time, DECsystem products, based on MIPS technology, will continue to bring price/performance advantages to the UNIX environment.

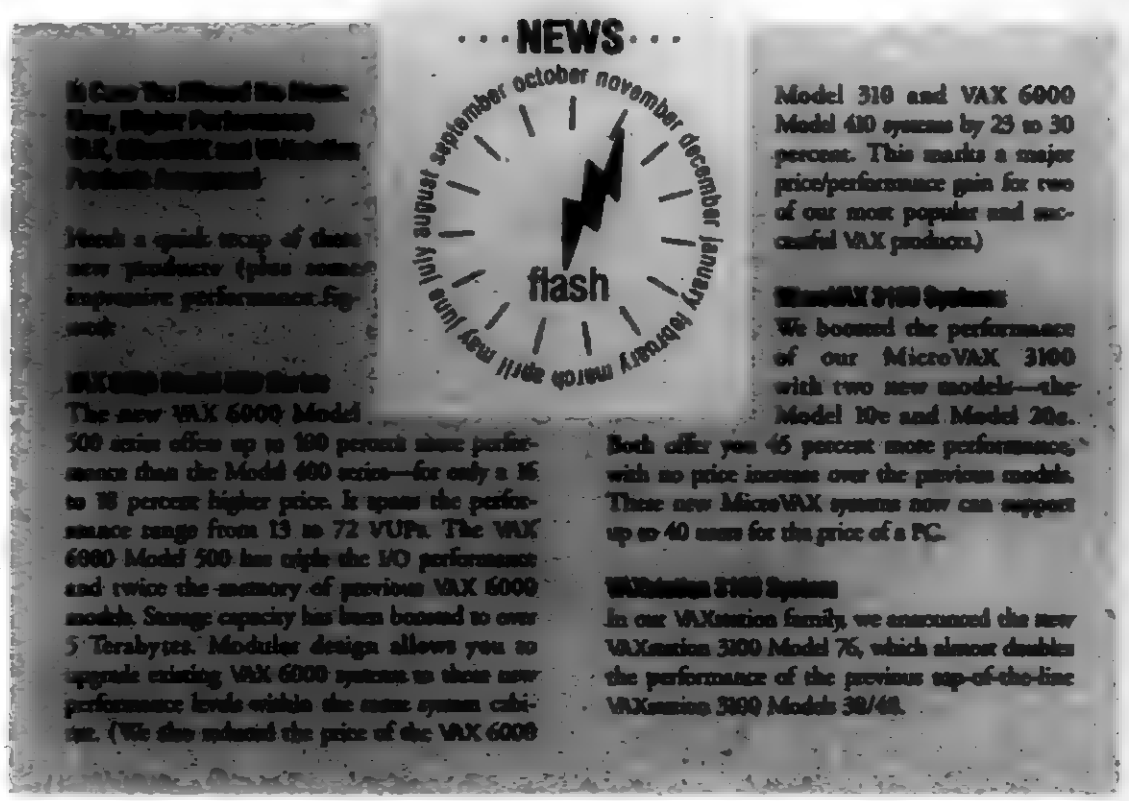
Just as important, through NAS we are able to provide you with these price/performance benefits in a unified computing environment —one that includes all Digital systems *and* systems from other major vendors.

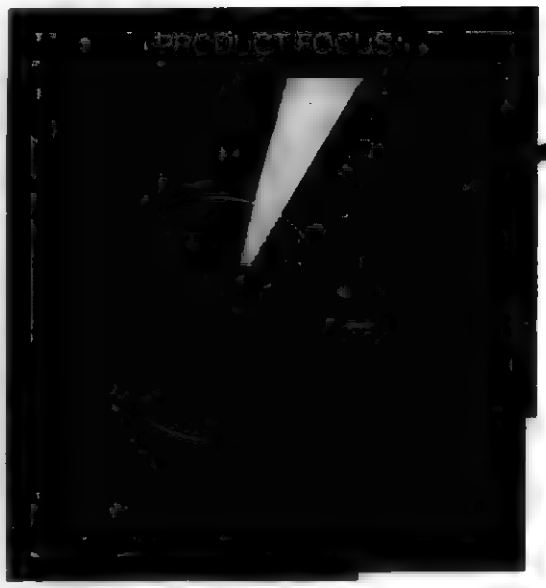
Question: *What do these new directions for VAX and VMS mean for Digital?*

William Demmer: We believe that this continued acceleration of VAX hardware and VMS software enhancements clearly surpasses the competition—putting us in a very strong position for the remainder of the decade, and beyond.

You are already familiar with the benefits of VAX and VMS and can easily appreciate the added performance available with the new VAX 6000, MicroVAX 3100, and VAXstation systems. I believe you'll applaud a move that brings more openness to VMS and enhanced performance to VAX.







Here is some news you can use on Digital storage products and programs:

KDM70 XMI Controller Does It All

The KDM70 XMI storage controller is Digital's most powerful single-host controller. It provides Digital Storage Architecture (DSA) devices with high-speed access to XMI-based VAX 6000 client/server systems and VAX 9000 production systems. The KDM70 underscores the benefits of DSA by providing the latest advanced technology supported by the entire range of RA series disk drives and TA series tape drives.

Powered by an on-board CVAX microprocessor, the KDM70 controller features two data channels and eight ports, with the capability of simultaneously supporting a mix of disks and tapes. The two channels are dynamically allocated to the eight ports for optimum I/O performance, making the KDM70 the only DSA controller that allows devices to operate in parallel at the maximum speed of the controller. The KDM70 can service up to 1,200 I/O requests per second and sustain data rates of 3.4 MB per second to support two spiraling RA92 disks, and 4.0 MB per second for two ESE20 disks. This also makes the KDM70 our fastest and most versatile single-host controller.

Comparison Notes on the KDM70

When compared to the KDB50/BI-based controller, the KDM70 is approximately three times more expensive, but provides twice as many ports, delivers almost six times more performance, and connects directly to the XMI bus.

When compared to the HSC40/CI-based storage server, the KDM70 is approximately one-third the price, requires no additional floor space, provides 25 percent fewer ports, and delivers similar performance while reducing I/O traffic on the CI bus.

Fastest Disk Just Got Faster

Our fastest solid state disk, the ESE20, now provides up to 1,200 I/O requests-per-second throughput when used with the KDM70 disk controller. Quadrupling the current ESE20 solid state disk performance, the device-level access time decreased from 1.3 ms to near zero. The increased speed of the ESE20 balances the increased processing speeds of the VAX 6000 and VAX 9000.

New RA Disk for All Storage Arrays

The new RA92 disk drive provides a 25 percent increase in capacity and 10 percent higher performance over the RA90—at a lower price per megabyte.

It is featured in the SA800 and SA850 storage arrays, and it is also supported in all existing SA600, SA650, and 40-inch RA90 cabinets. It plugs right into current HSCs and other DSA/SDI controllers without interrupting system operations and without needing to change either system or application software.

The RA92 allows the SA800 storage array to configure up to 12 GB of usable storage in 5.5 square feet of floor space. Capacity isn't the only metric by which the RA92 excels. With a 16 ms average seek time, and a transfer rate of up to 2.8 MB per second, the RA92 is a high-end disk that ranks with industry leaders.

News on Tape

At $1,800, Digital's new 525 MB TZK10 quarter-inch cartridge (QIC) tape drive offers leadership price, capacity, and performance in low-cost back-up. This industry-standard QIC drive is designed to provide unattended back-up for entry-level systems, and it's available now to support the new DECsystem 5100 systems.

Complementing the new TZK10 tape drive is the 1.2 GB TLZ04 tape drive. Now available across a wide range of ULTRIX and VMS-based systems and servers, the TLZ04 drive's formatted transfer rate of 170 KB per second can complete back-up of a gigabyte of data in less than 2 1/2 hours.

RA8X Migration Program: Save More, Worry Less

The popular RA8X Migration Program has been enhanced to include the latest storage products. If you have RA80, RA81, RA82, or SA482 series disk drives, you can now significantly reduce operating costs by upgrading to the newer RA92, SA70-JK (RA70 4-pack), SA800, or SA850.

Substantial savings begin "up-front" through the use of generous allowances on your existing RA8X series drives. You can receive $6,000 for either one RA82 or two RA81/RA80 drives toward one of the new RA92, SA800, or SA850 storage configurations. There's no limit on the number of trade-ins. You could, for instance, trade in 16 RA82 or 32 RA81 drives for a new SA800-LA, and receive a hefty $96,000 allowance towards the purchase—all after applying your DBA (Digital Business Agreement) discount.

In addition to these generous allowances, you will realize substantial long-term savings in floor space utilization, power consumption, HSC ports, and maintenance charges.

Additional program features include comprehensive migration planning services, de-installation and removal of the old equipment, installation of new equipment, and installation of any related storage products that are purchased at the same time—*all at no extra charge.*

Trade-in values are subject to periodic updates, so call your Digital sales representative for more details, or call our Technical Consulting Center at 800-343-4040 and reference the RA8X Migration Program.

Remember you can use our fast, easy, direct connections for ordering and information on these and other Digital storage products and services. Call 800-DIGITAL (800-344-4825), or log in to The Electronic Store (800-234-1998 at 1200/2400 baud).

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Listed prices are U.S. and subject to change.

The rising value of versatility

BY ALAN RADDING

Patricia Gilmore believes in being ready for any situation. "My aim has always been to have a staff that can program on anything for anything," she says.

That philosophy has been put to the test in recent months at Coleman Co., where Gilmore is director of MIS. Making do with less has become a way of life at the Wichita, Kan.-based sporting goods manufacturer since a leveraged buyout led to across-the-board staff reductions, including a 59% cut in the information systems staff.

The reductions came at a critical time for the IS department, Gilmore says. The company is on the verge of a major shift to personal computers and PC networks — a move that's in the budget for 1991.

Because she can't count on adding staff or even acquiring new tools during this period of extreme belt-tightening, Gilmore is depending on her existing staff to perform in a dramatically changed working environment. "Everyone's job is changing a lot," she says. "There will be fewer people in IS operations and more PC support and LAN support." Programmers who previously worked on the mainframe systems will now be doing PC applications, too.

Gilmore says she is confident that her remaining staff will rise to these challenges, chiefly because adaptability has always been one of her main hiring criteria. She has made a point, she says, of seeking people with a strong grasp of systems methodologies and changing technologies, steering clear of specialists and, instead, hiring graduates from four-year, degree-granting computer science programs.

Coleman's situation is far from the exception. Companies everywhere are either tightening their belts or trying to get into condition in case that need arises. The impact of this new emphasis on trimmed-down fitness is being felt in IS, as it is in every other department. At the same time, new technologies are pushing both high-level computing and IS staffs deeper into business areas.

Bob Barrett

Coleman's Gilmore *hires on the basis of adaptability*

As a result of these dual pressures, U.S. business and the IS function are both going through periods of transition. Unfortunately, it is easier to distinguish what is being left behind than where these trends are all heading.

It is an oversimplification to say IS is changing from the centralized mainframe to distributed PCs and that staff members should prepare to shift their skills and focus accordingly. "In some companies, that is happening, but not everywhere. There is no one answer," says Steve Joffe, vice president at Paramus, N.J.-based Source EDP.

At Spalding Worldwide Sports in Chicopee, Mass., a number of changes are already under way. The focus of development is shifting away from Cobol, says Bard White, Spalding's director of MIS. Instead, the company is "bringing in more commercial packages and doing more client/server stuff on a PC."

Everyone on the systems staff is required to learn PCs, DOS and PC packages, he says, and telecommunications and networking skills are in heavier demand than ever before.

But these changes don't mean that traditional mainframe-oriented Cobol programmers are going to find themselves suddenly stuck with obsolete skills. Upkeep of existing Cobol code will provide work for a long time to come. Furthermore, there are many large companies that are far from ready to make a wholesale switch.

Burlington Industries in Greensboro, N.C., isn't ready for a big move, even though the company is moving toward a more diversified mixture of platforms.

"We need to go from the PC to the midrange to the mainframe. Networking, particularly local-area networking, is growing in importance," says E. Ritchie Fishburne, director of corporate IS. That's only part of the picture, however. "We also have 20-plus years of programming in place and need people to maintain those systems," Fishburne says.

Adaptability an asset

At many places, the major change will be that, like Gilmore, IS managers will soon place more emphasis on adaptability as a job qualification. According to Thomas Lodahl, chairman of Cognitech Services Corp., an Easton, Conn., consulting firm that deals with IS-related human resources issues, Cobol programmers of the future will need to know computer-aided software engineering, C, C++, object-oriented programming and Unix, and they will have to deal with core systems in which network hooks are as important as the basic code.

Even companies that are moving in the direction of mainframes for the first time aren't planning to settle for plain vanilla mainframe programming skills.

Highland Superstores, Inc., a 100-store consumer electronics chain based in Plymouth, Mich., is converting from an IBM System/38 to a mainframe to accommodate its rapid growth. Highland is seeking programmers who understand DB2 and SQL and are capable of functioning as business analysts, says George Buick, vice president of distribution, warehousing and IS.

It is not just the hiring

Continued on page 64

Radding is a free-lance writer based in Newton, Mass.

INSIDE

Harnessing team power
Page 65

Observations of an occasional employee
Page 68

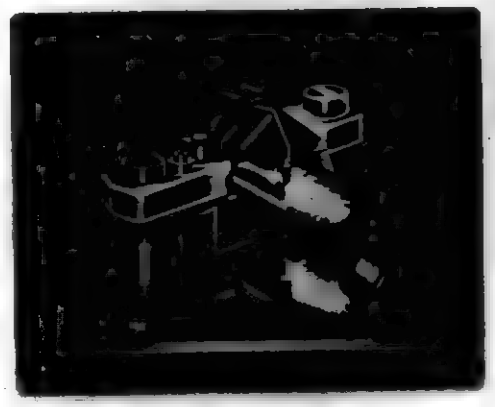
IBM lets the Now 486 technology

Without the proper venue, dazzling ability often falls short of expectations. That's certainly been the case with the Intel 486™ microprocessor, a processor that hasn't been utilized to its full potential. So that's what IBM set out to do. Just as it takes a seasoned jockey to turn a thoroughbred into a champion, it took IBM to give the 486 processor every opportunity to work its genius. Introducing IBM Personal System/2® Model 90 XP 486 and Model 95 XP 486.

From speed and storage capacity to graphics capabilities and upgradability, the new PS/2® Models 90 and 95 are designed to optimize the power of the Intel 486 processor and deliver a truly balanced performance—equipping you with solutions for today, and providing a platform of growth for tomorrow.

The 90's Are A Powerful Breed.

Right out of the starting gate, the Models 90 and 95 will astound you with their power and sophistication. Featuring a 33 MHz processor and a 25 MHz processor that's easily upgraded to 33 MHz, they deliver blazing speed and balanced performance, expanding your capacity for computer-intensive applications like CAD/CAM, financial modeling and multimedia. The course between your data and your processing has also been strengthened—the Micro Channel™ 32-bit data path, combined with a lightning-quick data-transfer rate, not only optimizes the present power of the 486 processor by feeding it a steady stream of information, but also provides for processor enhancements and will allow you to benefit from advanced operating systems to come. Plus these other innovations: a wider 64-bit data path which optimizes the 486 processor's access to system memory; 4MB memory standard (expandable to 32MB); and a 256KB cache option for even greater speed. All in all, it's easy to see how the concept of computer "power" has been enhanced, and how IBM helps you take full advantage of every second of computing time.



Brilliance On Display.

With increased power comes increased capabilities—the most visually stunning of which is Extended Graphics Array (XGA), standard on the PS/2 Models 90 and 95, and the heart of IBM's spectacular new display presentation.

With high resolution (1,024 x 768 pels) and execution that's significantly faster than VGA, XGA's sharper, clearer picture, coupled with the IBM 8515 color display, gives you swifter performance in windowed environments, and provides graphics-intensive applications such as desktop

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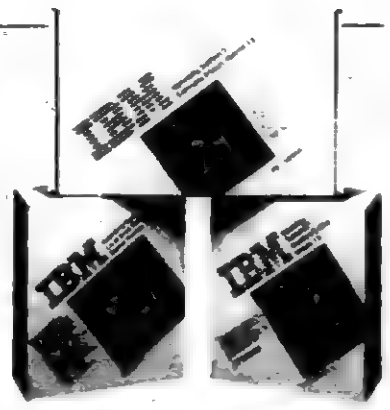
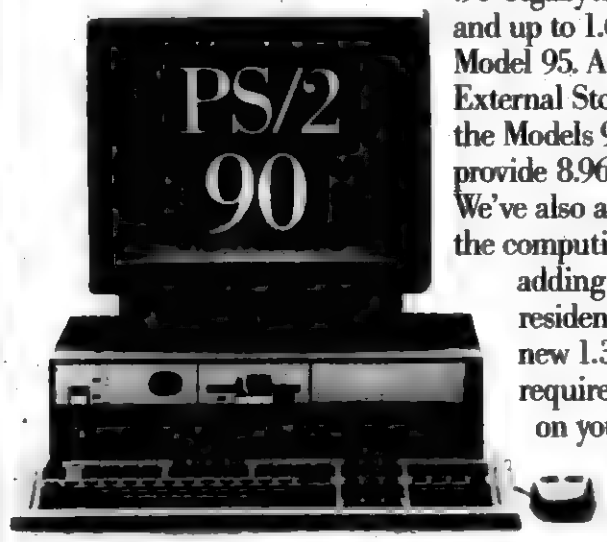
publishing, image processing and engineering design with a stunning new look.

FAST TIMES ARE IN STORE.



To satisfy even the most demanding storage needs, from LAN systems to data base management to numeric-intensive applications like financial analysis and modeling, IBM has one of the most advanced solutions available. IBM's super-fast SCSI hard disks are pure state-of-the-art performers. With additional hardfile expansion bays, the PS/2 Models 90 and 95 have enormous storage potential—up to .96 Gigabytes on the Model 90 and up to 1.6GB on the Model 95. And with the PS/2 External Storage Enclosures, the Models 90 and 95 can provide 8.96GB and more. We've also augmented the computing power by adding more flexibility to resident memory—our new 1.3 version of OS/2® requires as little as 2MB on your system. With this streamlined version you not only get more room for applications, but some users will experience a substantial performance increase in system functions as well. So when you need to make great strides with your computing power, you can count on IBM to give you terrific storage capability wherever you may need it.



Feature	IBM PS/2 Model 90	IBM PS/2 Model 95
Microprocessor		
Standard	80486	80486
Clock speed	25-33 MHZ	25-33 MHZ
Optional upgrade	33 MHZ	33 MHZ
Memory		
Standard	4MB (70ns)	4MB (70ns)
Maximum	32MB	32MB
Integrated Functions	Extended Graphics Array (XGA) and display port, dual DMA serial ports, DMA parallel port, pointing device port, keyboard port, diskette controller support for three drives, SCSI adapter with Cache.	
Fixed Disk Storage		
Standard	80-320MB	160MB-320MB
Display Modes		
APA Modes	XGA (includes all VGA modes) 640 x 480 x 256 colors/ 64 gray shades; 1024 x 768 x 16 colors/gray shades; hardware support for 132 column text mode; 16-bit direct color mode at 640 x 480 x 64K colors	
Available Expansion Slots	three 32-bit	six 32-bit
Bus Architecture		
Data path	MCA 32-bit	MCA 32-bit

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Continued from page 81

expectations that are changing; so are the settings in which IS staff members can expect to work. Although head counts in many central IS departments are flat or shrinking, overall demand for IS professionals is not diminishing as much as those figures and all the talk about user programming would indicate.

Instead, IS staffs only seem to be getting smaller because IS professionals are being drawn into business areas.

"LANs and PCs are pushing IS professionals into the user groups," Joffe says. Furthermore, many consultants and recruiters say that when these systems professionals become ensconced in business areas, they may become harder to identify because of title shifts that de-emphasize their technical orientation and emphasize their support function. A systems analyst assigned to a marketing department may, for example, wind up carrying a business card that says "marketing analyst."

And that's not even the farthest reach of the integration trend. J. Daniel Couger, professor of IS and management science at the University of Colorado in Colorado Springs, says many IS professionals are now being hired directly into business departments. More than half of Couger's last graduating class took that route, he says.

It is true that some users are beginning to perform functions that used to belong to IS professionals, but most observers say this is a case of cooperation, not replacement.

If you are concerned about efficiency, it makes no sense to have users operating on their own, Buick says. It's true, he adds, that "if you have an astute user, he can use SQL to query the database on his own." The question is whether you really want him to. Buick says he thinks not: "It sucks up cycles if you let the users run amok." Instead, Highland channels requests through its IS analysts, who use the same advanced tools to "knock out the requests four to five times faster," he reports.

The increase in educated requests from users who could do for themselves in a pinch is one reason why demand is expanding so rapidly for technically skilled analysts. By the end of the century, this job category will be growing at a faster annual rate (72%) than that of programmers (60%), in part because of the broader scope of the analyst function, says Brenda Wallace, an economist at the U.S. Bureau of Labor Statistics.

These projections represent the continuation of a trend that has already begun, says Richard Wonder, national director at the IS Division of Robert Half International, Inc. in Menlo Park, Calif. — "a collapsing of functions, with more programmer/analysts than pure programmers or pure analysts," he says.

This new breed of programmer/analyst, Wonder says, will write code where necessary, do systems analysis and write documentation, aided by new tools that accommodate this combination of jobs.

Wonder is most worried about the pure coder who has no experience with or interest in higher-level languages or business issues. "The ones who should be most concerned are Cobol programmers without any business skills," he says.

Joffe, however, says that the person who should be most concerned is the nontechnical analyst — one who does not have programming skills at any level. For individuals of this type, he says, the handwriting is on the wall: "He'd better become technical or become a user."

IS shops are already looking for interdisciplinary types. "I need someone who is not afraid to code but is also not afraid to do analysis," says Steve Crapser, manager of systems development at Kendall Healthcare Products Co. in Mansfield, Mass. Crapser can usually find one or the other, he says, but the combination is hard to come by.

"Technical skills are a given. We expect people to be state of the art and to maintain that level," says Donna McNamara, director of human resources at the Corp. Technology Group of Colgate Palmolive Co. in Piscataway, N.J.

It's what can be layered on top of those technical skills that really makes the difference, says McNamara — things such as the ability to listen to clients, understand their needs and communicate with them; the ability to think like a businessperson; and the ability to work as part of a team that includes business and financial people as well as systems professionals.

Personal skills a plus

Other IS directors echo McNamara's insistence on a combination of technical and business/personal skills. Their message is clear: Neither skill set is enough by itself anymore.

"The IS person must understand the business and then know where to get the technology to solve the problem," says Christina Kucharyszyn, manager of IS staffing at Glenview, Ill.-based Kraft General Foods, Inc. She warns prospective IS staff members at Kraft to be prepared to spend as much as 95% of their time working with users.

To find these people, many firms are paying a premium — at least for certain skill combinations — despite corporatewide efforts to keep costs down.

Gilmore has found it imperative to "hang onto key people," despite the intense pressure to cut costs. As a result, she has been "fairly generous with salary increases," even as she moves people into the end-user PC networking environment.

At Spalding, White pays a premium for the combination of technical skills and business knowledge. But, he adds, "the closer you get to the end user — the pure PC person — the softer the salaries get."

If the IS staff is increasingly involved with the user, then who is doing the routine or specialized work of IS? Often, the departments are turning to outsiders — independent contractors who come either with a highly specialized skill or as a general reinforcement to take over routine programming chores during peak periods.

The use of independent contractors, like outsourcing itself, has become an accepted option, but there is no major upswing in the use of consultants, Wonder reports. Contractors are used mainly as a short-term solution.

At Highland, for instance, Buick is able to keep his IS staff stable at about 100 people, despite going through an IBM System/38-to-mainframe conversion that requires rewriting every application, by turning to independent contractors. At times, the population of his IS shop has reached 200 people, half of them independent contractors. "We hold the [permanent] head count at 100, because that's the appropriate long-term level," he notes.

"The real value of consultants is when you are doing a conversion. Otherwise, we prefer permanent staff," Crapser says. Kendall went through a major conversion to IBM Application System/400s and used contractors extensively but has since minimized the use of outsiders.

Even Alan Bugh, vice president of MIS at Wilson Sporting Goods Co. in River Grove, Ill., brings in contractors for some projects, although he doesn't like using them. "These are not very exciting projects — things like IMS-to-DB2 conversions," he explains.

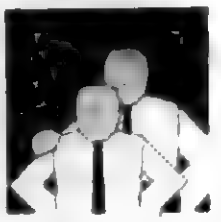
"If the project is going to last, say, 18 months, then I'll hire, but if it's just for three or four months, then I'll use a contractor," Fishburne notes.

Despite the dim economic outlook, corporate imperatives to reduce expenses and the increasing use of programmer productivity tools, growth in IS staffs is inevitable, because demand for information continues to skyrocket.

"There continues to be growth because there is such a demand — more and more projects. We never make as much progress as we'd like to," says Garland Gunter, director of MIS at Cincinnati-based Lenscrafters, Inc. •

Hot technologies

Staffing consultants see a growing demand for personnel grounded in a number of new technologies. The following are among the most desirable competencies:



- **CASE and fourth-generation languages.** Programmers and analysts who know how to use these tools are finding that they can command a premium, particularly in IBM midrange and mainframe environments.
- **Unix and open systems.** Consultants say most of the activity in this area is currently at the departmental level. Unix programmers, however, are in short supply and get top dollar.
- **Personal computer applications developments.** IS staffs are regaining influence over PC applications development. Some shops are moving applications development to PC platforms. DOS and OS/2 skills are in demand, but PC-only experience does not pay as well as PC skills combined with more conventional IS skills. Experience with Microsoft Corp.'s Windows and Presentation Manager as programming environments pays much better than standard PC development.
- **Networking.** While IS shops are paying increased attention to networking, most of the work and the best salaries are going to networking and telecommunications specialists.
- **Relational databases.** Experience with DB2, Oracle Systems Corp.'s Oracle, Ingres Corp.'s Ingres, Sybase, Inc.'s Sybase or other relational databases is in short supply and will attract excellent compensation.
- **Client/server.** Almost any experience with client/server architecture will bid up the salary offers.

Bend and stretch

In an effort to attract and keep good people, some information systems departments are starting to consider more flexible work arrangements (see story page 84).

"A lot of IS lends itself to nontraditional work arrangements," says Gil Gordon, a Monmouth Junction, N.J., consultant specializing in IS staffing issues.

Spalding Worldwide Sports is flexible about when people put in their hours, says MIS director Bard White, and some IS staff members work from home using remote terminals. The only stipulation, he says, is that arrangements be made in advance.

George Buick, vice president of distribution, warehousing and IS at Highland Superstores, Inc., says he is happy to provide flex time, although Highland itself doesn't endorse it. "It is necessary in IS," Buick says, to relieve traffic pressure on a computer that "is busy from 9 to 5." Job sharing is a more difficult situation, he says, although "IS jobs can often be broken into small pieces and done by part-timers."

George DiNardo, executive vice president at Mellon Bank Corp., says he'll try anything to attract good people and boost productivity: "Telecommuting, flex time — anything that relieves pressure on the CPU, I'm happy." Job sharing? "Sure, that gets me about 2½ times the output out of two people."

There are limits to how much flexibility can be built into IS jobs. Alternative work schedules can, for example, conflict with the need to increase interaction with users and can represent a headache for managers trying to juggle schedules. For the most part, however, only a small part of the eligible staff will avail themselves of such arrangements. On Mellon's IS staff, about 5% participate.

COMPANIES EVERYWHERE ARE either tightening their belts or trying to get into condition in case that need arises. The impact of this new emphasis on trimmed-down fitness is being felt in IS.

Player-managed teams score very well

BY SHERYL KAY

The self-managed team is being hailed as the latest and greatest idea in management theory and the possible key to the U.S.' productivity conundrum. Although it is hardly likely that a concept could live up to that billing, many companies across the country that have experimented with letting groups of employees manage themselves say the results are impressive. For the most part, these experiments have taken place in manufacturing settings. Some people, however, believe this is an idea that is tailor-made for information systems organizations.

The way self-managed teams operate is that a group of four to 15 employees is given the authority to set their own work schedules, target strategies, disciplinary procedures and other processes. These groups may be permanent or formed for the duration of a specific product. They may be culled from one department or represent a cross-functional mix. In place of a manager, the team adviser usually serves as a resource individual.

Shrednick says *operations team reduced costs*

There are many opportunities to apply this concept to the IS department, says Kathryn J. Hayley, senior manager at Deloitte & Touche in Chicago. The more managers you have on your IS teams, she says, the more time you'll spend on administrative activities that only serve to "burn time and money."

Harvey Shrednick, vice president of information services at Corning, Inc. in Corning, N.Y., reached a similar conclusion two years ago when the company's operations manager accepted a new position at another division of Corning. "It gave us the impetus to say, 'Why bother refilling the job?' " Shrednick says.

Today, the computer operations area at Corning functions as a fully self-managed team. "They develop their own training requirements, schedule their own shifts, do their own personnel reviews and award merit increases," Shrednick says.

Since the change, the quality of work has improved, Shrednick says. Systems availability is up, and the cost of running the department is down. In fact, the benefits of the team approach have become so apparent that Shrednick has started similar groups in several other areas, including customer service, the computer utility business team and administrative systems. By January 1991, technical services will also be self-managed.

At Hyatt Corp. in Chicago, autonomous work groups have a shorter history, but results have been equally promising. Gordon Kerr, vice president of MIS, initially moved to this management method as a matter of necessity. He had two groups of applications developers at work on two important projects. What he didn't have, he says, were the "available personnel or the time to attempt the traditional management approach."

Although born of scarcity, the approach paid off handsomely, according to Kerr. Not only were projects completed on time, he says, but there was also "a shared learning experience and a sense of ownership about the projects."

At Chaparral Steel in Midlothian, Texas, a company cited as an example of productive manufacturing by MIT's Commission on Industrial Productivity in 1989, IS staff members work on self-managed teams as part of larger cross-disciplinary efforts. Dave Fournie, who oversees a portion of the IS department as part of his responsibilities as general manager of operations, points to an inventory group, which is broken down into three self-directed subteams: quality assessors, production trackers and software designers and developers.

According to Fournie, the combined efforts of these teams have streamlined inventory procedures, giving Chaparral a strong competitive advantage.

Of course, self-managed teams don't work in all situations. Certain IS groups may not function well in the self-directed work model. Some people want to be told what to do, Fournie says: "When you give them full authority, they back off and say, 'You are going to help us, aren't you?' "

There are other inhibitors as well. Hayley says that if the IS team does not have a well-defined task, a solid set of technical skills, sound business judgment and members who can be trusted and know when to seek help, then the self-directed style should not be considered.

Frank Opperman, logistics manager at the Tape Manufacturing Division of 3M Co. in Freehold, N.J., says he probably wouldn't try it. Although such teams are already operating in many parts of 3M, Opperman doesn't think the idea would work in IS, which has to respond rapidly to changing business requirements. ●

Kay is a Tampa, Fla.-based business consultant and free-lance writer specializing in emerging technologies and human resources.

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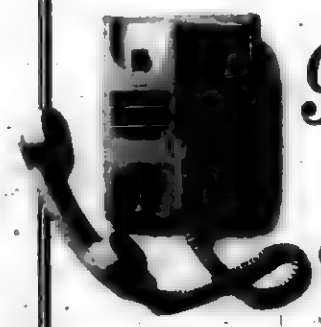

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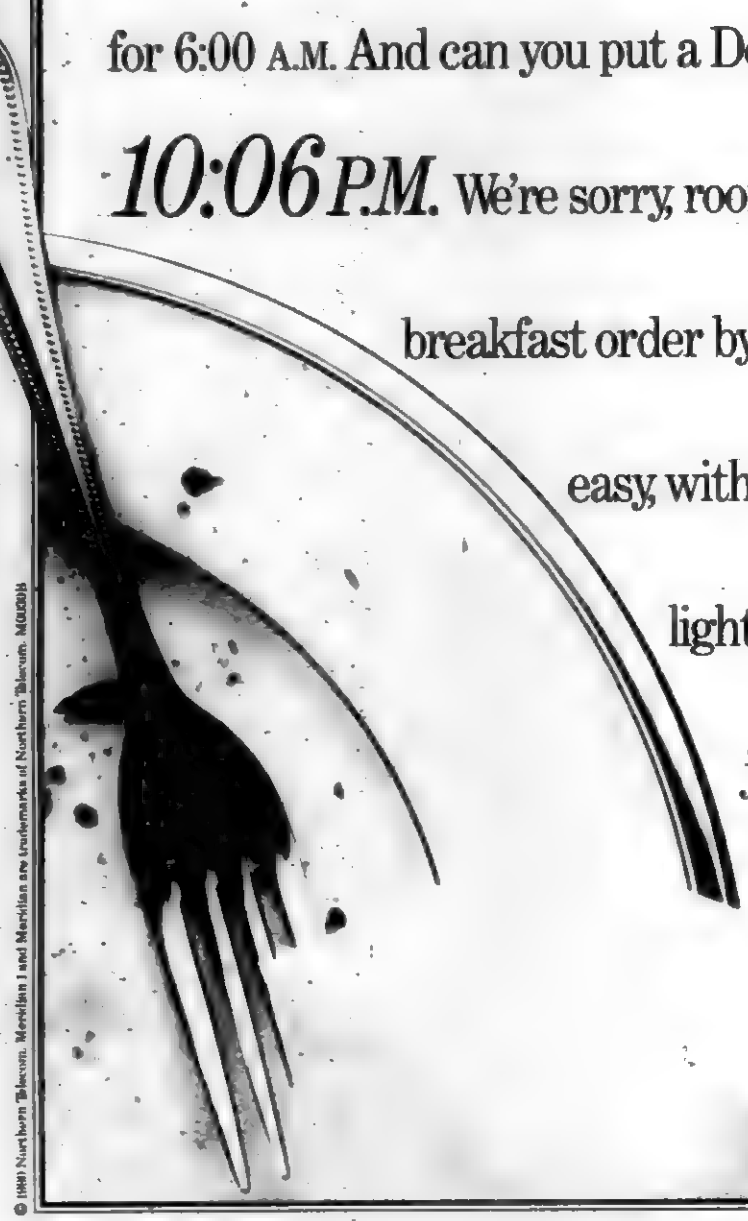

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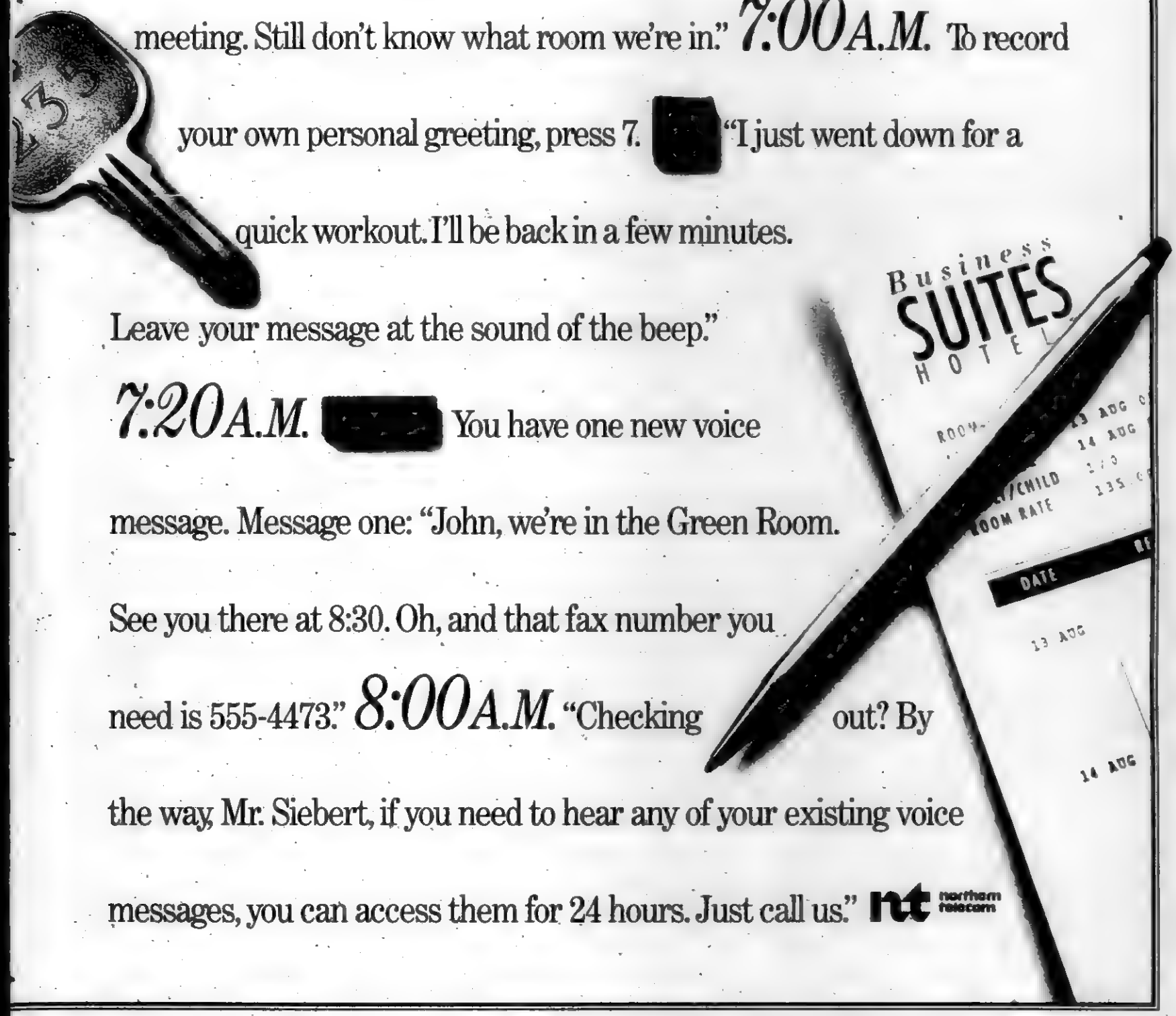

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What's the matter today with information systems staffs?

FIRST PERSON

BY LOUIS SCHANER

After more than 20 years of alternating between full-time and contract employment as a programmer/analyst, I am convinced of two things: One is that, although information systems personnel can be difficult to manage, they are not nearly as self-centered and lacking in loyalty as is usually portrayed. The other is that this misconception stems largely from the fact that IS departments are usually no better managed than the companies that house them.

Problems in IS staffing and staff management are symptomatic of a macro problem plaguing the entire country. We are a country of mature organizations whose energies are mostly spent in keeping the bureaucratic machinery oiled and running.

Synergy and individual contributions are subordinated to maintenance, and employees are measured by how well they fit and perform within the confines of the machine.

Older not always better

If a new cog doesn't fit properly or makes too much noise, we try greasing it, then modifying it. If neither of these actions work, we end up replacing the cog with a new one.

What that ignores, of course, is the probability that the new cog is the best component of the machine and that a far better course would be to consider replacing the surrounding worn-out parts that can't perform up to the standards of the new one.

Most IS departments don't acknowledge that this is the way they operate — but it is. When they advertise for employees, they emphasize the opportunities, the technologies they have invested in, the training that is available and the strategic directions.

Then, as often as not, they try to turn the database administrator they have hired into a programmer developing in Cobol on a personal computer. The exciting tools that were mentioned in the interview turn out to be off-limits, because the company isn't really interested in exploiting the technology right now. The training programs are often very real but serve only to help disgruntled professionals build their portfolio of skills for the next job interview, because there is nowhere to apply the learning in their present jobs.

Of course, there is a reasonable explanation for much of this: Faced with a growing shortage of highly skilled professionals, IS managers often hire the best people they can find, with the hope of eventually finding the ideal slot for them — one that will make use of their skills and knowledge of advancing technologies. Unfortunately, by the time the right job materializes, the person has usually left.

Less easy to explain is the unwillingness of many organizations to listen to ideas or explanations of reality from staff members. I've seen developers come up with estimates for projects using a company's approved methodology, only to be told that the job will have to be done for a third of the cost in a fraction of the necessary time. I've also seen plans rejected or ignored when advanced by staff members and then subsequently embraced when put forth — without substantial change — by an outside consultant. In fact, I've been on both sides of that particular fence.

Contributing factors

Many of these problems result from bad management practices that permeate the whole company, not just the IS department. Furthermore, IS departments are often hobbled by policies over which they have no control.

One major example is human resources guidelines that allow the hiring of a new employee at a substantial increase but prevent giving the same amount as a raise to a current staff member who has acquired enough new skills to justify the raise but has not accumulated what is considered to be enough time in his current position.

More aggressive compensation and more flexible management could help to stem turnover considerably and build more stable and productive IS staffs.

What could help even more, however, is commitment to the principles, philosophies and methodologies put forth by any of the gurus of total quality management.

A company or IS department that builds its culture around those ideas won't have to depend on consultants for constructive ideas. The employees will come up with plenty of ideas on their own — and will stick around to see them implemented. ●

Schaner operates a consulting company based in Madeira Beach, Fla. He has worked in the information systems field for 23 years, spending roughly equal parts of that time as IS employee and consultant.

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Vice President
Large Marketing Company

"Our staff is 25% more productive per account here than at a traditional bank due to the automation. KnowledgeWare's tools help us to quickly and accurately develop the systems to give us the competitive edge."

Systems Development Manager
British Bank

"We like the openness of methodology we get with KnowledgeWare tools. The tools let us develop a methodology that fit the experience of our people. When the methodology fits the people who use it, it's a lot easier to get them to buy into it."

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Financial Software
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Aerospace Manufacturer

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Technical Manager
IS Division of Manufacturing Conglomerate

"Another advantage of IEW tools is that all the information regarding analysis and design is stored in a single repository, available at your fingertips through a window-like interface."

Project Manager
British Water Utility

"KnowledgeWare tools could provide immediate productivity gains with the MS-DOS based IEW and also had the commitment of being compatible with AD/Cycle through its OS/2-based Application Development Workbench™ (ADW). We liked the idea of being able to get started right away with IEW, then migrate transparently to ADW without losing any of our analysis and design investment."

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Project Consultant
Government MIS

Preparing for AD/Cycle

Even though the real products are a ways off, it's not too early to start the long climb

BY SAMUEL B. HOLCMAN

Considering all the AD/Cycle component tools, the application development platform and the new development methodology needed to use them successfully, IBM's AD/Cycle represents one of the biggest changes in the history of systems development.

AD/Cycle will affect everyone involved with software development. No employees will continue to perform their jobs as they do today if they take advantage of AD/Cycle.

The magnitude and importance of this change demand that systems development organizations understand and manage the cultural and organizational changes that will take place.

Despite the fact that many AD/Cycle components are not yet available, the organizations that will gain the greatest competitive advantage from AD/Cycle have already begun to make preparations and are implementing their plans. There are many implementation activities that can — and must — be started today.

Who will take charge?

Unfortunately, being a "change leader" is not part of anyone's job description.

Few people responsible for implementing AD/Cycle have considered the organizational changes that face them. Even fewer have taken steps to ensure that the change process is managed effectively.

Considering the cultural and organizational difficulties that many development organizations have had in implementing individual computer-aided software engineering tools, inadequate attention given to the AD/Cycle change process is guaranteed to cause the implementation to fail.

However, even more cultural and organizational changes will follow as the system development community begins to implement AD/Cycle. It's clear that managing organizational change is a critical success factor in implementing AD/Cycle.

Nicolas Ascol

An important first step for every development organization to perform is a self-assessment. This is needed to evaluate and understand how prepared an organization is to introduce AD/Cycle.

In their book *Changing Ways*, Murray Dalziel and Stephen Schoonover identify four attributes to consider when assessing how prepared an organization is for the needed change:

1) History of change. Historical results are a good indication of how ready a development organization is for the introduction of AD/Cycle.

It is important to understand how well previous implementations of new software development tools and techniques have succeeded and what factors contributed to their success.

2) Clarity of expectations. Each organization affected by the introduction of AD/Cycle must clearly understand its role in the change process.

Misstated or misunderstood expectations have caused otherwise successful productivity tools and techniques to fail within a software development organization.

3) Amount of top management support. Support for AD/Cycle throughout the organization is a critical factor. Those who are most affected by AD/Cycle should play a major role in identifying the benefits to the software development process and the most effective methods of introduction. The size and expense of introducing AD/Cycle certainly require top management's support.

However, it is important for this support to be sustained throughout the various implementation activities and for it to be clearly visible to those who are affected by AD/Cycle.

4) Compatibility with organizational goals. Of course, top management's commitment to introducing AD/Cycle must also be consistent with other policies and directions being established by top management that affect system development practices.

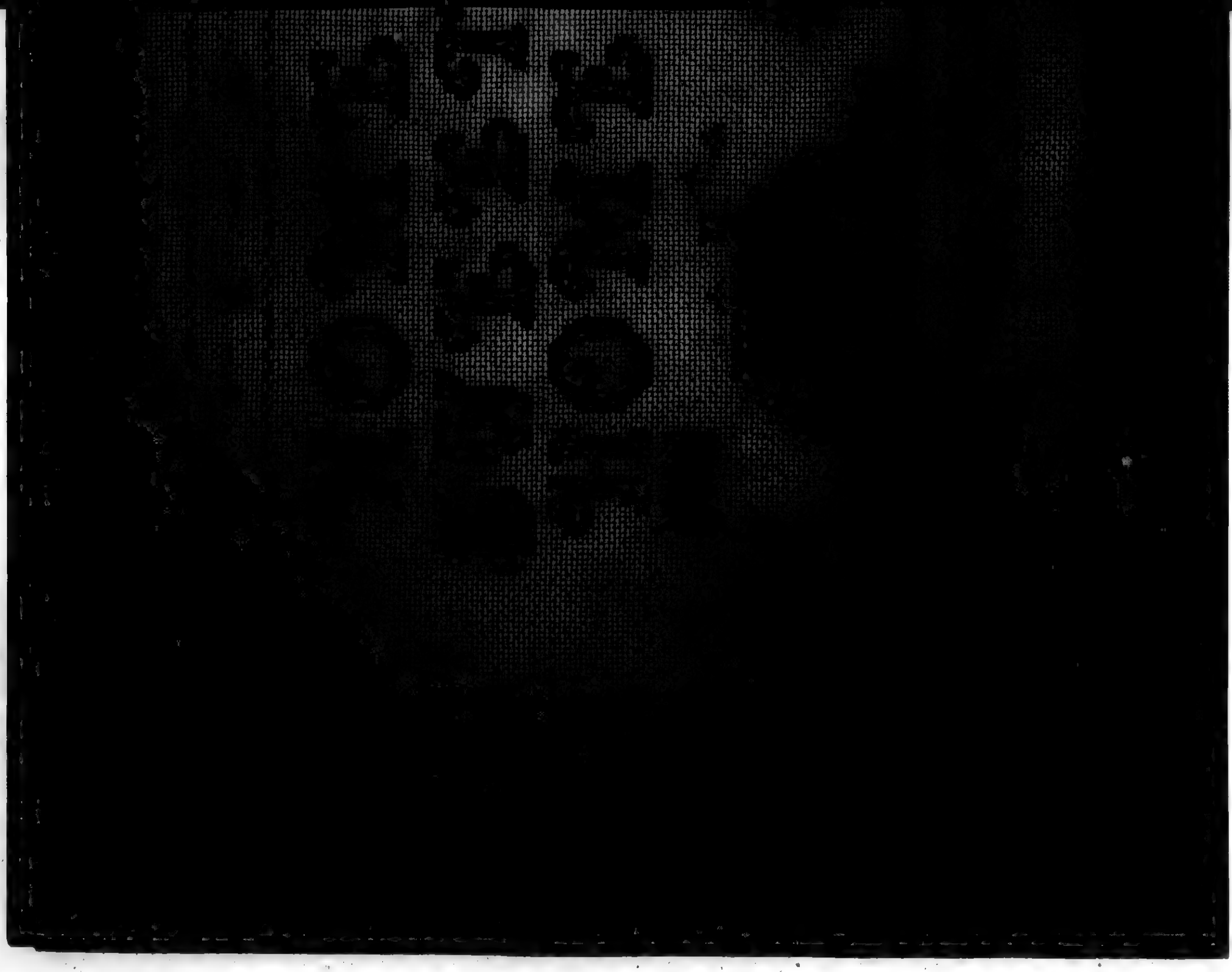
As AD/Cycle implementation plans are developed, the impact of cultural and organizational change should constantly be considered.

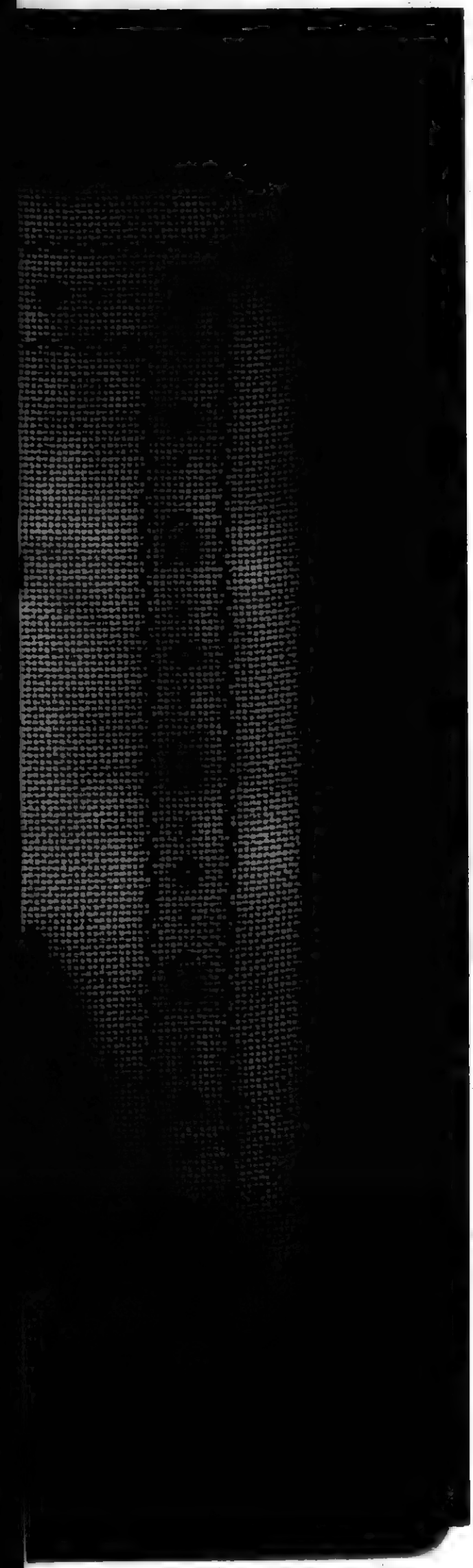
Implementation plans should include activities that guide the change process so that change can be used as an asset rather than a liability.

Dalziel and Schoonover also identify five critical factors to consider when planning change. These five factors can be applied

Holcman is president of Computer & Engineering Consultants Ltd. in Southfield, Mich.

- **Organizational changes are key**
- **Long- and short-term plans needed**
- **The time to start is now**





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to AD/Cycle implementation:

1) Clarifying plans. AD/Cycle implementation plans and benefits should be defined and conveyed to everyone affected by the new systems development environment. This includes clearly identifying the changes that are required by all levels of the organization.

2) Integrating new practices. Time should be taken to learn how the AD/Cycle tools and methodology will be incorporated into the existing systems development environment.

Everyone involved in the software development process should clearly understand when to utilize the new AD/Cycle components and when possibly to continue to utilize previous development practices.

ESTABLISHING A SENSE of ownership will lead to greater acceptance and more effective use of AD/Cycle.

3) Providing education. AD/Cycle requires many people to learn new roles and take on new responsibilities within the software development process. Education and support need to be provided to these individuals so that they can learn to effectively utilize AD/Cycle components and processes.

4) Fostering ownership. A continual effort must be made to avoid "imposing" AD/Cycle on software development organizations.

Establishing a sense of ownership will lead to greater acceptance and more effective use of AD/Cycle. Individuals who are affected by AD/Cycle should have key participation roles in the planning and implementation of AD/Cycle activities.

5) Giving and getting feedback. AD/Cycle implementation objectives should be defined and monitored during all introduction activities. The effectiveness of implementation activities should be used as feedback to modify and improve AD/Cycle implementation plans.

The justification for AD/Cycle is another key aspect that has to be addressed during the preparation activities. Steps need to be incorporated into the implementation plans that measure and document the benefits of AD/Cycle.

First things first

Before that, however, software development organizations must understand and document how well they perform software development activities today.

By understanding which software development steps are performed well and which need improvement, AD/Cycle

AD/Cycle in six steps

Software visionary Ed Yourdon has identified six changes required by software development organizations that introduce IBM's AD/Cycle:

1) An organizational commitment to use a common, standard set of development tools and methodologies rather than every software engineer and/or project team using a private set.

2) An organizational commitment to use a code generator and/or application generator and get out of the business of handwritten code.

3) The use of a common repository to store all information about all systems in the organization and the decision to treat this information as a major corporate asset.

4) A shift in emphasis away from superfast production of mediocre systems to a new emphasis on high-quality systems that are responsive to user needs.

5) A corporate commitment to capture metrics on all aspects of systems development and maintenance.

6) A decision to use an active approach to software reusability at the beginning of projects.

SAMUEL B. HOLCMAN

Short-term strategies

Your short-term plan for implementing AD/Cycle should identify steps that can be performed during the coming year.

These will get you started and help your organization achieve some of the longer range benefits.

1) Assess current capabilities
- Establish AD/Cycle project team
- Review current applications development approach
- Assess current tools
- Identify current skills
- Assess organizational readiness

2) Establish methodology
- Talk to others
- Identify alternatives
- Develop methodology
- Document methodology
- Prepare education materials

3) Select initial AD/Cycle components
- Establish tool requirements
- Evaluate and select AD/Cycle tools
- Identify education and support
- Complete justification process
- Acquire and install AD/Cycle tools

4) Initiate education plan
- Identify skill requirements
- Evaluate education sources
- Develop initial education plan
- Begin education program

5) Establish measurement program
- Select metrics
- Establish measurement procedures
- Measure current quality and productivity levels

6) Conduct pilot projects
- Identify and select projects
- Prepare project plans
- Acquire management support
- Educate project team
- Conduct projects
- Document project results

SAMUEL B. HOLCMAN

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   - 99. Others _____

   (Please specify)

3. **COMPUTER INVOLVEMENT** (Circle all that apply)
   Types of equipment with which you are personally involved either as a user, vendor, or consultant
   - A. Mainframes/Supermins
   - B. Minicomputers/Small Business Computers
   - C. Microcomputers/Desktops
   - D. Communications Systems
   - E. Local Area Networks
   - F No Computer Involvement

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OS/2, Unix facing net clash PS/2 tries

The Newsweekly of Information Systems Management

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implementation activities can be prioritized by need.

Furthermore, if the effectiveness levels of current development practices are measured and quantified, these measures can be used to determine the improvements, benefits and justification associated with implementing AD/Cycle.

Because one of the primary motivations in introducing AD/Cycle is to improve software development productivity and quality, we need to understand the productivity and quality levels currently being achieved by the development organization.

Software guru Ed Yourdon has written: "It makes no sense to bring in expensive tools to improve productivity if you don't know your current productivity level. Why bother trying to increase quality if you don't know your system's current quality level and you have no agreed-upon way of measuring quality?"

SUPPORT FOR AD/CYCLE throughout the organization is a critical factor. Those who are most affected by AD/Cycle should play a major role in identifying the benefits to the software development process and the most effective methods of introduction.

Software development organizations should measure current productivity and quality levels *before* they introduce AD/Cycle.

To accomplish this, a short-term strategy can be identified and executed to prepare development organizations for AD/Cycle (see story page 72).

AD/Cycle provides the software development community with great potential for increased productivity and quality improvement.

However, this improvement will be realized only by those organizations that prepare themselves wisely. The good news is that many of the AD/Cycle tools are not yet available, allowing software development organizations time to get ready.

With the tremendous impact AD/Cycle will have on software development in the '90s, failing to prepare will be equivalent to preparing to fail. ●

Long-term strategies

As additional AD/Cycle components become available, you'll need to develop a longer range strategy.

This plan will identify the remaining steps needed to integrate future AD/Cycle components into a comprehensive environment that can support software development, implementation and maintenance activities.

1) Review short-term results
- Consolidate project results
- Document quality and productivity improvements
- Identify remaining areas for improvement
- Develop continuing introduction recommendation
- Renew management support

2) Complete methodology introduction
- Review project feedback
- Revise methodology
- Update documentation
- Revise education materials
- Establish ongoing feedback and improvement process

3) Select additional AD/Cycle components
- Update tool requirements
- Evaluate and select additional AD/Cycle tools
- Identify education and support
- Develop integration plan
- Complete justification process
- Acquire and install AD/Cycle tools

4) Complete education program
- Review/revise skill requirements
- Evaluate education effectiveness
- Update education plan
- Complete education program

5) Deploy measurement program
- Begin ongoing measurement program
- Identify quality and productivity improvement opportunities
- Establish quality and productivity goals
- Integrate measurement reporting into planning processes

6) Establish support functions
- Review project support skills and effectiveness
- Identify support organizations:
  - Methodology
  - Data administration
  - Process administration
  - AD/Cycle components
  - Training
  - Measurement
- Develop personnel recommendations

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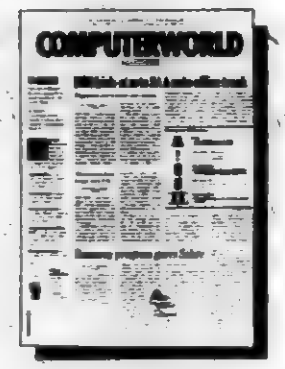

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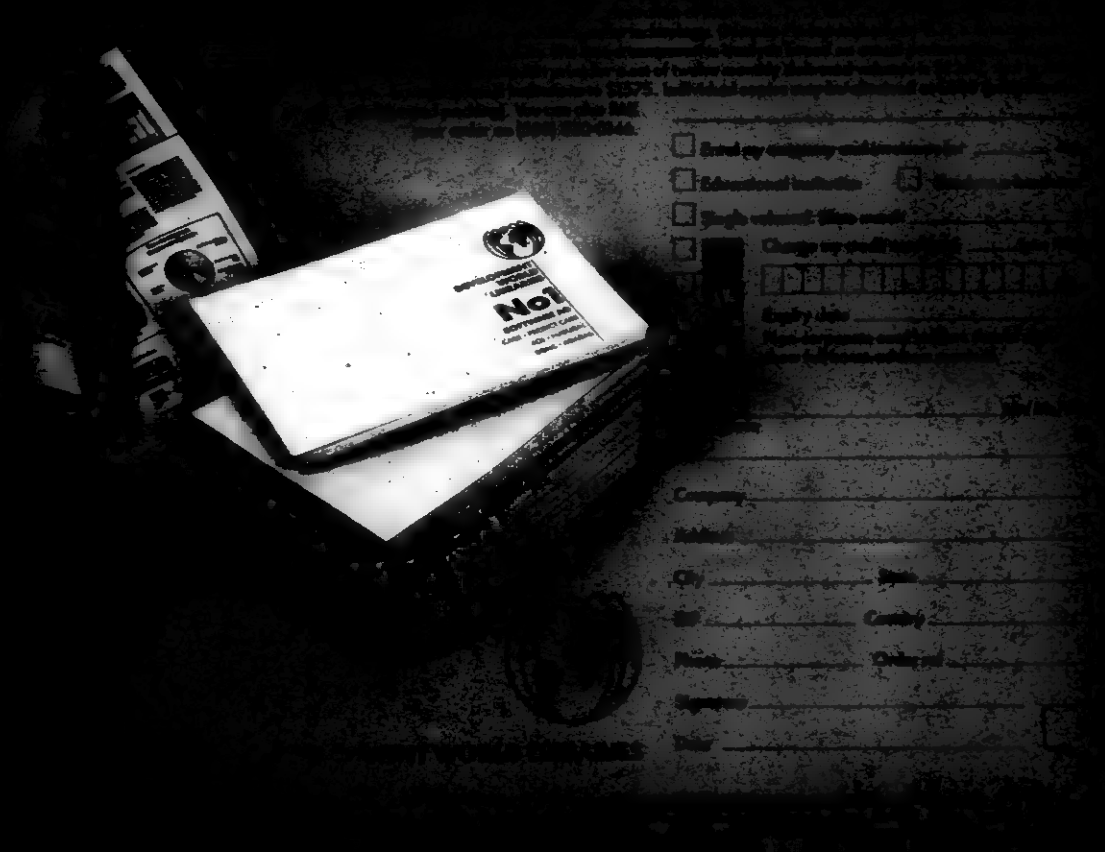

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Future present

Scotts Valley, Calif.-based compact disc/read-only memory systems provider **Meridian Data, Inc.** earlier this month extended a seat on its board to former **Apple Computer, Inc.** executive Jean-Louis Gassee. Meridian President Fred Meyer said the firm hopes to leverage Gassee's experience in the computer industry as the CD/multimedia and commercial computer worlds converge. Meanwhile, back at Apple, a spate of executive announcements added up to a vote of confidence in **Michael Spindler**, nearing his first anniversary as president. Included: a board seat for Spindler.

Switching

After some 20 years in private data communications networks, Cambridge, Mass.-based **BBN Communications** is reaching to cut itself a heartier slice of the networking market. The firm said that over the next two years it will vault its traditional packet-switching and internetworking capability into broadband networking based on cell switching. Toward that goal, BBN pledged to provide T1 and frame-relay support on its new T/300 packet-switching node and integrate its proprietary network management tools and applications on **Digital Equipment Corp.**'s EMA architecture by 1993.

What a CAD

Nostalgia is unlikely to be the reigning sensation as the computer industry bids adieu to 1990 next month; it might run high, however, in the CAD/CAM/CAE sector. According to a recent report from market research firm **Daratech, Inc.**, 1990 was a banner year for vendors in this arena, with overall revenue growth at 14.2%, up two points from 1989, and the three market leaders — **IBM, Intergraph Corp.** and **Prime Computer, Inc.**'s Computervision division — all posting solid double-digit increases. For Huntsville, Ala.-based Intergraph, in particular, 1990 should evoke fond memories as the year in which the firm broke the $1 billion barrier, moved securely into the No. 2 position in the CAD/CAM market and outscored all direct competitors in user satisfaction, according to Daratech.

Filling in the gaps with Brownstone

DB2 development software firm makes its mark where giants don't tread

BY CLINTON WILDER
CW STAFF

NEW YORK — Think of development repositories, DB2 tools and computer-aided software engineering (CASE) methodologies, and you have to think big. Big names such as IBM, Andersen Consulting and Knowledgeware, Inc. come to mind — and Brownstone Solutions.

Who?

Brownstone, a 4-year-old, 16-employee software company tucked amid the bustle of midtown Manhattan, plays in the neighborhood of the big boys. In fact, Brownstone has something that the big boy named IBM doesn't have yet: a DB2-based data dictionary, called Data Dictionary/Solution (DDS), that provides an environment for a DB2 software repository.

What made the Brownstone's founders take their game to this arena?

John Marshall

Brownstone's Stone (left) and Brown *found a need and filled it*

"If we'd thought about it too hard at the time, we wouldn't have done it," director Barry Brown explained. "Selling strategic software to Fortune 500 companies as a two-person outfit? People said we were crazy. But we didn't think of it that way. We just had ideas that we wanted to work on."

The company takes its name not from the handsome Murray Hill townhouses that line the streets near its office, but from the names of its co-founders and co-directors, Brown and Lewis Stone. These guys are not even "thirtysomething" yet — they are 30 (well, Brown turned 31 last week). And their highly specialized, highly technical software niche has doubled Brownstone's revenue every year so far and landed the company several accounts that include Citibank NA, Merrill Lynch & Co., General Mills Corp. and Metropolitan Life Insurance Co.

Brown and Stone met right

Continued on page 82

Smart cards coming to forefront in Europe

BY PHILIPPE ROSE
IDG NEWS SERVICE

PARIS — From telephone cards to banking applications and pay-per-view television, smart cards are evolving into a mass market in Europe. According to market research firm Dataquest, Inc., European smart-card production is expected to increase 35% annually and reach 200 million units by 1994, compared with 45 million units in 1989.

Currently dominated by credit cards and prepaid telephone cards — which are not "smart" — the value of the European memory-card market is expected to multiply 8½ times to total $139 million in 1994, compared with its 1989 value of $16.3 million, a compound annual growth rate of 54%.

Production of prepaid telephone cards, or token cards, and smart cards used in the banking sector currently account for more than 95% of the market. France's Bull S.A., Gemplus, Schlumberger Ltd. and Sligos Monetique manufactured 41 million token cards in 1989, largely used as prepayment cards for public pay phones, vending machines and parking lots. Together, these firms account for about 57% of total memory-card production.

More than 95% of the token cards manufactured were used by France Telecom as prepaid public telephone cards. This market is expected to continue to expand, according to Dataquest. Most European countries, including Finland, Ireland, Norway, Germany and Spain, have recently adopted this form of payment.

The study revealed that in 1989, four out of 10 smart cards produced were for banking applications, mainly in France. These memory cards are destined to replace the traditional magnetic-stripe credit or bank cards introduced at the end of the 1960s. While the production cost remains the same, the banking "smart card" offers two new features: security obtained through local control of a confidential code and the ability to use integrated circuits to incorporate additional services. After much hesitation, France has committed itself to this type of smart-card technology, essentially for security reasons.

However, the Dataquest study revealed that adoption of the smart card across Europe has not aroused enthusiasm from banks, which believe that the savings from prevention of fraud are not sufficient justification alone for migration away from magnetic-stripe credit cards.

France and Norway, however, are proving to be exceptions to the conservative European banking rule. According to Dataquest analysts, French banks — with four million out of the 19 million cards equipped with chips — work closely with the strategic initiatives in information technology advocated by the French government. In Norway, the fixed lines needed for on-line processing are so expensive in comparison with similar costs in the rest of Europe that smart cards are necessary.

Telephone and banking applications will continue to monopolize the smart-card market at least through 1994, holding a 52% and 37% share of units produced, respectively. These figures compare with 86% for telephone applications and 8% for banking solutions in 1989.

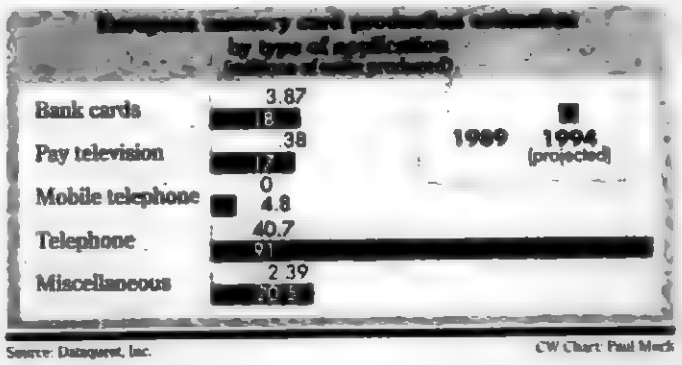
Pay-per-view television, which accounted for less than 1% of the total market value in 1989, is expected to grow to 17% by 1994, according to Dataquest. The first fruits of prepaid TV viewing began with the British movie channel Sky Channel in February and with the Canal Plus station in France. French firms such as Bull are also focusing on this market niche.

"By the year 2000," said Jonathan Drazin, an analyst at Dataquest Europe, "we expect to see one card per human being in Europe."

Philippe Rose is a writer at Le Monde Informatique, *an IDG publication.*

Get smart

Banks and pay television are leading the surge toward 'smart' memory cards in Europe



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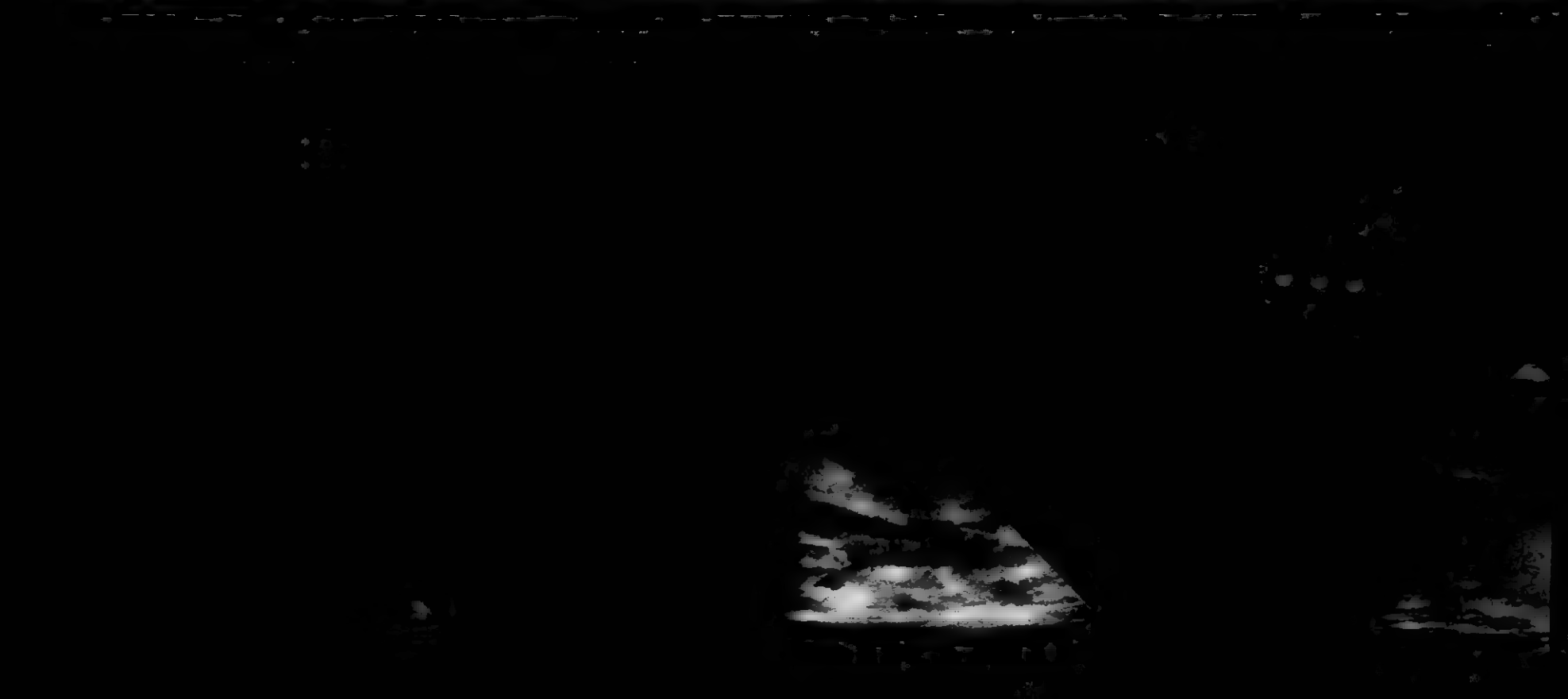

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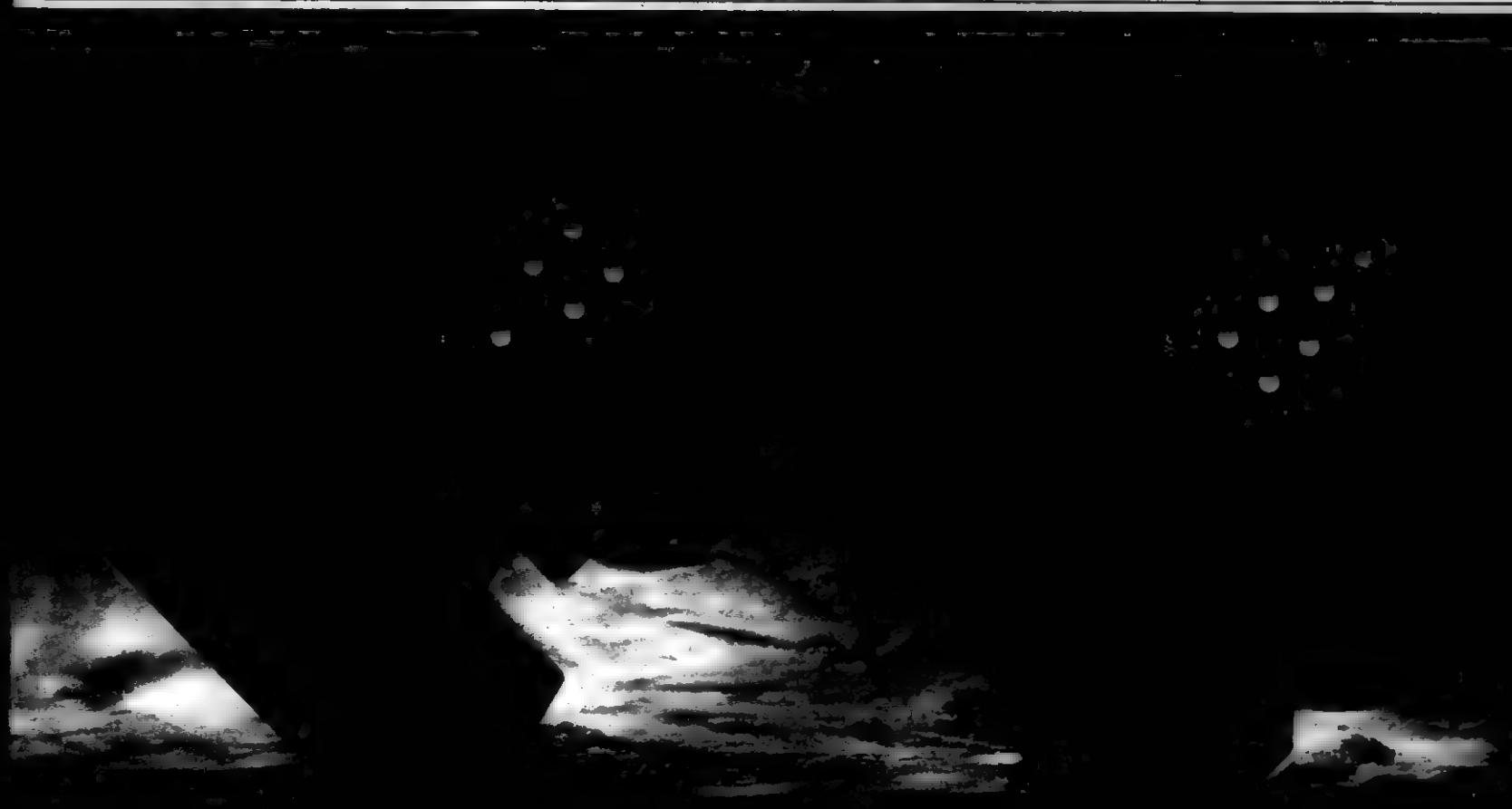

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Andersen guards No. 1 status

Consultancy exec enjoys firm's success; analyst notes its Achilles' heels

BY ELLIS BOOKER
CW STAFF

CHICAGO — "If they write a postmortem on Andersen Consulting a decade from now," declared George T. Shaheen, managing partner and chief executive officer, "it'll say, 'They didn't take advantage of the position they had.' "

Jealously guarding that position as one of the world's premier systems integrators appears to be Job No. 1 for Shaheen, who seems genuinely convinced by the message his firm routinely gives to its clients. "In the '90s, change will happen dramatically, quickly and will be very final," he said. "There will be winners and losers."

For the moment, however, Andersen enjoys an enviable and winning position. The company, one of the two business units of The Arthur Andersen Worldwide Organization, posted a 30% revenue growth from $1.44 billion to $1.88 billion for the fiscal year ended Aug. 31. By the end of 1991, the firm hopes to have grown from 22,000 to 26,000 or 27,000 employees and have revenue in the $2.4 billion to $2.5 billion range, Shaheen said.

A holistic approach

Analysts credit Andersen with taking a holistic approach to consulting. The firm broadened its "main-line" business of systems engineering several years ago to include strategic consulting on the front end, training and organizational consulting — what Andersen refers to as "change management" — on the back end and facilities management in between.

"They are very smart in terms of pulling technology as opposed to pushing it," said Rich Peterson, president of Impact Research, Inc. in Upper Montclair, N.J. "They think process rather than product; they think business rather than technology."

Nevertheless, Peterson noted at least two areas in which Andersen is marginally vulnerable. First, he said, there are Andersen's prices, which Peterson estimated are up to 20% — and in some cases 50% — higher than those of its competitors.

Shaheen *expects continued growth*

Given this, Peterson has a hard time accepting the theory that outsourcing customers get much of a break. "I just can't imagine Andersen supplying people at rates comparable to [those of] the in-house organization," he said.

Andersen overcomes such comparisons, Peterson said, by telling customers that it will bring in top talent to re-engineer the data center — both its operations and applications — and make it more efficient and capable.

However, this leads to another vulnerability, he said: the fact that Andersen does not have enough "heavy hitters" to go around.

According to Peterson, this is a frequent complaint of customers who may be sold on Andersen on the weight of a very senior partner only to see the job handed to junior personnel once the contract has been inked. "You're sold the Cadillac, and the Plymouth shows up," he said.

Andersen's answer is that at Andersen, even the bottom of the corporate ladder is the top of the line. Grooming its staff — 9,000 employees in the U.S., 22,000 worldwide — is a cornerstone of the approach favored by the firm, which spends 8% to 10% of its earnings on training and has committed $150 million to a five-year retraining effort focused on the St. Charles, Ill., campus it acquired in the late 1970s.

Change, volatility and the strategic advantage companies can realize in such times are what fuel Shaheen's vision of Andersen and what prompts him to keep a watchful eye over his shoulder, he said.

On the short list of firms he considers competitors, Shaheen included General Motors Corp.'s subsidiary Electronic Data Systems Corp., IBM and European-based CAP Gemini Sogeti.

While gracious about these challengers, Shaheen managed to suggest that each lacks something, from a strong international presence to a diversified product line, that maps against Andersen's own suite of services and products.

Shaheen expressed confidence that Andersen will continue to see a stream of clients despite the worsening worldwide economy. "There will be scrutiny and rigid expectations [by customers]," he said, "but I do not feel information technology will be subjugated to a second-tier priority."

REPORTER'S NOTEBOOK

Adapso: Names, games, videotapes

BY PAUL GILLIN
CW STAFF

Few people recall what the old acronym stood for in the first place, and soon no one will even have to try: **Adapso**, the software and services industry organization, is changing its name to the **Information Technology Association** in a stated effort to "be a voice of the entire information technology industry," said Adapso President Luanne James at the association's semiannual meeting early this month. However, the move may be prompted as much by a need to bolster sagging membership as by an effort to be an industry leader. Adapso lost about 100 members in recent years. It plans to take another stab at bolstering membership by recruiting hardware-only firms but is unclear how aggressive it plans to get. Outgoing Chairman David Eakra included the plan on a list of major Adapso goals in a speech to members. Certain Adapso hot buttons have become crucial to hardware as well as software firms. However, James noted, "I'm not going to tell you I expect a bunch of disk drive makers to suddenly join."

Despite a near-tragic incident in which a conference attendee was bitten by a tiger hired as part of the entertainment, the charity benefit roast of **Dun & Bradstreet Software** Chairman **John Imlay** went ahead. Among the zingers aimed at Imlay and others on the podium:

"As a child, little John developed an uncanny ability to locate his parents each time they moved to a new location" — Georgia Sen. Sam Nunn.

"At D&B, he's in the awkward position of being forgotten but not gone." — Attorney Robert Steed.

"[Knowledgeware Chairman] Fran Tarkenton attended Georgia State on a full athletic scholarship, which as you know includes the crayons and everything." — Steed.

Women now hold the top two positions at Adapso. **Judith Hamilton**, a partner at **Ernst & Young**, was elected to a one-year term as chairman earlier this month, and **James** was promoted from executive director to president.

One hit of the conference was a five-minute rap video aimed at schoolchildren and promoting computer careers. The video, which was produced by an Adapso committee on a $1,700 shoestring budget, uses rapid-fire film clips and a thumping rap beat to make careers in computing look hip and fun.

Seagate not planning to build optical disc drives

BY MAURA J. HARRINGTON
CW STAFF

Seagate Technologies, Inc. has no plans to incorporate any optical disc drives into its product lineup in "the foreseeable future," Chief Executive Officer and co-founder Alan Shugart told *Computerworld* during an interview at the Comdex/Fall '90 show earlier this month in Las Vegas.

"We have no optical disc drive efforts going on right now . . . and we don't think it's compatible with any of our mainstream markets," Shugart said. "As long as magnetic recording technology continues to increase . . . we don't see [optical] as a viable competitor."

In addition to already having a profitable established product line, Shugart said, Seagate is reluctant to dive into optical drives because the market is still a niche market, the governing standards are too few, and the prices are too high.

However, he said, that is not to say the firm won't profit from other emerging technologies.

"Multimedia technology and the general growth of computers will cause our company to grow, too," Shugart said.

Indeed, Seagate has grown considerably in the past year. Including its acquisition of former Control Data Corp. division Imprimis, Inc., the company's net income grew from $349,000 in 1989 to $1.17 million in 1990. In addition, net sales almost doubled, from $1.37 billion in 1989 to $2.41 billion in fiscal 1990, ended June 30.

Shugart said there is plenty of room for the company to grow even more.

Seagate, he said, is focusing on very high-end technology for data-intensive users — nine-head magnetic storage devices, for example — and on increasing its position in the 2½-in. drive market in noncomputer applications.

"I think that by the better half of this decade, we'll see noncomputer applications that are just as exciting as [those for] computers," Shugart said.

Taiwan pours money into its own microchip development

BY CHRIS BROWN
IDG NEWS SERVICE

TAIPEI, Taiwan — Midway through a five-year semiconductor research plan, Taiwan has decided to redirect its energies into developing its own semiconductor mass-production process.

Taiwan's $214 million submicron development plan, which was initiated in 1988 by the Ministry of Economic Affairs, has come under scrutiny during the last few months. Government planners said they want to see Taiwan develop its own semiconductor manufacturing process so that it can mass produce integrated circuits for the international market.

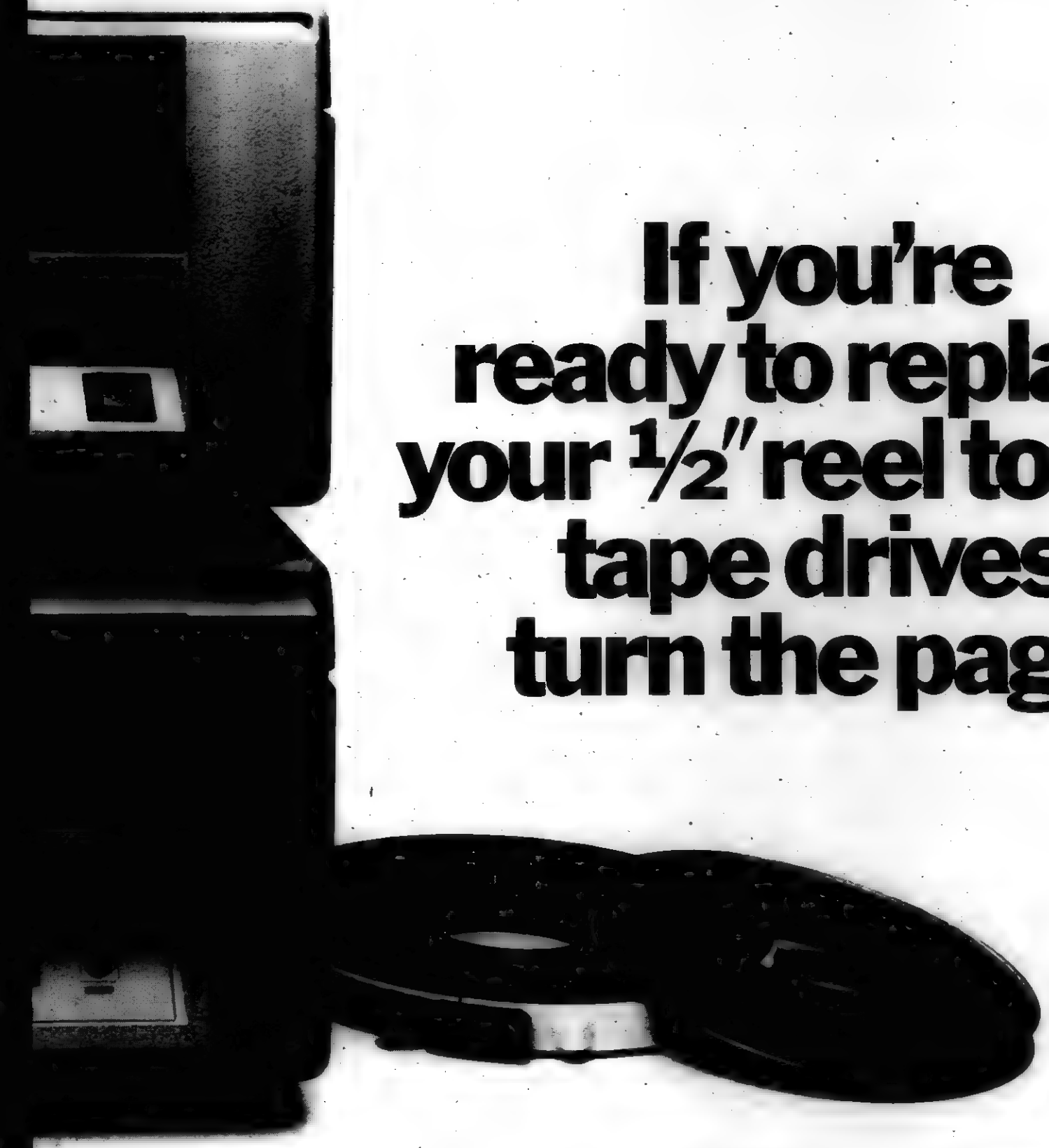
The new plan is backed by top-level government leaders. Shi Yao-hsiang, director of the government's Science and Technology Advisory Group, has been one of the supporters urging Taiwan to develop its own semiconductor production technology.

In the past, the state-sponsored Electronics Service & Research Organization (ERSO) has focused mostly on design of integrated circuits. But it is now beginning to sign up foreign firms to help out with the submicron project. An August agreement between ERSO and U.S.-based Applied Materials Technology is the latest example.

Taiwan is looking particularly to develop its own fabrication process technology. One plan from the Ministry of Economic Affairs calls for the government and private industry to jointly invest in projects.

ERSO is expected to draw up a blueprint for the memory chip venture by 1992. Last year, Taiwan's Acer, Inc. and Texas Instruments, Inc. signed a joint venture to co-produce 4M-byte memory chips with Taiwan starting in the third quarter of next year.

If you're ready to replace your ½" reel to reel tape drives, turn the page.



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The choice of the world's leading computer companies.

Dealer, reseller channels a must in Europe

BY MAURA J. HARRINGTON
CW STAFF

MUNICH, Germany — Information systems managers aiming to help their companies expand their computer operations in Europe, take note: Business in Europe is a whole different game.

So says Jochen Tschunke, founder and chairman of Munich-based Computer 2000, which sells to about 15,000 dealers and resellers in Europe.

The IS manager who plans to buy products in Europe, he said, will no longer be able to bank on buying directly from a distributor. The computer reseller channel is much stronger in Europe than in the U.S., Tschunke said. Moreover, he added, end users have more incentive to buy products — which tend to be between 10% and 15% more expensive — through this channel because it offers more end-user support.

"The reseller channel is much different here than [it is] in America," Tschunke said. "It is much more decentralized in Europe."

Tschunke, head of one of the fastest growing distribution companies in Europe, said that mail order buying — the other apparent purchase option of choice in the U.S. — is also relatively unviable in Europe. "That doesn't really fit into the way Europeans do business, and it hasn't spread here like it has in the U.S.," Tschunke said.

How does one find a decent reseller in Europe? Tschunke may tell you to make sure the reseller's distributor is selling only quality goods to the resellers, as he himself claims to do.

Whatever Computer 2000 is doing appears to be good for the company's business. Service, support and one golden rule — which is never to compete with systems manufacturers or dealers — has brought the company's annual revenue up to an estimated $400 million for fiscal 1989, which ended in September, Tschunke said.

Across the Atlantic, he said, this is how it goes: Distributors buy from manufacturers and sell to the retail chain, which in turn sells to end users, usually at prices 10% to 15% higher than the cost of the same product in the U.S.

Bent on becoming Europe's largest peripherals and software distribution company serving the IBM Personal Computer and compatibles market by 1992, Computer 2000 has a significant lead on many of its German counterparts, most of which have revenues hovering in the $65 million to $100 million range, according to Doug Kass, a distribution and retail chain analyst at Dataquest, Inc., a market research firm based in San Jose, Calif.

Tschunke *will buy products in Europe*

Competition is increasing from U.S. distribution giants such as Ingram-Micro D Corp. and Merisel, Kass said. However, Tschunke claimed that Computer 2000 has an edge because it is a European company with an understanding of the European way of doing business.

"Many other distribution companies do not account for cultural differences when they are making their forecasts," he said. "For example, some European companies will laugh at you if you tell them you want their money before 180 days after the sale," Tschunke said, adding that it would be a cultural faux pas to expect the money.

Founded in 1983, Computer 2000 claimed that it has always been profitable, with a 128% increase in total sales volume for the 1990 fiscal year.

Posted year-end revenue for the company jumped to 600 million deutsch marks, compared with 262.8 million deutsch marks in total sales volume for fiscal year 1989, according to Tschunke.

"We are positively convinced that we will go over 1 billion deutsch marks in sales by the end of 1992, which is about $700 million," Tschunke said.

With operations in Germany, Switzerland, Austria, Spain, the UK, Belgium and the Netherlands, Computer 2000 has no plans to slow down its growth. Tschunke said the company plans to expand its operations into Eastern Europe, Portugal, Italy and France through acquisitions and alliances.

While he did not foreclose the option of expanding to the U.S., Tschunke said the company's main focus rests on Europe.

Way to go

Munich-based Computer 2000 credits its rise to its ability to deal with dealers and resellers

CW Chart: Paul Moch

Brownstone

FROM PAGE 77

out of college while working together in the early 1980s at Arthur Andersen & Co.'s technical services organization — the predecessor of today's Andersen Consulting.

Working on large-scale development projects for big clients such as First Boston Corp. in the early days of DB2, the two perceived a need for better development tools.

"Instead of doing it with manpower, the way Andersen would, we thought we could do it with software," Brown said.

Thus were born two unlikely entrepreneurs, who left Andersen to consult by day and code by night in their equivalent of the legendary Jobs/Wozniak garage: Brown's New York studio apartment. "We started as technicians, and we still are," Stone said. "You can get us more excited about a new technology innovation than about the dollars coming in next quarter."

Brownstone, which forecasts revenue of about $2.2 million this year, has a history that is almost too storybooklike to believe. "When we went to open our first corporate bank account and they asked us for a deposit, Lew and I each reached into our pockets and pulled out a $20 bill," Brown recalled with a laugh.

Since then, spurning the overtures of venture capital firms, Brownstone has been self-financed. It has released an enhanced version of its core DDS product every year and developed three add-on products.

Along with several moves into successively larger Manhattan office spaces because of growth, it has opened sales offices in Philadelphia and Chicago and plans a San Francisco opening by the end of the year. The firm also runs a small development center in Norwalk, Conn., where programmers working on new products can "hibernate," Brown said.

Bigger than both of them

Brown and Stone admitted that their company's size posed a marketing challenge in the early days, with some customers requesting a credit check on their finances from The Dun & Bradstreet Corp. "But that doesn't happen anymore," Brown said. "The typical user assumes we're much larger than we are."

And bigger is not necessarily better, said Brownstone user Lucy Cole, data services manager at Hewlett-Packard Co.'s Information Systems Group in Palo Alto, Calif. "Smaller companies tend to be more responsive, and that's a very positive thing," Cole said. "They're unlikely to promise what they can't deliver. With Brownstone, we've been able to rely on their delivering what they say they will."

Brownstone's three add-on products to DDS in the past three years are DB2 Admin/Solution, a suite of tools for DB2 administration; IMS Admin/Solution, a comparable tool set for the older IBM database management system; and IE Admin/Solution, a link between Knowledgeware's workstation-based programming and Brownstone's DDS repository on the mainframe.

Future product plans include workstation-based graphical interfaces to Brownstone's mainframe tools. The company is also considering links to the development environments of other leading CASE vendors such as Index Technology, Inc. and Bachmann Information Systems, Inc.

But the biggest question looming over Brownstone's future is a few miles north in Westchester County, N.Y. When IBM fills in the gaps of AD/Cycle and delivers its full repository, will Brownstone's niche disappear?

"We will continue to provide a dictionary and tools on top of the IBM Repository," Stone said. "We don't feel like we're in the path of the steamroller."

"When we started," Brown added, "the sky was all blue. A lot of CASE and DB2 tools have come out since then, but we have adapted. And we have twice as many ideas for new products now as when we started. We see our future role as something like software systems integrators."

Moreover, it is not a foregone conclusion that Brownstone users will migrate to the IBM Repository when the day arrives. Early Brownstone customer Pacific Bell in San Ramon, Calif., is "in a constant state of evaluation" about the migration decision, systems analyst Bob Jones said.

"What [Brownstone] will provide that IBM won't is not clear, but IBM so far is not providing a lot of tools," he said. "My own personal opinion is that before we migrate, we want to make sure that we won't lose any of the functionality that we currently have."

INTERNATIONAL BRIEFS

Olivetti cuts deeper

In the face of tough times in the European computer industry, Italy's **Ing. C. Olivetti & Co.** is reportedly about to cut another 7,000 jobs from its worldwide work force. Olivetti, which has 57,000 employees worldwide, has already cut 3,500 this year and 2,000 in 1989 as part of a major restructuring plan. During the past two years, the firm reorganized its business into four operating firms to halt slumping profits caused by declining demand, stiff competition and the strong lira.

Taking notes

An alliance of 47 **Taiwanese** firms is gearing up to launch what will soon be the standard notebook computer for Taiwan. The firms are aligning Taiwan's state-sponsored Computer & Communication Laboratory to agree on a design specification and standard parts. Meanwhile, the notebook made its debut at Comdex/Fall '90 in Las Vegas.

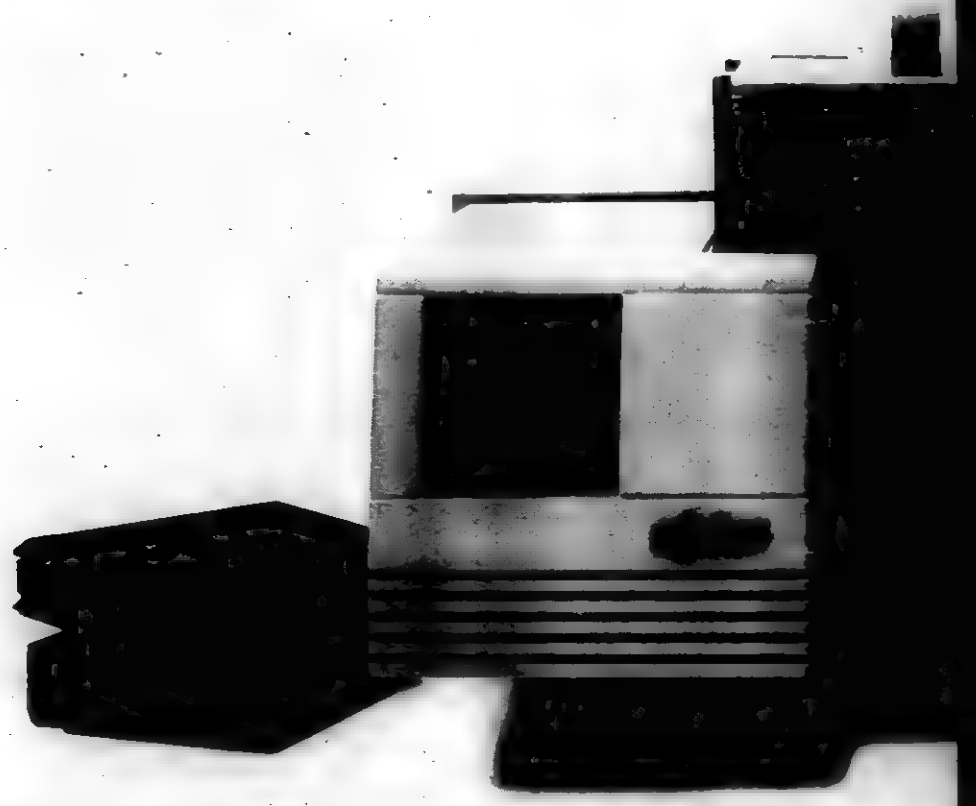
Universal Unix

AT&T is branching out in Asia to license its latest version of Unix to hardware firms and to win over Unix software developers. Tokyo-based **Unix Systems Laboratory Pacific**, an AT&T start-up, has set up offices in Taipei and Seoul, South Korea, over the last two months. The firm has already been operating in many Asian markets for several years.

Submarine nets

NEC Corp., Fujitsu Ltd. and **Ocean Cable Co.** have signed a contract in Brunei to construct an undersea fiber-optic cable network linking Brunei, Singapore, Malaysia and the Philippines, all members of the Association of Southeast Asia Nations. The Brunei-Singapore connection should be complete by November 1991, with the line from Brunei through Malaysia and the Philippines operative two months later.

If you're not, go back a page.



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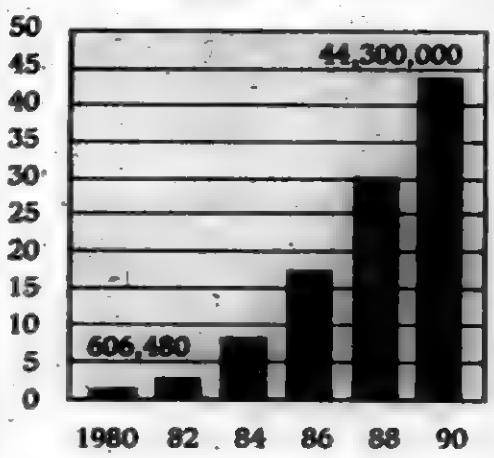
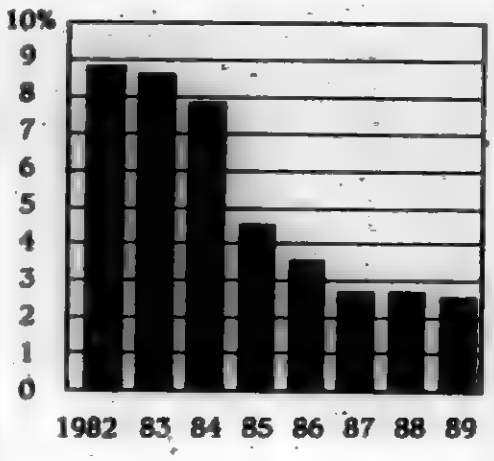


Fewer campus freshmen are choosing computer careers**



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The viability of telecommuting in IS

BY KEVIN BURDEN
CW STAFF

Telecommuting — working at home using a personal computer and modem linked to the office — is allowing many professionals to boost productivity while avoiding the grind of daily commutes. But is it appropriate for all types of workers?

The answer for information systems professionals depends greatly on the nature of their jobs and their managers' attitudes toward telecommuting. For example, Pacific Bell in San Francisco, which has had a formal telecommuting program in place since 1984, is a strong advocate of telecommuting because it allows employees to maintain flexible hours.

"When you have someone who can solve a problem in the middle of the night, it's much easier for them to roll out of bed and walk 20 steps to their computer than hop in the car and drive 20 miles to the office," says Steve Cotler, Bay Area vice president at Pacific Bell.

At Blue Cross/Blue Shield in Washington, D.C., Amee Nable, a systems programmer, sees a similar advantage: "Because our computer system stays on-line 24 hours a day, I can catch up from home anytime if I fall behind."

Increases in productivity, although difficult to measure, are often cited as a key benefit of allowing employees to work in outlying locations.

Most companies can expect a 20% productivity hike from telecommuters, regardless of the type of work, says telecommuting proponent Gil Gordon, president of Gil Gordon Associates in Monmouth Junction, N.J. Companies also report enhanced work quality, heightened employee morale and lower relocation expenses as a result of telecommuting policies.

Telecommuters say that their overall working conditions vastly improve: They can spend more time with their families by not having to make a round-trip of as much as two hours per day, and they claim to feel less stress.

Even if a company or manager gives the green light to telecommuting, employees must determine whether telecommuting is viable for the types of jobs they perform.

Workers whose physical presence in the office isn't necessary for their jobs are at a clear advantage. Programmers and analysts, for example, can crate the essential materials from their offices in a briefcase and effectively work at home on their own PCs. Even some IS managers find they can telecommute on a part-time basis.

However, telecommuting is not a utopia, and it can cause some problems. First, there is something to be said for working in an interactive office environment. Many offices foster a team atmosphere in which an employee can walk 10 steps to a neighboring cohort to ask a question that might take 10 minutes or longer to answer by calling from home.

Although the more autonomous the better, telecommuting is most conducive to those workers who don't need frequent contact with the outside world. Unfortunately, a good portion of IS jobs are service-oriented. Many IS executives act as firefighters for the host system and must be on-site.

According to Diane Bengston, IS human resource director and a telecommuting manager at The Travelers Corp. in Hartford, Conn., those professionals who support highly technical systems are just not suited for telecommuting.

Getting management to buy into telecommuting is easier said than done, says Jack Nilles, a telecommuting consultant: "IS managers feel that the work won't get done unless their people are huddled around each other."

The county of Los Angeles, which employs 8,000 people, reports that only 10 of its 700 telecommuters are IS workers. "Our IS department has been slow in starting telecommuting, but that's been a management issue," says Margery Gould, the county's project manager for the telecommuting program.

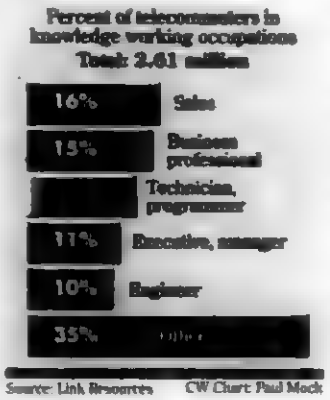
The problem is that managers have to make some big adjustments in their work styles, Nilles says. All of a sudden, they can't see what their employees are up to or how long they're at lunch. They must base management decisions on end results of the work performed.

Another pitfall to telecommuting is the difficulty of setting a worker up at home with the proper equipment. While many employees in the IS profession already own PCs, they're accustomed to working on state-of-the-art technology at work.

While telecommuting isn't a revelation for all, it does offer workers and their companies some undeniable benefits. And although office buildings are not expected to empty out, experts predict that in the future it won't be hard to find companies testing telecommuting.

Burden is the research coordinator at *Computerworld*.

Winning the bronze
IS positions are the third most common telecommuting job



Source: Link Resources CW Chart: Paul Mock

If the shoe fits . . .

Autonomous, computer-intensive positions fit the telecommuting bill best: market researchers, salespeople, journalists and IS professionals. But even within those professions, there's a fine line between who is suitable and who isn't. The following requirements are key attributes of a successful telecommuter:

- **Work can be transported to and from the office.**
- **Interpersonal communication is not vital to the job.**
- **The employee is an independent worker.**
- **The tasks and deliverables are clearly defined.**
- **Work activities are measurable.**
- **The work is content-oriented, not process-oriented.**
- **The worker has a working knowledge of a telecommuter's most valuable and useful tools — the PC and modem.**

KEVIN BURDEN

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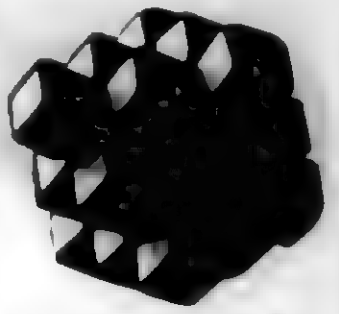

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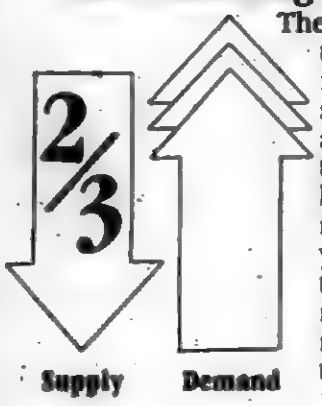
A few important tips on recruiting computer professionals

Finding computer talent isn't as easy as it used to be. In fact, there was a time when you'd just run an ad in the local newspaper and you could make a hire without waiting too long or spending too much.

But times have changed. And like so many facets of today's business, so has the effectiveness of traditional recruiting methods.

What's more, many of today's recruiters *don't use* today's most efficient methods — methods that save time and money for some widely unknown reasons.

The supply of qualified professionals isn't meeting demand



The American Council on Education reports that the number of college students choosing computer careers is down two-thirds since 1982. To make matters worse, there are more computers in today's business that require the skills of this shrinking market than ever before. And while you may never consider the company next door your competitor, it likely *is* competing for the same computer talent today. The result is a classic supply/demand problem that isn't changing for the better -and that's sure to make your recruiting tougher in the '90s.

Ads in local papers don't reach your major hiring market anymore

That's because they generally reach "active" job seekers — those who actively seek out the local newspaper to find jobs — and who a recent *Computerworld* job satisfaction survey found to represent 2 in 10 of today's computer professionals. The study also found that 7 in 10 of today's computer professionals are "passive" job seekers — those who would *consider* new job options, but likely never look for them in the local newspaper. (The remaining small percentage are "non-movers" content with long-term jobs.)

For every 10 of today's computer job seekers . . .
2 are Active
7 are Passive
1 is a Non-mover

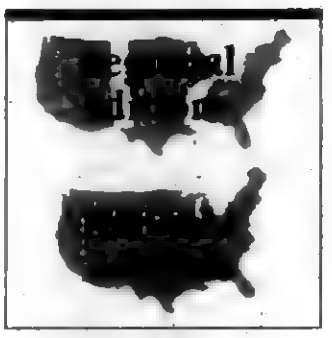
In short, this means that your ad in today's local newspaper reaches no more than 20 percent of today's computer job seekers. What's worse, if you're not using other vehicles that reach far more job seekers, your local newspaper expenses are as inefficient as their limited audience.

More job seekers see your ad in Computerworld than in any other newspaper — Sunday, daily, or trade

That's because *Computerworld* reaches over 612,000 qualified computer professionals every week — the largest audience of its kind, and one that's rich with passive and active job seekers.

That's why more companies advertise more jobs in *Computerworld* than in any other professional newspaper. And why *Computerworld* is the *single place* where America's computer professionals *expect* to see the most jobs every week.

Computerworld gives you regional editions



A key option when you need a regional candidate and want to avoid national response and relocation. Yet if your search is national in scope, *Computerworld* can also give you more widespread national exposure than any other source.

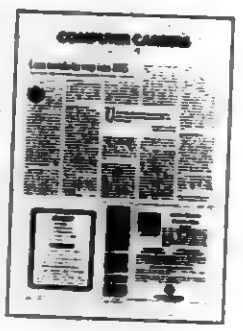
Computerworld needs just 3 working days for your ad to appear

That's comparable to most local newspapers. And why your ad can quickly appear in the next issue to start generating quality response.

Computerworld costs no more than local papers

And with a regional line rate of just $10.80, your cost-per qualified candidate reached is better than *any* newspaper - Sunday, daily or trade. Or just about any other source, for that matter.

Computerworld leads candidates to your ad



Just look at this week's Computer Careers section. You'll find a career editorial topic that will stir the interest of virtually any computer job seeker — passive *or* active. It's just one of countless reasons *Computerworld* is America's newspaper of choice on computing. No matter how much the times change.

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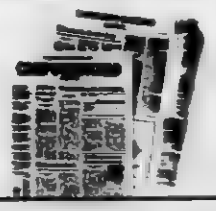

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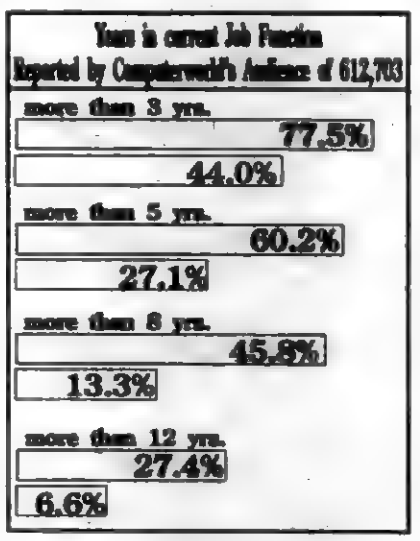

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More firms taking road to PC rentals to meet demands

BY DAVID CLAIBORNE
SPECIAL TO CW

EAI Corp., a defense contractor in Abingdon, Md., had two weeks to obtain 10 personal computers and associated peripherals to fulfill a contract to support the U.S. government in a high-level on-site product development project. The assignment was to be completed in 90 days. Where would the company find the systems the government needed? Should they be rented, leased or purchased, and who offered the best deal?

The defense contractor opted to rent because of the short turnaround period and the immediate need for the systems. It did not make sense to buy the equipment because the company would have no use for it after the project.

Furthermore, rental was the most cost-effective solution. The firm only "incurred the cost of the units for 90 days, and we were able to charge the entire cost back to the client," says Monica Borland, EAI vice president.

Safe from breakdowns

The rental route also added some security: If a computer broke down at any time during the project, another could be sent to the company within 24 hours as part of the rental agreement, Borland says.

Despite the advantages of renting PCs, many companies often view purchasing as the only option. Short-term rentals are ideal for meeting the demands of crash projects or for temporary replacement of failed equipment.

Rentals also offer companies the opportunity to evaluate products under real-life circumstances before they lay out a large purchase price.

A company's fear of being stuck with obsolete technology can also weigh heavily in deciding whether to rent or buy. Technology changes so rapidly that there are no guarantees that the PCs purchased today will be up-to-date in two years.

Lastly, if a company chooses to rent, it is spared many of the maintenance and depreciation hassles. Most rental contracts specify that the rental agents will incur responsibility for all maintenance for the length of the contract.

The dark side of these contracts is that it will end up costing a company more to rent systems to meet long-term needs.

Rental contracts, of course, vary. A random survey of rental companies on their monthly rates for an IBM Personal System/2, Model 50 uncovered a range from $248 to $275. For Apple Computer, Inc.'s low-end Macintosh SE30, the rates ranged from $340 to $380. All the monthly rates include maintenance fees. Some rental companies even offered 24-hour replacement service, depending on the rental firm's location in relation to the rentee. Delivery and installation fees were not included in the monthly rate.

According to a combination of industry resources, the annual PC rental market currently stands between $300 million and $400 million, with growth rates predicted to be between 20% and 30% over the next three years.

Despite this volume, the market has been historically populated by small, independent companies serving local geographic regions.

Partly because of the lack of big-name, nationally advertised rental firms, many potential renters have not been aware of the number of companies that can supply computers and peripherals on a daily, weekly or monthly basis.

However, Dan Ness, an analyst at La Jolla, Calif.-based research firm Computer Intelligence, says people are starting to become more aware of rental companies. "While CI isn't tracking rentals right now, our clients who sell to these corporations are starting to show more interest in the rental market," he says.

Indeed, during the past 18 months, several well-known vendors have entered the market. For example, IBM, recognizing the potential sales volume represented by rental companies, has authorized three pilot rental centers; Digital Equipment Corp. is planning a similar program for its systems.

Large retail outlets such as Computerland Corp. and Businessland, Inc. have started rental divisions. Since January 1989, five "Businessland Rents" depots have opened, and there are plans for 15 more over the next three years.

Furthermore, several of the smaller rental companies are starting to expand to multiple-city outlets, primarily through the franchising route. The entrance of these franchises is similar to the presence of The Hertz Corp. and Avis, Inc. in the car rental business: They add credibility.

Where to choose?

Now, renters are faced with more choices: independent rental firms, franchises and big names such as IBM.

One advantage of independent rental houses is that they offer a variety of machines, including low-priced clones, to suit customer needs.

On the other hand, big-name vendors would only rent their own brand, which may or may not fit the bill. There may also be fewer pricing options. However, the major brands are well established and very secure compared with the other outlets.

The benefits of franchises are that they generally offer customers the security of a well-established firm, a larger support staff and larger inventories. Smaller rental places may have dubious track records.

The bottom line? The rental market is growing not only in size, dollars and recognition but also in the options that users can choose from.

Claiborne is a consultant in Highland, Md.

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Closing prices report for the week ending November 16, 1990

	Nov 1990	1989	1988
IBM PC Model 176	$375	$500	$600
XT Model 086	$500	$765	$1,150
XT Model 089	$550	$1,025	$1,300
AT Model 099	$650	$1,600	$2,050
AT Model 239	$875	$1,725	$2,375
AT Model 339	$900	$1,825	$2,450
PS/2 Model 30-286	$1,250	N/A	N/A
PS/2 Model 60	$1,500	$2,700	N/A
PS/2 Model 70P	$3,425	N/A	N/A
Compaq Portable II	$800	$1,625	$1,700
Portable 286	$1,375	$1,600	N/A
SLT 286	$2,500	$2,600	N/A
Portable 386	$2,800	$4,100	N/A
LTE 286	$2,000	N/A	N/A
Deskpro 286	$1,175	$1,775	$1,900
Deskpro 286/20	$2,900	N/A	N/A
Apple Macintosh Plus	$750	$1,350	$1,425
SE	$1,150	$2,200	$2,550
II	$3,100	$3,500	$3,600
IIFX	$6,600	N/A	N/A

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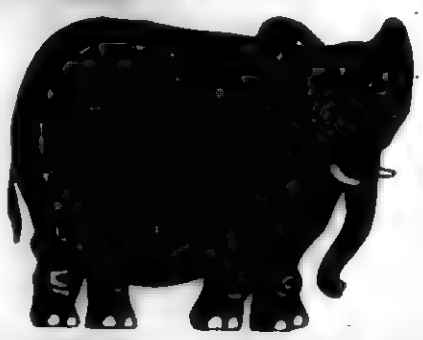

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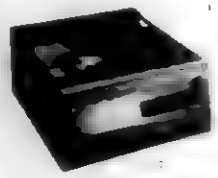

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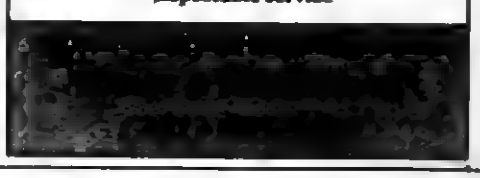

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Retraining for changing times

As IS moves ahead, professionals are forced to learn or perish

BY KATIE CRANE
SPECIAL TO CW

Information systems veterans who have watched their profession grow since its infancy are now facing a hard-boiled choice: retrain or be replaced.

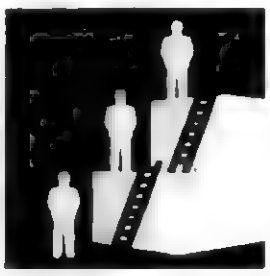
To accomplish this, IS executives must alter their outlook from one that is strictly technical to one that also focuses on business strategies, says Bob Slusser, vice president of IS management at Northrop Corp.'s Aircraft Division in Hawthorne, Calif. Those who don't, he says, may lose their jobs.

Furthermore, the threat doesn't just apply to top IS executives, says Kay Redditt, president of Cognitech Corp. in Easton, Conn. She insists that systems professionals must also change to reflect the cultural shift in IS organizations today. While there is still a demand for technical expertise, there is also a stronger need for negotiating abilities, interpersonal skills and business savvy as companies insist that IS professionals develop a business perspective. Even systems analysts are expected to stop being experts and become consultants to users, she says.

Train to remain

It boils down to this: "Retrain or die," says Lewis Leeburg, director of the Information Systems Research Program at the Anderson School at the University of California, Los Angeles (UCLA), one of the many programs attempting to address these issues. He says he believes training scenarios will vary depending on the structure of the IS organization, the nature of the business, its corporate culture and the current skills and attitudes of the IS professionals. But in one way or another, they have to change. For many, that means retraining.

Concurrent with the tough realities facing veteran IS executives, firms are also grappling with their own issues — namely, whether to outsource or hire outsiders to fill those roles rather than re-educate current employees.



Many of Redditt's clients are recruiting business school graduates on the theory that it is easier to teach them technical skills than it is to teach veterans the interpersonal communications, negotiation and facilitation skills they would need to change.

Even retrained IS executives can become victims of the Peter Principle, says Bill Harris, chairman of Behnke Harris Associates, a management consulting firm in New York. Many professionals who acquire the business acumen don't always have the political savvy to deal with the business' cultural demands. "For this reason, many companies turn to business-trained executives to replace or step in over the IS manager," he says.

However, the strategy of replacement doesn't always work, says Richard Kish, vice president of MIS at Waldenbooks in Stamford, Conn. Kish admits that he falls more into a younger generation, having risen to his current position in just 12 years. But he has built his career on a strong base of technical skills. The business savvy came later as he learned how to discuss technical decisions in business terms.

"My boss doesn't want to know we're putting in an ES/9000 next year; he wants to know if that means we can expand our tele-ordering operations." Kish acknowledges that his kind of thinking may not be widespread and that "there are still plenty of folks who have yet to change."

Fortunately, many companies opt for the retraining rather than replacement. They are developing in-house programs or sending employees elsewhere for assistance.

The Association for Systems Management (ASM) offers courses and seminars to help IS veterans learn about their new roles. Among the most effective ASM offerings are the local chapter meetings, says Charles Black, director of education. The members determine the programming, and more often than not, a typical dinner meeting will focus on a business topic such as, "How to sell your ideas," rather than a technical topic.

Slusser cites accelerated management programs such as those at Harvard University and Stanford University and programs such as Leeburg's at UCLA as the most frequent sources of retraining for IS people, particularly those at the top.

However, while plenty of companies are addressing the need for skills training, little is being done to address attitude change, Redditt says.

That's why Harris advocates that chief information officers address retraining within a larger context. He sees it as a vital part of the total IS planning process, first tying each IS project to some strategic or tactical business objective, then defining the resources needed to do the job well. Seen in that context, he says, "There will probably always be a need to refocus, retrain and acquire new skills."

Map out a course

Joe Izso, vice president of information technology at A.T. Kearney in Santa Monica, Calif., agrees with this approach but adds one caveat: These higher-level IS executives must start with a vision and then map out a very purposeful program for retraining selectively, starting with themselves. "You're on the wrong track if you're trying to retrain the entire IS organization," he insists.

The other side of the argument is that retraining responsibilities shouldn't rest entirely on a company's shoulders. "Those of us who have survived have been through a half-dozen evolutionary changes. If you don't change, you're history a long time ago!" says Gary Kirkham, a 25-year veteran of the profession now at Forecasting Planning Associates in Dallas. The ones who want to stay on the leading edge will take the initiative themselves, he adds.

"It's a tough world out there. Not everyone will survive the evolution of this species," Kirkham says.

Crane is a free-lance writer based in Norwich, Vt.

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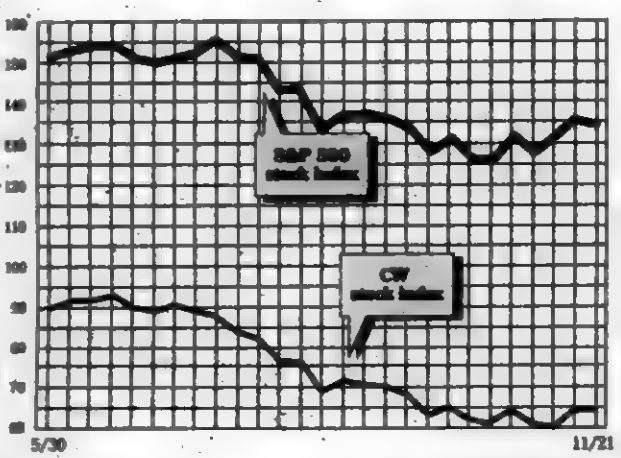
STOCK TRADING INDEX



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Communications	105.3	102.9
Computer Systems	63.4	63.6
Software & DP Services	94.7	92.4
Semiconductors	40.1	38.7
Peripherals & Subsystems	70.7	70.4
Leasing Companies	47.7	50.7
Composite Index	64.7	64.4
S&P 500 Index	135.3	134.9

Communications

Computer Systems

Software & DP Services

Semiconductors

Peripherals & Subsystems

Leasing Companies

CW CHARTS

Computerworld Stock Trading Summary

CLOSING PRICES TUESDAY, NOV. 20, 1990

EXCH		52-WEEK RANGE		PRICE CLOSE NOV. 20, 1990	WEEK NET CHNGE	WEEK PCT CHNGE
	Communications and Network Services					
N	AMERICAN INFO TECHS CORP	68	53	66.375	0.8	1.1
Q	ANDREW CORP	26	16	19.5	0.8	4.0
Q	ANTEL COMM CORP	10	2	2.25	-0.3	-10.0
N	AT&T	47	30	32.5	-1.3	-3.7
Q	AVANTEK INC	4	2	2.375	0.0	0.0
N	AYDIN CORP	17	10	11	0.1	1.1
N	BELL ATLANTIC CORP	57	40	53.125	-0.1	-0.2
N	BELL SOUTH CORP	59	49	53.125	0.0	0.0
Q	COMPRESSION LABS INC	16	7	13.875	-0.1	-0.9
Q	CONTEL CORP	38	23	33	-0.8	-2.2
Q	DATA SWITCH CORP	4	2	3	0.1	4.3
Q	DIGITAL COMM ASSOC	27	9	11.75	-0.1	-1.1
Q	DYNATECH CORP	19	12	15	-0.3	-1.6
Q	FIBRONICS INTNL INC	13	5	7.375	-1.6	-18.1
Q	GANDALF TECHNOLOGIES	6	2	2.875	0.1	4.5
Q	GENERAL DATACOMM INDS	5	2	2	-0.1	-5.9
N	GTE CORP	36	24	27.875	-1.0	-3.5
Q	INFOTRON SYS CORP	9	1	1	-0.1	-11.1
N	ITT CORP	51	40	47.75	-0.3	-0.5
Q	M A COM INC	6	3	5.625	0.6	12.5
Q	MCI COMMUNICATIONS CORP	48	19	19	-12.9	-40.4
Q	NETWORK EQUIP TECH INC	24	5	6.5	0.4	6.1
Q	NETWORK SYS CORP	15	8	10.25	-0.1	-1.2
N	NORTHERN TELECOM LTD	30	21	25.375	-0.3	-1.0
Q	NOVELL INC	30	12	28.75	-1.3	-4.2
N	NYNEX CORP	82	67	70.5	-0.9	-1.2
N	PACIFIC TELESIS GROUP	52	38	44.375	-1.9	-4.1
A	PENRIL CORP	9	5	6.5	0.0	0.0
N	PLESSEY PLC	42	39	0.01	0.0	0.0
N	SCIENTIFIC ATLANTA INC	28	9	11.75	0.6	5.8
N	SOUTHWESTERN BELL CORP	65	47	52.5	-0.5	-0.9
Q	3 COM CORP	19	8	7.5	-0.5	-6.3
N	US WEST INC	41	32	37.5	0.6	1.7
	Computer Systems					
Q	ALLIANT COMPUTER SYS	9	1	1.125	0.1	12.5
Q	ALPHA MICROSYSTEMS	6	1	2.625	0.6	31.3
A	AMDAHL CORP	19	10	13.5	0.1	0.9
Q	APPLE COMPUTER INC	48	24	35.5	-1.5	-4.1
Q	AST RESH INC	27	10	25	-0.4	-1.5
N	BOLT BERANEK & NEWMAN	8	4	4.375	-0.1	-2.8
N	COMPAQ COMPUTER CORP	68	36	49.875	-1.8	-3.4
N	COMMODORE INTNL	12	5	9	1.1	14.3
Q	COMPUTER AUTOMATION INC	6	0	0.938	0.0	0.0
N	CONTROL DATA CORP	22	8	11.125	0.8	7.2
N	CRAY RESH INC	51	20	27.875	0.0	0.0
N	DATA GEN CORP	14	4	4.375	0.4	9.4
N	DATAPOINT CORP	8	1	1.125	-0.4	-25.0
Q	DELL COMPUTER CORP	14	5	12.5	0.4	3.1
N	DIGITAL EQUIP CORP	98	46	51.75	-0.5	-1.0
N	FLOATING POINT SYS INC	4	0	1.375	0.1	10.0
N	HARRIS CORP	36	14	19	0.8	4.1
N	HEWLETT PACKARD CO	50	25	28	-0.3	-0.9
N	HONEYWELL INC	112	71	88.625	-1.9	-2.1
N	IBM	123	93	113.375	-0.1	-0.1
Q	INFORMATION INTL INC	14	6	9.125	0.4	4.3
Q	IPL SYS INC	14	5	12.75	2.5	24.4
N	IMAI BASIC FOUR INC	4	1	1	0.1	6.6
N	MATSUSHITA ELEC INDL LTD	168	118	124.25	-2.0	-1.6
Q	MENTOR GRAPHICS CORP	26	9	11.75	0.5	4.4
N	MSI INC	1	0	0.125	0.0	-19.9
N	NCR CORP	72	45	54.25	-2.4	-4.2
Q	PYRAMID TECHNOLOGY	38	12	12.75	-2.6	-17.1
Q	SEQUENT COMP SYS INC	34	13	17.75	-1.9	-9.6
Q	SUN MICROSYSTEM INC	37	15	18.25	-0.4	-2.0
Q	SYMBOLICS INC	2	0	0.25	0.0	0.0
N	TANDEM COMPUTERS INC	20	9	12.25	-0.3	-2.0
N	TANDY CORP	44	24	28.25	-2.8	-9.1
N	ULTIMATE CORP	10	1	1.625	-0.1	-7.1
N	UNISYS CORP	17	2	2.875	-0.1	-4.2
A	WANG LABS INC	6	3	2.875	-0.1	-4.2
	Software & DP Services					
Q	AMERICAN MGMT SYS INC	20	11	15.25	0.4	2.5
Q	AMERICAN SOFTWARE INC	18	8	10.125	-1.3	-11.0
N	ANACOMP INC	5	1	2	-0.3	-11.1
Q	ANALYSTS INTL CORP	24	10	13	0.3	2.0
Q	ASHTON TATE	15	5	8.25	0.4	4.8
N	AUTO DATA PROCESSING	60	46	54	0.0	0.0
Q	AUTODESK INC	60	32	43.25	-2.5	-5.5
Q	BMC SOFTWARE INC	30	17	23	0.5	2.2
N	BUSINESSLAND INC	12	1	1.5	-0.3	-14.3
Q	COGNOS INC	10	4	8.125	0.8	10.2
N	COMPUTER ASSOC INTL INC	17	4	8	0.4	4.9
Q	COMPUTER HORIZONS CORP	17	8	13.625	-0.8	-5.2
N	COMPUTER SCIENCES CORP	59	37	46.75	0.9	1.9
N	COMPUTER TASK GROUP INC	12	7	7.25	0.4	5.5
Q	COMSHARE INC	25	14	19	1.0	5.6
Q	CORPORATE SOFTWARE	16	4	7.25	0.3	3.6
N	GENERAL MTRS (CLS E)	38	24	36.5	1.6	4.7
Q	GOAL SYSTEMS INTL	18	8	9.25	0.0	0.0
Q	HOGAN SYS INC	7	2	2.125	-0.3	-10.5
Q	INFORMIX CORP	18	4	3.875	-0.1	-3.1
Q	INTELLICORP INC	8	1	1.75	-0.3	-15.2
Q	LEGENT CORP	31	17	22.75	-0.3	-1.1
Q	LOTUS DEV CORP	39	13	16.75	1.0	6.6
Q	MICROSOFT CORP	81	38	68.25	-1.3	-1.8
Q	NATIONAL DATA CORP	35	8	13.125	-0.8	-5.4
N	ON LINE SOFTWARE INTL INC	11	4	4.125	0.0	0.0
Q	ORACLE SYS CORP	188	5	8.375	0.4	6.3
N	PANSOPHIC SYS INC	19	7	8	0.3	3.2
Q	PHOENIX TECHNOLOGIES INC	5	1	1.625	-0.1	-7.1
N	POLICY MGMT SYS CORP	43	30	39.25	0.0	0.0
Q	PROGRAMMING & SYS INC	13	5	5.5	0.0	0.0
Q	RELATIONAL TECH INC	10	3	9.125	0.0	0.0
N	REYNOLDS & REYNOLDS CO	27	12	15.5	1.0	6.9
Q	SAGE SOFTWARE INC	16	8	11	0.9	8.6
Q	SEI CORP	22	15	16.75	0.0	0.0
Q	SHARED MED SYS CORP	17	12	18	0.8	4.9
Q	SOFTWARE PUBG CORP	28	12	16.75	-0.8	-4.3
N	STERLING SOFTWARE INC	11	6	7	-0.1	-1.8
Q	SUNGARD DATA SYS INC	28	10	12.25	-0.8	-5.8
N	SYSTEM CENTER INC	25	6	8.625	-0.1	-1.4
N	SYS. SOFT INC	29	13	23.75	1.3	5.6
Q	WORDSTAR	2	1	1.219	0.1	8.4
	Semiconductors					
N	ADV MICRO DEVICES INC	11	4	4.125	-0.6	-13.2
N	ANALOG DEVICES INC	10	6	5.75	-0.1	-2.1
Q	ANALOGIC CORP	10	6	8.5	0.1	1.5
Q	CHIPS & TECHNOLOGIES INC	24	5	7.75	0.6	8.8
Q	INTEL CORP	52	28	36.75	-1.1	-3.0
Q	MICRON TECHNOLOGY INC	18	7	8.875	-0.8	-7.8
N	MOTOROLA INC	88	51	51.375	-4.6	-8.3
N	NATL SEMICONDUCTOR	9	3	3.5	-0.4	-9.7
N	TEXAS INSTRS INC	44	23	27.25	-0.5	-1.8
A	WESTERN DIGITAL CORP	15	4	5	-0.3	-4.8
	Peripherals					
Q	ALLOY COMP	2	0	0.438	0.1	27.3
N	AM INTL INC	5	1	1.5	-0.3	-14.3
Q	AUTO TROL TECH CORP	4	2	2.063	0.0	0.0
Q	BANCTEC INC	24	10	12.75	0.8	6.3
A	COGNITRONICS CORP	7	3	5.875	0.3	4.4
Q	CONNER PERIPHERALS	31	11	24.625	-0.8	-3.0
A	DATARAM CORP	22	7	7.25	-1.5	-17.1
N	EASTMAN KODAK CO	44	34	42.75	0.8	1.8
N	E M C CORP MASS	10	3	8.625	-0.4	-4.2
Q	EMULEX CORP	9	4	5.125	-0.1	-2.4
Q	EVANS & SUTHERLAND	35	14	17	1.3	7.9
Q	ICOT CORP	2	0	0.313	-0.1	-16.5
Q	INTERLEAF INC	8	3	3.375	-0.1	-3.6
Q	IOMEGA CORP	8	3	4.125	-0.3	-5.7
Q	MASSTOR SYS CORP	5	0	0.25	0.1	33.0
Q	MAXTOR CORP	17	4	4.875	0.1	2.6
Q	MICROPOLIS CORP	10	3	7.25	0.9	13.7
N	MINNESOTA MNG & MFG CO	91	74	80.625	0.1	0.2
Q	PERSONAL COMP PRODUCTS INC	5	4	3.625	0.0	0.0
Q	PRINTRONIX INC	15	6	8.875	-0.1	-1.4
N	QMS INC	21	9	12.25	-1.0	-7.5
Q	QUANTUM CORP	28	9	20	0.0	0.0
Q	RECOGNITION EQUIP INC	8	4	4.6	-0.1	-2.7
N	REXON INC	10	4	5.625	0.1	2.3
Q	SEAGATE TECHNOLOGY	20	8	8.875	-0.3	-2.7
N	STORAGE TECH CORP	35	11	19.5	-1.0	-5.1
Q	TANDON CORP	4	1	1.75	0.0	1.8
N	TEKTRONIX INC	18	12	16.75	-0.4	-2.2
Q	TELEVIDEO SYS INC	1	0	0.25	0.0	0.0
N	XEROX CORP	60	28	34.125	0.0	0.0
	Leasing Companies					
N	CAPITAL ASSOC INTNL INC	8	1	0.688	-0.1	-8.3
N	COMDISCO INC	29	15	15.5	-1.0	-6.1
Q	LDI CORPORATION	18	9	9.5	0.0	0.0
Q	SELECTERM INC	7	3	3.25	0.0	0.0

EXCH: N—NEW YORK; A—AMERICAN; Q—NATIONAL

Slim pickin's

Some tech firms eat losses, but most investors weren't dining

Either most investors were home gobbling turkey or someone posted a "Do Not Enter" sign at the end of Wall Street last week. With a few exceptions, Thanksgiving's shortened work week was slower than slow in the technology sector.

Evidently, the summit between NCR Corp. and AT&T was still a cause celebre last week. However, contrary to recent events, NCR came out the loser last week, at least by Tuesday's close — down 4⅛ points to 54¼. AT&T skipped up ⅛ a point to close Tuesday at 32½.

Rivals MCI Communications Corp. and United Telecom — U.S. Sprint Communications Co.'s parent company — each suffered large hits. MCI skidded 3⅜ points by Tuesday to close at 19 after announcing a restructuring plan the previous week and warning that they will likely be down quarters to come. United Telecom, meanwhile, dropped 1⅜ points to 20⅛.

Most other movement among technology shares was scant, with many ⅛-point changes in the semiconductor sector. The following firms fell ¼ of a point last week: Motorola, Inc. to 51⅜; National Semiconductor Corp. to 3½; and Intel Corp. to 36⅜. Texas Instruments, Inc., however, picked up ⅛ of a point, closing at 27⅛.

Hewlett-Packard Co. reported a fourth-quarter profit drop on Nov. 16, then closed at 28, down ⅜ of a point. Elsewhere in hardware, Sun Microsystems, Inc. added ⅛ of a point to 18¼ and Apple Computer, Inc. advanced ⅜ of a notch to 35½. Digital Equipment Corp. lost ½ a point to 51⅜ and IBM shed ¼ of a point to 113⅜.

Personal computer software maker Autodesk, Inc. stumbled 1⅜ points to 43¼, breaking its three-week upward trajectory. Other big firms gained, however, including Lotus Development Corp., which jumped ½ a point to 18⅜, and Microsoft Corp., which moved up ⅛ of a point to 68¼.

KIM S. NASH

NEWS SHORTS

New PCs from Memorex Telex

Tulsa, Okla.-based Memorex Telex Corp. fleshed out its personal computer hardware line last week with several PCs, a synchronous or asynchronous remote controller and a token-ring adapter. Memorex's Model 7035 PC is based on Intel Corp.'s 80386SX chip and is priced starting at $2,295. The company also released 80286- and 386SX-based boxes that can display four simultaneous host sessions in an IBM 3270 environment. The PCs sell for $7,495 and $8,295, respectively. The firm's STP 6641 Multifunction Communications Controller costs $4,125, and the IBM Personal Computer AT-style or Micro Channel Architecture token-ring adapters cost $895 and $925, respectively.

Hyundai loses court battle

A California jury last week ordered Hyundai Electronics America to pay $450,000 to Lifetime Memory Products, Inc. to resolve a 2-year-old dispute with the Huntington Beach, Calif.-based distributor. The case evolved after Lifetime Memory Products, then known as Columbus International, charged that Hyundai breached a contract to deliver 100,000 dynamic random-access memory chips to the company at $1.05 each during the U.S. memory chip shortage of 1988. Hyundai said in a written statement that it will appeal the verdict, while an attorney for Lifetime Memory said the company will seek to make Hyundai cover the plaintiff's legal expenses.

Cost of VDT law pegged

San Francisco's proposed VDT ordinance would have a one-time cost of between $73.2 million and $120 million, said city budget analyst Harvey Rose. More than 60,000 workers would be covered by the law, which would require work spaces to have adjustable desks and chairs, nonglare lighting and positioning of workers at least one meter from the back of a VDT.

CFOs to watch federal systems

President Bush last week signed legislation establishing chief financial officer positions at 23 federal agencies. The bill also establishes a presidentially appointed super-CFO within the Office of Management and Budget. The CFOs are expected to oversee agencies' financial systems and prevent fraud.

CDC selling trading-room group

Control Data Corp. last week concluded a six-month search for a buyer for Micrognosis, its $100 million trading-room systems unit, agreeing to sell to CSK Corp., Japan's largest independent computer service company. CSK officials said they hope to use the Danbury, Conn., company, which provides integrated trading-floor systems, as a springboard for its international business. Terms for the sale were not disclosed.

Printer groups to merge

Storage Technology Corp. in Louisville, Colo., and Siemens Nixdorf Information Systems, Inc. in Burlington, Mass., signed an agreement last week to merge their respective U.S. high-performance, nonimpact printer operations. The joint venture is slated to become operational in January 1991. Upon closing the deal, Siemens Nixdorf will own 51% of the operation, and Storage Tek will own 49%. Storage Tek anticipates that more than 100 of its employees will be transferred to the new entity.

Mosaic faces court woes

The copyright infringement trial of Lotus Development Corp. vs. Mosaic Software concluded last Wednesday in Federal District Court in Boston. During the two-day trial, Judge Robert E. Keeton fined Mosaic $12,500 for unnecessarily delaying the trial, but Mosaic said it is having difficulty raising the money. If the fine is not paid on time, Mosaic automatically forfeits the trial, a Lotus spokesman said. This may be a moot point, as Keeton told the court he is leaning toward ruling against Mosaic, adding that he cannot envision anything Mosaic may say in a post-trial brief that would change his mind.

Quake threat has Midwest edgy

BY ELLIS BOOKER
CW STAFF

ST. LOUIS — Better safe than sorry. That is how some information systems executives in the Midwest are reacting to a controversial prediction that a major earthquake will rock the region next Monday or Tuesday.

Some data centers have scheduled hot-site recovery testing to coincide with the prediction, and one user contacted by *Computerworld* last week said he made contingency plans on the basis of self-taught meteorologist Iben Browning's prediction of a quake along the New Madrid seismic region. The area is centered in southeast Missouri and northeast Arkansas and extends into parts of Illinois, Indiana, Kentucky, Mississippi and Tennessee.

The Browning prediction, roundly dismissed by geophysicists, holds that there is a 50% chance of a "tidally triggered" quake measuring 6.5 to 7.5 on the Richter scale on Dec. 2 to Dec. 3, give or take two days.

E. D. Jones & Co., a retail brokerage house in a St. Louis suburb, is taking the prediction seriously. "We're not planning on a pre-emptive declaration or positioning people in hot sites, but we want to make sure we can successfully put the pieces back together if it does happen," manager of computer operations Tom Barry said.

According to Barry, his department discussed the possibility of a pre-emptive disaster declaration but backed away after calculating it would cost more than $500,000 per week.

Meanwhile, the brokerage house, which has 1,600 retail offices in 42 states, is taking extra precautions. It has hardened its St. Louis headquarters, spending $20,000 on bracing and securing electrical systems and the cooling and air-conditioning system in its 12,000-sq-ft data center. The company will also pay extra to have its backup data tapes transferred to Kansas City, Mo., for two weeks.

Matter of course

"These are the kinds of things that should be done anyway," said Barry, who reported that many of his counterparts in the St. Louis area are similarly anxious about next week. "A lot of people are taking the same precautions we are . . . and some are taking even more," he said.

> "WE WANT TO make sure we can successfully put the pieces back together if it does happen."
>
> TOM BARRY
> E. D. JONES

If a quake comes, mail-order company House of Lloyd will be in an excellent position, as it will be inside a Comdisco Disaster Recovery Services, Inc. (CDRS) hot site in Wood Dale, Ill.

Jack Moran, vice president of IS at the firm, said the company ships the majority of its orders in the two months before Christmas, "and we're always careful about the fourth quarter." Among other routine precautions, the Kansas City firm outfits all of its 100 IS employees with beepers and adds a backup generator to support the IBM 3090 300E in its data center during this part of the year.

The Wood Dale test — the firm's third for the year — had tentatively been scheduled for some time in December, and the fact that it was moved to early December does not indicate undue panic, Moran said.

If someone believes there will be a catastrophe during the critical pre-Christmas season, Moran said, "We're going to listen but not overreact."

Long-distance company AT&T, which has major routes through St. Louis — including the hub for its 800 service — is also bracing for Dec. 3.

"We're taking the prediction seriously," a company spokeswoman said, adding that a team of network engineers has been assembled to reroute traffic and minimize network damage.

"Business has increased about twofold," said Richard B. Zane, president of the North American division of CDRS.

CDRS has not added staff or modified its recovery centers in advance of Dec. 3, according to Zane, although he said the staff had been made aware of the concerns of some customers. "It's really business as usual," he said.

The New Madrid fault was the site of the strongest series of earthquakes in U.S. history in late 1811 and early 1812. Missouri and Arkansas both received two major quakes, estimated to have been in the 7.8 to 8.3 range on the Richter scale.

Hackers

FROM PAGE 1

"It is a new reality — not a virtual reality — that you will go to prison," said William Cook, an assistant U.S. attorney in Chicago. "The sentences reflect the judge's and society's concern that the hackers are trying to use the telecommunications industry as their playground. Well, the playground is closed."

The severe sentences should also send a signal to corporations that have been victimized by computer hackers, Cook said. "It should say that it is worthwhile for you to cooperate when unjustly violated by people who hack into your system and that it is worthwhile in sentencing and in terms of the restitution that we will call for."

The three hackers, members of a self-proclaimed elite group of about 15 hackers called the Legion of Doom, could have received sentences of between five and 10 years and fines of $250,000. However, attorneys for the Justice Department recommended lighter sentences, because the trio provided information that was helpful with investigations of other Legion of Doom members.

Darden, who used the handle The Leftist, and Riggs, who called himself The Prophet, pleaded guilty to a conspiracy to commit computer fraud, wire fraud, access code fraud and interstate transportation of stolen property. Grant, who operated as The Urvile and Necron 99, pleaded guilty to a separate count of possession of long-distance telephone access codes with the intent to defraud.

Gail Thackeray, an assistant attorney general in Arizona who has investigated and prosecuted a number of computer-related crimes, said the sentencing indicates that the legal system may be moving toward a more consistent approach to prosecuting computer-related crimes.

The courts are focusing more on the intent of the computer hacker in handing out sentences, Thackeray said. The sentences will be more severe in cases such as the Bellsouth case, in which the hackers carried out "deliberate, vicious attacks" with the intent to do harm. Trespassing in a computer system or engaging in reckless behavior by exploring a system's electronic innards will continue to draw lesser penalties, Thackeray said.

In the days leading up to the sentencing, some security experts said hackers would launch an attack on telecommunications systems as a form of protest. Bellsouth received reports of the threats, but no attempts were made to disrupt the system, said Scott Ticer, operations manager at Bellsouth.

Global

FROM PAGE 1

Ltd., both suppliers of IBM-compatible mainframes in addition to proprietary systems, "are flexing their muscles and deciding that they're tired of being the power behind the throne," said Donald Bellomy, director of worldwide market studies at International Data Corp. in Framingham, Mass. "They'd like to be viewed as the computer monarchs that, in fact, they are."

Most of Fujitsu's $16 billion in annual revenue stems from sales of computers and electronic equipment; roughly one-third of Hitachi's $42 billion comes from computer-related sales.

In the U.S. arena of IBM-compatible mainframe sales, there are only three players: $60 billion IBM, $2 billion Amdahl Corp. in Sunnyvale, Calif., and $1 billion Hitachi Data Systems Corp. (HDS) in Santa Clara, Calif. Fujitsu holds 43% of Amdahl's stock, while Hitachi owns 80% of HDS stock.

Fujitsu recently acquired Britain-based International Computers Ltd. Hitachi distributes its IBM-compatible machines in Europe through Comparex GmbH and in Italy through Ing. C. Olivetti & Co. in addition to HDS' European direct-sales force. The other major Japanese supplier, NEC Corp., sells non-IBM-compatible large systems internationally through Groupe Bull in France.

However, the familiar shape of that global market is slowly but surely changing, posing the possibility that IBM's 80% share of the IBM-compatible world market may slip in the not-too-distant future.

"I expect a slow, steady increase in market share by Hitachi and by Fujitsu, boosting their combined market share from 20% to 30% worldwide," said Mark Hess, program director of IBM large-computer market research at Gartner Group, Inc. in Stamford, Conn.

In Japan, IBM-compatible systems make up just 30% of the installed base. (Installations of Fujitsu's MSP operating system are not included in that figure, although it was originally designed to be compatible with IBM's System 360 architecture.) Market shares shift only slightly from year to year because each vendor depends largely on sales of proprietary operating systems.

The introduction of Unix in Japan, however, would threaten this stable domestic market for Japanese vendors, analysts said. "About 80% of the mainframe market is for upgrades or replacements, so there is not much chance to change software," Jeremy said. "Open systems should reduce this barrier."

"If the yen strengthens, which it probably will, there will be incentive for Japanese companies to buy overseas assets, including software companies and venture start-ups," Jeremy said. "Don't expect the Japanese to become European computer vendors overnight. It will take 10 years to see results. But now is a good time for them to expand."

Indeed, Japanese vendors see a wide-open world market, including opportunities in fast-growing Asian countries and the robust Unix market in Europe. With their proprietary systems customers firmly in hand at home and the Japanese mainframe market growing at approximately 10% per year, the Japanese are building an infrastructure for overseas markets. That buildup includes hundreds of millions of dollars' worth of investment in research and development labs, field service and software support overseas.

"Up to now, the Japanese manufacturers have made their presence known through minority investments in Western computer companies," said longtime IBM watcher Bob Djurdjevic, president of Annex Research in Phoenix. But the competition is, after all, formidable: "IBM is bigger than the next five makers put together," Jeremy said. "So a frontal attack by Japanese makers in the U.S. [would be] useless."

The process of gaining greater market share outside Japan seems inexorable. Fujitsu struck in Europe, buying up Britain's ICL. And with General Motors Corp.'s Electronic Data Systems Corp. subsidiary as a 20% partner, Hitachi bought out National Advanced Systems, Inc. in May 1989.

Amdahl, Fujitsu's ally in the U.S. and selected international markets, stressed that it does not relabel Japanese boxes, preferring to use Fujitsu semiconductors and components in its own designs. But despite Fujitsu's 19-year relationship with and partial ownership of Amdahl, there is no legal restriction against the Japanese vendor selling directly in the U.S. The only caveat is that Fujitsu cannot violate Amdahl/Fujitsu cross-licensing patent agreements for specific jointly developed system features.

Fujitsu Chief Executive Officer Takuma Yamamoto termed the long-standing and close relationship with Amdahl, into which Fujitsu infused $54 million in capital and loans from 1972 to 1976, as a brotherly one. "In mainframes, Amdahl is playing our main role in the U.S.; they're our brother company," he said. "We have only a subrole, and this situation will not change over the next five to six years."

Even so, IBM must react to Fujitsu's changed role in Europe and in Asia or lose market share. "I don't think there's anything IBM can do over the next five years to stop this," Hess said. "The only possibility is that IBM pulls together its development and product-delivery processes so that there's a flawless rollout of significant new function by 1993."

Fujitsu appears to have taken the lead in girding for this major battle — slightly ahead of HDS, which is using the period from 1990 to 1992 to build up its manufacturing capacity. (See story below.)

In recent months, Fujitsu announced a new mainframe Unix product, UXP/M, which is based on AT&T's Unix System V Release 4 as well as a new high-end eight-processor M-1800 mainframe, which overpowers IBM's top-of-the-line, six-way Enterprise System/9000, although neither system is ready for shipment. Fujitsu is said to be building a Unix research capability in the U.S. to augment hundreds of Unix researchers at its home offices in Japan.

Although much larger than Fujitsu, Hitachi generates two-thirds of its revenue from sales of heavy industrial equipment and consumer products. But Hitachi is building a second mainframe factory in Ibena, Japan, to supplement its Odawara Works site west of Tokyo; it is also building a new disk-drive plant in Orleans, France, scheduled to be completed in 1992. And while HDS customers have complained of disk-drive shortages this year, Hitachi has been dou-

On the trail

In the U.S., Fujitsu's partner, Amdahl, has established a strong lead in sales of IBM-compatible systems

Source: Annex Research — CW Chart: Doreen St. John

Fujitsu CEO's global agenda

Software, hiring managers still primary problems for Japanese makers

Fujitsu Ltd. Chairman Takuma Yamamoto met with IDG News Service Bureau Chief Lori Valigra in Tokyo recently to discuss the top Japanese mainframe maker's international strategies. Though Fujitsu sits well positioned through strategic alliances with Amdahl Corp. in the U.S. and ICL in Europe and has made strong moves toward adopting Unix as its open systems strategy, Yamamoto said Japanese companies will not change the global mainframe market equation anytime soon.

Fujitsu introduced two main strategies for mainframes this fall: the UXP/M operating system for high-end mainframes and supercomputers that is based on [AT&T's] Unix System V Release 4 and the top-end M-1800 mainframe, which was announced one day before IBM's Enterprise System/9000. How will these two strategies translate into international markets, especially the U.S. and Europe?

Fujitsu is promoting open systems fairly actively. We will support small computers through mainframes and supercomputers with Unix and Unix with Japanese-language support.

Amdahl has not decided yet whether it will offer our UXP/M Unix . . . But Amdahl is developing its own high-end system, so it probably will not sell the M-1800 system in the U.S. or Europe. Fujitsu could market the M-1800 in the U.S. directly, but it would be primarily to Japanese corporations there who are already customers.

What are the major obstacles you face in overseas mainframe markets?

Customer support requirements are different in Western countries [than in] Japan. In Japan, customer requirements for support are very strong. That's why it is hard for foreign manufacturers to enlarge their activities in Japan.

For Japanese manufacturers, the overseas market is difficult because applications software is based on the culture of the society. But in markets where no support is necessary, for example, in personal computers, we are doing well overseas already. In the future, Japanese mainframe manufacturers will work on support overseas.

We're now in the process of changing from a Japanese company only into a global company. The 80% capital participation in ICL is one of the steps we took to globalize. But software is still the primary problem for Japanese makers trying to internationalize. The other problem is hiring and promoting capable business managers in local operations.

What are Fujitsu's mainframe market priorities over the next five years?

The cost of systems support is rising continually, so we plan to introduce more packaged software applications to reduce software development costs for us and our customers. The other priority is supporting and maintaining our customers' assets in our proprietary systems.

NEC on the outside

NEC has remained the outsider in the mainframe market with a non-IBM-compatible strategy. Nonetheless, it has managed to win a strong customer base with its own technology.

"NEC started the ACOS mainframe family in 1979 as a countermeasure to the IBM System/360, which was very strong at the time," said Takehiko Inoue, vice president of NEC's information processing group in Tokyo.

The company's entrance into the mainframe market was, ironically, sponsored by Honeywell, Inc. Not only did NEC outlast Honeywell, but it owns a minority stake in and is the large system supplier to Bull HN Information Systems, Inc., the U.S. subsidiary of Groupe Bull, which encompasses the former computer operations of Honeywell.

"NEC's philosophy is to always pursue an original market for NEC using ACOS, so we have advantages and disadvantages as an IBM competitor," Inoue said. "The advantage is we can use new ideas and special features to improve our mainframes. But with a proprietary system, we cannot use third-party software." To correct that, NEC is also working on developing Unix products in a bid to expand its share of the global large systems market.

In the U.S., NEC has already built up a solid identity in low-end systems and peripherals. And with state-subsidized Groupe Bull under pressure from the French government to resolve its current financial crisis, speculation is rampant that NEC will increase its stake in the French firm.

LORI VALIGRA

bling the capacity of its plant.

Hitachi has sold its products to U.S. and European accounts through its HDS subsidiary. Now Hitachi is planning a broad-based Unix strategy. "We are thinking of offering a mainframe based on [the Open Software Foundation's] Unix," Endo said. "We're committed to delivering a high-end mainframe by the end of [1991] worldwide."

Unix sales are brisk in Europe, where trade restrictions will fall in 1992. Unix systems also offer a greater degree of application portability from one hardware platform to another.

Outside Europe, the fastest-growing mainframe market is in Asia. "All of this started in Japan," explained Joan Lewick, director of international marketing and services in IBM's corporate offices in Armonk, N.Y. "The outer islands [in Asia] represent a great opportunity for IBM, but they are also a great opportunity for the Japanese computer manufacturers."

The world's computer vendors seem destined to grope for the boundaries of this expanding global marketplace during the next few years. To hold onto its Japanese accounts, IBM created a corps of Japanese-speaking "assignees" who relocate to countries where Japanese firms are setting up shop.

Just one year ago, IBM reorganized its corporate marketing management; now, six executives coordinate IBM account support on a global basis.

By the year 2000, most observers said, there will be only a handful of global mainframe suppliers, particularly because of the "deep pockets" each player needs to project its products around the world. "They may be consortiums or mergers of the U.S. and European and Japanese firms that exist today," said Jim Belassone, executive vice president of marketing at HDS. "But the battle for mainframe market share will be fought on a global basis, and you have to play on a worldwide basis in order to win."

Speed, however, is not of the essence in this global computer game. "If it takes until the 21st century to do it, so be it," Djurdjevic said.

Valigra is the Tokyo bureau chief for the IDG news service.

No easy task

A long-term view is seen as a prerequisite to challenging IBM's dominance of the worldwide mainframe market

Worldwide mainframe market shares

IBM	51.8%
Fujitsu	9.5%
Hitachi	6.8%
Unisys	6.6%
Amdahl	4.6%
Siemens	2.8%
NEC	2.7%
Others	15.2%

Source: Nikkei, IDC CW Chart: Marie Haines

Unix evens odds for Japanese

Japanese vendors see Unix as chance to garner mainframe market share

BY JEAN S. BOZMAN
CW STAFF
and LORI VALIGRA
IDG NEWS SERVICE

Unix is seen by Japanese computer vendors as a wedge into IBM accounts in Europe and the U.S. and also into European accounts that have traditionally bought computers from European makers such as France's Groupe Bull, Germany's Siemens AG, Britain's International Computers Ltd. and Italy's Ing. C. Olivetti & Co.

"The Japanese are being realistic about where the market opportunities lie," said Rikki Kirzner, a senior analyst at Dataquest, Inc. in San Jose, Calif. "They see that with Unix, they can create an installed base that IBM won't be targeting — at least not at first."

Jim Belassone, executive vice president of marketing at Hitachi Data Systems Corp. (HDS), sees another advantage of Unix: It removes IBM's home-court advantage of changing software or hardware standards at will.

"You can think of Unix as a magic bullet that levels the playing field," Belassone said. "With Unix, we will no longer be waiting for IBM architecture and IBM software. Hitachi will be able to exploit its technology as fast as it wants to, without having the millstone of waiting for IBM around its neck."

Users in Europe may not feel as tied to their IBM machines as U.S. users, analysts said, largely because their overall investment in IBM technology is smaller.

"Midsize mainframe shops are not as trapped in the IBM MVS environment as large-scale mainframe sites," explained Frank Gens, vice president of technology assessment at Technology Investment Strategies Corp. "As IBM puts a squeeze on customers by applying higher software prices, these will be the first customers to move to other vendors or to open systems environments."

Fujitsu's interest in Unix has become apparent in recent months with the release of UXP/M Unix, based on AT&T's Unix System V Release 4.

Complementary lab

Fujitsu is also said to be building a U.S.-based Unix research facility to supplement its Unix software labs in Japan. Fujitsu is active in the Unix International standards group and in London-based X/Open Ltd.

Amdahl Corp. Chief Executive Officer John Lewis does not rule out some direct Fujitsu sales in the U.S. "There's nothing to stop them from selling a Unix system here," Lewis said. "I think the open systems marketplace will be wide open, with everyone competing." However, Lewis said he believes that Amdahl's UTS system, now 10 years old, is about two years ahead of AT&T's Unix System V in terms of security and other data management features.

To date, HDS has outpaced Fujitsu in direct sales to U.S. customers. Like Fujitsu, Hitachi is planning a broad Unix strategy that will be announced next year.

The Hitachi mainframe will run OSF-1 Unix and is intended for use as a host in client/server networks supporting Unix workstations, said Soji Endo, division manager for overseas operations at Hitachi. Although Hitachi's OSF Unix is not completely compatible with IBM's AIX Unix, he said, users can buy OSF software tools to make it AIX-compatible.

Hitachi and IBM/Japan have agreed to cooperate on Unix development for the Japanese market. Viewed by some as potential trading partners, both companies belong to the Open Software Foundation (OSF) Unix standards body. Hitachi has given IBM/Japan a software development tool based on the OSF/Motif graphical user interface.

Hitachi's Unix systems will initially be sold in the U.S. and Europe, Hitachi said.

Amdahl and HDS hold allies in separate light

BY JEAN S. BOZMAN
CW STAFF

SAN FRANCISCO — In the computer industry, East meets West in Northern California. That is where Fujitsu Ltd. and Hitachi Ltd. hold stakes in U.S. computer vendors Amdahl Corp. and Hitachi Data Systems Corp. (HDS).

But Amdahl Chief Executive Officer John Lewis portrays his $2 billion firm as an independent player in the global computer market. He likes to say that Fujitsu and Amdahl use the same computer-component "bricks" to build their systems but adds that the resulting machines are quite different. Amdahl, he said, has 1,200 engineers who specify mainframe designs and manufacture the products in Sunnyvale, Calif., and in Dublin.

By combining a Unix operating system, UTS, and IBM systems software on the same machine, Amdahl may well be ahead of the mainframe pack in open systems, Lewis contended.

HDS' Moore *plans on building the firm's infrastructure*

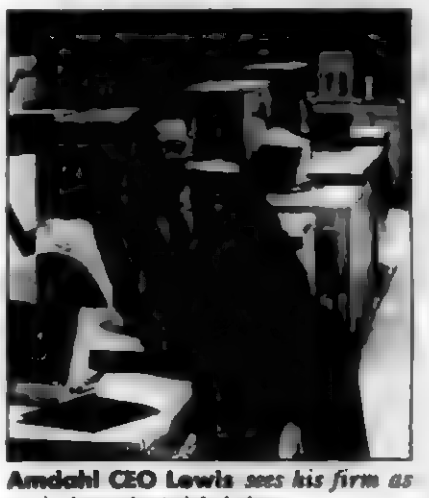
"We've got a two-edged sword in our Amdahl mainframe architecture," Lewis said. "We'll allow customers to run IBM's operating system or open systems Unix software. We're the only one that has one foot in the IBM world and the other in the open world and doesn't have an ax to grind," he said.

At Amdahl competitor HDS, the watchword is "building the infrastructure," CEO Gary Moore said.

"We're not trying to be cocky, because we're the smallest of the three in the U.S.," Moore said. "We had 30% growth in our first year of business, and we're trying to build an infrastructure that will give us the strength we need to grow at double-digit rates in the coming years."

HDS is beefing up its global direct-sales force, just as parent Hitachi builds additional CPU and disk-drive manufacturing capacity in Japan and Europe. "My owners are my parents," Moore said, noting that Hitachi owns 80% of HDS, while Electronic Data Systems Corp. owns 20%. "They are strong, they are committed, and one of my parents does all the design and manufacture of my equipment."

At HDS, the next two years have been set aside for positioning rather than for growing at top speed. And there have been some bumps along the way for the 18-month-old firm. Moore readily admits that some HDS customers have been frustrated this fall by delays in disk-drive shipments and by back orders on large-scale mainframes. "We installed as much equipment as we could with the field engineers and software engineers we had," Moore said.



Amdahl CEO Lewis *sees his firm as an independent global player*

Second-class postage paid at Framingham, Mass., and additional mailing offices.
Computerworld (ISSN 0010-4841) is published weekly, with a single combined issue for the last week in December and the first week in January by CW Publishing/Inc., 375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171.
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TRENDS

AS/400 MIGRATION

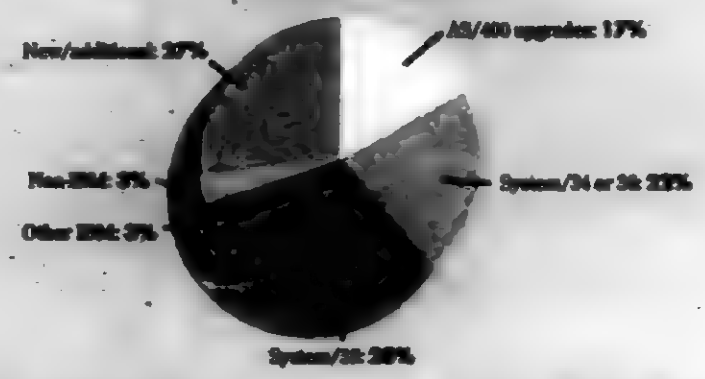
Successful from the start, IBM's AS/400 spells relief for established IBM shops

Systems being replaced by AS/400s

(U.S. sites)

Most AS/400s have found their way into System/38 sites, while 27% have gone to new sites or to those supplementing existing systems

Percent of new/re-order AS/400s
(Respondent base: 1,536)

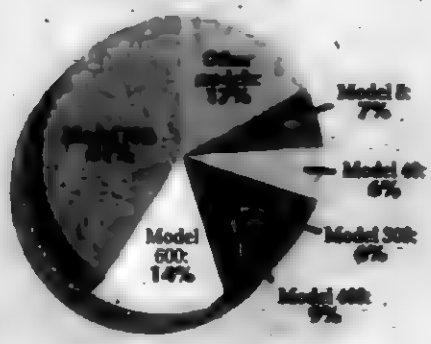


System/38 models replaced by AS/400s

(U.S. sites)

System/38 Model 700 users are the largest group to have converted to AS/400s. Being the most powerful System/38 model, users needing to upgrade have no other choice but to change product lines

Percent of System/38s
(Respondent base: 430)

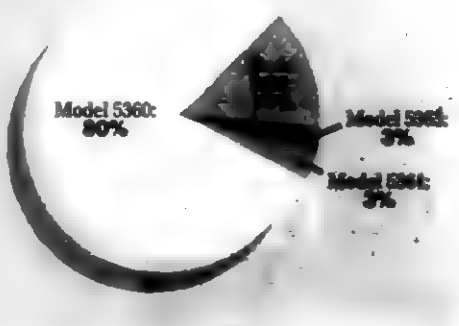


System/36 models replaced by AS/400s

(U.S. sites)

System/36 Model 5360 users are also leaning toward the AS/400, particularly the mid- to high-end models, feeling that upgrade options are limited

Percent of System/36s
(Respondent base: 249)



Source: Computer Intelligence, La Jolla, Calif.

CW Chart: Tom Monahan

NEXT WEEK

Special series: Women in IS. In the last half of the 1980s, some 245,000 computing jobs were opened to women. However, women in IS hold only about 30% of all computing jobs — and far less in IS management. High-level managers such as Mellon Bank Vice President **Patricia Farwig** are still rare. See In Depth for the first of a two-part series.

Scott Goldsmith/Black Star

Decisions, decisions: Should your organization use systems integrators, outsourcing companies or in-house talent? Manager's Journal takes a look at four companies that faced these decisions and went four separate ways — each reflective of the individual company's own business needs and information systems culture.

INSIDE LINES

Everybody's doing it

Not to be outdone by IBM or Unisys, DEC is also getting into data center facilities management. DEC has one outsourcing contract to run a Unilever DEC-based data center in the UK and is close to signing two similar deals in the U.S., said Tom Mitchell, corporate manager of DEC's Facilities Management Services Group. There are no plans at this point to seek contracts for multivendor data centers, however.

Time for Snowdevil?

We've received several calls in recent days from hackers who fear that federal law enforcers are preparing to launch Operation Sundevil II, a large-scale roundup of hackers suspected of carrying out computer crimes. We can't find any evidence to suggest this is true, but it is hard to overlook the fact that the Department of Justice executed Sundevil in early May, only days after Robert T. Morris was sentenced and public attention was still focused on the issue of computer crime. With the recent sentencing of three hackers in Atlanta, one of whom was accused of stealing a document about a 911 system, another raid may be in the offing to take advantage of the publicity.

Genius flares over Sun policy

Well-known hacker Richard Stallman, the advocate of free software who recently won a prestigious "genius award" from the MacArthur Foundation, is fuming over a Sun Microsystems announcement that would make X View free. The announcement purports to offer the software for free if it is linked with an applications program but Sun would require payment of royalties if the software is included with a computer, Stallman said. "We want to try it with Gnu [a Unix clone that Stallman and others at MIT are developing], but X View is not a program we can freely distribute," Stallman said.

Laptop flash

Hidden among Intel's Comdex/Fall '90 display of 14 prototype 80386SX-based notebook computers was one unidentified notebook object that featured both a 3½-in., 1.44M-byte floppy disk and a flash memory card drive. Industry sources say the box was made by Inventa, a Taiwanese OEM with close ties to Intel's Far Eastern group, and is due in the spring.

Hacker as sports agent

When federal agents raided the dorm room of Adam E. Grant, a student at Georgia Tech University, among the evidence they turned up to incriminate Grant for illegal hacking (see story page 1) was a credit bureau report on Bruce Dalrymple, a former Georgia Tech basketball star. According to government documents filed in the case, Grant tutored Dalrymple, who is now an assistant basketball coach at Georgia Tech.

Lotus to go

Lotus may lose more than one major 1-2-3 installation to the competition because of its hard-line "one machine, one license" policy. In reply to several letters of complaint, this month's issue of *Lotus Magazine* published an "editor's reply" reaffirming that users who want to take 1-2-3 home or on the road must first "de-install" the software from their office PCs — or buy a second license. This has caused an IS manager to begin thinking seriously of converting more than a thousand 1-2-3 users to "a vendor that takes a more practical, 'use it like a book' approach to licensing."

Marketing expertise. The party's over for U.S. Robotics, Inc., and that means good news for next year, said Casey Cowell, founder and chairman of the Skokie, Ill.-based modem maker. Cowell told an audience at the seventh annual Illinois High Tech Entrepreneur Awards dinner that the number of hot dogs consumed at its Comdex/Fall '90 Monday Night Football party has been an accurate indicator of how the company will fare the following year. Party goers pushed down 20% more dogs this year than last. Dogs may be one apt way to gauge the economy these days, but if you are aware of bright technological lights on the horizon, phone them in to News Editor Pete Bartolik at (800) 343-6474, message COMPUTERWORLD *on MCI Mail or send a fax to (508) 875-8931.*

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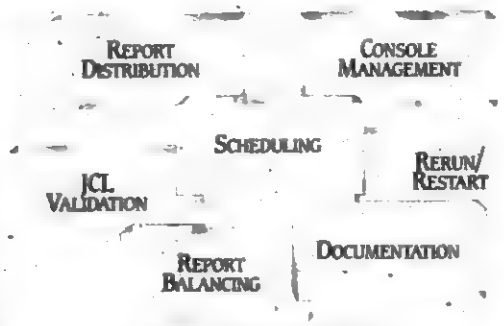

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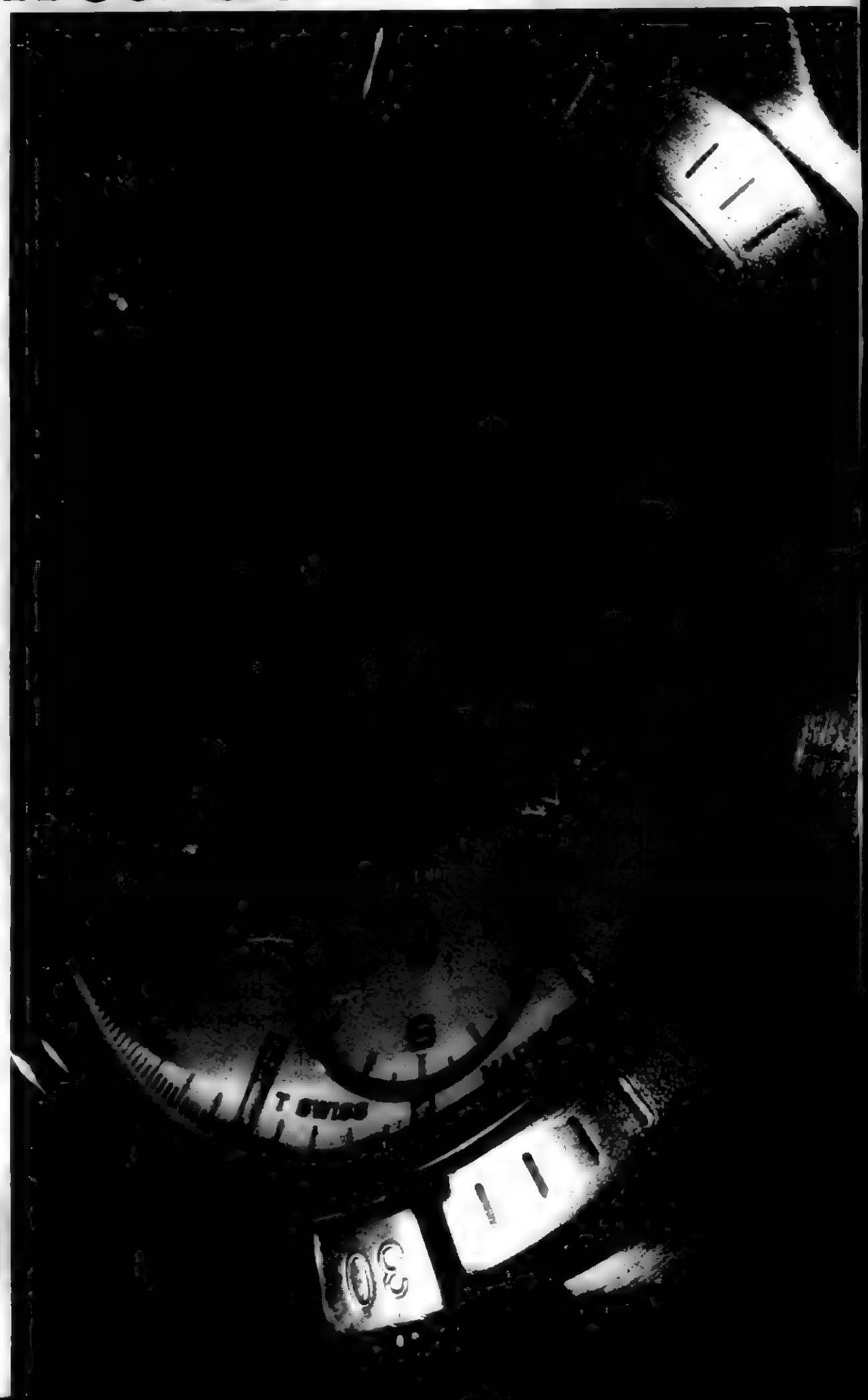

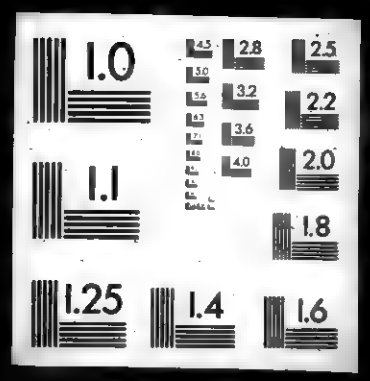
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VOL 24
ISS 49
DE 3 1990
UMI

THE NEWSWEEKLY OF INFORMATION SYSTEMS MANAGEMENT
December 3, 1990 · Vol. XXIV · No. 49 · 136 Pages · $2/Copy · $48/Year

COMPUTERWORLD

HUD set to outsource IS

$526M deal includes new data center, networks

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — In one of the largest outsourcing deals ever, the U.S. Department of Housing and Urban Development agreed last week to pay Martin Marietta Corp. $526 million to update and operate its information systems for 12 years.

"Our business is running housing assistance programs, not owning and operating computer systems," said HUD deputy secretary Alfred A. DelliBovi. "People should do what they're good at."

HUD has contracted with Bethesda, Md.-based Martin Marietta to do the following:

- Set up a new data center based on Unisys Corp. and Hitachi Data Systems Corp. mainframes.
- Establish a nationwide data communications backbone linking the data center with HUD headquarters and 81 field offices.
- Replace all of HUD's local-area network equipment and personal computers. Some 50,000 PCs are to be installed during the life of the 12-year contract.

Martin Marietta will not replace or enhance its applications software but will gradually move the applications to the new data center from HUD's two existing mainframe centers, which will then be closed. The data center's equipment will then be sold

Continued on page 119

Industry tally
Overall IS budget growth will slow from 6.9% this year, but the impact through the different industries varies greatly with computer equipment on the high end and aerospace at the other

Projected 1991 IS budget growth by industry

Overall	5.3%
Aerospace	(3.0%)
Airlines	8.1%
Autos/factory equipment	6.5%
Banks/financial services	2.2%
Computers/Electronics/ Software	10.5%
Consumer products	3.8%
Media and entertainment	(0.9%)
Oil and energy	5.9%
Pharmaceutical/ Health products	8.5%
Telecommunications	3.4%
Transportation/ Public utilities	1.3%
Other	5.6%

Source: Index Group, Inc.

Recession fears trim '91 budget growth

BY JOANIE M. WEXLER
CW STAFF

CAMBRIDGE, Mass. — Growth in corporate information systems budgets is slowing, according to an Index Group, Inc. survey to be released this week. While technology expenditures are expected to increase in 1991 despite general economic predictions of a recession, the growth margin will reportedly be the industry's weakest in three years.

In a report describing a survey of 394 North American IS executives, Index Group concluded that 1991 IS budget growth will drop from a 7.5% average increase in 1988 to a 5.3% predicted increase next year.

"The one thing a recession is going to do is spur a need for businesses to re-engineer themselves," said Robert Reck, an Index Group vice president. "If you're told you have to cut costs by 20% for the company to keep its earnings per share on the mark, you need to fundamentally change how you're operating the business."

Be careful out there

Users agreed that caution is the budget watchword for 1991. "It's certainly going to be a tougher year for getting capital money," said Jim Matsey, corporate director of IS at Reynolds Metals Co. in Richmond, Va. Matsey said Reynolds' 1991 budget is slightly higher than last year's and that while there has been no official cutting back on

Continued on page 6

Heschel quits after 7-month stint at SPAC

BY CLINTON WILDER
CW STAFF

LOS ANGELES — One of the year's most prominent IS executive hirings abruptly turned sour last month when Michael S. Heschel resigned as chairman and chief executive officer of Security Pacific Automation Corp. after seven months.

Heschel *departed suddenly*

Heschel, who was hired from the top information systems post at Deerfield, Ill.-based Baxter International, Inc. last April, was tight-lipped about any disagreements that occurred. "It wasn't like I designed a new system that blew up," he said last week.

Continued on page 6

IBM easing corporate discount terms

BY ROSEMARY HAMILTON
CW STAFF

IBM is increasingly offering discounts to customers based on the dollars they agree to spend rather than a commitment to specific products. This so-called revenue-based discounting allows a customer to change acquisition plans during a contract period without losing the discount, as was often the case with product-related contracts.

The company is apparently taking various approaches in delivering these deals. IBM has officially announced one deal for air-cooled mainframes, confirmed another for high-end mainframes that was never publicly released and denied the existence of a third revenue-based plan that information systems executives said covers corporatewide purchases.

The revenue-based plans, however, all share a common theme: They allow customers to juggle their purchases during a given contract period and maintain their discounts as long as they stick to their revenue commitments. Previously, customers typically agreed to a specific number of product purchases and lost their discounts if they did not follow through on the actual product commitment.

Three IS executives contacted last week said IBM plans to provide what they call an enterprisewide agreement, which is a revenue-based plan for corporatewide purchases. These deals are more far-reaching than what had previously been offered, the executives said. In addition to being based on financial commitments, the discounts also span

Continued on page 120

Microsoft lines up big guns for multimedia product push

BY JAMES DALY
CW STAFF

SAN JOSE, Calif. — Microsoft Corp. attempted to jump start the struggling multimedia market in the DOS world last week with the announcement of a set of hardware and software development specifications as well as multimedia extensions for both Windows and OS/2. The move was supported by IBM, Tandy Corp., AT&T and several other industry heavyweights.

However, some observers said the link between multimedia — the blending of audio, video and animation into traditional data presentations in an interactive manner — and the needs of the average computer user remains elusive.

"There is still a lot of convincing that needs to be done," said Michael French, a senior consultant at Inteco Corp., a market research firm in Norwalk, Conn. "The market potential is there, but there is not one thing that will go boom and suddenly the market will magically appear."

Potential users said the "must-have" application that would cost-justify the hardware upgrade needed for multimedia simply does not exist.

"Technology for technology's sake is becoming increasingly hard to justify in this economic climate," said Nancy Newell, a manager at

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INSIDE

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How well do T1 multiplexers meet your business needs?

Response base: 184

Includes: Stratacom's IPX, NET's IDNX, Newbridge Network Corp.'s Mainstreet 3600, Timeplex, Inc.'s Link

For detailed product ratings, see Buyers' Scorecard page 82

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Technology Analysis: Lotus' Magellan 2.0 is still a strong text searcher, but new utilities rate below par. Page 55.

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8 Apple has underestimated the appeal of its **Macintosh Classic**: The wiped-out supply will not be replaced until late March.

10 Allied gives the green signal to its **Autolite** division to switch from IBM's platform to a SQL-based RDBMS.

12 Found guilty in a lawsuit filed by rival Cambex involving its IBM 3080 memory product line, **EMC** says it plans to appeal the verdict.

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The 5th Wave

IN A DISPLAY OF PERVERSE BRILLIANCE, CARL THE REPAIRMAN MISTAKES A ROOM HUMIDIFIER FOR A MID-RANGE COMPUTER, BUT MANAGES TO TIE IT INTO THE NETWORK, ANYWAY.

EXECUTIVE BRIEFING

■ **Leaner times lie ahead for information systems budgets.** An Index Group survey of 394 IS executives said 1991 budgets will increase by the lowest percentage in three years. Cost-cutting is the watchword, with data center consolidations and outsourcing the most popular methods. However, the recession also represents an opportunity for IS to take the lead in re-engineering business practices to improve the bottom line. **Page 1.**

■ **Michael Heschel resigned as head of Security Pacific Automation** just seven months after his much-publicized hiring. The former IS chief at Baxter called his surprise departure "just one of those things that didn't work out." Security Pacific Vice Chairman John Singleton, Heschel's former boss, will take over his duties on an interim basis while a replacement search proceeds. **Page 1.**

■ **The venerable Sabre airline reservations system** will be broken up and run on smaller platforms. Using the newest version of IBM's transaction processing system, American Airlines will subdivide the huge Sabre database to run on several application-specific platforms. **Page 4.**

Bankamerica will close its Hong Kong data center as part of a move to consolidate overseas processing. The bank says the moves will pay for themselves in two to three years. **Page 119.**

■ **The Autolite Spark Plug Division** will leave the IBM nest of parent Allied and use a Sequent-based Oracle manufacturing resource planning system instead. Allied's other automotive divisions plan to migrate from an IBM 4381 to Application System/400s, but Autolite chose its own path for better integration with its Oracle shop-floor system. **Page 10.**

■ **Choosing the right path among outsourcing,** systems integration or in-house talent is a tricky business. It requires knowing your company's business, what role technology plays and a large amount of old-fashioned soul-searching. **Page 69.**

■ **A regional Prime Computer user organization** was the driving force in the automation of an adoption resource center in Denver. The group convinced Prime to donate computer equipment to the center. **Page 97.**

■ **University IS holds its own unique challenges** for professionals, including lack of hardware and software standardization as well as a shortage of technical support. **Page 104.**

■ ***Computerworld*** **honored the best and the brightest** — the Top 10 most effective users of IS — at the *Premier 100* awards dinner. **Photo, page 69.**

■ **More women work in computing today** than a decade ago. According to the U.S. Department of Labor, some 245,000 women took IS jobs in the 1980s. But most took lower-level positions that paid 30% less than they paid males, and percentage growth remained flat. Still, many are hopeful about the new decade. **Page 93.**

■ **Network management users say graphical user interfaces** could help deal with the flood of messages coming in from the network. Icons and lines representing network elements may help simplify the network manager's job. **Page 63.**

■ **On-site this week:** Manufacturers Hanover hopes to make the most of its computer resources by giving users access to both Digital Equipment Corp. VAXs and IBM AS/400s. **Page 63.** The November elections gave voters a chance to change the look of the U.S. House; now the House's IS group is giving the legislative body's computers a new look. **Page 25.** A Wang minicomputer is helping New York authorities in their bid to battle juvenile delinquency. **Page 28.**

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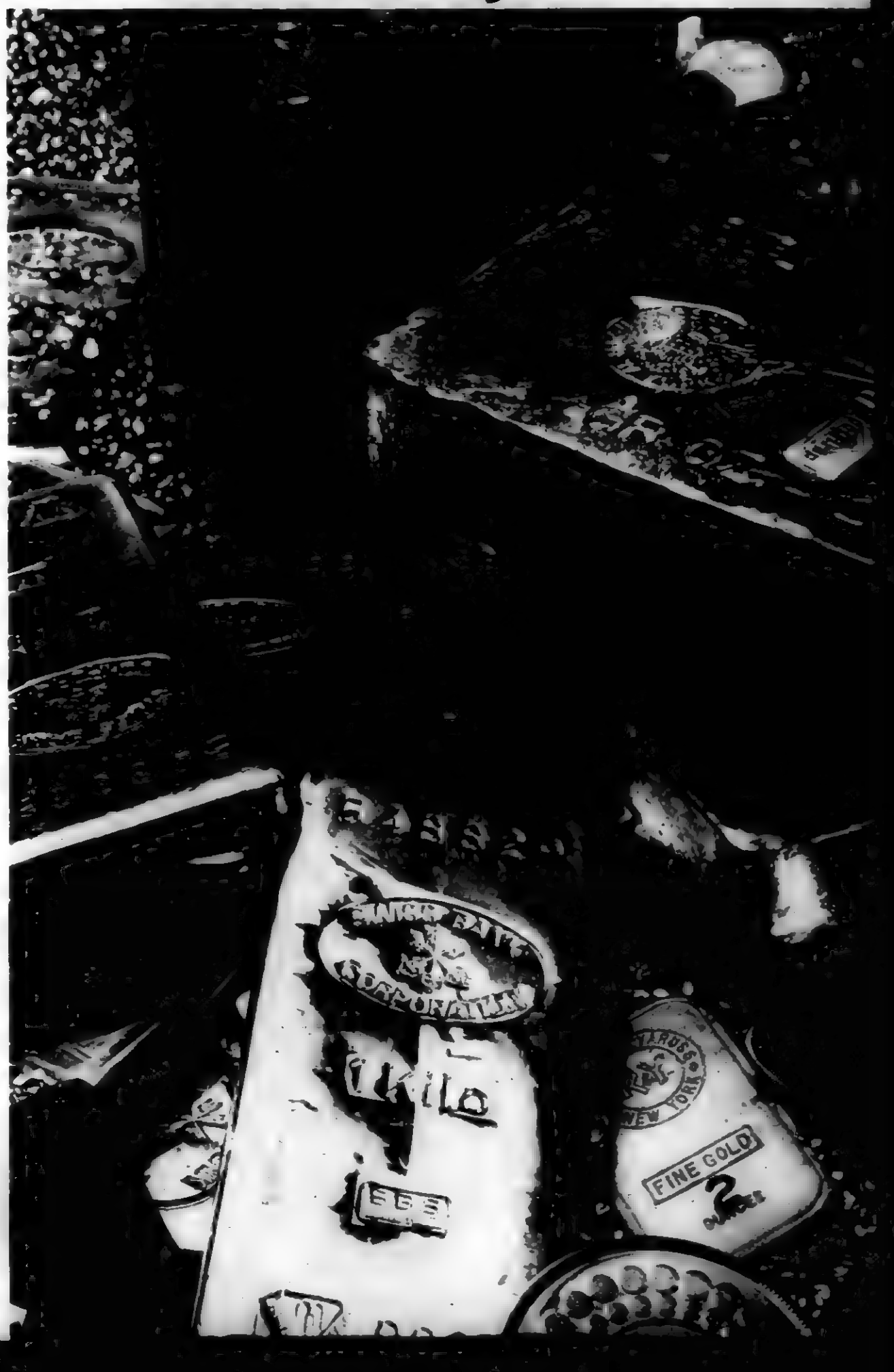

HP launches minis, New Wave Access

BY J. A. SAVAGE
CW STAFF

PALO ALTO, Calif. — Hewlett-Packard Co. is set to announce five minicomputers tomorrow for both its Unix and proprietary operating systems and an extension of the company's New Wave Office application. This comes on top of a spate of computer-aided software engineering (CASE) products for commercial systems announced last week.

Two minicomputers in HP's proprietary operating system line, the Series 3000, will fill out the series between the current Models 932 and 955. The new models will run at between 15 million instructions per second (MIPS) and 22 MIPS. Two Unix-based minicomputers will be added to the midrange of the 9000 series and will also run at between 15 MIPS and 22 MIPS. The last Unix-based minicomputer will be at the high end, more than 50 MIPS, according to analysts.

Some analysts, including Carolyn Griffin at International Data Corp. in Framingham, Mass., said HP is changing its marketing to emphasize its minicomputers for commercial transaction processing.

Packaging for the Series 3000 will also change to allow for easier upgrades.

Instead of having to swap boxes three times between the low end of the multiuser models and the high end, users will only have to swap between the high end and the low end. According to analysts, this will be accomplished with the new minicomputers that are built to bridge the upgrade gap between low-, middle- and high-end boxes to make it just low- and high-end boxes with board swaps in-between.

Wave of the future

A software application, called New Wave Access, will also be announced. The product, according to Michael Goulde, vice president of Open Systems Advisors, Inc. in Boston, allows a New Wave-based system (a personal computer-based application holding many functions under one graphical user interface) to link with several different relational databases.

HP would not provide details on the rollout at press time.

Last week, HP announced more products in its Casedge strategy to allow software development and maintenance in heterogeneous environments.

> "IT'S NOT terribly unlike Digital Equipment Corp.'s strategy."
>
> MICHAEL GOULDE
> OPEN SYSTEMS ADVISORS

Three packages that allow CASE development in a client/server environment for use with mainframes, client/server systems and PCs will be available in 1991. The products are part of a strategy to let users develop software in HP's proprietary or Unix environment and apply it to these different computing environments.

"The idea of Casedge is to separate the development environment from the target environment," according to Korak Mitra, product line manager for CASE at HP. Some of these products have been available on Unix-based workstations. Mitra said that by the end of next year, the products will be available across both the Series 9000 and Series 3000 computers.

"They're looking to provide [IBM] AD/Cycle-like functionality in a CASE environment," Goulde said. "And it's not terribly unlike Digital Equipment Corp.'s strategy — to develop CASE for multiple target platforms. That's valuable in today's environment."

The products, ported to HP's operating systems by third-party vendors, are Paclan/C, a multiuser Unix repository from CGI Systems, Inc. in France "that is client/server in nature but generates code for other machines," Mitra said. Similar CASE tools scheduled to be available next year include Maestro II from Softlab, Inc. in Germany and Powercase from Cognos Corp. in Burlington, Mass.

Slivers of Sabre will simplify, speed systems

BY JEAN S. BOZMAN
CW STAFF

TULSA, Okla. — American Airlines' Sabre, the largest airline reservations system in the world, is about to be subdivided. Sabre will be broken into multiple application-specific processors to simplify computer operations — and to speed development of new software systems.

"We need to solve the problem of the monolithic database, or having all your eggs in one basket," said Roy Smyth, managing director of Sabre Engineering here. "We are going toward having different functional processors for different applications."

American has wanted to break Sabre's central complex into smaller pieces for some time. However, Sabre's custom version of the IBM Airline Control Program (ACP), which had been running for 18 years, prevented such a move. ACP required the IBM 3090 processors to operate as a single unit to achieve real-time synchronization.

In March, Sabre converted to Transaction Processing Facility (TPF) 3.1, the latest version of IBM's transaction-oriented system, which supports multiple functional processors. Breaking up Sabre will, however, require additional software development that matches CPU activity to database updates on selected disks.

"The focus we are trying to take is that of the user's perspective," said Thomas J. Kiernan, president of American's Sabre Computer Services Division in Dallas. "We have to figure out a way to make the system available around the world, 24 hours a day, seven days a week, and that's a focus we didn't have three to four years ago."

Just last month, Sabre signed an agreement with Amadeus, a consortium of several European airlines, which may link up with Sabre in a future global reservations network.

Downtime is a key concern, demonstrated most dramatically in May 1989, when a software failure forced Sabre to go off-line for 13 hours. Sabre's systems software gets turned off once per week, for 10 to 12 minutes of scheduled maintenance. That is down from 10 minutes per day three years ago. Unscheduled systems maintenance sometimes forces Sabre operators to take the system off-line for several minutes, causing concern among travel agents and bogging down airport operations.

In the future, IBM's new Escon fiber-optic channels for the Enterprise System/9000 mainframes will help support larger complexes running TPF, even if those TPF complexes are broken down into smaller, more manageable clusters. Moving to multiple TPF systems — and possibly to some future MVS and Unix systems — will give Sabre greater operational flexibility.

Steve Wisniewski

Kiernan: *Sabre needs to be available around the world*

According to Kiernan, it will also speed the development of new software applications and travel "products" for travel agents. "We need to carve applications out of the Sabre monolith and carve out the necessary piece of the database, too," he said. That would mean segregating hundreds of Sabre's 1,380 disk drives into database groups.

The appearance of multiple TPF complexes — American's Flight Operations System was stripped from the main complex earlier this year — is new to American. But competitor Covia, United Airlines' reservations system, has had multiple-functional processors for more than two years.

A dual Sabre data center is not in the cards immediately, executives said. "Right now, our data distribution plan is to separate the database logically, not geographically," Kiernan said.

That stance could change by 1993, when AAnet, a digital backbone network with a bandwidth of 45M bit/sec., is scheduled to be completed. AAnet will link American Airlines' core data and aircraft maintenance operations here and with American's headquarters in Dallas/Fort Worth.

George Maulsby, managing director of reliability management, said, "When AAnet becomes fully operational, the only thing you'll need to do to access a Sabre database is to create a new communications connection."

CORRECTION:

A story on personal computer graphics standards efforts [CW, Nov. 19] incorrectly referred to Texas Instruments, Inc.'s Graphics Architecture as Graphics Array.

A hard bits item on Sentinel Computer Services [CW, Nov. 19] should have indicated that the company is now providing on-site technical reconditioning support for water-cooled IBM systems.

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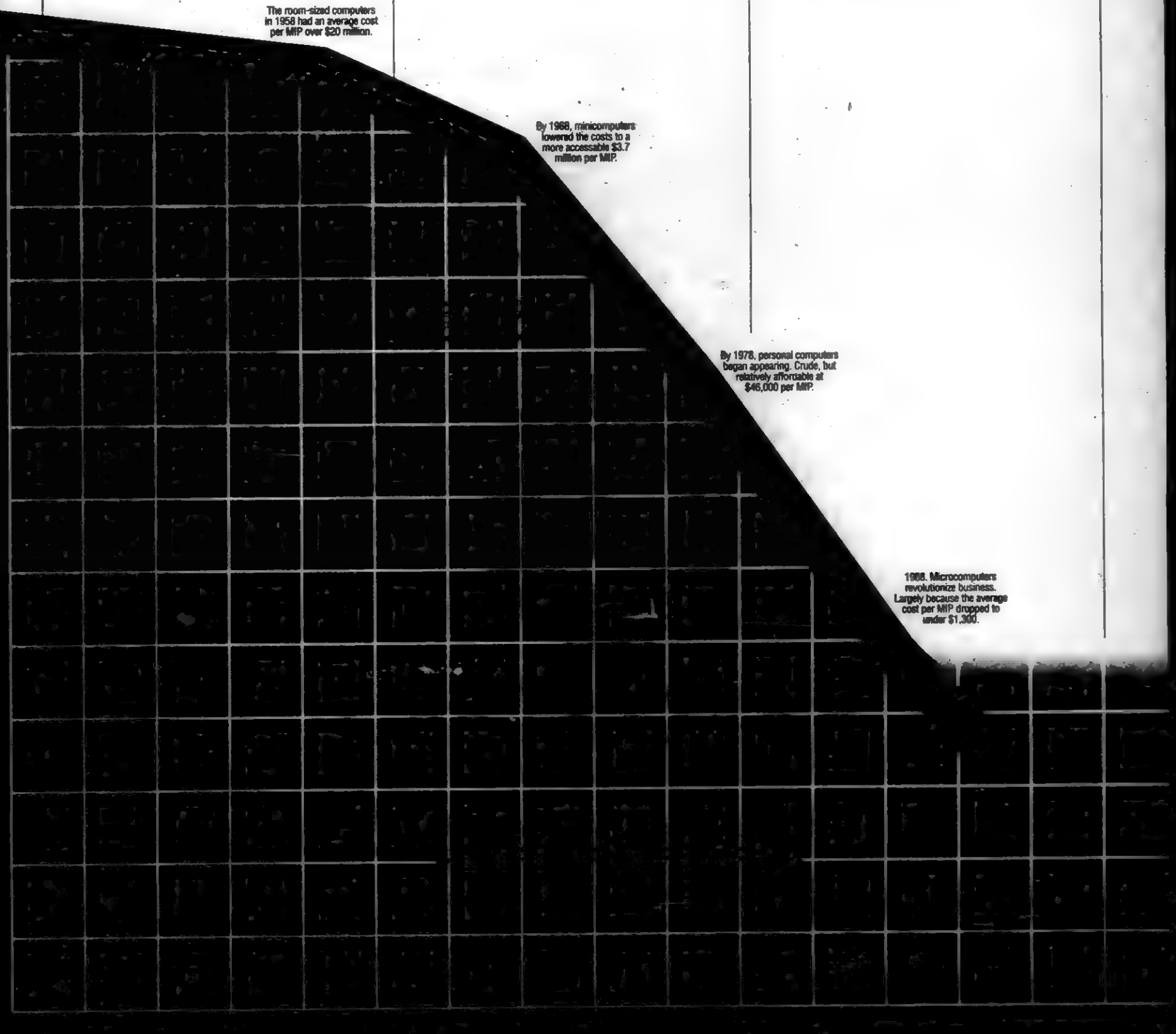


Recession

FROM PAGE 1

procurements or staff, the company is re-examining project priorities.

"Projects that are central to improving the business will get the go-ahead," he said, "while others will be put on hold."

Reck said the study revealed an overall "cost-cutting morale" in IS, instigated by both the threat of war in the Middle East and industry-specific factors.

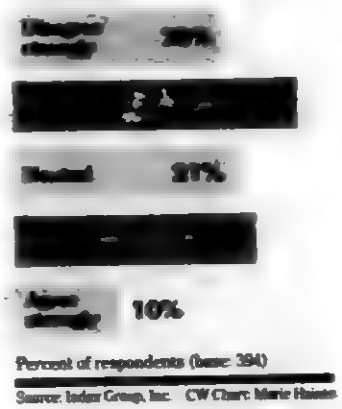
For example, he said, two-thirds of existing pharmaceuticals patents will expire during the next five years, so companies in that industry are already in a ramp-up mode for flattening business — although IS managers are frustrated by business managers "who don't appreciate the value technology can offer."

Major cost-cutting measures IS departments are taking include varying degrees of outsourcing (36%) and consolidating data centers (47%).

Of the 36% of the respondents who are outsourcers, the most popular forms include turning over applications development (45%), personal computer procurement and training (42%) and telecommunications and networking (30%) to a third party, according to the report.

The move is on

The open systems movement has swept up a third of surveyed IS executives



Percent of respondents (base: 394)

Source: Index Group, Inc. CW Chart: Marie Hainen

Outsourcing is a method for firms to focus on their core businesses, the report stated, rather than getting distracted by computing and networking activities.

Reck also said the survey results revealed "a naivete on the part of business managers about the role technology is playing in business."

Education the key

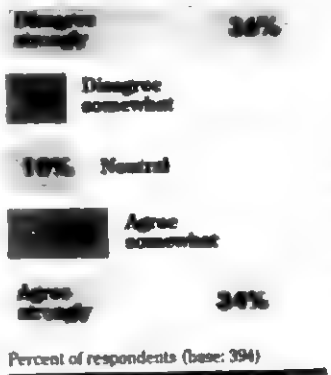
He advised IS managers to strive to educate executive management on appropriate technology investments during a recessionary period and to form a "partnership" with them to counteract the problem.

One instance where such a partnership is taking place is at Spencer Gifts, Inc. [CW, Nov. 26] in Pleasantville, N.J. Chief Executive Officer John Hacala views IS on a par with operations, site selection and other strategic facets of the business. He recently got involved hands-on with Vice President of IS Eugene Murtha to design the Spencer Integrated Retail Information System, a database that will fundamentally reshape the way the company does business.

Other users said they are trying to leverage their vendor relationships in anticipation of recession.

Squeezing out efficiencies

Most of the IS executives surveyed either have been deeply involved in data center consolidation or have done nothing



Percent of respondents (base: 394)

Source: Index Group, Inc. CW Chart: Marie Hainen

Tom Loane, vice president of computers and communications at Alamo Rent-A-Car in Fort Lauderdale, Fla., said he is surprised that the Mideast crisis has not translated into any downturn in leisure car rentals. He acknowledged, however, that he has "a fear in the back of his head that things could go south." As a result, he said, he is trying to negotiate vendor contracts that allow him to back out "without too much pain."

Another rampant cost-cutting measure is data center consolidation. Index Group estimated that companies consistently reap 25% to 33% savings as a direct result of data center consolidation (see chart), through improved price/performance ratios of information technologies, reduced equipment space requirements and "lights out" (unattended) data center operations.

Senior editor Rosemary Hamilton contributed to this report.

Colleges learn lessons on using IS to cut costs

BY MICHAEL ALEXANDER
CW STAFF

MIAMI BEACH — Higher education must practice more of what it has been preaching in its business schools: Colleges and universities must rely more on information technology to cut costs, boost productivity and become more entrepreneurial.

That was the primary lesson hammered on in session after session at the College and University Systems Exchange Conference held here last week.

Colleges and universities are feeling the same sorts of economic and societal pressures that have plagued businesses in recent years, according to users who attended the conference.

The cost of providing higher education is soaring, while at the same time, students and parents are questioning whether they are getting their money's worth from increasing tuitions, said Robert Heterick Jr., vice president for information systems at Virginia Polytechnic Institute and State University. "The gap between higher education and society's willingness to pay has never been wider," he said.

Recruiting overseas

A slumping student enrollment — declining in recent years at an annual rate of 14%, by some estimates — has caused many institutions to lose market share or shift their recruitment efforts overseas, speakers said.

As in the business world, information technology is being touted as the strategic weapon to help institutions of higher education compete successfully.

Campus computer systems are also starting the transformation from centralized to distributed systems that businesses are undergoing and grappling with issues the change entails.

Learning institutions typically have a wide assortment of computer systems on campus, and hooking them together and supporting a campuswide network will be one of an IS manager's most daunting and costly challenges during the next 10 years.

One option that merits consideration is outsourcing at least part of the IS function, some speakers said.

"We have looked at it very, very hard and continue to look at it," said Lewis Tameres, chief information officer at the University of Miami. "We are currently evaluating our whole telecommunications network maintenance for outsourcing."

Is a 'computer prince' necessary?

The campus computer user community is extremely diverse; getting this pluralistic user base to hook into a campuswide network and networks beyond takes considerable management skills. It seems like a perfect job for a chief information officer, right? Well, maybe.

"If Machiavelli were alive today, the prince would be a CIO," said Robert Heterick, vice president for information systems at Virginia Polytechnic Institute and State University. There is too much diversity on campuses for a central authority or "computer czar," he said.

The trend toward client/server architectures and away from integrating administrative and academic systems means there is little need for a CIO, he said.

"Contrary to popular belief, I ain't dead," quipped Lewis Temares, CIO at the University of Miami. As campuses rely more on information technology, the CIO will play an increasing role in executive decision-making, he said.

A recent College and University Systems Exchange newsletter noted that university search committees are increasing their efforts to find CIOs. State universities of California, Pennsylvania, Minnesota, Tennessee and Wisconsin are all currently looking to fill a CIO post, the newsletter reported.

MICHAEL ALEXANDER

Heschel

FROM PAGE 1

"Sometimes you don't always fit as perfectly as you'd like. I don't want to get into it any further than that."

Heschel's departure was effective Nov. 15. Former SPAC Chairman John P. Singleton, now vice chairman of parent Security Pacific Corp., will assume Heschel's duties on an interim basis until a replacement is found.

Singleton, to whom Heschel reported, was traveling last week and was unavailable for comment. A Security Pacific spokeswoman said Heschel "resigned to pursue other business opportunities," although an industry source said that was not the reason he left.

> "SOMETIMES YOU don't always fit as perfectly as you'd like. I don't want to get into it any further than that."
>
> MICHAEL HESCHEL
> (FORMERLY) SECURITY PACIFIC

The source said Heschel was shocked by the sudden bad turn in his relationship with the company. Heschel acknowledged that "sometimes curveballs come at you.

"Sometimes marriages don't work out either," he added. "It was just one of those situations that sometimes happen in life."

Strong willed

Singleton and Heschel both have reputations as strong-willed executives, and industry sources speculated about the possibility that their personalities clashed.

However, former SPAC Chairman DuWayne J. Peterson, who hired Singleton, said an impulsive action by Singleton "sounds out of character to me."

"I'm very surprised by the news," said Peterson, now top IS executive at Merrill Lynch & Co. in New York. "John is demanding, but fair, and a very good developer of people. He's not an egomaniac who doesn't want good people around him. He's very solid, one of the best business executives in any field."

Peterson said he met Heschel for the first time at a conference in Palm Springs, Calif., in late October, just weeks before Heschel's sudden departure. "He didn't seem to be under any pressure that I could sense," Peterson said.

Heschel, who had relocated with his family to the Los Angeles suburbs, said he will spend a quiet month before returning to the job-seeking trail. "The only good thing about this is it gives me some time to take the process slowly and think about what I want to do," he said.

Heschel spent much of his early IS career in Southern California at American Hospital Supply Corp.'s American McGaw Laboratories unit in Irvine. He later moved to American Hospital Supply and survived that firm's 1985 acquisition by Baxter to become its top IS executive and one of the most prominent spokesmen in the IS profession.

Motorola 68040 shipment gets mixed welcome

BY MAURA J. HARRINGTON
CW STAFF

AUSTIN, Texas — The cheers for Motorola, Inc. were restrained last week after the company announced volume shipment of its fourth-generation 68000 family complex instruction set computing (CICS)-based microprocessor.

Analysts said the 68040, which is several months late, is an improvement over the 68030 and is competitive with current-generation reduced instruction set computing (RISC)-based microprocessors such as Sun Microsystems, Inc.'s Scalable Processor Architecture chip. But, they added, Motorola's inability to produce the chip in volume in a timely fashion has had an irreversible effect on the company and its customers competing in the Unix workstation market.

Hewlett-Packard Co. is one such example. Last year, analysts said HP was easily the No. 2 workstation vendor when the firm acquired Apollo Computer, Inc.'s product line. Because HP continues to rely on CISC-based technology to power its workstations, it was depending on the timely production of the 68040 chip when it announced its first combined HP-Apollo workstation last spring.

"When we learned about the product delay, we instituted models with the 68030 chip with inexpensive upgrade options to the [68040] as soon as it started shipping," an HP spokeswoman said. That upgrade, she added, costs $2,000.

That process, according to analyst David Card at International Data Corp., a market research firm in Framingham, Mass., caused HP to lose market share that it could have potentially held onto.

HP's market share loss, however, is not really a result of Motorola's late microprocessor, but more that of the increasing competition from the RISC workstation vendors, analysts said.

The increase in competition, as well as Motorola's delay in shipping the 68040, has caused several of the firm's potential customers to fall back or change their focus, analysts said.

"I don't think Motorola lost customers because they're shipping now and not six months ago. They lost customers because they are shipping now and not a year and a half ago," said Michael Slater, editor and publisher of the "Microprocessor Report," a trade newsletter.

Next, Inc. is basing its product line on Motorola's chip but has only 15,000 orders spread over the next nine to 12 months, Card said. Next was not hurt by the delay as much as HP, because it was not ready to ship its products, he added.

"The [68040] was a little bit later than we would have liked, but we've been working closely with Motorola, so we knew," said Rich Page, Next's vice president of hardware engineering. "The good news is that the chip is faster than we expected. We thought it would only run at 10 [million instructions per second], but we've found it to run at 15 MIPS."

The 68040 microprocessor incorporates the floating-point processor and integer unit on a single chip, which helps boost the performance between three and five times that of the 68030, said Jim Reinhart, marketing manager for the 68000 family product line.

Tandy chooses Novell over 3Com

BY JIM NASH
CW STAFF

FORT WORTH, Texas — Tandy Corp. has dropped its OEM agreement with 3Com Corp. and replaced 3Com with networking leader Novell, Inc.

Ed Juge, director of market planning at Radio Shack, a subsidiary of Tandy, said the company decided not to renew its OEM agreement, which expired Oct. 31. A spokesman for 3Com in Santa Clara, Calif., declined to comment other than to say it was a mutual decision.

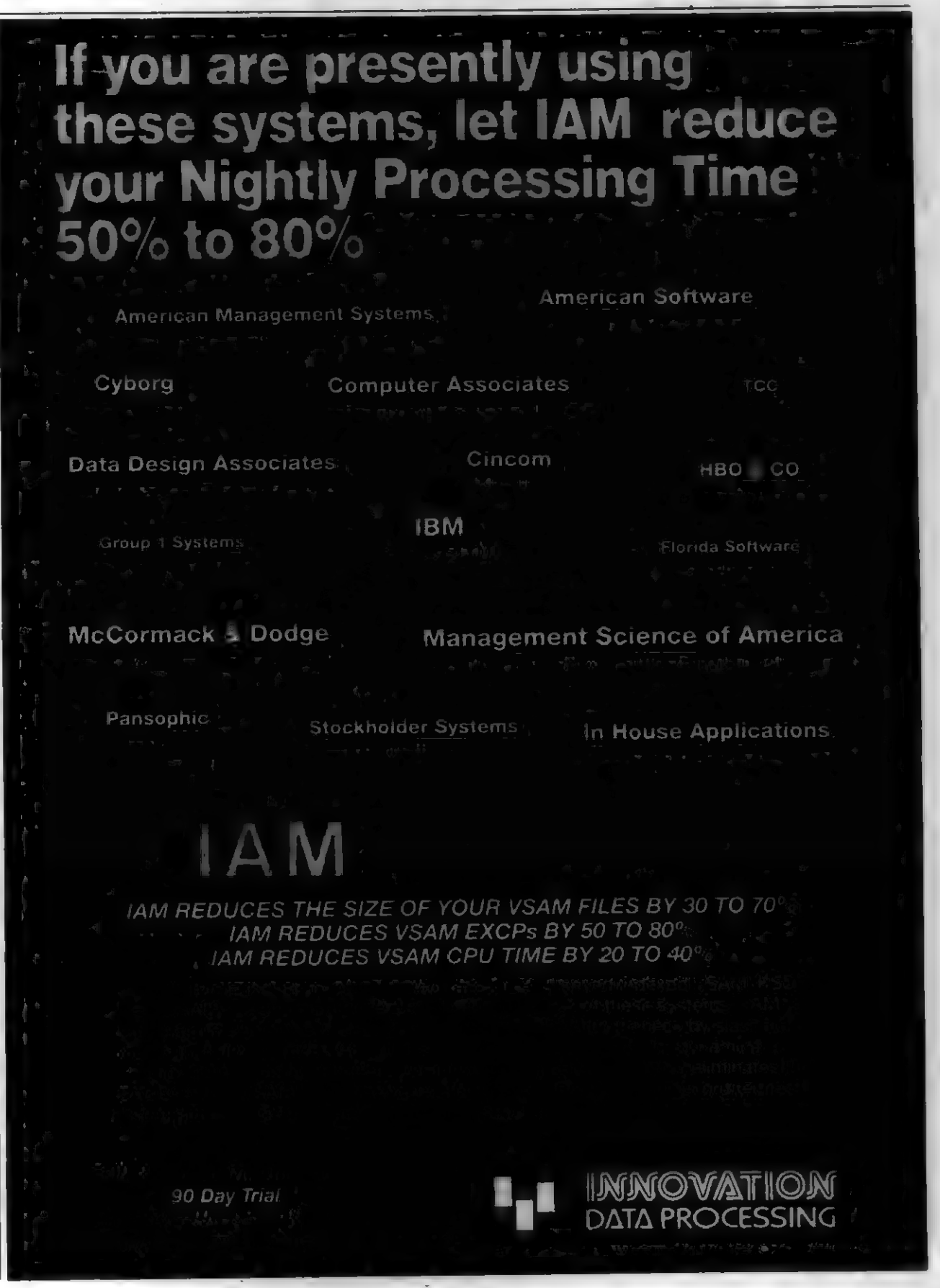
"The majority of our [customers] are asking for the Novell network operating system," Juge said. "We've responded with what the market has asked for." However, Juge would not say if an OEM agreement had been signed with Novell.

"It was a friendly parting of ways," Juge said. "There will still be an association; we will supply whatever the customer wants," but only on a special order basis. Although Juge would not reveal how long Tandy had been contracting with 3Com for its local-area networking products, he said the two firms had been working closely for "two or three years."

About 700 of the 7,000 Radio Shacks had been selling 3Com equipment, including its 3+Share and 3+Open operating systems and Ethernet adapter cards.

John Girton, an analyst at Van Kasper & Co. in San Francisco, said the decision should have little negative impact. While there may be a movement away from the struggling firm at present, he explained, "3Com will stem that movement when they get the Novell protocol loaded on its server protocol stacks." 3Com has announced plans to deliver such a product.

Tandy has an OEM contract with The Santa Cruz Operation for its Xenix network operating system.



NEWS SHORTS

User interface upgraded

Siemens Nixdorf Information Systems, Inc. updated its user interface development tool for the Open Software Foundation Motif environment last week with the announcement of Xbuild Release 1.1. The latest release of Xbuild reportedly allows users to extend the number of graphical objects used for an interface as well as customize the environment to a particular company's standards. As with the first version, Siemens Nixdorf will offer the software on a trial basis to users before payment is required. The software includes an object library and editors. Currently, the company will offer Xbuild for its own Targon systems as well as workstations from Sun Microsystems, Inc. and Digital Equipment Corp.

Businessland wins Kodak pact

Beleaguered personal computer dealer Businessland, Inc. said last week it will provide Eastman Kodak Co. with an automated computer products ordering and inventory-tracking system. Intended to reduce PC order times, offer on-line status reporting and improve record keeping, Cleanstream will be available to other users in the third quarter of next year, Businessland said. Also last week, Businessland announced more restructuring moves to stop its string of losing quarters. The firm will be segmented and will run as four business divisions: General Products, Network Systems, Service and Distribution.

NYSE closes 'down,' for real

The New York Stock Exchange is "still looking into" the cause of an electrical failure that halted trading on Nov. 23, an exchange spokesman said. The outage, which lasted about 1½ hours, was caused by some internal problems, he said. In the meantime, the exchange plans to install an uninterruptible power supply within the next 12 months because its existing battery-powered backup system did not do the job. Still, the exchange didn't suffer too badly from the 94-minute outage, which started at 9:41 a.m. and lasted until 11:15 a.m. Because it was the day after Thanksgiving, trading was light anyway.

Apple buys into RISC start-up

Apple Computer, Inc. continued to send out feelers into the area of reduced instruction set computing (RISC) technology last week with the announcement of a $3 million investment in a new chip company. The Advanced RISC Machines Ltd. venture plans to produce RISC chips that can be used in PCs and telephones and as embedded controllers in consumer and automotive electronics. No date has been set for an initial product offering. An Apple spokesman called the deal with Cambridge, England-based Advanced RISC Machines "strictly an investment opportunity." Apple is also working with Motorola, Inc. to integrate Motorola's RISC technology into its Macintosh line by as early as next year [CW, Oct. 15].

U.S. grooms firms for Japan entries

The U.S. Department of Commerce selected an elite group of 20 U.S. companies last week — including Oracle Systems Corp. and Compaq Computer Corp. — to get extensive government help in penetrating the Japanese market. The official "blessing" of the U.S. government will open the right doors in Japan, because Japanese business leaders will know that these prescreened companies are committed to a five-year program to boost sales in Japan, said Riley Repko, Oracle's director of government affairs.

Tandem plans software ties

Tandem Computers, Inc. is expected to announce this week that it will focus on applications software development through a new business partner program called the Tandem Applications Group. The new Tandem marketing arm will include the 6-year-old Alliance program for independent software vendors that write packages for Tandem's transaction-oriented computers. The development of new open systems software, including Unix applications, will be emphasized, Tandem executives told *Computerworld* last week.

More news shorts on page 120

Mac Classic: Just try to get your hands on one

BY JAMES DALY
CW STAFF

CUPERTINO, Calif. — If you are dying to see your fingers dance across the keyboard of Apple Computer, Inc.'s new Macintosh Classic any time in the near future, sit tight: Company officials said they will be unable to meet demand for the entry-level machine until late March.

The Classic, which was introduced six weeks ago along with the higher-priced Macintosh LC and Macintosh SI, has become a victim of its own success. Pent-up user demand for a low-cost Macintosh — the Classic sells for between $800 and $1,500, depending on configuration — and Apple's $40 million advertising campaign have brought buyers flocking to retailers with checkbooks in hand. But chains such as Computerland Corp. said their shelves are bare of the Classic and that back orders may take weeks to fill.

Get 'em while they're hot

"The Classic is the hottest model we've got today, but we just can't get them," said Edward Anderson, president of Computerland in Pleasanton, Calif. "Obviously, it's causing a strained feeling among our dealers." Anderson would not speculate on how many sales were lost because of the undersupply.

Apple officials have scrambled to step up production, but analysts said the shortages could undermine the machine's original mission to win back mass-market shoppers from low-cost IBM Personal Computer clones.

Apple has seen its share of the $42.3 billion domestic PC market plummet from about 15% only a few years ago to about 10% today, according to Dataquest, Inc., a research firm in San Jose, Calif.

Potential users said the shortages of the Classic and the delayed availability of the LC — early volume shipments are not expected until late January — are frustrating in light of the early hype.

"Apple is really missing the boat here," said Rick Christjansen, manager of information systems at Manville Corp. in Denver. "There's going to be a lot of [IBM Personal System/1s] under the tree this Christmas instead of Classics or LCs because of that mistake." Christjansen, a self-described Apple devotee, said he will begrudgingly await the high-volume arrival of the new models, which he sees as basic corporate computers rather than just home or small business systems.

Retailers, however, have downplayed the seasonal appeal of the Classic. "The Classic is not an impulse buy," Anderson said. "It's a business buy, and people will wait."

Half the price

Analysts said they see the Classic, which essentially duplicates the discontinued Macintosh SE at half the price, as a key revenue generator for Apple. Paul Norris, an analyst at Gartner Group, Inc., a research firm in Stamford, Conn., estimated that 1 million Classic sales are possible within the next year — if Apple can alleviate the shortages.

Fred Forsyth, senior vice president of worldwide manufacturing, said Apple tried to do too much too fast. "We introduced three new products in 121 countries in one day; we've never done that before," he said.

In response to the shortages, Forsyth said, the Singapore manufacturing plant where the Classics are made will go from a five-day, two-shift schedule to a seven-day cycle where manufacturing is done nearly nonstop. The machines will also be air-shipped around the world, instead of by boat, as had been done earlier. Classic production has also been initiated at a Cork, Ireland, plant for European distribution, he added.

Microsoft

FROM PAGE 1

the Buick Motor Division of General Motors Corp. in Flint, Mich. Newell said that "someday" the company would like to integrate multimedia into its dealer training program, "but it's a little too cost-prohibitive at this point."

Manufacturers said an entry-level multimedia setup would include an Intel Corp. 80286-equipped personal computer or higher, a compact disc/read-only memory drive, at least 2M bytes of random-access memory, a 30M-byte hard disk, standard or enhanced IBM Video Graphics Array, enhanced audio and the Windows multimedia extensions — additions that could add several thousand dollars to the cost of a typical PC configuration.

Some early multimedia users, however, said the cost justifies the results. "The payback in personnel training, cost savings and increased productivity can be tremendous," said Meg Lewis, manager of advanced technology at American Airlines in Dallas. American has already begun integrating multimedia applications into the training of its pilots, maintenance engineers and travel agents, Lewis said.

Analysts said Microsoft's announcement confronts the most important hurdle facing the widespread integration of multimedia into the DOS world: a severe lack of software. Software houses have so far targeted most of their multimedia development efforts at more graphically-oriented PC platforms, such as Apple Computer, Inc.'s Macintosh and Commodore Business Machines, Inc.'s Amiga. With the introduction of Microsoft's Windows 3.0 in May, however, the DOS world suddenly assumed a more graphical feel.

> "TECHNOLOGY for technology's sake is becoming increasingly hard to justify in this economic climate."
>
> NANCY NEWELL
> BUICK MOTOR DIVISION

The specifications, which co-developers Microsoft and IBM announced at the outset of Microsoft's Multimedia Developers Conference, could lower the entry price by standardizing development efforts in two areas: common data file formats and applications programming interfaces for controlling media devices. The Redmond, Wash.-based software firm also announced its multimedia development kit.

Tandy Chairman John Roach said it will begin shipping development systems and expects to have multimedia products available by next year. "I intend to go into this with the same type of barnstorming as we did in the early years of the PC industry," Roach said.

Analysts said the match with Tandy and its Radio Shack chain of retail electronics outlets is a good one. "I don't think there is a better dealer network in the country than Radio Shack for selling multimedia systems," said Nick Arnett, editor of the "Multimedia Computing & Presentations" newsletter in Santa Clara, Calif. "There's nobody else who's nearly as successful as Tandy at selling both consumer electronics equipment and audiovisual equipment."

Other companies that said they would deliver PCs supporting the specification in 1991 were Compuadd Co., Fujitsu Ltd., NEC Technologies, Inc., Ing C. Olivetti & Co. and Zenith Data Systems.

Closing Arguments

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Autolite shuns IBM mold

Allied's spark plug unit preserves shop-floor Unix system

BY ELISABETH HORWITT
CW STAFF

FOSTORIA, Ohio — After weeks of debate, Allied Signal Corp.'s Autolite Spark Plug Division finally got management approval last week to break with the Allied automotive sector's IBM tradition. The division will replace a 15-year-old IBM 4381 manufacturing resource planning (MRP) system with a packaged MRP system based on Oracle Systems Corp.'s SQL-based relational database management system and running on a Sequent Computer Systems, Inc. Unix processor. Autolite needs to install an MRP system that runs on top of a SQL-based, truly relational DBMS in order to integrate its scheduling and business systems with an existing Oracle-based shop-floor control system, according to Autolite project engineer Richard Sturgeon.

Management's decision to let Autolite design its MRP system for compatibility with its existing shop-floor system — rather than vice versa — was an acknowledgment of the division's "desire to preserve their investment" in the shop-floor system, said Carole Pritchard, the sector's director of information systems and planning. The value of that investment was proven in 1989, when the system helped Autolite boost its productivity by 13% to become the most productive division within its sector [CW, Nov. 19].

At the heart of the shop-floor system is a distributed network of OS/2- and Unix-based computers running Oracle's SQL Server software. The servers use Netwise, Inc.'s RPC Tool remote procedure call software to collect real-time shop-floor data from IBM Personal System/2-based devices, which in turn interface with intelligent shop-floor equipment. The servers make the collected data available to a wide variety of users, including accountants, process engineers and shop-floor managers, Sturgeon said.

Autolite's Advanced Manufacturing Group had the foresight to bring the division's IS group into the project meetings early, Sturgeon said.

"Our engineering folks are way out in front of us, which is not a very comfortable position to be in, from an IS standpoint," said Ronald Williams, manager of application support at Autolite. "We haven't gotten in their way; we want to get on that train and reap the benefits."

However, when Autolite was ready for the next step of integrating the shop-floor system with the MRP system and proposed a Sequent Unix-based solution, it came up against the automotive sector's "dominant strategy" to use IBM, according to Pritchard.

Before it went to Sequent, Autolite had carefully evaluated a number of IBM-based MRP systems, including an Application System/400-based strategy that had been adopted by a number of other Allied automotive sites. But the division concluded that integrating an AS/400 system with the existing shop-floor system would be too difficult because the AS/400 does not yet have a truly relational SQL-based DBMS, Sturgeon said.

"We have established a strategy at Autolite that is based on free access to data that requires a relational model throughout the enterprise," Williams said. "The only way to do that successfully at an IBM site is to go to DB2, which Autolite's infrastructure is not big enough to support."

The automotive sector as a whole "will watch Autolite to see how useful and feasible their system is," Pritchard said. "We want to learn from their success, copy what we can and go beyond." Indeed, the sector's IS department has begun to guide people toward migrating their applications to commonly accessible, nonproprietary databases, she added.

However, Pritchard said, "I don't know if picking up the system Autolite implemented and dropping it someplace else would achieve the same productivity gains." Whether the automotive sector will migrate to a SQL-based RDBMS "will depend on where IBM goes with SQL on its AS/400 and other platforms," she said.

Autolite has no intention of hopping aboard the automotive sector's AS/400 bandwagon, Sturgeon said. However, Sturgeon and his group intend to evaluate IBM's AIX-based RISC System/6000 as a possible migration option in a year or two. Migration to the RS/6000, if Autolite does choose that road, "is likely to be easy," Sturgeon said, given that IBM's workstation already supports Oracle.

Meanwhile, Sturgeon and his group are preparing within the year to start the next phase of moving Autolite's financial applications to Oracle and Unix.

> "OUR ENGINEERING folks are way out in front of us, which is not a very comfortable position to be in, from an IS standpoint."
>
> RONALD WILLIAMS
> AUTOLITE

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Michael Abrahamson
Wagner Stott Clearing Corporation subsidiary of Merrill Lynch

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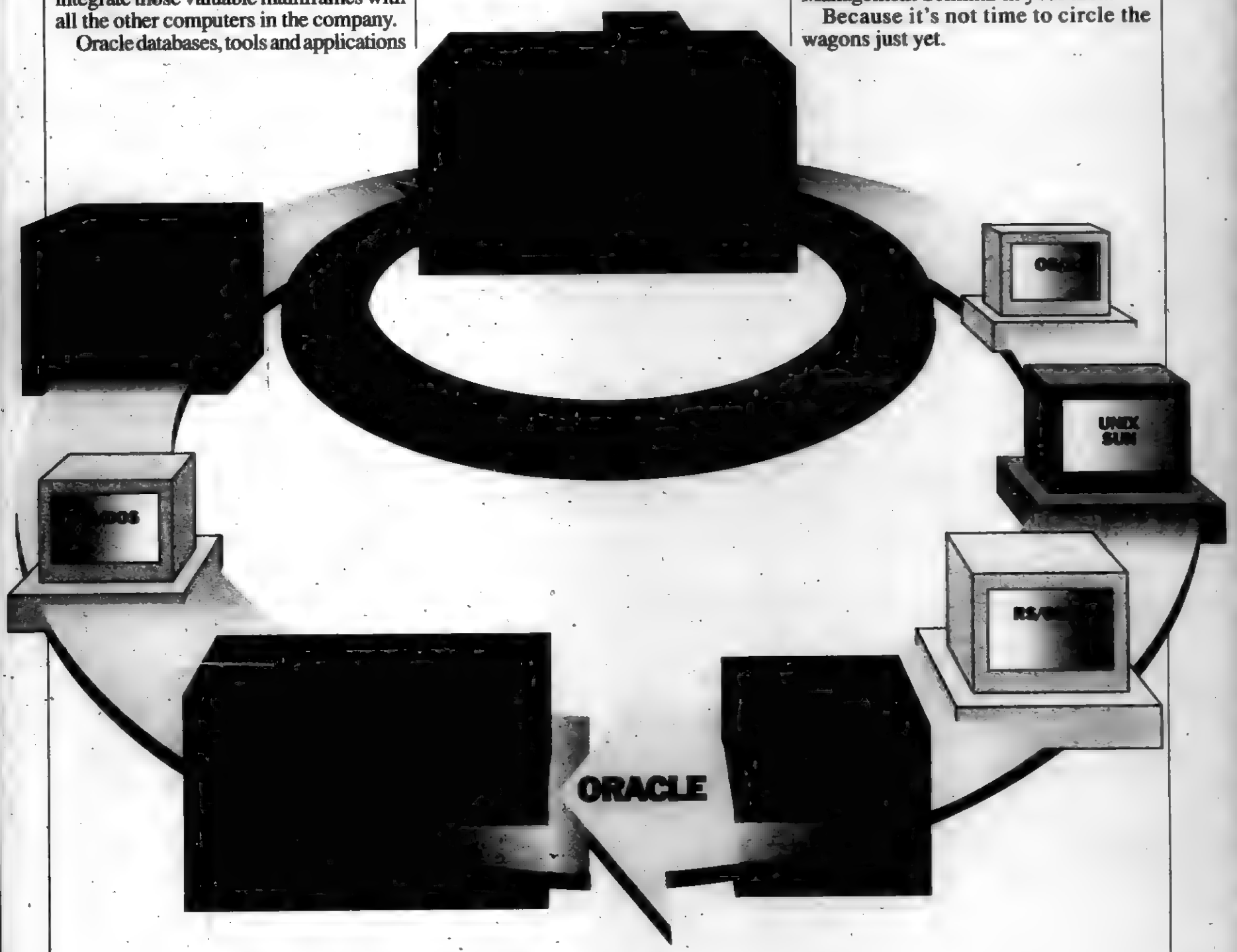

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EMC to appeal guilty judgment in Cambex suit

BY ROSEMARY HAMILTON
CW STAFF

HOPKINTON, Mass. — EMC Corp. plans to appeal a guilty judgment handed down against it late last month in a lawsuit filed by Cambex Corp., its chief rival in the mainframe third-party memory business.

EMC was found guilty of the misappropriation of certain trade secrets concerning its IBM 3080 memory upgrade product line. It could be required to pay Cambex at least $2 million, which is the amount the jury determined Cambex lost and EMC gained from the 3080 memory market.

Cambex plans to seek a trebling of damages. However, the amount of Cambex's reward will not be determined until next month by the Middlesex County Superior Court in Massachusetts, at which time EMC plans to launch its appeal.

While Cambex applauded the court's decision, the initial fallout for EMC appeared to be minimal.

A spokesman for Storage Technology Corp., EMC's biggest business partner, said the guilty verdict should not influence its relationship with the company. "It doesn't involve a product that we are selling, and it doesn't involve anything affecting our future plans," the spokesman said.

"It never helps your reputation to lose a lawsuit, but chances are it won't hurt them very much because it's not a very big deal now," said Sheldon Grodsky, director of research at Kenneth, Jerome & Co. in Florham Park, N.J. "That particular market [of 3080 memory] has diminished, and it's not a market for EMC today."

Minimal business

Sheldon Schenkler, Cambex's chief financial officer, acknowledged that the 3080 business is minimal. However, he added that "we achieved justice. We also hope that customers will look at the findings and make their own assessments."

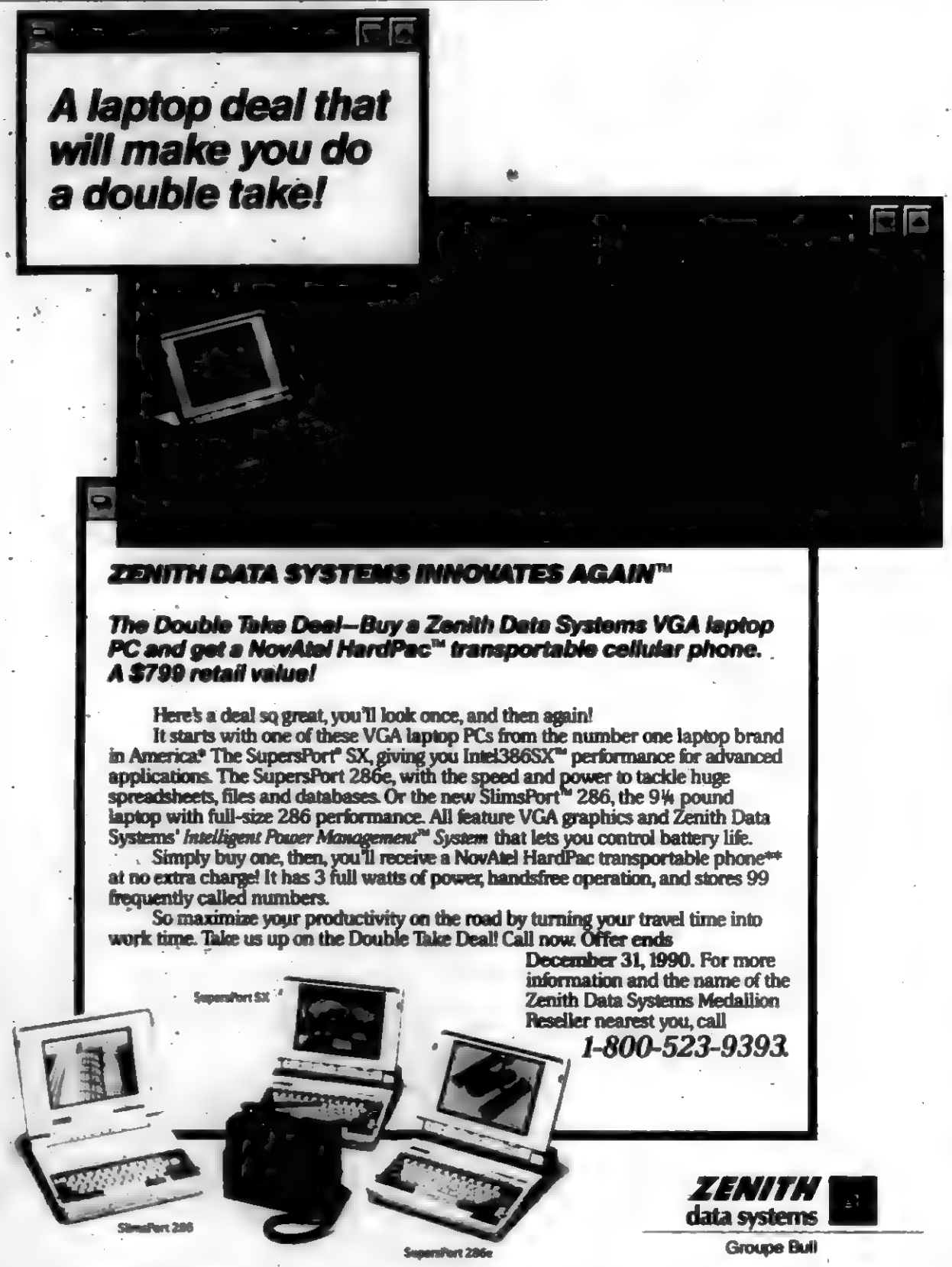
Schenkler claimed that EMC's 3080 business helped the company launch its more recent 3090 memory business, a market in which Cambex also competes. "Certainly they didn't do any stealing for the 3090s, but logic will tell you that what they did goes directly to 3090 business," he said.

Cambex's lawsuit was filed in 1987 and focused on a consultant, Richard Belanger, who was said to have worked for both Cambex and EMC on the development of their 3080 products.

According to Cambex, Belanger worked on microcode changes that were necessary for the IBM mainframes to recognize non-IBM memory. The microcode changes were actually licensed from another source, Allen-Myland, Inc., in Broomall, Pa., but required additional fine-tuning, which was Belanger's job. Cambex claims the consultant took that fine-tuning to EMC.

EMC maintains that the microcode changes had been available from various other sources.

"There was nothing that was their property," EMC spokesman Brian Fitzgerald said. "The material involved is available from a number of different sources."



Hitachi shows general-purpose neural computer

BY JOHANNA AMBROSIO
CW STAFF

NEW YORK — Hitachi Ltd. demonstrated a neural computer at its technology fair held here last week. But the computer is not going to be commercially available for at least two years, Hitachi executives said.

The computer is in "an experimental stage," said Yasutsugu Takeda, general manager at Hitachi's Central Research Laboratory in Tokyo.

Modeled after the human brain, the computer has 1,152 connected "neurons," which act as learning capacitors. These work with a traditional microprocessor to perform up to 2.3 billion operations per second.

Because of wafer-scale integration and other advances in semiconductor technology, all the neurons and the machine's microprocessor are contained in a cabinet that measures 1 foot high by 8.3 in. wide by 9 in. deep.

Uses humanlike intuition

Hitachi is calling this a "general-purpose" computer that is meant for tasks such as stock price prediction and signature verification, which require humanlike intuition.

Like the human brain, this computer will be able to learn quickly and build on its knowledge base because of all the built-in neurons, Hitachi said.

According to Takeda, the computer will be available in Japan in about two years, with U.S. availability sometime after that.

The Hitachi neural computer represents an advancement over a neural computer Hitachi announced in September 1989 that had 576 neurons.

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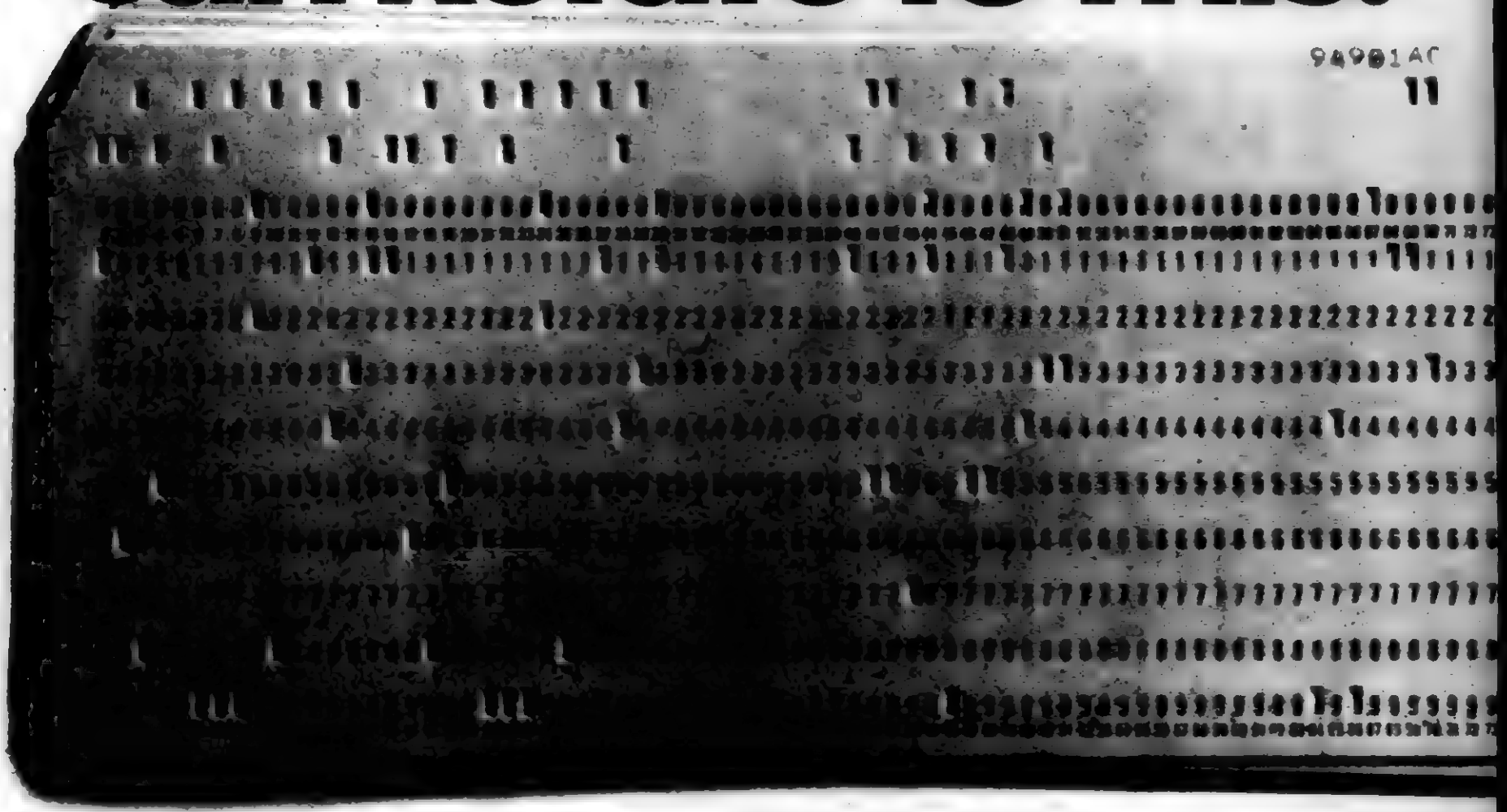

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SAS System optimized for OS/2

BY SALLY CUSACK
CW STAFF

CARY, N.C. — SAS Institute, Inc. last week released a version of the SAS System optimized to tap into the memory potential under IBM's OS/2 operating environment.

The SAS Applications System Under OS/2 supports Release 1.2 and higher of OS/2 for Standard and Extended Editions using Presentation Manager.

Introduced in 1976, the SAS System is an integrated software package for managing, analyzing and presenting data. It operates across a variety of vendor hardware platforms, including those from IBM and Digital Equipment Corp.

Danny Wu, systems manager at the Memorial Sloan-Kettering Cancer Center's Biostatistic Department in New York, said the SAS OS/2 release eliminates the memory constraints he experienced with the package under MS-DOS. His department uses SAS on DEC VAX/VMS machines and MS-DOS computers to run programs on biomedical survival analysis.

Other users agreed that the additional memory capabilities in the OS/2 version are necessary for many of their applications.

Michael Virnig, senior scientist at the Grand Metropolitan Technology Center in Minneapolis, said the OS/2 environment "seemed like a better fit for our applications."

The technology center conducts research for Pillsbury Co. and other food manufacturers and was previously running SAS software on an IBM 4361. After deciding to eliminate the larger machine, Virnig said, "We had to find a new home for our applications, and at the time, one-third to one-half of the processor was used for SAS."

Virnig added that the company did not want a minicomputer, choosing to take advantage of an application that could run on its existing 300-user Novell, Inc. Netware local-area network instead.

The SAS Applications System Under OS/2 utilizes many native OS/2 functions, including Dynamic Data Exchange, Named Pipes and Unnamed Pipes. The software supports the IBM Personal System/2 and compatibles and can run on several LANs.

First-year licensing fees for the product range from $695 for one workstation to $9,695 for 100 workstations.

CA in legal tiff with ex-employee

BY JOHANNA AMBROSIO
CW STAFF

MINEOLA, N.Y. — Computer Associates International, Inc. filed a lawsuit against a former employee who recently left to start his own firm. The suit, filed on Nov. 9, came to light last week.

The lawsuit claims that Payman Pouladdej, formerly a vice president of research and development at CA, breached his employment and other contracts, which stated that he would not solicit current CA employees to join his new firm. The CA complaint says Pouladdej has been "actively soliciting" CA employees "since at least" August.

In mid-October, Pouladdej left CA to form Softblox, Inc., based in Huntington, N.Y., which plans to sell cooperative processing tools. The other Softblox principal is William Habermaas, a CA cofounder who left the firm two years ago.

The suit does not name Habermaas or Softblox as defendants.

"It's a laughably frivolous suit. It's not winning they're after; their legal department is quite active, and you can infer whatever you want from that," Pouladdej said.

The suit was brought because of a "personal problem" that CA executives have "with my leaving," Pouladdej claimed.

Pouladdej charged that a third person, also a CA vice president, had been "coerced" into staying at CA "through strong-arm tactics by high-level CA executives." The unidentified person had resigned from CA shortly after Pouladdej did, he said, only to wind up staying at CA.

Through a spokesman, CA executives declined to comment on these charges. However, a CA attorney, Michael McElroy, said, "There have been no strong-arm tactics. That simply isn't true." He disputed Pouladdej's version, saying that the unidentified vice president "had never tendered his resignation. He had rejected [Pouladdej's] offer."

CA's suit seeks a permanent injunction against Pouladdej's solicitation of CA employees. No monetary damages, besides the cost of the legal action, are sought. A hearing about whether to grant a temporary restraining order will be held this Friday.

Pouladdej said the suit will not interfere with Softblox's ability to operate. "The suit is obviously not helping us, but it won't put us out of business. We have personal capital to last us until we get products off the shelf."

Softblox's workstation components are almost done, he said, and the company is now seeking a partner, either a software vendor or a user organization, to work with on the mainframe side.

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TECH TALK

Warmed-over chip

■ Researchers at the University of Wisconsin at Madison and Sandia National Laboratories in Albuquerque, N.M., have developed what they said is the world's first high-temperature superconducting transistor. The device, called a superconducting flux-flow transistor, has been coupled with passive microwave components to create circuits, said David Ginley, Sandia's supervisor of semiconductor research. The transistor operates at minus 320 degrees Fahrenheit.

Model modeler

■ Spatial Technology, Inc. in Boulder, Colo., recently said that its new Release 1.2 version of ACIS Geometric Modeler will be the first solid modeler designed as a tool kit for virtually any computer-aided design and manufacturing application and the first hardware and software independent geometric modeler to run on platforms ranging from Intel Corp. 80386-based personal computers to the IBM RISC System/6000 engineering workstation. Among the enhancements to the new release are multistage Boolean operations, never before available in geometric modelers, that provide an architecture for highly customized surface construction routines. The new release is expected to be available in the second quarter of 1991.

Tiny but super

■ Trident Microsystems, Inc., a Sunnyvale, Calif., developer of very large-scale integration chips, introduced a custom-designed Super Video Graphics Array chip last week that is the smallest on the market, the company said. The new chip, called the TVGA8900C, features 1,024- by 768-pixel resolution with 256 colors in interlaced and noninterlaced mode. The more efficient use of space on the chip allowed the firm's engineers to add more features to the chip. The new chip is slated to ship in February.

It's a whole new HDTV ball game

High-definition TV still front and center, but digital tech has shaken up the rosters

BY MICHAEL ALEXANDER
CW STAFF

High-definition television (HDTV), which promises to deliver the quality of motion pictures and compact disc sound to homes and businesses alike, has been viewed as the last competitive battleground for U.S. electronics manufacturers. Give up HDTV development to Japanese and European competitors and with it will go a wide range of technologies and industries dependent on high-resolution displays, several manufacturers have argued.

That was then, and this is now. Today, HDTV is still being touted as the final bastion for U.S. industry, but it is no longer the same HDTV. Instead of being based on analog technology, HDTV systems now being proposed or under development will be either partly or entirely digital transmission systems. What is more, digital technology is being hailed as a way for U.S. companies to leapfrog offshore competition and take the lead in custom chip design, high-resolution displays and many other areas.

Digital video technology for HDTV and other applications was thought to be three to five years away. However, in June, General Instruments Corp. stunned rival HDTV proponents when it unexpectedly submitted a completely digital HDTV system for Federal Communications Commission evaluation. This impelled Philips Telecommunications N.V., Thomson SA in France, SRI International's David Sarnoff Research Center and NBC to form a consortium to also introduce a completely digital system. Zenith Electronics Corp. has proposed a system partly based on digital technology.

FCC testing HDTV

Two weeks ago, the FCC said it would begin testing HDTV systems in April 1991 as a preliminary to deciding on a standard. The FCC has winnowed 22 proposed systems down to six; three of those systems use digital technology. The FCC said it planned to decide on an HDTV standard in the spring of 1993.

"That may be rushing things," said Peter McCloskey, president of the Electronic Industries Association. McCloskey last week delivered the opening remarks at the Second International Workshop on Digital Video Communications, sponsored by the Electronic Industries Association and the Institute of Electrical and Electronics Engineers, Inc. in Cambridge, Mass. "The remarkable advances in digital compression techniques have changed the whole ballpark."

Up to this point, the FCC and the Bush administration have been criticized for not taking a more active role in fostering research and development for HDTV systems. Now, HDTV proponents say the FCC's lack of action has allowed time not only for digital video systems to emerge but also for allowing its proponents to hammer out standards for compression and transmission as well as resolving other issues that the technology raises.

"The U.S. has taken, some would say by accident, an approach that makes economic sense," said Sidney Topol, former chairman of Scientific-Atlanta, Inc. and now a fellow at the John F. Kennedy School of Government. "Our approach to choose a set of transmission standards for terrestrial, satellite, telephone and cable companies will win out."

▲ **Weinstein foresees** *"HDTV on workstations before home TV sets"*

McCloskey notes *"remarkable advances in digital compression"* ▶

Photos by Sheila Johnson

The notion that Japan and Europe are ahead of the U.S. in HDTV is untrue, Topol said. "The HDTV picture is chaos and confusion in Europe," with as many differences as there are national boundaries. In Japan, where HDTV was launched earlier this year, the technology is not economically sound, in part because the TVs cost several thousand dollars and are beyond reach of all but the most affluent consumers, Topol said.

There are economic, political and societal issues that must be resolved before HDTV's launch here, Topol and other conference speakers said.

Tuning in 'telecomputers'

TV manufacturers here are wrestling with the notion of developing a hybrid of TV and computers, which some call "telecomputers," designed to be used with digital video systems. Those HDTV proponents are pushing for modular — or open architecture — TV sets that can be tailored to individual tastes such as personal computers.

Topol said that a TV-computer would not fly with consumers who have traditionally shied away from self-contained, multipurpose appliances. While TV and computers use similar technology, it is doubtful consumers would want one set to "do income tax work and watch NFL football," Topol said.

HDTV is about much more than watching movies at home, speakers at the conference said. One panelist in a session on digital video broadband services and applications suggested dropping HDTV in favor of "high-resolution imaging," which he said "reflects the view that HDTV is more than about television."

HDTV is the "foundation technology" for a wide range of industrial, professional, commercial and educational applications," said Stephen Weinstein, division manager of systems integration research at Bellcore. Nonentertainment applications based on high-quality video are likely to debut well before the first consumers tune in to HDTV broadcasts on big-screen TV sets, he added. "We'll see HDTV on workstations before home TV sets."

The nation's telecommunications carriers are particularly interested in digital video technology because fiber optics will be one of the key delivery systems for HDTV and a whole host of multimedia services still on the drawing board, said Mark Lee, manager of strategic programs development at Northern Telecom, Inc.

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HEWLETT PACKARD

EDITORIAL

Self-justification

NO MATTER WHAT your business, no matter what your industry, ask yourself this question: Do you believe that the margins in your company will increase during the next 10 years?

That's what author, lecturer and information systems guru Peter Keen asked of the crowd at last week's annual *Computerworld Premier 100* awards dinner. Not a single hand went up.

He then said, "Raise your hand if you believe your company will *not*, in the next decade, be involved in a merger, acquisition or major reorganization." Again, not a single hand went up.

The obvious conclusion? We are in a period of tremendous change and uncertainty in which prosperity across the board will be viewed as a phenomenon of the 1980s. And in the midst of this angst-filled era, the capital requests of IS management in corporate America are consuming *50% of all capital outlays*, according to Keen.

Is it any wonder that the understanding gap, addressed on the opposite page by a former chief information officer, Ron Brzezinski, has re-emerged as an issue? Here we have IS soaking up huge amounts of money which, if it weren't spent, could drop to the bottom line. And if these outlays aren't going to increase margins — the lifeblood of U.S. business — then why spend so much?

The cost-justification process is getting even more complex, as Brzezinski explains. Formerly, the IS manager had to educate the chief executive officer about the value of mainframes, shortening project life cycles and other fairly tangible items.

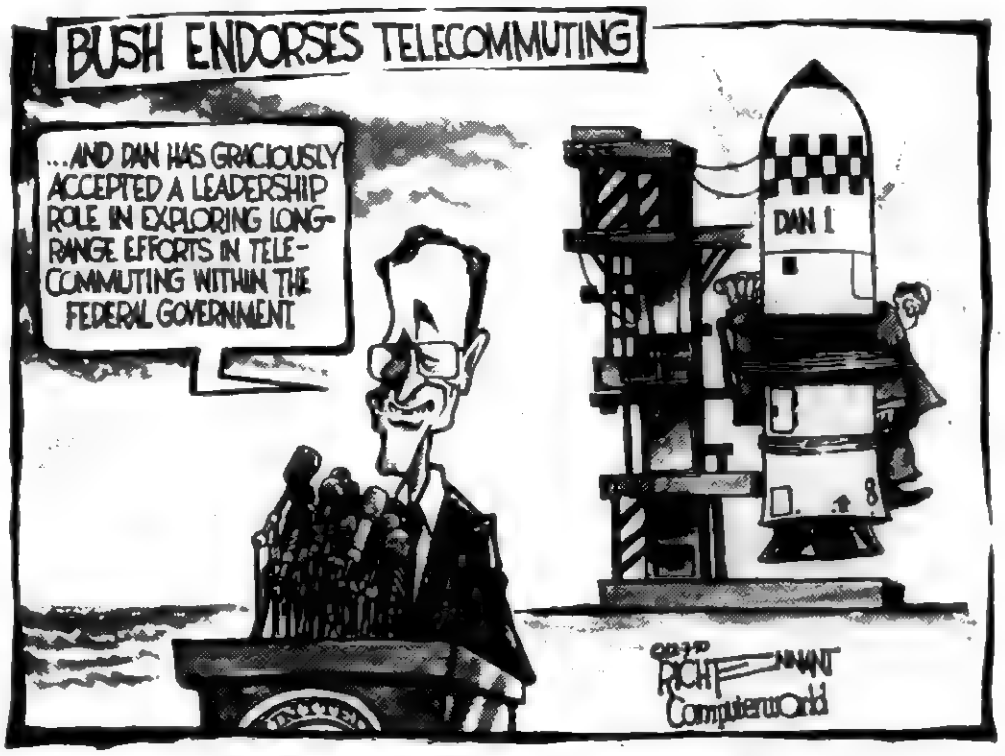
But in today's technology environment, the justification pertains to fuzzier items such as enterprise networks to foster work-group productivity (try that one on the CEO). Meanwhile, the CEO picks up the *Harvard Business Review* and reads the words of Max Hopper, head of IS at American Airlines, who writes that the era of using IS for competitive advantage is, for all practical purposes, past.

Whew. Nice things to consider as you're preparing those capital expenditure requests.

Keen and Brzezinski, as well as many other veteran IS watchers, do agree that only dialogue can save what at times could be a wholesale gutting of IS, with Brzezinski arguing that two out of every five of a CIO's work hours should be spent essentially explaining what he's doing.

For Keen, the task is even more daunting. Somehow the CIO must change the CEO's mindset from thinking of the IS investment as overhead to something far more strategic.

Ultimately, the CEO is asked to take a great leap of faith into an area that will likely always remain far beyond his ken. As with any other act of faith, the bottom line is trust in someone else, trust built on a record of forthright communication. That is why Brzezinski's suggestion that you spend as much as 40% of your time validating your existence deserves serious consideration.



LETTERS TO THE EDITOR

Eye on standards

Jeff Angus' article on standards [CW, Oct. 29] is nonsense. His central thesis is that standards enforce some sort of mediocre mean, but the concept of a mean value has no meaning for most of the issues dealt with by standards. How do you calculate the mean of a graphical user interface standard or of a communications protocol?

Without interface standards, systems cannot communicate with systems, and there will be no chance for synergistic leverage as the number of systems increases in this post-Babel world. Instead, creativity will be slowly strangled by the sheer effort of moving data around.

Standards are not the easy option; they have to be enforced because the easy option is rarely the best option. Abandoning standards is just another example of the short-sighted, short-term focus that has become fashionable in the last decade.

If Mr. Angus wants an educational metaphor for standards-setting, then the appropriate one is that of an examination with a failing grade for those efforts that don't shape up.

Andrew Raybould
Jersey City, N.J.

Abort . . .

In regards to your article "Abort, retry, ignore — truth about the PC age" [CW, Nov. 5] there is a solution to your problem of finding what seems to be a user-friendly computer: Apple Computer, Inc.'s Macintosh.

IBM vs. Mac — Insert a raw disk into an IBM-compatible personal computer and the system will grind confusingly to a halt and produce the message "Abort, Retry, Fail?"

Insert a raw disk into a Mac, and lo and behold, it will understand: "Hmmm. This disk isn't initialized. Do you want me to initialize it for you and then verify it?"

MIS: Macintosh Interface Superiority. Get the hint?

Brian Marantz
Project Manager, Mac EIS
Fluor Daniel, Inc.
Irvine, Calif.

Retry . . .

Glenn Rifkin's "Abort, retry, ignore — truth about the PC age" [CW, Nov. 5] is probably more on target than the industry wants to admit.

It has been my experience that while there are selected individuals who could be classified as "power users," the vast majority of personal computer users know how to turn it on and run their application well and have some minimal knowledge of two to three other PC applications. "Their application" may be a PC database application or financial projections in a spreadsheet, but beyond that, most PC users are not proficient in multiple applications.

Pick up any set of manuals for spreadsheet or word processing software and you will likely be faced with at least four inches of documentation. The truth is that there are immense amounts of information to be consumed in each application. Most people are consumed with the real work of their day-to-day jobs and do not have the time to learn how to manipulate their application software. Rifkin's "PC maverick" and information center staffs learn through the experience of helping others; their work is to learn the applications. They are not geniuses; it is just their job.

The world is comprised mostly of Glenn Rifkins and, unfortunately, the marketing hype about user friendliness far exceeds reality.

The PC industry is a long way from providing ease of use that matches that of a TV remote control.

Ray Thomas
D/FW Computer Alliance
Fort Worth, Texas

Ignore

I was amused by Glenn Rifkin's comments on the novice's approach to the personal computer [CW, Nov. 5]. Maybe five or six years ago they would have been novel or cute enough to warrant inclusion in *Computerworld*. Just what small dark corner of the "Information Age" has he been documenting?

Is he really trying to tell us that IBM JCL is easier to learn than PC DOS? That a System/38 has a friendlier user interface than a PC?

Stick with Donna Reed, Glenn. It's no surprise to me that you escape to the television.

Thorne Perry
Lake Bluff, Ill.

Computerworld welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor In Chief, Computerworld, *P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701. Fax number: (508) 875-8931; MCI Mail:* COMPUTERWORLD. *Please include a phone number for verification.*

Plug the understanding gap

RON BRZEZINSKI

"What do you feel is the key barrier to the chief information officer's success?" Coopers & Lybrand recently posed this question to 200 chief executive officers and chief financial officers. Their answer: Lack of peer understanding of the information systems department's mission.

Just when we thought that senior executives were in tune with the IS department, the understanding gap is returning. Senior management's comfort with information technology and understanding of how it benefits the business may be returning to 1970s levels.

New questions are being asked of the CIOs, such as, "What is network computing? Why are you spending so much on something called CASE? What is information re-engineering all about?"

As technology becomes more embedded in the business processes, senior management must have answers, understanding, knowledge and the confidence to "partner" with the CIO in finding ways to exploit, apply, sponsor and fund new technologies to benefit the business.

Brzezinski is a senior vice president at Coopers & Lybrand in New York.

IS executives have worked for 30 years to close the understanding gap between business and technology. The gap was almost closed in the late 1980s, after the introduction of the personal computer. For a short time, the CIO's purpose and function had gained peer acceptance in the organization.

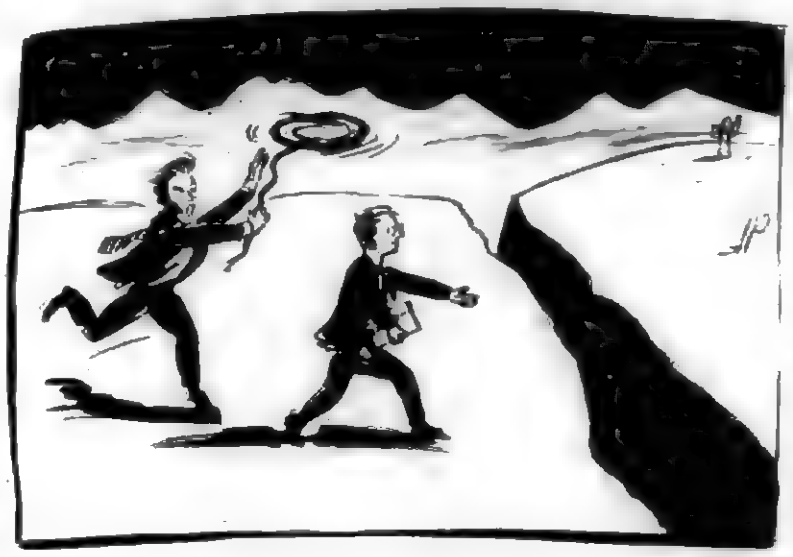
The gap now appears to be widening again because the rate of technological change is increasing faster than nontechnical management's ability to keep up. Robert Allen, AT&T's CEO, once said, "Open a piece of optic fiber and see a slice of America going about its business."

Allen's statement illustrates how dramatically information technology impacts business, education, entertainment and all aspects of our lives. CIOs who have lived through understanding gaps know that it is essential to concentrate on closing the gap again.

CIOs are facing a new challenge in attempting to restructure business processes using new information technologies.

Restructuring is a complex task, and large systems integration projects touch all functions of the business. Organizational change and customer and vendor relationships require senior and peer management "sponsorship." Senior management's understanding of how and when technology should be used in the business is key to the CIO's success.

This is not a rehash of 5-year-old issues. Although the message is essentially the same, the reasons and the potential solutions are different.



Bruce Tagaro

In the past, we educated senior management about information technology to help explain growing budgets, project delays and changing mainframes. These subjects are generally well understood by senior management today. The new questions about networks, computer-aided software engineering, outsourcing and continuing technological change present new challenges.

Countless articles have appeared in the general business press during the past five years about the impact of technology on business. These articles raise the awareness level of senior management, but they also contribute to widening the understanding gap. The new technologies are explained in excruciating detail, but the business benefits require the CIO's interpretation and explanation.

What can be done? Suggestions for the CIO include the following:

• **Awareness** — Look around your company and see if the understanding gap is beginning to widen. The signs center on the types of questions being asked. What articles are of interest and how often are technology explanations required when discussing budgets, service levels and new projects?

• **Time allocation** — The CIO must invest significant personal time with peers and senior management to ensure that peers and senior management will be prepared and comfortable with the subject when it is time to "champion" the next technology wave. In general, less than 20% of the CIO's time is spent with other managers and senior executives. The CIO should begin to spend between 30% and 40% of his time with his business peers to prevent an understanding gap.

• **Themes** — One approach to help close the gap is to identify a "program theme" that can help explain the IS department's objectives and accomplishments for a two-year horizon. Themes help provide common reference points in our rapidly changing world.

• **Validation** — Continual monitoring of peer management's understanding and expectations is required. This is the key reason for allotting 30% to 40% of the CIO's time. Informal, one-on-one meetings will help ensure that peer understanding and support are in place when needed.

4GL vs. 3GL: A debate rages without meaning

KEITH HOWARD

Does anyone know a good veterinarian? One who will take the colicky fourth-generation language (4GL) vs. third-generation language (3GL) debate and mercifully put it to sleep?

This is a perennial sneer campaign involving the vendors of 4GLs, whose marketing people were smart enough to seize a nomenclature that implies an evolutionary step in programming technology beyond their allegedly extinct ancestors, vs. the 3GL manufacturers, who insist that unless you write every last line of code yourself, your application will run like a dog. You will, they say, have burned the boat that could have carried you to the promised land of open systems. Who is right, and who is wrong?

Howard has been working in software and commercial product development for almost 20 years. He currently lives in San Francisco.

The first point to recognise about this debate is that it's not a legitimate debate at all.

It's like comparing a bus with a submarine and expending too much energy wrangling over which is the better vehicle.

Counter-evolutionary

The confusion stems from the term 4GL itself. The term 4GL has created a misconception that these products represent an evolutionary stage beyond 3GLs. After all, 4GLs are *written* in 3GLs so the conclusion is obvious. Are we to believe that 5GLs, whatever they might be, will be written in 4GLs? I'll bet the ranch they won't be. To unmuddy the waters, we have to start calling things by their proper names.

A 3GL is a full-service programming language offering its own unique level and style of abstraction of data and instruction constructs. It is customized to service a specific niche in the data processing marketplace. C is customized to be a portable assembler, while Cobol is the programming *lingua franca* of business applications. Cobol's data types are tuned for people who balance their checkbooks in decimal, not hexadecimal.

A 4GL, on the other hand, is a partially built, tunable application. The user-tunable portions (I/O screens, data layout) try to be everything to as many applications as users commonly build. The elasticity of the tuning range is the limiting factor. For some users, that range may be sufficient; for others, it may not be.

4GLs also differ from 3GLs in that most of the major 4GL products ride on top of a relational database. They are expressly designed to front end such data repositories. Their affinity to relational database technology, in fact, is as cozy as SQL's. There's one difference worth noting, however: I haven't heard of anyone predicting that SQL will replace Fortran.

Some 4GL vendors now provide gateways to nonrelational repositories, and others are broadening their reach by offering the capability to call 3GL modules. 3GLs counter by supporting embedded SQL calls to access relational databases.

SQL is a language in its own right, and blending its syntactic style with the control and data constructs of a host language does require some effort. Nevertheless, SQL enhances a 3GL by giving it the capability to execute multiple row updates, freeing it from its procedural one-record-at-a-time processing heritage.

A 4GL, on the other hand, can never become a 3GL, no matter how many gateways and hooks it provides. The underlying nature of the product is materially different.

Different families

Once we acknowledge that 4GLs and 3GLs are not from the same gene pool, we can end the senseless battering and examine the strengths that each product offers and how they might be combined to create a better tool.

The future portends the combination of the flexibility of general-purpose programming languages with ready-made high-level service modules (screen protocols and persistent storage facilities) that can be configured in any way the user pleases. This, of course, is the object-oriented approach. The libraries of ready-made service modules or classes will be interoperable across different programming languages if the promise of open object orientation is truly fulfilled.

In the meantime, the 4GL vs. 3GL debate needs to be put to bed. Different beds. There's no litmus test that will unequivocally tell you which approach is right and will continue to be right for years ahead. If your application needs are not complex and you like to use your computer like a household appliance, then a partially built application with some tuning knobs will likely suffice.

If, on the other hand, you anticipate that new applications will spring up once you have captured the corporate data and you want the flexibility to embrace new technologies as they evolve, then you'd be better off selecting a 3GL. You can then evaluate software products and mix and match them with the 3GL as your application demands grow.

It is a frustrating reality of the computer industry that if you want the best application development tool, you should come back in 10 years.

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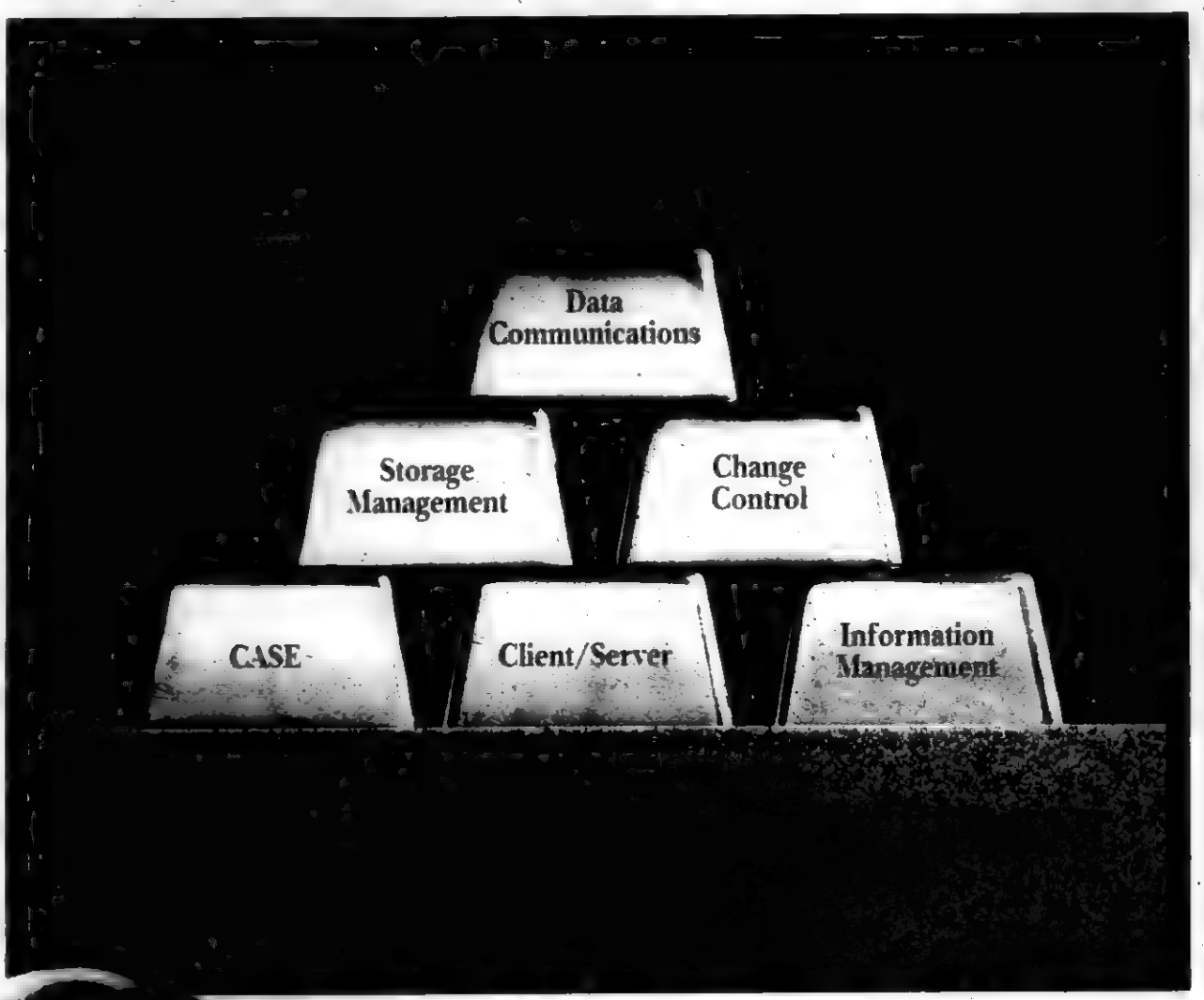

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COMMENTARY

Johanna Ambrosio

Not-so-open open systems

Unix has been in the news a lot lately. Salomon Brothers and other users have adopted it, and vendors including NCR are betting their companies on it. Still, Unix remains pretty much a sleeper in the commercial sector. And there are several reasons for this beyond the much-talked-about "Unix wars" between competing industry factions.

First, there's no such thing as a truly open system, and there probably won't be in our lifetime. Second, vendors aren't pushing them because of economic factors. Last but not least, users don't want them — at least not right now.

Let's take each point. Today's Unix systems are open all right but only to a certain degree. You can mix and match computers from different vendors, and you can run the application on virtually any size computer you want. Those are both good things, because they allow for much greater flexibility and a more competitive environment, and the information systems manager wins.

But no such openness exists on the software side. Sure you can run the application wherever you want, but you're locked in. Once you've written mission-critical applications in a fourth-generation language

Continued on page 29

U.S. House awaits relief from old IS technology

ON SITE

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — Linda K. Berdine may be among the few information systems managers who find professional inspiration in the words of Abraham Lincoln.

According to Berdine, Lincoln urged the development of telegraph systems spanning the Atlantic and connecting Washington to the national forts. "Such communications established with any reasonable outlay would be economical as well as effective aids," Berdine quoted the former president as having told Congress in 1861.

Berdine, whose Capitol Hill office contains a number of Lincoln portraits, is looking for similar aids for 6,000 users of an antiquated patchwork of applications that support the missions of the U.S. House of Representatives.

At the heart of the House's information systems is the Member Information Network, which consists of dozens of independent databases on an IBM 3090-400J mainframe running MVS/ESA under CICS. Users access databases written for Software AG's Adabas and IBM's Stairs and VSAM files. Databases include text from the "Congressional Record" and other publications, news wire services, past and current legislation, grants and contracts, committee schedules and hearings, voting records, federal laws, the federal budget, economic and census statistics and much more. The network's 6,000 users typically log some 500,000 interactive sessions per day, Berdine said.

There are about 100 local-area networks on Capitol Hill for the House of Representatives, many of them surrounding Digital Equipment Corp. VAXs and all festooned with dumb terminals, personal computers from IBM and Apple Computer, Inc. and Unix workstations. Most of the LANs reach the mainframe via a campuswide Ethernet backbone.

The applications are hardly user-friendly. Users must individually log on and off of each database, and it is cumbersome to link or combine databases for complex but powerful queries. "We have 80 databases and 10- to 15-year-old technology. It's not fun," Berdine said.

Now, Integrated Systems and Information Services (ISIS) is to replace Member Information Network. ISIS is based on a client/server model in which local office systems become clients to the mainframe-based databases, the information servers.

Requests to the mainframe will flow through Sybase, Inc.'s Sybase SQL Server on Sun Microsystems, Inc. Sun-4/490 servers or Digital Equipment Corp. VAXs to an IBM RT gateway running Sybase Net Gateway, software for connecting

Continued on page 29

D&B plans receivables enhancement

BY SALLY CUSACK
CW STAFF

NATICK, Mass. — Dun & Bradstreet Software has committed to an enhancement for its D&B Accounts Receivable software system and has said that the revised version of the product is scheduled to be available in the first quarter of 1991.

The company has promised that the augmented package will include several items specifically requested by the user community, such as improvements to the product's aging and cash applications as well as several ease-of-use features.

Initially released as Millennium Accounts Receivable software by McCormack & Dodge in 1985, the software runs in IBM DOS/OS and MVS environments. A version that was developed exclusively to run on the Digital Equipment Corp. VAX computer series was released last month.

According to Scott Davey, national chairman of the D&B Software AR:M user group, the customers initially presented their requests to McCormack & Dodge, and after the merger, D&B Software concurred that enhancements to the package were indeed necessary.

"They've done a pretty good job of handling the requests that came through," Davey said, referring to D&B Software's response to user suggestions. He added that the vendor has complied with 70% to 80% of the items presented by the user group at that time.

The most important enhancement for the users, Davey said, is the revised Dynamic Aging portion of the software, whereby the program will identify on an ongoing basis just how much money has actually been collected on aged accounts.

"As the invoices are paid, it will reduce the bucket that the invoice was in," Davey said. An aged account is defined as being between 30 to 60 days in arrears, and the software is designed to allow follow-up on aged account collections.

Other enhancements are said to include reworked portions of system reporting functions in an effort to make them faster and less resource-intensive.

Davey said that the upcoming release follows the usual enhancement request time frame of two years from concept to completion and predicted that the accounts receivable package will eventually work with IBM's DB2, although he said he does not see a large demand for a DB2-compatible version for at least five more years.

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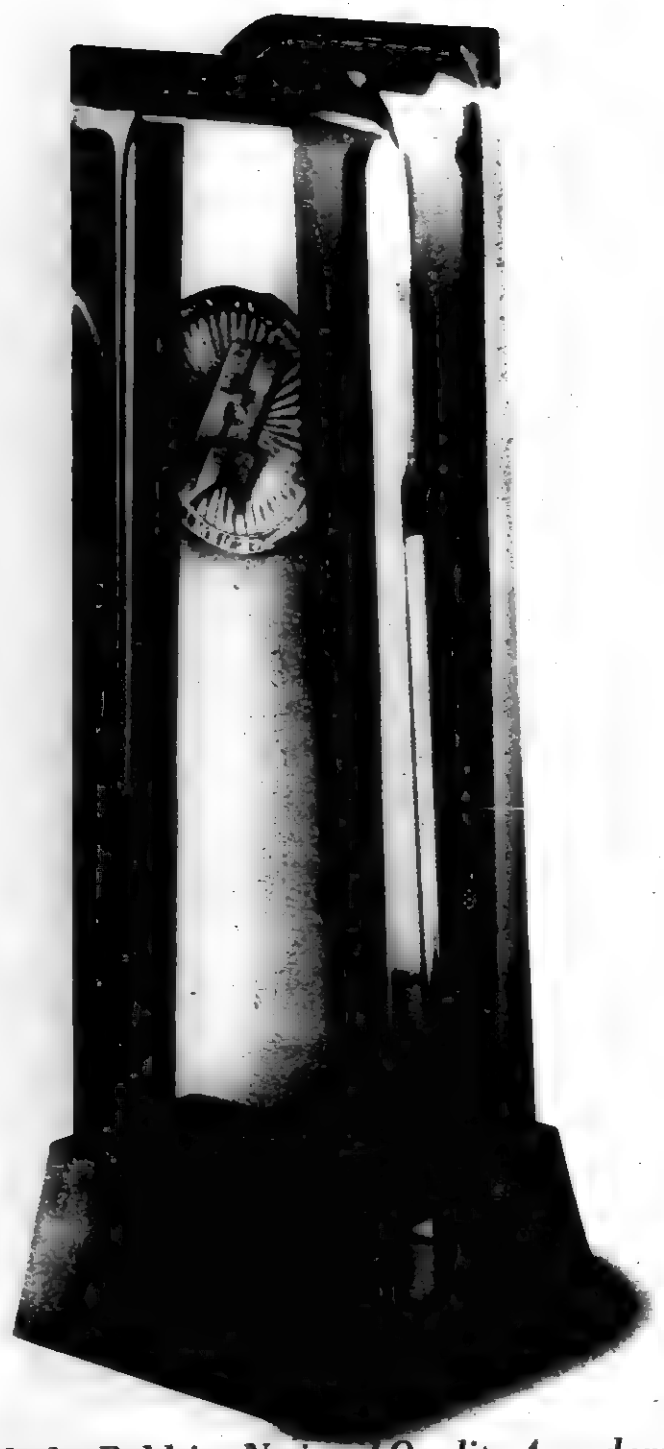

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Utility opts for Supra over DB2

BY ROSEMARY HAMILTON
CW STAFF

DES MOINES, Iowa — One of the key reasons that Iowa Power selected Cincom Systems, Inc.'s relational database management system over IBM's DB2 was because it wanted to call the shots, according to Nancy Jacobson, manager of data and security administration.

A second factor was the RDBMS' associated application development tool. Iowa Power wanted to license the two as a package and was not interested in hunting around for the best DB2 third-party tool. The Cincom package of Supra and the application development system Mantis beat out IBM's DB2 and Cross System Product, which Iowa Power found difficult to use.

Although a DB2 choice would have given the company, which is a subsidiary of Midwest Resources, Inc., the benefits of using the leading mainframe RDBMS, it did not have the hardware platform options that Iowa Power wanted left open to it, Jacobson said.

These days, the Cincom system continues to give Iowa Power the flexibility it wants, Jacobson said. The company is currently finishing up the test run on the latest release of Supra, Cincom's RDBMS, which it will move into production early next year. It is also considering bringing in a Supra version for a Digital Equipment Corp. system and has looked at the local-area network version of Supra, which has not been officially released.

What is more, the company continues to run the software on an IBM 3081 mainframe. When it reviewed DB2, IBM had recommended both a hardware and operating system upgrade to better accommodate the RDBMS, Jacobson said. Iowa Power was not interested in moving up to a 3090 and the ESA version of MVS.

"The plus is the flexibility," Jacobson said. "We can state our own direction. DB2 has a corner on the market, but we felt we'd get cornered with it, too. We didn't want to get caught in a hardware trap because of our software choice."

However, Jacobson is also quick to point out that the lack of a thriving third-party market — which provides DB2 users with their choice of tools — continues to be a downside to the Cincom system. Yet, she said, Cincom's stated goal is to make Supra 100% compatible with DB2, which should give the company access to some of the third-party tools. Mantis, she said, gets a thumbs-up from her staff for ease of use. The company has three Mantis-built applications in various stages of development.

"Mantis is easy to install," she said. "I did it myself, and I try not to do techie things."

In addition, support for both the RDBMS and application development tool comes from Cincom, which saves the firm the hassles of dealing with more than one vendor, Jacobson added.

Sierra Group: HP's New Wave for smart shoppers

BY J. A. SAVAGE
CW STAFF

Despite its requirement for more memory, a mouse and two types of personal computer software, Hewlett-Packard Co.'s New Wave application is "a bargain" when used in conjunction with an HP 3000 minicomputer, according to a recent report by The Sierra Group, Inc.

The report, called "Midrange Systems Cost of Ownership," noted that the features of New Wave, such as accessing data from open systems networks, as well as IBM's Professional Office System office automation system and a user-friendly graphical interface, would cost companies $450 per user on a 100-user system. That cost includes a 1M-byte memory upgrade, Microsoft Corp.'s Windows, New Wave software and a mouse.

However, these numbers only account for 10% of users having full capability, including memory and networking, to use all of New Wave's capabilities, The Sierra Group's report said.

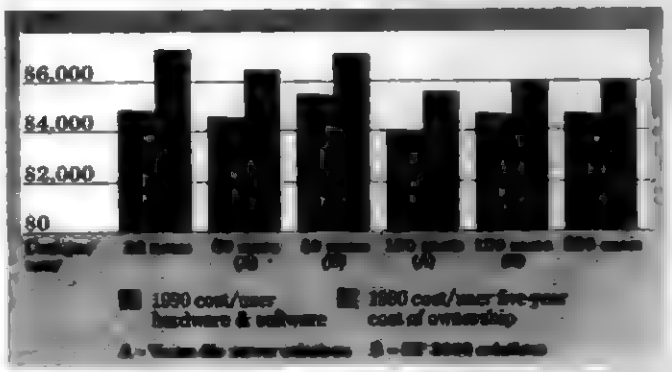
This is the second time in two years that The Sierra Group, a Tempe, Ariz., market consulting firm, has run numbers on HP's New Wave software based on a client/server configuration.

The study noted that although only 10% of users would be set up to fully use New Wave, HP was not low-balling configurations to achieve a better cost of ownership. "Due in large part to a significant increase in the workstation and PC requirements for client/server configurations . . . HP's PC-based server configurations are somewhat more expensive. However, most of the HP configurations are less expensive this year, even with the more robust workstations specifications," because of price sensitivity at the minicomputer or server level.

The study noted that the cost of peripherals has "increased . . . as a percentage of overall costs" for systems between eight and 32 users.

Smooth road

Hewlett-Packard has established a realistic growth path for migration from PC-based to minicomputer networks, according to Sierra Group research



Source: The Sierra Group — CW Chart: Doreen St. John

First LAN-based EIS released last week

BY SALLY CUSACK
CW STAFF

WALTHAM, Mass. — An executive information system (EIS), claimed to be the first entirely based on local-area network topology, was unveiled last week by Information Resources, Inc.

Called Express/EIS, the system runs on a personal computer or a LAN, the vendor said, and data can also reside on a mainframe or minicomputer platform.

According to Steve Rubinow, director of decision support services at The Quaker Oats Co. in Chicago, the company has been beta-testing the software for approximately three months in an IBM environment.

"We want to be able to tie into many of the data sources around the company in real time, while integrating existing software applications into the EIS," Rubinow said.

Quaker Oats is running the front end using IBM Personal System/2s under DOS, which communicate with an IBM 3090-600 mainframe over Novell, Inc.'s Novell token-ring.

Rubinow anticipated that between 50 and 60 corporate executives will be accessing the system when it is fully operational. The firm is currently working to tie in-house-developed software, such as performance analysis and sales applications packages, into the EIS and is running certain program components on approximately 50 PCs scattered throughout the company.

The product incorporates a set of decision support software tools designed to allow users to work with a variety of data sources to track, analyze and respond to critical issues.

An Information Resources customer since 1987, Quaker Oats also uses the vendor's Express software system for applications development.

The Express/EIS requires an Intel Corp. 80386-based platform with 4M bytes of memory, and a 5M- to 10M-byte disk on each additional PC residing on the LAN.

In addition to the PC LAN-based environment, the software also operates several other architectures, including IBM MVS and VM, Digital Equipment Corp. VAX/VMS, Hewlett-Packard Co. MPE/XL and Prime Computer, Inc. Primos.

LAN support includes Novell, 3Com Corp., IBM Token-Ring, Ethernet, Systems Network Architecture, bisynchronous, asynchronous and Banyan Systems, Inc. Virtual Networking Software.

Pricing starts at $50,000, depending on system configuration and CPUs.

Express/EIS is currently available.

Users test Decbank tool

BY JOHANNA AMBROSIO
CW STAFF

NEW YORK — Remote management and isolation of users from data processing "mumbo jumbo" are key features cited by early users of Digital Equipment Corp.'s integrated family of software and services products for banks, which was announced two weeks ago.

Called Decbank, the family encompasses DEC hardware and communications products and adds integration software and a customizable end-user interface. The integration layer allows banks to plug in their existing applications and bank-specific devices such as statement printers.

Decbank also links with a dozen or so existing off-the-shelf packages from third-party vendors. These packages range from teller applications to software for loan processing and management reporting.

"Decbank is a deliverable piece of software that allows banks to incorporate third-party applications, distribute data and incorporate a standard client/server architecture," said Bob Russell, vice president of Digital Services Industries. "We've been delivering this in pieces, but Decbank ties it all together."

The banking industry is DEC's fastest-growing market, with annual growth rates of more than 20%, Russell said. This year, DEC will earn approximately $1.2 billion in revenue from this sector, he added.

Decbank, which runs under VMS, incorporates existing DEC communications products such as Network Applications System and Decnet and links to other vendors' computers. Decbank uses DEC's relational database, RDB.

A Chemical bond

Chemical Banking Corp. in New York has positioned Decbank as the server component of its three-tier architecture. Decbank allows workstations in approximately 80 Chemical Bank branches to link to the bank's mainframes, according to James H. Kelley, vice president and group head of Chemical's information and technology services.

"We use Decbank as a giant server — for database, print, local-area network" and other types of functions, Kelley said. "It insulates the person in the branch from all the mumbo jumbo that data processing has created over the past 20 years."

Another Decbank user is Ameritrust Corp. in Cleveland. Robert C. Salipante, executive vice president of the Banking Services Group, said his organization will have Decbank in 100 branches by February.

"We've been able to integrate our existing teller machines and do remote management of them, something we could not do before," he said. Another plus is using standard computer paper to print forms instead of having to buy preprinted forms, he added.

IS helps juvenile system

Wang 7150 allows courts to deal with increasing caseloads

ON SITE

BY SALLY CUSACK
CW STAFF

NEW YORK — Soaring juvenile crime rates across the country are keeping court administrators, caseworkers and law enforcement officials working double duty to keep up with rapidly increasing caseloads.

To combat the ever-growing onslaught of data coordination and reporting requirements, the city of New York's Juvenile Justice Information Services (JJIS) division is working constantly to improve system services for its end users.

"If I have computer downtime, a kid who should be in jail could be on the streets," said Barry B. Edison, director of JJIS.

The department is responsible for servicing the computer information needs of all the New York boroughs. It currently relies on a Wang Laboratories, Inc. VS 7150 minicomputer as the hardware hub of its informational wheel.

The JJIS must track information from the point at which a child enters probation through sentencing completion. Relevant data and required documentation must be coordinated with client history profiles, and absolute privacy must be guaranteed under the laws protecting juvenile defendants. The system also maintains all family-related court counsel information and tracks data on periods of actual detention.

> "IF I HAVE computer downtime, a kid who should be in jail could be on the streets."
>
> BARRY B. EDISON
> JJIS

The organization's two main applications — corporation counsel and probation — were tailored from a case management system developed by Inslaw, Inc., a company based in Washington, D.C. According to Edison, the JJIS leased two versions of the Inslaw Promis tracking system software and customized it to serve the needs particular to the JJIS and its client agencies.

Databases from the various software systems can be merged, Edison said, but due to the delicate nature of the data, this can be done only if special authorization is given.

Because a juvenile's right to privacy is so strictly protected on federal, state and local government levels, all hard copy is shredded after output, and other information is kept sealed. The JJIS data center is littered with piles of large, transparent plastic bags stuffed with shredded reports.

"We produce tremendous amounts of reports for our user agencies, ranging from one to thousands of pages, on both a weekly and monthly basis," Edison said. JJIS compiles requests from the police department, the district attorney's office, the department of probation and other government agencies.

The computer system itself uses a combination of Wang security and software security developed in-house, and it implements extensive, layered audit-trail facilities.

JJIS supports approximately 120 terminals across the city, with approximately 40 of those doubling as personal computers, Edison said.

In addition to the VS 7150 at headquarters, the department also uses a smaller Wang VS-6E to facilitate local-site data and word processing functions in the Bronx Family Court. The VS-6E also communicates with the 7150 for general-purpose data processing and reporting.

Edison and his staff are busy linking computers together these days. The office is installing a Wang VS 5000 in the Queens Family Court and a VS-6 in the Manhattan Family Court.

"It's great having the minis out there," Edison said. "It reduces the number of phone lines coming in here, and each division can maintain independent word processing operations." The JJIS is replacing its multichannel service units with direct-dial lines, and the department depends on Wang's WSN protocol for both direct-transfer and point-to-point communications.

Describing the Wang computers as "good, solid equipment," Edison said JJIS has also worked with systems from Digital Equipment Corp. and Prime Computer, Inc. and that he finds the VS line to be the "easiest to maintain and operate." He also added that the department is thinking of imaging as a possible vehicle for data entry and hopes to someday upgrade to the top-of-the-line Wang 10000.

And while the system protects the rights of juveniles, its communication and tracking capabilities also serve to protect the general population, Edison said.

"If a kid commits a crime in Manhattan on Monday, is bailed out and is picked up for performing another crime on Tuesday, we know. That information is entered immediately for access and used by the agencies we serve," Edison said.

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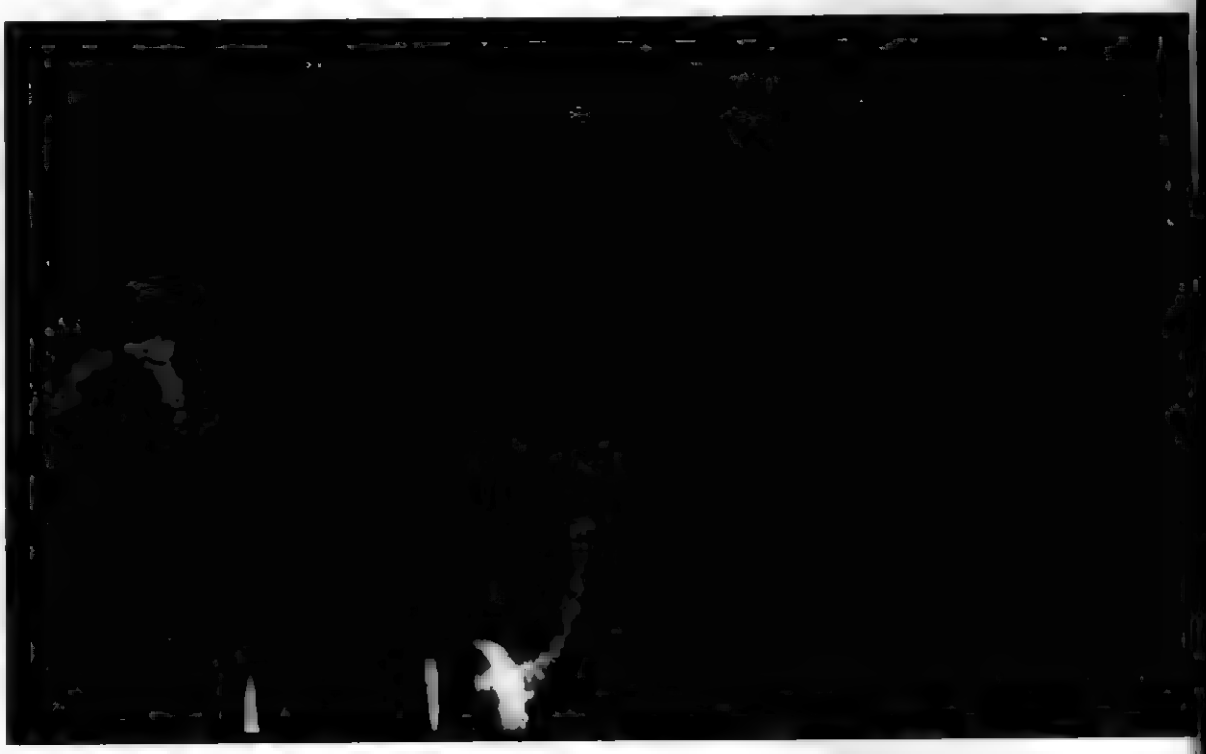

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Ambrosio

CONTINUED FROM PAGE 25

(4GL) or you begin to use a certain database management system, that's it. You're locked into that DBMS or 4GL. It doesn't matter whether the operating system is DOS, Unix, MVS or something that hasn't been invented yet. One cannot change these decisions without a major migration effort, and the promise of open systems does not yet include this ability.

Many factors work against this truly open environment ever becoming a reality. There is no economic advantage for vendors to provide this, because they will have a dickens of a time differentiating their wares. This is already happening, and that's why virtually every vendor that supports Unix will have a different version.

Not only will the operating system be tuned to their particular hardware, but the version offered by each vendor will be different enough to make switching to another Unix version a decision that most IS folks will want to think about. Even though the versions will be "compatible," there will almost certainly be tweaking required by users. And as we all know in the software world, it's the little things that can kill you.

On the user side, I don't know many IS shops that really want to change their mission-critical systems all that often. The freedom to do this might be nice, if for no other reason than to hold it as a threat over the head of an uncooperative vendor. However, the reality remains that software acquisition is a decision that is not made lightly. Committees are formed, permission sought from top executives and budget constraints worked out. It is a lengthy, exhaustive process.

Implementing software is even less easy — especially given that with most large applications, there is a healthy degree of customization. What you wind up with is a hybrid of off-the-shelf and homegrown software, and most users would not want to go through this any more than they absolutely have to.

So, to paraphrase Gertrude Stein, an operating system is an operating system. Most users look at Unix as just another operating system to deal with, and unless they have a specific application for Unix, they will wait. And we all know how plentiful commercial Unix applications are.

Then, too, there are the political implications for users. Cynics say that most IS shops naturally fight the move to open systems because the need for IS "priests" would be lessened, as would the political clout of IS. A lot of IS executives will dispute this by saying that the move to personal computers — open systems of sorts — has proved how needed IS is after all. And more than one IS manager has said that the move to open systems has made him or her a hero because of the flexibility these systems provide.

Still, I find it interesting that a quarter of a century after the advent of computing, we're moving from a hardware-dependent industry to a software-dependent one. I don't know how long it will take to achieve total independence, but without more users pushing for it, we may never know.

Ambrosio is Computerworld's Mid-Atlantic senior correspondent.

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- PLATINUM Database Analyzer™
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- PLATINUM Data Compressor™
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- PLATINUM Pipeline™ for DB2

PLATINUM technology
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IBM Business Partner

FOUNDING MEMBER

U.S. House

CONTINUED FROM PAGE 25

Transmission Control Protocol/Internet Protocol to Systems Network Architecture LU6.2 and for mapping client requests to CICS transactions. The requests then go to Sybase's Open Server for CICS on the mainframe, which processes them, retrieving data and sending the results back downstream.

The ability to easily retrieve information from different types of files and databases and move it to different types of systems will be the magic of ISIS, according to database administrator James Daly. "What makes it all work for us are the net gateway products [on the RT and mainframe] that open up the mainframe to all these different client platforms."

The two Sybase products allow the House to avoid much of the cost of rewriting applications and converting files and databases, Daly said. "It allows us to use technology that spans many years. And it allows us to have nice [graphical user interfaces] on the Macs while leaving the old mainframe front ends unchanged."

Windowing and the ability to link the databases will give users enormous new powers, Berdine said. "Members' press secretaries sometimes have to put together speeches in minutes. Now they'll be able to click on pieces of a bill and move them into a speech."

ISIS consists of logical bundles of applications that Berdine calls "workbenches": one each for the executive, legislative, constituent, press and analytical functions. Two applications in the executive workbench will be operational next month, and all of ISIS is due for completion in 1993.

Berdine would not say what ISIS will cost, but she said she is keeping costs down by using much off-the-shelf software and relying entirely on her own staff of 240 programmers and analysts.

Berdine said the House is becoming hungry for technology, even for the rather cumbersome tools offered by the existing MIN system.

"We had 560 people logged onto the system on election night. Two years ago, everyone used to telephone us for information," she said.

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Ingres gateway product attracted Ask

BY JEAN S. BOZMAN
CW STAFF

MOUNTAIN VIEW, Calif. — When Ask Computer Systems, Inc. acquired Ingres Corp. in October, it gained several key technical tools to be used in Ask's next-generation application software products.

Prime among these are the Ingres "gateway" products and Ingres tools that, when used in combination, will link Ask applications on Unix, Digital Equipment Corp. and Hewlett-Packard Co. computers with corporate databases running on IBM mainframes.

"Ask didn't pay all that money just to protect the Ingres database engine on which they're basing their new products," said the president of Chicago-based Performance Computing, Inc., Rich Finkelstein, who is evaluating the Ingres gateways. "They are looking for a way to expand their business, and Ingres' fourth-generation language tools are extremely good, state-of-the-art technology."

So far, the Ask/Ingres gateways link Ask/Ingres applications to DEC's RMS and RDB databases and to IBM's IMS and DB2 databases. However, more gateways are on the way, including one for Tandem Computers, Inc.'s Nonstop SQL database, Ask Chief Executive Officer Sandra Kurtzig said.

Ingres' gateway products, officially announced in October, have been used at beta-test sites for 10 months. Used in conjunction with Ingres tools and the Ingres/Star and Ingres/Net networking products, the gateways push Ask applications, developed with Ingres tools, into mixed-vendor environments.

One part of the Ingres gateway resides on a DEC computer or a Unix machine, while the other resides on the IBM mainframe. According to Ask, users do not need to run an Ingres database management system to use the gateway product; they only need to write the application using Ingres tools.

An Ingres demonstration shows that the mapping to DB2 is so complete that IBM's DB2 error messages appear on the Unix or DEC user's screen. That kind of functionality, analysts said, appears to be unique among the gateways offered by DBMS vendors.

Still questions

"There are major performance issues to be faced," Finkelstein said. "You can use these gateways to access remote databases, but I'm interested in seeing how these products work in user sites, handling large and complex transactions."

Until the new gateway products are widely deployed, however, some analysts question the range of functionality in the Ingres gateway code. "A gateway product can always translate SQL into a series of commands that would update an IMS database. The question is: Will they work efficiently?" asked Herb Edelstein, a partner at Euclid Associates, Inc. in Berkeley, Calif.

ICI Pharmaceuticals Group in Wilmington, Del., has been using an Ingres Gateway since September. The gateway is used in a production application linking a DEC Vaxcluster to an IBM 3090 Model 600 mainframe running DB2.

The ICI application allows users to create ad hoc queries from DEC terminals and run them against sales data stored under the DB2 relational DBMS. Other vendors' gateway products can query DB2 for information, but most of these products, with the exception of Sybase, Inc.'s DB2 gateway, cannot do so in real time.

"We had been displeased with the kind of development tools available for DB2. Now, we're able to leverage our Ingres expertise to run real-time queries against the corporate sales database," said Aidan Farrell, manager of technology development at the ICI unit. Previously, batch updates to the IBM mainframe had limited ICI users' database queries to preprogrammed formal reports.

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The Next 10 Years

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HDS

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INFORMATION SYSTEMS: THE NEXT 10 YEARS

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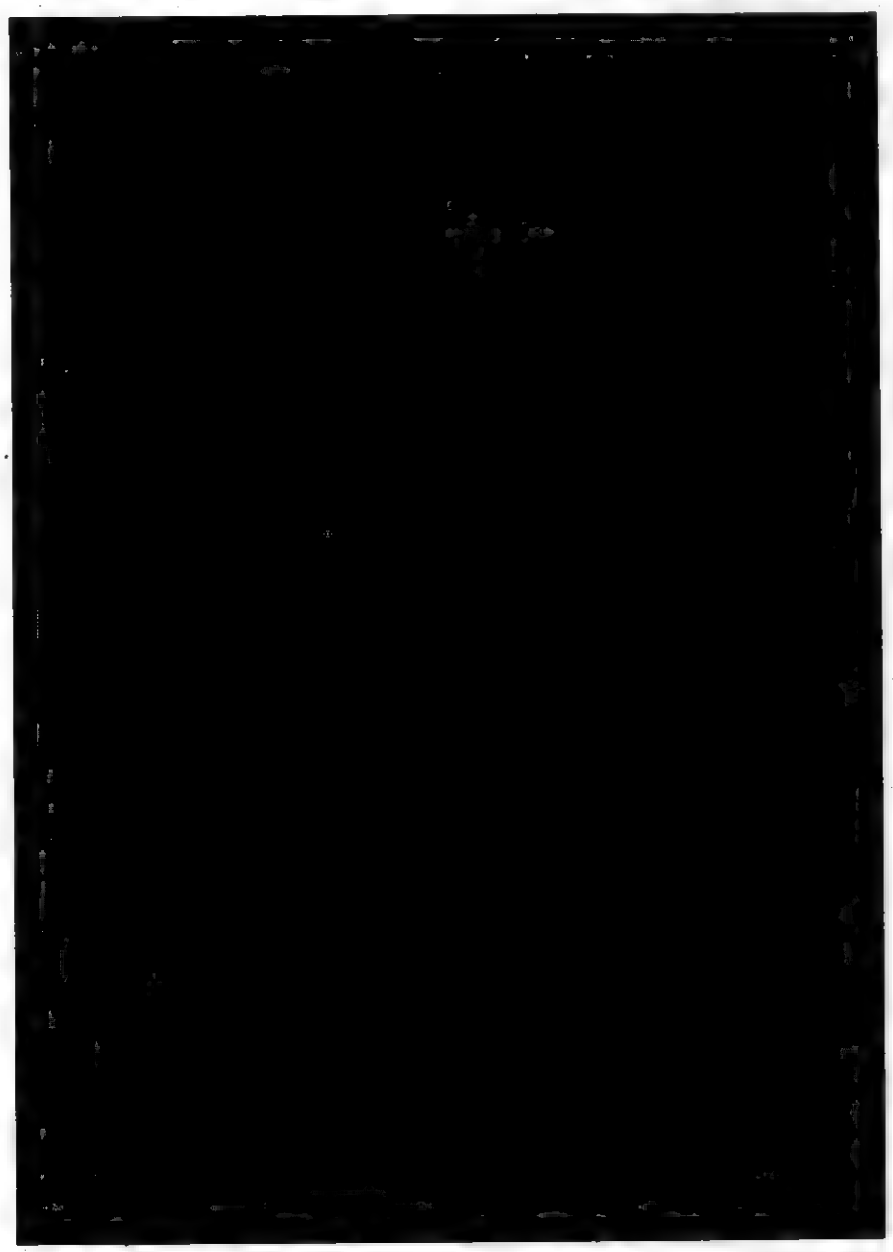
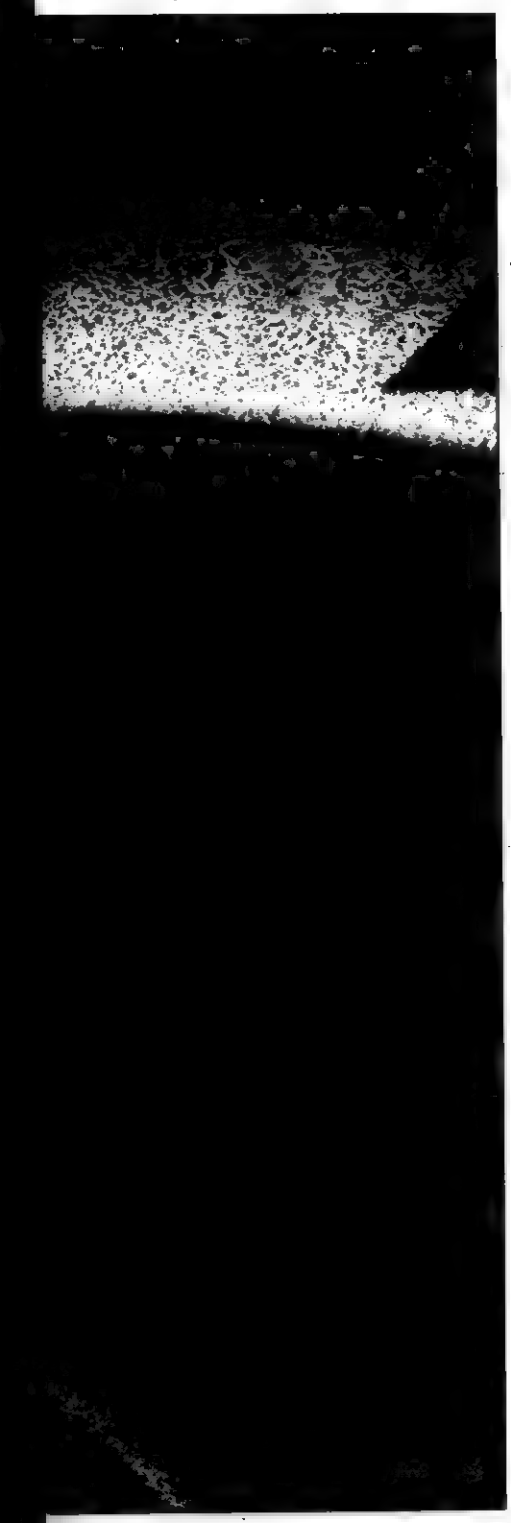




"WITH THE AMOUNT OF MONEY SPENT ON IS OVER THE LAST 10 YEARS, I COULD HAVE BOUGHT TOYOTA AND NISSAN OUTRIGHT."

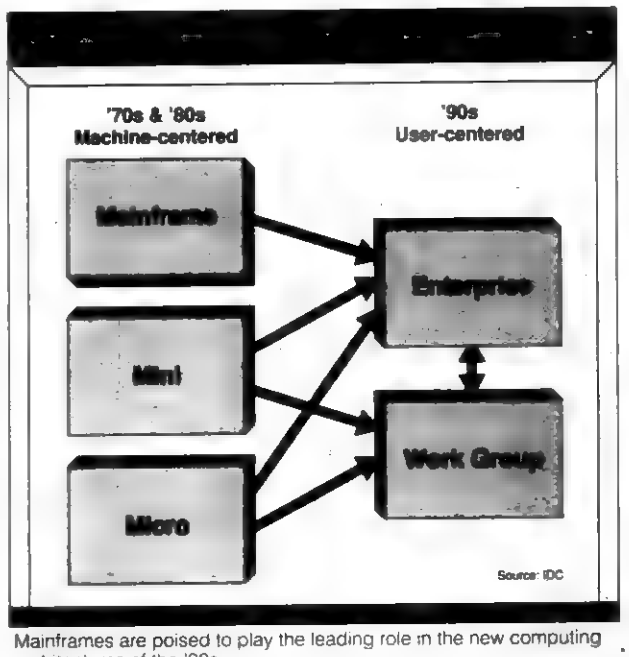
—FORMER GENERAL MOTORS CHAIRMAN ROGER SMITH

INFORMATION SYSTEMS: THE NEXT 10 YEARS

OVER THE NEXT 10 YEARS, MAINFRAME COMPUTERS WILL CONTINUE TO PROVIDE CORPORATE-WIDE ACCESS, CONNECTIVITY, CONTROL AND MANAGEMENT OF INVALUABLE CORPORATE DATA ASSETS. IN THE INCREASINGLY COMPETITIVE BUSINESS CLIMATE OF THE '90s, MAINFRAMES WILL DO THIS BY ANSWERING THE CALL FOR DISTRIBUTED PROCESSING POWER OVER WORLDWIDE NETWORKS. THAT IS WHAT THEY WILL DO; WHAT THEY WILL NOT DO IS GO AWAY. ■ CONSIDER, AS AN EXAMPLE OF THIS URGENT NEW "EXTENDED ENTERPRISE" ENVIRONMENT, A TYPICAL HIGH TECH MANUFACTURING

company with headquarters in the northeastern United States. Its manufacturing operations are centered in Asia. Its subcontracted design work is done in Ireland. Sales offices are sprinkled around the world with coordination in San Francisco. Research and Development is in Germany. A truly global operation. Corporate IS is responsible for ensuring the smooth, secure and timely transfer of sensitive company data across all these far-flung locales. In reality, that means seamlessly linking dozens of different systems and networks that are subject to different government regulatory restrictions. Mainframes make this sprawling international operation work by acting as hubs that connect the various locations.

In the late '80s, data processing architectures were compressed from three tiers to two: The machine-oriented dominions of mainframes, minicomputers and PCs were broken down and reformed into user-oriented enterprise and work-group domains. This new architectural focus has received various labels, including "cooperative processing" and "client/server" computing. No matter what it is called, traditional mainframes will play the central role in its operation.



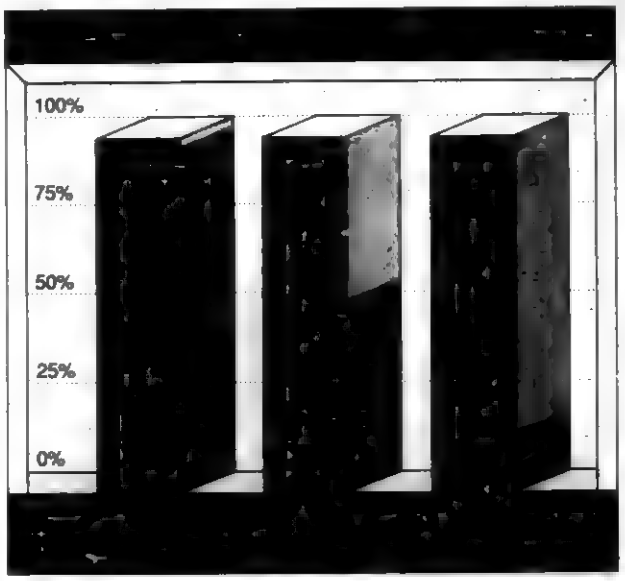
Mainframes are poised to play the leading role in the new computing architectures of the '90s.

THE DATA WAREHOUSE

The mainframes of 1995 will be characterized as data vaults or warehouses for the enterprise. These huge providers of services will control communications, provide security, and manage data access and throughput for a system of interlocking databases. This will lead to a high level of diverse database integration, enhanced system integrity, and in the end, a cost-effective array of hardware, software and personnel.

Despite the much-publicized movement toward downsizing, few companies expect to erase the need for large mainframes any time in the near future. In fact, the strategic plans of most large organizations run to the contrary. The reallocation of selected processing, and in some cases selected control, to workstation-based, end-user departments is generating an increased workload for mainframes. This shows the role of mainframes is becoming more, not less, important. There are several reasons:

• At the high end of the processing-power scale, large mainframes cannot be readily and cost-effectively matched by incremental additions of small processors. This is especially true in high-volume transaction processing



Tending to an increasingly computer-literate end-user population will become a major preoccupation with MIS staffs by 1998.

• Mainframes have sophisticated security mechanisms for both access of data resources and secured transmission of sensitive, valuable data

• Formal and standardized procedures and products for reliable backup and recovery on mainframes have been developed over the years, insuring system integrity. The lack of these procedures and products is the most frequent cause of failure for distributed networks linking smaller machines

• Mainframes provide the automated control and integration of storage devices as well as other peripherals and resources necessary to carry on a global business

• Mainframes provide system control and all-important auditing facilities that maintain data, applications and operating-system integrity.

THE CHALLENGE OF PERSONAL COMPUTERS

Since their introduction in the early '80s, personal computers have been touted as "mainframe killers." It is true that, incrementally, the growth of power in the form of millions of instructions per second (MIPS) has increased much more rapidly in personal computers than in mainframes. This remarkable growth in raw processing power played a major role in the migration of specific applications from mainframes to smaller machines such as personal computers.

PCs have several distinct competitive advantages over mainframes:

• They are easier to learn, easier to install and easier to use, particularly for the non-DP-professional

• Relative to mainframe computing power, personal computers can provide a very cost-effective solution for certain types of standalone or departmental processing such as spread sheets, word processing or application development

• Hardware and software prob-

lems on PCs require relatively lower maintenance skills which are widely available.

However, while PCs are very powerful when properly applied to the appropriate problem, they are not viable alternatives to mainframes for jobs that require robust security, task interleaving with other data processing jobs, and high rates of transaction processing. There are many recent examples of corporate data processing jobs that were offloaded to PC networks. Within months, MIS directors were asked to recapture and reschedule these jobs back to mainframes due to poor security, and the difficulty in administering, managing and repairing local area networks (LANs). Few organizations have realized the optimal organizational structure required to properly and successfully support distributed processing across LANs.

NEEDS OF THE '90s

Long gone are the days of 15% annual staff growth with salary increases to match. If anything, staff reductions are the order of the day. Commercial data processing departments are realizing that the work force needed to support large computing systems must be closely controlled and, in many cases, reduced. Further, retained personnel are being asked to expand their expertise and work toward achieving the objectives of the core business.

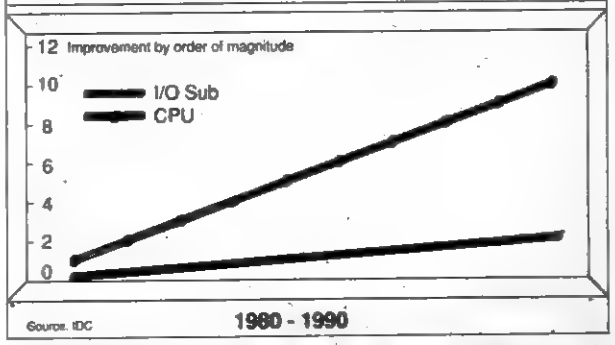
In these lean times, both MIS managers and vendors are faced with a paradox. Corporate management says the computing complexity can increase as long as personnel and training required to support and manage it declines. Given this new criterion for buying computers, hardware vendors will be under constant pressure to provide more cost-effective systems.

The computer processor environment over the next five to 10 years will continue on its heterogeneous path. Along this path, corporate data processing departments are moving into an era of hardware specialization. They are dedicating mainframes to the management of very specific business situations such as automated teller machines, on-line transaction processing (OLTP) and batch processing. It is not unusual for each of these dedicated processors to come from different vendors. Therefore, the challenge is to maintain multi-vendor hardware solutions with limited staff.

MAINFRAME MARKET DYNAMICS

In a recent IDC survey of 75 senior MIS managers with IBM 3090-class mainframes, respondents were asked to discuss their plans for acquiring large computers over the next three years. Of those who are planning an acquisition during that time period, 58% are considering IBM, but models other than the newly-announced ES/9000 series. Nineteen percent are considering a plug compatible manufacturer (PCM) solution from vendors such as Hitachi Data Systems (HDS) or Amdahl. Twenty-three percent are considering a non-IBM-compatible mainframe or Unix acquisition. The fact that large-processor users are expressing an early, tentative approach to the newly-announced IBM ES/9000 is no surprise. Users typically warm up slowly to new machines.

Growth in computing power vs. I/O subsystem power



As the growth of CPU performance has outstripped increases in input/output subsystem power, local area networks have been enlisted to offload mainframes.

Soaring mainframe growth, which reached nearly 20% at times during the past 20 years, gave way to a modest growth rate of 5% to 7% by 1990. Barring any unexpected and unprecedented technological breakthroughs, IDC predicts similar unspectacular growth —but not unspectacular profits—for the '90s.

The promise of mainframe longevity and the possibility of 70% profit margins has resulted in cutthroat marketing campaigns by IBM and the PCMs. Once a group much larger in number during the glory days of the "BUNCH," the PCMs are now limited to Amdahl and HDS. Both companies are expected to demonstrate staying power over the next 10 years.

The PCM marketing push has clearly been felt by the perennial leader, IBM, as that company's market share has slowly eroded. Big Blue has lost customers to the PCM vendors primarily on price/performance issues.

Prior to the fall of 1990, a period that saw several important announcements concerning mainframe technology, the mainframe market shares for the leading vendors were:

IBM	68%
Unisys	17%
Amdahl	9%
Hitachi Data Systems	3%
Bull HW	2%
Control Data	1%

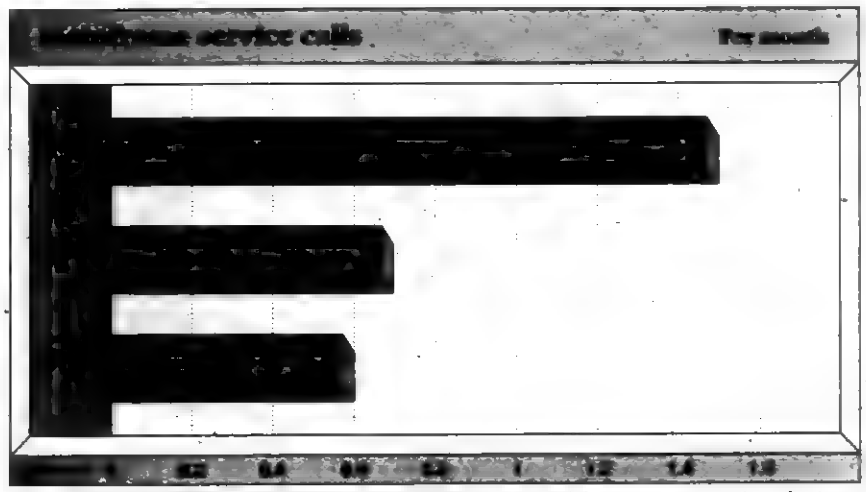
The 1990 competition picked up during June when HDS announced the industry's fastest processor, the model EX/420. The EX/420 is rated at approximately 150 MIPS. This introduction was followed in short order by rapid-fire announcements from Amdahl, Fujitsu and IBM. This series of announcements virtually restructured mainframe technology.

The new machine families offer dramatically new features and functions with the promise of even more advanced features over the next several years. HDS seems to have come out a winner in this new-product derby as 16% of survey respondents say their companies are now planning on buying HDS machines. Otherwise, the introductions did not seem to have a great impact on future brand loyalty. Some 62% of respondents still expect to buy from Big Blue.

Internationally, five-year mainframe-market growth in the Pacific Rim is expected to double that of the rest of the world. The Japanese, Australian and Asian markets pose an interesting dilemma for mainframe makers. IBM systems compatibility is less critical in these markets than in the U.S. As a result, several European and Far Eastern manufacturers have aggressively carved out and maintained a significant market share. Thus, IBM and the PCMs have found themselves in the unaccustomed position of playing catch-up.

The aggressive marketing of the PCM vendors, joint ventures and far reaching marketing agreements among industry giants have IBM looking anxiously over its shoulder. What it sees is Fujitsu buying International Computers Ltd. outright, and 42% of Amdahl. In another similar move, Electronic Data Systems bought 20% of HDS. Rarely lacking in marketing acumen, IBM is expected to have more than 100 strategic alliances of its own, mostly with

SOH



The decreasing number of mainframe service calls creates higher user expectations for large applications such as airlines reservations and banking.

software partners, before January 1, 1991.

Less than five years ago, the top price for the high-end machine in a mainframe family was in the range of $5 to $6 million. Today, these machines exceed $24 million. Add in the large margins which hardware designers require to support R and D efforts, and these price tags will only climb. Despite such astronomical costs, however, there is no sign that the world's largest corporations are reluctant to buy. They have to buy if they want to compete.

On a positive and less expensive note, significant savings can be realized from operational consolidation. Money can also be saved by agreeing to new hardware purchases only if free software licenses are included. For example, an IBM buyer might save the $250,000 yearly cost of DB2. Mainframes have a definite advantage over smaller computers in this area.

TECHNOLOGY ADVANCES

Technological advancements came with dizzying rapidity in the '80s, and will continue to do so in the '90s. Processors, from the most powerful mainframes down through the least powerful personal computers, increased in speed dramatically. We have reached the point now where speed improvements of 25% to 30% per year are taken for granted—and even demanded—by some end users.

General-purpose processor speeds are now in the 150-to-210 MIPS range and expected to reach 300 to 500 MIPS by 1995. They will hit 1,000 MIPS and more by the year 2000. Fujitsu, a leading Japanese mainframe manufacturer, hints that it is developing a 600-MIPS machine. When it will reach the market is a matter of debate. At this point, there are very few applications that require or can fully take advantage of that kind of power. Actual applications that could utilize such fast machines are generally found in the military.

As commercial applications begin to require such processing power, it seems likely that a customized configuration will be developed for each individual installation. This is not an an extraordinary expectation given the sums of money that will be invested by users.

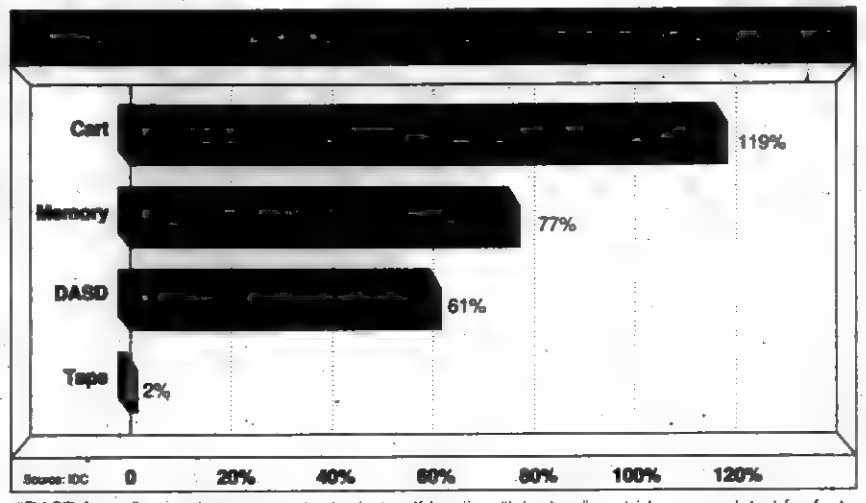
Advances in processor design include the implementation of improved instructions that control processing within the computer. Smaller machines with reduced instruction set computing (RISC) and scalable processor architecture (SPARC) are now common, although such technologies are not expected to gain widespread use in the mainframe class until 1995, at the earliest.

Despite advances in hardware miniaturization, dramatic reductions in the size of mainframe computers are not expected soon. A quick look inside almost any current large model reveals considerable open space that is required for easy access.

Despite all the technological gains, however, the disparity between the computer's ability to "crunch" data and its ability to move data through input output subsystems is disappointing. CPU's simply cannot move data around as fast as they can process it. One solution to this shortcoming is the use of work-group-oriented LANs.

This disparity continues to exist even after the introduction of IBM's Enterprise System Connection Architecture (ESCON). This dramatic new channel architecture uses a light-emitting diode as the light source, and fiber-optic cable as the transmission medium. ESCON allows direct-access storage devices (DASDs) to be located up to five miles—instead of only several hundred feet—from mainframes. It also provides 10M bit/sec transmission I/O speed, which, although fast, still lags behind internal CPU speed.

In order to put the issue in perspective, consider this: CPU cycle times are in the nanosecond (one-millionth of a second) range. I/O subsystems operate in the millisecond (one-thousandth of a second) range. If we arbitrarily assign one nanosecond as one hour, then one millisecond is approximately 41 days.



"DASD farms" are a hot storage topic, but self-loading "juke box" cartridges are slated for faster growth over the next five years.

REACHING FOR RELIABILITY

Asked to comment on mainframe service calls, survey respondents say they expect

the number of these calls to decrease from 1.5 to 0.6 a month by the year 2000. In such a stable environment, users will demand an even higher rate of reliability for such applications as airlines reservations, banking, credit card processing and point-of-sale transactions. While the majority of today's mainframes is not fault-tolerant, there are vendors that have specifically designed their machines to offer 100% reliability. The demand for such perfection will surely engender industry-wide, mainframe fault-tolerance within the next 10 years. It is needed now.

Mainframe reliability is worth its weight in gold. Retail credit card operations are a good example. Research indicates that if a retail credit card validation is delayed longer than 15 seconds, the consumer will offer another card. Thus, the first credit card company loses an opportunity to, in effect, grant a high-interest, short-term loan. Mainframe makers are motivated by the fact that credit card companies typically purchase whatever processing equipment brings them lower response times.

THE "LOGICAL" MAINFRAME

The 24-hours-per-day, seven-days-per-week, 365-days-per-year processing schedule is standard operating procedure in most large organizations with critical time requirements. The future decade will carry this a step further by making any downtime unacceptable.

This demanding environment is spawning what IDC calls "distributed data center complexes." Distributed data center complexes are a collection of geographically diverse data centers coupled by wideband, wide-area communication capabilities. Each complex is tighly coupled with all other complexes, sharing central memory, storage and other mainframe facilities. The number of central processing units contained in each of these complexes is increasing. Currently, there is a maximum of eight. That number could reach 24 by 1995.

In this environment, each of these distributed data center complexes—while to a large degree self-contained—requires information sharing with smaller, "mini-mainframes." These unattended "lights-out" systems could be located regionally or in departments.

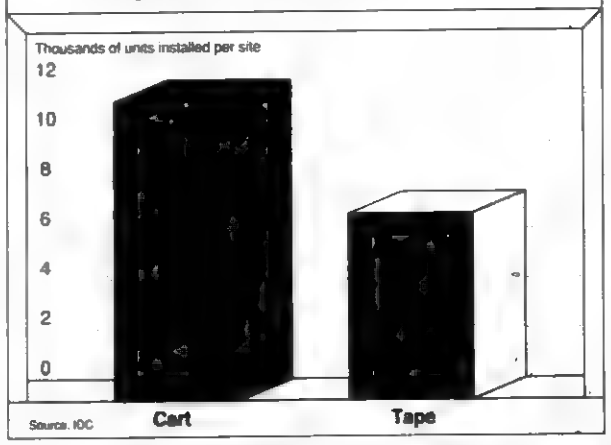
Overall enterprise control of such communication will be accomplished by a "logical" mainframe—a distributed data center computer that stands logically apart from any other CPUs. This master computer will not be invasive. It will not make modifications to any of the "outlying" operating systems. Its automated process control will not retard the performance of the host systems. Its strategic decisions will be made transparently and according to priorities established by management.

EXPERT SYSTEMS

In order to manage and control processing, enterprise-wide systems of the future will require more knowledge than any one person can supply. Artificial intelligence, or more precisely, mainframe-based expert systems, will help fill this knowledge gap. These systems are comprised of knowledge and rules built by extracting decades of experience from hundreds of hours of interviews with human experts. Expert systems will gradually replace the human component and make the thousands of split-second decisions needed to run a large mainframe complex on a daily basis.

Without such systems—and they are finding their way into data centers now—the complexity of running data centers efficiently will quickly push machine-operating personnel to their limits. They will be overburdened as schedules, workload balance, and the need for 100% uptime require processing that will be divided among distributed heterogeneous mainframes. The scope of the task increases significantly when performance, network, resource and data management are included.

Cartridge leads tape-1990



The average IDC survey site has 13,000 cartridge tape units installed, as opposed to only 8,500 reel-based units

According to the IDC survey, portability and integration of multi-vendor hardware and software solutions is rated as one of the most pressing issues facing IS management over the next five to 10 years. The object-oriented environments used by expert systems address those two issues by raising the level of portability and easing multi-vendor integration. As a result, the accumulated expertise gathered from many highly technical disciplines is transmitted to organizations that would otherwise go without.

PERIPHERALS

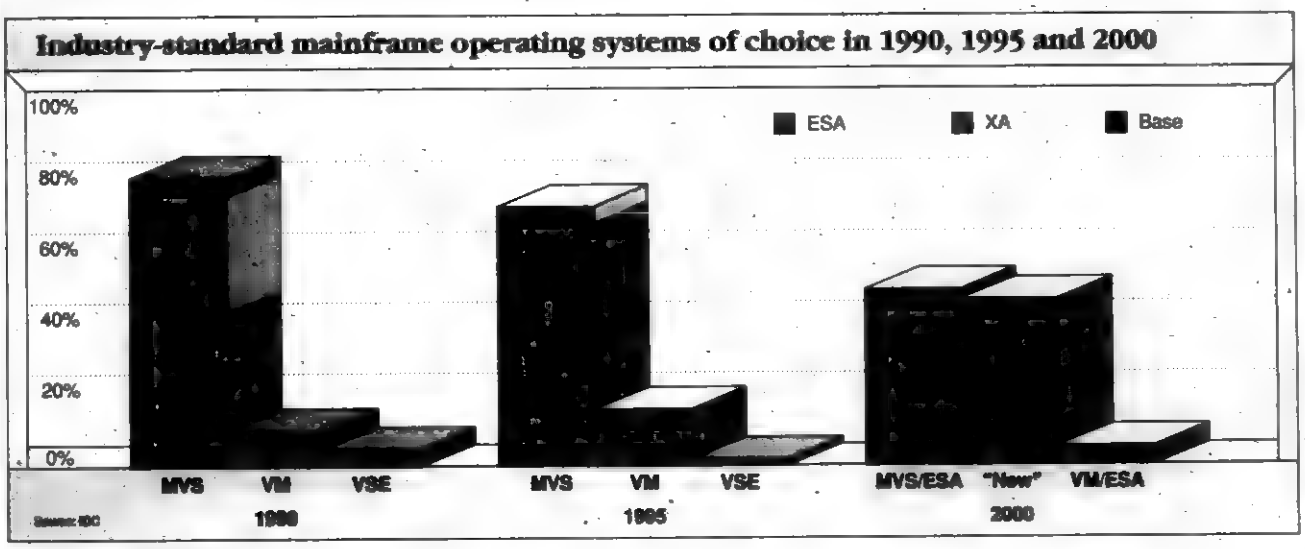
When speaking about mainframes, the term "peripheral" has become synonymous with data storage devices and printers. While they play a significant role, there are also vast numbers of personal computers and workstations urgently requesting data from mainframe-based master data repositories.

In order to provide that support, peripheral storage devices, whether they be traditional, rotating, DASDs, or some other medium such as optical disk, will be used heavily. Survey respondents believe that the growth of DASD will increase over the next five years by a robust 61%. However, they also believe that tape storage will grow an even more impressive 119%. That growth is largely reserved for the newer, smaller cartridge tapes, as opposed to the traditional reel-mounted versions. The cartridge devices offer several key advantages, but one stands out: the ability to automate the mounting process with so called carousel or "juke box" hardware. This eliminates virtually all human intervention.

While optical disk storage devices have been available for some time, acceptance of these devices within mainframe environments has not been overwhelming. Currently, write-once-read-many (WORM) technology is finding a niche in such areas as image processing and microfiche replacement, and is much favored by government agencies such as the IRS. Advances in this technology, such as multi-function disks, are expected to expand the market, but not on a large scale. Mainframe optical-disk devices made up less than 5% of disk shipments in 1989, and barring an unexpected breakthrough, that market share is not expected to increase dramatically over the next five years.

HDS

SOH



Users anticipate the emergence of a new operating system by the turn of the century.

FIBER OPTICS AT THE HEART OF COMMUNICATIONS

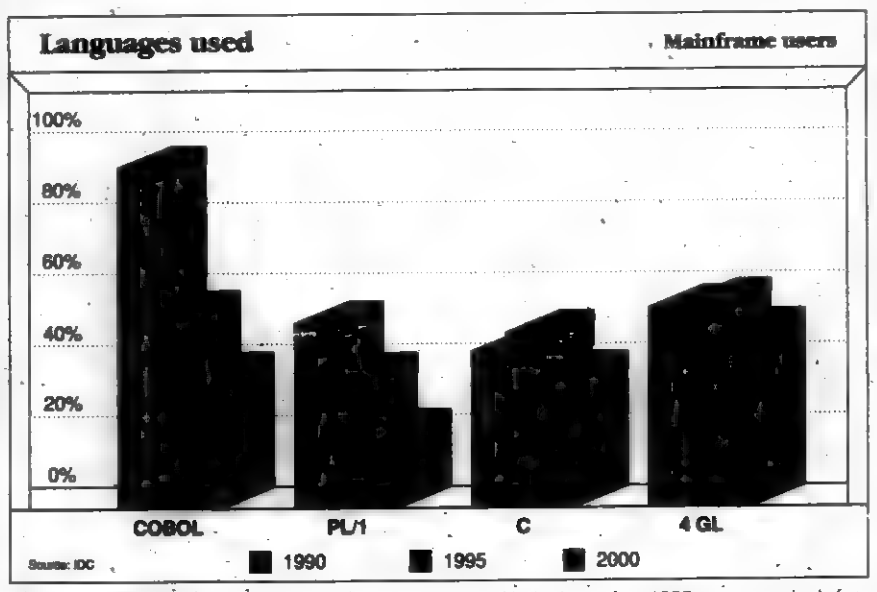
The explosion of peripheral input/output devices required by OLTP has engendered two new remote data storage entities. The first is the "DASD farm," while the second, more futuristic one, is the remote "optical-storage plantation." Success in moving very large amounts of sensitive data over long distances to either of these two requires reliable, high quality communication capacity. This capacity is increasingly being supplied by internal fiber-optic mainframe links and external fiber-optic networks.

The expansion of fiber-optic technology has given new life to remote sites. The combination of fiber and channel extenders can bring logical mainframe processing to any remote site. In the case of system failures, this same combination bolsters disaster recovery by greatly enhancing the reliability of continuous, on-line computing links to remote backup mainframes.

OPERATING SYSTEMS: THE GLUE

As mainframes increase in power, operating systems must keep pace. Sophisticated hardware complexities can be fully utilized if the software is easy for human operators to use.

Mainframe operating systems must have the power and intelligence to operate in a near-fault-tolerant manner. They must be easy to install, maintain and integrate. Newer versions from IBM, Digital Equipment Corp., and others are following a clearly defined path toward these objectives. While each new year sees significant developments, survey respondents still expect their operating system to come from IBM over the next five years. Not surprisingly, sometime in the next decade, they expect an undefined new operating system to appear.



The movement toward fourth-generation languages will slacken after 1995, as users look for something better.

UNIX AND THE DATA CENTER

The Unix operating system, which originated in the late '60s at the Bell Labs division of AT&T, is well known for its flexibility in supporting long-distance telephone communications. Unix provides a simple, very robust operating system with an emphasis on fault-tolerance. Most of the major mainframe vendors have given a passing acknowledgment to Unix by supporting it or some close derivative on their platforms.

To date, however, the very traits that allow Unix to achieve fault-tolerance cause it to be functionally deficient in the sophisticated facilities required to support full-scale commercial applications. Of prime concern is the lack of tight, manageable security. Moreover, traditional mainframe users maintain that Unix has a shortage of operating system tools and utilities. This, they say, prevents the operations staff from closely monitoring and managing mainframes. Realizing this, soft-

ware vendors are rapidly offering more Unix system software.

Interestingly, Unix's lack of complex utilities and system software is viewed by many as a saving grace. They say the lack of utilities results in much simpler machine configurations, which in turn can lead to far less expensive operations.

The general feeling is that Unix has not yet become a full-function, commercially-oriented operating system. However, few doubt its potential. In fact, 15% of survey respondents state they are currently considering the use of Unix. However, only 4% say they will consider implementing Unix in the next five years.

APPLICATIONS SOFTWARE: THE CATALYST

Applications will continue to drive the need for faster mainframes. The new application development paradigm will see application developers utilize new languages and tools that dramatically cut the time required to develop new applications. Programmers are already reducing the great bulk of their time spent writing third-generation computer code. But this expected transformation will not happen over night. The survey reveals use of COBOL at 92% of the companies surveyed. Indeed, there are currently some 100 billion lines of COBOL code in existence.

The 92% figure is expected to drop slowly to 56% over the next five years, and to 35% in 10 years. Even then it will lead alternatives such as PL/1 and C. This adherence to COBOL is a reflection of the massive investment in installed code now existing in data processing libraries. It also reflects the difficulty in migrating away from applications that have no documentation or exist only as machine code.

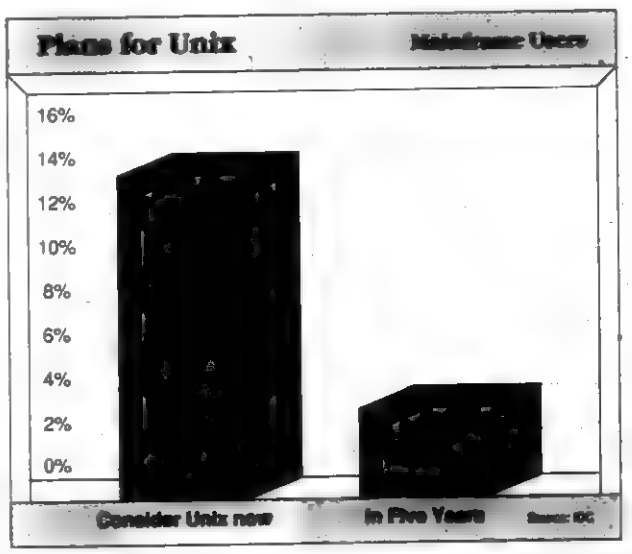
While many additional application development departments would sorely like to migrate to a more productive fourth-generation language, the inability to safely understand the logical flow of 20-year-old programs with unnumbered patches remains a major impediment. Still, 57% of respondents currently utilize a fourth-generation language. That percentage is expected to increase somewhat over the next five years.

DIAGNOSTICS AND SOFTWARE

In the future, mainframe hardware and software will work more closely than ever. In fact, as hardware gets less expensive, a phenomenon that occurs at a rate of at least 25% per year, sales will be made on the issue of software function. Manufacturers already realize that offering strictly hardware is a shortcut to disaster. In order to maintain market presence and share, most vendors will aggressively and closely integrate hardware and software. This will be most true in the area of maintenance and service.

The survey found 82% of respondents had installed some type of software-based automated diagnostic capability. While many packages are available, most of those installed on mainframes will "sense" an impending problem before a critical stage is reached and actually call the manufacturer's service facility via an integral modem. Further, these diagnostic tools place a probability on impending failure and suggest replacement parts. Therefore, a technician dispatched from the vendor's facility will usually arrive at the installation with all parts required to fix the problem before it occurs.

IDC predicts that by 1995, advanced diagnostic capabilities will virtually eliminate outages. By then, diagnostic capabilities of one processor will help resolve problems with others. Automatic error recovery of circuits, channels and media devices will be the key to assuring 100% system availability. Currently, there is at least one mainframe-based hardware and software package that detects and calls in possible future problems.



FUTURE SHOCK

Data processing end users are becoming increasingly computer literate, a trend that will continue. They are growing more aware of the potential power that exists in the data center and demanding their share. This is not an unreasonable demand for the ultimate bill payer. Therefore, expectations will soar to the near-impossible, and the MIS departments will have to deliver. Measurable standards and service-level agreements will be developed and accepted, forcing MIS departments to comply with tightly-defined thresholds of reliability, availability and serviceability.

The role of MIS professionals will change significantly in this high-pressure environment. Their expertise will be used at higher levels within the organization; they will be viewed as enterprise consultants. Meanwhile, technicians will concentrate on training, custom-tuning hardware for specific business requirements, and problem solving.

Open architecture will give way to a completely object-oriented approach, where even the technicians will be all but immune to hardware and software configurations. The tedious definition of OLTP configurations, data communications networks, establishing performance criteria, and monitoring a myriad of operating thresholds will all reside in software. Organizations will no longer be able to afford problem solvers. A new job description will arise, that of "problem preventer." Assisted by highly-automated software products, system operators will have expert support in managing machine-speed systems linked to multi-vendor networks and applications.

The era of the self-managed system is not far away. Systems of the 21st century will require so much sophistication and technical specialization they will have to manage themselves. The mainframe of 1998 will control the master console. It will direct the system to seek and maintain balance as determined by an "operator" that may be a computer located thousands of miles away.

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NEW PRODUCTS — SOFTWARE

System software

Goal Systems International, Inc. has announced a disaster recovery system that automates various processes used during a system recovery procedure.

Arise II automatically identifies, tracks and reports on the essential components of user-selected applications, identifies resources necessary to support such applications at an alternate site and creates and maintains recovery job control language.

The product can also be used to identify the direct-access storage device requirements needed for data set recoveries, the vendor said.

Pricing ranges from $42,000 to $64,000.

Goal Systems International
7965 N. High St.
Columbus, Ohio 43235
(614) 888-1775

Development tools

SQL Solutions, Inc.'s SQR Developer's Kit, a recently announced debugging environment for programmers, automates the process of error tracing, scoping variables and determining program structure.

The product is currently available for Oracle Systems Corp.'s Oracle and Sybase, Inc.'s Sybase relational database management systems running on DOS, OS/2, VMS and Unix platforms. It is being included as an option with SQL's SQR family of fourth-generation languages. Pricing ranges from $250 to $10,000, depending on type of platform.

SQL Solutions
8 New England Executive Park
Burlington, Mass. 01803
(617) 270-4150

Alsys, Inc. has announced a version of its Ada development environment that was designed for IBM 370 platforms running under AIX.

AIX Ada includes the same user interface and tool set as previous versions. Pricing ranges from $45,000 to $150,000, depending on CPU size.

Alsys
67 S. Bedford St.
Burlington, Mass. 01803
(617) 270-0030

Utilities

Advanced Systems Concepts, Inc. has announced a tape sharing software product designed for Digital Equipment Corp. Vaxcluster systems.

Tapeshare allows locally attached tape devices to be transparently served to other nodes in a Vaxcluster configuration. It enables users of an entire Vaxcluster to access a tape device without requiring any additional hardware, the vendor said.

Version 1.0 of Tapeshare is scheduled to begin shipping this month.

The product is priced between $1,000 and $12,500, depending on CPU model.

Advanced Systems Concepts
33-41 Newark St.
Hoboken, N.J. 07030
(201) 798-6400

Sterling Software's Dylakor Division has introduced a front-end software product that supports many key functions of Sterling's DYL-Audit Excel auditing and financial system.

DYL-Online TSO Release 3.3 enables users to create, test and run DYL-280, DYL-280 II and DYL-Audit Excel programs by using English-like commands.

Pricing ranges from $10,000 to $16,500, depending on the type of IBM processor group on the host CPU.

Sterling Software
9340 Owensmouth Ave.
Chatsworth, Calif. 91313
(818) 718-8877

Legent Corp. has announced a report distribution package that features customized output facilities and formatting capabilities.

Release 4.0 of Bundl includes a custom view facility that enables a data center to deliver information to its clients in a format the client wants, the vendor said. End users working with on-line reports can use the product for reformatting, defining and storing up to 36 formatting profiles or reprinting a customized report.

The product runs under all versions of MVS running JES2 or JES3. Annual lease pricing starts at $22,500.

Legent
2 Allegheny Center
Pittsburgh, Pa. 15212
(412) 323-2600

Cynosure, Inc. has released system management utilities for IBM Application System/400 and System/38 computers.

The products include Byte Size History ($300), which provides usage trend analysis and a history of storage consumed by objects, files or libraries; Disk Usage ($300), which provides point-in-time analysis of data storage capacity; View CPU History ($300), which generates accounts of how users consume CPU resources; Job Tracking Analysis ($1,500), which monitors system resource use; and Time Reporting System ($1,500), which tracks the amount of time that staff members work on projects.

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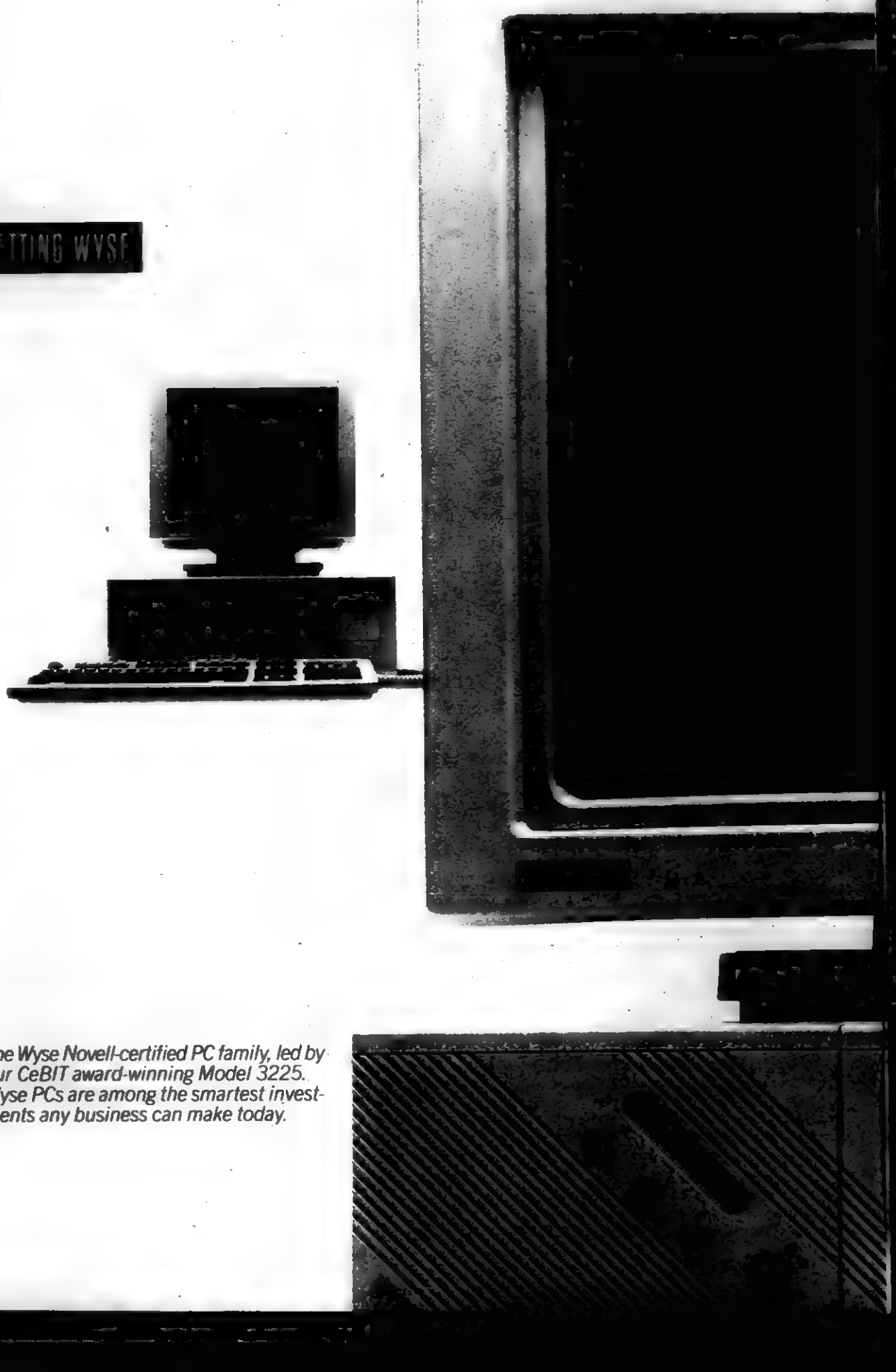

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Scanner users see new benefits

Features once found on $50,000 systems are now available for $6,000

ANALYSIS

BY ELLIS BOOKER
CW STAFF

Steady improvements in features and price/performance of optical scanners are benefiting users ranging from those with simple needs (a personal computer connected to a desktop scanner capable of processing a few pages per minute) to those with specialized, high-speed applications that require dedicated servers and scanners able to handle hundreds of pages per minute.

According to analysts and vendors, scanner technology has improved within the past two years, pushing features once found only in $50,000 systems onto $6,000 devices suitable for PC applications.

In hand

Handheld scanners will hold a slight edge, but both handheld and desktop scanners are expected to show solid growth during the next four years

*Projected

Source: BIS CAP International

CW Chart: Paul Mock

A three-tier market

There are three levels in the scanner market today, said Scott McCready, director of image systems at International Data Corp. in Framingham, Mass., and a principal at Avante Technology, Inc., a consulting firm specializing in imaging systems:

- Desktop scanners able to process between two and six pages per minute and ranging in price from $5,000 to $18,000.
- Midrange scanners, which are often paired with a dedicated server, able to process six to 20 pages per minute and priced from $6,500 to $20,000.
- High-end systems capable of scanning hundreds of pages per minute, priced from $50,000 to $120,000.

At the high end, McCready said, improvements over the past two years have been in the mundane but important area of paper transport. "They've simplified the mechanism that transports the paper through [the scanner]," he said, adding that the best scanners on the market can handle "tissue paper to cardboard with paper clips on it."

Meanwhile, midrange scanners have gained the ability to correctly position the paper that enters them from an automated feeder, enabling them to make an accurate scan. Two years ago, McCready said, this feature was found only in devices costing $50,000 or more.

There will also be an increasing demand for inexpensive ($250 to $400) handheld scanners and optical character recognition (OCR) software for use by individuals at their desks, predicted Kristy Holch, a market analyst at BIS CAP International, Inc. in Norwell, Mass.

"I think the laptop market is another opportunity," Holch said, noting that, until now, handheld scanners "haven't been marketed as something to take along to the trade show."

Another development includes the introduction of bar-code readers into scanners. A number of imaging applications have begun using bar codes on incoming documents as a way of automating the labor-intensive but crucial job of indexing the document once it has been scanned into the image database.

Two other technical improvements include the appearance of double-sided scanners and those with small computer systems interface (SCSI) ports. Unlike the relatively sluggish 19.2K bit/sec. speed of the standard RS-232C interface, a SCSI port can transfer data at 5M bit/sec., which makes a difference given that an image data file of a page can be 10 to 20 times larger than its ASCII text equivalent.

"Font independence is here today," said Wayne Crandall, vice president of sales and marketing communications at 2-year-old Xerox Imaging Systems, a wholly owned Xerox Corp. subsidiary in Cambridge, Mass., that was formed when Xerox merged Kurzweil Computer Products and Datacopy Corp.

Crandall claimed Xerox broke the $10,000 omnifont (font-independent) barrier as far back as 1987 with a PC-based product, but Crandall said he believes scanners able to consistently recognize handwritten fonts will be generically available in the middle of this decade. There are already some systems that can recognize numerical data.

Part of the problem is that font-independent recognition requires computational overhead.

Trying to separate high-speed scanning from the OCR function, Xerox introduced in June the K5200, a reduced instruction set computing-based processor with 6M bytes of

Continued on page 60

Borland to add networked Sidekick

BY JAMES DALY
CW STAFF

SCOTTS VALLEY, Calif. — Borland International will produce a network version of its Sidekick personal organizer application by first-quarter 1991, company sources said.

Like earlier versions, Sidekick 2.0 will include a notepad, an address book, a calculator and communications programs. But the new product adds a windowing and pull-down menu user interface with mouse support. It will sell for $99.95, sources said.

Although a stand-alone version will be available, Borland insiders said the chief goal with Sidekick 2.0 is to have it serve as an organizational hub. As such, connectivity support will be offered for a variety of networks, including those from Novell, Inc., 3Com Corp., Banyan Systems, Inc., IBM's Token-Ring and others that are 100% compatible with DOS Version 3.1 or higher.

The package will also provide direct links to a variety of organizer and database files and allow the exchange of data with other applications through Microsoft Corp.'s Windows dynamic data exchange.

New additions to the Sidekick package include a reconciliation feature in the Time Planner, which allows users to resolve schedule conflicts that occur, for example, when updates are made on the road via laptop and the user also has a Sidekick in the office.

Sidekick 2.0 will require only 35K bytes of conventional random-access memory because it uses expanded memory or hard disk for memory swapping.

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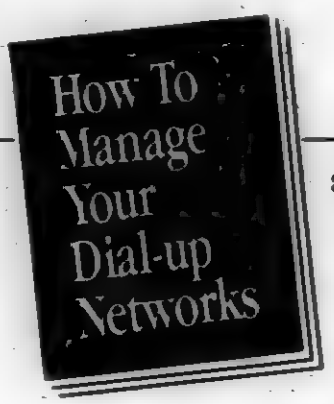

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Magellan: Strong text searcher, weak DOS shell

Technology Analysis — a roundup of expert opinion about new products.

With Release 2.0, Lotus Development Corp.'s Magellan joins other DOS shells in offering a variety of disk management utilities. While these additions receive some credit, Magellan's original features — text searches and file viewers — remain its greatest strengths, according to reviewers at the leading personal computer laboratories and publications.

In addition to menuing, file deletion, undeletion and backup, Lotus has added a widely praised Zip compression program that allows users to view or transfer a group of files as a single, compressed file, which can then be "unzipped" back into the original files at any time.

Magellan's text search capabilities allow users to find information anywhere on a hard disk within a matter of seconds. These have been enhanced by support for 40 different file formats, up from 10 in Version 1.0.

Reviewers are less enamored of Magellan's directory function. Lacking a true directory tree, the screen display was described by *PC World* as "clumsy and not very configurable." Another common complaint from reviewers was Magellan's lack of mouse support.

Magellan requires 512K bytes of random-access memory. For $139, Magellan offers ultrafast text retrieval and versatile file viewing. Users with heavy requirements in these areas and less need for utilities will find that this shell fits the bill.

The Magellan summary was compiled by Computerworld *intern Derek Slater.*

Score calculations: *Published reviews: average of available numeric scores from reviews multiplied by a factor of 3. Analysts' ratings: average of 1-to-10 rating from product analysts multiplied by a factor of 2. Users' ratings: average of 1-to-10 rating from major users multiplied by a factor of 1.5. Cost evaluation: average of users' and analysts' ratings of the cost to get a product up and running multiplied by a factor of 2. Vendor financials: average of 1-to-10 rating from analysts on the health of a firm and product sales multiplied by factor of 1.5. The 1-to-10 scale: 1 is poor, 10 is excellent. Criteria are weighted in favor of expert opinion and most important areas.*

Reviews Summary

Criteria	Inkworld 5/28/90	[illegible]	PC World [illegible]
Ease of use	Very good	Good	Fair
File manager	NC	[illegible]	[illegible]
File viewer	NC	Far ahead of competition	Excellent
Documentation	Good	[illegible]	NC
Technical support	Very good	NC	NC
Value	Very good	[illegible]	[illegible]
Reviewer's score	7.5*	Lukewarm	NC

**Ratings are based on weighted scale of 1 to 10 where 10 is excellent. Only the Inkworld rating is included in score chart above. NC: No comment. These are excerpts from the reviews. Refer to actual articles for details*

Lotus Magellan

Points (maximum)	Category
23 (30)	Published reviews
14 (20)	Analysts' ratings
12 (15)	Users' ratings
14 (20)	Cost evaluation
12 (15)	Vendor financials

(Overall maximum score: 100)

RATINGS

What the experts say

Using a 1-to-10 scale, users and analysts rated product performance and cost to get the product up and running. Financial experts rated vendor and product sales.

- **Users: Frank Nestor, Summit Consulting, Inc. (*performance:* 6, *cost:* 6); Greg Saddler, WKLS Radio (10,10); Steven Frankel, Adams Harkness & Hill, Inc. (9,10).**
- **Analysts: Dean Hiller, D.A. Hiller & Associates (7,6); Andrew Seybold, Dataquest, Inc. (8,8); David Chernicoff, National Software Testing Labs (7,4).**
- **Financial analysts: Steven Frankel, Adams Harkness & Hill (10); David Reedermeyer, Shearson Lehman Brothers (7); Alfred Tobia, Mabon Nugent & Co. (7).**
- **Lotus earned $67 million net income on $556 million revenue last year. The vendor does not release figures on number of copies of Magellan sold.**
- **"Lotus is a cash-rich company. While this year's results are below what investors expected, it's still a very good year. The installed base is faithful; there haven't been mass defections," said Adams Harkness & Hill's Steven Frankel.**

Lotus responds

Comments from Will Reynolds, general manager at Magellan:

With 2.0, we wanted to offer the most used utilities within our simple interface.

The directory is straightforward once users realize the left and right arrow keys are all they need to navigate through the hierarchy.

We felt it was more important to maintain consistency with our simplifying mechanism (list of files on the left, contents on the right) than to construct a tree.

Lotus plans to eventually introduce a "Bonus Viewer Disk," free to registered users. It will include seven new file viewers and mouse support.

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Users seek breathing room in upgrade avalanche

One way to find order in the upgrade process is to obtain a negotiated support agreement

BY PATRICIA KEEFE
CW STAFF

NEW YORK — As the desktop application market rapidly segues into the "upgrade decade," users are starting to look for an easier way to manage and control the growing deluge of new releases and enhancements.

"Virtually every major upgrade we've seen lately has been marked by Keystone Kop screwups — which buyers don't think are funny anymore," said Jeffrey Tarter, editor of the "Softletter" newsletter, in a recent issue. For example, sometimes the new release of software lacks compatibility with the file structure of the previous release — no minor issue for users. When this happens, what recourse do users have?

Cutting back on upgrades is not considered a serious option, even though microcomputer managers such as Alex Kask, who also serves as treasurer for the Microcomputer Managers Association, Inc. (MMA), have "serious questions whether even a tenth of my software upgrades are worthwhile."

Many end users said they feel compelled to at least purchase each successive upgrade for each package whether they want to or not, mostly out of fear of being penalized should they choose to upgrade with a later release.

The "penalty" can come in the form of higher costs, a more difficult upgrade or dropped support for the older version, said Stephen Ferranti, a vice president of marketing at The Taylor Group, a Bradford, N.H.-based firm specializing in accounting software.

Rarely is it feasible to switch to another application standard. However, Gartner Group, Inc. analyst Leslie Fiering, a former microcomputer manager and MMA member, maintained that users are in the driver's seat more often than they realize.

Still, the best that resigned users hope for is an orderly migration to the new releases. One approach that is currently beginning to emerge is a negotiated support agreement, a tactic the MMA recommended three years ago in a white paper on software upgrade issues.

A negotiated support agreement is not a site license or volume purchase agreement. What it does do, according to the MMA, is provide the structure necessary for policies that can simplify the upgrade process, jettison copy protection and facilitate the transfer of information among vendors and users on bugs and bug fixes.

Any support agreement worth its weight in lawyers should also cover user/vendor communications, pricing, software distribution and documentation, legal rights of both parties, ownership and technical development issues.

SOMETIMES THE new release of software lacks compatibility with the file structure of the previous release — no minor issue for users.

The MMA divides a negotiated support agreement into five areas: upgrades, bugs and bug fixes, copy protection, copying of documentation and "other."

Users should demand the right to continue to purchase older releases of software and receive extended support for those versions. They should maintain the right not to return system disks. Annual maintenance fees should cover the price of all upgrades released by the vendor within the year.

The MMA also recommends that users try to establish a corporate upgrade path that will allow companies to skip several intermediate upgrades, for example, going from Release 1 to Release 4.

Recognizing that many upgrades are really bug fixes, the MMA suggested that users negotiate access to an electronic bulletin board that provides information on bugs and fixes. As backup, it is recommended that users request notification by mail of the same information as well as regular information about fixes, patches and "workarounds."

Users are urged to request noncopy-protected software and the ability to brand software with the user's name and company logo, which in turn would give firms a tool to discourage illegal copying of software.

One problem associated with mass upgrades is that often there are not enough copies of the documentation to go around. The support agreement can guarantee the right to duplicate or electronically distribute documentation.

Other benefits that the MMA recommended users negotiate with their vendors include the following: specialized technical newsletters for corporate support staff, technical hot lines staffed by vendor experts, long-term strategic information on products, network licenses, technical training and application development support.

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StorageTek.

Claris reworks Hypercard strategy, gives users a choice

BY JAMES DALY
CW STAFF

SANTA CLARA, Calif. — Claris Corp. sketched in more details of its Hypercard 2.0 product strategy recently, announcing that it will abandon the older one-size-fits-all configuration and allow users to choose from three different designs.

The announcement came two months after Apple Computer, Inc. transferred responsibility for the package to Claris and only weeks after the first shipments of the Hypercard upgrade.

The basic Hypercard 2.0 configuration will come free with each Macintosh and is geared toward users who run stacks — the small individualized programs that run within Hypercard — but do not create or customize them. The package allows users to browse through stacks and enter data. It includes a 35-page manual and three sample stacks. Users can also change the access level to operate within the program's highest user levels.

Claris will also offer the Hypercard 2.0 Upgrade Kit for current users who want to create and modify scripts. The five-disk upgrade kit includes more than 12 stacks that provide Hypercard Help, ready-made buttons and fields, stack templates and fonts. The upgrade kit will cost $49.

The Hypercard 2.0 Development Kit is for advanced users interested in advanced scripting and extensive documentation. The $199 package will include five manuals totaling more than 1,400 pages as well as the five disks offered in the upgrade kit. The development kit will ship in January.

The company also announced that ex-Apple software designer Bill Duval has joined Claris as director of Hypercard development. Duvall also previously served as a research scientist at Xerox Corp.'s Palo Alto Research Center in California.

Grid to supply Texas Commerce

BY JIM NASH
CW STAFF

HOUSTON — Texas Commerce Bank executives, designing their own document-imaging system to process 500,000 stored documents, have chosen Grid Systems Corp. to provide an Intel Corp. I486-based file server for the project.

Eroy Wilkins, vice president and division manager for office technology at the bank, said he will put Grid's debut file server to work on his 80-user local-area network. Wilkins and his staff will add prototyping duties to the ordinary LAN tasks as soon as the server is brought on-line.

Grid's server, the 486EI-25/SVR, was announced at Comdex/Fall '90 and will cost $11,999. It is scheduled to be available this month. It has nine expansion bays, offering up to 4G bytes of disk storage, 8K bytes of cache memory and 256K bytes of secondary cache. The Fremont, Calif., firm is a subsidiary of Tandy Corp.

"This is another step toward Grid becoming a full-service [personal computer] vendor," Gartner Group/Infocorp analyst Peter Teige said. For LAN managers who have a large Grid installed base, this move offers the possibility of a desirable single-vendor environment.

Wilkins said he chose the Grid server despite the fact that it is the first such device from a traditionally portable-focused hardware company. "Getting the file server was an important first step in the prototyping project," he explained. "There is a high degree of interest in our company to see if this would work based on our past good relationship with Grid."

Wilkins said that from what he has seen so far, Grid's system is "much faster than the 386 file servers out there."

The bank has used several of Grid's hardware products to augment its Novell, Inc. Netware LAN and Compaq Computer Corp. Systempro 80386 and 486 file servers, he said.

Nexgen to join multiplatform show

BY MAURA J. HARRINGTON
CW STAFF

SAN JOSE, Calif. — Another in a string of high-end multiplatform personal computers is expected to be introduced in the second quarter of 1991 when Nexgen Microsystems, Inc. releases an as-yet-unnamed product.

In a twist, however, Nexgen will not base its system — which will run DOS, OS/2 and The Santa Cruz Operation's Unix — on commodity microprocessors. Instead, Nexgen promises Intel Corp. I486 compatibility from its own reduced instruction set computing-based microprocessor called the Fast86.

"We are working on a system targeted for high-end server and desktop applications," said president and co-founder of Nexgen, Thampy Thomas, adding, "a high-end system that is already compatible with industry standards."

The Fast86 will sit on Nexgen's bus, called Nexbus, which has a bandwidth of 267M byte/sec. and the ability to support as much as 512M bytes of system memory on the motherboard, according to Thomas.

From a hardware standpoint, Thomas said, the processor will be compatible with the Extended Industry Standard Architecture bus and IBM's Micro Channel Architecture bus, both 32-bit architectures.

While many analysts are still unfamiliar with Nexgen's future system, Nexgen's investors include Chips and Technologies, Inc., based here; Compaq Computer Corp., based in Houston; Ascii Corp., Mitsui Corp. and Yamaha Corp., all in Japan; Ing C. Olivetti & Co., based in Italy; and Kleiner, Perkins, Caufield and Byers, a venture capital firm in Palo Alto, Calif.

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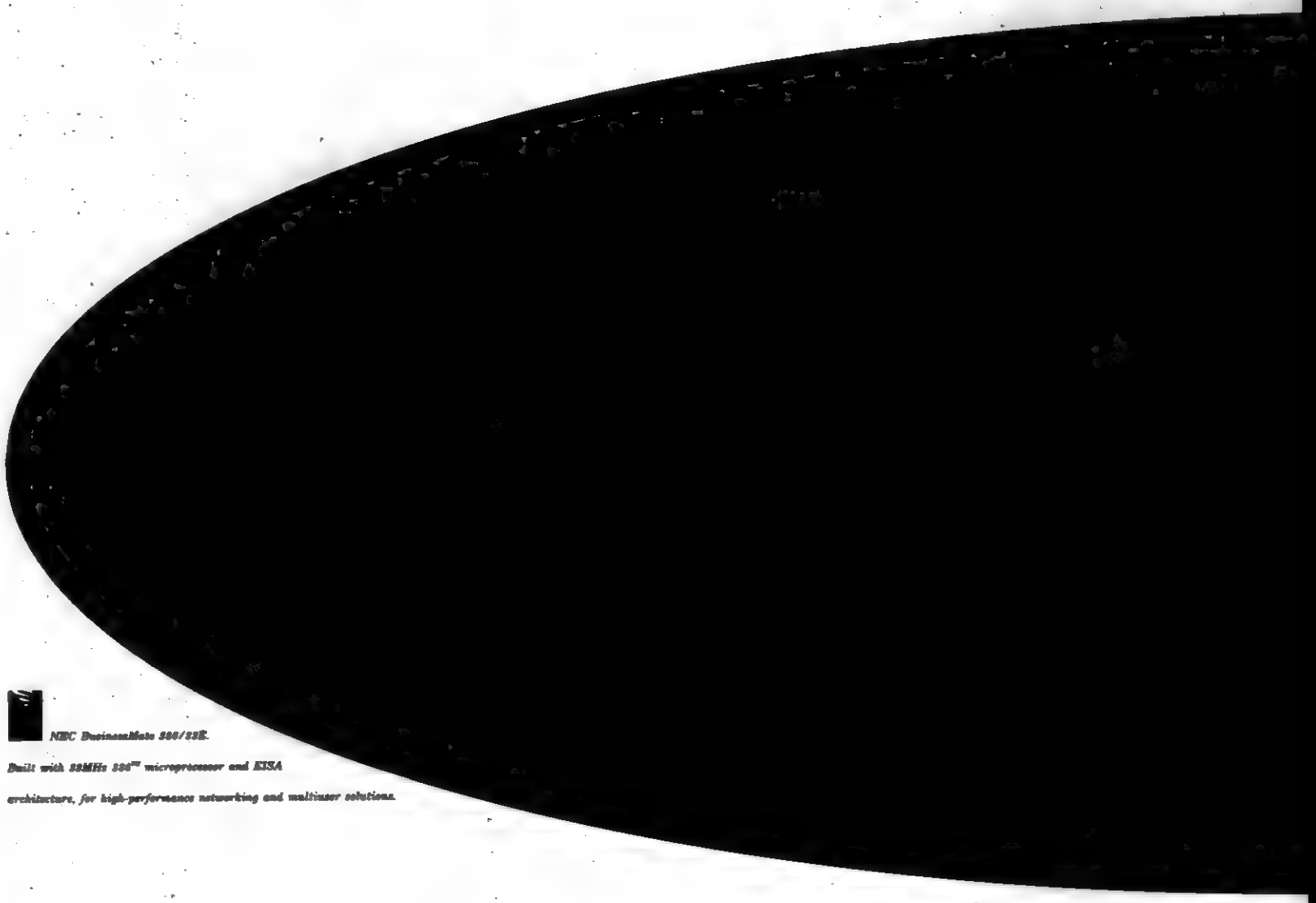

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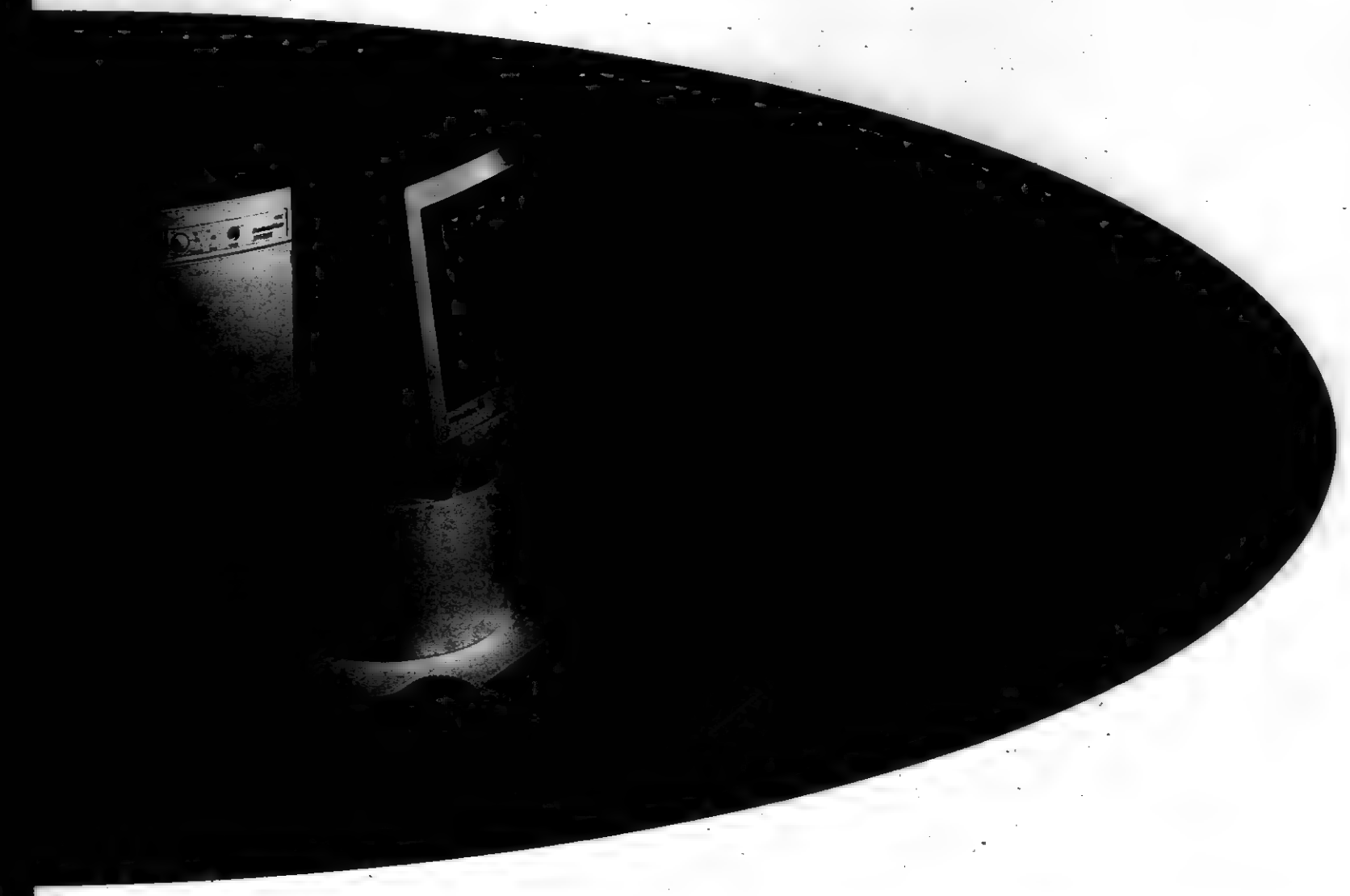

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NEC

Caere unveils trainable OCR product

BY JIM NASH
CW STAFF

Adopting the stripes of competitors, Caere Corp. plans to introduce training, or matching, abilities to its line of optical character recognition (OCR) software products. But at least some users of Caere's OCR products want the company to spend more time on the basics.

Caere and other high-end OCR companies, such as Calera Recognition Systems, Inc., have made their mark with software that recognizes the structure of individual letters in numerous languages, allowing them to be identified even if they appear stylized in italics, for example. Other manufacturers have chosen a less expensive technique that has the software matching letters to a single template.

Ray Goldie, general counsel to Compulaw Ltd. and Legal Solutions, Inc., said he is anxious to receive a copy of Caere's Omnipage Professional. He now runs Omnipage 386 Version 2.0 and said the program leaves only "one or two minor editing tasks per page."

The training feature would help eliminate a few repetitive mistakes that Version 2.0 makes in reading certain broken characters, Goldie said from his office in Rancho Mirage, Calif.

Skeptical users

Other users are more skeptical. Architect Don Wheat, at Myers-NBD, Inc. in Dublin, Ohio, said he picked up Omnipage 386 Version 2.1 with a computer-aided design system and was disappointed to see what he estimated to be an 80% accuracy rate on its first few trial runs. He said he intends to give that version another audition before moving up to any new Omnipage software.

Kristy Holch, an analyst at BIS CAP International, Inc. in Norwell, Mass., said it is significant that Caere has combined character analysis and matching against a stored template. When a mathematical symbol or an incomplete letter created by a damaged but often-used typewriter is encountered, Holch said, users can save the image to a separate file for future reference by Omnipage Professional.

The Los Gatos, Calif.-based company said it will begin delivering Omnipage Professional this month for $995.

The software will be available for Microsoft Corp. DOS Version 3.1 and Windows Version 3.0 this month and Apple Computer, Inc. Macintosh systems in the first quarter of 1991, according to a company spokesman.

MICRO NOTES

Shaw, Lotus sign agreement

Shaw Data Services, Inc., a supplier of portfolio management systems, has signed a joint marketing pact with **Lotus Development Corp.** The two will cross-sell Shaw's mainframe-based on-line service with Lotus' One Source personal-computer-based business and financial databases.

Commodore Business Machines, Inc. has announced a $25 rebate good through Jan. 31 to purchasers of its Amigavision icon-based multimedia authoring system.

Easel Corp. and **Wang Laboratories, Inc.** are collaborating on the development of a communications module that will enable the Easel graphical application development system to talk with Wang's midrange VS systems. The resulting product is slated to ship in the first quarter of 1991 and will be sold in conjunction with the Easel/DOS Development System.

Novell, Inc. has announced a version of the Netware Requester for OS/2, which will allow users of **IBM's** OS/2 Version 1.3 to access Netware services. It will be available on Netwire, Novell's on-line information service, two to four weeks after OS/2 version 1.3 ships.

Scanner

FROM PAGE 51

memory that scans documents and then processes them into ASCII code as a background job.

OCR, which is also called matrix matching, is the software function that compares the scanned font to stored examples and outputs the appropriate ASCII code.

A more sophisticated approach, intelligent character recognition (ICR), extracts certain features from a scanned character or symbol and looks for a mix of elements that distinguishes it from other characters. This approach, called feature extraction or pattern recognition, is more flexible since it is font-independent.

However, a persisting problem with both OCR and ICR is high user expectations. "The toughest battle in the industry is that you can't get to 100% accuracy," Crandall said. The issue is more subtle, he insisted, and calls for an analysis of the applications and a judgment about "where there's a break point between accuracy and speed."

Crandall charged that comparisons of scanner speeds are often based on scanning of laser-printed documents.

Gregory Van Buren, a consultant at Arthur D. Little, Inc. agreed.

"The input function seems to be a real bottleneck in document image management systems," he said. Especially problematic and expensive, Van Buren said, is the process of capturing existing paper or microfilm archives into an imaging system.

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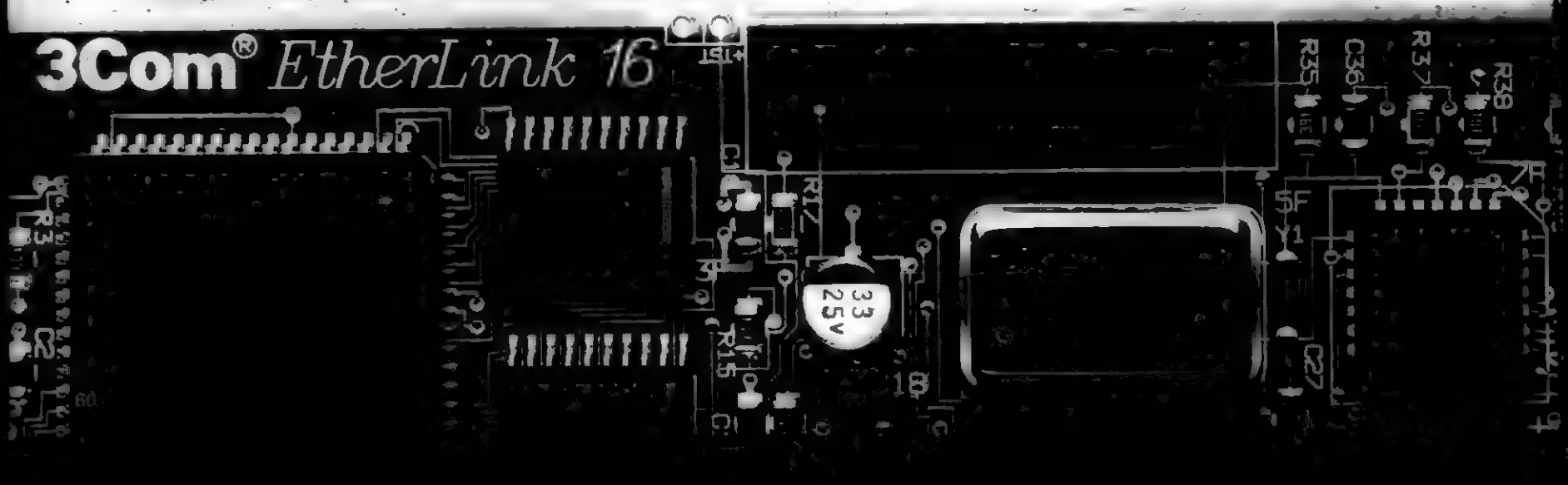

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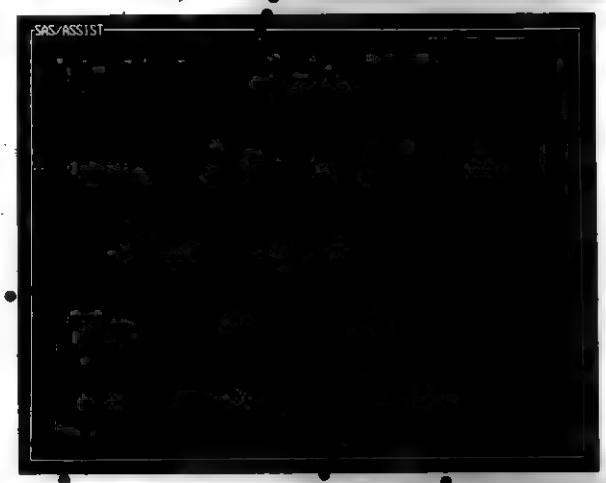
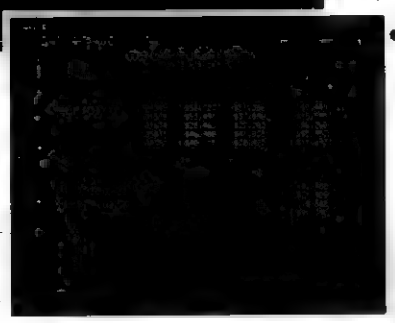
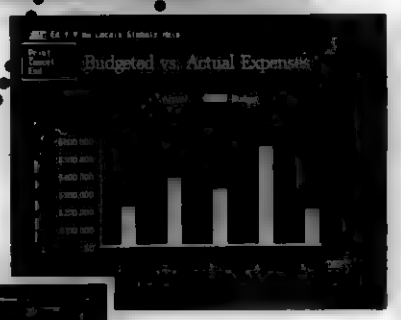




It's never been easier to access, manage, analyze, or present data. You can even build your own executive information systems.



The menus, powered by keywords, make it even easier to run the SAS System's most widely used applications. Without having to know a word of syntax, users can access a data base... read in data... perform analyses ranging from simple statistics to specialized applications such as forecasting, project management, and quality improvement... and generate a variety of reports and graphs.

If you're approaching the SAS System from an applications development viewpoint, you'll find all the capabilities you'd ever expect in a powerful and productive programming environment. And then some.

There's a command-driven interface especially for systems analysts, applications developers, MIS personnel, and the Information Center staff.

From this interactive windowing environment, you can use the SAS System's English-like commands to build applications in a fraction of the time. And you can customize any application any way you choose by adding user-friendly menus and fill-in-the-blank screens.

We've made sure you'll never get boxed in.

While the industry struggles to define a common operating environment, the SAS System eliminates the need for one.

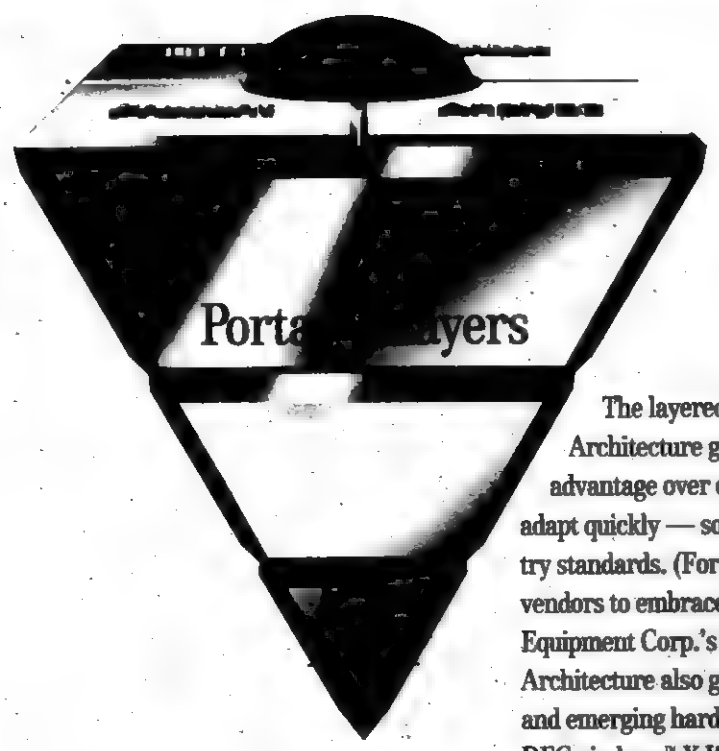
Our exclusive MultiVendor Architecture™ gives you the power to decide where a particular application belongs — in the data center, at the departmental level, on the desktop, or a combination of all three. The SAS System, and the work you do, is portable across the entire range of computing environments.

A dynamic programming interface lets you customize your development environment. As your program takes shape, so do the results.

Monitor programs as they execute. Pull-down menus make editing, file management, and other essential programming tasks easy.

Directly access and manipulate the SAS System's English-like command language.

SiliconGraphics
The 3D Computer Company
IBM
Business Partner
sun
microsystems
Catalyst
Advanta
Program



The layered approach of our MultiVendor Architecture gives the SAS System a unique advantage over other software. The SAS System can adapt quickly — sometimes instantly — to new industry standards. (For instance, we were among the first vendors to embrace both IBM Corp.'s SAA and Digital Equipment Corp.'s NAS in one system.) MultiVendor Architecture also gives you the freedom to exploit new and emerging hardware technologies — such as DECwindows,™ X Windows, Presentation Manager,™ and other native windowing interfaces — without worrying about your existing inventory of applications.

With the SAS System, you'll always have state-of-the-art software for state-of-the-art equipment. You'll never again be boxed in to a particular hardware platform.

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SAS software lets you stay on the leading edge of such new technologies as native windowing.

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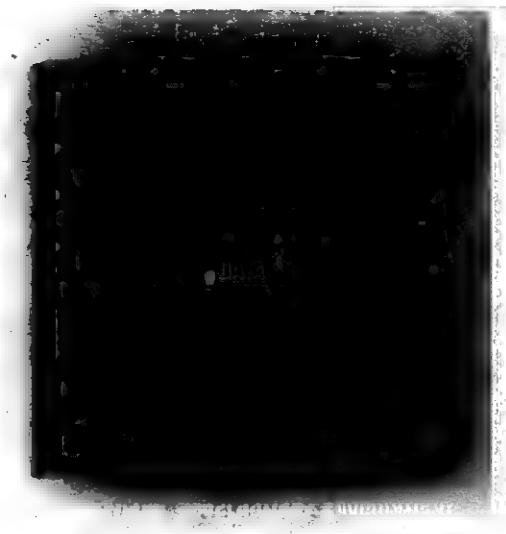
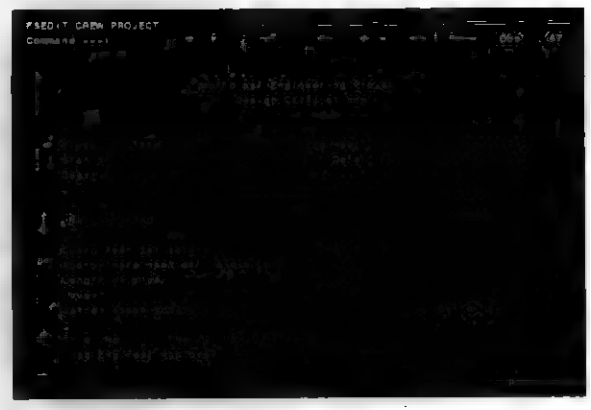


There are four data-driven tasks common to all your computing applications. We've designed the SAS System with these tasks in mind.

The first task is to identify and *access* the data you need. With the SAS System, you'll find direct and transparent interfaces between your applications and the most popular data base management systems such as DB2, SQL/DS,™ ORACLE,® Rdb/VMS,™ Lotus 1-2-3,® dBASE,® and SYSTEM 2000.® You can get your hands on data without having to know data base terminology, and without sacrificing data base security. What's more, the SAS System's support of SQL™ gives programmers a standard language for data query. The SAS System can also be used to access raw data files in any format — even files with messy or missing data.

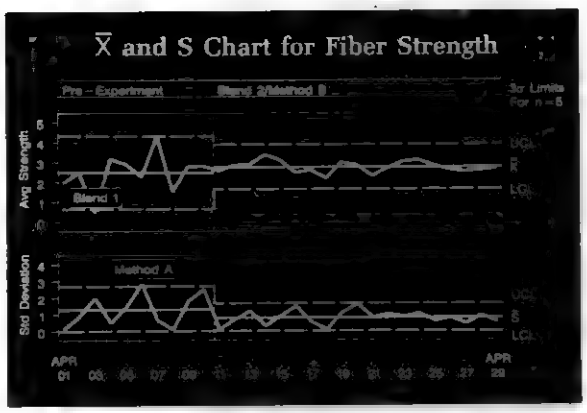
But getting data from place to place is just part of the challenge. Data *management* is also key, and the SAS System responds with efficient ways to enter new data...edit and query data files...and manipulate your data. You can even merge data from totally different kinds of files. And your inexperienced users can enter their data through customized fill-in-the-blank screens that look exactly like your business forms.



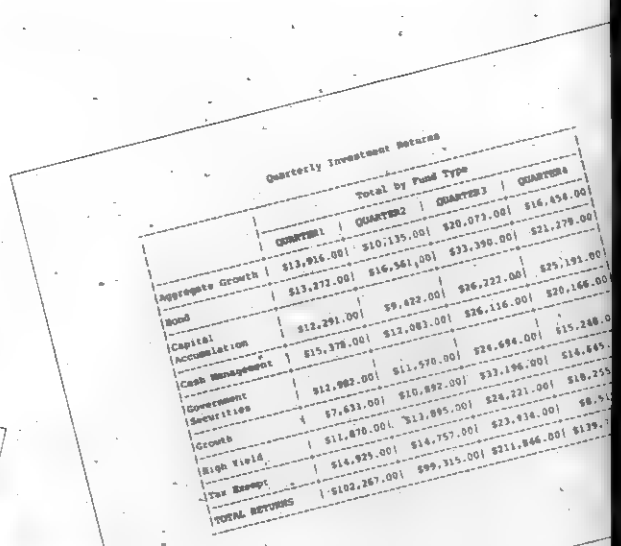
Users can take a common-sense approach to data entry using fill-in-the-blank screens.

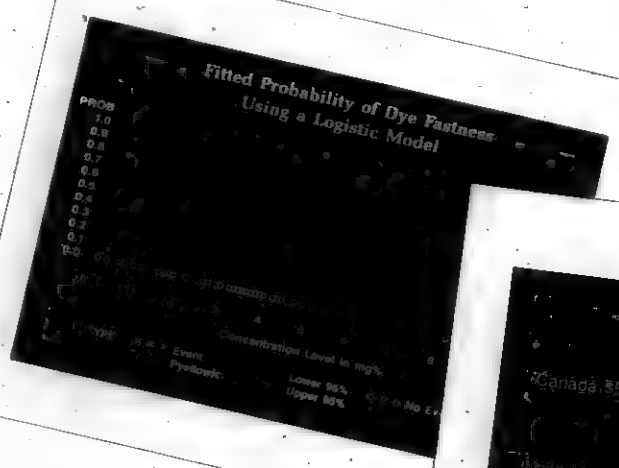
Turning data into meaningful information has always been a hallmark of the SAS System. And now you'll find more ways to *analyze* data than ever before... everything from descriptive statistics to advanced multivariate techniques. You'll also find specialized tools for virtually any kind of business need: planning, forecasting, electronic spreadsheets, operations research, decision support, and more. Plus the most sophisticated methods for statistical quality improvement and experimental design.

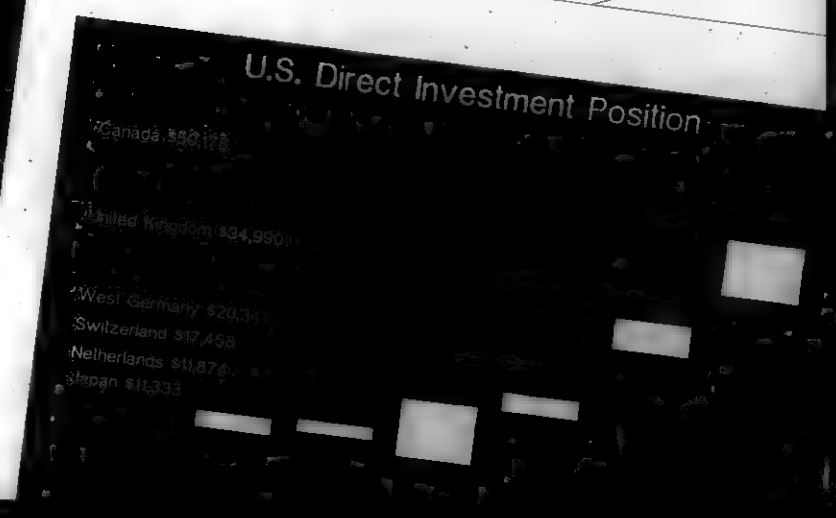
And once you have analyzed your data, the SAS System makes it easy to get the attention you, and your data, deserve. Our data *presentation* capabilities are unsurpassed — from simple printed lists to spectacular full-color graphics. Here's just a sample:



You can rely on one software to handle all your analytical needs.







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NEW PRODUCTS

Software applications packages

Visix Software, Inc. has announced an upgrade to its graphical user environment for Unix-based workstations and X Window System-based terminals.

Looking Glass Version 2 provides users with a graphical tree view feature that facilitates file system navigation and a command line window that enables users to edit and submit commands to a shell directly from the Looking Glass application.

The product is scheduled to begin shipping this month. Pricing ranges from $595 to $1,295, depending on type of platform.

Visix Software
11440 Commerce Park Drive
Reston, Va. 22091
(703) 758-8230

Chipsoft, Inc. has announced the latest version of Turbotax, its tax preparation and planning software package, which was designed for IBM Personal Computer XTs, ATs and compatibles, as well as Apple Computer, Inc. Macintosh machines.

The product includes a logical next-step feature that uses pop-up windows to guide users through each tax preparation step, the vendor said.

The product also features reworded menus that facilitate command selection and additional tax forms, including Schedule 3 and Forms 4137, 4868, 8822, 8453 and W-4.

A PC version costs $75, and 44 state programs are available for $40 each. Pricing for the Macintosh version is $89, and 11 state versions are currently available for $49 each.

Chipsoft
6256 Greenwich Drive
San Diego, Calif. 92122
(619) 453-4446

Data storage

Brier Technology has announced a backward-compatible version of Flextra, its high-capacity standard floppy disk drive.

The 25M-byte device fits into a standard 3½-in. half-height slot and can be adapted to fit a 5¼-in. slot.

According to the vendor, the disk drive features an integrated drive electronics interface or small computer systems interface, both of which can be integrated with IBM Personal Computer XTs, ATs or compatibles as external or internal add-on devices.

The drive is priced at $300 in OEM quantities.

Brier Technology
25 Meca Drive
Norcross, Ga. 30093
(404) 564-5550

Chinon America, Inc. has announced Model CDC-431, a compact disc/read-only memory drive that features built-in remote CD audio control and digital display units.

The drive features an average access speed of 350 msec or a mean time between failure rate of 25,000 hours, the vendor said. It can operate with an IBM Personal Computer or an Apple Computer, Inc. Macintosh.

The drive is priced at $895 and is slated to be available next month.

Chinon America
660 Maple Ave.
Torrance, Calif. 90503
(213) 533-0274

Board-level devices

American International Devices, Inc. has announced a 24M-byte board that incorporates 4M-bit dynamic random-access memory chips.

The AI/1217 memory module is available for Unisys Corp.'s A-12, A-15 and A-17 machines. Its 24M-byte memory can be expanded to 48M, 72M and 96M bytes for use on Unisys A Series machines that can accommodate large-capacity boards, the vendor said.

The board costs $10,000.

American International Devices
12540 Beatrice St.
Los Angeles, Calif. 90066
(213) 305-8161

Industrial Computer Source, Inc. has announced an Intel Corp. 80286-based CPU card that is compatible with IBM Personal Computer ATs.

Model SB286CS is a single plug-in board equipped with a CPU, random-access memory, read-only memory, I/O ports and an optional math coprocessor, the vendor said.

The product also features a built-in IBM Video Graphics Array video adapter that supports analog monitors as well as a floppy controller that supports dual-speed 3½- and 5¼-in. disk drives.

Prices range from $895 to $1,495 for 512K-, 1M-, 2M- or 4M-byte versions.

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Lasergo, Inc. has begun shipping a memory board with its Goscript software as a bundled package priced at $295.

The board was designed for the Hewlett-Packard Co. Laserjet Series IIP and III and comes equipped with 1M byte of memory, which can be expanded to 4M bytes.

Goscript enables users to print Postscript language files on all of HP's laser printers.

According to the vendor, the product features 13 scalable fonts, requires 640K bytes of random-access memory and runs on an IBM Personal Computer AT, XT or compatible as well as on IBM Personal System/2 computers.

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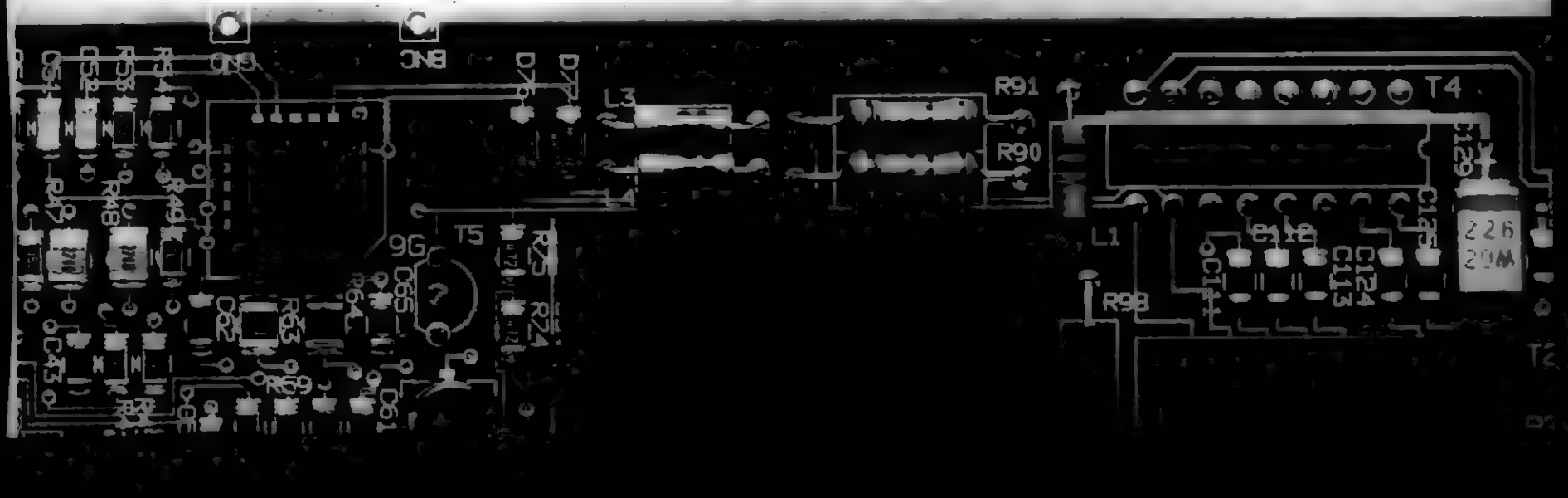

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ON SITE

BY ELISABETH HORWITT
CW STAFF

NEW YORK — As part of a major data center consolidation move now under way [CW, Nov. 12], a group at Manufacturers Hanover Trust Co. is exploring how to maximize computer resources by allowing users to access both Digital Equipment Corp. VAXs and IBM Application System/400s from the same workstation.

The financial firm's global banking communications group "grew up as a DEC data center" but now has two AS/400s and plans to install seven or eight next year, according to Patrick Molloy, assistant vice president of the recently formed group.

The AS/400s were bought because the group wanted access to certain applications that run on those systems, Molloy said. "Our approach is to buy the box for the application; there is no move to standardize on one type of system."

In addition to the AS/400s in New York, Molloy's group has 10 assorted DEC VAXs and Microvax IIs installed in New York, Australia, Tokyo and London, he said.

Several hundred users of personal computers and terminals, residing both on Ethernet and IBM Token-Ring local-area networks, often need to access "one type of system in the morning, a second in the afternoon and a third at night," Molloy added.

This can require the user to access three different terminals "so that you have to do huge changes when the user moves" to a different office location, Molloy said.

Molloy's group was looking for an integration tool that would "allow users to get at all systems from a single device and a standard interface, so when they move, all you have to do is find a free terminal server port," he said.

The group has installed on its networks Mitek Systems Corp.'s Openconnect Systems Server, which can act as both a LAN-to-host gateway and as a translator between Transmission Control Protocol/Internet Protocol (TCP/IP) environments and the IBM Advanced Peer-to-Peer Networking/Advanced Program-to-Program Communications (APPN/APPC) protocols used by AS/400s, Molloy said.

Servers now installed on LANs at Manufacturers Hanover can support the following connections:

- PC users and DEC hosts can communicate via TCP/IP.
- PC users can access AS/400 hosts via TCP/IP with the Mitek gateway translating the TCP/IP transmissions into APPN/APPC.
- DEC VT100 terminals can access AS/400s by emulating 5250 terminals, while 5250 terminal users can access DEC hosts via the TCP/IP Telnet protocol.

Insufficient references

The Manufacturers Hanover group evaluated a Forest Computer, Inc. gateway "that supported Decnet on one side and APPN on the other" but was unable to get sufficient user references, Molloy said.

In addition, the group was inclined to use TCP/IP as a common access protocol for user devices, partly because "a bunch of our areas want [reduced instruction set computing]-based machines and are clamoring for TCP/IP," Molloy said.

With some of its connectivity issues settled, the group now faces the question of how to provide network management across its IBM and DEC environments, Molloy said. Manufacturers Hanover's overall data center organization will be reviewing the possibility of a more centralised network management system — probably based on IBM's Netview — as a future phase of its consolidation effort, according to Senior Vice President Steve Sheinbeit.

On a local level, however, the global banking group is primarily DEC-based, and its AS/400s cannot support Netview, Molloy said. The group is evaluating the possibility of using DEC's Decmcc Director management platform, with a Simple Network Management Protocol module to manage the group's Wellfleet Communications, Inc. and Vitalink Communications Corp. bridges, Molloy added.

FEATURE: NETWORK MANAGEMENT ISSUES

Using graphical interfaces to take a closer look

BY MICHAEL HURWICZ

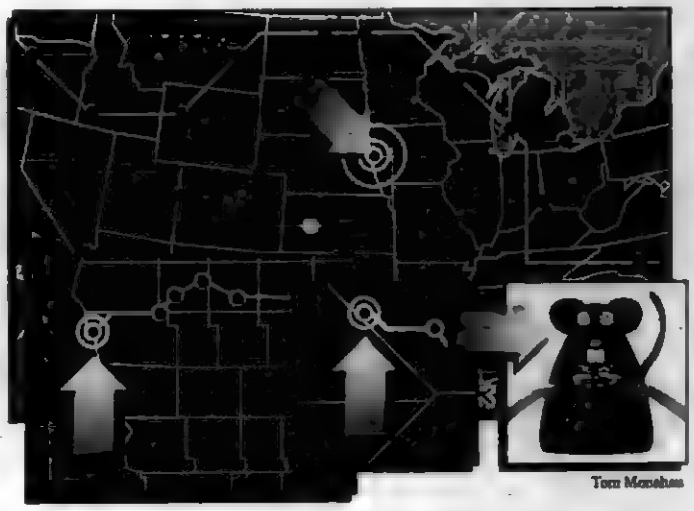
In a network control center, a picture is often worth more than a thousand words. Thousands of cryptic messages, representing the status of the many devices in a complex network, can be overwhelming and confusing when they are cascading across a screen.

In contrast, users say, network management software with a graphical user interface can show the broad outlines of a network problem at a glance, using icons and lines to represent network devices and links.

Such a clear overview of the network can be particularly helpful in the early stages of problem hunting, making it possible for network managers to react more quickly to glitches.

With a graphical interface, "we can look up and see summaries of the network, at whatever level we want to display, and tell immediately whether everything is operating correctly or if something demands attention," says Jim Montequin, senior manager of data communications at Union Pacific Railroad in Omaha.

While most users agree that graphics can play a useful role in network management, some companies nevertheless choose to focus attention on other issues, such as network management automation, which may lessen their need for graphical user interfaces.



Tom Monahan

State of the union

Graphical user interfaces are particularly valuable in monitoring large networks, says Ronald M. Tuccitto, senior manager of business planning at Union Pacific. Tuccitto oversees a network that includes 15,000 data devices on an IBM Systems Network Architecture (SNA) network, 600 microwave sites and 1,000 base radio sites spread across the U.S. IBM's Netview handles network management, with non-SNA devices using Netview/PC to communicate with the mainframe-based Netview system.

On large networks such as Union Pacific's, a character-

Continued on page 64

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Graphical

FROM PAGE 63

based user interface can submerge staff in text, Tuccitto explains.

Such networks, Tuccitto notes, can generate thousands of "one liners," or alerts, each of which appears as a single line of text on a screen. "When you have that many alerts popping up on a console, there comes a point where you get buried in data," he says.

Union Pacific employs a huge projection screen that presents its wide-area network in living color. Graphic images on network management consoles point the staff in the right direction when they start investigating a problem, Tuccitto says.

Graphical user interfaces enable users to drill down for details. Union Pacific staff members can zoom in on a graphics screen to get a specific view of a particular portion of a state or regional network topology map. They also have the option of consulting textual alerts for the full details of any problem.

"We get a fast read on what's going on, rather than having to spend a lot of time analyzing what's going on," Montequin says. "With lines going past on a screen, it's much more complex. And when people are busy, they don't necessarily notice [that information]."

Color graphics can also make it easier to determine the severity and priority of a problem, Tuccitto explains.

For instance, if a T1 line goes down completely, that link may show up in red. Another color may be used to highlight the fact that the connection is present but unable to carry its rated traffic load. A severe but intermittent problem may appear as a line that flashes red. Such color coding helps managers prioritize problems.

Good relations

Graphical user interfaces can also make it easier to correlate multiple related alerts, says Kevin Huff, a Princeton, N.J.-based program manager for General Electric Co,'s international network and formerly head of a GE project concentrating on IBM's Netview/PC.

"We get multiple alerts that may be related to one specific failure," Huff says. "On T1 networks, for instance, if one T1 [line] goes down, you get multiple boxes reporting it."

This requires the network manager to correlate the alerts in order to determine the original source of the failure, because one failure affects many pieces of equipment.

> "THE [graphical user interface] . . . doesn't reduce interaction with the network management system."
>
> DOUGLAS UNDERHILL
> CSX CORP.

However, on a dynamic screen, where text-based alerts are rolling past quickly, it can be hard to do this, Huff says.

On the graphical screen, it is easier to see the pattern of T1 devices reporting the error and thus determine which alerts are grouped together.

The pattern of the failures may also make it easier to determine which device has the primary failure and which ones are failing because of a domino effect. "It's a much better way of doing network monitoring," Huff says.

Despite the attractions of graphical user interfaces, users should not overestimate their value, cautions Douglas Underhill, assistant vice president of technical services at the information systems subsidiary of CSX Corp., a Jacksonville, Fla.-based railway carrier. CSX has a network of approximately 20,000 workstations, terminals and printers at 500 locations scattered throughout the Eastern U.S.

"The [graphical user interface] makes network management information easier to understand," Underhill says, "but it doesn't do what you really want to do — reduce interaction with the network management system."

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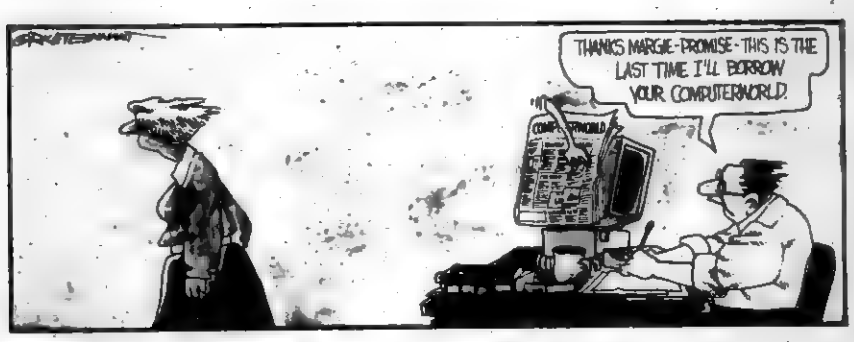

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The danger with graphical user interfaces, Underhill says, is that because interaction is easier, users may become complacent and not search for more automated ways of handling network management. When network managers become too focused on the joys of graphics and mice, "there is a tendency simply to develop a two-finger approach instead of 10-finger approach to having humans supply commands," he says.

"The [graphical user interface] is a manual way users of network management systems can monitor the network," agrees Todd Dagres, director of communications research and consulting at The Yankee Group in Boston. "The next stage is where somebody doesn't have to sit there and look at [the] network and click down to the fault." For that, Dagres says, users need knowledge-based or artificial intelligence tools, which will make it possible for the system to correct faults automatically.

If that trend could be taken to its logical extreme, Dagres notes, a graphical user interface would not be necessary.

Keeping priorities straight

In fact, some network managers put a graphical user interface rather low on their list of concerns, according to Kevin O'Neill, vice president of network integration and consulting at Business Research Group in Newton, Mass.

Tuccitto: *Graphics needed for large networks*

"While users prefer a [graphical user interface] over a character interface if given a choice," O'Neill says, "most are grappling with more fundamental network integration and management issues such as performance tracking, report generation, security, rerouting capability and remote systems management."

O'Neill adds, however, that this may change as users conquer these basic issues and go on to address more advanced functions such as alarm correlation and integrated control.

View repair

Graphical network management software, while it saves time in interpreting and correlating alerts, can also mean extra work. For instance, Tuccitto says, Union Pacific has created customized views of its network, which require constant maintenance as the network changes.

Union Pacific is studying the feasibility of implementing a single database manager for all of its network support information. As part of this project, the company would like to be able to generate new customized views of the network automatically whenever the database changes.

Because of the work required to configure and maintain them, Dagres notes, graphical user interfaces will not necessarily reduce network management staff requirements, either in numbers of people or skill levels. And while graphical user interfaces make a graphic statement when problems occur, it is still necessary, in many cases, for network managers to consult a detailed textual report as well. "The [graphical user interface] is just the cherry on top of the sundae," Dagres says.

Despite difficulties in keeping views up to date and the danger of becoming overly infatuated with graphics, however, the basic fact remains: A picture is frequently the fastest, easiest way for the human mind to absorb and organize information. In resolving network problems, seconds often count.

As networks grow steadily larger and more complex, lessening some of the demands on network support staff is important. These facts combine to paint a rosy picture for network management graphical user interfaces.

Hurwicz is a free-lance writer and consultant based in Eastsound, Wash.

Flash and substance

Network managers rank the use of graphics, such as network topology maps and red light indicators, high on their list of priorities

	Ranking (1=not important, 5=very important)
[illegible]	
Fault detection/diagnosis	4.4
Problem management/reporting tools	4.3
Centralized network management	4.2
Graphics of network status	4.2
[illegible]	
Performance statistics	4.1
Network security functions	3.7
Configuration management	3.6
Network design/capacity planning	3.6
Change management	3.5
Training	3.4
Network assets management	2.8
Call accounting/network cost allocation	2.6

Source: CSI, a division of 3Com Corp. CW Chart: Paul Mock

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Hubs become network's be-all, end-all

BY JOANIE M. WEXLER
CW STAFF

As the smart hub cabling craze continues, vendors are scrambling to compete by throwing everything but the kitchen sink into their products. Not only are users able to integrate various local-area networks under a common management system in the hubs — also called intelligent wiring centers — they can now get bridging, routing, network monitoring, terminal server and other functions in the devices as well.

Smart hubs allow users to connect nodes on a LAN or interconnect LANs running over different media in a physical star configuration. A cabling connection from the intelligent wiring center to each device allows foolproof detection of faulty nodes.

The topologies and access methods specified by the different LAN standards (such as token-ring's ring topology and token-passing access method) are handled logically within the hub.

Vendors such as Cabletron Systems, Inc., Racal-Interlan, Inc. and Synoptics Communications, Inc. have been showering the industry with enhancements to their products during the past several months.

Cabletron said it will announce today that it is shipping a $3,995 network monitoring module of Novell, Inc.'s Lantern product for Cabletron's Multi Media Access Center (MMAC). The move follows last month's rollout of a new version of the MMAC that integrates up to five Ethernet, Token-Ring and Fiber Distributed Data Interface (FDDI) modules and one management/repeater module.

Through thick and thin

The new MMAC version interconnects LANs running over unshielded and shielded twisted-pair, thin and thick coaxial cable and fiber. The MMAC also includes modules for Ethernet-to-Ethernet and Ethernet-to-FDDI bridging. A routing module is under development with Cisco Systems, Inc., according to Cabletron.

Racal-Interlan unveiled its Internext 5000 Communications System at Interop '90 in October. The hub integrates modules supporting 10Base-T concentrators, terminal servers and Simple Network Management Protocol (SNMP).

10Base-T is the recently approved — and flourishing — standard for running 10M bit/sec. Ethernet LANs over unshielded twisted pair. Other existing Ethernet standard media are coaxial and fiber-optic cabling.

Racal's terminal server module — which obviates the need to buy separate terminal servers — brings multiple non-intelligent terminals into the LAN environment, allowing them to connect to multiple hosts. Racal offers a module supporting both Local Area Transport — Digital Equipment Corp.'s widely installed proprietary network protocol for VAX terminals — and Transmission Control Protocol/Internet Protocol, another rampant communications protocol for Ethernets.

"Integrating the terminal server function into the hub will dramatically reduce the space required for our equipment," commented Marty Talarovich, senior research engineer at Kraft General Foods, Inc. in Glenview, Ill. Kraft started beta-testing Internext last week.

"The major cost savings will come in the maintenance area. Instead of having people screwing around with all different kinds of equipment, you'll have a single point of repair," he said.

However, Chris Oliver, Cabletron's director of engineering, estimated that users can save up to 30% on equipment costs alone by buying smart hub modules rather than separate devices, such as bridges, routers and terminal servers.

Synoptics announced in October a technology exchange with Xyplex, Inc. to incorporate Xyplex's terminal server into its Lattisnet System 3000 hub. A month earlier, the company integrated a multiprotocol local Ethernet router — developed in conjunction with Cisco — into the system.

The proliferating advances in wiring center technology will play an important role at Dallas-based Frito-Lay, Inc., which plans to expand its network from seven to 47 sites next year, according to Jack Sprague, a consulting engineer at the firm.

Sprague said recent wiring center advances will "keep us from having to train people at every location about all the different wiring nuances."

Other recent hub developments include Ungermann-Bass, Inc.'s recent announcement of intentions to integrate Advanced Computer Communications' multiprotocol bridge/router technology into the Ungermann-Bass Access/One hub. In addition, Lannet Data Communications released its Multinet II Super Hub in October. The product accommodates up to 18 Token-Ring, four Ethernet and one FDDI LAN and integrates bridge, routing and gateway functions.

David Systems, Inc. has announced that SNMP support will be available in its Expressnet hub in January, and Proteon, Inc. has added 4M and 16M bit/sec. fiber LAN support to its Series 70 hub Intelligent Wiring Center.

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Technologies for linking LANs to T1 networks emerge in products

BY CARL MALAMUD
SPECIAL TO CW

Fast packet, frame relay and cell relay: You've heard of them in relation to linking local-area networks across a T1 circuit (see story page 77). Now that the technologies are starting to show up in the form of real and announced products, you may be wondering which capabilities to choose for your LAN interconnection scheme.

The decision depends on the amount, type and speed of traffic crossing the T1 channel, as well as the distance being covered. In some cases, you won't need any of these new options.

Such would be the case when a network manager wants to integrate several different work groups into a single, logical network. Most bridges and routers now support 1.5M bit/sec. T1 links, which should provide sufficient bandwidth for two 10M bit/sec. LANs regularly exchanging data within a metropolitan area. Some LAN interconnectivity devices even support multiple T1 links for those users who want to interconnect multiple LANs or LANs with particularly high-volume traffic. The routing function inside of the device decides which line to use for any given packet.

Cisco Systems, Inc.'s AGS+ router supports more than 20 T1 lines. The lines can go to 20 different locations, or multiple lines can go to one location, providing increased bandwidth and some protection against line failures.

Dedicated T1 lines are not always economically feasible, however, and traffic does not always travel in a steady stream, especially between LANs. With T1 lines costing several dollars per mile per month in a national network, it makes economic sense to allocate the T1 bandwidth among several different applications, including LAN interconnection, voice and video.

One way to do this is through a T1 multiplexer, which serves as an entry point to the T1 network for both LAN interconnectivity devices and other customer premises equipment such as private branch exchanges. The multiplexer allocates subchannels within the T1 link to LANs, voice, video and other applications through circuit-switching technology.

While circuit switching is an inexpensive technique, it also requires dedicated bandwidth allocation, which can be inefficient if the traffic on each circuit is not continuous. The technologies that are starting to address more flexible bandwidth allocation are frame relay and its counterpart, cell relay. The CCITT standard-based version of cell-relay technology is called Asynchronous Transfer Mode. Frame relay and cell relay are both fast-packet technologies.

Frame relay is both an interface and a transport service that handles packets of variable length. By contrast, cell relay interfaces and transports packets of fixed length. Frame- and cell-relay interfaces and transport services can be mixed and matched. For example, Stratacom's $12,500 packet assembler/disassembler (PAD) for its IPX T1 multiplexer uses frame relay on the application side of its interface and a proprietary cell-relay technique on the wide-area network side.

When both nodal processors — on the sending and receiving end — support packet-switching technologies, such as frame and cell relay, they can dynamically allocate bandwidth for applications as needed instead of fixing a maximum for each one. For instance, if data and voice share a T1 pipe, the nodal processor can squeeze a little more data into the gaps between words, giving more rapid throughput for the data application.

Rush-hour traffic

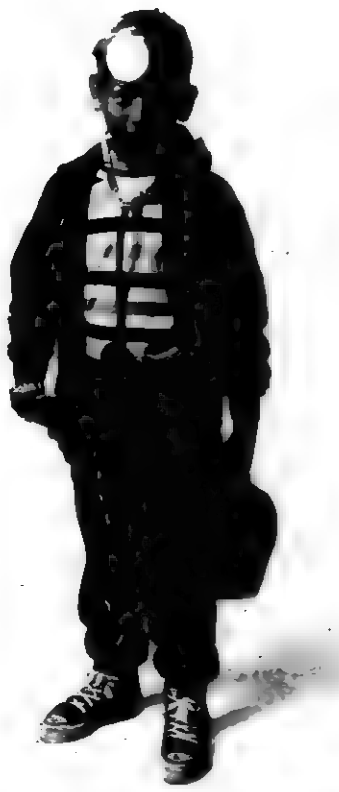
Frame relay parallels X.25 packet switching in that it allows a LAN interconnection device to tell a nodal processor it wishes to set up a virtual circuit in the private network. It is also specifically designed to handle traffic sent in bursts. It is faster than traditional packet-switching in that it eliminates error-detection and correction on each network link, as does cell relay. Error-checking at only the origin and destination nodes is made possible by today's highly reliable communications media, such as fiber-optic cabling.

Frame-relay products are just starting to hit the market. Cisco and Stratacom are shipping products, and Codex Corp., which has a 20% investment in Stratacom and resells the IPX as its 6290 T1 multiplexer, said it will also support frame relay on its 6525 X.25 packet switch and 6507 PAD in first-quarter 1991.

While frame relay has shown up only in equipment for private networks, it can be used as an interconnection to a public data network. In this case, the user needs to purchase only the bridge, router or gateway that supports frame relay and let the carrier provide the nodal processors and transport service. U.S. Sprint Communications Co. has announced frame-relay service for late 1991, and Northern Telecom, Inc. has announced equipment that will allow other carriers to offer public frame-relay-based services in the future.

Senior writer Joanie M. Wexler contributed to this report.

Malamud writes professional reference books about computer networks.



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NEW PRODUCTS

Micro-to-micro

Information Presentation Technologies, Inc. (IPT) has announced the implementation of a version of its Ushare interoperating system connectivity software package onto IBM RISC System/6000 Power Server computers.

Ushare comprises programs that reside on a Unix platform and enable the product to act as an Apple Computer, Inc. Appleshare-compatible server. It enables the RS/6000 to provide Apple Macintosh machines and IBM Personal Computers with a gateway to IBM mainframes, according to the vendor.

Ushare is priced at $1,195 for a file server only and $3,995 for the server equipped with all its modules.

IPT
305 San Vincente Blvd.
Santa Monica, Calif. 90402
(213) 393-6281

Dataviz, Inc. has announced Version 4.5 of Maclinkplus/PC and Maclinkplus/Translators, both of which enable users to translate text files with embedded graphics for word processors.

The software package includes all necessary software and cabling for bidirectional file transfers and conversions between Apple Computer, Inc.'s Macintosh, DOS, Sun Microsystems, Inc. or Next, Inc. Next environments.

Maclinkplus/PC version costs $199; Maclinkplus/Translators sells for $169.

Dataviz
35 Corporate Drive
Trumbull, Conn. 06611
(203) 268-0030

Links

Adtech Micro Systems, Inc. has introduced Perfect Fax Plus, a facsimile card designed for automatic fax, voice or data switching.

The 9.6K bit/sec. CCITT Group III device can share a single telephone line with a telephone, answering machine or modem. An automatic group creation feature enables users to create databases of frequently called numbers can be used with Intel Corp. 80386- or I486-based XTs, ATs or compatibles. A built-in text editor allows fax text to be created and edited.

It is priced at $295.

Adtech Micro Systems
43120 Christy St.
Fremont, Calif. 94538
(415) 659-0756

Intellicom, Inc. has added a line-powered version to its Long Link family of parallel interface extenders.

The Long Link III is available in three models: the LLLP-50, the LLLP-100 and the LLLP-300. According to the vendor, the products enable personal computers to communicate with a printer from distances of 50, 100 and 1,000 feet, respectively.

Prices range from $149 to $179, depending on model.

Intellicom
20415 Nordhoff St.
Chatsworth, Calif. 91311
(818) 407-3900

Gateways, bridges, routers

Hailey Systems, Inc. has introduced a family of source routing bridges designed for token-ring networks.

The Connectlan 300 Token-Ring Bridge series of products includes the Connectlan 300, which can be switched between 16M and 4M bit/sec. token-ring networks. Other members of the series include the Connectlan 302 local bridge, the Connectlan 311 single-link remote bridge, the Connectlan 321 dual-link remote bridge and the Connectlan 331 triple-link remote bridge.

Pricing ranges from $6,995 to $11,500, depending on configuration.

Hailey Systems
2730 Orchard Pkwy.
San Jose, Calif. 95134
(408) 432-2600

Fairchild Data Corp. has announced an Ethernet-to-broadband bridge designed to be a link between local-area networks.

The LBR8323 can extend individual LAN connections by up to three miles by dividing the LAN into independent sections, parts or subnetworks. It also reportedly lets users isolate faults and reduce network traffic, delays or collisions.

The bridge uses 32-bit processing to provide a forwarding speed of 14,000 packet/sec. and a 25,000 packet/sec. filtering speed.

It is priced from $6,995.

Fairchild Data
350 N. Hayden Road
Scottsdale, Ariz. 85257
(602) 949-1155

Simware, Inc. has announced an enhanced version of Simac, its presentation and connectivity software package designed for Apple Computer, Inc. Macintoshes.

Simac 3.1 provides Macintosh users with a Macintosh interface while also performing the 3270 emulation tasks needed to access IBM mainframe applications.

The product costs $395.

Simware
20 Colonnade Road
Ottawa, Ont. K2E 7M6
(613) 727-1779

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MANAGER'S JOURNAL

EXECUTIVE TRACK

Ronald C. Eubank has been named director of information technology in the Global Technology and Operations Division at **Whirlpool Corp.** in Benton Harbor, Mich.

Eubank was formerly manager of information technology planning for the company. In his new position, he reports to Senior Vice President Lawrence J. Kremer.

He joined Whirlpool in 1973 as a systems analyst and progressed through a series of positions in the information technology area. He holds a bachelor's degree in business from Indiana University at Bloomington and a master's degree in business from Indiana University at South Bend. He is a certified information systems auditor.

Richard L. Wambold has been given responsibility for corporate information services functions at **J I Case**, the Racine, Wis.-based agricultural and construction equipment subsidiary of Tenneco, Inc.

Wambold, 38, added corporate IS and corporate planning and development to his duties when recently promoted to executive vice president from senior vice president. He remained general manager of Case's international business group.

Wambold previously held positions in corporate systems at Houston-based Tenneco.

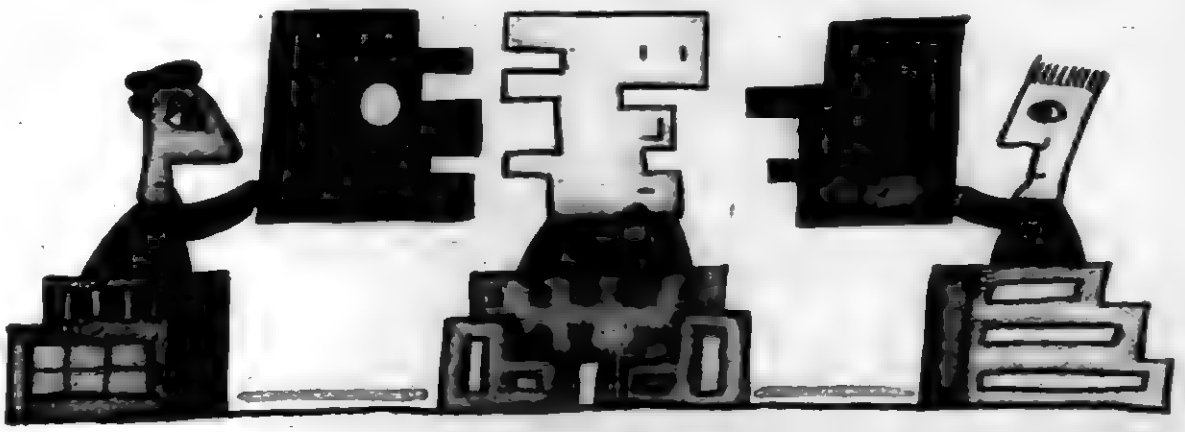
Donald L. Morchower, executive vice president and chief information officer at **Empire Blue Cross and Blue Shield** in New York, has been promoted to executive vice president and chief operating officer.

Morchower is now responsible for customer service and sales as well as IS.

Morchower joined Empire Blue Cross as CIO in 1987 after 25 years at Deloitte Haskins & Sells, which is now Deloitte & Touche. His positions included partner in charge of information technology and partner in charge of the New Jersey Consulting Division.

Soul-searching: four case studies

Choices of integrators, outsourcers or in-house talent contain some common threads



Richard A. Goldberg

BY JOHANNA AMBROSIO
CW STAFF

Some companies will, some will not, and some are thinking about doing it more frequently. But whatever a company's philosophy is toward using systems integrators for important information systems projects, most of those that have reached a decision have gone through a similar process of soul-searching. And there are some common threads in the quest for answers.

The steps that most firms go through can be broken down into two major categories. First is determining what the company's core business is and how critical technology is to that business. Second is figuring out what specific technology and expertise are needed to support that business, what exists in-house and what should be brought in from outside — if anything.

A look at four firms illustrates how they went about deciding whether to use systems integrators or outsourcers and for what. Diesel Technology Corp., a manufacturer in Grand Rapids, Mich., outsourced its entire IS function, while Canada Post Corp., the privately owned Canadian mail delivery service in Ottawa, opted to outsource major portions but not the whole thing.

Taking a different approach was New York-based Shearson Lehman Brothers, Inc., which decided not to use outsiders for much. Somewhere in the middle is Goldman Sachs & Co., also in New York, which has used systems integrators in the past for specific projects and likely will again.

• **Diesel Technology.** The firm's technology decision odyssey began when Derek Kaufman became president in November 1988. The firm had previously been a division of General Motors Corp., with headquarters in Rochester, N.Y., and the manufacturing plant in Grand Rapids. Diesel Technology's entire computing resource was a time-shared mainframe in Rochester.

"Our DP system cost over 3% of revenues, and we couldn't afford it," Kaufman recalls. So as part of his overall strategic revamping of the firm, Kaufman and his management team began to figure out how they wanted Diesel Technology to operate. They began an item-by-item analysis of what the company should be doing and what it should bring in from outside, including everything from components in the manufacturing process to computers.

"We make only certain things here," he says, "and we buy other things, like springs and O-rings, from outside suppliers because it doesn't make sense for us to do them. It lets us add value to what we do because we concentrate on our main business."

Similarly, Kaufman says, "We don't do systems integration very well either." Still, the decision to outsource "did not come easily. Our first inclination was to do everything ourselves. My internal MIS guy started talking about building an empire of people and machines. And you have to consider that you're paying $300 per person a

Continued on page 73

Computerworld honors cream of the crop

The 10 most effective users of information technology in 1990, as ranked by the *Computerworld Premier 100*, were honored last week in New York. Information systems executives accepting awards were: (front row, from left) Carmine Vona, Bankers Trust New York Corp.; Allen Ditchfield, MCI Communications Corp.; Ron Cybyske, Banc One Corp.; Thomas Kiernan, AMR Corp.; Linda George, Gencorp; and Anish Mathai, Bankers Trust.

(Back row, from left) *Computerworld* Publisher Fritz Landmann; *Computerworld* Editor in Chief Bill Laberis; Robert McKinney, Paine Webber, Inc.; International Data Group Chairman Patrick McGovern; Brian Phillips, Norwest Corp.; and keynote speaker Peter Keen.

Other firms in the top 10 were FMC Corp., Union Texas Petroleum Holdings, Inc. and General Dynamics Corp.

John Martin

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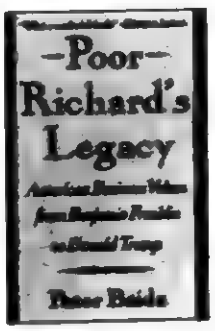
BOOK REVIEW

Looking back on more than 200 years of American business

POOR RICHARD'S LEGACY: AMERICAN BUSINESS VALUES FROM BENJAMIN FRANKLIN TO DONALD TRUMP
By Peter Baida
William Morrow and Co., $22.95

Given the choice between "a 250-year stroll through business history" and a trip to the dentist, many of us might opt for a nice shot of Novocain and call it a draw.

So Peter Baida was certainly tackling a formidable topic when he ventured forth with his book *Poor Richard's Legacy: American Business Values from Benjamin Franklin to Donald Trump.*



Baida reaches back through more than two centuries of American business morality and practices, spiking the story with well-researched biographies of such major players as Benjamin Franklin and IBM's Thomas Watson. Baida also highlights the popular business literature of the past, noting how business was a powerful magnet for the prose of muckraking journalists.

The author is a graduate of Harvard University and has an MBA from the University of Pennsylvania's Wharton Business School. He has written on business for *The Wall Street Journal, The New York Times, The Atlantic, Harvard Business Review* and other publications. Baida plies his expertise throughout *Poor Richard's* 341 pages, displaying a wealth of detail and sprinkling the text with anecdotes.

Still, the book has a tendency to stagger under its own weight, reading more like a well-written college textbook than a would-be business best-seller. Surely Baida's call for a return to the "basic values of savings, hard work and keeping an eye on the future" will startle no one with its novelty.

By far the most interesting bits in the book are the stories about famous — and infamous — business moguls such as John D. Rockefeller, Andrew Carnegie, Cornelius Vanderbilt and Henry Ford.

Rockefeller, we learn, was busy keeping score while other little boys played ball. The founder of the Standard Oil Co. grew up with "the soul of a bookkeeper" and a tendency to lecture himself sternly as an antidote to overconfidence.

Henry Ford gets the sternest treatment in the book as Baida describes how the auto magnate destroyed his son and allowed the management of his automobile company to deteriorate. "Nowhere in the history of American business are the dangers of one-man rule more frighteningly demonstrated than in the decline of the Ford Motor Co. in the last 30 years of Henry Ford's life," Baida notes.

While the author presents a meticulously detailed case on the decline of American business values — contrasting it with the rise of corporate and consumer debt — he gets a trifle whiny at times with chapter subheadings such as "Whatever Happened to Yankee Know-How?" or "Whatever Happened to Thrift?"

Naturally, his tale begins and ends with that legendary tower of thrift and Yankee know-how, Benjamin Franklin, whom Baida sketches in the glowing terms of an unabashed admirer.

The author is a big fan of IBM as well. The chapter on "The Triumph of IBM" is glowing to the point at which it seems to embarrass even Baida, who spreads a thick coating of glossy company history over the narrative. He gets positively giddy about IBM's humble beginnings as "an unlikely conglomeration of companies that made meat slicers, butcher scales, coffee grinders, time clocks and primitive tabulating machines."

"Reading about IBM, even a doubting Thomas may begin to feel a sneaking fondness for it," he writes, admitting to a certain "uneasiness" because "everyone associated with IBM seems to say the same wonderful things and to have the same wonderful attitudes."

Oh, spare us.

Then again, perhaps a business historian cannot help but wax poetic about a company that in less than 80 years "became one of the world's most profitable industrial enterprises."

Baida finds little to admire in 20th-century business culture. He dismisses the "shamelessly cynical" business books of the 1970s, such as Robert Ringer's *Looking Out for Number One,* and bemoans the way the "success literature" of the last few decades veered away from the thrift, discipline and hard work embodied by Benjamin Franklin's philosophies.

The bottom line of *Poor Richard's Legacy* is rather like The Historian's Lament with a business twist: We should be learning from the past with the firm intention of repeating it.

"Perhaps we have lost not merely the capacity to work and to save but also the capacity to listen," Baida writes. Americans, he insists, have lost "not merely the discipline to deny ourselves for the future, but also the discipline to learn from past."

MARYFRAN JOHNSON

Johnson is a *Computerworld* senior editor, systems and software.

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Repetitive Motion Institute opens, first in U.S.

BY J. A. SAVAGE
CW STAFF

SAN JOSE, Calif. — Calling repetitive motion illness the "occupational epidemic of the '90s," Santa Clara County last month established what is believed to be the first Repetitive Motion Institute in the U.S.

"The number of those suffering from repetitive motion injury is increasing. Most of that increase is coming from information processing workers," said Linda Morse, medical director at the Institute.

Repetitive motion illness usually manifests itself in carpal tunnel syndrome, tendinitis and ulnar nerve compression. Morse said the clinic is not just administering to workers who suffer from repetitive motion illness, but is working "with companies and unions to prevent injuries."

When a firm or its insurance company calls the institute, it will respond by first taking a survey of workers, according to Tami Carver, project director at the institute. The survey will find out if workers are experiencing neck or wrist pain as well as find out if hobbies or nonwork-related activities may be contributing to such problems.

The institute will then offer education. Institute representatives will also share their supply of various ergonomic products, or what they like to call "quick fixes." These include wrist rests for use with a keyboard, phone headsets to relieve the hands from the strain of holding a receiver and footstools and pillows to improve posture.

"The real answer is fully adjustable chairs and work surfaces," Morse said. "But most companies can't afford it all at once."

Other than physical changes, altering work habits can also help. "We try to get management to rotate work tasks such as clerical and word processing," Morse said. "There is also the issue of work breaks."

She said she thinks a few minutes of break and exercise every half hour to hour is important. "The body just wasn't created to type 20,000 strokes an hour."

During the last five years, the Santa Clara Valley Medical Center, which hosts the institute, has treated repetitive motion illness as part of its occupational health clinic. Santa Clara County decided to fund an institute "to create a focus that this is a major problem," Morse said.

Not what the doctor ordered

The following is a list of common ergonomic problems for office workers, according to the Santa Clara Valley Medical Center Repetitive Motion Institute:

- Standing in odd place.
- Sitting erect without a back support.
- Desk too high or too low for task.
- Seat too high or too low.
- Trunk curved forward when sitting.
- Head held forward.
- Frequent bending or twisting of body.
- Wrists bent when working on keyboard.
- Pressure on fingertips.
- "Winging" elbows.
- Improper lighting.

Soul-searching

CONTINUED FROM PAGE 69

month for benefits coverage."

Kaufman said he was convinced by Electronic Data Systems Corp. (EDS) that outsourcing was the way to go. In a seven-month period, using EDS as its sole source, Diesel Technology got off the time-shared mainframe, brought in computers for all aspects of the company and "cut our DP costs in half," Kaufman says.

"They convinced me they could get small, get fast and get cheap," he says.

• **Shearson Lehman Brothers.** On the other end of the spectrum, David Sherr, vice president of distributed infrastructure support at Shearson, expresses complete confidence in Shearson's staff to handle IS operations and systems integration themselves. "Under very special circumstances, if the business need is acute, we would consider [outside integration firms]," he says. "But we have a lot of experience in-house, and we generally handle any integration projects."

Sherr's 1-year-old group, made up of 13 people, "has demonstrated we have the skill and the ability to do it." So there is little need to go outside for help, he says. And the one time he did try an ambitious project with outsiders, "it did not go well," he says.

Another factor at Shearson is the company's homegrown layer of software to connect applications to databases, communications and computer gear. It allows Shearson flexibility in changing vendors for different computing components.

That layer of software "is our competitive advantage. So we're very careful about who gets to see it," Sherr says.

• **Goldman Sachs.** Shearson rival Goldman Sachs approaches the subject with a very different perspective. "We've used integrators to help with specific projects, and I'd do it again," says James K. Burns, vice president of IS management. When the company converted from Burroughs Corp. to IBM mainframes one year ago, he used Andersen Consulting and Computer Associates International, Inc.

Then again, Burns has a more personal history with systems integrators than do many of his IS colleagues. He used to work for Andersen Consulting, which gives him more exposure to the subject. "I know how to work with these guys, how to prequalify them so they know our company and what we need," he says.

Burns thinks of using systems integrators as a way to temporarily expand his resource pool. Otherwise, he says, "you either have too many people on your payroll or you don't satisfy demand because you have too few.

"My job is to do what's best for the company," he says. "Sometimes that means using internal people, sometimes external." In most cases the external people have a supplemental role to the internal IS staffers, he says.

> "I KNOW HOW TO work with these guys . . . so they know our company and what we need."
>
> JAMES K. BURNS
> GOLDMAN SACHS

• **Canada Post.** The Canadian postal service took a more radical tack to using outsiders. "We've had to redefine how we deliver systems to the corporation," says James T. Baines, corporate manager of purchasing. "We currently have a mish-mash of systems that never did, and never will, suit our business needs."

So the goal is to help people implement systems that will better fit the business requirements. But "MIS guys and end users may not know there are better ways to do something. We had to improve that process," Baines says.

Now, end users bring their requests to a member of the company's information technology group, who figures out what specific business skills a project requires. The group then decides which systems integration vendor is best suited for that project and brings in that company.

The systems integrator spends time with the end users and information technology people, and together, all three groups derive a functional specification for the system. The outside firm then defines specific deliverables of the project and Canada Post sends out bids, evaluates them and awards the project.

Canada Post used this technique when it built a state-of-the-art mail processing center, working with such integrators as EDS and Andersen Consulting. And the firm will use more of the technique in the future.

"We're looking for companies that will be the integrators of record for large areas of our company; to own a piece of our business," Baines says. "We want to outsource our infrastructure. We'll provide the architecture, set the standards and tell them what we want, and they'll do it. We're passing the responsibility to them but also the risk."

The decisions faced by all four firms clearly go much deeper than the technology needs of any one project. To an increasing extent, going outside or staying in-house will say a lot about a company's business strategy and corporate culture. The elusive "what's best for the company," even between firms in the same industry, can — and will — vary widely among the fellow soul-searchers in IS.

MANAGEMENT BRIEFS

OASI issues call for papers

The Office Automation Society International (OASI) has issued a call for papers for its eighth annual conference to be held June 17-19 in Alexandria, Va.

The theme of the conference is converging technologies. Papers are encouraged in the areas of management in automated environments, applications, new or emerging technologies and problem identification and solutions.

Those interested must submit an abstract of the paper by Dec. 30. Completed papers are due Feb. 15, 1991. To make a submission or to request more information, contact: OASI, P.O. Box 374, McLean, Va. 22101, (703) 821-6650.

The OASI is a nonprofit association dedicated to providing education and professional certification in office automation systems and management.

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CALENDAR

Users of Sun Microsystems, Inc. workstations will gather at the Sun Open Systems Expo in Boston, Feb. 25-27.

The event will feature a series of tutorials under three different technical topics: the Scalable Processor Architecture, networking and windowing/graphics. There will also be exhibits by Sun and related peripheral and software vendors.

For more information, contact Sun Open Systems Expo in Austin, Texas at (512) 331-7761.

JAN. 6 - 12

Macworld International Summit. San Francisco, Jan. 7-9 — Contact: Susan Carroll, Macworld Communications, Inc., San Francisco, Calif. (415) 978-3302.

International Security Conference and Exposition West '91. Anaheim, Calif., Jan. 9-11 — Contact: Cahners Exposition Group, Des Plaines, Ill. (708) 299-9311.

JAN. 13 - 19

ICA Winter Seminar. Houston, Jan. 13-16 — Contact: International Communications Association, Dallas, Texas (214) 233-3000.

Pacific Telecommunications Conference: Accessing the Global Network. Honolulu, Jan. 13-16 — Contact: PTC, Honolulu, Hawaii (808) 941-3789.

National Retail Federation Retail Industry Convention and Exposition. New York, Jan. 13-16 — Contact: NRF Convention Registrar, New York, N.Y. (212) 563-5113.

Technical Conference on the X Window System. Boston, Jan. 14-16 — Contact: MIT Laboratory for Computer Science, Cambridge, Mass. (617) 253-8861.

JAN. 20 - 26

Data Visions '91. San Francisco, Jan. 20-23 — Contact: Earle Speranza, Worldtech Systems, Orinda, Calif. (415) 254-0900.

The Downsizing Conference. San Francisco, Jan. 21-22 — Contact: Digital Consulting, Andover, Mass. (508) 470-3880.

Unix Technical Conference. Dallas, Jan. 21-25 — Contact: Usenix Conference Office, El Toro, Calif. (714) 588-8649.

Infotext '91. Las Vegas, Jan. 22-23 — Contact: Bob Dale, Infotext Publishing, Capistrano Beach, Calif. (714) 493-2434.

Uniforum 1991. Dallas, Jan. 22-24 — Contact: Bob Linke, PEMCO, Des Plaines, Ill. (708) 299-3131.

JAN. 27 - FEB. 2

Communication Networks '91 Conference and Exposition. Washington, D.C., Jan. 28-31 — Contact: Michael Sullivan, World Expo Corp., Framingham, Mass. (508) 820-8268.

Network Computing Forum and Exposition. Washington, D.C., Jan. 29-31 — Contact: Christine Krajewski, World Expo Corp., Framingham, Mass. (508) 820-8126.

FEB. 3 - 9

Macapp Conference. Phoenix, Feb. 4-8 — Contact: Macapp Developers Association, Everett, Wash. (206) 252-6946.

Macintosh/N.Y. '91. New York, Feb. 5-7 — Contact: Peter Kimpton, Exposition Management, Waltham, Mass. (617) 290-0412.

Florida Educational Technology Conference. Tampa, Fla., Feb. 5-8 — Contact: Barbara Ann Cox, Office of Educational Technology, Tallahassee, Fla. (904) 488-0980.

NOMDA West Regional Convention. San Diego, Feb. 7-9 — Contact: Katy Dunn, NOMDA, Kansas City, Mo. (816) 941-3100.

FEB. 10 - 16

The Development Center Institute Conference. Orlando, Fla., Feb. 10-13 — Contact: Development Center Institute, Indianapolis, Ind. (317) 846-2753.

Video Expo. San Francisco, Feb. 11-15 — Contact: Debbie Rotolo, Knowledge Industry Publications, White Plains, N.Y. (914) 328-9157.

FEB. 17 - 23

SAS Users Group International Conference. New Orleans, Feb. 17-20 — Contact: SUGI Registration, SAS Institute, Cary, N.C. (919) 677-8000.

Northwest Computer Show. Minneapolis, Feb. 19-20 — Contact: Judy Koch, Plymouth, Minn. (612) 420-5376.

Trax User Group Conference. Long Beach, Calif., Feb. 19-22 — Contact: Anne Silferman or F. Thomas Cox, TraxSoftworks, Culver City, Calif. (213) 649-5800.

Multimedia '91. Orlando, Fla., Feb. 20-22 — Contact: Society for Applied Learning Technology, Warrenton, Va. (703) 347-0055.

FEB. 24 - MARCH 2

IEEE Conference on Artificial Intelligence Applications. Miami Beach, Fla., Feb. 24-28 — Contact: IEEE Computer Society, Washington, D.C. (202) 371-1013.

Share 76. San Francisco, Feb. 24-March 1 — Contact: Share Headquarters, Chicago, Ill. (312) 644-6610.

Communications Connections (Connexions '91). San Diego, Feb. 25-27 — Contact: Dimensions, Redwood City, Calif. (415) 591-0183.

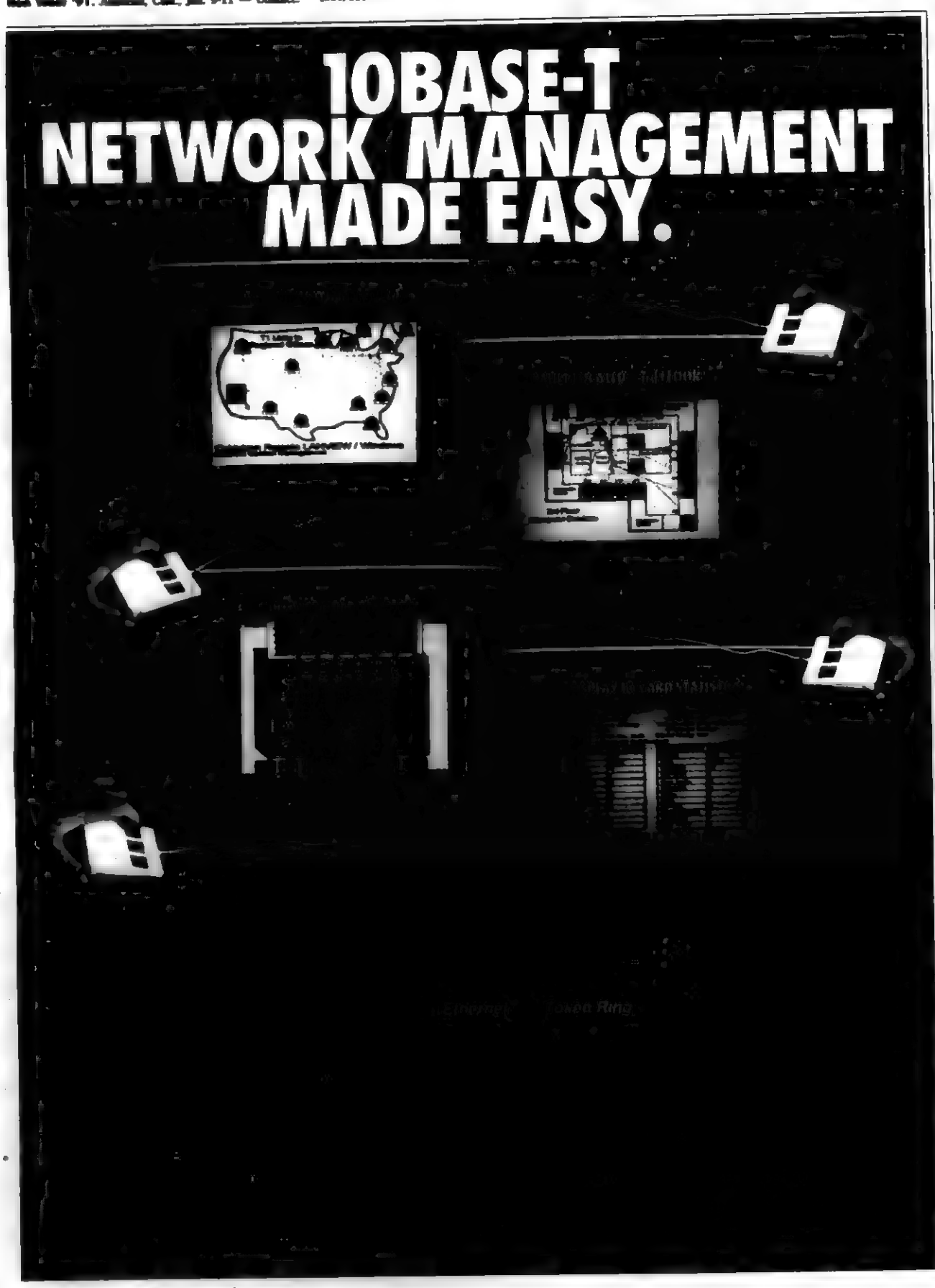
Compcon Spring '91. San Francisco, Feb. 25-March 1 — Contact: Roger Anderson, Livermore, Calif. (415) 422-8572.

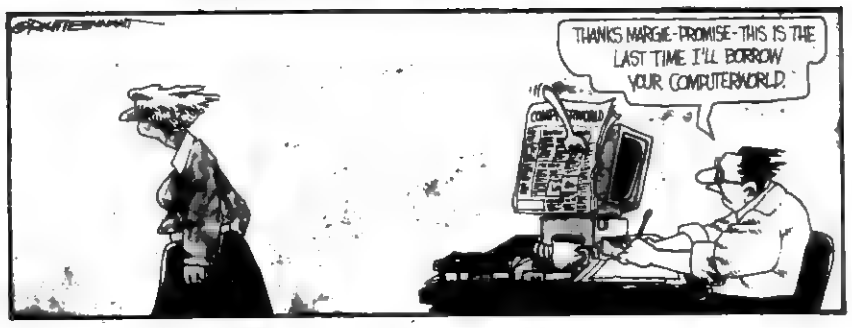
EDI and the Law '91. Washington, D.C., Feb. 26-27 — Contact: Data Interchange Standards Association, Alexandria, Va. (703) 548-7005.

European Wireless Systems Conference. Munich, Germany, Feb. 26-27 — Contact: Rita A. Tannenbaum, Probe Research, Cedar Knolls, N.J. (201) 285-1500.

Financial Market Data Conference. New York, Feb. 26-27 — Contact: Waters Information Services, Binghamton, N.Y. (607) 772-8686.

Strategic Planning Systems Conference. Tempe, Ariz., Feb. 27- March 1 — Contact: Pete Ashey, Conference Coordinator, Nardoni Associates, Lebanon, N.J. (201) 730-9444.





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T1 SERVICES AND EQUIPMENT

Private/public mix stirs up new issues

BY MICHAEL HURWICZ

Before fractional and switched T1, it was easy to decide who controlled what part of the network: The carrier provided the raw bandwidth, and the user provided everything else, including multiplexing, networking, rerouting, monitoring and first-line troubleshooting.

With these newer T1 services and the appearance of carrier-offered frame relay, the division of labor is not so simple. With fractional T1, the carrier provides the multiplexing capability, while with switched T1 and frame relay, networking and rerouting are built into the service.

But that doesn't mean users can — or want to — throw the control of their networks to the carriers. For one thing, most customers will still need the full bandwidth of their point-to-point private T1 pipes, installing the newer public T1 services only where they are needed.

More importantly, frame relay, switched and fractional T1 may be economically attractive, but many customers are not yet comfortable with the degree of control they will have over these publicly-offered lines.

While carriers are good providers of transmission capacity, most people are not convinced that they can also manage an entire network, says Jim Kolbe, director of telecommunications at United Stationers Supply Co., the nation's largest wholesaler of office products.

"A T1 pipe can be used in so many different ways: for voice, compressed voice, various types of data protocols, frame relay, fast packet switching," he says. Each application requires different types of equipment and different management strategies.

Carriers, he continues, have been more experienced with point-to-point dedicated circuits that provide a fixed amount of bandwidth — the same kinds of circuits required for voice.

What people are looking for is a satisfactory method of testing and monitoring carrier performance and availability before entrusting their data networks to these services.

"I can't remember a time when so many new technologies and products became available to customers. The products are coming out faster than network management is keeping up with them," says Bernie Schneider, director of product management at U.S. Sprint Communications Co.

On-demand services such as switched T1 and frame relay bring new management problems that carriers have not yet addressed in a satisfactory way, Schneider says. For instance, users cannot afford to wait until the end of the month to find out how much switched T1 is costing them, he says. They need up-to-date information on use.

Another issue is determining how a particular data call is being routed so that if a user calls the company's network control center with a problem, both the network control staff and the carrier know which circuits and pieces of equipment to test. "Users and carriers are driving toward these services," Schneider says, "but there are no easy solutions in sight."

Currently, the carriers do provide performance reporting, and there are products emerging now that help users monitor and interpret those reports. One is Clearview Surveillance System from Clear Communications Corp. in Lincolnshire, Ill.

John S. Dykes

In addition, AT&T has announced that the Accumaster Services Workstation will support its T1 service starting in the first quarter of 1991.

This service will provide notification when user-defined thresholds for error statistics have been exceeded. The workstation will provide round-the-clock access to network management information and will also provide a rerouting capability.

But carriers offering fractional, switched or frame relay services still have some work to do before users are satisfied. At companies such as Progressive Property and Casualty Insurance Co. in Cleveland, the network is considered a "lifeline," says Dick Bradner, vice president of telecommunications. The network spans 232 locations and operates at a rate of 110 million transactions per month. The Systems Network Architecture (SNA) network includes 21 T1s and three fractional T1s used exclusively for data, Bradner says.

While he is happy with the flexibility, speed and cost-effectiveness of fractional T1, Progressive's dedicated point-to-point T1s still form the core of the network, and Bradner can manage that core with intelligent multiplexers and a Communications Management System from Racal-Milgo.

Fractional T1 services have been available from smaller carriers such as Williams Telecommunications and Cable and Wireless Communications, Inc. since early 1989, with major carriers such as AT&T, MCI Communications Corp. and Sprint joining the bandwagon in mid-1989.

Like other users, Bradner was attracted to fractional T1 for the cost savings — people can pay for 64K bit/sec. increments of bandwidth rather than leasing a full 1.5M bit/sec. line. Part of the cost savings, however, is reaped by moving networking intelligence from the customer premises to the public network.

For instance, users can reduce local-access charges by letting the interexchange carrier handle a "fan-out" service, which brings each digital circuit

Continued on page 78

Harwicz is a free-lance writer and consultant at MTI Group in Eastsound, Wash.

INSIDE

One Lump or Three?
A guide to the cost-effectiveness of various T1 services. Page 78.

Buyers' Scorecard
Users rate Stratacom's IPX No. 1 in five of six top categories. Page 82.

Product Guide
A comprehensive listing of bit error rate testing tools. Page 89.

When — and if — to make a move

BY BRIJ BHUSHAN

Are you ready to move to a T1 network, or is fractional T1 or T3 more your speed? By determining break-even points, the charts at right can help you determine which to choose.

The top chart lists the cost of T1 services for various paired cities. The bottom chart can be used to perform a break-even analysis between the various T1 options.

There are two steps in the process:

- First, determine the mileage between the two locations for which communications are needed (the horizontal axis). Read across to the intercept with the T1 vs. AT&T's Dataphone Digital Service (DDS), fractional or T3 curves.

Round the number from the vertical axis to the next higher integer. This number represents the number of circuits at which the cost of provisioning is the same as the cost of going to the next higher-speed circuit.

- Second, determine the number of circuits that are needed to satisfy the needs of your business. If that number exceeds the break-even number arrived at in the process above, a higher-speed line is likely justifiable, especially in light of the excess circuits available in the higher-speed circuit.

If the number of needed circuits is less than the break-even number, then on the basis of these economics alone, the cost of other services is less expensive. (Note that other factors may still swing the balance in favor of T1 and T3 services.)

For example, the break-even point between T1 and DDS service is anywhere from three to five DDS circuits. For a circuit mileage of 800 miles, four (3.357) DDS circuits equals the cost of one T1 circuit. If you needed a fifth DDS circuit, it would pay to order a T1 circuit.

The break-even point between T1 and T3 ranges from seven to 13 circuits, and the break-even point between T1 and 64K bit/sec. fractional T1 is anywhere from eight to 19 circuits. •

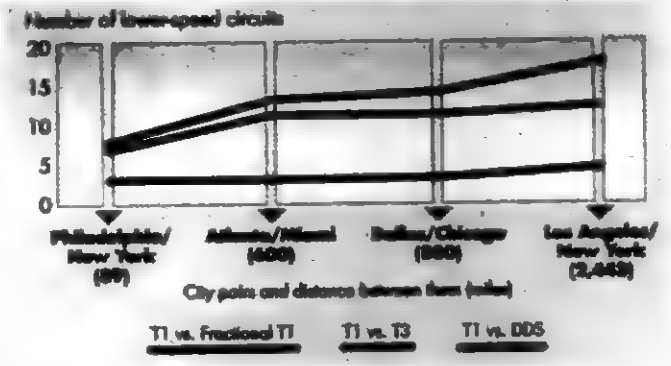
Bhushan is president of Reston Consulting Group, Inc., a consulting firm in Herndon, Va., that provides consulting services in wide- and local-area networks.

Comparative cost of various point-to-point AT&T interexchange services

City pair	DDS cost	Fractional T1 (1 DS0)	T1 cost	T3 cost
Philadelphia/New York (92 miles)	$889	$822	$2,793	$19,918
Atlanta/Miami (600 miles)	$2,014	$494	$6,685	$75,600
Dallas/Chicago (800 miles)	$2,282	$559	$8,185	$96,200
Los Angeles/New York (2,443 miles)	$4,482	$1,101	$20,500	$265,429

- Costs are for interexchange portions only (between AT&T's points of presence) and do not include any service functions or local-access service tariffs
- All tariffs are based on monthly charges, and no volume discounts are taken into account
- The tariffs in both charts are in accordance with AT&T's Federal Communications Commission Tariff No. 9 with an effective date of Oct. 12, 1990

Various AT&T interexchange tariff comparisons



- This chart is intended for guidance only and should not be used for comparing costs with actual network configurations
- Calculations include only the cost of interexchange circuits between different cities

Source: Reston Consulting Group

CW Chart: Doreen St. John

Continued from page 77

as close as possible to its network termination. If customers provide the fan-out, they have to pay for access charges from the T1 multiplexer to each termination point.

In addition, fractional T1 requires less intelligence of customer premises equipment. Because the carrier does the multiplexing, users supply only access multiplexers, which are less expensive and sophisticated than switching multiplexers or nodal processors. The access multiplexer provides access to a channel group and doesn't need to switch channel groups to different network locations.

Like fractional T1, switched T1 services also hand a degree of control to the carrier. With this service, users can get either full or fractional T1 bandwidth, but they get it on demand and pay for it only when they use it. Because the carrier handles the switching, customers do not need to have switching multiplexers on the premises.

AT&T announced switched T1 in November, with availability slated for the second quarter of 1991. MCI says it will have switched T1 and T3 in the third quarter of 1991, and Sprint offers no switched T1 services.

Higher bandwidth circuits will also be available from some carriers. Nynex Corp., for one, is preparing a tariff for switched T3, a 45M bit/sec. digital offering from which 28 T1 circuits can be derived.

Basic testing on switched T1 service is fairly easy: As with voice calls, users can simply attempt a connection and see how long it takes. Managing T1 bandwidth on demand for optimal price/performance is more difficult, however.

Current network management schemes offered by carriers for automatically bringing up and bringing down T1 bandwidth are based on time of day. Sprint's

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Caregivers sought

Some users say it would make life a lot simpler and their networks more flexible if they could trust the carriers with network management.

"Today, when we run into a problem, we have to determine where the problem lies," says Jim Kolbe, director of telecommunications at United Stationers Supply Co. "If it's a line problem, we call the carrier. If it's a [private branch exchange] problem, we call the PBX vendor. If it's a multiplexer problem, we call the multiplexer vendor."

United Stationers is in the process of talking with vendors and carriers in hopes of turning a portion of the network over to a third party within a year or two.

Dick Bradner, vice president of telecommunications at Progressive Property and Casualty Insurance Co. in Cleveland, would also like to turn to carriers for installation and maintenance of sophisticated T1 networking equipment. Not only would it give him another alternative in configuring Progressive's network, but Bradner says he also feels the carriers could offer such services at competitive prices.

MICHAEL HURWICZ

Schneider says. This may be acceptable for voice traffic, which tends to be rather predictable, but data traffic, especially that associated with personal computers and local-area networks, is often bursty.

T1 bandwidth used for data may sit idle much of the time if it is brought up and down by time of day alone.

What is really needed, according to Schneider, is a protocol that would allow customer premises equipment and the public network to exchange information about network usage and performance. That protocol does not yet exist, he says.

Midlantic Banks, which is based in Edison, N.J., is planning to use switched T1 services in the future, but only for disaster recovery reasons.

Frank Ferrara, vice president of communications services at the bank, says that so far, he has had no reason to opt for the lower bandwidth on a constant-traffic basis.

When Ferrara does sign up with a carrier to perform switching services, it will be for backup reasons only. "Most carriers can't fight their way out of a paper bag" when it comes to sophisticated data networking, he says.

It is with frame-relay services that managers will begin to require very detailed and complex types of information, especially when public carriers begin offering them.

Public frame-relay services will combine various data streams in the same way that a T1 multiplexer or nodal processor does, eliminating the need for a T1 multiplexer or nodal processor on the customer's premises.

But neither MCI, Sprint nor AT&T will offer these public frame-relay services until certain standards — especially those handling congestion and data stream prioritizing — are established, and that probably won't be until sometime in 1991.

AT&T currently supports frame relay, but only for its Customer Network Offering II, which is a private networking service.

A coalition of frame-relay vendors — Northern Telecom, Inc., Digital Equipment Corp., Stratacom, Inc. and Cisco Systems, Inc. — has detailed new specifications that address some network management concerns.

The specifications address Layer 1 (physical) connections, service enhancements, such as broadcasts, and a local management interface that provides a number of features, including congestion control, a physical "heartbeat" indicating that the hardware is still functioning and "logical link status messages," which provide information on the availability of the permanent virtual circuits provided by the frame-relay service.

However, there is no provision yet for collecting statistics on what happens to individual packets, how many packets are transferred during a given period of time or how long it takes a packet to traverse the network.

United Stationers is planning to install private frame-relay equipment. If the public carrier price is right, however, Kolbe says he may hand over all his frame-relay traffic.

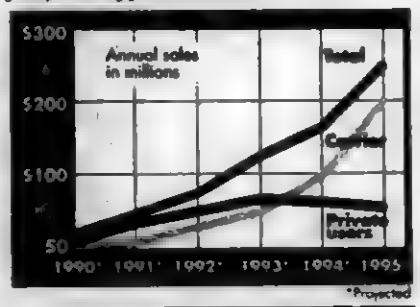
That depends, however, on whether devices exist to monitor the carrier's performance, Kolbe adds.

He says he'd have to not only be able to determine the health of the underlying T1 pipe but also make sure the frame-relay protocol isn't creating problems.

"The carriers will have to add another level of network control," Kolbe says. "My ability to deploy public frame relay will depend on how effectively they can deploy that network control." ■

T3 to go

Sales of T3 private network equipment are forecast to grow 70% annually, but carrier-based offerings will start to become standard fare for many firms in 1993



Source: The Yankee Group — CW Chart: Doreen St. John

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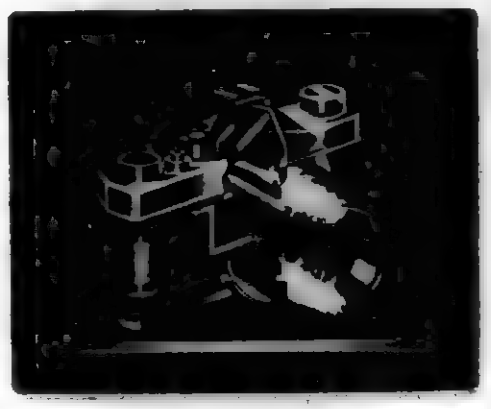

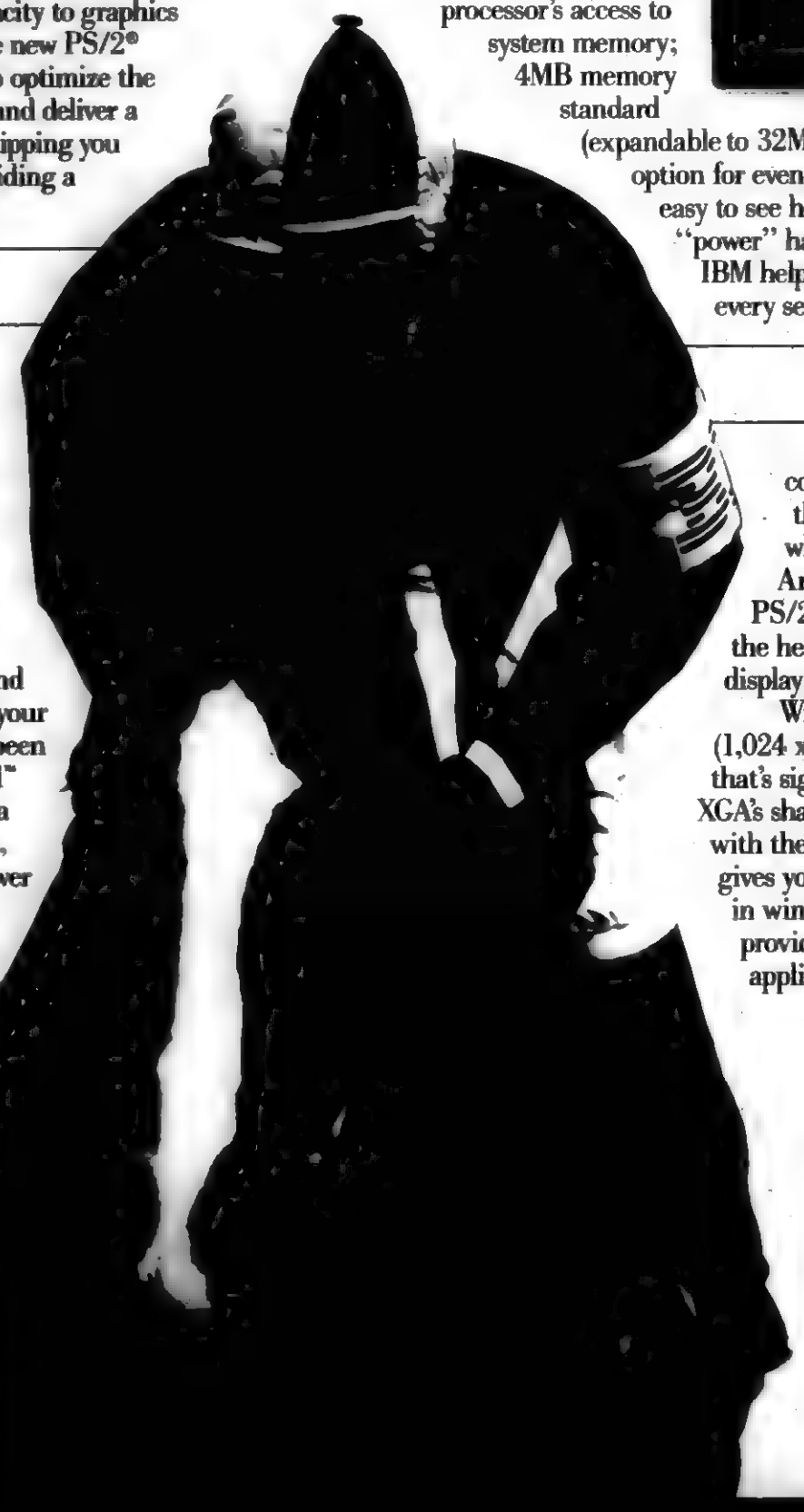

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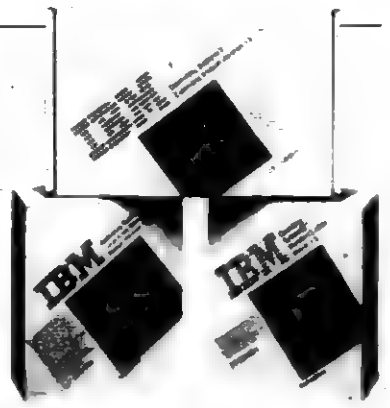
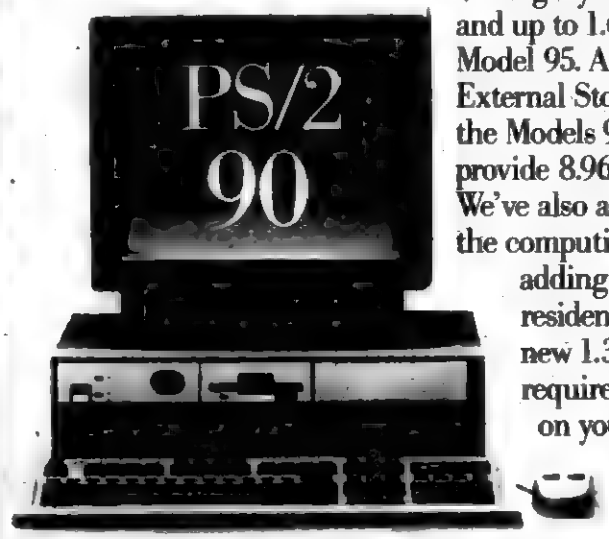


To satisfy even the most demanding storage needs, from LAN systems to data base management to numeric-intensive applications like financial analysis and modeling, IBM has one of the most advanced solutions available. IBM's super-fast SCSI hard disks are pure state-of-the-art performers. With additional hardfile expansion bays, the PS/2 Models 90 and 95 have enormous storage potential—up to .96 Gigabytes on the Model 90 and up to 1.6GB on the Model 95. And with the PS/2 External Storage Enclosures, the Models 90 and 95 can provide 8.96GB and more. We've also augmented the computing power by adding more flexibility to resident memory—our new 1.3 version of OS/2® requires as little as 2MB on your system. With this streamlined version you not only get more room for applications, but some users will experience a substantial performance increase in system functions as well. So when you need to make great strides with your computing power, you can count on IBM to give you terrific storage capability wherever you may need it.



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Features	IBM PS/2 Model 90	IBM PS/2 Model 95
Microprocessor		
Standard	80486	80486
Clock speed	25-33 MHZ	25-33 MHZ
Optional upgrade	33 MHZ	33 MHZ
Memory		
Standard	4MB (70ns)	4MB (70ns)
Maximum	32MB	32MB
Integrated Functions	Extended Graphics Array (XGA) and display port, dual DMA serial ports, DMA parallel port, pointing device port, keyboard port, diskette controller support for three drives, SCSI adapter with Cache.	
Fixed Disk Storage		
Standard	80-320MB	160MB-320MB
Display Modes		
APA Modes	XGA (includes all VGA modes) 640 x 480 x 256 colors/ 64 gray shades; 1024 x 768 x 16 colors/gray shades; hardware support for 132 column text mode; 16-bit direct color mode at 640 x 480 x 64K colors	
Available Expansion Slots	three 32-bit	six 32-bit
Bus Architecture		
Data path	MCA 32-bit	MCA 32-bit

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BUYERS' SCORECARD

Stratacom's IPX sweeps T1 multiplexer ratings

BY MICHAEL L. SULLIVAN-TRAINOR
CW STAFF

Pioneering new technology is a dangerous gamble. Winners can take the lead in the market or create a new one. Losers are destined for obscurity. For vendors, the difference between the two alternatives rests primarily on user acceptance.

Stratacom can rest easy based on the results of *Computerworld*'s Buyers' Scorecard on the leading T1 multiplexer product lines. Stratacom's users gave its IPX series top marks in 12 of 16 categories, including five of the six most important areas to all users surveyed, making it a clear winner in terms of overall satisfaction ratings.

Survey results are based on interviews with 34 users of Stratacom's IPX series and 50 users of each of the following product lines: Network Equipment Technologies Corp.'s (NET) IDNX series, Newbridge Network Corp.'s 3600 Mainstreet series and Timeplex, Inc.'s Link series. Each user group evaluated only the product it uses (see methodology next page).

Of the top four market leaders considered, Stratacom, a $30 million firm, has the smallest market share. It is also the only vendor to implement a fast-packet switch architecture. The other three use a time division architecture.

IPX's strengths are reflected in high user ratings for reliability (9.6 out of 10) — the most important criteria to all 184 users — and time required to reroute (9.0). The most glaring weaknesses surface in ratings of fractional T1 support (a last-place finish) and useful management reports (a first-place rating but IPX's lowest rating overall).

NET's IDNX series also garnered high user ratings. The product line was a close second in many of the areas where IPX came in first and received the highest rating in one of the top six categories — providing sufficient overall capacity. IDNX users rated it low in providing efficient asynchronous data interfaces, however, giving it the worst marks of the group in that area.

Newbridge's Mainstreet 3600, another relatively new series, received the top user rating in compatibility with carrier services — a characteristic that placed seventh in terms of user-assigned importance. It also received the best score for fractional T1 support.

At the moment, however, that achievement carries less weight with users, who assigned this consideration 14th place on their importance scale. Users rated Mainstreet low in routing and network management capabilities.

Timeplex's Link series received lukewarm to cold reviews from its users, garnering four third-place ratings for efficient synchronous and asynchronous data interfaces, parameter routing and fractional T1 support. Link users gave it the lowest rating in the 12 other categories, with the lowest being useful management reports (5.3).

Lower ratings for Timeplex's Link series may also be attributable to its being the oldest product group surveyed. Thirty-nine of the Timeplex users have had its products installed for three years or more, while users of the other products have had them installed for shorter periods of time. ●

COMPUTERWORLD BUYERS' SCORECARD

T1 Multiplexers

Total scores reflect all criteria and their user-assigned importance
Response base: 50 per product, except Stratacom's IPX series (34)

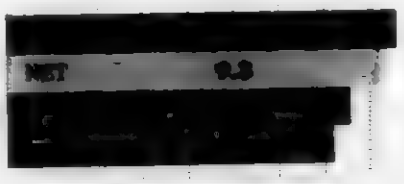
Product	Three highest ratings	Three lowest ratings
Stratacom's IPX series SCORE 66	Reliability Time required to reroute Effective support for digital voice	Useful management reports Reasonable cost to upgrade Fractional T1 support
NET's IDNX series SCORE 64	Reliability Compatibility with carrier services Sufficient overall capacity	Useful management reports Reasonable cost to upgrade Reasonable initial costs
Newbridge's 3600 Mainstreet series SCORE 61	Compatibility with carrier services Reliability Sufficient overall capacity	Useful management reports Reasonable cost to upgrade Reasonable initial costs
Timeplex's Link series SCORE 58	Compatibility with carrier services Reliability Efficient synchronous data interfaces	Useful management reports Reasonable cost to upgrade Effective diagnostic tools

KEY RATINGS

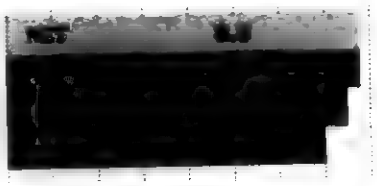
Stratacom users rate its IPX series highest in five of six areas considered most important by all users surveyed. While NET users rate the IDNX series just as high in providing sufficient overall capacity, they place it second in the other five criteria

User importance rating:

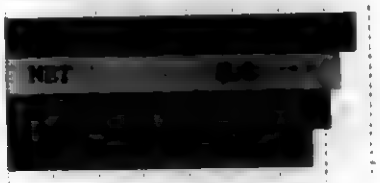
9.6 **Reliability**



8.8 **Sufficient overall capacity**



8.6 **Efficient synchronous data interfaces**



8.5 **Effective diagnostic tools**

8.4 **Effective network management capabilities**

8.4 **Time required to reroute**

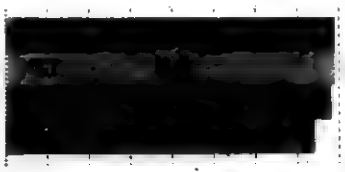
CW Charts: Paul Mock

A CLOSER LOOK

Stratacom's IPX series continues its high ratings, capturing five of nine top positions in remaining categories and tying with Newbridge and NET products in ability to interoperate. NET tops reasonable cost to upgrade, and Newbridge ties with NET in carrier services compatibility.

User importance rating:

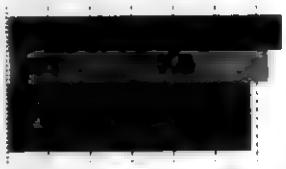
8.2 Compatibility with carrier services



8.2 Efficient parameter routing

8.2 Ability to interoperate with other products supplied by manufacturer

7.9 Reasonable initial network configuration and installation costs



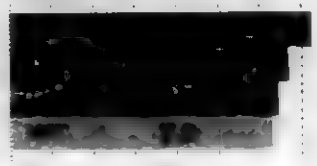
7.8 Useful management reports

7.7 Reasonable cost to upgrade

7.7 Effective support for digital voice communications

7.3 Fractional T1 support

7.0 Efficient asynchronous data interfaces



Loyalties

How likely would you be to purchase this product again if you were making the decision today?

(Reasons based on most frequently stated responses)

Stratacom's IPX series

Response base: 34

Number of respondents

Likely
The reason:
Service and support

Unlikely
The reason:
No management statistics

NET's IDNX series

Response base: 50

Number of respondents

Likely
The reason:
Reliability

Unlikely
The reason:
Better/newer technology available

Newbridge's Mainstreet 3600 series

Response base: 50

Number of respondents

Likely
The reason:
Reliability

Unlikely
The reason:
Low-end equipment; poor voice compressor

Timeplex's Link series

Response base: 48

Number of respondents

Likely
The reason:
Reliability

Unlikely
The reason:
Better/newer technology available

Verbatim

What do you like best/least about this product?

(Responses are based on the most frequently stated answers)

[redacted]

Likes
Reliability
Fast-packet technology
Service and support

Dislikes
Management reports
Poor diagnostic/management feedback
Price to upgrade

[redacted]

Likes
Reliability
Rerouting capabilities
Service and support

Dislikes
Cost
Report capabilities
Clocking issues and problems

[redacted]

Likes
Reliability
Flexibility
Ease of use

Dislikes
Network management software
Insufficient diagnostic tools
No mechanism to inform customers of upgrades

[redacted]

Likes
Reliability
Service and support
Flexibility

Dislikes
Diagnostics/monitoring
Price
Support

Vital statistics

Total number of respondents: 184

What is your position?

Data communications manager	143
IS manager	41

How many nodes are included on this network?

3 to 4	42
5 to 9	58
10 to 20	43
21 to 49	25
50 to 99	9
100 to 199	2
More than 200	4
No response	1

When was the first multiplexer from this vendor installed?

More than 5 years ago	14
3 to 5 years ago	58
1 to 3 years ago	79
More than 6 months ago	16
More than 3 months ago	16
No response	1

METHODOLOGY

Products rated in *Computerworld*'s Buyers' Scorecard on T1 multiplexers were chosen on the basis of vendor installed base and revenue. Users' responses to the top four major vendors' high-end products were compared.

Rating responses were obtained from 50 users for each product, with the exception of Stratacom's IPX. For that product, the minimum was lowered to 34 because of the vendor's low installed base.

The survey was conducted by telephone interviewers at First Market Research, which is located in Austin, Texas.

Total weighted scores were computed by multiplying the mean scores that users assigned to the importance of each criterion by the mean scores that each user group gave to its own products.

RESPONDENT PROFILE

The majority of users surveyed use the following models: Timeplex — Link 1 and Link 2; NET — IDNX 20, IDNX 40 and IDNX 70; Newbridge — Mainstreet 3600; and Stratacom — IPX 16 and IPX 32.

Respondents say that 39% of their T1 traffic is fractional T1 and that the systems carry an average of 65% data, 29% voice and 6% video traffic.

Sixty-three percent of the users work at companies that have annual revenue of more than $1 billion, and 29% are in the manufacturing industry.

Users say they would like to see the following features or functions added to their products (the most common responses are listed): Stratacom's IPX — fractional T1 support, frame-relay support and the ability to run diagnostics on specific cards from the console; NET's IDNX — enhanced network management, better user interface and lower-cost network management; Newbridge's Mainstreet — enhanced report writing, improved network management and frame-relay capability; and Timeplex's Link — better management and diagnostic tools, fast-packet technology and built-in terminals.

ACKNOWLEDGEMENTS

Computerworld would like to acknowledge the assistance provided by the following: Rosemary Cochran, Vertical Systems Group; Thomas Nolle, CIMI Corp.; Harry Reynolds, Reynolds Communications; Computer Intelligence; and International Data Corp.

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Fractions can stump multiplexers

On multiplexers, you can get various levels of functionality

BY ROSEMARY COCHRAN

If you opt for fractional T1 services, you might be in for a surprise: Not all T1 multiplexers directly support these services. To make things more confusing, neither price nor the level of sophistication of the equipment will tell you the machine's fractional functionality.

In fact, most end multiplexers in the $17,000 to $30,000 range are as functional for fractional T1 as networking multiplexers that cost three to four times that amount.

You can segment the three categories of multiplexers (see box) into three levels of fractional support:

• **Level 1:** ***Multiplexers that are fractional T1-compatible.*** Level 1 multiplexers can format a T1 aggregate into multiple virtual or logical circuits, either as individual DS0s or bundles of DS0s.

To do this, the multiplexer must support an internodal link interface module that conforms to the D4 format specification — that is, a T1 frame channelized as 24 DS0s.

D4 support ensures compatibility with the digital cross-connect system equipment that most carriers use to provide fractional T1 services.

• **Level 2:** ***Multiplexers that offer fractional T1 networking support.*** These machines can maintain single-point network control through fractional T1 circuits. For many people, this is the minimum level of functionality required.

To support single-point management, the multiplexer's aggregate module must be able to place a supervisory link within the DS0 bundle defined as an internodal link.

Supervisory links are an integral part of the telemetry and control system, which permits remote network management for T1 networks. These links are used to transport operations data, such as circuit provisioning information and alarm reports.

The amount of bandwidth required for the supervisory link is considered overhead bandwidth and varies by manufacturer. For some machines, the size of the supervisory link can be adjusted based on the size of the internodal circuit.

• **Level 3:** ***Equipment that has multiple supervisory links.*** With the high cost of individual local exchange channels, many users seek alternate methods to access carrier central offices. One common vehicle to avoiding access charges is multiplexed interfaces, such as Primary Rate Interface.

Similarly, using a single local channel to combine multiple fractional T1 circuits reduces the total number of local channels and their associated charges.

For the multiplexer to do this, a supervisory link must be included in each virtual fractional T1 aggregate. The virtual aggregates are split into separate interoffice channels at the carrier's central office for routing to different destinations.

One disadvantage to this approach is that you lose the inherent backup protection multiple physical channels provide. Users with critical applications find this implementation unacceptable. Others claim you can diminish the risk through normal contingency planning in the overall topological design of the network.

Multiplexers with Level 3 functionality can support multiple virtual aggregates — as distinct bundles — on a single physical aggregate. Each virtual aggregate represents a unique internodal link with its own supervisory link. For a T1 line, the maximum number of virtual aggregates is 24.

Each of the products in this category

Multichoices

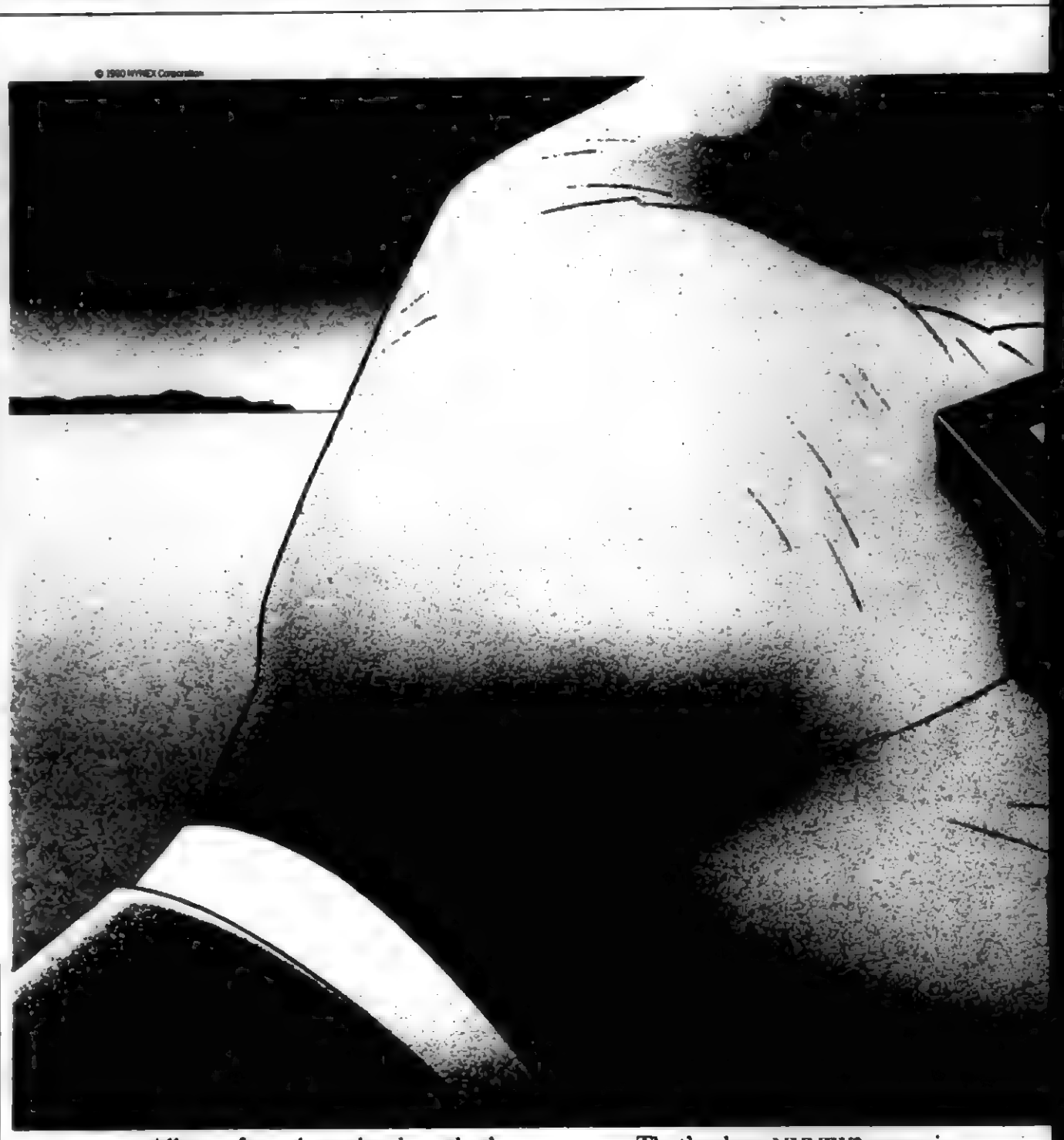
Vertical Systems Group divides multiplexers into three categories:

• **Networking multiplexers** typically have proprietary architectures and are implemented to build wide-area enterprise backbone networks. These networks have mesh topologies, support multiple voice and data applications and require the flexibility to adapt to changing bandwidth and connectivity requirements.

• **End multiplexers with networking capability** are used to support small or relatively static enterprise networks. The key difference between products in this category and networking multiplexers is the degree of operations automation and network control.

• **End multiplexers** are designed for compatibility with carrier services and therefore have standards-based architectures. They are typically aimed at point-to-network configurations that connect user locations to a central office for access to carrier-based services. They are also used in point-to-point configurations to link two or three end-user locations in a private network.

Cochran is a principal at Vertical Systems Group, a market research and consulting firm in Dedham, Mass.



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Three levels of fractional support

Networking multiplexers	Network Equity Technologies 3552/70 Timeplex 9000 Timeplex IPX	N/A	CASE/Datatel DCP/100 Infotron IT1000 Telematics DX-500	IBM Acudata 740/745 Ascend CBX General Datacomm Magnum 1RS Newbridge 3600 Timeplex Link 2+
End multiplexers with networking capability	N/A	N/A	DSC Communications CP1000 CP4000 Racal-Milgo Omnimux 8000	Acudata Multistar IV
End multiplexers	General Datacomm Magnum Plus	Canstream D/1 Micro III Tekno Systems Route 24 Tekroad Micro I	Avanti 6MC 100 Aydin 6240 CASE/Datatel DCP/100 DSC Communications CP1000s	Acudata Multistar III AT&T Acudata 740 Newbridge 3630

Source: Vertical Systems Group — CW Chart: Doreen St. John

(see chart) can support as many as 24 separate supervisory links per T1 aggregate, with the exception of Avanti Communications Corp.'s ONX, which handles as many as 16 links.

What if your T1 multiplexer does not have the level of fractional T1 support you need? External equipment such as an intelligent channel service unit, format converter or channel bank with an N times DS0 data port can provide it. Depending on the implementation and specific equipment capabilities, fractional T1 support at Levels 1, 2 or 3 can be achieved.

One vendor that uses this approach is Network Equipment Technologies Corp. (NET), which acts as an OEM for an intelligent channel service unit from Cylink Corp. This external device formats an N times 64K bit/sec. aggregate from an NET IDNX as a bundle of DS0s. As many as two bundles can be defined, each with its own supervisory link.

This implementation allows Level 3 support, albeit for a maximum of two virtual aggregates per T1.

While the use of external equipment is a convenient way to achieve fractional T1 support, there are shortcomings to this approach if the external equipment cannot be managed via the T1 multiplexer's network management system.

You need to coordinate the management of these external devices and the multiplexers to ensure that fractional T1 circuits can be remotely configured and tested.

This assessment of product capabilities is based on the Vertical Systems Group's independent technical evaluation and represents functionality that was operational in end-user networks as of July 1990. This article is based on information from the recently released report, "Private Network Industry Analysis: 1990-1991." ●

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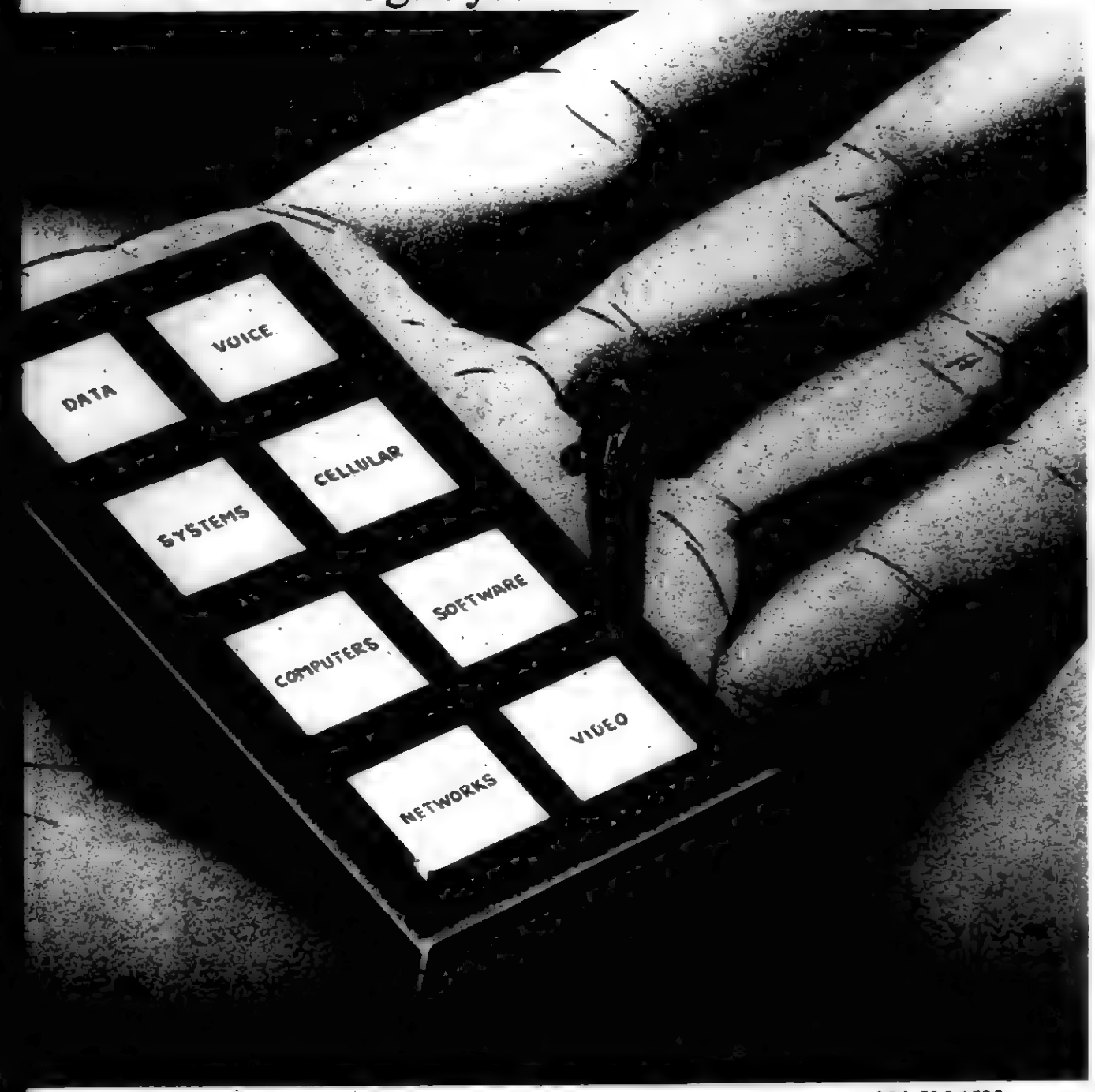

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METROPOLITAN FIBER SYSTEMS, INC.: Using the Metrofiber DS1 Hub service, up to 24 individual analog or digital channels from multiple locations on a Metrofiber network can be aggregated onto a DS1 circuit for individual collection or distribution. In addition, the Metrofiber DS1 to DS0 Digital Cross Connect System enables Metrofiber to clock the individual circuits to ensure synchronized data transmission and minimal data loss.

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New Service/
Business Development
Fedex International
Transmission Corp.
Memphis, Tenn.

NETRIX CORP.: The #1-ISS allows you to use the integrated T1 multiplexing capabilities to send a copy of any circuit back to your central network management site. This way, engineers with data scopes and other sophisticated test equipment can examine the problem and reconfigure the equipment accordingly.

To each his own T1 network

BY CHRISTOPHER HERBST

Choosing among the various T1 bandwidths is a very individualistic decision. What all T1 customers do have in common, however, is not only higher speed transmission but also cost savings.

At the Royal Bank of Canada, higher bandwidth was only one reason for going to T1. When the bank installed two T1 lines between its offices in Toronto and New York, it not only centralized all processing in the Canadian city but also turned out the lights for the New York data processing operations.

Herbst is a free-lance writer based in Washington, D.C.

"By doing all the processing in Toronto, we, in effect, closed the data center in New York and made it into something like a switching center," says Brian Commerford, project manager for telecommunications facilities.

All in all, Commerford estimates, Royal Bank's T1 lines have saved the bank about $500,000 annually, allowing payback of the original investment in hardware — including leasing the lines and purchasing new multiplexers — within 10 months to a year.

Royal Bank chose two separate carriers to handle its two lines. In the U.S., it leases lines from AT&T that connect with a Bell Canada T1 at the Canadian border. The other T1, which connects with a Unitel Communications, Inc. T1 at the Canadian border, is provided by MCI Communications Corp.

If both lines were provided by the same carrier, Commerford explains, "you could end up with both channels running on the same path ... Intrusion could damage both of them simultaneously."

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For some companies, just keeping up with a fractional T1 channel's smaller increments can prove a challenge.

Minneapolis-based Cargill, Inc., which purchases, processes, stores, transports and merchandises agricultural and other bulk commodities throughout the world, uses T1 lines for domestic communications. However, for its European and Asian divisions, it communicates via fractional T1 lines.

Fractional T1 lets the firm "buy increments as we need them," says Reuben Lantto, Cargill's director of international telecommunications. Rather than starting with the full T1 bandwidth of 1.5M bit/sec., the firm can allocate bandwidth in 64K bit/sec. increments.

Commerford: *His T1 paid for itself*

Previously, Cargill leased long-distance lines for its voice and data communications at rates of $4,000 to $5,000 for a line to a single European customer.

Not only was it expensive, but "we just couldn't get a good connection" when making data transmissions, Lantto says.

Overall savings from switching to fractional T1 have been significant, he says, amounting to several hundred thousand dollars during the past three years.

Cargill chose Overseas Telecommunications, Inc. as its carrier because it supported the 64K bit/sec. base rate, which is the international standard. In the U.S., most equipment vendors support multiples of 56K bit/sec.

Even on fractional T1, Cargill can't always keep up with filling bandwidth. When expanding capacity from 128K to 256K bit/sec., it can be difficult to "fill up the next increment," Lantto says.

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And then there are customers for whom even T3 bandwidth isn't enough.

Kaiser Health Plan, Inc./Kaiser Hospitals, Inc. is bulking up its private microwave T1 network with dual T3 lines — with 90M bit/sec. capacity — that will support high-bandwidth applications such as videoconferencing and transfer of large image files from ultrasound scans.

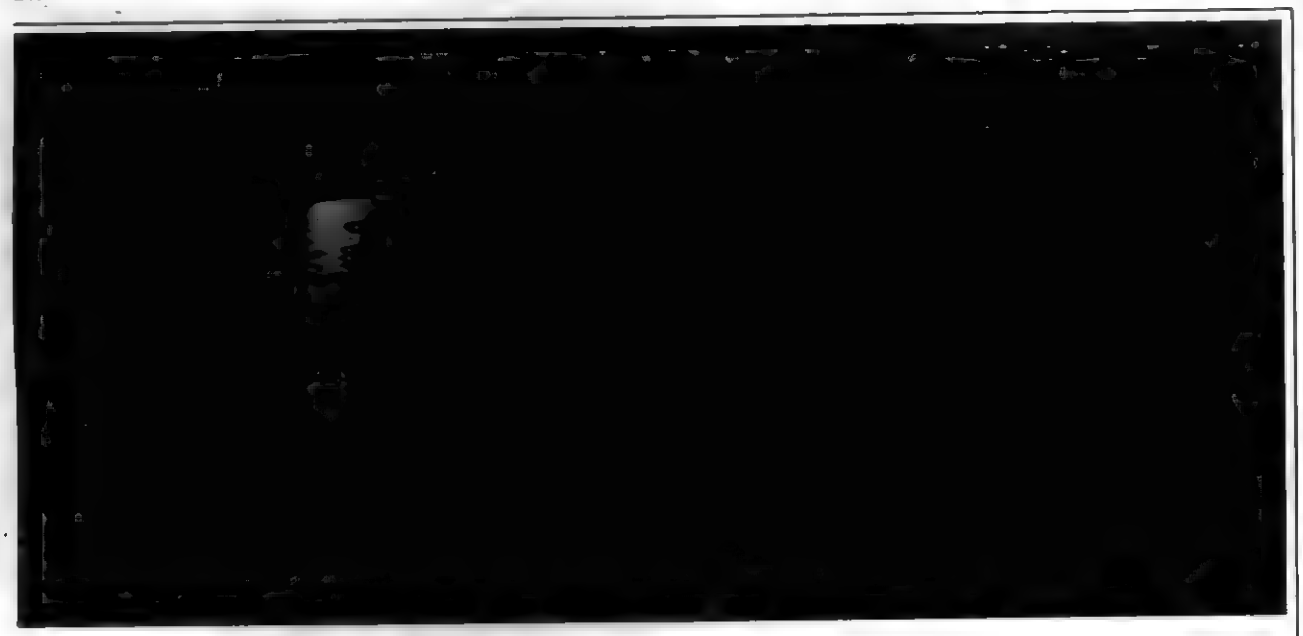
Lantto: *Fractional T1 saves money*

Demand for bandwidth is likely to skyrocket as image networking applications take off, says Joe Beaupre, manager of Kaiser's Telecommunication Network Division. "Everyone is putting in proposals to do transferring of image data, and we have a proposal to start testing on-line transfers of medical records."

Kaiser set up its network in 1988 to interconnect its internal voice and data lines in the Northern California region, using multiple T1 and T3 lines to connect nearly 50 sites.

The hospital had previously leased 56K bit/sec. data lines as well as voice lines from AT&T and Pacific Telesis. Although the new network cost $12 million, Beaupre says he expects payback to occur after 3½ years.

Even installing the T3 lines did not present a financial burden, especially compared with the cost of microwave towers and power supplies. "Putting in 45M bit/sec. lines really didn't increase the cost that much," he says. •



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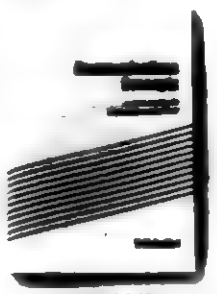

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Bit Error-Rate Testers

VENDOR	PRODUCT NAME	BIT RATE SUPPORTED (BIT/SEC.)	STORES AND RECALLS TEST SETUPS	SIZE CLASSIFICATION	DISPLAY SIZE (line x character)	LINE CONNECTION SUPPORTED	PERIPHERAL DEVICES SUPPORTED	LOCAL/REMOTE USAGE	GENERATES REMOTE LOOP-BACK	TEST TYPES[1]	FRAMING FORMATS SUPPORTED	LINE CODES SUPPORTED	AC POWER SOURCE REQUIRED	PRICE
ADC Telecommunications, Inc. (612) 938-8080	Netster Performance Monitoring System	1.544M	Yes	Rack mount	PC emulated	Hard-wired installed system	Remote access port, printer, standard T1.1 language interface via RS-232 ports	Both	Yes	Bipolar violation, framing errors, ESF CRC errors, DS1 signal frequency, all ones, yellow alarm detection	Unframed, D4, ESF, DLC	AMI/bipolar, B8ZS, ZBTSI	Yes	Varies depending on size of network
	Sabine 2000 Test Set	1.544M	Yes	Portable	8 x 40	Jacks	Printer	Local	Yes	Bipolar violation, framing errors, ESF CRC errors, DS1 signal frequency, all ones, yellow alarm detection	Unframed, D4, ESF, DLC	AMI/bipolar, B8ZS	Yes	Full-function DS1 test set. Bert can be added for $1,495.
Berry Test Sets (800) 428-9267	8406 L3	1.544M	No	Portable	NP	Jacks	Remote access port	Both	Yes	Bipolar violation, framing errors, ESF CRC errors, phase jitter analysis, all ones, yellow alarm detection	D4, ESF	AMI/bipolar, B8ZS	No	$1,995

[1]Includes bit error-rate tests.
[2]SLC is a registered trademark of AT&T.
[3]Generates remote loop-back for 1.544M bit/sec. rate only.

The companies included in this chart responded to a recent survey conducted by *Computerworld*. When a vendor is unable to provide specific information about its product, the abbreviation NP (not provided) is used. When a question does not apply to a vendor's product, the abbreviation NA (not applicable) is used. Further product information is available from the vendors.

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to outperform DASDMON?

PRODUCT SPOTLIGHT

VENDOR	PRODUCT NAME	BIT RATE SUPPORTED (BIT/SEC.)	STORES AND RECALLS TEST SETUPS	SIZE CLASSIFICATION	DISPLAY SIZE (line x character)	LINE CONNECTION SUPPORTED	PERIPHERAL DEVICES SUPPORTED	LOCAL/REMOTE USAGE	GENERATES REMOTE LOOP-BACK	TEST TYPES[1]	FRAMING FORMATS SUPPORTED	LINE CODES SUPPORTED	AC POWER SOURCE REQUIRED	PRICE
Case/Datatel (800) 426-6481	DCP1000	1.544M, 2.048M	No	Portable	LCD	DA-15S, V.35, HS-232, HS-422	Printer	Both	Yes	Bipolar violation, framing errors, ESF CRC errors, DS1 signal frequency, all-ones detection	D4, ESF, G.703 European	AMI/bipolar	Yes	$4,995
Compression Technologies Corp. (703) 478-0300	T-Star 1500, 1000A, 1000	1.544M, fractional T1	Yes	Handheld, portable	16 x 24	DB15, RJ48 Bantam jacks	Remote access port, printer	Both	Yes	Bipolar violation, framing errors, ESF CRC errors, DS1 signal frequency, all-ones, yellow alarm detection	D4, ESF, SLC/96	AMI/bipolar, B8ZS	No	$4,995, $5,295, $3,995 (options available)
Hekimian Technologies, Inc. (800) 289-0800	Telest T1	1.544M	Yes	Handheld	2 x 16	Clips, jacks, DA-15S, 6 pin modular, V.35	Remote access port, printer	Local	No	Bipolar violation, framing errors, ESF CRC errors, DS1 signal frequency, all-ones detection, smart jack	Unframed, D4, ESF, SLC/96	AMI/bipolar, B8ZS	No	$1,995
	Telest FT1	1.544M, fractional T1	Yes	Handheld	2 x 16	Clips, jacks, DA-15S, 6 pin modular, V.35, Bantam jacks	Remote access port, printer	Both	Yes	Bipolar violation, framing errors, ESF CRC errors, DS1 signal frequency, all-ones, yellow alarm detection, smart jack	Unframed, D4, ESF, SLC/96	AMI/bipolar, B8ZS	No	$2,995
	Telest Monitor Link Analyzer and Channel Monitor	1.544M	Yes	Handheld	2 x 16	Clips, jacks, DA-15S, 6 pin modular, V.35	Remote access port, printer	Both	Yes	Bipolar violation, framing errors, ESF CRC errors, phase jitter analysis, DS1 signal frequency, all-ones, yellow alarm detection, smart jack	Unframed, D4, ESF, SLC/96	AMI/bipolar, B8ZS	No	$3,400
DCM Industries, Inc. (415) 428-0600, (800) 423-0600	TDM/96 Handheld T1 Monitor	1.544M	No	Handheld	4 digit LCD	Clips, jacks	None	Local	No	Bipolar violation, counts framing errors, ESF CRC errors, all-ones, yellow alarm detection	D4, ESF, SLC/96	AMI/bipolar, B8ZS	No	$850
	DI-30	1.544M	No	Portable, rack mount	5 digit LED	Clips, jacks, RJ11, RS-232, DB9 receive and transmit clock	Remote access port, printer, built-in modem	Both	No	Bipolar violation, counts framing errors, ESF CRC errors, all-ones, yellow alarm detection, VF-monitor/speaker, VF-input/output	D4, ESF	AMI/bipolar, B8ZS	Yes	$2,995, $120 (optional carrying case)
	BT-10 Ber test set	1.544M	Yes	Portable, rack mount	4 x 40	Clips, jacks, RJ11, RS-232, central office repeater power	Remote access port, printer, built-in modem	Both	Yes	Bipolar violation, counts framing errors, ESF CRC errors, DS1 signal frequency, all-ones, yellow alarm detection, VF-monitor/speaker, VF-output	D4, ESF	AMI/bipolar, B8ZS	No	$2,995, $120 (optional carrying case), $350 (internal battery pack)

PRODUCT SPOTLIGHT

VENDOR	PRODUCT NAME	BIT RATE SUPPORTED (BIT/SEC.)	STORES AND RECALLS TEST SETUPS	SIZE CLASSIFICATION	DISPLAY SIZE (line x character)	LINE CONNECTION SUPPORTED	PERIPHERAL DEVICES SUPPORTED	LOCAL/REMOTE USAGE	GENERATES REMOTE LOOP-BACK	TEST TYPES[1]	FRAMING FORMATS SUPPORTED	LINE CODES SUPPORTED	AC POWER SOURCE REQUIRED	PRICE
Electrodata, Inc. (314) 663-3333	TTS 3	1.544M, fractional T1	Yes	Handheld	2 x 16	Clips, jacks, DA-15S, 8 pin modular	Remote access port, printer, modem	Both	Yes	Bipolar violation, counts framing errors, ESF CRC errors, DS1 signal frequency, all-ones, yellow alarm detection	Unframed, D4, ESF, SLC/96, D1D, D2	AMI/bipolar, B8ZS	No	$4,495, $995 (fractional T1 module)
Hard Engineering, Inc. (205) 533-2663, (800) 367-3126	705T/WAN	1.544M, fractional T1	Yes	Portable	25 x 40	Bantam jacks	Remote access port, printer	Both	Yes	Bipolar violation, framing errors, ESF CRC errors, DS1 signal frequency, all-ones, yellow alarm detection	D4, ESF, G.703 European	AMI/bipolar, B8ZS, ZBTSI	Yes	$11,800
Hekimian Laboratories, Inc. (301) 590-3000	Model 6301 DS1 Performance Unit	1.544M	Yes	Portable, rack mount	2 x 40	Jacks, barrier strip	Remote access port, printer	Both	Yes	Bipolar violation, counts framing errors, ESF CRC errors, all-ones detection, frame slips, excessive zeros	Unframed, Autoframed, D4, ESF	AMI/bipolar, B8ZS	No	$4,475
	Model 3705/3707 PCM/VF Communications Test System	1.544M	Yes	Portable, rack mount	1 x 40	Jacks, RS-232C, barrier strip	Remote access port, printer	Both	No	Bipolar violation, counts framing errors, ESF CRC errors, phase jitter analysis, DS1 signal frequency, all-ones, yellow alarm detection, errored second, excessive zeros	ESF, SLC/96, D1D, D2, D3/D4	AMI/bipolar, B8ZS	No	$10,795
	Model 3709 PCM-30/VF Communications Test System	2.048M	Yes	Portable, rack mount	1 x 40	Jacks, barrier strip	Remote access port, printer	Both	No	Bipolar violation, counts framing errors, ESF CRC errors, phase jitter analysis, DS1 signal frequency, all-ones, yellow alarm detection, errored second, excessive zeros	G.704 European	AMI/bipolar	No	$11,695
Hewlett-Packard Co. (408) 553-7030	HP37701A T1 Tester	1.544M	Yes	Portable, rack mount (option)	21 x 44	Clips, jacks, DA-15S, 8 pin modular, RJ48	Remote access port, printer, HP15901A (Datacom test module)	Both	Yes	Bipolar violation, framing errors, ESF CRC errors, DS1 signal frequency, all-ones, yellow alarm detection	D4, ESF, SLC/96	AMI/bipolar, B8ZS	No	$4,700
International Data Sciences, Inc. (401) 232-6200	Model 70B Bit Error-Rate Tester	1.544M, fractional T1, 2.048M	No	Handheld	2 x 48	DA-15S	None	Both	Yes	Bipolar violation, framing errors, ESF CRC errors, all-ones, yellow alarm detection	D4, ESF, G.703 European	AMI/bipolar, B8ZS	Yes	$2,800
Network Communications Corp. (612) 944-8559	7100 Network Probe	1.544M, fractional T1, 2.048M, 10M	Yes	Handheld	25 x 80	Clips, jacks, DA-15S, 8 pin modular, V.35, RS-232C, RS-422/423/449, Bantam jacks	Remote access port, printer	Both	Yes	Bipolar violation, framing errors, ESF CRC errors, phase jitter analysis, DS1 signal frequency, all-ones, yellow alarm detection, red alarm, blue alarm detection	Unframed, D4, ESF, D1D, D2, D3, 2M/CEPT, Multiframe	AMI/bipolar, B8ZS, B7, HDB3	No	$11,995

PRODUCT SPOTLIGHT

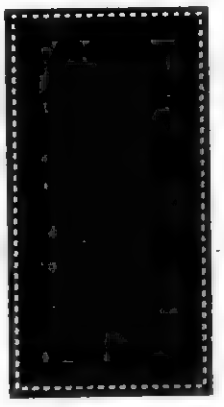
VENDOR	PRODUCT NAME	BIT RATE SUPPORTED (BIT/SEC.)	STORES AND RECALLS TEST SETUPS	SIZE CLASSIFICATION	DISPLAY SIZE (line x character)	LINE CONNECTION SUPPORTED	PERIPHERAL DEVICES SUPPORTED	LOCAL/REMOTE USAGE	GENERATES REMOTE LOOP-BACK	TEST TYPES[1]	FRAMING FORMATS SUPPORTED	LINE CODES SUPPORTED	AC POWER SOURCE REQUIRED	PRICE
Fluke Microsystems, Inc. (800) 723-1200, (800) 669-5400	1641/1642 Quick Test & Quick Test	1.544M	No	Handheld	LED	Clips, jacks	None	Local	No	Bipolar violation, framing errors, ESF CRC errors, all-ones, yellow alarm detection, out of frame, loss of signal, T1; 403 parameters	D4, ESF	AMI/bipolar, B8ZS	No	$795 (1641), $495 (1642)
	1651A T1 Test	1.544M, 2.048M, DS0	Yes	Portable, rack mount	8 x 40	Clips, jacks, DA-15S, 8 pin modular	Remote access port, printer	Both	Yes	Bipolar violation, framing errors, ESF CRC errors, DS1 signal frequency, all-ones, yellow alarm detection, frame slips, clock slips, frequency, wander	D4, ESF, G.703 European	AMI/bipolar, B8ZS	No	$3,995
	1650A Communications Analyzer	1.544M, fractional T1, 2.048M, DS0A, DS0	Yes	Portable, rack mount	16 x 32	Clips, jacks, DA-15S, 8 pin modular, V.35, RS-449, T1L	Remote access port, printer	Both	Yes	Bipolar violation, framing errors, ESF CRC errors, phase jitter analysis, DS1 signal frequency, all-ones, yellow alarm detection, clock analysis, wander, Histogram	D4, ESF, G.703 European	AMI/bipolar, B8ZS	Yes	$6,995
	1646 T1 and Channel Access Test Analyzer	1.544M, fractional T1, DS0A, DS0	Yes	Portable, rack mount	4 x 40	Clips, jacks, 8 pin modular	Remote access port, printer, RS-232	Both	Yes	Bipolar violation, framing errors, ESF CRC errors, DS1 signal frequency, all-ones, yellow alarm detection, clock analysis, wander, DDS, TMS testing	D4, ESF	AMI/bipolar, B8ZS	Yes	$7,495
Scientific Atlanta (404) 925-5007	AT96000E Digital Transmission Analyzer	1.544M, 2.048M, 44.736M	Yes	Portable	7 x 40	Jacks	Remote access port, printer, IEEE 488	Both	Yes	Bipolar violation, framing errors, ESF CRC errors, DS1 signal frequency, all-ones, yellow alarm detection	D4, ESF, G.703 European, DS3	AMI/bipolar, B8ZS, B32S, HDB3	Yes	$18,000
Electro-Tel Associates (408) 988-4888, (800) 227-0402	4000A Filtering Test Analyzer	1.544M	Yes	Handheld	1 x 8-40	Jacks	Printer included	Local	Yes	Bipolar violation, framing errors, ESF CRC errors, DS1 signal frequency, all-ones, yellow alarm detection, C3D and 16 looping codes	D4, ESF	AMI/bipolar, B8ZS	No	$3,595
T-Com Corp. (415) 964-3615	235A T-1 Transmission Analyzer	1.544M	Yes	Handheld	2 x 20	Jacks	Remote access port, printer, span power, VF monitor and measurement channel signaling devices	Both	Yes	Bipolar violation, framing errors, ESF CRC errors, phase jitter analysis, DS1 signal frequency, all-ones, yellow alarm detection	Unframed, D4, ESF, SLC/96	AMI/bipolar, B8ZS	No	$2,500, $125 (battery option), $850 (span power)
Tau-Tron (800) 662-8436	Model 1560, 5120, 5130	1.544M, TIC 3.152 Mbit (5160, 5140, 2.048M (5120)	Yes	Portable, rack mount	2 x 80	Clips, jacks	Remote access port, printer	Both	Yes	Bipolar violation, framing errors, ESF CRC errors, phase jitter analysis, DS1 signal frequency, all-ones, yellow alarm detection, wink timing, signaling bit analysis	D4, ESF, G.703 European	AMI/bipolar, B8ZS, ZBTSI	No	$5,000
Tekelec (818) 880-7900	Chameleon 8000	1.544M, fractional T1	Yes	Portable, rack mount	16 x 40	Jack, DA-15S, 8 pin modular, V.35, RS-232, RS-449	Remote access port, printer, IEEE 488 (optional)	Both	Yes	Bipolar violation, ESF CRC errors, DS1 signal frequency, all-ones, yellow alarm detection, drop and insert of DS0 channels supported	D4, ESF	AMI/bipolar, B8ZS, ZBTSI	Yes	$7,750
Telecrafter/LFCOM (415) 967-6400	TC 1000-30/C1	1.544M, fractional T1, 2.048M	Yes	Portable	480 x 480 character	Jacks	Remote access port, printer	Both	Yes	Bipolar violation, framing errors, ESF CRC errors, DS1 signal frequency, all-ones, yellow alarm detection, drop and insert testing	D4, ESF, G.703 European, D4D, D2	AMI/bipolar, B8ZS	Yes	$8,075
Tele-Pack Industries, Inc. (703) 982-0844	DS1 Loop Test Unit	1.544M, fractional T1	Yes	Portable, rack mount	8 x 40	Clips, jacks, DA-15S	Remote access port, printer	Both	Yes	Bipolar violation, framing errors, ESF CRC errors, DS1 signal frequency, all-ones, yellow alarm detection	D4, ESF	AMI/bipolar, B8ZS	No	$5,250
Telecommunications Techniques Corp. (301) 353-1550	T-Bird 107	1.544M	No	Handheld	2 x 16	Clips, jacks	Printer	Local	Yes	Bipolar violation, counts framing errors, ESF CRC errors, DS1 signal frequency, all-ones, yellow alarm detection	D4, ESF, SLC/96	AMI/bipolar, B8ZS	No	$2,395, $995 (transmit option)
	T-Bird 300A/B2	1.544M	No	Portable, rack mount (option)	2 x 40	Clips, jacks, DB-15S, 8 pin modular	Remote access port, printer	Both	Yes	Bipolar violation, counts framing errors, ESF CRC errors, phase jitter analysis (311 only), DS1 signal frequency, all-ones, yellow alarm detection, frame slips, multiple pattern automated test systems	D4, ESF, SLC/96	AMI/bipolar, B8ZS, ZBTSI (optional)	No	$5,395 (300A), $6,995 (311)
	Firebird 6000	1.544M, fractional T1, 2.048M, TIC, 4M	Yes	Portable, rack mount (option)	2 x 40	Clips, V.35, RS-449, Balun, Wico 310	IEEE 488 and RS-232 remote control port, printer	Both	Yes	Bipolar violation, counts framing errors, ESF CRC errors, DS1 signal frequency, all-ones, yellow alarm detection level, Simplex Current, Data Link monitoring, VF transmit and receive	D4, ESF, G.703 and G.704 European	AMI/bipolar, B8ZS	Yes	$6,995
	Firebird 6900	1.544M, fractional T1, 2.048M, TIC, 4M	Yes	Portable, rack mount (option)	2 x 40	Clips, V.35, RS-449, Balun, Wico 310	IEEE 488 and RS-232 remote control port, printer	Both	Yes	Bipolar violation, counts framing errors, ESF CRC errors, phase jitter analysis, DS1 signal frequency, all-ones, yellow alarm detection, VF transmit and receive, wander, variable error insert rates	D4, ESF, G.703 and G.704 European	AMI/bipolar, B8ZS	Yes	$8,495
Telecom Corp., AR Diagnostic Products, (703) 644-9000	Interview 7200 Turbo	1.544M, 2.048M	Yes	Portable, rack mount	21 x 16	Jacks, DA-15S	Remote access port, printer	Local	Yes[2]	Bipolar violation, framing errors, ESF CRC errors, yellow alarm detection, drop and insert, protocol analysis on selected channels, data protocol emulation	D4, ESF, G.703 European	AMI/bipolar, B8ZS, HDB3 (2.048M)	Yes	$23,000-$36,000
	Interview 7700 Turbo	1.544M, fractional T1, 2.048M	Yes	Portable, rack mount	21 x 16	Jacks, DA-15S	Remote access port, printer	Local	Yes[2]	Bipolar violation, framing errors, ESF CRC errors, yellow alarm detection, drop and insert, protocol analysis on selected channels, data protocol emulation	D4, ESF, G.703 European	AMI/bipolar, B8ZS, HDB3 (2.048M)	Yes	$28,000-$32,000
IBM Dynatel Systems Div. (512) 994-1000, (800) 426-2000	Vencit F-80	1.544M	No	Portable, rack mount	8-digit	Jacks	Remote access port	Both	Yes	Bipolar violation, framing errors, ESF CRC errors, all-ones, yellow alarm detection	D4, ESF	AMI/bipolar, B8ZS	Yes	$4,995
Wandel & Goltermann Technologies, Inc. (919) 941-5730	PF-45 DS3/DS1 Analyzer	1.544M, 44.736M	No	Portable	2 x 20	Jacks	Built-in printer, RS-232C, IEEE 488	Both	Yes	Bipolar violation, counts framing errors, ESF CRC errors, all-ones, yellow alarm detection	D4, ESF, DS3, M13 frame, C-parity framing	AMI/bipolar, B6ZS, B8ZS at DS3	Yes	$10,475
Wiltron Products, Inc. (800) 526-2052, (800) 229-1855	D400 Digital Test System	1.544M, fractional T1	Yes	Portable, rack mount	4 x 80	Jacks	Remote access port, printer, modem	Both	Yes	Bipolar violation, framing errors, ESF CRC errors, phase jitter analysis, DS1 signal frequency, all-ones, yellow alarm detection	D4, ESF, SLC/96, CCRS, channel numbering, D1D, D2, D3	AMI/bipolar, B8ZS	Yes	$6,900
	D300 DS-Channelyzer	1.544M, fractional T1	Yes	Handheld	4 x 20	Clips, jacks	Printer	Local	No	Bipolar violation, ESF CRC errors, DS1 signal frequency, all-ones, yellow alarm detection	D4, ESF, SLC/96	AMI/bipolar, B8ZS	No	$2,495
Wiltron (408) 778-2000	Model 9067 High Capacity Digital Test Unit	1.544M	No	Rack mount	CRT	Wire wrap	TL1 interface to remote operations system	Remote	Yes	Bipolar violation, framing errors, ESF CRC errors, DS1 signal frequency, all-ones, yellow alarm detection	D4, ESF	AMI/bipolar, B8ZS	No	$6,000-$10,000 (depending on configuration)

Women under glass

Despite a decade of advances, women still struggle to reach top ranks of IS management

BY MARYFRAN JOHNSON

Part of an occasional series.



Patricia Farwig remembers a lesson about succeeding in a male-dominated corporate world that came straight from Woody Hayes, the legendary football coach of Ohio State University's Buckeyes.

"Woody always said it doesn't matter how smart you are or what your connections are — as long as you're willing to work hard, they'll never outwork you," says Farwig, Hayes' former secretary and now vice president of telecommunications at Mellon Bank in Pittsburgh. "Those words always stuck with me."

Farwig is typical of the handful of women who have made it into upper information systems management positions. She is an admitted workaholic who spends more than 60 hours per week at her job. Yet while hard work and intelligence have taken her to the top, Farwig is still a rare breed in IS.

Despite numerical gains, women have far from equal footing at the slippery top of the IS management pyramid. While the actual number of women employed in computer-related occupations grew by 245,000 between 1985 and 1990, according to the U.S. Department of Labor Women's Bureau, most of the growth occurred in lower paying, nonmanagement positions.

Moreover, pay for IS women averaged 30% less than that for male counterparts doing the same jobs, the Labor Department says.

Analysts cite sexism, a lack of female role models and the historical male domination of computing as the main reasons for the inequities and slowed advancement of women in IS.

"It's discrimination," says Mike Williams, an economist at the Women's Bureau. "Men are in control, and they tend to promote men."

While optimistic about the future, more than 20 women managers, vice presidents, chief information officers and entrepreneurs interviewed by *Computerworld* agree that there is much room for improvement.

"No matter how much we complain, it's still a male-dominated world, and it is harder for women," says Janice Miller, vice president of marketing at Clusterlink in Silver Springs, Md.

Farwig adds: "All other things being equal, the male who has been there longer gets promoted. Things may be good now, but they could be a great deal better. Within IS, there are a lot of good women with very few places to go."

Numbers grow, not influence

Government statistics support the assertion that women in computing careers still have a long way to go:

- A 1988 National Science Foundation report on women and minorities showed that women make up 49% of all professionals but only about 30% of all computer scientists.
- The top layer of computer managers in 1988 totaled 53,000 people — 75% men and 25% women — according to the U.S. Equal Employment Opportunity Commission. Nearly a decade ago, there were only about 24,000 top managers in IS — 82% male and 18% female.

That 7% gain is slow progress indeed, female IS executives point out, particularly since the size of the profession overall grew by 270% during that period.

- Progress for minorities and minority women at the higher end of the career ladder has been at a standstill for nearly a decade. The commission's figures show that managers were 92% white and 8% minority in 1988 — the identical percentage found in 1980 and 1985.

"Women are continuing to accelerate in management levels, but not at the pace I anticipated," says Skip Tolette, a specialist in high-tech executive recruiting and a partner at the New York firm of Schmitt Bishop Tolette.

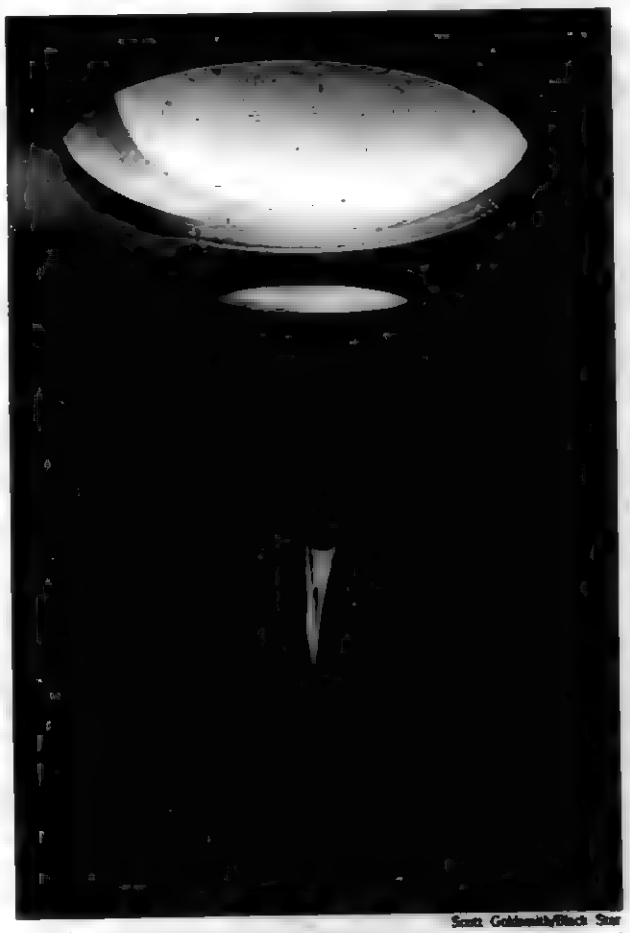
After placing a woman in the senior vice presidency of corporate systems at a major bank back in 1981, Tolette recalls thinking women were making "a major breakthrough." Yet in the past five years, only two of the 40 or so top IS executives he placed were women.

"I just don't see that much dramatic change," Tolette says. "You do read about women as CIOs in the press, but I think it's their novelty that gets them on the cover."

- The great majority of growth for women in IS has been in professional and nonmanagerial positions — a trend that many IS recruiters expect will continue.

Between 1984 and 1989, for example, the number of women systems analysts and computer scientists increased by nearly 85,000. But the numbers are deceiving: The actual percentage of women workers grew by only 1.7% over the previous five years, to 32.4%.

A recent survey of 100 corporate human resources directors conducted by Romac & Associates, a nationwide recruitment agency, found that systems analyst, project manager and programmer analyst were considered the most promising jobs for women in computing.



Scott Goldsmith/Black Star

Mellon Bank's Farwig: ***"Within IS, there are a lot of good women with very few places to go."***

Salaries lag behind men's

Moreover, salaries for women in IS have not kept pace with those for males. In 1989, for instance, male systems analysts and computer scientists earned a median weekly salary of $747, while women earned $620. The $127 per week difference is virtually unchanged since 1984, according to Labor Department figures.

At higher levels of IS management — where six-figure salaries are closely guarded — it is harder to tell if women are keeping pace with men. Most believe that they are not. In a 1990 *Computerworld* investigation of top IS salaries, for example, only one woman, Elaine Bond at The Chase Manhattan

Johnson is a *Computerworld* senior editor, systems and software.

'Superwoman' dead and gone

Today, women executives acknowledge they cannot do it all

BY MARYFRAN JOHNSON

Common to the lives of many executive women in information systems is the sheer unpredictability of their career paths and their struggles with "the Superwoman complex."

Following are brief profiles of how several women have handled their IS career growth and the accompanying stress.

Kathy Hudson
Vice president and director, Corporate IS
Eastman Kodak Co.

Hudson launched her career by earning a bachelor's degree in business and economics from Indiana University. She joined Kodak in 1970 as a systems analyst in the distribution department. A stint as a financial analyst followed, then a move to communications and public relations.

By the mid-1980s, Hudson found herself managing Kodak's Instant Photography Division, which was dissolved after a 1986 court ruling upheld Polaroid Corp.'s patent infringement lawsuit.

"I never did have a definite career path in mind, and I believe that will be more the typical path of the future," she says. "In the past, people would pick a functional specialty and then climb a vertical ladder."

Hudson is also the mother of a toddler and is thus familiar with the career/family juggling act that so absorbs the "thirty-something" generation.

"I could work 24 hours a day, but with a 2-year-old, I can only work from about 7:30 a.m. to 6 p.m.," she notes.

Hudson stresses the perspective and personal balance that family commitments bring: "Whether you are male or female, you have to make trade-offs if you have young children or are active in the community. You cannot do everything."

Susan Mersereau
Vice president and general manager
Weyerhaeuser Information Systems

Mersereau has collected college degrees in European culture and thought, history and education. But telecommunications ultimately held the greatest allure for the Portland, Ore., native.

She moved from teaching in inner-city Chicago schools to a federal job evaluating education programs, then returned to the Pacific Northwest as a planner for Seattle public schools. Her job as MIS director for the school district was the first time computers entered her career plan.

By 1980, she had joined Weyerhaeuser in Tacoma, Wash., as a planning analyst. Two years later, she was promoted to director of telecommunications, eventually becoming the first female manager of an operating division within the corporation. Earlier this year, *Business Month* magazine named Mersereau one of "100 women to watch in corporate America."

"Even if I had written the steps, I couldn't have known what was coming," she says. "To some extent, I've just followed my own course, continually asking the question: Does this make sense? How can we do this better?"

Now settled into a second marriage that added two teenage stepsons to her responsibilities, Mersereau recalls a time in her early 30s when the intensity of her work plus caring for her young daughter made her feel "the opposite of the superwoman complex — I wasn't doing a super job at anything!"

Mary Jo Greil
Manager, management services and planning
International Paper Corp.

Greil joined International Paper last summer, with responsibilities including both management services and technical training needs for 400 IS employees.

Her earlier jobs included managing an electronic document interchange project at Amca Corp., a $5 billion steel manufacturing firm.

Career demands have made it difficult for Greil to sustain a long-term personal relationship and prompted her to undertake a major health program earlier this year because of additional stress.

"This is stress I accepted, and at one point it was very exhilarating," she says. "Then I realized it was taking a major toll, which I don't know is necessarily worth it."

Nowadays, Greil concentrates on developing a more spiritual side of her personality to leaven her ambitions. "I start my day by going to church. It helps me to be a little more balanced," she says.

"I've found that I moved more into the education/administration area, but this is not where I want to be. I really don't have a career path worked out, but I know I am more adventuresome and creative and need a certain element of freedom of action."

Patricia Farwig
Vice president, telecommunications
Mellon Bank

Farwig had a college degree in zoology when she went to work for Woody Hayes, the Ohio State University football coach, in 1975. She pursued her MBA from Ohio State on a part-time basis until 1979.

Arriving at Mellon Bank in 1980, she sold corporate cash management services, then moved into product management, strategic planning and, eventually, telecommunications.

She says the long hours devoted to her career at Mellon Bank eventually contributed to her divorce. Today, she says, "I'm not juggling anything other than a personal relationship now, so I don't have to play superwoman."

Farwig explains that her " 'significant other' is extremely understanding and helpful, and that is absolutely a necessity. You can both be very high-powered in your careers, but it has to be a cooperative effort."

Joan Alvarez
Vice president
Swiss Re Services

Alvarez speaks with intense gratitude for the opportunities that enabled her to rise within the Switzerland-based reinsurance firm and the help her husband provides at home. After his injury 20 years ago in a serious auto accident, he took over all the responsibilities at home.

"He has assumed everything," she says, including the care of her 83-year-old mother. "I have been very lucky, and I am envied because of the support I have."

Alvarez admits that her standard work week has been 50 to 60 hours for at least 30 years. "I am very bad. I will take stuff home, and I travel on Sundays to be sure I'm at a Monday meeting, and I don't do recreation well at all!"

Karen Hughes
Chief of communications services
Federal Reserve Bank of New York

Hughes started at the bank 10 years ago as an MVS systems programmer on an IBM mainframe, expanding into data communications, automated operations and recovery facility work. A promotion put her into the bank's initial level of management.

However, a 15-year absence from the workplace to raise children meant "a lot of lost ground" toward her management goals, she notes. Today, she says, it is important to work extra hard to gain the recognition of corporate management.

Patricia Wallington
Vice president, Information management
Xerox Corp.

Wallington acknowledges that she works "incredible hours," averaging 16 hours per day.

"I'm a believer that you go through stages where different things are important at different times," she explains. "I grew up in a time when 'shoulds' were a part of the environment. But if I did everything people told me I should do, I would not be where I'm sitting today." •

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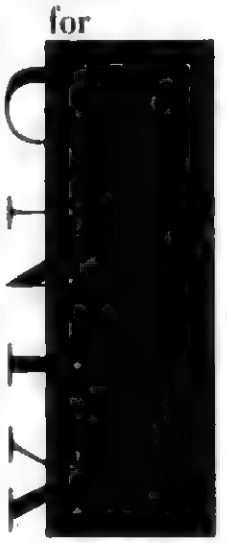

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One reason women are sometimes offered lower salaries is that because of family and child-bearing duties, they are often perceived as lacking the mobility of male executives.

"If a client comes to a recruiter but is restricted in budget, he can basically get a better caliber woman" for the same dollar amount as would be spent for a male executive, Tolette explains. "Because of the apparent lack of mobility for women, there are some extremely talented ladies available at lower salaries."

Few role models

The problems facing women in computing extend even beyond the work force. Fewer and fewer U.S. students, including women, are electing to study computer science. A University of California at Irvine study found that in 1986, women earned only 12% of all computer doctorates. Little has changed since then, researchers say.

And the dwindling numbers of women academicians are increasingly being lured into private industry, which promises better hours that are often more conducive to family-building, reports an article in the November issue of *Communications*

Equal work, not equal pay

Women in IS staff jobs fare no better than female colleagues in other fields. Average pay: 70 cents for every dollar earned by males

Systems analysts/computer scientists

1989 .... men $747 .... women $[illegible]
1984 .... men $623 .... women $[illegible]

Programmers

1989 .... men $651 .... women $[illegible]
1984 .... men $510 .... women $[illegible]

Data entry/keypunch

1989 .... men NA* .... women $300
1984 .... men NA* .... women $258

[illegible]

1989 .... men $416 .... women $321
1984 .... men $373 .... women $268

Figures are median weekly incomes for full-time wage and salary workers

* Not available: Fewer than 50,000 U.S. workers

Source: U.S. Department of Labor Women's Bureau
CW Chart: Marie Haines

of the ACM.

The long-term effects of such shortages concern many women IS managers. Kathy Hudson, vice president and director of corporate IS at Eastman Kodak Co., worries about the declining number of women receiving technical and engineering degrees.

"It was 26% in 1988, compared with 39% for men — and both numbers are in decline," she notes, adding, "I think we as a country have some extremely challenging times ahead in how we deal with that."

Further complicating matters is the fact that women who achieve high-level IS positions are often determined *not* to call attention to themselves as an oddity or exception to a rule. Several executive women who spoke with *Computerworld*, for example, were leery of speaking on the topic of women in IS and made a point of saying they did not want to be identified as feminists in any way.

Ellen M. Hancock, vice president and general manager of communications systems at IBM, for example, declined to be interviewed. "She doesn't do that sort of interview," her spokeswoman said.

Despite these less-than-heartening realities, many women in IS today are upbeat about their future prospects. "We are in a transition era as women," Hudson says. "The number of women at very senior levels is still quite small, though one keeps hoping that will change."

Many are optimistic

"I think you will find fewer women in the higher ranks now than you will in 10 years," predicts Diane Smigel, vice president of IS at John Hancock Mutual Life Insurance Co. in Boston. "There just haven't been that many women in the management pipeline before. But I think the IS profession is very well suited for women to do well and to progress through the ranks."

Unlike the entrenched business worlds of finance or industry, the relatively young MIS field opened up "a more level playing field" for women, notes Mike Hammer, IS consultant and president of Hammer & Co. in Cambridge, Mass.

"Compared to other functions in corporate environments, systems has been relatively hospitable to women," Hammer says. "One reason is that IS as a whole is a new function, as opposed to older ones with accumulated bias against women and a pipeline full of men. Women didn't have to elbow their way past a lot of others."

Certain fields, such as insurance, telecommunications and law, are widely believed to be more hospitable to women IS executives than banking and finance.

"Years ago, banks were paying much lower salaries, so they attracted women and minorities," explains Mary Kay Hamm, a partner at Romac & Associates in suburban Philadelphia. "Now, those same people are moving into management positions."

Smigel says she believes the midmanagement talent pool is brimming with women preparing to assume a more equitable share of the top jobs by the year 2000.

Small galaxy of stars

Despite several obstacles, IS systems management is slowly developing its own roster of high-profile female executives, such as Hudson, Bond, Smigel, Patricia Wallington, vice president and CIO at Xerox Corp.'s U.S. Marketing Group, and Carlene Ellis, vice president of corporate administration at Intel Corp.

Women who do arrive at the uppermost reaches of the profession are likely to have backgrounds emphasizing business training over technical expertise.

Devi Huggins, for example, is a technical officer in securities clearance at Manufacturers Hanover Trust Co. She is working on her MBA by taking night classes at New York University.

"I'm aiming for corporate management," explains Huggins, president of the New York chapter of the Association for Women in Computing. "This is something my employer encouraged me to do."

Mary Jo Greil, who manages the Management Services and Planning Division at International Paper Corp. in Memphis, also underlines the need for IS professionals to flesh out their business backgrounds to "gain credibility" with top company managers. She holds a doctorate in education with an MIS speciality, as well as an executive master's in telecommunications and IS management.

Women in IS

The number of women entering computing swelled during the last five years of the 1980s, but percentages remained the same

Systems analysts/computer scientists

1984 total:
310,000 .... 93,000 women (30.7%)
1989 total:
566,000 ... 177,930 women (32.4%)
UP [illegible]

Programmers

1984 total:
507,000 ... 177,450 women (35.4%)
1989 total:
561,000 ... 196,350 women (35.2%)
UP [illegible]

Data entry/keypunch

1984 total:
351,000 ... 319,410 women (91.3%)
1989 total:
414,000 ... 360,180 women (87.8%)
UP 40,770

1984 total:
713,000 ... 456,320 women (64.7%)
1989 total:
870,000 ... 556,800 women (64.2%)
UP 100,480

Source: U.S. Department of Labor Women's Bureau
CW Chart: Marie Haines

The next big step

Moving from middle and upper management into company leadership is still an elusive goal for many executive-level women, however.

"The real challenge is to move higher. You have to work hard to stand out," says Karen Hughes, chief of communications services at Federal Reserve Bank in New York. "Many women, including myself, have not really been raised to be assertive, to push your way forward. You have to learn how to do that."

One way to get to the top fast is to get out of the corporate rat race, says Margeurite Zientara, author of *Women, Technology and Power* and editor of *Boston Computer Currents*. "The Glass Ceiling *does* exist, and the best way to get around it is to go off and do it yourself. Start at the top by starting your own company."

She cites personal computer luminaries such as computer newsletter editor Esther Dyson and Janelle Bedke, cofounder of Software Publishing Corp., as proof of the opportunities for women, especially in the PC industry.

Others are more sober about the immediate prospects for women in IS management. "I'm not expecting a miracle," Hamm says. "Organizations are getting flatter all the time, and a lot of middle managers are being let go."

Another bad sign, she says, is the growing popularity of a practice she calls "swabbing out." In this, experienced workers, including many women, are laid off and soon replaced by less costly, less experienced workers.

Even so, Hudson and others say they are optimistic about the future for women in IS. Today's issues may not even be relevant, she adds.

"Forget the male vs. female stuff," Hudson says. "In the future, we'll be dealing with a flatter, more technologically dependent corporation. Careers will be more like meandering down a stream than climbing the rungs of a ladder."

Next week: Strategies for advancement. •

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Data General Corp. began shipping its reduced instruction set computing-based Aviion computers last week to the Water Resources Division of the **U.S. Geological Survey**, notwithstanding a reportedly pending congressional investigation into the awarding of the $127 million, seven-year federal contract. The struggling computer maker has thus far legally prevailed against a losing bidder's attempts to have the U.S. Court of Appeals overturn the lucrative deal.

Another bumper crop from the farmer of the Dell

Widely reported softening in the personal computer market apparently bypassed the Austin, Texas, door of **Dell Computer Corp.** Crediting strong gains both at home and abroad, Dell reported a third-quarter net income increase of 700%, to $7 million on revenue of $137 million, which was a 43% increase over sales posted for last year's corresponding quarter. The company did, however, inject a note of caution into an otherwise crowing prepared statement: Noting that margin improvements were shaved by a recent spate of price cuts, the statement said that pricing pressures in the personal computer market show no sign of abating.

More briefs on page 99

Manufacturing alliance takes shape

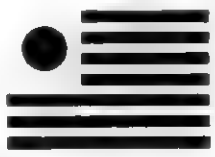
BY GARY H. ANTHES
CW STAFF

TOKYO — The U.S., Japan and Europe have reached an agreement in principle to form an ambitious partnership in advanced manufacturing technologies.

In two days of meetings held late last month, delegations from the three regions agreed to set aside their differences and proceed to establish one or more interregional consortiums of manufacturing companies and universities.

No firm plan detailing funding, organization or specific research topics has yet been drafted, and the partnership is far from a done deal, said Mark S. Lieberman, acting assistant technology secretary at the U.S. Department of Commerce and leader of the U.S. delegation.

"But I am very encouraged that we will come up with a mutually acceptable program," Lieberman said. He added that the next step is to take the concepts agreed on to U.S. industry for approval. If that goes well, another three-way round of negotiations will be held in Washington, D.C.



"U.S. industry sees this as a wake-up call for developing its own manufacturing agenda," Lieberman said.

Zeroing in

U.S. industry has proposed that the partnership focus on international standards for advanced manufacturing and information technology, manufacturing systems integration, quality engineering and process technologies.

The so-called Intelligent Manufacturing Systems project sparked controversy when it was originally proposed by Japan.

Japan's Ministry of International Trade and Industry (MITI) proposed a 10-year, $1 billion collaboration, with MITI putting up $400 million and Japanese, U.S. and European industry each providing $200 million.

Japan explained the lopsided funding as a response to charges that Japanese industry gets more than it gives in the international high-technology arena.

However, at a meeting in May, U.S. and European officials balked at the proposal, saying that unequal funding implied unequal control. An updated proposal from Japan in August suggested that each region provide one-third of the funding.

U.S. industry and the U.S. Department of Commerce supported the concept of international collaboration but worried that the proposal appeared to be going after superior U.S. know-how in software, artificial intelligence and systems integration technology without a fair return of applied manufacturing technology, in which Japan excels.

"No, I'm not at all surprised an agreement was reached," said Masahiro Moshii, a professor in the materials science and engineering department at Northwestern University.

"The stumbling block has been in our minds," he said. "The Commerce Department has been concerned about Japan stealing our brains, our ideas. That could happen, but it depends on how we set it up."

According to Moshii, earlier missteps on the part of Japan resulted because the idea for Intelligent Manufacturing Systems was conceived and led by politically naive Japanese university professors. "Things like this are not well orchestrated in Japan," he said.

Vendor and users unite to help children find homes

BY SALLY CUSACK
CW STAFF

DENVER — Combine a couple of thousand children waiting to be adopted, a dedicated computer software user group, minicomputer vendor Prime Computer, Inc. and an energetic director, and what do you get?

You get the Rocky Mountain Adoption Exchange, a resource center for hundreds of adoption agencies networked throughout the country.

It all started in March 1983, when Adoption Exchange Executive Director Dixie van de Flier Davis issued a plea on a weekly installment of the popular network television segment "Wednesday's Child" saying that the Rocky Mountain Adoption Exchange was in dire need of office space and computer assistance. The service was then working with a post office box and a handful of volunteers.

Peggy A. Long, vice president of Fitzgerald and Long, a Denver-based software and systems support firm, was the first to respond. The company provides services exclusively to the Prime Information database user community, and Long said she felt there must be a way to tap into the Colorado Prime Users Group for help.

Davis remembers the event clearly: "Peggy Long called me and said, 'Let me talk to you about your computer needs.' And we went from there." They went, in fact, to Prime; inspired by its users, the firm donated the needed computer equipment.

Continued on page 98

Florinda Rosso

Adoption *of this child became a reality, thanks to Prime*

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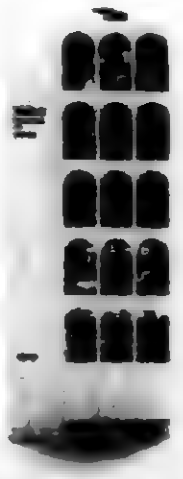

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Children

CONTINUED FROM PAGE 97

Long proceeded to organize the response within the Prime Information community, Davis said, and initially arranged for free computer time-sharing and organized a data-entry committee consisting of Prime Information users.

The group entered data and sent literature to interested parties, wrote entry screens and created databases within Prime Information to coordinate donor activities and mailing lists and maintain pertinent data on both the children and the prospective parents.

"We started out with computerized matching," Davis said, "and things just took off from there."

This type of technical support enabled the Adoption Exchange to blossom and establish fund-raisers on several regional television stations, Davis said. "We do fund-raisers in three states every spring," she said, "and the Prime users help us to put together the response."

The Adoption Exchange exists to find families for hard-to-place children. Usually, this means older children and adolescents as well as children with physical handicaps, multiracial heritages and learning disabilities, Davis said.

"The average child waiting to be adopted is a 12-year-old boy who has spent four years in and out of foster care before being eligible for adoption," Davis explained.

The center relies on media, mass mailings and an extensive database in an effort to match the child with adoptive parents. According to Davis, 97% of the adoptions in the U.S. are successful, and in fiscal year 1990, the Adoption Exchange matched 187 children with families. "It was our best year ever," she said.

Davis added that the computer equipment and support has allowed the agency to be more efficient and to spend less time on manual records management and more time with clients.

Things have changed since the early '80s, however, and as the Adoption Exchange grew over the years, extensive word processing and database inquiry functions outpaced the dial-up port on which the group originally relied. The user group appealed to Prime for a solution to the problem. Prime initially responded by donating a Prime 2250 minicomputer to the organization, and terminals and peripherals were contributed by a variety of other companies. The Adoption Exchange continued to grow, and Prime eventually added a 2755 machine, 25 PT250 terminals, a laser printer and even kicked in support from its local branch office.

"Prime gives us reduced rates on our maintenance and treats us like a regular customer," Davis said. Prime employees, she added, even get involved with the center's data management committees, helping out with communications and other technical issues.

"Prime is happy to continue supplying the exchange with equipment that speeds up the process of matching adopting families with children in need," said Paul D. LaBelle, a spokesman for Prime.

Working for the Adoption Exchange is an ongoing commitment. The center's mailing list now approaches 18,000 entries, and, according to Davis, the programming is still done entirely by the Prime user group volunteers.

"By this time next year, over 1,000 children will have been placed since Peggy Long contacted us in 1983," Davis said.

Corporate contributions

Industry giants such as IBM and Eastman Kodak Co. have long been making substantial financial donations to supplement the arts, sciences and education.

Fortunately, the trend continues. AT&T recently donated computer equipment valued at $1.2 million to the University of Miami's medical school to be used for research of certain medical conditions and diseases — particularly high-risk pregnancies and acquired immune deficiency syndrome.

The contribution includes an AT&T Unix System V-based network computing platform and several AT&T midrange computers, as well as training and technical support.

Another vendor caught in the act of Good Samaritanism is SAS Institute, Inc. in Cary, N.C. SAS donated PC SAS Version 6.03, a personal computer version of its SAS information management package to the Women's Center in Raleigh, N.C., and has provided training and file conversion services for the center.

The Women's Center, a multiservice counseling and resource center for women, offers peer counseling, support groups, workshops and referral services. The SAS system generates quarterly statistics of a demographic nature, such as number of women serviced, age, income and location. The data is then forwarded to agencies that help to fund the center, such as the United Way and the city of Raleigh.

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COMMENTARY

J.A. Savage

Let others do the grunt work

No blueprint exists for the seemingly incongruous marketing plan that Sun Microsystems has embarked on. It's not just anti-IBM marketing gospel, it's anti-business school. Don't get me wrong, though — just because it wasn't hatched in B-school doesn't mean that it won't work.

The plan has the potential for two extremes: It will either send Sun screaming down dank, bankrupt canyons pursued by its own motherless clone progeny, or it will allow the firm to ride high on the tide of technical innovation provided by other computer companies — at no cost to Sun.

Officially, Sun's strategy goes like this: "Open systems, licensing, partnerships and the promotion of next-generation technologies are some of the ways Sun is changing the rules to achieve strategic intent . . . Since healthy competition stimulates innovation and gives customers value, the solution is to open up markets to more vendors . . . Competing through collaboration . . . encourages parallel innovation, as various companies concurrently design their own version of this technology . . . Licensing technology also helps establish new standards, reducing the risk for companies by ensuring them a broad market, and for customers, it reduces risk by making sure they aren't captives of a single vendor."

In real-life terms, here's what it means: Other RISC companies — with one minor exception, Hewlett-Packard, but I'll get to that another time — take it upon themselves to do all their own research and development. Mips, Intel and Motorola have their own engineers developing the next greatest, fastest RISC chip. They also have their own engineers trying to surmount all the problems of the next greatest, fastest RISC chip.

Then those companies license the silicon mask to chip makers, which tailor the chips to their own specifications. There are second, third and fourth sources, but they are all the same.

Not Sun. Once Sun had the basic architecture for its Sparc RISC processor, it invited everyone to the party. And all the guests were — and still are — dire foes in the marketplace. Still, they sip their cocktails and make nice with the binary compatibility specifications necessary for Sparc.

Chip makers such as Texas Instruments, LSI Logic and Cypress Semiconductor — as Sun licensees — now have to send their own engineers back to R&D to come up with the next greatest, fastest Sparc processor. Those companies — and there are lots more than the three mentioned here — are spending their own bucks to improve Sparc. Sun doesn't have to do a thing except wait for the best chip to come out and then put it into its own systems. Its R&D goes elsewhere — into value added — while the licensees do all the grunt work.

HP licenses its Precision Architecture RISC technology in much the same way, but it is limited to only two licensees at this point, and there is little competition between them. Sounds good so far for Sun's strategy, but even the company knows the gruesome potential of its own business plan.

All those licensees can build their own computers around their own Sparc chips. They could be cheaper and more powerful than Sun's own computers. Users could prefer these clones the way they buy IBM PC clones at the low end.

That's the rub. "No, I don't love these guys; I want to beat them," Ed Zander, Sun's top marketing man, said. But without them, Sparc wouldn't be as well developed or as popular.

Comdex/Fall '90 offered the first glimpse of the fruits of Sun's strategy. Sun's CEO, Scott McNealy, didn't even know how many Sparc compatibles were going to appear. His first public estimate was 30, and that was revised down to 10 early last month. Eight actually appeared. Sun is taking an interesting risk. The company will see its offspring grow into challenging adolescents. Will they offer the advantages to users that Sun does and reap the benefits Sun now enjoys? We'll see.

"If we do nothing more than invent clones that take the market, then that's the last chapter for Sun," Zander said.

Savage is a *Computerworld* West Coast senior correspondent.

NATIONAL

BRIEFS

Ascii and you shall be given

Last year, Menlo Park, Calif.-based database maker **Informix Corp.** bought a 10% stake in Tokyo-based **Ascii Information Systems**, a subsidiary of Japan's **Ascii Corp.** Last week, Ascii, which is actively bearing the open systems banner in Japan, agreed to purchase 5% of Informix for approximately $6.7 million. The firms are resolved to intensify their relationship only within limits; last week's agreement includes a ceiling on the number of Informix shares Ascii can acquire.

EIS

If You're Thinking About It...

Hong Kong telecom plan falters

BY LAURA M. JANNEY
and KENNETH WONG
IDG NEWS SERVICE

HONG KONG — Hong Kong lost more than the potential for cable television last month when Hong Kong Cable Communications (HKCC) withdrew from the well-publicized cable TV project. The bigger issue may be the future of telecommunications competition in Hong Kong.

In discussions last year, Miles Davenport, an executive at HKCC consortium member US West, said Integrated Services Digital Network switching was as important to HKCC as its cable TV plans. At the time, Davenport said he was startled by the many people who said they believed the company was primarily interested in cable TV.

During those discussions, Davenport called for the dismantling of the domestic voice telecommunications monopoly, saying that HKCC was well prepared to take advantage of any relaxation of the monopoly.

But in disbanding its cable TV project, the consortium also appears to have given up its plans for voice telecommunications. In fact, it appears that the group has called a stop to all further business activity.

During attempts to contact HKCC late last month, the firm refused telephone calls, explaining that company executives would no longer be in the offices and that the phone lines were going to be disconnected. Davenport has since been posted back to the U.S., and other US West executives in Hong Kong were unavailable for comment.

However, Davenport's belief in a second, competing telecommunications network is apparently shared by others in the industry. Lawrence Garfinkel, AT&T's vice president for government affairs, said last month, before HKCC's announcement, that Hong Kong should go ahead with its development of a second telecommunications network. Doing so would generate competitive pressure that would benefit Hong Kong's business community, he said.

"Introduction of a second carrier such as the one proposed by the [HKCC] group can stimulate competitive pressure in a monopoly environment," Garfinkel told a meeting of the Hong Kong Management Association.

> "THE HONG Kong government has announced the first step to stimulate competition by developing an alternative carrier."
>
> LAWRENCE GARFINKEL
> AT&T

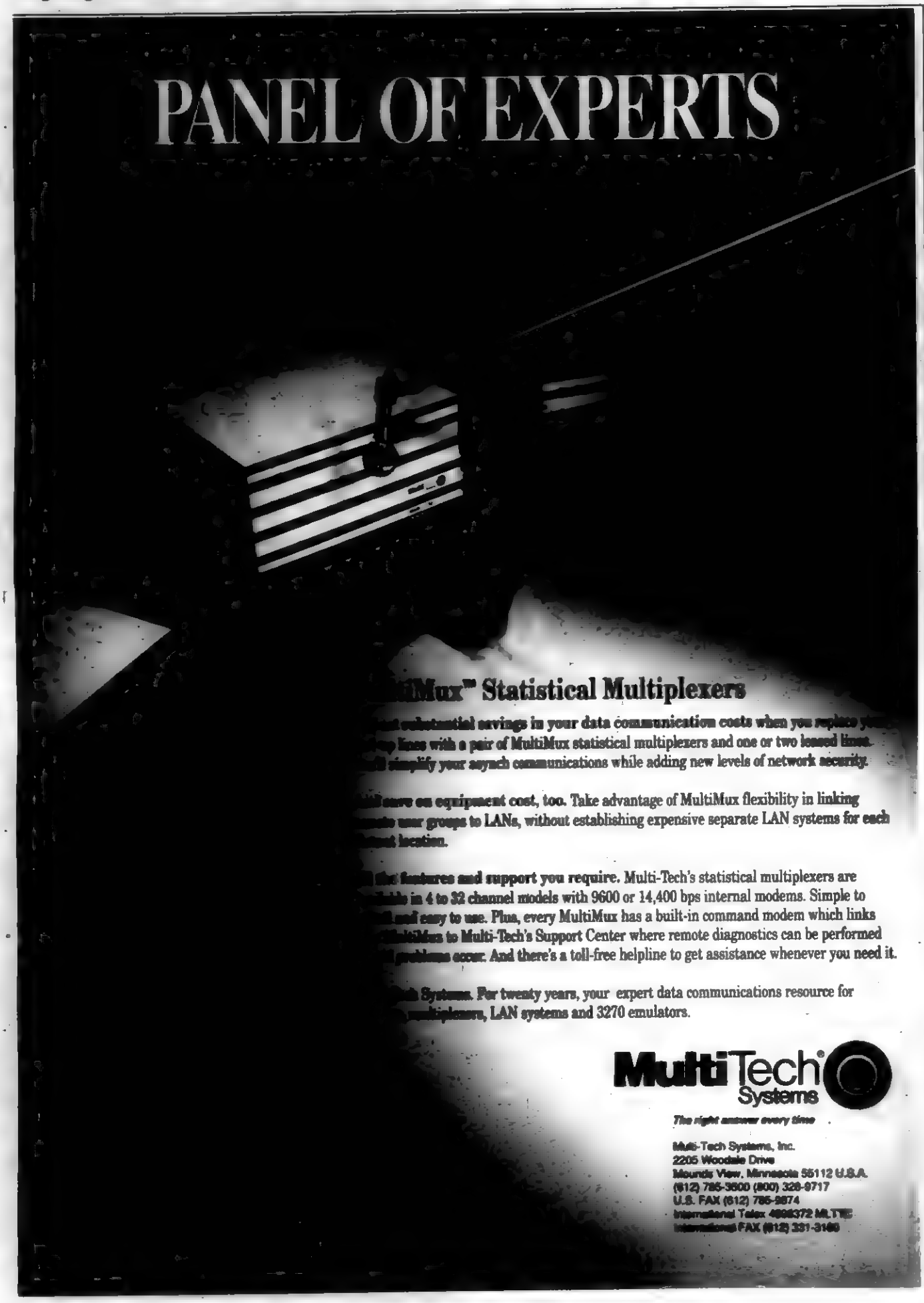
AT&T was one of the parties interested in the second carrier project, but it did not succeed in mounting a winning proposal, Garfinkel said. He observed that introducing a second network is the first step toward inducing competition.

"According to my understanding, the Hong Kong government has announced the first step to stimulate competition by developing an alternative carrier," he said. Hong Kong Telephone's present franchise for domestic telecommunications ends in 1995.

Rumors of the withdrawal had been circulating since local investment holding company Hutchison Whampoa Ltd. announced its intention to develop satellite master antenna TV early this summer. The proposal was given the go-ahead by the Hong Kong government in late October.

The government has indicated that future negotiations will likely divide the issues of cable TV and voice telecommunications.

Janney and Wong write for Computerworld Hong Kong, *an IDG publication.*



AMD lays off 200 employees

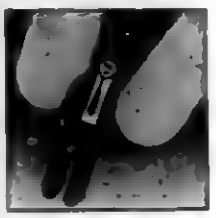
BY MAURA J. HARRINGTON
CW STAFF

SUNNYVALE, Calif. — Like a high-flying kite caught unexpectedly in a thunderstorm, Advanced Micro Devices, Inc. (AMD) last week laid off 200 of its 12,000-plus worldwide staff.

The layoff came only weeks after AMD won significant legal victories in its ongoing battle with Intel Corp. over the right to use key chip technology [CW, Oct. 15].

AMD further confirmed that the layoffs, due to be completed by the end of the month, will be followed by at least one more round of work-force cuts. Sources speculated that the combined layoffs will trim up to 4.2% of the company's worldwide work force and practically eliminate its U.S. marketing department, which analysts claim is much needed to successfully market AMD's upcoming AM386 microprocessor, an Intel clone chip. AMD declined to comment on how deep the combined layoffs will cut.

The first round of cuts were mostly at the sales and administrative levels, according to an AMD spokesman, who called them a necessity to help offset the firm's most recent quarterly losses. AMD reported a net loss of $17.8 million on revenue of $254.2 million in worldwide sales for its third quarter ended Sept. 30; the revenue figure marked a 7.5% drop from sales posted in the comparable quarter last year.



The next wave of layoffs, which is expected to affect as many as 300 people shortly after the new year, will cut deeper into the company and on a higher level, including upper-level marketing and sales executives, the source said.

AMD is blaming the first wave of layoffs on lagging CMOS chip sales, a lower than expected plant productivity rate and unusually high capital spending, the spokesman said.

"Capital spending in 1990 will have totaled $300 million, of which nearly $200 million is being spent on our submicron facility in Sunnyvale," which is due for completion sometime next year, the spokesman said.

AMD is not the only Silicon Valley semiconductor firm experiencing layoffs. Applied Materials, Inc., in Santa Clara, Calif., slashed between 250 and 350 employees from its staff last week and reduced executives' salaries by 10%, the company said.

Mail-order firm losing cash, CEO

BY MICHAEL FITZGERALD
CW STAFF

EDEN PRAIRIE, Minn. — Mail-order personal computer vendor Northgate Computer Systems, Inc. announced last week that it was not meeting the provisions of its bank loans and had replaced its chief executive officer, indicating that the company was in trouble.

A relative newcomer to the PC industry, Northgate, which was founded in 1968 but switched from novelty products to PCs only three years ago, has followed a strategy of providing low prices, high-quality machines and excellent service to make it in the brutal mail-order business.

While Northgate still projects $240 million in sales this year — more than double its 1989 sales of $110 million — it is almost out of cash, according to documents recently filed with the Securities and Exchange Commission, in which the company states that it is not meeting some provisions of its bank loans. The same documents noted the resignation of its CEO, Lawrence Greenberg — even as the December issue of *Minnesota Ventures* magazine featured a cover article on Greenberg's skillful management of growth at Northgate. Greenberg, still a board member, was replaced by Gary Held, former president of the retail chain Connecting Point of America, Inc.

The company's cash problems come after a $1.9 million third-quarter loss, and despite almost $10 million in financing garnered over the last two quarters. In July, after unsuccessful attempts to go public, Northgate took a rarely used alternative and cut a "junk stock" deal with Ante Corp. II, a Minneapolis-based fund, selling Ante a 13% stake for $4.4 million and thus becoming a publicly traded firm without making an initial public offering.

In addition, Northgate's bankers reportedly increased the firm's revolving line of credit from $10 million to $15 million in the last quarter. Northgate officials did not return *Computerworld*'s calls.

Northgate has been implementing a program to cut costs, laying off 150 of its 870 employees since the beginning of September. Last week, Held cut his salary and those of the other two senior managers by 50% and said expenses had been reduced by $1 million per month.

Nevertheless, analysts appeared loath to count Northgate out last week. The recent news is "definitely not a good sign, but there's nothing we can see from here to make us say [they're gone]," said Dan Ness Jr., PC analyst at Computer Intelligence in La Jolla, Calif.

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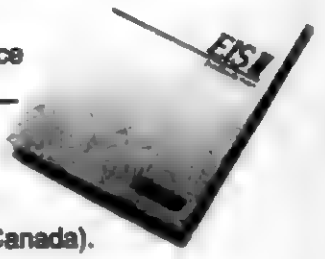

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*David W. DeLong, co-author of "Executive Support Systems: The Emergence of Top Management Computer Use."

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INTERNATIONAL
BRIEFS

Whither the House of Cables?

Thatcher's out, Major's in — now, on to the really hard decisions for the **UK Parliament**, which has on its agenda for this session the question of whether to implement a cable network aimed at wiring Whitehall into the computer era. The decision will be made in light of a recent report on computer services released by the UK Commons Services Committee, which urged, in part: "The House cannot continue to adopt the wholly amateur approach to the use of new technologies," in contrast to the strides made by parliaments of other countries.

Light at the end of the Channel

Despite the immediate recession, long-term growth prospects for the European computer industry through the 1990s are still bright, according to a study released by UK-based **Ovum Ltd.** By the year 2000, Ovum forecasts overall industry sales at three times what they are today in real terms. The company said it also believes that the industry will return to real growth averaging some 11% annually.

Unification privatization

Telekom, the telephone business of the **German Bundespost**, is reportedly being considered for partial privatization. The move is intended both to raise money to help cover the cost of German unity and to speed the recabling of what was formerly East Germany. A study group set up by the Bonn cabinet is currently investigating alternatives for the infusion of private capital into infrastructure projects.

Brand-name loyalty oath

The gospel according to Madison Avenue is finding converts in **Hong Kong**, where computer manufacturers are fast becoming aware of the need to develop brand-name recognition. Spurred by the increasing commoditization of personal computers, peripherals and even facsimile machines — and the consequent decrease in OEM margins — the **Hong Kong Trade Development Council** is holding a conference on brand names, and the chairmen of leading high-tech firms such as Informtech and Video Technology have plans to develop their own brand names.

EDI going Dutch

With about 30 electronic data interchange (EDI) networks currently operational and a similar number in test phase and almost ready to go, **The Netherlands** is becoming a hotbed of EDI development. Some 1,400 institutions now use Dutch EDI; the figure climbs to the 1,800 to 2,300 range when hybrid videotex/EDI systems are counted. The Dutch Ministry of Economic Affairs is actively stimulating new projects, because EDI is seen as key to the country's future economic development. So said Walter Zegveld, director of a Netherlands-based research center, in a report given before the 1,000 attendees who flocked to the country's first EDI national conference, held recently in The Hague.

EXECUTIVE CORNER
Alpha COO steps down

Alpha Microsystems announced the resignation of its president and chief operating officer, John S. Cain, last month. Cain, who cited personal reasons, leaves at the end of a year that saw his company log 11% growth, complete two major acquisitions and expand its multiuser systems and software sales into the worldwide market. Replacing Cain is NCR Corp. veteran and marketing consultant **Clarke Reynolds**, who had been serving as vice chairman of Alpha Microsystems and will continue to hold that office.

Storage Technology Corp. expanded its international marketing savvy with the advent of 30-year worldwide marketing veteran **Geoffrey de Belloy** as senior vice president reporting on special assignment to Storage Tek president and Chief Executive Officer **Ryal Poppa.** De Belloy's experience spans systems companies and continents: For the past eight years, he has served at **Wang Laboratories, Inc.** in Europe, most recently as head of distribution for Europe, Africa and the Middle East.

Retix promoted its president, **Steve Frankel**, to president and CEO late last month, replacing **Andy De Mari** as CEO. De Mari, founder of the Santa Monica, Calif.-based Open Systems Interconnect products manufacturer, will retain his position as chairman of the board. Frankel joined Retix as president and COO two years ago. He served as president of Emulex Corp. prior to joining at Retix.

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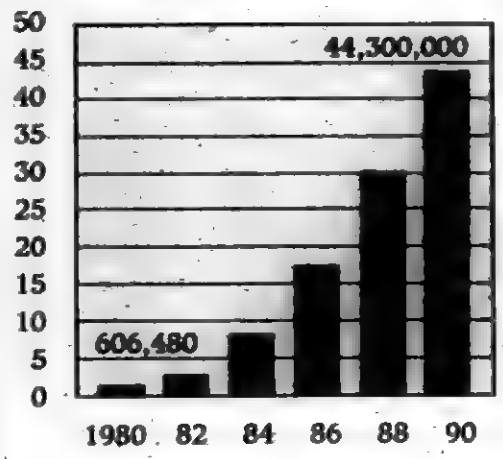
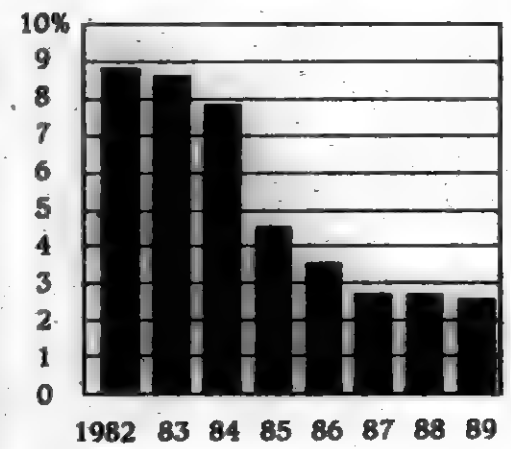


Fewer campus freshmen are choosing computer careers**



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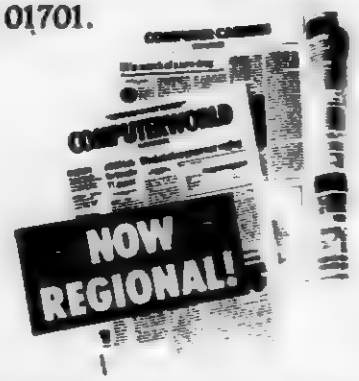

COMPUTERWORLD

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University IS poses tough challenges to the unwary

Before making a job switch, consider roadblocks you may face

BY BRYAN K. BEVERLY
SPECIAL TO CW

Managing technology in an academic environment has its unique twists and turns. As an information systems professional and research assistant at Johns Hopkins University in Baltimore, I've come to grips with what these idiosyncrasies are and how they should be dealt with. Any IS executive considering a move to academia should be aware of these problems and some possible solutions, or the transition to academia could be daunting.

• **Lack of hardware and software standardization.** In many universities, faculty members — professors and associate professors — are given free rein in choosing whatever brand of equipment they want as long as the cost is covered by their grants. As a result, professors and their staffs can't easily share information because of multiple workstations and incompatible software programs.

One solution in this freewheeling environment is to set limits on the selection process. While IS managers don't want to restrict faculty members in their research needs, they can provide a limited — but reasonable — list of products that the IS department will support.

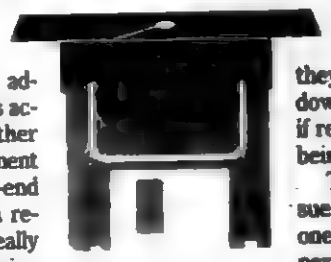
• **Inconsistent technical training.** Faculty members place various levels of emphasis on upgrading skills. This results in a lack of consistent technical training, which reduces the efficiency and the effectiveness of the entire university staff. Some faculty members allow ample work time for themselves and their staffs to enhance their technical skills; others don't because of cumbersome teaching and research schedules.

> IN MANY universities, faculty members — professors and associate professors — are given free rein in choosing whatever brand of equipment they want.

The IS manager can address this problem by meeting with appropriate department leaders to emphasize the dire need to enhance the skills of the research and support staff in particular.

This task must be handled with sensitivity if there are concerns that the staff members will leave after an investment has been made in their professional development. While the risk of turnover should be carefully weighed, the scale will likely tip in favor of better training to increase productivity.

• **Mismatches between technology and work load.** Mismatches result in slow turnaround times and user frustration. For example, one department that is more prestigious than another may have more advanced technology than is actually needed. On the other hand, a science department may be working on low-end personal computers for a research project when it really needs high-end processing abilities.



For the latter example, IS managers can help out by collaborating with the faculty on what the needs of a particular project are during the grant application process. If the professor explains the information technology needs of the project, the manager can recommend the best equipment based on the prices and the desired tasks. The collaboration of the faculty and the manager not only ensures proper purchases but also helps the faculty understand the importance of planning information systems for empirical research.

• **Shortage of technical support.** Many universities are shorthanded in this area, which slows the pace of work and forces departments to rely on technical support from outside to maintain hardware and software. Because of the transition from centralized to decentralized processing in the 1980s, one person can't possibly support the technical needs of a large university.

With microcomputers available in every department, the faculty member, staff member or student who is most proficient in any aspect of computers is usually called on to solve everyone's problems, ranging from formatting a disk to installing software. The problem is that these people are perceived as being able to solve all technical problems, and they shouldn't be bogged down with that responsibility if research or other tasks are being done.

The technical support issue can be resolved by hiring one technical support person per department to maintain the information technology. If hiring an additional staff member is not financially feasible, then the alternative step is to designate and train a faculty or staff member to support the department on a part-time basis.

Good information technology in any environment is a must. But special roadblocks exist in academia, and it's helpful to understand what you may be up against before you make a move to a college or university. Based on my experience, techniques such as standardizing the hardware and software, upgrading the skills of the staff, carefully assessing the information needs of projects and staffing each department with a technical support person will improve the productivity of the faculty, staff and students.

Beverly is an IS executive and research assistant at Johns Hopkins University in Baltimore.

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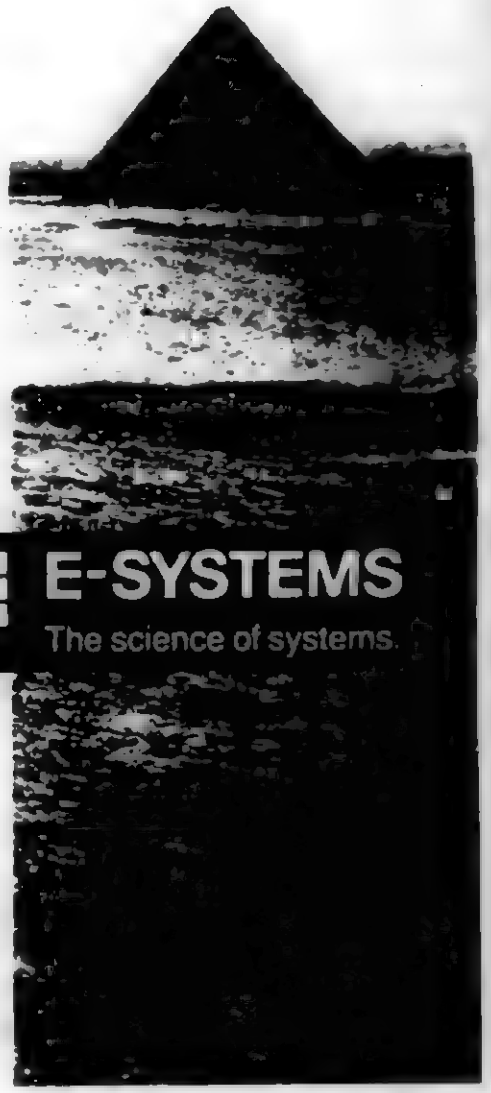

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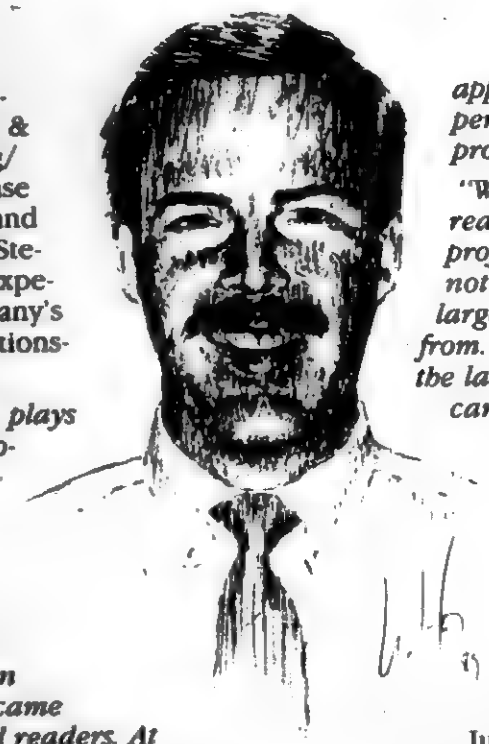

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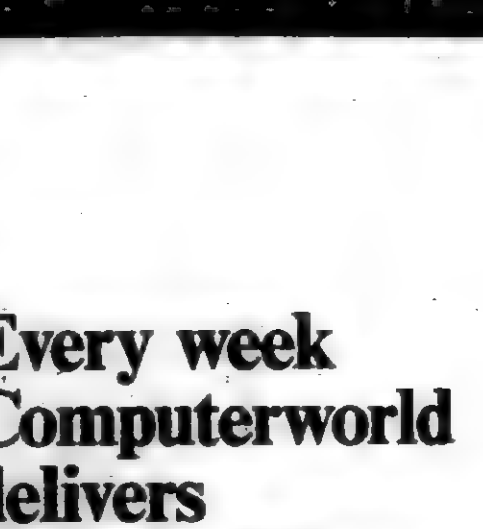

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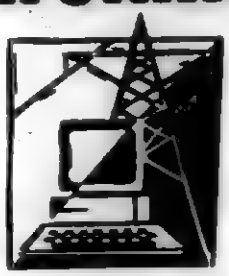

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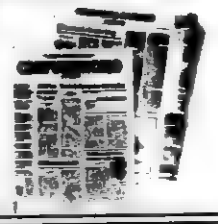

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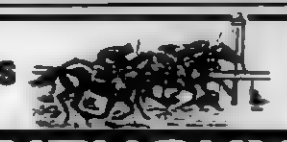

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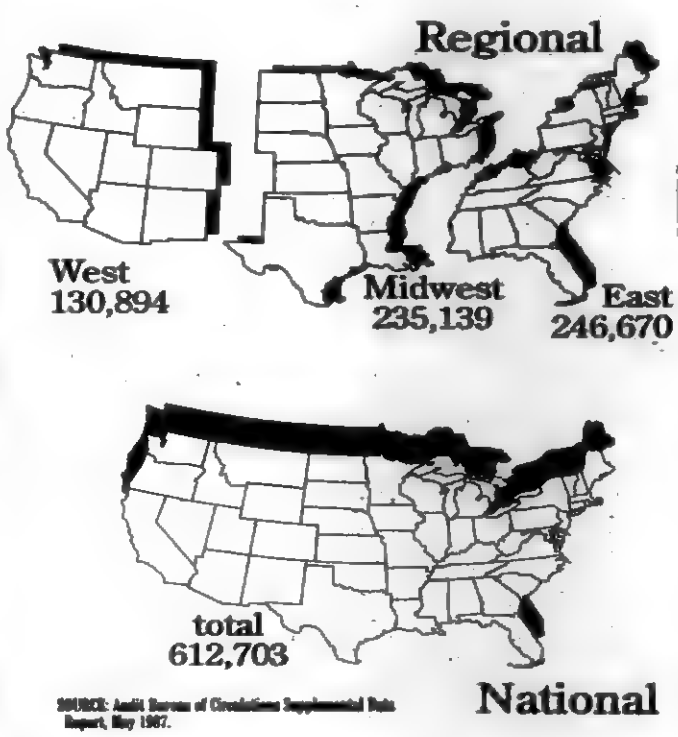

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Time's up on unlimited toll-free technical support

BY CONNIE WINKLER
SPECIAL TO CW

Software developers are feeling the financial squeeze and are beginning to pass support costs on to their customers. Many vendors are rethinking and retooling product support, especially toll-free help telephone lines.

In the last year, a growing number of developers, including Lotus Development Corp., Microsoft Corp. and Aldus Corp., switched from toll-free 800 lines to 900 numbers, for which customers pay anywhere from $1 to several dollars per minute — plus the cost of the call — to obtain technical support.

"It's terrible. If companies don't make manuals and programs user-friendly enough, they should provide a toll-free help line," says Bruce Stark, president of Computer Tutor, a training and consulting firm in New York. Ironically, Stark stands to benefit indirectly from the developers' new policy. Computer Tutor includes crisis advice as part of its service, and poor vendor documentation and support is a reason why many users sign up in the first place.

Along with offering frequent and costly software updates, Stark says the switch to 900 service is another way vendors are pinching more pennies from their users.

Vendors, however, say they're installing 900 lines to meet the growing needs of their customers. "We were unable to keep up with the demands on our support staff," says Deedee Walsh, director of marketing communications at Buttonware, Inc. in Bellevue, Wash.

About a year ago, after determining that only 20% of its support calls concerned Buttonware products (the rest were either regarding other products or DOS), the developer began researching other alternatives, Walsh says. Consequently, Buttonware installed the 900 option with no charge for the first minute and a $1-per-minute charge thereafter.

Lotus, in Cambridge, Mass., says it put the 900 service into place so it could beef up its support staff to respond to its customers' needs more quickly and efficiently. However, Lotus still has an 800 service that is free for the first six months and $49 annually thereafter.

Customers would rather pay than wait, says Lotus spokesman Bryan Simmons, referring to the typical wait for the 800 service. "Now on 900, Lotus customers can call as many times as they want with the first minute free and then $2 a minute. All 800 and 900 calls are answered by the same support staff, although 900s supersede the others in the queue," he says.

For Aldus, best known for its Pagemaker desktop publishing package, the technical support squeeze came last year. Not only were customers dissatisfied with its slow technical support response, but they were also disillusioned with delayed products. On top of that, says John Archdeacon, director of customer support at Aldus, the complex nature of desktop publishing software also meant customers were calling with conceptual, page design questions — not just technical questions such as how to set tabs in a columnar format.

Eventually, Aldus switched to a 900 service with a flat fee of $15 per counseling session. Prior to that, Aldus had a $100-per-year service contract for up to five hours support time after the free 45-day support period. The $100 didn't sit well with customers who said it seemed like too much money.

After determining that the average length of help calls to Aldus was 12 minutes, Archdeacon set the flat fee at $15 so that customers wouldn't debate on whether Aldus answered the questions fast enough if charged per minute. With this new arrangement, customer support is now a separate entity, almost like a subsidiary, generating its own revenue, Archdeacon says. The customer service department only seeks to break even, he adds.

However, some users are taking active steps to insulate themselves from the costly dilemma. Seafirst Bank in Seattle, with 178 branches throughout Washington state, has its 4,000 Apple Computer, Inc. Macintosh computers cared for by a 60-member support team. "If we didn't have this [in-house support], a lot more calls of a rather elementary nature would go to software developers," says Robert Bowman, vice president and manager of personal computer support at Seafirst.

MANY LARGE firms disallow any kind of 900 number use because the numbers provide costly access to . . . services such as horoscopes, jokes or X-rated services.

Other companies have unwittingly put up roadblocks to 900 support lines, and they are making other vendors such as Wordperfect Corp. think twice about switching. Many large firms disallow any kind of 900 number use because the numbers provide costly access to other commercial services such as horoscopes, jokes or X-rated services.

Whether users will end up changing products rather than fighting the fees remains to be seen. But few vendors say they expect the free support standards of the past to survive much longer.

"There's a sense that the right to vote and free support go hand-in-hand, but I don't see a lot of situations where's that's true," Archdeacon says.

Winkler is a free-lance writer based in Seattle.

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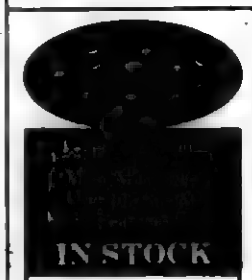

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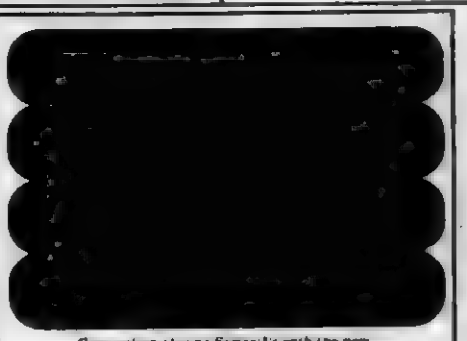
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Defeating computer illiteracy

Computer illiteracy — the unproductive use of systems and software — has escalated to an alarming level in U.S. organizations, according to Elliot Masie, president of the Association for Computer Training & Support (ACTS) in Raquette Lake, N.Y.

A recent survey of 1,000 information systems managers and trainers conducted by ACTS, an international membership organization for computer training and support professionals, revealed that one-third of all computer programs in office environments are cast aside by users six months after purchase.

Masie spoke recently with associate editor Cathleen Duffy on the causes of and solutions to this rising concern.

What kinds of people fall into the computer illiterate category?
We're not talking about people who are computer resistant. A computer illiterate can be two things: A person who doesn't know how to utilize a computer or software tool to perform his job; or a person who dramatically underutilizes the features of a software package or computer.

The first is a more severe problem. Our study found that six months after a person has been sent to train on new software, he is not using that package. Consequently, the company is not getting one cent of return on its investment in either the new technology or the training.

The second type of computer illiteracy — underuse of a particular software package — is less dramatic but more common. A simple thing, like a user not understanding that instead of typing the same paragraph over and over again he could just insert several times, is unproductive.

What are some of the causes of this illiteracy problem?
First, the amount of people who now use computers has dramatically risen in five years, and organizations aren't fully prepared to handle that.

Second, you have your vanity buyers: Users decide, "I want to get Harvard Graphics, Lotus, desktop publishing, and give me that project manager package." They get these packages because they've heard about them, and they sound wonderful. But they have no commitment to take the time to learn how to use them to do their job.

Who's to blame — the IS manager, the user or the company?
Actually, I put the culpability squarely on the actual managers of the users. Unfortunately, line managers have been very poorly prepared for knowing how to manage the automated resources in their departments.

For example, if I'm manager of a purchasing group, and I've got four or five people in my group who use different software, part of what I have to manage is their use of software. But if I don't know how to use the package, I may do a really bad job in managing my staff's use of automation.

What are some things that IS managers and trainers can do to help these line managers?
If a company buys several software packages, IS managers or trainers should conduct a training session directly with the line managers — not on how to use the package, but on how to manage the use of the package.

In other words, show the managers the key features that their employees will need, estimate how long it should take his employees to get up to speed on the package and demonstrate what the package should be able to do in helping the employees perform their work.

ACTS' Masie: *Organizations aren't fully prepared for the increase in computer users*

In what way is the training function in some companies failing?
Because of lack of commitment and low budgets, companies often substitute informal on-the-job training for formal training. But we would never teach somebody how to drive a forklift that way. Companies give people high-powered systems that could be as dangerous to data as a forklift could be to some material in the warehouse — but with only the bare essentials in training.

Even companies that have strong commitments to training run into problems. They teach people how to "do packages" rather than how to do their jobs.

One example that our survey uncovered involved a steam-plant manager who had taken a Lotus 1-2-3 training class. During the course, all the trainer showed him how to do were loan applications — not industrial applications. He walked away deciding never to use that package.

In another case, we found that a division of the Internal Revenue Service had been sending its lawyers off to take generic courses on Wordperfect without much success. Someone made the suggestion to the IRS that they offer essentially the same class, but hold it just for lawyers and call it "Preparing legal briefs using automation." It's psychological, but it works.

Do you see a near end to this computer illiteracy problem?
No. I expect the illiteracy level to reach even higher levels. Organizations just aren't making a commitment to training because it's perceived as expensive — which is false in the long run. They'll just end up doing more support, which will end up being even more expensive.

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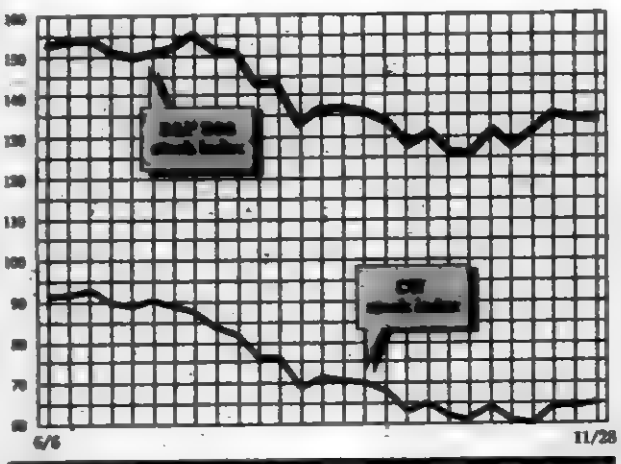

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Communications	102.9	104.1
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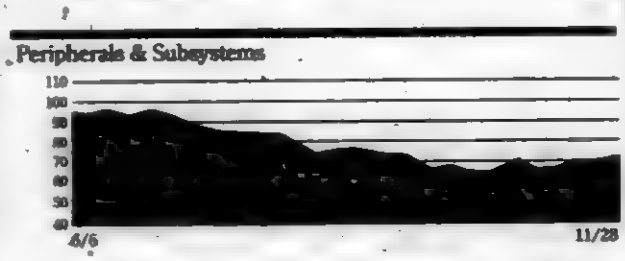
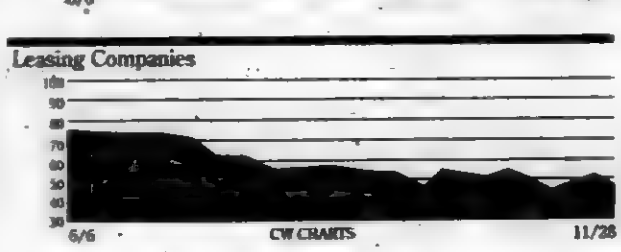
Software & DP Services	92.4	95.4
Semiconductors	38.7	40.6
Peripherals & Subsystems	70.4	71.2
Leasing Companies	50.7	48.9
Composite Index	64.4	65.5
S&P 500 Index	134.9	134.3





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EXCH		52-WEEK RANGE		PRICE CLOSE NOV. 28, 1990	WEEK NET CHANGE	WEEK PCT CHANGE

Communications and Network Services

N	AMERICAN INFO TECHS CORP	68	53	68.875	0.5	0.8
Q	ANDREW CORP	28	16	19.5	0.0	0.0
Q	ARTEL COMM CORP	10	2	2	-0.3	-11.1
N	AT&T	47	30	31.875	-0.6	-1.9
Q	AVANTEK INC	4	2	2.5	0.1	5.3
N	AYDIN CORP	17	10	11.5	0.5	4.5
N	BELL ATLANTIC CORP	57	46	53.25	0.1	0.2
N	BELLSOUTH CORP	56	48	52.875	-0.3	-0.5
Q	COMPRESSION LABS INC	16	7	13.25	-0.6	-4.5
Q	CONTEL CORP	36	23	33.5	0.5	1.5
Q	DATA SWITCH CORP	4	2	3.375	0.4	12.5
Q	DIGITAL COMM ASSOC	27	9	11.25	-0.5	-4.3
Q	DYNATECH CORP	19	12	15	0.0	0.0
Q	FIBRONICS INTNL INC	13	6	7.625	0.3	3.4
Q	GANDALF TECHNOLOGIES	6	2	2.5	-0.4	-13.0
Q	GENERAL DATACOMM INDS	5	2	2.125	0.1	6.3
N	GTE CORP	36	24	28.5	0.6	2.2
Q	INFOTRON SYS CORP	9	1	1.125	0.1	12.5
N	ITT CORP	61	40	46.25	-1.5	-3.1
A	M A COM INC	6	3	6	0.4	6.7
N	MCI COMMUNICATIONS CORP	45	19	19.875	0.9	4.6
Q	NETWORK EQUIP TECH INC	24	5	5.875	-0.6	-9.6
N	NETWORK SYS CORP	15	8	11	0.8	7.3
N	NORTHERN TELECOM LTD	30	21	25	-0.4	-1.5
Q	NOVELL INC	31	13	30.5	1.8	6.1
N	NYNEX CORP	82	67	69.625	-0.9	-1.2
A	PACIFIC TELESIS GROUP	52	36	44.5	0.1	0.3
A	PEIRCE CORP	9	5	5.875	0.4	5.8
N	SCIENTIFIC ATLANTA INC	29	9	12.25	0.5	4.3
N	SOUTHWESTERN BELL CORP	66	47	54.25	1.8	3.3
Q	3 COM CORP	19	5	7.75	0.3	3.3
N	U S WEST INC	41	32	37.5	0.0	0.0

Computer Systems

Q	ALLIANT COMPUTER SYS	9	1	0.875	-0.3	-22.2
Q	ALPHA MICROSYSTEMS	5	1	2.188	-0.4	-16.6
A	AMDAHL CORP	19	10	13.875	0.4	2.8
Q	APPLE COMPUTER INC	48	24	38.75	1.3	3.5
N	AST RESH INC	27	10	25.5	0.5	2.0
N	BOLT BERANEK & NEWMAN	8	4	4.375	0.0	0.0
N	COMPAQ COMPUTER CORP	68	36	52.5	2.6	5.3
N	COMMODORE INTNL	12	5	9.875	0.9	9.7
N	COMPUTER AUTOMATION INC	6	0	0.875	-0.1	-6.7
N	CONTROL DATA CORP	22	8	10	-1.1	-10.1
N	CRAY RESH INC	51	20	28.625	0.8	2.7
N	DATA GEN CORP	14	4	4.625	0.3	5.7
N	DATAPOINT CORP	5	1	1.5	0.4	33.3
Q	DELL COMPUTER CORP	14	5	13.125	0.6	5.0
N	DIGITAL EQUIP CORP	95	46	50.125	-1.6	-3.1
N	FLOATING POINT SYS INC	4	0	1.25	-0.1	-9.1
N	HARRIS CORP	38	14	19.25	0.3	1.3
N	HEWLETT PACKARD CO	80	25	29	1.0	3.6
N	HONEYWELL INC	112	71	89.75	1.1	1.3
N	IBM	123	93	112.375	-1.0	-0.9
Q	INFORMATION INTL INC	14	8	9.125	0.0	0.0
Q	IPL SYS INC	14	5	13.25	0.5	3.9
N	MAI BASIC FOUR INC	4	1	1.125	0.1	12.5
N	MATSUSHITA ELEC INDL LTD	166	116	124.25	0.0	0.0
Q	MENTOR GRAPHICS CORP	26	9	12.625	0.9	7.4
N	NBI INC	1	0	0.125	0.0	0.0
N	NCR CORP	72	45	55.25	1.0	1.8
Q	PYRAMID TECHNOLOGY	36	12	14	1.3	9.8
Q	SEQUENT COMP SYS INC	34	13	17.75	0.0	0.0
Q	SUN MICROSYSTEM INC	37	15	19.875	1.6	8.9
Q	SYMBOLICS INC	2	0	0.281	0.0	12.4
N	TANDEM COMPUTERS INC	30	9	12.5	0.3	2.0
N	TANDY CORP	44	24	27.75	1.5	5.7
N	ULTIMATE CORP	10	1	2.25	0.6	36.5
N	UNISYS CORP	17	2	2.875	0.0	0.0
A	WANG LABS INC	6	3	2.75	-0.1	-4.3

Software & DP Services

Q	AMERICAN MGMT SYS INC	20	11	15.875	0.6	4.1
Q	AMERICAN SOFTWARE INC	18	8	11.5	1.4	13.6
N	AMACOMP INC	5	1	2	0.0	0.0
Q	ANALYSTS INTL CORP	24	10	13.5	0.5	3.8
Q	ASHTON TATE	15	5	7.75	-0.5	-6.1
N	AUTO DATA PROCESSING	60	45	54.375	0.4	0.7
Q	AUTODESK INC	60	32	46.25	3.0	6.9
Q	BMC SOFTWARE INC	30	17	21.75	-1.3	-5.4
N	BUSINESSLAND INC	12	1	1.375	-0.1	-6.3
Q	COGNOS INC	10	4	7.625	-0.5	-6.2
N	COMPUTER ASSOC INTL INC	17	4	7.75	-0.3	-3.1
Q	COMPUTER HORIZONS CORP	17	8	14.25	0.6	4.6
N	COMPUTER SCIENCES CORP	59	37	47.5	0.8	1.6
N	COMPUTER TASK GROUP INC	12	7	7.25	0.0	0.0
Q	COMSHARE INC	25	14	18	-1.0	-5.3
Q	CORPORATE SOFTWARE	16	4	7.75	0.5	6.9
N	GENERAL MTRS (CLS E)	38	24	35.875	-0.6	-1.7
Q	GOAL SYSTEMS INTL	18	8	9.25	0.0	0.0
Q	HOGAN SYS INC	7	2	2.25	0.1	5.9
Q	INFORMIX CORP	18	4	4.75	0.9	22.6
Q	INTELLICORP INC	8	1	1.75	0.0	0.0
Q	LEGENT CORP	31	17	23	0.3	1.1
Q	LOTUS DEV CORP	39	13	22	3.3	17.3
Q	MICROSOFT CORP	81	38	70.375	2.1	3.1
Q	NATIONAL DATA CORP	35	8	13.75	0.6	4.8
N	ON LINE SOFTWARE INTL INC	11	4	4.375	0.3	6.1
Q	ORACLE SYS CORP	188	5	6.625	0.3	3.9
N	PANSOPHIC SYS INC	19	7	8	0.0	0.0
Q	PHOENIX TECHNOLOGIES INC	5	1	2.5	0.9	53.8
N	POLICY MGMT SYS CORP	43	30	39.25	0.0	0.0
Q	PROGRAMMING & SYS INC	13	5	8	0.5	9.1
Q	RELATIONAL TECH INC	10	3	9.125	0.0	0.0
N	REYNOLDS & REYNOLDS CO	27	12	15.5	0.0	0.0
Q	SAGE SOFTWARE INC	18	8	11	0.0	0.0
Q	SEI CORP	22	15	18	1.3	7.5
Q	SHARED MED SYS CORP	17	12	16.25	0.3	1.8
Q	SOFTWARE PUBG CORP	28	12	15.75	-1.0	-6.0
N	STERLING SOFTWARE INC	11	6	7.125	0.1	1.8
Q	SUNGARD DATA SYS INC	28	10	12	-0.3	-2.0
N	SYSTEM CENTER INC	25	6	10.375	1.8	20.3
N	SYS. SOFT INC	29	13	23.75	0.0	0.0
Q	WORDSTAR	2	1	1.063	-0.2	-12.8

Semiconductors

N	ADV MICRO DEVICES INC	11	4	4.25	0.1	3.0
N	ANALOG DEVICES INC	10	6	6	0.3	4.3
Q	ANALOGIC CORP	10	8	8.375	-0.1	-1.5
Q	CHIPS & TECHNOLOGIES INC	25	5	7.875	0.1	1.6
Q	INTEL CORP	52	26	37.75	1.0	2.7
Q	MICRON TECHNOLOGY INC	16	7	10	1.1	12.7
N	MOTOROLA INC	88	51	54	2.6	5.1
N	NATL SEMICONDUCTOR	9	3	3.875	0.4	10.7
N	TEXAS INSTRS INC	44	23	31.875	4.6	17.0
A	WESTERN DIGITAL CORP	15	4	5	0.0	0.0

Peripherals

Q	ALLOY COMP	2	0	0.188	-0.3	-57.1
Q	AM INTL INC	5	1	1.25	-0.3	-16.7
Q	AUTO TROL TECH CORP	4	2	1.875	-0.2	-9.1
Q	BANCTEC INC	24	10	12.25	-0.5	-3.9
A	COGNITRONICS CORP	7	3	6	0.1	2.1
N	CONNER PERIPHERALS	31	11	28.75	1.1	4.6
A	DATARAM CORP	22	7	7.875	0.6	8.6
N	EASTMAN KODAK CO	44	34	42.625	-0.1	-0.3
N	E M C CORP MASS	10	3	8.25	-0.4	-4.3
Q	EMULEX CORP	9	4	5.5	0.4	7.9
Q	EVANS & SUTHERLAND	35	14	17	0.0	0.0
Q	IDOT CORP	2	0	0.188	-0.1	-38.9
Q	INTERLEAF INC	6	3	3.375	0.0	0.0
Q	IOMEGA CORP	6	3	4.75	0.6	15.2
Q	MASSTOR SYS CORP	3	0	0.375	0.1	50.0
Q	MAXTOR CORP	17	4	4.5	-0.4	-7.7
Q	MICROPOLIS CORP	10	3	7	-0.3	-3.4
N	MINNESOTA MNG & MFG CO	91	74	80.375	-0.3	-0.3
Q	PERSONAL COMP PRODUCTS INC	5	4	4	0.4	10.3
Q	PRINTRONIX INC	15	6	8.625	-0.3	-2.8
N	QMS INC	21	9	12	-0.3	-2.0
Q	QUANTUM CORP	28	9	21	1.0	5.0
N	RECOGNITION EQUIP INC	6	4	4.75	0.3	5.6
Q	REXON INC	10	4	5.563	-0.1	-1.1
Q	SEAGATE TECHNOLOGY	20	6	9.125	0.3	2.8
N	STORAGE TECH CORP	35	11	19.875	1.4	7.4
Q	TANDON CORP	4	1	1.75	0.0	0.0
N	TEKTRONIX INC	18	12	17.125	0.4	2.2
Q	TELEVIDEO SYS INC	1	0	0.281	0.0	12.4
N	XEROX CORP	60	28	33.75	-0.4	-1.1

Leasing Companies

N	CAPITAL ASSOC INTNL INC	5	1	0.563	-0.1	-18.2
N	COMDISCO INC	29	16	15.875	0.4	2.4
Q	LDI CORPORATION	16	9	9.75	0.3	2.8
Q	SELECTERM INC	7	3	3	-0.3	-7.7

EXCH: N—NEW YORK; A—AMERICAN; Q—NATIONAL

Necromancy

Tech stocks rose from the grave with the aid of Wall St. buyers

In 1897, Mark Twain said, "The reports of my death are greatly exaggerated." Technology stocks might claim the same. While they are certainly not at the swollen prices of five months ago, when the Dow Jones industrial average brushed the underside of 3,000 points, computer firms plowed ahead of other sectors last week. Compaq Computer Corp. helped lead the way with a 5¼-point gain last week that pushed it to 54¼ by Thursday's close.

Other hardware companies registered vital signs, such as Sun Microsystems, Inc., which lunged forward 2⅛ points to 20⅛. Apple Computer, Inc. pulsed up ⅜ of a point to 36¾ on news that it and semiconductor firm VLSI Technologies, Inc. formed a joint venture with a British firm to make reduced instruction set computing chips. VLSI fell by ⅛ of a point to 4⅛. Digital Equipment Corp. grabbed 1½ more points to 50⅛.

Personal computer software makers were also alive and kicking. Autodesk, Inc. gained 3⅛ points to 47¾, and Microsoft Corp. skipped up 2⅛ points to 71¼. Lotus Development Corp. picked up 2⅜ points, closing Thursday at 23⅜. Even longtime laggard Oracle Systems Corp. surged 1⅜ points to 7¾.

IBM was one of the few losers last week, slipping ⅛ of a point to 112. Both National Semiconductor Corp. and Lattice Semiconductor Corp. lost ⅛ of a point, closing at 3⅛ and 5⅜, respectively. Other chip makers gained, however, including Texas Instruments, Inc., which picked up 1⅜ points to 31¼. Intel Corp. jumped 2¼ points to 37¾. According to Securities and Exchange Commission reports, Intel Senior Vice President Larry Hootnick sold 99% of his holdings in the company in early October.

Meanwhile, NCR Corp. advanced ⅛ of a point to 55½ as would-be partner AT&T lost ½ a point, closing at 31⅛.

KIM S. NASH

HUD

FROM PAGE 1

by the company.

Although the contract does not ask the company to remedy the financial systems shortcomings widely cited as having contributed to the massive misuse of HUD funds during the 1980s, the new environment will facilitate the development of better applications and tighter system controls, according to Peter A. Bracken, vice president and program manager at Martin Marietta. He said other contractors have already begun overhauling the agency's financial and administrative systems.

A HUD spokesman said HUD Secretary Jack Kemp had pledged that no agency employees would lose their jobs as a result of the outsourcing. Data center personnel would be reassigned or lost through natural attrition, the spokesman said.

DelliBovi said the new network will contain checks and balances to prevent wayward transactions, an occurrence that has, for example, resulted in failure to record the sale of houses. He also said the new environment will better support integration of applications.

New directions

Martin Marietta Chairman Norman R. Augustine said the HUD job significantly advances the firm's strategy for diversifying beyond its traditional aerospace and defense roots. He said the contract would have "a positive effect on our 1991 operating earnings and a significant impact into the next century." Last year, the company reported earnings of $307 million on sales of $5.8 billion, most of it from defense and aerospace work.

"Their [diversification] strategy is working," said Peter Aseritis, defense analyst at First Boston Corp. "Going after civilian agencies plays to their strengths. Martin Marietta is a very good information processing company, and they're good at setting up a disciplined network of suppliers."

Aseritis predicted more big federal outsourcing deals. "Outsourced services can be done cheaper and more efficiently than they can in-house."

James Kerrigan, federal program director at Input, Inc.'s Vienna, Va., office, said other forces are stimulating outsourcing as well. Federal agencies often specify limits on employment, and contracting out is one way to save on body count without sacrificing the agency's mission. He also said the growing disparity between pay scales in the public and private sectors is making it difficult to retain the senior systems people needed at large data centers.

Companies that submitted losing bids for the huge job included Electronic Data Systems Corp. and Boeing Computer Services. Neither company would say whether it planned to protest the award — a common practice in federal systems megadeals.

"A protest is inevitable," said Kerrigan, who estimated each bidder spent about $5 million developing proposals. "Besides, procurement rules for something like this are so complex, the odds are very good that HUD did do something wrong. There are so many hoops to jump through, it's easy to miss one."

About 40% of the contract revenue will flow to 13 subcontractors, principally Unisys, Hitachi, Network Systems Corp., Netrix Corp., Amax Engineering Corp. and Novell, Inc., Bracken said.

Bankamerica axing Asian hub

Closing Hong Kong center in bid to consolidate international operations

BY JIM NASH
CW STAFF

HONG KONG — Bankamerica Corp. is shutting down its Asian data center. In a cost-cutting move, the resurgent multinational financial company is consolidating its three international processing centers at one suburban London location.

Dan Hartman, vice president and general manager of Bankamerica's Asian Pacific operations, said the bank's Latin American processing center was moved from Los Angeles to Croydon, England, in the first quarter of this year. The Hong Kong center is expected to follow in April 1991.

"The overall objective is to save money," said Hartman, who has worked for Bankamerica in Asia for six years. While he refused to reveal how much the move will cost, "the savings will be significant," Hartman said. The move will pay for itself in "two to three years," he added, and will have no effect on domestic transactions. While there are links between domestic and international transaction databases, Bankamerica treats the two as separate operations.

Croydon was the logical choice, Hartman said. The facility already has the hardware, floor space and brainpower to accommodate all of Bankamerica's international banking transactions.

He explained that the Croydon data center currently processes all European transactions with a new Amdahl Corp. 5995 1400 mainframe and a 5890 300E. Just as important, however, is Croydon's role in developing all application software for the bank's international branches.

When the move is completed, Croydon will become the on-line hub for all internationally generated voice and data transactions for Bankamerica. A fiber-optic backbone will connect telecommunications hubs in both of the former data centers to the England center, Hartman said. The site will be backed up by a British Telecom disaster recovery center also in England.

A combination of cable and satellite methods will continue to link local branches in each of the three regions.

Each transaction generated abroad will be processed in real time through the English center, Hartman said. "We deal with a lot of multinationals, and they are not willing to wait until the close of business to have a transaction completed in Bangkok or Tokyo."

Latin America operations were moved because they made up only a small portion of the total business process in the Los Angeles office, he explained. Afterward, the bank saw that despite increased telecommunications costs, the move was actually cost-effective. In June, it examined shifting to Hong Kong for increased savings.

> "THE OVERALL objective is to save money."
>
> DAN HARTMAN
> BANKAMERICA

A spokesman for the bank said the planned transfer of British sovereignty over Hong Kong to China in 1997 played little or no part in the decision to move operations. "It's a matter of constant streamlining. Maybe, way in the back of somebody's mind, someone thought of that, but it was not discussed," the spokesman said.

DEC unveils integrated net security program

BY MARYFRAN JOHNSON
CW STAFF

MAYNARD, Mass. — Digital Equipment Corp. launched an integrated security program last week aimed at solving corporate security problems on networks of multivendor computers.

Included in the long-range development program is DEC's Distributed System Security Architecture, a framework for implementing security features in a distributed, multivendor environment.

Peter Schay, an analyst at Gartner Group, Inc., based in Stamford, Conn., noted that much of DEC's security program will not be available until 1992 for users of VMS and Ultrix, DEC's version of Unix. Multivendor shops have a longer wait, he added.

A series of security enhancements was announced last Friday, including the following:

- Additions to the VMS operating system password management to deter attacks based on guessing user or systems account passwords.
- New management features in DEC's Ethernet Enhanced Security System, which will provide node authentification, access control and encryption.
- Development of a Compartmented Mode Workstation (CMW) that will meet the U.S. government standards for B1 and CMW "level of trust." DEC is developing the highly secure workstation under contract with the U.S. Defense Intelligence Agency, basing the machine on both reduced instruction set computing and VAX architectures, the Ultrix operating system and X Window System/Motif.
- Availability through DEC of Sybase, Inc.'s Secure SQL Servicer, a multilevel secure relational database management system that runs on VAX Ultrix systems.

Advisor delays EPA report

The White House Science Advisor has delayed public release of an Environmental Protection Agency (EPA) report on potentially harmful effects of electromagnetic fields, such as those emanating from VDTs.

Due for public release early last week, the EPA evaluation discusses potential carcinogenicity and other biological effects of electromagnetic fields. It was delayed after project leader Robert McGaughy was called into the advisor's office last Monday.

The White House was trying to delay the release of the report until after the Scientific Review Board, a panel of outside experts, had finished its review, which is expected to be completed sometime in the spring, McGaughy said.

McGaughy said administration officials are concerned that electromagnetic fields are affecting everyone through exposure to such things as power lines, electric blankets and VDTs, unlike other potentially cancer-causing materials where exposure is more selective.

Efforts to reach White House officials for comment were unsuccessful.

McGaughy said he "expected," then changed his word to "hoped," that the report would be made public this week.

J. A. SAVAGE

SPA hits two Chicago firms

CHICAGO — The Software Publishers Association (SPA) said last week it had conducted search-and-seizure operations at two corporations in Chicago suspected of unauthorised duplication of software.

The SPA disclosed that one of the raids was here at Davy-McKee Corp., a pharmaceutical engineering organization. The SPA initially said it had reached a settlement with Davy-McKee over the allegations but subsequently retracted that statement.

Davy-McKee officials declined to comment on the SPA charge.

The second company was not identified by SPA officials, who said such disclosure would impede its efforts to negotiate a settlement.

Several area microcomputer managers contacted about SPA activities said they believed the action would be received positively by the information systems community.

One manager commented that "upper management has no understanding of software and the licensing requirements and effectively encourages software copying." He also said that the size of the fines could serve to change management attitudes.

MICHAEL FITZGERALD

NEWS SHORTS

VDT legislation pared

San Francisco County dropped a requirement that VDTs be placed one meter away from adjoining workers in a compromise with businesses that said it would cost too much. The county's VDT legislation, supported by a majority of the county's supervisors, now leaves protection from electromagnetic radiation to a health panel. The legislation still has protections against repetitive stress injuries.

AMS, Bell Atlantic go international

Bell Atlantic Corp. and American Management Systems, Inc. (AMS), a software and services vendor based in Arlington, Va., are eager to exploit the recent trend toward deregulation and privatization of foreign telecommunications monopolies. The firms jointly announced last week that Bell Atlantic will market AMS' Tieline software to local and long-distance telephone companies in selected countries. The software automates many of a telephone company's customer-oriented functions, including billing, collections and order management.

Echelon eyes wiring scheme

A dozen manufacturers are expected this week to unveil household, office and factory products embedded with programmable silicon chips that communicate with each other over common electrical wiring. Bea Yormach, vice president of marketing at Palo Alto, Calif.-based Echelon Corp., said the companies — which she refused to identify — have used technology developed by Echelon. The chips are said to control access, lighting, climate and equipment use by linking motion sensors with a building's heating and ventilation, lighting and security systems.

MCA sees 'opportunities'

MCA, Inc. Vice President of Information Systems George Brenner said last week's announced $6.6 billion friendly buyout of his entertainment firm by Japanese consumer products giant Matsushita Electric Industrial Co. presents some intriguing opportunities. "There are a lot of strategic things we can do in the areas of telecommunications, disaster recovery and technology sharing," Brenner said. "I'm sure we've done something they haven't, and they've done something we haven't; we could do a little swap."

Judge lets outsourcing proceed

A Tennessee Chancery judge last week denied the Nashville Electric Service Employees' Association's request for an injunction to prevent Nashville Electric from outsourcing its IS function to a Memphis-based computer services firm [CW, Nov. 5]. The utility's board then voted to proceed with the seven-year outsourcing contract, which was slated to take effect this past weekend. Despite failing to get the injunction, the employees' association will proceed with its lawsuit against the utility, seeking damages for its affected members.

Surgery for IS?

Centralized IS departments in many large companies are due for major reconstructive surgery, according to a study by Forrester Research, Inc. in Cambridge, Mass. The report said reorganizations have been fueled by outsourcing mainframe management functions and "downsourcing" application development to units closer to the business function. IS will take on a three-point structure, anchored by outsourcing providers, line IS groups and central IS, which take on monitoring and management roles, the study found.

LAN management up for review

IBM and 3Com Corp. said last week they have made available for general review their specifications for a proposed Ethernet/Token-Ring network management standard. The companies had announced in July that they would work together on such a standard. Last week, the firms said that four companies have reviewed those preliminary specifications.

Object-oriented group sets standards outline

BY ROSEMARY HAMILTON
CW STAFF

FRAMINGHAM, Mass. — The Object Management Group (OMG) issued a report last week on the architecture it will promote as the industry standard for object-oriented systems.

Like other standards groups before it, the OMG expects it will take a few years before all the components of the architecture are selected and finalized.

It intends to forge ahead without official support from either IBM or Microsoft Corp. However, it has the support of nearly every other major company in the industry.

IBM in particular could pose a problem for the group, because it has announced its own big plans for object-oriented technology and expects to begin announcing products next year.

However, John Slitz, a spokesman for the group, said IBM had contributed to the creation of the Object Management Architecture Guide. An IBM spokesman could not confirm this, but he said he was aware that some IBM representatives had attended OMG meetings.

Building their own

Slitz said OMG members are building their own object-oriented systems that will be modified as the architecture's components are determined. The group will select only commercially available technology and will not accept academic proposals.

"We are obviously flying the plane while still building it," Slitz said. "But at least we are working at it. It's a better answer and more realistic" than starting from scratch, he added.

The OMG architecture consists of four major components to govern various aspects of an object-oriented system. Currently, the group has issued a request for technology for an Object Request Broker, which would manage the messaging between objects, and a request for information on its Objects Services component, which includes the data model.

The Object Request Broker is considered to be the core of the architecture in that it has the critical job of determining how messages are passed between objects.

Slitz said he expects requests for information to go out for the other two components — Common Facilities and Application Objects — in 1991.

Common Facilities are those items that can be shared by any application, such as a spelling checker. The Application Objects component will govern the building of applications through the use of object classes.

"To fill out this entire architecture, it will take us about 2½ years," Slitz said.

IBM

FROM PAGE 1

hardware, software and maintenance product lines.

Last week, observers said it appeared that the actual discounts will not improve much with revenue-based plans, but the significance of these deals is the flexibility they will provide to users.

Some observers also suggested the movement to revenue-based plans may have a hidden benefit for IBM. By putting more contracts on a revenue plan — particularly those that reportedly span hardware and software product lines — IBM has a more competitive weapon.

"My reading is they are giving large customers a little more incentive to do business with IBM, and therefore, it's harder for someone like [Storage Technology Corp.] to come in and cherry-pick a deal," said one IS manager who is negotiating a revenue-based contract.

Art Cohen, IBM director of product business practices, confirmed that IBM quietly shifted to a revenue-based plan for high-end mainframes earlier this fall. At the same time, the firm officially announced revenue-based discounting deals for Enterprise System/9000 air-cooled models.

Cohen said there is no official IBM enterprisewide agreement as described by the three IS executives. Any such agreement would fall under a special bid banner and would therefore be considered proprietary information.

However, two IS executives contacted last week said they are currently negotiating large-scale revenue-based deals that cover corporatewide purchases. In addition, Jack Cooper, president of CSX Technology, the IS division of CSX Corp., said he has been informed of enterprise agreements and added, "We are anticipating doing one."

Cooper said he believes IBM is trying to make contract negotiations easier for users. The enterprise agreement, he said, would allow him to add up all expenditures: "processors, software, maintenance, even some of your leasing and aggregate it to one number."

He said that with previous contracts, "everything was separate — disks, tape, processors — and it was done on a unit basis. So during the year, you had discounts on each type of unit. If you were a little short on one unit, you were compromised on maintaining that discount."

Big accounts have long been able to negotiate a variety of sweet deals under a cloak of secrecy known as the special bid. In some isolated cases, they may have been based on revenue commitments. But the recent shift for both water-cooled and air-cooled processors by IBM shows a determination to make this more far-reaching.

Jack Lewis, president of Amdahl Corp., said he believes IBM has done revenue-based deals "outside for years, particularly in Canada." While he said he was not familiar with widespread plans here, he added, "It wouldn't surprise me."

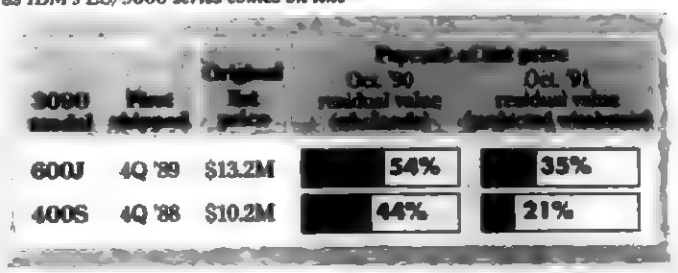
"I'm sure they are doing it in some places," Lewis said. "They'll just try to do whatever they can to optimize their competitive position."

Other users said they are either negotiating or evaluating the various revenue-based plans. One senior IS vice president, who requested anonymity, said he is negotiating a revenue-based enterprise agreement "that includes hardware purchases, software, maintenance, PCs [and] education."

The IS executive said he is required to project that for a one- or two-year period, total IBM purchases will increase by 10% annually. "They take that amount, stir up their secret formula and come back with a proposed discount across the whole amount," he said.

Out with the old

Residual values of IBM 3090 mainframes are projected to fall dramatically as IBM's ES/9000 series comes on-line



Source: Computer Economics, Inc.

CW Chart: Paul Mack

Ex-IBM exec dead at 62

Burton S. Goldberg, 62, a former head of IBM's Large Systems Division and a developer of the IBM System 360 and System 370, died of a heart attack last week.

Goldberg retired in 1984 after three decades at IBM. Pointing to his ongoing involvement in various ventures, colleagues said Goldberg was still in his prime as an industry executive.

He was a member of the boards of 3Com Corp., LAN Systems, Inc. and Software Publishing Corp. and an adviser on venture capital deals through affiliations with The Mayfield Fund and New Enterprise Associates.

"Burt had at least half a dozen projects going," said Belden Menkus, editor of "EDPACS," a computer security newsletter. "His wife recently told me that they were thinking of giving up their apartment and moving back to a house just to make room for all of his ventures."

Along with former IBM Treasurer David Finley, Goldberg was in the process of launching his own company, Technology Builders International, a consulting firm aimed at bolstering young or underachieving technology firms.

"Burt had a child's curiosity for how to apply technology to markets of opportunity," said 3Com Chairman and co-founder William Krause. "In this way could an Easterner leave his mark on Silicon Valley."

In addition to spearheading major systems architectures at IBM, "Burt was one of the first people to understand the enormous significance of distributed processing," said consultant and former IBM colleague Sam Albert. The IBM 8100, an early attempt at distributed processing, was Goldberg's creation, Albert said. At the time of his retirement, Goldberg headed IBM's personal computer operations in Europe.

Goldberg is survived by his wife and two children.

IBM readies update on Officevision progress

IBM plans to go public with a progress report on Officevision Release 2 in two weeks, a company spokesman said last week.

The clock is ticking away on the company's shipment deadlines for Release 2. It had promised to have two Release 2 versions out in the fourth quarter and to announce an availability date for the Application System/400 version in this time frame.

However, in an October interview, Tony Mondello, vice president for office systems development, said it was possible that IBM could slide by a few weeks in delivering both the local-area network and mainframe VM versions. At that time, he could not promise if IBM would be ready to announce by year's end an availability date for the AS/400 version. The MVS version has long had a 1991 delivery date.

Last week, a spokesman said IBM "is looking to having additional details on our plans available by mid-December."

He said Mondello's group is currently reviewing OS/2 Version 1.3. However, the Release 2 version of Officevision for the Personal System/2 was intended to work with OS/2 Version 1.2. The spokesman said the newest version of the operating system will "not necessarily" override OS/2 1.2 because Officevision is "scheduled and announced to run on [Version] 1.2."

IBM COULD slide by a few weeks in delivering both the local-area network and mainframe VM versions.

ROSEMARY HAMILTON

Unisys takes commercial tack

Firm's defense systems unit announces plans for satellite-based service

BY ELLIS BOOKER
CW STAFF

MCLEAN, Va. — Apparently seeking to tilt its defense systems unit toward the commercial market, Unisys Corp.'s Space Systems Division last week announced plans to build a commercial, satellite-based service for geolocational, messaging and remote equipment monitoring services.

Expected to be operational in the middle of the decade, the project is believed to be the first commercial venture for Unisys' defense systems unit and could generate revenue in excess of $250 million over 10 years, Unisys said.

However, analysts observed that the planned Satellite Tracking Radiolocation and Communications system, or Sat/Trak, will face an uphill fight against the half-dozen or so existing and planned providers of satellite-based geolocation and messaging services for fleets of trucks, ships and other vehicles.

"It doesn't bring anything to the market," said John Pemberton, program director for communications at Gartner Group, Inc. in Stamford, Conn. Gartner Group predicted that the $370 million market for mobile satellite services will grow to $600 million in 1991 and $6.2 billion by 1995. Gartner Group believes wireless communications will be the fastest growing segment of the communications market during the next five years and will represent $35 billion of a worldwide $385 billion market in 1995.

Pemberton said a number of defense and aerospace companies are moving into the wireless communications business, especially satellite-based systems, where, he said, they have an affinity and technological prowess. While precise geopositioning is most urgently needed for intercontinental air traffic, the use of the technology for "remote monitoring of equipment is tremendous," Pemberton said.

However, Pemberton questioned the project's choice of untried technology — the 20- to 30-GHz Ka satellite band for end-user applications. Existing services, including the Global Positioning System now being used by U.S. military forces in the Persian Gulf, use the lower 1- to 2-GHz L satellite band and are less susceptible to interference from adverse weather conditions, according to Pemberton.

But A. J. Seastone, vice president of Energetic Satellite Corp., Unisys' Denver-based partner and the satellite designer for the project, said the service will be superior to the competition because it will not require either expensive transceivers on the vehicle or expensive satellites in the sky.

"Our transceivers only send and receive signals, as do our satellites," he said. "All the processing, location determination and messaging is done at the ground center."

For this reason, he estimated, the transceivers for Sat/Trak will cost only $250 to $350, rather than the $3,000 to $5,000 users must now spend for such equipment. This low price, he said, could open up the market for end-user satellite services.

Unisys' Space Systems Division, a provider of software and services to the National Aeronautics and Space Administration, has responsibility for Sat/Trak and will develop and operate the service's ground station and ground processing system. Unisys will also provide software, hardware and parallel processors for the ground station, to be located in Salt Lake City.

Energetics Satellite Corp. is Unisys' partner in the exclusive venture and will design the satellites, which will be built by Intraspace Corp. in Salt Lake City.

Stratus turns to networking initiatives

BY JOANIE M. WEXLER
CW STAFF

MARLBORO, Mass. — Users cannot live by fault tolerance alone, Stratus Computer, Inc. acknowledged last week. The firm announced networking initiatives aimed at facilitating application interoperability between its XA2000 Continuous Processing System and other computing and network platforms.

A new piece of software, OSI Server, due out early next year, is said to allow Open Systems Interconnect (OSI) applications to be developed for Stratus' proprietary VOS operating system. OSI Server for FTX — Stratus' Unix System V-based operating system slated to ship by month's end — will be available sometime in 1991, the company said.

Not too important

One XA2000 user, David Marshall, manager of systems development for marketing applications at Intercontinental Hotels Corp., said the OSI announcement "is not terribly important" for his company today. "But in two to three years, the world is going to be a different place," he said. "It's good to stick with a vendor developing products for the full OSI stack."

Rick Villars, an analyst at International Data Corp. in Framingham, Mass., said that some research conducted by his company indicates solid plans by several Fortune 100 companies to move to OSI backbones within the next three to five years.

"If that reflects an industry trend, it will be vital for companies running on-line transaction processing applications to have a platform in place for migrating to OSI," he said.

Stratus' main targets for OSI Server are companies in Europe, telecommunications service providers and other large North American companies that resell telecommunications service. OSI Server's first appeal will be for fault-tolerant electronic mail backbones, the firm said.

The company also announced last week that it will distribute, support and enhance Network Express, software that pulls dissimilar computing platforms into a single on-line transaction processing environment. Stratus would not comment on when Network Express might be available for FTX.

Network Express prevents applications running on an XA2000 from having to be rewritten in order to communicate with other protocols. It was designed and marketed for Stratus by Scientific Software, Inc.

Network Express will reportedly gain support for Transmission Control Protocol/Internet Protocol and IBM's Nethios. Protocols already supported include X.25 and IBM Systems Network Architecture.

Second-class postage paid at Framingham, Mass., and additional mailing offices.
Computerworld (ISSN 0010-4841) is published weekly, with a single combined issue for the last week in December and the first week in January by CW Publishing/Inc., 375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171.
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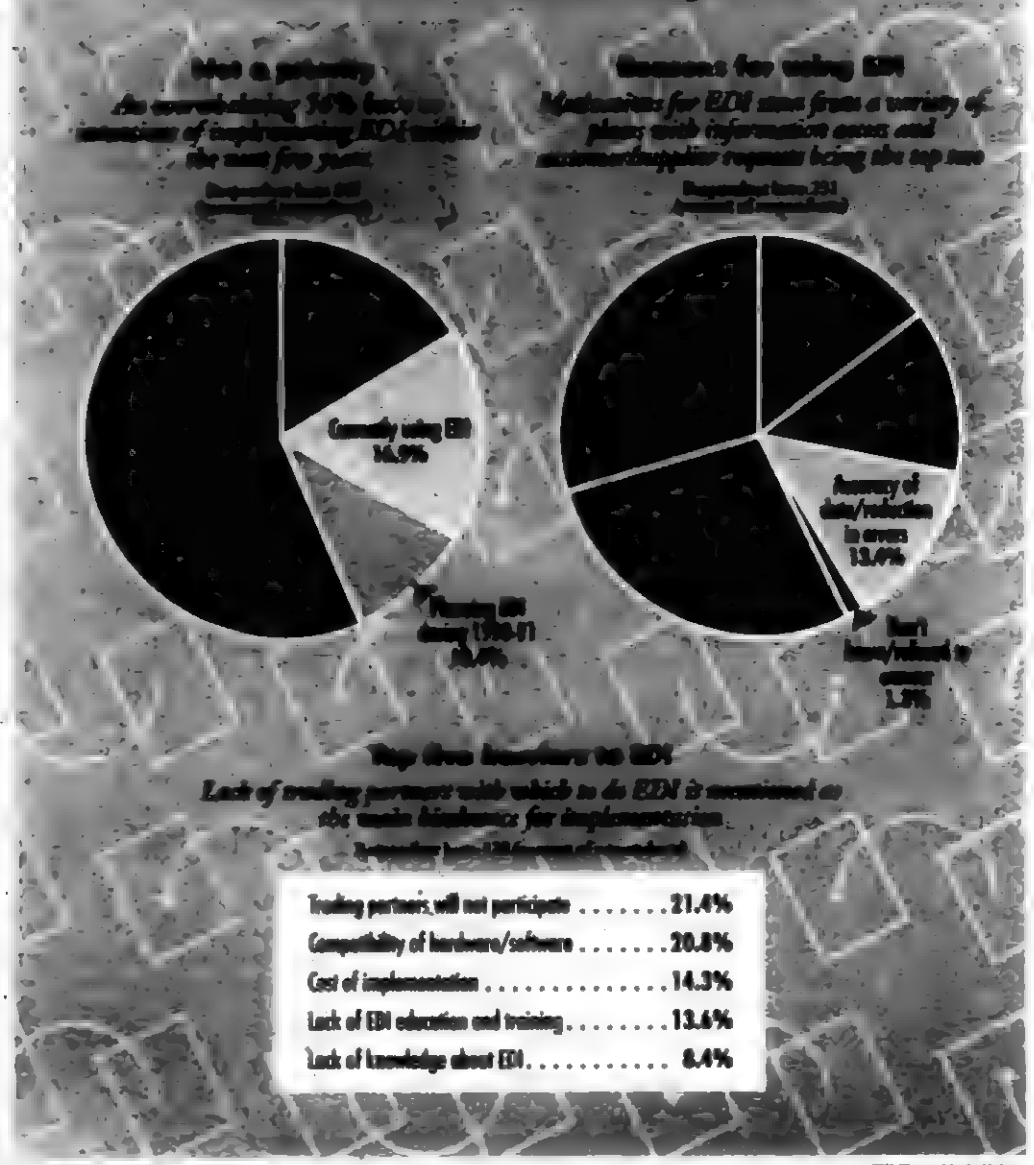
TRENDS

Electronic Data Interchange

With the technology eliciting a lukewarm response at best, external pressure from customers is one of the driving forces behind electronic data interchange (EDI)



Source: EDI Research, Inc., Oak Park, Ill.

CW Chart: Marie Haines

INSIDE LINES

Underground stirrings

Computerworld received a call last week from an anonymous source who warned us that Kryptik, an underground hacker group, intended to plant a virus in a telephone network this Wednesday. A second source described the group as a "bunch of real nasty kids" and added, "If anybody could do it, they could." Still another source claimed the group was preparing to carry out its mischief around Christmas to coincide with a hacker's convention slated for Houston. The group is apparently bent on revenge for the recent sentencing of three hackers, who were given 14- to 21-month jail terms and fined stiff restitution payments for breaking into Bellsouth computers. A similar threat, which was not carried out, was made days before the Nov. 15 sentencing.

Finger painting

Bill Gates wants to have information at his fingertips — and talk to his machine, too. Accordingly, Microsoft is expected to announce this week that it has increased its holdings in Natural Language, Inc. in Berkeley, Calif., a 60-person software firm specializing in English-language user interfaces. Microsoft only spent $1 million this time, which is said to increase its share of Natural Language stock to more than 10%.

Virus? What — me, worry?

It must be a sign of the times. *MAD* magazine's Computer Virus Edition just hit the newsstands. The summer 1991 special edition features 96 pages of "glitches," including a "bug-infested Alfred E. Neuman program." Wanna-be *MAD* hackers are urged to waste time, energy and money copying programs that will create a *MAD* logo and Neuman's face.

More MIPS from Mips

The next RISC processor from Mips Computer Systems should be in the hands of systems companies by next month and in products by late summer 1991. The processor, seen as late to the dinner table by analysts, should rival the speed of Sun's latest RISC processor, at 40 MHz and about 29 MIPS.

Here we go again

The never-ending Wang rumor mill is now buzzing with word of big doings sometime next month. While nothing has been confirmed, analysts are speculating that the Lowell, Mass.-based minicomputer and imaging vendor is shopping around for financing and may be considering some type of limited partnership or distribution deal with Hitachi Data Systems.

Killer technology

The upcoming high-end Apple Macintosh based on the Motorola 68040 chip is reportedly hooked up to such a large monitor in the company's labs that Apple engineers have christened it with a suitably imposing nickname: Megadeath. The machine is scheduled to arrive in the first half of next year.

Did you say you had a problem?

For Oracle customers who haven't complained enough already, there will be a new customer support service to track users' problems that involve billing, ordering and other non-product issues. The new service, which may be announced as early as this week, is an addition to Real-Time Support, Oracle's revamped call-in customer service line. "This new organization will take responsibility for all nontechnical issues," Mike Fields, president of the Oracle USA Sales Division, told *Computerworld* last week.

In a prophetic slip of the tongue, Merrill Lynch IS boss Du Wayne Peterson began his keynote speech at the CIO/AMR conference in late October by mistakenly referring to a Wall Street Journal ***story on Merrill Lynch as a chronicle of "the current changes going on at Security Pacific" — where he was IS head five years ago. Later, Security Pacific CEO Michael S. Heschel began his remarks by joking, "When I heard what Du Wayne said, I almost rushed to call my office to see what was going on." Heschel gave up that office last month (see story page 1). Stirrings in the top ranks are always of high interest, so tip off News Editor Pete Bartolik at (800) 343-6474, message*** COMPUTERWORLD ***on MCI Mail, or fax the info to (508) 875-8931.***

NEXT WEEK

Two very different things lured **Ken Graham** out of retirement at the age of 59: the romance of the wine-making industry and the introduction of the IBM Application System/400. Learn more about Robert Mondavi Winery's director of MIS and the use of systems in the genteel but competitive wine business in a Manager's Journal profile.

Andy Freeberg

What DOS shell excels at file management but is hard for beginners to get their hands around? Answer: Xtree Co.'s Xtree Pro Gold. See what the experts have to say and how they rate the product in Technology Analysis, a comprehensive summary of opinions from personal computer laboratories, publications, users and analysts.

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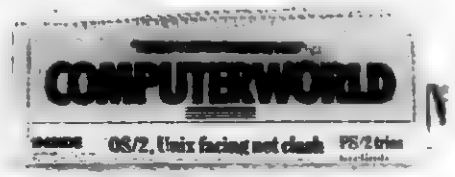
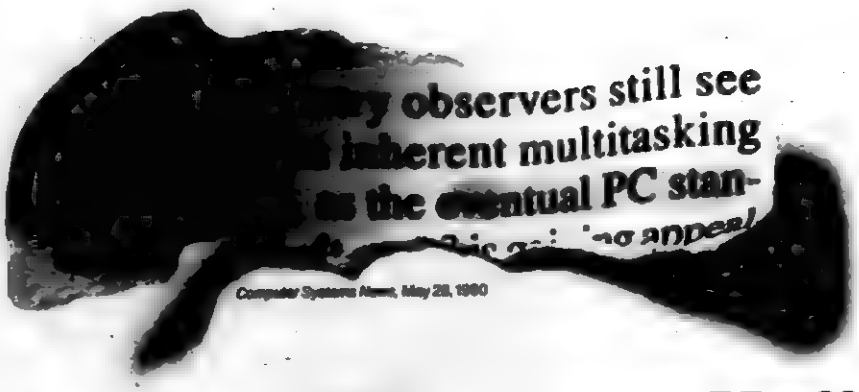
Why take chances?



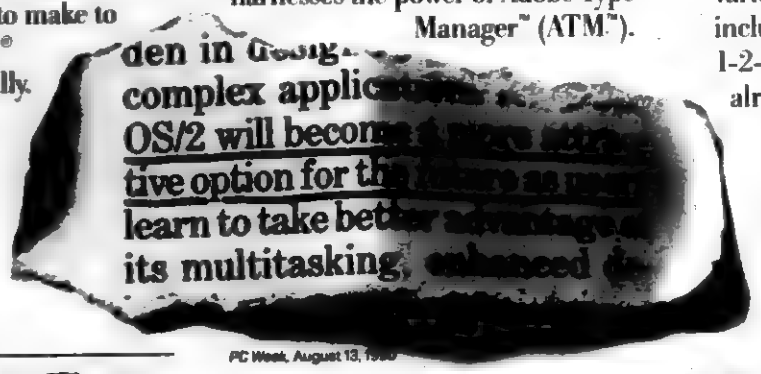


"Eventually" is here.

Announcing The OS/2 You've Been Waiting For.

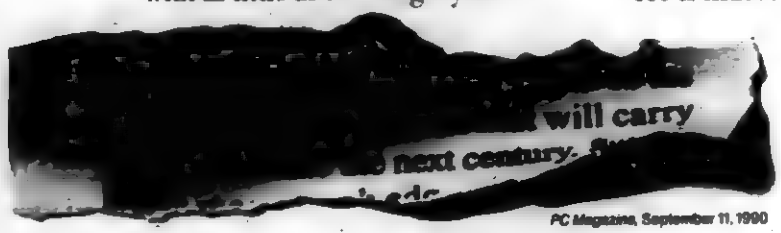
For quite some time, the press has been writing about the move everyone will want to make to OS/2.® Eventually.

Well, all at once OS/2 1.3 has made OS/2 the operating system it was meant to be—the one you'll want to move to right here and now.



OS/2 Loses A Little Weight.

For starters, OS/2 has lost some of its appetite for memory. In fact, now you can make the move to OS/2 1.3 with as little as two megabytes on your system. What's more, this streamlined version leaves more room for applications and will offer some users a substantial performance increase in many system functions.

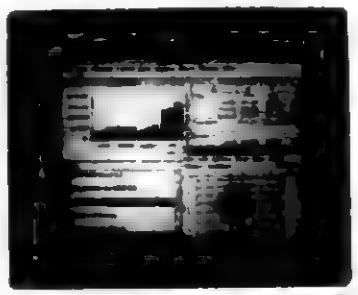


Functionality. Functionality. And Did We Mention Functionality?

Multitasking. Seamless connectivity. The ability to run applications larger than 640K. DOS compatibility. All these features have made OS/2 appealing in the past, but new features have catapulted OS/2 into the here and now.

For instance, now OS/2 1.3 harnesses the power of Adobe Type Manager™ (ATM™). With this new feature, the quality of screen fonts has improved dramatically, giving you a true WYSIWYG capability so what you see is indeed what you get. ATM also gives OS/2 more flexibility in document creation by supporting a wide range of outline fonts.

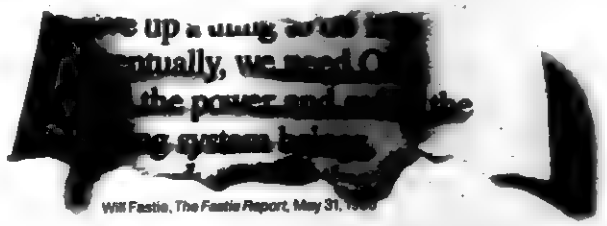
Of course, what good is all this without printer support? Not much. So OS/2 1.3 has improved and expanded its printer support to include drivers for almost all popular printers.



Business Is Booming.

Now that OS/2 is moving forward, so are software developers. Every day, more and more applications are joining the growing pool of available OS/2 software. In fact, a variety of major business programs, including Aldus® PageMaker,® Lotus® 1-2-3/G® and Microsoft® Excel, have already made the transition to OS/2. These, along with many others, have been redesigned to go beyond DOS memory limits and take advantage of OS/2's intuitive graphical interface—Presentation Manager.™

It's been said that eventually you'll want to take advantage of everything OS/2 has to offer. Well, wait no more because "eventually" is here.



For more information on what OS/2 can do for you here and now, or to get details on a no-charge upgrade to Version 1.3, contact your IBM Authorized Remarketer or marketing representative.

OS/2 can do!

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VOL 24
ISS 50
DE 10 1990
UMI

THE NEWSWEEKLY OF INFORMATION SYSTEMS MANAGEMENT
December 10, 1990 · Vol. XXIV · No. 50 · 130 Pages · $2/Copy · $48/Year

COMPUTERWORLD

AT&T bets computer business on NCR takeover

Industry's history frowns on hostile takeovers

ANALYSIS

BY NELL MARGOLIS
CW STAFF

If AT&T succeeds in the hostile takeover of a computer firm, it will join a highly selective group; if it acquires NCR Corp. and proceeds to actually create the merged firm it envisions, it will be in a class by itself.

"The history of acquisitions in the computer industry is that they generally don't work," noted Peter Labe, an analyst at Labe, Simpson & Co.

The most spectacular failure of recent years is the attempt of former Burroughs Corp. Chairman W. Michael Blumenthal to swallow Sperry Corp. and build Unisys Corp. into a $10 billion powerhouse designed to carry enough weight to challenge IBM. Today, after layoffs and restructurings, Unisys is a relative shadow of its former self, with its shareholdings valued at considerably less than $1 billion.

If the general prognosis for computer industry acquisitions is dim, several analysts saw nothing brighter in the particular prospect of an AT&T/NCR union.

"Takeovers are risky; hostile takeovers are all the more so —

Continued on page 125

Global view
If it acquires NCR, AT&T will gain a foreign presence that dwarfs its own

1989 installed base	AT&T	NCR
Small scale[1]		
U.S.	41,400	51,500
Worldwide	48,900	106,700
Medium scale[2]		
U.S.	6,100	1,800
Worldwide	6,900	4,900

1989 value of small and medium scale shipments		
U.S.	$470M	$470M
Worldwide	$520M	$1,140M

1 Systems costing $10,000 to $100,000
2 Systems costing $100,000 to $1 million

Source: International Data Corp
CW Chart: Paul Mock

Besieged execs spurn unwanted bid, but users see value in marriage of open systems strategies

BY ELLIS BOOKER
and MICHAEL FITZGERALD
CW STAFF

While NCR Corp.'s chairman struggled against the unwanted embrace of AT&T's hostile $6.12 billion takeover bid last week, NCR customers were calmly evaluating the merits of a proposed merger.

A merger "would strengthen me as a customer and offer the marketplace [a strategy] that would complement but not directly compete with IBM," said Jim Wegmann, vice president of corporate electronic data processing at Talman Home Federal Savings and Loan in Chicago. The bank uses NCR personal computers and Tower systems and AT&T's Unix System V.

Analysts baffled

The proposed merger, which began with talks first reported in mid-November, left analysts amazed at the sudden aggressiveness of AT&T and debating the likelihood of yet another grand computer industry partnership going up in flames (see analysis at left).

The all-cash bid to shareholders of the Dayton, Ohio, computer maker, which AT&T hopes

Continued on page 124

Humbug! No Officevision under the tree this season

BY ROSEMARY HAMILTON
CW STAFF

IBM will miss its year-end deadline for delivery of Officevision Release 2, industry sources confirmed last week.

The company plans to release a status report on the strategic integrated office platform later this month, an IBM spokesman reaffirmed.

Analysts and an industry source with access to development plans said IBM will announce a delay of at least three more months. They said they believe the earliest IBM can deliver Officevision Release 2 is early in the second quarter of 1991.

Industry sources said they expect IBM to pin the delay on a shift in development efforts for the workstation version of Officevision. Apparently, the company has decided not to proceed with its previous plan to deliver the local-area network version of Officevision Release 2 on OS/2 Release 1.2 but will instead target it for OS/2 Release 1.3, which has two availability dates. OS/2 Release 1.3 Extended Edition is scheduled for shipment by year's end. The LAN Server version is due out in March.

The shift to Release 1.3 will likely cause delays on the host-based versions of Officevision Release 2, the sources said. A key aspect of the host versions is a direct connection to OS/2, requiring an accommodation to the shift to Release 1.3. •

Latin America making connections

BY ELISABETH HORWITT
CW STAFF

Drug wars, political upheavals and alligators in the public waterways notwithstanding, one of the biggest deterrents to doing business in Latin America has been the lack of decent communications services. That may be on the verge of a change, with commerce-hungry administrations bringing in foreign companies to provide the necessary funding and expertise to bring their telephone systems up to snuff.

The improvements cannot come fast enough for communications managers struggling to provide an adequate network infrastructure for their companies' Latin American business dealings. Among the major hassles are unreliable or nonexistent telephone circuits, exorbitant charges, regulatory obstacles to implementing communications and computer equipment "not made here" and delays in circuit orders that can stretch out over months.

"The hardest places to get private lines are in Latin America; it's been a burr in our sides," said Patrick Greenish, managing director of Federal Express Corp.'s international tele-

Continued on page 6

Simmons puts Bank of Boston on IS offensive

BY MARYFRAN JOHNSON
CW STAFF

BOSTON — With the defensive posture of a bank beset by tumbling real estate values and severe economic doldrums, senior managers at Bank of Boston will take a look at a new offensive from their top information systems executive this week.

Michael Simmons, group executive vice president for technology and operations, will present the bank's audit committee with his "Technology Strategy," a five-year blueprint for streamlining the bank's disjointed IS plan.

John Owens

Simmons *to offer new strategy to streamline IS*

When Simmons came to Bank of Boston last spring from the top IS job at Bankamerica Corp., he surveyed the technical landscape and found 131 major applications, 55 separate databases, 13 local-area network operating systems, 110 LAN servers, nearly 3,500 workstations and more than 10,000 dumb terminals and personal computers.

Ironically, part of his blueprint involves casting off some of the local computer vendors whose woes are often seen as partially to blame for the decline of the Massachusetts economy, which has been in a slump since late last year.

From 11 different hardware platforms, Simmons will be paring away several vendors including Data General Corp., Wang Laboratories, Inc., Nixdorf Computer Corp. and Bull HN Information Systems, Inc. However, Simmons said he will keep IBM mainframes, Digital Equipment

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INSIDE

Executive Report — Is moving from central IS to business departments a career advancement? Many IS staffers think so. Page 87.

In Depth — Career boosters for women in IS. Page 95.

Computer systems are vulnerable, security panel says — and users are quite often their own worst enemy. Page 4.

Northern Telecom bails out of LAN development, leaving small user base wondering where to turn. Page 123.

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12 In the event of an outsider grabbing 20% of **Oracle**'s stock, a protection plan gives shareholders the option to buy stock at reduced cost.

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Quotable

"It must be a desperate attempt to salvage AT&T's disastrous foray into the computer business."

CHARLES E. EXLEY JR.
NCR

"Chuck, all we have is a difference of opinion on price."

ROBERT E. ALLEN
AT&T

On AT&T's bid for NCR.
See story page 124.

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LATE NEWS

Signet signals outsourcing vendors

BY ELISABETH HORWITT
CW STAFF

RICHMOND, Va. — Signet Banking Corp. is expected to put out a request for proposals to a number of "major outsourcing vendors" this week as part of a recently initiated outsourcing evaluation, according to Floyd Griggs Jr., executive vice president of information systems.

The bank's IS department initially met with bank management to propose the evaluation on Nov. 5, Griggs said late last week.

"We felt we could not overlook the outsourcing alternative as a means to accomplish a number of planned major IS initiatives," he added. "The timing and cost of getting those initiatives done [in-house] is known; the outsourcing evaluation is simply to see if there is a provider that can implement those plans in a more cost-effective, shorter time frame than we could."

The initiatives, which have been approved by management for implementation during the next four years, include the following:

- Developing application software for an integrated systems approach "so that, for example, you would have one deposit application instead of several to handle different kinds of activities," Griggs said.
- Data center automation targeting lights-out operations.
- Migration of the bank's data center operations from "a multivendor mainframe environment to a single environment: IBM's," Griggs said.

The financial firm has hired First Manhattan Consulting Group of New York to assist it in the evaluation process. The process, which should be completed by March, "will put everything on the table" as possible outsourcing fodder, including IS, data center, networking and network management operations, Griggs said.

Signet, a $12.4 billion holding company, has banking operations in Virginia, Maryland and Washington, D.C., as well as an international division. With 6,592 employees, it is the 46th largest U.S. bank.

EXECUTIVE BRIEFING

■ **NCR users appeared unconcerned** last week about AT&T's $6.12 billion hostile takeover attempt. Users said the two vendors share similar open systems strategies, and some hoped AT&T's bankroll would shore up NCR's ambitious plans to overhaul its product line. But the computer industry's poor merger history has many analysts concerned that the combination could be disastrous for both firms. Some European users think NCR's position will be strengthened overseas if it can get an injection of Unix savvy from AT&T. **Pages 1, 124 and 125.**

■ **Can IS and business really mix?** IS professionals who've made the move into user departments say yes. Although some twinges of separation anxiety are common, most say they were able to adjust to the new setting. Some are anxious to shake their technical image and blend into the mainstream for career advancement. **Page 87.**

■ **Computers are too vulnerable** to security breaches, and the government, vendors and users aren't doing enough to deal with the problem, a government study group said last week. The panel of experts recommended that a nongovernment foundation be established to promote safe computing. **Page 4.**

■ **Kill the letter: Save a buck — even ten.** That could be the word coming from corporate offices when executives learn that despite the use of PCs, the cost of producing a one-page, dictated letter has risen 79% in 10 years to $10.85. **Page 81.**

■ **Sweeping changes are on the horizon** for IS at ailing Bank of Boston. Newly installed CIO Michael Simmons has outlined a strategy that cuts out existing proprietary systems, consolidates data centers and greatly expands networks. **Page 1.**

■ **IBM will miss its 1990 target ship date** for Officevision Release 2, sources say. It will probably blame the latest delay on a decision to move to OS/2 Release 1.3 as the workstation platform for Officevision. **Page 1.**

■ **Northern Telecom has quit** the LAN market, discontinuing its Lanstar hub and leaving about 100 users with no easy migration solution. Northern will continue to support Lanstar but won't enhance it. **Page 123.**

■ **Hiring plans are producing negative numbers** for the first time since 1983, said a report by Manpower. The agency found that more firms plan to cut workers than to hire them. Most of the 15,000 companies responding to the survey reported no plans to change their staffing levels. **Page 82.**

■ **IS professionals in nonprofit organizations** say that while salaries may lean toward the low end, generous benefits, job security and satisfaction make their vocations worthwhile. **Page 108.**

■ **New York-area users who are nervous about disaster recovery** should get a boost from a decision by New York Telephone and New England Telephone to let alternative access providers share central office space. The move should make backup services more accessible. **Page 8.**

■ **On-site this week:** New technology means new market opportunities for the world's leading credit-card companies. Firms such as Visa and Mastercard hope to use computers and sophisticated networks to help customers use credit cards in new ways. **Page 71.** Having started out with an old, donated minicomputer to support its processing needs, Litel is among the first to try DEC's mainframes. **Page 33.** Residents of Ontario will soon be getting copies of official records out of an imaging database. **Page 34.** PCs are becoming a standard systems development tool at First National Bank of Chicago, which hopes that type of technology use will help it become a leader in quality. **Page 45.**

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U.S. systems open to threat, panel says

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — An independent panel of experts said last week that computer systems in the U.S. are highly vulnerable to intruders and are becoming more so as a result of the failure of the federal government and the computer industry to set standards and develop technology for security, safety and reliability.

The panel, a committee of the National Research Council, also faulted users for their failure to follow the most basic and important tenets of computer security, and it said that recent highly publicized reports of viruses, worms, Trojan horses and the like are "leading indicators" of the security problems of the next decade.

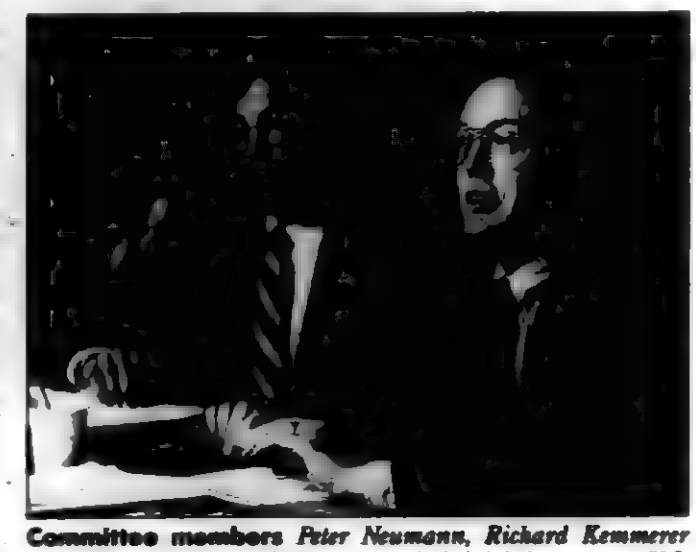
Horror stories

The panel cited a number of computer horror stories, including a $259 million currency scam at Volkswagen of America, Inc., an attempt that was very nearly successful to bilk the Pennsylvania lottery out of $15 million by printing counterfeit lottery tickets and thousands of reported attacks from viruses and other rogue programs.

While the panel blamed poor technology for some of those incidents, it said users are often their own worst enemies when it comes to computer security.

Users routinely do things that defy basic security principles, such as picking easily guessed passwords, storing passwords to secure machines on machines with no security, failing to reset default logons provided by vendors, failing to log security-relevant system actions for later audit and failing to develop recovery mechanisms, according to the panel's 300-page report.

Users often suffer because they buy equipment without security features to save money, said Harold F. Tipton, a committee member and computer security manager at Rockwell International Corp.: "It's like seat belts. When they cost extra, not many people bought them." He said the equipment evaluation and certification process recommended by the panel would encourage more bundling of security features with basic equipment configurations, "so users can't strip it out to save $1,000."



Committee members *Peter Neumann, Richard Kemmerer and Chairman David Clark (from left) briefed the press on U.S. computers at risk*

Nurture security

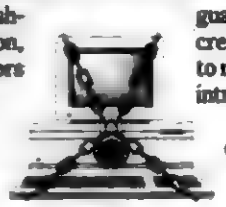
The panel recommended establishment of a nongovernment foundation to nurture the development and commercialization of technology for computer security, safety and reliability.

"Our central conclusion is that national computing and communications systems are vulnerable to potentially catastrophic security breaches and accidental failures," said David D. Clark, committee chairman and a computer scientist at MIT. "So far the nation has been remarkably lucky in escaping any successful systematic attempts to subvert critical computing systems."

The panel's report, "Computers at Risk — Safe Computing in the Information Age," released last week, caps an 18-month effort by 16 representatives of industry and academia appointed by the National Research Council, the principal operating arm of the National Academies of Sciences and Engineering. The work was requested by the Pentagon's Defense Advanced Research Projects Agency in the wake of the Internet worm incident two years ago.

Foundation developed for software security

The National Research Council-sanctioned commission on computer security recommended the establishment of an Information Security Foundation, which would be a consortium of users, vendors and parties such as insurance companies.



The foundation would formally evaluate and certify security products as well as "broker and enhance communications between commercial and national security interests."

The foundation would also develop and publish software development principles for secure systems. For example, the committee's report stated that software developers should strive for simplicity and smallness, use higher-level languages, design software that would limit the need for secrecy and provide excess memory and processing power to reduce the need to later solve performance problems by introducing complexity in the software.

Possible elements of generally accepted system security principles, according to the report, would include quality control, access control, user identification and authentication, protection of executable code, security logging, data encryption, operational tools to support security, independent audit and hazard analysis.

GARY H. ANTHES

DEC to unroll network, applications blueprint

BY MARYFRAN JOHNSON
CW STAFF

MAYNARD, Mass. — Digital Equipment Corp. will roll out some big wheels for its networking and distributed applications strategy this week with the introduction of DEC Message Q and Application Control Architecture.

Akin to electronic mail sent among users, DEC Message Q is like E-mail between applications residing on different network machines. This high-level application programming interface will be available in early February in versions for VAX/VMS, DEC's Unix-based Ultrix, MS-DOS and OS/2.

"At a shop where programmers have to write all the complex linkages between different applications, most of us would rather buy it than write it ourselves," said Shalom Bryski, vice president of VAX systems and networks at Bankers Trust Co. in New York.

What analysts considered to be the more significant part of the announcement, however, was Application Control Architecture. While it is only a paper architecture at this point — no software will be available for six to nine months — it will eventually enable separate applications to communicate across a network without forcing each computer to run its own version of that application.

Application Control Architecture "really can be considered the second version of DEC Live Links, which today requires the application to be resident on each computer," said Cliff Conneighton, an analyst at Gartner Group, Inc. in Stamford, Conn. "This is DEC's first serious stab at an object-oriented environment for end users, but it's not the part they see. It's all about how applications communicate."

Also this week, DEC will commit itself to fully integrating the Open Software Foundation's Distributed Computing Environment into its own Network Application Support program, which is the marketing umbrella for a number of its networking software products.

DEC Message Q was born out of actual customer experiences with distributed applications. "The product has been around for four years but only through DEC's customer software services contracts," Conneighton explained. "Now DEC is packaging it, pricing it and documenting it better."

Unlike the industry standard Remote Procedure Call, which is intended for communication between tightly coupled, synchronous applications, the Message Q software is a collection of interfaces for building loosely coupled applications that can communicate asynchronously.

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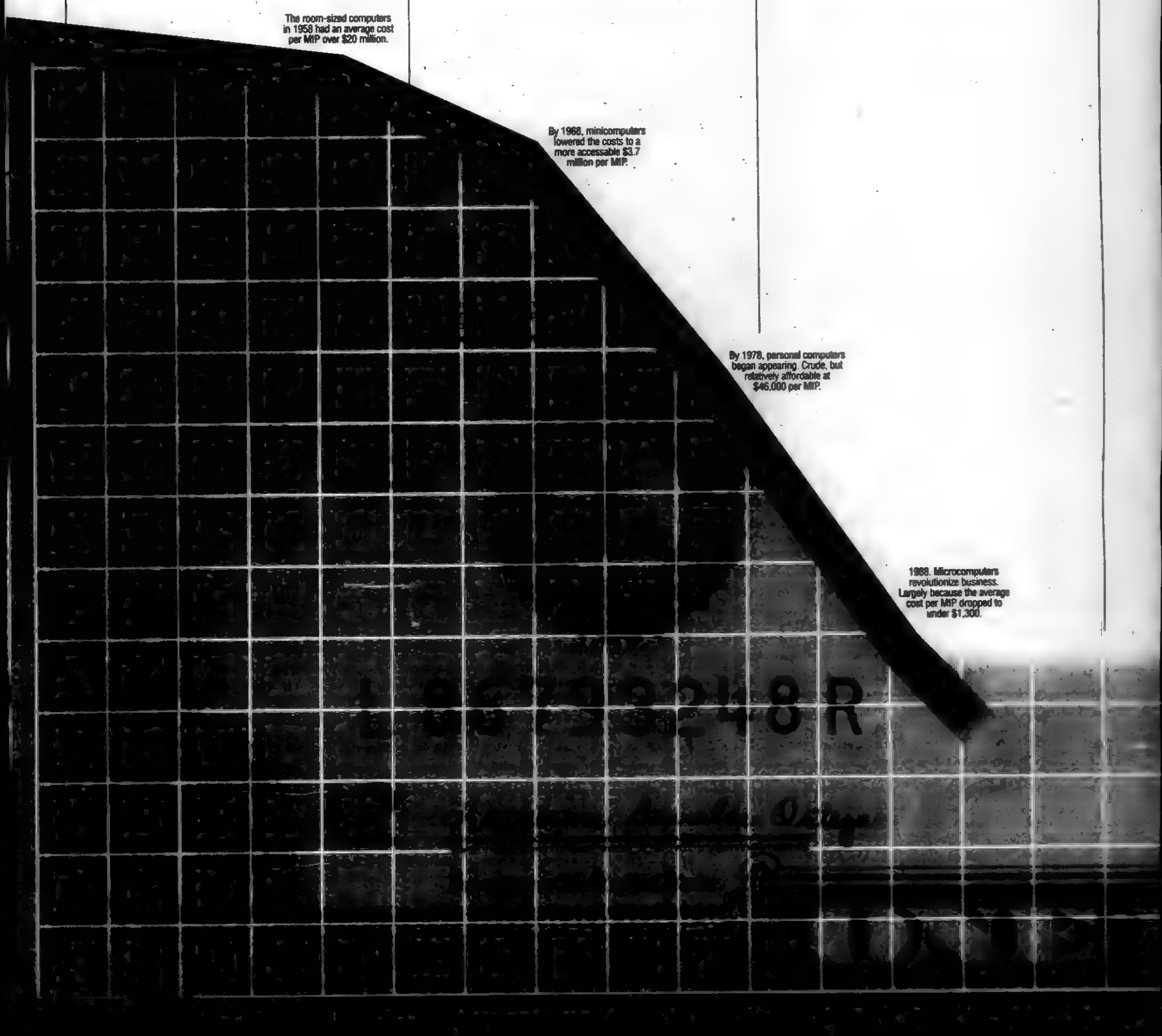


IBM branch makes move to UK

BY JOHANNA AMBROSIO
CW STAFF

ARMONK, N.Y. — IBM announced last week it is moving the headquarters staff of its Communication Systems line of business overseas, marking the first time it has located responsibility for that important a division outside the U.S.

IBM said that the staff will relocate to the UK in a bid to become a more "global" organization. Communication Systems is responsible for products in the areas of networking, value-added network services and network management.

About 120 IBM employees, most of them from the U.S., will be in new offices in Staines, England, just outside of London. Included in the move will be Ellen M. Hancock, general manager and the top executive at Communication Systems; Frank J. Elliott, assistant general manager for marketing; and John J. Cachianes, assistant general manager of finance and planning. The move will occur in phases, to be complete by September 1991.

Outside observers and IBM executives said the move should have no immediate impact on users because support, product development and marketing will remain much the same as they are now.

"Most customers deal with the marketing organization, not the headquarters staff," Elliott said. He also pointed out that most of Communication Systems' 12,000-plus employees will remain where they are. The hub of the organization's U.S. activity will continue to be in Raleigh, N.C.

Telling time

The move does mean that developers in IBM's Communication Systems group in Raleigh will "have to learn how to deal across different time zones" with headquarters staff when it comes to discussing such issues as "worldwide opportunity and market segmentation" for various IBM communications products, Elliott said.

The move puts Hancock and her staff closer to major IBM development laboratories in Europe, company sources pointed out. These include the CICS lab in Hursley, England; the Lagaude, France, lab, which is primarily responsible for communications controllers and modems; and the Rome laboratory, which develops Open Systems Interconnect products as well as some Netview components and which IBM recently announced it would expand.

Analysts noted that the move will give users better access to products developed for the more standards-conscious European market. "It gives customers a more leading-edge viewpoint," said H. Paris Burstyn, vice president of telecommunications research at Business Research Group in Newton, Mass.

He said it is a "good move for IBM. If you're going to play in the global market, it's important to be geographically close to the various countries, because each one has different requirements."

Senior editor Elisabeth Horwitt contributed to this report.

Better integration is focus of IBM software unit shift

BY JOHANNA AMBROSIO
CW STAFF

ARMONK, N.Y. — IBM has quietly made a series of organizational changes to coordinate integration strategies among various business units. Among these moves is a new group to oversee client/server computing and integration between Systems Application Architecture (SAA) and AIX computers.

Taken together, the moves mean "customers should see better-integrated solutions than in the past," said William J. Malik, program director of software management strategies at Gartner Group, Inc. in Stamford, Conn. "IBM is focusing on the key area of applications compatibility across its platforms."

The changes were announced on Nov. 30 to IBM employees via the company's electronic bulletin board. No formal statement was issued.

Among the changes was the creation of a new group called Systems Structure and Management. It is based in Somers, N.Y., and is under the purview of the Programming Systems organization headed by Earl F. Wheeler. The new unit is charged with overseeing cooperative processing, client/server computing and integration between the company's SAA and AIX platforms.

Mike Saranga was named assistant general manager of Systems Structure and Management. He had previously been the assistant general manager of the Development Operations Group in the Personal Systems organization based in Boca Raton, Fla.

Another unit was formed to coordinate the development of all operating systems for personal computers and workstations. IBM had previously announced it was working on common subsystems for OS/2 and AIX, and this group provides the organizational framework to do so, an IBM spokeswoman said.

The group, called Programming, is also based in Somers but is part of the Personal Systems organization headed by James Cannavino. Leland Reiswig Jr. is assistant general manager of Programming. He had previously been vice president of programing in the Entry Systems Division in Boca Raton.

The IBM spokeswoman characterized the moves as "small reorganizations. They're more for operational efficiencies and don't signify any new mission intents."

Connections

FROM PAGE 1

communications group.

Federal Express avoided the problem of line scarcity in South America by negotiating with governments to put in its own very small-aperture terminal networks, Greenish said. The drawback of this arrangement is that once such systems are built, the government usually takes them over and leases the bandwidth back to the user, he added.

Global garment manufacturer Benetton Group S.p.A. employs a General Electric Information Services network to maintain information flow among its subsidiaries, foreign plants and agents in 23 countries. However, "We don't communicate with our company in Brazil, although we would like to, because gateways are too costly," said Bruno Zoccaro, the Italy-based firm's information systems manager.

Brazil continues to protect local industry by prohibiting the use of communications and computer equipment "not made here," users reported. Federal Express ran up against this policy when it wanted to install IBM Systems Network Architecture (SNA) terminals at the Brazilian offices of its Flying Tiger subsidiary, according to Denise Smalley, Federal Express senior telecommunications analyst. The firm has been testing SNA equipment manufactured by a Memorex Telex N.V. subsidiary in Brazil but has no guarantee that such equipment will interoperate with Memorex Telex equipment manufactured in Argentina, she said.

The good news is that the newly elected Brazilian government recently said it would lower trade barriers, including import duties on telecommunications equipment.

A common practice for users in many Latin American countries is to "purchase twice as many lines as you need at any given time, because roughly half of them will be out of service," said Yousef Javadi, a spokesman at international carrier Overseas Telecommunications, Inc.

There are exceptions to this bleak picture. Countries such as Chile and Costa Rica "have outstanding [telecommunications companies]," said Richard Boley, manager of international communications at Westinghouse Electric Corp. However, the systems in most countries "couldn't get any worse, or they would totally collapse," he added.

Relief may be coming, however, on the wave of privatization that is sweeping Latin America and has extended to telephone companies in at least three countries (see story at right). However, while improving telecommunications services is a stated objective for such sales, it could take years for users to experience any significant change for the better, sources said.

One of the most serious obstacles to a large-scale revamp is the entrenched government bureaucracies that the new owners will have to deal with — and probably trim. "These are state-run, feather-bedding companies," Boley said. "You can't afford to pay all these people who are doing nothing; however, when the new buyers start handing out pink slips, they will run up against the unions."

Southern allure

Already the major trading partner of Latin American countries, the U.S. may benefit from a thriving demand for technology in the southern countries, according to the International Trade Administration

	Number of telephones per 100 inhabitants	1989 U.S. trade balance (in millions of dollars)	Projected market growth rate (hardware/software)
Argentina	8.2	$(389)	20% / 20%
Brazil	6.5	$(3,103)	20% / 18%
Chile	6.0	$50	10% / 30%
Colombia	3.9	$(400)	6% / NA
Venezuela	7.8	$(3,736)	15% / 30%
Mexico	7.4	$(3,000)	18% / 20%

Source: Guide to Computer Hardware and Software Markets in Latin America, International Trade Administration

CW Chart: Doreen St. John

Going private

Mexico, Brazil, Chile and Argentina are at the head of a trend that might be described as "Latin American *Glasnost*."

The administrations in those countries are "putting aside nationalistic tendencies to attract investments and grow," said Grady Means, chief economist at Coopers & Lybrand.

About four years ago, Chile began the trend of privatizing various state-owned companies, including transportation, post offices and most recently, telephone companies.

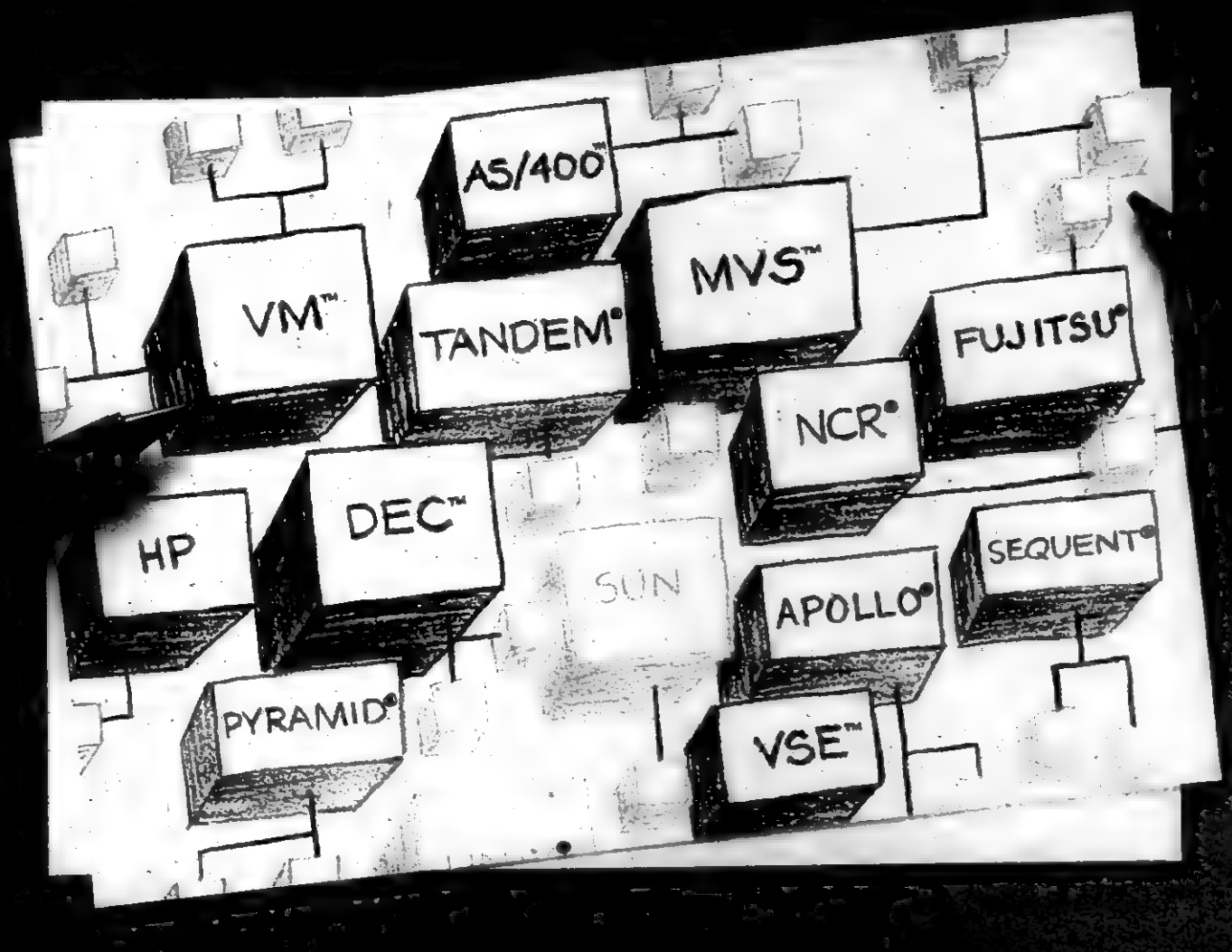
Chile has sold off its telephone company to a consortium that includes Telefonica de Espana and The Chase Manhattan Bank N.A. Argentina is on the verge of consummating the sale of its telephone company, Entel, to two separate consortiums: one led by J. P. Morgan & Co. and the other by Citicorp. The Mexican government recently announced the three final bidders for Telefonos de Mexico (Telmex).

Such moves are likely to benefit all parties involved, including users. The governments gain a much-needed infusion of cash and, in the case of Argentina and Chile, forgiveness of some of their debts to U.S. banks. Argentina will receive $100 million in cash and $2.3 billion of the debt it owes J. P. Morgan in return for the northern part of its telephone company, J. P. Morgan spokesman Joseph Evangelisti said.

The governments can also hand the burdensome responsibility of running the telephone network over to owners with the funding and expertise to give it a much-needed overhaul.

The Mexican government laid out in its operating license for Telmex certain minimal improvements that the new owners must make to keep the license, said Raoul Robledo, director of international projects for Banco International, the government's agent in the bidding process.

ELISABETH HORWITT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NEWS SHORTS

Mattson joins Gillette

Information systems executive David E. Mattson lost one job because of a corporate merger, but he recently found a new one at a company that successfully resisted a takeover attempt. Mattson, the former director of MIS planning at Sterling Drug, Inc., has joined Gillette Co. as director of corporate systems development. He reports to Gillette's top IS executive, Vice President Herbert W. Moller. Mattson left New York-based Sterling Drug earlier this fall after his position was eliminated in a reorganization related to Sterling's 1988 acquisition by Eastman Kodak Co. Gillette, on the other hand, was able to rebuff last year's takeover attempts by an investment group led by Revlon, Inc. Chairman Ronald O. Perelman.

Pick ported to Avion

Pick Systems announced last week that the Advanced Pick relational database management system has been ported to Data General Corp.'s Unix-based reduced instruction set computing Avion workstations. Under the terms of the OEM agreement, DG will market, sell and support the Pick software through its direct sales force and through Pick resellers targeting vertical market industries. In a separate announcement, DG said that the Avion family now supports the Informix Software, Inc. Wingz spreadsheet.

IS rides out Continental problems

Company spokesmen said the Chapter 11 filing by Continental Airlines Holdings, Inc. caused nary a ripple at the IS arm of Continental Airlines and System One, the firm's reservations division. They said that no freezes were planned for either equipment purchases or hiring. "I know it's hard to believe, but it's really business as usual," System One spokeswoman Yvonne Donaldson said, adding that System One's proposed deal with Electronic Data Systems Corp. (EDS) was also still alive. EDS spokesman Roger Still said the firms hope for a facilities management contract and a joint marketing agreement.

Exchange standard backed

The U.S. Department of Commerce called on U.S. industry last week to help implement an international product data exchange standard. The standard is to become a cornerstone of the U.S. Department of Defense's (DOD) Computer-Aided Acquisition and Logistics Support program. The standard, which allows the electronic expression and exchange of all useful information about a product, would be useful to any company involved in computer-integrated manufacturing and concurrent engineering, the Department of Commerce said. The agency said it would work with the DOD to spur research of the technology in the government and the private sectors.

DEC fleshes out TCP/IP support

As part of its recently announced commitment to supporting Transmission Control Protocol/Internet Protocol (TCP/IP) on its Decnet Phase V architecture, Digital Equipment Corp. announced last week that its Decserver 300 will now support the TCP/IP protocol Telnet, as well as its own Local Access Transport (LAT) protocol. This will allow terminals to concurrently access DEC and non-DEC hosts via either protocol or over Ethernet networks, DEC said. 3Com Corp. also announced Connection Service software for its terminal servers providing the same dual Telnet-LAT host connections.

DEC, System Industries settle suits

Storage products vendor System Industries, Inc. and DEC last week settled lawsuits centered on DEC's 1989 claim that System Industries' disk- and tape-drive products infringed on DEC patents. System Industries had filed counterclaims charging DEC with violating antitrust laws. Under the settlement, System Industries agreed to phase out sales of products covered by several DEC interface patents and to compensate DEC. In return, DEC agreed to provide System Industries with alternate means for attaching its products to future DEC systems.

More shorts on page 123

Nynex carriers to allow rivals shared access

BY ELISABETH HORWITT
CW STAFF

The New York and New England Telephone companies said last week that they would allow alternative access providers to co-locate transport equipment in their central offices as a way to give their rivals access to the regional Bell operating companies' (RBOC) network facilities.

The announcement paves the way for "disaster-sensitive" metropolitan-area businesses to finally get the backup services they need, according to Henry Levine, a partner at Washington D.C., law firm Morrison & Foerster.

Co-location would significantly extend the potential market base of alternative providers to companies with some sites outside the providers' fiber-based network, said Marie Brockhurst, a spokeswoman at Metropolitan Fiber Systems, Inc. (MFS).

Currently, MFS and other alternative providers can only connect sites directly over their own fiber connections. Co-location would allow them to sell fiber links to the regional carrier, which would then direct user transmissions to those sites that MFS does not serve, Brockhurst added. MFS' customer base is now in the "tens," with its oldest rival, Teleport Communications Group, "probably" having a slightly larger revenue base, Brockhurst said.

Alternative options

Co-location also gives the regional operating companies' Centrex customers the option of using an alternative provider's network as backup facilities, said Jeffrey Marshall, managing director of communications at Bear Stearns & Co.

The New York investment firm currently uses a variety of network providers, including MFS and Teleport Communications, to ensure that its network runs over diverse lines and switching facilities, according to Marshall. Indeed, Bear Stearns became one of the first companies to participate in a co-location arrangement when it set up a direct link to a long-distance carrier through Teleport Communications, "so I am familiar with some of the struggles involved in co-location," Marshall said.

Alternative providers such as MFS and Teleport Communications compete against the RBOCs in a narrow but lucrative market segment: Fortune 500 companies that are looking to back up rather than replace their regional carriers, Levine said. However, alternative providers have been handicapped by their dependence on their rivals for access to long-distance carriers, as well as to the regionals' much more extensive customer base.

The Nynex Corp. companies' announcement has potentially broad implications for users in other parts of the country, Levine said, because it takes all the force out of past arguments by Nynex and other regional holding companies, which said co-location was impossible and inappropriate.

To date, the two Nynex RBOCs, in addition to Bell Atlantic's New Jersey Bell, may be the only regional carriers to provide any type of direct link to alternative providers, Levine said. Teleport Communications and MFS are both actively negotiating with Pacific Bell to provide "some sort of virtual but not physical co-location," Brockhurst said.

Claris checks out Windows applications

BY JAMES DALY
CW STAFF

SANTA CLARA, Calif. — Apple Computer, Inc. is using its Claris Corp. software division to produce applications for Microsoft Corp.'s red-hot Windows 3.0 package, a competing product that replicates the once-unique screen appearance of Apple's Macintosh personal computer.

Analysts have long speculated that Apple abandoned long-standing plans to spin off Claris into a separate business unit earlier this year because it feared Claris would focus on building applications for the success of Windows 3.0, which Microsoft said has sold more than 1 million units since being introduced in May.

"There has always been a misconception that we brought Claris back to prevent them [from] building a Windows product; we want a Windows product," Apple Chairman John Sculley said last week at a forum here hosted by Technologic Partners.

While Sculley admitted that Windows development "will not be Claris' great mission," Claris executives said the rapid success of Windows 3.0 has made it difficult to ignore. "We no longer believe that Windows will go away," said Yogen Dalal, vice president of product development at Claris.

Dalal added that Windows development efforts "are still a little squishy," but initial work would most likely focus on porting existing Claris products such as the Macwrite word processing application, Filemaker database management software and the Macdraw graphics package to Windows.

Later undertakings could entail the creation of entirely new applications, he noted. "We want to avoid addressing users on a lowest common denominator basis," he said.

Users were enthusiastic at the possibility of Claris developing for Windows. "We'd love to see a package that could span both DOS and Apple, because it would really ease the pain of integrating the two environments," said Mary Howlett, manager of management information technologies at Hughes Aircraft Co.'s ground systems group in Fullerton, Calif.

Sun to limit releases to CDs

BY J. A. SAVAGE
CW STAFF

SAN JOSE, Calif. — By the end of 1991, Sun Microsystems, Inc. will no longer distribute new software releases on media other than compact disc.

Donna Novitsky, group marketing manager at Sun, announced at the 8th Annual Sun User Group meeting here last week that the company would promote CD drives by offering one free drive with two years' service/support contract — if the pack was paid for up-front.

While several vendors offer documentation or software on compact disc/read-only memory (CD-ROM) discs, Sun is apparently the first mainstream systems supplier to make it a requirement and refuse to ship tapes or disks. Next Computer, Inc. initially shipped its systems with a CD-ROM instead of a hard drive but revised that policy when it ran into user opposition.

Sun users who said they have seen the firm suddenly drop other endeavors or product lines groaned but appeared to take the announcements in stride.

"Drives are cheap," said Doug Kingston, a systems administrator at Morgan Stanley & Co. "For about the price of a box of tapes, you can get a drive." Kingston priced the drive at approximately $1,000. "The rub will be the one- and two-man shops, then $1,000 will be a lot of money."

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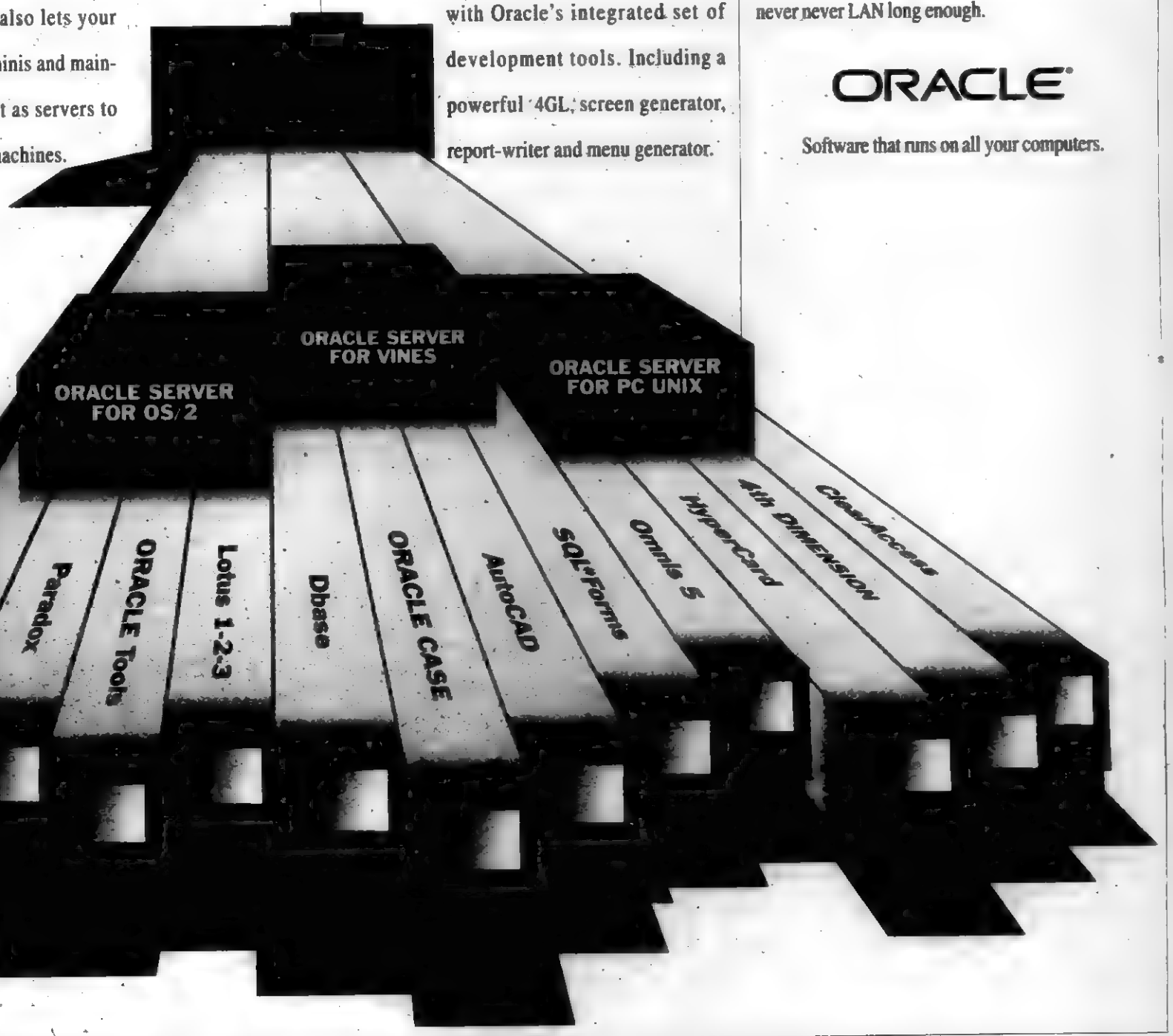

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NASA refutes hacker break-in story

BY MICHAEL ALEXANDER
CW STAFF

HOUSTON — A National Aeronautics and Space Administration (NASA) spokesman angrily denied a published report last week that computer hackers rang up a $12 million telephone bill over a two-year period after compromising a private branch exchange at the Johnson Space Center.

"We strongly disagree with the dollars," said Steve Nesbitt, a public information officer at the Johnson Space Center. The $12 million figure is twice what Johnson Space Center paid in telephone charges over the past two years, he said. "Our entire bill per year is only $3 million, and that serves the legitimate needs of 10,000 users," Nesbitt said.

The *Houston Chronicle* said the $12 million figure was "extracted from costs of similar break-ins around the nation described by law enforcement agents specializing in computer crime."

An Arizona assistant attorney is quoted in the *Chronicle* article as having said that hackers typically ring up illegal charges of $100,000 per month at small firms and $500,000 per month at large firms.

Assuming the unknown hackers used NASA's telephones for two years, the agency could have lost service worth as much as $12 million, based on the assistant attorney's valuation, the newspaper said.

Officials at the space center said they are willing to believe that hackers were able to get into the Federal Telephone System, a dedicated telephone service for government employees, through the space center, but they added that the cost of the intrusions was probably less than $10,000.

While investigating the break-in, NASA officials discovered that one of its AT&T calling cards had been fraudently used to ring up $9,600 in charges. "That is the only theft that we have been able to verify," Nesbitt said.

Carriers offer ISDN alternate

BY JOANIE M. WEXLER
CW STAFF

The most sought-after Integrated Services Digital Network (ISDN) application is now available *sans* the ISDN price tag from two major long-distance carriers. This scenario could tide users over through tough economic times until they can make the equipment and service investments the technology requires.

U.S. Sprint Communications Co.'s recent bundling of an automatic number identification service with its Ultra 800 offering joins MCI Communications Corp.'s service and leaves only AT&T customers out in the cold for getting caller identification capabilities without investing in ISDN. Automatic number identification is the ability of a network to notify the called party of the caller's and/or directory listing.

Aside from potential equipment upgrades, ISDN services carry hefty per-connection installation and monthly service fees. Sprint and MCI are also actively marketing ISDN, and analysts see the recent offerings as both another stumbling block and a potential migration path to full-blown ISDN technology.

"If the carriers offered only ISDN [automatic number identification] [like AT&T], they would encourage the use of ISDN," commented Steve Sazegari, an analyst at Dataquest, Inc., a market research firm in San Jose, Calif. "However, ISDN is currently considered a luxury and is on the back burner for many firms."

"Having a cheaper way to do [automatic number identification] could prove its usefulness to would-be ISDN users," countered H. Paris Burstyn, vice president of telecommunications at Newton, Mass.-based Business Research Group.

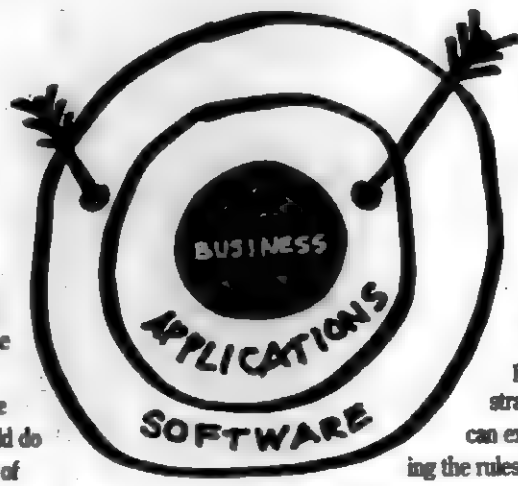
"If all you're looking for is [automatic number identification], ISDN is a poor choice," commented Sanjeev Malaney, president of Mediatel Corp., a service bureau in Campbell, Calif., that has been beta-testing Sprint's non-ISDN automatic number identification service since September. "Why spend the money [for ISDN] if the only ISDN capability you need is [automatic number identification], and you can get it on existing equipment?"

Mediatel uses a homegrown voice response system for its business, and Malaney said the investment in an ISDN-capable private branch exchange alone would currently be prohibitive for him.

Frank McConnell, director of telecommunications at Colonial Penn Group, Inc. in Philadelphia, said that as soon as he heard Sprint had rolled out non-ISDN automatic number identification, he got on the phone to his long-distance carrier, AT&T, and "demanded to know if they had it and if not, when they were going to get it."

AT&T has reportedly remained adamant in requiring users to subscribe to ISDN Primary Rate Interface service for automatic number identification. That is one reason Mediatel uses Sprint, Malaney said. "We refuse to be bullied by the company into using ISDN just for [automatic number identification]." AT&T was unavailable for comment at press time.

As long as the aim of CASE vendors is better software, they'll be off-target.



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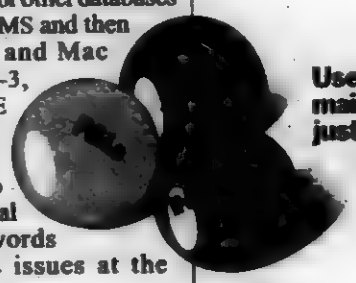

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Microsoft buys into natural-language interfaces

BY JEAN S. BOZMAN
CW STAFF

BERKELEY, Calif. — Microsoft Corp. plans to incorporate natural-language interface options into its next generation of personal computer software, Microsoft Chairman Bill Gates said last week. However, the company does not expect English to replace point-and-click graphical interfaces any time soon.

Microsoft hedged its bets last week by increasing its holdings in Berkeley-based Natural Language, Inc., to 10%. Microsoft has the right to use Natural Language's technology in its future products. The investment comes three months after IBM announced its own natural-language interface for database query, IBM SAA Language Access, which will be available by June 1991.

Natural-language interfaces allow users to request data in English, with the computer translating the queries and prompting the user for more detailed information if necessary. While future Microsoft products may offer the natural-language interface as an option for certain applications, the keyboard-driven interfaces are not meant to replace graphical user interfaces such as Windows, Gates said.

In the short term, industry analysts said, Microsoft's and IBM's investments will not change the niche nature of the fledgling natural-language business. However, Gates said the natural-language interface holds promise for the next generation of Intel Corp. I486-based desktop workstations.

Currently, products made by Natural Language and its primary competitor, Intelligent Business Systems, Inc., in Milford, Conn., run on Digital Equipment Corp. VAXs, Sun Microsystems, Inc. workstations and other Unix computers. AI Corp. in Waltham, Mass., also sells natural-language query systems for midrange and mainframe computers.

"As personal computers become more powerful, there will be lot of cases where the natural-language interface will be superior," Gates said.

Gates called the investment a long-term strategic move by Microsoft. "This is high-end stuff," he said. "This investment wasn't made thinking that something was going to explode [in this area] in the next 12 months."

Some of Natural Language's 100 user sites reported that the interface can work well for certain classes of end users who may feel uncomfortable with point-and-click interfaces for database query. "There's a comfort factor in this," said Ron Bleed, vice chancellor of information technologies at Maricopa Technical Community College in Phoenix, which uses Natural Language's products on its VAX 6400s. "In our end-user community, college advisers, faculty and administrators are used to dealing in words." However, Bleed said, the college system has invested much more heavily in PC software that has graphical user interfaces.

Natural Language has received $12.4 million in venture capital funding since 1984, while Xerox Corp. and Ing C. Olivetti & Co. have invested $26 million in Intelligent Business Systems, which makes the competing Easytalk interface. Intelligent Business Systems has about 25 sites, compared with Natural Language's 100 sites worldwide; neither company has annual sales of more than $5 million.

In the PC market, the dominant natural-language query product is Q&A, made by Cupertino, Calif.-based Symantec Corp. Q&A runs against a proprietary database and works with less than 512K bytes of memory. Symantec said it has sold more than 300,000 units of the $350 MS-DOS based product since 1985.

In contrast, prices for the Natural Language and Intelligent Business Systems products range from $3,000 per unit to $100,000.

Oracle moves to deter takeovers

REDWOOD CITY, Calif. — Oracle Systems Corp. has created a "poison pill" designed to fend off any hostile takeover attempts, the company said last week. Oracle's board of directors approved a stockholder rights plan that gives shareholders the option to buy additional Oracle stock at a fraction of its market value. That option is triggered if an outside group acquires 20% of Oracle's stock. The plan goes into effect on Dec. 31.

"You don't want to allow a raider to accumulate a lot of the stock before your board [of directors] has a chance to act," said Michael Musson, director of investor relations at Oracle. "You want to have a plan in place that forces the acquiring party to negotiate with your board."

The plan was designed to delay any takeover attempt, giving the board time to find another buyer or bargain for a higher price, Musson said. At week's end, Oracle stock was trading for less than $8 per share.

At the same time, Oracle announced that it had named George-Paul Dreyer as president of its subsidiary Oracle Complex Systems Corp. in Arlington, Va.

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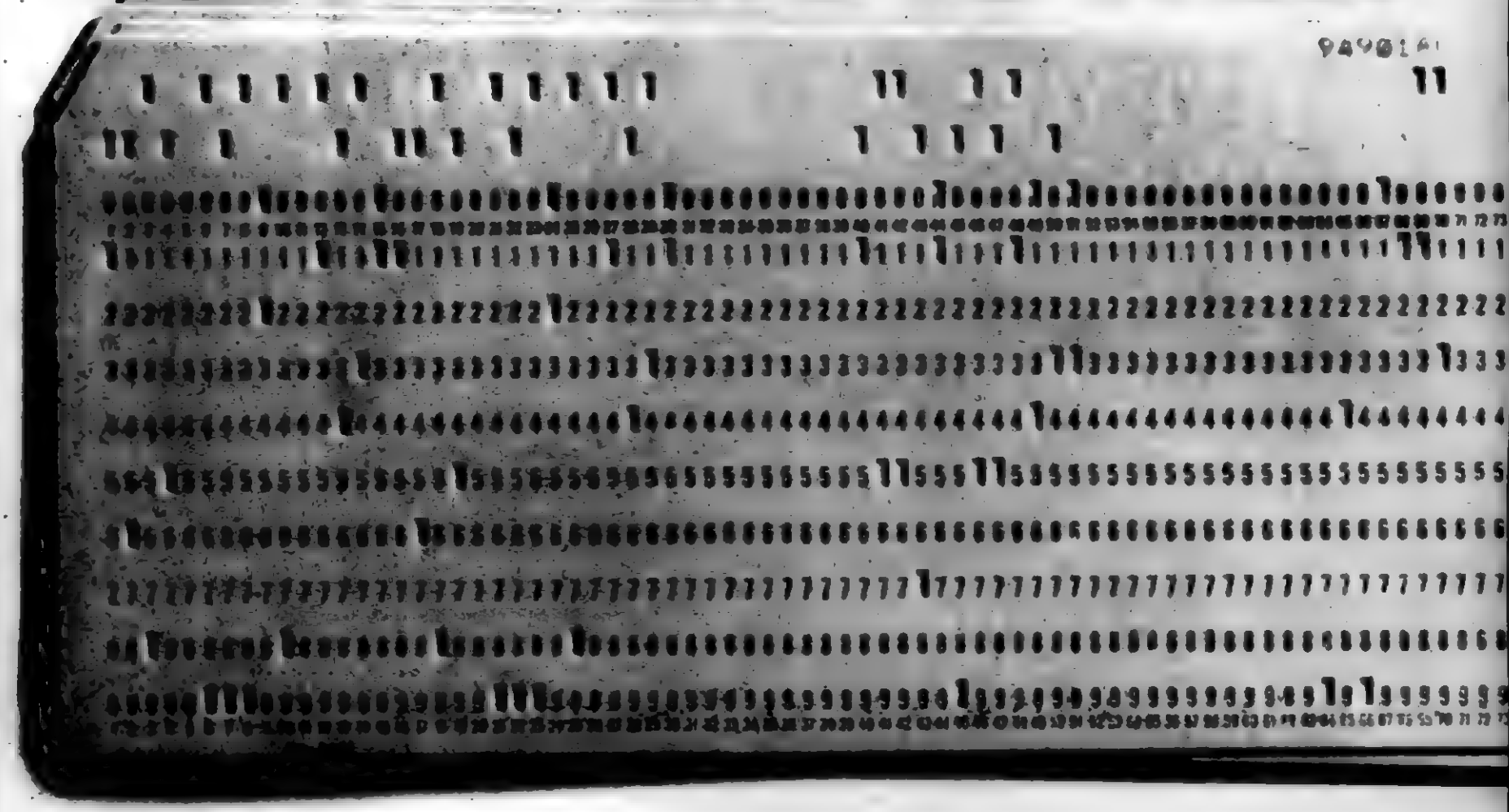

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Five HP minicomputers debut

BY J. A. SAVAGE
CW STAFF

CUPERTINO, Calif., — Hewlett-Packard Co. filled in its minicomputer lines with three Unix-based systems and two models based on its proprietary operating system last week.

Adding Models 948 and 958 to the high end of the company's Series 3000 line of midrange systems that run the proprietary MPE/XL operating system leaves HP with midrange minicomputers extending from the low end at 5.7 trans/sec. for $26,000 with the Model 920 to 38.6 trans/sec. for $245,000 with the new Model 958, according to the company. Users can upgrade among models in this range with a board swap.

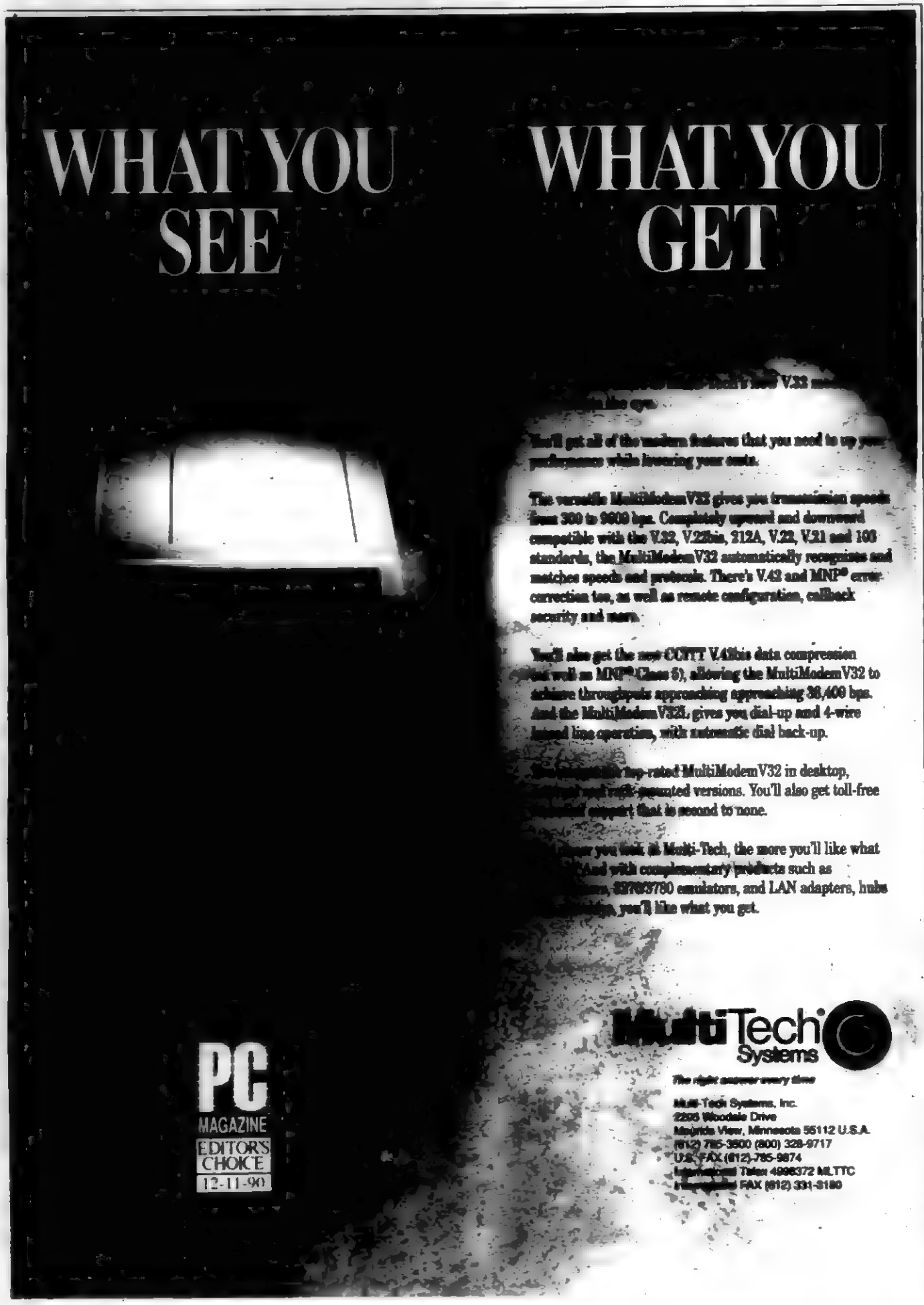
Barry Zarakov, director of corporate information services at Pip Printing International in Agoura Hills, Calif., said the introductions make him more comfortable that there is room to grow from his Model 925 with only a board swap. "Board swaps are obviously an easier creature to deal with," he said.

With the new introduction, the price per trans/sec. is now below $20,000, according to Wim Roelandts, vice president and general manager of HP's Computer Systems Group.

"Less than a year ago, it was $30,000 to $35,000," he said. The figure is based on the Transaction Processing Council's estimate of the cost of five years of ownership, and it includes terminals, memory, disks, software and maintenance.

The company also rolled out three Unix-based models. In the lower end of the range, users can go from the 11 million instructions per second (MIPS) Model 822S, which costs $27,900, to the 52 MIPS Model 852S, priced at $143,000, with a board swap.

The Model 842S was also introduced with a processing speed of 29 MIPS and a price of $85,000. HP filled in the middle of its high-range Unix-based computers with the Model 865S, which runs at 53 MIPS and costs $275,000.



CGI buys Yourdon

BY ROSEMARY HAMILTON
CW STAFF

CGI Informatique, the Paris-based computer-aided software engineering (CASE) company last week acquired Yourdon, Inc., a company founded by Ed Yourdon, the man who established the popular Yourdon CASE methodology.

The move should give CGI a boost in the U.S. CASE market. The company will pick up more than 250 users in North America, which is twice the amount of CGI users in Europe.

The acquisition will also provide CGI with a set of front-end tools that, in some cases, overlaps its current lineup. Yourdon sells a personal computer-based design tool and a code generator. CGI Systems, Inc., the U.S. subsidiary of CGI Informatique, markets a repository-based full life cycle tool set for mainframe and local-area network-based CASE development.

According to Richard Ramsdell, president of CGI Systems, the plan is to provide support for Yourdon users. However, the long-term goal will be to move them to the CGI environment.

He said CGI will provide a data transfer interface but added "we don't anticipate building a totally integrated connection."

The company will also give Yourdon users a break on licensing the CGI system. "We will probably give them the benefit of the price they've already paid [for the Yourdon tools]," Ramsdell said. The Yourdon tools are based on the Yourdon Structured Method, which approaches CASE from a process point of view.

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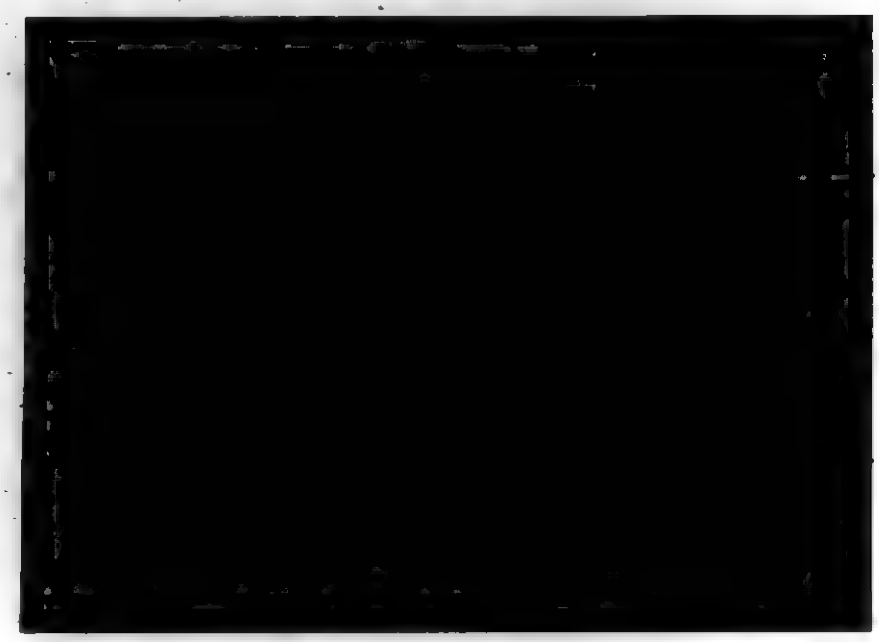
How to tell a great idea from



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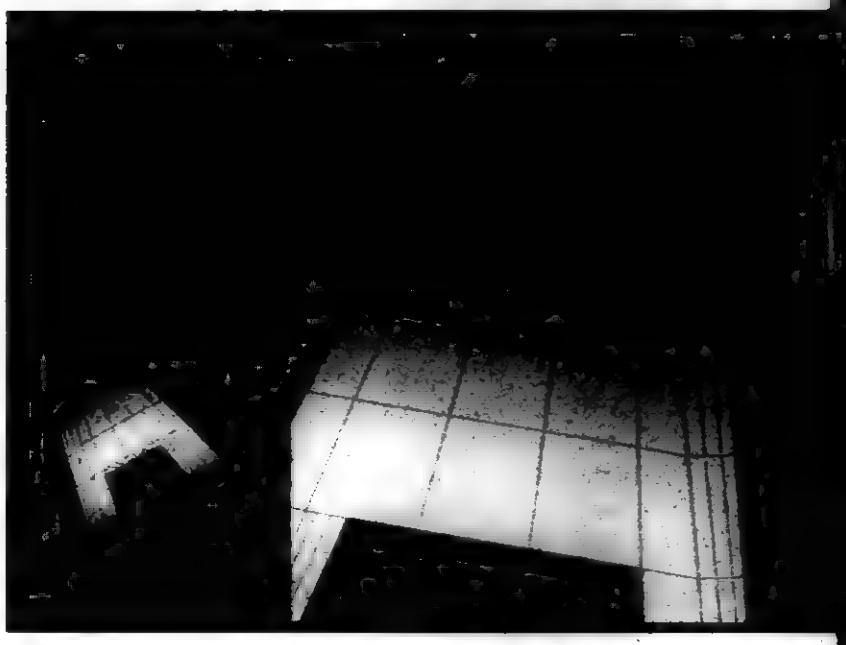

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HEWLETT PACKARD

Microsoft aims for desktop document standard

BY RICHARD PASTORE
CW STAFF

Suppose you could embed a Lotus Development Corp. 1-2-3 spreadsheet into an Aldus Corp. Pagemaker document and link them together so a change to the spreadsheet would automatically be reflected in the Pagemaker text. This "compound document" could also travel as a single unit across a network. And the live links would be invisible to the user, who would only see a single document.

This idealistic scenario will become reality if Microsoft Corp. can convince enough third-party applications developers to support its latest effort to set a desktop computing standard.

Microsoft expects more than 200 developers to attend a conference today to receive copies of its new compound document specification, dubbed OLE, for Object Linking and Embedding. Among those expected to announce support for the Windows 3.1-based OLE are Lotus, Wordperfect Corp., Aldus, Micrografx, Inc. and Borland International. "If you've got a word processing document that contains a spreadsheet brought in from Lotus [1-2-3] or [Microsoft's] Excel, it makes sense to work on the spreadsheet" data without having to manually load the application, said Michael Drips, senior strategist at U.S. Sprint Communications Co.

Because of the popularity of Windows, Drips thinks OLE will become a standard.

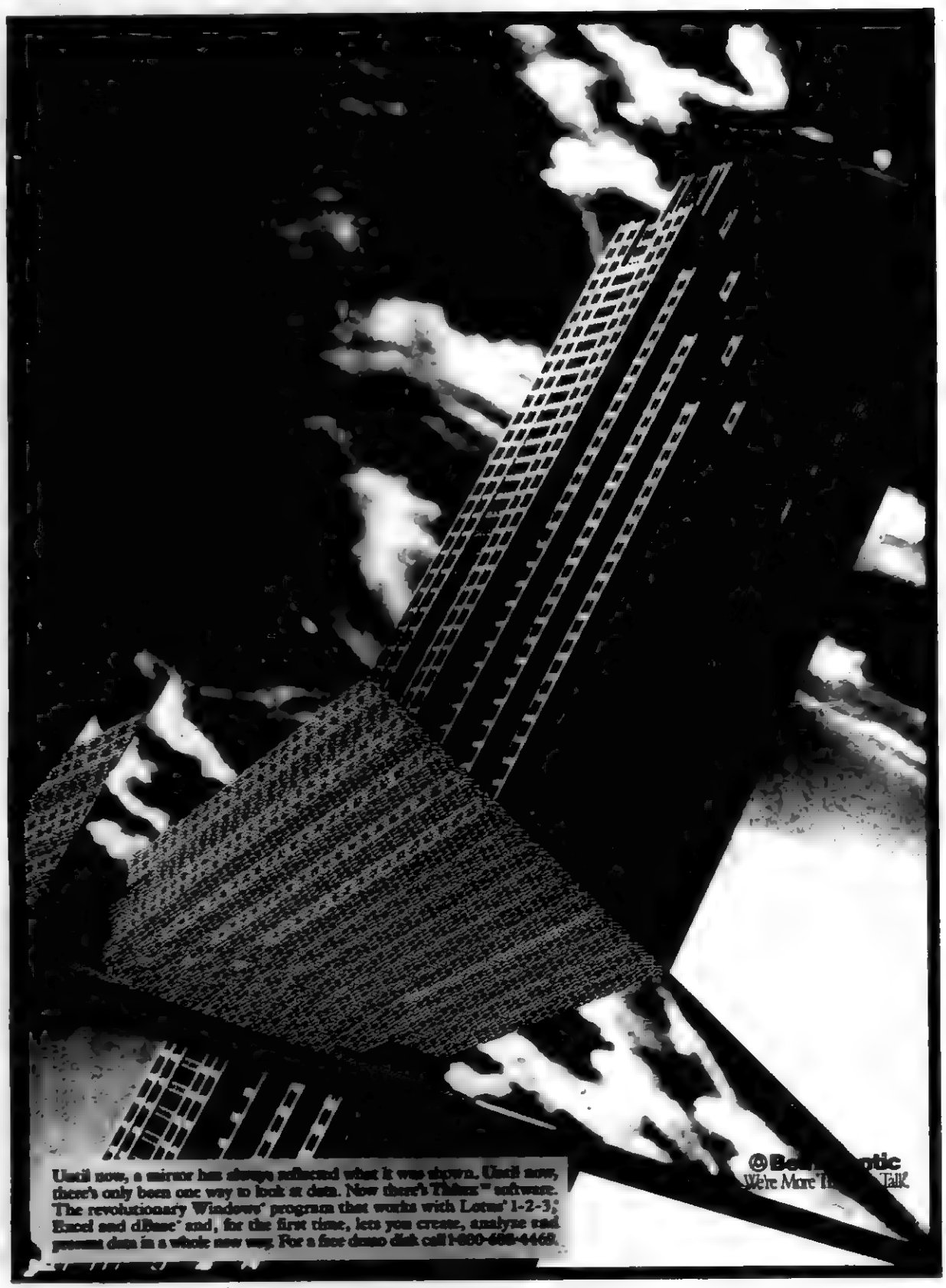
In the past, various applications have made it possible to "hot-link" and embed portions of one application into another, but only with applications specifically modified. For instance, linking is already possible between certain Lotus and Wordperfect applications.

Interleaf, Inc. is incorporating a similar capability, active documents, in the next release of its publishing software due to ship this month. However, the feature is for Unix-based systems, and Interleaf is not pushing its technology as a standard.

But Microsoft seeks to widen the scope of this capability to all applications on all personal computer platforms.

"We can already do [linking] between our own applications, but this is a lot smoother," said Chuck Middleton, director of OS/2 and Windows Development at Wordperfect. "Microsoft seems to be the logical company to start a move toward standardizing that capability."

The next major releases of Microsoft's own Windows-based applications will support OLE, according to Darryl Rubin, vice president of application strategy. Microsoft also plans to adopt OLE for Apple Computer, Inc.'s System 7 when it is released and for OS/2 with Presentation Manager "at a later date," Rubin said.



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Morris looking for new ruling

BY MICHAEL ALEXANDER
CW STAFF

NEW YORK — Seeking to overturn the January 1990 conviction of Robert T. Morris for creating a worm program that immobilized computers on the Internet computer network, his attorney argued in federal appeals court last week that Morris did not deliberately set out to cause harm.

Thomas Guidoboni, the Washington, D.C., attorney who defended Morris, told the panel of three judges in oral arguments he understood the law to mean that the government had to prove Morris intended to access the computer systems and cause the harm that resulted from paralyzing thousands of computers for up to three days in November 1988. In his trial, held in Syracuse, N.Y., last January, Morris said a programming error caused the worm program to replicate out of control and clog the memories of the computers that were attacked.

Guidoboni also said Morris did not break into the computers but merely exceeded a right to use the computers while attending Cornell University as a computer science graduate student in 1988.

Ellen Meltzer, one of two government attorneys who prosecuted the case, argued that the law clearly does not require the government to prove the intruder intended to cause harm.

In an interview, Guidoboni said the issue of intent was both familiar and evident to the judges. The second argument, that Morris had a right to use the computers but exceeded his privileges, was more technical and thus may not have been as readily grasped by the judges.

The second U.S. Circuit Court of Appeals in New York is expected to prepare a written statement and issue a decision, probably within four to six months, Guidoboni said.

Morris, 25, was the first person brought to trial under a section of the Computer Fraud and Abuse Act of 1986 that makes it a felony to break into a "federal interest" computer and prevent its authorized use. He was convicted and sentenced to three years' probation and 400 hours of community service and was fined $10,000. He has been fulfilling his community service requirement by working part-time at the Boston Bar Association.

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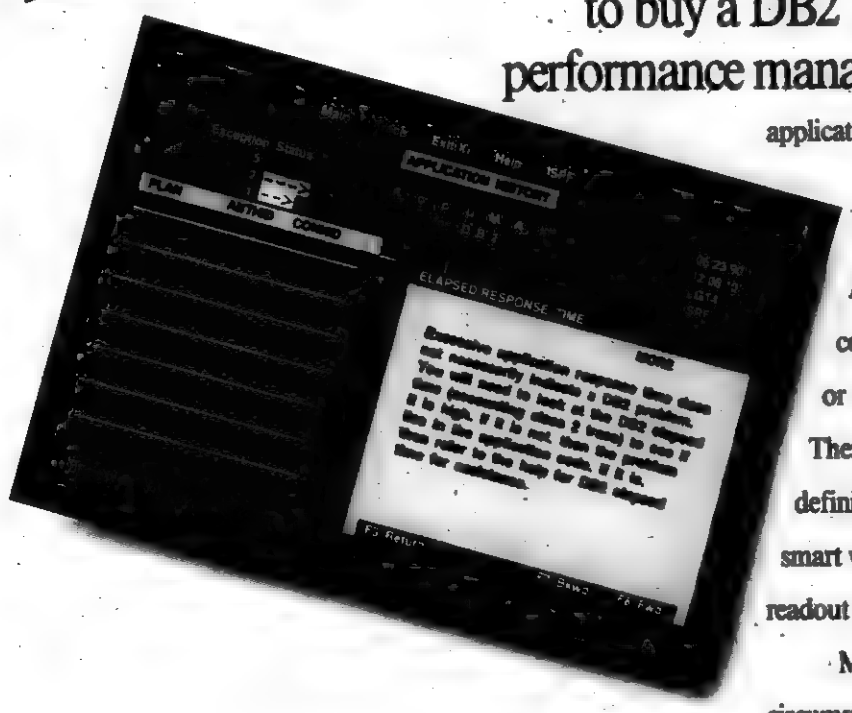

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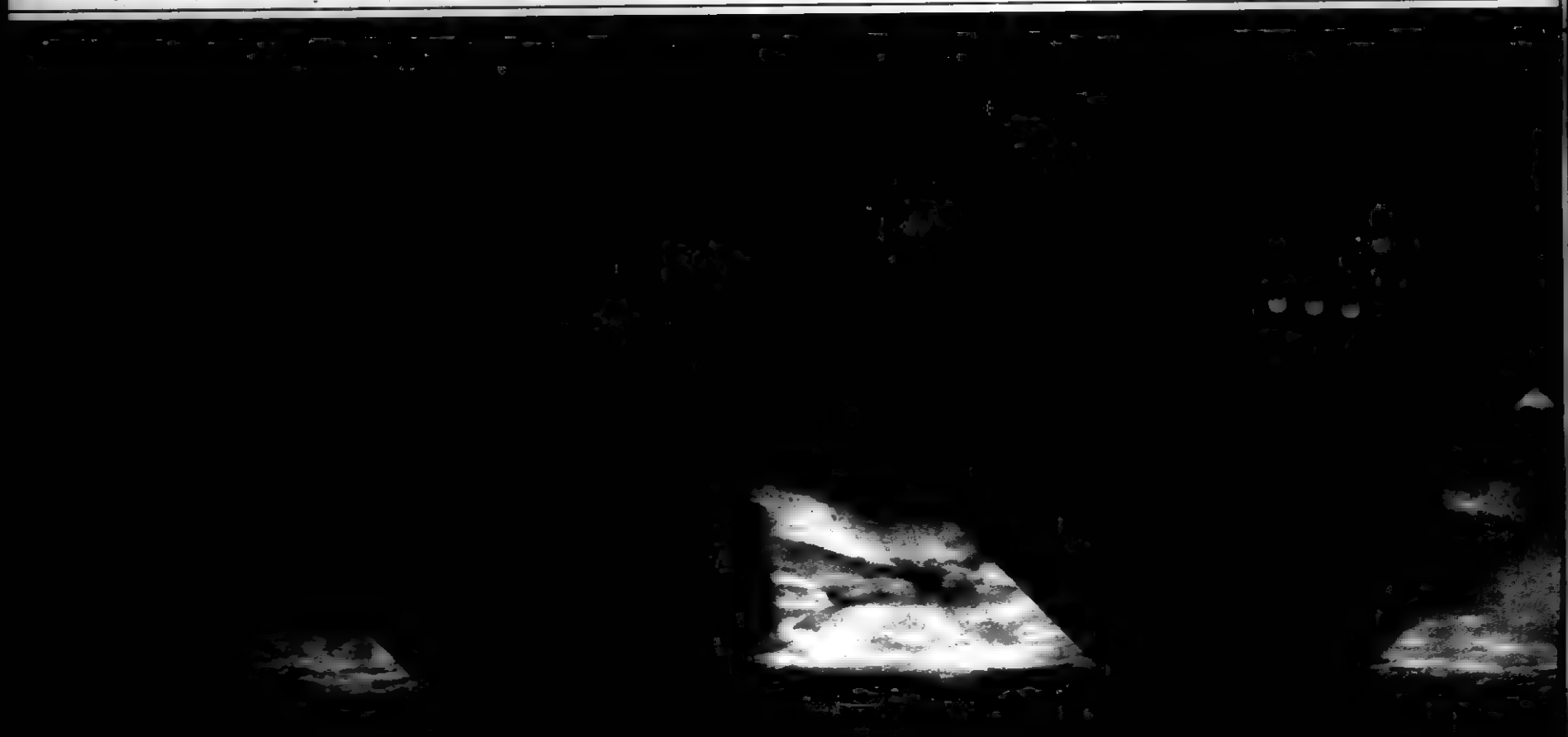

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ADVANCED TECHNOLOGY

TECH TALK

New from NCR

■ NCR Corp. is showing off what it said is one of the first commercially available manufacturing cell control systems based on Open Systems Interconnect standards. The cell control system is also one of the first to integrate Unix Version 3 and Manufacturing Automation Protocol (MAP) 3.0, the company said. The system is aimed at manufacturers who want to integrate shop-floor devices made by a variety of vendors, according to Ray Chagnon, director of manufacturing industry marketing. NCR will market the cell control system under an agreement with AEG, Inc., based in Germany. The German firm will market MAP hardware and software and a programmable logic controller.

Mobile money machine

■ Anyone who uses an automated teller machine (ATM) must wonder what people did before cash dispensers were invented. ATMs have become so popular, in fact, that First Citizens Bank and Trust Co. in South Carolina has decided to put one on wheels to make the rounds of country fairs, racetracks and other places where cash-hungry hordes are apt to gather. The mobile ATM, an NCR 5084 cash dispenser, is housed in a two-ton truck equipped with dial-up telephone line and satellite antenna system.

Brainy chip

■ Local operating networks using an inexpensive device called a neuron chip will make it possible to automate everything from security systems at home to energy-saving thermostats at the office. At least, that is the plan of A. C. "Mike" Markkula Jr., ex-chairman of Apple Computer, Inc., and M. Kenneth Oshman, co-founder of Rolm Corp., now jointly owned by IBM and Siemens AG. The two Silicon Valley entrepreneurs hope to have the programmable neuron chip implanted in a wide variety of appliances.

Tackling systems tasks in tandem

Processors in hybrid computers use cooperative approach to boost performance

BY GARY H. ANTHES
CW STAFF

High-performance computers of the year 2000 are likely to be built from specialized modules employing different architectures, each module performing a task — such as image or speech processing, sorting or encryption — for which it has been explicitly designed. Manufacturers are now beginning to combine specialized engines for better overall system performance, and experts said the trend will accelerate as companies look for ways to distinguish their products in an increasingly standardized world.

Companies have traditionally made their machines more powerful by building faster processors. But as the laws of physics threatened to flatten soaring performance curves, it became a matter of faith that the fastest computers would need multiple processors.

Mainstream companies such as IBM embraced the concept of parallel processing in a limited way, while a few bold companies — often with help from Uncle Sam — went whole-hog with systems having thousands of processors.

While the limits of neither approach are in sight, computer designers are increasingly trying out a third, complementary tack in which heterogeneous systems — computers or groups of computers — employ multiple specialized components, each doing what it does best.

Super specialized

Last month, the supercomputer unit of Intel Corp. announced the planned delivery of a new generation of its Touchstone computer, an ultra-fast — peak speed is claimed to be 32 billion operations per second — machine with 528 Intel i860 processors. But Touchstone also uses 42 Intel 80386 processors for I/O and special routers that pass messages between processors at a whopping 40M byte/sec.

Paul Mock

Intel plans to add a specialized processor for three-dimensional graphics to the next generation, available in one year.

IBM's recent rollout of the new System/390 included a $125,000 optional processor specialiy designed to do the number crunching demanded by data encryption algorithms. Michael Monachino, director of IBM's Mid-Hudson Valley Development Laboratory, said a European bank with the add-on has been able to extend total machine performance by 46% while running programs requiring encryption or decryption.

James Key, assistant director at the University of Maryland's Engineering Research Center, said future supercomputers will have basic architectures with hooks for field additions of modules for graphics, animation, speech input and output, image and data compression and encryption. Some of these will work in parallel with the CPU, and some will act as front or back ends.

Key said the approach will increasingly be used in mainframes and smaller systems, too. "As we move toward standardization, how do you add value? You drop in specialized, application-specific modules." Key said manufacturers will be reluctant to incur the enormous expense of developing new architectures if product differentiation can be achieved some other way.

Key said demand will blossom for image processing in areas such as medical, seismic and satellite photography applications. And users will increasingly want their images animated — something that takes enormous processing power. Even relatively mundane applications such as processing digitized credit-card receipts could benefit from specialized modules, he said.

Hitachi show is a preview of things to come

BY JOHANNA AMBROSIO
CW STAFF

If Hitachi Ltd. has anything to do with it, the future will include a programming language that works by animation, an intelligent optical filing system and laptop video cassette recorders.

These and other prototypes were on display at Hitachi Technology 1991, a kind of mini World's Fair held in New York late last month. Walking robots, medical imaging gear, a neural computer with more than 1,100 neurons [CW, Dec. 3] and other futuristic devices filled the arena. Most of what was shown is at least two years away from being offered as actual products in Japan, with U.S. availability coming some time after that.

Especially novel was the Visual Programming Language, which allows users to specify a sequence of events using keyboard commands or speech and watch an animated helpmate carry out the prescribed actions on-screen.

Suppose, for example, the user wants a series of on-line databases searched for a specific topic. The user can either type in or speak what he wishes to be done and then the user watches Sally, the on-screen helper, simulate the job. If at any point during the process the user decides to alter the process, the animation will respond instantly.

After a sequence of events has been defined and the user is satisfied, the Visual Programming Language translates all the commands into code.

The intelligent optical filing system allows users to search through a 1,000-page database of text and pictures. Using expert system techniques, the system will present the user with a list of possible matches to a query. It works somewhat like today's text-management systems.

Also on exhibit were computer-aided software engineering (CASE) tools, which are being used internally at Hitachi but are not yet sold. These include software for systems analysis and something called Problem Analysis Diagram, a picture of the program that replaces flow charts. All the CASE tools' output can be used as input into the other programs.

Other research and development efforts at Hitachi include neural networks and fuzzy logic, an offshoot of artificial intelligence. The company already sells expert systems in Japan, including a machine that translates English into Japanese and vice versa.

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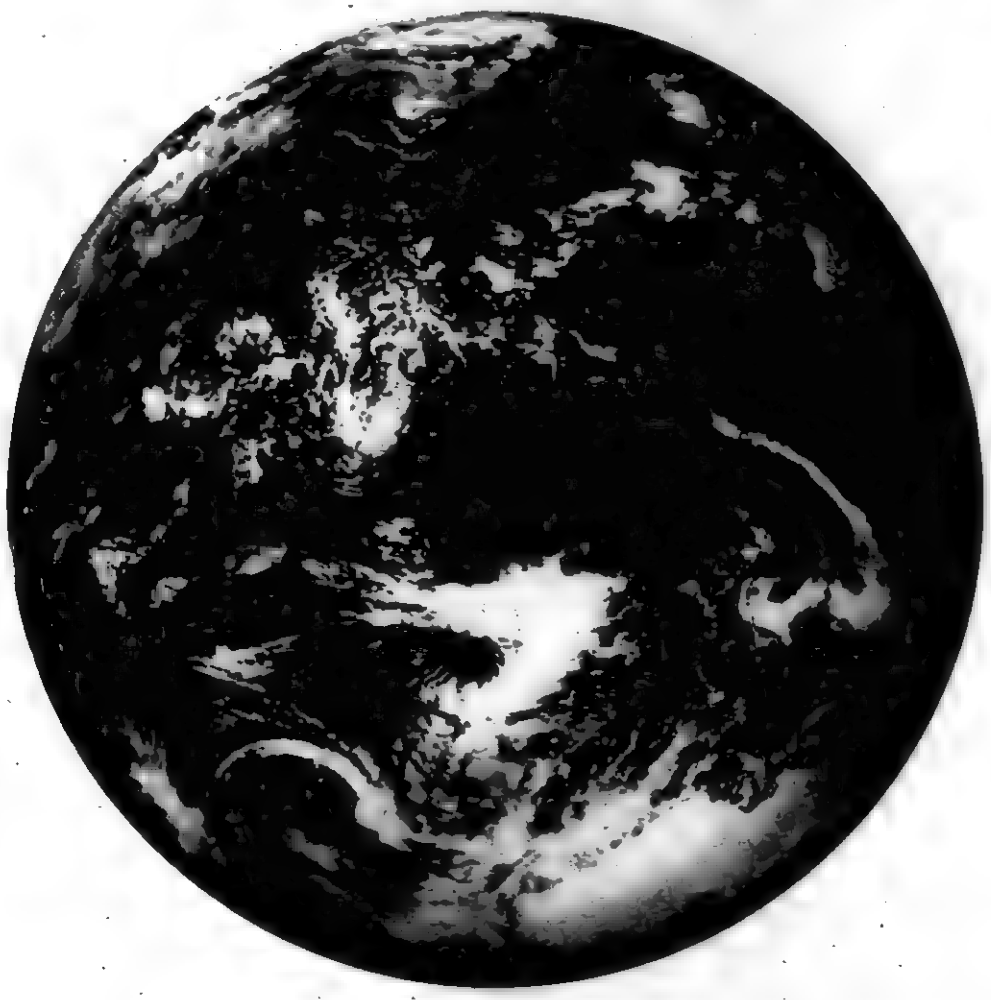

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EDITORIAL

Good for you?

IN HIS BOOK *Wave of Change*, published a decade ago, Charlie Lecht foresaw a battle of galactic proportions between IBM and AT&T, who Lecht felt would fight it out for supremacy in the future days of networked computing (once AT&T was broken up, which Lecht also foresaw).

Certain pieces of this scenario actually began to fall into place. IBM became more aggressive in the communications area, investing heavily in a satellite venture and buying up a promising private branch exchange vendor named Rolm.

AT&T jumped full-force into the systems arena, striking a major deal and equity investment with Olivetti while pouring untold tens of millions of dollars into the sinkhole of large systems development.

Today, Satellite Business Systems, Rolm and the Olivetti deal are part of a costly and futile history, while the systems sinkhole continues to pull millions away from AT&T's bottom line, and the basic premise of Lecht's book holds true: AT&T feels its future depends on being able to provide totally integrated solutions, leveraged by its fabulous communications network. So it's gunning for NCR.

As of this writing late last week, NCR had decided that AT&T's takeover attempt might not be all that bad if the telephone company could just raise its offer a bit, despite pronouncements earlier in the week that NCR just wasn't for sale to AT&T.

Interestingly, in the many news accounts of this, the biggest buyout in computer industry history, the focus has been on what's good for NCR's shareholders and Chairman Charles Exley and what's good for AT&T and its failed computer strategy and what's good for the fictitious widows and orphans who, it used to be said, own AT&T.

What about the customer? What would make such a megamerger right for them? Is AT&T's long-term survival strategy in harmony with the customers' best interests?

Recent history indicates that big hardware mergers soon falter, stumble and even crash. Consider Rolm/IBM, Burroughs/Sperry, Bull/Honeywell. And when the stride of these big merger partners is broken by poor performance, you'd be hard-pressed to make a case that the customer ultimately benefits. Without question, some shareholders do benefit, at least those who dump their stakes early enough.

Still, it is the customer who both prevails in determining whether the merger works — and suffers if it doesn't. We've heard NCR's senior management clearly state that the merger is not in NCR's interests and, by extension, not in the interests of its customers.

Should AT&T sweeten its offer even higher into the financial stratosphere, these same executives are going to have a very difficult job convincing customers that all of a sudden this marriage makes sense and that it's time to put away the shotgun and take out the rice.

LETTERS TO THE EDITOR

LISPing

Regarding the articles by Johanna Ambrosio and Shaku Atre on expert systems and object-oriented programming (OOP) systems [CW, Sept. 17], artificial intelligence has come a long way in the past seven plus years, and I believe that it is poised to provide a foundation for the challenge of the coming decade.

While many of today's AI vendors are writing in C, I believe only LISP can handle the need for expert systems and AI in a true high-volume, high-performance production environment.

The key to an AI product succeeding in the marketplace will be its ability to consistently give high levels of performance under the burden of large volumes of data.

AI systems need to provide a seamless, portable environment that businessmen and data processors can use to quickly develop tools and implement systems.

I will look forward to more articles on AI, expert systems and OOP systems in the future.

Robert S. Dominko
President
RSD Associates of New Jersey, Inc.
Annandale, N.J.

Racial tension

In "IS: A tough road for minorities" [CW, Nov. 19], Ms. Wilson levels a number of accusations at the information systems establishment regarding racial inequality. But to imply that blacks are still discriminated against with little published factual basis within the article borders on the inflammatory.

I find Ms. Wilson's claim that a "majority" manager would prevent a black manager's career advancement simply because the "majority" manager is intimidated or insecure to be highly offensive. I trust that in those cases, the one being discriminated against would bring some type of discrimination suit against his or her employer. However, to suggest that white managers squelch black subordinates' career aspirations due to insecurity and intimidation, without citing actual cases or statistics of occurrence, is alarming. Where did this information come from?

Ms. Wilson's recommendation to blacks to "continue a sense of giving 110% to accomplish the same as their 'majority' counterparts" is intended to encourage blacks to disprove the "majority" misconception that blacks are not as hard-working. What she is saying, in fact, fosters the belief that blacks are not as good as whites; that they are not as smart or as diligent or as competent. How ludicrous! *All* IS professionals should work hard and be rewarded as a result of their efforts. It is equally wrong to promote on the basis of skin color.

Michael K. Ackerbauer
Systems Administrator
CS Technologies, Inc.
Poughkeepsie, N.Y.

Beyond relational

Regarding your article on IBM's object-oriented direction [CW, Nov. 5], by announcing that its relational systems will be enhanced to provide object-oriented support, IBM is admitting that relational technology is no longer state-of-the-art. They are acknowledging that users need, and are demanding, the significant advantages of semantic and object-oriented databases.

Will IBM be able to make such enhancements? My guess is no. The fact that they have not ruled out the development of a new database management system shows they realize the enhancement approach might not work. Users who move from IMS to DB2 may be in store for yet another conversion in the future.

This may not be a problem for many shops if this newer technology is years away. Many believe, as the article states, that "it will take at least two or three years before object-oriented technology gains widespread use in mainstream information systems shops." This is only true if "mainstream information systems shops" means those using IBM hardware. This advanced technology has been commercially available for a number of years and is now being used to build production systems.

This is not widely known because it is happening outside the IBM hardware environment. Unisys has had a powerful post-relational DBMS for a number of years. But IBM's monopoly of the mainframe market continues to make it difficult for other hardware vendors to get publicity for their products.

Robert Finkle
Consultant
Effective Systems, Inc.
San Francisco, Calif.

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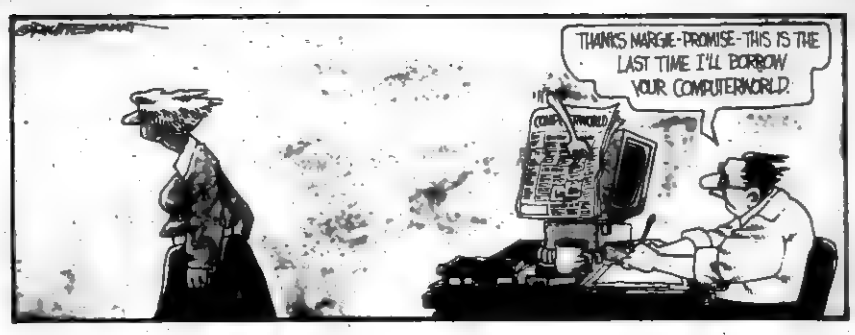

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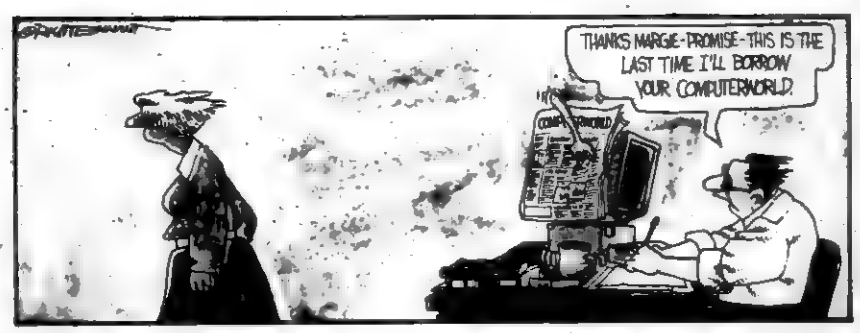

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U.S. must seize tech initiative

MICHAEL DUKAKIS

This is a transitional moment for U.S. high technology. Rapid political and technological change hold the promise of great things to come in the 1990s, yet a lot of industry people I talk to these days are as anxious and perplexed as I have ever seen them. Where, they say, do we go from here?

As the people of Massachusetts know, I am an inveterate optimist. We saw what the technology industries were capable of in the 1980s as the computer companies boomed. And the 1980s were only a taste of things to come, as rapid progress in a variety of technologies begins to sow the seeds of new growth in the 1990s. What troubles me is that I don't see any evidence that our country is prepared to *lead* the technology revolution.

Think back just a few months, when the Berlin Wall came down and communist governments fell all over Europe. Suddenly, the Cold War was over. Democracy had triumphed. The time was at hand to throw off the dead weight of an endless arms race and recommit ourselves to peacetime investments in technology, education and training — the things we need to restore the U.S.' competitive edge.

Yet just when great opportunity beckons, we find ourselves mired in a morass born of the opportunities squandered in the 1980s. Twelve years after the last great energy crisis, the U.S. is back at the mercy of the oil markets, with no national energy policy. Ten years after massive federal tax cuts — tax cuts that were to revive U.S. productivity and technological leadership through new investment — we are tallying up the massive cost of worthless investments in junk bonds, leveraged buyouts, hostile takeovers and the fraudulent real estate portfolios of the savings and loan industry.

What makes this moment more perilous still is the relentless pace of international competition. Nowhere is this more apparent than in high technology.

The U.S. Commerce Department recently concluded in a study of 12 emerging key technologies that the U.S. is losing badly to Japan in the development of four technologies, losing less badly in six and holding its own in two.

The U.S. is rapidly losing market share in semiconductors, computers, fiber optics and advanced materials. High-tech products such as computer memory devices, which were staples of U.S. high-tech production just five years ago, have now met the fate that consumer electronics and automobiles met over a decade ago.

We are certainly seeing the effects of the new global high-tech order in Massachusetts. Our companies succeeded brilliantly for years with minicomputers and proprietary systems; now they are competing fiercely in an international market that calls for open systems and ever-smaller computers.

So why am I an optimist?

First, I know from experience that outstanding firms such as Digital Equipment Corp. have faced tough times before and emerged even stronger.

Second, as the more established companies in Massachusetts have become leaner, I have watched a whole new crop of companies come to the fore.

There is nothing wrong with U.S. innovation and invention, either in Massachusetts, Silicon Valley or anywhere else. What we are increasingly poor at is nurturing these companies so they grow into established firms that fully exploit emerging technologies and spin off the new products and new jobs that the U.S. so desperately needs.

It is long past time for the U.S. to place the same intensive focus on national competitiveness in high technology that we once placed on the race to the moon and, until recently, on the superpower arms race.

It is time for a shift away from unnecessary defense research with little commercial application to the support of precompetitive technologies, such as biotechnology and microelectronics, where the U.S. can take a leadership position. It is time for regulators to move decisively toward the creation of high-speed data networks and the "smart" highways of the future, just as the Japanese have. And it is long past time for us to stop the endlessly circular debate over "industrial policy" and use the tools available to the president and his administration to promote U.S. leadership in technology.

Japan is winning the technological race because it provides a protective home market to emerging technologies that not only encompasses joint research and development and favorable interest rates but the education and training of people as well. Japan's investment in people not only makes it a manufacturing powerhouse but also a laboratory for the assimilation of new technologies.

I simply cannot believe that our own budget and trade policies are incapable of providing similar support to new technologies without resorting to endless debate over whether we should have an "industrial policy." After all, it will be pointless for any president to swear off picking "winners and losers" if the U.S. has no technological contenders at the starting line.

Dukakis is the governor of Massachusetts and will be leaving office in January.

Japanese investors eye U.S. brainpower

GLENN RIFKIN

The headline blared off the front page of a recent *New York Times*: "Japanese Labs in U.S. Luring America's Computer Experts." The lengthy article offered yet another bleak scenario of the U.S. computer industry being bested by the Japanese. It may be the scariest yet.

So just when it seemed Japan-bashing had become passe, like junk bonds and Reaganomics, we get a reminder that the Japanese are relentless (ruthless?) in their pursuit of excellence and that they have pockets deep enough to pay for it. They've bought the companies; they've bought the buildings; they've bought the land. Now they are buying the minds — and some pretty decent ones at that.

According to the article, Japanese computer makers are quietly setting up research labs across the U.S. and luring some of the best and brightest computer scientists to work in these labs. NEC has already opened a lab in Princeton, N.J., Matsushita and Canon are starting ones next year in San Francisco and Stanford, Calif., respectively. And Mitsubishi is considering a lab in MIT's neighborhood.

The Japanese say that these labs will simply increase the great technology in the world, thus benefiting everyone. And oh, by the way, the Japanese will own the patents to these great ideas.

There are two ways of responding to information like this. One is to indulge in some last-gasp Japan-bashing. The other is to recognize that, while what we're looking at is a very real and serious situation, it is also one mostly of our own creation and one that we can take steps to reverse.

Though university computer science departments are filled with promising students and gifted faculty, the kind of researcher who can make quantum changes in the field is a valuable commodity. Despite that fact, these geniuses are often working for five-figure (or low six-figure) salaries with little hope of a major payoff unless they become entrepreneurs and start successful computer companies.

Since few researchers have any interest in doing that, it shouldn't come as any surprise that, when the Japanese come in and offer salaries reportedly in the area of $250,000 for senior researchers, more than a few are going for it.

More than money

Money isn't the only motivator, either. Everyone agrees that the best minds in computer science are here in the U.S., on campus, in private research labs and in industry. Everyone also agrees that though these minds often come up with the breakthrough ideas, the expected products don't always result.

Unlike the Japanese, who are famous for taking concepts and turning them into best-selling products, U.S. companies have often stumbled on manufacturing and marketing issues.

Simply put, computer scientists have to like what the Japanese can bring to the lab. No more constant worry about grants and financing research. No more working with second-rate equipment. No more waiting in vain for an idea to turn into a product.

Right about now, you have to ask the obvious question: Why don't U.S. companies and universities offer these incentives themselves? The answer isn't so clear.

It would be inaccurate to say that no U.S. companies or research labs offer sterling environments for their computer scientists. But they generally offer parts of the package. If they have state-of-the-art equipment, then the salaries are not high enough. If the salaries are good, the product development is slow.

Most of all, there hasn't been widespread acknowledgment of just how valuable these folks are. And the patriotism argument doesn't hold water just for that reason. In a free global marketplace, these scientists are within their ethical rights to sell themselves to the highest bidder.

I'd be willing to bet that U.S. firms wouldn't have to match offer sheets anyway.

If we could provide salaries that were more in line with their true value and better follow-through on good ideas, it would be a lot easier for our computer scientists to look at the Japanese offers and just say no. Loyalty arguments would be easier to swallow in a world-class environment.

Of course, before you computer science types start your *Katakana* lessons, keep an important point in mind. It's not all roses working for a Japanese boss. The perks may be great, but the cultural barriers can be enormously high between here and Tokyo. Talk to software developers, for example, who have tried to work for Japanese companies here in the U.S. and ended up frustrated and disillusioned over a laundry list of unsolvable problems. More than a few of the Americans will be cleaning their desks and returning to the fold once the relationship turns sour.

With that said, this scenario is a serious one. The U.S.' global position in the computer wars is already showing signs of strain, and the economic slowdown is sending thousands of computer industry people out with resumes. It is a perfect time for someone with the right credentials to listen to a fantastic offer, no matter where it originates from. If we are to maintain a leading role in the future of computer science, some answers must be found to address the latest Japanese buying spree.

Rifkin is a *Computerworld* features editor.

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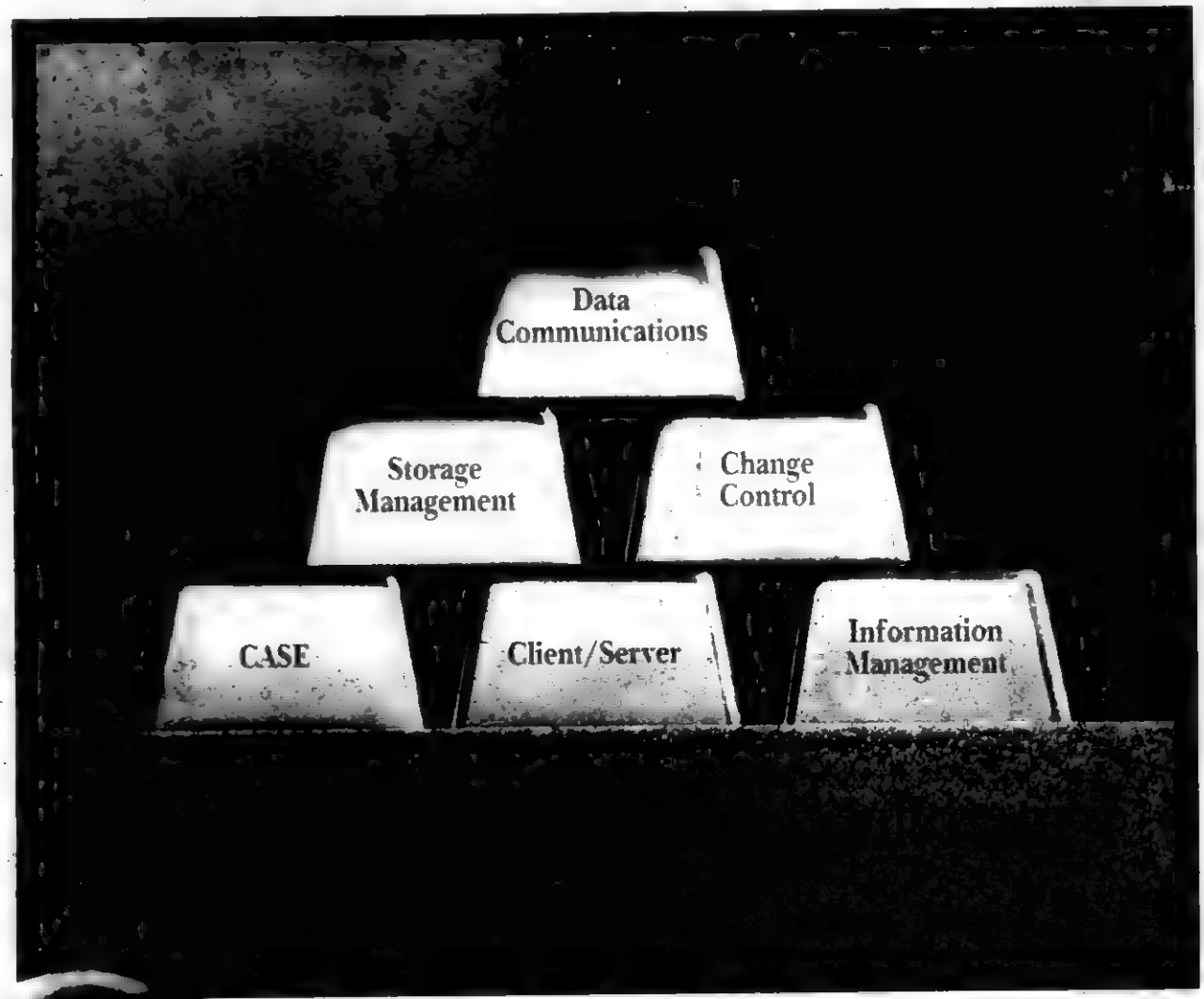

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COMMENTARY

Rosemary Hamilton

Discounts for big spenders

On the surface, IBM's revenue-based discounting contracts look pretty good for users. A closer look shows some good points and a potential downside as well.

First of all, revenue-based discounting in simple terms is a method of determining discounts based on a total dollar amount a customer commits to for a given contract period. In many cases, this would replace an approach that established discounts based on specific products — an approach that could penalize customers if they didn't meet those commitments.

Now the good side. The chief benefit of a revenue-based plan appears to be flexibility. With this type of contract, a customer can juggle requirements during a given contract period as needed. These days, that can be a very big deal.

As an example, a customer could commit to three smaller-size processors for his two data centers for the next 24-month period. Toward the end of next year, the customer's company may determine that the information systems department must consolidate its operations into one data center to cut back on costs. This customer could adjust acquisition plans to fit the one data center. Perhaps the customer could upgrade an existing processor and purchase a larger one instead of two new ones. If the combination of one large processor and an upgrade

Continued on page 38

DEC exec clarifies Unix strategy

Ultrix defined as major Unix platform, but special products still count

BY JOHANNA AMBROSIO
CW STAFF

NASHUA, N.H. — Although Digital Equipment Corp. supports three different flavors of Unix — with another on the way — the company does indeed have a cohesive Unix plan, according to a DEC manager.

"We have one major Unix platform — that's Ultrix — and lots of specialized products," said Glenn Johnson, corporate software engineering manager for the open software program. He said DEC will continue to sell AT&T System V and The Santa Cruz Operation (SCO) versions of Unix, which are geared to specific market niches, even as the company is blending its Ultrix with OSF/1, the Open Software Foundation's operating system.

DEC is selling AT&T Unix System V into the telecommunications market because "that's what those customers demand," Johnson said. And SCO Unix is intended for DEC's so-called Application computers, which are based on Intel Corp. chips and intended for small to medium-size businesses.

The company went with SCO Unix, Johnson said, because of the small-business applications available under that operating system. "SCO is part of our general systems strategy, not part of our Unix strategy," he said.

However, if the Intel architecture proves popular with DEC's existing Ultrix base, "we might port Ultrix to that platform," Johnson added. This version of Ultrix would not have binary compatibility with DEC's high-end Ultrix, however.

The blending of Ultrix to the OSF/1 kernal will take place "late next year," he said. He promised the transition will be painless for most customers, with most just having to recompile their current applications to take advantage of the new kernal. But he acknowledged that "some" applications may have to be rewritten to fully comply with what DEC is calling Ultrix 5.0.

"We're committing to a high degree of applications portability" between the existing versions of Ultrix and Ultrix 5.0, he said.

Still, DEC's strategy has left some observers wondering. "It's confusing, and I expect it to get more so," said Rikki Kirzner, senior industry analyst at Dataquest, Inc. in San Jose, Calif. "They've bitten off a mouthful to be able to sell and support all those versions."

DEC's motivation is money, Kirzner added. "It appears they don't want to walk away from any segment of the market, and I'm not sure they're in a financial position to do so," she said.

Another analyst concurred. "I think [DEC] is hedging its bets," said Chuck Barney, director of competitive analysis at Workgroup Technologies in Hampton, N.H. "They're trying to be all things to all people."

However, Roy Schulte, program director of Stamford, Conn.-based Gartner Group, Inc.'s software management strategies group said, "If [DEC] were inventing a brand-new strategy for the '90s, this would not be the one they would have chosen. But they arrived at it over time, kind of an accident of history, and in that context, it makes sense."

There are, however, some weak points, Schulte said. "[DEC] is not as competitive in the commercial Unix marketplace as some others are." Most notably missing is a transaction processing monitor to run under Ultrix, he said.

"Although some of the others aren't yet shipping their products, they've at least announced them. And unless DEC does something very soon, they might be behind. They're going to have to work very hard to catch up," Schulte said.

Information users opening up to Unix-based PI Plus

BY SALLY CUSACK
CW STAFF

NATICK, Mass. — When Prime Computer, Inc. released PI Plus, the Unix version of its Pick-based Information database product in August, its 3,500 loyal Information users accepted the news with cautious enthusiasm.

Now, four months later, with a definitive delivery schedule for the next version of PI Plus and a road map from Prime headquarters outlining Prime's database evolution, customers are more confident that Prime will be able to produce a fully functioning rendition of Information on a Unix platform — when and if they choose to migrate to an open systems environment.

"For most commercial and university users, the mandate is to move to open systems," said Lee J. Leitner, editor and publisher of *Infocus*, a bimonthly magazine for Prime Information users. Leitner added that the move to open platforms is not propelled by technical reasons but results from management's desire to break away from proprietary vendors.

Gains missing parts

Stephen W. Machnik, vice president of the new Prime Information Business Unit, said Prime will deliver a multinational version of PI Plus in June. It will include many functions users missed in Release 1.0. Among the enhancements will be increased networking capabilities for Prime 50 series platforms, file extension systems and Fortran support for the software's General Calling Interface.

"When we shipped the first release last summer, 95% of the product was complete in terms of customer requirements," Machnik said, referring to PI Plus' ability to mirror Information in a Unix environment. "The next release will provide the remaining 5%."

Jeff Beller, vice president of research and development at Stauffer Information Systems, an Oxnard, Calif.-based software development firm, is very pleased with the PI Plus product.

"It's quite straightforward," Beller said. "We have a [fourth-generation language] program, Blacksmith, originally written for the Prime Information environment. It has 80 or 90 files and more than a thousand programs,

Continued on page 38

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Maintenance productivity gains of up to 10-to-1.

In this same study, developers were asked to compare IEF maintenance productivity with their former methods. Of those responding, *more than 80 percent had experienced gains of from 2-to-1 to 10-to-1.* (See chart.)

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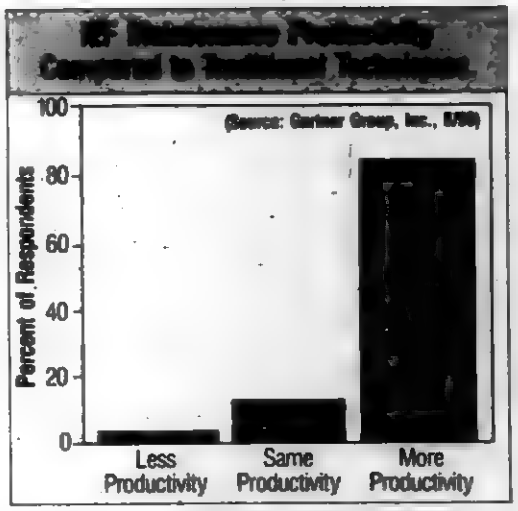

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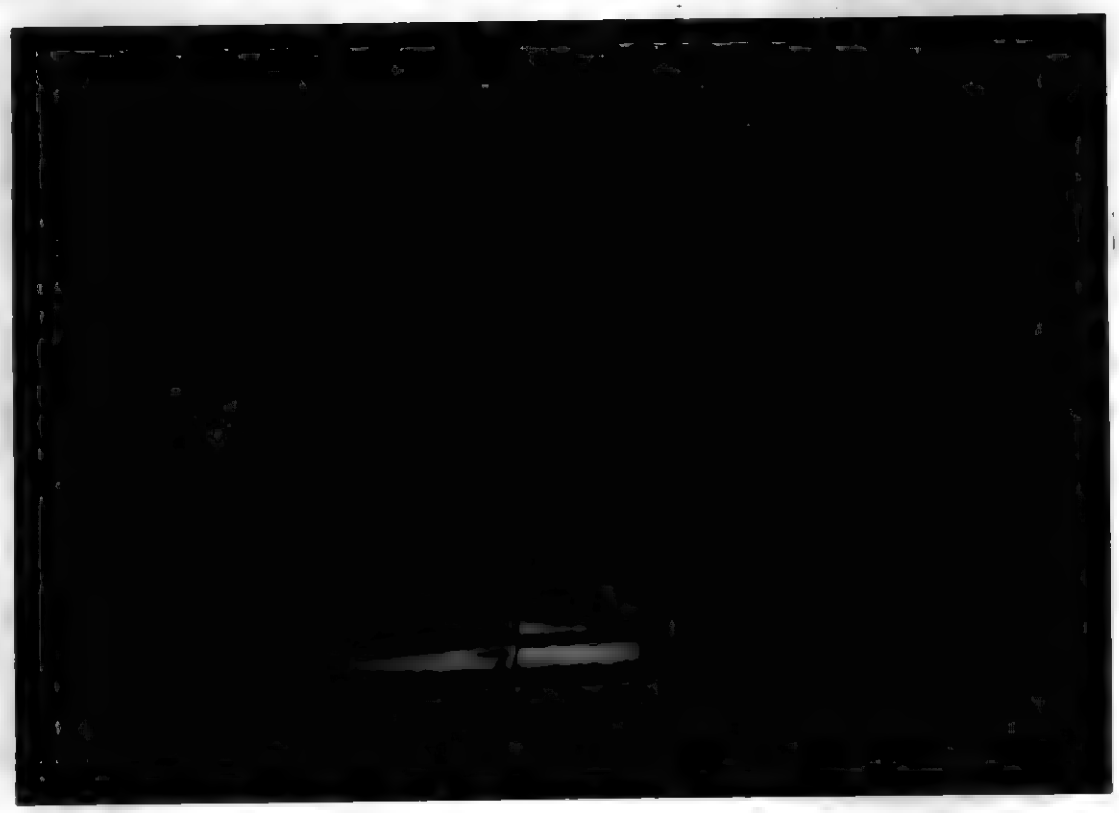

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COMMENTARY

Jean S. Bozman

Break out of your shell

Tandem Computers has a new software strategy: Break out of the protective shell of the proprietary Guardian operating system, and get more business partners to break into the world of open systems applications.

That policy was underlined by last week's announcement of the new Tandem Applications Group (TAG). The group, an extension of the 6-year-old Alliance program, will involve outside software suppliers in the task of readying a new generation of open systems applications for Tandem computers. It is, in short, an attempt to reduce development time for a wide range of applications that will run against databases stored on Tandem systems.

TAG is intended to allow Tandem to establish long-range plans with dozens of outside software vendors. That process has already begun, however. A newfound relationship with Oracle Systems will allow end users to query Tandem's Nonstop relational database as they would query an Oracle database on a Unix computer. In time, Oracle's computer-aided software engineering (CASE) tools will be ported to run on a Tandem host.

Another relationship with Information Builders will allow Information Builders' Focus users to combine data from the Tandem Nonstop database with data from Unix and IBM systems.

Wait a minute! Wasn't Tandem known for its proprietary Guardian operating system and the type of high-speed transaction-processing used in banking networks? Why would Tandem want to branch out from its relatively stable niche — one that brought it nearly $1.9 billion in sales last year?

The answer is that Tandem, like other systems vendors, has seen the handwriting on the wall. Users are tired of revamping their entire IS architectures every time a new machine or system comes on-line. Open systems, in all the shades of meaning that phrase is beginning to assume, are "in." Proprietary systems are merely running in place.

To increase its revenue, Tandem must simply step into a broader arena, such as the robust Unix marketplace in Europe

Continued on page 38

Litel expands into VAX 9000

ON SITE

BY MARYFRAN JOHNSON
CW STAFF

WORTHINGTON, Ohio — Seven years ago, a donated midrange computer with a Digital Equipment Corp. label set Litel Telecommunications Corp. on the path to becoming one of DEC's first mainframe customers.

This rapidly growing telecommunications firm, which started off with a PDP 11/750 given to company founder Lawrence McLernon, is a regional competitor of AT&T, MCI Communications Corp. and U.S. Sprint Communications Co. The privately held Litel owns and operates a fiber-optic-based network that reaches from Pennsylvania across Ohio and Michigan and south into Illinois and Indiana.

Litel's ***Guider has high expectations of company's primary vendor DEC***

"Sometimes I wonder what fate would have been if Larry McLernon had been offered a small IBM midrange instead," said Michael Guider, vice president of network and information services at Litel. "But DEC has demonstrated its capability to help Litel grow from $2 million in revenue in 1985 to $250 million to $300 million this year."

Yet, Guider minces no words about how much Litel expects from its primary vendor — particularly now that a mainframe VAX 9210 is running a new, large-scale transaction processing application for billing and order processing.

"The service level for a mainframe is very different, because the impact of an outage is much larger," Guider noted. "An ability to grow the system while it stays in service is critical for us. Also, DEC must deal now with asset protection from a customer point of view."

He is one DEC customer convinced that the mainframe line will help save the Maynard, Mass.-based company from the industry blight on minicomputer vendors.

"If DEC didn't produce a mainframe-class system, I am sure that they would have gone out of business," Guider maintained. "It would have forced all those large customers like us to IBM at a certain point."

Litel began gearing up for its mainframe environment three years ago by hiring information systems professionals grounded in the IBM environment, not in DEC equipment.

"We built our technical and management staff on people with a large-scale MVS-based environment as background. We could not find VMS people with that experience," Guider explained.

As one of a dozen IS directors on DEC's VAX 9000 customer advisory board, Guider is a polite but vocal critic of DEC's mainframe software pricing, which DEC officials are now reconsidering. "DEC cannot just decrease hardware costs and increase software costs with price/performance and cost of ownership staying the same," he stressed. "They need to widen the [price] gap with IBM, not close it."

The 18-month delay between when Litel was promised its VAX mainframe and the actual delivery in August still rubs a little raw with Guider. "They get good marks on the performance of the 9000, but their time line

LiTel Telecommunications Corporation

was off by an unacceptable margin," he said.

Once the mainframe was online, Litel was able to begin field testing its major "new-generation" application: an order processing and billing system built on Computer Associates International, Inc.'s CA-DB database for VAXs, a product previously sold as Enterprise DB by now-defunct Cullinet Software, Inc.

The order processing segment is in production now, and the billing system is in beta test. Both will run on the VAX 9210 and on several VAX 6000 Model 440s, with a second mainframe, a VAX 9410, joining them this month.

"We have more than 4,600 programs running on the VAXs, and the order processing application alone has 600 programs in it," Guider noted.

The new application is intended to enable Litel to reduce its time-to-market for new products from two to six months to "days and weeks," Guider said. Litel plans to bring out additional new products and services yearly with its new mainframe processing capability, he added.

Two months ago, Guider merged two Vaxclusters in the data center, using the VAX 9210 and a VAX 6000 Model 410 as connection points for a cluster that now includes four 8000-class processors, five 6000 models and a string of hierarchical storage controllers.

Litel's own network of 750 terminals, including about 30 workstations from DEC and Sun Microsystems, Inc. and 175 personal computers, links the corporate headquarters with departmental local-area networks in Cleveland and Detroit.

Parcplace updates Smalltalk

BY JEAN S. BOZMAN
CW STAFF

MOUNTAIN VIEW, Calif. — Parcplace Systems, a supplier of object-oriented languages, recently issued new releases of its Objectworks/Smalltalk and Objectworks/C++ products.

The enhanced packages, both priced at $3,500, are designed to ease portability among various hardware systems and offer more user-friendly features, according to the company.

Objectworks/Smalltalk, used by many software firms to develop object-oriented code, now supports color for the first time, according to Catherine J. Tucker, Smalltalk product manager. Other new Smalltalk features include defaults for standard windowing systems, automated "garbage collection" of discarded objects and support for international languages.

The new version of the company's 1-year-old Objectworks/C++ supports tighter integration with standard Unix development tools and support for AT&T's C++ Language System, Release 2.1. Parcplace has decided to market new C++-class libraries, or definitions of object types, in a separate package called Objectkit/C++.

Teamnet integrates NFS

BY CAROL HILDEBRAND
CW STAFF

SANTA CLARA, Calif. — Teamone Systems, Inc. raised the curtain on Teamnet 2.0, development software that supports the fledgling concurrent engineering market.

The Unix-based product, which runs on Sun Microsytems, Inc. workstations and can be accessed from non-Sun platforms, is an upgrade from the existing Teamone and includes several new features, one of which is integration with Sun's Network File System (NFS).

NFS enables users on an NFS-compatible system within a network to access design files transparently, as well as manage design changes more effectively.

"Teamnet makes sure that all the right components from various groups are assembled correctly, a procedure that had previously been done through individual tools," Teamone spokesman Kirk Norlin said.

Teamnet also includes a point-and-click interface based on the X Window System and Open Software Foundation Motif standards as well as data compression techniques that minimize the amount of disk space used during the course of a design cycle.

Teamnet 2.0 pricing depends on the installation and costs from $100,000 to $175,000 for 50 to 100 users, including maintenance and training. Teamone system users can upgrade to Teamnet free of charge.

Sybase's Open Tools offers choice of vendor support

BY JEAN S. BOZMAN
CW STAFF

EMERYVILLE, Calif. — Sybase, Inc. recently moved to provide large customers with one-stop shopping for its own products and applications development tools that are sold by Unify Corp. in Sacramento, Calif., and Uniface Corp. based in Alameda, Calif.

Sybase's new Open Tools program, which Unify and Uniface have joined, is an extension of Sybase's existing Synergy program, which includes 100 software vendors, according to Richard Yanowitch, director of market development at Sybase.

Users can buy products from Sybase, Uniface, Unify or any combination of the three and specify which vendor is to give them technical support. Sybase is also willing to provide customer support for all Open Tools products, as well as for its own SQL Toolset fourth-generation language.

"In a number of large accounts, we have found that users have a strong preference for third-party tools that they already know," Yanowitch said.

For its part, Uniface expects to strengthen its two-year relationship with Sybase, Ann Shukla, Uniface's vice president of marketing said.

Storage system to benefit Ontario government

ON SITE

BY TIM GRANTHAM
SPECIAL TO CW

Canadians in the province of Ontario will soon be able to get certified copies of birth, death and marriage registrations in minutes, because the Office of the Registrar General is automating its vital statistics systems with imaging technology.

Over the next couple of months, the Office of the Registar General, the branch in the provincial Ministry of Consumer and Commercial Relations (MCCR) charged with tracking vital statistics, will convert more than 10 million documents for storage onto optical discs.

When the ministry moves its headquarters from Toronto to Thunder Bay in 1991, the Office of the Registrar will begin the ongoing capture of the half-million pages of new registrations it receives each year.

The current procedure to obtain certificates requires several days, according to Allen Zimmerman, manager for technology innovation at the information technology planning branch of the ministry. "When a request for a certified copy is made by mail or form, it's entered into our mainframe, and an overnight match is done against the database of registrations. If a match is found, a pick sheet is produced so that staff can go through the file room and pull the document and make the actual copy. If no match is found, that's another day gone by," he said.

The new system is expected to provide same-day fulfillment of the half-million requests for certified copies that the office receives yearly.

According to Ron Binsell, director of the information technology planning branch, the $6 million imaging system will not only improve service; it will reduce staff costs by 15% and storage costs by 8,000 sq ft, for combined savings of $1 million annually.

The MCCR's imaging system will use the Advanced Imaging Management System (AIMS) supplied by Hewlett-Packard (Canada) Ltd., with custom application development by Andersen Consulting. According to Binsell, the ministry chose the HP/Andersen Consulting joint offering because it satisfied all the ministry's requirements at the lowest price while using demonstrable products. He also cited Andersen's imaging application development experience and HP's ability to integrate the imaging system with the ministry's current technology.

The AIMS configuration as implemented at the MCCR conversion site consists of HP Vectra personal computers acting as either capture or retrieval stations connected to an HP 9000 Model 375 minicomputer on a Starlan local-area network. Each PC has either a scanner or laser printer attached and runs Microsoft Corp. Windows-based conversion and image management software designed by Andersen Consulting.

An operator at a capture station uses the PC to scan a batch of registration pages. The conversion software assigns the registration number to each image; this number acts as the key to the image in the database. It then transmits the compressed image to the Unix-based minicomputer, which stores it on a write-once read-many optical disc. The discs are mounted in a Cygnet optical jukebox.

Long-distance retrieval

Document retrieval staff members in Toronto will be able to access the image database 1,200 miles away in Thunder Bay from their workstations when they wish to make a certified copy.

Each retrieval operator's workstation will use a Windows 3270 terminal emulator to obtain the registration number on the ministry's mainframe via an IBM Systems Network Architecture gateway on the LAN. "Then," said Rob Kloustin, project manager at Andersen Consulting, "the application will pull the registration number off the 3270 window using Windows' Dynamic Data Exchange capability and go out to the imaging server and pull the registration image for that key."

Once the operator has verified the image on the two-page display, he will send it to a laser printer to produce the certified copy. If an amendment has been made since the original form was scanned, such as a name change, this will also be converted to an image and combined with the original during printing.

The provincial Vital Statistics Act previously required that a certified copy be made from an original registration. The act was amended in April to permit the use of images. "We could have used microform and copies from microform [for the project], but we wanted the potential for access at other sites in the future," Zimmerman said.

Andersen Consulting designed the front-end PC software using the Plexus Application Designer provided with HP's AIMS environment. According to Kloustin, Application Designer allowed his programmers to paint dialog boxes and create forms for the Windows interface using a fourth-generation language. "There are very few packages that support the [graphical user interface] on the front end and also support a relational database on the back end," he said.

Grantham is a free-lance writer based in Toronto.

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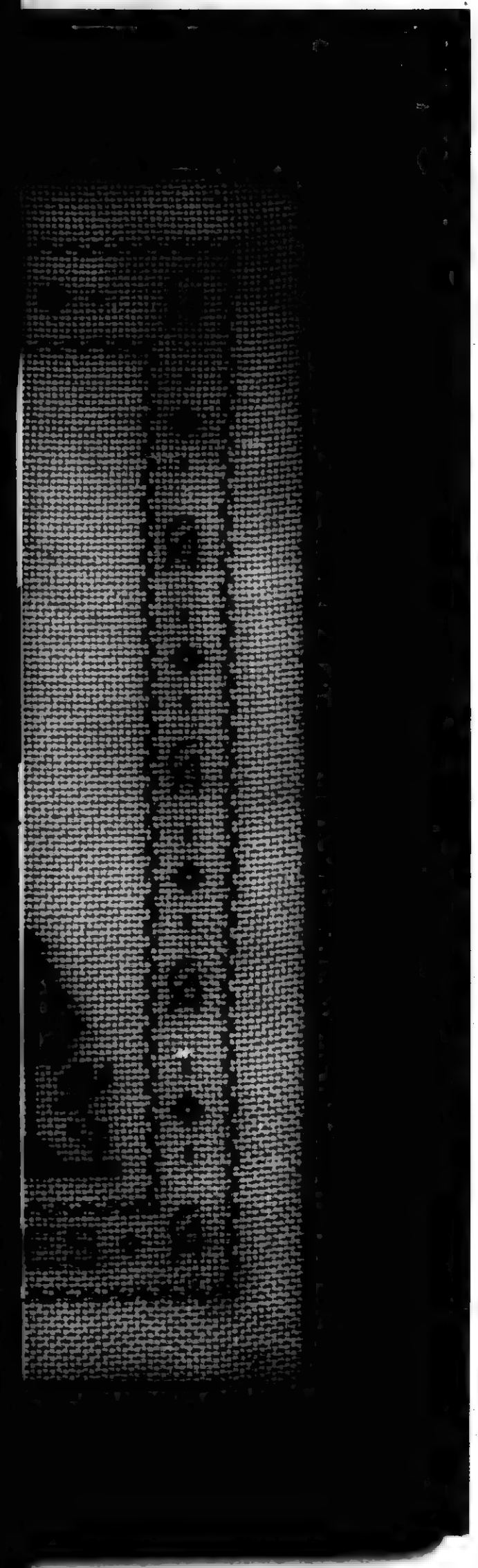

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PI Plus

CONTINUED FROM PAGE 29

and we were able to port over in about four days." Beller said the firm has several applications, such as internal general ledger and accounting programs, that were ported to PI Plus in a few hours.

PI Plus is binary- and source-code-compatible with Information on the Primos 50 series, and, according to Prime, 90% of an existing Information system can be transferred without recompilation.

"We could have made the PI Plus box really scream, but we pay a performance price of about 5% for maintaining our binary compatibility with the Primos 50 series," said Andrew Ridgers, director of engineering at the Information Business Unit.

There are currently 6,000 Information licensees worldwide.

Introduced in 1978, Prime Information's Pick-based database management system allows users to access more than 4,000 commercial applications written for Pick or Pick-compatible programs.

With PI Plus, Prime hopes eventually to port all Information customers onto the Unix platform, preferably on Prime's recently announced EXL series of Unix-based systems and servers.

Industry watchers said the Unix version of the database software could drive EXL sales. PI Plus is priced from $1,400 in a four-user configuration to $120,000 for 500 or more users.

Hamilton

CONTINUED FROM PAGE 29

matches the dollar value of three smaller systems, the customer would retain his discount.

Of course, that's a simplistic example. Most customers have far more products and concerns to juggle. But that's the beauty of a revenue-based plan. Where it gets really interesting is with the so-called enterprise agreement. According to some IS managers, IBM is offering a deal that would span all corporate purchases. (For the record, IBM has said these deals do not officially exist.)

However, according to at least three IS executives, the enterprisewide agreements are very real. If a customer had such a deal and was faced with a major IS change — be it consolidation or a move to more distributed computing — that customer could shift all kinds of products to accommodate the change.

In addition to flexibility, IS managers contacted recently said they see the revenue-based plans as a way of making contract negotiations easier. In a way, this is like IBM's Serviceplan concept for maintenance and service. Serviceplan was intended to reduce the amount of time a customer had to devote to paperwork by creating a master contract to cover all services instead of individual contracts for various aspects of IS.

This, however, leads to the potential downside of revenue-based plans. It seems to me that there could be a hidden price to pay for this notion of easy and flexible contracts, particularly those revenue-based deals that cover corporate purchases. Customers could be locking themselves into IBM across-the-board purchases and cutting off their options from the competition.

They could run the risk of losing better deals and, in some cases, superior products from IBM competitors.

The solution, then, is for customers to weigh these IBM plans carefully against a competitor's offering. This, of course, means that a lot of the work that goes into purchase plans will not be reduced after all.

Hamilton is a Computerworld senior editor, systems and software.

Bozman

CONTINUED FROM PAGE 33

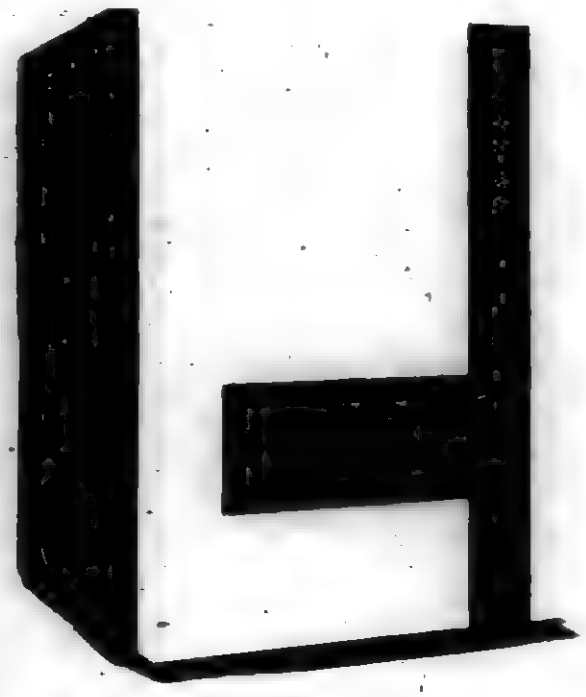
and Asia — and venture even further into the world of IBM systems. To do this, Tandem has become a latter-day advocate of CASE technology, in which applications are designed before they are ported to specific hardware platforms.

That doesn't mean Tandem is abandoning the Guardian operating system. It's just that Guardian will remain "behind the scenes," running transactions out of the end user's sight. Meanwhile, users will continue to gravitate away from mainframe terminals and toward DOS, OS/2, Apple Computer, Inc. Macintosh and Unix desktop computers. And new applications will be placed on Unix file servers and PC networks.

On-line transaction processing "is still our foundation," said Tim McSweeney, a senior product manager in Tandem's application development tools group. "Critical business applications will continue to require high throughput, fast response times and high-speed updates to the database," he said. "But in the future, users with no specific knowledge about Tandem should be able to query Tandem systems from their own open systems machines."

Of course, the open systems trend transcends Tandem. Hewlett-Packard has already taken the open systems route, and now it looks like DEC will follow. In the 1990s, it's somewhat comforting to know that newfound open systems applications will still be anchored to the mainframes that hold most of corporate America's data.

Bozman is Computerworld's West Coast senior editor.



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NEW PRODUCTS — SOFTWARE

System software

Legent Corp. has announced Release 1.0 of Automate/VM, an automated operations software product designed for IBM's VM operating environment.

The product automatically responds to system events or changes in resource status. If a problem occurs, it also reports on conditions that cannot be resolved immediately, according to the vendor.

Automate/VM runs on VM/SP, VM/HPO Release 4.0 or higher, VM/XA SP2 and VM/ESA. Pricing starts at $7,500.

Legent
2 Allegheny Center
Pittsburgh, Pa. 15212
(412) 323-2600

The Adesse Corp. has announced Release 1.0 of VM/Xaid, a product developed to enable IBM VM/XA-based systems to execute a program that runs correctly in 370 mode but fails when running in XA-mode-based virtual machines.

The product extends IBM Control Program set commands, thereby enabling users to turn System/370 emulation on and off, the vendor said.

Initial licenses range from a onetime charge of $9,600 to a $4,400 annual charge.

The Adesse Corp.
36 Mill Plain Road
Danbury, Conn. 06811
(203) 790-9473

Development tools

The Dylakor Division of Sterling Software has introduced Dyl-Online CICS Release 2.5, an interactive menu-driven program development system designed to assist users in executing Dyl-280 II programs in CICS environments.

The product automates product development tasks and enables users to view job outputs by pressing a single key, the vendor said. It includes rewritten command-level code that complies with requirements for the CICS version for Enterprise System Architecture.

Pricing ranges from $8,000 to $16,500, depending on type of operating system and CPU size.

Sterling Software
Dylakor Division
9340 Owensmouth Ave.
Chatsworth, Calif. 91313
(818) 718-8877

Sunrise Software International, Inc. has announced a Digital Equipment Corp. VAX/VMS version of Eax, a development tool for Open Software Foundation Motif graphical user interface applications.

The product is priced at $3,500 for a single-user version.

Sunrise Software International
1151 Aquidneck Ave.
Middletown, R.I. 02840
(401) 847-7868

NEW PRODUCTS — HARDWARE

Data storage

Optical Laser Systems, Inc. has introduced a laser filing and retrieving archival system that uses write-once read-many optical drives.

The OLSI Smartfile is an integrated stand-alone system that facilitates random data retrieval and includes a patented software package.

It is priced at approximately $25,000.

Optical Laser Systems
8640 Phillips Highway
Jacksonville, Fla. 32256
(904) 739-3500

Decision Data Computer Corp. has announced a direct-access storage device that can be connected to IBM Application System/400 Models B30 through B70.

The 9432 disk array comprises three pairs of 300M-byte, 3½-in. disks and features a disk rotation speed of 4,318 rpm, thereby reducing average latency to 6.95 seconds, the vendor said.

Pricing for the product ranges between $14,200 and $30,600, depending on configuration.

Decision Data Computer
1 Progress Ave.
Horsham, Pa. 19044
(215) 956-6700

I/O devices

Idea Courier has introduced an upgradable family of paper white IBM 3270 and Application System/400 displays.

The Idea 12000 series of black-and-white displays complies with the Swedish agency Semko's MPR-P 1987:2 standard for electrostatic and electromagnetic emissions, the vendor said. The displays can be configured as mainframe or mid-range units by inserting coaxial- or twin-axial-compatible plug-in logic modules.

Pricing ranges from $1,395 to $1,595, depending on type of mainframe or mid-range models purchased.

Idea Courier
1515 W. 14th St.
Tempe, Ariz. 85281
(602) 894-7000

COMMENTARY

Patricia Keefe

Users come first, right?

Last month at Comdex/Fall '90, Michael Maples, vice president of applications at Microsoft, warned the user community that it "must keep up with the new technologies, or they're going to be left behind."

Oh really? Who determines the difference between a user falling "behind" and a product ahead of its time?

I mean, doesn't Maples have this backwards? It seems to me that the dictum should read: Vendors who are not responsive to user needs will watch black ink fade to red right before their eyes.

It sounds like what he was saying was, "Buy into our product strategy right now, or we'll wash our hands of you." Because after all, the vendor knows what's best for the user, right? Too often that involves buying more products. A user of Wang equipment once grumbled to me that his account rep's idea of fixing his problems was to throw more products at him. This went over like a lead balloon.

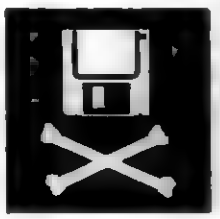
Telling users "buy or else" is an interesting marketing concept considering we stand on the precipice of a recession. But

Continued on page 48

SPA offers free (audit) software

BY MICHAEL FITZGERALD
CW STAFF

If you knew that the Software Publishers Association (SPA) had a free kit to help you keep your personal computers immune to illegally copied software, would you call its toll-free number to request the kit, even if you were sure that your PCs were clean?



"You get a little scared calling people like that," admitted Tom Peltier, an information security specialist at General Motors Corp. in Detroit. "You have that foreboding that they're going to be checking into you."

However, Peltier said that just the opposite occurred after his phone call and request for an audit kit. He has since decided that snooping "is not [the SPA's] role in life — they want to make sure that people clean up their acts if they need to, and that's all they're about. Working with them, we've come up with a very strong program for General Motors."

Ironically, GM, or any other company, can make as many copies of Spaudit, the SPA's auditing software, as it wants, as long as the program is only used internally.

GM did its first internal audit in 1985, using Peter Norton Computing, Inc.'s Norton Utilities package, and started to develop a software copying policy in February 1988, before the SPA developed its audit program, released in May.

GM has developed four 20-minute movies, with the help of Boston-based Commonwealth Films, Inc., that it shows to its 780,000 employees worldwide to help drive home the importance of data security in general. GM, through its subsidiary, Electronic Data Systems Corp., also has an extensive series of internal publications on data security and proper use of software, and an anticopying provision is written into the company's code of ethics.

The company began a wholesale audit of its PCs last week, starting at corporate headquarters, Peltier said. He said Spaudit will save the company extensive amounts of time.

SRI International, a nonprofit research group based in Menlo Park, Calif., was so pleased with Spaudit that it decided to develop a version of the program for Apple Computer, Inc.'s Macintosh. This version is now being beta-tested at SRI and will be distributed by the SPA as soon as it is ready for delivery.

Prior to getting Spaudit, SRI used Xtree Co.'s Xtree and painstakingly wrote out the list of software programs by hand. Larry Shoemaker, senior internal auditor at SRI, said that Spaudit "has cut down drastically the amount of time required to do an examination of a hard disk. We used to need one or two hours for a machine, but now it takes about five minutes."

Shoemaker reported that SRI has done 22 audits this year, covering some 2,000 machines.

Shoemaker said housekeeping seems to be the major issue SRI has to face. A user might get a new machine, and the old machine will be given to a different user, with all its original software still intact on the hard disk. Shoemaker pointed out that this is technically a violation of the law, even if the user is unaware that the illegal copies exist on the machine.

In the kit

Spaudit, the SPA's auditing kit, comes with the following:

- A list of suggested procedures for a corporate self-audit.
- Sample memoranda for management to distribute on what constitutes illegal copying of software programs.
- Two brochures: "Software Use and the Law" and "Is It Okay To Copy My Colleague's Software?"
- Spaudit, a licensed software application on 3½- and 5¼-in. floppy disks.

The number for the SPA is (202) 452-1600. Orders can also be mailed to SPA Audit Materials, Suite 901, 1101 Connecticut Ave., N.W., Washington, D.C. 20036. The kit is free of charge.

MICHAEL FITZGERALD

Ventura adds Mac Publisher

BY JAMES DALY
CW STAFF

SAN DIEGO — One of the most popular DOS-based publishing packages came to Apple Computer, Inc.'s Macintosh line recently when Ventura Software, Inc. announced that it has begun shipment of Ventura Publisher, Macintosh Edition.

The application is functionally similar to the Ventura Publisher package available for the DOS, OS/2 and Microsoft Corp. Windows 3.0 environments but adds several features including movable dialogue boxes, a spelling checker, revised menus and documentation as well as additional text and graphics import and export filters.

Additionally, all versions of Ventura Publisher are designed to be compatible across platforms, enabling users to share documents between IBM personal computer-compatible and Macintoshes.

Officials at Ventura, a Xerox Corp. firm, said the Macintosh version of Ventura Publisher has a suggested list price of $795.

In 1991, Ventura Publisher is also expected to be offered for the Unix operating system running under Sun Microsystems, Inc.'s and AT&T's Open Look.

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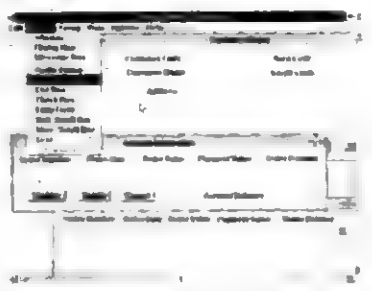

The Early User Program version of Dialog System 2 gives easy access to Presentation Manager or SAA CUA objects.

For more information about Dialog System 1.1 or Early User Dialog System 2, call Micro Focus today at 1-800-872-6265 or 415-856-4161.

What does Compaq give 386 users who expect the moon?

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The COMPAQ DESKPRO 386S Personal Computer is also designed to handle general business applications. Its 16-MHz 386SX microprocessor gives you exceptional 386 performance. And its 32-bit architecture lets you run today's popular business software. It also offers the flexibility to run tomorrow's advanced business software.

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The stars.

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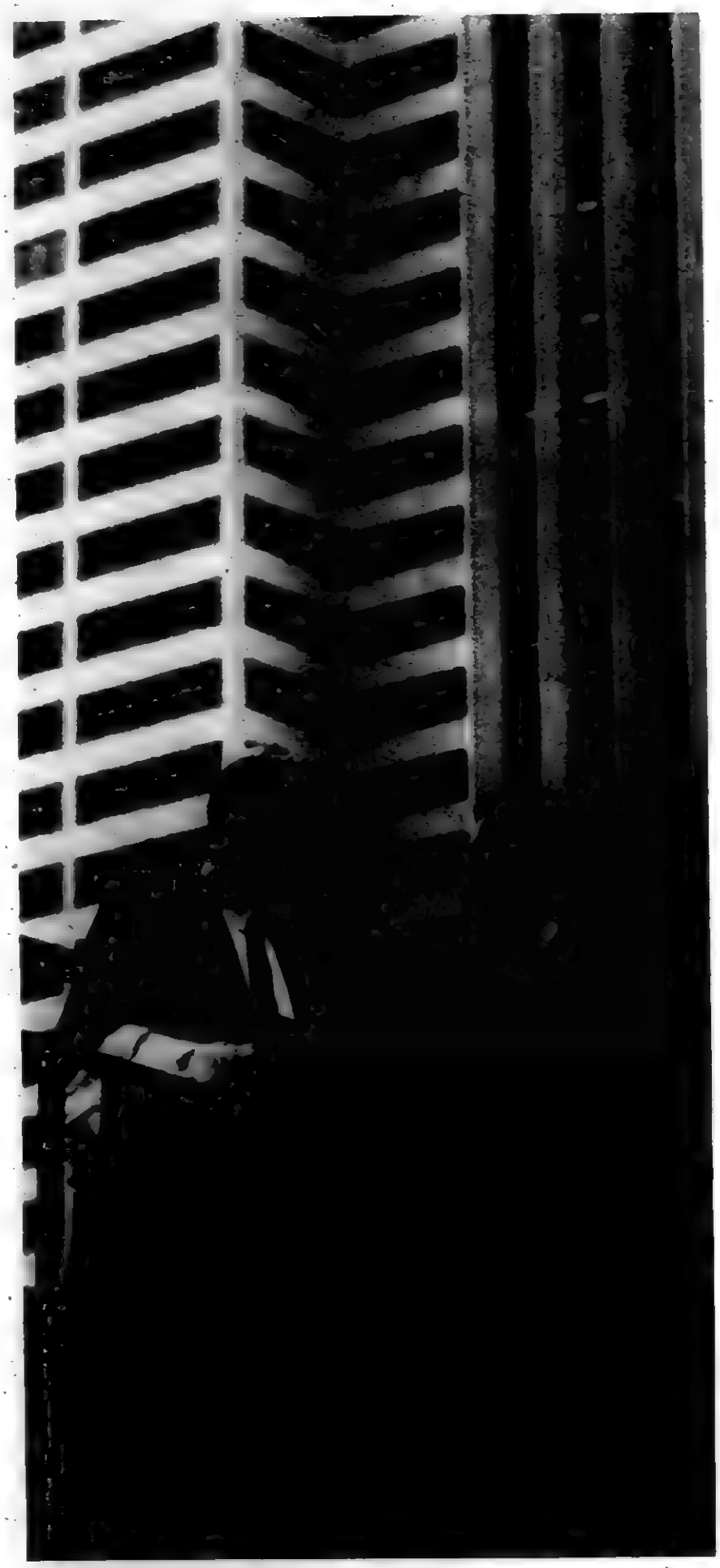

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PC-based CASE helping bank boost productivity

ON SITE

BY MICHAEL FITZGERALD
CW STAFF

CHICAGO — At First National Bank of Chicago, the emphasis is on becoming the first bank to win the U.S. Department of Commerce Malcolm Baldridge National Quality Award, and the bank's systems group is leaving no stone unturned to qualify for the award, including a brand-new move away from mainframe-based code development to doing computer-aided software engineering (CASE) on personal computers.

"Our thrust is to get the Baldridge award, and we're just looking for new ways to continually increase quality, said Martin Bronstein, senior vice president of customer services group systems development at the bank. "I'm not going to lie to you and say that the PC products are one of our main strategies," but moving CASE development onto PCs will improve delivery time for new products, primarily in the highly competitive cash-management market, Bronstein said.

The First, which has 4,500 PCs and is also an intensive user of large IBM mainframes and Tandem Computers, Inc. minicomputers, has been using CASE tools for three years, starting with a pilot version of Texas Instruments, Inc.'s Information Engineering Facility (IEF).

About two months ago, the bank installed and began using IEF Version 4.1 for OS/2 on several PCs in its development area. Now, while the final code generation still must take place on the mainframe, all the initial development work and code generation can be done under OS/2.

Saving time

Despite the nascent nature of the PC effort, Bronstein said that development time will be saved just in terms of not having to upload code after each development stage to check the progress of the program.

Today, IEF 4.1 is being used to develop projects for cash management, sales and marketing and collateral transactions.

The First has also moved to develop database applications on the PC. It licensed Oracle Systems Corp.'s Oracle for AIX in November 1989, and it now has some eight applications under development, including three for marketing, one for international trading and an internal systems development tool.

Neither tool has been a breeze to implement and use effectively, although Bronstein joked that he is having more success with applications development than with a "take a businessperson to lunch" drive launched by the IS group 18 months ago to strengthen relations with users.

For instance, while he is pleased with Oracle's flexibility, "we're suffering through support issues on Oracle AIX, which is not at the same level as [Oracle] is on some of the other Unix platforms," Bronstein said.

"We don't think Oracle is easy to learn. We think they're making a lot of money off their consulting services, Bronstein said, although he added that the First had no expectations otherwise, and it negotiated its contract to include ample service.

Working with IEF "has been a slow process," Bronstein said. "We've had some successes; we've also had one project where we got killed on the scope, and we eventually stopped the project and took a step back because a $1 million project was turning into a $3 million project." Bronstein is quick to say that IEF was not the problem with the project.

Ralf-Finn Scanish/Sabin

The First's Bronstein *is hoping to increase quality and win national attention*

Overall productivity has not increased for the bank's programmers since they started using IEF, but Bronstein said he does expect to see increases in productivity within the next 18 months, especially when dealing with systems maintenance. He added that time-sharing option expenses for the programmers using IEF have gone down almost 90% since the First started using IEF.

Bronstein said he thinks IEF and Oracle will be important strategic tools that will help his department be more active and more able to "adapt to a market where the product life cycles are going to be shorter, we need to get products on the marketplace quicker, and change is going to be a way of life."

The push to the Baldridge Award also represents an overall change in the way IS does business.

"What we're trying to do is have the business managers prioritise [development needs] on a business basis and then allocate the [programming] resources based on the business needs — not the classic way of saying to a business group, 'you have 10 [programmers], do what you want,' " Bronstein said.

"That's a very big change in mentality, and it's not easy to implement," he said.

Fresh signs of multiprocessor standard

BY RICHARD PASTORE
CW STAFF

Hardware vendors in the multiprocessor personal computer market have largely been going their own way, investing millions of dollars in architectural design and then hoping third parties will provide customized support. This strategy has limited the players on the hardware, software and customer sides.

However, signs of potential change came through last month when two hardware vendors and two software firms announced support for M/PAX, a multiprocessor chip set announced in February by Chips and Technologies, Inc.

M/PAX is a symmetric multiprocessor design that supports a mix of as many as six Intel Corp. I486 chips, Motorola, Inc. 68040 chips and reduced instruction set computing processors. It is compatible with IBM's Micro Channel Architecture (MCA), the AT bus and the Extended Industry Standard Architecture (EISA).

Chips and Technologies has been positioning the platform as a potential standard for third parties. "It's a lot of work to design and get one of these systems up and running," said Michael Ares, Chips and Technologies' marketing manager for advanced systems. "We want to bring this technology to these manufacturers at the lowest up-front cost."

A standard chip set could bring more vendors to the marketplace at lower price points and could encourage support from third-party peripheral and operating system vendors.

Four on board

The two hardware firms that signed on at Comdex/Fall '90 were Arche Technologies, Inc. and American Megatrends, Inc. Both companies' machines are in the prototype stage and are expected to debut next year.

The Santa Cruz Operation, Inc. and Corollary, Inc. also announced software support for the chip set. The companies unveiled a port of their multiprocessor version of Unix MPX and SMP Unix kernel, respectively.

Despite commitment from these firms, setting a true standard will not be easy. Companies such as Compaq Computer Corp., which has invested millions in multiprocessing development, are not likely to adopt someone else's standard.

"Chips and Technologies narrows the number of flavors out there, but you'll still have three or four of these architectures," said Frank Dzubeck, president of Communications Network Architects in Washington, D.C.

The chip set "is going to bring the multiprocessor technology to a wider variety of vendors at a lower cost," said Frank Michnoff, an analyst at Meta Group, Inc. in Westport, Conn.

While clone makers may have cheaper access to the technology, they still face expenses and hurdles that could keep prices high and delay system rollouts, analysts said. These may include licensing the MCA or EISA buses and developing advanced disk array technology.

"It's not just like building a classical PC; it's a whole different expense category," Dzubeck said, adding that this is one reason for many vendors' hesitancy to support the chip set.

Another factor that may slow M/PAX adoption is the dealer support issue. Clone manufacturers typically sell through less service-oriented dealers and mass merchandisers — segments ill-equipped to support high-end systems.

Also, while major firms can afford specialized multiprocessor training for their dealer channels, clone vendors may not have the same financial capability.

Chip sets such as M/PAX may have their biggest impact five years down the road, when dealer support is no longer crucial. "In the future, users will get used to this [multiprocessor] concept and have the support people in-house," Michnoff said. At that point, multiprocessor clones could proliferate and prices will plummet, he said.

DG extends service to cover customers' Sun equipment

BY SALLY CUSACK
CW STAFF

WESTBORO, Mass. — Moving to establish its presence as a service provider, Data General Corp. recently announced that it will now offer complete service to all DG customers using Sun Microsystems, Inc. equipment.

This is the first attempt DG has made to service nonproprietary workstations, servers and personal computers in multivendor network environments. The company has been providing service on other vendors' peripheral equipment, such as printers and disk drives, since 1987.

According to Paul Phaneuf, director of services marketing at DG, the company does not have any hard data detailing the number of DG sites with Sun equipment. However, DG estimated that the number of dual-platform environments is sizable.

DG's Motorola, Inc. 88000-based Aviion workstation entered the reduced instruction set computing-based sector in 1989, when many sites had already committed to Unix and had installed the Sun workstations.

The new service agreement is based on a three-year contract between DG and Apex Computer, a Redmond, Wash.-based firm that specializes in fourth-party service for the Sun environment. Apex is training DG field engineers and technicians and providing spare parts inventory.

The program will initially begin to be implemented in 14 U.S. cities: Atlanta, Boston, Chicago, Dallas, Detroit, Houston, Los Angeles, New York, Philadelphia, St. Louis, San Francisco, Seattle, Washington, D.C., and Orlando, Fla. Same-day four-hour response and next-day response features are optional.

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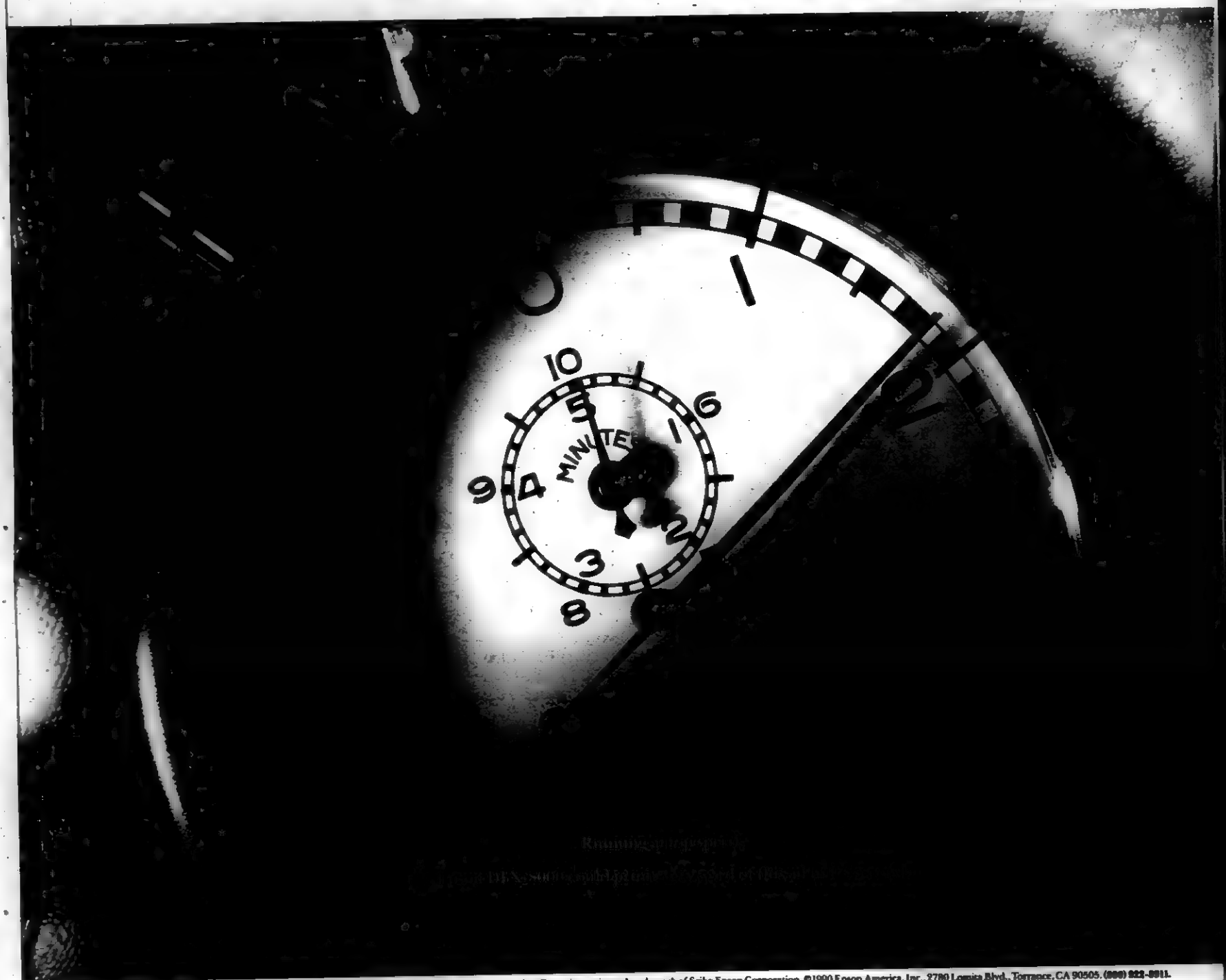

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CONTINUED FROM PAGE 41

perhaps that explains the note of urgency with which this message is usually delivered. It's even more interesting, given that users are getting to be real good at turning up their noses at vendor directives and "hints" that *they* think don't apply to their sites.

For example, OS/2 was supposed to be the second coming of operating systems, obliterating ugly, clunky DOS from the desktop. "Unnnnnnnnn, I don't think so," chorused the user community. So today, while DOS is undergoing a revitalization of sorts, OS/2 is languishing in a pool of disinterest, relatively speaking.

More recently, also at Comdex, an IBM executive got his knuckles rapped for giving a less-than-illuminating answer to a question about a LAN Manager technology direction announced one year ago. An understandably irate user snapped back that this was just the sort of duck that users were sick of. At a number of sites, this frustration has translated into an unwillingness to consider any LAN Manager-based server until some definite answers are spelled out.

There are countless examples of vendors attempting to either lay down the law or nudge users in the "right" direction. But the question is, right for who?

Look at Intel's "no 286" campaign, IBM's Officevision, Microsoft's LAN Manager, Lotus' licensing policies regarding "shadow" copies, anyone's Unix, or the upgrade-itis sweeping the industry. How successful have these pushes really been?

Companies may be standardizing on the 80386, but they aren't buying them in droves, and they aren't deep-sixing their installed base of 80286 machines either. And these same users don't buy Windows 3.0 viability on a 286, no matter what Microsoft says.

They aren't convinced that LAN Manager is reason enough to dump Novell's Netware, and they aren't satisfied with Officevision and its oft-delayed upgrades and grudging support for the DOS world. In some cases, laptop users are protesting Lotus' licencing policies by taking their business elsewhere, or at least threatening to consider it.

And more and more, users are digging in their heels when it comes to software upgrades. "I have a serious question whether even a tenth of my software upgrades are worthwhile," said Alex Kask, treasurer for the Microcomputer Managers Association, Inc., and a micro manager responsible for thousands of PCs.

Instead of blindly upgrading, users are beginning to question the value to be gained by moving up.

The point is that you can't shove technology, or rules governing its use, down users' throats. No matter how quickly users seem to acquiesce, when push comes to shove, it never works. Vendors have to start from the position that whatever they do has to accommodate existing real-life user situations.

Wordperfect is a company that has taken this to heart, even to the point of going a little overboard. But whatever Wordperfect deems an appropriate technological direction is open to change if its users — and it doesn't even have to be most of 'em — suggest otherwise.

Software Publishing Corp. has caught on as well. Once an ardent OS/2 supporter known to gnash its teeth over Windows, Software Publishing co-founder Fred Gibbons is taking the lead from his users these days. If they want it, he'll do it. If they don't, he won't. He's learned it can be painful otherwise. Now, if the rest of the vendor community would just catch on.

Keefe is *Computerworld's* senior editor, PCs and workstations.

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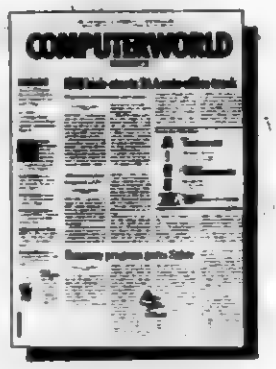

COMPUTERWORLD

The newspaper for information systems management

Zeos introduces lightweight mini

ST. PAUL, Minn. — Zeos International, Ltd. recently unveiled a $2,295 notebook computer, based on the Intel Corp. 80386SX chip. The machine, weighing less than seven pounds, will come standard with 1M byte (expandable to five) of random-access memory, IBM Video Graphics Array display, a 20M-byte hard drive and a 1.44M-byte, 3.5-in. floppy drive.

Zeos has made a name for itself through pricing, and the Zeos Notebook 386 is no different.

"That's an aggressive price point," said Bruce Stephen, microcomputer analyst at International Data Corp. in Framingham, Mass. Stephen added that he expected prices on SX notebooks in general to drop quickly.

Zeos spokesman Rick Apple said the company decided to release the 386SX because of strong demand for its 286-based notebook machine. Zeos has priced the 386SX at $300 more than its 286 notebook. It will begin shipping the product by mid-December, Apple said.

However, it is not clear that low price alone will guarantee Zeos a spot on corporate shopping lists.

"Zeos is certainly growing, and has to be viewed as one of the up-and-comers in the mail-order channel," Stephen said. "They're making money and broadening their product line. I think they've attracted attention because of the low price point — this is a commodity game."

IDC WHITE PAPER

Information Systems:
The Next 10 Years

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HDS

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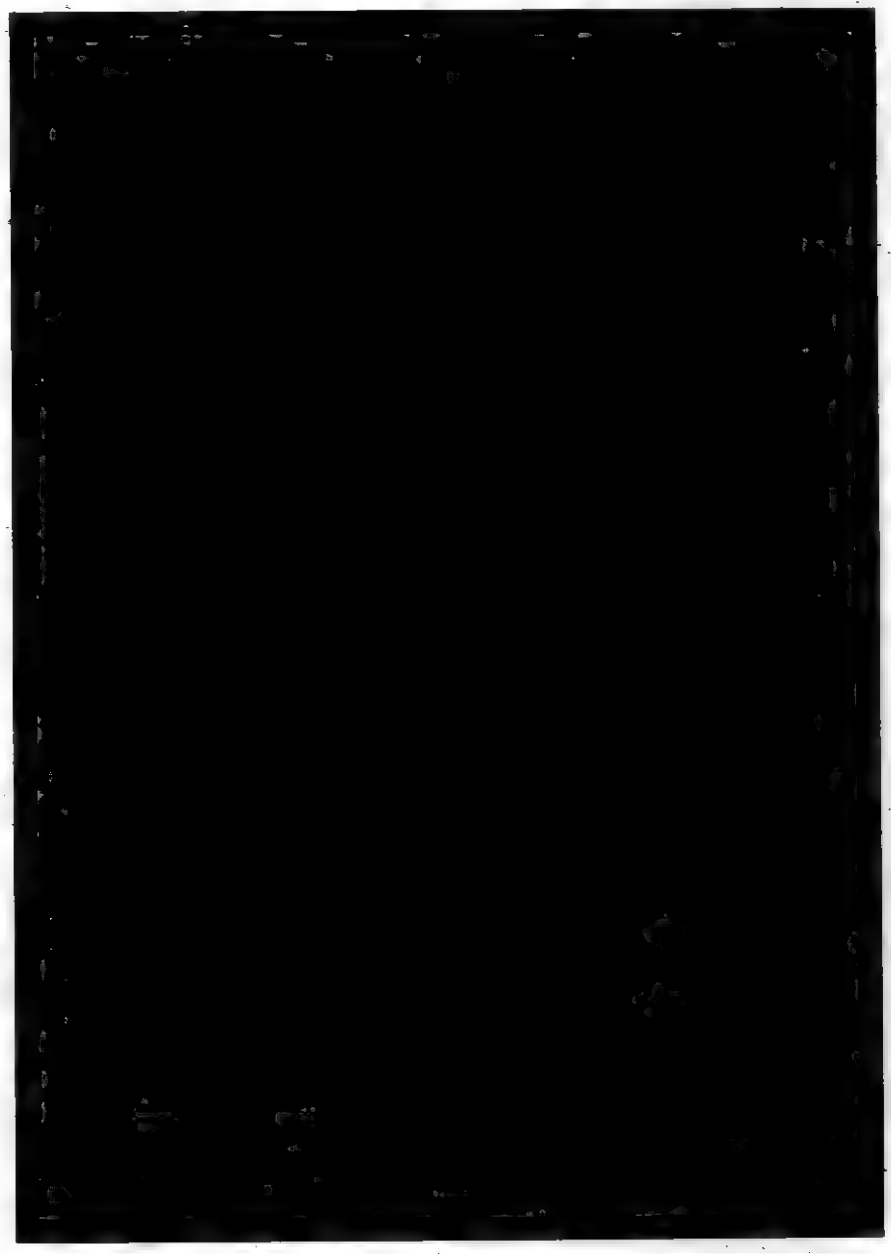
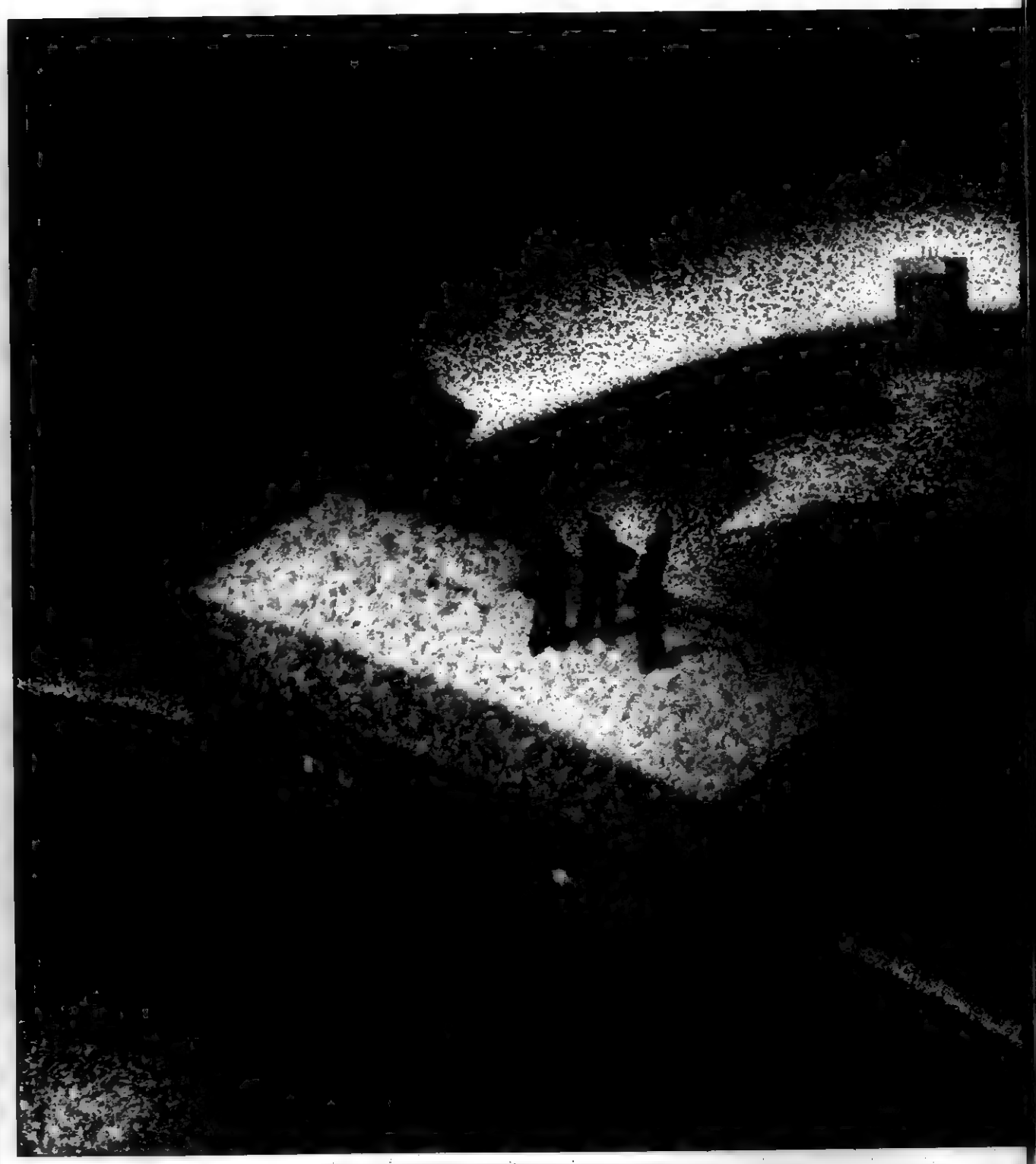
INFORMATION SYSTEMS: THE NEXT 10 YEARS

AN IDC WHITE PAPER FOR INFORMATION SYSTEMS MANAGEMENT





"WITH THE AMOUNT OF MONEY SPENT ON IS OVER THE LAST 10 YEARS, I COULD HAVE BOUGHT TOYOTA AND NISSAN OUTRIGHT."

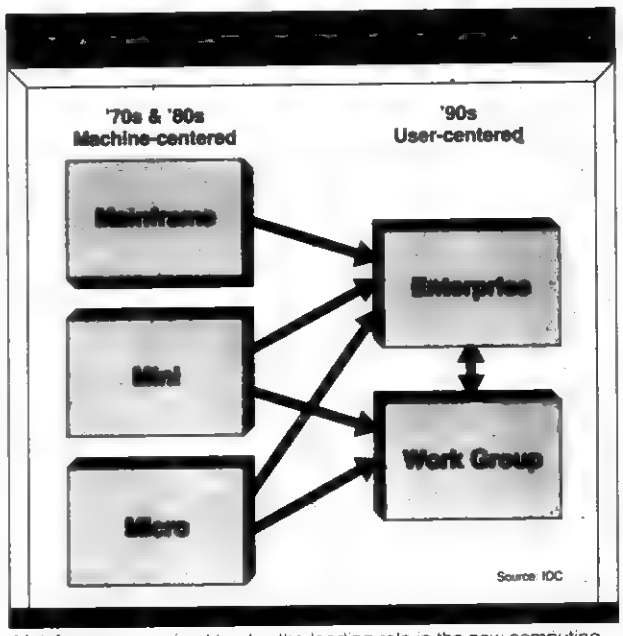
—FORMER GENERAL MOTORS CHAIRMAN ROGER SMITH

INFORMATION SYSTEMS: THE NEXT 10 YEARS

OVER THE NEXT 10 YEARS, MAINFRAME COMPUTERS WILL CONTINUE TO PROVIDE CORPORATE-WIDE ACCESS, CONNECTIVITY, CONTROL AND MANAGEMENT OF INVALUABLE CORPORATE DATA ASSETS. IN THE INCREASINGLY COMPETITIVE BUSINESS CLIMATE OF THE '90s, MAINFRAMES WILL DO THIS BY ANSWERING THE CALL FOR DISTRIBUTED PROCESSING POWER OVER WORLDWIDE NETWORKS. THAT IS WHAT THEY WILL DO; WHAT THEY WILL NOT DO IS GO AWAY. ■ CONSIDER, AS AN EXAMPLE OF THIS URGENT NEW "EXTENDED ENTERPRISE" ENVIRONMENT, A TYPICAL HIGH TECH MANUFACTURING

company with headquarters in the northeastern United States. Its manufacturing operations are centered in Asia. Its subcontracted design work is done in Ireland. Sales offices are sprinkled around the world with coordination in San Francisco. Research and Development is in Germany. A truly global operation. Corporate IS is responsible for ensuring the smooth, secure and timely transfer of sensitive company data across all these far-flung locales. In reality, that means seamlessly linking dozens of different systems and networks that are subject to different government regulatory restrictions. Mainframes make this sprawling international operation work by acting as hubs that connect the various locations.

In the late '80s, data processing architectures were compressed from three tiers to two: The machine-oriented dominions of mainframes, minicomputers and PCs were broken down and reformed into user-oriented enterprise and work-group domains. This new architectural focus has received various labels, including "cooperative processing" and "client/server" computing. No matter what it is called, traditional mainframes will play the central role in its operation.



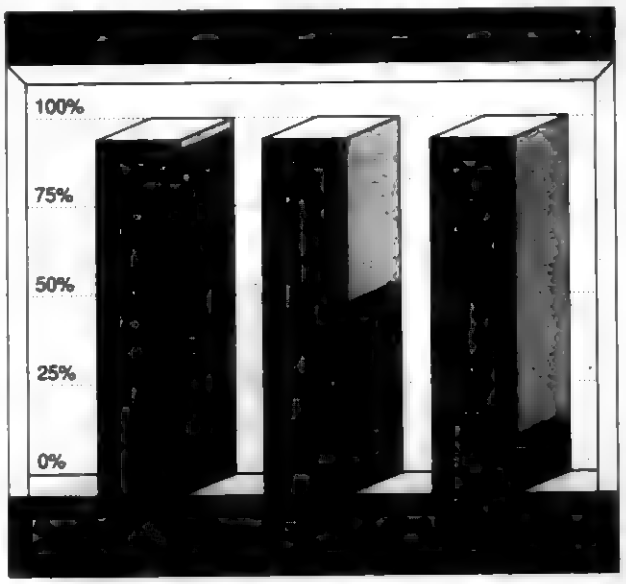
Mainframes are poised to play the leading role in the new computing architectures of the '90s.

THE DATA WAREHOUSE

The mainframes of 1995 will be characterized as data vaults or warehouses for the enterprise. These huge providers of services will control communications, provide security, and manage data access and throughput for a system of interlocking databases. This will lead to a high level of diverse database integration, enhanced system integrity, and in the end, a cost-effective array of hardware, software and personnel.

Despite the much-publicized movement toward downsizing, few companies expect to erase the need for large mainframes any time in the near future. In fact, the strategic plans of most large organizations run to the contrary. The reallocation of selected processing, and in some cases selected control, to workstation-based, end-user departments is generating an increased workload for mainframes. This shows the role of mainframes is becoming more, not less, important. There are several reasons:

• At the high end of the processing-power scale, large mainframes cannot be readily and cost-effectively matched by incremental additions of small processors. This is especially true in high-volume transaction processing.



Tending to an increasingly computer-literate end-user population will become a major preoccupation with MIS staffs by 1998.

• Mainframes have sophisticated security mechanisms for both access of data resources and secured transmission of sensitive, valuable data.

• Formal and standardized procedures and products for reliable backup and recovery on mainframes have been developed over the years, insuring system integrity. The lack of these procedures and products is the most frequent cause of failure for distributed networks linking smaller machines.

• Mainframes provide the automated control and integration of storage devices as well as other peripherals and resources necessary to carry on a global business.

• Mainframes provide system control and all-important auditing facilities that maintain data, applications and operating-system integrity.

THE CHALLENGE OF PERSONAL COMPUTERS

Since their introduction in the early '80s, personal computers have been touted as "mainframe killers." It is true that, incrementally, the growth of power in the form of millions of instructions per second (MIPS) has increased much more rapidly in personal computers than in mainframes. This remarkable growth in raw processing power played a major role in the migration of specific applications from mainframes to smaller machines such as personal computers.

PCs have several distinct competitive advantages over mainframes:

• They are easier to learn, easier to install and easier to use, particularly for the non-DP-professional.

• Relative to mainframe computing power, personal computers can provide a very cost-effective solution for certain types of standalone or departmental processing such as spread sheets, word processing or application development.

• Hardware and software prob-

lems on PCs require relatively lower maintenance skills which are widely available.

However, while PCs are very powerful when properly applied to the appropriate problem, they are not viable alternatives to mainframes for jobs that require robust security, task interleaving with other data processing jobs, and high rates of transaction processing. There are many recent examples of corporate data processing jobs that were offloaded to PC networks. Within months, MIS directors were asked to recapture and reschedule these jobs back to mainframes due to poor security, and the difficulty in administering, managing and repairing local area networks (LANs). Few organizations have realized the optimal organizational structure required to properly and successfully support distributed processing across LANs.

NEEDS OF THE '90s

Long gone are the days of 15% annual staff growth with salary increases to match. If anything, staff reductions are the order of the day. Commercial data processing departments are realizing that the work force needed to support large computing systems must be closely controlled and, in many cases, reduced. Further, retained personnel are being asked to expand their expertise and work toward achieving the objectives of the core business.

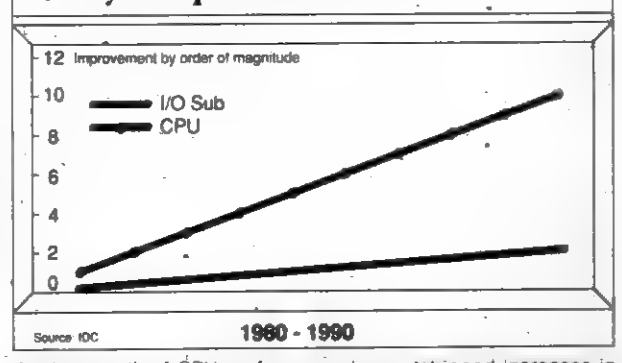
In these lean times, both MIS managers and vendors are faced with a paradox. Corporate management says the computing complexity can increase as long as personnel and training required to support and manage it declines. Given this new criterion for buying computers, hardware vendors will be under constant pressure to provide more cost-effective systems.

The computer processor environment over the next five to 10 years will continue on its heterogeneous path. Along this path, corporate data processing departments are moving into an era of hardware specialization. They are dedicating mainframes to the management of very specific business situations such as automated teller machines, on-line transaction processing (OLTP) and batch processing. It is not unusual for each of these dedicated processors to come from different vendors. Therefore, the challenge is to maintain multi-vendor hardware solutions with limited staff.

MAINFRAME MARKET DYNAMICS

In a recent IDC survey of 75 senior MIS managers with IBM 3090-class mainframes, respondents were asked to discuss their plans for acquiring large computers over the next three years. Of those who are planning an acquisition during that time period, 58% are considering IBM, but models other than the newly-announced ES/9000 series. Nineteen percent are considering a plug compatible manufacturer (PCM) solution from vendors such as Hitachi Data Systems (HDS) or Amdahl. Twenty-three percent are considering a non-IBM-compatible mainframe or Unix acquisition. The fact that large-processor users are expressing an early, tentative approach to the newly-announced IBM ES/9000 is no surprise. Users typically warm up slowly to new machines.

Growth in computing power vs. I/O subsystem power



As the growth of CPU performance has outstripped increases in input/output subsystem power, local area networks have been enlisted to offload mainframes.

Soaring mainframe growth, which reached nearly 20% at times during the past 20 years, gave way to a modest growth rate of 5% to 7% by 1990. Barring any unexpected and unprecedented technological breakthroughs, IDC predicts similar unspectacular growth —but not unspectacular profits—for the '90s.

The promise of mainframe longevity and the possibility of 70% profit margins has resulted in cutthroat marketing campaigns by IBM and the PCMs. Once a group much larger in number during the glory days of the "BUNCH," the PCMs are now limited to Amdahl and HDS. Both companies are expected to demonstrate staying power over the next 10 years.

The PCM marketing push has clearly been felt by the perennial leader, IBM, as that company's market share has slowly eroded. Big Blue has lost customers to the PCM vendors primarily on price/performance issues.

Prior to the fall of 1990, a period that saw several important announcements concerning mainframe technology, the mainframe market shares for the leading vendors were:

IBM	68%
Unisys	17%
Amdahl	9%
Hitachi Data Systems	3%
Bull HW	2%
Control Data	1%

The 1990 competition picked up during June when HDS announced the industry's fastest processor, the model EX/420. The EX/420 is rated at approximately 150 MIPS. This introduction was followed in short order by rapid-fire announcements from Amdahl, Fujitsu and IBM. This series of announcements virtually restructured mainframe technology.

The new machine families offer dramatically new features and functions with the promise of even more advanced features over the next several years. HDS seems to have come out a winner in this new-product derby as 16% of survey respondents say their companies are now planning on buying HDS machines. Otherwise, the introductions did not seem to have a great impact on future brand loyalty. Some 62% of respondents still expect to buy from Big Blue.

Internationally, five-year mainframe-market growth in the Pacific Rim is expected to double that of the rest of the world. The Japanese, Australian and Asian markets pose an interesting dilemma for mainframe makers. IBM systems compatibility is less critical in these markets than in the U.S. As a result, several European and Far Eastern manufacturers have aggressively carved out and maintained a significant market share. Thus, IBM and the PCMs have found themselves in the unaccustomed position of playing catch-up.

The aggressive marketing of the PCM vendors, joint ventures and far reaching marketing agreements among industry giants have IBM looking anxiously over its shoulder. What it sees is Fujitsu buying International Computers Ltd. outright, and 42% of Amdahl. In another similar move, Electronic Data Systems bought 20% of HDS. Rarely lacking in marketing acumen, IBM is expected to have more than 100 strategic alliances of its own, mostly with

SOH

The decreasing number of mainframe service calls creates higher user expectations for large applications such as airlines reservations and banking.

software partners, before January 1, 1991.

Less than five years ago, the top price for the high-end machine in a mainframe family was in the range of $5 to $6 million. Today, these machines exceed $24 million. Add in the large margins which hardware designers require to support R and D efforts, and these price tags will only climb. Despite such astronomical costs, however, there is no sign that the world's largest corporations are reluctant to buy. They have to buy if they want to compete.

On a positive and less expensive note, significant savings can be realized from operational consolidation. Money can also be saved by agreeing to new hardware purchases only if free software licenses are included. For example, an IBM buyer might save the $250,000 yearly cost of DB2. Mainframes have a definite advantage over smaller computers in this area.

TECHNOLOGY ADVANCES

Technological advancements came with dizzying rapidity in the '80s, and will continue to do so in the '90s. Processors, from the most powerful mainframes down through the least powerful personal computers, increased in speed dramatically. We have reached the point now where speed improvements of 25% to 30% per year are taken for granted—and even demanded—by some end users.

General-purpose processor speeds are now in the 150-to-210 MIPS range and expected to reach 300 to 500 MIPS by 1995. They will hit 1,000 MIPS and more by the year 2000. Fujitsu, a leading Japanese mainframe manufacturer, hints that it is developing a 600-MIPS machine. When it will reach the market is a matter of debate. At this point, there are very few applications that require or can fully take advantage of that kind of power. Actual applications that could utilize such fast machines are generally found in the military.

As commercial applications begin to require such processing power, it seems likely that a customized configuration will be developed for each individual installation. This is not an an extraordinary expectation given the sums of money that will be invested by users.

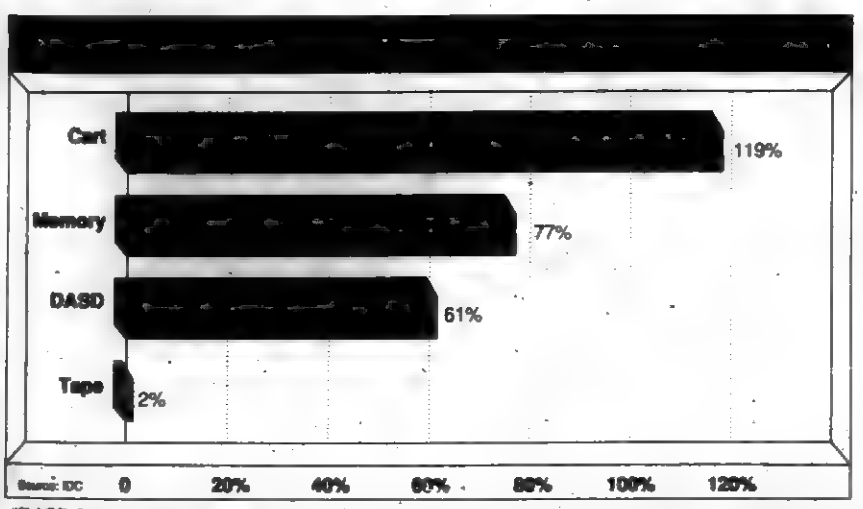
Advances in processor design include the implementation of improved instructions that control processing within the computer. Smaller machines with reduced instruction set computing (RISC) and scalable processor architecture (SPARC) are now common, although such technologies are not expected to gain widespread use in the mainframe class until 1995, at the earliest.

Despite advances in hardware miniaturization, dramatic reductions in the size of mainframe computers are not expected soon. A quick look inside almost any current large model reveals considerable open space that is required for easy access.

Despite all the technological gains, however, the disparity between the computer's ability to "crunch" data and its ability to move data through input/output subsystems is disappointing. CPUs simply cannot move data around as fast as they can process it. One solution to this shortcoming is the use of work-group-oriented LANs.

This disparity continues to exist even after the introduction of IBM's Enterprise System Connection Architecture (ESCON). This dramatic new channel architecture uses a light-emitting diode as the light source, and fiber-optic cable as the transmission medium. ESCON allows direct-access storage devices (DASDs) to be located up to five miles—instead of only several hundred feet—from mainframes. It also provides 10M bit/sec transmission I/O speed, which, although fast, still lags behind internal CPU speed.

In order to put the issue in perspective, consider this: CPU cycle times are in the nanosecond (one-millionth of a second) range. I/O subsystems operate in the millisecond (one-thousandth of a second) range. If we arbitrarily assign one nanosecond as one hour, then one millisecond is approximately 41 days.



"DASD farms" are a hot storage topic, but self-loading "juke box" cartridges are slated for faster growth over the next five years.

REACHING FOR RELIABILITY

Asked to comment on mainframe service calls, survey respondents say they expect

the number of these calls to decrease from 1.5 to 0.6 a month by the year 2000. In such a stable environment, users will demand an even higher rate of reliability for such applications as airlines reservations, banking, credit card processing and point-of-sale transactions. While the majority of today's mainframes is not fault-tolerant, there are vendors that have specifically designed their machines to offer 100% reliability. The demand for such perfection will surely engender industry-wide, mainframe fault-tolerance within the next 10 years. It is needed now.

Mainframe reliability is worth its weight in gold. Retail credit card operations are a good example. Research indicates that if a retail credit card validation is delayed longer than 15 seconds, the consumer will offer another card. Thus, the first credit card company loses an opportunity to, in effect, grant a high-interest, short-term loan. Mainframe makers are motivated by the fact that credit card companies typically purchase whatever processing equipment brings them lower response times.

THE "LOGICAL" MAINFRAME

The 24-hours-per-day, seven-days-per-week, 365-days-per-year processing schedule is standard operating procedure in most large organizations with critical time requirements. The future decade will carry this a step further by making any downtime unacceptable.

This demanding environment is spawning what IDC calls "distributed data center complexes." Distributed data center complexes are a collection of geographically diverse data centers coupled by wideband, wide-area communication capabilities. Each complex is tightly coupled with all other complexes, sharing central memory, storage and other mainframe facilities. The number of central processing units contained in each of these complexes is increasing. Currently, there is a maximum of eight. That number could reach 24 by 1995.

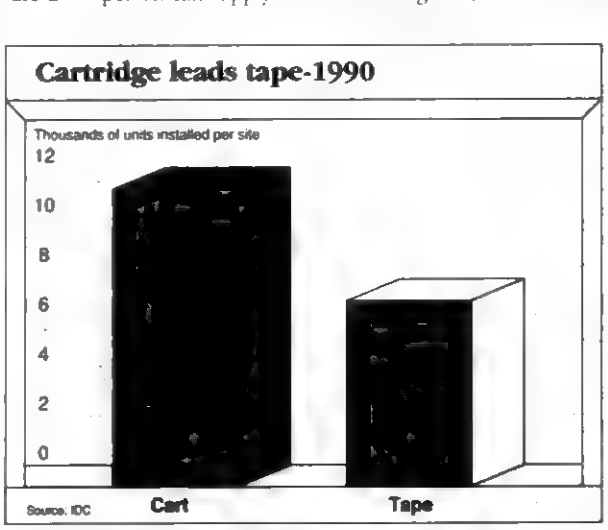
In this environment, each of these distributed data center complexes—while to a large degree self-contained—requires information sharing with smaller, "mini-mainframes." These unattended "lights-out" systems could be located regionally or in departments.

Overall enterprise control of such communication will be accomplished by a "logical" mainframe—a distributed data center computer that stands logically apart from any other CPU's. This master computer will not be invasive. It will not make modifications to any of the "outlying" operating systems. Its automated process control will not retard the performance of the host systems. Its strategic decisions will be made transparently and according to priorities established by management.

EXPERT SYSTEMS

In order to manage and control processing, enterprise-wide systems of the future will require more knowledge than any one person can supply. Artificial intelligence, or more precisely, mainframe-based expert systems, will help fill this knowledge gap. These systems are comprised of knowledge and rules built by extracting decades of experience from hundreds of hours of interviews with human experts. Expert systems will gradually replace the human component and make the thousands of split-second decisions needed to run a large mainframe complex on a daily basis.

Without such systems—and they are finding their way into data centers now—the complexity of running data centers efficiently will quickly push machine-operating personnel to their limits. They will be overburdened as schedules, workload balance, and the need for 100% uptime require processing that will be divided among distributed heterogeneous mainframes. The scope of the task increases significantly when performance, network, resource and data management are included.



The average IDC survey site has 13,000 cartridge tape units installed, as opposed to only 8,500 reel-based units

According to the IDC survey, portability and integration of multi-vendor hardware and software solutions is rated as one of the most pressing issues facing IS management over the next five to 10 years. The object-oriented environments used by expert systems address those two issues by raising the level of portability and easing multi-vendor integration. As a result, the accumulated expertise gathered from many highly technical disciplines is transmitted to organizations that would otherwise go without.

PERIPHERALS

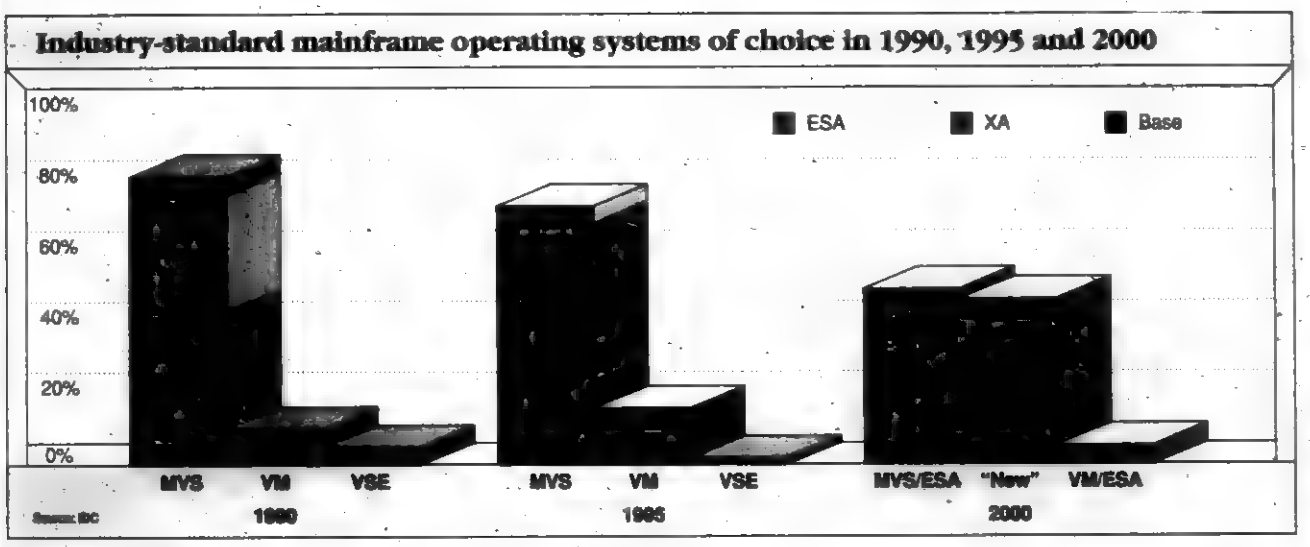
When speaking about mainframes, the term "peripheral" has become synonymous with data storage devices and printers. While they play a significant role, there are also vast numbers of personal computers and workstations urgently requesting data from mainframe-based master data repositories.

In order to provide that support, peripheral storage devices, whether they be traditional, rotating, DASDs, or some other medium such as optical disk, will be used heavily. Survey respondents believe that the growth of DASD will increase over the next five years by a robust 61%. However, they also believe that tape storage will grow an even more impressive 119%. That growth is largely reserved for the newer, smaller cartridge tapes, as opposed to the traditional reel-mounted versions. The cartridge devices offer several key advantages, but one stands out: the ability to automate the mounting process with so called carousel or "juke box" hardware. This eliminates virtually all human intervention.

While optical disk storage devices have been available for some time, acceptance of these devices within mainframe environments has not been overwhelming. Currently, write-once-read-many (WORM) technology is finding a niche in such areas as image processing and microfiche replacement, and is much favored by government agencies such as the IRS. Advances in this technology, such as multi-function disks, are expected to expand the market, but not on a large scale. Mainframe optical-disk devices made up less than 5% of disk shipments in 1989, and barring an unexpected breakthrough, that market share is not expected to increase dramatically over the next five years.

HDS

SOH



Users anticipate the emergence of a new operating system by the turn of the century.

FIBER OPTICS AT THE HEART OF COMMUNICATIONS

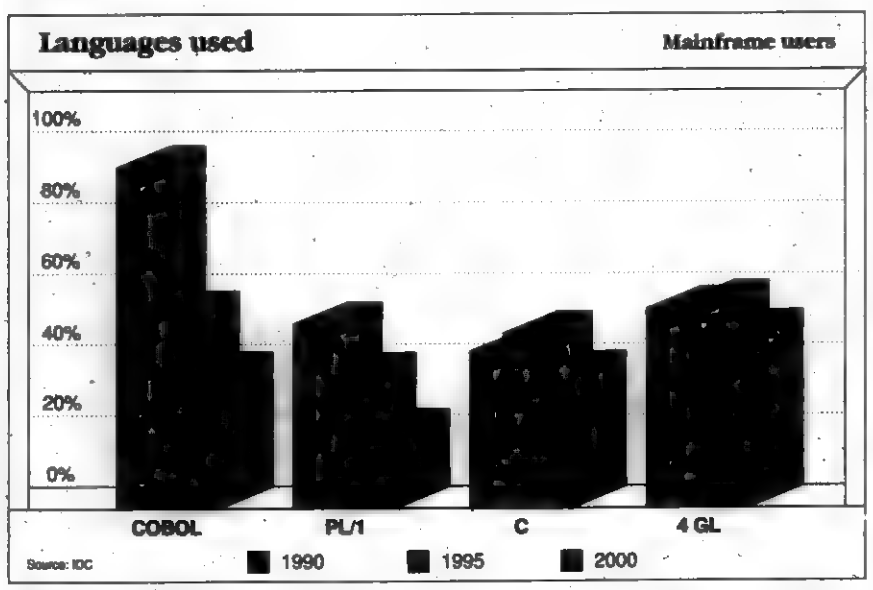
The explosion of peripheral input/output devices required by OLTP has engendered two new remote data storage entities. The first is the "DASD farm," while the second, more futuristic one, is the remote "optical-storage plantation." Success in moving very large amounts of sensitive data over long distances to either of these two requires reliable, high quality communication capacity. This capacity is increasingly being supplied by internal fiber-optic mainframe links and external fiber-optic networks.

The expansion of fiber-optic technology has given new life to remote sites. The combination of fiber and channel extenders can bring logical mainframe processing to any remote site. In the case of system failures, this same combination bolsters disaster recovery by greatly enhancing the reliability of continuous, on-line computing links to remote backup mainframes.

OPERATING SYSTEMS: THE GLUE

As mainframes increase in power, operating systems must keep pace. Sophisticated hardware complexities can be fully utilized if the software is easy for human operators to use.

Mainframe operating systems must have the power and intelligence to operate in a near-fault-tolerant manner. They must be easy to install, maintain and integrate. Newer versions from IBM, Digital Equipment Corp., and others are following a clearly defined path toward these objectives. While each new year sees significant developments, survey respondents still expect their operating system to come from IBM over the next five years. Not surprisingly, sometime in the next decade, they expect an undefined new operating system to appear.



The movement toward fourth-generation languages will slacken after 1995, as users look for something better.

UNIX AND THE DATA CENTER

The Unix operating system, which originated in the late '60s at the Bell Labs division of AT&T, is well known for its flexibility in supporting long-distance telephone communications. Unix provides a simple, very robust operating system with an emphasis on fault-tolerance. Most of the major mainframe vendors have given a passing acknowledgment to Unix by supporting it or some close derivative on their platforms.

To date, however, the very traits that allow Unix to achieve fault-tolerance cause it to be functionally deficient in the sophisticated facilities required to support full-scale commercial applications. Of prime concern is the lack of tight, manageable security. Moreover, traditional mainframe users maintain that Unix has a shortage of operating system tools and utilities. This, they say, prevents the operations staff from closely monitoring and managing mainframes. Realizing this, soft-

ware vendors are rapidly offering more Unix system software.

Interestingly, Unix's lack of complex utilities and system software is viewed by many as a saving grace. They say the lack of utilities results in much simpler machine configurations, which in turn can lead to far less expensive operations.

The general feeling is that Unix has not yet become a full-function, commercially-oriented operating system. However, few doubt its potential. In fact, 15% of survey respondents state they are currently considering the use of Unix. However, only 4% say they will consider implementing Unix in the next five years.

APPLICATIONS SOFTWARE: THE CATALYST

Applications will continue to drive the need for faster mainframes. The new application development paradigm will see application developers utilize new languages and tools that dramatically cut the time required to develop new applications. Programmers are already reducing the great bulk of their time spent writing third-generation computer code. But this expected transformation will not happen over night. The survey reveals use of COBOL at 92% of the companies surveyed. Indeed, there are currently some 100 billion lines of COBOL code in existence.

The 92% figure is expected to drop slowly to 56% over the next five years, and to 35% in 10 years. Even then it will lead alternatives such as PL/1 and C. This adherence to COBOL is a reflection of the massive investment in installed code now existing in data processing libraries. It also reflects the difficulty in migrating away from applications that have no documentation or exist only as machine code.

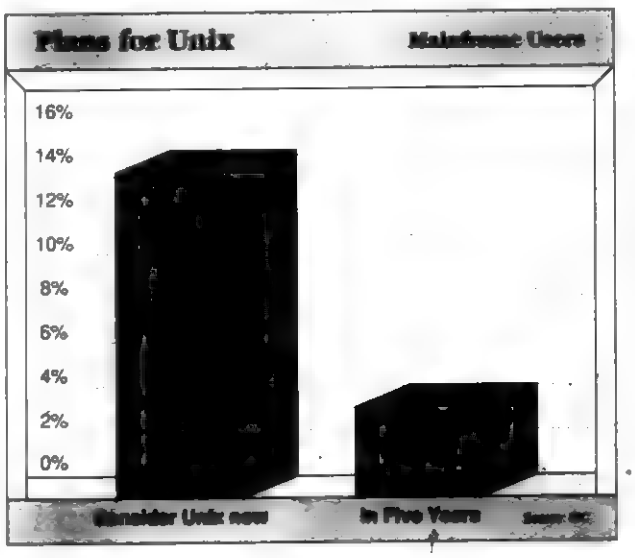
While many additional application development departments would sorely like to migrate to a more productive fourth-generation language, the inability to safely understand the logical flow of 20-year-old programs with unnumbered patches remains a major impediment. Still, 57% of respondents currently utilize a fourth-generation language. That percentage is expected to increase somewhat over the next five years.

DIAGNOSTICS AND SOFTWARE

In the future, mainframe hardware and software will work more closely than ever. In fact, as hardware gets less expensive, a phenomenon that occurs at a rate of at least 25% per year, sales will be made on the issue of software function. Manufacturers already realize that offering strictly hardware is a shortcut to disaster. In order to maintain market presence and share, most vendors will aggressively and closely integrate hardware and software. This will be most true in the area of maintenance and service.

The survey found 82% of respondents had installed some type of software-based automated diagnostic capability. While many packages are available, most of those installed on mainframes will "sense" an impending problem before a critical stage is reached and actually call the manufacturer's service facility via an integral modem. Further, these diagnostic tools place a probability on impending failure and suggest replacement parts. Therefore, a technician dispatched from the vendor's facility will usually arrive at the installation with all parts required to fix the problem before it occurs.

IDC predicts that by 1995, advanced diagnostic capabilities will virtually eliminate outages. By then, diagnostic capabilities of one processor will help resolve problems with others. Automatic error recovery of circuits, channels and media devices will be the key to assuring 100% system availability. Currently, there is at least one mainframe-based hardware and software package that detects and calls in possible future problems.



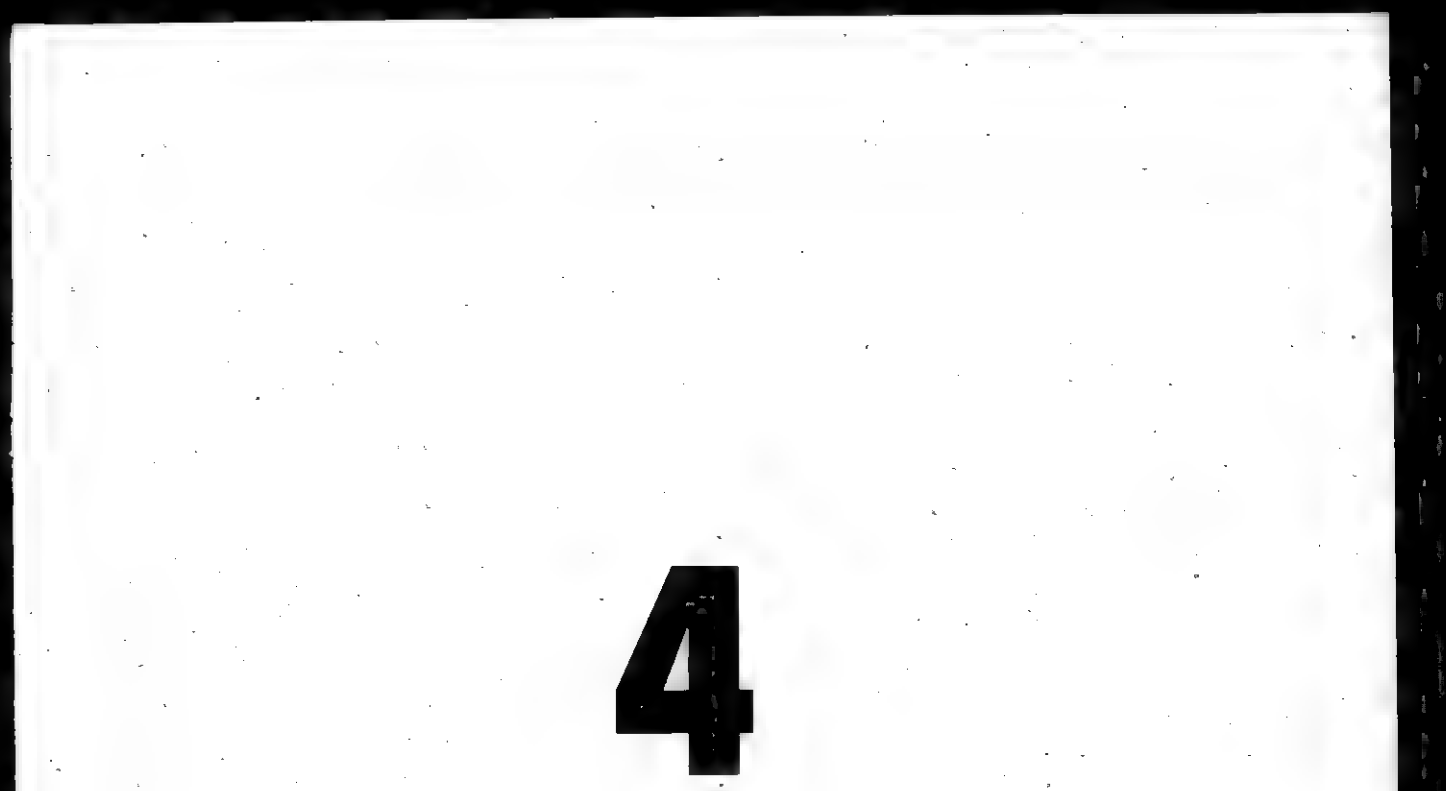
FUTURE SHOCK

Data processing end users are becoming increasingly computer literate, a trend that will continue. They are growing more aware of the potential power that exists in the data center and demanding their share. This is not an unreasonable demand for the ultimate bill payer. Therefore, expectations will soar to the near-impossible, and the MIS departments will have to deliver. Measurable standards and service-level agreements will be developed and accepted, forcing MIS departments to comply with tightly-defined thresholds of reliability, availability and serviceability.

The role of MIS professionals will change significantly in this high-pressure environment. Their expertise will be used at higher levels within the organization; they will be viewed as enterprise consultants. Meanwhile, technicians will concentrate on training, custom-tuning hardware for specific business requirements, and problem solving.

Open architecture will give way to a completely object-oriented approach, where even the technicians will be all but immune to hardware and software configurations. The tedious definition of OLTP configurations, data communications networks, establishing performance criteria, and monitoring a myriad of operating thresholds will all reside in software. Organizations will no longer be able to afford problem solvers. A new job description will arise, that of "problem preventer." Assisted by highly-automated software products, system operators will have expert support in managing machine-speed systems linked to multi-vendor networks and applications.

The era of the self-managed system is not far away. Systems of the 21st century will require so much sophistication and technical specialization they will have to manage themselves. The mainframe of 1998 will control the master console. It will direct the system to seek and maintain balance as determined by an "operator" that may be a computer located thousands of miles away.



THIS NUMBER IS THE CORE OF OUR BUSINESS.

We're Hitachi Data Systems. By applying the vast resources and expertise of our parent company to four key product areas, HDS has become a leader in both high performance and reliability. These product areas include mainframe systems, DASD, cartridge tape devices and semiconductor disks. One example of our innovation is the HDS EX™ Series of mainframes. With over 20 models to choose from, including our newest, most powerful EX 420, the EX Series protects your investment through a 30-fold growth path and complete compatibility.

HDS

Hitachi Data Systems

EX is a trademark of Hitachi Data Systems

203

THIS NUMBER KNOWS THE RIGHT NUMBER.

In our very first year as Hitachi Data Systems, we added to our client list over 200 new companies from 36 countries around the world. To learn why, contact your local sales office. Or call HDS today: (408) 970-1000. Let us put together some numbers for you.

Hitachi Data Systems, 750 Central Expressway, P.O. Box 54996, Santa Clara, CA 95054-0996

Hitachi Data Systems

Pro Gold: Power file manager, limited utilities

Unembellished with a lot of extras, Xtree Co.'s Xtree Pro Gold 1.3 holds the honor of being one of the most powerful DOS shells available.

Traditionally considered an experts-only program, Pro Gold's current capabilities, such as file viewing and a flexible approach to launching applications, make it more appealing to intermediate users. But beginners may still be put off.

Reviewers applauded Pro Gold's clear-cut approach to file management. Among other things, users can display and transfer files between two directories and file sets on the screen at the same time.

However, they said, Pro Gold comes up short in menu-making. There is no macro or programming facility for use in setting up application menus or DOS-command shells.

Pro Gold 1.3 also does not include features such as desktop utilities and telecommunications, but it does offer the ability to maintain a history of the last 15 commands issued from the DOS command line and a text editor. A file-compression program, which may be useful because Pro Gold takes up almost 800K bytes of disk space when installed, is sent free to registered users of Version 1.3 and is integrated with Version 1.4, a minor upgrade.

If you do not need all the features that accompany other shells, and if you feel confident in your skills, Xtree Pro Gold's $129 price tag will buy you what reviewers consider possibly the best file-management capabilities around. Upgrades from previous versions cost $40.

Compiled by free-lance writer Suzanne Weixel.

Score calculations: *Published reviews: average of available numeric scores from reviews multiplied by a factor of 3. Analysts' ratings: average of 1-to-10 rating from product analysts multiplied by a factor of 2. Users' ratings: average of 1-to-10 rating from major users multiplied by a factor of 1.5. Cost evaluation: average of users' and analysts' ratings of the cost to get a product running multiplied by a factor of 2. The 1-to-10 scale: 1 is poor, 10 is excellent. Criteria are weighted in favor of expert opinion and most important areas. Vendor financials: No rating is available because Xtree does not publicly report financial data. The omission is reflected in the change of maximum score this week from 100 to 85.*

Reviews Summary

Criteria	[illegible]	[illegible]	[illegible]
Ease of use	Very good	Fairly easy but not for novices	Poor
File manager	NC	[illegible]	Good
File viewer	NC	Flexible	Good
Documentation	Good	NC	NC
Technical support	Very good	NC	NC
Value	Excellent	NC	Fair
Reviewer's score	7.8*	Editor's choice	NC

**Ratings are based on a weighted scale of 1 to 10 where 10 is excellent. Only the* Infoworld *rating is included in the score. **Version 1.4 reviewed. NC: No comment. These are excerpts from the reviews. Refer to actual articles for details.*

RATINGS

What the experts say

Using a 1-to-10 scale, users and analysts rated product performance and cost to get the product up and running.

- **Users: Tim Duncan, Anderson, DeBartolo, Pan, Inc. (*performance:* 7, *cost:* 9); Frank Nestor, Summit Consulting, Inc. (8,8); Jim Turner, South Coast Air Quality Management District of California (8,8).**
- **Product analysts: Dean Hiller (6,6); Andrew Seybold, Data-quest, Inc. (8,6); David Chernicoff, National Software Testing Labs (8,8).**
- **"Xtree Pro Gold may not be ideal for casual users but for heavy-duty hackers, it is the most useful DOS shell around," Seybold said.**
- **Financial analysis: "Xtree is very stable financially. They are profitable and have virtually no long-term debt. Relative to my client base in the same areas, they're well positioned," said Melanie Hatt, Coopers & Lybrand.**
- **Xtree earned revenue of $10 million in 1990 and has sold more than 2 million copies of Xtree and Xtree Pro Gold products. In the summer of 1989, Xtree offered an amnesty program, registering users of pirated copies of Pro Gold for $20.**

Xtree Pro Gold score:
(Maximum score: 85)

Points (maximum)	Category
23 (30)	Published reviews
15 (20)	Analysts' ratings
11 (15)	Users' ratings
15 (20)	Cost evaluation

(See financial information below)

Xtree responds

The following are comments from Chris Williams, Xtree Pro Gold product manager, in response to the reviewers' assessments:

Xtree's mission is to make Xtree Pro Gold the best file and disk manager available. We want to make it available to beginners as well as advanced users.

It's the user interface and not the features themselves that make it confusing for novices. So we're planning to deliver an upgrade by the end of the year that simplifies the interface by implementing pull-down menus. This will make Pro Gold more accessible to beginners. But there are certain features designed for experts that beginners wouldn't use anyway.

Poc-It cooks up guide for developing systems

BY RICHARD PASTORE
CW STAFF

As information systems shops take on growing dockets of development projects, managers can find it dizzying to keep track of all the activity. For some, mission control comes in the form of the consistent methodologies and automated tracking features of on-line development aids.

Poc-It Management Services, Inc., an IS consultancy in Santa Monica, Calif., added a Systems Development Guide to its personal computer-based Microman II project management system last month. The guide, which is packaged on floppy disks and in a 250-page bound volume, offers IS managers "a cookbook approach of how to go about developing a system," one beta-test user said.

"If you don't have a standard development method in place, everyone does it their own way," said guide beta tester Richard Smith, director of MIS for Snohomish County, Wash. This makes it twice as hard to keep track of who is doing what and how projects are progressing, he said.

While the county IS department had its own informal project methodology prior to purchasing the Poc-It guide, it was not well documented, Smith said.

Now, the guide's electronic templates walk Smith and his project managers through a consistent series of development steps. The templates are divided first into five phases: planning, analysis, design, construction and implementation. These are further divided into activities and specific deliverables.

Users of Microman II, Poc-It's project-tracking software, can load the template into Microman and use that software's scheduling features to estimate the amount of time and resources to allot for a particular activity.

Cost-justified

Smith justified the guide's $7,500 price tag by noting that it would cost the department more to develop and document its own methodology from scratch. And after all that work and expense, a homegrown methodology may turn out to be unworkable. "This one is well thought out," Smith said of the guide.

Smith, who has loaded the IBM-compatible software on a 3Com Corp. server and 3Plus-Open local-area network, checked out other package options, including a $69 template from another consulting firm. "It was fairly cursory in nature," he said.

While the Poc-It package offers much more depth, "this one is not so complex that you get overwhelmed with the process," Smith said.

Although the templates offer the flexibility of customization, some users do not see themselves fitting into a development formula of any kind. "Using templates would be helpful if that was the way we did our projects, but unfortunately, it's not. Every one of our projects is so different," said Steve Stadler, microcomputer analyst at A. G. Edwards & Sons, a retail brokerage in St. Louis.

Stadler uses Poc-It's $2,895 Microman primarily for its scheduling features. "The main intent from the package was to better inform our end-user community about what we were up to," he said. Microman's time tracking helps Stadler update users on when their needs will be met.

"That's a big factor when you're trying to make people happy or at least keep them informed," Stadler said.

Stadler and other Poc-It software users said implementing the products and training users is swift and relatively painless.

"We needed new technology to turn our passion for customer service into results. That's why we chose SAA."

Jay Dinwoodie, Senior VP/Information Systems, GE Capital Fleet Services

While some companies are wondering what IBM SAA™ can do for them, the people at GE Capital Fleet Services already know.

And so do their customers.

The company is America's leading car and truck fleet services business, and their goal is to cement that position by changing the rules, by redefining the word *service*.

SAA, or Systems Application Architecture,™ is key to that strategy.

They've built a complete SAA system, with a variety of applications running cooperatively on three IBM platforms: an ES/3090,™ an AS/400® and a multitude of PS/2s® using OS/2.®

Easy to build.

According to Jay Dinwoodie, development has been quick and smooth.

"We implemented the first modules in March '90, and since then we've been adding new ones like building blocks. Which is the whole idea. SAA lets us hook things together—data, image, you name it—in ways we never could before. What we're doing here today could *never* be done the old-fashioned way."

Jay's users agree, especially the 45 mechanics who man the phones helping customers who have car trouble.

With SAA applications in multiple windows, they provide a level of service that's truly unique: diagnosing the problem, finding the best nearby garage, estimating the cost, negotiating discounts, determining warranty status, scheduling preventive maintenance and more, all while keeping detailed records, in minutes, in one phone call.

To a salesman stuck on the road, that's money in the bank. Ditto for GE Capital Fleet Services.

Easy to learn.

Says Jay, "We bring customers in and show them what we're doing. Nobody walks away unimpressed, and in fact, SAA's helped us win a number of new accounts."

Another big SAA advantage is training time, or lack of it.

"When we first got running, we went to the mechanics' area for a training session, to get some thoughts for writing a manual. We started at one end of the room, spent a few minutes with each guy, then moved on. We weren't half-way across the room when the first people were actually using the system, doing real work. We never did write a manual."

Easy to live with.

Their system is now running about 35,000 PC-host transactions a day, and Mr. Dinwoodie estimates that traditional technology would require about 250,000 transactions to accomplish the same work. He says, "Our SAA apps are just incredibly efficient, and they've been completely reliable."

How strange that some people are still asking if SAA is for real.

"It's just a question of confidence," says Jay. "We knew exactly where we wanted to go and that ultimately SAA was the only way to get there. So we took that first step, we've never looked back, and expectations—both ours and our customers'—have been exceeded."

IBM®

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NEW PRODUCTS

Peripherals

Extended Systems, Inc. has introduced two printer-sharing devices that support serial or parallel computer connections.

The Sharespool 2089 ($945) and Multispool 2289 ($995) enable eight computers to be connected via serial or parallel connections, depending on the type of computer application.

Both products include the company's Extendedlink technology, which reportedly provides a four-, six- or eight-wire long-line connection to a computer's parallel port.

Extended Systems
6123 N. Meeker Ave.
Boise, Idaho 83704
(208) 322-7575

Grid Systems Corp. has announced a light pen that enables users of personal computers with IBM Video Graphics Array-compatible graphics to enter data and share applications developed for field use on a Gridpad handheld computer.

The FT-1210 and FT-1215 Light Pen packages were manufactured by FTG Data Systems. They include an interface board and a Gridpen interface software package and cost approximately $400. Both models are now available from FTG Data Systems.

Grid Systems
47211 Lakeview Blvd.
Fremont, Calif. 94538
(415) 656-4700

Digital Products, Inc. has introduced Printdirector Plus, an enhanced version of its Printdirector peripheral sharing package.

The product can print output from graphic programs through a laser printer at a rate of 5,000 char./sec., according to the vendor. A plug-and-print feature enables a user to share one printer among many personal computers by plugging in the appropriate cabling.

Printdirector Plus is available in six-, 10- or 16-port models, which are respectively priced at $695, $995 and $1,895.

Digital Products
108 Water St.
Watertown, Mass. 02172
(617) 924-1680

Office Automation Systems, Inc.'s Laserpro LP 90/8 is a laser printer that was designed as a desktop system for performing applications such as computer-aided design or custom forms design.

The device prints on label or card stock and can process a range of paper sizes, including letter, legal and envelope, the vendor said.

The product lists at $2,295.

Office Automation Systems
9940 Barnes Canyon Road
San Diego, Calif. 92121
(619) 452-9400

Database management systems

Clarion Software, Inc. has announced Version 2 of its Graphics Language Extension Module, a product designed for its Clarion Professional Developer database program.

Version 2 enables users to graphically display, print or plot data from a Clarion database. The product allows graphics to be integrated into applications developed with the Clarion Professional Developer and features device-driver support for a wide range of manufacturers' video cards and printers.

The product is priced at $199.

Clarion Software
150 E. Sample Road
Pompano Beach, Fla.
33064
(305) 785-4555

Wordtech Systems, Inc. has announced that its Arago dbxl Ashton-Tate Corp. Dbase IV-compatible database will include a nonintrusive program test coverage analyzer.

The analyzer can be used to instantly indicate untested parts of an application that are prone to execution errors. The analyzer is controlled with two commands: one to switch coverage on or off and one to initiate reports.

The Arago dbxl was scheduled to begin shipping last month. A package including the coverage analyzer and a source-code debugger is priced at $495.

Wordtech Systems
21 Altarinda Road
Orinda, Calif. 94563
(415) 254-0900

Software Products International, Inc. has introduced Version 1.1 of Access SQL, its front-end interface for Gupta Technologies, Inc.'s SQL-base.

The product includes a report writer equipped with a preview feature that enables users of database management systems to view customized reports in what-you-see-is-what-you-get formats. It is compatible with Microsoft Corp. Windows Version 3.0 and is available in single-user, network (one to four users), front-end and network expansion configurations.

Pricing ranges from $695 to $1,595, depending on configuration.

Software Products International
10240 Sorrento Valley Road
San Diego, Calif. 92121
(619) 450-1526

Object Design, Inc. has introduced an objected-oriented database management system software package designed for Sun Microsystems, Inc. Sun 3 series and Sparcstation computers.

Objectstore is based on the industry-standard C++ programming language. It provides the capabilities of a production-level DBMS for managing complex objects and enables users to create distributed work group-style applications. The product runs in client/server computing environments that consist of networked workstations and high-end personal computers.

Pricing ranges from $2,000 to $9,000, depending on the number of users and type of site license.

Object Design
1 New England Executive Park
Burlington, Mass. 01803
(617) 270-9797

Data storage

Kris Technologies, Inc. has introduced a 20-MHz Intel Corp. 80386SX-based notebook computer.

A basic configuration features 1M byte of standard random-access memory, a 20M-byte internal hard drive and a 640- by 480-pixel, 16-gray-scale LCD that is compatible with IBM's Video Graphics Array.

The price for a basic configuration is $3,899.

Kris Technologies
260 E. Grand Ave.
S. San Francisco, Calif. 94080
(415) 875-6729

Micropolis Corp. has introduced a series of small computer system interface (SCSI) hard drives that feature access times as low as 3.9 msec.

The High Speed series includes 180M- and 385M-byte 5¼-in. half-height models, as well as 382M-, 765M- and 1.2G-byte full-height versions. The drives are compatible with IBM Personal Computer ATs, Apple Computer, Inc. Macintosh systems and Sun Microsystems, Inc. workstations.

Pricing ranges from $1,175 for the 180M-byte drives to $4,325 for the 1.2G-byte models.

The company also announced two 5¼-in. SCSI Winchester disk drives. Model 1908 ($6,995) is a 5,400-rpm device that features an unformatted storage capacity of 1.6G bytes. It is scheduled to be commercially available in second-quarter 1991.

Model 1548 ($8,695) is a 2G-byte drive equipped with a SCSI-2 interface that yields communications rates as high as 10M byte/sec., according to the vendor. It is scheduled to be available in first-quarter 1991.

Micropolis
21211 Nordhoff St.
Chatsworth, Calif. 91311
(818) 709-3300

Systems

Two desktop units from Leading Edge Products, Inc. — Model D3/SX20C and Model D3/33 — are scheduled to begin shipping this month.

Model D3/SX20C is a 20-MHz Intel Corp. 80386SX-based unit with a 32K-byte cache. Model D3/33 is a high-end 33-MHz machine equipped with 4M bytes of random-access memory, a 64K-byte cache and eight expansion slots.

Pricing ranges from $1,995 and $2,995 for the D3/SX20C and from $3,495 and $4,495 for the D3/33, depending on configuration.

Leading Edge Products
117 Flanders Road
Westboro, Mass. 01581
(508) 836-4800

Software applications packages

Microsoft Corp. has announced The Microsoft Office for Windows, a software product that combines three business applications for the Microsoft Windows Version 3.0 graphical user environment.

The product includes Microsoft Excel for Windows, a graphical spreadsheet; Word for Windows, a Windows-based word processor; and Powerpoint for Windows, a presentation graphics program.

The Microsoft Office has an introductory price of $995.

Microsoft
One Microsoft Way
Redmond, Wash. 98052
(206) 882-8080

Software Utilities

Marasys, Inc.'s Colorcube, a recently announced color graphics productivity tool, enables users of database management systems to present three-dimensional data in row or column formats using color as the third dimension.

By striking a single key, users can display numbers behind colors, and another key enables users to browse data.

The product requires an IBM Personal Computer AT, XT or compatible, MS-DOS 2.01 or higher and an IBM Color Graphics Adapter, Video Graphics Array or Enhanced Graphics Adapter color monitor.

The product is priced at $59.95.

Marasys
15425 Los Gatos Blvd.
Los Gatos, Calif. 95032
(408) 356-9367

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COMMENTARY

Elisabeth Horwitt

Dangers of complacency

Telecommunications threatens to become one more area where the U.S. had better look to its laurels if it wants to stay competitive in the global business market. While we may gripe about our long-distance carrier's high prices or occasional network glitches, we are accustomed to taking advantage of our highly reliable, transparently transcontinental telecom services and looking down at other nations' "primitive" networks.

This type of complacency is rapidly becoming dangerous. European and Pacific Rim countries are aggressively upgrading their networks and using global networking standards such as ISDN to do so.

Japan, France and the UK are all making great strides in deploying domestic ISDN services and reaching out to other countries. In addition, organizations such as the European Economic Community are funding long-term efforts to set up pan-European broadband ISDN. And the CCITT is coming up with telecommunications standards that will ensure interoperability between different nations' services.

In contrast, the U.S. is still years away from having widely

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'I'd like to charge that burger'

Credit-card companies use networks to target cash-oriented market

BY JOANIE M. WEXLER
and MAURA J. HARRINGTON
CW STAFF

"The future, my boy, is in plastics."

Some of the major credit-card companies are adding a new twist to the famous omen from the 1967 film *The Graduate*. Visa International, Inc. and Mastercard International, for example, see lucrative opportunities for plastic in the sprawling cash- and check-dominated consumer transaction markets. They hope that technology will help carry them into businesses such as fast-food chains, grocery stores, parking garages and movie theaters, where plastic is now largely a stranger.

Visa is undergoing a worldwide restructuring of its processing technology to invade these fast-paced businesses, which depend on rapid-fire network response time (see story page 76). The company's Visanet 2000 project, which involves deploying a global hierarchical "supercenter" architecture and a fiber-optic T1 backbone, is under way in anticipation of a 500% increase in transaction volume during the next 10 years, according to Roger Peirce, executive vice president of Visa International Delivery Systems.

Wide-open market

Visa estimated that about $3.5 trillion worth of worldwide consumer transactions take place annually. Eighty-five percent of these transactions involve cash or personal checks as the form of payment, and 9% are on forms of plastic other than Visa cards, according to the company. Currently, about $1.6 billion in Visanet transactions are processed each year.

Mastercard is also leveraging the high-bandwidth capacity of fiber to handle an increased transaction load. Last summer, the firm consolidated two nodes on its wide-area network — called Banknet — into a switch that routes data among member banks over a fiber backbone.

Banknet can now reportedly combine up to 24 member banks on a single circuit, rather than running individual links to each bank. The network also automatically reroutes data to avoid service delays, according to the company.

In addition, Mastercard employs "negative file technology" for speeding up transactions. A cashier can scan the credit card, and a local copy of a worldwide stolen- and restricted-card database is instantly searched for a match, according to Meg Jacobson, senior vice president for U.S. merchant business at Mastercard.

If there is no match, Jacobson said, the system automatically authorizes a purchase of up to $25 and waives the signature rule. The credit-card companies have long been waiving the cardholder signature requirement for certain markets, such as airlines and direct marketing. The firms acknowledge that they will have to seriously consider waiving it in the other quick turnaround environments that they are hoping to infiltrate.

Cindy Charles

Raley's CIO Donley *says customers tend to spend more when they use credit cards to pay for groceries and fast food*

Breaking tradition

Visa and Mastercard already have pilot projects under way in several industries that have been traditionally cash-oriented.

In one full-scale program, Raley's Superstore in Sacramento, Calif., has both a debit system and a credit system that accepts Mastercard or Visa, according to Chief Information Officer Joanne Donley.

A negative database system with signature waiver is in place in separate Visa and Mastercard trials at Arby's, Inc., which will roll out credit-card service in 22 cities in all its company-owned stores by the end of next year, according to Rege Braun, director of research and development operations.

Arby's uses an off-line satellite authorization system from Merchant Tech International and has determined that 2.5% of its total sales must be credit sales to offset the additional cost of accepting credit cards.

At the Houston airport, Allright Parking Texas, Inc. has been accepting Mastercard, Visa and American Express cards for 10 years. Using Celerex Corp. credit authorization terminals, which also operate on the negative database concept, "we can process a credit-card transaction in 10 or 12 seconds," said Steve Howard, Allright Parking airport

Continued on page 76

LAN standard: A bridge too soon?

BY JIM NASH
CW STAFF

Initial reaction to the trial balloon regarding an Ethernet/Token-Ring management standard, raised by 3Com Corp. and IBM, has been muted.

3Com, the leader in Ethernet local-area network adapter cards, and IBM, sovereign in Token-Ring systems, announced in July that they were working on specifications for a heterogeneous LAN management standard. The standard is intended to allow network managers to monitor and operate Ethernet and Token-Ring networks on one console.

Late last month, IBM and 3Com said they had given a preliminary version of the specifications to Banyan Systems, Inc., Novell, Inc., The Santa Cruz Operation (SCO) and Microsoft Corp. for their comments. They have opened their review to any interested parties.

The proposed standard is based on the first two layers of the Open Systems Interconnect common management information protocol model. It was designed to use a limited amount of memory in order to coexist with current network software.

While some of the chosen four vendors are making noncommittal statements about the proposal, some users expressed skepticism about its relevance and chance for success.

Dick Tribble, network manager at Baylor University Medical Center in Dallas, said 3Com and IBM "should learn to walk before they run" by managing different networking vendors on Ethernet first.

"The effort is honorable," Tribble said, "but why don't [they] work on the multivendor management that so many companies have babbled about before we worry about multiple networking [media] standards?"

Creating standards

Other managers working in mixed environments are asking if just two companies can push a standard into being. 3Com and IBM may need to form a broader consortium to really light a fire, said Bill Conley, manager of information technology services at Noral Aerospace, Inc. in Newport Beach, Calif.

Conley partly discounted the clout they may have won when the Institute of Electrical and Electronics Engineers, Inc.'s (IEEE) Project 802 committee for LAN standards voted earlier this month to adopt heterogeneous LAN management as a preliminary standard. He suggested that pulling in Xerox Corp. and Digital Equipment Corp. might bring the movement to critical mass.

The vendors chosen to review the standard in September had little to say about it.

A spokesman for Westboro, Mass.-based Banyan said his firm would work with IBM and 3Com to include gateway functionality in the standard, which he said is presently oriented toward network adapter cards.

Rick Thomas, manager of network management development at IBM's Research Triangle Park, N.C., facility, said gateway functionality was one of the attributes deliberately left off the first version of the proposal for the sake of simplicity.

Novell said only that the company will discuss the proposal with 3Com and IBM as it evolves. An SCO spokesman said his company had not prepared a statement on its findings. Sources at Microsoft were unavailable for comment.

There are a few companies — mostly intelligent wiring hub firms — that have announced their intention to deliver Ethernet/Token-Ring management, but their solutions require proprietary hub hardware for full functionality.

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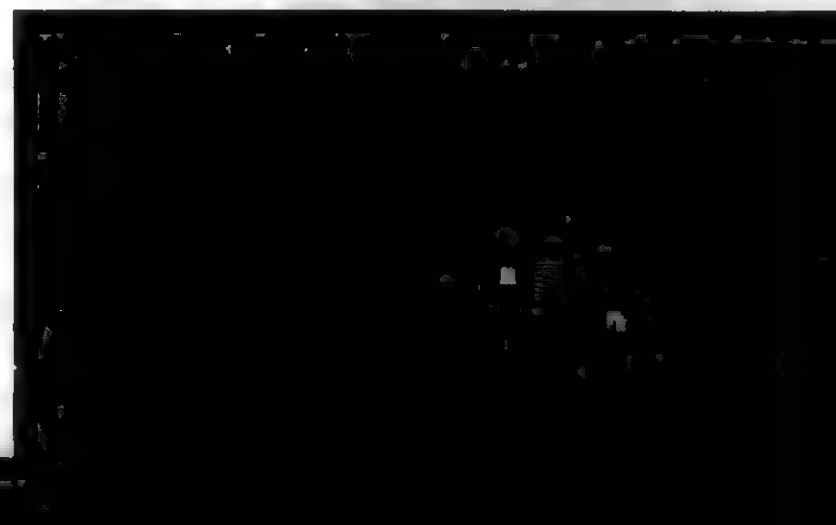

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Fast-packet a plus for dumb terminals

BY JOANIE M. WEXLER
CW STAFF

Dumb doesn't necessarily mean slow and inefficient.

The bandwidth-optimizing capabilities of fast-packet technology are now being applied to dumb terminals — an installed base estimated at over 17 million today and expected to reach 20 million by 1994, according to market research firm Dataquest, Inc. in San Jose, Calif.

Sync Research in Tustin, Calif., has announced that it will start shipping a network access product next month that concentrates traffic from different manufacturers' dumb terminals onto a fast-packet network via a frame-relay interface. The Frame Relay Network Access Controller is intended to speed up the wide-area network portion of direct data transfers from terminals to remote hosts.

According to Greg Toussaint, vice president of sales and marketing at Sync Research, response time delays improve from 0.5 to five seconds on an X.25 network to 50 to 100 msec on a frame-relay network. The product, he explained, is also intended to deliver the bandwidth-on-demand efficiency afforded by fast-packet technology to the terminal-user community.

FRAME RELAY is faster than X.25 in that it capitalizes on today's highly reliable digital circuits.

The state of Florida reportedly supports about 15,000 terminals from various vendors throughout its statewide agencies. Most of the myriad terminals connect directly to a remote host, according to a spokesman at the state's communications division.

The state plans to start testing the network access controller this spring in hopes of replacing several of its $75,000 to $80,000 IBM 3745 front-end processors with the $6,000 to $15,000 Sync Research products. The controller performs the traffic management functions of an IBM front-end processor and is not limited to IBM functionality, the spokesman noted.

Frame relay is a form of fast-packet technology suited for transporting data that travels in bursts, such as terminal-to-host transaction processing applications or traffic exchanged between local-area networks. This is because frame relay ships data in variable-length packets, which is characteristic of the data in its original form.

Like traditional X.25 packet switching, frame relay allows users to allocate bandwidth on demand to squeeze as much functionality out of their circuits as possible.

However, frame relay is faster than X.25 in that it capitalizes on today's highly reliable digital circuits by eliminating the overhead of error checking and correction on each node.

The network access controller parallels the role of a bridge, router, terminal server or cluster controller on the customer premises side of a WAN. The product has reportedly passed compatibility testing with Stratacom, Inc.'s fast-packet IPX T1 networking multiplexer. The specifications shared by the Sync Research and Stratacom products conform to those nailed down in September by Cisco Systems, Inc., Digital Equipment Corp., Northern Telecom, Inc. and Stratacom to tide the industry over until a final version of the formal CCITT standard emerges.

Terminals directly attached to remote hosts — the market targeted by Sync Research's product — will continue to account for approximately 24% of the installed base of dumb terminals through at least 1992 when total installations will reach nearly 19 million, according to Dataquest.

Ther
Of Good Reaso
These Are

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FROM PAGE 71

available, carrier-independent nationwide ISDN services. Carriers have given the same excuses for years now: They are waiting for "stable, complete" standards that will ensure interoperability between different types of carrier switches and between the switches and customer premises equipment.

However, what has really stunted ISDN's growth in the U.S. is lack of market demand: We consider it a luxury here. After all, unlike most of the rest of the world, the U.S. already has reliable, transparently accessible transcontinental telecommunications services.

Telephone lines support 9.6K bit/sec. data transmission; for users with higher bandwidth needs, dedicated lines are available. We are even getting high-speed switched digital services now — through a wide variety of proprietary and "standard" technologies such as switched multimegabit data service, frame relay and cell relay.

In contrast, it is still difficult to make a telephone call in many parts of the world, and many countries are just beginning to install digital networks. All this is changing rapidly, however, as 1992 approaches. Europeans recognize they must unify and enhance their communications systems if they want to compete. And the very fact that many countries are starting with primitive networks makes it easier for them to leapfrog the U.S. If they have to do a complete revamp anyway, it isn't such a big deal for them to install the latest communications technologies, including ISDN.

By 1992, according to Gartner Group, a significant part of Europe will not only have broadly available ISDN but internationally interconnected ISDN services. Indeed, several organizations, including the European Commission and a consortium of Postal Telephone and Telegraph authorities, are said to be readying projects to implement broadband ISDN across Europe.

U.S. carriers such as AT&T now provide switched international links to ISDN services in France, Britain, Japan and elsewhere but without the full intelligence and bandwidth of a true end-to-end ISDN connection. No doubt, U.S. carriers will provide true ISDN connections with overseas carriers when the CCITT's standard is finalized. However, those links will have limited utility until we also have a truly end-to-end ISDN network throughout the country, instead of a hodgepodge of slightly incompatible services.

IF THE U.S. does not put more pressure on the communications industry to get the national ISDN house in order, we'll be second-rate citizens in a global community.

If U.S. businesses and government bodies do not put more pressure on the communications industry to get the national ISDN house in order, we'll be second-rate citizens in a global community that is tied together with standardized cost-effective digital links — supporting 64K bit/sec. now, 2M bit/sec. soon and 45M bit/ sec. in the not too distant future.

Such services are becoming a top priority for businesses that are accelerating their global strategies and looking to set up new overseas plants, offices and partnerships. Such firms need to run bandwidth across borders to keep track of the latest sales figures at their outlets around the world, to ensure timely exchange of change orders and invoices with suppliers via electronic data interchange and to ensure that the latest price figures get to all their subsidiaries in a timely fashion.

Let's not let international networking be one more area where our complacency turns us into also-rans in the global market.

Horwitt is a *Computerworld* senior editor, networking.

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Charge

CONTINUED FROM PAGE 71

manager. Howard said about 30% of his business is done by credit card.

The Celerex system transfers Allright's daily reports to a local accounting package, and the processed data is transmitted to the Houston headquarters' mainframe over telephone lines during the night using modems.

He noted that the service fees using electronic transmission of charges rather than pen and paper have caused the discounts on his receipts to fall to about 2% to 3% with Visa and to close to 4% with American Express.

The amount that a merchant loses in credit-card service fees is a major consideration for low-margin businesses.

Credit-card company candidates such as Hardee's Food Systems, Inc., a fast-food restaurant chain in Rocky Mount, N.C., and Byerly's, a 10-store grocery chain in the Minneapolis area, said the current receipt discount structure eats up their profits. For this reason, they have elected not to implement credit-card systems just yet, although both acknowledged that, because of competition, credit cards will probably be in their future.

"We're not considering accepting credit cards at this time, though it's technically feasible," said Gerald Rowland, comptroller at Hardee's. "Our margins are 9% to 10% as it is, and simple math tells you that paying a 3% to 5% service fee to a bank" takes a significant chunk out of the profit.

Lynn Smith, director of telecommunications at Hardee's, added that the company is developing its own terminal with a credit-card slot and restaurant information system that could also accept a debit card, such as a bank card.

"Our customers would be good candidates, but I don't see supermarkets a good place for credit cards until the discount issue gets resolved," added Tom Harberts, president of Byerly's.

Procedures differ

"We put together certain procedures for certain types of businesses," said Jeanne Alford, director of public affairs at Visa. "For airlines and direct mail, we have an address verification check in place to protect against fraud. We're looking at a system for checks and balances in the fast-food and grocery markets, but I can't comment yet on what that would be."

However, Donley said it is possible to offset credit-card service fees by offering higher-profit products, such as kitchen appliances and home accessories, to buyers. She said when people are buying food on credit, they are more likely to buy other items.

According to Donley, the program is too young for Raley's to provide statistics about its profitability, but she said Raley's management is "pleased" with the alternative payment program, in which 52 of the chain's 58 stores currently participate.

Overhaul

Visa International has determined that its anticipated 500% increase in transaction volume during the next decade will require a heavy-duty restructuring of its information technology. Enter the Visanet 2000 project, which has been under way since June.

Based on a hierarchical "supercenter" concept, primarily for improved network management and backup, the data centers will include 3090-type machines linked across the Atlantic by fiber-optic T1 circuits, according to Roger Peirce, Visa's executive vice president of delivery systems.

Visa foresees the swelling of credit-card volumes because of an effort to invade traditional cash- and check-oriented markets such as fast food. Peirce also said the melding of the European Economic Community in 1992 should help pump up credit-card use because it "throws the whole payment system up for grabs. Visa is the closest thing to a standard international currency." The supercenters are payment processing centers that serve national payments in the countries in which they are located and will back up other supercenters, according to Peirce. Four supercenters will be deployed in this decade.

At the second level of the hierarchy, interchange centers in the U.S., Canada, Asia/Pacific, Europe, Middle East, Africa and Latin America will handle regional and national processing.

Visa has committed to splitting its dedicated lines between AT&T and MCI Communications Corp. The company will reportedly use Network Equipment Technologies, Inc. T1 multiplexers.

Peirce said that previously Visa "had never formalized the data flow" and that the peer-to-peer nature of its processing centers "wasn't manageable" enough to handle the anticipated increased traffic down the road.

Visanet 2000 will cost approximately $150 million, Peirce said, and should have a 10-to-1 payback over seven years.

JOANIE M. WEXLER

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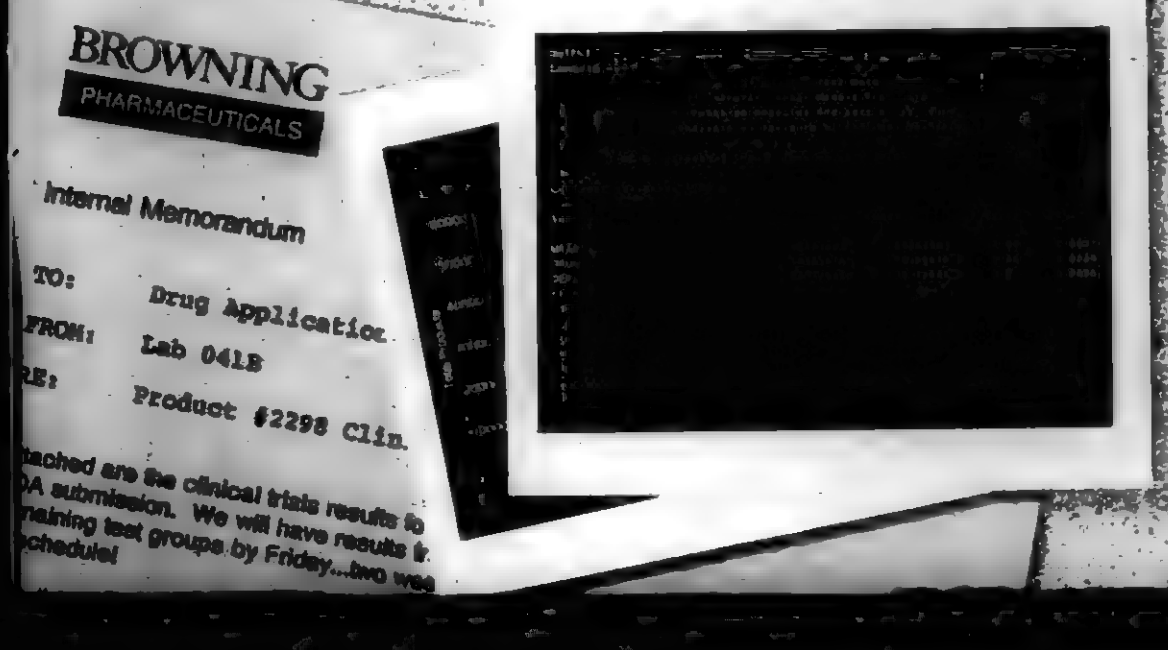

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NEW PRODUCTS

Network management

Hewlett-Packard Co. has introduced HP Probeview 3.0, a software package designed for use with the HP 4990S Lanprobe network analysis system.

HP Lanprobe comprises an HP 4991A Lanprobe segment monitor ($4,470 to $4,995), HP 4990A Probeview software ($5,000) and an optional HP 4992A Node Locator ($975).

HP Probeview 3.0 includes an embedded database that can be used to organize data according to node, segment and network. An HP 4993A Probeview console equipped with an HP Vectra QS/20 personal computer configured with HP Probeview 3.0 is priced at $12,750.

Hewlett-Packard
3000 Hanover St.
Palo Alto, Calif. 94304
(800) 752-0900

David Systems, Inc. has introduced an in-band communications module (ICM) designed for its five- and 12-slot intelligent concentrators.

The Supervisor ICM establishes a communications function between the concentrator and a control workstation for a network management system and provides in-band signaling via an Ethernet network. Firmware on the concentrator's Supervisor module includes Simple Network Management Protocol (SNMP) compatibility, and when joined with an ICM, complete SNMP management connectivity is provided, the vendor said.

The product costs $795.

David Systems
701 E. Evelyn Ave.
Sunnyvale, Calif. 94086
(408) 720-8000

Rainbow Technologies Inc. has introduced a site license management system designed to let network managers control the number of concurrent users of an application software program running on a local-area network.

Netsentinel can be operated only with a hardware key. It tracks how many users are simultaneously accessing a software application and bars additional users from accessing the same program when the limits of a site agreement have been met.

Pricing ranges from $49 to $299 per system, depending on quantity and type of hardware key model purchased.

Rainbow Technologies
9292 Jeronimo Road
Irvine, Calif. 92718
(714) 454-2100

Local-area networking software

Aim Systems, Inc. has announced an optical-based information and image management software product that uses Microsoft Corp.'s Windows as an application interface.

Target is a set of modules that support document scanning, work-flow or document routing and facsimile I/O. It also includes modules that download mainframe-generated documents and provide software emulation for IBM 3270, Digital Equipment Corp. VT-100 and VT-200 and asynchronous terminals.

Pricing ranges from $2,500 to $29,000.

Aim Systems
1130-D Burnett Ave.
Concord, Calif. 94520
(415) 682-7922

Links

Control Corp. has introduced a 100M bit/sec. controller that was designed for Unix multiuser graphics systems.

Multivision enables users to connect as many as 16 graphics stations to an Intel Corp. 80386- or I486-based IBM Personal Computer AT-compatible system. It runs under The Santa Cruz Operation's Xenix or Unix and AT&T's Unix System V.

A Multivision host controller costs $995, and a system that can connect four graphics stations at a distance of up to 225 feet from a host costs $3,742.

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	TOTAL		✓
	CA-IDMS		✓
	CA-DATACOM		✓
PORTABILITY Runs identically on....	MVS		✓
	MVS/XA	✓	✓
	MVS/ESA	✓	✓
	VSE		✓
	VM		✓
	PC-DOS		✓
	PC LAN		✓
STANDARDS	ANSI SQL	✓	✓
	FIPS	✓	✓
	SAA	✓	✓
	NAS		✓
DISTRIBUTED DATABASE	Remote Request	✓	✓
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MANAGER'S JOURNAL

EXECUTIVE TRACK

Larry L. Betsinger has been promoted to executive vice president and director of corporate information services at **UJB Financial Corp.** in Princeton, N.J.

Betsinger joined UJB in December 1989 as a senior vice president. He is responsible for corporatewide computer operations, systems and programming and telecommunications at the $13.6 billion financial services firm.

Before joining UJB, Betsinger was a senior vice president and chief information officer at Meritor Financial Corp. in Philadelphia, which outsourced its information systems function to Electronic Data Systems Corp. in 1989. Prior to that position, he was president and chief executive officer of First City Services Co., the IS subsidiary of First City Bancorp in Houston.

Betsinger attended Drake University and completed requirements for a degree from the University of Wisconsin Graduate School of Banking.

Alexander Ferrauiola has been named assistant vice president and director of the University Computer Center at **New York University.**

Ferrauiola, 43, was most recently director of MIS at the Reserve Fund. Before that, he was director of international IS at Schering-Plough, Inc., holding positions in the U.S. and Europe.

Stephen A. Little was promoted to vice president of corporate IS at **Square D Co.**, a manufacturer of industrial control and electrical distribution products in Palatine, Ill.

Little had been Square D's director of IS since joining the company in 1989. In his new position, he has overall responsibility for the planning, design and implementation of the company's IS worldwide.

Little holds a bachelor's degree in industrial management from Purdue University and an MBA from the University of Chicago.

A taste for IS and an ancient art

Mondavi's Graham crafts systems with respect for wine-making tradition

BY JAMES DALY
CW STAFF

An empty oak barrel rolls into position, a pungent and fruity smell emanating from its cabernet-stained inner walls. An apron-wrapped worker nimbly inserts a hose into the cask and fills it with the juice of plump grapes plucked from the nearby Napa Valley hills. The barrel is later moved into a cellar, where it will languish for a year or more while the French oak helps transform the rough palate of the juice into a full and subtle wine.

"Wine making is a very old and ancient art, and I have to respect that," says Ken Graham, director of MIS at the Robert Mondavi Winery, while observing the centuries-old process. "There's not too much a computer can do to change that."

What has changed, however, is that the wine-making industry has become a fiercely competitive business where such modern concerns as marketing, sales and distribution efficiency can make or break a vintner. When Graham joined Oakville, Calif.-based Mondavi as information systems head two years ago, he was faced with the challenge of establishing a technology infrastructure that could apply the sophisticated tools of the Silicon Age to an industry that has remained essentially unchanged since biblical times.

Lured from early retirement by both technological advances and the chance to move to an area he loves, Graham, 59, knew he had his work cut out for him. When vintners lovingly describe the soft romance of "the brotherhood of wine making," they tacitly refer to an emotional domain where technology dares not trample.

PROFILE: Ken Graham

Andy Freeberg

Position: *Director of MIS, Robert Mondavi Winery*

Mission: *Applying technology to marketing, distribution and other business areas while appreciating the subtle art of wine making*

"My first important step was to make top management realize how important IS can be to the company," Graham says. "In the wine-making business, MIS is clearly not the driving factor in making you a success, but we play a very key role."

Co-workers say that when Graham arrived, the IS infrastructure of the winery had slipped and was not flexible enough to handle Mondavi's 10% to 15% annual growth rate. "We needed to start all over in some areas," says Caroline Csavas, marketing manager at Mondavi's Woodbridge, Calif., sales office. "We knew what we wanted in the areas of computers but were totally unable to get our arms around the problem. Ken figured out what we needed and was instrumental in selling those ideas to management."

Continued on page 82

The high cost of the lowly business letter

BY MITCH BETTS
CW STAFF

The cost of a secretary-produced, one-page business letter shot up 79% during the last decade, despite the increasing use of personal computers by secretaries, according to Dartnell Corp., a business information publisher based in Chicago.

The cost hike was driven mostly by the increasing salaries of secretaries and their bosses in the 1980s, which tracked the economy's inflation rate, according to Dartnell Senior Editor Bob Minor.

Meanwhile, there is no hard evidence that PCs — compared with modern electronic typewriters — boost secretarial productivity for one-page missives, he said.

"There is no cost-saving visible when a computer is used on a short business letter, but that picture can change" for complex, multipage documents such as bids, quotes, reports and legal filings, Dartnell reported.

The cost of a one-page business letter resulting from face-to-face dictation rose 6% to $10.85 in 1990, according to the study. (If the boss uses a dictation machine, the cost is 22% less, or $8.41, because the secretary does not have to spend 10 minutes taking dictation.)

However, Minor acknowledged that the methodology of the long-running study, which focuses on letters produced by secretaries, is becoming outdated because of advances in technology and the likelihood that many managers write their own business letters on PCs.

The cost of the standard business letter has been rising steadily for decades, from 30 cents in 1930 to $1.83 in 1960, $3.05 in 1970 and $6.07 in 1980, the study said. Last year, the cost exceeded $10 for the first time.

The study considers the standard business letter to be about 180 words. The cost calculation includes the salaries of the boss and secretary for the 18 minutes needed to produce the letter, as well as the costs of overhead, supplies and first-class postage.

Dartnell noted that there is currently a strong demand for secretaries with computer skills, while less than 10% of the 300 companies surveyed are asking for shorthand skills.

Ancient art

FROM PAGE 81

Graham discovered that the old information system primarily handled accounting chores and was sorely in need of an upgrade if Mondavi was going to turn computer technology into competitive advantage. His first goal was to expand communications links between the winery's several vineyards and keep a closer tab on the status of 10.3 million gallons of wine stored in nearly 150 storage tanks and 13,000 aging barrels.

By meeting with top managers as well as lower-level employees, Graham was able to discuss the function and problems of each department and pinpoint areas where IS could contribute to Mondavi's $120 million business.

"Ken believes that there really are intelligent people at the other end of that computer," says accounting manager Nancy Sellers. "His perspective enabled us to do a more thorough job in the selection and implementation of our new core systems."

When walking through the Mondavi winery, it is difficult to discover anything more technologically sophisticated than the Nintendo games children fiddle with while their parents sip chardonnay. Yet, it's all there.

Employing an annual budget of $1.5 million, Graham has nimbly crafted an arrangement that is as subtle and complex as a fine zinfandel.

His first step was to install an IBM Application System/400 minicomputer running a variety of off-the-shelf and homegrown software.

Keeping tabs

An elaborate local-area network using hundreds of terminals and IBM Personal Computer clones was developed to hook up the central sales offices with a nearby distribution center that handles the 2 million to 3 million cases of wine that Mondavi ships each year.

"We wanted to keep as close an eye as possible on our bulk wine processing so we could tie it in with the orders coming in," Graham says.

It's hardly the type of arrangement one would expect from a man who retired from the IS profession in 1967 with only one idea burning in his head. "I wanted to get as far away from computers as possible," he says.

Graham began his long career in IS when he joined The Boeing Co. in 1955 as a systems analyst. He spent nine years there, working on the production of the original 707 and 727 jet airliners. His last project was as the senior production control supervisor of the building of a new Air Force One for President John F. Kennedy, the same aircraft that brought Kennedy's body back from Dallas after his assassination in 1963.

Following his stint at Boeing, Graham spent 23 years in the IS sector at the Gallo winery in nearby Modesto, Calif., supporting Gallo's growth from a $100 million business to a $1 billion wine-making giant. Although he worked on some exciting projects there, such as beta-testing some of the world's first CICS Cobol applications, he says Gallo was often a "furiously hectic place. I grew tired of the pressure," he says.

He retired to go into business for himself, starting a small financial services firm. But then something happened that proved that, even after declaring himself officially retired, he could take the man out of IS but couldn't take the IS out of the man: IBM introduced the AS/400 in 1988.

"I suddenly saw this as a very interesting computer with a tremendous amount of potential," he says. "I was anxious to get my hands on it."

Next on Graham's Mondavi agenda is a project that will completely revamp the winery's central database and offer the field sales force the ability to dial in for up-to-date information. Graham says he has actively solicited suggestions from sales representatives so they can feel a sense of ownership in the system.

Although he is trying to implement some very fundamental changes, Graham realizes that he must gingerly toe the fine line between the past and the future. "Ultimately, the final arbiters of wine making are the sense of taste and the sense of smell," he says. "We're here to make sure that comes off without a hitch."

U.S. hiring to drop in '91

BY CLINTON WILDER
CW STAFF

MILWAUKEE — Further proof that there is a U.S. recession came out last week when Manpower, Inc. reported that more U.S. companies plan to cut employees than hire new workers in the first quarter of 1991.

The quarterly survey of more than 15,000 firms found that 16% intend to reduce their work force in the first quarter, compared with 15% that plan to increase hiring. Two-thirds of the companies said they plan no changes in employment levels during the quarter.

The net hiring drop of 1% is the first negative hiring factor shown by the survey since the first quarter of 1983, when an equivalent hiring pattern reflected the lingering effects of the 1982 recession.

By contrast, in the first quarter of 1990, 20% said they planned to increase hiring while only 12% intended to cut back. For the current fourth quarter, 23% intended to hire more workers while 11% planned to have work-force reductions.

Not surprisingly, the wholesale and retail trade industry will be especially hard hit, with 24% planning cuts and only 12% adding new employees. The construction industry had the most pessimistic outlook, with 27% cutting back and only 10% hiring. The services sector will fare among the best, with 19% of services firms hiring and 10% cutting back.

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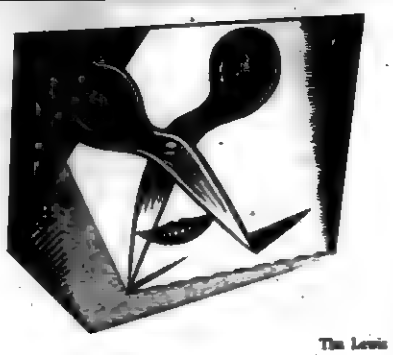

Tim Lewis

Summaries from leading scientific and management journals

Hypertext serves businesses by providing shortcuts to information that might otherwise get buried in bulky hard-copy reports.

Hypertext has tremendous potential in several areas. The education arena can benefit from hypertext's free-ranging abilities. A student can start out learning about cotton planting in Georgia and segue to studying the life of Thomas Edison.

Groupware can also exploit hypertext's abilities. Using it, project teams that are geographically isolated can exchange linked information. The use of built-in intelligence in some systems makes the systems even simpler to use.

The growing use of hypertext in groupware is raising compatibility issues, however. Proprietary architectures and software may cause problems as people increasingly try to share information across different systems. The problem of attribution could also arise as increasing amounts of people access linked data pools. — Carol Hildebrand

"Investigating the support role of the information center"

By Francois Bergeron, Susanne Rivard and Lyne De Serre

MIS Quarterly
September 1990

■ End-user computing requires an investment in providing those users with technical support. Otherwise, inexperienced users can spend a great deal of unproductive time on the computer.

But what makes an effective support organization? A study of the information centers at 19 corporations in Eastern Canada provided several clues:

- The information center should be located close to users, even if that means dispersed centers. Users want fast answers and face-to-face help.
- The best results are achieved with a small but competent support staff.
- The support center should focus on supporting a limited number of software packages and corporate databases. Apparently, spreading the efforts of the support staff over too many products runs the risk of supporting none of them very well. — Mitch Betts

"The new industrial engineering: information technology and business process redesign"

By Thomas Davenport and James Short

MIT Center for Information Systems Research
Working paper, June 1990

■ For firms that want to take advantage of information technology to change the way they operate, there is a five-stage model for redesigning the business:

- *Develop business vision and process objectives rather than eliminate inefficiencies.* Most successful redesign efforts start with management developing a broad strategic vision. One possible approach is reducing time by reorganizing sequential tasks to run in parallel.
- *Identify processes to be redesigned.* A practical strategy is to focus on fixing the processes that have the greatest impact on the business rather than trying to remake the whole organization.
- *Understand and measure existing processes.* This way, you know what is wrong and can measure improvements.
- *Identify information technology levers early in the process instead of at the end.* Technology excels at improving coordination, information access and analysis. It can also be applied to intra- and interorganizational tasks such as ordering from suppliers, filling customer orders and developing budgets.
- *Design and prototype the process.* Redesigning is iterative, but a new process should be tested and refined before being locked in. Technologies such as computer-aided software engineering can help. — Paul Gillin

"Hypertext: The smart tool for information overload"

By Robert Haavind

Technology Review
November-December 1990

■ The Information Age has resulted in a deluge of data, bringing with it not only unparalleled access to data but also sensory overload. Hypertext, a method of organizing and interlinking computer information, is a smart bet to plug that dike.

Hypertext, which was first conceived in the early 1960s, presents information in a format that lets a user jump easily from subject to subject; sideways, as opposed to the more conventional hierarchical database. Screenfuls of data are stored as "nodes," and related information from a linked node can be easily accessed.

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1991 Editorial Calendar
(January-June)

Executive Reports	Issue Date	Ad Closings: Color	Ad Closings: B/W
Maximizing the I/S Investment: Laying the Groundwork for New Architectures	Jan. 7	Dec. 20	Dec. 28
Taming the Unmanageable Network	Jan. 21	Jan. 4	Jan. 11
How I/S and Individual Business Units are Negotiating Project Priorities	Feb. 18	Feb. 1	Feb. 8
How Large Companies are Creating Data Standardization	Mar. 4	Feb. 15	Feb. 22
Maximizing the I/S Investment: Evaluating Advanced Technologies	Mar. 18	Mar. 1	Mar. 8
The I/S Role in Workforce Education	Apr. 15	Mar. 29	Apr. 5
View from the Top: How CEOs and CFOs Evaluate I/S	Apr. 29	Apr. 12	Apr. 19
Maximizing the I/S Investment: Data Center Efficiency	May 13	Apr. 26	May 3
Striking the Right Balance Between Centralization and Decentralization	June 17	May 31	June 7
Product Spotlights/Buyers' Scorecards			
High-end Modems	Jan. 14	Dec. 28	Jan. 4
Network Connectors - Gateways, Bridges and Routers *(Featuring Buyers' Scorecard)*	Jan. 28	Jan. 11	Jan. 18
Systems for Flexible Manufacturing	Feb. 11	Jan. 25	Feb. 1
Relational Databases *(Featuring Buyers' Scorecard)*	Feb. 25	Feb. 8	Feb. 15
Project Management Software	Mar. 11	Feb. 22	Mar. 1
Software Maintenance Tools *(Featuring Buyers' Scorecard)*	Mar. 25	Mar. 8	Mar. 15
Sales Force Automation	Apr. 8	Mar. 22	Mar. 29
CASE Tools *(Featuring Buyers' Scorecard)*	Apr. 22	Apr. 5	Apr. 12
LAN Servers	May 6	Apr. 19	Apr. 26
Network Management *(Featuring Buyers' Scorecard)*	May 27	May 10	May 17
Minicomputers	June 10	May 24	May 31
Portables and Laptops *(Featuring Buyers' Scorecard)*	June 24	June 7	June 14
Integration Strategies			
Using Commercial Systems Integrators	Feb. 4	Jan. 18	Jan. 25
How Companies are Effectively Incorporating LANs into the Integration Strategy	Apr. 1	Mar. 15	Mar. 22
Strategic Integration of Databases	June 3	May 17	May 24
Industry Closeups			
Industry Closeup: Information Systems in Medical Care	Feb. 4	Jan. 18	Jan. 25
Industry Closeup: Information Systems in Transportation	Apr. 1	Mar. 15	Mar. 22
Industry Closeup: Information Systems in Energy Production	June 3	May 17	May 24
Special Reports			
Special Report: Advances on the PC Front	May 20	May 3	May 10

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A second conference on outsourcing will be sponsored by Boston-based The Yankee Group. "Outsourcing: Options & Tactics" will be held Jan. 29-30 in Orlando, Fla.

The agenda features users Bob Temple of First City Bancorp, George DiNardo of Mellon Bank and John Hammitt of United Technologies. IBM general manager Bill Wilson will discuss IBM's newly formed Systems Services Division, devoted to outsourcing services.

For more information or registration, contact: The Yankee Group, Boston, Mass. (617) 367-1000.

JAN. 6 - 12

Do Voice Systems Really Work? New York, Jan. 7-8 — Contact: Media Dimensions, New York, N.Y. (212) 533-7481.

Macworld International Summit. San Francisco, Jan. 7-8 — Contact: Susan Carroll, Macworld Communications, Inc., San Francisco, Calif. (415) 978-3392.

International Security Conference and Exposition West '91. Anaheim, Calif., Jan. 9-11 — Contact: Cahners Exposition Group, Des Plaines, Ill. (708) 299-9311.

JAN. 13 - 19

ICA Winter Seminar. Houston, Jan. 13-16 — Contact: International Communications Association, Dallas, Texas (214) 233-3889.

Pacific Telecommunications Conference: Accessing the Global Network. Honolulu, Jan. 13-16 — Contact: PTC, Honolulu, Hawaii (808) 941-3789.

National Retail Federation Retail Industry Convention and Exposition. New York, Jan. 13-16 — Contact: NRF Convention Registrar, New York, N.Y. (212) 563-5113.

Technical Conference on the X Window System. Boston, Jan. 14-16 — Contact: MIT Laboratory for Computer Science, Cambridge, Mass. (617) 253-8861.

Computer Graphics Show. New York, Jan. 15-17 — Contact: Computer Graphics Show, Silver Spring, Md. (301) 587-4545.

Service and Quality: Tactical Deployment. St. Louis, Jan. 17-18 — Contact: Bonnie Sex, Washington University, St. Louis, Mo. (314) 889-5380.

Lawdex '91. Irvine, Calif., Jan. 17-19 — Contact: Lands, Elmhurst, Ill. (708) 863-3111.

JAN. 20 - 26

Data Visions '91. San Francisco, Jan. 20-23 — Contact: Earle Speranza, Wordtech Systems, Orinda, Calif. (415) 254-0900.

The Downsizing Conference. San Francisco, Jan. 21-22 — Contact: Digital Consulting, Andover, Mass. (508) 470-3880.

Unix Technical Conference. Dallas, Jan. 21-25 — Contact: Usenix Conference Office, El Toro, Calif. (714) 588-8649.

Infotext '91. Las Vegas, Jan. 22-23 — Contact: Bob Dale, Infotext Publishing, Capistrano Beach, Calif. (714) 493-3434.

Unifocus 1991. Dallas, Jan. 22-24 — Contact: Bob Linke, PEMCO, Des Plaines, Ill. (708) 299-3131.

JAN. 27 - FEB. 2

Communication Networks '91 Conference and Exposition. Washington, D.C., Jan. 28-31 — Contact: Michael Sullivan, World Expo Corp., Framingham, Mass. (508) 820-8268.

Network Computing Forum and Exposition. Washington, D.C., Jan. 29-31 — Contact: Christine Krajewski, World Expo Corp., Framingham, Mass. (508) 820-8126.

FEB. 3 - 9

Macapp Conference. Phoenix, Feb. 4-8 — Contact: Macapp Developers Association, Everett, Wash. (206) 252-6946.

Macintosh/N.Y. '91. New York, Feb. 5-7 — Contact: Peter Kimpton, Exposition Management, Waltham, Mass. (617) 290-0412.

Florida Educational Technology Conference. Tampa, Fla., Feb. 5-8 — Contact: Barbara Ann Cox, Office of Educational Technology, Tallahassee, Fla. (904) 488-0980.

NOMDA West Regional Convention. San Diego, Feb. 7-9 — Contact: Katy Dunn, NOMDA, Kansas City, Mo. (816) 941-3100.

FEB. 10 - 16

The Development Center Institute Conference. Orlando, Fla., Feb. 10-13 — Contact: Development Center Institute, Indianapolis, Ind. (317) 846-3753.

Video Expo. San Francisco, Feb. 11-15 — Contact: Debbie Rotolo, Knowledge Industry Publications, White Plains, N.Y. (914) 328-9157.

FEB. 17 - 23

SAS Users Group International Conference. New Orleans, Feb. 17-20 — Contact: SUGI Registration, SAS Institute, Cary, N.C. (919) 677-8000.

Northwest Computer Show. Minneapolis, Feb. 19-20 — Contact: Judy Koch, Plymouth, Minn. (612) 420-5376.

Trax User Group Conference. Long Beach, Calif., Feb. 19-22 — Contact: Anne Silverman or F. Thomas Cox, Trax Software, Culver City, Calif. (213) 649-5800.

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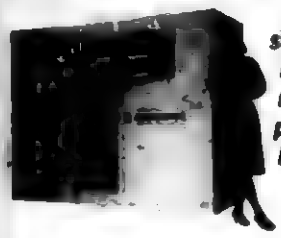

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Systems transplants thrive in business settings

BY ALICE LAPLANTE

Tod Fanning says he feels as if he's made it into prime time. A former programmer/analyst at Baxter International, Inc.'s central information systems department, Fanning now functions as a manager of national accounts at Baxter's IV System Division.

This position uses Fanning's systems background but puts him in the middle of what he regards as the real action: selling Baxter health care products to corporate customers.

"I always wanted to do more than just work within information resources. I didn't want to be pigeonholed," says Fanning, who joined Baxter right out of college with a bachelor's degree in mathematics. "I saw the salesmen making a lot of money and getting out in front of people. They had more prestige and were regarded as higher up than typical systems workers."

Michael L. Abramson

Baxter's Fanning: *'I always wanted to do more than just work within information resources. I didn't want to be pigeonholed'*

Close encounters

Close contact with the mainstream of business activity is becoming a more common experience for IS professionals in many U.S. corporations. Decentralization of certain IS functions — for example, applications development — is coming to be seen as a productive way to tailor applications more closely to a core business unit.

"Corporations want a deeper sense of profit-and-loss accountability from their separate business units," says Jim Webber, president of Omicron, a consortium of 60 major U.S. corporations formed to help members effectively apply computer technology. "Moving a systems team out to a division or subdivision is one way to accomplish this."

At Royal Bank of Canada in Toronto, the practice of putting systems people into business units — or putting business users into the IS community — is called "co-locating." Although it has been going on informally at Royal Bank for 15 years, it has only been during the past three years that co-locating has been recognized as a legitimate way of developing strategic information products and services.

The bank has appointed an official coordinator for such efforts — Ted Carrett, manager of consulting services for systems and technology. According to Carrett, recent co-location efforts involving large-scale movements of staffs have proved so successful that they are likely to become common. "We've found that it cements the partnership between the business unit and the systems staff," he says.

At Valspar Corp., a Minneapolis-based manufacturer of paints and coatings with $600 million in annual sales, mixing IS professionals into business departments is an idea that has long been considered but only recently implemented. One person has already made the transition, and another is getting ready to make her move.

Baxter began the process of "seeding" business areas with technical personnel in 1987, starting with its Scientific Products Division located in McGaw Park, Ill., where a relatively small core IS staff — 20 employees total — was struggling with the responsibility for coordinating a complex mix of corporate, divisional and local departmental systems.

The only way to effectively accomplish this, according to Larry Levin, the division's IS director, was to recruit systems experts who would operate within end-user departments and help resolve problems or conflicts at the local level.

Sometimes these departmental systems experts come from the business community: people who have an aptitude for technical matters and are trained by the IS department. Sometimes they are IS employees from the corporate staff, anxious to broaden their horizons.

Not just computer jocks

Fanning was one of those who co-located. Starting in 1988, he spent two years in the Scientific Products Division's national accounts department developing a reporting system for corporate sales accounts. He got there, he says, by taking advantage of a Baxter policy that allows any employee to nominate himself for a job opening listed on a corporatewide job board.

"I saw an opening listed in [the Scientific Products Division] for a senior consultant, and the job description sounded to me like I could move around and get some business experience," Fanning says. The strategy worked. Last month, Fanning was offered a chance to move into his current slot in the IV System Division, reporting to the vice president of national accounts in Los Angeles.

Fanning says his current job, which involves designing better ways of communicating with Baxter's national accounts, draws on both his systems background and the business experience he picked up at the Scientific Products Division as a senior programmer/analyst.

"I'm responsible for managing the relationships and getting these accounts the right information about Baxter products as well as their own account histories," Fanning says. "My IS background helps me know what information is in the Baxter system, where it is probably located and how I can get access to it."

What his stint in the Scientific Products Division gave him, he says, was an awareness of how time is measured in the business world.

"In IS, you are not directly in

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INSIDE

The pendulum swings two ways
Pages 90 and 91

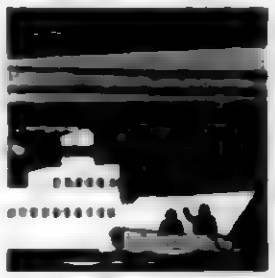
The business manager's perspective
Page 94

LaPlante is a free-lance writer based in Palo Alto, Calif.

Continued from page 87

contact with customers, so you don't feel the urgency that salespeople feel," Fanning says. "You put in your time, and if you are meeting your deadlines, you don't need to kill yourself. Or, if you get unreasonable demands from users, you can just say no. But there is no way you can have this kind of attitude with an outside customer."

These days, Fanning's primary identification is with the business. He is currently working toward an MBA and takes considerable pride in the fact that business managers no longer regard him as "just Tod, the computer jock."



"I feel like I am earning the respect of the regional sales managers, that they don't just think of me as a techie who can help them out of a jam but rather as someone who is more on the ball," he says.

Still, old identifications and old habits can be hard to shake. "People come to me with their systems questions, even if it's not in my area of expertise," he says. "They assume because something has to do with computers, I must understand it."

Furthermore, Fanning says, it's sometimes hard to resist the urge to roll up his sleeves and jump back into coding.

"I often find it hard to step away from the systems stuff. When some programming needs to be done, I know that if I just did it myself, I could get it done more quickly than if I delegated it," Fanning says.

Steve Miller has also discovered that old patterns persist, even when jobs change. Miller, who manages electronic data interchange (EDI) implementation at Baxter's Scientific Products Division, says that, like Fanning, he is always being asked by users in his department to act as an informal liaison with the systems staff. "A good portion of my time is spent serving as the department computer jock," Miller says.

Still, Miller, who has both undergraduate and graduate computer science degrees and is halfway through an MBA program, says making the move from central IS to working directly with division sales and marketing personnel was a step in the right direction.

"You can work for years and years in information resources and have virtually no contact with the people responsible for using the system," Miller says. As a result, he says, when a three-year stint developing Baxter's proprietary EDI system led to the offer of his current job, the idea of working with users sounded exciting.

In fact, Miller says, the biggest challenges in his current position don't involve technology but rather "talking to Baxter's customers about how they would prefer to do business using this technology" and convincing them to discuss the details of their EDI systems with an outsider.

Early hours

Setting his alarm clock to get up earlier is just one of the adjustments Tom Wondra has had to make since transferring from the central IS department at Valspar's Minneapolis headquarters to the company's Chicago-based Consumer Paints Division.

Wondra, who interned at Valspar as a computer science student and then accepted his first job out of school as a programmer at the headquarters of the paint and coatings manufacturer, now answers to the title of manager of scheduling.

Working in that capacity at a manufacturing plant means early hours, Wondra says. "The guys in the warehouse start work at 4 a.m., and manufacturing operations run around the clock," he says. "If I get here at 9 a.m., I have dozens of fires to put out, and the morning can get off to a crazy start."

Work pacing has been an even bigger adjustment, according to Wondra. "At corporate [headquarters], I was working on two- to three-year projects. The emphasis was very long term," he says. "This is more of a day-to-day job."

Wondra likes the quickened pace. He also likes the camaraderie of his new setting. Unlike at corporate headquarters, where everyone is rushing in different directions, here the entire department is highly focused on a common goal. "It's one for all and all for one," he says.

In fact, when it comes right down to it, Wondra likes just about everything about what he is doing now better than the life of a programmer. "As soon as I was hired, I knew I liked the business side of what I was doing better than the programming [side]," he says.

There was plenty of time for comparison. After Valspar acquired the company that was to turn into its Consumer Paint Division in 1987, Wondra became a sort of part-time fixture at the plant where he now works, shuttling back and forth between Minneapolis and Chicago to handle development tasks.

The post Wondra accepted last February — for which he moved his family to the Chicago area — involves scheduling the manufacturing plant's resources.

Part of his job still involves programming. A current project is a personal computer-based scheduling and forecasting application.

There are times, Wondra says, when he does experience divided loyalties — particularly when he hears end users complaining about the systems department. "People in the field say that they never get what they want and that the whole system is backlogged," he says. "Of course, I know what causes these things from a systems point of view, but now, for the first time, I know how users feel."

That's a difficult leap to make, he says, for a full-time IS employee stationed hundreds of miles away. "When you are sitting at a desk in Minneapolis, you know very little about making paint."

Although he's now close

DECENTRALIZATION OF certain IS functions — for example, applications development — is coming to be seen as a productive way to tailor applications more closely to a core business unit.

Maintaining career course outside corporate IS

When corporate information systems employees jump — or are pushed — from the corporate IS mother ship to work in business departments, they frequently experience at least a few twinges of career anxiety.

Fortunately, many organizations pursuing relocation strategies realize this and have put some structures in place to ensure that remote IS employees are not dead-ended in terms of further advancement within the company — whether they choose to go back to IS or continue working in a business capacity.

"One of the things my people worried about when they began this project in the Treasury Department is that they would lose their connection to MIS," says John Reitsma, manager of investment banking and treasury technologies at Royal Bank of Canada in Toronto. Reitsma oversees a group of IS employees located away from the IS home base for extended periods of time. "But we have worked hard to make sure that they are still included in MIS functions and that their career options will not be limited to the department they are working in today."

Ted Carrett, manager of consulting services at the bank, says, "Systems people need to feel that they are being nurtured and that we will ensure their future well-being. So even if they report to a business unit, we make sure there is a 'dotted line' connecting them back to MIS."

IS managers say this can be accomplished in several ways. First, keeping remote personnel on the IS electronic mail list goes a long way toward making them feel involved. Communication shouldn't just be limited to business, IS managers say. Remote employees should also be informed of birthdays, departmental lunches, family picnics and other activities in which the IS staff participates.

Second, voice mail can help, they say. Being able to leave a detailed, private message rather than just a name and telephone number with a secretary or message center keeps up the sense of personal contact that some remote employees miss.

Bob Simonson, director of business computer systems at Eastman Kodak Co.'s Clinical Products Division, says the company works hard to encourage social connections and career paths between remote IS departments and the central staff (see story page 90). "We have a very sophisticated framework of making sure MIS personnel information gets distributed to the right people," he says. There is a comprehensive job posting system as well as career counseling, training and education classes that all work to provide Kodak IS employees with career options, he says.

Enormous strides have been made since the early days of remote data centers, says Simonson, who learned a lot about working in a remote business unit from a stint in a previous Kodak IS job at Eastman Savings & Loan, a New York chartered savings and loan serving Kodak employees. He was MIS manager there at a time when there were no clear paths between Eastman Savings & Loan and the central Kodak IS organization — something he took care to change.

When he was at Eastman Savings & Loan, Simonson says, the job posting system didn't exist, and he had to rely on a device of his own, which was to send every programmer or analyst he was considering as a hire for an interview with the central IS group. That way, he says, he could make sure each person hired by him was considered suitable and would therefore have a growth path at Kodak ahead of him.

Not all paths from remote IS postings lead back to the central staff. Some technical employees who are moved into business areas discover career interests outside the systems area.

Tom Wondra, a former programmer at Valspar Corp., a paint and coatings manufacturer in Minneapolis, says he thinks he will eventually leave the systems arena in order to advance within his department's business function.

"I want to give it a try," he says. "I'm not saying I'll never go back to MIS, but I haven't seen a lot of MIS folks getting into senior corporate management."

Tod Fanning, manager of national accounts at Baxter International, Inc.'s IV System Division, is also looking ahead to more business-oriented roles. "I think I'd like trying to be a sales manager eventually," he says. "I like getting out in front of customers."

Once they have found their footing in their new situations, many departmentally based systems personnel gain confidence in the value of their new and broader experiences.

Steve Miller, manager of electronic data interchange implementation at Baxter's Scientific Products Division, is one of that group. "If I were to go back to information resources, it would be at the management level. I've learned a lot being in the user community."

ALICE LAPLANTE

enough to smell the paint fumes and reports not to IS but to the production control manager for latex production, Wondra hasn't totally given up his commuting habit or his ties to IS. He still makes frequent trips to Minneapolis in order to talk to the IS director and Valspar's recognized PC guru. "There's a lot of experience up there I can draw on," he says.

Wondra's situation is the first of its kind at Valspar, but it isn't likely to be the last. In fact, he says, another IS employee in Minneapolis is currently being groomed for transfer into a business unit. "Valspar has been thinking about doing this for a long time," he says. "In fact, when I was first hired, I was asked if I would be interested in being eventually moved out to a business group."

Now that he's had a chance to sample life outside IS, Wondra says, there's "a good chance" that his career will move further away from that specialty and closer to the business of manufacturing paint. "At this stage of the game, I'm willing to give that a try," he says. "I've got certain aspirations for upper management."

A little of each

John Reitsma resists the idea that it's necessary to make a choice between systems and business. His current title is manager of investment banking and treasury technology at Royal Bank of Canada, and he presently hangs his hat in the Treasury Division, which is about one mile away from the building that houses the bulk of the bank's IS staff.

Still, Reitsma doesn't think of himself as belonging in either a business or an IS box. "I've had a lot of different masters here at the bank, and I don't necessarily see myself being categorized in one area or another," he says.

Reitsma has been deeply immersed in the business of the Treasury Division since 1986, working on a project to bring workstation technology into the foreign exchange trading room, and he and his staff moved in on a full-time basis last year.

Still, he keeps a foot in both worlds. In addition to overseeing the project in the Treasury Division, Reitsma also manages a 25-person staff in the central IS department that deals with the bank's credit card customers.

"It's a real tribute to management that I can handle this. We have a management team that runs operations very well without having to take too much direct control," Reitsma says.

"As far as the work I do with treasury," he explains, "the treasury management business team knows more about my day-to-day activities than the MIS management team."

Hand in hand

Reitsma's team works in concert with business programmers who are part of the permanent staff of the Treasury Division, and assimilation has progressed to the point that he says it is sometimes difficult to tell who belongs to which group.

Although Reitsma finds living within the business unit an efficient and comfortable situation, he doesn't necessarily regard the situation as permanent and tries to impress on his staff the fact that an open-ended assignment is not the same as permanent relocation.

"I've always told them this isn't necessarily a permanent thing," Reitsma explains. "If this winds down, nothing is cast in stone, and things could change dramatically for them. I think management is very aware of everyone's concerns," he adds, "and is determined to make this [co-location] a positive experience for everyone concerned." •

Multiple meanings

At Royal Bank of Canada, intermingling of IS personnel and business personnel — a phenomenon referred to as co-location — can take many forms.

Not all the variations entail moving systems personnel, says Ted Carrett, manager of consulting services for systems and technology at the bank.

Sometimes it makes more sense to bring a business analyst who is working on the final phases of a systems project into the IS department, so that he can be close to IS resources during the testing phase. Among the variations Carrett enumerates are the following:

- Sending a single IS person into a business unit to work one-on-one with a user on a specific project.
- Sending whole teams of IS personnel into business units for indefinite periods of time to pursue technology initiatives that are considered strategic. An OS/2 project might be given that kind of support, Carrett says.
- Removing both IS and business personnel who are working together on a strategic systems project to a remote site for the duration. This, Carrett says, is something that would probably only be done when the project involves leading-edge technology of critical importance to the firm and the ongoing presence of all parties is essential.

ALICE LAPLANTE

EIS

If You're Thinking About It...

Kodak experiments with local support

BY ALICE LAPLANTE

Mention Eastman Kodak Co., and most people in the information systems field will think of outsourcing. However, there's another kind of restructuring going on in the IS department of that Rochester, N.Y., company. Kodak has also been experimenting with the use of decentralized systems teams to support remote Kodak user departments.

The main reason Kodak began scattering systems people in business units was concern about responsiveness to business needs, says Bob Simonson, director of business computer systems at Kodak's Clinical Products Division.

According to Simonson, "There is simply no way that you can understand the particular challenges facing a business unit unless you are actually there, day by day."

For the most part, Simonson adds, marketing functions were the first areas to obtain their own dedicated systems staffs. His own group has been supporting sales and marketing in the Clinical Products Division since 1986.

Although typical in its concentration on sales and marketing, Simonson's department has always been particularly independent.

In most instances, systems members working in the satellite departments were still formally employed by Kodak IS. A director or supervisor of a combined systems and marketing team acted as a liaison connecting the systems employees in the remote marketing site with central IS.

In the Clinical Products Division, however, Simonson and his 20- to 25-person staff always worked for the division, not for Kodak IS.

The chain of command is complicated, Simonson says. He reports to the general manager of the division — a Kodak corporate vice president — for business issues such as planning and budgeting concerns. But he also has responsibility to a group manager who oversees the systems operations in Kodak's many health-related businesses and in turn participates in a central executive MIS council.

Although the reporting structure sounds ponderous, Simonson says, the reality is much simpler and looser than it sounds. "We're as autonomous as we want to be," he explains. "Other than conforming to corporate standards, we carry on the business the way we want."

No longer unique

Setups like this are becoming more common, according to Simonson. Although initially, few Kodak businesses wanted the responsibility of "owning" their own IS function and were "quite happy getting support from the central group," that attitude is changing rapidly.

Even now, most Kodak divisions — even those with systems people in their midst — still rely on the host systems for a significant portion of their systems' needs.

The Clinical Products Division, however, has its own data center supporting two IBM Application System/400 midrange computers and has pursued a number of independent systems initiatives.

"For example," Simonson says, "our division used to rely on the core system to handle our order processing needs, but we decided to go out on our own, purchasing our own software and developing a processing system that fit our needs."

Another project now under way that was designed and implemented at the division level involves automating the Clinical Products Division's sales, marketing and other staffs with a network of 300 Apple Computer, Inc. Macintoshes. ●

Outward bound

In its recent survey on "Critical Issues of Management for 1991," Index Group, Inc. in Cambridge, Mass., found fewer companies planning restructuring moves now than last year. Twenty-four percent said they planned to change the focus of IS activities, as opposed to 32% last year. Of those companies planning to make a change in the direction of decentralization, the following activities were most often mentioned as candidates:

- Systems analysis, design and development, particularly development not vital to the operation of the company.
- Data entry.
- Report distribution and data access.
- Support for personal computers, local-area networks and other technologies.

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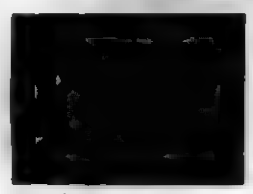

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Tribune strives to balance independence and efficiency

BY SHERYL KAY

While many information systems organizations are dispersing or scattering functions and personnel across the business landscape, the wind is blowing in the opposite direction at one Chicago-based corporation.

"I feel we are out in front of a new wave," says Tomi Hubert, manager of systems development at Tribune Co., a media conglomerate that consists of 28 operating units, including seven newspapers, 14 television and radio stations and the Chicago Cubs baseball team. Though she says decentralization may still make sense for departmental systems, Hubert is convinced that in companies with mainframe systems, multiple data centers and large-scale data sharing, centralization is the future trend.

Hubert foresees centralization wave

Until 1988, most of Tribune's 28 properties supported their own IS groups, as seemed to befit their status as independent operating companies. At that point, however, management decided that the systems for one struggling newspaper, the *New York Daily News*, should be handled by its corporate IS staff. Profitability at the paper was poor, Hubert explains, and management felt that part of the problem involved poor service from the local systems department.

Successful experiments

Hubert's group had already had several chances to prove its ability to operate beyond the central staff borders when it was called on to service the financial systems of broadcast subsidiaries that the Tribune acquired during the early 1980s. When the experiment of centralizing the *New York Daily News* systems also produced positive results, the Tribune's management decided to gather all business systems into the core IS fold.

In large part, Hubert says, the decision was based on the opportunity to realize economies of scale from centralization and standardization of all business systems. Less equipment is needed because capacity can be managed more effectively. Peripheral devices and software site licenses "don't have to be replicated across many entities," she says.

Centralizing procurement also means that volume discounts and maintenance contracts can be negotiated more easily and more reasonably.

Business systems such as general ledger, accounts payable, fixed assets, payroll, credit and billing were chosen for centralization because Tribune management believes in the division between production and business systems, Hubert says. Production systems are part of the culture at the operating units and are very much attached to that division's environment and development, while business systems are more generic, she adds.

Although her department is not yet an independent profit and loss center, Hubert describes her group as a performance center that has the goal of expanding its services. Although Hubert says centralization isn't likely to be complete until sometime between 1993 and 1995, substantially more than half of the 28 operating companies have already gone through consolidation, and one-third of those remaining are currently in the process of migrating their business systems.

When a subsidiary is identified as a candidate for business systems centralization, Hubert sends a team from her department to do an on-site cost/benefit analysis and prepare a report on how centralization will be accomplished.

Calming fears

The only real stumbling blocks, Hubert says, are the apprehension and reluctance of local systems staffs and users. On the part of technical personnel, there is often concern about whether the takeover will reflect badly on them or spell unemployment. In fact, she says, most wind up being absorbed into other positions within the company.

For users, the source of concern is different. "The clients at the subsidiary don't know us, have never met us, so why should they be convinced that centralization is best, especially if their own IS staff is good and their company is not feeling a pinch?" Hubert says.

To help alleviate these apprehensions, Hubert's staff includes both local IS personnel and users in project steering committees, and she encourages them to talk to other business units that have been through the change.

"Some of it is just a matter of time," Hubert says, "and maybe that's why we move so slowly — we recognize that we have to earn their trust." ●

Kay is a Tampa, Fla.-based business consultant and free-lance writer specializing in emerging technologies and human resources.

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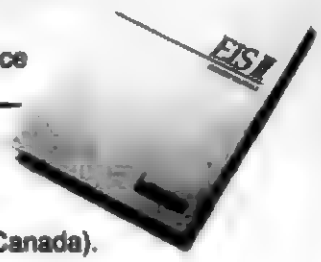

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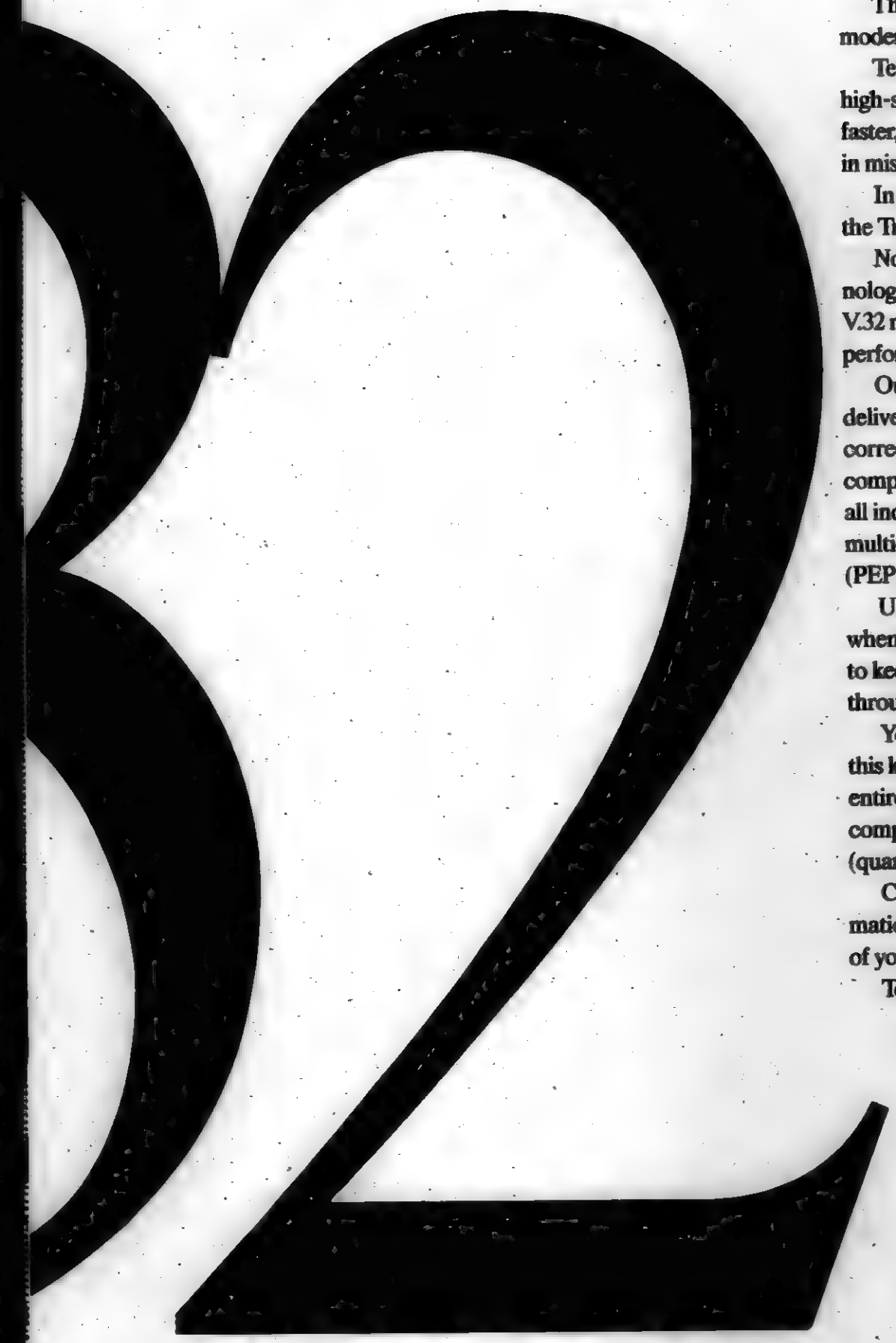

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How business managers greet arrivals

Integrating business and information systems staff members requires some adjustments

BY SCOTT KRAMER

When information systems personnel move into business departments, the managers of those departments often find it necessary to rethink and adjust their management practices.

Peter Grierson, vice president of operations and systems for the Treasury Department at Royal Bank of Canada in Toronto, is a nontechnical manager supervising eight IS managers and a substantial contingent of IS personnel, office operations and administrative and clerical employees. He says there is no real challenge in dealing with IS personnel involved in front-end trading systems or the development of personal computer systems. Those relationships are fairly easy, he says, because those IS professionals understand both the business and him.

However, with mainframe programmers and analysts, the story is different. "I spend a lot of time explaining to mainframe systems developers what it is we're trying to achieve," he says.

It takes time to blend what are essentially two different worlds, says Guy Martin, who manages both information services and mechanical engineering at Parker Hannifin Corp.'s Hydraulics Division in Irvine, Calif. Only steady and prolonged exposure to the language and thought process of the other culture will bring IS and engineering people to a meeting of the minds.

Of course, it helps "to pick IS personnel wisely, avoiding bit and byte types," he says. But even those with good motivation and good communication skills, he adds, will have to sit through a certain number of meetings before they are able to discuss projects fluently in language engineers will accept. "By throwing them into the middle of things, including them in staff meetings and product group meetings, I hope that over a period of time, they'll become familiar with the operating lingo and products of the division."

In the meantime, Martin, who has had IS professionals on staff only since July, is resigned to translating. It is not that hard for him: He is a transplant from IS himself.

Management style varies

Gail Slauson, a user service manager concentrating on production support at Pioneer Hi-Bred International, Inc. in Johnston, Iowa, has managed both IS professionals and nontechnical trainers for four years. According to Slauson, the two groups "tend to have different types of personalities. The technical people tend to require more specifics about exactly what needs to be done," she says. "With the other group, you can be a little more vague about what you want."

Slauson's approach to unifying the two groups involves creating both a climate and an office design that encourage open communication.

"We've always worked consciously on just plain communication," Slauson says. "We have the core group sitting in offices close to each other but also sitting in with several of the support staff members for our inventory area. Not only are they not isolated from support staff and end users, they're also not isolated from each other. I think that's helped a lot."

> "TECHNICAL PEOPLE TEND to require more specifics about exactly what needs to be done."
>
> GAIL SLAUSON
> PIONEER HI-BRED

Struggle within the information services department as to which group controls the domain of the computer people is another aspect considered by end-user managers. "We do have very strict project management guidelines that we adhere to, whether they're part of my own group directly or whether they're within the IS group," Grierson says. "We haven't thrown out the IS rule book. It is essential to keep in touch with the larger, centralized IS group to make sure the systems we're developing here in our business are compatible with other systems in the bank."

Slauson says that although she shares control over her data processing people with the IS department, she has never had any problems. "There have been missed deadlines, but typically that's never caused a problem," she says.

"It's just a matter of priorities," Slauson adds. "Sometimes the training and user service area has placed a different priority on things. It's just a matter of discussing the priority and reaching an agreement." ●

Kramer is a partner at Engineered Software, an information systems consulting firm in Alhambra, Calif.

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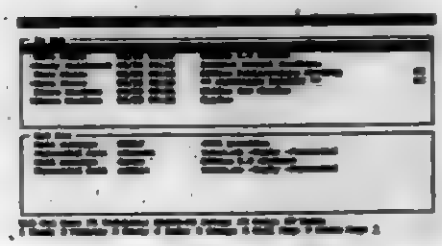

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Career boosters for women

Best advice for women IS execs? Network and learn to play what men play

BY MARYFRAN JOHNSON

Part of an occasional series.

Learn to play golf. Strike up an interest in baseball, football, basketball — any game that men play wearing uniforms. And don't let the Old Boy Network get you down. In fact, get your own network started by volunteering for high-profile jobs in professional organizations.

These are key recommendations from women executives who have learned to navigate the choppy corporate seas without sinking.

Former U.S. Labor Secretary Elizabeth Dole undertook a "glass ceiling initiative" to attack discrimination that bars women and minorities from the top levels of management, including information systems management. Dole had tagged the issue "a top priority" and asked the department's Office of Federal Contract Compliance Programs to investigate patterns of discrimination.

The U.S. Department of Labor Women's Bureau has also funded a study of career mobility of female executives in industrial, service and government organizations. The study's results will form the basis for further action by the bureau.

On a local level, a few activities and suggestions can increase the chances of women IS managers making it into the upper ranks.

Be a sport

Playing golf is frequently mentioned as the ideal way to make valuable social contact with chief executive officers and other heavyweights at client firms and competing companies. "These are the outings where you meet the CEO, the president and senior management," says Patricia Farwig, vice president of telecommunications at Mellon Bank in Pittsburgh. "Just about all of these guys play golf!"

Devi Huggins, president of the New York Association for Women in Computing, has followed football for years and finds it a great icebreaker. "It gives you something nonpersonal to talk about," she notes.

Joan Alvarez, vice president of Swiss Re Services in New York, made the leap about five years ago from managing an IS division to the corporate management level of the Zurich-based reinsurance empire.

In her 30-year career, Alvarez says her most useful networking contacts came through the Life Officers Management Association, a professional organization of 700 insurance companies in the U.S. and Canada.

Yet she and other IS professionals note that networking is networking — regardless of sex. The differentiating factor for women may be their ease in social situations.

"Meeting people, developing a network, asking for information, sharing information — if you put time into that, it comes back to you threefold," Alvarez stresses. "The most important thing is to make yourself visible."

Kathy Hudson, vice president and director of corporate IS at Eastman Kodak Co., says the 600-member Rochester Women's Network is one of her favorite places to trade information and keep in touch with other businesswomen. The monthly meetings are "about two-thirds business and one-third other stuff," including discussions of hot news topics, business problems and even dieting, she says. "Frankly, we just hang out."

Cindy Charles

Intel's Ellis *learned to play golf at a Centrum gathering in order to make valuable networking contacts*

Susan Mersereau, vice president and general manager of Weyerhaeuser Information Systems in Tacoma, Wash., keeps in touch with executive-level women through her own network. "I have a lot of friends who are women in high-level management positions," she says. "I am just beginning to meet some executive women in IS, too."

Among the groups specifically geared to IS professionals, the top choice for networking seems to be the 1,800-member Society for Information Management (SIM).

"I have been very active in SIM, and that has given a number of vice presidents the opportunity to see me work," says Madeleine Weiss, president of Weiss Associates, Inc., a Bethesda, Md.-based consulting firm specializing in IS management. "I think these kinds of contacts really help. They see I can get things done," Weiss adds.

Meeting of the minds

Index Group, Inc., a Cambridge, Mass.-based consultancy, sponsors the Centrum organization, which brings together top computer executives for discussions of IS issues. The group's members include Hudson, Xerox Corp.'s Chief Information Officer Patricia Wallington and Carlene Ellis, vice president of corporate administration at Intel Corp.

Ellis recalls how Hudson taught her to play golf at one of the Centrum conference gatherings to which both women sometimes bring their families.

Women who have reached the corporate suite rarely use the word "feminist" and seem to shun all-female organizations.

"I don't network as much with other women as I do with men," says Mary Jo Greil, manager of the Management Services and Planning Division at International Paper Corp. in Memphis. "I have always felt uncomfortable seeking out women-only organizations for support. Sometimes I have seen people in these groups become more narrow and defensive."

Another important topic is keeping the right attitude about work, says Kay Mary Hamm, a partner at Romac & Associates, a personnel placement agency.

Women's problems in advancing are "not in skill level or education," Hamm says. Instead, women often become too loyal to their organizations, which makes many hesitant to leave — even for a better job.

"There's a lot of misplaced loyalty to companies," she says. "Women often abrogate the responsibility to self to be loyal to the corporation." Hamm advises a nonemotional approach, clarifying values and not diminishing one's self. A good question, she says, is, "How do you look at yourself in relationship to your employer?" •

Johnson is a *Computerworld* senior editor, systems and software.

The feminine technique in IS

Women in IS management carry distinctive personal skills

BY MARYFRAN JOHNSON

When women reach the upper echelons of information systems management, they bring more than just skills equal to those of their male colleagues or a keener interest in day-care issues.

The business world tool kits women executives carry, according to executive women and prominent IS figures, are likely to be packed with enhanced negotiating skills, a talent for consensus building and a more balanced world view.

"I think we bring an openness and willingness to deal at more of a relationship level," says Madeline Weiss, president of Weiss Associates, Inc., a Bethesda, Md.-based IS consulting firm. "Women tend to be much more attuned to developing ownership and commitment through participating."

Jeanette Horan, who supervises 50 employees as director of software engineering at the Open Software Foundation in Cambridge, Mass., says she believes women tend to be calmer, better balanced and more rational on the job than men. "Women sometimes act in the role of helping everyone to see different points of view," she says.

"Women have always been raised to be managers," adds Devi Huggins, president of the New York Chapter of the Association for Women in Computing. She says she believes that women's natural management skills — once applied solely to families and households — transfer smoothly to the corporate environment.

"If you're a good mother and can take care of children having tantrums, you're just made for the corporate world," she says only half-jokingly. "There are people who will be obstructive, and you can get around them without shouting."

Mike Hammer, an IS consultant and president of Hammer and Co. in Cambridge, Mass., treads cautiously when asked what unique skills women bring to corporate management.

"I hesitate to indulge in stereotype," he explains, "but I'm tempted to use the word 'sensitivity.' I think many women are tuned into nuances of business relationships and interactions in a way more sensitive than that of men."

"The participatory management style of women is fundamental for a quality program," adds Mary Jo Greil, manager of the Management Services and Planning Division at International Paper Corp. in Memphis.

Less possessive

Women may also have a "less territorial outlook," suggests Patricia Farwig, vice president of telecommunications at Mellon Bank in Pittsburgh. "We want our folks to buy into our decisions. Maybe because we are still proving ourselves, we feel we have to follow through and complete a task to be measured fairly."

The lack of a male-style aggressiveness is not necessarily a handicap, notes Margeurite Zientara, author of *Women, Technology and Power* and editor of *Boston Computer Currents*.

"What I found [while writing the book] was that several of the women, who in person were very sweet and gentle, used that as a way of disarming people. Underneath that sweetness, they were actually driving a hard bargain. It was like they were turning a disadvantage to their advantage," Zientara says.

A few more female faces in corporate boardrooms also lends a higher profile to day-care issues — a big concern of working mothers with young children.

As the only woman on the 12-member executive management staff at Intel Corp., Carlene Ellis brings more than a female viewpoint to executive discussions. The vice president of corporate administration is also a single parent raising a 4-year-old son and 10-year-old daughter.

"My promotion was an opportunity to put a different viewpoint on the executive staff — not only female but also fundamentally different than these guys," Ellis explains. "Most of the executive staff's kids have grown and left. But I think you need a diverse population running your company, because the planet Earth's population is diverse. It's easy to be a leader of people exactly like you."

Yet even with a live-in nanny to help run her home, the Intel executive acknowledges feeling the standard working mother's guilt now and again. "How do I juggle career and home? Carefully," she says, noting that she tries to cut back on business travel whenever possible and avoid overcommitting her free time.

"There are days when I think, 'Why am I doing this?' But I love my work, and I love my kids, and I hope I'm balancing it all properly," Ellis says. "Obviously, I think you *can* do both." •

Tomorrow's jobs for women

Big growth areas for women include project manager and programmer analyst, according to corporate human resources directors

HIGH

1. Project manager
2. Programmer analyst
3. Project leader
4. Programmer
5. Systems analyst
6. Development manager
7. Applications MIS director, Consultant, Systems programmer, Tech services manager

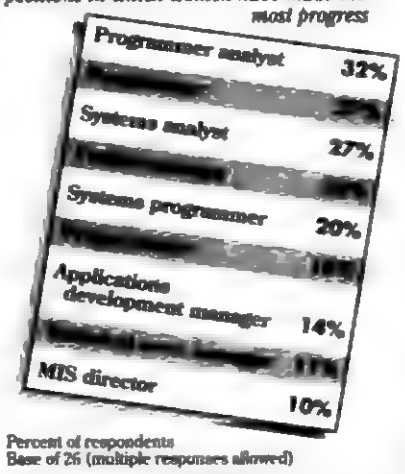
LOW

Number of respondents: 15

Source: Ramac & Associates CW Chart: Doreen St. John

Bright spots, but not on top

Corporate human resources directors say programmers and analysts top the list of IS positions in which women have made the most progress



Percent of respondents
Base of 26 (multiple responses allowed)

Source: Ramac & Associates CW Chart: Marie Haines

Resources for women climbing computing ladder

Numerous professional associations and agencies actively help women get ahead in computing. Here is a sampling:

Adapso
(703) 522-5055
The computer software and services industry association seeks to facilitate professional contacts between minority- and women-owned firms and large, established information services companies. Publishes directory of firms owned by women and minorities.

U.S. Department of Labor
Women's Bureau
(202) 523-6601
Provides a variety of services and publications aimed at helping women in all businesses. Keeps excellent statistical records.

U.S. Small Business Administration
Office of Small Business Ownership
(202) 653-8000
Runs the Women's Network for Entrepreneurial Training, which sets up tutorial relationships between new and established companies owned by women.

Index Group, Inc.
(617) 492-1500
This IS consulting organization sponsors the Centrum organization, which periodically unites a small number of top computer executives for wide-ranging discussions of various IS issues.

Association for Computing Machinery
(212) 869-7440
Publishes monthly and quarterly publications that occasionally feature articles on the role of women in computing.

Association for Women in Computing
Each geographic area runs its own groups, so there are no national offices. For information, contact Devi Huggins, New York-area president, Manufacturers Hanover Trust Co., (212) 482-4809.

British IS execs fare little better than U.S. sisters

BY JOSEPH MAGLITTA

Two decades ago, Great Britain had high hopes for women in computing. Today, many Britons are still hoping.

Like the U.S., Britain saw many women enter the computing field in the 1980s. But as in the U.S., actual percentage increases have stayed flat for nearly a decade. Today, women fill only about 20% of all computer jobs in the UK.

Worse, many British women working in computing are paid less, promoted far less frequently and let go far more often than their male counterparts, according to a new report by Computer Economics, a British research firm.

The study of 657 British firms found that in 1990, fewer women are entering computing, and those who do aren't making it up the career ladder as far as men.

Computing "promised great things for women in its early days as a profession, without traditions or inequality," says Peter Stevens, director of research at Computer Economics. He recently told the British press that it appears "computers have let women down."

Britain's education secretary, John MacGregor, agrees, calling the state of affairs "puzzling and disappointing."

The problem, MacGregor and other observers say, is that computing in Britain is still seen as a male preserve. They blame the usual impediments: too few female teachers, an absence of role models, pressures from peer groups and family and ignorance of career possibilities.

At present, women represent only one in five of all computer programmers and analysts in Britain, compared with about one in three in the U.S.

The picture gets even bleaker at the top. In Britain today, 5.9% of computing managers are women. In contrast, women in Spain make up 8.7% of information systems managers and 6.6% in France.

Despite these numbers, however, there are still bright spots. Male/female pay differences in Britain, for example, are far smaller than those in the U.S. In many positions, such as systems managers and computer operators, women are paid as much as men in Britain.

In other IS jobs, the difference is small: Pay for women professionals, such as analysts and programmers, is 98% of the pay for men (compared with 70% in the U.S.). Raises for women IS managers averaged approximately 3% less than for male counterparts, while the difference was about .5% for other IS professionals.

Britons are not taking the discouraging statistics lying down, however. The British government says it will reform educational programs to abolish sexual stereotyping on women's use of computers. The powerful British Computer Society is also working to kill notions that IS is suited only to degreed young males.

The group is encouraging British business to offer more part-time work and at-home work as well as better training in order to attract more women. •

Maglitta is a *Computerworld* senior editor, in depth/integration strategies.

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Women out on their own

Many finding satisfying alternatives to corporate rat race

BY MARYFRAN JOHNSON

In one of the final scenes in the movie *Baby Boom*, actress Diane Keaton confronts a room full of smug male executives who have just offered to buy her homemade baby food company and make her a millionaire.

Much to their shock and her own amazement, she turns them down flat. The rat race, Keaton informs them, will have to get along "with one less rat."

Madeleine Weiss and Diane Kamionka can identify with that. Weiss, who serves as vice president of the Society for Information Management (SIM), bailed out of the corporate rat race eight years ago by opening her own information technology consulting firm, Weiss Associates, Inc. in Bethesda, Md.

Kamionka walked away from a 20-year information systems career at Western Southern Life Insurance Co. in Cincinnati — where she was the first female vice president in the company's history — to launch her own software company, Cintech Telemanagement Systems, Inc., also in Cincinnati.

Both women acknowledge that dropping off the corporate ladder actually catapulted them into a different kind of contest as self-supporting, independent businesswomen.

"As a friend of mine says, we're shooting with real bullets now," Kamionka says. "The best part of owning your own business is having that elbow room, which you can't get in a corporate structure. Personally," she explains, "you can feel such a sense of accomplishment."

Weiss *started her own consulting firm*

She adds, "but the lows are also much lower. Things are just more *intense*."

The idea apparently has some appeal to others: *The Fall 1990 Adapso Directory of Minority and Women-owned Firms* lists nearly a dozen firms — ranging from computer services, publishing, consulting and software development — that are headed by women.

From a position as programmer/analyst at Bell Systems, Inc. in the early '60s, Weiss moved briskly upward into management consulting work at Electronic Data Systems Corp. and eventually into a full-time faculty position directing the MIS program at American University in Washington, D.C.

It was the familiar career/family struggle that fueled Weiss' decision to fire up her own company. "I wanted the self-determination of my own firm, and I wanted the flexibility with my children. Being a mother is very important to me," says Weiss, whose three children were six, 11 and 14 the year she established the business. "When it comes right down to it, I wanted control over my work life."

> "THE BEST PART of owning your own business is having that elbow room."
>
> DIANE KAMIONKA
> CINTECH

What had especially begun to grate on her nerves as a corporate consultant was the "drop everything and go" mentality. "I didn't want to be told, 'You have to go to Dallas tomorrow for six months,' " she recalls. "My husband had a career, too, and he was not willing to pick up and move."

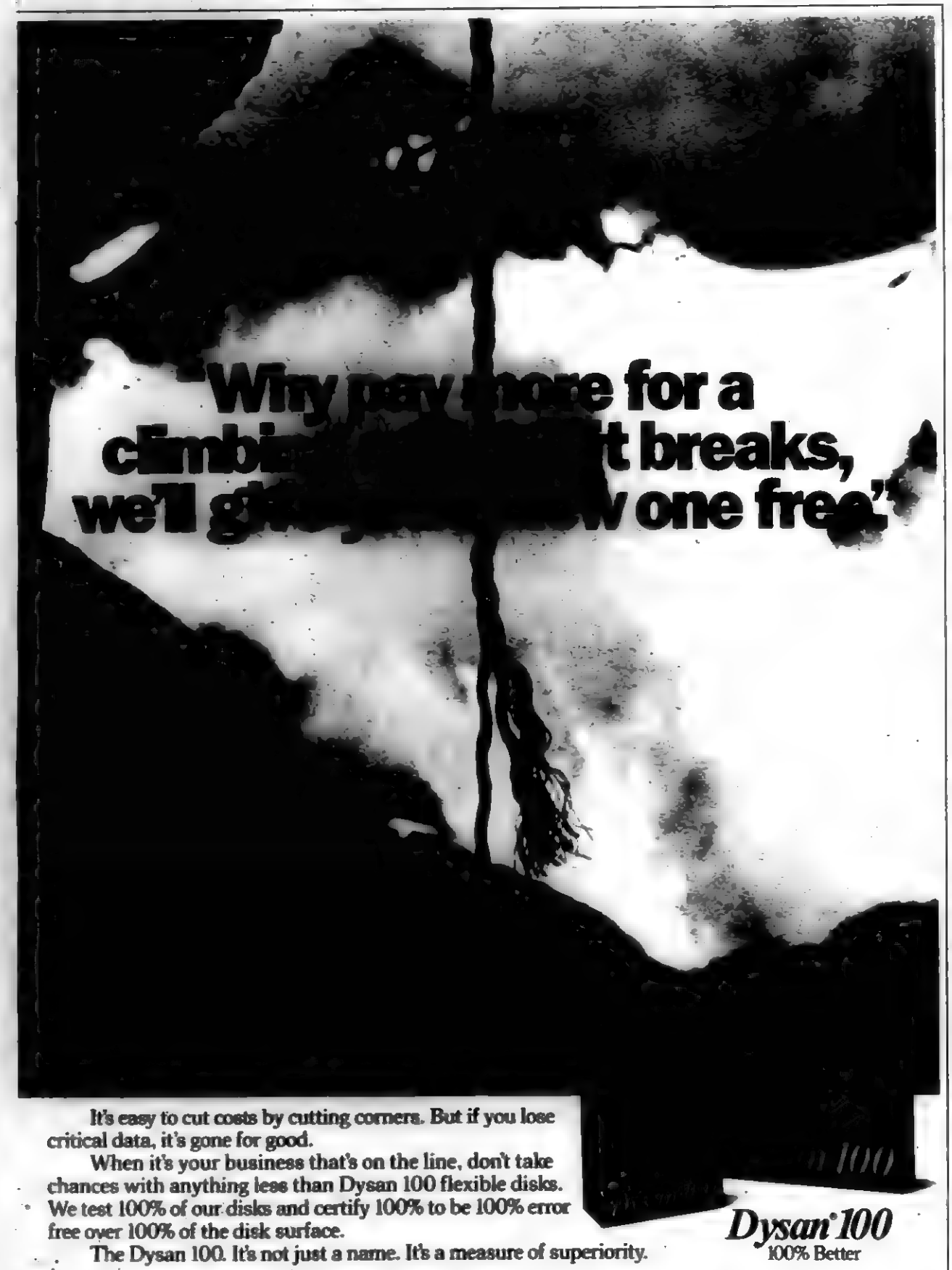
Shifting into her own consulting business was therefore a logical next step. "The irony is that now I spend a lot of time traveling," she says, "but the difference is that I'm making the choice." Her clients today include Corning, Inc., Black & Decker Corp. and The World Bank.

"These days, I do bring too much work home," Weiss acknowledges. "One of the downsides of having a business is there's always work to be done."

Kamionka copes with that same problem. "I wanted to be passionate about something, but I don't think I expected this to take up 100% of my life," she says with a sigh. "I have trouble just making myself read the Sunday *New York Times* now so I'll have something to make small talk about."

Today, Cintech has 13 employees and is about to double in size to handle a new personal computer-based product about to be announced. The company markets Tele-Series, a range of telecommunications accounting modules that runs on DOS-based systems and Digital Equipment Corp.'s VAX/VMS.

Kamionka plans to grow Cintech to a healthy size and then sell it. "In five years, I want to be lying on the beach!" she jokes. Her next career metamorphosis will likely be troubleshooting at small companies as a "business turnaround" specialist, she says. •



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Can Concurrent make a comeback?

BY NELL MARGOLIS
CW STAFF

TINTON FALLS, N.J. — With commercial demand for Unix systems just starting to take hold in the autumn of 1988, real-time systems vendor Concurrent Computer Corp., fresh from a merger that netted it Unix know-how, seemed poised to catch a rising wave.

Instead, the firm — a union of two seemingly complementary vendors that wedded one's expertise with low-end systems to the other's specialty of high-end systems — has spent precious lead time bogged down in post-merger misery while traditional vendors co-opted its technological edge.

A financier's vision and a technologist's dream, the merger that formed Concurrent rapidly devolved into a corporate culture nightmare, according to industry observers and company insiders. Two years of wrestling with its effects has taken a severe financial toll on the firm (see chart page 106). Now in the middle of an attempted comeback under the direction of a turnaround specialist, Concurrent may find its most daunting prospect is to convince would-be customers that technology has not passed it by. "I think that it has, and now they can't compete," said Raymond Tellier, information systems director at Buxton, Inc., a Concurrent user site in Springfield, Mass.

CEO Brown facing *rough competition and tough economy*

When Westford, Mass.-based Massachusetts Computer Corp. (Masscomp) acquired Concurrent and merged the companies under that name in August 1988, the game plan was to wed Masscomp's low-end, Unix-based real-time computer line with Concurrent's high-end real-time computers, migrate the proprietary Concurrent offerings to Unix and blanket the market.

"Two years ago," said a former Concurrent executive who asked not to be identified, "this was hot stuff. But real-time extensions to Unix are getting to be commonplace."

In the interim, mainstream players including IBM, Digital Equipment Corp., Hewlett-Packard Co. and Sun Microsystems, Inc. have launched or enhanced their own Unix-based, real-time entries, according to John Logan, an analyst at Aberdeen Group in Boston.

"The [user] reactions you're

Continued on page 106

Major merger mishaps

Echoing the mistakes of former parent Perkin-Elmer, Concurrent may be watching a bright future fade to black because of a merger that worked better in theory than in practice.

- 1974: Aiming at leveraging itself into the computer industry, traditional, conservative Perkin-Elmer acquires entrepreneurial Interdata.
- 1974-1985: Perkin-Elmer's bold move runs aground as corporate cultures fail to meld.
- 1985: Perkin-Elmer leaves industry, spins off computer group (formerly Interdata) as Concurrent.
- 1988: Aiming at blanketing the Unix-based real-time computer market, traditional, conservative Concurrent merges with entrepreneurial Masscomp.
- 1988-1990: Concurrent's bold move runs aground as corporate cultures fail to meld.
- July 1990: Firm lays off 450 workers and closes plant.
- Firm reports $38 million net loss on revenue down 15% for fourth quarter.
- September 1990: CEO James Sims abruptly departs firm.
- Firm reports $9.9 million net loss for first-quarter 1991.

Firm alleges word processor dumping

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — The federal government has launched an investigation into allegations that companies based in Japan and Singapore are selling personal word processors in the U.S. at less than their fair value. The action was requested on behalf of U.S. industry by Smith Corona Corp., which says the firms have been dumping in the U.S. for a year.

Smith Corona Chairman Lee Thompson said offenders include Brother Industries Ltd., Panasonic Co., Canon, Inc., Sharp Corp. and others. He said a word processor selling for $995 in Japan is being sold by the companies in the U.S. for about $400. Smith Corona has no choice but to meet that price but would sell the unit for about $600 if fair competition existed, Thompson said.

The U.S. is the world's largest market for word processors and is the only country where the firms are currently dumping them, Thompson said. He declined to give sales figures but said Smith Corona has an estimated 50% of the domestic market for typewriters and word processors, which together will account for sales of some 3 million units this year.

Investigating damage

The U.S. Department of Commerce's International Trade Administration (ITA) is investigating whether dumping is occurring. It has notified the U.S. International Trade Commission (ITC) and asked it to determine whether imports of word processors from Japan or Singapore are injuring or threatening to injure U.S. industry. The ITC is scheduled to make a preliminary finding by Dec. 21. If affirmative, the ITA is to announce its preliminary finding on the dumping question by April 15, 1991 and its final determination by July 1, 1991. The ITA's final conclusion on the injury question would come 45 days after that.

If dumping and injury are found to have occurred, the offending companies will have to pay a penalty on every item exported to the U.S. thereafter, the fee proportional to the amount by which their U.S. prices were found to fall below fair value. Such penalties are assessed for at least one year, then may be removed.

A spokeswoman for Sharp said the company would not comment on the investigations until it has filed a formal reply with the U.S. government. Representatives of the other firms could not be reached for comment.

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EC outlining information technology strategy

BY ELIZABETH DE BONY
IDG NEWS SERVICE

BRUSSELS — Next month, the European Community Commission will issue a document outlining its strategy for the information technology sector.

The strategy could give the first indication of how the commission plans to revamp its 10-year-old Esprit program in information technologies, Filippo Maria Pandolfi, the European Community's (EC) research and development commissioner, said last month at the close of a week-long conference devoted to Esprit. During the conference, companies and commission officials analyzed Esprit's successes and identified technological changes that have revolutionized the sector over the last couple of years and that should be taken into account in a second revamped Esprit effort.

Major changes targeted by the conferees included the growing importance of software, which currently represents 45% of the information technology market and is expected to account for 80% by the mid-1990s, the acceleration into open systems and shorter life cycles for technology, in contrast with the need for long-term company strategies. The conferees also noted the development of parallel systems — a trend that could herald the emergence of a new industry based on high-performance, low-cost computers.

Faced with these changes, Jean-Marie Cadiou, head of the commission's information technology division, suggested that Esprit funding be doubled from its current $2.08 billion.

Cadiou underlined the importance of information technology R&D by pointing out that of the 13 identified critical "emerging technologies," 10 fall in the information technology sector. Basing his comments on a study by Price Waterhouse for the U.S. Department of Commerce, Cadiou explained that of the 10 information technology developments, Europe is ahead of or even with the U.S. and Japan in eight categories. According to a table summarizing the study, the EC leads the U.S. in digital imaging technology and flexible computer-integrated manufacturing (CIM) and is even with it in advanced semiconductors, high-density data storage, sensor technology, superconductors, advanced materials and software technology. The EC falls behind the U.S. in artificial intelligence, high-performance computing, optoelectronics, biotechnology and medical devices.

The EC leads Japan in flexible CIM and software technology, is on par in AI, digital imaging technology, sensor technology, superconductors, biotechnology and medical devices and falls behind in advanced semiconductors, high-performance computing, high-density data storage, optoelectronics and advanced materials.

Cadiou warned that although the EC is currently well positioned, it does face some "strong disadvantages in the technolgy race." Those include the following:

- While the U.S. claims to spend only $1.5 billion in direct R&D, another estimated $70 billion is spent on defense funding, of which 10% goes to research in the information technologies.
- Japan benefits from very low interest rates. While EC and U.S. firms may pay an average 18.5% on R&D projects, Japanese firms pay only 8.5%. In the UK, the rate is a staggering 25%, Cadiou said.

De Bony writes for the IDG News Service's European Bureau.

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NATIONAL BRIEFS

Microsoft goes natural

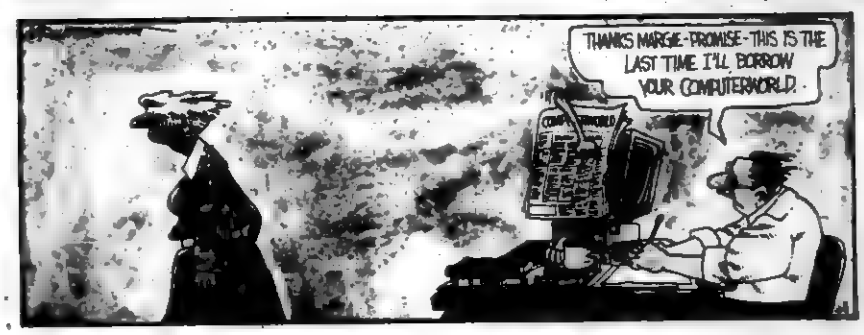
Microsoft Corp. took a major step in its move beyond the graphical user interface last week by strengthening its financial and technological ties with Berkeley, Calif.-based **Natural Language, Inc.** A $1 million investment gives Microsoft, a Natural Language minority stakeholder and licensee since 1987, 10% ownership of the privately held firm whose technology offers a route to new dimensions in easy-to-use applications.

Compuadd II: The superstore

Austin, Texas-based personal computer retailer **Compuadd Corp.** has targeted suburban Chicago as the maiden market for the computer "superstores" on which the firm is pegging its next round of expansion. In contrast with its present 74 stores, which average 5,500 sq ft, each new emporium will span 12,000 to 25,000 sq ft and offer a proportionally broader range of wares, according to Compuadd. The first of 12 proposed superstores is scheduled to open this week in Schaumburg, Ill.

It worked for Tinkerbell

Recession notwithstanding, a blue-ribbon roster of PC company executives who responded to a survey sponsored by market research firm Technologic Partners said they believed their sector would increase 12% in the coming year and 14% in 1991. The respondents also predicted an approximate 19% growth in dollar value for PC-related software in 1991.



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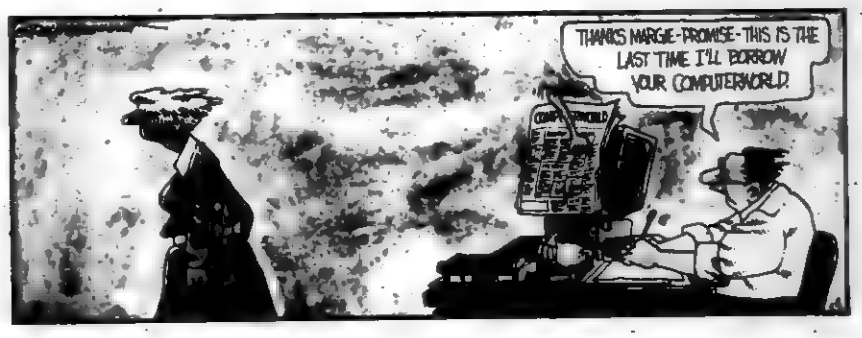

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COMPUTERWORLD

OS/2, Unix facing not clash

The Newsweekly of Information Systems Management

Concurrent

CONTINUED FROM PAGE 103

going to find to Concurrent could depend a lot on which world you're asking about: the Masscomp world or the old Perkin-Elmer one," said Peter Staaterman, president of Global Electronic Markets, Inc. in Bedford, Mass. Perkin-Elmer Corp. spun off Concurrent in 1985. Staaterman described himself as an "extraordinarily satisfied" user of proprietary processors from the Perkin-Elmer spin-off.

Not all agree. "We're going to be Concurrent users for about three more months — then we switch over to the [IBM] RS/6000," Tellier said. Disenchanted with its Concurrent XF610, Buxton looked at entries from a host of vendors before settling on the IBM workstation/server line.

"Everything we looked at was 10 times faster than Concurrent, at half the price," Tellier said. "We're going to pay for our two IBM RS/6000s in what we save on maintenance over two years."

Denis Brown, who was named Concurrent chief executive officer in September, said the challenge of differentiating its wares in an era of brutal competition and tightening purse strings "is something the whole industry will have to grapple with. The strength [we] will bring to the mix is software, tools and applications. We won't just be selling a box."

Downward track

Financial news has been mostly downhill for Concurrent since it was merged with the former Masscomp

	Q1 '90*	Q2 '90	Q3 '90	Q4 '90	Q1 '91 (Ended September)
Revenue	$87M	$89.22M	$80.71M	$78.39M	$70M
Net income	-$1.4M	-$2.22M	$164,000	-$38M	-$9.9M

*Acquired by and merged with Masscomp

Source: Concurrent Computer Corp. CW Chart: Tom Monahan

Indeed, Concurrent's latest real-time Unix entry, the Motorola, Inc. 68040-based Series 7000, announced last month, arrived with a long list of software vendors already signed up to support it.

However, while Lew Brentano, an analyst at market research firm Gartner Group/Infocorp, gave the machine high technological marks, he said he sees the new line as an unlikely vehicle to fuel Concurrent back to the front ranks.

"The good news about the 7000 is that it offers the best price/performance for a real-time system out there today," he said. "The bad news is that to get it there, Concurrent has cut its price per unit so dramatically that they have to sell 20% more just to break even."

Nevertheless, a new team at the top is giving industry observers some degree of faith that Concurrent will be there to fight for a piece of the turf it had once hoped to own.

> "THE GOOD NEWS about the 7000 is that it offers the best price/performance for a real-time system out there today."
>
> LEW BRENTANO
> GARTNER GROUP/INFOCORP

Turnaround expert Brown, who presided over the reconstitution of a $1 billion Penn Central subsidiary between 1985 and this year, was brought in with a mandate to repeat the act.

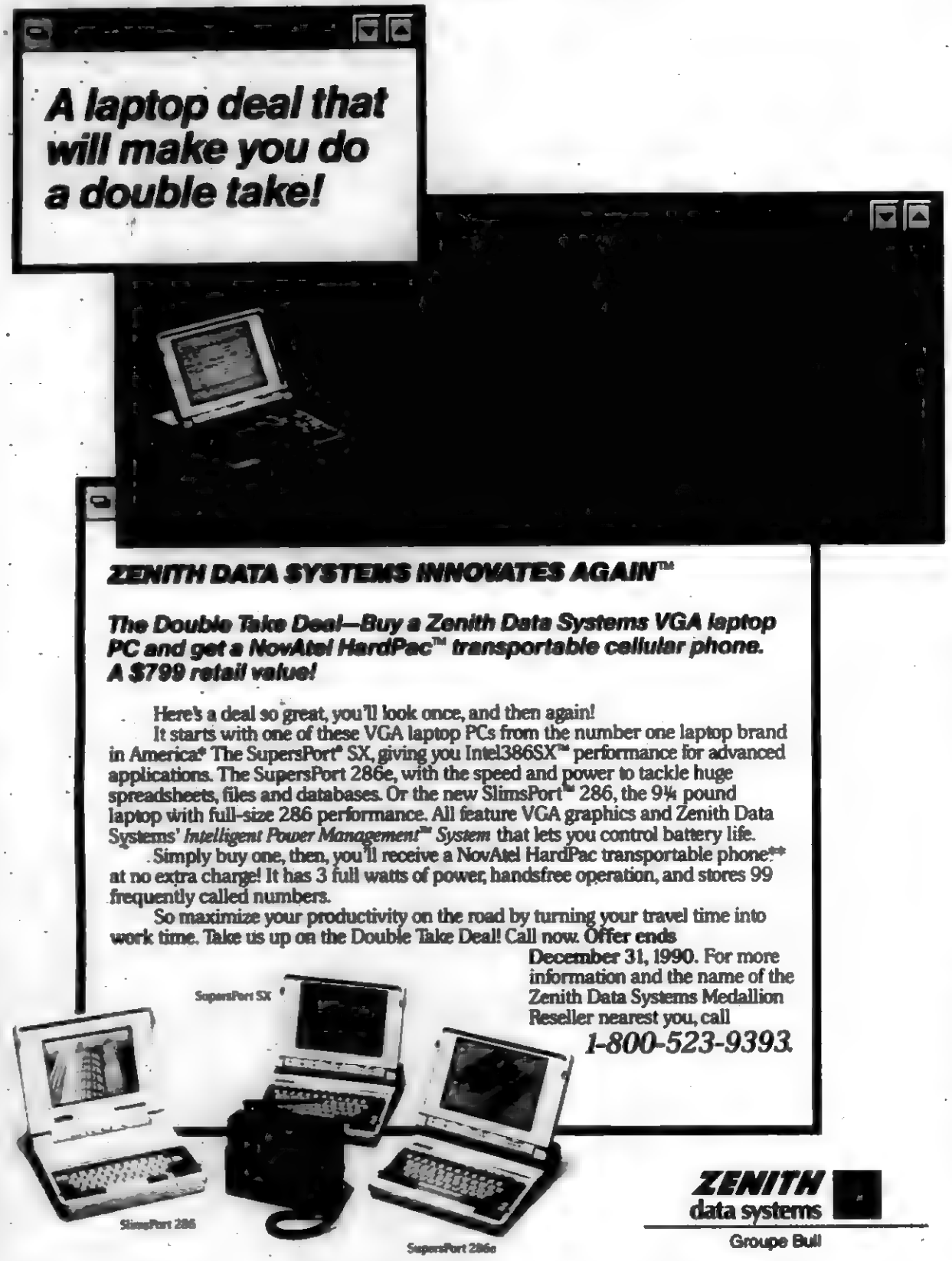
In his first weeks at the helm, Brown won grace periods from banks and bondholders holding debts on which Concurrent technically is in default. Last week, the formal grace periods ended; however, recapitalization discussions with the lenders are ongoing, Brown said. He added that a new business plan on which the firm has been working since September should be in the lenders' hands within days.

While others raised the issue of technological extinction, Brown remained sanguine. "We're still winning major new business," he said. "I don't see this as an issue." September, for instance, was marked by a $1.1 million order for six Concurrent 8400 reduced instruction set computing real-time Unix systems from a government subcontractor.

Brown acknowledged that the issues first tackled by the new team he has assembled were financial and organizational rather than technological — priorities dictated by the assumption that survival comes before growth.

However, Brown said, technology has not been neglected: Formerly warring development teams have already been consolidated into one unit, with one direction to march in and a new leader — Vice President of Development George Sampson, brought on-board in September — to march with.

The new business plan — an early version of which was apparently sufficient to sway the bankers to leniency — will be made public by the end of the year, Brown said.



NASA steps up effort to improve industry ties

BY GARY H. ANTHES
CW STAFF

The National Aeronautics and Space Administration (NASA) has received 30,000 requests for technology from the private sector since it established its technology transfer program 28 years ago. Now, the space agency says it wants to do better.

"In the past, we've waited until a NASA-sponsored technology was on the shelf before looking for commercial applications. That process takes 10 years. Now we want to do things in parallel," Adm. Richard H. Truly, NASA administrator, said to 1,500 industry hopefuls attending the first annual conference and exposition of NASA technology in Washington, D.C., last month.

The exposition is part of NASA's strategy to forge stronger government-industry ties. The space agency is taking other steps to expand the scope of its programs by which technology in artificial intelligence, computer hardware and software engineering, data management, robotics and other disciplines finds it way into the production lines and onto the balance sheets of U.S. corporations.

Bigger than Apollo

In particular, NASA sees its major new programs — the Space Station, the National Aerospace Plane, the Earth Observing System and the Mars mission — as generating a flood of new technologies that will dwarf those that flowed from the Apollo program of the 1960s. "A question [for these programs] is how to maximize technological and economic spin-offs," said Frank E. Penaranda, the NASA official in charge of commercial programs. "The key is to build in technology transfer from the beginning."

Tantalizing examples were not lacking at NASA's Technology 2000 conference. In two tracts devoted to computer-related technology, NASA presented projects such as these:

- Scientists from the Ames Research Center described the virtual environment display system, which allows a user to explore a 360-degree "virtual" environment via a head-mounted three-dimensional display. The Johnson Space Center is helping a university adapt the technology so that medical students can navigate inside virtual cadavers.
- A researcher from the Langley Research Center described a NASA project to develop a high-performance rewritable optical disc recorder. It is intended to record at 300M bit/sec. per disc, hold 10G bit of data per disc, transfer data at 1.8G bit/sec. and orbit the Earth for two to four years without repair.
- A computer scientist at the Goddard Space Flight Center described an experimental method for accessing data over heterogeneous systems without having to know the access methods of the constituent systems.

An even more direct way that NASA gets its computer smarts out to industry is through its Computer Software Management and Information Center (Cosmic) at the University of Georgia. The NASA-funded center collects software written by and for the various NASA facilities, scrubs it for bugs, reviews documentation and offers it for sale to the public.

The Cosmic catalog contains 1,200 software titles selling for an average price of $600 each, or $300 for personal computer-based programs. They span nearly every conceivable field, from accounting to nuclear physics, but are concentrated in scientific and engineering applications. In most cases, source code is provided without restriction.

NASA operates nine regional Technology Utilization Offices that help match industry needs with NASA technology. Ten university-affiliated Industrial Applications Centers provide information retrieval services from 100 million scientific documents in a NASA database and from 600 other databases. The space agency also publishes NASA "Tech Briefs" and "Spinoffs," publications aimed at technology transfer.

NASA will also enter into various kinds of consulting arrangements with companies, sometimes for a fee and sometimes at no cost. Also, the space agency has a portfolio of 4,000 patents available for exclusive or nonexclusive licensing.

INTERNATIONAL BRIEFS

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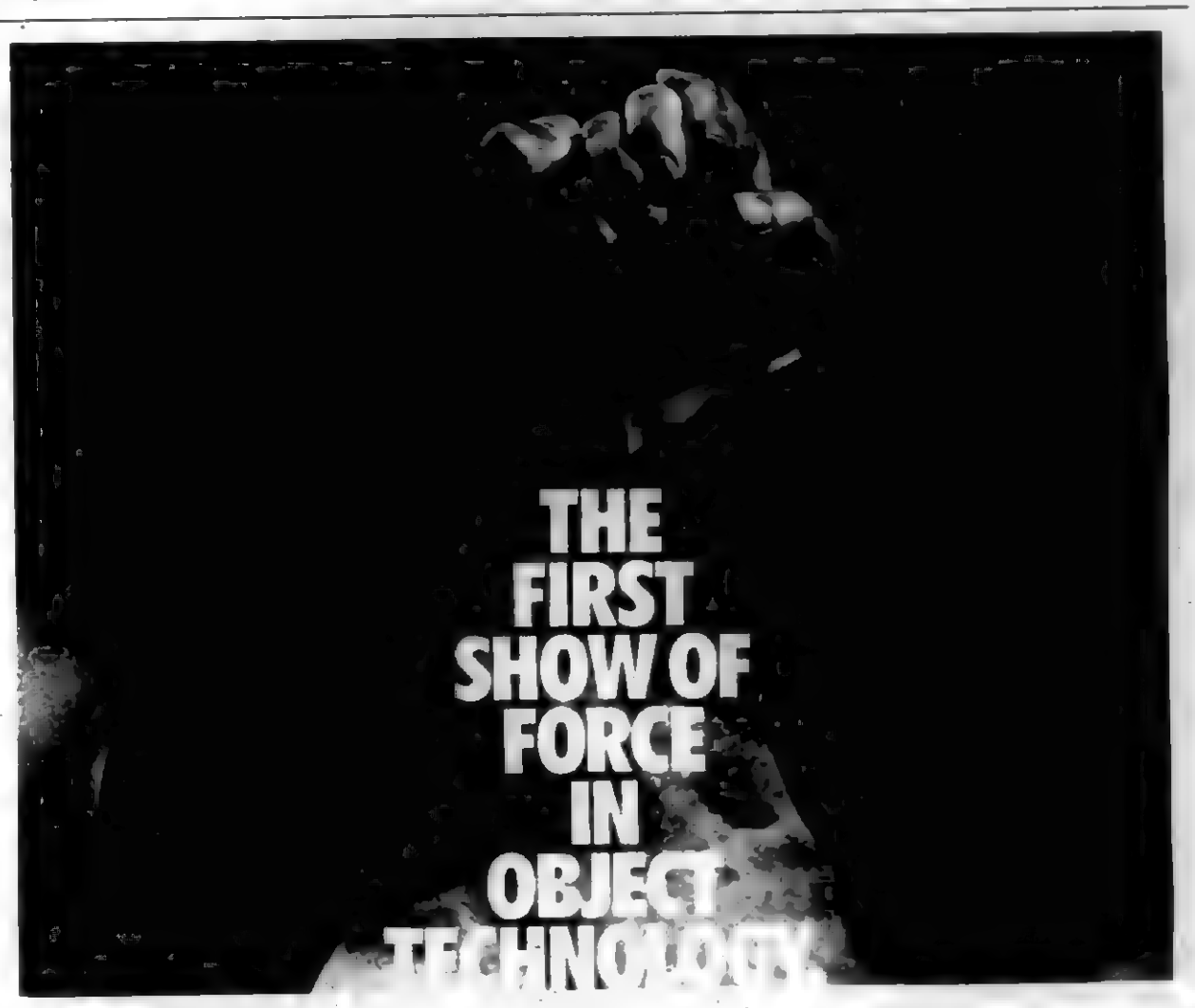
Struggling Dutch technology vendor **N.V. Philips** shocked the European computer industry with an announcement that it now expects to incur net losses of some $2.3 billion in 1990 — roughly double the $1.16 billion loss that the firm earlier anticipated.

Novell, si

A Spanish court recently ruled that Madrid-based **Computer Technology di Espana**, a software development firm, violated **Novell, Inc.**'s intellectual property rights by copying Novell's Netware and marketing it under the name Compnet. The court ordered the Spanish firm to surrender all Compnet copies — and, once determined, revenue — to Novell.



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Tired of takeovers? Try nonprofit groups

Pay is sometimes lower, but those who have left commercial IS behind say benefits go beyond salary

BY SHERYL KAY
SPECIAL TO CW

Information systems professionals seeking relief from the corporate chaos of takeovers and competitive turmoil may find their ideal career in nonprofit organizations.

Although nonprofits generally offer lower salaries, they usually provide generous benefits and job security. They are also not without their competitive zest and technological pizzazz.

"In a sense, we are absolutely no different than for-profit organizations," says James Burger, director of IS and services at the Jewish Federation and United Fund of Metropolitan Chicago.

For example, Burger's agency vies for the same funds being sought by other charities — a definite form of competition. Under Burger's direction, the federation's IS team has developed a number of applications, including a statistical demographics system to target the right people at the right time during fund-raising periods.

The IS department at the Boy Scouts of America in Las Colinas, Texas, employs similar competitive tactics. Susan Spalter, national director of the IS division, says her group developed and maintains several revenue-building systems, including membership, wholesale and retail sales, magazine subscriptions and investments.

By helping to keep the organization financially fit, Spalter says, the IS division indirectly plays a part in making the Boy Scouts a growing, attractive organization for children and parents alike.

The lure of competitive challenges aside, IS professionals say there are hidden benefits in the nonprofit field. John Kopkovits, director of information resources at the H. Lee Moffit Cancer Center and Research Institute in Tampa, Fla., says working in a hospital setting has enabled him to feel like he is making a positive contribution to society. "I never felt this in the corporate world," says Kopkovits, who spent the first eight years of his career in the for-profit sector.

Spalter likes to refer to these hidden nuggets as "psychic income," or the part of your job that makes you feel good about yourself. Before joining the Boy Scouts, she worked for 16 years in the commercial IS world.

While there were times, Spalter says, when she was proud of her accomplishments in commercial business, "it never compared to the thrill I get when I come upon a group of scouts on a hiking trip, and I know that what I'm doing makes their scouting possible."

The downside

Of course, nonprofit is certainly not a perfect world for IS professionals. One major frustration many IS managers have to deal with in nonprofit organizations is a lack of business awareness.

"We have 400 councils around the U.S., and some of these [program organizers] are not paying attention to the bottom line. We do cost/benefits analyses, but not everyone understands why we have to do this, because they don't view everything from the profit side," Spalter says.

A second drawback is that salaries in nonprofit organizations are almost always lower than those in corporations, says Richard Wonder, national director of the IS division at Robert Half International in Menlo Park, Calif.

However, benefits such as vacation time, medical plans and pensions are almost always better in nonprofit groups, Wonder adds.

In addition, other than organizations that rely on yearly grants, few nonprofit groups are going out of business or merging with other organizations, so job security is usually very strong.

> MANY IS PROFESSIONALS say there are hidden benefits in the nonprofit field. For example, it can make you feel like you are making a positive contribution to society.

Though lagging in pay, nonprofits are frequently advanced in the use of technology, Kopkovits says. In many areas, certain software products are now being installed — particularly in clinical environments — that call for highly skilled applications developers.

The use of the latest technology can also boost salaries to higher levels. For example, Kopkovits says, his organization is willing to pay competitive salaries to get the skills it needs.

IS professionals should seek areas in nonprofit organizations that use the latest technology to guarantee that their skills can be transferred from profit to nonprofit environments and vice versa, Wonder advises.

Many IS professionals who wish to leave nonprofit organizations after a lengthy career and enter the commercial sector fear that their backgrounds may not be taken seriously.

For instance, Burger thinks that his 11 years of nonprofit experience may unjustly carry some sort of stigma.

"Employers might question what sort of exposure I have had and how creative I have been," Burger says. He says he hopes that if he's ever in the position of looking for a new job, the employer will look past what the organization does and judge him by his accomplishments.

However, to generalize that anyone from a nonprofit organization cannot adjust to commercial firms is an unfair assessment, Wonder says. Any profit-making company that espouses this philosophy may be passing up qualified candidates, he adds.

Kopkovits underlines that misconception: "We are managers of expectations and agents of change, just the same as in any technical department of any corporation."

Kay is a Tampa, Fla.-based business consultant and free-lance writer specializing in emerging technologies and human resources.

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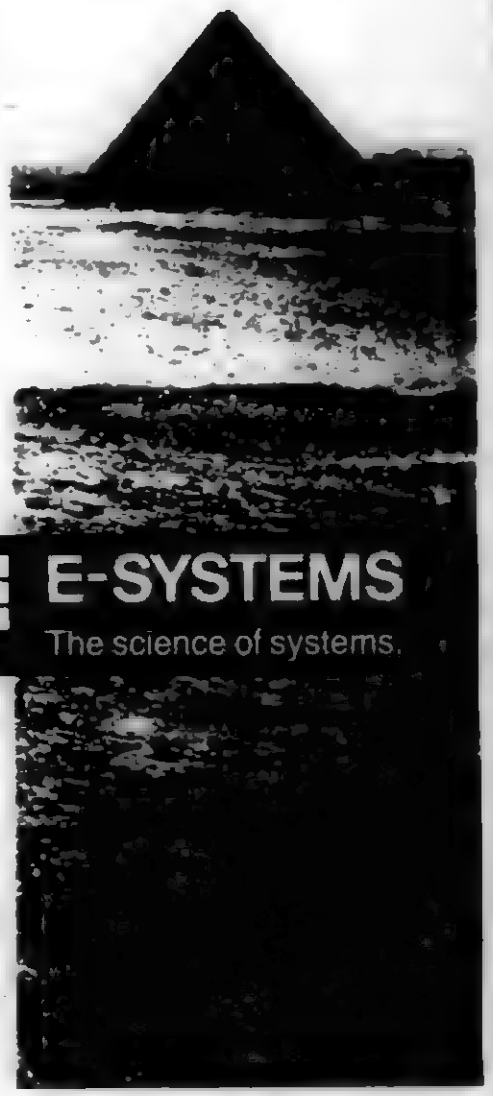

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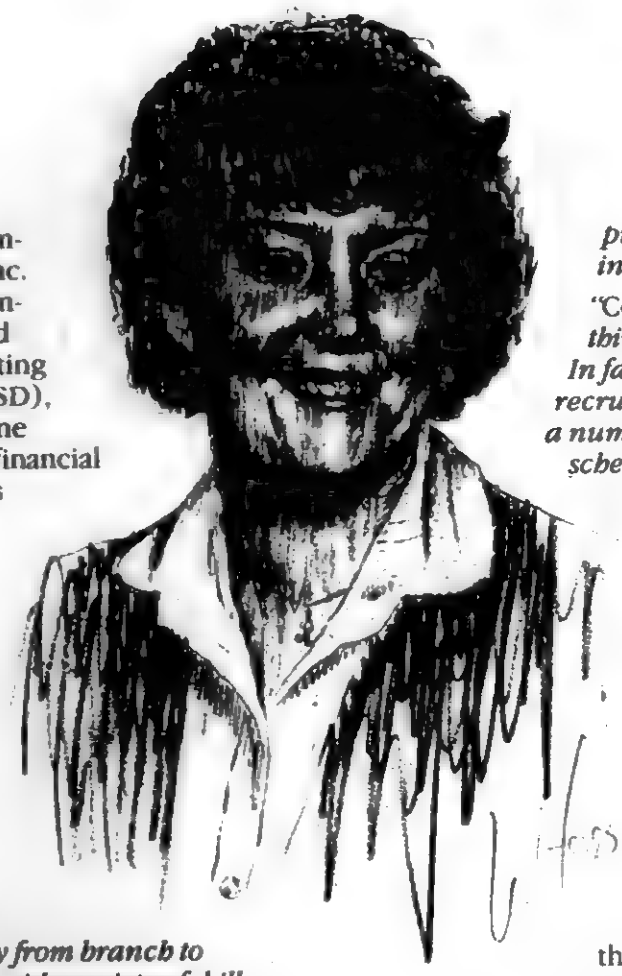

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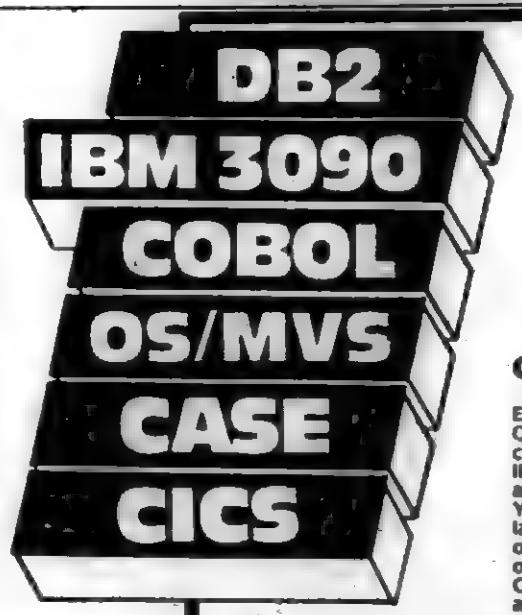

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Inexpensive options simplify connectivity

BY SIMSON L. GARFINKEL
SPECIAL TO CW

Connectivity among different kinds of computers — exchanging files between IBM Personal Computers, Apple Computer, Inc. Macintoshes and Unix workstations, for instance — has become much more affordable and less complicated in recent years. From the standpoint of information systems managers, there are more options and a broader market of products to select from. We haven't reached connectivity nirvana, however. Different PCs and workstations from different vendors still store information on floppy disks and magnetic tapes in fundamentally incompatible formats. But when properly configured, all of the leading brands of computers — and many more — can transparently access one another's files over a network.

There are two levels to interconnecting disparate workstations: physical and logical. Two workstations are physically connected if they share the same local-area network — which is not hard to arrange, given that third-party vendors now provide Ethernet and token-ring cards for Macintoshes, PCs and a variety of Unix workstations.

The cost of the hardware depends on how quickly users need to transfer information. Every Macintosh comes standard with a Localtalk interface, but Localtalk only transfers 230K bit/sec. If a user wants high-speed transfer, he'll have to buy an Ethernet or token-ring interface card for each computer he wants on the network. Most of these cards cost between $400 and $600.

However, physical connectivity is only the first phase. The second, or logical connection, is more complicated, because it can involve reconciling incompatible disk storage, network server software and application software formats.

Network software comes in two parts. Server programs make the files stored on servers available over the network. Client programs run on local computers and make the files stored on the server available to the operating system.

On MS-DOS computers, Novell, Inc.'s proprietary Netware is the most popular networking protocol. Netware runs with Ethernet. Software clients are also available for the Macintosh and OS/2, which means these computers can access files stored on a Netware server. But Netware is expensive: The server software costs between $3,000 and $8,000, depending on options. This may seem steep, but 250 users can share a single Intel Corp. 80386 server using the $7,995 Netware 386. Netware clients cost approximately $200 per workstation.

If an office is mostly using Macintosh computers, users will probably choose Apple's Appleshare remote file system. To use Appleshare, users must dedicate one Macintosh computer to be a file server, and only files stored on the server can be shared among users. While any Macintosh can be a server, the faster ones, such as the Macintosh IIFX, give better performance to all users. Of course, the faster Macintoshes are also more expensive. The server costs $790.

Next year, however, Apple's long-awaited Version 7.0 operating system "will allow [users] to set up part of [their] individual Macintosh as a nondedicated server," says Doug McLean, Apple's product line manager for network integration.

In the Unix world, Sun Microsystems, Inc.'s Network File System (NFS) is undisputedly the most popular network file system. Although NFS was originally a proprietary protocol, it is now a standard. The free software is available from the University of California at Berkeley. Also, NFS is highly portable, because it is based on the industry-standard Transmission Control Protocol/Internet Protocol. As a result, it is available for practically any computer for which a network interface can be purchased, anything from PCs and Macintoshes to supercomputers.

Unfortunately, NFS pays a price for this portability. "The performance of most NFS solutions with DOS does not really compare with Netware," says James Van Bokkelen, president of FTP Software, which sells NFS for the IBM PC.

However, the advantage of NFS is its adherence to an open and well-thought-out standard, Van Bokkelen says. Since NFS is a standard, it is available on far more platforms than any other network file system. And NFS software is a good investment, because it is likely to be supported by any computers users buy in the future.

Unfortunately, merely being able to access files stored on the server is often not enough. If a user uses his PC to access data written by a Macintosh, he must be sure that the application programs on the two computers can interchange files in a mutually compatible format.

For example, the Macintosh version of Microsoft Corp.'s Microsoft Word can read and write data files in a variety of formats, including the format used by Microsoft Word running under Windows 3.0. If a user wishes to use a specific application on a variety of platforms, he should be sure that the various versions can all exchange data files.

Sharing plain text files between operating systems can often be more complicated than sharing data files from application programs. This is because DOS, Apple and Unix use different series of control characters to indicate the end of a line and the end of a paragraph. Conversion between the formats often requires nothing more than search-and-replace inside a word processor, but on a daily basis, the need to convert is annoying.

Garfinkel is a free-lance writer and computer consultant based in Cambridge, Mass.

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PS/2 Model 30-286	$1,100	$1,300	$1,025
PS/2 Model 60	$1,500	$1,800	$1,400
PS/2 Model 70P	$3,425	$3,450	$3,175
Compaq Portable II	$900	$1,050	$875
Portable 286	$1,100	$1,450	$1,000
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Portable 386	$2,600	$2,800	$2,500
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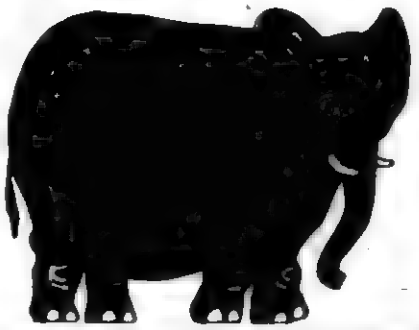

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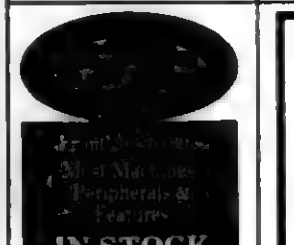

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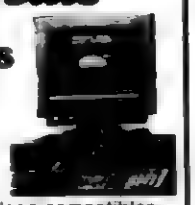

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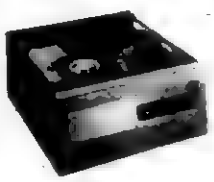

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The Commission reserves the right to waive technicalities and to reject any and all bids.

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Request for Proposals (RFP). The State of Wisconsin, Department of Health and Social Services, is inviting proposals for a Project Manager to assist in the implementation of a Child Support Data System (CSDS) in its 72 counties. The individual or firm selected to be the Project Manager will be responsible for overseeing and directing state CSDS staff and the CSDS System Contractor to be selected under a separate RFP. Further information and the RFP packet are available from Shirley Anderson, Department of Health and Social Services, Room 450, 1 West Wilson Street, P.O. Box 7935, Madison, WI 53707-7935 (telephone: 608/266-2546). Proposals are due January 14, 1991. The individual or firm selected to be the Project Manager will not be eligible to compete under the RFP to select the System Contractor.

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Sealed proposals will be received by the CDPA, 301 N. Lamar St., 301 Building, Suite 508, Jackson, MS 39201 for the following equipment and services:

RFP No. 1035, due Thursday, January 10, 1991 at 3:30 p.m. for the acquisition of 15 terminals and 3 printers to connect to the main campus Unisys mainframe for the administrative offices of HINDS COMMUNITY COLLEGE, Raymond Campus.

RFP No. 1084, due Tuesday, January 8, 1991 at 3:30 p.m. for the acquisition of eleven (11) microcomputers, printers, hard disk upgrades and digitizers for COPIAH-LINCOLN COMMUNITY COLLEGE.

RFP No. 1085, due Tuesday, January 8, 1991 at 3:30 p.m. for the acquisition of a ten (10) workstation Local Area Network for ALCORN STATE UNIVERSITY.

RFP No. 1087, due Thursday, January 3, 1991 at 3:30 p.m. for the acquisition of CD-ROM computer-based training courseware for the CENTRAL DATA PROCESSING AUTHORITY INSTITUTE.

RFP No. 1088, due Thursday, January 3, 1991 at 3:30 p.m. for the acquisition of twenty-seven (27) 80386-based microcomputers, two (2) laser printers and four (4) dot matrix printers for the General College for Excellence; and ten (10) 80386-based microcomputers and peripherals for the Department of Education and Psychology at ALCORN STATE UNIVERSITY.

RFP No. 1089, due Thursday, January 3, 1991 at 3:30 p.m. for the acquisition of an uninterruptible power supply for two networked Data General Computers, and a 1.0GB disk subsystem and 2.0GB 8mm cartridge tape for an existing Data General MV/15000 Model II computer for the Mississippi Agricultural & Forestry Experiment Station at MISSISSIPPI STATE UNIVERSITY.

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Cutting costs, not training

Education is often the first to go in tough times, but maybe it shouldn't be

BY STEWART L. STOKES JR.
SPECIAL TO CW

As we prepare to turn the corner into the new year, economic and competitive forces are pressuring U.S. companies to do more with less — and do it faster.

However, while this "do more with less" attitude sounds logical, not all strategic areas of a company should be squeezed.

One important area that is often cast aside — an area that could be a vehicle to pull companies out of the economic hole and ahead of the competition — is training.

Training close-up

At a quick glance, training — both technical and nontechnical — appears to be big business in this country. According to the American Society for Training and Development (ASTD), an association for training and human resources development professionals, U.S. enterprises currently spend approximately $210 billion for all types of employee education.

But on a closer look, the overall attention given to training has some flaws.

"As a country, we are still state of the art in technology, but we are far from state of the art in training workers to reap the benefits of that technology. The result is an enormous lack of competitive muscle," ASTD President John Hurley says.

On top of that, U.S. firms must keep a close eye on their foreign competition in terms of training. Some countries are putting forth serious efforts in training, education and professional development. The ASTD is gathering data for employee training and education abroad and has information to indicate that our country is falling well behind Germany and Japan.

Furthermore, an ASTD publication recently stated that the UK invests approximately $1,176 per worker in formal job-related training. The U.S. investment? Only $256 per worker, or approximately one-fifth of the UK amount.

Tom Peters, author of *Thriving on Chaos* and one of the nation's leading spokesmen for enterprisewide change in organizations, underlines the problem more bluntly: "Our investment in training is a national disgrace. Despite lip service about people as our most important asset, we value hardware . . . over people. Even when we do train, we get it backwards."

The root of the problem is that firms perceive training to be too expensive. When times get tough, training gets cut.

A second, deep-seated problem is that training is a "lag" strategy; it is always the last thing to happen when change occurs, and it may even tend to be an afterthought: "Oops, we'd better get these people trained, and the faster and cheaper, the better." In that situation, training is developed and delivered in a quick-and-dirty fashion, with predictable results. Little real learning takes place, and the recipients muddle through with a sour taste in their mouths.

Consequently, information systems managers and trainers have an uphill battle to fight in convincing their firms that training should be positioned as a strategic weapon.

With a little perseverance and creativity, however, managers and trainers can come out on top. First, they will need to advocate the role of training in an organization. They will need to become strong spokesmen and aggressive marketers by linking training very explicitly to the objectives of the organization.

One way they can do this is by becoming more creative in their sales tactics. For example, one manager actually pulled together a videotape that positioned and rationalized specific training courses. This video, which was shown before each training session, emphasized the importance of training and its practical application.

Another tactic IS managers and trainers can employ is to develop quantitative measurements. Take the example of customer service representatives who are not handling their systems properly: Customers become frustrated because of long waits, and the order often gets botched. Trainers can take advantage of this situation by designing a training course that will solve those specific problems and then turn it into a cost/benefit analysis.

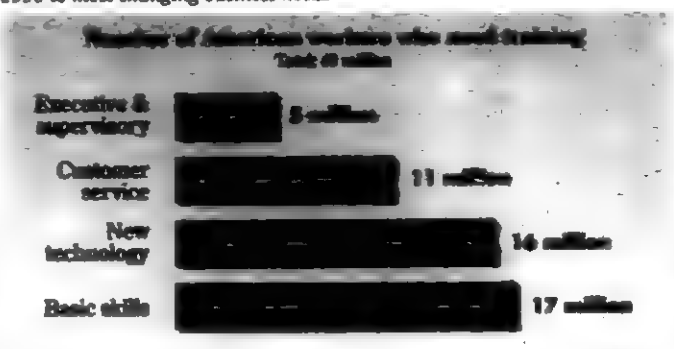
This analysis serves to bring the managers involved together around a common issue. From that point, training solutions can be developed.

The bottom line in this tough national economic climate is that companies must resist the pressures for the easy answer and the quick fix. Planning for the "long pull" and investing in training cannot be sacrificed because it is perceived as too costly. It will end up costing companies more later.

Stokes is a senior vice-president at QED Information Sciences, Inc. in Wellesley, Mass.

Training shortfall

Forty-nine million Americans will need training in the following areas in 1990 to meet changing business needs



Source: American Society for Training and Development — CW Chart: Doreen St. John

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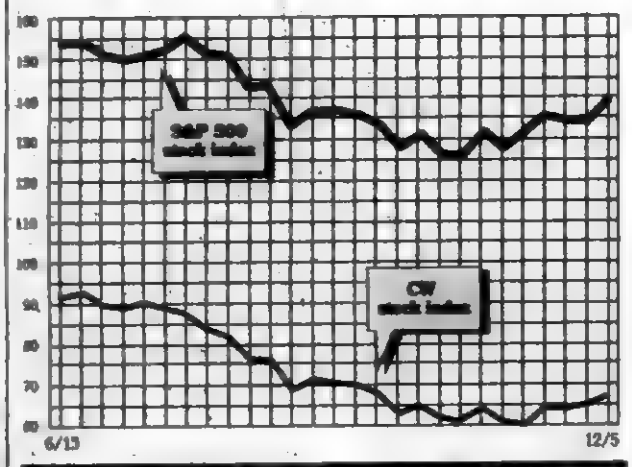

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Communications	104.1	106.0
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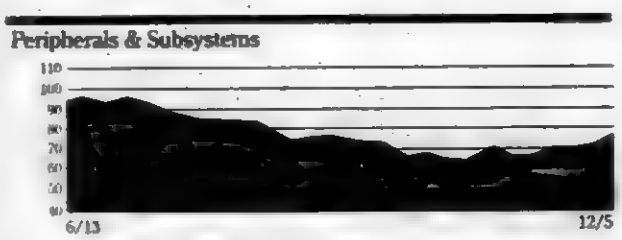
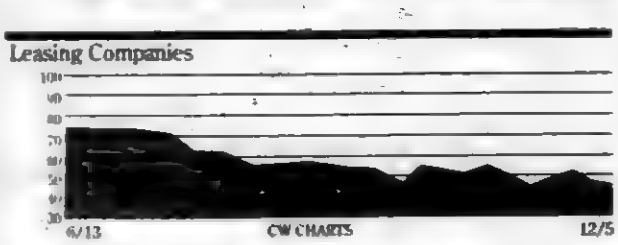
Software & DP Services	95.4	99.9
Semiconductors	40.6	43.6
Peripherals & Subsystems	71.2	77.3
Leasing Companies	48.9	47.1
Composite Index	65.5	67.9
S&P 500 Index	134.3	139.4





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CLOSING PRICES WEDNESDAY, DEC. 5, 1990

EXCH		52-WEEK RANGE		PRICE CLOSE DEC. 5, 1990	WEEK NET CHNGE	WEEK PCT CHNGE
Communications and Network Services						
N	AMERICAN INFO TECHS CORP	69	53	67.5	0.6	0.9
N	ANDREW CORP	26	16	19.75	0.3	1.3
Q	ARTEL COMM CORP	10	2	1.75	-0.3	-12.5
N	AT&T	47	30	30.125	-1.8	-5.5
Q	AVANTEK INC	4	2	2.375	-0.1	-5.0
N	AYDIN CORP	17	10	12.75	1.3	10.9
N	BELL ATLANTIC CORP	57	40	55.25	2.0	3.8
N	BELLSOUTH CORP	59	49	54.25	1.4	2.6
Q	COMPRESSION LABS INC	16	7	11.125	-2.1	-16.0
Q	COMPUTER NETWORK TECH	0	0	0.01	0.0	0.0
Q	CONTEL CORP	36	23	34.5	1.0	3.0
Q	DATA SWITCH CORP	4	2	3.125	-0.3	-7.4
Q	DIGITAL COMM ASSOC	27	9	12.5	1.3	11.1
Q	DYNATECH CORP	19	12	15.75	0.8	5.0
Q	FIBRONICS INTNL INC	13	5	8	0.4	4.9
Q	GANDALF TECHNOLOGIES	6	2	2.125	-0.4	-15.0
N	GENERAL DATACOMM INDS	5	2	2.375	0.3	11.8
N	GTE CORP	36	24	29.25	0.8	2.6
Q	INFOTRON SYS CORP	9	1	1.125	0.0	0.0
N	ITT CORP	61	40	47.875	1.6	3.5
N	M A COM INC	7	3	6.625	0.6	10.4
Q	MCI COMMUNICATIONS CORP	46	19	19.625	-0.3	-1.3
Q	NETWORK EQUIP TECH INC	34	5	6.125	0.3	4.3
Q	NETWORK SYS CORP	16	8	11	0.0	0.0
N	NORTHERN TELECOM LTD	30	22	28	3.0	12.0
Q	NOVELL INC	34	14	32.75	2.3	7.4
N	NYNEX CORP	92	67	71.625	2.0	2.9
N	PACIFIC TELESIS GROUP	52	36	45.625	1.1	2.5
A	PENRIL CORP	9	5	7.125	0.3	3.6
N	PLESSEY PLC	42	39	0.01	0.0	0.0
N	SCIENTIFIC ATLANTA INC	29	9	12.25	0.0	0.0
N	SOUTHWESTERN BELL CORP	65	47	56.125	1.9	3.5
Q	3 COM CORP	19	5	9	1.3	16.1
N	U S WEST INC	41	32	37.375	-0.1	-0.3
Computer Systems						
Q	ALLIANT COMPUTER SYS	9	1	0.875	0.0	0.0
Q	ALPHA MICROSYSTEMS	5	1	2.563	0.4	17.1
Q	ALTOS COMPUTER SYS	8	5	8.25	0.0	0.0
A	AMDAHL CORP	19	10	13.875	0.0	0.0
Q	APPLE COMPUTER INC	48	24	40.125	3.4	9.2
Q	AST RESH INC	28	10	27.875	2.4	9.3
N	BOLT BERANEK & NEWMAN	8	4	4.25	-0.1	-2.9
N	COMPAQ COMPUTER CORP	66	36	56	3.5	6.7
N	COMMODORE INTNL	12	5	10.5	0.6	6.3
Q	COMPUTER AUTOMATION INC	6	0	0.688	-0.2	-21.4
N	CONTROL DATA CORP	22	8	9.375	-0.6	-6.3
Q	CONVEX COMPUTER CORP	0	0	14	0.0	0.0
N	CRAY RESH INC	51	20	32	3.4	11.8
Q	DAISY SYS CORP	1	0	0.156	0.0	0.0
N	DATA GEN CORP	13	4	5.875	1.3	27.0
N	DATAPOINT CORP	4	1	1.5	0.0	0.0
Q	DELL COMPUTER CORP	14	5	13.375	0.3	1.9
N	DIGITAL EQUIP CORP	65	46	58	7.9	15.7
N	FLOATING POINT SYS INC	4	0	1.125	-0.1	-10.0
N	HARRIS CORP	36	14	20.375	1.1	5.8
N	HEWLETT PACKARD CO	50	25	33.375	4.4	15.1
N	HONEYWELL INC	112	71	93.5	3.8	4.2
N	IBM	123	93	114.625	2.3	2.0
Q	INFORMATION INTL INC	14	8	8.75	-0.4	-4.1
Q	IPL SYS INC	17	5	15.75	2.5	18.9
N	MAI BASIC FOUR INC	4	1	1	-0.1	-11.1
N	MATSUSHITA ELEC INDL LTD	166	116	121	-3.3	-2.6
Q	MENTOR GRAPHICS CORP	26	9	13.375	0.8	5.9
N	NBI INC	1	0	0.102	0.0	-18.4
N	NCR CORP	87	45	86.625	31.4	56.8
N	PRIME COMPUTER INC	7	4	0.01	0.0	0.0
Q	PYRAMID TECHNOLOGY	36	12	13.625	-0.4	-2.7
Q	SEQUENT COMP SYS INC	34	13	16.75	-1.0	-5.6
Q	SHAREBASE CORP	1	0	0.516	0.0	0.0
Q	SILICON GRAPHICS CORP	31	23	29	0.0	0.0
Q	STRATUS COMPUTER	23	19	29	0.0	0.0
Q	SUN MICROSYSTEM INC	37	15	22.75	2.9	14.5
Q	SYMBOLICS INC	2	0	0.281	0.0	0.0
N	TANDEM COMPUTERS INC	30	9	13.625	1.1	9.0
N	TANDY CORP	43	24	29.75	2.0	7.2
N	ULTIMATE CORP	10	1	2	-0.3	-11.1
N	UNISYS CORP	17	2	3	0.1	4.3
A	WANG LABS INC	8	3	2.875	0.1	4.5
Software & DP Services						
Q	ADVANCED COMP TECH	NA	NA	0.01	0.0	0.0
Q	AMERICAN MGMT SYS INC	20	11	16.875	1.0	6.3
Q	AMERICAN SOFTWARE INC	18	8	12.75	1.3	10.9
N	ANACOMP INC	5	1	1.75	-0.3	-12.5
Q	ANALYSTS INTL CORP	24	10	14.25	0.8	5.6
Q	ASHTON TATE	15	5	8.5	0.8	9.7
Q	ASK COMPUTER SYS INC	10	4	5.563	0.2	3.5
N	AUTO DATA PROCESSING	69	45	54.875	0.5	0.9
Q	AUTODESK INC	60	32	50.375	4.1	8.9
Q	BMC SOFTWARE INC	30	17	25.25	3.5	16.1
Q	BOOLE & BABBAGE INC	22	11	14	0.3	1.8
N	BUSINESSLAND INC	12	1	1.5	0.1	9.1
Q	COGNOS INC	10	4	7.5	-0.1	-1.6
N	COMPUTER ASSOC INTL INC	17	4	8	0.3	3.2
Q	COMPUTER HORIZONS CORP	17	8	15	0.8	5.3
N	COMPUTER SCIENCES CORP	50	37	49	1.5	3.2
N	COMPUTER TASK GROUP INC	12	7	7.625	0.4	5.2
Q	COMSHARE INC	25	14	18.25	0.3	1.4
Q	CORPORATE SOFTWARE	16	4	7.5	-0.3	-3.2
N	CULLINET SOFTWARE INC	0	0	0.01	0.0	0.0
N	GENERAL MTRS (CLS E)	38	24	37.5	1.6	4.5
Q	GOAL SYSTEMS INTL	19	8	9.0	-0.3	-0.3
Q	HOGAN SYS INC	7	2	2.625	0.4	16.7
Q	INFORMIX CORP	18	4	5.375	0.6	13.2
Q	INTELLICORP INC	8	1	2	0.3	14.3
Q	KEANE INC	0	0	0.01	0.0	0.0
Q	LEGENT CORP	31	17	23	0.0	0.0
Q	LOTUS DEV CORP	39	13	22	0.0	0.0
Q	MANAGEMENT SCI AMER	19	18	0.01	0.0	0.0
Q	MICROSOFT CORP	81	38	75.25	4.9	6.9
Q	NATIONAL DATA CORP	35	8	14.5	0.8	5.5
N	ON LINE SOFTWARE INTL INC	11	4	4.5	0.1	2.9
Q	ORACLE SYS CORP	188	5	8.125	1.5	22.6
N	PANSOPHIC SYS INC	19	7	8	0.0	0.0
Q	PHOENIX TECHNOLOGIES INC	5	1	2.375	-0.1	-5.0
N	POLICY MGMT SYS CORP	43	30	39	-0.3	-0.6
Q	PROGRAMMING & SYS INC	13	5	6	0.0	0.0
Q	RABBIT SOFTWARE INC	0	0	0.01	0.0	0.0
Q	RELATIONAL TECH INC	10	3	9.125	0.0	0.0
N	REYNOLDS & REYNOLDS CO	27	12	15.625	0.1	0.8
Q	SAGE SOFTWARE INC	16	8	10.75	-0.3	-2.3
Q	SEI CORP	22	15	18.25	0.3	1.4
Q	SHARED MED SYS CORP	18	12	17.875	1.8	10.0
Q	SOFTWARE PUBG CORP	28	12	20.25	4.5	28.6
N	STERLING SOFTWARE INC	11	6	7.75	0.6	8.8
Q	SUNGARD DATA SYS INC	26	10	14	2.0	16.7
Q	SYSTEMATICS INC	46	30	43.625	0.0	0.0
N	SYSTEM CENTER INC	25	6	10.25	-0.1	-1.2
N	SYS. SOFT INC	29	13	26	2.3	9.5
Q	WORDSTAR	2	1	1.063	0.0	0.0
Semiconductors						
N	ADV MICRO DEVICES INC	11	4	4.625	0.4	8.8
N	ANALOG DEVICES INC	10	6	6.375	0.4	6.3
Q	ANALOGIC CORP	10	8	8.75	0.4	4.5
Q	CHIPS & TECHNOLOGIES INC	24	5	8.625	0.8	9.5
Q	INTEL CORP	52	28	38.25	0.5	1.3
Q	LSI LOGIC CORP	0	0	0.01	0.0	0.0
N	MICRON TECHNOLOGY INC	16	7	11.625	1.6	16.3
N	MOTOROLA INC	88	49	55	1.0	1.9
N	NATL SEMICONDUCTOR	9	3	4.375	0.5	12.9
N	TEXAS INSTRS INC	44	23	36.25	4.4	13.7
A	WESTERN DIGITAL CORP	15	4	6.25	0.3	5.0
Peripherals						
Q	ALLOY COMP	2	0	0.094	-0.1	-50.0
N	AM INTL INC	5	1	1.375	0.1	10.0
Q	AUTO TROL TECH CORP	4	2	1.875	0.0	0.0
Q	BANCTEC INC	24	10	11.5	-0.8	-6.1
Q	CIPHER DATA PRODS INC	8	4	8.125	0.0	0.0
A	COGNITRONICS CORP	7	3	6.5	0.5	8.3
N	CONNER PERIPHERALS	31	11	28.25	3.5	13.6
A	DATAPRODUCTS CORP	10	5	0.01	0.0	0.0
A	DATARAM CORP	22	7	9.5	1.8	20.6
N	EASTMAN KODAK CO	44	34	41.875	-0.8	-1.8
N	E M C CORP MASS	10	3	7.875	-0.4	-4.5
Q	EMULEX CORP	9	4	5.75	0.3	4.5
Q	EVANS & SUTHERLAND	36	14	19.75	2.8	16.2
Q	ICOT CORP	2	0	0.375	0.2	99.5
Q	INTERLEAF INC	8	3	4.25	0.9	25.9
Q	IOMEGA CORP	6	3	5.125	0.4	7.9
Q	LEE DATA CORP	3	1	0.01	0.0	0.0
Q	MASSTOR SYS CORP	3	0	0.313	-0.1	-16.5
Q	MAXTOR CORP	17	4	5.375	0.9	19.4
Q	MICROPOLIS CORP	10	3	8.25	1.3	17.9
Q	MINISCRIBE CORP	0	0	0.03	0.0	0.0
N	MINNESOTA MNG & MFG CO	91	74	83.625	3.3	4.0
Q	PERSONAL COMP PRODUCTS INC	5	4	3.563	-0.4	-10.9
Q	PRIAM CORP	0	0	0.01	0.0	0.0
Q	PRINTRONIX INC	15	6	8.625	0.0	0.0
N	QMS INC	21	9	14.25	2.3	18.8
Q	QUANTUM CORP	26	9	22.625	1.6	7.7
N	RECOGNITION EQUIP INC	8	4	4.875	0.1	2.6
Q	REXON INC	10	4	5.875	0.3	5.6
Q	SEAGATE TECHNOLOGY	20	8	10.75	1.6	17.8
N	STORAGE TECH CORP	35	11	22.5	2.6	13.2
Q	TANDON CORP	4	1	2.125	0.4	21.4
N	TEKTRONIX INC	19	12	17.875	0.8	4.4
Q	TELEVIDEO SYS INC	1	0	0.219	-0.1	-22.1
N	XEROX CORP	60	29	38.75	3.0	8.9
Leasing Companies						
Q	AMPLICON INC	12	7	8.25	0.3	3.1
N	CAPITAL ASSOC INTNL INC	5	0	0.438	-0.1	-22.2
N	COMDISCO INC	28	15	18	2.1	13.4
Q	CONTINENTAL INFO SYS	1	0	0.039	0.0	-17.0
Q	LDI CORPORATION	17	9	10.875	1.1	11.5
Q	PHOENIX AMERN INC	6	3	5.25	0.0	0.0
Q	SELECTERM INC	7	3	2.75	-0.3	-8.3

EXCH: N—NEW YORK; A—AMERICAN; Q—NATIONAL

Merge urge

AT&T continues to woo NCR while tech stocks flourish

Youch! If familiarity breeds contempt, then AT&T and NCR Corp. must have been lifelong friends in another incarnation, because $6.12 billion worth of hostility now exists between the two firms. NCR's top brass sneered at AT&T's takeover bid of $90 per share, but investors apparently thought better of it. NCR shares zoomed up 36 points last week, closing Thursday at 92¾. AT&T, however, dropped 2 points by Thursday to close at 30⅛.

As the multibillion-dollar offer ricocheted around Wall Street, other technology stocks also lurched into action. Compaq Computer Corp. jumped 5¼ points to 58⅛, while Dell Computer Corp. finished Thursday just shy of a new high, up ½ of a point to 13⅝. Digital Equipment Corp. shot up 4¾ points to 56½.

Borland International topped its 52-week high, gaining 2¾ points for the week to 30⅜, and Autodesk, Inc. climbed 2⅛ points to 50¼. Prudential-Bache Securities, Inc. rates Autodesk a buy, citing its 70% hold on the computer-aided design software market. Lotus Development Corp. fell 2 points to 20¾.

IBM announced it will reorganize in the U.S. and Europe, which sent shares down 2⅛ points to 111½.

Among semiconductor firms, Motorola, Inc. soared 3½ points to 54. Texas Instruments, Inc. gained 3¼ points to 34⅛.

KIM S. NASH

NEWS SHORTS

Flight from Phoenix brings suit

"Phoenix's trade secrets and its employees are its most valuable assets," Phoenix Technologies, Inc. Chief Executive Officer Ron Fisher said last week, explaining why the firm hauled five ex-members of the latter "most valued asset" group into court on charges of stealing the former. Also charged with misappropriation of trade secrets and unfair business practices is Systemsoft Corp., the software firm founded by several of the defendants after leaving Phoenix. Systemsoft President Robert Angelo denied all charges. The suit, he said, "is clearly the act of a desperate company, intended to divert attention away from Phoenix's fundamental business and product problems."

Lotus closes Samna offer

Lotus Development Corp. said last week that stockholders of Samna Corp. had tendered 95% of outstanding Samna shares to a Lotus subsidiary formed to acquire word processing vendor Samna. Lotus' $65 million tender offer of Nov. 7 expired last week with almost 3 million Samna shares being tendered.

Temporary software exports OK

The U.S. Department of Commerce recently eased restrictions on the export of certain software for temporary purposes such as exhibitions, testing and inspection. These items may now be exported provided they are returned to the U.S. within one year: software used as a "tool of trade," software used in demonstrations not exceeding 120 days at any site and software used in news gathering by accredited media personnel.

German military requires openness

Midrange computer systems vendors will only be able to sell their products to the German Defense Department if they can prove the products correspond to current X/Open Portability Guide specifications (XPG3). According to the Defense Department, it made the decision in accordance with the German government's administrative recommendations. The Defense Department said XPG3 compatibility is essential for all acquisitions in the midrange data technology sector.

Bug overstates Army requirements

A bug in the U.S. Army's software for setting inventory levels at divisions' forward support units caused excess inventory equal to a $110 million, 10-day supply, the U.S. General Accounting Office (GAO) said. The Army issued "an emergency system change request" to fix the software, the GAO said.

Interface postponed

Interface/'91, the long-running industry conference focusing on the communications arena, has been rescheduled to coincide with Comdex/Spring '91, May 20-23 in Atlanta. Originally slated for March 26-28, the show was moved to complement Comdex, according to The Interface Group in Needham, Mass., which produces both events.

IBM to outline chip breakthroughs

IBM scientists this week are expected to claim world speed records for the types of circuits used in mainframes. In presentations scheduled for today at the International Electron Devices Meeting in San Francisco, IBM plans to describe its use of bipolar technology to set several records using both silicon and silicon-germanium transistors. IBM also plans to announce that it has built CMOS transistors out of a material called silicon-on-insulator, which it says can run three times faster than comparable silicon CMOS transistors.

MCI wraps EDI in X.400 envelope

MCI Communications Corp. last week announced the MCI EDI 400 service, which is said to provide global exchange of documents that comply with electronic data interchange standards over MCI's X.400-compliant electronic-mail service. The service also delivers to users that do not use X.400, MCI said.

Northern leaves LAN market

BY ELISABETH HORWITT
CW STAFF

NASHVILLE — Northern Telecom, Inc. last week pulled the plug on its one remaining local data networking product, Lanstar, and announced that it is officially giving up on the market. The action leaves 100-odd Lanstar customers out on on a proprietary limb and wishing that Northern had been more adept at nurturing what they claim is a uniquely useful product.

Lanstar, introduced in 1985, is a proprietary hub that links workstations and local-area networks over unshielded twisted-pair wiring. Its failure to sell is primarily due to its lack of LAN standards support, Northern spokesman Brian Murphy said.

Product not to blame

Users, while agreeing that Lanstar needed standards support, blamed Northern for "not recognizing a good product and not knowing how to market and sell it," said Larry Gauthier, systems planning coordinator at the University of Michigan. The university uses approximately two dozen Lanstar hubs to interconnect 1,500 to 2,000 workstations running Banyan Systems, Inc. Virtual Network Software (Vines).

Gauthier and other users praised Lanstar's high reliability as well as its ability to deliver 2.5M bit/sec. to each user on unshielded twisted-pair wiring over distances of up to 2,000 feet. In contrast, products based on the Ethernet 10Base-T standard — which users reportedly turned to instead of Lanstar — are prone to degradation problems and security leaks and require workstations to be within 308 feet of the wiring plant, Gauthier pointed out.

"I think Lanstar provides a level of functionality that is not offered in other products, through its long reach and high reliability," said Mark Beauchemin, senior network analyst at Lexington, Mass.-based MIT Lincoln Laboratories. Lanstar connects about 200 Lincoln Labs users, whose personal computers communicate via Novell, Inc.'s Netware and Apple Computer, Inc.'s Appletalk, he added.

Northern's promise to support Lanstar for the next 10 years "is no good whatsoever" unless the vendor also promises to update the product's software drivers to support the latest releases of Netware and Vines, Gauthier said.

Stuart Robinovitz, a senior information consultant at the University of Michigan, said this is an important consideration for the university, which may not be able to afford to migrate off its huge Lanstar installation in today's tough economic times.

Northern has chosen to focus its efforts on "connectivity, compatibility and network management" in the wide-area networking arena through its central office, Fiberworld, and packet-switch product lines, Murphy said. "We will still have LAN, but not hub-oriented LAN capabilities, through the Meridian 1," a digital private branch exchange system that, in addition to providing RS-232-based workstation links, can interface with Ethernet and Appletalk, Murphy added.

> "LANSTAR PROVIDES a level of functionality that is not offered in other products."
>
> MARK BEAUCHEMIN
> MIT LINCOLN LABS

Northern's decision to abandon local data networking makes sense, given its "pretty spotty track record" in the local networking arena, said Jack Musgrove, an associate director at San Jose, Calif., research firm Dataquest, Inc. Aside from Lanstar, Northern's major thrust into that market was the Meridian Data Networking System. The multipurpose, proprietary data connectivity platform was introduced approximately two years ago with maximum fanfare and was quietly discontinued in the summer of 1989.

Simmons

FROM PAGE 1

Corp. midrange and desktop machines and fault-tolerant computers from Stratus Computer, Inc. and Tandem Computers, Inc.

"At this point, a lot of what will affect Bank of Boston is beyond their control. The bank is in a defensive mode right now," said Michael Starr, an analyst at Duff & Phelps, Inc. in Chicago. "In the long term, however, this technology change is very positive and will put the bank in a more competitive position."

Like the rest of the bank, however, his six technology groups just finished cutting 8% of their budgets.

Yet even with its third-quarter losses of $255 million, Bank of Boston "is doing better than a lot of large banks in New England," said Lisa Todario, a bank analyst at SNL Securities in Charlottesville, Va.

"This is strategy on a rubber sheet," Simmons said, stressing that no spending plan has been mapped out yet. "It can be longer or shorter as needed, but it's overwhelming in its simplicity."

The basics of the technological changes that Simmons has under way include consolidating four data centers into two, casting off several midrange vendors and eventually creating a bank-wide network with "any-to-any" communications from each desktop.

"The key issue is access to data and linking up all these isolated technologies," he said.

"The business of banks is not counting money. We're in the information management business," Simmons added. "The communication network *is* the compute facility."

Taking the offensive

Consistency and cost cutting are the watchwords for Simmons' offensive on the hard times facing the financial industry.

"We're reducing and simplifying the choices," he said. "Most important of all, we're empowering the users."

Included on his "recommended short list" for workstations and LANs are IBM and DEC terminals, Intel Corp. 80386- and 1486-based PCs and Apple Computer, Inc. Macintoshes, with Microsoft Corp.'s LAN Manager as the preferred standard network operating system. If necessary, users can also turn to Novell, Inc. or Banyan Systems, Inc. LANs.

Bank of Boston also has nine different electronic mail systems which cannot cross-communicate. Eventually, there will be only three that will communicate: DEC's All-In-1, IBM's Toes and CC:Mail.

Simmons' technology blueprint will ultimately mean substantial expenditures, he acknowledged. But the adaptable nature of this "rubber sheet" strategy should adjust to whatever level of financing is available, he said.

"Electronic delivery of our products and services is our survival," he pointed out.

Consolidating data centers and streamlining computer platforms not only makes sense from a cost-cutting perspective, Starr noted, but should dispel the bank's reputation for being slow to respond to technological change.

"Simmons is a very positive influence in the bank," said Michael Landolfi, technology manager for the banking services division. "He's what this bank needed."

Europe a plus in AT&T bid

BY LINDA LEWIS
IDG NEWS SERVICE

PARIS — The European market is a big factor in AT&T's bid for NCR Corp. French customers of NCR were mulling over the same questions as customers in the U.S. last week: Will the immense resources of the telephone company offset the difficulties NCR faces in turning from a proprietary systems line to an open systems strategy?

Michel Loury, president of an NCR user committee in France, viewed the proposed merger as mostly positive. "It would enhance NCR's role as a supplier of computer systems to European companies," he said. "Companies not offering Unix are no longer a consideration."

Michel Morin, head of the computer division at FR3, a French television network, said he believes NCR is better positioned to remain independent.

Didier Caspers, who is in charge of the computer department at Banque Nationale de Grece, said his organization's major preoccupation is migrating its NCR 9300 to the new 3000 series and the transition from NCR's ITX proprietary Unix systems to Unix System V. "NCR can't drop its old clients," he said.

AT&T, NCR engaged in war of words

A flurry of correspondence between NCR Chairman Charles E. Exley Jr. and AT&T Chairman Robert E. Allen escalated into a heated war of words over the merits of such a merger. What follows are excerpts from that correspondence:

Dear Bob:

. . . The board of directors of NCR has unanimously determined to reject AT&T's proposal to purchase NCR for $85 per share in AT&T stock as not in the best interests of the shareholders and other stakeholders of NCR.

. . . We at NCR are disappointed that, despite our having shared with you our most candid and careful evaluation of your proposal and the attendant risks for everyone affected by it, you have continued in your efforts to acquire NCR.

. . . If AT&T is prepared to offer a price which more accurately reflects what you characterized to our board as the substantial prospects of NCR's business plan . . . NCR is prepared to enter into private discussions.

— Exley to Allen, Nov. 30

Dear Chuck:

. . . I had hoped by now we would be jointly announcing the successful negotiation of the merger. Unfortunately, this is not the case . . .

. . . To our surprise, your advisers promptly dismissed our higher proposal and stated that NCR would not share any information, meet with us or our advisers or even look at a draft of the merger agreement until we further increased our price to an unstated amount that you consider to be "preemptive."

. . . AT&T and its board of directors are committed to the combination of our two companies . . .

— Allen to Exley, Dec. 2

Dear Bob:

I am puzzled and dismayed by the misleading characterizations of the events to date both in your latest letter and AT&T's Dec. 2 press release. The press release could only have been written by someone with no knowledge of the facts.

AT&T's Allen

NCR's Exley

. . . I want to set the record straight. You came to us with an unsolicited proposal to acquire NCR in an $85 stock-for-stock transaction, which threatened a hostile takeover . . . We have never participated in negotiations with AT&T relating to any potential business combination.

. . . The combination of AT&T and NCR makes no sense from a business or strategic view . . . Already the process of destroying [AT&T] shareholder value . . . is under way.

— Exley to Allen, Dec. 3

Dear Bob:

. . . NCR is prepared to commence negotiations if AT&T offers to pay not less than $125 per NCR share.

. . . You have still given us no reason whatsoever to change our view that the transaction you propose makes no business sense, and so it must be a desperate attempt to salvage AT&T's disastrous foray into the computer business.

— Exley to Allen, Dec. 5

Dear Chuck:

I'm sorry to tell you that AT&T feels it now has no choice but to go ahead tomorrow and commence its cash tender offer for NCR at $90 per share . . . We intend to continue our computer business under the NCR name and the leadership of NCR's senior management . . .

Second, we do not intend, in any way, that NCR's people be diverted from dedicating all their energies and resources toward NCR's existing programs and customers . . . We do not understand how you can maintain . . . that a merger at $125 in AT&T stock would work . . . but a merger at $90 would be a strategic disaster. Chuck, all we have is a difference of opinion on price.

— Allen to Exley, Dec. 5

NCR takeover

FROM PAGE 1

will finally bring it success in the computer business, came one day after NCR's board unanimously rejected an unsolicited $90 per share stock-swap merger proposal. NCR did say that it would be willing to enter into confidential negotiations should AT&T begin its bid with a $125 per share stock-swap offer.

AT&T and NCR users took the news in stride. Many said they recognized the synergies between the two firms, which have bet their futures on Unix, open systems and a client/server network computing architecture.

"AT&T and its whole networking and communications ability adds a lot to what NCR has to offer," said Timothy Gallagher, head of TP Gallagher and Associates, Inc., a Chicago-based systems integrator specializing in retail banking. Gallagher said he expected it would take three to five years before there would be any benefit from the union.

"I don't see any particular reason for concern," said NCR customer David V. Evans, vice president of information systems at J. C. Penney Co. in Dallas. "I believe the table is set for someone to be enormously successful in Unix for commercial customers."

Mind your own strategy

Any anxiety users had involved the prospect that AT&T would meddle with NCR's daring strategy to be the first of the old-line computer companies to abandon its proprietary approaches in favor of Unix and an exclusively microprocessor-based hardware platform. The System 3000 computer family, announced in September [CW, Sept. 24], will use Intel Corp.'s 80386 and I486 chips and range from laptop computers to loosely coupled, parallel systems.

"I'm only nervous if it's going to distract NCR from meeting its objectives" with the System 3000 project, said Paul Gallico, director of the information center at Toys-R-Us, Inc.

Big V Supermarkets, Inc. in Florida, N.Y., has used NCR's 9800 mainframe for 2½ years, along with NCR Towers, PCs and communications front ends from NCR Comten. The lease on the 9800 runs for another two years, and the company is seriously considering a move at that point to a Unix platform — perhaps as a stepping stone to NCR's System 3000. "If NCR is left to its own devices, that's fine," said Dennis Melville, vice president of IS at Big V.

In counterpoint to the cool reaction of its customers, NCR itself may be brought kicking and screaming to the negotiating table with AT&T. Declaring his company is not for sale, NCR Chief Executive Officer Charles E. Exley Jr. repeatedly blasted what he called AT&T's "pressure tactics" and promised his company would fight the takeover with all available means.

Among other defensive actions, Exley, who turns 61 this week, said he will resign from NCR if AT&T succeeds with its effort. NCR's board also beefed up its "poison pill" defense late last week, modifying shareholder rights provisions.

Several users and analysts argued that AT&T needs NCR more than NCR needs AT&T. Executives at AT&T as much as conceded that point, pledging to keep NCR intact and turn over its own money-losing computer operations to NCR's current management team.

"AT&T's stuff isn't selling, and NCR, has come up with an implementation strategy that's similar," said George Brenner, director of corporate IS and vice president at Universal City Studios in Los Angeles. Universal has a number of AT&T 3B2 minicomputers.

"When the 3B2s run out of gas," he said, "we will look at the next level of Unix box, and if there's an easy migration to NCR, we'll take it."

AT&T's aggressiveness surprised several analysts who originally predicted the telecommunications giant would not pursue a hostile takeover action and risk the expense or the ill will it would cause within NCR's top ranks.

Unexpected urgency

"Frankly, I'm kind of surprised," said Harvey L. Poppel, a partner at Broadview Associates, a Fort Lee, N.J.-based information technology merger and acquisition firm. Such a move, he said, is totally against AT&T's typical modus operandi and "shows a sense of an imperative that this is a company they absolutely must have."

Robert M. Kavner, AT&T's group executive for data systems and federal systems, called the proposed merger "an essential strategic step for us" and said it would produce "a strong American company to compete in the global marketplace, with $45 billion in combined assets."

AT&T's desire for NCR, which has been rumored in other years, is not the first indication AT&T was looking for a solution to its problems in building a viable computer business. During the past nine months, AT&T has inked three different OEM deals with Pyramid Technology Corp., Tandem Computers, Inc. and Intel Corp. It also holds a 19.1% equity stake in Sun Microsystems, Inc.

"AT&T needs a stronger position in the computer market or has to get out of it," said Tom Nolle, president of CIMI Corp., a technology assessment company in Voorhees, N.J. "The 3B has not succeeded in the commercial market and is not going to."

AT&T's resources would fund NCR's "gutsy and desperate" Systems 3000 gambit, Nolle said. No other company has successfully migrated its base to open systems, he noted, adding, "NCR needs to establish the credibility of the System 3000 or their life span will be measured in years."

However, promises to retain NCR's status quo are suspect, he continued. He estimated there was a 15% to 20% overlap in field sales forces between the two companies, a 30% manufacturing overlap and an even greater duplication among headquarters and management personnel.

Exley to AT&T: Not at any price

In a telephone interview Friday morning, NCR Chairman Charles E. Exley Jr. made clear his personal opposition to a merger with AT&T, even if the price rose to a point where it would make sense for NCR shareholders. Following are excerpts of the interview with Computerworld *Midwest Bureau Chief Ellis Booker.*

Is NCR as of this morning still planning to fight AT&T's hostile takeover attempt?
Oh, yes indeed.

If it's a disaster at $90 per share, why not at $125?
It will be a disaster at $90, at $125, at $200 . . . At $125 per share, it does make business sense for NCR shareholders . . . If they were willing to meet that price — and I hope they do not — I would feel it was my duty, hate it though I would, to sell the company.

What happens to NCR if it fights a protracted battle? At some point, won't this harm customers?
Reaction we're getting so far from customers is positive. The raider has said wonderful things about us . . . If I were an AT&T customer, on the other hand, I'd be mighty concerned.

If we were running the [merged computer operations], we would orphan the 3B2 as fast as we could . . . We have selected Motif; they have selected Open Look. Open Look would get axed. Our client/server architecture is based on the PC model; theirs is on the Unix model. The Unix model would get axed.

You were Burroughs Corp.'s chief financial officer until Sept. 1, 1976. From this vantage point, do you think an NCR/AT&T combination risks becoming another Unisys?
I don't think it would be that bad. That's an especially colossal calamity. At least we begin with a healthy company on one side — NCR. But I think we've got to remember that a sick elephant can kill a healthy dog just by falling on it.

AT&T has a need to fulfill

BY ELLIS BOOKER
CW STAFF

"Why are we doing it now?" AT&T Computer Systems President Richard McGinn asked rhetorically. "Because there's an absolute sea change customers are making as they move from traditional computing to network computing."

McGinn said this shift is as fundamental as the move from centralized processing to the personal computer in the 1980s, but he conceded that "organic growth only, quite honestly, won't be enough" for AT&T to gain a leadership position.

In its heart, then, AT&T hopes a combination with NCR Corp. will give it the market access and management savvy it desperately needs to realize its goal of becoming a significant provider of integrated computer and communications systems.

NCR is also attractive because its areas of dominance, the financial and retail industries, do not overlap with AT&T's strengths in the lodging, telecommunications and federal government markets.

NCR, the fifth largest computer company in the U.S., also claims an attractive international business, with 60% of its sales coming from outside the U.S. AT&T's computer group counts only about $100 million of its annual $2 billion in revenue from overseas sales.

From a product standpoint, too, the congruences are strong.

In software, both AT&T and NCR have client/server computing approaches that actually share common components. AT&T's Rhapsody, the office automation and work flow automation platform it launched in March, and Cooperation, the objected-oriented office and work flow environment NCR announced in October, both use Hewlett-Packard Co.'s New Wave graphical user interface.

NCR was also an early backer of Unix, the operating system developed by AT&T Bell Laboratories, which has become a cornerstone in AT&T's postdivestiture work-group, server and high-end computer strategy.

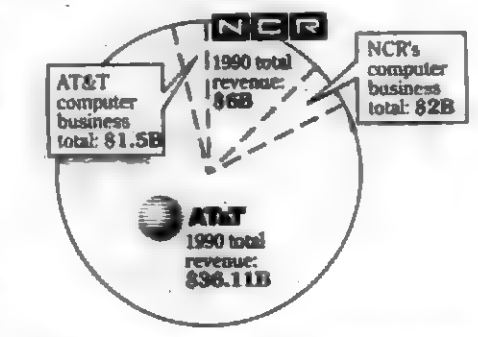
Finally, NCR and AT&T have the same network management approach, the former using an OEM version of AT&T's Stargroup Unix-based LAN manager.

However, when it comes to discussing current hardware products — specifically, whether the much-maligned 3B2 minicomputer that AT&T launched in 1984 will be terminated as a result of a merger with NCR — AT&T officials appear to be on the defensive.

"Fifty thousand [3B2s] have been sold since '84 . . . about the same number as NCR Towers," McGinn said, adding, "It's a profitable business for us."

Both the Tower and the 3B2, he continued, will be transcended in time with Intel Corp. I486- and reduced instruction set computing-based architectures.

Lines of business
While NCR is only 1/6 the size of AT&T, its computer business is 1/3 larger than the size of its potential acquirer



Source: Prudential-Bache Securities, Inc. CW Chart: Marie Haines

Hostile

FROM PAGE 1

especially one like this where [the target's] management has been doing a good job," said Scott Smith, an analyst at Donaldson, Lufkin & Jenrette.

The proposed AT&T buy could put anywhere from a six-month to a year-long crimp in NCR's ambitious System 3000 strategy, said Judith Hurwitz, an analyst at Patricia Seybold's Office Consulting Group in Boston — that is, if NCR's current management remains and is given the reins. Hewlett-Packard Co.'s 1988 acquisition of workstation maker Apollo Computer, Inc. — one of the friendlier computer industry combinations in recent history — produced costly product line delays, she said.

When both sides are willing — even eager — the melding of disparate technologies and corporate cultures inevitably turns out to be a longer, harder and costlier proposition than anticipated.

The added threat that critical talent will walk out the door in protest has kept most firms from even trying to acquire a computer company against its will, Smith said.

Nevertheless, some industry observers and players said they believe that technological, financial and corporate trends are converging to create a computer industry far less unfriendly to hostile takeovers than has traditionally been the case.

"These acquisitions will make more sense as the industry matures and standardization proliferates," said Bahar Gidwani, a computer industry analyst based in New York. "The more standards each company relies on, the less disruption of their respective product lines after a takeover." Outsourcing will also ease transitions, he said.

Merger veteran Joe M. Henson, now chairman of Legent Corp., said the AT&T bid "is vastly different from the debt-financed hostile bids driven by financiers that we were seeing so many of a short while back."

Rather, Henson said, "there is a marketplace imperative to this consolidation" of NCR and AT&T, with "too many players with too many products chasing too few prospects."

Henson has seen the combination game from all positions. As chief executive officer of Prime Computer, Inc., he presided over that company's hostile acquisition of computer-aided design and manufacturing player Computervision, Inc. in 1987. Henson was still aboard one year later when MAI Basic Four, Inc. mounted its hostile takeover attempt against an engorged Prime that was struggling with indigestion. Subsequently, he guided software firms Morino Associates, Inc. and Duquesne Systems, Inc. through their merger into Legent.

Industry economics, he said, are making a moot point of the hostile/friendly distinction.

"NCR isn't going to make it alone," he said. Any work-force reduction or product line trimming, he added, "will probably happen anyway. In the long run, isn't it better that it happens because of a merger that creates a viable [computer industry contender], rather than at the mercy of economic necessity?"

TAMING OF THE FEW

Consummated hostile takeovers have not fared well in the computer industry. Examples include the following:

1985: **Datapoint, Inc.** falls to arbitrageur Asher Edelman. Many losses, reorganizations and lawsuits later, a vastly pared-down Datapoint reported a profitable quarter last week.

1986: **Burroughs Corp.** acquires Sperry Corp. and emerges as Unisys Corp., which is for a short time the second largest computer vendor in the world. In the wake of losses and draconian work-force cuts, Unisys is now seen as a ripe acquisition target, with its market value slipping to well below $1 billion.

1988: **Computervision, Inc.** falls to Prime — but technological woes leave Prime open to the hostile advances of MAI Basic Four, Inc. Nine months of resistance devastate Prime's bottom line, employee roster and morale. White knight J. H. Whitney & Co. makes eleventh-hour purchase of Prime.

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Computerworld (ISSN 0010-4841) is published weekly, with a single combined issue for the last week in December and the first week in January by CW Publishing/Inc., 375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171.
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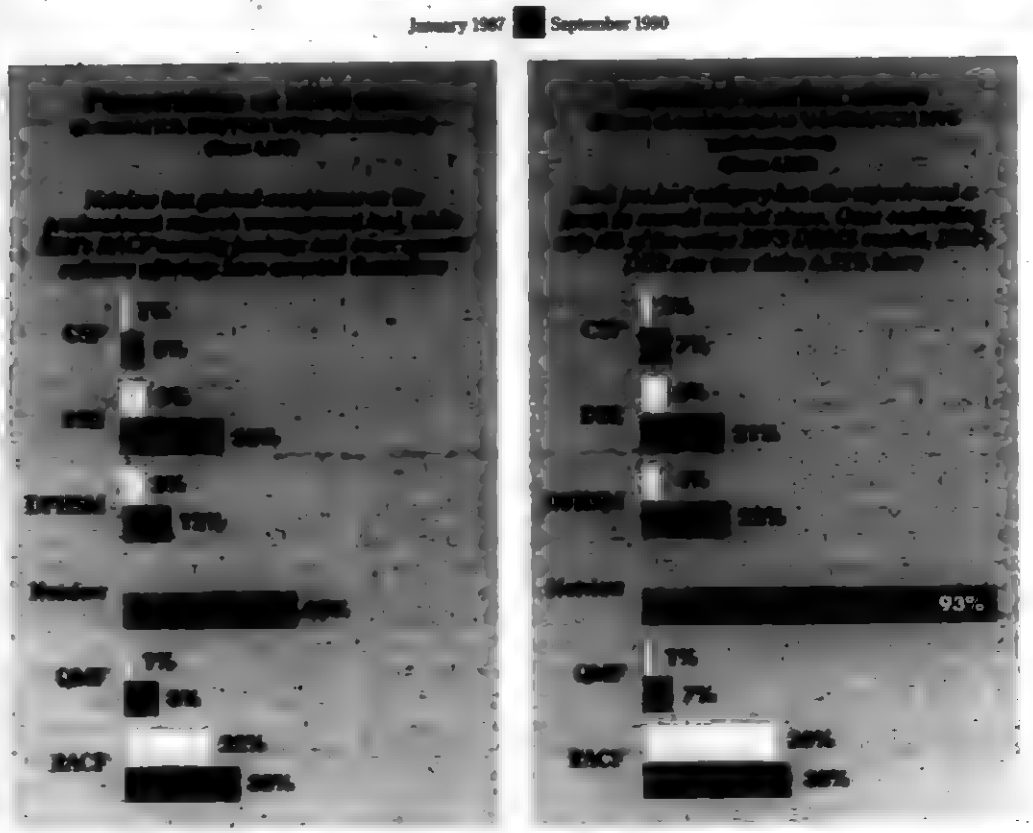
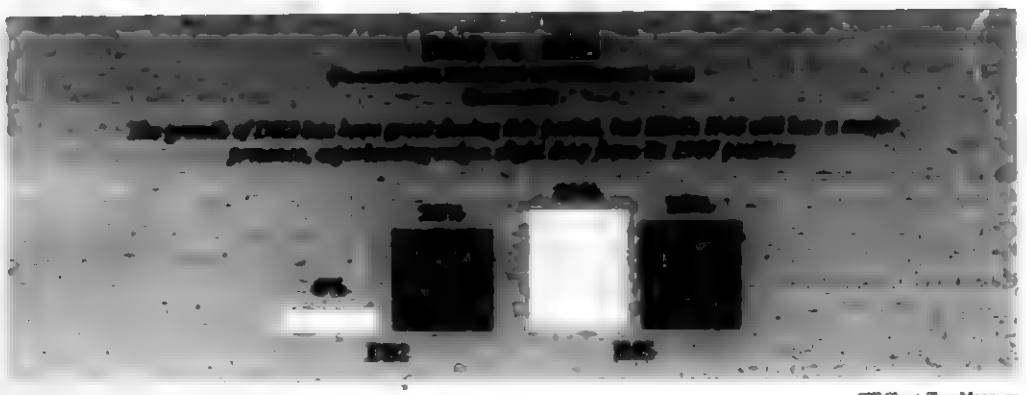
TRENDS

Strategic Systems Software

Six major IBM systems software products have strengthened their foothold within the MVS arena during the last few years





Source: Computer Intelligence, La Jolla, Calif.

CW Chart: Tom Monason

NEXT WEEK

As Operation Desert Shield enters its fifth month, U.S. armed services officials are evaluating how local- and wide-area networks have helped smooth the fastest mobilization in military history. IS managers at **Oakland Army Base** only have to look out their windows to see how their electronic tracking and planning systems are working.

Robert Holmgren

Johnson Wax is serious about re-engineering with information systems — so much so that the IS department has transformed its own human resources allocation process with an innovative database application that matches jobs and projects with skill levels. In Depth examines the leading-edge IS strategy of this global manufacturer.

INSIDE LINES

Big John on the prowl?

Rumors are rife in the industry these days that Dun & Bradstreet Software is looking closely at a privately held software company in Michigan to augment D&B Software's line of products for the IBM Application System/400 midrange computer series. Whether it would be an outright acquisition or some type of marketing agreement remains uncertain at this point, but the Michigan software house responded to *Computerworld*'s questions with a big "no comment." A spokesman for D&B Software added that it is company policy not to comment on acquisition or divestiture rumors.

And a very merry to you, too

Wang has confirmed that it will close many U.S. operations for an unpaid "holiday shutdown" from Dec. 24 through Jan. 2 in an effort to cut expenses during a traditionally slow time of year throughout the industry. According to a Wang spokeswoman, manufacturing facilities will not be affected, and skeleton crews will be working in various departments.

Just down the street

Gary Kennedy, who resigned as president of the Oracle USA sales division during an Oracle Systems shake-up in early September, has landed on his feet. The former chairman of Oracle Complex Systems in Arlington, Va., is now just a hop, skip and jump away at PRC, Inc., a systems integration company in McLean, Va. Kennedy, whose aggressive sales style helped build Oracle into a $971 million software giant, is now president and chief executive officer at $700 million PRC, a Black & Decker subsidiary. "I considered many offers after I left Oracle," Kennedy said last week. But it only took six weeks from the time he left Oracle Complex Systems on Oct. 15 until he became a top cat once again.

AT&T lightens up

Robert Kavner of AT&T said last week that a stripped-down version of Unix is in the works for personal computers. Addressing Technologic Partners' semiannual gathering of the tribes in California, Kavner said developers are working on a version that will require as little as 4M bytes of random-access memory and a 40M-byte hard disk. "Unix Lite" will take out all the extraneous enhancements to Unix and make them available as add-on packages, he said.

Next, not in line

An impromptu and decidedly unscientific survey at the recent Cause '90 conference for campus information systems folks found virtually no intent to buy a Next, Inc. machine. The reason? The machine is costly, which is bad enough, but the college computer chiefs also complained that the level of support for the machine, as required by Next, is way out of line. One conference attendee said he bought three of the machines from another university to get around the support requirements. Next started off planning to sell the machine to campus computer users but has since decided also to market to corporate customers.

Will they call in Sherlock Holmes?

Scotland Yard has set up a computer crime unit to keep track of computer virus outbreaks in hopes of compiling evidence and cataloging the damage caused by a particular virus, assuming the virus author is nabbed. The unit is staffed with four detectives and based at New Scotland Yard, London. Under the UK's new Computer Misuse Act of 1990, a virus author could be imprisioned for as long as five years.

NCR CEO Charles E. Exley Jr. showed he hasn't lost his sense of humor during the running battle to stave off AT&T's takeover attempt. Taking time out from the NCR war room to make an appearance at Businessland's Technology Summit in Atlanta last Thursday, Exley wisecracked, "I heard AT&T is going to change its tag line to 'Reach out and grab someone.' " But that was all he had to say, and he dodged a press ambush on his way back to Dayton, Ohio. We'll be staying on top of the action and working on the postmortems, so call in your opinions and insights to Assistant News Editor Jim Connolly at (800) 343-6474, message COMPUTERWORLD *on MCI Mail or fax documents to (508) 875-8931.*

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DE 17 1990
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THE NEWSWEEKLY OF INFORMATION SYSTEMS MANAGEMENT
December 17, 1990 · Vol. XXIV · No. 51 · 102 Pages · $2/Copy · $48/Year

COMPUTERWORLD

MAP/TOP to get better standards fit

BY ELISABETH HORWITT
CW STAFF

After remaining frozen for two years, MAP/TOP 3.0 is due to be thawed next spring and freshened up with some of the latest advances in standards-based networking, the North American MAP/TOP Users Group announced recently.

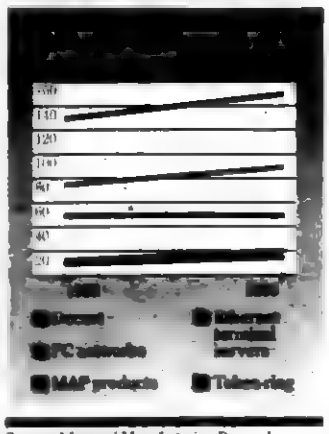
Among the more notable enhancements that will be incorporated into the 1991 MAP/TOP 3.0 supplement are Integrated Services Digital Network and 10Base-T support for Technical Office Protocol and the long-awaited fiber-based version of the 802.4 token-bus protocol. Manufacturing Automation Protocol and TOP are user-defined subsets of the Open Systems Interconnect standard, with MAP targeting the local factory networking environment and TOP addressing the office and business environment (see story page 47).

The supplement will help to align MAP and TOP protocols

Continued on page 16

Catch-up time

Manufacturing Automation Protocol (MAP) has lagged behind other technologies on the factory floor



Source: Advanced Manufacturing Research
CW Chart: Paul Mock

Judge kills Dbase copyright

Decision clears way for clone makers to invade Ashton-Tate turf

BY JAMES DALY
CW STAFF

In a move that could signal the beginning of a radical opening up of the database software market, a federal judge has ruled that Ashton-Tate Corp.'s original copyright for its popular line of Dbase software applications is invalid.

The ruling by U.S. District Judge Terrence J. Hatter Jr. came at the culmination of a drawn-out copyright infringement suit that Ashton-Tate had brought against Fox Software, Inc. for allegedly duplicating the appearance of the Dbase III Plus package. The ruling could open the Dbase market to competitors and make a wider variety of low-cost options available to users. "A major drawback with Dbase is its high price," said Rocco Esposito, personal computer coordinator at Maidenform, Inc. in Bayonne, N.J., which uses Dbase-compatible software.

Neglected to disclose

In dismissing the 2-year-old case, Hatter ruled that when Ashton-Tate filed for its original Dbase copyright, it neglected to disclose that the program was a derivative of the Jet Propulsion Laboratories Document Information System, a public-domain application developed at the Jet Propulsion Laboratories in Pasadena, Calif.

"As a result of its inequitable conduct," Hatter declared the Dbase copyrights invalid.

While developers have hailed the move as an opportunity to open up the database market, Ashton-Tate President William Lyons said the company had no inkling the case would blow up in its face and would immediately ask Hatter to reconsider. "We're surprised and alarmed because we never got to the

Continued on page 96

IN DEPTH: JOHNSON WAX

Playing 'Skill Connection' with IS

BY JOANIE M. WEXLER
CW STAFF

The 400-member worldwide information systems staff at S. C. Johnson & Son, Inc. is holding its head high these days. It has re-engineered its *modus operandi* with a system that is now serving as a model for the entire firm.

Lengyel *heads IS skills development*

Traditionally, the strategic role of IS has meant providing users in such business areas as sales, marketing and manufacturing with quick access to corporate resources that allow them to make better decisions faster. However, the firm, commonly known as Johnson Wax, has decided that IS employees *themselves* are strategic resources. It has developed a "skills inventory" database application to match individuals' expertise with the projects that suit them best.

Dubbed Proficere, the database system was built around Information Builders, Inc.'s Focus and was designed by Johnson's Information Services Group to provide quick, analytical access to the human resources it needs.

The project, spearheaded by Vice President and Chief Information Officer Laurance Burden and Director of IS Management Support Services Randy Lengyel, was based on more than a year's worth of interviews conducted with human resources and IS

Continued on page 63

Failures pester portable PCs

BY RICHARD PASTORE
and MICHAEL FITZGERALD
CW STAFF

The first of Frank Nestor's Zenith Data Systems Supersport portable computers died on Oct. 23, 1989. The screen turned black on the Intel Corp. 8088-based unit. Since then, Nestor's 16 Supersports have failed a total of 31 times.

"Zenith would send me a replacement machine, and that would fail also," said Nestor, director of MIS at Summit Consulting, Inc. in Lakeland, Fla. He awaits an explanation from Zenith.

This is just one horror story from the world of portable computing, which frustrated users claim is rife with reliability problems, brand inconsistencies and exorbitant repair costs.

A high-ranking information systems official at a major federal agency using 1,500 Intel 80286-based Supersports said the machines have had several bad screens and defective hard drives. The agency said it was sending in so many units for repairs that its third-party maintenance firm complained it was losing money on the service contract.

NEC Technologies, Inc. almost lost a major customer because of chip failures and difficult setup procedures with its Prospeed 386-based portables.

The problems surfaced in "a

Continued on page 4

3Com to cut back software operations

Microsoft will take on LAN Manager control

BY PATRICIA KEEFE
CW STAFF

3Com Corp. will bail out of the network operating system business next month. According to internal documents obtained by *Computerworld*, 3Com intends to sell the rights to its LAN Manager-based 3+Open software and license a raft of LAN Manager research and development efforts to longtime partner Microsoft Corp.

Knowledgeable sources indicated that the announcement will take place early next month.

3Com President Eric Benhamou also told an assembly of managers last week that 3Com will stop investing money in four areas: directory services, personal computer-based internetworking, the Maxess Systems Network Architecture gateway family and various "nonessential aspects" of network management.

Managers were also told that if 3Com cannot find an investor or buyer by Jan. 15 for either Maxess or the Communications Solutions, Inc. division that

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INSIDE

Product Spotlight — There's a maze of client/server definitions to navigate before you buy actual products. Page 59.

The disgruntled staff member who allegedly wrote and sent the Scores virus on its way through an EDS computer and eventually into NASA systems could face charges in a few weeks. Page 4.

What lurks in the shadows? Perhaps a new source of cash for software vendors and some clarification of the policies governing the use of a single copy of a program. Page 7.

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6 Although its bell-ringing method of collection has been around for years, the **Salvation Army**'s database is brand new.

10 Concerned corporate Macintosh users meet with **Apple** executives to voice integration concerns and other needs.

12 IS staff members at **Amoco** are being reassigned — organizationally, not physically — to business units, where profit/loss responsibility lies.

16 **Fibronics** is forbidden to participate in next year's Interop show for violating a nondisclosure agreement.

95 Analysts say if IBM's **Officevision** doesn't deliver something soon, frustrated users may give up on it.

95 **D&B Software** is putting customers in the limelight, promising increased service and executive visibility for the new year.

96 The former **Houston 30** joins the Corporation for Open Systems and fields hundreds of membership inquiries from across the U.S.

Quotable

"Frankly, it's embarrassing to be an expert on EDI and to forecast explosive growth year after year after year."

THOMAS P. COLBERG
PRICE WATERHOUSE

On users' cautious acceptance of EDI. See story page 48.

SYSTEMS & SOFTWARE

25 While DEC's software is more than adequate, its method of marketing leaves much to be desired, according to analysts.

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35 It don't matter to me: Although some **Businessland** clients are concerned about the company's downward financial turn, others are saying, 'No problem.'

NETWORKING

47 Supporters of the standard are concentrating their efforts on raising users' OSI consciousness level — all the way to the top of the corporate ladder.

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49 Although few executives remain unscathed during the IS career battle, many emerge healthier, happier, wiser — and wealthier.

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The 5th Wave

"I SAID I WANTED A NEW MONITOR FOR CHRISTMAS! MONITOR! MONITOR!"

EXECUTIVE BRIEFING

■ **Johnson Wax has successfully re-engineered** several business functions with information technology — including the IS department itself. The $2.5 billion manufacturer uses a "skills inventory" database that matches IS employees to appropriate projects — and saves money. The firm is also revamping its financial applications and using an expert system to cope with worldwide environmental regulations. **Pages 1, 63.**

■ **Amoco's IS organization is the latest to push more responsibility** out to business units. Five hundred of Amoco's 1,900-employee IS staff will report to business unit executives instead of to IS managers. However, Amoco remains committed to several centralized IS functions, including consolidated data centers. **Page 12.**

■ **Laptop computers are rife with reliability weaknesses,** brand inconsistencies and high repair costs. Analysts attribute the portable problems to vendor compromises between weight, cost and durability. **Page 1.**

■ **An EPA study of radiation from VDTs** and other sources recommends a wave of new studies on the potential health risks. A draft of the study concluded that there is enough of an "elevated risk" of a link between cancer and electromagnetic fields to justify more studies. **Page 96.**

■ **A federal judge found Ashton-Tate's database copyright invalid** because the original copyright application failed to acknowledge existing technology from which the Dbase software was derived. The ruling, which caused the dismissal of Ashton-Tate's 2-year-old suit against Fox Software, could open up the personal computer database market and set a precedent for other pending copyright cases. **Page 1.**

■ **Data General founder Edson de Castro resigned** from the company, but the move was seen as more symbolic of the end of an era than as an action that would have a major effect on the company. De Castro had been much less involved in daily operations than President and Chief Executive Officer Ronald Skates. DG continues to bet its future on the Aviion line, which faces big hurdles in the brutally competitive workstation market. **Page 97.**

■ **The so-called Houston 30 users alliance** joined the Corporation for Open Systems. Officially known as the User Alliance for Open Systems, the group is one of a growing number within COS pushing to define user standards for vendors. **Page 96.**

■ **The high-tech holiday spirit** is in full swing at The Salvation Army in Chicago. A Microsoft Works database helps the Salvation Army schedule bell-ringing Santas and track donations at more than 650 "kettle sites" in the Chicago area. **Page 6.**

■ **What recession?** A leading IS executive search firm says that demand for top IS talent is as strong as ever — as are the salaries it commands. **Page 49.**

■ **The list of the IS field's "worst job seekers"** and their blunders includes short-term thinkers, money-mongers and poor interviewees. **Page 81.**

■ **Legal eye:** IS managers need to keep on top of copyright and patent laws in the early stages of software development. These laws are becoming more stringent than ever, and the stakes are high. **Page 87.**

■ **On-site this week:** Operation Desert Shield officials are generally pleased with the success of a massive PC network that tracks equipment and materials for the operation. **Page 48.** At Alaska Airlines, integration of in-house capabilities and outside services such as System One has helped keep the growing Seattle-based carrier profitable for 18 years. **Page 27.** One of the world's more unusual expert systems tracks mushroom-growing afflictions such as "bacterial blotch" at the Mushroom Experimental Station in The Netherlands. **Page 39.**

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Police set to nab virus author

Creator of the Scores virus is believed to be a former EDS employee

BY MICHAEL ALEXANDER
CW STAFF

DALLAS — The Dallas Police Department is preparing to file charges within weeks against the reputed author of Scores, a highly infectious and destructive virus that attacks Apple Computer, Inc. Macintoshes. It will be one of the few instances where a computer virus author has been identified and prosecuted for releasing his creation, according to computer virus experts.

The suspect, who authorities did not name, is thought to be a former employee of Electronic Data Systems Corp. (EDS), because the virus was originally designed to attack two proprietary applications used exclusively by EDS. The infected programs caused computer systems to crash repeatedly.

The virus was written in late 1987 and released in February 1988, according to a number of virus experts. It was quickly discovered and eradicated by EDS engineers within two weeks, according to Roger Still, a spokesman for EDS. The virus infected 20 to 25 machines but did little real damage, he added.

It is uncertain how, but the virus showed up on federal government computers in Washington, D.C., Maryland and Florida in April 1988. In Washington, the virus infected 200 Macintoshes at the National Aeronautics and Space Administration, as well as dozens of computers belonging to several other federal agencies and congressional offices. Computers at Apple's government sales office in Washington were also infected.

NASA officials asked Dallas police to gather evidence and file charges, Sgt. Gary White of the Dallas Police Department said. "They felt that because it started in Dallas, it therefore makes it our jurisdiction."

NASA conducted its own investigation into the incident and turned over the information to Dallas authorities, according to Frank Kasmer, a special agent in NASA's Office of Inspector General. Kasmer said that other "government agencies, private citizens and companies would like them to look into it locally, because the federal prosecutors decided that it would be a local problem." He declined to comment further on the case.

Among the willing

EDS is not among those companies that are asking Dallas law enforcers to prosecute the case, Still said. However, the company is willing to cooperate in the investigation, he added.

Charges will probably be filed in mid-January or the first part of February, White said. "We're going back through the evidence, plus whatever else we can come up with, to see if it will fit local laws." The charges will be filed under the state's Harmful Computer Access statute.

Dallas police officials said they believe they have enough evidence to prosecute but added last week that they were gathering testimony from people and organizations who claim to have been hit by the virus in an attempt to catalog how widespread the virus has become and attach an estimate of damages.

"Once we go to court, we'll be trying to show that even though it started here, it went worldwide and that thousands of individuals and companies were affected," White said. The investigators will also attempt to affix a dollar loss to the damage because that would determine what a suitable penalty will be.

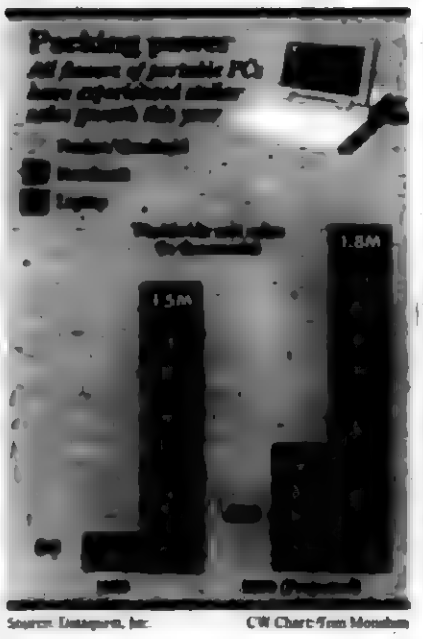
Dallas authorities said they expect the suspect to plead guilty when shown the evidence against him. They will probably seek a suspended sentence with community service and a public apology, White said.

"It will depend on the prosecutor who prosecutes the case, but 50 years in jail isn't going to accomplish anything," White said. "We would rather see the community get something back."

Portable PCs

FROM PAGE 1

significant number of machines," said Dick Nelson, vice president of systems at New York Life Insurance Co. In October, Nelson stopped placing orders for Prospeeds, which had been New York Life's standard portable computer for its agency business. After one month of talks and reassessment, the firm decided to resume its relationship with NEC.



Source: Datapro, Inc. CW Chart: Tom Monahan

According to some users, portables break more frequently than their cousins on the desktop. At Jockey International, Inc. in Kenosha, Wis., about 10% of the firm's installed desktop personal computers are being repaired at a given time. But 35% to 40% of its portables require fixing, estimated Jacqueline Byndorp, Jockey's PC coordinator.

Even more disturbing is that unlike most desktop PCs, the portables often break down during their first year of service, Byndorp added.

Analysts attributed these problems to vendor compromises on weight, cost and durability. As the portable PC shrinks in size and grows in power, these design trade-offs will become even more agonizing.

"Anytime you try to make things lighter, [something else] suffers," said John Dunkle, vice president at Workgroup Technologies, Inc. in Hampton, N.H.

The new 386SX-based notebook PCs "are probably not as durable as they ought to be, judging from what I saw" at Comdex/Fall '90, said Will Fastie, editor of the "Fastie Report" in Baltimore.

Users of 20-pound arm busters cannot rest easy either, however sturdier the bigger portables may seem.

While some laptop PCs have held up well, "we found the Mac Portable to be a much more fragile piece of technology," said John Moriarty, president of Lapstop Corp., a portable-PC rental firm in Salem, Mass.

"Our records say [laptops] do fail more often than the desktops — probably at a 25% to 30% higher failure rate," said Thomas Ewing, vice president and assistant general manager at TRW Customer Service Division, a nationwide service organization in Fairfield, N.J.

Laptops such as *Zenith's Supersport* shape up as being less reliable than desktop systems

Ewing said laptop problems were widely varied, and laptops take almost twice as long to repair as desktops.

Their proprietary construction makes parts for laptops two to three times more expensive than comparable desktop PC components.

For instance, fixing a distracting line down the center of a portable's gas plasma display can cost customers between $1,000 and $1,500.

"It's really ridiculous, and customers take it out on us," said Richard Allegretto, general manager of Data National Corp., a PC repair house in Boston.

At Caisse Nationale de Credit Agricole, all 12 of its LTEs developed cracks. Worse, new cases obtained from Compaq Computer Corp. at no charge "produced exactly the same cracks, so there was no real point in continuing to replace the cases," said Paul Nelis, senior microcomputer specialist at the bank's North American operation.

Vendors have been reluctant to comment on these problems because few statistics are kept on portable repair rates.

A Compaq spokesman said only "a small percentage" of customers reported cracks, but added that the cases "were not consistent with the kind of quality we think we should be providing." The company has switched to new materials and provided owners of older LTEs with a lifetime warranty.

A Zenith Data Systems spokesman claimed "an insignificant number" of Supersport 286 machines suffered video failures because of motherboard instabilities. The flaws were reportedly fixed as of Jan. 1, 1990, and Zenith doubled the one-year warranty on models made before that date.

When prodded, PC repairmen and analysts will cite particular brands that seem hardier (and more pricey) than others — Toshiba America, Inc. and Compaq among them. But they caution that there is no best portable.

"They've all failed. They've all been in here. Nobody's exempt," said Dan Mazurek, service manager at Advanced Computer Repair Centers in Woburn, Mass.

Despite these complaints, there are many users who extol the rugged virtues of their units. The U.S. government recently purchased a number of off-the-shelf Zenith portables for use in Operation Desert Shield because of their durability.

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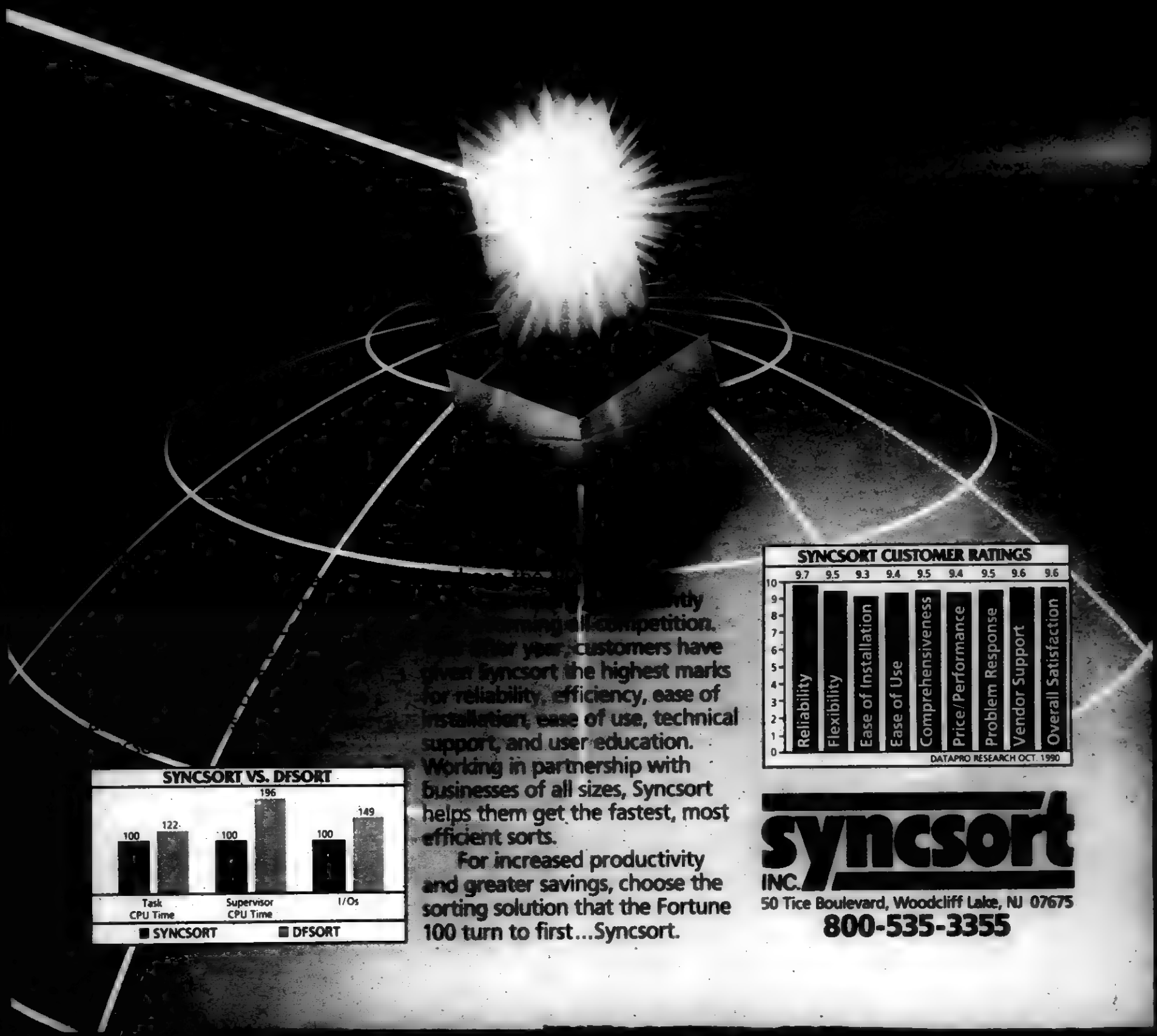

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AT&T/NCR make their stands

BY MICHAEL FITZGERALD
CW STAFF

AT&T and NCR Corp. appeared to be settling into siege positions as AT&T's bid to take over the Dayton, Ohio-based computer manufacturer moved into its second week.

AT&T's hostile takeover bid, which started on Dec. 6 after the NCR board rejected a friendly merger, remains in place, and NCR executives continue to do what they can to keep the company independent. Late in the week, NCR's board rejected the $90 per share hostile tender offer, calling it "grossly inadequate."

"Clearly, AT&T is attempting, for its own purposes, to take advantage of NCR's artificially and temporarily depressed stock price," NCR Chairman Charles E. Exley Jr. said in a written statement.

Meanwhile, AT&T said it still hopes to negotiate a settlement and announced that it had lined up a consortium of banks to fund its $6.12 billion, all-cash takeover move. NCR filed suit in an Ohio court, asking for a judgment stating that NCR's shareholder rights plan is lawful.

Analysts are betting that if the deal goes through, it will be for more than $90 per share.

"Anything can happen in this deal," said Byron Walker, credit analyst at Moody's Investor's Service. Walker said only one thing is certain: "[Exley] will maximize returns to stakeholders. He believes in that and has the wherewithal to do it."

Most analysts said NCR is not worth Exley's asking price of $125 per share, and some said they think it was fairly valued at $55. The market price last week held at just above $90 per share. The New York Stock Exchange briefly suspended trading Wednesday on NCR's stock because of a news report about negotiations between NCR and potential "white knights."

In the meantime, doubts swirled about the merits of the deal.

A quick deal benefits all

If AT&T's effort to take over NCR is lengthy, it will hurt both companies, no matter what the resolution, analysts said.

"Their competitors will lap at their chops to see it not go through in a hurry, and people will legitimately have concerns, because NCR will be late with products," said Bob Vautrain, an analyst at Gartner Group/Infocorp in Santa Clara, Calif. "Both companies' competitors will pick up on this and use it as a FUD [fear, uncertainty and doubt] factor against them."

However, if the merger is smooth and resolved quickly, NCR should not be thrown off its System 3000 stride, said David Card, midrange analyst at International Data Corp. in Framingham, Mass.

Then the deal should strengthen the position of the combined companies against Hewlett-Packard Co., IBM and Digital Equipment Corp. and fend off any ventures that Sun Microsystems, Inc. may make into commercial Unix.

Most analysts said they believe that AT&T will let NCR stay autonomous. "I kind of see this acquisition by AT&T as an attempt . . . to get out of the computer business," said David Schofield, an analyst at Duff & Phelps, Inc. in Chicago. With the acquisition, AT&T could immediately rid itself of its troubled computer division, while at the same time maintaining a presence in the computer market.

The way the financing shakes out could also affect the venture. Exley's asking price of $125 per share would be paid with AT&T stock, while AT&T's current bid is an all cash one and will expire on Jan. 4.

Stock or cash makes a difference, said Barry Bosak, who follows NCR at Smith Barney, Harris, Upham & Co. in New York. A stock swap is more attractive to investors because of the capital gains tax incurred by a cash sale.

AT&T customers not fazed by NCR threats

BY ELLIS BOOKER
CW STAFF

NCR Corp. Chairman Charles E. Exley Jr.'s vow to "ax" a number of AT&T computer products, should AT&T succeed with the hostile takeover attempt it launched two weeks ago, was not being taken seriously by AT&T customers last week.

Exley's threat painted a scenario in which the head of a company that loses a takeover battle could not only keep his job but also purge the victor's product lines.

AT&T would let NCR "pick and choose" what it wanted to retain from AT&T Computer Systems' product portfolio, Exley said. In a letter to Exley on Dec. 5, AT&T Chairman Robert E. Allen said he would want NCR senior management to run the merged operation.

Vengeance is mine

If given such oversight, Exley has said he would quickly "orphan" the AT&T 3B2 minicomputer line, select the Open Systems Foundation's Motif over Open Look — AT&T's choice for graphical interfaces — and "ax" AT&T's Unix client approach and Tuxedo transaction monitoring system in favor of NCR's technology.

"They're both reputable companies, and I'd really be shocked if either walked away from their customers," said Frank Erbrick, senior vice president at United Parcel Service, Inc. (UPS) in Greenwich, Conn.

UPS is a major customer of AT&T and NCR. Eighteen months ago, it signed a $20 million purchase contract with AT&T Computer Systems for personal computers. UPS also buys NCR terminals, scales and NCR Tower computers.

Several AT&T customers said they see the logic behind AT&T's interest in NCR, which also backs an open systems architecture and Unix. Some went so far as to advocate a merger.

"It signals [that AT&T] wants to be a big-time player in telecomputing, to be the preeminent provider of these services," said Steve Muzzo, chief executive officer at Wallmark, Inc. in West Lake Village, Calif. Wallmark last week announced it was engaged in a five-year, $30 million deal with AT&T for a health information network linking insurance providers, employers and medical facilities.

Muzzo expressed little concern that his AT&T field service representatives — who have been on-site since October — may be reporting through Dayton soon. "It doesn't concern me . . . unless NCR changes the aggressive way AT&T has approached the market," he said.

However, Amtrak's senior director of data center operations, David Hadrick, said he was uncomfortable with the level of service from AT&T and NCR. "The service and support on data processing equipment from both is not up to par with IBM," Hadrick said. "If it got any worse as the result of a merger, I'd be worried."

This year, Amtrak signed a $14 million contract with AT&T to replace its terminals with AT&T brand, IBM-compatible PCs and controllers. Amtrak also buys self-service ticketing machines from NCR.

Database helps keep bells ringing

BY CAROL HILDEBRAND
CW STAFF

Collecting coins in a kettle is a pretty old-fashioned method of fund-raising, and the Salvation Army is a pretty old-fashioned outfit. But the army's Greater Chicago area divisional headquarters is using the power of high tech to pull it out of the Norman Rockwell age when it comes to keeping track of its bell-ringers.

According to Don Eley, director of special efforts at the Chicago office, the logistics of coordinating the Christmas kettle event gave him the idea for putting the data on-line.

The Chicago area has about 650 kettle sites under the jurisdiction of 30 community "core" centers. Using Microsoft Works from Microsoft Corp., Eley created a database that tracks pertinent information for individual sites.

Jon Gutmiller

The Salvation Army *is using a database to coordinate information from its collection sites*

The database has really been a help in scheduling the volunteers who man sites, Eley said. For example, sites are not manned continually. "If they're at a train station, they'd be manned in the morning and the evening but not throughout the whole day." He said he can use the database to staff each site most effectively. "That way, we don't end up with too many people ringing bells at each location."

Troubleshooting in this hectic season is also eased. If there is a problem at a site, Eley said, he can check the database to find out which officer is responsible for that location. "I can then just call him and get immediate assistance out there," he said.

The amount of money that is taken in at each location is also tracked. By combining information about the location and the number of hours the site was worked, Eley said, he can compute the hourly intake of each site, which helps him plan for the future.

SDI information database available for commercial use

WASHINGTON, D.C. — The U.S. Department of Defense has established a database of information on technologies developed for the Strategic Defense Initiative (SDI) that has potential for commercial use. The database contains 1,400 unclassified, nonproprietary summaries of SDI spin-offs.

The database is available to any U.S. citizen or company that has signed an agreement with the Defense Logistics Agency.

According to the Pentagon's Strategic Defense Initiative Office (SDIO), commercial computer spin-offs from SDI have included optical supercomputers, computer-aided design and software engineering tools and new computer security measures. For example, the SDIO said Odyssey Research Associates in Ithaca, N.Y., is extending work done for SDI to develop ways to permit computer security for networked computers to be controlled from any site.

The database contains pointers to other technology transfer databases and business assistance programs provided by more than 600 federal, state and local agencies.

GARY ANTHES

Lotus seeks industry dialog on shadow copies

BY PATRICIA KEEFE
CW STAFF

Should applications be licensed on a per user or per machine basis? Rocketing sales of laptop and home computers are pushing this question to the fore, especially given speculation that software developers are looking to the growing ranks of portable users to pump up flagging sales.

Thus, Lotus Development Corp., which is taking heat over its per-machine policy, is taking steps to spearhead an industry powwow that could provide a consensus on how to deal with so-called "shadow copies."

Although the effort is in the very early stages, analysts questioned last week whether this might constitute an antitrust violation.

"Shadow copies are a gigantic problem," said Lotus Chairman Jim Manzi, who added he has spoken informally in recent weeks with officials from both Microsoft Corp. and the Software Publishers Association (SPA) about working within the SPA, and possibly with customers, to "intelligently" resolve this issue and others.

For example, some users have questioned why they are allowed to license one copy of software, install it on one machine and have 10 people use it, yet one user cannot install one package on two machines for personal use.

Even the most vigilant personal computer managers can be overwhelmed by an installed base of hundreds and thousands of users running a mix of packages all sporting different use restrictions. "It's a record-keeping nightmare," one Midwest federal user asserted.

"It's a real can of worms," said Jeff Tarter, publisher of the "Soft Letter" newsletter. He maintained that the issue is not one of payment for corporate managers but rather a desire to provide users with a set of consistent rules. This is not possible today.

Cumbersome procedures

As do many developers, Lotus requires users to purchase a separate copy of software for each machine. If a user wants to install Lotus' 1-2-3 on a second computer, it must initially be removed from the first computer — a cumbersome procedure that many users object to.

"It ticks off the user and doesn't create a lot of good will," said Nancy McSharry, an analyst at International Data Corp.'s Menlo Park, Calif., office.

In recent months, *Lotus* magazine has published several letters from readers complaining about the developer's policy. One user said he had decided against purchasing Lotus, while another was looking "real hard" at alternative software.

One such alternative comes from Borland International, Inc., which has effectively wielded its liberal licensing policy as a marketing tool. Borland's "no-nonsense" license compares software to a book. Users can make as many copies as they want, as long as the copies are for their personal use. This approach draws applause from users and analysts alike. "From a standpoint of customer relations, other vendors would do well to adopt Borland's approach," said Will Fastie, publisher of "The Fastie Report."

A software license buys a user the ability to access the software, a PC manager at a major West Coast bank said. He added that it should not matter how the user uses the package, as long as there is no simultaneous use.

Microsoft falls in between. It allows copies under tightly defined circumstances, but these rules go out the window if the user can state that he uses one computer 80% of the time. Then the user is permitted to install copies on a second computer. But some users condemn this approach as wishy-washy and too subject to interpretation.

As for the SPA, Director Ken Wasch offered yet another twist. The SPA promotes awareness of software as protected intellectual property. It is leery of anything that encourages users to copy software. Wasch said he leans toward charging users a minimal amount, perhaps $50, for what he calls a laptop or home computer "extension."

Not a good idea

Users and analysts generally turned a cold shoulder to the idea. "The idea is ridiculous; users won't do it anyway," Fastie said.

However, David Cearley, a Gartner Group, Inc. analyst, suggested that unless a portable is really a secondary machine, software companies may be justified in requiring purchase of a second copy.

It is preferable to spending several hundred dollars, and it would work on an individual basis, said Dick Nelson, a vice president at New York Life Insurance Co. in New York. But he also said it would prove a bureaucratic nightmare for corporations. "I have 8,000 agents with laptops. I can't possibly administer that!"

Yet another option is the unlimited use site license. Nelson would prefer that route — but based on the number of users, not machines. A systems manager at a Fortune 1,000 retail concern said he has successfully negotiated site licenses. "Vendors are willing to negotiate, as long as [users] play straight. You have to guarantee no concurrent use and then police yourself internally," he said.

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NEWS SHORTS

Bachman, Index move to OS/2

Bachman Information Systems, Inc. announced OS/2 versions of two re-engineering tools: Capture for IMS and Capture for PL/1. In September, the company announced an OS/2 version for Bachman Analyst, the process and logic modeling environment used by its re-engineering tools. At the same time, Index Technology Corp. said that the OS/2 version of its Excelerator design product will go out to early support sites some time this week.

Dbase IV for DEC's VMS shipping

Ashton-Tate Corp. continued to target multiuser, multitasking platforms as it began shipping an edition of its Dbase IV Version 1.1 database application for Digital Equipment Corp.'s VMS operating environment. The product, which is being marketed and supported in the U.S. by DEC, will allow Dbase IV users to run the DOS-based application on a DEC VAX VMS system without modifying or recompiling code. DEC is offering introductory pricing of $995 for single-user workstations and $4,200 for a four-user license until March 31, 1991. In separate news, the company promoted President William Lyons to chief executive officer.

New firm to target OOP

A group of software industry veterans, many recently departed from minicomputer maker Data General Corp., have banded together to form a new venture, dubbed Hyperdesk Corp. The new entry is being financed by Tokyo-based ASCII Corp., a Japanese systems and applications software vendor of the personal computer, workstation and server market. Hyperdesk will offer object-oriented software products in distributed local-area network environments. The software technology was purchased from DG, and under terms of the agreement, the DG Aviion workstation will be one of the first development platforms for the new software.

Apollo to crew: Find other jobs

Trying to shrink its work force at the Apollo Systems Division of Hewlett-Packard Co., which is located in Chelmsford, Mass., HP told 120 hardware and software engineers to look for other jobs within the company. Some jobs will be available at the Chelmsford site, but most are expected to be at other locations. With that directive, HP has asked a total of more than 1,120 employees to look for another job this year, according to a spokeswoman. Of those, approximately 800 have secured other work within the company.

The Leningrad stock exchange

The City of Leningrad signed a letter of intent with Englewood, N.J.-based Peake/Ryerson Consulting Group and New York-based Transvik, Inc. last week to create a highly automated stock and commodities exchange. Scheduled for completion in about one year, the system will be styled after the Nordex Scandinavian commodities exchange in London, which Transvik built, and centered on DEC Vaxclusters, "assuming it is permissible and possible," Transvik Chairman Bjorn Wiesen said. No details were given on how much the system will cost or how Leningrad will pay for it.

Stratus strikes Seven-Eleven deal

Stratus Computer, Inc. last week announced a $3.9 million deal with the Seven-Eleven Japan Co. in Tokyo, which will buy nine Stratus XA2000 systems to run its new store inventory management and merchandising system. Using what Stratus claims is the world's largest Integrated Services Digital Network, Seven-Eleven, the largest convenience store chain and food retailer in Japan, will be collecting sales transactions from its 4,200 stores on the Stratus systems by June 1991. The entire project, including new hardware, software, networking equipment and terminals, is estimated at $17 million during the next two years.

More news shorts on page 95

Users to demand net software

BY JOANIE M. WEXLER
CW STAFF

The deficit of applications optimized for Banyan Systems, Inc. Virtual Networking Software (Vines) and other networks could turn around if the efforts of a fledgling group of high-clout user companies are successful.

About 25 large user companies — unofficially calling themselves the Enterprise Network Applications Consortium — met early this month to consider approaching software developers en masse to demand commercial availability of the networking applications they need.

The group included some of Banyan's largest users: Compaq Computer Corp.; Pacific Gas & Electric Co.; Pennsylvania Blue Shield; Nike, Inc.; U.S. Sprint Communications Co.; MCI Communications Corp.; and the Canadian National Defense.

Considerable size

Members of the consortium said the group accounts for about 70,000 workstations and 2,500 servers running on Banyan networks. It plans to work with Banyan in driving the development of commercially available applications that integrate with the Vines network operating system at all network levels. A Banyan spokesman said the vendor is behind the group's efforts all the way.

Art Beckman, manager of information technology services at Pacific Gas & Electric, currently spearheads the group. He pointed out that the theme of the consortium is to "get more applications for the networking world — period." He noted that "there is a special flavor for Banyan, because we're all large Banyan users." However, he said, because of a lack of networking standards in general, the issue reaches to anyone involved in enterprisewide networking.

Beckman explained that the efficiency of applications tested to work on local-area networks does not necessarily translate into the enterprise network. "Often developers take a standalone application and turn it into a network application tested on a LAN with only a few nodes," he said. "But with a scenario of 200 to 300 servers talking to each other at various speeds — real-life networking — a lot of applications aren't efficient throughout the entire organization."

"The application developers want input from us; we represent an opportunity for them," said Michael S. Kinsey, who represents Pennsylvania Blue Shield on its steering committee. "There are applications available that work in conjunction with Vines but are not Vines-integrated. I can't take a file right out of word processing and dump it directly into electronic mail. I want integration across all layers; I want to enter my password once — not three times — for all the functions I do."

Cover up with third parties

Kinsey said that currently, his firm — which is installing Banyan as its enterprise networking scheme — is using third-party applications "to mask that inelegance to users."

Kinsey also noted that Pennsylvania Blue Shield would prefer not to do in-house development. "Every time Vines gets upgraded, we'd have to recode our applications — an application maintenance nightmare."

The consortium is slated to meet again in February to focus its charter, which is currently under construction by th steering committee.

3Com

FROM PAGE 1

supplies it, it will begin to "wind down" the SNA division.

Meanwhile, a marketing and engineering team has been directed to establish "an affordable network management solution."

During at least one internal meeting and throughout the documents, 3Com stressed that it will not abandon affected users. It has "forged an agreement [with Microsoft] that will protect 3Com's customers' and resellers' investment in LAN Manager while this transition occurs."

Managers were told that Microsoft will modify LAN Manager to facilitate migration of 3+ and 3+Open 1.X customers.

Although steps are being taken to ensure continued support and product migration, 3Com does risk losing customers who had been attracted to its one-stop shopping. "The network had 3Com's name on every piece; management figured it had to work together," said Matt Scholz, IS manager at the San Diego County Water Authority.

One user said he no longer knows what 3Com's business is. It is "disheartening," said Bob Saur, IS manager at Index Technology Corp., to see 3Com "bailing out" of networking. Handing off sole responsibility for LAN Manager development to Microsoft is expected to hasten the development of a core LAN Manager product. "Where we find ourselves [today] is with a great [network operating system] platform, which threatens to diverge, and customers who are confused as to where they should go to get LAN Manager solutions," 3Com officials said in the documentation.

The decision to halt further investments into LAN Manager allows 3Com to "turn [its] networking expertise more aggressively toward producing server, management and connectivity platforms and solutions . . . from a network operating system neutral stance," according to the documentation.

In short, the company intends to continue the shift in strategy it began earlier this year by moving away from work groups and client/server technology toward providing the pieces required to connect and manage open, global data networks.

Last week, 3Com founder Robert Metcalfe said LAN Manager sales never constituted more than 10% of 3Com's revenue. In fact, during the manager's meeting last week, Benhamou repeatedly cited poor return on LAN Manager investments, a source said.

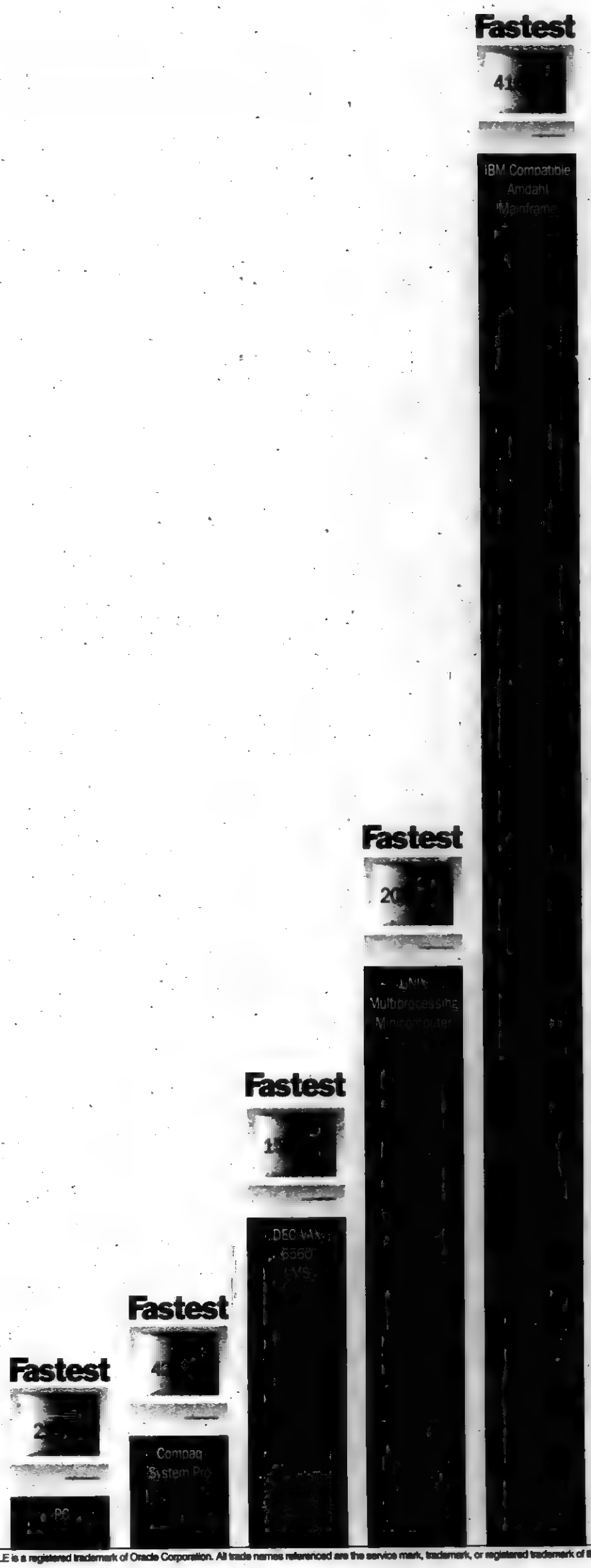
Former 3Com Executive Vice President Les Denend said the writing was on the wall last August when first-quarter figures showed that Distributed Systems Division sales were sinking. Benhamou "made it clear at the time that 3Com would be less involved with LAN Manager development," Denend said.

> IT IS "DISHEARTENING" to see 3Com "bailing out" of networking.
>
> BOB SAUR
> INDEX TECHNOLOGY

The deal will also relieve 3Com of its obligations under a contract with Microsoft that requires it to pay Microsoft license fees, regardless of how many copies of LAN Manager it sells, a source said.

The two vendors co-developed LAN Manager, but the upcoming announcement will deed the source code to Microsoft. In return, Microsoft will license the rights to three 3Com LAN Manager development efforts: X.500 services, Apple Computer, Inc. Macintosh connectivity and Novell, Inc. Netware connectivity.

West Coast correspondent Jim Nash contributed to this story.



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Apple users voice Mac concerns

BY JOHANNA AMBROSIO
CW STAFF

ORLANDO, Fla. — Corporate Macintosh users met last week to challenge Apple Computer, Inc. on issues ranging from service and support to how the Macintosh fits into an enterprisewide computer network.

While users said they continue to be satisfied with the Macintosh as a personal productivity tool, conversation centered on networking, integration, and whether Apple is doing enough to help the Macintosh connect to mainframes and other environments. Some users voiced concern over whether they are doing the right thing by continuing their Macintosh investments.

"Users are saying that we're using the Macintosh strategically, and we want some recognition by Apple of that fact," said Millie Koss, an associate director at Harvard University in Cambridge, Mass. "It's more than just a PC now."

The forum for Koss and other large Macintosh users to voice their concerns was the fourth Managing Apple Computers in Information Systems (MACIS) conference. An independent group formed in February 1989, MACIS is comprised of 120 member organizations, with a total of 200,000 Macintoshes installed. Each member has at least 100 Macintoshes.

"The big bugaboo in my organization right now is how the Macintosh will work with AD/Cycle," said an IS staff member from a large Midwestern insurance firm, referring to IBM's architecture for computer-aided software engineering.

"Our executives are really concerned that OS/2 will have some kind of strategic advantage in the AD/Cycle environment," he said.

Even users who have thousands of Macintoshes installed as their primary workstation platforms are having some doubts. "I'm sneaking in a few PS/2s with Windows," said one director at a large services firm. "Even though our official platform is the Macintosh, I don't want to wake up one day and find that we've missed out."

For their part, Apple executives at the meeting tried to allay users' concerns. They said they are addressing the networking issues and will continue to do so, both with Apple-developed products and by entering into relationships with third parties.

Customer service concerns

Service and support were also on users' minds. Despite the Apple representatives' assurances that the company is formalizing its internal support mechanisms and making more services available for its dealers to provide to customers, some users expressed skepticism that the new strategy will work.

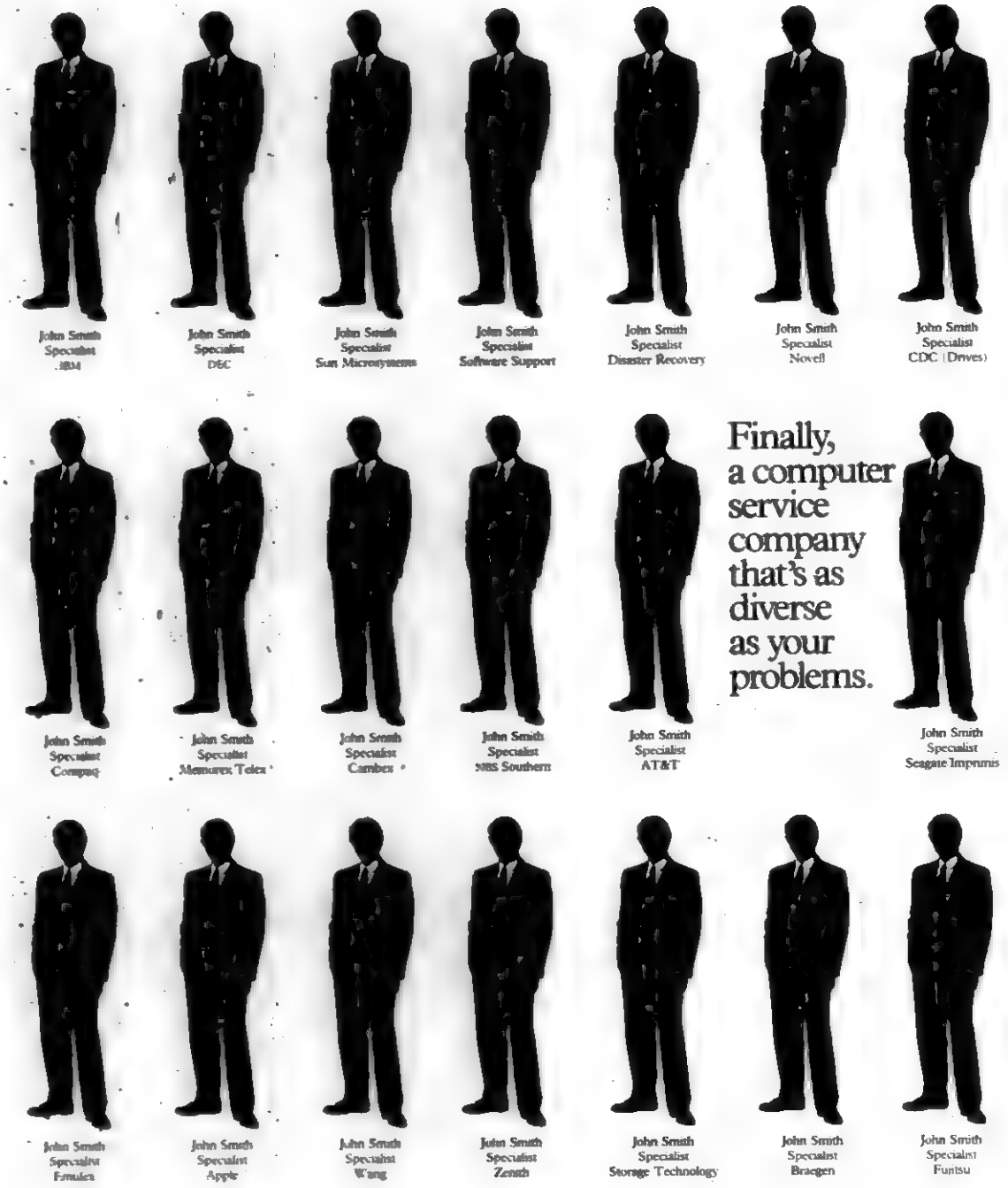
"I'm very doubtful that the dealer channel will ever come up to the level we need," said Karen L. White, supervisor of advanced technology at the California State Automobile Association in San Francisco.

Still, Morris Taradalsky, Apple's vice president of customer support, pledged that "by 1993, Apple will be the very best provider of service. We are developing an institutional support framework to make sure everyone gets the support they need."

He said Apple will make a tool called Network Design Simulator available to dealers in 1991 to help them design and analyze network performance.

Other support mechanisms include a toll-free number, a three-tier warranty reimbursement, an improved parts distribution system and more education for the Apple representatives assigned to large accounts.

What most users' problems boil down to is "that these people are taking a risk — a personal risk — by installing Macintoshes," said Keith R. Fox, vice president of Apple's Business Markets Group. "They want assurances that we will stand behind them, and we will."



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Amoco brings IS closer to end users

Gives operating units more responsibility for application development

BY JOHANNA AMBROSIO
CW STAFF

CHICAGO — Amoco Corp. is reassigning about one-fourth of its corporate information systems work force to end-user divisions as part of a broader effort to move profit-and-loss responsibility out to business units.

The move, announced on Dec. 7 to Amoco employees, will be completed by March, said John Reid, general manager of IS. Some 500 of a total of 1,900 staff members in the corporate IS group will now report directly to management in the operating companies, including Amoco Oil Co., Amoco Chemical Co. and Amoco Production Co.

"There will be no geographical movement, just movement on the organizational chart," Reid said. "Where they had solid-line reporting responsibility to the IS unit and dotted-line responsibility to the operating companies, it will be the other way around."

Amoco is doing this, Reid said, "to put the applications development people in closer alignment with end users." He said the move fits in with Amoco's corporate philosophy of giving the operating units the tools they need to take profit-and-loss responsibility for themselves.

Most of the reassigned IS employees are applications development staff members, including project leaders, programmers and analysts. Reid said they will be doing many of the same things they have done in the past, and only the reporting structure will change. In fact, recruitment, training and career management for the 500 people "will be something we in IS will continue to handle," Reid said.

Another Amoco IS executive characterized the move as "more of a reaffirmation of IS' responsibilities." Richard Fenlon, manager at the Amoco computing center in Tulsa, Okla., said, "I wouldn't call it earth-shattering. For me, it's business as usual; there's been no major change in our philosophy."

> "THERE WILL be no geographical movement, just movement on the organizational chart."
>
> JOHN REID
> AMOCO

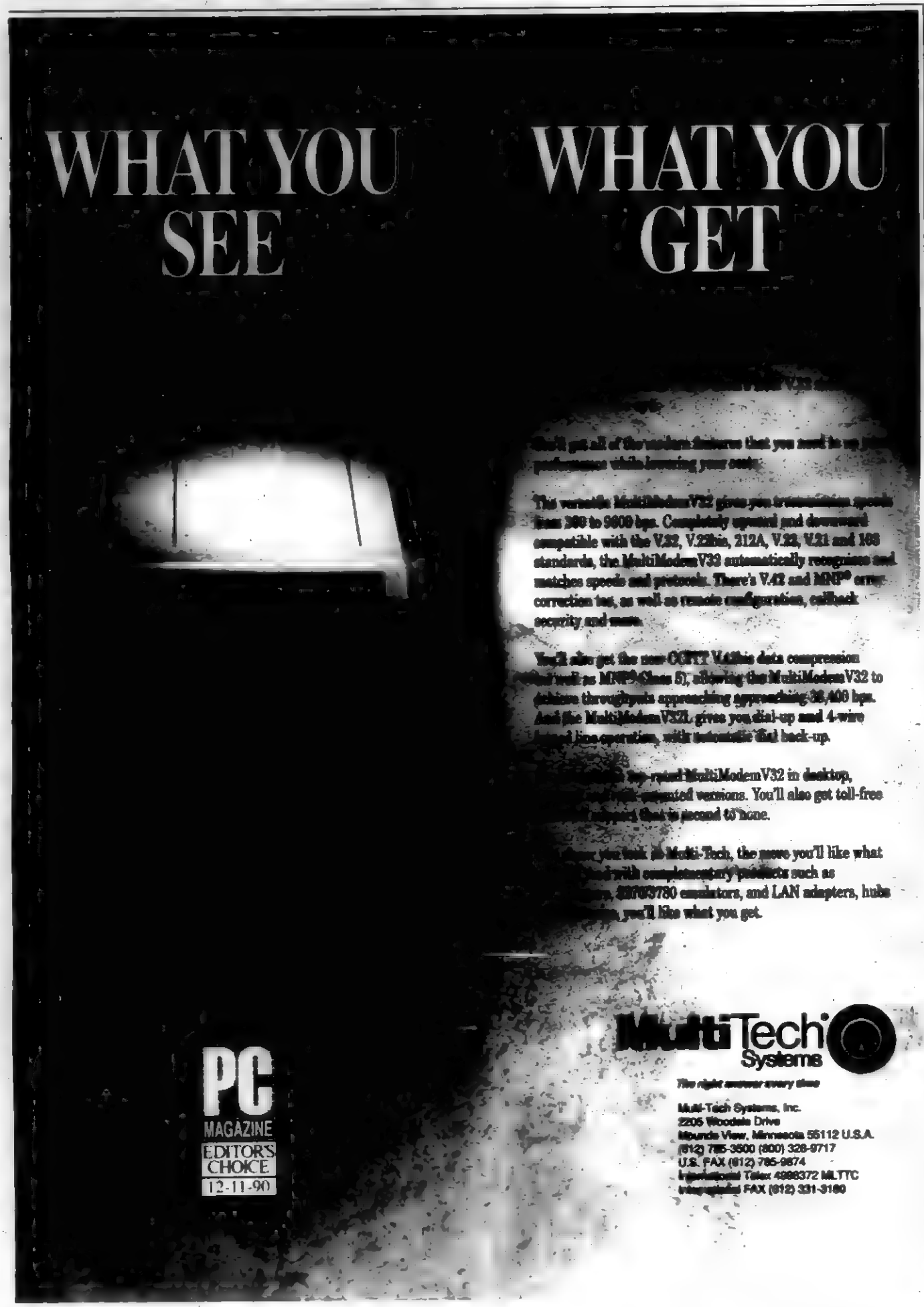
Reid stated emphatically that this move does not represent any intent to dismantle corporate IS. "There are very good and just reasons to keep a centralized IS unit. These include determining longer term strategy, introducing technology into the corporation in the right way and realizing economies of scale when purchasing hardware and software," he said.

The reassigned people represent about half of the corporate IS group's systems development staff. "The other half will stay here to work on those things that impact the corporation as a whole," such as human resources, Reid said.

During the past two years, Amoco has taken steps to centralize its IS function by consolidating five data centers into two, he said. "They very much remain under the control of IS."

He added that the move was not caused by the worsening economy. "The economy won't change anything here at Amoco," he said. "We've already had good practice at coping with unfavorable economic conditions."

If anything, Reid said, the economy "will cause IS to undergo the same scrutiny all other cost structures will get. We're not focused on one element of costs. We're focused on the business units, and IS expenditures are their decision — just like whether to put in a new pipeline or drill a new well."



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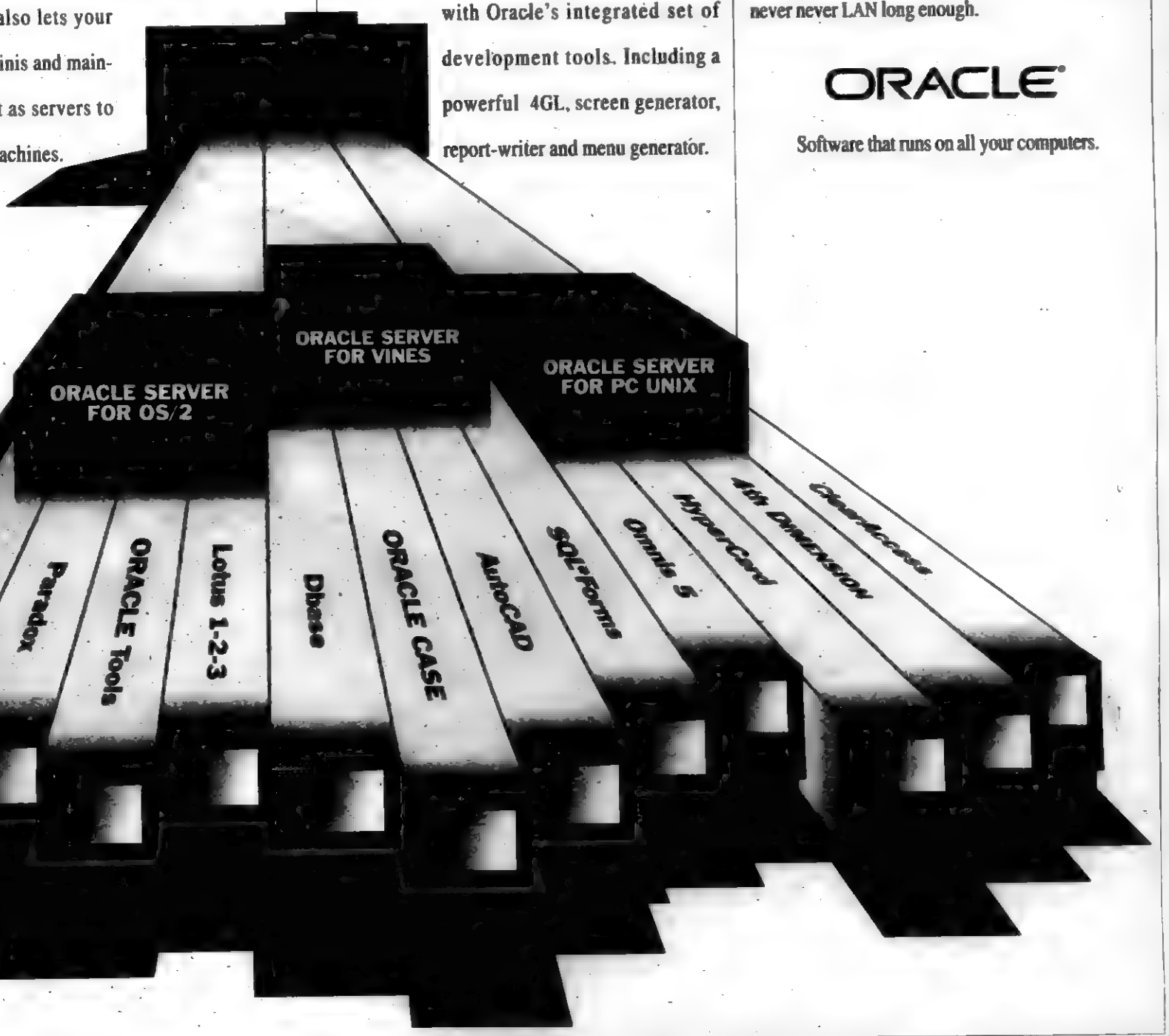

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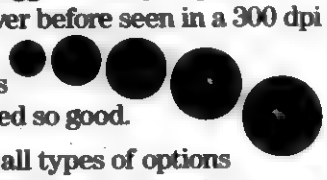

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HEWLETT PACKARD

Interop bans Fibronics

BY JOANIE M. WEXLER
CW STAFF

Unsportsmanlike behavior has reportedly gotten Fiber Distributed Data Interface (FDDI) pioneer Fibronics International, Inc. banned from participating in next year's Interop show.

Reports that the company has been circulating a list of approximately 30 FDDI vendors whose equipment may have performed under par during October's preshow hot-staging were confirmed last week by Interop, Inc. President Dan Lynch. Participating vendors must sign a nondisclosure agreement stating that interoperability performance is confidential, and according to Lynch, Fibronics violated that agreement.

Almost 40 vendors participated in an FDDI demonstration at Interop '90. It was the first public demonstration of heterogeneous FDDI equipment exchanging data over the 100M bit/sec. fiber-based ring-topology local-area network. Fibronics network management equipment monitored the network.

"We have forbidden Fibronics from being in the show next year," Lynch stated. He said he saw a copy of the list, which was sent to him by an angry Fibronics competitor that participated in the FDDI demonstration.

Inaccurate attack

"Only some of the critique was accurate," Lynch said. He added that the Fibronics official took "snapshots in time." For example, a device that was not up on the ring at a given moment "might have been working fine three hours later," he explained.

Fibronics' Director of Marketing Hal Spurney said the document had been intended for "internal use only. What has happened is that someone has picked up and circulated a confidential document. It is not Fibronics' policy to use these tactics."

MAP/TOP

CONTINUED FROM PAGE 1

"with the 1988, as opposed to the 1984 versions" of International Standards Organization's OSI specifications, said Randy Olson, a MAP/TOP steering committee member and a systems associate at Eastman Chemical Co. The supplement will also broaden the range of protocols and functions supported by the standards.

For example, a fiber-based version of 802.4 will appeal to a number of sites that can make use of fiber-optic cable's ability to carry signals over longer distances and lesser vulnerability to electronic interference as compared with MAP's traditional broadband medium, Olson said.

Token-bus products could well use a boost in market appeal. A recent study by Advanced Manufacturing Research, Inc. (AMR) in Cambridge, Mass., showed that sales for such products have been flat.

One protocol that stands to gain from the supplement is the Manufacturing Message Service (MMS), which has become the closest thing to a plant-floor networking standard, AMR President Anthony Friscia said.

The supplement will provide an application programming interface for MMS, making it much easier for users to write their own applications to run on top of the messaging service, Olson said.

Perhaps even more significant is the planned addition of MMS to the TOP protocol suite that targets business and office applications, Friscia said.

TOP support of MMS will enable users to port the messaging service across 802.4, 802.3 and 802.5 protocols, Friscia pointed out. This is desirable for firms that do not want to be tied to one local-area network standard. One such firm is Eastman Chemical's parent, Eastman Kodak Co., which has already ported MMS to 802.3 — the TOP protocol — at some sites, Olson said.

Weyerhaeuser Co. has already identifed MMS as a promising basis for its factory data collection system but is likely to implement the protocol more quickly if the enhancements promised in the supplement "work as advertised," said Randy Cunningham, manager of Weyerhaeuser's manufacturing integration unit. The Tacoma, Wash.-based firm is setting up a laboratory to test a range of networking standards as part of a computer-integrated manufacturing strategy.

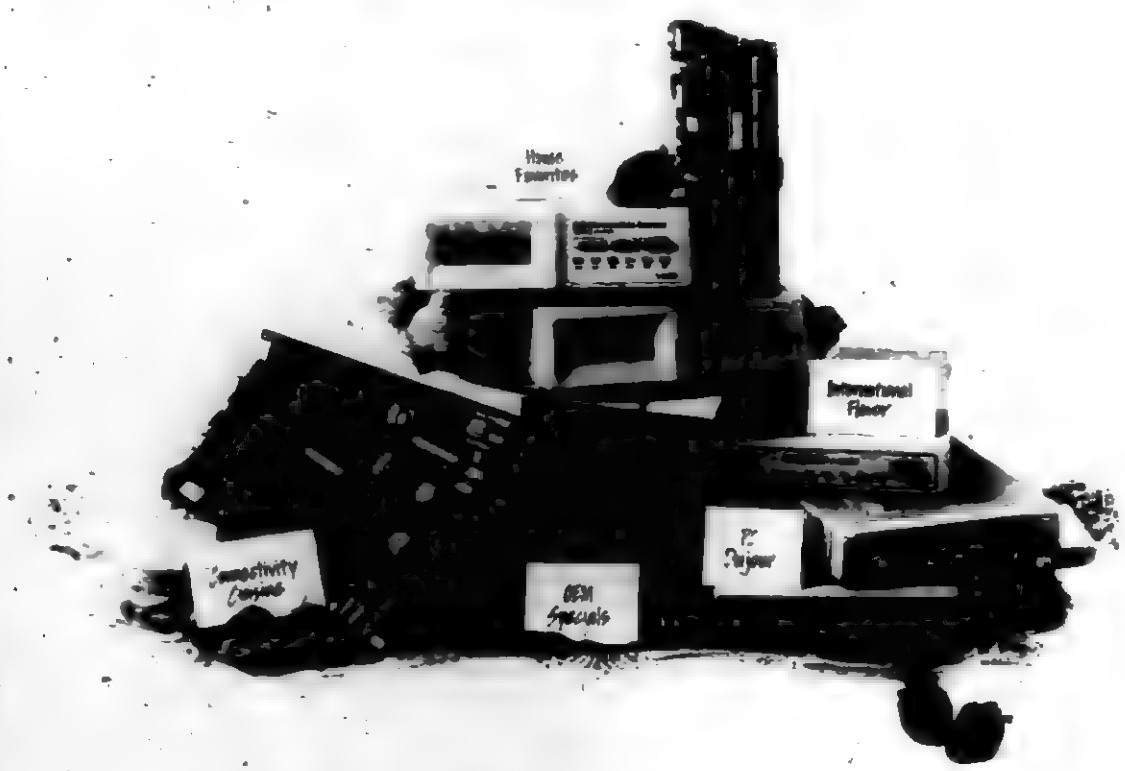
Don't tie me down

A big concern for Weyerhaeuser is not to be tied down to any particular LAN protocol, Cunningham said. "Getting involved in 802.4 vs. token-ring or baseband vs. broadband is gibberish; what we're interested in is getting information from the plant floor all the way up to the CEO."

Other features of the supplement, due for publication in the first quarter of next year, include the following:

- TOP support of ISDN as an interconnectivity protocol for LANs.
- TOP support of the 10Base-T standard, which defines 10M bit/sec. Ethernet over twisted-pair.
- Record-level file access via File Transfer, Access and Management.
- Connectionless LAN-to-LAN connectivity service for both MAP and TOP.
- Inclusion of Fiber Distributed Data Interface in the TOP appendix.
- MAP support of the International Graphics Exchange Standard.

V.32 Smorgasbord



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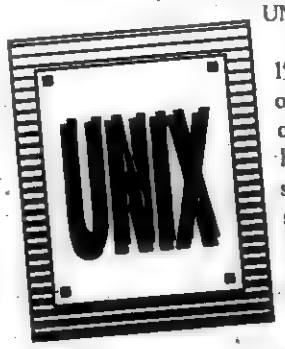
Digital & UNIX Computing

SERIOUS BUSINESS

by
Dom LaCava
Vice President
UNIX-based
Software and Systems
Group

The decisions you face about computing with the UNIX operating system may be the most important computing decisions you'll make during the coming decade. Many computer vendors claim to be "serious about UNIX." It's the fashionable thing to say these days. But the degree to which a vendor is "serious" about UNIX—and the ways in which it demonstrates its commitment—can determine if that vendor will succeed during the 1990s.

Digital *is* very serious about UNIX computing. And we're proving it every day with products. We've dedicated enormous resources to build the best hardware and software for UNIX computing.

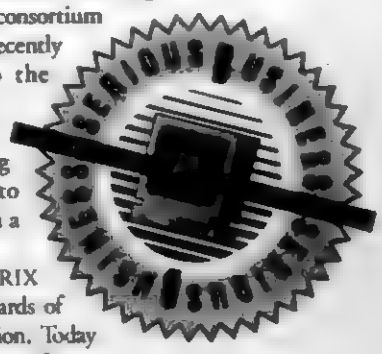


In just 23 months we've announced 15 RISC-based systems that run ULTRIX, our enhanced version of the UNIX operating system. Our RISC family has grown to include six workstations and eight server/timesharing systems. In October we introduced the DECsystem 5100 and 5500 systems. These are server/timesharing and general purpose systems that fit into the low end and mid range of our RISC server family. They offer outstanding price/performance and expandability. Coupled with our new ULTRIX services for PC software, these systems make ideal servers for PC workgroups. Recently, we've also announced a family of Intel-based systems and servers designed specifically for small businesses. These systems run the SCO operating system.

ULTRIX: Standards-Compliant, Open UNIX Computing

Digital's approach to UNIX software is dictated by your business needs. Our corporate UNIX product is ULTRIX, based on the Berkeley 4.2 release, with 4.3 and System V enhancements. We're always developing and enhancing ULTRIX. It is one of the most standards-compliant UNIX products available today, and we're continually expanding it to incorporate new standards and new capabilities.

ULTRIX is leading the way in standards compliance through Digital's support of POSIX, X/Open, and the Open Software Foundation (OSF). Digital has been a strong supporter of OSF since the consortium was founded in 1988. We recently announced plans to ship the OSF/1 developer's kit in the first quarter of calendar 1991, making Digital the first vendor to announce a ship date for such a product.



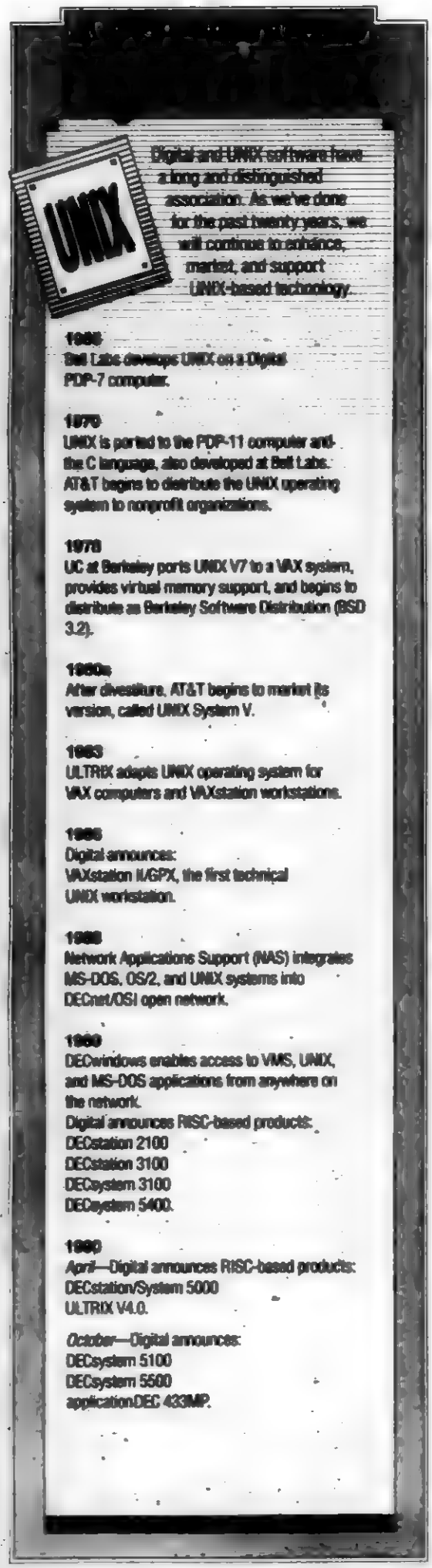
Digital is making ULTRIX compliant with all the standards of the Open Software Foundation. Today ULTRIX conforms to OSF's Motif standard for the user interface. It will incorporate the OSF standards for the Distributed Computing Environment (DCE) and OSF's Distributed Management Environment (DME) technology. These activities show our strong support for industry standards in UNIX computing.

The Door to Open Computing

Many of you are interested in UNIX as a way to achieve "open computing"—a vendor-neutral computing environment based on portable applications and standard hardware. This kind of computing goes beyond UNIX to include multiple operating systems, applications, and hardware platforms from a variety of vendors.

Each of the three major U.S. computer vendors offers at least three families of hardware, and at least three operating systems. But there's a key difference among these vendors: only Digital merges these different families where it counts—at the application level. Through our Network Application Support (NAS) products, we can integrate VAX/VMS systems, UNIX systems, DOS systems, OS/2 systems, and Apple Macintosh systems. Computers that run the UNIX operating system are full participants in this larger, integrated computing environment. They can share data, applications, and networked resources with systems from other vendors that run different operating systems.

continued ➤



➤ Serious Business continued

That's true "open computing," and it's the most important part of what Digital offers to UNIX users. We offer a highly productive family of systems that run UNIX, and a highly standards-compliant UNIX operating system. But we also enable our UNIX products to function in the larger, "open computing" environment. UNIX computing is not "open computing" unless UNIX users can benefit from all the resources of the larger computing environment. Today Digital is the only vendor offering these capabilities. That's a serious approach to UNIX software as a part of open computing.

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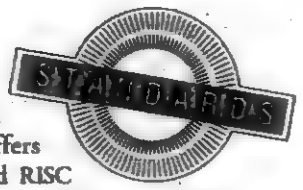
We've designed our RISC systems to be highly expandable. We've built them on a foundation of tough, innovative engineering. Digital has built TURBOchannel—perhaps the fastest bus in the RISC business. And we offer the highest level of graphics board integration available today.

Our RISC systems support standards in every aspect of their design. These systems support DSSI, SCSI, Q-bus, fiber optic networking, Ethernet, and soon VME. And as further proof of our commitment to open computing, we've opened the TURBOchannel to the industry—at no charge.

We've built our RISC systems on widely available, standards-based technology from MIPS Computer Systems, Inc. And we're continuing to develop new RISC systems based on the latest technology from MIPS.



That's dedication to openness. Today Digital offers the lowest-priced RISC workstation, the fastest desktop graphics system, and the most expandable RISC servers. We're committed to creating RISC systems that continue to extend the boundaries of price/performance.

Digital's newest RISC-based systems are designed for use in commercial environments. The new servers are very fast, but their real strengths are in I/O, disk write speeds, storage, and communications—the features commercial users need most.

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We're just as serious about support for UNIX users. During the past year, Digital has trained more than 7,000 sales and support people in our UNIX technology.

And this is only the start. Today we're working on a new generation of RISC systems, based on the MIPS technology. You'll be hearing about it in a few months. We're developing the next major release of ULTRIX, which will be based on the OSF/1 standards, and completely backward-compatible with our earlier releases of ULTRIX. Soon, we will introduce RISC-based workstations that will extend our price/performance leadership.

Is Digital serious about UNIX?

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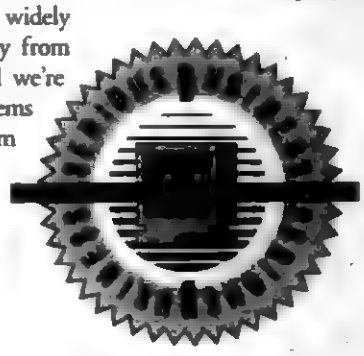
As you make your UNIX choices—what may well be your most important computing choices of the 1990s—doesn't it make sense to go with the company that's serious about UNIX? That company is Digital.



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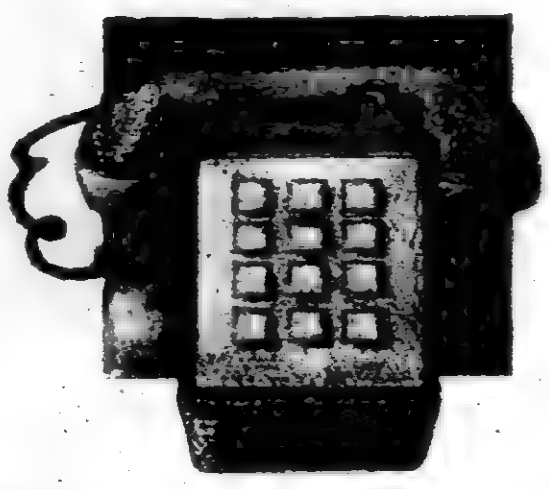

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DECsystem 5100	RZ23 RZ24 RZ55 RZ56 RZ57 RX23	104 MB 209 MB 332 MB 665 MB 1.0 GB 1.4 MB	Paging/swapping Primary internal storage Expansion Expansion Expansion	TZK10 TLZ04 TZ30 TK50Z RRD40	525 MB 1.2 GB 95 MB 95 MB 600 MB	128 MB	MS44-BA MS44-DA	8 MB 32 MB	8*
DECstation 3100 DECsystem 3100	RZ23 RZ24 RZ55 RZ56 RZ57	104 MB 209 MB 332 MB 665 MB 1.0 GB	Internal paging/swapping Internal storage/paging Expansion Expansion Expansion	TZK10 TLZ04 TZ30 TK50Z	525 MB 1.2 GB 95 MB 95 MB	24 MB	MS01-AA	4 MB	12*
VAXstation 3100 - Model 76	RZ22 RZ23 RZ24 RZ55 RZ56 RZ57	52 MB 104 MB 209 MB 332 MB 665 MB 1.0 GB	Internal paging/swapping Primary internal storage Primary internal storage Expansion Expansion Expansion	TLZ04 TZ30 TK50Z	1.2 GB 95 MB 95 MB	32 MB	MS44-AA	4 MB	8
MicroVAX 3100	RZ22 RZ23 RZ24 RZ55 RZ56 RZ57	52 MB 104 MB 209 MB 332 MB 665 MB 1.0 GB	NA Internal storage Internal storage Expansion Expansion Expansion	TLZ04 TZ30 TK50Z	1.2 GB 95 MB 95 MB	32 MB	MS42-AB MS42-KA MS42-BA MS42-CA	4 MB 8 MB 12 MB 16 MB	1
VAXstation 3540	RZ55 RZ56	332 MB 665 MB	Internal storage Internal storage	TK70 RRD40	296 MB 600 MB	96 MB	MS60-AA MS60-BA	8 MB 16 MB	3

*Option requires two slots.

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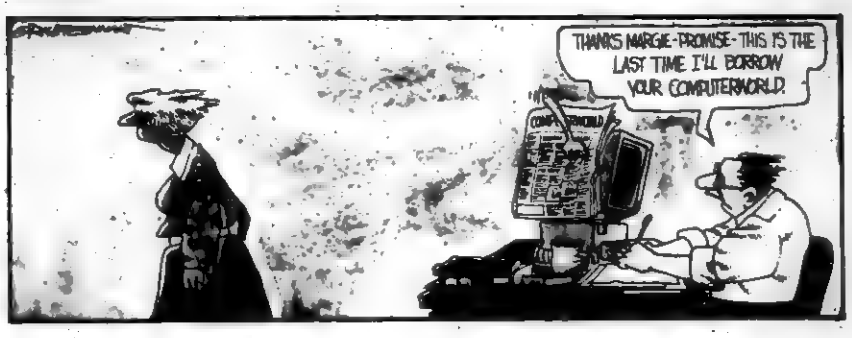

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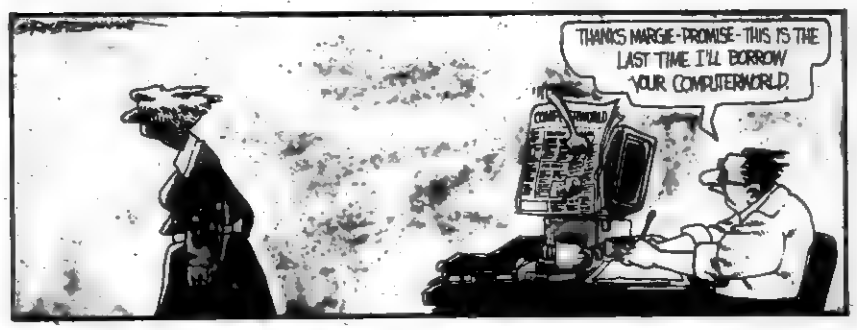

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   - 65. Communications Systems/Public Utilities/ Transportation
   - 70. Mining/Construction/Petroleum/Refining/Agric.
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   - 13. Treasurer, Controller, Financial Officer
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   - 51. Sales & Mktg. Management

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ADVANCED TECHNOLOGY

The race is on for the world's first 64M-bit chip

Companies such as IBM are increasing their investment in the development of advanced DRAM chips

BY MICHAEL ALEXANDER
CW STAFF

A mainframe small enough to wear on your wrist like a watch. A supercomputer that easily fits on your lap. A pocket-size voice recorder that records an hour of voice without using tape. A portable high-definition television smaller than this newspaper. It seems that anything is possible with 64M-bit dynamic random-access memory chips.

Even though 4M-bit DRAMs are only now being produced in volume, and the first production samples of 16M-bit chips are slated to arrive in the coming months, the world's top semiconductor manufacturers are racing down the road to the next generation of 64M-bit chips.

About a dozen companies in the U.S., Europe and Japan are working on 64M-bit DRAM chips, including Hitachi Ltd.; NEC Technologies, Inc.; Mitsubishi Electric Corp.; Fujitsu Ltd.; Toshiba Corp.; Siemens AG; IBM; and Texas Instruments, Inc.

"Who will get there first is the big question," said Robert Frizzell, senior analyst at VLSI Research, Inc., a chip technology and market analysis firm in San Jose, Calif. The first samples will probably begin to appear in late 1993 or early 1994, according to Frizzell.

The world market for semiconductors was approximately $50 billion in 1989, with an average growth rate of 15%, according to market researchers. The memory chip market makes up more than 25% of the total semiconductor market.

Whoever gets to market first stands to gain the most and recoup what will have been a significant investment in research and development and production facilities. "A cost [of] $1 billion wouldn't surprise me," Frizzell said.

Initial price drops

The cost of a new semiconductor rapidly plummets soon after it is introduced. "One generation might come out at $200 to $400 a part, and within six months to a year, after volume production is up, that price might drop to $40 to $50," Frizzell said.

IBM, which was first in the world to produce 64K-bit, 1M-bit and 4M-bit DRAMs in production quantities, is working on 64M-bit chips for its own use, however. In October, the company opened its Advanced Semiconductor Technology Center in East Fishkill, N.Y., and said it has committed $500 million to the center to develop the next generation of 64M-bit and 256M-bit DRAM chips.

There is general agreement that computer memory capacity should grow in proportion to its speed, if the speed is to be used effectively, according to Fujio Masuoka, a manager of the device reseach department at Toshiba's Research & Development Center in Kawasaki, Japan. He heads a team that in a matter of weeks will introduce a prototype 64M-bit DRAM.

In a paper for the Institute of Electrical and Electronics Engineers, Inc., Masuoka said the general rule of thumb is that memory capacity in megabytes should be equal to four times the processor speed in millions of instructions per second (MIPS).

Using today's 1M-bit chips, 1G byte of main memory is about what can be used to still keep reliability within tolerable limits, he said.

The latest workstations are capable of performing at a rate of more than 10 MIPS, which means their ideal memory size is more than 40M bytes, according to Masuoka. That is more than it is possible to build using 1M-bit chips. However, 4M-bit chips are ramping up in volume, and workstations with 40M bytes of DRAM have already been developed. Judging by past trends, the 64M-bit chip will probably be mass-produced in 1995, according to Kiyoo Itoh, chief researcher at Hitachi's Central Research Laboratory. Hitachi unveiled the world's first 64M-bit DRAM at a symposium on very large-scale integration circuits, held in Hawaii in June.

For 64M-bit DRAMs, engineers are shooting for circuit line widths of 0.25 microns. Etching lines that fine in a silicon wafer using existing optical or photolithography technology is difficult but not impossible. Recently, engineers at Fujitsu were able to develop a prototype 64M-bit chip using a technique called "phase-shifted" photolithography. The process makes it possible to etch lines as fine as 0.35 microns.

Several companies are working on a lithography process that makes use of X-rays, whose wavelengths are shorter than light and thus more precise (see story at left).

Keeping pace with DRAM technology

Starting with the 1K-bit chip introduced in 1970, the memory capacity of DRAM chips has quadrupled about every three years. At that rate, 256M-bit chips will debut in 1998 and 1G-bit chips will show up near the year 2000. That assumes researchers will be able to resolve what may be the most difficult challenge of all: developing the technology needed to etch circuit lines small enough to pack billions of transistors onto a piece of silicon not much larger than a thumbnail.

Today, circuit lines are etched into silicon wafers by passing a light through a mask, which acts like a photographic negative, onto a silicon wafer that has been coated with photosensitive chemicals. The silicon is dipped into an acid bath that etches the lines into the wafer. The process is called optical- or photolithography. Circuit lines can also be etched into the surface of the wafer using a process called electron-beam lithography. The drawback is that the process is too slow to mass-produce 4M-bit or greater chips in high volume.

Engineers now believe that a process called X-ray lithography will allow them to etch even finer lines than is now possible into silicon wafers with the density needed to produce 64M-bit and greater chips.

X-rays have a shorter wavelength than ultraviolet light, whose wavelengths are too large to make the ultrafine lines that are needed. Today's photolithography etching process operates at about 1 micron, or about one-hundredth the width of a human hair, which is enough to pack the equivalent of one million transistors on a single chip. In comparison, the X-ray process can etch circuit lines of about 0.1 micron, or about one-thousandth the width of a human hair — fine enough to put the equivalent of four billion transistors on a chip.

The device that can create the X-rays for circuit etching is an electron storage ring called a synchrotron. Electrons are shot into the ring and whip around at close to the speed of light. Magnets bend the path of the speeding electrons, throwing off X-rays, which are funneled down beam lines to an exposure station. The X-rays pass through a mask onto the silicon wafer.

Developing small rings

One hitch has been the need to develop synchrotron storage rings small enough to be used on the factory floor. Most of those in use now have rings that measure hundreds of feet in diameter. However, the National Synchrotron Light Source at Brookhaven National Laboratory in Upton, N.Y., has developed a prototype synchrotron that is only 13 feet long and 7 feet wide. Some Japanese firms have also built compact synchrotrons in the range of 13 to 16 feet long.

IBM, considered among the world's leaders in X-ray lithography, plans to have the first privately owned synchrotron storage ring running late next year at its Advanced Semiconductor Technology Center in East Fishkill, N.Y. The compact, superconducting synchrotron is about 20 feet long and 7 feet wide and is being built to IBM's specifications by the Oxford Instrument Group in England. IBM has been experimenting with X-ray lithography processes at the Brookhaven Laboratory and will shift its work to the new center when its own ring is operational. Researchers have used the technology to produce experimental chips with 0.25-micron line widths, IBM said.

MICHAEL ALEXANDER

EDITORIAL

'Tis the season

THAT season's drawing once more near,
So here's our yearly gift of cheer
To those whose actions, bold and meek,
Fill our pages every week.

Let's hang on Exley's Christmas tree
A phone that can't call AT&T,
Or if bidders be they still,
A candy-coated poison pill.

To Manni, Lotus' erstwhile coach,
We take a more Novell approach,
With no more mergers in his head,
He'll sue for look and feel instead.

To Frank Dodge here are Tonka trucks
To hold his 14 million bucks
Of pay for suffering the frustration
Of taking a one-year vacation.

John Cullinane can stuff his sock
With lumps of coal called CA stock.
Oracle's gift? A quick review
On recognizing revenue.

Ingres shopping's an easy task;
All they had to do was ASK,
Though Unisys would be more merry
If Burroughs never heard of Sperry.

IBM has special reason
To party in this special season:
Its mainframe performance sure is rousin',
Almost good as RS/6000.

What gift for OS/2 is best?
How 'bout some user interest?
Or better yet, a stunning blow
like bugs in Windows 3.0.

DEC hopes to find beneath its tree
A real live Unix strategy
Or, perhaps, another chance
To stage a midrange renaissance.

Software firms should get some lifts
From brightly wrapped vaporgifts.
Apple's present: a paradigm.
Macs are cheaper, you just can't buy 'em.

Compaq wishes Yuletide bells
Would ring away those ads of Dell's,
While dealers hope the season's bargains
Aren't harbingers of future margins.

Wang folks have a special rhyme:
"Jingle bells, it's Miller time!"
While down the road at Prime, they might
Give thanks for their own Silent Knight.

For Paperback, let's trim a tree
In tinsel cloned from 1-2-3
Or type a worm-filled Yuletide chorus
On Internet for Robert Morris.

To users under outsource stress,
A season void of EDS;
To S&L staff in their grief,
A billion MIPS in tax relief.

Lest we drone on past our due,
We'll want to end by thanking you
For sticking with us through the year,
'Cause readers are why we're here.

LETTERS TO THE EDITOR

Defining success

Regarding Vivian G. Wilson's editorial, "IS: A Tough Road for Minorities" [CW, Nov. 19], the words "women," "Asians" or "Hispanics" could be substituted for "Blacks," and her advice would be equally as shallow.

I have learned over the years that there is a simple formula for success in your career. First, set goals in writing. Determine what you want to do or be. Vivian suggests management as a utopia to be sought by all. Why?

Second, determine what it takes to achieve your goals.

Third, do whatever it takes to achieve your goals. Giving 110% isn't the key. Most give, at best, a 50% effort.

I wish Vivian could meet a young man I know. He left a widow and a son in Vietnam and spent 10 years as a refugee and boat person to get to Houston. He set goals, went to school and became a programmer. We hired him this year, and he's doing great. He does his work well using a workstation and a complex keyboard. Just like you and me, right? Except, you see, this man's right arm has been paralyzed since the age of 12. Successful? We think so.

Sam W. Love
Staffing Manager
Computer Power Group
Houston, Texas

Gloom and doom

In his Viewpoint article [CW, Nov. 26], Mr. Norris sounds more like a gloomy socialist than a representative of a free-market perspective.

Consider these unsupported assertions: "... there must be a substantial increase in funding by the federal government ... These objectives [technological cooperation in R&D, manufacturing and research] can be achieved only if the federal government provides more money ..."

Government funding means you and I turn over part of our output to the government, which means we no longer have these assets to invest. The conceited, elitist presumption of those who would advocate government funding is that the judgment of a bureaucrat is somehow better than mine.

A better prescription for technology development and economic health of the nation is to disembowel government funding. Billions of dollars used for socialized purposes could then be used by individuals and industry for research, development, charity and private enjoyment. The stock market would soar, because you and I are closer to the problems of the world. The nature of knowledge itself limits the ability of the politician to solve my problems for me.

F. William Ballou
Ridgewood, N.J.

Military missteps

Kudos to the U.S. Air Force Office of Special Investigation's computer crime unit [CW, Oct. 22]. While this instance focuses on the U.S. Army Criminal Investigation Command (USACIDC), this is another situation where an organization abysmally fails to intelligently plan uses of AIS.

I am the information management specialist with responsibility for USACIDC in Europe — the *only* one. That entails responsibility for the automation planning and implementation of approximately 50 USACIDC offices scattered throughout Germany, Holland and Italy. Did these agents rely on their information management people, for example, the information management office in which I work, to initially diagnose possible data recuperative/investigative measures? Of course not. They initially relied on their own "expertise," as most users do. Users feel omnipotent when they can do this, thus they can then tackle any personal computer problem. Unfortunately, such "hacking" creates a false sense of computer literacy.

Here in Europe, there are no agents of the U.S. Army Criminal Investigation Command who are computer experts. They can use application software but are novices in diagnosing computer-related problems. I've visited enough of our offices here where I've rectified that which the "experts" supposedly cleared up.

It's a shame the Army had to turn to the Air Force for such help. Better training and security software would have provided a more expeditious outcome with less frazzled agents' nerves during the investigation.

David Molush
Information Management Specialist
USAISC-CIDC
Heidelberg, Germany

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Consortia offer R&D solutions

GRANT DOVE

Our country faces a growing crisis in applied research and development — the effort needed to move an invention from scientific discovery to practical use.

In its Science and Engineering Indicators Report for 1989, the National Science Board (NSB) reported a "dramatic slowdown" in funding for applied R&D. The NSB figures showed that between 1986 and 1989, spending on applied R&D slowed to an average annual growth of only 1%.

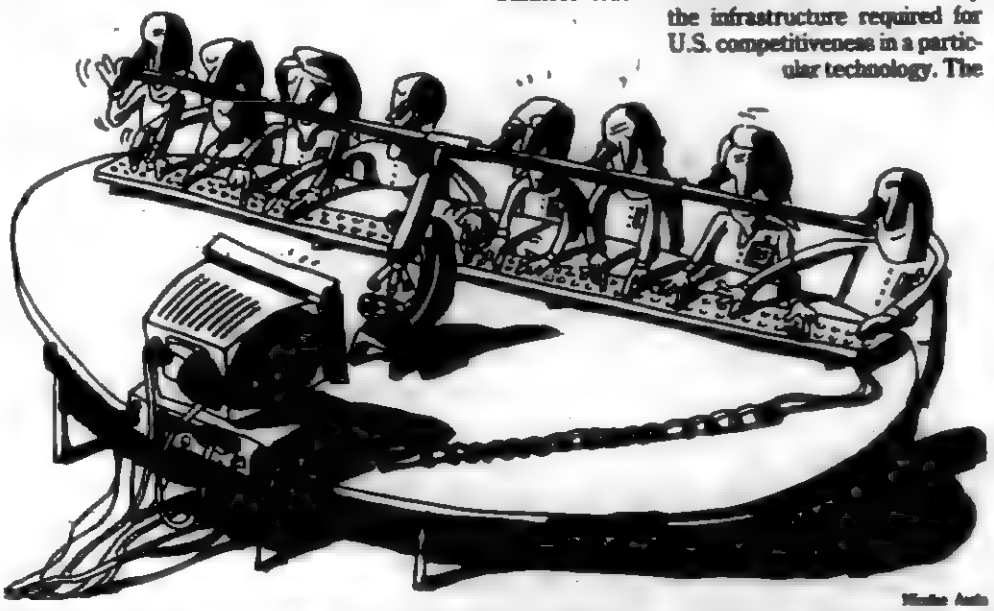
This trend is reflected most significantly in our industrial research, where the bulk of applied research and R&D takes place. At the beginning of this year, the National Science Foundation reported that we in the U.S. are experiencing negative real growth in total industrial R&D — a decline of 1% from 1988 to 1989 and the first such decline since 1975.

Because of competitive pressures, industry is now investing a much larger portion of its R&D budget in product development at the expense of the three- to 10-year horizon of applied research and advanced development.

We risk an accelerating decline in the health of our industries if we fail to address this trend. We cannot simply create more resources.

We must use the resources we have more efficiently by actively pursuing strategic partnerships, leveraging our research dollars and creating incentives for advanced R&D.

This is the fundamental rationale for consortia. The Microelectronics and Computer Technology Corp. and other consortia have become centers of collaboration involving strategic partnerships between universities, industry and the government. Consortia leverage scarce resources, increase the efficiency of resource deployment and provide a vital conduit for transferring advanced technology into product development. Consider several reasons why consortia are a vital part of our national agenda:



Nicolas Ando

• Just about every U.S. business leader and government policymaker would agree that one of our biggest common headaches is the cost of capital. Consortia can help by leveraging R&D dollars and talent to develop new generic technologies. This is especially appropriate to longer range, higher risk emerging technologies.

• Consortia can encourage more efficient use of resources to accelerate the pervasive adoption of new technology. When users and suppliers cooperate, they can achieve the aggregation of volume necessary for rapid and broad deployment of new technology. This is especially applicable to technologies that may not be key differentiators in the domestic market but are serious competitors in international markets.

• Consortia can also efficiently marshal resources to develop the infrastructure required for U.S. competitiveness in a particular technology. The Semiconductor Research Corp., for example, fosters outstanding undergraduate and graduate university talent as a spin-off of its semiconductor research.

• Consortia are also useful in responding to common industry challenges, especially those in support of a broad customer base. Consortia can bring suppliers and users together to achieve cost leverage in developing industry standards for the benefit of each and of their customers.

• Consortia can play an important role in U.S. government's competitiveness policy. Strategic partnerships, implemented through industry-led consortia, can be appropriate, effective and efficient in the leveraging of public investment in science and technology.

In the recently released statement of U.S. technology policy, the Office of Science and Technology focused on the importance of collaborative efforts to create generic technologies in areas where the research is so expensive that a single company cannot adequately support the work.

This is precisely where cooperative research is most appropriate and the benefits of leveraging are the most compelling.

Congress — and now the Bush administration — support the role of the Advanced Technology Program in the Commerce Department, which is designed to encourage collaboration in precompetitive R&D. Another encouraging sign is language in the 1991 Defense Department Authorization and Appropriations bills that would enable the Defense Advanced Research Projects Agency to distribute $50 million among consortia for precompetitive research.

The fact that more policymakers are focusing on the use of consortia is an indication that what began as an experiment is now being recognized as a key tool for maintaining U.S. competitiveness.

Dove is the chairman of the Microelectronics and Computer Technology Corp. in Austin, Texas.

Lotus going a little too far with Marketplace

MARTY GRUHN

A recent article in *The Wall Street Journal* about Lotus Development Corp.'s new Marketplace product offers a peek into a technology future that could get personal for each of us very soon.

Scheduled for announcement next year, Lotus' Marketplace holds information on the names, addresses, shopping habits and likely income levels of 80 million U.S. households. This state-of-the-art database and accompanying software will be sold to businesses that want to reach very specific marketplaces. Unlike lists that are limited to one-time use, the buyers of this database can reuse it.

The product offers buyer information based on census data blended with credit bureau information and categorized by postal codes. Results are further narrowed by giving each household a "psychographic" profile developed by Equifax, the Atlanta-based credit reporting bureau that is assisting Lotus in developing the product.

Remember when the government promised you that your detailed census answers would remain protected? They are, sort of. But now your local peddler can have a "blended" and enhanced version for the price of some software and a compact disc.

Marketplace fits the future trend in which vendors will become purveyors of information rather than just the hardware and software used to create and manipulate it.

At best, this will create a new era in which vital business information will be at our fingertips and decision-making will be greatly enhanced. At worst, it provides a platform for rampant abuse of personal information that you and I have not knowingly released for use.

The potential for abuse is being downplayed by Lotus, which seems bewildered by the storm of protest coming from privacy watchdogs. Lotus execs cite the benefits of putting this information into the hands of small businesses that can't afford to lease conventional lists. This, of course, is nonsense. If a business can afford Lotus Marketplace at 8 cents per name, it can afford to buy other lists on which each name costs 12.5 cents.

In the wrong hands

One area that privacy watchdogs are most upset about is potential misuse of the information. Lotus insists that the list will only be sold to legitimate businesses at verified addresses that have been cross-checked against a fraud file. Lotus promises stiff penalties for misuse.

Lotus' intent is laudable, but enforcement is the key. If the government can't locate and prosecute all the fraudulent mail and boiler-room operations, how is Lotus going to assure this information doesn't fall into the hands of the unscrupulous? The software can be copied and distributed. Sure, Lotus has a long list of companies it has sued for illegally copying and distributing its software. But the reality is that pirated copies of Lotus products still exist.

Lotus indicates that the user of Marketplace will not be able to pull up a profile of an individual, and that the software will only list an individual that fits a particular profile or set of parameters. This is computer doublespeak at its best. They can't get everything on you at one time, but they can keep searching to find out how many lists you show up on. Once completed, this information can be recompiled as a personal profile. That makes the information harder to obtain — but obtainable nonetheless.

Finally, Marketplace fans suggest that the net effect of this product will be that we will all receive a few more pieces of mail. I don't know about you, but my mailbox is already stuffed full of coupons, flyers and nuisance mail that hits the garbage without even being opened. What I don't need is a few more pieces of mail to throw away every day.

In the final analysis, Lotus' Marketplace sends a signal to all of us in the computer industry that some technological frontiers will be crossed at a high price. We need to set some standards regarding the use of information. Sure, we all want highly detailed information on our potential customers to give us the competitive edge.

The catch comes when business' right to know becomes personal, when a company's competitive edge means that it can peek into our pocketbooks and make judgment calls on which "psychographic" category we fit into.

Who wins? Companies that take personal information that individuals have not authorized for sale and sell it to anyone with the ante to get into the game.

Today, your protection is limited to writing Lotus, Equifax, or the Direct Marketing Association in New York to have your name pulled from the database. I've opted not to be victimized. My protest is already in the mail.

Gruhn is a consultant based in Mesa, Ariz.

CSX Transportation uses BMC Software products for the long haul.

CSX Transportation, one of IBM's largest North American customers, believes that licensing BMC's IMS, CICS and DB2 products makes good business sense now and in the future.

The fast track

Kerry Tenberg, DB2 Technical Specialist says, "BMC consistently offers quality products that significantly increase our productivity. BMC also provides responsible and knowledgeable support representatives. The support is terrific."

According to Tenberg, BMC's outstanding track record at CSX with IMS and CICS, as well as DB2, is why new BMC products are evaluated: function, performance and quality are why BMC products are brought on board.

The long haul

To help us stay on the leading edge of technology, BMC provides continuous product growth and evolution. For instance, we've been extremely pleased with how fast BMC's DB2 products exploit new DB2 capabilities. Our participation in BMC product development focus groups has convinced us that BMC's commitment to future development will continue," says Tenberg.

Get on track with the leader

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DEC sends network message

ANALYSIS

BY MARYFRAN JOHNSON
CW STAFF

MAYNARD, Mass. — "All dressed up and no place to go" is how one industry analyst summed up Digital Equipment Corp.'s software announcements last week.

Yet that said more about what is seen as DEC's marketing ineptitude than about the additions to its Network Application Support (NAS) program of software, services and tools for multivendor networking.

"Technically, DEC has a lead over IBM and other vendors in terms of the basic software and technology," said Judith Hurwitz, an analyst at Patricia Seybold's Office Computing Group in Boston. "As far as communicating that, they do a lousy job."

What DEC unveiled was one real product — a high-level application programming interface called DEC Message Q — and plans for an object-oriented environment called Application Control Architecture (ACA).

DEC also pledged to support all of the Open Software Foundation's Distributed Computing Environment (DCE) technologies, which include standards-based technologies such as the X.500 communications protocol or Carnegie Mellon University's Andrew File System.

"DEC is the only one to belly up to [the] bar and say they'll put in full DCE, and that will be their method of communicating between heterogeneous systems," said John Dunkle, vice president of Workgroup Technologies in Hampton, N.H.

ACA specifications

Next month, DEC will supply the architectural specifications for ACA, but no services will show up until summer 1991. Tools to develop user applications will be on the market in the fall of 1991 for DEC's VAX/VMS, Ultrix, OS/2 and MS-DOS.

In the meantime, DEC said it will seek industry blessings for its new architecture from the Object Management Group, a standards body for object-oriented technologies.

Once applications start rolling out from independent software vendors (which play critical roles in ACA's success), users could use ACA to transparently link applications such as spreadsheets, databases and word processors across the network.

Introduced in 1988, NAS has quietly expanded to include a wide range of software and services that allows information and data sharing between multivendor networked computers. The operating systems included in NAS are VMS, Ultrix, OS/2, MS-DOS, Unix and Apple Computer, Inc.'s Macintosh.

As the DEC equivalent to IBM's Systems Application Architecture (SAA), NAS should be a household word among DEC customers. Yet when Workgroup Technologies polled 200 DEC users, Dunkle said, they were uncertain about what NAS includes. "DEC has not taken the high visibility position that NCR has with Cooperation or IBM has with SAA," he said.

DEC Message Q could be just the kind of product DEC needs to boost its visibility in network interoperability, according to some analysts.

Unlike the other NAS services introduced so far, Message Q is slated to arrive in February with versions for several platforms at once: VMS, Ultrix, OS/2 and MS-DOS. There is also a VMS/LU6.2 option that provides data interchange and interoperability among applications residing on IBM systems.

For more than one year, the MIS department at the Allen-Bradley Industrial Computer and Communications Group in Twinsburg, Ohio, has been using DEC Message Q to integrate communications between a corporate IBM mainframe in Wisconsin and factory shop-floor Vaxclusters in Ohio.

"We're just now going to production with our first application and will be working on an automated, point-of-use inventory system," said MIS Manager Michael Krueger.

A division of Rockwell International Corp., Allen-Bradley manufactures programmable industrial controllers. The company is decentralizing its operations, moving some applications from its IBM 3090 Model 500S to the shop-floor VAXs. The Message Q interface makes communications between the IBM and DEC systems easier by "providing low-level communications capability that we would have had to build otherwise," Krueger said.

Prices for the messaging interface product vary according to platform. There are three different DEC VAX/VMS licenses, priced from $4,000 to $12,000, and two Ultrix licenses: a $4,000 version for reduced instruction set computing Ultrix systems and a $9,000 version for VAX/Ultrix systems. DEC Message Q is priced at $200 for the MS-DOS version and $250 for the OS/2 version.

IBM plans high-end AS/400 in 1991

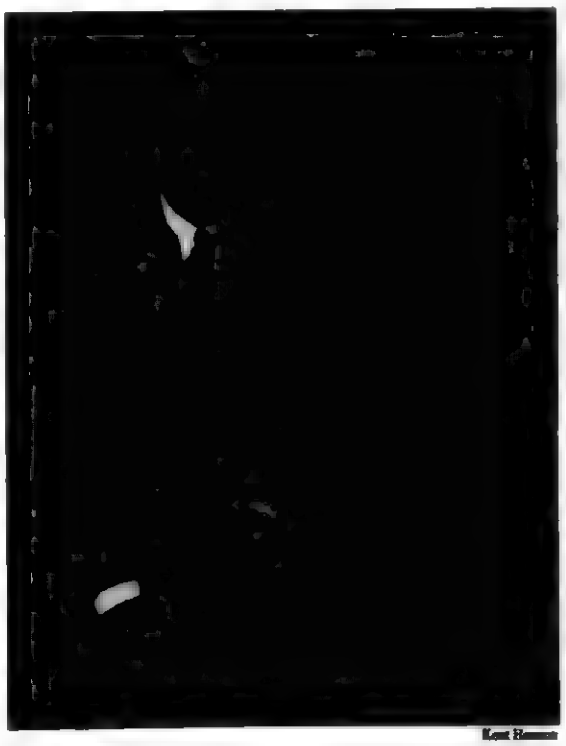
BY MICHAEL FITZGERALD
CW STAFF

ROCHESTER, Minn. — Saying IBM intends to plot its course for the Application System/400 based on "market-driven openness" in 1991, Robert LaBant, IBM's vice president and general manager of application business systems, recently provided an overview of its 1991 strategies for the AS/400, including a new high-end system.

Openness should in no way be confused with support for Unix, LaBant emphasized. Instead, he said, the term refers to improving the portability of application software, not of OS/400, the mid-range computer's operating system.

LaBant added that IBM intends to address customer "wants," including common communications standards, the ability to share data among different installed systems, more widespread use of software and application portability. LaBant also said IBM would continue to enhance OS/400 to better support personal computers and networks and give interoperability with other vendors' large systems.

"We want to bring more value-added things to the customer to enable them to achieve solutions," said LaBant, who noted that the major focus for IBM would be improving the relational database, the system manager, the network manager and the system security on the AS/400.



IBM's Labant *included a new high-end system in his company's strategies for 1991*

Dave Andrews, president of ADM, Inc., an AS/400 consulting firm based in Cheshire, Conn., said he expects IBM to introduce a multiprocessor version of the AS/400 by May 1991. The whole AS/400 line will be refreshed, Andrews said, with new technology similar to the strategy IBM used when it replaced the AS/400 B models with AS/400 Cs.

Senior editor Maryfran Johnson contributed to this report.

Knowledgeware announces OS/2-compatible tool set

BY ROSEMARY HAMILTON
CW STAFF

Knowledgeware, Inc., one of IBM's key business partners in the computer-aided software engineering (CASE) market, recently announced a host-based development tool set that uses OS/2 workstations as front ends.

ADW/MVS, scheduled for initial release in the first quarter of 1991, was designed for information systems shops that do software development on mainframes with OS/2 workstations serving as front ends. It is a set of design tools that works with an encyclopedia component, which runs on IBM's DB2 and manages the development environment. The setup is similar to IBM's AD/Cycle application development strategy, which will be managed by Repository Manager and is intended to work with OS/2-based front ends.

Michael Ryan, Knowledgeware's senior vice president of research and development, said the goal is to eventually integrate ADW/MVS with IBM's Repository Manager. Initially, the company will ship a data transfer tool for IBM's Repository Manager that would allow a customer to share data between the new Knowledgeware host-based environment, ADW/MVS, and the IBM platform.

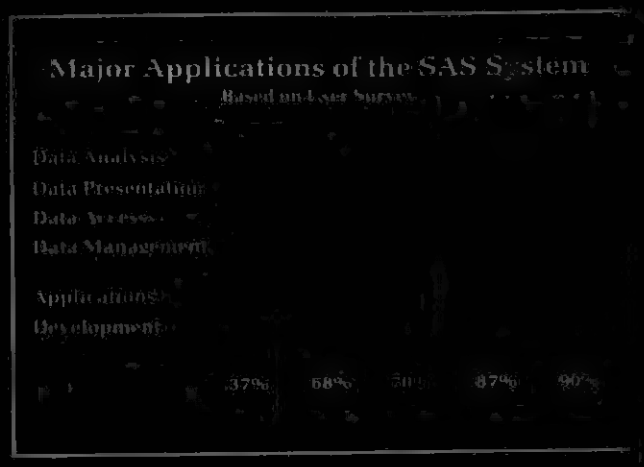
The tool, called the Repository Enablement Facility, will also work with Knowledgeware's ADW/MF host-based tool set, which uses MS-DOS-based workstations as front ends, Ryan said.

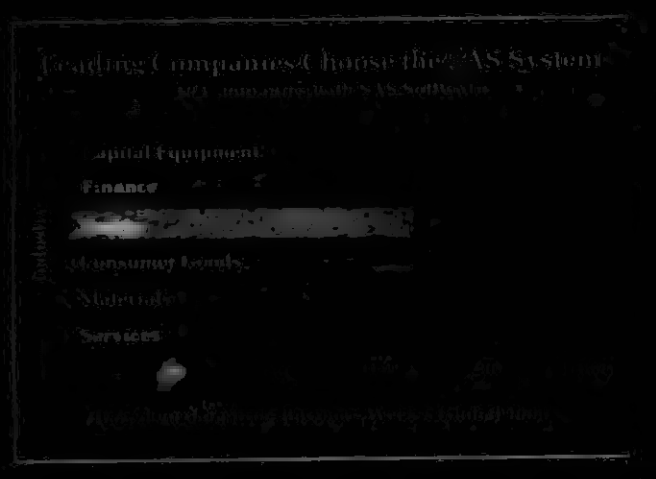
He also said ADW/MVS is not intended as a substitute for IBM's host-based CASE platform, even though it has its own encyclopedia component that runs on IBM's DB2. He said there are some similarities between the Knowledgeware encyclopedia and IBM's Repository Manager but added that the plan is to integrate ADW/MVS with Repository Manager, which will manage various tools beyond the Knowledgeware environment.

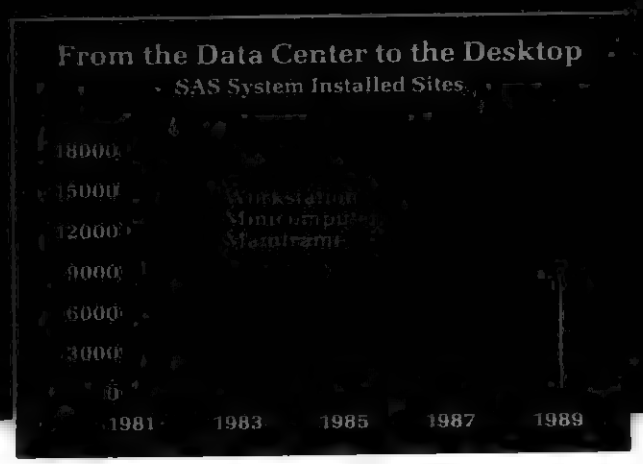
A select group

Knowledgeware is one of a select group of software companies that was anointed as an AD/Cycle business partner when this application development strategy was announced in 1989. The company has been working with IBM in the development of the information model — the guidelines contained in Repository Manager that will govern how applications are developed.

The company and the other business partners are also required to tailor their products to the IBM AD/Cycle platform in order to be compatible with the IBM CASE strategy. This typically involves two steps. First, they must move MS-DOS-based CASE tools to the OS/2 operating system. Secondly, they must integrate those OS/2-based tools to IBM's Repository Manager.







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Seeking out children in need

BY SALLY CUSACK
CW STAFF

BENTON HARBOR, Mich. — On any given day in the U.S., 1,840 children are abused, and every 53 minutes, a child dies because of poverty or related causes.

Time is essential to those working with abused children, and inadequate, improperly recorded or misplaced information can literally mean the difference between life and death.

The Berrien County Department of Social Services Office in Michigan is piloting a Unix-based computer platform to reduce this risk element by providing instantaneous on-line access to all client-related information.

Called the Childcare Protection System, the software product is offered by Bull HN Information Systems, Inc. in Billerica, Mass., and runs on a Bull XPS 1000 minicomputer under the AT&T Unix System V operating system.

"We have access to critical, case-related information 24-hours a day," said Jane Mecomber, a children's protective services specialist at Berrien County. "Using the laptop computer, we can do history checks and verify facts when we're on call. Before, we didn't have access to this data after regular working hours."

Faster turnaround

Using the system, caseworkers can update files as necessary on a round-the-clock basis, using either home personal computers or the department's Zenith Data Systems' laptop computer via a cellular telephone or modem. This allows them to respond accurately and quickly to calls and emergencies that are received after normal working hours.

According to Mecomber, if there is an emergency and a child has to be removed to foster care, the placement information can be immediately accessed. "This happens several times a week," she added, "and it used to take hours of calling around to locate appropriate and available care."

Workers access the minicomputer via one of six Bull terminals over 2,400 bit/sec. asynchronous lines, and the system incorporates two software products: the Uniplex package, which includes a word processor, spreadsheet, diary and calender management system; and the Oracle relational database management system from Oracle Systems Corp.

Additional features include a risk assessment function, designed to aid caseworkers in determining the risk of further harm or neglect to the child using the risk assessment model of their choice.

By reducing the administrative burden, the software also provides more time for caseworkers to interact directly with children and their families. Prior to the Bull system installation, protection service workers at Berrien County relied on endless rows of file cabinets stuffed with folders to house their valuable case histories and client status reports. Each case was tracked manually, making it more difficult to identify related cases and maintain finely detailed records.

"It changes how we use our time," Mecomber said. "Now we have much better documentation, and we're able to cross-reference cases more thoroughly."

The Bull system, which has been in development at the Berrien County facility for three years, is now available commercially. Pricing for the system begins at $80,000.

Alaska Air uses systems to keep on profit course

ON SITE

BY JEAN S. BOZMAN
CW STAFF

SEATTLE — Alaska Airlines, based here for 35 years, puts as much care into targeting its software projects as its pilots put into landing in subzero conditions on a field of sheer Alaskan ice.

The little airline, with $916.5 million in annual revenue last year and just 1% of the U.S.' airline business, has been profitable during each of the last 18 years, and it expects to report $1 billion in revenue in 1990.

Although relatively small, Alaska Airlines and its subsidiary, Horizon Air, Inc., were able to take home a hefty $43 million in after-tax profits last year by focusing its efforts where they are most needed.

In the area of transportation, this has meant adding new routes to fly Alaskans south to California, Seattle and Mexico instead of just flying the traditional routes that bring snowmobilers north to Anchorage.

In the area of software, this has meant developing custom software that adds value to Alaska Airlines' ticketing and customer service and buying the rest of the needed software — sometimes from other airlines.

"Our software is very tactical. It's very close to the needs of the business," said Bob Reeder, director of applications development at the airline. "We do a lot of integration, but we also buy a lot of software." No matter what their purpose, all applications must interface with System One, the IBM-based airline reservations system run by Continental Airlines. Over the years, use of this outsourced reservations service has saved Alaska Airlines millions of dollars in overhead costs, according to Alaska Airlines officials.

Even hardware purchases are carefully considered for possible impact on the bottom line. "We don't want new products to drive the IS process," said Dan McDonald, director of data processing services. "We won't jump on a technology just because it's there." The latest and greatest holds little appeal for the information systems managers here; instead, they prefer the pragmatic approach of using proven technology that enhances existing systems.

Dan Conrad

Alaska Airlines' ***Haslund, Reeder and McDonald are working to develop 'tactical' systems***

Saving money is a priority, as long as it doesn't adversely affect the business. In 1987, Alaska Airlines combined a VM system and two MVS systems that had been running on two different IBM 4300 machines and placed both on a single Amdahl Corp. 5890 mainframe.

Batch and on-line operations are now running under the Amdahl machine's Multiple Domain Facility but are segregated into separate memory partitions. As a result, Alaska Airlines pays just one IBM license fee for MVS, saving thousands of dollars in support costs each year.

The airline converted from Sperry Corp. 1100 mainframes in 1985. "Software drove the move away from Sperry, because we didn't see any future in that system," said Leif Haslund, assistant vice president of administration, who is Alaska Airlines' equivalent of a chief information officer.

Since then, Alaska Airlines has used an IMS database management system from IBM to track sales data. Meanwhile, McDonald and Reeder are studying IBM's DB2 relational database, but they are in no rush to install

Continued on page 28

Swiss are betting futures

BY MICHAEL FITZGERALD
CW STAFF

FRANKFURT — This nation's futures exchange threw the switch on its computerized trading system recently, making it the second such European exchange to go electronic in less than one month.

The Deutsch Terminbose (DTB) followed on the heels of the Swiss Options and Financial Exchange (Soffex), a *Computerworld* Smithsonian award winner that implemented an electronic exchange for Swiss stock futures on Nov. 9.

The DTB and Soffex have said they will tie their trading hours to those of the established capital markets, although the DTB will allow an hour of post-market trading. Still, the actions are being seen by some as a harbinger of a worldwide electronic trading system.

"It's just another step toward the inevitable creation of a global electronic marketplace," said Junius Peake, chairman of the Peake/Ryerson Consulting Group in Englewood, N.J. Peake added that the U.S. exchanges were behind the rest of the world in terms of automation.

The DTB and Soffex systems also claim to be the first to offer complete integration of automated clearing and automated trading functions.

Trading options and futures was illegal in Switzerland before Soffex was created in 1988, and German law before 1990 treated options losses as gambling debts, which can be walked away from. This had limited the market.

The two exchanges expect to gain liquidity from the opening of futures trading. The DTB also hopes to take at least half of the 40,000 to 45,000 daily contract volume for Bund futures, the long-term German government bonds traded on the London International Financial Futures Exchange.

Trades are made through a blind matching system, with the computer acting as a clearinghouse for all trades, much like the system to be employed by Globex, the automated futures exchange being developed by the Chicago Mercantile Exchange, the Chicago Board of Trade and Reuters Holdings PLC.

High costs

The Swiss have spent more than $50 million to develop their new exchange, the Germans $60 million. The DTB's option trading system was purchased from Soffex.

Both the DTB and Soffex rely on host clusters and distributed processors from Digital Equipment Corp., although the DTB's futures trading software has been customized to allow exchange members to connect IBM's first-generation AEX machine, the 6150.

Soffex intends to purchase DEC VAX 9000s to run its system sometime next year, possibly in the first quarter, and the DTB is looking at the DEC mainframe as well. Both exchanges are engaged in heavy development of new products.

In another recent move, the Paris Bourse flipped the switch on its new Reglement et Livraison de Titres system, based on an IBM 3090 mainframe, which will be used to clear and settle stock deals.

The Paris Bourse expects to be able to challenge the London exchanges for international business through the resultant cost savings and efficiencies.

Alaska Air

CONTINUED FROM PAGE 27

it. Still, the airline did not flinch at installing a more costly MVS/ESA environment late last month, after several months of testing.

Personal computers are being added wherever practical, and several key PC-based subsystems were installed during the last two years.

When possible, the PC's on-board intelligence is put to work to request data from the System One reservations system, which is otherwise accessed from dumb terminals.

Reeder's developers are working on software systems to automate that process, leveraging PC power to request additional System One data as needed.

One such application is a system called Wally, which reassigns passenger seats when operations managers have to change the type of aircraft used on a given flight.

However, PCs are not considered a cure-all at Alaska Airlines. Yield management is done over a Novell, Inc. local-area network, but Alaska Airlines' frequent-flyer program is managed from the Amdahl mainframe.

"It's tough to turn mission-critical systems over to PCs, because their operating systems aren't sophisticated enough to support them," Haslund said. "We put applications on PCs because it solved a business problem. We haven't had a religious experience that says PCs are a better platform than mainframes."

Behind all of the technology changes is a gritty philosophy that matches the highly competitive business Alaska Airlines' IS group supports.

"We aren't delivering the most esoteric solutions here," Reeder said. "We're being flexible so that we can adapt to changing business conditions. But then, you don't fly into Alaska in the winter unless you're adaptable."

Cognos presents VAX CASE tool

BURLINGTON, Mass. — Cognos, Inc. last week introduced a computer-aided software engineering (CASE) tool aimed at small to midrange VAX/VMS systems from Digital Equipment Corp.

Cognos officials said its Powercase software is the first such tool to be fully integrated within the company's Powerhouse fourth-generation language.

The tool enables users to create applications — from design to documentation — more quickly within Powerhouse. It is also integrated with ANSI, SQL and DEC RMS flat files.

According to Kristina Sorensen, an analyst at Boston-based Aberdeen Group, "Many CASE tools serve only one aspect of the application development process, such as just the design or the code generation."

Sorensen added, "Powercase's strength is that it covers all aspects of applications development."

Priced at $15,000 for the initial license, Powercase is available immediately for VAX workstations running Decwindows.

MARYFRAN JOHNSON

HARD BITS

Sears named technology innovator

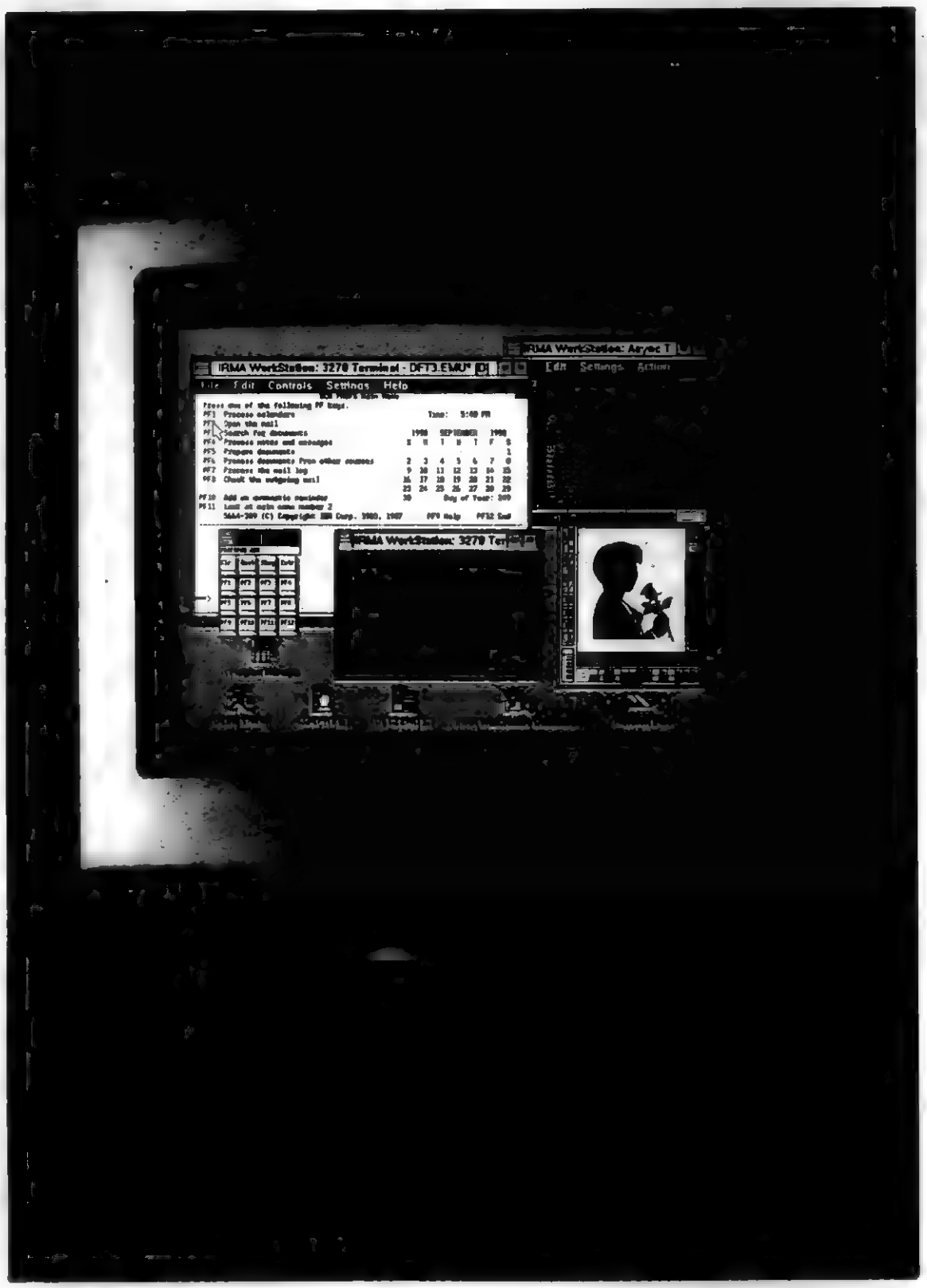
Digital Equipment Corp. named **Sears, Roebuck and Co.** the winner of the Retail Innovation Technology Award last month for its use of innovative computer technology. Sears won for its integration of a merchandise assortment planning process that relies on distributed database technology, networking and extensive end-user computing.

SAP America, Inc. has entered an agreement with professional services firm **Deloitte & Touche** for the purchase and support of SAP's R/2 system. The R/2 system is on-line, real-time mainframe software for handling a range of business applications.

System Software Associates, Inc. has announced the availability of AS/SET Integrator, a new computer-aided software engineering product that integrates **Knowledgeware, Inc.**'s Information Engineering Workbench with System Software's AS/SET on the IBM Application System/400. The integrator product is currently available and is priced between $3,000 and $10,000.

Wang Laboratories, Inc. and the **University of Southern California** recently announced an alliance for marketing automated student admissions processing software. The product reportedly allows admissions counselors to view electronic images of student applications, transcripts, letters of recommendation and other paper-based documents interactively with computerized student data records.

Sun Data, Inc. and **Sungard Recovery Services, Inc.** are currently cooperatively marketing disaster recovery services for IBM midrange systems, including the Application System/400, System/36 and System/38. The two firms will share disaster recovery facilities and personnel as well as support capabilities.



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DCA.

SAS Institute announces plan to link with Ingres database on VAX

BY SALLY CUSACK
CW STAFF

LAS VEGAS — SAS Institute, Inc. chose Dexpo West '90 as the place to announce that it is working on an application that will link the SAS Applications System under Digital Equipment Corp.'s VMS environment with Ingres Corp.'s Ingres database software.

According to SAS, the product is still in the experimental testing phase and is scheduled for release in the second quarter of 1991. When completed, the interface will reportedly allow VMS users to seamlessly access Ingres tables directly from within the SAS Applications System or extract data for placement in SAS data files. SAS products are currently installed at 3,500 DEC VAX sites worldwide.

SAS/CPE upgraded

In addition, SAS has released an enhanced version of the SAS/CPE performance evaluation software for DEC VAX system users.

Release 2.0 was designed to allow systems analysts to collect, analyze and report on current system use as well as anticipate adjustments for future VAX performance requirements. The software offers a menu-driven screen interface and a command-line interface that mimics standard VMS utilities, the vendor said. First-year license fees for SAS/CPE range from $575 to $4,100.

The Cary, N.C.-based software company also revealed that the SAS Applications System will soon include vector processing support for DEC VAX 6000 and VAX 9000 users.

Beginning next month, SAS will release a collection of vector manipulation subroutines that use the VAX Vector Architecture.

Dexpo West draws vendors

BY GARY BYRNE
CW STAFF

LAS VEGAS — At the Dexpo West '90 conference last week, Nicholson Systems announced an upgrade to its User Shell, a window-oriented interface designed for Digital Equipment Corp. VAX/VMS terminals.

Version 2.1 enables an organization to configure User Shell for each user or user group. The product uses VMS security to control access to available commands.

License fees range from $495 for a single user to $9,995 for unlimited users.

Some of the other products announced at the show included the following:

• Russell Information Sciences, Inc.'s Xecutive Office System, a menu-driven environment that protects the VMS operating system from user interference.

A menu interface enables any application, utility or custom Digital Command Language procedure to be added to a user's menu in less than one minute.

The product is available for VAX or Vaxstation systems running VMS. Pricing ranges from $795 to $34,995, depending on type of VAX configuration.

• Version 4.0 of Synthesis Computer Technologies, Inc.'s Case/ap application development system, a tool that enables users to produce C or Cobol code from within a VAX/VMS environment.

Pricing ranges from $5,000 to $75,000, depending on CPU size.

• Version 4.0 of Executive Software International's Diskeeper/ Plus on-line disk defragmenter. The product features a DK View utility that enables VAX managers to monitor disk fragmentation and defragmentation activities in real time.

Pricing ranges from $250 to $10,600, depending on configuration.

The company also unveiled I/O Express, an automatic data caching software package that was designed for VAX/VMS systems. A proprietary algorithm enables I/O Express to determine which blocks to keep in cache, depending on the type of application being run, the vendor said.

Pricing ranges from $375 to $16,000, depending on CPU size.

• Networking Dynamics Corp.'s Multisessions 2.0, which allows VAX/VMS users to run multiple sessions from any VT-style terminal.

License fees for stand-alone CPUs range from $1,099 to $8,900, depending on VAX configuration.

• Clearpoint Research Corp.'s TSB-T02 ($54,000), an IBM 3480-compatible, rack-mountable, 18-track, ½-in. cartridge-tape subsystem designed for DEC VAX 6000 and 8000 series systems.

Clearpoint also announced that its DCME-D52, a memory upgrade for the Decstation 5000 Model 200, is now available in 8M- and 32M-byte versions, which are priced at $2,000 and $10,000, respectively.

• Version 3.1 of Gray Matter Software Corp.'s Scriptserver Printing System, designed to interface with and manage local or network attachments of multivendor Adobe Systems, Inc. Postscript-based printers to VAX/VMS systems.

License fees range from $495 for Vaxstations to $3,995 for Vaxclusters.

For once, an announcement that will have businesspeople jumping into windows.

Until now, a lot of businesses have been hesitant to take the plunge into Windows. People have wondered, for instance, whether critical applications and viable communications would become available.

Well, if we may be so bold, we'd like to give you a little push – by introducing you to DCA®'s new IRMA™ WorkStation for Windows.

A BREAKTHROUGH IN 3270 CONNECTIVITY: IRMA WORKSTATION FOR WINDOWS.

In the Windows 3.0 operating environment, only IRMA WorkStation for Windows gives you a choice of single (CUT) or multiple (DFT) sessions via coaxial cable, remote SDLC or token-ring connections, as well as asynchronous connections.

It also gives you 3270 terminal, 3270 printer and asynchronous terminal emulations, and an extensive range of 3270 and asynchronous file transfer protocols, including DCA's and IBM®'s. Both DCA and IBM hardware are supported, as well.

All of which means that you won't have to keep reinvesting in new software as your business's needs change.

In addition to its tremendous flexibility, IRMA WorkStation for Windows is quite simple to use, which helps boost productivity.

For instance, mainframe data can be directly embedded into a word processor or spreadsheet, using DCA's QuickScript™ and Windows Dynamic Data Exchange.

Only IRMA WorkStation for Windows supports APPC and supplies you with a user interface that conforms to IBM's SAA/CUA standard. It also provides you with a transparent migration path to OS/2,® using DCA/Microsoft® Select™ Communications Workstation.

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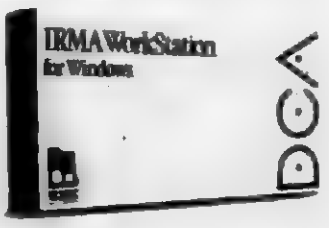
Best of all, from now until March 29, 1991, we'll let you trade up from your old 3270 communications software – regardless of who you bought it from – for just $149 per unit (the suggested retail price is $495). For more information or to order, call 1-800-289-4DCA, ext. 66E (please have a photocopy of your master diskette on hand to fax in to DCA as proof of purchase).

It's easy. Just take a deep breath. Close your eyes, if you feel like it.

And jump.

DCA



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"The IEF is a superior tool for implementing Information Engineering because it integrates the entire process from planning through code generation. We're deploying the IEF throughout the corporation."

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Vice President
Director, Information Systems
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Mark Quinlan
Senior Programmer/Analyst
Huntington National Bank

"To meet the dramatically reduced time-to-market requirements for our products, we need high-quality systems that can be changed fast. That's why we've chosen the IEF as the CASE solution for our entire organization."

John Pajak
Executive Vice President
Mass Mutual Life Insurance

"The strengths of the IEF are clear-cut. One obvious quality advantage is that application changes are made to diagrams, not code. This ensures ongoing integrity —the specification always matches the executing system."

Paul R. Hessinger
Chief Technology Officer
Computer Task Group

"I've seen other CASE tools fail, so I raised the bar high when we evaluated the IEF. It passed with flying colors. I could not be happier with my decision to adopt the IEF company-wide."

John F. Mott
President
AMR Travel Services

"Our users were extremely pleased when we finished our first project—a 60-transaction system—in one-half the budgeted time. We had tried interfaced CASE tools without success. IEF integration makes the difference."

Giorgio Sorani
Division Head – MIS
Lubrizol

"We are using the IEF to develop a new generation of manufacturing systems replacing over 300 existing systems. We estimate that IEF will increase our productivity by between 2-to-1 and 3-to-1 for new systems development.."

Wal Budzynski
Head of Operations, Systems/Computing
Rolls-Royce

"We used the IEF to rebuild our aging Frequent Flight Bonus system. With DB2 tables of up to 52 million rows, we needed high performance. And we got it...98% of our transactions complete in less than 3 seconds."

Cloene Goldsborough
Director of Data Resource Management
TWA

"Our first IEF system was completed faster, and with fewer errors, than any system I've ever seen. If I had to go back to the old ways, I'd find another job...outside the DP world. It means that much to me."

Mogens Sorensen
Chief Consultant
Nykredit (Denmark)

op information systems with uctivity and maintainability.

The success of Texas Instruments CASE product is proven—in the field.

Major companies have used TI's CASE product, the Information Engineering Facility™ (IEF™), for everything from rebuilding aging high-maintenance-cost systems to development of new enterprise-wide strategic systems.

Study shows zero code defects.

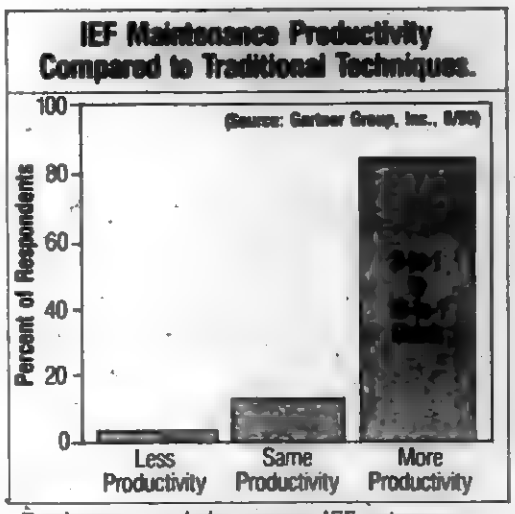
The quality of IEF-developed systems is remarkable. In recent CASE research by The Gartner Group, application developers were asked to report the number of abends they had experienced. (An "abend" is a system failure or "lock-up" caused by code defects.) *IEF developers reported zero defects—not one abend had occurred in IEF-generated code.*

Maintenance productivity gains of up to 10-to-1.

In this same study, developers were asked to compare IEF maintenance productivity with their former methods. Of those responding, *more than 80 percent had experienced gains of from 2-to-1 to 10-to-1.* (See chart.)

Specifications always match the executing application.

With the IEF, application changes are made to diagrams, not code. So, for the life of your system, specifications will always match the executing application. The Gartner Group research showed that *all* IEF users who reported making application changes made *all* changes at the diagram level.



Developers were asked to compare IEF maintenance to former methods. Of those responding, more than 80% reported productivity gains of from 2-to-1 to 10-to-1.

Mainframe applications can be developed and tested on a PC.

With our new OS/2 toolset, you can develop mainframe applications, from analysis through automatic code generation, on your PC. Then, using the IEF's TP monitor simulator and the diagram-level testing feature, you can also test these mainframe applications without ever leaving the PC.

More environmental independence coming soon—develop on PC, generate for DEC/VMS, TANDEM, UNIX.

The IEF has generated applications for IBM mainframe environments (MVS/DB2 under TSO, IMS/DC, and CICS) since early 1988. Soon you'll be able to develop systems in OS/2 and then automatically generate for other platforms. DEC/VMS, TANDEM and UNIX are scheduled for availability in 1991. More will follow. We are committed to increased environmental independence in support of the Open Systems concept.

We are committed to standards.

IEF tools and IEF-generated code will comply with standards as they emerge. We will adhere to CUA standards and to the principles of IBM's AD/Cycle and DEC's Cohesion—and we will support Open Systems environments centering around UNIX. In any environment, the COBOL, C and SQL we generate adhere closely to ANSI standards. Our presence on standards committees helps us keep abreast of ANSI and ISO developments affecting the CASE world.

Full-service support.

Of course, our technical support, consultancy, training courses, satellite seminars, and other informational assistance will continue apace. We also offer re-engineering and template services. This full-service support will remain an integral part of the IEF product.

For more information, including a VHS video demo, call 800-527-3500 or 214-575-4404.
Or write Texas Instruments, 6550 Chase Oaks Blvd., Plano, Texas 75023.

TEXAS INSTRUMENTS

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68108

NEW PRODUCTS — SOFTWARE

Unix software

Interactive Development Environments, Inc. has announced that Software Through Pictures Release 4.2 is now available for Sun Microsystems, Inc.'s Openwindows Version 2.0 application environment and Sun's Sparcstation 2 workstations.

The product allows users to set up an X Window System X11-based software development center that consists of a Sun Sparcserver 490 to Sparcstation SLC combined with an X11 display server.

Single license fees range from $5,000 to $21,000, depending on configuration.

Interactive Development Environments
595 Market St.
San Francisco, Calif. 94105
(415) 543-0900

Applications packages

Andersen Consulting, a division of Arthur Andersen & Co., has introduced job-shop software modules as part of its MAC-PAC integrated manufacturing, distribution and financial application software package, which was designed for IBM Application System/400s.

The modules enable users to manage inventory, purchasing, planning, job control and cost functions within a job-shop manufacturing environment.

Pricing ranges from $8,000 to $30,000, depending on the hardware model.

Andersen Consulting
69 W. Washington St.
Chicago, Ill. 60602
(312) 580-0069

IBM has announced an enhanced version of its Optimization Subroutine Library (OSL), a mathematics package designed to allow users of workstations, mainframes and supercomputers to solve complex applications.

The product can find a series of optimal answers after an initial calculation has been done without having to recalculate the entire problem, the vendor said.

OSL runs on IBM Personal System/2s, RISC System/6000s and all System/370 and 390 processors.

Pricing ranges from $2,285 to $149,200, depending on the type of system used.

IBM
T. J. Watson Research Center
P.O. Box 218
Yorktown Heights, N.Y. 60598
(914) 945-3471

Tesseract Corp. has announced a set of human resources applications designed for midsize firms and larger organizations with limited resources.

HRMS Express enables users to enter a new employee's record into a single database that contains information on all employees and work with the same data throughout other applications.

The product features predefined table entries and code sets, established screen definitions and implementation aids, the vendor said.

It runs on IBM mainframes under DOS/VSE and MVS and cooperatively under OS/2 or DOS Version 3.0. Pricing starts at $75,000.

Tesseract
150 Spear St.
San Francisco, Calif. 94105
(415) 543-9320

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President
National Computer Associates

Stephen Kukoy is not only President of National Computer Associates but also President of Abacus Consultants, Inc. in Denver. Having been in the recruitment business for nearly 15 years, he knows the critical role advertising plays in finding the best qualified professionals. He also knows where his recruitment advertising dollars are best spent.

Founded in 1971, National Computer Associates (NCA) is an exclusive group of private firms dedicated to importing and exporting computer personnel on a national basis. With an active membership of 32 firms throughout the United States and Australia, NCA is virtually a network of "branch offices" working together to place the best qualified IS professionals in the right jobs. Today, NCA's aggressive growth and strategic market positioning make recruitment advertising more important than ever.

"Since Computerworld *is the most respected professional newspaper for computer professionals, we believe it's our most direct means for reaching our entire target audience — programmers, systems analysts, and IS directors . . . operations, technical support, telecommunications, and PC professionals . . . even vice presidents and presidents. And with its national reach,* Computerworld *is the perfect place to tell these IS professionals about how NCA, with its pooled resources and industry expertise, offers them a wider variety of jobs in more companies in just about every location.*

"Because of our long-term recruitment success, we place 100% of our national media advertising in one publication. Computerworld. *Time after time,* Computerworld *produces top-calibre candidates — qualified professionals who are truly interested in keeping their careers abreast of the industry's rapid changes and trends.*

"Looking ahead, we expect several factors to escalate our recruitment advertising needs — the growing demand by clients for greater selectivity, an increasingly specialized industry, a continually mobile marketplace, and NCA's current plan to select an affiliate in the lucrative European marketplace. As this all happens, we intend to increase our advertising budget in Computerworld *proportionately.*

*"*Computerworld *recruitment advertising has been equally successful for Abacus Consultants. Although we've experienced many such situations, one specific instance comes to mind. After local advertising proved unsuccessful for finding a particularly hard-to-find individual in the Denver area, the client gave us the go-ahead to advertise nationally. We ran one recruitment advertisement in* Computerworld *— and got an instant response from just the candidate we were looking for — right here in our local area. It just goes to show that* Computerworld *delivers far better candidates than any other source."*

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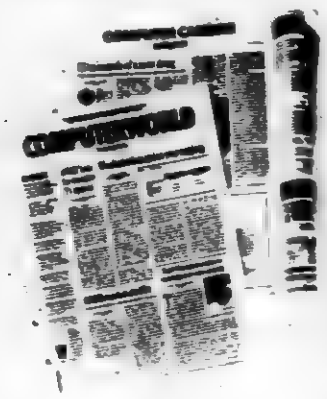

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An IDG Communications Newspaper

NEW PRODUCTS — HARDWARE

Data storage

Hewlett-Packard Co. has announced plans for its HP 9000 Series 800 and HP 3000 Model 900 computers to support the HP Series 6300 Model 20GB/A rewriteable optical-disc library.

Users of HP 3000 Model 900s running the HP MPE/XL 3.0 operating system will now be able to streamline backups using the Model 20GB/A optical library and the company's HP Turbostore/XL II backup software.

A rack-mount option for the HP Series 6300 Model 20GB/A was also announced. The Model 20GB/A with rack-mount option is available for HP 9000 Series 3000 workstations for prices ranging from $36,000 to $84,000, depending on configuration.

Hewlett-Packard
3000 Hanover St.
Palo Alto, Calif. 94304
(800) 752-0900

Perceptics Corp. has added the Triple Drive Pack 525 to its line of optical subsystems for Digital Equipment Corp. VAX/VMS and Unix workstations.

The TDP-525 provides slightly less than 2G bytes of write-once data storage. Its multiple optical-disc drives are connected to a host workstation via a small computer systems interface, and its Laserware software package makes the optical-disc drives transparent to the workstation's operating system, according to the vendor.

The product is priced at $17,950.

Perceptics
725 Pellissippi Pkwy.
Knoxville, Tenn. 37933
(615) 966-9200

PRODUCT REVIEW

Sapiens almost hits the mark

Sapiens International

This is the seventh in a monthly series of performance benchmarks that for the next several months will focus on the integration of computer-aided software engineering (CASE) and fourth-generation language (4GL) products. The benchmarks are monitored by an independent team headed by David Whiteside, managing director of Computing Futures Ltd. and his associate, Prof. Eberhard Rudolph, formerly of the University of Auckland, for exclusive publication in Computerworld.

Each product is observed in action over a three-day period during which a vendor team solves the case study project costing system, an application that is familiar to most information systems professionals. The team's mission is to demonstrate the capability of the major CASE/4GL environments to deliver complete and complex business solutions under "live fire" conditions. In this issue, we look at Sapiens, a rule-based, object-oriented development tool from Sapiens International.

DEVELOPMENT PRODUCT BRIEFINGS WORLD

•

Building on artificial intelligence technology, Sapiens, a relatively unknown product, is one of the few mainframe application generators participating in IBM's AD/Cycle.

•

Carried out in London, the team of two people provided a solution that fell short in a number of areas. Some of the shortcomings were cosmetic while others came from the team cutting corners to avoid a lower level time-consuming approach. While the final solution exceeded the requirements in several areas, the system still contained some bugs. We gave a rating of "good" for the level of completion.

•

The team completed the benchmark and its enhancement in 14 working hours with an overall effort of 24 hours. Such a development speed was remarkable. It was achieved partly because of a shrewd approach to use of time and compromises in the solution. Nevertheless, the power of the tool was the predominant factor and justified a "very good" development speed rating.

•

The power of the rule-based approach was even more evident in the enhancement section, where the team was able to change 40% of the system in just one hour and 40 minutes. This time the team cut no corners and delivered without compromise. A grade of "excellent" was more than justified for speed of maintenance.

•

The documentation provided was straightforward, listing data elements with associated processing rules. The higher level CASE documentation was presented in a pleasant graphic format but used an unusual notation, even unfamiliar to the chief developer. A comprehensive, on-line cross-reference facility keeps track of the use of each data element throughout the entire system. We awarded a rating of "very good" for documentation.

•

The Object-Modeller CASE tool directly created data structures in the single data dictionary. Being an early version of the CASE tool, it was limited to simple object relationships. The tools are currently fully integrated in a one-way direction (top-down). We rated the level of integration as "good."

•

The end-user language, Quix, was very efficient and produced excellent results with very little effort in merely 10 minutes. The language was given a rating of "very good."

•

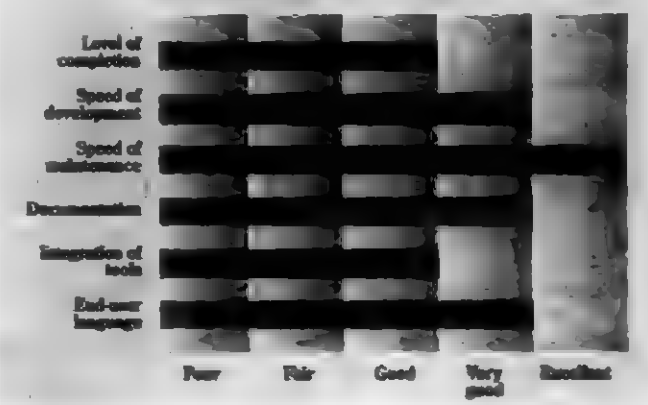
In summary, Sapiens is a refreshing product. It merges AI principles with current CASE and database technologies and produces a highly flexible and productive environment. Its particular strength lies in maintenance.

As with any new approach there are initial problems. For Sapiens to reach full potential, the CASE tool will have to leapfrog current CASE technology to incorporate rule-based development. If Sapiens can achieve this, it will become a product to be watched.

The Sapiens tool kit

- Object-Modeller — CASE tool
- Sapiens — Development platform including a knowledge base
- Quix — Query language
- Perfect — PC/3270 emulation mainframe link

Consultant's assessment



Development and maintenance report card

ANALYSIS AND DESIGN: D
The CASE support of the analysis and design was limited to defining objects and their relationships. No business rules were supported at this level, yet Sapiens relies heavily on general rules. The early version of the tool was unable to represent some objects and relationships of the complex transaction.
STRENGTH: Graphics are well presented.
WEAKNESS: Design is only partial.

DATABASE SETUP: B
This stage took slightly longer than usual because a large number of the data constraints were defined as general rules. All data is referred to by a unique number, currently restricting a database to 10,000 items.
STRENGTH: Edit checks are implemented at a global level.
WEAKNESS: Data has to be defined at two levels.

FILE MAINTENANCE TRANSACTIONS: B
The requirement of being able to update multiple files from multiple processes proved to be difficult to implement in an object rule-based environment. One-to-one relationships were implemented "on the fly."
STRENGTH: Most of the work is done by general rules.
WEAKNESS: Results can be unpredictable.

COMPLEX TRANSACTIONS: C
The complex screen format and connections to the database were easily generated. As in many other cases, the time arithmetic required special handling and proved cumbersome. Special control fields were needed to navigate between different screen sections.
STRENGTH: The results can be incrementally refined.
WEAKNESS: Display fields cannot be concatenated.

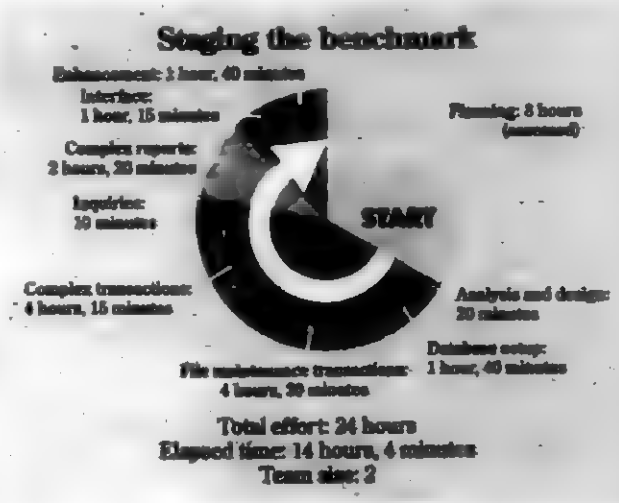
INQUIRIES: A
The Quix query language generated the solutions with a few simple lines. While end users could write such code, they also had to be familiar with the data structure, including the awkward time representation.
STRENGTH: It is very fast.
WEAKNESS: No weaknesses are evident.

COMPLEX REPORTS: D
The standard report generator could not produce the "two-up" presentation called for in the requirements. The team refused to drop to its lower level 4GL Cobol generator, thus compromising "level of completion" for "speed of development." The report was generated from intermediate data and did not reflect the exact state of the files.
STRENGTH: It is good for straightforward reports.
WEAKNESS: Data duplication may be required.

INTERFACE: B
A manual conversion of the Ashton-Tate Corp. Dbase file was needed to include a control data item to each record. Once this was completed, the general rules already in place for the complex transaction were used to validate the external data.
STRENGTH: Reusable code is supported.
WEAKNESS: Dbase file layout has to be modified.

ENHANCEMENT: A
The selected enhancement required changes in the data structure, interface structure, screen layout and reports. Here, the rule-based global approach to program logic showed its full strength, producing the best result so far.
STRENGTH: Change is encouraged with the environment.
WEAKNESS: Changes are not automatically reflected in the design documentation.

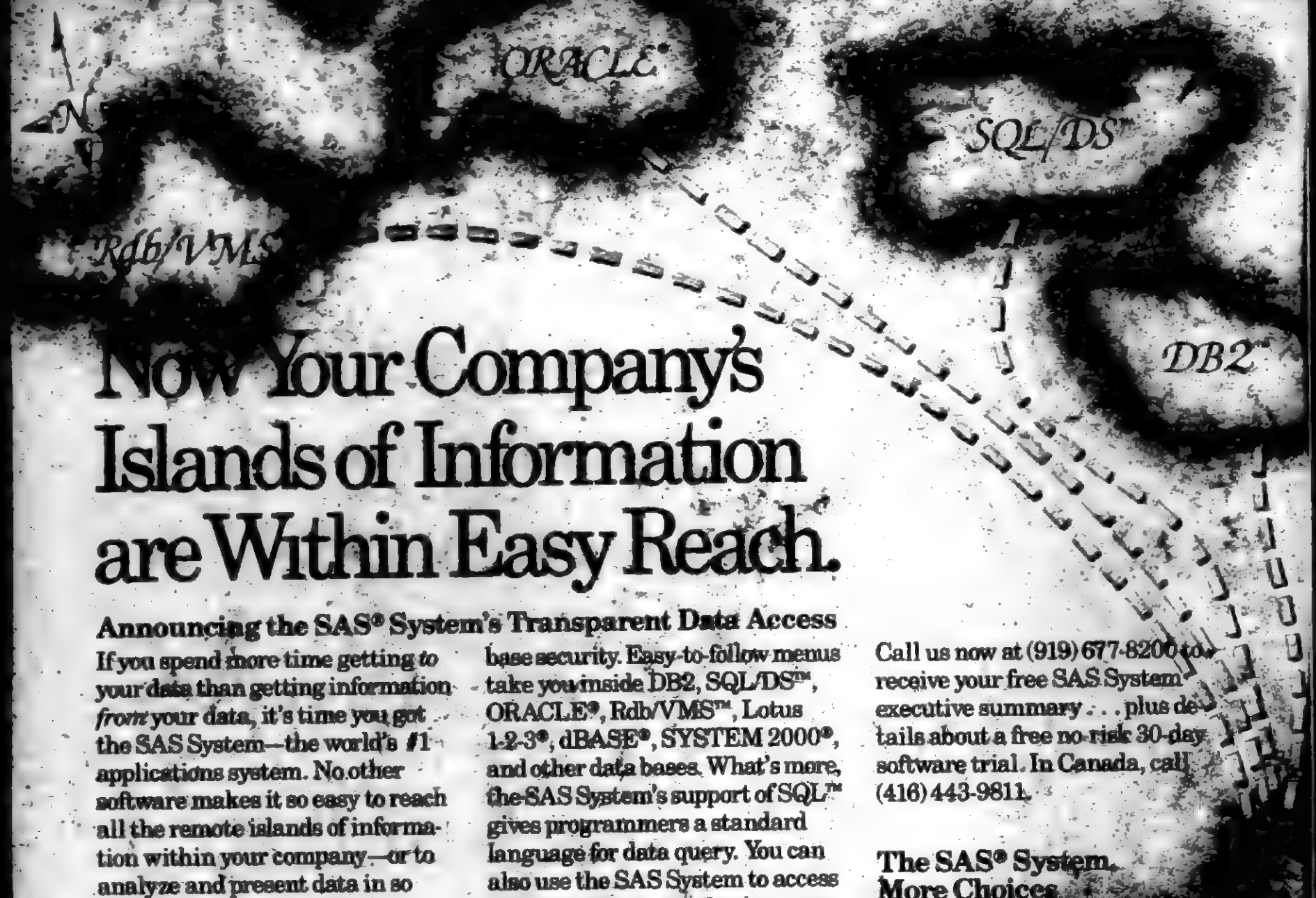
Staging the benchmark



Total effort: 24 hours
Elapsed time: 14 hours, 4 minutes
Team size: 2

The solution was initially developed on a single (due to resource constraints, not design constraints) Intel Corp. 80386-based DOS workstation connected via the Perfect 3270 emulator to an IBM 4361 mainframe running under VM/CMS.

Details of the product are available from Sapiens USA, 295 7th Ave., New York, N.Y., 10001, (212) 366-9394.



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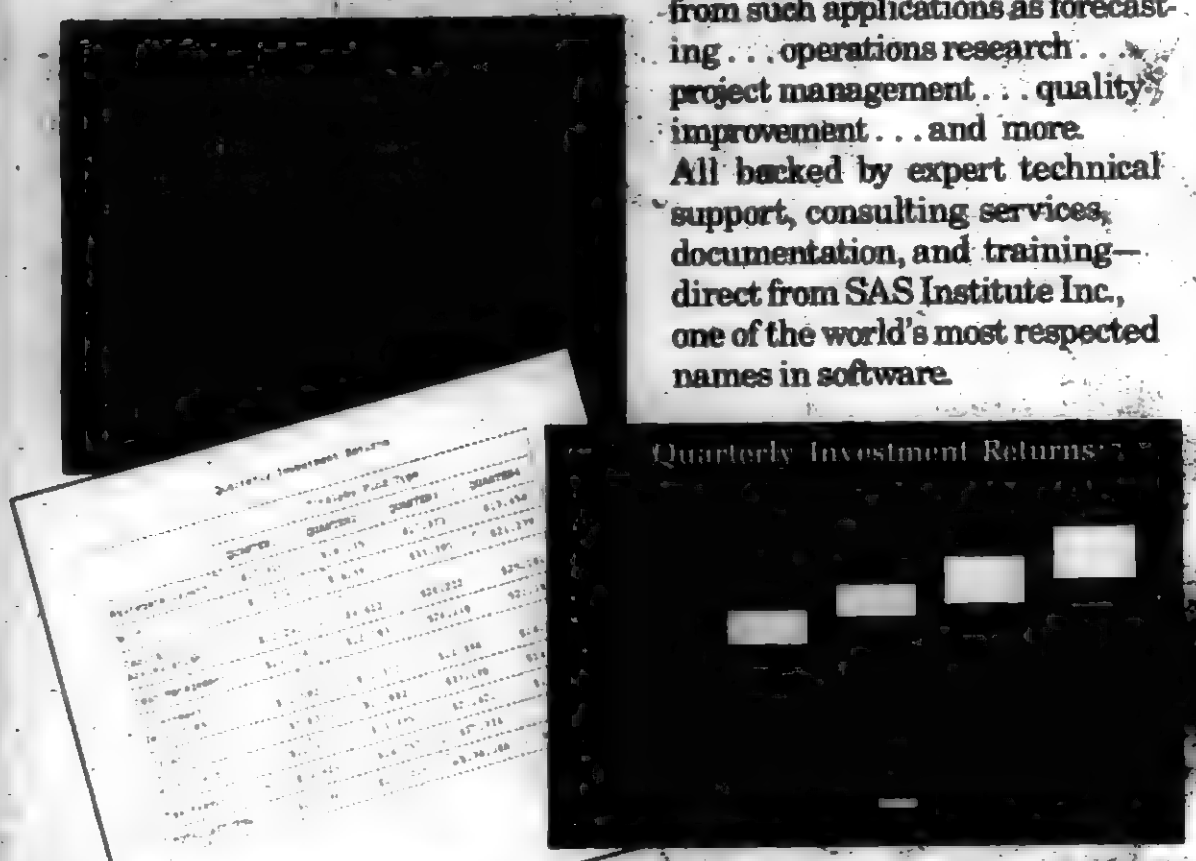

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The SAS System runs on mainframes, minicomputers, workstations, and personal computers.

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SYSTEM 2000

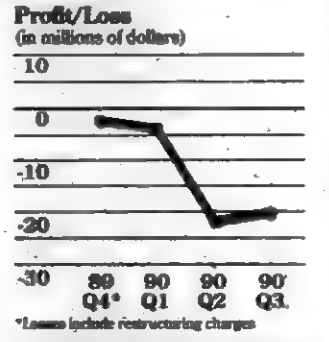
Users eye Businessland plan

BY RICHARD PASTORE
CW STAFF

ATLANTA — Struggling Businessland, Inc. garnered votes of confidence from customers earlier this month at its two-day technology summit. The personal computer dealer also described a restructured strategy that it said will pay off by providing for more efficient service and competitive prices.

Deteriorating picture

Businessland's results have been in the red all year



Source: Businessland, Inc. CW Chart: Paul Mock

Despite the financial beating Businessland has taken in the past 12 months, major customers attending the summit described their relationship with guarded satisfaction.

"I haven't seen any cutback in what they do for me," said Michael Esposito, manager of advanced technology systems at Federal Express Corp. The courier buys hardware, software and some PC support services from Businessland.

"I haven't seen [Businessland's problems] reflecting on our business relationship," added George Billings, manager of network computing services at Pitney Bowes, Inc. in Shelton, Conn.

Several Businessland clients, while saying they are happy with the dealer, added that they would not be overly inconvenienced should the company give up the ghost. "What we are buying from Businessland is talent," said Irene Stecher, manager of production management at Grand Metropolitan PLC. Grand Metropolitan's Pillsbury Corp. subsidiary contracts for on-site network support from 18 Businessland employees.

"If something was to happen to Businessland, I have every confidence that we could arrange something like a transfer for these people," Stecher said.

No problem

Federal Express is also not worried. "We're not so strategically aligned — whatever happens [to Businessland] won't hurt us," Esposito said.

Other users are not as blase about Businessland's fortunes. "Our decision to go with Businessland was made before the problems with their indicators," said P. J. Gottardi, manager of information services at Phillips Petroleum Co., which has a long-term hardware contract.

Gottardi said he is happy with Businessland, but "I look at their difficulties now, and I hope they're temporary," he said.

Early 1991 is Businessland's goal for restored profitability, and management is counting on a new operating structure to help reach this target.

At the same time, the new operating groups are intended to speed up delivery, enhance technical expertise and keep prices competitive, according to Leslie McNeill, vice president of strategic planning at Businessland and the architect of the new structure.

While all of the dealer's services were once driven by its single sales division, Businessland broke its operation into four independent segments late last month. The General Products Division will handle commodity sales. Network Systems will offer network installation and integration services and large-scale vertical applications. The Service Division will support desktop hardware. The last group, Distribution, will handle internal shipping and warehousing.

With the segmentation, "customers will see more efficient delivery of product, and the availability will improve," McNeill said. For example, Businessland now offers Quickship, a toll-free PC-order line with a 24-hour turnaround. A more focused concentration on the service segment will achieve the goals of 85% spare parts availability and an 85% rate for first-visit fixes, McNeill said.

While he is satisfied with current service levels, Billings said the segmentation could lead to improvements. "With this differentiation, I would think you would get better service because people could specialize and not be spread too thin," he said.

Businessland's segmented focus will also reduce overhead, which in turn should lead to more competitive prices for customers, McNeill added. However, with service now officially separated from sales for the first time, the days of free support are finally over, he said.

"No one segment will subsidize another," McNeill said. "We have to make a profit."

Si, this word processor is bilingual

BY JAMES DALY
CW STAFF

SANTA CRUZ, Calif. — A small start-up software house has created a bilingual English/Spanish word processing program that is intended to offer dramatic benefits for firms in places where a large Hispanic population resides.

Westcliff Software, Inc.'s Dos Amigos program, or "two friends" in Spanish, allows users to work in English, Spanish or both at the same time, thus allowing computer access to a heretofore untapped labor pool, company officials said. The program creates, edits and checks the spelling in a document in both languages and comes with a bilingual dictionary of more than 291,000 words.

Dos Amigos, which has been enthusiastically received by the Hispanic Chambers of Commerce, was designed by a pair of former Borland International, Inc. developers who said a burgeoning market was largely overlooked.

"Hispanics are one of the fastest growing population segments in America, yet somehow the computer industry has failed to recognize this," President Mark Andrews said. He and Executive Vice President Jim Moody estimated that there are more than 900,000 Hispanics working in the San Francisco Bay Area alone.

Choice of default

The user chooses English or Spanish as the default that appears on the screen when the program is started, but second-language interpretations of all aspects of the product are available: menus, Help screens, manuals and software tools.

While Dos Amigos is not a translator, single-word translation duties can be performed, Andrews said. For example, if a user wanted to interpret "powerful" into Spanish, he would press a key and the words "poderoso" and "fuerte" would be presented. The user would then insert the chosen word. Westcliff officials admitted that cultural and linguistic nuances make it nearly impossible to develop a 100% accurate automatic translation program but said they are moving in that direction.

The application allows the user to do mail merges, print and share files with other personal computers.

The suggested retail price of Dos Amigos is $149, but Westcliff officials said they are offering the program at an introductory price of $124.50.

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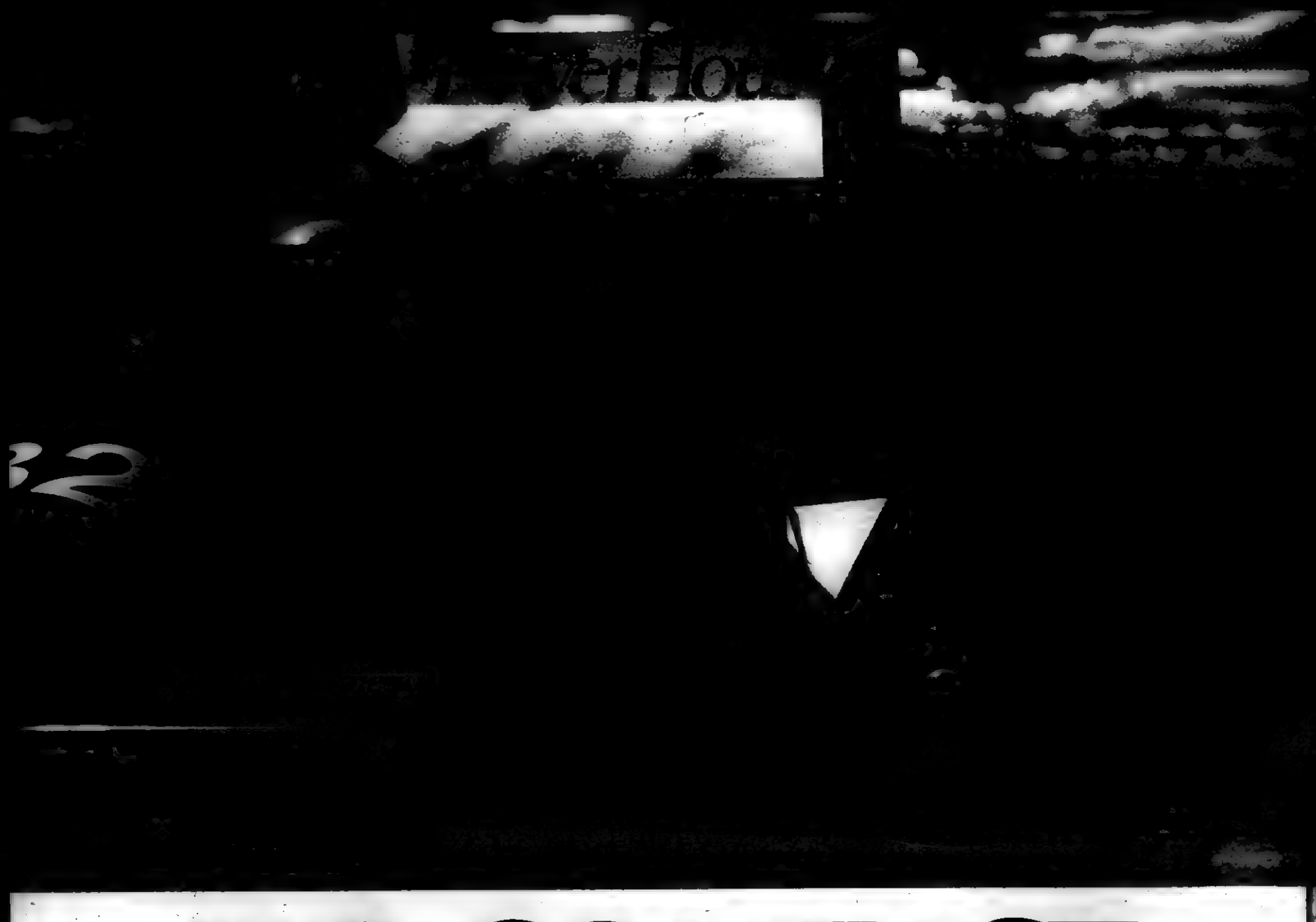

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Dutch growers use IS to fight battle of the blotch

ON SITE

BY SALLY CUSACK
CW STAFF

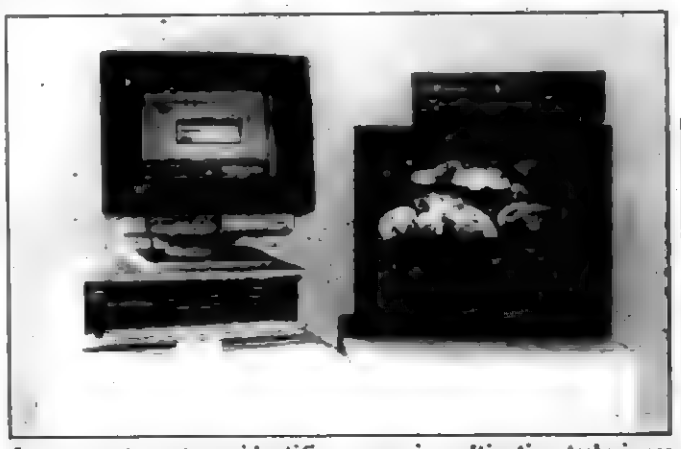
HORST, The Netherlands — Next time you eat a mushroom, consider bacterial blotch. No, it is not some weird type of skin disorder you develop from consuming mushrooms. Bacterial blotch appears as dark spots on the cap of a mushroom, and a bad case of it can be devasting to a mushroom grower.

The mushroom industry provides Holland with $175 million per year, and the country has enlisted the aid of expert system software to help win the ongoing battle of the blotch.

Leo Van Griensven started building an expert system in 1987 at the Mushroom Experimental Station, a government institution that is financed by both the growers and the government. Together with Joost Backus, a knowledge engineer and systems builder, Van Griensven has developed an easy-to-use system to guide mushroom growers through the threat of pests and disease during the cultivation process.

The duo relied on the Knowledge Engineering System from Software A & E in Arlington, Va., as the basis of its agricultural aid program. The Knowledge Engineering System communicates to the end user by means of text, hypertext and Sony Corp. Laservision images. The Dutch are currently running the program on an OS/2-based Compaq Computer Corp. 386/25 machine.

Because there is no cure for bacterial blotch, which occurs when there have been errors in cultivation and climate control, the expert system tries to identify problems in the cultivation process or faults in the climate control equipment.



An expert system *identifies errors in cultivation techniques and climate control that cause bacterial blotches on mushrooms*

Once the question-and-answer criteria is satisfied, the system gives the grower advice on bacterial blotch prevention.

Through an embedding technique, the user interface has been enhanced to allow the user to respond by clicking on "active words" in the dialogue window. The information is displayed on a television monitor next to the computer screen, and data is stored on a Laservision disk.

One of the main requirements when developing the system was that it be easy to use, Van Griensven said. In this case, end users will be growers and farmers, and for many of them, this will be their first experience with a personal computer, he added.

"We have 850 small growers out there, and because they are small, they need the extension service an expert system can provide," Van Griensven said. Using the software, the grower can enter the system during cultivation for advice on pests and diseases as well as general agricultural information.

There are no actual users yet; the developers said they anticipate "going live" by year's end. Because the project runs under no profit margin, hard numbers are unavailable as to the cost of the system to the end user. However, Van Griensven noted that it is "not very expensive."

Maximo a hit with users

BY CAROL HILDEBRAND
CW STAFF

Millwrights and electricians are not generally the types that get excited about the latest technological bells and whistles. But Maximo Series 3 maintenance management software from Cambridge, Mass.-based Project Software and Development, Inc., may have them waving their wrenches.

"People just won't believe you when you say you've got maintenance people excited about a computer package, but they were," said Glenn Coogan, West Coast-area engineer at beta-test user Ocean Spray Cranberries, Inc. in Marlcom, Wash. Ocean Spray uses Maximo, which tracks equipment maintenance, repair and other tasks. The six facilities nationwide average five to 10 networked workstations each.

Maximo uses Microsoft Corp.'s Windows 3.0 as a front end and Gupta Technologies, Inc.'s Sqlbase relational database. User reaction to both was positive. Series 3 is the follow-on to Maximo Maintenance System, which is in place at more than 400 firms worldwide.

"When I first saw the new Maximo screen it looked a little hokey, but the more I played with it, the more excited I got," Coogan said. He added that the only downside to Series 3 was the memory requirements. "But that's a Windows problem, not a Maximo problem."

John Curry, the technical maintenance manager at Hewlett-Packard Co. in Corvallis, Ore., said he expected the relational abilities to save him a lot of time. Currently, to charge out labor and materials for a work order, Curry uploads all information, such as charge numbers and verifications of signature authorization, to an HP 3000, which then analyzes the data and sends error reports if an item is not keyed in correctly. With Sqlbase, "We should be able to tell whether our information is good when we type it in in the first place," Curry said.

Pricing starts at $14,480, and Maximo Maintenance System users can upgrade at no charge.

Observers say fast CD-ROM 'not a big deal'

BY CAROL HILDEBRAND
CW STAFF

Hitachi Sales Corporation of America may make it into the record books with its new compact disc/read-only memory (CD-ROM) drive, which it said is the world's fastest, but industry observers are not exactly overwhelmed by the feat.

"It's nice; they had to work hard to do it, but so what?" said John Hartigan, principal consultant at Optiview Consultants.

The CDR-1700S sports an access time — the amount of time it takes to get from one segment of data to another on a CD-ROM — of less than 340 msec. According to Linda Helgerson, editor of "CD-ROM End User," that is about 10 msec faster than the previous record. "In terms of speed, it isn't a big difference," she said.

Hartigan agreed. "Anytime you speed [drives] up, you want to brag about it, but I just don't think that it's that big a deal."

CD-ROM drives, which have average access times of approximately 400 msec, suffer from a reputation for being slow, but just how slow is a relative matter, Hartigan said.

"Three hundred and forty msec is not a long time: It's less than half a second. If you've got an encyclopedia application and you're looking up references in it, 340 msec isn't going to bother you," Hartigan said.

The CDR-1700S also features several safeguards that help eliminate reliability problems caused by dust and other contaminants. The unit is compatible with IBM Personal Computers, Personal System/2s and compatibles and retails for $995.

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4th Dimension: Speed and ease of use even better

***Technology Analysis** — a roundup of expert opinion about new products. Summaries written by* Computerworld *free-lancer Susanne Weisel.*

Acius, Inc.'s 4th Dimension relational database management system package, a powerful development tool for the Apple Computer, Inc. Macintosh, is now even better, according to personal computer reviewers. Version 2 offers improved performance and ease of use, the reviewers say.

Ease of use: Like Version 1, Version 2 features a high-quality interface and design environment. Unlike Version 1, however, many common database operations are now built-in.

Overall performance: Although 4th Dimension has increased speed, the package still generates large files and reads and writes to disk often during operations, so a large, fast hard disk and a lot of memory are recommended.

Data management: 4th Dimension ensures that all the steps in a group of data operations are completed before it executes.

Reporting: The product's interactive symbolic debugger and built-in commands allow nonprogramming users to turn out elegant applications.

Macintosh compatibility: Ready-to-use buttons and other features can be implemented by standard Macintosh interface options.

At $795, the package is not cheap, and it requires at least a Macintosh Plus with a hard drive. But for the money, 4th Dimension Version 2 brings the power of a high-end database to the Macintosh and makes database capabilities more accessible than ever.

Reviews Summary

Criteria	PC Week 5/28/90	Mac User 2/90	Mac Week 3/6/90
Ease of use	8	Easier than ever to use	Simpler to use than previous version
Overall performance	8	Powerful, but	Improved, optimized data [illegible]
Data management	8	Improved file handling	NC
Reporting	9	New graphical report writer [illegible]	Powerful, but flexible application generator
Macintosh compatibility	9	NC	Deviates from Macintosh guidelines
Reviewer's score	8.6*	The best gets better	Excellent choice provided you have

**Ratings are based on a weighted scale of 1 to 10 where 10 is excellent. Only* PC Week *rating is included in the score chart (right). NC: No comment. These are excerpts from the reviews. Refer to actual articles for details.*

RATINGS

- **Users:** John Heckendorn, University of California (*performance:* 8, *cost:* 9); David Chennault, Randy Farmer, McDonnell Douglas (8,7)
- **Analysts:** Michael Masterson, Masterson Consulting (5,4); Richard E. Meyeroff, Meyeroff Computer Consultants (7,7) "Version 2 is more accessible to end users, albeit power end users." Meyeroff said.
- **Financial:** 4th Dimension has a 65% share of the Macintosh database system market with an installed base of more than 150,000 users, according to the company. It is distributed by Acius, Inc., a subsidiary of ACI France.

4th Dimension
(Maximum score: 85)

score: 63

Points (maximum)	Category
25 (30)	Published reviews
12 (20)	Analysts' ratings
12 (15)	Users' ratings
14 (20)	Cost evaluation

(See financial information below)

Acius responds

Comments from Mark Vernon, vice president of sales and marketing:

Overall performance: In Version 2.1.1, we tweaked performance for the low end.

Data management: In Version 1, you could delete fields and files, but people were deleting data. Now they can't do that.

Mac compatibility: We want to be consistent with the Macintosh user interface guidelines, but we won't limit functionality.

Double Helix: More controls improve features

Double Helix
(Maximum score: 85)

score: 72

Points (maximum)	Category
24 (30)	Published reviews
14 (20)	Analysts' ratings
14 (15)	Users' ratings
14 (20)	Cost evaluation

(See financial information below)

Odesta responds

Comments from Julie Lyons, product manager:

Ease of use: We offer programmers three features: developing for a client/server multiuser environment, a fast, flexible method and VAX portability.

Performance: This is one of the fastest multiuser [database management systems] running on a Mac.

Reporting: A pop-up list of choices will be included in the next upgrade.

Reviews Summary

Criteria	PC Week 5/28/90	Mac User 2/90	Mac Week 3/6/90
Ease of use	8	New viewing modes make one even easier	Easy to modify
Overall performance	7	Significantly improved	Fairly complex but improved
Data management	8	NC	Good, icon-based
Reporting	8	Improved [illegible]	Still complex, very powerful
Macintosh compatibility	9	NC	NC
Reviewer's score	8.0*	A good choice	Still a good choice

**Ratings are based on a weighted scale of 1 to 10 where 10 is excellent. Only* PC Week *rating is included in the score chart (left). NC: No comment. These are excerpts from the reviews. Refer to actual articles for details.*

RATINGS

- **Users:** Ron Anderson, manager of video production at Federal Express Corp. (*performance:* 9, *cost:* 8); Bob Antley, Antley Business Systems, Inc. (10,8). "The number one key is its ease of use. It's a very complicated, sophisticated database that's easy to use," Anderson said.
- **Analysts:** Michael Masterson, Masterson Consulting (6,5); Richard E. Meyeroff, Meyeroff Computer Consultants (8,8).
- **Financial:** With more than 50,000 installations, Double Helix is produced by Odesta Corp., which has only 150 employees. Double Helix has a 40% share of the Macintosh relational database management system market.

Odesta Corp.'s Double Helix takes the unique approach of using object-oriented icons for data management and applications development. The current upgrade from Double Helix II to Version 3 has increased the program's speed and power, according to personal computer reviewers.

Ease of use: Version 3's icon-based approach makes it easy to modify databases, and there are built-in controls to ensure that icons cannot be connected to create incorrect syntax.

Overall performance: Helix's free-form style of database management imposes structural overhead that slows the system down when building an index, *Macworld* said.

Data management: Special icons or dialog boxes perform key functions that usually require procedural programming.

Reporting: New to Version 3 is a concession to procedural control — an icon that can hold a sequence of Helix views, eliminating the need to step manually through a series of procedures.

Macintosh compatibility: The icon building-block approach is combined with a visual interface and comprehensive documentation that makes the program particularly appealing to novice users who are accustomed to the Macintosh environment.

Double Helix 3.0 costs $595 and requires a Macintosh Plus with 1M byte of random-access memory and a hard disk. It can be very useful for midsize databases that need to be modified frequently, and it offers one feature that no other Macintosh database system has: It can be used to develop applications for a VAX.

Methodology: *Published reviews: average of available scores from published reviews multiplied by 3. Analysts' ratings: average of 1-to-10 rating (1 is poor, 10 is excellent) from product analysts multiplied by 2. Users' ratings: average of 1-to-10 rating multiplied by 1.5. Cost evaluation: average of both groups' ratings of the cost to get a product up and running multiplied by 2. Financials: No financial ratings are included because the vendors do not release financial data. This is reflected in a reduction of the overall score from 100 to 85.*

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Focus on multimedia standard

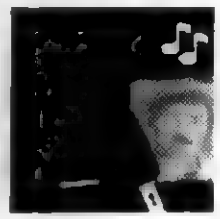
BY MAURA J. HARRINGTON
CW STAFF

A compact disc version of an encyclopedia defines the location of Tibet with a video presentation of the country. A teach-yourself foreign language program aids users with pronunciation by asking them to speak into the personal computer. These are just two small examples of the potential of multimedia technology.

A growing number of companies are announcing hardware products to run these new multimedia software products — niche market applications focusing on the fields of education, corporate training, marketing and publishing.

Products introduced at the recent Microsoft Multimedia Developers Conference [CW, Dec. 3] and scheduled to ship in volume by mid-1991 include audio boards, multimedia computer chips and fully equipped multimedia PCs with compact disc/read-only memory (CD-ROM) drives.

While there are already some companies with multimedia-based products that offer similar multimedia capabilities, Microsoft Corp.'s recent introduction of its Multimedia Developers Kit, which lays down standard specifications for multimedia hardware and software products, is the push that has been needed to get some of the larger computer companies to stand behind emerging multimedia technology, according to industry analysts.



Price break coming

Nick Arnett, editor of "The Multimedia Report," based in Santa Clara, Calif., said the fact that hardware and semiconductor companies are taking such an interest in multimedia technology will help to bring about a break in the price barrier that can sometimes prevent a new technology or product from gaining widespread support in the marketplace.

Companies such as AT&T's Computer Systems Division, Headland Technology, Inc. (formerly Video Seven), Tandy Corp., Fujitsu Ltd. and NEC Technologies, Inc. announced that they have supported Microsoft's standard and that they will develop multimedia products for shipment in "early 1991" under the software giant's new Multimedia specifications.

Boxboro, Mass.-based NEC said that next spring, it will introduce a full multimedia PC product line from the Intel Corp. 80386SX-level microprocessor on up, which is to include "at least 4M bytes of random-access memory," a CD-ROM drive and audio, graphics, text, motion and still video capabilities, according to Marc Miller, director of strategic planning at NEC's multimedia division.

Affordable systems

Tandy is scheduled to ship software development systems for affordable PC-based multimedia systems based on the company's 4025 LX computer, which includes a 25-MHz Intel 80386 microprocessor, according to the company.

The system — and others conforming to its specifications — will also include at least 2M bytes of RAM, a CD-ROM drive, a 30M-byte hard drive, a 1.44M-byte 3.5-in. floppy drive and video and sound capabilities for multimedia developers. Tandy's system is scheduled for delivery to customers "sometime in 1991," the vendor said.

AT&T supported Microsoft's announcement and committed to integrating multimedia capabilities into its Rhapsody Business computer product line.

Tokyo-based Fujitsu said it will also market multimedia products based on Microsoft's multimedia version of Windows, announced on the same day that the Multimedia Developers Kit was released at the developers conference.

Combo package

Headland Technology said it is developing a multimedia computer board and CD-ROM drive combination package. It is scheduled to be available to users next spring for less than $1,400, according to Jim Anderson, Headland's director of strategic marketing for the company's graphics products.

However, while acknowledging that the hardware products help to drive the multimedia technology down to an affordable level, analysts were careful to note that Microsoft's announcement is still one of the first steps for the new technology.

Software applications for the general consumer market, analysts said, are still at least three years away.

A personal computer sets out to sea

BY GARY H. ANTHES
CW STAFF

BILOXI, Miss. — It was far and away the biggest catch of tuna that Tam Trinh had ever landed. The Vietnamese fisherman had just completed his first day with an experimental, personal computer-based system, and his boat, Princess Sabrina, returned to port riding low in the water with the results.

The system was supplied by the Mississippi Department of Economic and Community Development and was built in part from software developed by the National Aeronautics and Space Administration for computing water-temperature contours from satellite data. The National Marine Fisheries Service added features to display water depth and submerged obstacles, and the state agency added rules specifying the behavioral characteristics of 12 species of fish that live in the Gulf of Mexico. The system pinpoints on a map display those areas where fish are most likely to be found, and its water-temperature database can be updated as often as every 52 minutes.

Trinh was one of four fishermen chosen to test the system. The night after the installation of the PC, cellular telephone and antenna, he slept with the system on the boat, said David P. DeBlanc, programs coordinator for the Mississippi Technology Transfer office at the Stennis Space Center. But then Trinh started carrying the gear home with him each evening. "The word got out that the government had put some super-sophisticated equipment on his boat. He was worried someone would slit his throat," DeBlanc said.

DeBlanc said Trinh was trained to use the system the first day out on the job, a process that took about 20 minutes over the cellular telephone.

One day, the Technology Transfer Office received a call from Trinh. The computer would not boot. When technicians discovered screws missing from the computer's case and loose parts inside, Trinh admitted he had been exploring the machine's innards. "He told us he was 'looking for the magic,'" DeBlanc said.

Works too well?

DeBlanc said the system works so well that it has been criticized by environmental groups, who fear it may lead to depletion of the less common fish species.

The software will be licensed to Gulf Weather Corp., a Mississippi start-up based at Stennis. The company will license the software and sell monthly dial-up or radio access to the satellite data, which is available for all of the world's oceans, President Frank Schatzle said.

Schatzle said Gulf Weather will expand the service along the Texas and Florida coasts, then up the East and West Coasts of the U.S. Eventually, the company will seek to license the system to overseas companies for use around the world.

Schatzle said data about additional species of fish will be added, and the software will be upgraded periodically based on fish-catch history from the National Marine Fisheries Service.

The system is written in Fortran for PCs based on an Intel Corp. 80286 chip as well as with IBM Video Graphics Array graphics and a hard disk.

Sun gets backing for commercial software

Six firms develop packages to enhance Sun's accounting software

BY J. A. SAVAGE
CW STAFF

Driving to get Unix accepted in commercial markets, Sun Microsystems, Inc. recently announced that six developers have produced versions of corporate accounting and business management software packages for Sun platforms.

The new products are large software systems with several modules for functions such as accounts payable and receivable, and general ledger.

"We're not going specifically into the accounting business, but accounting is a fundamental piece to get into the general business market," said Bob DeLaney, manager of market development for business markets at Sun.

Variety of products

Products are currently available for Sun's Sparcstation platforms from State of the Art, Inc. in Irvine, Calif., in its M.A.S. 90 Evolution/2; from Armor Systems, Inc., in Maitland, Fla., in its Premier package; from Fourgen Software, Inc. in Edmonds, Wash., with its Fourgen Accounting System and from Oracle Systems Corp. with its Oracle Financials.

Expected in the first half of 1991 are two more packages: a Database Accounting Library from SBT Corp. in Sausalito, Calif., and Classic package from MCBA, Inc. in Glendale, Calif.

Combined, the software vendors have an installed based of more than 200,000, and Sun hopes that if those users migrate to the Unix operating system, Sun will get their hardware business, according to the company.

Apple offers protocols for terminal services

BY JAMES DALY
CW STAFF

CUPERTINO, Calif. — Apple Computer, Inc. moved to encourage a range of multivendor connectivity options last week by announcing that it will license its Apple Terminal Services (ATS) protocols to third-party developers and corporate IS departments.

ATS protocols are designed to allow a developer to create mainframe or minicomputer programs that display and retrieve information on remote personal computers and allow the host to play the role of a local desktop application.

The protocols are currently available on Apple's Macworkstation, a server application that provides a Macintosh interface as well as printing and filing services to client applications running on remote computers.

With the license, developers can create PC software for IBM PCs and compatibles. The software retrieves the ATS commands from a mainframe and displays the information on the PC's screen.

The license will also allow software to be developed to display mainframe information on Unix-based workstations.

Only on Macs before

Prior to the announcement, the ATS protocols could be used only on Macintosh computers.

Using ATS protocols, a developer could create, for example, a hotel reservation system in which a central mainframe could be accessed by hotel clerks using a variety of PC models in various remote sites.

Apple officials also announced two early third-party licensees: United Data Corp. in San Francisco, which sells software for IBM PCs and compatibles, and Integrated Solutions, Inc. in King of Prussia, Pa., a vendor of Unix software.

OSI groups tackle user issues

Organizations are encouraged to raise the awareness of OSI

BY ELISABETH HORWITT
CW STAFF

Now that the various flavors of the Open Systems Interconnect (OSI) standard have achieved a certain level of technical viability, consistency and stability, standards bodies are converging on the two remaining obstacles to widespread deployment of such protocols: lack of compliance testing and user resistance.

At a recent meeting of the North American MAP/TOP Users Group, Laurie Bride, manager of network architecture at Boeing Computer Services Co., called for raising users' OSI consciousness all the way up to the chief executive officer level.

ADDRESSING USER barriers to implementation of standards is a goal of the Users Alliance for Open Systems.

"A lot of our efforts now are in getting vendors to build products and users to start implementing them," said Michael Kaminski, manager of computer integrated manufacturing/networking at General Motors Corp. and a member of the MAP/TOP Users Group. "At GM, a lot of my people who in the past had mostly been doing development are now focused more on implementing."

Indeed, most Manufacturing Automation Protocol (MAP) supporters in the user community today have shifted focus from getting the standard technically workable to "making things happen in their various environments," Kaminski noted. "The MAP [3.0] specification was finalized in 1988; we had products by mid-1989. It took until the middle of 1990 to get the first implementations going. That's where we are now," he added.

The North American MAP/TOP Users Group plans this spring to "come out with an extension that will add functionality" to MAP 3.0 and Technical Office Protocol 3.0 while preserving compatibility with existing MAP and TOP products, Kaminski said.

Addressing user barriers to implementation of standards — "not just for open communications, but also open user interfaces, databases and operating systems" — is one of the main raisons d'etre for the Users Alliance for Open Systems, according to Kaminski, a member. Such barriers "exist within any type of organization because a lot of times you don't have a good business case" for standards deployment, Kaminski added.

Open systems are "thought of more as an appendage that maybe helps, maybe doesn't help" the organization's bottom line and key competitive strategies, Kaminski said. Another common barrier is information systems departments' frequent inability to sell top management on the idea, "because maybe the 'high priest' of computers doesn't talk the same language" as business executives, he said.

The Users Alliance last week announced that it has finalized a relationship with the Corporation for Open Systems (COS) as a more effective and formalized way of communicating its priorities to the various user and vendor standards organizations, Kaminski said. The MAP/TOP Users' Group is already part of the COS umbrella; in addition, the Users Alliance hopes to use COS as a pipeline to such standards organizations as X/Open Ltd., the OSI Network Management Forum and the Open Systems Foundation, he added.

GM's Kaminski *says his group has shifted focus from development to implementing new products*

"We have the makings of an umbrella group, which could be the U.S. equivalent of what goes on in Japan and in Europe," in terms of establishing "a requirements definition and product direction that are focused around the requirements of users" as opposed to developing and implementing standards "in a more or less haphazard fashion," Kaminski said.

Another user group that is making more use of the COS' resources is the National Institute for Standards and Technology (NIST), which coordinates standards definition and implementation for the U.S. government.

The COS announced recently that NIST has provisionally registered its test center to conduct testing to determine whether products comply with several Government Open Systems Interconnect Profile specifications, including X.400, X.25, transport, File Transfer, Access and Management (FTAM) and 802.3.

The COS also recently announced that it has issued a request for information, looking for tools that can be used to expand its COS Mark conformance testing program to include additional OSI protocols, according to COS spokesman Eric Bolton.

The protocols to be added include: X.400 (1988 version), CCITT X.500 directory services, additional FTAM functionality and OSI network management protocols, the standards body said. The COS co-develops and sponsors the development of conformance test tools, which it makes available to its members, Bolton said.

Budget cutbacks will spare some markets

BY JOANIE M. WEXLER
CW STAFF

Though the growth rate of corporate networking budgets is tumbling in tandem with overall information systems investments, there is fertile spending ground for equipment and services providing companies with quick paybacks, bottom-line business benefits or both.

According to Boston-based research firm The Yankee Group, markets that will enjoy the highest compound annual growth rate through 1991 will be enterprisewide network management (48%), local-area network interconnection (42%) and video equipment and services (40%).

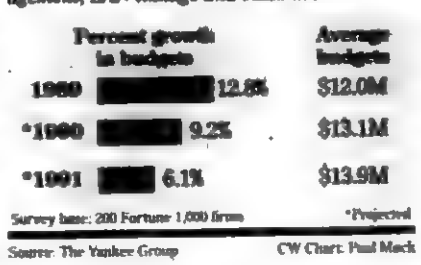
One reason these markets will spiral is that they are still fairly untapped and have a long way to go before becoming saturated. However, users also flag these areas as either requiring relatively low investments in relation to their payback potential or as too tightly linked to business goals for companies to survive without them.

For example, John Faccibene, vice president of telecommunications at New York-based brokerage firm Garban Ltd., recently implemented a LAN in his firm's San Francisco office. Faccibene purchased gateways and bridges to interconnect the San Francisco LAN with his New York LAN over an existing T1 backbone network "as a cost-effective way to extend our trading-desk application."

Faccibene explained that the interconnection equipment was less costly than building a separate real-time central processor for the San Francisco site. "LAN interconnection is one of our biggest growth areas," said Howard Hunter, corporate manager of telecommunications in the Tulsa, Okla., office of Los Angeles-based Occidental Petroleum Corp. "We're now implementing the first in a series of six or seven capital investments aimed at linking 50 to 75 LANs in the U.S."

Bare-bones budgets

The declining growth rate in the average communications budget parallels that of overall IS, though fertile ground exists in network management, LAN linkage and video markets



Source: The Yankee Group — CW Chart: Paul Mack

He explained that the investment is necessary to his business to allow remote sites to communicate with corporate headquarters. He said this requirement is a pressure that has "recently arisen because our users view distributed networking as competitive."

Hunter commented that setting corporatewide standards has enabled him to save some cash and still meet those wide-area needs in tough economic times. "We have just gained a corporatewide agreement on which remote bridge to use [from Crosscom Corp.]," he said, "and we've also standardized on [Novell, Inc.] LANs."

The high growth potential of systems to manage these wide-area networks may depend on users becoming convinced that the "right" product has finally arrived. Todd Dagres, an analyst at The Yankee Group, said network management is where "there is the greatest need and the least capability."

Vendor 'sinkhole'

A recent report from Cambridge, Mass.-based Forrester Research, Inc. described network management systems to date as a "sinkhole" for vendors. The report also states that computer giants IBM, Digital Equipment Corp., Hewlett-Packard Co. and AT&T have recouped less than half their network management investments.

At Occidental, Hunter said, "network management is a big unknown, because I don't believe anyone has yet brought out a product that warrants a $300,000 to $400,000 expenditure. The systems purport to be global networkwide systems but frankly, don't yet deliver."

Faccibene cautioned, though, that "you certainly shouldn't scrimp on network management in the wide area; it's an investment that is as key as putting in the network itself." He said his cost-cutting measures in the brokerage industry pertain more to "getting away from providing carte blanche service and returning to the basics of what information is truly needed."

Another strategy in an economic downturn, Faccibene added, is negotiating longer term networking contracts and avoiding "knee-jerk management" that is short-term-oriented.

Dagres said many companies are turning to video to save on travel and time. For example, he said, "J.C. Penney is saving hundreds of thousands of dollars a year by having their buyers view merchandise over a video network rather than traveling."

He added that the technology for both freeze-frame and full-motion video is "better and cheaper," and that a glut of available bandwidth makes video possible for many companies.

"Time savings are worth more than airfare," Hunter said. He added that while he will remain "very, very cautious of the technology because it is still a substantial up-front investment," the company's myriad overseas operations are "where video will ultimately help us."

PC network tracks mobilized equipment

ON SITE

BY JIM NASH
CW STAFF

OAKLAND, Calif. — Napoleonic generals had a saying: "The loss of a nail, the loss of an army." It means the littlest trifle — a horseshoe nail — can spell defeat when it is forgotten or delivered too late in a war.

George Bush-era generals hold the same concept dear; they just track their nails with worldwide networks of computers. Although the process is aided by personal computers, bar codes, leased lines and mainframes, it remains an enormous task even without the risk of war.

Massive amounts of equipment were mobilized in August with little warning for Operation Desert Shield. It was up to information systems managers in the military to find out where equipment and provisions had to go, how it was going to get there and when it had to arrive. Military Traffic Management Command, part of the U.S. Department of Defense, used its PC network to orchestrate what many consider history's largest and fastest military buildup.

With Desert Shield sweating out its fifth month, system administrators said they are satisfied with the network's performance. Brian Richards, microcomputer program officer for traffic management here, said few shortcomings have been uncovered.

He said an acute shortage of PCs quickly developed in August. "One day you had one computer with three people in a room using it and the next there were 15 people. That slowed things down somewhat."

Richards also pointed to preparation of reservists. Some needed crash courses in advanced versions of software such as Ashton-Tate Corp.'s Multimate and Dbase III + and Lotus Development Corp.'s 1-2-3.

One of the most striking successes, he said, can be found at the Elounte Island Terminal near Jacksonville, Fla. That terminal had been vacant port space until defense officials realized they needed a new terminal on the East Coast.

Three days after being designated the new terminal in August, it was linked and fully operational with standard and customized communication devices, Leading Edge Products, Inc. Model D PCs and Zenith Data Systems Z-248 PCs. Thirty-five cargo ships have since been loaded at the terminal.

In a sense, Elounte's first days of production were the result of seven years of work. The traffic management division introduced its first network in 1983, linking three offices with little more than spreadsheet software. By the time Iraq invaded Kuwait, the system had evolved into a Novell, Inc. Netware 286 network of 3,500 PCs on 64 fault-tolerant file servers at 35 sites worldwide. Thin Ethernet coaxial cables link PCs within each local-area network. The LANs are connected to 56K bit/sec. leased lines to form a globe-girdling wide-area network.

Commanding officers have become dependent on standard applications that offer file sharing, electronic mail and database manipulation. "When we were setting up Elounte Island," Richards said, "the three commanding generals [of traffic management] were frantically moving from location to location to see that everything necessary to get the job done was available."

He said that officers on the road ran their commands largely by E-mail via portable PCs. They found that they could not afford to be out of the network.

But the network has also found supporters with those working closer to the actual shipping. It has become integral in pinpointing any in-transit gear.

"One of the best things about the network has been the status reporting of cargo shipments," Richards said. "Any number of people, from unit leaders to ship captains, need to know where that equipment is very quickly."

Sharp rows of sand-colored Bradley troop carriers stand idle in a gray asphalt yard along Oakland's Africa Street, awaiting shipment to Saudi Arabia. Every step of their journey to the base was planned, traced and confirmed with the PC networks, said Charles Cann, a traffic management specialist at Oakland Army Base.

Robert Holmgren

Troop carriers *at Oakland, Calif., army base readied for shipment*

Of mice and PCs

In one of the more striking changes that technology has brought to the administration of military planning, PCs and mice have replaced butcher paper sketches of how equipment is to be loaded on ships.

Charles Cann, a traffic management specialist at Oakland Army Base, recently demonstrated the art of fitting objects such as tanks, guns and troop carriers on massive U.S. Navy cargo vessels. What was once done with wax pencils and butcher paper is now completed with computer-generated graphics.

An electronic manifest is compared with the military's master cargo database stored on a Bull HN Information Systems, Inc. Level 6 mainframe at Oakland. Dimensions and weights of the equipment on the manifest are transferred to a PC, which contains the exact layout of a vessel's hold.

Using a mouse, military personnel place a silhouette of each item one by one within the ship's parameters. The application will not allow equipment to be stowed on decks that are inaccessible or too small or for the equipment. A four-color printout is made and given to the ship's captain and the officer in charge of loading the machinery.

JIM NASH

EDI user numbers growing stronger

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — Fulfilling decades-old predictions, companies are beginning to embrace electronic data interchange in significant numbers, but users are walking the EDI path slowly and are finding it marked by pitfalls as well as promises, according to experts at a recent trade show here.

"EDI should be growing faster than it is," said Thomas P. Colberg, a partner in Price Waterhouse's EDI Consulting Group. "Frankly, it's embarrassing to be an expert on EDI and to forecast explosive growth year after year after year."

But if recent trends continue, Colberg may soon recover from his embarrassment. According to Dallas-based EDI consulting firm Spread the Word the number of companies worldwide using EDI — the electronic exchange of business information between companies in a standard format — is growing at 45% annually — robust growth if not exactly an explosion. The number of U.S. companies appearing in the firm's directory of EDI users increased to 9,400 in August, 19% more than the 7,888 that appeared seven months earlier and 94% more than were listed 14 months ago.

While the number of users is rising rapidly, most have automated only a small number of transactions for a handful of key customers or vendors. Speaking at the Electronic Data Interchange Association's 22nd national conference, Colberg quoted a study showing that the average number of trading partners for firms that have embraced EDI is just 33. "The biggest obstacle is the lack of readiness on the part of trading partners," he said.

But a consensus of EDI users and would-be implementers at the conference revealed an even bigger problem. Efforts fail to the degree that firms underestimate how much work is involved in EDI implementations and to the extent that they approach EDI as a narrow technical exercise. "EDI is a culture change on the order of *perestroika*. Technology plays a significant but supporting role," Colberg said.

"The mistake people make is focusing on EDI as a technology, not on overall corporate goals," said Holger G. Ericsson Jr., senior group purchasing manager at Digital Equipment Corp. "We at Digital don't talk about the cost of implementing EDI; we talk about the cost of implementing things like just-in-time and total quality control."

Ericsson said a company should take a top-down look at the way it does business and let EDI follow rather than lead a comprehensive business strategy. For example, in discussing electronic funds transfer with a bank, a firm implementing EDI should ask whether the bank should be doing the company's accounts payable, Ericsson said. "I could take off my shirt and show you the scars because we didn't start to think about these things early enough."

Sears, Roebuck and Co. has taken EDI further than most companies since 1968, when it transmitted its first digital order to a supplier. Now the retailing giant supports 10 EDI transaction sets and swaps 1.4 terabytes of data per month with 700 suppliers.

But Sears struggled to get there, R.J. Ferkenhoff, information services vice president, said in his conference keynote address. "Our early attempts at implementing EDI were difficult and slow . . . We found that talking about EDI was far easier than the actual implementation."

EDI gurus agreed that top management involvement is essential. "You have to get the right people involved from the beginning — in particular, non-technical senior managers," said Jack Shaw, president of EDI Strategies, Inc. in Marietta, Ga. "It doesn't have to be a lot, maybe an hour a month or a half-day a quarter, but you cannot possibly succeed without it."

Shaw said as a rule of thumb, companies might expect to spend 1% of one year's sales over three to five years for a comprehensive EDI implementation. But, he said, a return on investment of 100% per year is not out of the question.

Colberg said a typical firm should plan to spend $1 million-plus for EDI and could expect a return as high as 5% of sales.

In a comment from the audience to an EDI expert panel, June Heale, EDI systems designer at Eastman Kodak Co., said the hardest technical challenge is not dealing with EDI per se, but with the need to make extensive changes to applications, many of them old and complex, in order to get the benefits of EDI.

To that Shaw responded, "Nuke those systems, don't make incremental changes."

Colberg advised, "Obliterate, don't automate."

MANAGER'S JOURNAL

EXECUTIVE TRACK

Judith A. Campbell has been named director of business process in the information management department at **Xerox Corp.** in Rochester, N.Y.

She is responsible for driving business architecture and business process activities to position Xerox to respond to competitive pressures.

Campbell joined Xerox in 1977 as a technical consultant in the General Services Division. She was most recently manager of strategic technology deployment in corporate information management.

Campbell holds a master's degree in history from Columbia University.

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Henryk Starecki has been promoted to director of information systems at **Volvo Finance North America, Inc.** in Rockleigh, N.J., the leasing subsidiary of Volvo North America Corp.

Starecki was previously computer systems manager in the IS department. Before joining Volvo Finance, Starecki worked for Volvo Car Corp. and Volvo Data Corp. in Gothenburg, Sweden.

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Donald Jackson has been promoted to corporate vice president of IS at **Computer Products, Inc.** in Boca Raton, Fla.

Jackson, 47, was previously director of systems and chief information officer. He manages all of the IS activities at the $120 million firm.

Before joining Computer Products, Jackson spent 18 years with Unisys Corp.

Who's on the go?

Changing jobs? Promoting an assistant? Your peers want to know who is coming and going, and *Computerworld* wants to help by mentioning any IS job changes in Executive Track. When you have news about staff changes, be sure to drop a note and photo or have your public relations department write to Clinton Wilder, Senior Editor, Management, *Computerworld*, Box 9171, 375 Cochituate Road, Framingham, Mass. 01701-9171.

SECTION FEATURE: BATTLE-SCARRED EXECUTIVES

Putting IS career crises in perspective

BY ALAN J. RYAN
CW STAFF

Larry Betsinger's career baggage includes the stinging memory of the day 20 years ago when he was fired from the company he had worked at for 17 years.

Betsinger had clashed frequently with his boss, who regarded Betsinger's methods in carrying out a mandated centralization of information systems as too heavy-handed. Still, because he knew that his skills were held in high esteem, the possibility of unemployment with a young family to support had never crossed his mind.

"I was stunned," he says, adding that the real culprit wasn't his boss but his own bullheadedness and lack of political finesse.

Few people in any profession reach executive rank without a few battle scars, and IS professionals are no exception. Most IS veterans have been through more than one skirmish. Sometimes the opponent is a boss, sometimes a peer. Occasionally, as in the case of having to fire people, the fight is internal. Win or lose, they say, overcoming the trauma can be a boon to career growth and maturity.

In hindsight, Betsinger says, he learned a great deal through being fired from his job running that company's computer systems. His resentment toward his former employer faded quickly, and within six weeks of losing his job, he had a better position at another company.

Perhaps more importantly, Betsinger, who is now MIS director at UJB Financial Corp. in Princeton, N.J., says being fired taught him important lessons in how to deal with superiors, subordinates and users of the systems for which he provides support. Even if he has a strong opinion on a topic, he says he makes sure he listens to the opposing ideas. And he no longer crams his ideas down the throats of others.

Reinhold Spengler

In hindsight, *UJB Financial's Betsinger reflects that being fired was a necessary setback in his climb to the top*

Betsinger also believes the firing did him good in a more material way. If he hadn't been dismissed, he says, he might have spent his entire career at one company and made a lot less money. "The only way I got to being a big shot and making lots of money was because I got fired," he says.

That doesn't mean, however, that Betsinger is in total agreement with his old boss. He has come up against some Young Turks who were just as stubborn as he used to be, he says. And, in nine cases out of 10, he's been able to work the problems out.

Betsinger's example is far from unique, says Norm Sanders, managing director at executive search firm Russell Reynolds Associates in Hazlet, N.J., although conflicts with bosses that result in firings represent a much smaller percentage of his business than job switches resulting from clashes with other line managers.

Sometimes such problems can be resolved with a little

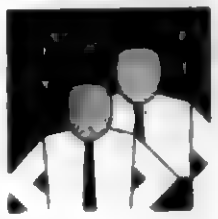
Continued on page 52

Recession won't cool demand for talent

BY CLINTON WILDER
CW STAFF

John J. Davis may not be Santa Claus, but he does have some tidings of comfort and joy for high-level information systems executives facing the U.S. recession.

Davis, president of New York-based IS executive search firm John J. Davis & Associates, Inc., said demand for top IS talent remains as strong as ever, and he sees no change in that demand — or in IS executive salary levels — in the coming year.



"When a company needs this kind of talent, we have not seen them balk at paying what it takes to get that talent," Davis said. "I don't see that changing as this so-called recession deepens."

The increasing pressure on IS departments to scrutinize expenditures or, in many cases, to cut them, may in fact *increase* the demand for the best IS executives. The executives who have proven that they can do more with less will be sought-after candidates in a recession, Davis said.

"If you can bring some unique skills to the marketplace and back them up with de facto proof that you have been able to execute, you will be in demand," he said.

Davis said he sees robust demand continuing for senior IS managers, strategic planners and telecommunications executives. The hottest area of all, however, may be computer security and risk management, where more and more companies have focused attention in the past two years, according to Davis.

The two job categories tracked by Davis that will have weak or flat demand in 1991 are chief technology architects (because the job is limited to only the very largest companies) and vice presidents of communications planning. "The demand is simply weak there, and we're not sure why," Davis said. "With the distribution of technology out to the users, you would think that more networking experts would be in demand, but we haven't seen that."

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BOOK REVIEW

Setting up strategic plans that really work

STRATEGIC CHOICES: SUPREMACY, SURVIVAL, OR SAYONARA
By Kenneth Primozic, Edward Primozic and Joe Leben
McGraw-Hill, 272 pp., $24.95

What type of management book do you suppose two longtime IBMers and a consultant would write? It is not hard to imagine that the book would offer successful examples of strategic planning — a mandatory, sometimes feared and often nonproductive business ritual. Throw in a lesson on thinking offensively while exploiting technology, and strategic action begins.

Strategic Choices: Supremacy, Survival, or Sayonara by Kenneth and Edward Primozic and Joe Leben, does not offer the usual recipe for success: Add one part luck, two parts hard work and keep an eye on the competition for good measure.

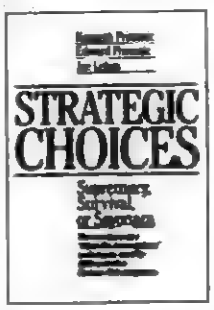
What the authors do recommend in this short but jampacked business book is a comprehensive five-step plan that incorporates vision, tactics to implement that vision and corporatewide follow-through.

Technology is the glue, they say, that helps the plan work. "Long-term success will be determined by how well [an organization] is able to capture, manipulate, exchange, manage and use information as a strategic tool," the authors write.

A strategic plan is not simple — it commands everyone's complete understanding and belief in all organizational policies and programs, with top management setting the tone and the vision.

Can I get there from here?
The authors argue that while most companies think today's business environment has "a lack of road maps" with which to guide strategic progress, it is the wise company that follows the pattern set by innovators such as Apple Computer, Inc. and American Airlines. This involves incorporating technology and strategy to reach a "new level of organizational effectiveness."

The authors challenge company executives (information systems managers, take note) to answer the question: "Is my organization's competitiveness substantial and sustainable" in relation to others in my specific industry? The successful strategic thinking process begins when this question is answered.



The authors recommend that organizations use a "new set of lenses" to examine themselves. This new way of looking at things can reveal the "linkages" between business functions and processes, as well as ties between the business and its extended enterprises.

Using these "new lenses" will enhance the organization's ability to exploit current "waves of innovation." But the authors warn that unless the company's strategic vision is clear, pursuit of innovation can be costly. It can lead to a loss of power and a bad business image.

Part I of *Strategic Choices* helps readers formulate their vision. It outlines a "linkage analysis planning" technique showing readers how to chart an organization's "extended enterprise" — suppliers, distributors, customers and so on. In this way, companies can focus attention and resources on the links between business functions and processes.

This "electronic channel" thrives on technology-enabled information exchange, which helps each member survive. "Technology applied to information channels will have a major impact on organizations in the 1990s," the authors state. They devote a substantial part of the book to such technology, called "electronic channel support systems [ECSS]." ECSSs are important as systems "that enable an organization to electronically create, distribute and present information or knowledge" to the extended enterprise. The goal is to reach the end user before the competition does.

Parts II and III of the book continue the linkage analysis planning theme in which the firm's vision is linked to strategy and tactics that help implement the vision. Top executives are warned to "make no assumptions" when considering strategy formulation. Management and operations personnel are advised to channel their strategic vision throughout the organization and extended enterprise.

The book's strength is in its examples of successful innovators, such as Federal Express Corp., which used strategic planning to change the rules of the game in the delivery industry. Two appendices are devoted to linkage analysis planning examples from industries such as health care and education.

The plan the book offers is not foolproof — each member of an organization must tie individual goals closely to corporate goals or the organization's strategic vision begins to lose clarity. But *Strategic Choices* is worth the investment for would-be visionary leaders. The ideas presented between its covers may become the backbone of strategic planning in the 1990s.

PAULINE SMITH

Smith is a *Computerworld* senior account executive.

Crises

FROM PAGE 49

accommodation. Gary S. Lynch, a regional manager at Pyramid Development Corp., recalls one example from his former career as a vice president and manager of corporate information security at a large New York brokerage house.

Constantly stymied by a high-level end user in a very data-sensitive area who told him that he had neither the time nor the inclination to discuss security for his personal computer, Lynch says he decided to change his timing and waited until 10:30 one night to meet with the user.

Persistence and the willingness to make his arguments at the user's convenience did the trick. "He became our greatest supporter," Lynch says.

Tougher fights
Other disagreements are more intractable, however. Sanders tells the story of a face-off between an IS manager and a risk-taking line manager who wanted to invest half a million dollars on unproven information technology.

The IS manager felt that the amount was too small to provide any real benefit and too much to spend on a test. "They reached a loggerhead," Sanders says, and in the end, the IS manager was fired. Frequently, the outcome of such stalemates is not firing but a mounting frustration that eventually leads to voluntary departure by one of the parties.

Michael Simmons, executive vice president of technology and operations at Bank of Boston, says there is usually some way to work with adversaries, and the best way is to try to understand them by walking in their shoes.

Lynch agrees that understanding is desirable but adds that it doesn't always produce acceptable compromises. That, he says, is one of the reasons he decided to switch to a job with a vendor.

One situation where understanding did not lead to compromise, Lynch recalls, involved a senior IS development manager who "was absolutely, incredibly against security." Lynch did discover, upon investigation, that the manager had some understandable reasons for opposing new security measures.

The proposed changes would have required the development group to create new interfaces, delaying delivery on a number of systems. The manager felt that delayed products would make him look bad, Lynch says, and that the security interfaces would complicate the lives of users.

Cloud was hurt by technical staff's lack of experience

"My goal was to secure systems," Lynch says. "His goal was to have the systems in the users' hands." It was, and remained, a stalemate.

Dissatisfaction and change
Simmons, who changed jobs three times during the 1980s, says anyone who leaves a job does it because of dissatisfaction or for a better opportunity. He has found himself in both circumstances, he says.

Simmons says most of the battles any executive faces are politically oriented. "An individual who wants to be something else in the organization will use anybody else in the organization to get there," whether it involves stealing ideas or using others to climb to the top. Simmons calls that type of worker an "empty suit" and says he's run into many during his career. Betsinger says he's run into that type of worker, too, but he's learned that more often than not, that person will eventually get his or her comeuppance.

"Sooner or later, those people simply can't survive," Betsinger says. And, sooner or later, Lynch adds, the savvy IS manager also learns to share more carefully. Of course, the thing that really matters is the company gets the benefit of the idea, no matter who gets the credit. But credit is also nice, and "as you mature, you learn to let some of the ideas out of the bag but not all of the facts," Lynch says.

No matter whose idea it was, when a system fails, the buck stops at the IS chief's desk. Handling that kind of situation is one of the most traumatic experiences a manager is likely to face.

Avery Cloud, manager of technical service in the IS department at Bowman Gray/Baptist Hospital in Winston-Salem, N.C., says that when inexperience among his technical staff led to the failure of a system critical to the business, he took a lot of heat.

Back in the IS office, Cloud distributed the heat to those who deserved it. He then used the unfortunate situation to show the workers how to work in a crisis situation. "I tried to create a nonthreatening environment and let them feel they had a right to fail," Cloud says. "If it's the first failure, it's easier to take. But don't do the same thing twice."

Dealing with adversaries

While each case must be handled on an individual basis, IS managers who have had to work with adversaries say the following techniques can help defuse conflict and minimize career damage in more than 90% of such encounters:

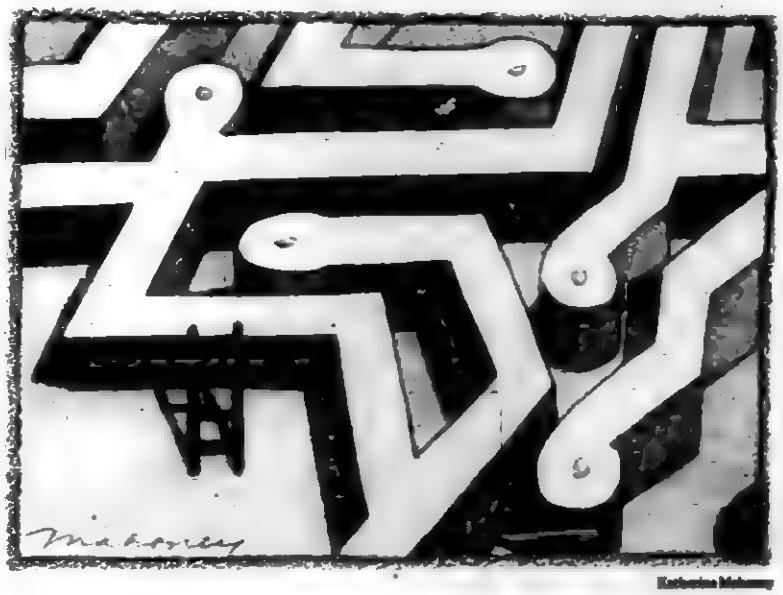
- **Examine the adversarial relationship from the adversary's point of view.** There may be clues there as to why that person is fighting you (your demands may be creating more work for him, for example).
- **Take time to develop a solution that will work for both parties.** That may mean avoiding the adversary by having one of your employees work with one of his employees. It can also mean finding the common ground where both parties agree to be more flexible and professional.
- **Try to be friends, but do not make that your life mission.** There are some personalities that will always clash; accept it and get on with your job.
- **Get the job done.** Under certain circumstances, that may mean taking a subordinating role to a peer, but the top priority must be work, not ego or stubbornness.
- **If all else fails, get tough.** Sometimes it comes down to your job or the adversary's job. If the adversary is a superior, you may be better off finding another position. If it is a peer, one of you may have to go. If it is a subordinate, the only solution may be to fire that person.

ALAN J. RYAN

CLIENT/SERVER PRODUCTS

Every which way but easy

BY BARBARA BOCHENSKI



Katherine Mahoney

Anyone who has navigated the jumble of client/server definitions and product offerings has probably emerged feeling a bit like a mouse lured into a maze containing small morsels of every conceivable kind of cheese.

The variety is enticing, but it's also disorienting and frustrating. Experts say users could find themselves bumping into dead ends as they try to design client/server systems. The same consultants are upbeat about this and other network computing architectures. However, they warn, there are some important components missing.

Part of the problem is the vagueness surrounding the term. One way to attempt understanding it is through a consensus of various definitions.

Several experts polled agree that the following five points are needed in a client/server architecture (in other words, if these features are not present, you have something, but you don't have a client/server architecture):

- A client end and a server end that can be distinguished from each other yet interact seamlessly.
- The client portion and the server portion can operate on separate computer platforms, but they don't have to.
- Either the client or the server hardware platform can be upgraded without having to upgrade the other platform.
- The server is able to service multiple clients concurrently.
- The client/server system includes networking capability.

That is the extent of the agreement. Even these requirements — save the first — came with at least some qualification.

For instance, while the client portion usually operates on a personal computer, experts say, the server portion can reside on a powerful workstation, dedicated server hardware, a minicomputer or even a mainframe. However, it is also possible for a client and server to function on the same hardware platform.

"The capability to install the client process and the server process on two separate platforms must be present for a product to qualify as a client/server," says Dave McGovern, partner and co-founder of Database Associates in Morgan Hill, Calif. "However, the end user need not exercise that option."

The distinction that only the option needs to exist applies to "networking capability" as well. However, none of the experts could agree on what was meant by "networking capability." For most of them, it means that the architectural components communicate over a local-area network. Others note that client/server LAN configurations are increasingly being connected to metropolitan- and wide-area networks, which instills them with more power and complexity.

There are four more requirements that many of the analysts listed but did not all agree on. These "debatable" requirements are as follows:

- Action is initiated at the client end. Some people argue that database servers can be programmed to trigger action at a certain time each day.
- A user-friendly graphical user interface should reside at the client end. Others say this is not a requirement.
- The database server should provide data protection, security and SQL capability.

Most experts say a database server should support SQL because of its standing as a de facto standard. "Information Builders' Focus claims to have a client/server architecture, but it doesn't," says Richard Finkelstein, president of Performance Computing, Inc. in Chicago.

On the other hand, says George Schussel, president of Digital Computing, Inc. in Andover, Mass., Focus can be considered among the ranks of client/server products because it divides the processing of a transaction between two platforms.

- A significant portion, or all, of the application logic resides at the client end.

Most consultants concur that the application logic should reside in the client end. The application on the client end controls the display management and data manipulation, while the database server handles the transaction logic and data integrity, Schussel says.

Others disagree. "If the workstation end has any intelligence, then that is a cooperative processing system," says John Dunkle, vice president at Workgroup Technologies in Hampton, N.H.

This brings us to another source of confusion: the difference between client/server, cooperative processing, distributed processing, distributed databases and network computing. As far as some people are concerned, client/server and cooperative processing are synonymous. Others find the distinguishing factor to be the involvement of a mainframe as the server. Others look to IBM.

"The rest of the world was using the term 'client/server,' and IBM introduced the term cooperative processing," says software guru James Martin.

In fact, cooperative processing now falls under IBM's recently formed Client/Server Computing Group. This would seem to indicate that IBM is now placing more emphasis on client/server architecture than on cooperative processing.

"The Client/Server Computing group was formed to ensure a cohesive strategy throughout

Continued on page 54

Bochenski, a 30-year veteran in IS, is a free-lance writer and advanced computing consultant in Bellevue, Wash.

INSIDE

Tips, Rules, Guidelines
What you need to know about client tools, server tools and network operating systems. Page 55.

Product Guide
A comprehensive listing of portable front-end application development tools. Page 59.

Continued from page 53

IBM," says Dick Newman, manager of planning for the IBM group. "In both client/server and cooperative processing, the application is spread between the workstation and the host. In cooperative processing, most of the processing is done on the host. In client/server processing, most of the processing is done on the workstation."

Most analysts agree that client/server systems can be considered a subset of distributed processing. However, they warn, you should never assume that client/server systems are distributed database systems.

Distributed systems require various transparency capabilities as well as adequate recovery management. Adequate recovery management and the handling of two-phase commitments have posed some of the biggest challenges to vendors trying to deliver these systems.

Some vendors market their client/server systems as also having distributed database systems. However, in most of those cases, the product is the current version of distributed database that they've been working on for years.

Buyer beware

What kinds of products exist that support client/server systems? You can break them into three categories: client tools (fourth-generation languages and application development packages), database servers and local-area network operating systems (see story page 55).

In all three categories, however, the rule is 'buyer beware.' "Just because a product is linking up to a back-end server does not mean that it performs well or that it's easy to use," says Richard Finkelstein, president of Performance Computing, Inc. in Chicago.

Not quite there

Most consultants say client/server architecture is unprepared to perform distributed database functions. Martin says, "With a client/server architecture, you're talking about two devices interacting. With distributed database processing, that number could be in the hundreds."

The other concern is the concept of a "unit of work," a term used in distributed database systems to indicate all the work that must be accomplished before a transaction can be committed. If any portion of the unit of work on any portion of the distributed database fails, all portions of the unit of work must be rolled back

"Remote procedure calls [RPC] are the classical way to implement client/server architectures and have no notion of a unit of work," says John Tibbetts, president of Kinexis, a consulting firm in San Francisco. "When it comes time to commit work in a distributed database system, you have to have a peer-to-peer protocol. You could use the client/ server RPC to prepare the transaction and a peer-to-peer protocol to commit or roll it back."

Members of the Transaction Processing standards committee, sponsored by the International Standards Organization and ANSII, say a standard will be ready by the middle of 1991 that will handle many of the problems currently faced by systems that try to do distributed database operations.

According to Martin, a new breed of software that he refers to as a "client/server management system" will address transaction processing as opposed to just queries, ensuring that transactions are not lost when failures occur.

A vendor that specializes in such software, he says, is Cooperative Solutions, Inc. in San Jose, Calif. The firm plans to announce a product in the first quarter of 1991 that would generate transaction-based systems on a LAN using a client/server architecture. The monitor would provide the same services now available in a mainframe transaction monitor, says Frank Clugage, director of product marketing at Cooperative Solutions.

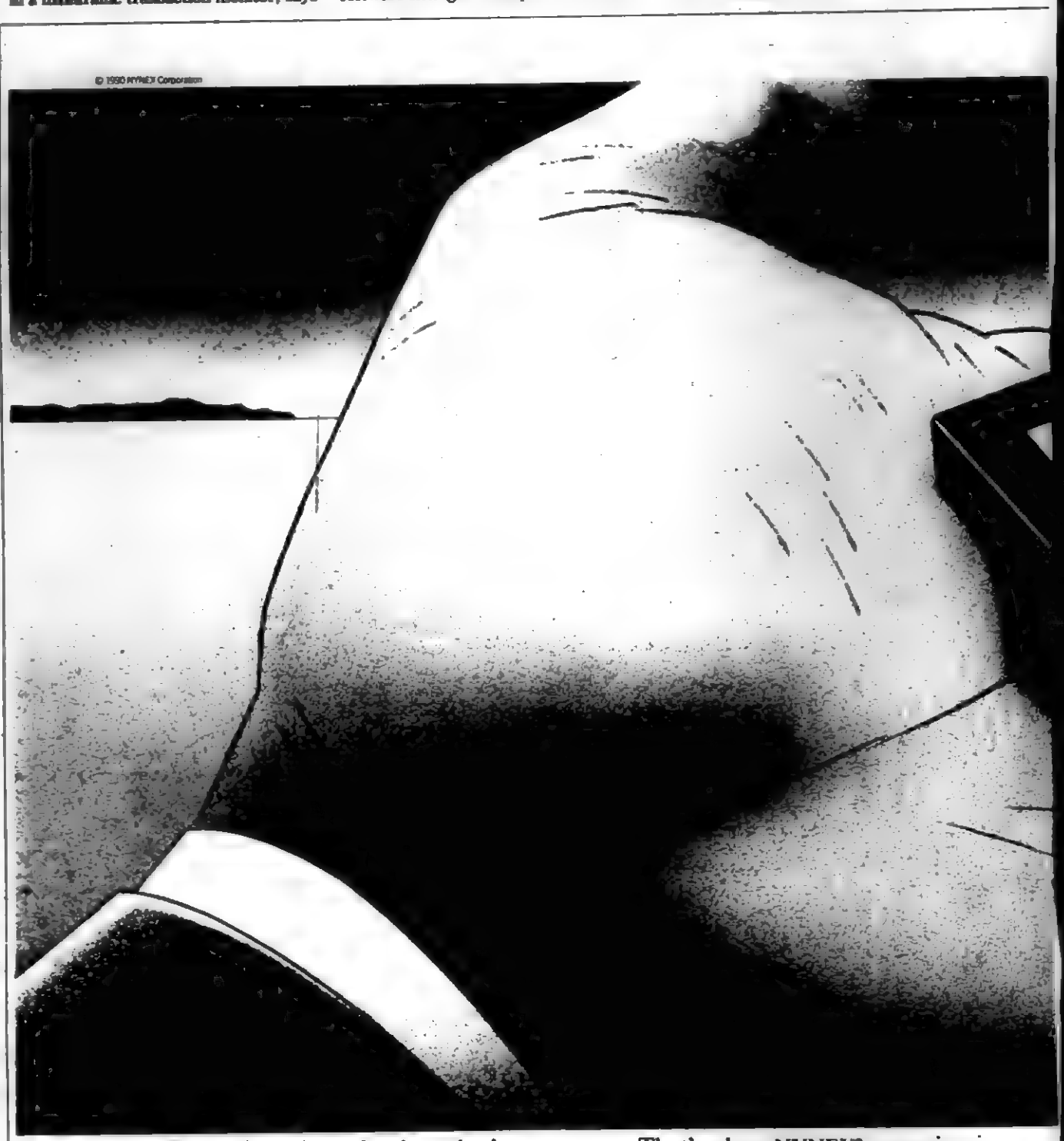
"Today's software has some of the capabilities needed on the database end, but the application end doesn't," Clugage says. "The database vendor will say that when an error occurs and we need to roll back, they take care of all that. Well, they do — on the database side. But the application is not taken care of, since it's now partly running on the client."

Another major concern is systems administration. Many large companies are starting to move into IBM's Systems Managed Storage to manage their vast storage needs.

In addition, people are wondering how they will distribute and refresh the client software sitting on multiple workstations. IBM's recently announced Systemview strategy has promised to address client/server system administration issues. However, it is doubtful if the strength and quality of products will be ready when people start to need them.

Despite these concerns and the confusion over definitions, firms are moving in the direction of what they consider to be a client/server architecture — whether that is a "true" client/server architecture or their own version of it.

"Big companies who are heavily into client/server have shut up about it" to keep a hold on what they consider prime technology, says Larry DeBoever, president of DeBoever and Associates. "They know it gives them tremendous competitive advantage." ●



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Avoid bad buys by following rules of thumb

CLIENT TOOLS

Features traditionally considered ideal in application development tools may not be so relevant in a client/server architecture. Todd Johnson, a consultant at Lante Corp. in Chicago, says to choose a tool for the newer setup, you may want to look at the following in a new light:

• **The user interface.** The tool should allow tight control over the look-and-feel aspects of the user interface, and there should be custom procedures to validate data values for an individual data field.

The developer also needs to be able to modify portions of the user interface throughout the development cycle, independent of changes to other portions of the program code.

The front-end tool should insulate the developer from the system calls necessary to produce the display. High-level functions to produce list boxes, radio buttons, push buttons, pull-down menus and other standard interface components should be well integrated into the development environment. Some tools provide spreadsheet and text-editing objects, such as Gupta Technologies, Inc.'s SQL Windows, Jyacc, Inc.'s JAM and Borland International, Inc.'s Paradox.

An access path should also be provided to let the developer access system-level calls to customise the functions.

• **Close integration of the front-end environment with the database server.** Back-end functions are usually accessed via an application programming interface (API) provided by the vendor. Many front-end tools allow the application to call these APIs directly; however, fourth-generation languages eliminate them. For example, some tools can take the results of a database query and place them directly into a user interface object. Paradox and SQL Windows provide these types of functions.

• **Reporting facilities.** Simple report layouts and calculations should not require extensive programming, so look for a tool that inherently supports the SQL language aggregate operators. Don't overlook multiple font and graphics output capabilities. Paradox 3.5 contains exceptional report-generation facilities.

• **Platform portability.** Portability should exist at both the front and back end of the application so that users can choose the database platform that best suits the needs of the current application. Several front-end tools support multiple graphical user interface environments, such as Easel Corp.'s Easel and Channel Computing, Inc.'s Forest & Trees, which are both available for Microsoft Corp.'s Windows and Presentation Manager.

• **External function calls.** The development tool is more useful if it contains a facility to make calls to code written outside of the native environment. This allows the application to take advantage of existing code libraries, reducing development time and allowing for code reusability. This also lets the developer write critical portions of the application in C or assembler for faster performance.

• **Interfaces to other applications.** The application should share data with other standard applications. Data from the client/server application can be written to standard file formats to be read by the standard applications.

• **Licensing costs.** Most vendors provide a standard developer package, allowing any number of developers to use the tool. Sometimes, a separate license must be purchased for each developer. SQL Windows and Easel require a runtime environment to execute the completed application. You may need to purchase a runtime license for every workstation.

For a list of portable application development tools, see page 59. •

SERVER TOOLS

Choosing the wrong database server can mean cost overruns and even canceled projects, says Richard Finkelstein, president of Performance Computing, Inc., a database management system consulting firm in Chicago. Some simple guidelines may help you avoid common mistakes:

• **Rule 1:** ***Stored procedures minimize network traffic.*** With stored procedures, the application issues only one command to execute a procedure. Good implementations are found on the Microsoft Corp./Sybase, Inc. SQL Server, Ingres Corp.'s Ingres server and IBM's OS/2 Extended Edition Database Manager.

• **Rule 2:** ***Look for a cost-based query optimizer.*** Query optimizers use statistics stored in the system catalog to determine the fastest way to retrieve data. All OS/2 database servers except for Oracle Systems Corp. use statistically-based optimization. Ingres and OS/2 Database Manager are particularly strong in this area.

• **Rule 3:** ***The database needs to enforce integrity consistently across all client applications.*** Referential integrity is the best way of doing this, and it can be implemented in two ways. IBM's OS/2 Extended Edition Database Manager and Digital Equipment Corp.'s RDB/VMS incorporate it in the SQL CREATE TABLE command of the data definition language.

SQL Server and Ingres use "triggers"

Continued on page 58

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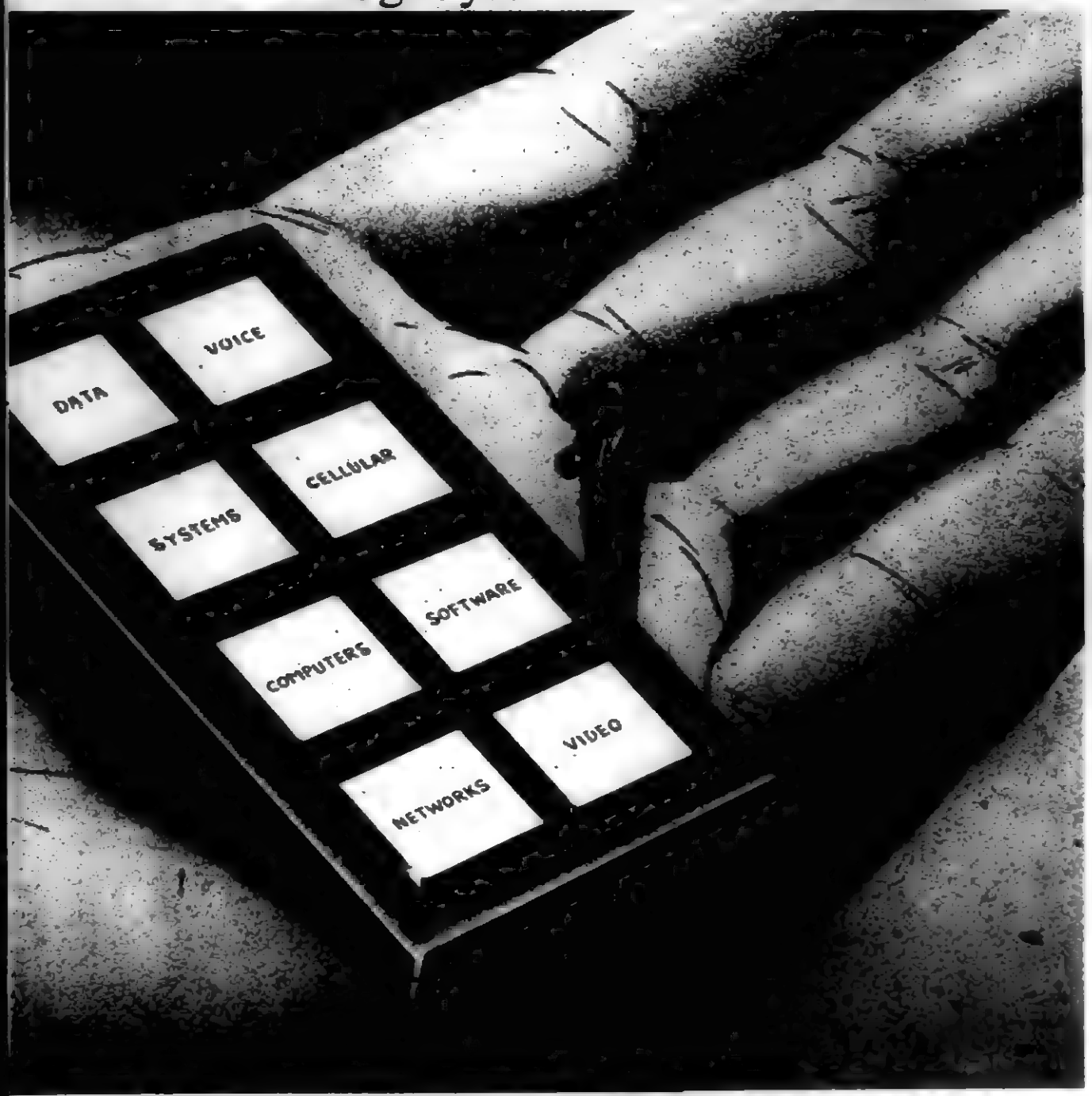

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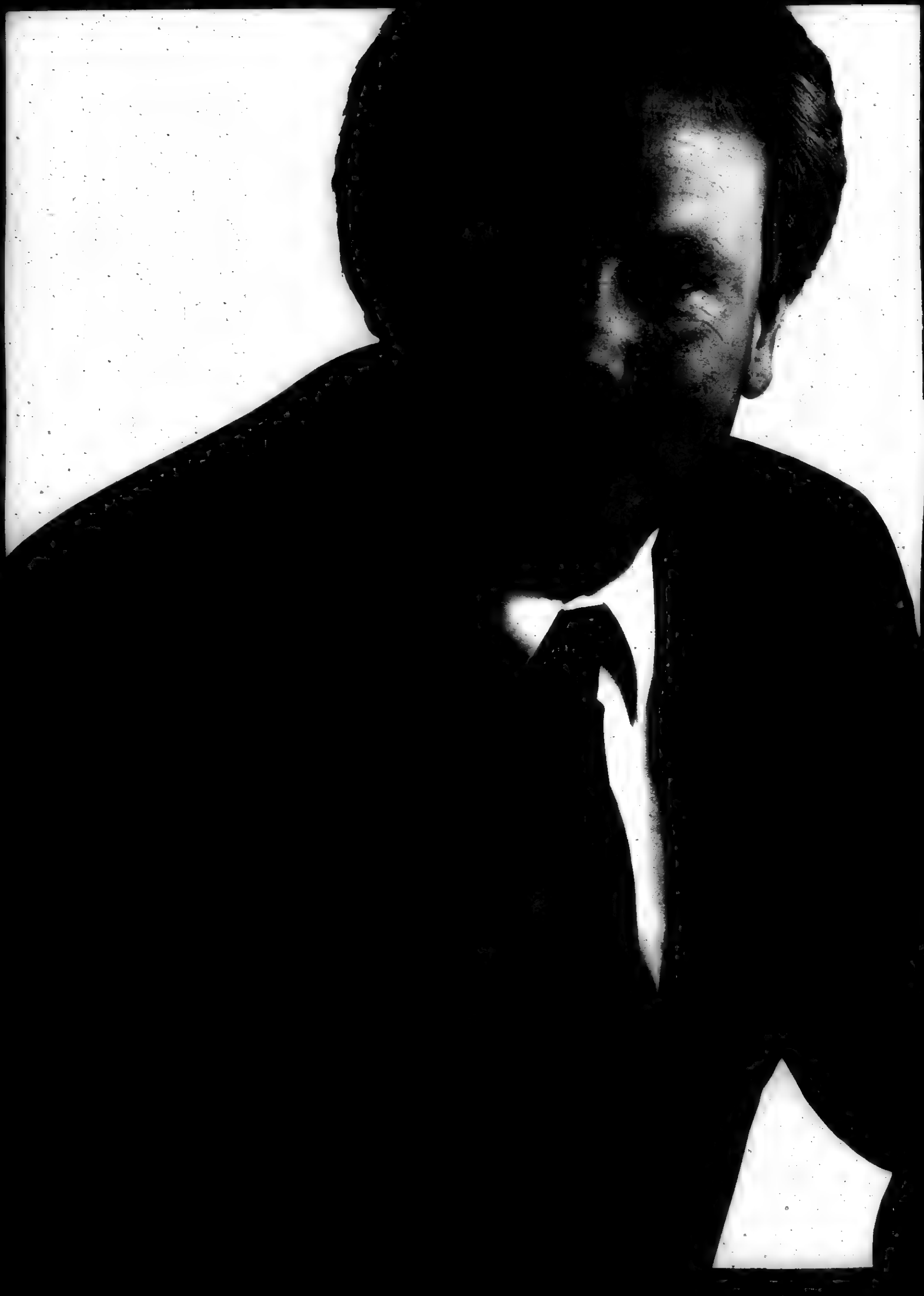

"We've got a complete SAA system up and running, and it's hard to say who's happiest: our programmers, our users, our customers, or me."

Keith Sievers, VP/Information Systems and Treasurer,
Federal Kemper Insurance Company

Federal Kemper Insurance Company is a home and auto insurer who's found some insurance for themselves, against system obsolescence.

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Their SAA system is a client-server approach that ties IBM PS/2®s running OS/2® (in remote locations and the home office) with an ES/3090™ host. They chose SAA for both short- and long-term advantage.

"In our business," says Keith Sievers, "there's a tremendous need to cut costs, to make everybody as useful as possible. SAA is helping us do that. We also need a platform that's consistent, easy to manage, and built for growth. For us, going with SAA was just the obvious thing to do."

For programmers.

The first people to notice an improvement were FKI's programmers.

"We did everything in COBOL, but in the Presentation Manager™ environment," says Keith. "All of a sudden, people who'd been here for years were driving to work a little faster. They were doing better work, they were making a difference, and they saw results quickly, even without CASE tools."

FKI now has applications for data, image and customer service that are easy to use and easily portable. And they're delivering more function to users at less cost, thanks to SAA's cooperative processing.

Says Keith, "Under SAA, we're moving a lot of our processing from the mainframe to PCs, which offer flexibility and portability. And we see real benefits from a disaster recovery standpoint."

For users.

And do users like it?

"They ought to," says Mr. Sievers, "they helped us design it. SAA screens are sort of a personal thing, so it only made sense to include the people who'd be using them every day. Our old screens had acronyms tucked into every available space. The new ones are a lot easier to look at and understand, and everybody loves the mouse. It's less like work and more like fun."

And while multitasking doesn't mean much to the public, it's going to be a real plus for FKI's customers.

For customers.

"When policyholders call with questions, they want answers fast. And when our SAA system is fully implemented, they'll get them. Our representatives will be able to solve problems on the spot just by popping a new window onto the screen. Instead of 'I'll get back to you later,' they'll say 'Here's the answer right now.' "

Keith Sievers has other reasons for liking SAA, especially since MIS isn't his only job. He's also the company treasurer.

"We wanted a leading-edge system that would still be leading-edge five years from now, a base we could build on, something we could enhance with AI, voice or image technology, but without having to toss out what we already owned. People ask questions about SAA, but of all the options we explored it was easily the *least* questionable.

"We're very competitive, and the truth is, only two things separate insurance companies—cost and service. SAA gives us an edge both ways."

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Continued from page 55

to enforce referential integrity. A trigger is a set of procedural and SQL commands that automatically executes whenever a table is modified. The first option is more reliable because it is developed and tested by the DBMS vendor.

• **Rule 4:** ***Embedded SQL commands are preferable to function calls in application programming interfaces.*** Most SQL database servers use this approach, but XDB has carried it one step further. Because it supports DB2's syntax, error codes, data types and semantics, it is an excellent DBMS for developing DB2 applications on a personal computer platform. OS/2 Extended Edition also has a very high degree of conformance.

• **Rule 5:** ***Database server architecture will have a substantial effect on resource utilization.*** On multithreaded/single-server machines, one database server runs on the computer, and a thread is created by the server for each user connection. SQL Server and Gupta Technologies, Inc.'s Sqlbase are two examples of this type.

Other servers, such as Oracle, use a process-per-user architecture, which creates a new process for each user connection. The downside to this architecture is that it requires more memory than threads and consumes more CPU resources. On the plus side, process-per-user servers can take advantage of multiprocessor hardware by distributing the process load across several processors.

Ingres combines both approaches with a multithreaded/multiserver architecture. These servers offer low resource consumption using multiple-processor computers by allocating servers to each of the available processors.

• **Rule 6:** ***Just because it says "portable" doesn't mean it is.*** Not all vendors support all platforms equally. For example, the VMS port of Oracle Version 6 supports Oracle's proprietary PL/SQL language, while the OS/2 version does not. SQL Server Version 4.0 is available only on Unix platforms. The latest release of Ingres has been ported to several Unix platforms but is not available under OS/2 or other lightly supported Unix systems. •

COMMUNICATIONS TOOLS

Deciding which network operating system is best for your client/server system depends primarily on the size of your company and the connectivity needs of your departments, according to Steven L. Guengerich, director of communications, and David A. Rhodes Jr., consultant, at Business Systems Group, Inc., a national systems integration firm in Houston.

If you've got 10 to 20 users with one file server, the network operating system should be able to run on the same file server as the database package. This requirement rules out Novell, Inc.'s Netware if you're planning to use Oracle Systems Corp.'s Oracle Server, Microsoft Corp.'s SQL Server or Gupta Technologies, Inc.'s Sqlbase. All of these require a nonproprietary multitasking operating system such as OS/2 and Unix.

With IBM's LAN Server and Microsoft and 3Com Corp.'s LAN Manager, on the other hand, the file server can support both the network operating system and the database server.

Separating the systems

If you have 50 or more users with more than one dedicated server, you can run the two systems on separate servers.

In this situation, Netware becomes more attractive. You can connect OS/2 machines running Oracle's Server for OS/2, SQL Server, Sqlbase or Ingres Corp.'s Server for OS/2 to the network using Novell's Netware Requester for OS/2. The Requester enables users to access the database server's resources via Novell's Sequenced Packet Exchange, Microsoft's Named Pipes or IBM's Netbios.

If your firm is large, ease of access to and management of databases across networks and platforms becomes a priority.

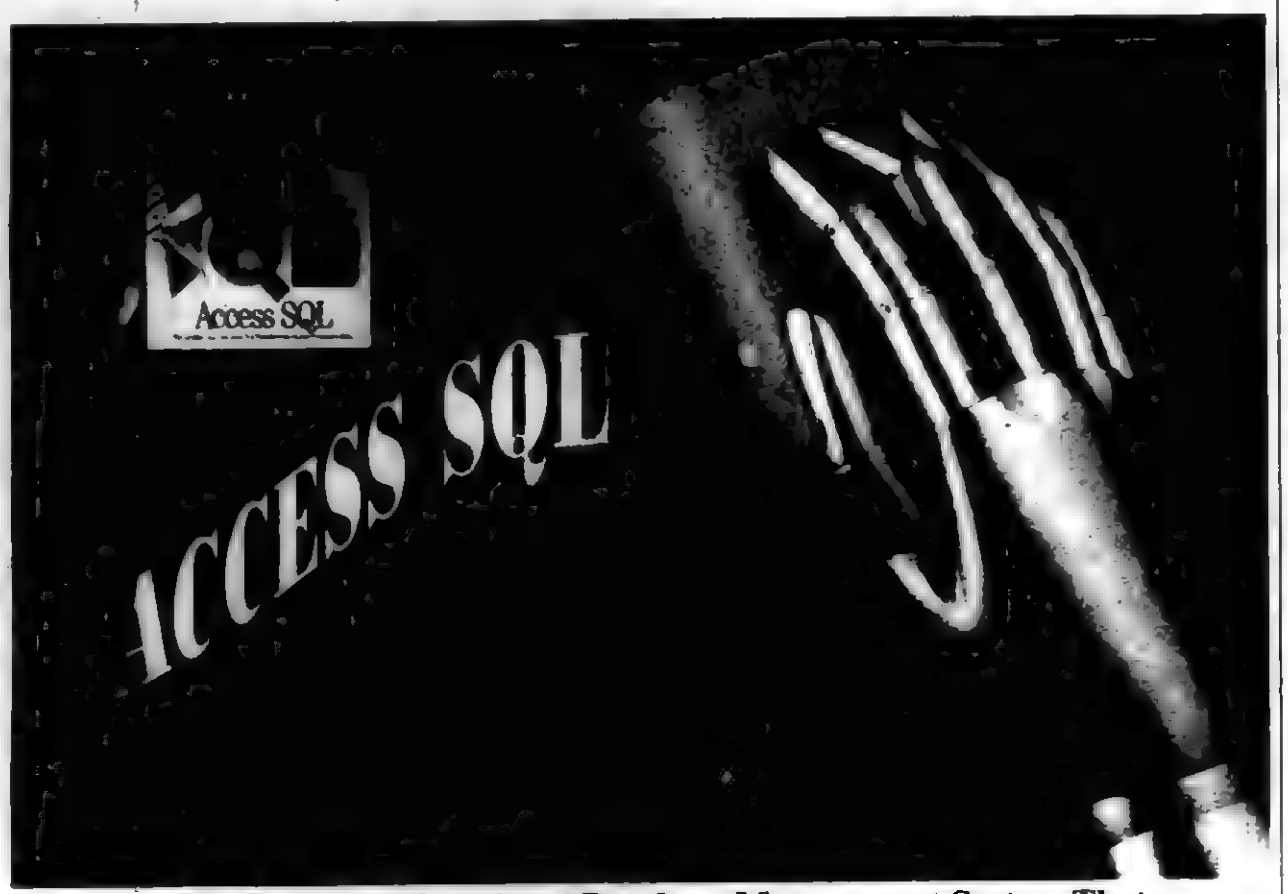
In these environments, systems such as Banyan Systems, Inc.'s Virtual Networking Software (Vines) often become the network operating system of choice. Because of its integrated Streettalk global naming service, users can transparently access resources anywhere on the network.

Vines servers are Unix-based, however, so there are few database servers available to run on them. However, Oracle offers Oracle Server for Vines, and Vines users running DOS can use Netbios to access Sqlbase. SQL Server supports only LAN Manager and Netware clients, but Named Pipes support for Vines is coming soon.

In large environments, it is also important to consider the network operating system's ability to expand into other systems, including Unix servers, minicomputers and mainframes.

Novell currently offers gateways for Netware into IBM 5250 minicomputers and 3270 mainframes, as well as Transmission Control Protocol/Internet Protocol for Unix networking. Other third-party vendors — including AST Research, Inc., Digital Communications Associates, Inc. and Racal Interlan, Inc. — offer similar gateways.

Microsoft and Digital Communications Associates have teamed up to create the DCA/Microsoft Communications Server to run as a server-based application with LAN Manager. IBM's OS/2 Extended Edition also includes a communications manager for gateways into minicomputers and mainframes. •



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Access SQL will help you see your organization in a whole new light.

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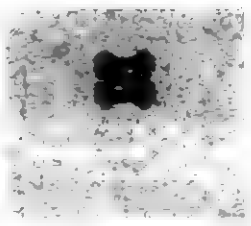

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1-800-937-4774

Portable application development tools

VENDOR	PRODUCT	DATABASE SERVERS ACCESSED	CLIENT OPERATING SYSTEMS SUPPORTED	CLIENT HARDWARE SUPPORTED	PROGRAMMING LANGUAGE	GENERATORS INCLUDED	CALL LANGUAGES SUPPORTED	NETWORK OPERATING SYSTEMS SUPPORTED	RAM REQUIRED ON CLIENT	HARD DISK STORAGE REQUIRED	USER INTERFACE	PRICE	COST OF ADDITIONAL USERS
Blythe Software, Inc. (415) 571-0222	Oracle 5	DEC Rdb, IBM DB2 and OS/2 EE Database Manager, Informix, Ingres, SQL Server, Oracle Server	DOS, Macintosh	Apple Macintosh Plus, Intel 80286 and higher IBM PCs and compatibles	Oracle Script	Application, form, report	Assembly, C, Pascal	Apple Share, any AFP or Nethios, LAN Manager, Novell Netware	1M on Apple Macintosh; 2M on PC	2M	Microsoft Windows, Apple Macintosh	$1,000	$999
Borland International, Inc. (408) 438-8400	Paradox 3.5 with Paradox SQL Link	DEC Rdb, IBM OS/2 EE Database Manager, SQL Server, Oracle Server	DOS	Intel 80286 and higher IBM PCs and compatibles	Turbo C	Form, report	PAL (Paradox Application Languages)	3Com 3+ Open, IBM LAN Server, LAN Manager, Novell Netware, Banyan Vines	1M	1M	Character-based	$795 for Paradox 3.5, plus $395 - $495 for SQL Link	$995 for each additional five users
Channel Computing, Inc. (603) 889-2882	Forest & Trees	Gupta Sqlbase, SQL Server, Oracle Server	DOS	Intel 80286 and 80386 IBM PCs and compatibles	Uses pop-up windows and menus	Application, report	3GL*	IBM LAN Server and PC Net, LAN Manager, Novell Netware, Banyan Vines	1M on Intel 80286; 2M on 80386	Less than 1M	Microsoft Windows, HP New Wave	$495 - $2,995	$495
Datacase International, Inc. (203) 374-8000 (800) 243-5123	Datacase SQL Professional Version 1.0	SQL Server	DOS, OS/2	Intel 80286 and higher IBM PCs and compatibles	Datacase	Application, form, report	Assembly, Basic, C, Cobol, Pascal	3Com 3+ Open, LAN Manager, Novell Netware	2M for DOS; 4M for OS/2	10M	Character-based	$995 - $1,995	$1,750 per additional five users
Datalex, Inc. (800) 963-9988 (415) 363-4466	Entrypoint 90	Oracle Server	DOS	IBM PCs and compatibles	Logic	Application, form	Assembly, C	Any Nethios, LAN Manager, Novell Netware, Banyan Vines	256K	1.5M	Character-based	$1,075 for developer license	$725
Easel Corp. (617) 938-8440	Easel	IBM OS/2 EE Database Manager and DB2, SQL Server	DOS, OS/2	Intel 80286-based IBM PCs and compatibles	Easel	Application, form	Basic, C, Cobol, Pascal	LAN Manager, Novell Netware, Banyan Vines	640K	400K	OS/2 PM	$7,500	$350
Guidance Technologies, Inc. (412) 221-1300	Cherrytopher	IBM OS/2 EE Database Manager, SQL Server, Oracle Server	DOS, OS/2	Intel 80386-based machines	Proprietary 4GL	Application, form	Assembly, Basic, C, Cobol, Pascal	LAN Manager, Novell Netware	4M	2M	OS/2 PM, Microsoft Windows	$7,500 for developer license	$995

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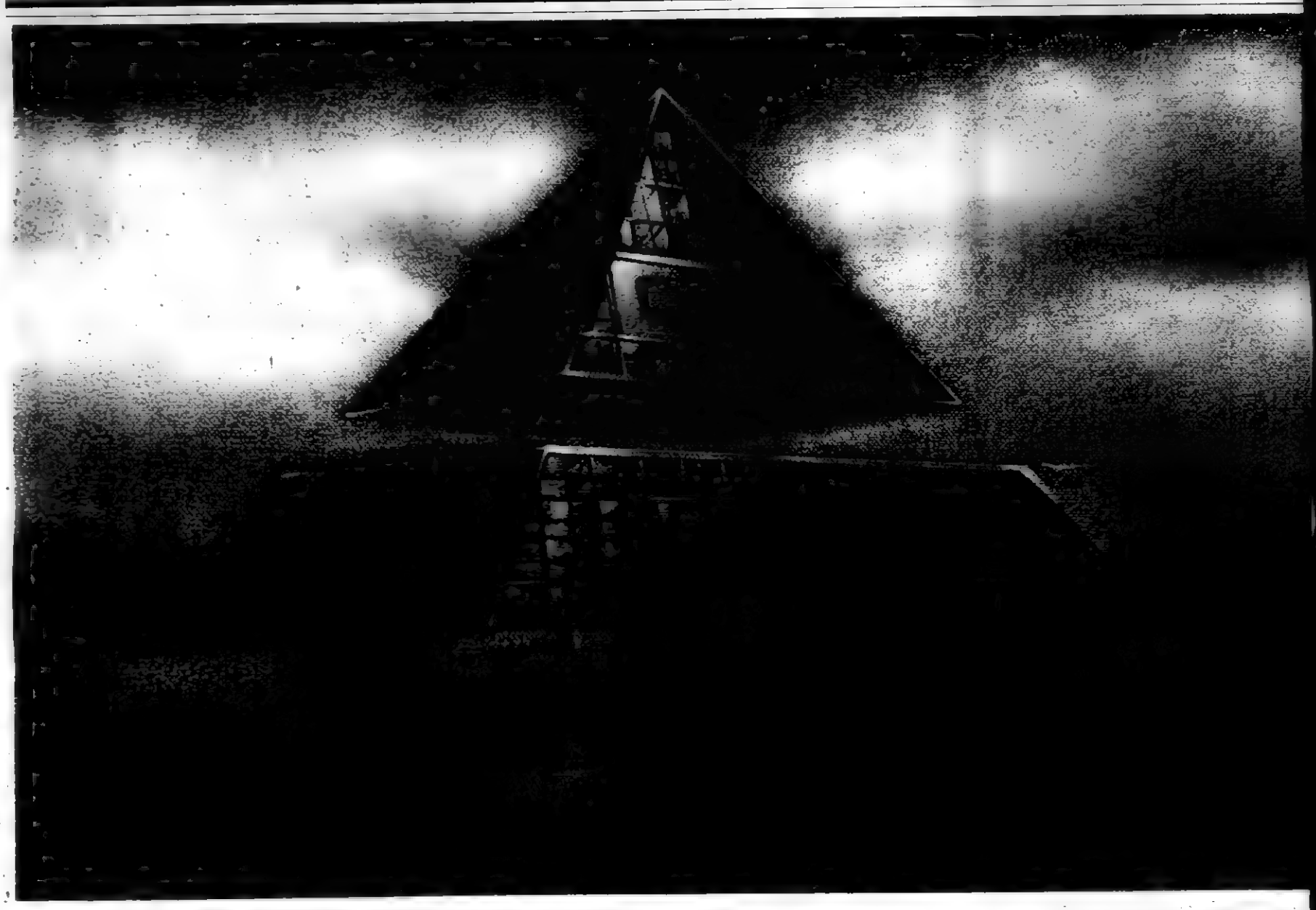
PRODUCT SPOTLIGHT

VENDOR	PRODUCT	DATABASE SERVERS ACCESSED	CLIENT OPERATING SYSTEMS SUPPORTED	CLIENT HARDWARE SUPPORTED	PROGRAMMING LANGUAGE	GENERATORS INCLUDED	CALL LANGUAGES SUPPORTED	NETWORK OPERATING SYSTEMS SUPPORTED	RAM REQUIRED ON CLIENT	HARD DISK STORAGE REQUIRED	USER INTERFACE	PRICE	COST OF ADDITIONAL USERS
Gupta Technologies, Inc. (415) 321-9500	SQL Windows	Gupta Sqlbase, IBM OS/2 EE Database Manager and DB2, Oracle Server	DOS	IBM PCs and compatibles	SAL (4GL SQL Windows Application Language)	Application, form, report	Assembly, C, Pascal	Any NetBios, 3Com 3+ Open, LAN Manager, Novell Netware, Banyan Vines	1M; 2M recommended	1.2M	Microsoft Windows	$1,295	$189
	SQL System Programmer's Toolkit	Gupta Sqlbase Server, IBM OS/2 EE Database Manager and DB2, Oracle Server	DOS, OS/2	IBM PCs and compatibles	C, Cobol	Application	C, Cobol	Any NetBios, 3Com 3+ Open, LAN Manager, Novell Netware, Banyan Vines	640K	3M	Character-based, OS/2 PM, Microsoft Windows (C API only)	$695	$695
Information Builders, Inc. (212) 736-4433	Focus	Focus DB Server, IBM OS/2 EE Database Manager, DB2 and SQL/DS, SQL Server, Teradata Nucleus	DOS, OS/2, Unix	IBM PCs and compatibles, Unix workstations	Focus 4GL	Application, form, report	Ada, Assembly, Basic, C, Cobol, Pascal	3Com 3+ Open, LAN Server, LAN Manager, Novell Netware, PCSA, Banyan Vines	470K	5M	Character-based, OS/2 PM, Microsoft Windows, OSF Motif, AT&T Open Look	$1,295+; $1,495 per four users	$1,295
Intelligent Environments, Inc. (800) 640-1080	Application Manager	IBM OS/2 EE Database Manager and SQL/DS, Oracle SQL/DS, SQL/Server	OS/2	Any machine running OS/2	AM HLL (high-level language)	Application, form, report	C	LAN Manager, LAN Server, Novell Netware	4M	1M	OS/2 PM	$5,000	$250
JYACC, Inc. (212) 267-7722	JYACC Application Manager (JAM)	VAX SQL/Services and Rdb, Gupta Sqlbase, DB2, Informix, Ingres, SQL Server, Nucleus, Oracle Server, Progress, Sharo Base, Ultra/SQL, XDB Server	DOS, OS/2, Unix, VMS, MPE/XL, Primos, iRMX, Xenix, VOS, AOS/VS	IBM PCs and compatibles, various midrange machines, Amdahl	C	Application, form, report	C, Cobol	DEC Decnet, LAN Manager, Novell Netware, SPX, TCP/IP, Banyan Vines, XNS	640K	4M	Character-based, OSF Motif 3270	$595 - $35,820, depending on hardware	No per-client charge
MDBS, Inc. (317) 447-1128	Object/1	IBM OS/2 EE Database Manager, MDBS IV, SQL Server, Oracle Server	DOS, OS/2	Intel 80286 and higher IBM PCs and compatibles	Object/1	Application, form, report	Assembly, Basic, C, Cobol, Pascal	LAN Manager, Novell Netware	4M	6M	OS/2 PM, Microsoft Windows	$995	No per-client charge
Neuron Data (415) 321-4488	Nexpert Object	Ashton-Tate DBase III, DEC Rdb, Gemstone Gatos, DB2 and SQL/DS, Informix, Ingres, Oracle Server, SQL Server	DOS, OS/2, Unix, VM, MVS, Macintosh, VMS	IBM PCs and compatibles, Macintosh, Unix workstations, VMS machines, MVS machines	Nexpert Rules and Objects	Application, form, report, expert system	Assembly, Basic, C, Cobol, Pascal	Any supported by the server	640K	2M	Character-based, OS/2 PM, Microsoft Windows	$5,000 - $50,000 for developer license	$750 - $50,000; runtimes sold by hardware model
Progress Software Corp. (800) 272-4880	Progress 4GL/RDBMS	DEC Rdb and RMS, Oracle Server, Progress	DOS, OS/2, Unix, VMS, CTOS/BTOS	Any DOS, OS/2 PCs, Unix workstations	Progress 4GL	Application, form, report	C	LAN Manager, Novell Netware, NFS, Banyan Vines	640K	3M	Character-based, Microsoft Windows, X Window System-based managers	$1,050 - $190,000	NA



PRODUCT SPOTLIGHT

VENDOR	PRODUCT	DATABASE SERVERS ACCESSED	CLIENT OPERATING SYSTEMS SUPPORTED	CLIENT HARDWARE SUPPORTED	PROGRAMMING LANGUAGE	GENERATORS INCLUDED	CALL LANGUAGES SUPPORTED	NETWORK OPERATING SYSTEMS SUPPORTED	RAM REQUIRED ON CLIENT	HARD DISK STORAGE REQUIRED	USER INTERFACE	PRICE	COST OF ADDITIONAL USERS
Revelation Technologies, Inc. (212) 645-1000	Advanced Revelation 2.0 with SQL Server Bund.	SQL Server, Ashton-Tate Dbase	DOS	IBM PCs and compatibles	Rdbasic	Application, form, report	Assembly, C	LAN Manager, Novell Netware, Banyan Vines, 3Com 3+ Open	640K, plus TM expanded memory	None required	Character-based	$695 for developer	$395 for 4-user LAN Pack option
SQ Software (216) 991-6551	SQR, Easy SQR	Ingres, Oracle Server, SQL Server	DOS, OS/2, Unix, VMS	More than 40 platforms, including IBM PCs and compatibles, Unix workstations, DEC, HP and other midrange machines	C	Report	Assembly, C, Cobol, Pascal	LAN Manager, Oracle SQL Net	400K for DOS	2.7M for DOS	Character-based for SQR; Windows for Easy SQR	$395 - $38,000, depending on hardware	$395 - $38,000
Unisys Corp. (215) 986-4011	Ally	Ashton-Tate Dbase III, C-ISAM, Informix, Oracle Server	DOS, OS/2, Unix, Unisys BTOS/CTOS	IBM PCs and compatibles, AT&T 3B series, Unisys B series, U 5000, 6000 and 7000 series, NCR 32 series, Sun Sparcstation, 300 and 400 series	Ally	Application, form, report	Assembly, Basic, C, Cobol, Pascal	Any TCP/IP, TTY	640K	11M	Character-based, Microsoft Windows	$900 - $65,000	$995 - $35,000; developer and run-time licenses sold by hardware model, not per user
Visionet, Inc. (219) 763-3881	Sqlfile System	SQL Server, Novell Netware SQL, Oracle Server	DOS, OS/2	IBM PCs and compatibles	C	Application, form, report	NA*	LAN Manager, Novell Netware	640K	None required	Character-based	$595 per server	No per-client charge
Wordtech Systems, Inc. (419) 294-3900	Quickdliver/SQL	Gupta Sqlbase, Oracle Server	DOS, Unix	IBM PCs and compatibles	Dbase with embedded SQL	Report	Assembly, C	3Com 3+ Open, Invisible LAN Manager, Lantastic, Novell Netware, Banyan Vines	640K	2.5M	Character-based	$795	No per-client charge

*Product automatically translates other languages into SQL, therefore does not make calls directly to or from traditional programming languages.

The companies included in this chart responded to a recent survey conducted by *Computerworld*. When a vendor is unable to provide specific information about its product, the abbreviation NP (not provided) is used. When a question does not apply to a vendor's product, the abbreviation NA (not applicable) is used. Further product information is available from the vendors.

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Johnson Wax's people investment

Continued from page 1

employees. In October, the program won the Assist Award from the Association for Computer Training and Support.

Finding and keeping qualified staff has become a major IS issue, and Johnson has chosen to invest in developing internal expertise rather than turning to consultants and outsourcing for "quick fixes," according to Dean LaGrange, senior manager of technical support, who helped design Proficere. The application gives the $2.5 billion privately owned maker of such consumer products as Raid insect repellent and Pledge furniture polish a firm grip on the IS skills it houses.

Implemented in the fall of 1989, Proficere compares available expertise with the skills required for upcoming projects so IS can determine its educational needs. Proficere is serving as a model for other Johnson business areas and will be licensed to other companies, such as Xerox Corp.

Internally, three functional departments — the U.S. consumer products sales staff, a 1,200-person consumer products manufacturing plant and corporate research and development — are involved in development projects modeled on Proficere.

The Proficere project is one component of an all-out Johnson effort to "re-engineer our business processes," says Bill Vinck, senior IS director of policy and planning. Another is the company's recent implementation of its $5 million Computer Integrated Customer Service System, which Johnson says has reduced customer order turnaround time from 14 days to approximately five.

Another part of the re-engineering process has involved decentralizing the IS support function by placing technicians in each business unit, says Tim Theriault, head of end-user computing services. In the R&D group, for example, corporate IS support time previously spent answering user questions has dropped from 60% to 25%. "We're trying to go even lower in reducing calls to the corporate help desk," he says.

All photos courtesy of Johnson Wax

Theriault, *head of Johnson's end-user computing services, says a re-engineering of the IS support group included decentralization*

IS recognized that it needed to get a handle on its resources, particularly on the staffing side, when Johnson undertook converting thousands of business applications from a Honeywell, Inc. platform to an IBM mainframe in 1988. According to the IS staff, the shift coincided with the October 1988 arrival of forward-thinking CIO Burden from Firestone Tire & Rubber, Inc.

Today's technologically spiraling industry, the company realized, meant keeping staffs trained in emerging database, fourth-generation language and a myriad of other technologies that could make or break IS' ability to keep Johnson competitive. For example, the company used Proficere to identify a Focus support expert quickly when the employee who handled that function in the end-user computing area left the firm.

Proficere will evolve, Burden says, because "we need to keep developing expertise to define systems that can exchange information effectively and rapidly with each other and with the corporate mainframe."

A primary goal of the firm is to reduce the number of major computing platforms, which now stands at seven. "It takes a lot of people to support all those platforms, and it is difficult to make integration seamless," explains Tom Heyerholm, senior IS manager of network services resource management.

Proficere has actually saved the company money. The company says it has so far decreased its annual professional development investment — $440,000 in 1989 — by 20%. For example, instead of individuals signing up for outside IBM DB2 courses ad hoc at "$1,000 a pop," the company used Proficere to identify 25 people needing training in that area and brought an instructor on-site for $2,800, says Mike Bereszowitz, IS education manager.

To design Proficere, the IS professional development group put together more than 100 IS job models that detailed the skill levels required for projects. "We probably hadn't rewritten our job descriptions in at least 10 years," says Lou Sesso, senior IS manager of resource development.

The job models set up a rating system for key IS skill areas such as business, personal, interpersonal and technical expertise. Interviews with staff provide data about an employee's existing skill level, and Proficere compares that data with the skill level required. Those employees and managers with access authority then determine the "percentage qualified" of an individual for a given project and identify training areas needed. ●

At A Glance

SC Johnson wax

Sales	$2.5 billion
Employees	13,000 in 47 locations worldwide; 402 in information services
Chief information officer	Laurance Burden
IS budget	More than $70 million
Key systems	IBM 3090 Model 300; 3090 Model 200; DEC VAX 6420s and Vaxclusters; IBM AS/400 (main computing platform overseas); Stratus Computer and Tandem Computers fault-tolerant systems for manufacturing applications
Host operating systems	IBM MVS (corporate systems), VM (marketing, scanner processing, demographic analysis); DEC VMS
Personal computers	2,000 IBM PCs (standardizing on Dell Computer Intel 80386-based systems), several hundred Apple Macintoshes
Database software	IBM DB2, Software AG Adabas (phasing out)
Development software	Texas Instruments Information Engineering Facility
Networks	British Telecom Tymnet with IBM Systems Network Architecture protocols; Fiber Ethernet supporting Macintoshes, IBM PC-based Token-Ring and Decnet; TAT-8 transatlantic fiber trial under way

When it comes networking solutions,

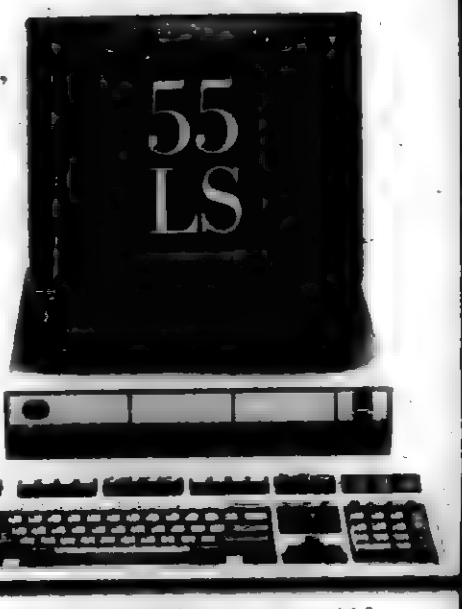
Recognizing the full potential of networking is one thing—actually realizing it is another. To truly fulfill that potential, every component of your network needs to turn in a great performance. That's why IBM offers a complete range of leading-edge LAN products in the desktop networking field—giving you the broadest range of solutions available to continually advance your system's possibilities.

Managers That Turn In A Great Performance.

At the heart of IBM networking are the members of the Personal System/2® family that act as high-performance LAN servers. The PS/2® Model 95 XP 486, IBM's sophisticated new 486™ computer, was especially designed to optimize network performance. The Model 95 features an Intel 33 MHz 486 processor or a 25 MHz 486 processor that's easily upgraded to 33 MHz, which quickens the pace of your LAN's operations. For your network's storage, not only are the Model 95's SCSI hard files lightning-quick, but the overall capacity is truly impressive—up to 1.6 gigabytes internally, and up to 8.96GB or more with IBM PS/2 External Enclosures. IBM also offers highly efficient, lower-cost server alternatives with the PS/2 Models 80 386 and 65 SX. All of IBM's PS/2 LAN servers feature the Micro Channel™ architecture, with its 32-bit data path and bus-mastering capabilities. The Micro Channel busmaster adapters allow you to expand your network's capabilities by adding multiple processors—like adding "computers" to your computer. It all amounts to highly reliable and powerful managers that inspire the same kind of performance from the rest of your network.

An Efficient Way To Bridle Your Data.

Whatever your needs may be, IBM has PS/2s that can serve as excellent client stations. And if you want to keep a tight rein on your network's information, IBM offers the PS/2 Model 55 LS, a medialess LAN station version of the best-selling Model 55 SX. A cost-efficient alternative to models with storage drives, the Model 55 LS provides a wide array of effective management controls, including enhanced data security, consistency in software levels, central software maintenance and central file backup. Not only is the Model 55 LS easy to hook up (it comes standard with a Token-Ring Network or Ethernet adapter), but should you need to modify your system, it's easy to upgrade with diskette and file storage devices.

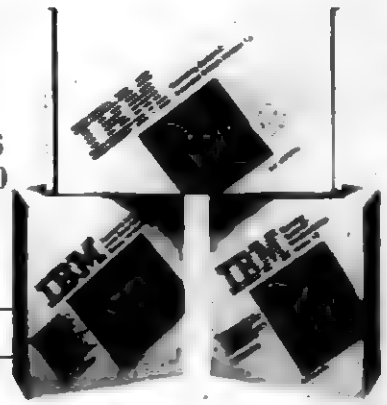


A New Breed Of Software.

Software that hits the ground running—that's our powerful new OS/2® V. 1.3, a high-performance, low-cost software package that supports both DOS and OS/2 clients on either a Token-Ring or Ethernet Network. Both the new OS/2 Extended Edition V. 1.3 and LAN Server V. 1.3 create an environment that delivers improved

to advanced IBM leads the way.

performance, less memory requirements, fewer DASD requirements and support for Adobe Type Manager™ fonts. And with support for 128 DOS requesters, LAN Server V. 1.3 can provide significant cost benefits for DOS network users. Compatibilities between IBM DOS LAN requester and the current version of Windows® 3.0 (LAN Manager 2.0 enhanced) have also been added, capping off the many ways IBM gives you greater flexibility in the LAN environment.



Printing That's The Best In The Field.

For a great finish to any project, IBM offers a full range of printers for client stations, as well as the speedy, large-capacity IBM LaserPrinter, an efficient printing station with immensely attractive LAN benefits. With a high-duty cycle and fewer parts for fewer breakdowns, it offers extremely reliable printing while still boasting a 10-ppm printing speed. The optional paper bins allow for more efficient collation, so there's no need to visit and rearrange the printing station prior to the particular job. You can also easily and inexpensively upgrade to Adobe PostScript® It all adds up to a range of complete, reliable printing solutions that can handle the kind of workload that any network, large or small, can generate.

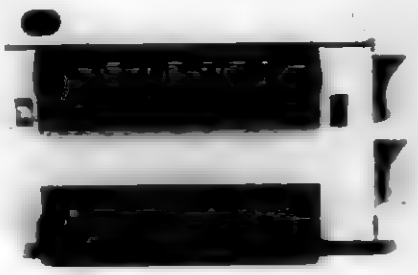
Step Up The Pace With Token-Ring Network.

To optimize the link between your LAN server and client stations, you need a hardware connection that gives you access to departmental and company data, as well as communication with your co-workers—in other words, you need access to a winner's circle: the IBM Token-Ring Network, the winner four years running of the *PC World Magazine* World Class Award. It's a reliable and flexible networking solution, one of the only connections with a data transfer rate of up to 16MB per second.

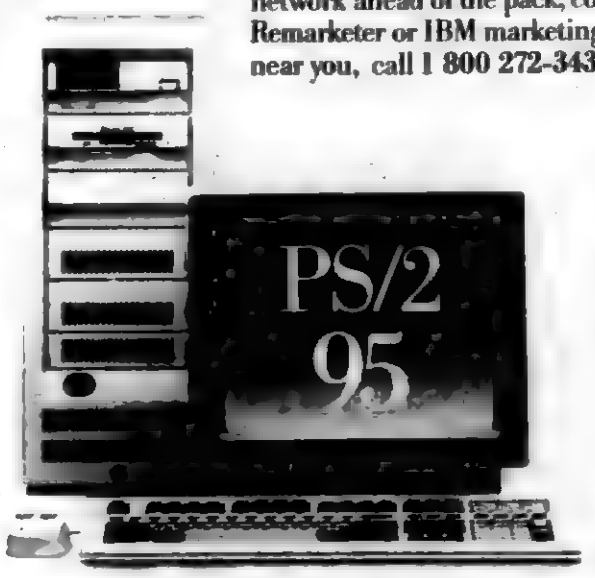
You can also diagnose, isolate and correct problems in one section of your LAN without affecting the rest of your network. A system you can build on, IBM Token-Ring Network provides a reliable connection that's as strong as your need to keep in constant touch with the people and information around you.

Communicate With Horses Of A Different Color.

Of course, IBM provides you with several ways not only to connect your PS/2 LAN to a multitude of mid-range and mainframe systems, but also to communicate with non-IBM systems as well. To conduct transactions such as hotel reservations, car rental and credit card authorization, an IBM communications adapter such as the IBM ARTIC Portmaster Adapter/A busmaster card, with the proper communciations software, can link your PS/2 with other companies' computers. With an Ethernet adapter, you can also connect to most Ethernet LANs. The integrated communications options of IBM OS/2 Extended Edition software can also allow your PS/2 to send mail, transfer files and access applications on other systems concurrently. So it's easy to benefit from the strengths of an IBM network while still having access to the rest of the computing world.



With the many components that constitute a Local Area Network, it's plain to see why a LAN is only as strong as its weakest link. That's why the IBM total LAN solution—LAN servers, workstations, networking software, printing stations and Token-Ring Network—is simply without peer: because there are no weak links. To find out how IBM can keep your network ahead of the pack, contact your IBM Authorized Remarketer or IBM marketing representative. For a remarketer near you, call 1 800 272-3438.



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Receiving the gift of technology

Firm's strategy targets PC compatibles, feature-rich LANs

BY JOANIE M. WEXLER

S. C. Johnson & Son, Inc. is undergoing a whole re-engineering of its business processes (see story page 1). Company officials say the effort will result in a waterfall of new technologies for the company's information systems staff.

For end users, the company, commonly known as Johnson Wax, standardized last month on Intel Corp. 80386-based personal computers from Dell Computer Corp. and the Microsoft Corp. Windows 3.0 interface. Tim Theriault, who heads up Johnson's end-user computing function, says that with the 150 new PC procurements the company plans to make next year, it will save $300,000 with the Dell platform.

CIO Burden: *SAA, Unix the compelling architectures*

"We can get three Dells for the price of two IBMs, so we're doing more with the same amount of money," he explains.

Unix, SAA in the lead

The firm is currently evaluating running Unix as a desktop operating system. "In the coming years, IBM's Systems Application Architecture and Unix will be the two compelling architectures we will concern ourselves with," adds Laurance Burden, Johnson's chief information officer.

The company also intends to turbocharge its local-area networking strategy by replacing limited-capability IBM Person Computer networks with a more feature-rich LAN platform, according to Theriault.

He notes that Johnson is pilot testing Novell, Inc.'s Netware and Microsoft's OS/2 LAN Manager. However, he says, the company would be open — if it were possible — to running Novell applications over a Banyan Systems, Inc. Virtual Networking Software backbone.

Johnson would like to capitalize on a combination of Banyan's Streettalk global naming service and the myriad business applications available for Novell LANs.

The new LAN strategy is meant to replace Token-Ring IBM PC networks in the administrative area, because the existing networks "have no security, and the speed and network level are inferior," Theriault says. He also notes that each IBM PC network server can accommodate only 10 users.

"In the 1990s," Theriault explains, "the network will be the most critical component for facilitating future applications."

For example, he says, running IBM's Professional Office System (Profs) on an IBM 3090 mainframe "is expensive and not as efficient; there are issues with response time and transparent access."

Theriault adds, however, that "we have to be sensitive to the impact LANs will have on Profs — it's the most important application we have."

Another new technology lurking in the Johnson corridors is the 100M bit/sec. Fiber Distributed Data Interface (FDDI) LAN. FDDI will eventually replace the existing 16M bit/sec. fiber Ethernet backbone connecting Johnson departments in two major buildings at the Racine, Wis., headquarters.

Johnson also says FDDI is on the drawing board for its overseas operations. •

A household name

Following is a summary of Johnson Wax's leading products:

U.S. Consumer Products Division
- Home care: Future, Brite and Klear floor waxes, Pledge and Favor furniture polishes, Glory home cleaner, Shout, Glade room deodorizer.
- Insect control: Raid and Off insect repellents.
- Personal care: Agree and Halsa shampoos and conditioners, Soft Sense skin lotion, Aveeno bath products, Edge shaving gel, Fisher-Price bath products for children.

Worldwide Innochem Division
Commercial and industrial cleaners, floor finishes, disinfectants, soaps and insect and odor control products, specialty chemicals for graphic arts, industrial coatings and adhesives industries

Worldwide Service Businesses Division
Commercial and industrial cleaning, disinfecting and pest-control services

Principal U.S. subsidiaries: Johnson Venture Capital, Inc.; Micro-Gen Equipment Corp. (pest control equipment); Prism (restaurant and hotel sanitation services)

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You can use it with your IBM PC, XT, AT, PS/2 Model 25 or 30 and compatibles, as well as EISA computers. And it's ready to run on NetWare, LAN Manager and 3Com® 3+Open™.

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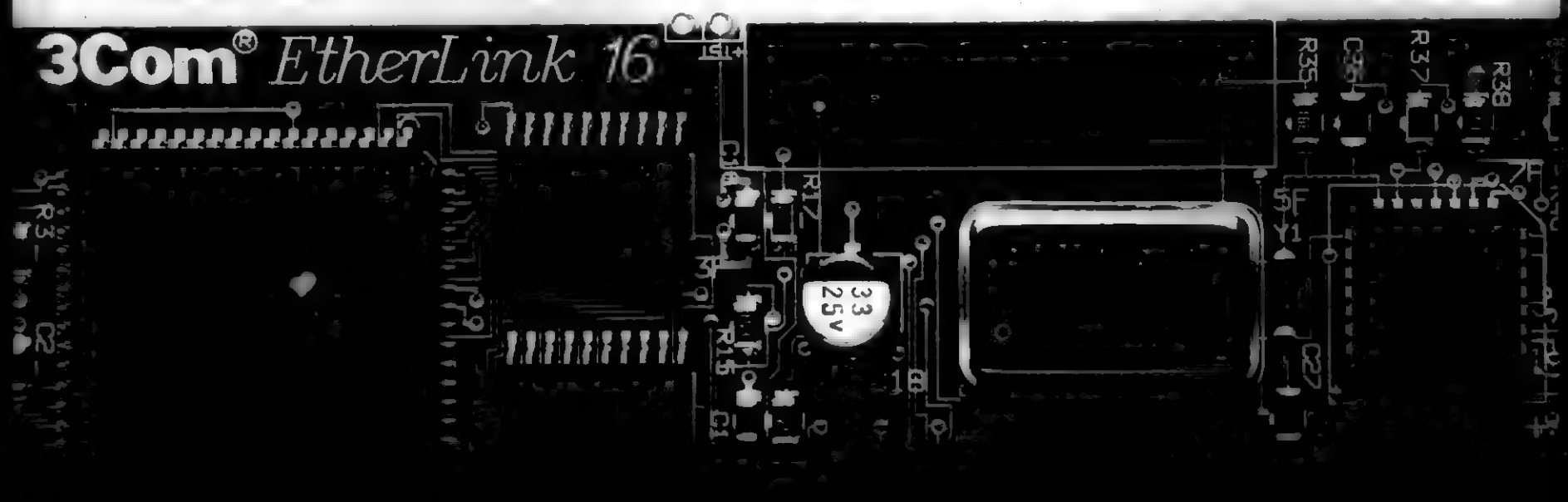

Johnson business units to get financial control

BY KIM S. NASH

The new year is expected to ring in a new financial system at Johnson Wax, and it comes not a moment too soon.

Although executives at the $2.5 billion, 104-year-old privately held firm appear unafraid of the recession talk that now ricochets around Wall Street, it will redesign its accounting system in 1991 to better service its diverse customer markets. By the summer of 1992, Johnson's Consumer Products, Worldwide Innochem and Worldwide Service divisions will no longer share one financial setup.

"It isn't that the current system is terrible, but it's not strategic now that our headquarters has become a virtual holding company for all of our other businesses," explains Mark Eckhardt, information systems director of financial services.

The goal of the Financial Systems Architecture Project (FSAP) is to give each unit control of its own accounting with complete financial environments at the business unit level. Now, each of the three units uploads monthly sales figures, operations expenses and other data to a single Software AG of North America, Inc. Adabas database running on an IBM 3090 mainframe in Johnson's Racine, Wis., data center.

While numbers are crunching, managers in the business units have no on-line access to their own data, Eckhardt says.

After 18 months of meetings with users, planning sessions with Chief Financial Officer Larry Switzer and Chief Information Officer Laurance Burden, Eckhardt says he expects to push FSAP ahead in 1991. FSAP will give each business a separate VSAM-based database that can run on either of Johnson's two 3090s, with user access via personal computers already in place.

We're keeping up, but . . .

Eckhardt denies that Johnson's financial department lags behind others in implementing a decentralized modus operandi, but he points to several areas that could be more strategically configured.

For example, some of the company's statistical analysis activities are just partially automated. When a manager at one of the 47 subsidiaries under the Consumer Products umbrella downloads data from Adabas, he often must manually enter those statistics into his spreadsheet.

Also, Johnson tracks plenty of telling business statistics, such as product-by-product sales comparisons and reports on regional research and development efforts. However, this data is not getting to the right people at the right time.

When FSAP is complete, Eckhardt says, "our managers will be looking at more information that is more accurate, on a timely basis."

Software is the real missing piece in the revamp. FSAP mandates only off-the-shelf packages because they are virtually bug-free and probably cheaper than those developed in-house, Eckhardt says.

After reviewing 30 financial packages, he whittled his list down to three vendors: Dun & Bradstreet Software, American Software, Inc. and Global Information Systems Technology, Inc. A final decision is due in early 1991. Johnson will customize the packages very little because, Eckhardt says, "we would rather change the way we do business than drastically modify any technology we may buy."

In some cases, new policy will improve work flow more than new software might, he notes. Specifically, Eckhardt wants to exploit Johnson's existing international Ethernet network by piggybacking financial data, such as treasury and loan information, atop regular monthly accounting numbers sent from international offices.

The subsidiaries currently send this data to headquarters on paper — data that Racine personnel must cross-check manually, a tedious, time-consuming job, he explains. Transmitting this information electronically would eliminate many errors and allow each unit to officially close its monthly books sooner.

Johnson's Eckhardt *says current financial system is no longer strategic*

Because final executive committee approval for FSAP deployment is not due until the end of this month or early next, the company will not project what bottom-line benefit or productivity gains it expects from FSAP. Eckhardt says, however, that the project's goal of simpler, more flexible finances that would allow more managers more access to data can only promote better decision-making. ●

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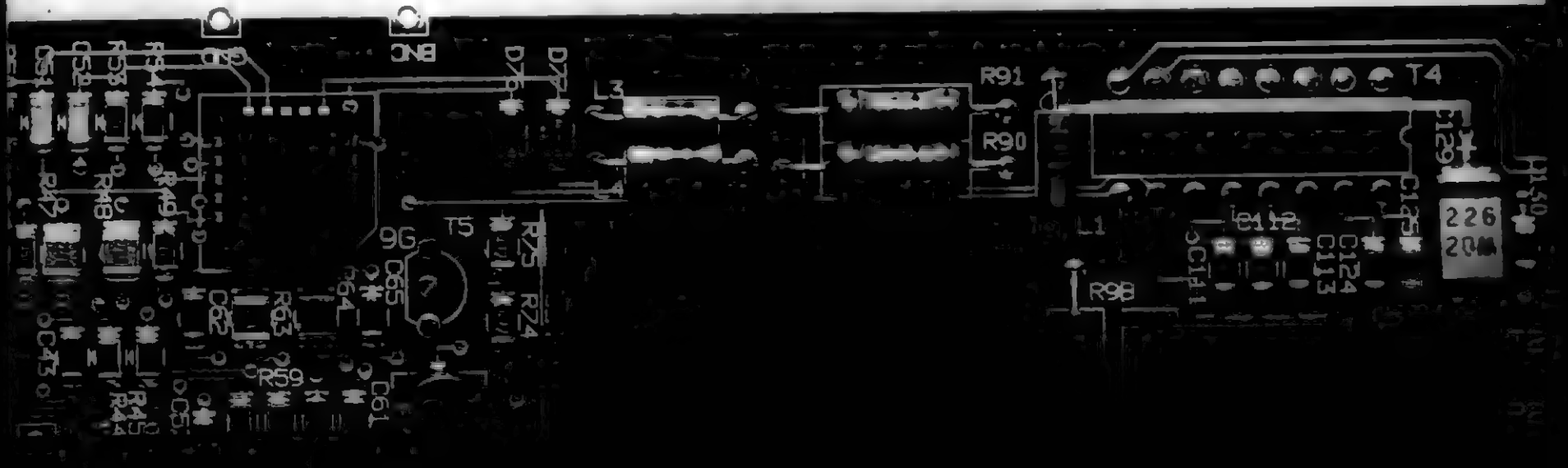

Database kills paperwork dead

Regi electronically tracks firm's product regulatory progress

BY KIM S. NASH

What do Africa's tsetse fly, Australia's bush fly and the American house fly all have in common? Besides being pesty at the family barbeque, those bugs are all vulnerable to a spray product: Raid.

Insect control products are Johnson Wax's most profitable business, but the product line itself is vulnerable. Because marketability of insecticides is strapped to environmental restrictions, "green" movements can be cause for concern at Johnson.

It is no coincidence that Johnson went live last month with a new $50,000 object-oriented database that tracks products as they weave through the environmental registration procedure. The Regi database (short for registration) will cut the work load of Johnson's regulatory affairs department by as much as 50%, says Annette Oleson-Wiles, information systems manager of knowledge engineering.

"Our registrations people are dying under paper," Oleson-Wiles says. Much of that paper is a by-product of the registration process that the U.S. Environmental Protection Agency (EPA) mandates for every new consumer product. State and local laws increase the paper deluge because they are often stricter and more complex than EPA rules.

Built on an expert system shell from Aion Corp., Regi automates the legal checks involved in manufacturing and selling chemical products. Regi tracks Johnson's goods through Byzantine state and federal registration processes, while allowing different departments to retrieve custom information.

The marketing department, for example, can ask for information about which states have approved a product and which have not. The state regulations group, meanwhile, can use Regi to prepare applications based on preprogrammed or customized criteria.

Before Regi, Johnson stored EPA and state data in different repositories on different computers. People could not easily find out where a product was in the cycle at any given time, Oleson-Wiles says. Now, all such data is housed at one easily accessible location.

Although Regi currently runs on IBM's SQL/DS from an IBM 3090 mainframe, Oleson-Wiles anticipates migrating the system to DB2 on Johnson's MVS mainframe within six months.

The EPA and local agencies can deny a new product for any of several clerical reasons, including a discrepancy in wording between the final and initial applications, Oleson-Wiles explains. The EPA requires that product labels, for example, convey the same idea that was originally registered. There is a subtle but important difference, she says, between claiming that a product "kills bugs faster" and saying that it "kills bugs twice as fast."

Johnson's Oleson-Wiles: ***"Our registrations people are dying under paper"***

By cross-checking such data, Regi can warn appropriate departments of any problems early in the process. Previously, if a mistake escaped the eyes of Johnson's registration personnel, it was not discovered until the product application came back rejected.

No competition

A registration delay "can put us out of the competitive picture," says Roger Grothaus, who supervises state and EPA product registration as Johnson's vice president of scientific support and government affairs.

Regi will eliminate clerical errors and increase Johnson's first-try registration acceptance rate to between 90% and 100% within a year, Grothaus predicts. "That means we get our products on store shelves that much faster," he says,

Johnson's business units abroad have already requested copies of Regi, says Ted Derse, director of corporate business systems, who oversees Oleson-Wiles' knowledge engineering group. Because of the database's generic framework, going on-line in foreign locales will take just 10% of Regi's original five-month development time, Oleson-Wiles estimates.

"The guts of the system are transparent. Local offices would only have to plug in local regulations," she says. However, she doesn't expect international rollout until 1992, "when it has been put to the test of all-out daily use." ●

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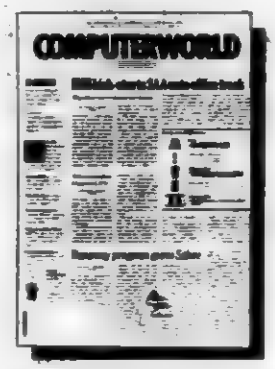

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NATIONAL
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Second quarter, second place

Shareholders resoundingly approved the $6.2 billion deal last week that will merge **Contel Corp.** and **GTE Corp.** into the second largest U.S.-based mobile/cellular telecommunications company, trailing only **McCaw Cellular Communications, Inc.** The firms anticipate a second-quarter 1991 closing.

Spreading the wealth

IBM has targeted nine U.S. communities where its employees are concentrated as recipients of a $3.5 million fund that will go to finance 21 child-care and elder-care centers, the company announced last week. The investment will be drawn from the $25 million IBM Dependent Care Initiatives Program announced last year.

In new hands

International telecommunications holding company **Bellsouth Corp.** is out of the leasing business — at least in the U.S. The Atlanta firm's U.S.-based equipment leasing portfolio, formerly held by its **Dataserv** subsidiary, is now in two new sets of hands: The data processing and check-sorting equipment leasing business was sold to **Meridian Leasing Corp.**, while **Sanwa Business Credit Corp.** bought the point-of-sale equipment leasing business.

Declaring independence

On-line transaction processing systems vendor **Stratus Computer, Inc.** planted a not-for-sale sign in its Marlboro, Mass. front yard earlier this month. The firm said its new shareholder rights plan, aimed at staving off hostile takeovers, was not adopted in response to any known acquisition attempt. The plan's adoption puts Stratus in yet another growth business: Some 1,300 U.S.-based firms, including many in the computer industry, have now enacted so-called "poison pill" provisions.

Shrinking deficit

At least, so says the **American Electronics Association** (AEA). Based on trade results through the third quarter of 1990, the AEA projected that the U.S. electronics trade deficit with the rest of the world will shrink 80%, from 1989's $9.6 billion figure to $1.9 billion at the end of the current year.

Picturetel prospers in tough times

BY NELL MARGOLIS
CW STAFF

PEABODY, Mass. — After six years of hard work and crossed fingers, Picturetel Corp., one of the nation's two publicly held firms devoted solely to producing videoconferencing equipment, is an overnight sensation.

A combination of technological foresight and managerial insight, according to analysts, has landed the 1964 brainchild of two MIT students — a firm that was forced to go public to raise its start-up fund when venture capitalists wrote it off as too risky — squarely in the right place at the right time:

- Technological advances have enabled the firm to offer conference-quality video at affordable prices (see story below).
- Long-distance telephone carriers have plugged into the teleconferencing services market through alliances with equipment providers — AT&T's marketing partnership with Picturetel, for example — blessing and driving the videoconferencing systems market in the process.
- Industry standards continue to increase domestic and international connectivity, allowing for expanded service at economy of scale-enabled price breaks.
- The current recession and the threat of an imminent oil crisis are adding urgency to the already felt need for an alternative to business travel.
- Picturetel and San Jose, Calif.-based Compression Labs, Inc. are the only major independent contenders in a market that analysts see as sustaining annual growth in the 35% ballpark for at least the next few years, to an estimated $600 million by 1995.

Three years ago, said John Mulcahy, vice president of information systems at Dun & Bradstreet Software, McCormack & Dodge, the Natick, Mass.-based firm he then served, looked at Picturetel "and found the systems too slow and too expensive." M&D gave it a pass. One year later, Picturetel broke through the price and quality barrier.

Last spring, in the wake of M&D's merger with Atlanta-based Management Science America, Inc., the firm — faced with dual headquarters, executives commuting between Georgia and Massachusetts and a critical need to make instant colleagues out of potentially warring work forces — signed on for two full videoconferencing systems, each supporting external document cameras.

"This doesn't just let us conduct our business more efficiently or economically," Mulcahy said. "It also lets us accomplish things that would simply be impossible otherwise."

"This is a real watershed time for Picturetel" said Chief Executive Officer Norman E. Gaut, a veteran computer industry entrepreneur who founded, grew and sold his own firm before taking over the helm at Picturetel in the fall of 1985.

Gaut said industry history has taught him that when a firm has one foot firmly on the skyrocket trail, the other is likely to be on a banana peel. With one factor after another breaking his company's way, Gaut is treading very carefully on both technological and corporate grounds.

Continued on page 77

Up and Coming: *Picturetel Corp.*

"Our biggest danger would be losing our focus. What we've got to do is use lots of third-party alliances, focus on the core technology and drive, drive, drive."

- **Location:** Peabody, Mass.
- **Incorporated:** 1984
- **President:** Norman E. Gaut
- **Employees:** approx. 185
- **Product line:** software-upgradable videoconferencing systems

HVQ method lets Picturetel realize a dream

Six years ago, MIT students Brian Hinman and Jeff Bernstein took a look down the decade and saw folks communicating face to face over the phone. Their vision was simple, elegant and even technologically feasible. It just wasn't time yet. High-quality, lifelike video images could be transmitted only at prohibitive prices via satellite; affordable transmission meant degraded reception.

Like novelist Ray Kinsella's baseball fan, Hinman and Bernstein got the message: "If you build it, they will come." The two carved out their own field of dreams: Picturetel. And "they" came: the technology, the financiers, the customers and, as of early autumn, the profits. What they came for was a videoconferencing system that works over dial-up digital or private networks for basically telephone call prices.

Picturetel attacked the resolution/expense conundrum by developing an image compression technique called Hierarchical Vector Quantization (HVQ). Video compression is the ability to reduce the amount of information needed to store or transmit a video image. This addresses the dollar side of the equation, since reduced transmission requirements mean lower costs. HVQ tackles the resolution issue as well: By coding images according to resolution level, it renders compression-driven distortions less visible. Picturetel's 1988 introduction of the C-3000 Video Codec (short for coder-decoder) — which compresses signals, decodes them and lets them be carried by ordinary telephone lines — "catapulted the company from obscurity to contender status," said Tucker, Anthony analyst Herb Maher.

The firm commands some 75% of the low-bandwidth videoconferencing market, analysts said. Customers can buy full systems, all operative on a phone line, starting at $34,000; alternatively, it will also sell you a codec and let you tailor your own system.

NELL MARGOLIS

Report hits Navy on use of IBM gear

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — A report detailing the results of a two-year congressional investigation blasted the U.S. Navy for its computer procurement practices but found IBM generally blameless in a tangled web of charges of fraud, abuse and anti-competitive bias.

"Through a combination of agency malfeasance and the dominance of [IBM], the fair and open system contemplated by Congress has been torpedoed in Navy [automatic data processing] procurement," the report said.

The House Government Operations Committee said the Navy has shown a systematic and illegal bias in favor of IBM in its procurement of mainframe computers. It also said the Navy has acted unethically and illegally in accepting gratuities and free training from IBM, some of whose employees coached Navy personnel in writing procurement specifications when those personnel were seeking bids for IBM or compatible equipment.

"The Navy cooperated fully with the committee during the course of the hearings and will implement any actions deemed appropriate to ensure that all ADP procurement is conducted fairly and in accordance with all laws and regulations," a Navy spokesman said.

"IBM appears, for the most part, not to be responsible for the bizarre Navy ADP acquisition system but merely its willing beneficiary," the House committee concluded.

A spokesman for IBM said the inquiry had turned up no evidence that the firm had acted unlawfully or unethically. "We consider the matter closed," he said.

The report had little to say that had not already been made public, but it did make several new recommendations. Among them was that the U.S. General Services Administration, which oversees federal computer buys, should undertake an immediate review of the training offered to the government by computer firms and contractors to determine whether it is suitable for attendance by federal employees.

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Patent rights getting much tougher to protect

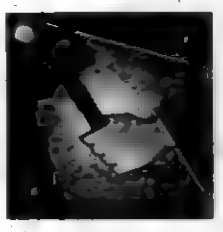
BY MAURA J. HARRINGTON
CW STAFF

SAN JOSE, Calif. — Patent rights have become increasingly difficult to protect in the computer industry, with more complex issues ahead in the 1990s, said Semiconductor Industry Association Director of International Trade and Government Affairs Daryl Hatano at the American Bar Association's recent annual fall meeting.

Although semiconductor companies can spend millions in litigation fees to protect their intellectual property rights, the investment makes for firms that are less inhibited when it comes to inventing new products — which means better products for end users, Hatano said.

Speaking specifically about the semiconductor industry, Hatano said that although increasing competition from Japan — and, soon, from Europe — has made it more difficult for U.S.-based companies to protect their patents, more firms than ever are turning to patents, copyrights and other means of protecting their intellectual property.

The semiconductor industry's annual revenue is currently around $50 billion and is expected to grow to $75 billion by 1993, Hatano said. Semiconductor companies account for almost 20% of the electronics industry, which today is a larger manufacturing employer in the U.S. than the auto, steel and aerospace industries combined, he said.



Thus, Hatano added, with about 10% of its annual revenue spent in research and development in this tighter, more competitive and more global market, the semiconductor industry has a compelling need to protect its intellectual property. In addition, Hatano said, semiconductor firms today face some of the following issues:

- Control of patents and copyrights — which are more common modes of protection for software — after products are shipped outside the U.S. This is a big problem in Thailand and South Korea, where there are no specific laws in place to protect intellectual property, according to Lee Green, an attorney at the Washington, D.C.-based law firm Baker & McKenzie.
- Niche-specific questions, such as whether software applications that help a semiconductor manufacturer maximize space on a computer chip nullify that manufacturer's patent. The question has been posed, Hatano said, because if the computer is doing all of the work mapping out the design of the chip, the likelihood that it will pick the same design for more than one computer-aided design user is very high, thus posing patent protection rights questions.
- Reverse engineering. Part of the reverse engineering technique involves photolithographic technology, which is the method of peeling off the chip layer by layer and photographing it to see how it was put together. While the method is legal, the right to reuse the knowledge gained from this technology is questioned.

Should this method be used in research and development? The issue is still unresolved, Hatano said.

Ask watchers still in dark

BOSTON — A corporate road show billed as the event at which Ask Computer Systems, Inc. would answer the burning question of exactly how it plans to play newly acquired Ingres Corp. left analysts largely underwhelmed earlier this month.

Ask founder and Chief Executive Officer Sandra Kurtzig and Ingres Products Division Vice President Marilyn Bohl, a former IBM developer credited with the development of DB2 and the only Ingres executive to remain at Ask after the acquisition, were generous with overarching goals but came up short on implementation strategy details.

Armed with Ingres, Kurtzig said, $4-million Ask will move beyond its role as a business and manufacturing applications provider to become a leader in software development targeted at client/server computing. To achieve its goal, she said, the merged company will leverage two strengths: a talent for partnership and the ability to derive more than half of the bottom line from international operations.

"We don't know anything now that we didn't know before, and some of the omissions are disconcerting," said Charlotte Walker, an analyst at Labe, Simpson & Co. Still among the missing, Walker noted, are specifics regarding Ask's plans for reconciling Ingres' and Ask's disparate accounting methods; the role that $60-million equity investors Electronic Data Systems Corp. and Hewlett-Packard Co. will play in Ask's assault on the client/server market; and how Ask intends to overcome the marketing deficit that dogged Ingres as a database and tool vendor and that, in Kurtzig's words, "had sushi and marketed it as raw fish.

NELL MARGOLIS

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Picturetel

CONTINUED FROM PAGE 73

"The biggest thing we have to avoid right now is losing focus," he said. "What we've got to do is use lots of third parties, focus on the core technology, and drive, drive, drive." Gaut is also resolved to resist the temptation to ride the technology and let the corporate side slide.

"As soon as a company grows beyond what I call the shouting limit — that 50-60 people size where when you shout, everyone can still hear you — corporate processes have to come into the picture," Gaut said. Corporate infrastructure becomes more critical, he added, when a firm reaches "that second plateau: the one around the $15 million to $20 million mark where technology is no longer dominant, and you realize . . . you've actually got to *sell* that son of a gun."

Gaut places Picturetel at the third plateau: "the stage at which so many companies stall out because they're the captives of their founders."

These traps will not snag Picturetel if Gaut can help it. When the company moved to the second plateau, Gaut replaced its chief financial officer, "who was very talented but inexperienced," with current CFO Joan Nevins, who came onboard armed with big-company experience. A similar switch brought in a new head of sales and marketing, Rob Mitro.

Gaut sees two signs that he made the right moves: the success with which both new appointees are meeting and the fact that both of their predecessors remained with the firm. "Nine times out of 10," he noted, "people will walk when someone is brought in over them." A third endorsement is coming from analysts, several of whom said that Picturetel's management depth bodes as well for the firm's future as does its flashy and timely technology.

"So many companies stumble at that $100 million mark," said Herbert R. Maher, an analyst at Tucker, Anthony in Boston. "Picturetel is only at $36 million, and Norm Gaut's already thinking about how to avoid the pitfalls; that strikes me as very encouraging."

Analysts also find it encouraging that the Picturetel management team is keenly aware that no free or easy ride lies ahead. Last quarter, the firm lowered one red flag when it posted its first profit on quarterly revenue, up 116% year to year. However, increasing attention focused on the videoconferencing market is bound to mean escalated competition — particularly from Japan. A slowdown in the development of its next generation of product or the inability to market them at an attractive price could prove anything from damaging to devastating.

Today, the firm that could not scare up a venture investor is 65% owned by a group of them that includes Kleiner, Perkins and Accel Partners, an ownership structure that provides not only funding, but also a hedge against uninvited acquisition. Japanese partner Kyocera also has a 6% stake in the firm.

INTERNATIONAL BRIEFS

Venture capital city

According to a recent report out of Taipei, the **Taiwan government** plans to boost its fledgling venture capital market with an infusion of at least $59 million during the next several months. The state-run **Bank of Communications** plans to use the venture capital fund as seed money to help start a handful of new venture capital funds, many of which will be targeted at the country's information industry.

European software sales rising

North American software firms' third-quarter 1990 European sales jumped to $229 million, 63% over 1989 figures for the comparable period, the **Software Publishers Association** (SPA) announced earlier this month. This compares with a second-quarter 48% growth rate, which varied from country to country, according to the SPA report. The German software industry is not faring very well internationally, according to a recent study by Paris-based corporate consultants **Pierre Audoin Conseil**. A preference for remaining small and independent at a time when their counterparts in other countries are focusing on mergers and acquisitions made German suppliers a no-show in Audoin's listing of the top 30 internationally strongest software firms, Audoin said. The study showed that U.S. suppliers are dominating the worldwide software and services sector. Led by **Electronic Data Systems Corp.**, with $2.48 billion in worldwide revenue, U.S. firms held the top six spots. France's **Cap Gemini Sogeti** ranked seventh; Germany's largest vendor, **Datev**, entered the ranks at a distant No. 36.

Slow boat to Hong Kong

IBM workstation users in Hong Kong are complaining about a string of late deliveries of the **RISC System/6000** since its release last February. "It's an open secret that IBM cannot meet the demand for the RS/6000 in Asia," one Hong Kong source said. In an official statement to *Computerworld Hong Kong*, IBM acknowledged "some shipment delays, due to a shortage of certain elements of the system" but noted that the situation is now "very much back to normal, and that the delays had no impact on sales."

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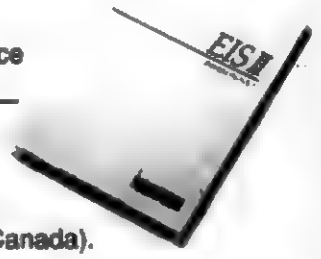

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*David W. DeLong, co-author of "Executive Support Systems: The Emergence of Top Management Computer Use."

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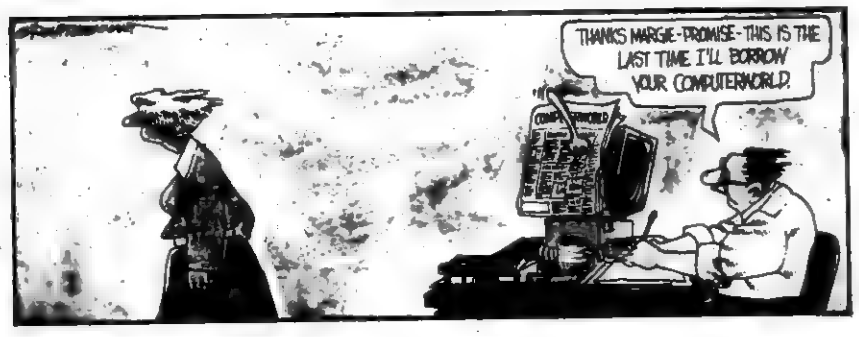

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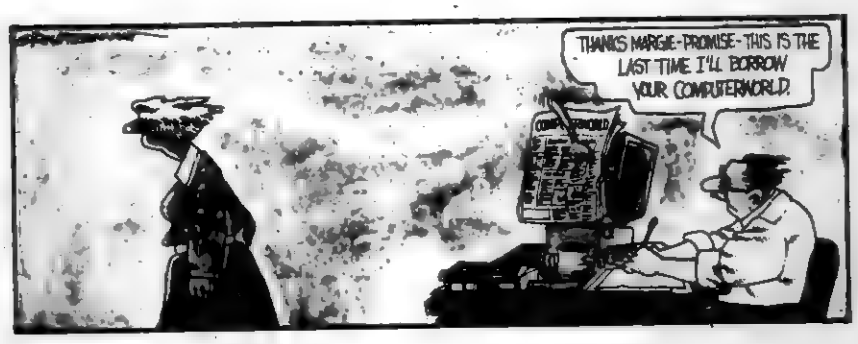

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Think twice before taking that 'perfect' job

Keep your career on track by changing positions only after careful thought and strategic planning

BY JANET RUHL
SPECIAL TO CW

What does it take to destroy a promising information systems career? Not much, say recruiters who specialize in placing IS personnel. As your career matures, a bad job decision can reduce your long-term employability and diminish the value of the experience you have built up over the years.

The most common blunder IS professionals make is to look at the short term rather than the long term. Short-term thinkers tend to focus on the money, the immediate technology or something else rather than stepping back and looking at the future.

Tempted by high salaries, experienced professionals may take jobs that represent career dead ends, says Mark Jacobs, a senior consultant at Data Pros in East Hartford, Conn.

For example, a DB2 specialist whom Jacobs worked with a few years ago turned down an offer for a database administrator job in favor of a consulting position because the latter paid $2,000 more per year. After two years as a consultant, she decided to return to the DB2 job market.

However, because the consulting position did not involve any work in DB2, Jacobs' client found that her skills were severely out of date. Had she taken the lower paying DB2 position and built on her previous skills, she would have qualified for jobs paying $10,000 more than her current salary, he says.

IS professionals also shortchange themselves by choosing positions that take them away from technology. Recruiters advise IS professionals to avoid jobs in user liaison and quality control particularly unless they are interested in a career change.

Even an alluring management position can end up being a dead end as far as an IS career is concerned if the new manager isn't involved in the technology issues, says Bob Hildreth, president of Electronic Systems Personnel, Inc. in Minneapolis.

On the other hand, Hildreth warns, focusing too heavily on the technical end can backfire if the person gets "pigeonholed in a language or tool that gets outdated."

Another career trap IS veterans fall into is what David Kirk, a recruiter at Dunhill Professional Search of Charlotte, Inc. in North Carolina, calls unrealistic expectations. IS people fail to understand that real career advancement becomes increasingly harder as they move up the ladder and away from entry-level positions, he says.

Yet many professionals erroneously assume that the rapid promotions and large salary increases of their early years will continue indefinitely.

Many professionals whose salaries are already in the $40,000 range unrealistically hope to move to the Southeast, for example, and receive hefty raises, ignoring the reality that most IS salaries in this region tend to be in the low thirties, Kirk says.

Keep your eyes open

Playing the job hunting game too safely and failing to recognize opportunities as they present themselves is another common stumbling block in the path of IS professionals.

Many people turn away from rare opportunities because they perceive them as risks, Jacobs says. He also finds that too often, people are looking to make a career move in companies that already have all of the technology "toys" and are unwilling to consider positions with smaller companies.

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> BOB HILDRETH
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But the most disastrous mistakes IS professionals make today are in the actual interviews for new positions, recruiters say.

Unfortunately, many IS job candidates have experienced a sellers' market earlier in their careers, and they do not realize that they have to sell themselves in today's tougher business climate, Jacobs explains. During the 1970s and the early- to mid-80s, when IS opportunities were plentiful, IS people relied exclusively on their technical abilities to clinch a job, Hildreth says.

Today, however, if a job candidate is asked a question such as, "Do you have DB2 experience?" the candidate must use this opportunity to describe in detail the kind of work he has done with that technology, Jacobs says.

To prepare for this "new" kind of interviewing, Hildreth suggests that IS professionals review the relevant technology, learn what the company does and practice role playing.

Another interview mistake IS professionals make is to grill the interviewer on the salary and benefits of the position. This aggressiveness gives the interviewer the overall impression that applicants are interested only in what the company can do for them, not what they can do for the company.

Other candidates destroy their chances for getting a job by spending the interview dwelling on the things they disliked about previous jobs, communicating a negative attitude to the interviewer.

In today's ultracompetitive world, IS professionals have a lot to protect on their path to the top: They have to keep a clear eye on their goals, watch for unrealistic expectations and guard against complacency.

But most of all, job seekers should beware of the glitter: It's not always gold.

---

*Ruhl is a consultant and programmer in Connecticut and author of **The Programmer's Survival Guide: Career Strategies for Computer Professionals.***

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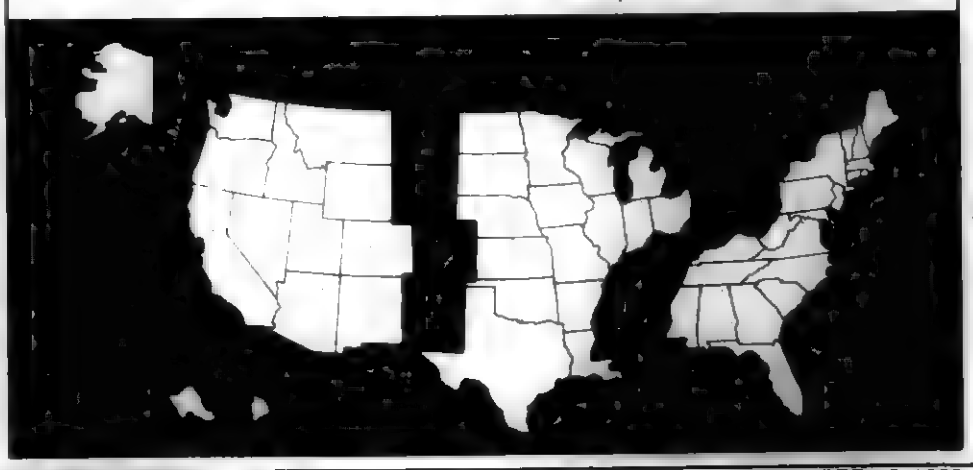

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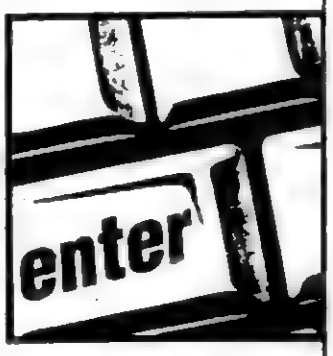

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MARKETPLACE

Patent laws protect creative development

Editor's note: Legal eye is a monthly column exploring legal issues and their impact on information systems.

BY RAYMOND T. NIMMER
SPECIAL TO CW

Copyright laws directing the software development industry for the past decade are taking a bow to a more powerful maestro: patent laws. And IS managers who oversee all new product development cannot afford to turn a deaf ear to the changes because the stakes are too high.

First, an IS manager should understand the differences between copyright and patent laws. Copyright prevents anyone from copying someone else's creative work, but patent law goes further. Patents make both copying and independent development equally prohibited.

For example, if one of your developers designs a software tool that optimizes how data is moved around in a particular environment, and your company patents that approach, another developer cannot use the same process without your company's permission — even if the second developer never saw the original invention.

Unlike copyright laws, patent laws protect the technology, not the code. They cover how the software directs the computer to perform. As a result, even if the computer uses entirely different code, a program that handles data in essentially the same way that a patented program handles data infringes on the patent. Merely refurbishing or fine-tuning the code or design may not bring the new program out from within the scope of the valid patent.

To obtain a patent, a company must file a claim for a specific invention. However, even if an invention requires substantial work and has great commercial value, no patent will be issued unless the invention reflects sufficient originality. That is, the invention should not be one that is obvious to another person skilled in the same technology.

During the patent application stage, a company or developer must describe how best to perform the invented procedure. Then, if a patent is issued, this description is made public in the patent files for anyone to reference.

Patent disclosure is a major benefit to individual companies and the software development industry. Disclosure laws give the inventing company a reason to reveal technology that it might otherwise conceal from others.

On the flip side, however, patent holders gain rights to exclude all others from using the technology they develop. The economic incentives created by the law can be strong and focused on innovation of a high order.

A major problem with the rise of software patents is that the patent examiners lack a comprehensive base of prior software innovations against which to compare a new claim. How can examiners determine whether a patent claim is obvious if they don't have a strong base of software invention patents to draw from? Unfortunately, software has not been developed against a background of patent protections, and many of the most innovative software systems have been designed, implemented and modified without any organized record.

This problem may soon be alleviated by the current overall shift to stronger software patent laws. At some point in the future, these rules are going to dictate or structure how software development occurs. This will be a fundamental change in the way software is created. Rather than an open field, it will become much more structured.

Specific differences between what we have now and a stronger patent rights system include the following:

- Companies will have to support the costs of the patent application system, requiring legal services to pursue the application and financing to bring it to a conclusion. The costs vary but are always an added factor requiring a greater investment than for copyright. Also, obtaining a patent takes a long time during which it will not be clear whether the application will succeed.
- Patent rules protect technology and methods. This protection runs counter to the status quo, in which new developments historically come from additive development and adaptation, rather than from breakthrough "grand insights."
- Patent rights do not permit an independent development defense. Once granted, the patent holder owns rights to preclude anyone from using the patented process. This may reduce independent, diversified development of software. It represents a change that contradicts what many believe to be the strength of the industry: its diversity and its flexibility.
- Patent protections encourage companies with the resources to collect numerous patents and enter cross-licensing agreements with other patent holders. Measured against existing industry practice, this creates another change. It moves away from laws that favor small companies and entrepreneurs to ones that favor resource-strong companies.

UNLIKE copyright laws, patent laws protect the technology, not the code.

Patent laws are taking hold of the industry and are here to stay — for a while, at least. IS managers who know the laws and their ramifications will be that much more ahead of the game. Unfortunately, in the case of patent law, ignorance is not bliss.

Nimmer is author of *The Law of Computer Technology* and is a Leonard Childs Professor of Law at the University of Houston.

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The BoCoEx index on used computers
Closing prices report for the week ending December 7, 1990

	Closing price	Recent high	Recent low
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XT Model 089	$550	$625	$400
AT Model 099	$650	$975	$500
AT Model 239	$875	$1,025	$750
AT Model 339	$925	$1,100	$900
PS/2 Model 30-286	$1,100	$1,300	$1,025
PS/2 Model 60	$1,500	$1,800	$1,400
PS/2 Model 70P	$3,425	$3,450	$3,175
Compaq Portable II	$900	$1,050	$875
Portable 286	$1,100	$1,450	$1,000
SLT 286	$2,500	$2,625	$2,000
Portable 386	$2,600	$2,800	$2,500
LTE 286	$2,000	$2,100	$1,850
Deskpro 286	$1,000	$1,200	$975
Deskpro 286/20	$2,900	$3,100	$2,400
Apple Macintosh Plus	$750	$975	$700
SE	$1,150	$1,450	$1,100
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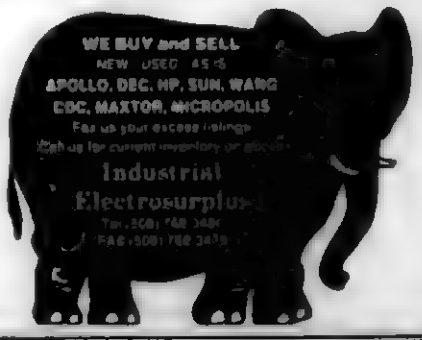

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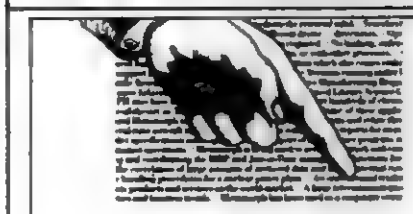

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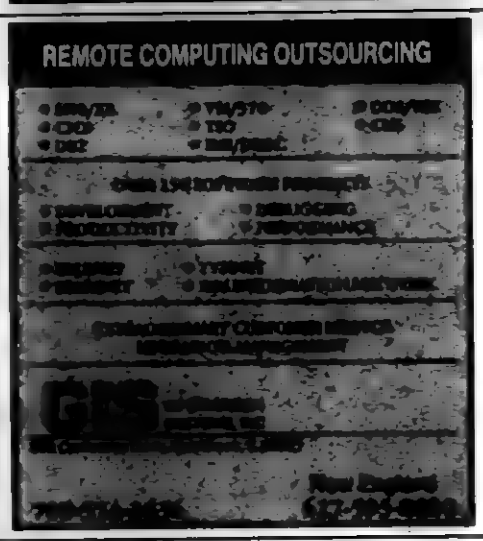

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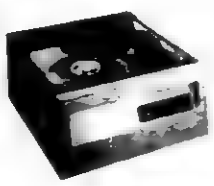

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The great videotape debate

Used properly, video cameras can save firms time, effort — and money

BY JESSICA KEYES
SPECIAL TO CW

Francis Ford Coppola or Steven Spielberg they will never be. But information systems training instructors can dazzle dull technical training classes by adding one of the 20th century's oldest presentational props to their bag of tricks — the video camera.

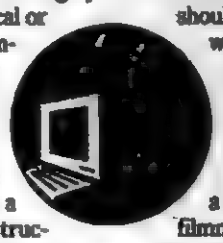
Video cameras, already available from most companies, are relatively cheap (a standard VHS model can be purchased for about $699), portable and easy to use. And the ultimate output, the videotape, is inexpensive to reproduce (about $3 per tape), saves time and money and is aesthetically stimulating to the viewers.

No personal contact

The most serious drawback to videotaped presentations is the lack of interaction between the viewer and the medium. A trainee can't just stop the tape and ask it a question. Thus, the trainer must decide what topics and in what instances videotape would be the best choice for training.

The following is a guideline of suggested uses for employing the video camera as a technical training tool.

• **Record "live" or instructor-led training sessions.** This tactic is especially helpful if the topic happens to be highly specialized and technical or if the training session involves a guest speaker who may not be available at another time.



Also, if the topic is presented in much the same way every time, a videotape can let instructors avoid having to repeat training classes. Recording the session will save the instructor time and the company money. However, trainers must take care that the topic is not one that will frustrate the trainees if there is no interaction.

• **Develop a "how-to" training video series.** A large percentage of training budgets is allotted for introductory courses of a how-to nature. But by videotaping subjects of an elementary, redundant nature, companies can actually save money to put toward more advanced technical training. For instance, videotapes could be made on subjects such as building a local-area network, configuring a personal computer or learning about DOS.

The process of developing a how-to videotape series is simple, but it does require some planning. To produce an effective how-to video, the trainer should spend some time writing an outline of the points to cover and the actions to take during the taping. This procedure is known as creating a storyboard, a term derived from the filmmaking industry.

For example, if a manager is developing a video on how to use a PC, he might create a storyboard as follows: a shot of a computer with a voice-over giving an introduction, then a shot of a person walking over to the computer and turning it on, with a voice-over explaining the term "boot up."

• **Train new employees more effectively.** Training new employees on specialized in-house systems is often given a broad-brush treatment. After all, it's not very exciting to train new insurance agents to use a life insurance underwriting system, for example. Video training can provide an affordable — not to mention lively — alternative.

This solution can also apply to training all company employees on a new custom-developed in-house system. Rather than trying to coordinate several live training sessions, employees will have the flexibility to watch an introductory tape at their convenience.

• **Produce high-tech multimedia extravaganzas.** For complex training requirements, a few extra ingredients can be added to the video training recipe. Many training classes make extensive use of visuals to clarify points as well as add pizzazz. A simple technique is to develop graphics on a PC and videotape the screen.

> RATHER THAN trying to coordinate several live training sessions, employees will have the flexibility to watch an introductory tape at their convenience.

However, this is a tricky process: Even good cameramen can't always find the right lighting to prevent glare on the screen. One solution is to use an add-in conversion board, which costs less than $600.

This board will translate the IBM Video Graphics Array-compatible output to the National Television System Committee standard for television and will permit the computer to be linked directly to a video cassette recorder.

One problem with this technique, however, is that voice has to be added to the tape later.

• **Capture live presentations and meetings.** What do managers do if they've hired a prestigious consulting company to study an important strategic technology issue, and it's coming on-site to expound on its solutions? Managers want their whole staff to hear their eloquence, but half of them cannot attend. The answer, of course, is to videotape it.

Videotaping of important presentations and meetings serves as extremely valuable training material. Dispatching a staff member with a pen and pad just isn't sufficient to capture the gist of these important events.

While videotaping is definitely not a panacea, nor is it the perfect way to train, it is a viable option for managers to add to their collection.

Keyes is president of New Art, Inc., a management and computer consulting firm in New York.

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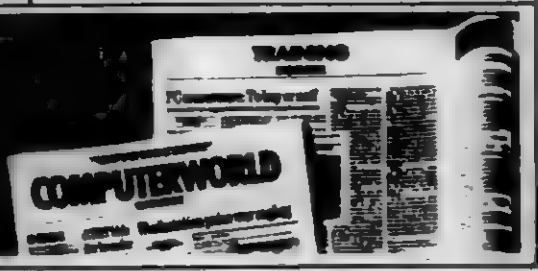

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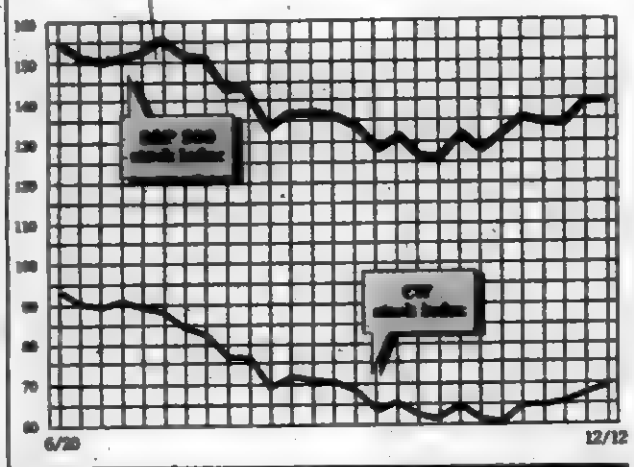
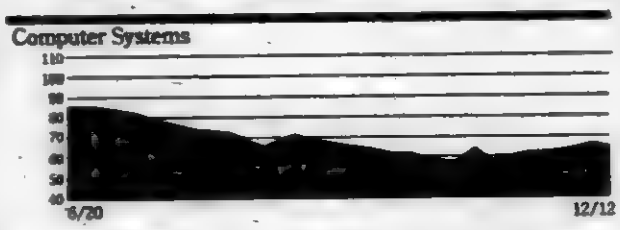
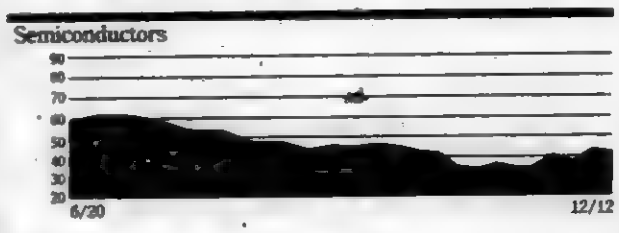
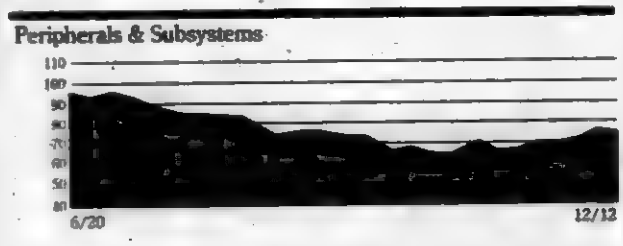
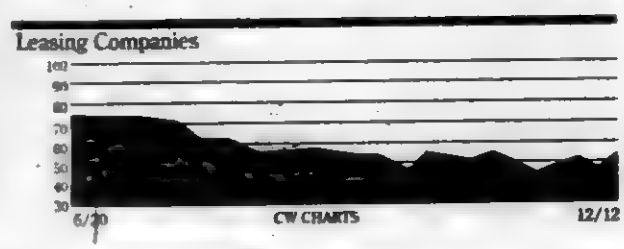


Indexes	Last Week	This Week
Communications	106.0	107.4
Computer Systems	67.4	66.9
Software & DP Services	99.9	98.5
Semiconductors	43.6	42.6
Peripherals & Subsystems	77.3	75.4
Leasing Companies	47.1	54.2
Composite Index	67.9	69.0
S&P 500 Index	139.4	139.5









Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, DEC. 12, 1990

E X C H		52-WEEK RANGE		PRICE CLOSE DEC. 12, 1990	WEEK NET CHANGE	WEEK PCT CHANGE
	Communications and Network Services					
N	AMERICAN INFO TECHS CORP	70	53	68.875	1.4	2.0
N	ANDREW CORP	26	16	21	1.3	6.3
N	ARTEL COMM CORP	10	2	1.625	-0.1	-7.1
N	AT&T	47	30	30.375	0.3	0.8
N	ANIXTER INC	4	2	2.25	-0.1	-5.3
N	AYDIN CORP	17	10	13.5	0.8	5.9
N	BELL ATLANTIC CORP	87	49	86.75	0.5	0.9
N	BELLSOUTH CORP	59	49	58	0.8	1.4
O	COMPRESSION LABS INC	18	7	10.375	-0.8	-6.7
O	CONTEL CORP	36	22	35.125	0.6	1.8
O	DATA SWITCH CORP	4	2	4	0.9	28.0
O	DIGITAL COMM ASSOC	27	9	12	-0.5	-4.0
O	DYNATECH CORP	19	12	17	1.3	7.9
N	FIBRONICS INTNL INC	13	5	8.25	0.3	3.1
O	GANDALF TECHNOLOGIES	5	2	2.5	0.4	17.6
O	GENERAL DATACOMM INDS	5	2	2.25	-0.1	-5.3
N	GTE CORP	36	24	28.875	0.6	2.1
O	INFOTRON SYS CORP	9	1	1	-0.1	-11.1
N	ITT CORP	61	40	48.5	0.6	1.3
O	M A COM INC	7	3	6.25	-0.4	-5.7
O	MCI COMMUNICATIONS CORP	46	19	20.125	0.5	2.5
O	NETWORK EQUIP TECH INC	34	5	6	-0.1	-2.0
O	NETWORK SYS CORP	15	8	11.125	0.1	1.1
N	NORTHERN TELECOM LTD	30	22	28.75	0.8	2.7
O	NOVELL INC	34	14	31.5	-1.3	-3.8
N	NYNEX CORP	82	67	75	3.4	4.7
A	PACIFIC TELESIS GROUP	52	36	46.5	0.9	1.9
A	PEIRL CORP	9	5	6.875	-0.3	-3.5
N	SCIENTIFIC ATLANTA INC	29	9	13.125	0.9	7.1
N	SOUTHWESTERN BELL CORP	66	47	56.25	0.1	0.2
N	3 COM CORP	19	5	8.625	-0.4	-4.2
N	U S WEST INC	41	32	38.625	1.3	3.3
	Computer Systems					
O	ALLIANT COMPUTER SYS	9	1	0.875	0.0	0.0
O	ALPHA MICROSYSTEMS	5	1	2.5	-0.1	-2.5
A	AMDAHL CORP	18	10	14.25	0.4	2.7
O	APPLE COMPUTER INC	48	24	39.625	-0.5	-1.2
O	AST RESH INC	30	10	27.75	-0.1	-0.4
A	BOLT BERANEK & NEWMAN	8	4	4.375	0.1	2.9
N	COMPAQ COMPUTER CORP	68	36	55.75	-0.3	-0.4
O	COMMODORE INTNL	12	5	11.5	1.0	9.5
O	COMPUTER AUTOMATION INC	6	0	0.75	0.1	9.0
O	CONTROL DATA CORP	22	8	9	-0.4	-4.0
N	CRAY RESH INC	51	20	31.75	-0.3	-0.9
N	DATA GEN CORP	13	4	5.5	-0.4	-6.4
O	DATAPOINT CORP	4	1	1.625	0.1	6.3
O	DELL COMPUTER CORP	15	5	15.125	1.8	13.1
N	DIGITAL EQUIP CORP	95	46	57	-1.0	-1.7
O	FLOATING POINT SYS INC	4	0	1.125	0.0	0.0
N	HARRIS CORP	36	14	20.125	-0.3	-1.2
N	HEWLETT PACKARD CO	50	25	33	-0.4	-1.1
N	HONEYWELL INC	112	71	93.875	0.4	0.4
N	IBM	123	93	114.375	-0.3	-0.2
O	INFORMATION INTL INC	14	8	8.75	0.0	0.0
O	IPL SYS INC	17	5	14.75	-1.0	-6.3
N	MAI BASIC FOUR INC	4	1	0.938	-0.1	-6.2
N	MATSUSHITA ELEC INDL LTD	168	116	126	5.0	4.1
O	MENTOR GRAPHICS CORP	26	9	13.125	-0.3	-1.9
N	NBI INC	1	0	0.094	0.0	-7.8
N	NCR CORP	93	46	89.5	2.9	3.3
O	PYRAMID TECHNOLOGY	36	11	11.75	-1.9	-13.8
O	SEQUENT COMP SYS INC	34	13	17.25	0.5	3.0
O	SUN MICROSYSTEM INC	37	15	22.125	-0.6	-2.7
N	TANDEM COMPUTERS INC	30	9	13.375	-0.3	-1.8
O	TANDY CORP	41	24	27.875	-1.9	-6.3
N	ULTIMATE CORP	9	1	1.625	-0.4	-18.8
N	UNISYS CORP	17	2	2.875	-0.1	-4.2
A	WANG LABS INC	6	3	2.875	0.0	0.0
	Software & DP Services					
O	AMERICAN MGMT SYS INC	20	11	17.75	0.9	5.2
O	AMERICAN SOFTWARE INC	18	8	12.875	0.1	1.0
N	AMACOMP INC	5	1	1.625	-0.1	-7.1
O	ANALYSTS INTL CORP	24	10	14	-0.3	-1.8
O	ASHTON TATE	15	5	8	-0.5	-5.9
O	ASK COMPUTER SYS INC	10	4	5.375	-0.2	-3.4
N	AUTO DATA PROCESSING	60	45	53	-1.9	-3.4
O	AUTODESK INC	60	32	47.5	-2.9	-5.7
O	BMC SOFTWARE INC	30	17	27.25	2.0	7.9
O	BUSINESSLAND INC	12	1	1.25	-0.3	-16.7
O	COGNOS INC	10	4	7.75	0.3	3.3
O	COMPUTER ASSOC INTL INC	17	4	7.875	-0.1	-1.6
O	COMPUTER HORIZONS CORP	17	8	14.75	-0.3	-1.7
N	COMPUTER SCIENCES CORP	59	37	47	-2.0	-4.1
M	COMPUTER TASK GROUP INC	12	7	9	1.4	18.0
O	COMSHARE INC	25	14	18	-0.3	-1.4
O	CORPORATE SOFTWARE	16	4	7.25	-0.3	-3.3
N	GENERAL MTRS (CLS E)	38	24	37.75	0.3	0.7
O	GOAL SYSTEMS INTL	18	8	11.75	2.75	30.6
O	HOGAN SYS INC	7	2	2.563	-0.1	-2.4
O	INFORMIX CORP	18	4	4.75	-0.6	-11.6
O	INTELLICORP INC	8	1	1.875	-0.1	-6.3
O	LEGENT CORP	31	17	24.25	1.3	5.4
O	LOTUS DEV CORP	29	13	18.75	-3.3	-14.8
O	MICROSOFT CORP	81	38	72.5	-2.8	-3.7
O	NATIONAL DATA CORP	35	8	12	-2.5	-17.2
N	ON LINE SOFTWARE INTL INC	11	4	4.625	0.1	2.8
O	ORACLE SYS CORP	168	5	7.875	-0.3	-3.1
N	RANSOFTWC SYS INC	19	7	8.375	0.4	4.7
O	PHOENIX TECHNOLOGIES INC	5	1	2.375	0.0	0.0
N	POLICY MGMT SYS CORP	43	30	38.5	0.5	1.3
O	PROGRAMMING & SYS INC	13	5	8	0.0	0.0
N	REYNOLDS & REYNOLDS CO	28	12	15.375	-0.3	-1.6
O	SAGE SOFTWARE INC	16	8	10.875	0.1	1.2
O	SEI CORP	22	15	20.625	2.4	13.0
O	SHARED MED SYS CORP	18	12	16.875	-1.0	-5.6
O	SOFTWARE PUBG CORP	28	12	19.75	-0.5	-2.5
N	STERLING SOFTWARE INC	11	6	8	0.3	3.2
O	SUNGARD DATA SYS INC	28	10	14.25	0.3	1.8
N	SYSTEM CENTER INC	25	8	9	-1.3	-12.2
N	SYS. SOFT INC	29	13	24.75	-1.3	-4.8
O	WORDSTAR	2	1	1.25	0.2	17.6
	Semiconductors					
N	ADV MICRO DEVICES INC	11	4	4.875	0.3	5.4
N	ANALOG DEVICES INC	10	6	6.75	0.4	5.9
O	ANALOGIC CORP	10	8	8.5	-0.3	-2.9
O	CHIPS & TECHNOLOGIES INC	24	5	8.5	-0.1	-1.4
O	INTEL CORP	52	29	28.75	-1.5	-3.9
N	MICRON TECHNOLOGY INC	16	7	10.25	-1.4	-11.8
N	MOTOROLA INC	68	49	52.5	-2.5	-4.5
N	NATL SEMICONDUCTOR	9	3	4.25	-0.1	-2.9
N	TEXAS INSTRS INC	44	29	36	-0.3	-0.7
A	WESTERN DIGITAL CORP	15	4	4.875	-0.4	-7.1
	Peripherals					
O	ALLOY COMP	2	0	0.156	0.1	88.0
N	AM INTL INC	5	1	1.25	-0.1	-9.1
O	AUTO TROL TECH CORP	4	2	1.875	0.0	0.0
O	BANCTEC INC	24	10	11.25	-0.3	-2.2
O	COGNITRONICS CORP	7	3	6.125	-0.4	-5.8
N	CONNER PERIPHERALS	31	11	24.25	-5.0	-17.1
A	DATARAM CORP	22	7	9	-0.5	-5.3
N	EASTMAN KODAK CO	44	34	41.5	-0.4	-0.9
N	E M C CORP MASS	10	3	7.875	0.0	0.0
O	EMULEX CORP	8	4	5.5	-0.3	-4.3
O	EVANS & SUTHERLAND	36	14	13.75	-1.0	-9.1
O	ICOT CORP	2	0	0.281	-0.1	-26.1
O	INTERLEAF INC	8	3	3.875	-0.4	-9.8
O	IOMEGA CORP	6	2	5.063	0.1	1.2
O	MASSTOR SYS CORP	3	0	0.375	0.1	19.8
O	MAXTOR CORP	17	4	4.625	-0.8	-14.0
O	MICROPOLIS CORP	10	3	3	-0.3	-3.0
N	MINNESOTA MNG & MFG CO	91	74	88.125	2.5	3.0
O	PERSONAL COMP PRODUCTS INC	9	4	3.625	0.1	1.7
O	PRINTRONIX INC	15	6	8.75	0.1	1.4
O	QMS INC	21	9	13.875	-0.4	-2.8
O	QUANTUM CORP	26	9	19.75	-2.9	-12.7
O	RECOGNITION EQUIP INC	8	4	5.125	0.3	5.1
N	REXON INC	10	4	6.375	0.5	8.5
O	SEAGATE TECHNOLOGY	20	8	10.375	-0.4	-3.5
O	STORAGE TECH CORP	35	11	20.5	-2.0	-8.9
O	TANDON CORP	4	1	1.813	-0.3	-14.7
N	TEKTRONIX INC	19	12	18.875	1.0	5.6
O	TELEVIDEO SYS INC	1	0	0.25	0.0	14.2
N	XEROX CORP	69	29	37	0.3	0.7
	Leasing Companies					
N	CAPITAL ASSOC INTNL INC	5	0	0.656	0.3	57.1
N	COMDISCO INC	29	15	16.125	0.1	0.7
O	LDI CORPORATION	17	9	12.25	1.4	12.6
O	SELECTERM INC	7	3	2.75	0.0	0.0

EXCH: N—NEW YORK; A—AMERICAN; O—NATIONAL

Bargain buys

Wall St. shoppers found deals in high-tech market

Investors shopped for sale items in the technology arena last week, taking advantage of recent price drops while the taking was still good. Among the apparent bargains was Stratus Computer, Inc., which traders thrust up 1⅜ points last week to 24½ by Thursday's close.

Evidently, Novell, Inc. was also a good buy after it reported fourth-quarter profits had doubled, compared with the same period in 1989. Novell shares gained a point last week to 32¾.

Adaptec, Inc. turned investors off, however, as it projected sagging earnings in the quarter to come. Adaptec dropped 5½ points for the week, closing Thursday at 9⅜. Other software issues were also without takers, including Microsoft Corp. and rival Lotus Development Corp. Lotus slipped 1¾ points to 19, while Microsoft fell 1½ points to 72¾.

The computer industry soap opera starring AT&T and NCR Corp. continued to capture audiences' attention on Wall Street. Watchers flip-flopped, however, sending NCR down and AT&T up last week, after the opposite had happened the week before last. AT&T regained 1⅛ of the 2 points it had lost the previous week, closing Thursday at 31. Similarly, although NCR shot up the week before last, it sank 1⅜ points last week to close at 90⅛.

Meanwhile, bellwethers IBM and Digital Equipment Corp. sent mixed signals. IBM inched up ⅜ of a notch to 112⅜. As news spread of DEC's money-saving scheme for the coming year — which includes executive shuffles and possible layoffs throughout the company — DEC stock faltered, losing ¾ of a point to close at 56⅜.

Elsewhere, semiconductor firms Advanced Micro Devices, Inc. and National Semiconductor Corp. each picked up ⅛ of a point, closing at 4⅞ and 4¾, respectively. Intel Corp., however, lost 1½ points, closing at 36¼.

KIM S. NASH

NEWS SHORTS

Sears pushing EDI with suppliers

Sears, Roebuck and Co.'s Merchandise Group, the nation's largest retailer, will begin mailing letters this week to its suppliers telling them when the company will expect them to be able to engage in ANSI standard electronic data interchange (EDI). Lance Dailey, director of EDI implementation at Sears' Merchandise Group, said suppliers will be expected to be up and running within 90 days of receiving the letter. Executives at several suppliers spoken with at a Sears-run EDI seminar were positive about the move, saying that it marked Sears' break with its proprietary network, Sensden.

DEC unveils 5¼-in. disk systems

Digital Equipment Corp. announced a new generation of 5¼-in. high-performance removable disk storage systems last week for its low- to midrange computers. The removable storage element subsystems come in two configurations — the 1G-byte RF72-RSE and the 381M-byte RF31-RSE — and are based on DEC's 5¼-in. Winchester disk drive with built-in controller. Prices range from $7,600 to $16,900, with availability 60 days after ordering.

FAA stops, restarts project

A 10-year plan for outsourcing the Federal Aviation Administration's administrative computing was withdrawn late last month, but a new request for proposals will be out this week. The original plan was hotly criticized by the General Accounting Office, and the FAA's authority to proceed with it was temporarily suspended this summer. Mike Sherwin, director of management systems at the agency, said the plans were basically the same, but the details will be different.

Amdahl pushes up UTS 2.1 delivery

Amdahl Corp. jumped its first-quarter 1991 schedule for delivering UTS Release 2.1, the latest version of its mainframe-based Unix operating system, by announcing immediate availability. UTS 2.1 complies with AT&T's Unix System V Release 3.1 and incorporates some features of Unix System V, Release 4 and Berkeley Unix BSD Release 4.3. Early UTS 2.1 user sites included US West Communications, Grumman Corp. data centers that support the National Aeronautics and Space Administration's Johnson Space Center and AT&T.

Ask/Apple team yields Smart/Look

Ask Computer Systems, Inc.'s Ingres Division and Apple Computer, Inc. have developed Ingres Smart/Look, which allows character-based applications developed with Ingres Corp. tools to run on Macintoshes, complete with the traditional Macintosh look-and-feel. Smart/Look will initially run on a DEC VAX computer, but support for Unix host systems will follow, Ask said. Smart/ Look is priced at $395 for a package that runs on the VAX host; an additional license fee of $395 is required for each Macintosh that is supported.

Netframe shows 250-user server

Netframe Systems, Inc. unveiled its Intel Corp. I486-based NF200 server, designed to handle local-area networks of as many as 250 users that have evolved beyond file sharing and communications applications to encompass SQL database processing. The base price for the NF200 is $26,950 with immediate availability.

Diebold buys into IBM's tellers

The terms were not disclosed, but the deal is done: As of late last week, Diebold, Inc. is the owner of those assets of IBM's automated teller machine (ATM) service business necessary to let Diebold fully support all U.S.-based IBM ATMs. The Canton, Ohio-based self-service transaction automator said it expects the acquisition to swell its customer service revenue by approximately 10% when the new service goes into full swing.

Users mostly unfazed by Officevision delay

BY ROSEMARY HAMILTON
and PATRICIA KEEFE
CW STAFF

When IBM delivers its scheduled status report on Officevision this week, it is expected to announce the second major delay for its strategic office system platform. However, customers and analysts contacted last week shrugged off the bad news.

"Who expects it to ship on time anyway?," quipped David Cearely, an analyst with the Gartner Group, Inc.

But the low-key reaction is not all good news for IBM. While some users contacted said they are not worried about IBM's schedule because they are slowly ramping up with Officevision themselves, others noted they had already decided to put off plans to implement Officevision, which some say does not work.

Users have not given up, but they are frustrated, said John Dunkle, an analyst with Workgroup Technologies, Inc. He predicted that 1991 will be a critical year for Officevision. If IBM fails to deliver some key, working pieces of the oft-delayed environment, it runs the risks of losing accounts to alternative electronic services, such as Hewlett-Packard Co.'s New Wave or NCR Corp.'s Cooperation.

For the already skeptical, the second product delay reinforces the earlier decision. "It just confirms we made the right decision," to go with Wang Laboratories, Inc. equipment a long time ago, said David Moore, a senior vice president at Mellon Bank Corp.

"We looked at Officevision, and it just does not fit our business needs," said Enrique Crespo Jr., corporate manager of computing service at Torrington Co., a "90%" IBM shop. Crespo is specifically disappointed in Officevision's lackluster support for MS-DOS. "I don't think it's ready for the public."

An IBM spokesman confirmed last week that the company will release a status report on Officevision this week, but declined to provide details (see story below).

Some industry sources have said IBM will be late by as much as several months in delivering the critical second release for all four Officevision platforms.

"I think IBM's big mistake was not in trying to do it, but in making a public commitment for when it would be ready," said Amy Wohl, president of Wohl Associates.

Delaying tactics

IBM's expected announcement of a revised Officevision schedule this week will probably downplay delays by repositioning the critical second release of the platform.

For starters, the company is expected to focus on OS/2 Release 1.3 Extended Edition, particularly for its LAN platform. Therefore, Officevision/LAN Series Release 2 will be attached to the delivery of OS/2 Release 1.3 for LANs, which is not expected until March 1991.

This is a departure from the long-standing plan to release Officevision for OS/2 Release 1.2 although industry sources said they are not clear why this shift would cause any technical delays. Release 2 of Officevision for the LAN platform is particularly important because it will provide many more office functions and the ability to snap in third-party applications.

It is also considered by many industry analysts to be the heart of IBM's future office strategy, because it focuses on the desktop environment.

"Being able to do E-mail on MVS is not strategically important to IBM," said Stuart Woodring, an analyst at Cambridge, Mass.-based Forrester Research, Inc. "What is important is to address the needs of OA in an architecture that reflects the 1990s, and that's the LAN version."

Meanwhile, an IBM spokesman indicated that the company will also likely start pushing a more modular approach to Officevision Release 2, particularly for the host platforms.

But the big news about it was the OS/2-to-mainframe direct connect component. Plans are under way now to separate this OS/2 direct connect component and position it as a distinct feature, the IBM spokesman said. The company can then ship what is technically Release 2 software, although it will not have what had been a key piece.

In fact, IBM quietly began shipping what it calls Officevision/MVS Release 2 in September. Two users contacted last week, one of whom just installed Release 2, said it has no OS/2 direct connect support but appears to have a performance kick and comes with a feature called the Enterprise Address Book.

ROSEMARY HAMILTON

D&B Software to increase services

BY SALLY CUSACK
CW STAFF

NATICK, Mass. — Falling in step with the recent industry trend of placing customers atop visible pedestals, Dun and Bradstreet Software said last week that, beginning next year, its 10,000-plus clients will receive extended professional and maintenance services. They will also have opportunities to interact one-on-one with D&B Software executives.

In addition, D&B Software Chairman and Chief Executive Officer John P. Imlay Jr. recast his executive team, luring former McCormack & Dodge (M&D) Executive Vice President John Landry to the company that was formed last year from the merger of M&D and Management Science America, Inc.

Landry, as D&B Software's executive vice president, will be responsible for research and development initiatives.

D&B Software's *Landry will be in charge of research and development*

Imlay has also promoted D&B Software Executive Vice President Henry P. Holland to president and chief operating officer and recruited Michael Choukas, formerly a vice president at Boston-based financial firm Bain & Co., as executive vice president for strategy and business development.

Paul Zagaeski, a senior analyst at The Yankee Group, a research and consulting firm in Boston, noted that D&B Software's reorganization may be a prudent one, but be cautioned that the software business is a "different ball game these days."

"Vendors have to establish an outsourcing relationship with the end user — and they have to be willing to share some of the users' risks in purchasing, designing and implementing these products," Zagaeski said.

Further study of VDTs needed, EPA reports

BY J. A. SAVAGE
CW STAFF

There are enough indications of health risks from the type of electronic fields emanating from VDTs to justify significant new studies, the U.S. Environmental Protection Agency (EPA) concluded in a report that was released Friday.

The external review draft of the "Evaluation of the Potential Carcinogenicity of Electromagnetic Fields" concluded that there is an "elevated risk" of a link between cancer and electromagnetic fields created by the electricity in everything from VDTs to high-voltage wires. The draft also said there appears to be a link between various biological changes at the cell level and exposure to the fields, according to Martin Halper, director of the analysis and support division of the EPA's Office of Radiation.

The report also noted that while there are indications of a link, "the interaction between electromagnetic fields and cancer is not understood."

The EPA, which had been waiting for the conclusion of this report, has yet to set aside funds for new studies, according to Halper.

Because of the interest in electromagnetic fields from power lines, a group of utilities has offered to create a voluntary fund to pursue more studies.

The report is expected to create so much interest that the White House Science Adviser's office and White House Chief of Staff John Sununu have held it up from public release since Nov. 27.

Burning rays?

Questions about the health effects of VDTs remain unanswered despite their increased use

U.S. installed base of VDT screens

	1989	1990
Terminals	13.7M	13.5M
PCs	50.7M	53.7M
Total	64.4M	69.2M

Source: International Data Corp.
CW Chart: Paul Mack

One of the reasons given to the EPA by the White House was fear of alarming people, confirmed EPA project manager Robert McGaughy and an EPA spokeswoman. "It does affect everyone," he said.

"This is a very difficult area that, I am sure you agree, requires careful treatment if we are to serve the public well," wrote White House Science Advisor D. Allan Bromley in an August memorandum to the head of the EPA. Union organizers said the EPA report is the kind of ammunition they need to get greater health protections for VDT workers.

However, a lack of solid information has unions backing off from some electromagnetic-related demands, such as work transfer during pregnancy.

"We just haven't had the ammunition," said Barbara Kellogg, an organizer at the Service Employees International Union in San Francisco. She said anecdotal reports of problems in the workplace, such as clusters of birth defects or stillbirths, reach her office, "but there is no documentation."

Not convinced

Despite EPA findings and pressure from unions, many companies that employ large numbers of VDT workers remain largely unconvinced of potential health effects on their workers based on scientific information available.

"None of the studies to date prove anything," said Terry Thompson, senior attorney at AT&T in Basking Ridge, N.J. "We think there is no foundation for fear."

"We have experts looking at this, but scientific data are inconclusive," a Pacific Bell spokesman said.

Previous studies have been largely inconclusive, because studying electromagnetic effects is nothing like looking for the effects of a chemical, according to Halper.

"It looks like it's breaking every rule established for dealing with chemicals," he said. "Forget linear threshold models and lifetime average daily doses; then we can begin talking about electromagnetic fields."

There will be a 90-day period during which the EPA will accept comments from the public regarding the report. Then it goes to a second review committee made up of scientists from 18 federal agencies.

The EPA report deals with extra low frequency (ELF) fields, which emanate from VDTs as well as power lines and appliances. ELFs range from 3Hz to 3,000Hz.

VDTs also give off another level of electromagnetic field, called very low frequency. That field is not covered in the report, according to McGaughy. The report is, however, being studied by the National Institute for Occupational Safety and Health for potential reproductive effects.

CW Chicago bureau chief Ellis Booker contributed to this story.

VDT regulations adopted

BY J. A. SAVAGE
CW STAFF

SAN FRANCISCO — San Francisco's Board of Supervisors voted eight to one last week to adopt legislation governing adjustable workstations and chairs, among other requirements, for employers who have more than 15 workers who use VDTs.

The hotly contested legislation was passed with major compromises to employers in an effort to keep them from leaving the city, according to supervisor Nancy Walker. "We don't want to have moving vans pull up," she said.

The legislation will be heard for a second reading this week and must be signed by Mayor Art Agnos, who has given no indication whether he will accept or veto it.

Employers would have two years from the date the legislation passes to conform to its requirements, and an advisory board will be able to suggest revisions to the legislation.

The city's budget analyst, Harvey Rose, said the current version of the legislation will cost the city and businesses $37.6 million less than the original estimate of $70 million to $120 million.

A space saver?

The savings are mostly from cutting out the provision that VDTs be placed no closer than five feet from each worker, which would have caused employers to acquire more office space for employees.

The Chamber of Commerce continues to oppose the legislation, despite being included in compromises between labor unions and the city. "We will encourage the mayor to veto it," a Chamber spokeswoman said. She added that major corporations in San Francisco, such as Wells Fargo Bank NA, United Airlines and RH Macy & Co., are reviewing legal action on the issue with their law departments.

User group joins COS

BY GARY H. ANTHES
CW STAFF

MCLEAN, Va. — The User Alliance for Open Systems, originally known as the Houston 30, announced last week that it has become part of the Corporation for Open Systems (COS) based here. The alliance joins a growing number of user-oriented units within COS whose mission is to poll their constituencies and write requirements for the vendor community.

E. W. "Bud" Huber, chairman of the alliance, said the group has received inquiries about membership from 835 user and vendor companies — about 90% of which are in the U.S. "At the end of 1991, I'll be happy to have 100 active people working in the alliance," he said.

Corporate members with sales above $15 million will pay $25,000 in yearly dues, while smaller firms will be assessed $9,500. "Allies" — essentially, recipients of COS and User Alliance information — will pay $2,000 yearly, and unaffiliated individuals will pay $150. The dues structure is an apparent response to earlier concerns that the $25,000 COS dues would bar smaller companies from participating in the User Alliance.

According to Huber, eight major organizations have joined the COS User Alliance.

Holding back

However, others who had attended the user coalition's meetings this year are holding back. One of these, General Electric Co., said it has no plan to join because it found that COS was too vendor-oriented when GE was a member. "The people at GE didn't feel COS had a user orientation and didn't think COS served GE's interest very well," said Duane Elms, program manager of technical computing at GE. However, Elms said he will join as an individual. "In spirit and in effort, we'll support what goes on."

Huber said the alliance will implement a list of "action items" for bringing down the barriers to open systems.

Judge

FROM PAGE 1

merits of the case," he said.

Lyons claimed there was no deliberate intention to mislead the copyright office. "The attorney who filed the original application in the early 1980s has testified in depositions that he did not mention JPLDIS in the application simply because he had never heard of it," Lyons said. Lyons also added that the copyright office would still have issued the copyright even if the JPLDIS was mentioned.

Some observers said Hatter's decision has the potential to affect other cases involving artistic inspiration. Apple Computer, Inc. is in a long copyright battle with Microsoft Corp. and Hewlett-Packard Co. in which it has charged the pair with copying its Macintosh screen appearance. The defendants, however, have countercharged that Apple based the look of the Macintosh on work done by Xerox Corp. at its Palo Alto, Calif., Research Center in the 1970s.

Officials from Torrance, Calif.-based Ashton-Tate said the original suit filed in November 1988 alleged that Fox's Foxbase product unlawfully copied Dbase's concept, "look and feel," programming language, sequence of events and arrangement of the program as presented to the end user. The legal action sought an injunction against sales and unspecified damages.

No clear precedent

While there is established legal precedent protecting a program's screen appearance, there has never been such a precedent for claiming proprietary rights to a programming language or a program's sequence of events. Opponents argued that such a ruling could threaten the open base of all programming.

"This certainly removes a cloud from the database world," said Dave Fulton, president of Perrysburg, Ohio-based Fox. "Now we'll be able to standardize the whole environment and mature like computer applications vendors ought to mature."

There are currently 10 vendors marketing Dbase language compilers and interpreters. Four of these — Ashton-Tate, Fox, Wordtech Systems, Inc. and Nantucket Corp. — hold more than 90% of the Dbase-compatible market.

Wordtech President David Miller added, "It ensures that Dbase is not a 'single-source' solution for purchasers, but rather a multisource solution with many suppliers."

However, Ashton-Tate's user base proved its loyalty during the 18-month period when the most recent release of Dbase was pulled from the market to fix a string of bugs.

"The reason I have stuck by Dbase is because of everything that can tie into it," said Rock Blanco, IS vice president at Garber Travel in Boston. "Price is one of the least things I consider."

Some analysts downplayed the news because they said the most important issues remained unresolved. "The judge never really addressed the basic question of whether you can or cannot copyright a language, so we may not have had that much of a precedent here," said David Mayer, an analyst at Montgomery Securities in San Francisco.

CW staff writer Carol Hildebrand contributed to this story.

DG founder resigns; possible ouster seen

BY SALLY CUSACK
CW STAFF

WESTBORO, Mass. — Another era ended last week as Data General Corp. founder and Chairman Edson D. de Castro announced that he will leave the company Dec. 31. He will not stand for re-election to the board.

"Obviously, there is a certain element of disappointment," de Castro said, referring to his departure amid speculation that his decision was somewhat forced by the board of directors. "Frankly, though, I'm anxious to get back to work. I'm not the type of person that can sit around and do nothing."

DG founder *de Castro's resignation marks the end of an era at the firm*

De Castro, engineer and entrepreneur, left Digital Equipment Corp. in 1968 to found DG, where he served as president until he was named chairman of the board and chief scientist in 1989, a position insiders said gave him figurehead status and little hands-on involvement in the company.

Ronald L. Skates, who was named president and chief executive officer in 1989, will continue to lead DG in that capacity, the company said.

According to Carolyn Griffin, a senior analyst at International Data Corp., a Framingham, Mass.-based market research firm, the transfer of power from de Castro to Skates has been in the works for a long time.

One longtime DG customer at a manufacturing facility added, "I don't think he has been actively involved in the day-to-day business for quite some time, so I really don't think it will affect us as customers at all. The only positive thing I see is that perhaps Wall Street investors will see this as a definite sign that things are going to change."

De Castro indicated he will be aggressively searching for new ventures and will consider several possibilities in the near future.

DG also announced that Vice Chairman Herbert J. Richman, the man who created DG's hard-hitting sales force, will not be standing for re-election.

Referring to de Castro as an "industry legend," Skates credited both the former chairman and Richman for making DG a leader in the industry and added that de Castro's leadership, technologically superior products and "dedication to excellence has earned Data General a reputation for quality and reliability."

Reflecting back on missed opportunities, de Castro said his greatest mistake was not getting into the personal computer business during its infancy, adding that it is a generic industry dilemma to become "so focused on the success of the day, you fail to look at options for the future."

Can Aviion save crippled DG?

Analysts say $100 million in workstation sales won't carry company

BY SALLY CUSACK
CW STAFF

WESTBORO, Mass. — With each disastrous financial report, Data General Corp. struts out an executive to say that sales of its Aviion workstation are "gaining momentum," and to confirm that the company is banking on its reduced instruction set computing (RISC) Unix-based machine to pull it out of the red ink.

The question is, in today's bleak financial climate, will Aviion sales move fast enough to save the limping corporation?

While DG boasts $100 million worth of Aviion sales for 1990, analysts agreed that the numbers are not substantial enough to carry the $1.3 billion entity. Industry experts estimated that there are several thousand Aviions currently installed in the U.S. and abroad, but that still gives the company a small market share in an extremely competitive RISC market — probably less than 1%.

The latest twist is that DG is no longer stridently positioning the Aviion as a workstation.

"We cannot compete on a head-to-head basis with Sun, HP and DEC in the workstation marketplace," said William Zastrow, DG's new vice president of Open Systems Marketing.

Citing Sun Microsystems, Inc., Hewlett-Packard Co. and Digital Equipment Corp.'s significant presence in workstation installations, Zastrow said DG will dominate targeted vertical markets, with the Aviion functioning in a server capacity.

"We're going to be a leader in the medium- and large-scale multiuser server market," Zastrow said, adding that workstation sales would naturally follow because of the architecture's binary compatibility.

Aviion customers, although small in number, reported they are happy with the product.

"The Aviion is truly excellent in terms of reliability," said Tom LaMarche, data systems manager at the Maricopa County Flood Control District in Phoenix. Last year, it installed seven Aviion workstations and an Aviion 5200 Server to run its Geographic Information Services (GIS) applications.

"Of course," LaMarche added, "like other people, we worry about DG's financial condition, especially through the recession."

Can't get enough

According to David Lundquist, vice president at Mercy Health Care Center in Oklahoma City, Aviion installations at the facility have gone "extremely well. Right now, we're behind schedule as far as people who want to sign onto the system."

The future of DG and Aviion seems to rest on how fast and how many value added-resellers and software applications will be available on the Unix-based platform, coupled with whatever value-added services the company can provide.

"The Aviion has to be the mechanism for survival," said George Weiss, an analyst at Gartner Group, Inc., a Stamford, Conn.-based market research and consulting firm.

"With the economy slowing down, even the big guys like Digital Equipment Corp. have been having trouble," said Lisa Thorell, an analyst at Dataquest, Inc., a market research company based in San Jose, Calif.

Noting that the company has recently scored some major wins, including a $45 million contract with U.S. Sprint Communications Co. for Aviion 100s, and has won its appeal on the much-publicised contract bid for government GIS-related installations, Thorell cautioned that DG "can't afford to make any mistakes at this point. They're coming up from behind."

According to DG, more than 400 software developers have agreed to port their applications to the Aviion line, which will eventually give Aviion users more than 1,000 applications to choose from. There are also approximately 550 value-added resellers currently partnered with DG, and a recent agreement with Softswitch, Inc. in Wayne, Pa., to build a switching product on the Aviion is an example of the vertical approach DG is taking to market its product.

Michael D. Zisman, president of Softswitch, said his company started looking for a Unix server last year and chose the Aviion because of its strong communication stacks capabilities. Zisman does not perceive DG's ailing financials as a threat to the product: "We didn't commit to a proprietary platform, but a Unix platform. If the Aviion disappeared tomorrow, 95% of the software architecture can be ported to another system."

DEC weeds out employee base, offers severance pay

BY MARYFRAN JOHNSON
CW STAFF

MAYNARD, Mass. — Digital Equipment Corp. announced last week a key executive shuffle intended to both simplify the corporate maze and provide better field service for its customers.

The company also inched a step closer to the possibility of employee layoffs in early 1991. A $1 billion cost-cutting effort now under way is forcing close scrutiny of every expenditure.

DEC's voluntary severance program has 7,000 employees considering whether to quit or move to other jobs within the company, according to spokeswoman Nikki Richardson. At the end of this month, managers will evaluate the results of the program, which has cut the worldwide staff of 125,900 by 3,200 in 1990.

"Layoffs are not out of the question, but there has been no decision to have a layoff," Richardson stressed.

In the executive shifts, Russell Gullotti moved into the vice presidency of the newly created Corporate Services, which pulls DEC's worldwide systems integration and support services under one senior manager. Donald Zereski, formerly vice president of customer services, is now vice president of all U.S. sales and services, including product delivery and management activities.

David Grainger, formerly head of the sales organization, was appointed vice president of another new creation: an OEM/VAR Business Group with global responsibility to expand DEC's indirect sales channels. All three executives report to Jack Smith, senior vice president of operations and right-hand man to DEC President Kenneth H. Olsen.

"You could call this one more flailing attempt to get DEC moving again," said Robert Herwick, an analyst at Hambrecht & Quist, Inc. in San Francisco. "Hopefully, this means there will be less redundancy, less coming back to customers to do what they should have done in the first place."

If the executive changes bring about the promised improvements in the field, DEC users would have much cause for rejoicing, several analysts said.

Customers often bemoan the quality of their sales representatives, noted Michael Artukovich, systems support supervisor at Health and Tennis Corporation of America in Los Angeles.

Artukovich said the majority of users he spoke with have "major complaints about their sales reps."

"If DEC will survive, they will have to revamp their sales organization," he said. "I've dealt with smaller, third-party subsystem manufacturers, and DEC should take lessons from companies like that, who stay in tune with their user base, understand what the user needs and respond to it."

Senior writer Alan Ryan contributed to this article.

Second-class postage paid at Framingham, Mass., and additional mailing offices.
Computerworld (ISSN 0010-4841) is published weekly, with a single combined issue for the last week in December and the first week in January by CW Publishing/Inc., 375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171.
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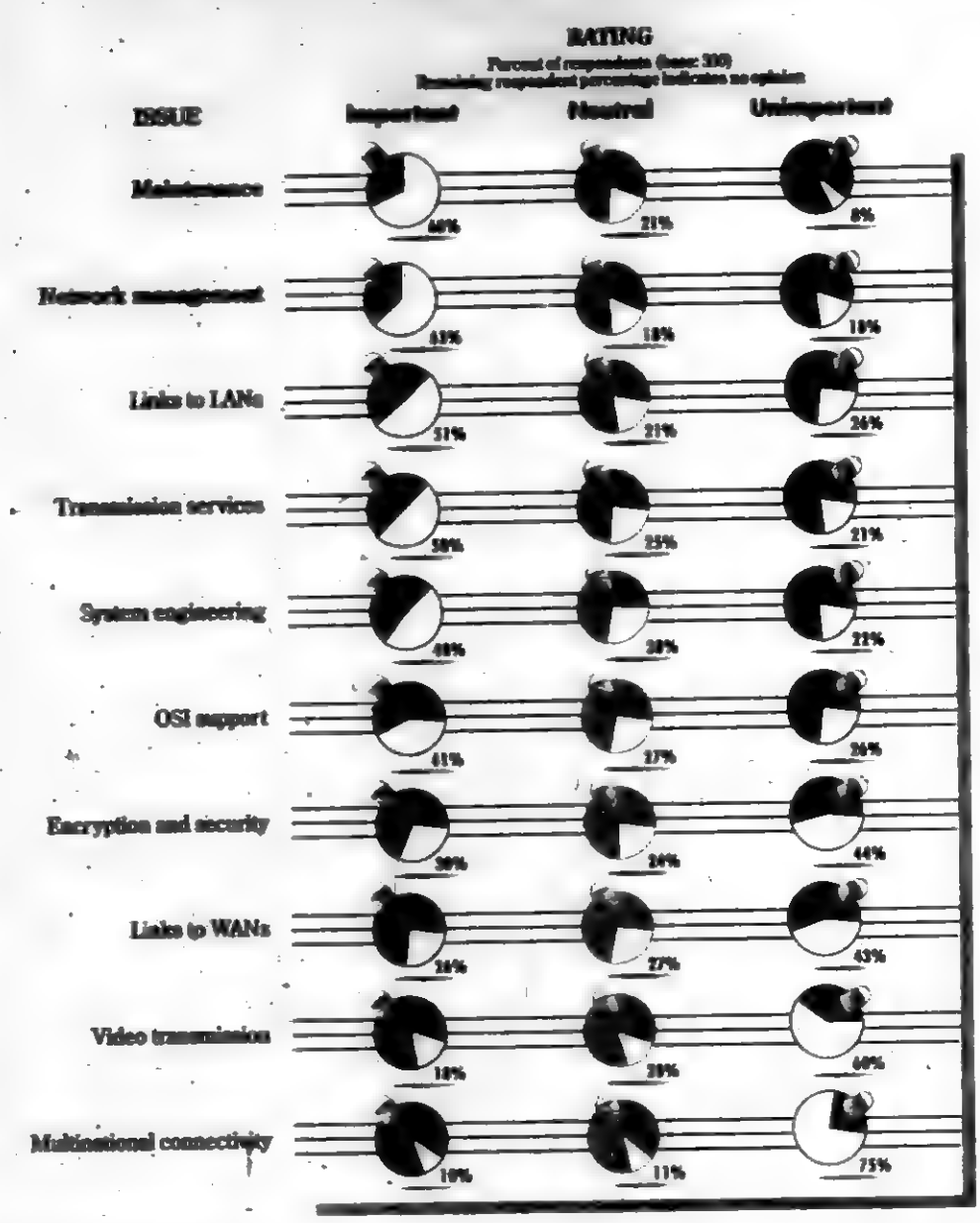
TRENDS

NETWORKING Wish List

Maintenance and network management get high marks when users list which networking issues are most important



Source: Link Resources Corp., New York

CW Chart: Doreen St. John

NEXT WEEK

Electronic data interchange has the potential to transform the way television stations sell advertising, and **Joe Harris**, director of information technology at NBC-TV Stations, is one executive leading the charge. However, there is plenty of resistance and defense of the old ways of doing business in the TV industry. See Manager's Journal.

Forecast 1991, a special year-end double issue, looks at the key issues facing information systems management in the coming year. You'll get practical tips for stretching your IS dollar and read about the hottest technologies and companies to watch in 1991. Plus, 1990 all-star team, job outlook and our 4th annual dubious achievement awards.

INSIDE LINES

This one got away

Dun & Bradstreet Software has apparently lost its bid for Wright Systems, a privately held Michigan-based software house. The company was acquired outright by Integral in Walnut Creek, Calif., in a deal that was formalized on Dec. 7. Lou Wright, president of Wright Systems, will serve on Integral's board as well as take on the title of chairman of the firm's Integral Midrange company. David Snyder, executive vice president at Wright Systems, will also be joining the corporate executive staff at Integral.

Get Blue, get open

IBM is actually threatening to leapfrog DEC on the Open Systems Interconnect (OSI) support track by coming up with common programming interfaces that will allow users to port messaging and file-transfer applications across both Systems Network Architecture and OSI, a user tells us. IBM already offers a common programming interface for porting transaction processing applications across LU6.2 and OSI, but this would broaden its ability — which DEC reportedly lacks — to shelter application developers from the differences between OSI and its own proprietary upper-layer protocols, the user says. IBM is apparently preparing several major OSI announcements.

When it rains . . .

Are more layoffs in the offing at Wang? Rumors have been heating up the airwaves and the Lowell, Mass., local newspaper. When Wang President Rick Miller was in San Francisco last month, he responded to a question about layoffs by saying there were no such plans on his desk. However, a source said Wang is looking especially carefully at a number of areas, including customer engineering and research and development. "A customer engineer told me they are tracking [them] real close, checking to see how many calls they make, how much time they spend on accounts," a source said. Separately, there are reports that research and development, particularly in platform engineering, may be cut 30% to 35%.

The Ballad of OS/2, part 157

Far from the unwavering facade presented to users, a wavering Microsoft moves forward with LAN Manager Version 3.0. A consultant who has preliminary paperwork on the next edition says every reference to OS/2 on the original document was scratched out. Meanwhile, Microsoft is also busy on the language front, where it is said to have inked an OEM deal with DEC, under which DEC will private-label Microsoft compilers. On the operating system front, while users await DOS Version 5.0, reports are already circulating about DOS Version 6.0, which includes built-in Windows.

Was Mr. Olsen seen leaving the building?

Where there's smoke . . . IBM's Business Recovery Services Division had a nasty surprise Tuesday, when a connection between two electric company power grids shorted out just outside the disaster-recovery service's headquarters in Tampa, Fla. Ironically, the dual-power grid "feed" to the disaster-recovery center is intended to ensure continuous operations. IBM's computers kept on humming, running on battery power, but electricity wasn't restored for more than one hour. Dozens of people were evacuated from the site — including those running backup and recovery tests in the computer room.

The stockings were hung . . .

Still looking for an industry-related stocking stuffer? Borland Chief Executive Officer Philippe Kahn and a handful of friends and coworkers have released a compact disc entitled "Pacific High." The 73-minute CD features 23 numbers, ranging from New Age mood pieces to "Turbo Disturbo," a rap song offering nods to Borland's Turbo C++ programming language. The package is slicker than motor oil — but don't quit your day job, fellas.

We'll be rapping about holiday cheer for the next week or so, but we're never too festive to take your tips and opinions. Call them in to News Editor Peter Bartolik at (800) 343-6474, message COMPUTERWORLD *on MCI Mail or fax us at (508) 875-8931.*

If you think the LaserPrinter E looks good in person,

wait till you see how it looks on paper.

	The IBM LaserPrinter E	HP LaserJet IIP
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Speed upgrade option	✓ up to 10 ppm	No
Adobe PostScript option	Yes	Yes
Printer emulation	✓ IBM, HP PCL	HP PCL
Std. plotter emulation	✓ Yes	No
Font card slots	✓ 2	1
Std. input paper tray capacity	✓ 200	50
Std. output paper tray capacity	✓ 100	50
Opt. sec. input paper tray capacity	✓ 500	250
Opt. envelope tray capacity	✓ 75	20
Mfr. sugg. retail price	✓ $1495	$1495
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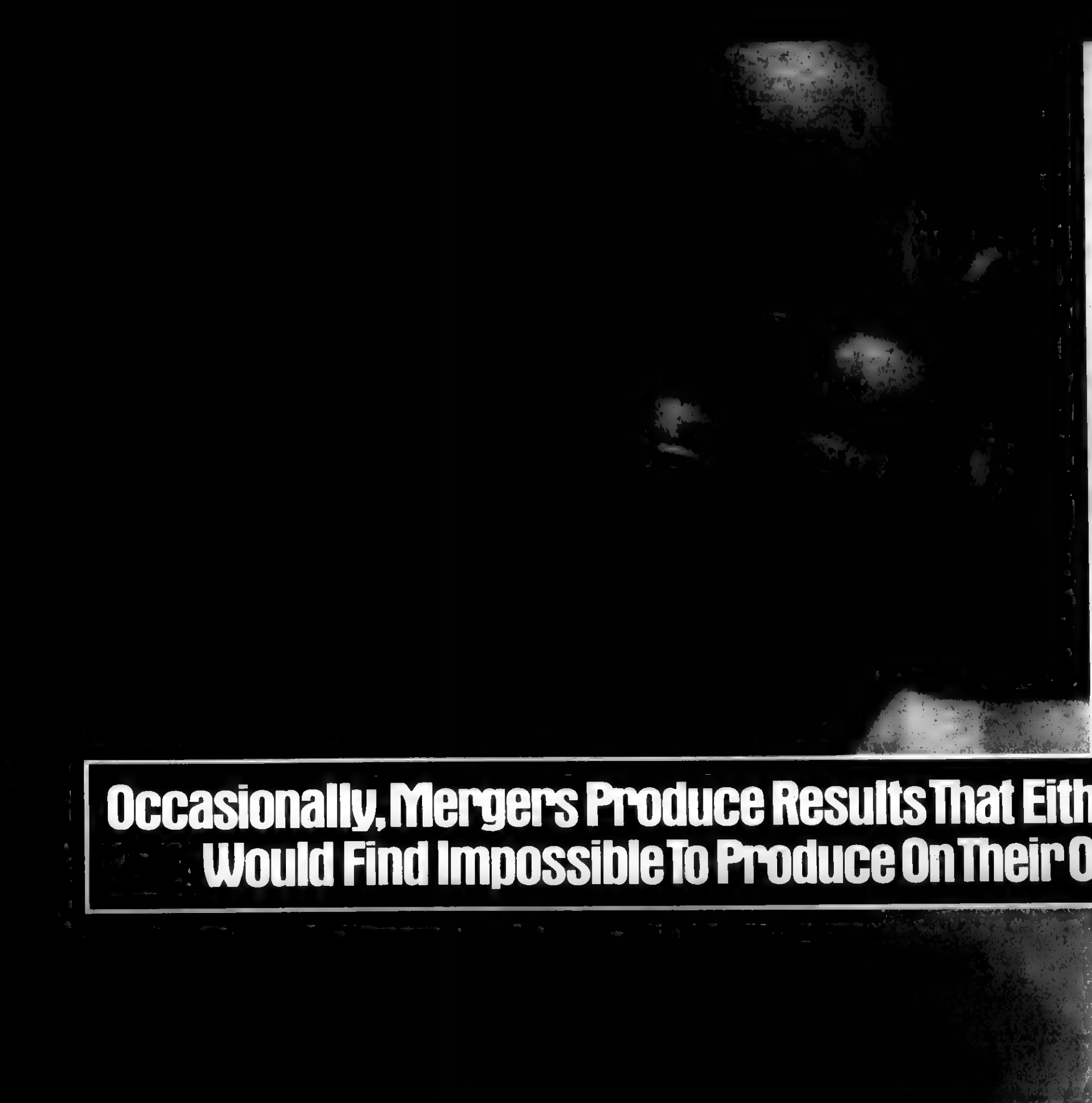

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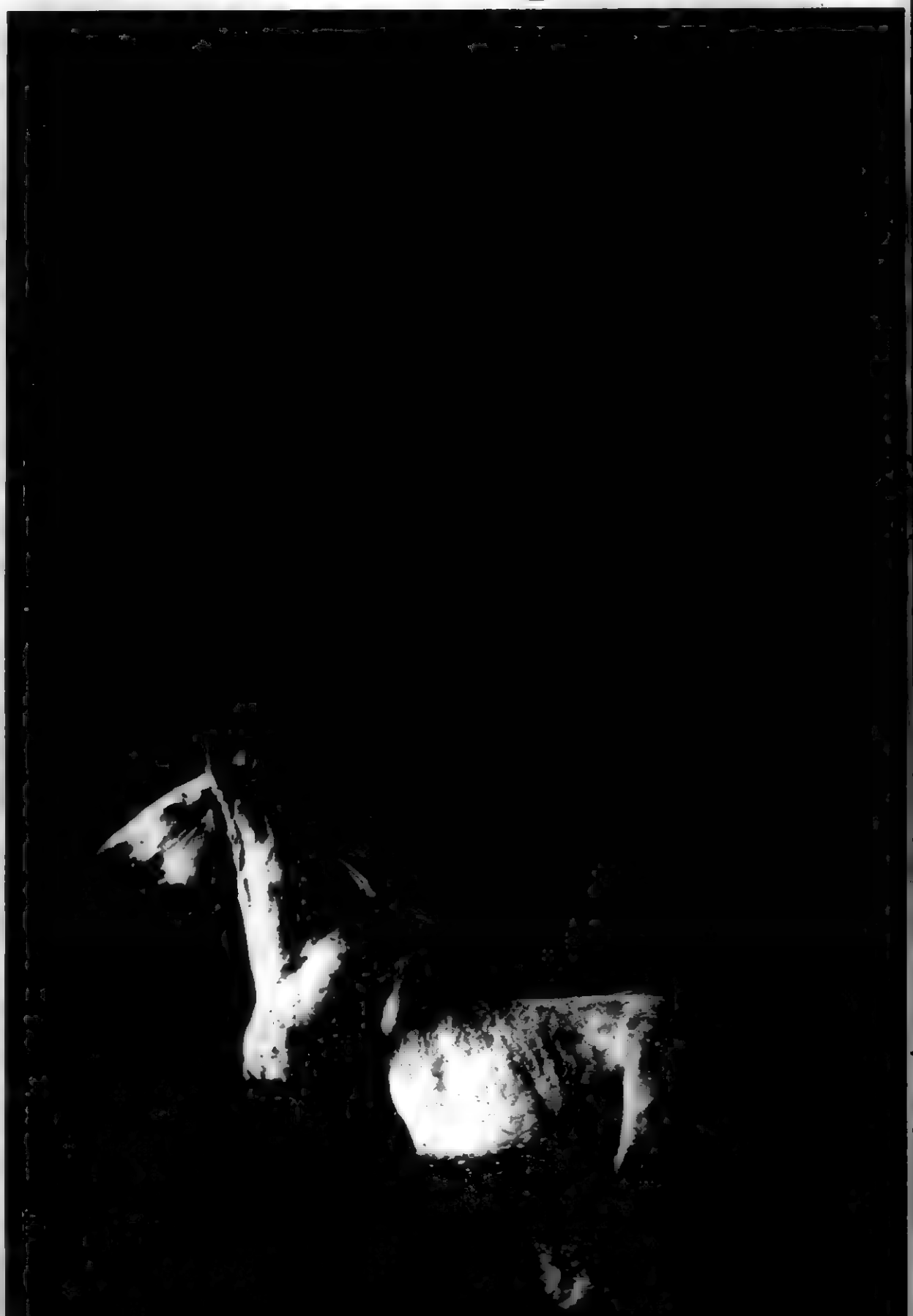

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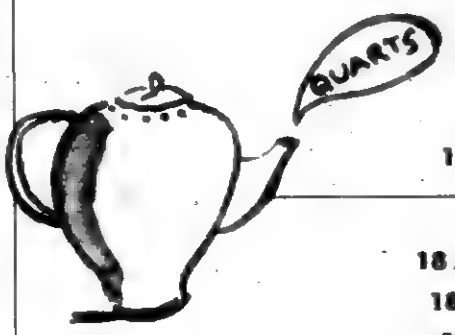

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COMPUTER CAREERS

Some bright spots in the IS trenches

BY CATHLEEN A. DUFFY

Want a new job but are too afraid to make a move during these economic dog days? Worried about your present job?

If you're a senior-level information systems executive in retail or banking (yes, banking), have a strong business orientation and live in the Midwest or on the West Coast, relax. IS consultants and recruiters say things aren't looking so bad for you next year.

For other IS professionals, there are a few glimmers of hope, but you'll have to know where to look for them. The following is a summary of projected hot and not-so-hot spots for careers in 1991:

• **Midwest is best.** According to several recruiters and consultants, the heartland gives IS the most reason to take heart. "The Midwest seems to be more stable because of the diversification of industry," says John Mengelt, a partner at the Chicago Search Group in Buffalo Grove, Ill. "If something else is down in the industry, there's always something else holding it up."

Although weaker than the Midwest, the West Coast is still seen as OK. Recruiters agree that the area is stable right now but could take a downturn at any time. For senior-level IS professionals, however, "the West Coast is very much alive," says Norm Sanders, a managing director at executive search firm Russell Reynolds Associates, Inc. in New York.

The East Coast, as nearly

Continued on page 6

Squeezing more from IS dollars

In a year of tight budgets, managers find creative ways to pinch pennies

BY JOSEPH MAGLITTA

If IS had a theme song for the New Year, it would be "Tighten Up."

Faced with leaner budgets and rising user demands, information systems chiefs in every industry are finding more creative ways to stretch their dollars.

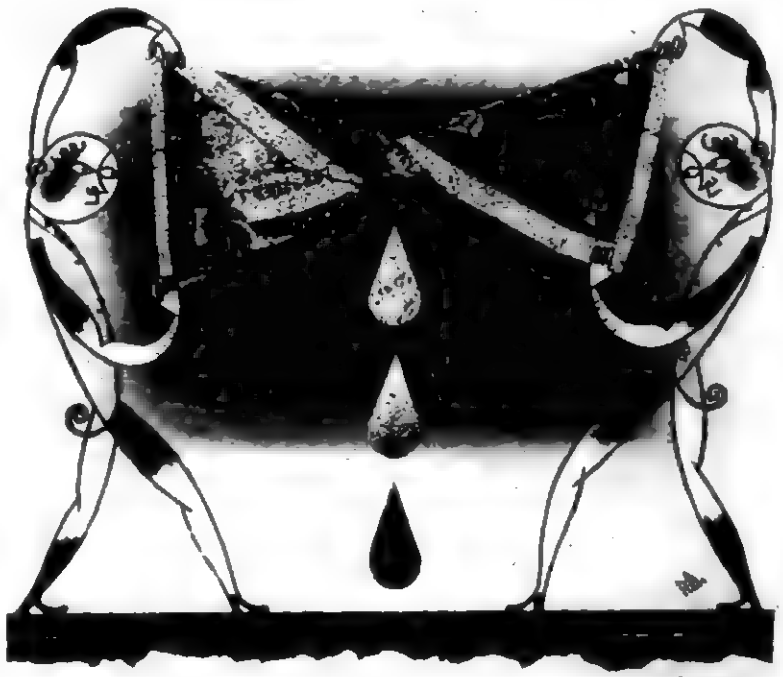
Tactics vary, but most come down to one thing, says John Piper, director of IS at Genex Ltd., a Des Moines, Iowa, distributor of industrial and medical gases: frugality.

Strategies range from trimming staffs, reorganizing departments and off-loading various tasks to employing user groups. Contract services and outsourcing are also popular. And many IS chiefs are scrutinizing work requests much more closely.

"There's an increased intensity of focus on the 'need to have' vs. the 'want to have,' " says Denis LaHood, president of Agway Data Services based in Syracuse, N.Y. "Technology isn't just being used because it's in vogue," he adds.

There will be plenty of chances for penny-pinching in 1991: Economists predict that dreary days will continue at least through the summer and possibly longer.

IS departments lucky enough to get increases will see hikes averaging 5.3%, according to Index Group, Inc., a Cambridge, Mass., consultancy. The firm's annual survey of 394 U.S. organizations showed that while IS budgets will grow modestly in 1991, most hikes will be far less than the 10% and 15% common in recent years. "The rate of increase has slowed to inflation level," notes Chuck Callan, an Index Group vice president. "We're about at ground zero."



Polly Anderson

Other less fortunate IS departments — especially in banking, manufacturing and airlines — face cuts of between 10% and 20% and possibly more.

Because situations can vary widely from company to company, consultants and IS chiefs say there is no universal cure for recessionary blahs. In general, Callan says, companies are looking at three remedies: redefining the IS function, outsourcing and attacking software maintenance.

Many organizations are working on several fronts. A few examples are:

• At Bethlehem Steel Corp., a 550-person IS work force is

Continued on page 4

Keep management hot about technology

BY MICHAEL L. SULLIVAN-TRAINOR

Warren Harkness is learning about keeping a technology project alive the only way there is: the hard way. Harkness, information systems director at Bose Corp. in Framingham, Mass., recently lost one of the firm's management sponsors at the crucial implementation point in a new bar-code scanning project. Through hard work and hustling, he was able to locate other supporters, and the project continued.

Harkness is one of the fortunate ones.

In these days of budget pressures and business breakups, the chances of losing sponsorship for a technology project are greater than ever. Funding can be cut because of a change in company priorities, supportive managers can disappear, and the whole nature of the company can shift through a takeover or divestiture.

So how do you keep management hot on IS during cool economic times?

First, by realizing that it *is* possible. For example, Frito-Lay, Inc.'s handheld computer project was frozen for 18 months by a change in top management. Revived by its initial sponsor, who was made company president, it became one of the best-known IS successes of the early 1980s.

The following are some practical tips for keeping technology initiatives alive and well:

• **Know thine enemy.** The key to dealing with the ebb and flow of project support, IS managers and consultants say, is knowing what type of problem you're facing.

According to Ralph Loftin, an IS consultant based in Newton, Mass., the three common project obstacles are reduced funding, loss of sponsorship or management change and "distractions." The latter are business or cultural issues that divert attention from IS.

• **Reschedule.** To counter funding cutbacks, IS managers should consider rescheduling a project. It can be extended over a longer period or timing can be shortened to move up deliverables. Projects should also be recast to match the current funding realities.

"If you're facing a 30% cut, don't pull the project back. Stretch it out,"

Continued on page 4

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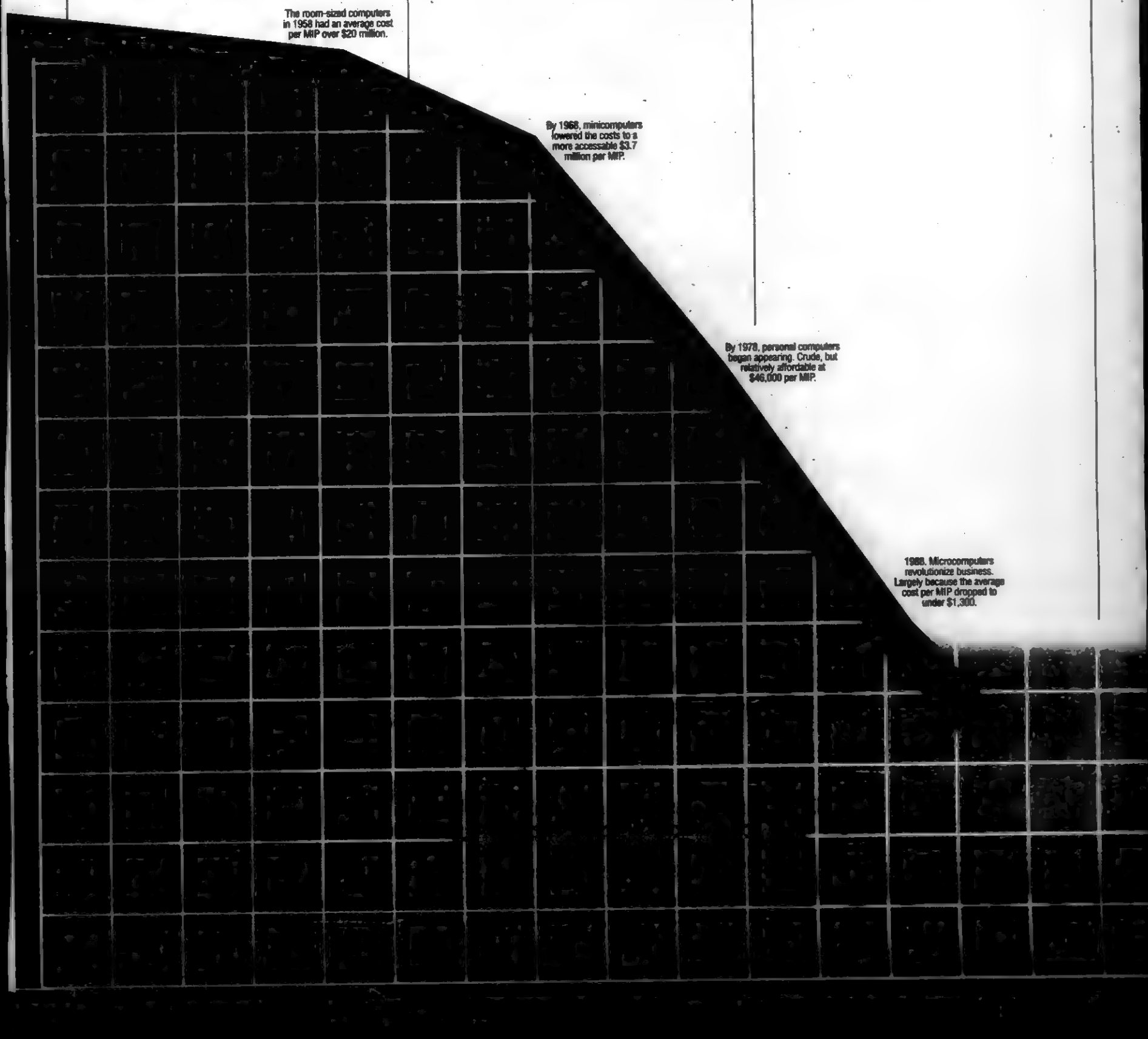


IS dollars

FROM PAGE 2

supplemented with 300 outside contractors. Merit and performance funds for permanent employees, however, are left untouched in this year's IS budget, says George Fugere, vice president of operations services.

Despite a 7% budget increase, he adds, IS projects are also chosen much more carefully at the Pennsylvania steel firm. "The skunkworks can't be off the wall," says the 34-year company veteran. "They have to stand the test of applicability."

• At Agway, a diversified manufacturer, LaHood works hard to maximize IS purchasing dollars by encouraging competitive bidding among vendors. "We don't single-source," he explains. "Competition is good for your company."

• Kendall Healthcare Products Co., a Mansfield, Mass.-based manufacturing firm, swapped an outside electronic mail contract for an in-house system.

The switch will save Kendall, which employs 8,000 people, about $120,000 per year, according to Roy Wilsker, manager of end-user services.

• Centerior Energy in Cleveland has taken several drastic cost-cutting steps. Specifically, the utility has restructured IS, greatly reduced staff levels, refinanced some hardware and consolidated three data centers into one, says Joseph Stricker, director of IS.

Moreover, all contractors and consultants have been eliminated, and some projects have been reduced in scope, Stricker says, adding: "We're looking at doing more generic applications instead of custom developing."

• At Genex, mainframe maintenance is now handled by a third party. The firm also recently purchased refurbished terminals instead of new ones.

• At Ashland Oil, Inc., the strategy is two-pronged, says D.H. Howard, director of systems: The plan is to boost the productivity of systems professionals while pushing out noncritical work to user groups.

To these ends, the Lexington, Ky., petroleum firm has rolled in various computer-aided software engineering and testing tools and is experimenting with having IBM's user support system handle end-user phone queries.

• At Caterpillar, Inc.'s Computer Technology Center in Mossville, Ill., some 900 people use PC-Write, a shareware package from Quicksoft in Seattle. At a cost of $14 per user, potential savings over commercial word processors amount to hundreds of thousands of dollars, office automation specialist Sharon Coons says.

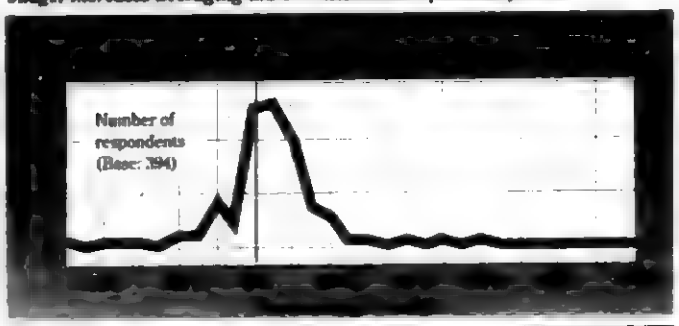
Similarly, the *Los Angeles Times* uses some 1,000 copies of PC-Write, yielding "substantial" savings, assistant systems editor Bart Everett notes.

• USAA is stretching its IS dollars by lengthening equipment write-offs on an IBM System/390 from five to seven years.

The benefit, explains Ken Thomson, is that "you use less budget money for the same equipment." The simple accounting switch lets the Houston insurer pass along cost reductions to users via lower charge-back costs.

IS budget growth slows

Many IS departments at large U.S. corporations managed to get 1991 budget increases averaging 5.3% — less than in previous years



Source: Index Group, Inc. CW Chart: Doreen St. John

• New England Telephone's training center in Marlboro, Mass., rents extra PCs to keep costs down. "We can't afford to keep 10 printers and PCs sitting in the back room," explains Bob Benway, a billing communications manager.

Buying and selling used equipment is also becoming a popular option. At the National Computer Exchange in New York, for instance, business has jumped 250% in 1990, according to President Robert J. Zises.

Ironically, IS groups in industries that have already weathered several years of tough times might be in the best shape to handle a souring economy. Many already have tight cost-cutting and containment measures in place. "We've been pulling in our horns all along," Fugere says. "So [the current downturn] is not a big deal."

Other organizations view the poor economy as just another bump — albeit a big one— on the long path to greater corporate competitiveness.

At the Berkshire Hathaway Insurance Group in Omaha, Tom Trotter, director of IS, says fears of a recession have not changed daily operations: "We aren't hiring new positions now, but we are replacing people who leave." However, Trotter says, pay raises may be affected if things get worse.

Similarly, at Loew's Companies, Inc., the North Wilksboro, N.C.-based hardware and building supply firm, "it's business as usual," says Frank Dooley, vice president. "We are being very conservative."

But IS chiefs say that all bets will be off if a shooting war erupts in the Middle East. If that occurs, they say, IS spending will undoubtedly be re-examined.

Silver lining?

Yet despite the bleak short-term outlook, many companies say they will forge ahead with key IS projects and initiatives. Ashland Oil, for example, is developing new disposal and monitoring systems and boosting staff development funds by 25% next year. Bethlehem Steel plans to continue a $30 million steel automation project. "Because things are tight, you just can't stop paying attention to technology," Fugere says.

If there is a bright side, it's that IS departments, despite tighter reins are, in many cases, seen as more valuable than ever to their companies. These days, Strickler observes, top management is very interested in "how the systems guys can help out the departments."

It would be bittersweet, but tougher economic times could actually boost interest in information technology even more in the coming months. In the meantime, IS is working hard to make every penny count. □

CW staff member Derek Slater contributed to this report.

Magiitta is a *Computerworld* senior editor, features.

Technology

FROM PAGE 2

Loftin advises. "In tight budget times, people are more concerned about getting more bang for the buck, so moving up the payback should help."

• **Share responsibility.** Another tactic for handling money problems is to let the business group share responsibility for funding and executing the project. "Once we get beyond the pilot stage, each project has joint sponsorship, and users pick up a large proportion of the cost," says Al Hyland, Polaroid Corp.'s IS director.

• **Get a new sponsor.** Changes in business sponsorship can be the toughest challenge for IS. The best prescription: Find a new champion *fast*. To secure the support of another influential executive, managers should determine how the project benefits the targeted sponsor and then sell it to him.

"You have to re-examine and confirm the benefits," Loftin says. "It's also important to relate them to the broader operation and strategy rather than deal on task level."

• **Show broad benefits.** When the change in sponsorship involves losing an executive, the dangers to a project can increase. That's because the new executive may want to assert his own plan and freeze everything that came before. Doing so is difficult if the project has intrinsic value to the whole organization. So it's up to the IS manager to make the case for broader benefits.

• **Sell, sell, sell.** How hard you have to work to keep projects going depends on the technology. New technology initiatives, for example, require constant selling by IS, because there's little proof that they will succeed.

Case in point: Poor interest threatened widespread use of computer-aided software engineering (CASE) at The Traveler's Corp.

Seeing a move toward corporate downsizing, IS made CASE a key unit in a new Application Services Division. The move created higher visibility and changed CASE from "an experiment to a contributor to productivity," says Susanne Niedzeilska, Traveler's manager for CASE application projects.

Even with this new support, Niedzeilska says she continually has to keep priming the pump of sponsorship interest. She does this by offering presentations on CASE benefits as they are achieved within the company.

"People sign up for a project because there is attention on it. After that attention fades, you have to face the inertia. You have to provide momentum through achievement of paced, short-term objectives," she says.

• **Enlist user support.** Another tactic to keep projects going is to get users to speak to other users about project benefits.

To recruit spokesmen for the project, IS managers should go back to supportive users and have them reassert their views of the project value. This can bring others around and prevent funding reductions, according to Loftin.

• **Compare data with "the enemy."** Outside information about competitors' activities can add new force to an IS manager's case.

Be warned: This tactic requires as many specifics as possible. The best case is made when competitors are using the same technology and getting a strategic advantage.

"It then becomes a competitive disadvantage if the project isn't accomplished," Loftin says.

• **Never stop communicating.** At Bose, Harkness spent most of his time "destroying myths" about the bar-code project. Project updates were put on the agenda of the management advisory council, which included the company president, vice presidents of manufacturing, finance and engineering, the general manager for audio systems and other directors.

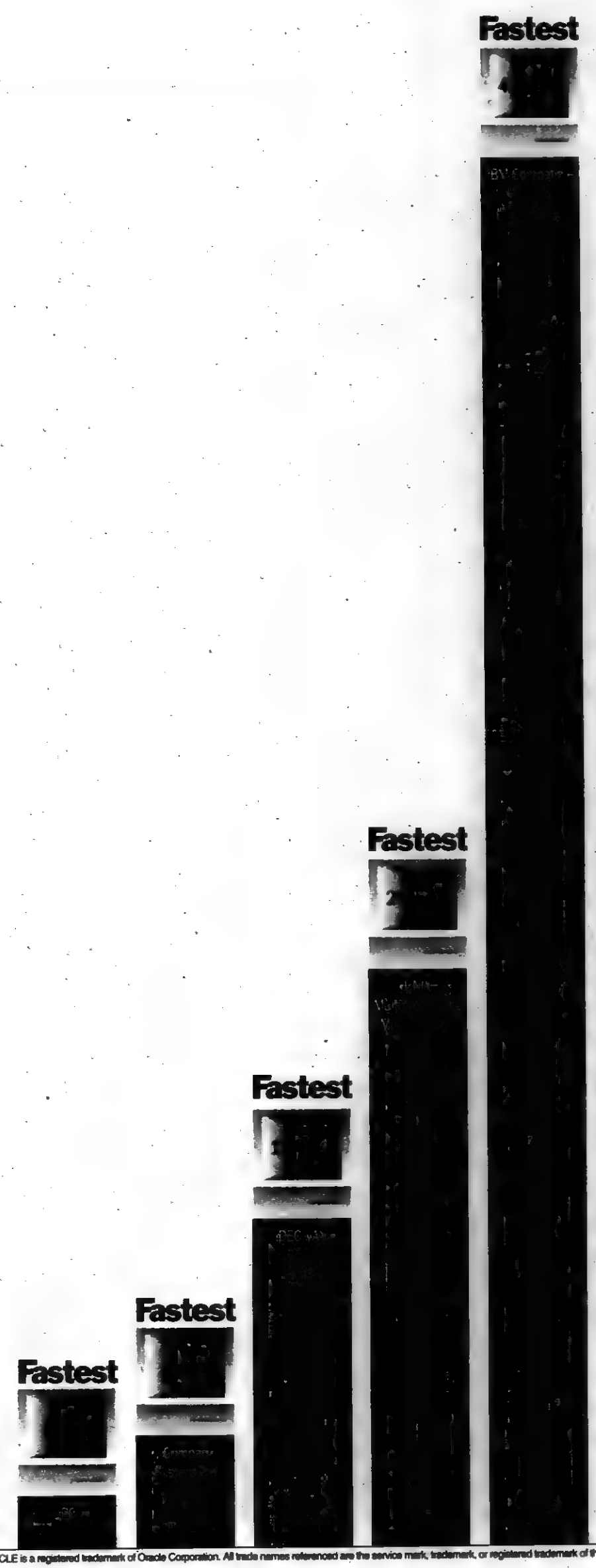
The pitch — which involved describing project benefits and detailing accomplishments — was well received. In one move, Harkness created awareness of his plans, eliminated negative opinion and dispelled incorrect assumptions.

• **Get out of the rat race.** The ultimate in protecting against loss management support is to stop playing the game altogether. That's what they did at Whirlpool Corp.

"We've just put in a new system to escape the conflicts of finding support for IS projects," explains Richard Koeller, vice president of information technology. The "value-oriented" process combines planning and budgeting. The result is that "users stay in control. IS takes over after the priorities are set and the resources are allocated." □

Bose's Harkness *knows the importance of project leadership*

Sullivan-Trainor is a *Computerworld* senior editor, features.



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Pacifying the power-hungry

Tips for handling MIPS-gobbling users without breaking your IS budget

BY DEREK SLATER

You have locked yourself in the castle, your meager supply of rations dwindling with each passing day. Carrion birds wheel through the darkened skies overhead, their calls shattering your fitful attempts at work. And outside the buttressed stone walls, an ever-growing horde of torch-bearing users cry out their demands, hammering at the giant oak door. How can the maddened crowd be pacified?

It's a recurrent nightmare and, increasingly, a reality that must be faced by information systems departments: End users clamoring for more power, speed and resources even as IS budgets groan under the growing weight of recession.

"Our load keeps going up, but we haven't really added staff," says David Long, director of IS at The Hotsy Corp., a high-pressure pump manufacturer in Englewood, Colo.

Long is not alone. Other IS executives say they expect user and budget pressures to grow even stronger in 1991.

"We've already received a bid from a user for the first 786-based machine we buy," says Roy Wilsker, manager of end-user services at Kendall Healthcare Products Co., a Mansfield, Mass.-based manufacturing firm that employs 8,000 people. "It's only partly tongue in cheek."

Where are the new demands coming from? Problem groups differ from company to company. But customer service, marketing, sales, accounting and administration top the list of users vying for attention from IS departments.

R. M. Kato

Increased user needs stem predominantly from a growing awareness of what technology can do. "People have discovered how much they can do with micro-based departmental systems and networks," says Robert Goldberg, vice president and manager of end-user computing at Providence, R.I.-based Old Stone Bank.

In the increasingly competitive business climate and job market, workers are eager to get the edge that new technology can provide. "They feel it will help them increase their productivity," Goldberg says.

Faced with the twin pressures of busier technical staffs and more demanding users, resourceful IS managers are finding ways to keep in-house customers smiling.

• **Empower users.** One common solution is to teach user groups to do as much as possible on their own.

At Kendall, efforts have centered on helping users retrieve more crucial information by themselves. Doing so lets users get their data faster, Wilsker says, "and also lets us leverage our time better to concentrate on more intensive IS functions." Like many companies, Kendall's central IS group now sponsors classes for end users.

Entergy Corp. is also focusing on helping users provide for themselves. Director of IS Planning Cy Hoorman has given many technical support responsibilities to staff members within end-user departments.

"In the past, the value-add that IS brought was familiarity with the technology," Hoorman notes. "Once the user departments reached a level of technical sophistication, we saw no reason not to turn that function over to them."

As a result, some of the expense can be passed along to the user departments, freeing IS dollars for other purposes.

Another benefit is faster service. Managers say support from the user department is usually quicker than sending someone over from IS.

• **Provide remote support.** Wilsker has developed another solution to the quick service problem: remote support. Kendall has purchased software that allows central IS to explore any user's personal computer over telephone lines. "To save time, we want to be able to just dial up any PC and poke around to see what the trouble is," he explains.

• **Exploit technology.** Another simple, yet effective, way of keeping users happy is to make sure existing technology is being used efficiently by IS.

For example, at Transport Life Insurance Co. in Fort Worth, Texas, phone lines were reprioritized to speed up user queries. Requests for policy information now go to the head of the phone queue, rather than waiting while less critical transactions fill the lines, according to Ronald Willis, vice president of MIS.

• **Get a plan.** IS managers say tougher economic times make it especially important *not* to treat the growing weight of end-user requirements haphazardly.

"It's a big enough issue that we're going to have to take a long look at it all, not just make a change here or there," Long says. □

Slater is a *Computerworld* staff member.

IS trenches

CONTINUED FROM PAGE 2

everyone knows, has an economy that's in the pits and sinking. But some recruiters remain optimistic, even upbeat. "Even though the papers say everything is falling apart, I don't think it's hopeless," says senior consultant Barbara Gibbs at Edward Perlin Associates, Inc. in New York.

She says that despite the blahs, there are still jobs at all levels, especially for systems architects and technical researchers.

• **Hottest jobs on the top, bottom.** Most recruiters agree that the greatest demand will be for low- to midlevel nonmanagement workers and top-level chief information officers.

In Houston, for example, the big need is for programmers and analysts, says John Froberg, associate director at recruitment firm Source EDP. "There are a lot of senior people down here, so there's ample talent to fill a position such as MIS director," he says. "Companies are tapping talent outside of the Houston area to fill junior- to midlevel positions."

Davis Gallison, a senior consultant at Coopers & Lybrand in Boston, agrees that on the troubled East Coast, lower level IS staffers will find more job opportunities than midlevel IS managers.

But recruiters across the nation say the biggest winners will be those on the CIO track.

"Technology is key, but the people who manage the technology are more important right now," says Steve Fogel, director of research at Korn Ferry International in San Francisco.

Recruiters add that placements for CIOs are much higher than for other IS job titles, which means more openings and better salaries.

• **Raises to vary.** In the hottest industries, high-level professionals can expect 15% to 25% pay increases this year. But recruiters say most gains will be more modest.

Projected hikes: Houston area, 5% to 8%; West Coast, approximately 5% but more bonuses; New York, about 6%.

In the Chicago area, firms are wavering too much to state an average raise figure, says John Rothschild, partner at Heidrick and Struggles, Inc. But he adds that top IS people with a business bent are "worth more than their weight in gold."

• **Bank on banking.** It's no joke. Recruiters say IS professionals will be greatly needed to help restructure systems and information flow at financial institutions that have been merged or downsized.

That's good news for everyone from programmers to IS managers, Gallison says. A range of skills, from re-application development to management, will be needed in overhauling and rethinking the systems, he explains.

Other IS growth areas for 1991 are likely to include retail, consumer goods and health care, recruiters and consultants predict.

• **Think globally, work locally.** Companies with a strong worldwide focus are expected to produce opportunities for IS professionals. In particular, Sanders says, globalized pricing and inventory will attract a lot of technology dollars.

• **It's worse in accounting.** Even with mixed prospects, IS workers are better off than colleagues in many other departments. "Overall, I don't think IS opportunities across the board and across the country will be hurt as much as other types of [office positions]," Mengelt says.

According to Gibbs, top-notch IS professionals will always be sought after, regardless of whatever downsizing takes place.

But recruiters warn against complacency. "Where once a company might have settled for a little less than they wanted — like a non-MBA — now they demand it," Mengelt says. □

Duffy is a *Computerworld* associate editor, features.

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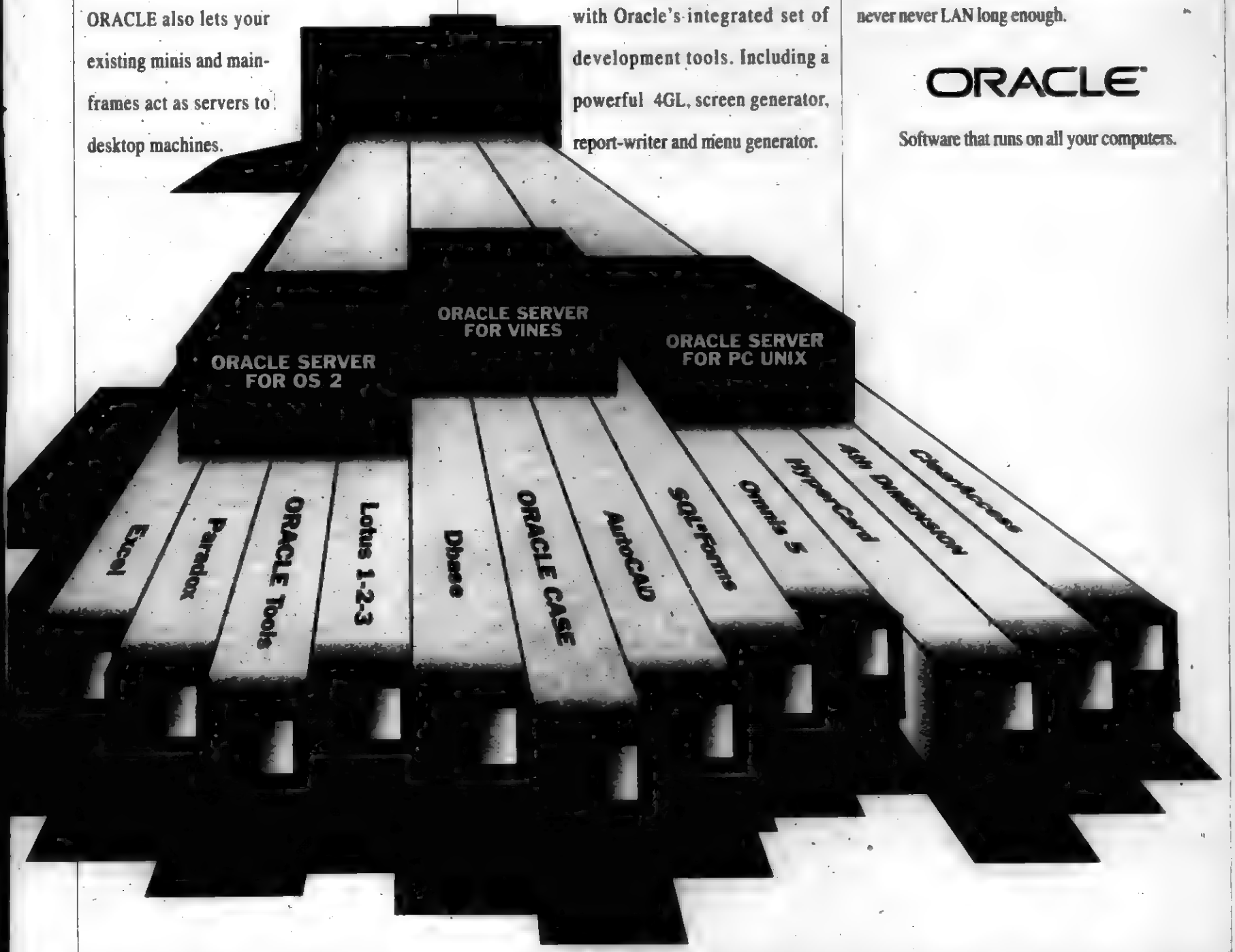

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Play the buying game with system vendors

Staying on top of the action in the industry can pay off in big savings when it comes time to make a purchase

BY DONALD ST. JOHN

"Every dollar counts."

In 1991, that maxim may be more true than ever. Information systems managers everywhere are expecting to have to use their budgets to the fullest, as companies try to do as much or more with fewer workers and less overhead.

The choice of tools was once mandated by the question, "What do we need to stay ahead?" That question is as important as ever, but now it's joined by its crucial counterpart, "How can I afford it?"

Affording often means getting the best deal possible from your vendor — and don't forget that your vendor is also trying to compete in a tightened economy. There are probably as many strategies for this as there are possible deals, but interviews with users revealed a number of approaches that are worth considering.

• **Do your homework.** The IS manager who knows as much as possible about what's available is most likely to get a bargain.

"I can't emphasize enough learning the economics of the [computer] business," says Tom Loane, director of information systems at Alamo Rent-A-Car, Inc. in Fort Lauderdale, Fla. "You've got to do hard homework to understand what's going on. If you don't, it's a very expensive way to learn."

Your grunt work shouldn't be limited to the specific product in mind, either. An imprudent buyer may make some gains on the product front, only to lose them in service terms and financing.

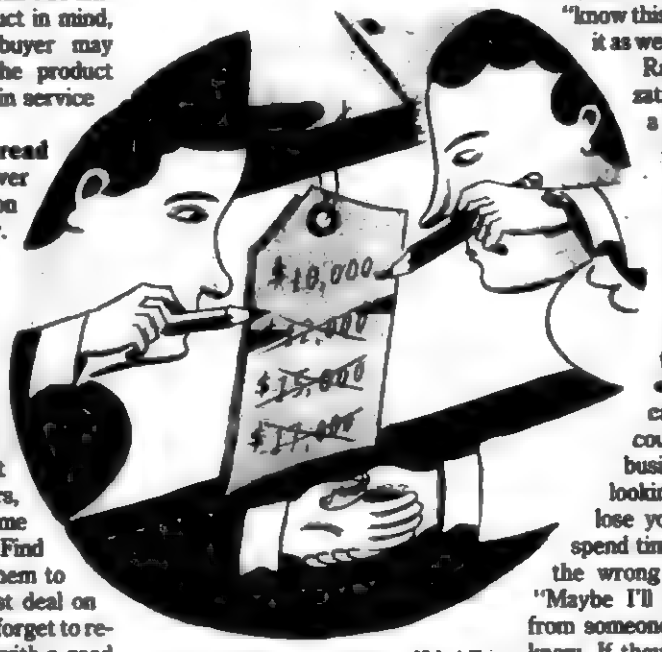
• **Read. Talk. Then read some more.** You can never have too many information sources, buyers say. Keeping abreast of the trade press is a must, as is reading such general business publications as *The Wall Street Journal* and *Business Week*.

Equally important is working the telephones to maintain market sources. "With PC dealers, we ask them to do some work for us — tell them, 'Find the best of X' and ask them to also help us find the best deal on that," Loane says. Don't forget to reward a successful effort with a good level of business, he adds.

• **Show what you know.** "The best tactic I have is to make sure my vendors know that I shop around," says Jacqueline Bynsdorf, personal computer support coordinator at Jockey International, Inc. in Kenosha, Wis. "When they know that, they know right away that I'm aware of the basic range of available price levels."

In larger companies, local purchasers can lean on their central IS buyers for information. "Our local groups can use our price to beat up a little on their local vendors, and I suspect they do it a lot," says Dave Strahan, manager of MIS administration at the Riverside, Calif.-based maker of motor homes and recreational vehicles.

• **Be up front with the vendor.** Surprisingly, the buyers surveyed don't always advise talking with vendor A, then turning around and calling vendor B to bid the price down.



Michael Klein

"If you do that, where does it stop?" Bynsdorf asks. "It would be in my best interests from a purchasing standpoint, but I also need to maintain support from [the vendors] to make sure that service stays good. I'd rather keep a good relationship with them and keep them aware that I do know what's available and for how much."

• **Don't shy away from working with your suppliers.** Establishing a solid partnership is another route to a "preferred customer" status that can yield benefits across a broad spectrum. C. W. Randall, vice president of telecommunications at Citizens and Southern National Bank of South Carolina, says alliances with AT&T, Bellsouth Corp. and Comdisco, Inc. have created partners that "know this bank and the people in it as well as anyone knows it."

Randall says his organizational chart at the bank, a Columbia-based subsidiary of CNS Sovran Corp., even has those firms listed. "They sit in on planning meetings, and they're free to go into any department or branch and work with the people there.

• **When necessary, call their bluff.** Of course, business is still business, and everybody's looking for an edge. Don't lose yours. "I don't want to spend time horsing around with the wrong things," Loane says. "Maybe I'll get one silly number from someone once, and I let them know. If they do it again — well, I don't *have* to work with them."

Bynsdorf employs an interesting strategy. When she gets a high quote from someone, she says she lets them know — and refuses to let them lower it. "Rather, I wait until the next time, and they'll usually come in lower on the next call," she says. □

St. John is a *Computerworld* senior editor, features.

A one-way street

Fortress Europe may bar transfers of personnel and customer data to the U.S.

BY MITCH BETTS

Sure, you can use that new global network to zap a personnel file to your office in Paris, but you may not be able to get it back to the U.S. again.

A proposal to regulate European databases of personal information — now winding through the European Community's superbureaucracy — would prevent the transfer of personal data from Europe to the U.S. if U.S. privacy laws are judged to be too weak.

"This has really frightened American multinational industries that are used to transferring personal information from one country to another with reckless abandon," says David H. Flaherty, a privacy expert at the University of Western Ontario.

Not surprisingly, American businesses are lobbying against the privacy directive, which is expected to be debated, revised and approved in 1991.

The measure stems from Europe's effort to achieve uniformity in its data protection laws and thus make it easier to transfer data among countries in the unified Europe of 1992. In essence, the European Commission wants to bring the five European countries that lack privacy laws — Belgium, Greece, Italy, Portugal and Spain — up to the level of countries (notably, France and Germany) that do have strict regulations.

The "transborder data flow" problem caused by uneven privacy laws has already snared some organizations, including the car company Fiat S.p.A. In 1989, a dispute with the French government's privacy commission over moving personnel files was resolved when Fiat agreed to follow French law.

Beata Sapara

Like the French and German privacy laws, the European Commission's draft proposal is based on the principle that people should have control over information files about them, including "informed consent" for the collection or transfer of personal data. The fundamental debate is whether that notion is too old-fashioned for the split-second world of interactive data communications and manipulation.

As a practical matter, getting permission from everyone in the database would stifle the free flow of information about financial transactions and credit reports, as well as employee and customer databases, according to Kenneth B. Allen, senior vice president of the Information Industry Association in Washington, D.C. "The major concern is that

Continued on page 10

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Industry Agenda: 1991
Axel Leblois, Chairman and CEO, IDC

1991 U.S. IT Spending Outlook
David C. Moschella, Sr. V.P., Worldwide Research, IDC

The Shifting Fortunes of the Networking Industry
Kim Myhre, Sr. V.P., Worldwide Consulting, IDC

The Restructuring of the Computer Industry
Panel Discussion, Chaired by David P. Vellante, V.P., Systems Research, IDC

Perestroika Comes to the Data Center: IBM and the MIS Revolt of the 90's
Frank Gens, V.P., Technology Assessment, Technology Investment Strategies Corp.

Managing Channels for Growth
Lee M. Levitt, Dir., Distribution Channels Research, IDC

Workstation Evolution: Up or Down
Vicki J. Brown, V.P., Systems Research, IDC

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One-way

CONTINUED FROM PAGE 8

the draft is totally unrealistic and onerous," he says.

However, Martin Bangemann, the commissioner in charge of the directive, argues that privacy is a fundamental civil right of Europe's citizens and that it must "not be sacrificed one-sidedly for economic interests."

Europe's privacy advocates are worried that businesses may evade the rules by moving their information processing operations to "data havens" (countries with little or no privacy protection).

Consequently, the European Commission's proposal bans the transfer of data to outside parties that lack "adequate" privacy laws — a characterization that might include the U.S.

The U.S. may be able to overcome this if it passes a bill sponsored by Rep. Robert E. Wise Jr. (D-W. Va.) that would create a nonregulatory Data Protection Board to advise the public and private sectors on privacy issues [CW, May 21]. But even this bill, which is far from being passed, may be too weak to satisfy Europe.

How good is U.S. privacy?

The question of whether privacy protection in the U.S. is really deficient has not been answered. The U.S. does not have an all-encompassing federal privacy statute, but it does have privacy laws in certain sectors, such as electronic mail, as well as numerous state privacy laws.

U.S. corporations will be trying to make that case as they lobby the groups that handle pan-European policies — the European Commission, the European Parliament and the Council of Europe.

However, the Europeans will not take kindly to criticism from Yankee businesses. Changes in the directive are more likely to come from lobbying by European businesses that happen to share U.S. concerns, as well as from the conservative German and UK governments, says G. Russell Pipe, publisher of the monthly journal *Transnational Data and Communications Report* in Burke, Va. □

Betts is *Computerworld's* national correspondent, based in Washington, D.C.

MINI POLL

How will you be spending time and money in 1991?

"We are planning to split our production into two different systems and toward the end of 1991, put them back on a single system. Right now, we have a System/38 Model 700 and two Application System/400s."

Frank D. Nester, *director of data processing, Summit Consulting, Inc., Lakeland, Fla.*

"We will be buying PC-related software and spending money on mainframe direct-access storage devices. Our mainframe system is an IBM-compatible Amdahl computer, and we have several hundred IBM-compatible PCs.

The DASD purchase is just for corporate data growth, the programming tools are an attempt to make our programmers more efficient, and the PCs and the PC software are our attempt to have a more controlled design environment."

Robert Kramer, *director of software development, Student Loan Marketing Association (Sallie Mae), Washington, D.C.*

"Everything that we are putting major efforts into in 1991 revolves around the questions of either customer satisfaction or total quality — from the corporate perspective down to an internal IS perspective. Things high on our list are general measurement of business activities, better documentation, better business flows in the company and benchmarking.

"We are dealing with linkage issues such as electronic data interchange. We have also started customer surveying to get a better idea of what expectations are."

Michael J. Thorsen, *vice president and chief information officer, Datacard Corp., Minneapolis*

"Out of a budget of approximately $52 million dollars, we will be spending $25 million dollars on existing people, $15 million dollars on hardware and the rest on communications.

"I expect we will be in a [computer-aided software engineering] pilot project. We may start an artificial intelligence project, and we may be doing a little R&D for imaging."

Ben Rosenman, *senior managing director and chief information officer, Bear Stearns & Co., New York* □

JODIE NAZE

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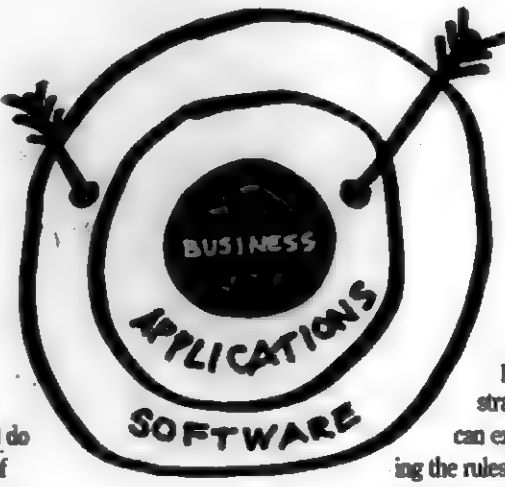

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Europe ho!

A guide to the subtler IS issues expanding into Europe

BY ALAN J. RYAN

For information systems managers in U.S.-based companies planning to do business in the new unified Europe, Big Ben's ticking is a reminder that there is no time to waste.

While analysts say it's unlikely that every goal outlined by the European Economic Community (EEC) will be completed by Dec. 31, 1992, many of the plans to lift trade barriers will be implemented during the next two years.

The most obvious concerns of companies doing business in Europe, or hoping to do so, involve systems and telecommunications compatibility. However, experts say there are many more subtle issues that also need to be studied.

According to international consultants and IS managers who have set up operations in Europe, IS groups in 1991 need to help their companies rethink how information technology can be better deployed in various areas.

At Polaroid Corp. in Cambridge, Mass., for instance, the IS department is helping simplify overseas trade and developing Europe-wide pricing systems. "We have to do some consolidation of our software across several countries," explains Al Hyland, director of worldwide systems.

Yet IS managers will need to look beyond the technical aspects of Europe 1992, says John Diebold, chairman of The Diebold Group, Inc. in New York. Broader issues of overseas data center consolidation, staff downsizing and IS departmental structures must also be considered, Diebold says.

According to users and analysts, several business functions will be considered most important in the coming year for IS managers at companies expanding into Europe:

• **Distribution and inventory control** offer great opportunity for IS impact in the new Europe, says Shaku Atre, a partner at Rye, N.Y.-based Atre Computer Assistance, a division of Coopers & Lybrand.

A good example is American Cyanamid Co. in Wayne, N.J. In 1991, the IS group at the pharmaceutical firm will continue work on systems to improve the company's distribution throughout Europe. This in turn "will lead to improved customer service," says Robert L. Jarecki, director of international information services.

• **Marketing and sales** will feel the changes of the European Community even more than manufacturing, consultants say.

However, companies planning to develop or consolidate systems for these tasks should plan carefully, Atre warns. Different cultures require different marketing approaches, she notes. For example, an advertising campaign that may succeed in Germany may fall flat in France. Thus, a continentwide pitch and unified supporting systems are unlikely to work. "No computer system is going to change the culture overnight," Atre says.

Another related challenge for IS is converting sales commissions into different currencies. For instance, if a Rome-based salesperson sells something in Sweden, or vice versa, IS will need to devise an equitable system for handling conversions. With currency exchanges changing daily, this won't be easy, consultants say.

• **Manufacturing** presents another, though more subtle, challenge for IS. The basic problem, consultants note, comes from dealing with two different weight and measurement systems. Nearly all of the EEC countries follow the metric system, but the UK and the U.S. do not. Thus, transferring manufacturing equipment between different countries could be difficult and would require software that could accommodate and translate the different systems.

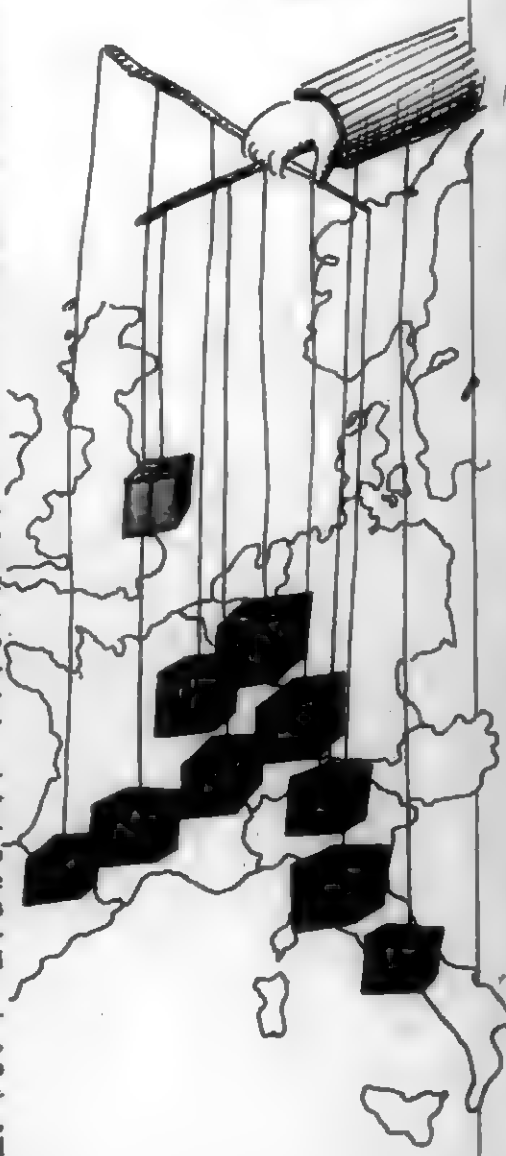
• **Data protection,** privacy laws and national sovereignty issues will also affect IS, says Aidan Walsh, international director at KPMG Peat Marwick and director of its Europe/USSR Center. "Someone in France might wonder whether someone in Spain should have the right to access information on French citizens," he says (see story page 8).

Issues related to transborder data flows may mean that U.S. companies doing business in Europe will need to create a new type of IS worker, such as senior vice president of international communications or transborder data, Walsh says. That job should involve ensuring that the company complies with not only international law but also with U.S. and European law.

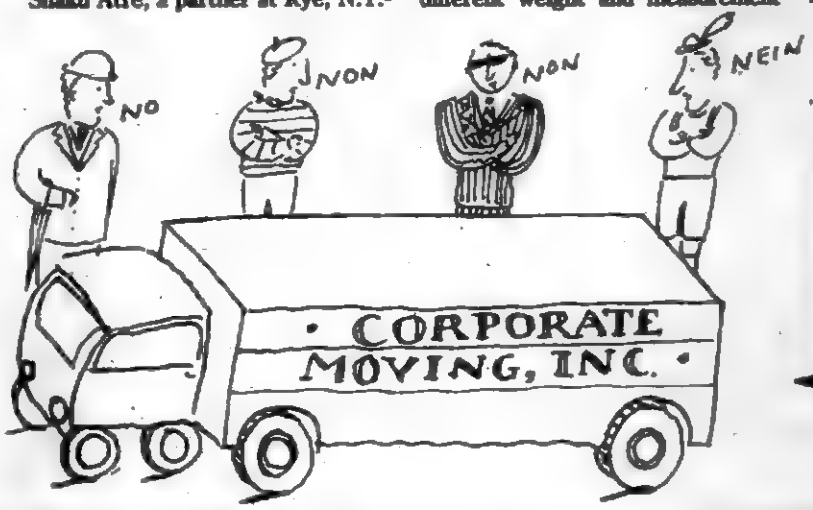
• **Human relations** and cultural differences in each European country could also affect IS and personnel systems. Many Europeans are averse to moving from city to city, let alone country to country, Atre notes. This means that firms with plans to centralize application development will probably have to hire new workers.

Even when companies are successful in persuading people to move, there will be other issues for IS to grapple with, including varying compensation plans, retirement plans, payroll, medical benefits and several other areas of concern.

"Human resource systems would have to evolve to allow for options packages that would differ country by country," Atre says. The biggest challenge, she adds, will be to avoid building a human resources system that becomes complex and too difficult to manage. □



Ryan is a *Computerworld* senior writer, features.



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Jay's users agree, especially the 45 mechanics who man the phones helping customers who have car trouble.

With SAA applications in multiple windows, they provide a level of service that's truly unique: diagnosing the problem, finding the best nearby garage, estimating the cost, negotiating discounts, determining warranty status, scheduling preventive maintenance and more, all while keeping detailed records, in minutes, in one phone call.

To a salesman stuck on the road, that's money in the bank. Ditto for GE Capital Fleet Services.

Easy to learn.

Says Jay, "We bring customers in and show them what we're doing. Nobody walks away unimpressed, and in fact, SAA's helped us win a number of new accounts."

Another big SAA advantage is training time, or lack of it.

"When we first got running, we went to the mechanics' area for a training session, to get some thoughts for writing a manual. We started at one end of the room, spent a few minutes with each guy, then moved on. We weren't half-way across the room when the first people were actually using the system, doing real work. We never did write a manual."

Easy to live with.

Their system is now running about 35,000 PC-host transactions a day, and Mr. Dinwoodie estimates that traditional technology would require about 250,000 transactions to accomplish the same work. He says, "Our SAA apps are just incredibly efficient, and they've been completely reliable."

How strange that some people are still asking if SAA is for real.

"It's just a question of confidence," says Jay. "We knew exactly where we wanted to go and that ultimately SAA was the only way to get there. So we took that first step, we've never looked back, and expectations—both ours and our customers'—have been exceeded."

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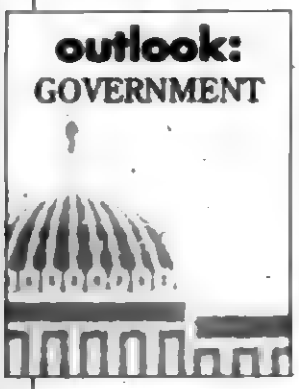
A slow year? Not in Washington



BY GARY ANTHES

A weakening economy may idle some in the computer industry, but industry lobbyists will stay busy in the new year, tracking and pushing diverse issues through the courts, the halls of Congress and the dockets of the regulatory agencies.

• National supernetwork. Attention will continue to go to a program for developing a national multigigabit/sec. research and education network.

A bill introduced by Sen. Albert Gore Jr. (D-Tenn.) was approved by the Senate this fall but not considered by the House, sending it back to square one in the next session of Congress.

The High Performance Computing Program was conceived as a five-year, $1.9 billion effort. It is intended to spur the development of a national data superhighway available to millions of government, academic and commercial users. Another goal is to speed the development of ultrafast supercomputers and to beef up training and education in computer science and related disciplines.

Interagency disputes over the network, which nearly killed the bill earlier this year, may resurface. And it is not clear that President Bush wants to hand a public relations coup to Gore, a man known to covet the White House himself. Even so, federal agencies are moving ahead with key portions of the plan by borrowing funds from other programs and getting more funds from Congress through normal appropriations.

"What Gore's doing is clearly in the national interest, and it has the widest possible support," says Eugene Eidenberg, executive vice president at MCI Communications Corp.

• Computer fraud and abuse. A bill that would have extended and modernized the 1986 Computer Fraud and Abuse Act was unanimously approved in the Senate but not considered by the House. Sen. Patrick Leahy (D-Vt.), the bill's sponsor, is likely to try again. Among other things, the bill would make it a misdemeanor to "recklessly" transmit destructive software and would provide for the payment of compensatory damages to people suffering losses caused by computer abuse.

Watchers of the Leahy bill say it is the best of a crop that includes some House bills dealing with computer crime.

• Long-distance deregulation. A number of telecommunications issues continue to simmer, and some are nearing the boiling point. The matters are complex, but they revolve around two fundamental questions: At what pace should the deregulation of AT&T proceed? What regulatory restrictions ought to apply to Ma Bell's children, the "Baby Bells?"

Tariff 12 allows AT&T to offer discount packages of voice and data services to large customers. Its future is uncertain, however, because of a recent court ruling that questioned its approval by the Federal Communications Commission.

The commission is now expected to draft a new justification, and some Tariff 12-like offerings are likely to remain after a period of customer confusion and delays.

Most observers say they believe FCC Chairman Alfred Sikes will move forward with deregulation in some areas.

The Baby Bells are also yearning to be free. The regional Bell operating companies want to manufacture telecommunications equipment and offer information services, both proscribed by the AT&T divestiture judgment. Legislation is likely to surface to permit entry into the new areas as long as the Bells do it via arm's length subsidiaries.

• Looser export restrictions? In 1990, progress was made toward loosening restrictions on the export of computer and telecommunications gear. But confusion remains as to how federal agencies will administer recent guidance from the White House.

Many in the industry say they believe that existing laws and regulations do more to harm U.S. competitiveness than to safeguard national security, particularly with the easing of Cold War tensions. □

Anthes is *Computerworld's* Washington, D.C., correspondent.

Bend me, shape me

What's the best shape for IS in the 1990s? Maybe Silly Putty

BY CLINTON WILDER

With recession upon us, plans to centralize and consolidate information systems operations are in full swing across corporate America. General Electric Co., First Interstate Bank, Avon Products, Inc., Ameritech and Eastman Kodak Co. (in connection with its outsourcing to IBM) are but a few of the Fortune 500 heavyweights in the midst of consolidating data centers.

The breakup of the traditional, centralized glass house over the last two decades was critical to integrating IS with business strategy. Now, however, some companies are finding major cost savings and strategic benefits from recentralizing operations.

"In the 1970s and 1980s, a lot of companies said they wanted to decentralise IS because that made them feel warm and fuzzy," says Dudley Cooke, president of the Executive Insight Group consultancy in Bryn Mawr, Pa. "Now, in a recession, they look around and say, 'Why are we spending so much?' "

Central debate

Yet 1991 may be the year in which the centralized vs. decentralized debate finally ends. A new organizational model is emerging that combines both to be flexible enough to adapt to changing business conditions. Neither a pyramid nor a network, perhaps the best model is Silly Putty.

The new, hybrid structure was the topic last summer in a *Harvard Business Review* article called "The 'Centrally Decentralized' IS Organization," written by Ernest von Simson at The Research Board.

For example, Arco Alaska, the Anchorage, Alaska-based subsidiary of Atlantic Richfield Co., recently created a network services group to centralize management of nearly 26 separate networks that had sprung up in the organization.

"Now all the networks will be managed in the same way, and we won't get 400 solutions to the same problem," explains Jim Porter, manager of administrative and information services.

Fifty-six of the 100 companies in the 1990 *Computerworld Premier 100* say their IS organizations are already a mix of centralized and decentralized functions; no less than 43 have recently merged or consolidated data centers.

Another good example of the new hybrid approach is Stamford, Conn.-based General Signal Corp. Despite its corporate organization as a highly diversified and decentralized manufacturer, General Signal centralized nearly all of the processing for its autonomous business units into two data centers. When recession pressure forced even more cost-cutting last year, it consolidated the two centers.

But what is the proper mix of centralized and decentralized functions? It may be a cliche, analysts say, but the answer depends on the corporation's culture or, more accurately, corporate technology culture.

Phil Marden

"If users have no problem adapting to new technology, then [central control] can be very loose," says John Sifonis, a vice president at Temple, Barker & Sloane, Inc.'s information management systems group in New York. He cites American Express Co. and United Services Automobile Association as heavily technology-oriented companies that have successful IS strategies mainly controlled by business units.

A consensus has emerged that setting technology and architecture standards, approving major purchases and identifying cross-functional systems opportunities are functions that should be managed centrally.

Conversely, there is agreement that business applications development should be in the business units, where IS and line managers can work together in response to customers and markets.

No matter what structure seems appropriate, Cooke says, the most important thing is to continue to be flexible — a practice he calls "rightsizing." The failure of some past organizational models, he states, was the failure of companies using them to stay attuned to changing business times.

More firms are seeing the value of placing IS people in a business unit but having them continue to report centrally to the IS executive. Microage Computer Centers, Inc. in Tempe, Ariz., made that move in late 1990.

"I have some very sophisticated users, and some that are not," says Chief Information Officer Tony Urso. "In the latter case, if I had the person reporting [to the business manager], there is a high probability that he wouldn't be used effectively because the user did not see the need for him in the first place."

That's being neither centralized nor decentralized; that's being flexible — a term that just might become *the* buzzword for IS in the 1990s. □

Wilder is *Computerworld's* senior editor, management.

INTERVIEW

End of IS budgets as we know them?

Forget cost-justifying, says maverick consultant Peter Keen — technology is infrastructure

After IS for competitive advantage and business re-engineering, what's next? The end of IS budgets as we know them, says Peter G.W. Keen, executive director at the International Center for Information Technologies in Washington, D.C. In an interview with Computerworld *Senior Editor Michael L. Sullivan-Trainor, Keen tells managers how to reframe their firms' cost-based approaches to information technology.*

John Martini

Keen: *Learning lessons from electricity and railroads*

Why can't IS managers successfully cost-justify their companies' investments in information systems?

You can always cost-justify applications, because you've got something to trade off — the benefits of the applications. But the difficulty is that when you're trying to cost-justify or even business-justify the infrastructures that enable those applications, they're all cost and no benefit.

For example, if you're looking at cost-justifying a global network, you can't, because the benefit is in the applications they make possible. But without the network, you can't have the applications. On the other hand, when you build the network, you don't know what the applications are going to be.

What led you to this conclusion?

I went back through previous efforts to look at the business value of big infrastructures. First, I chose the U.S. railroads, because everyone knows they had business value. Even economists can't measure the business value of the railroads. They can look at the business value of the applications — improvements in publication time for newspapers, freshness of vegetables and moving cattle from Chicago to San Francisco.

I then looked at the British industrial revolution and found that you don't get instant benefits from infrastructures. You put the infrastructure in place first. Then there's a long learning process, applications emerge, and some of them work and some don't. Maybe 50 or 100 years later, you know what the overall impact was. So the massive investments of the British industrial revolution don't provide measurable payoff for about 70 to 100 years.

My final example was electricity. When electricity first became commercially available, there were no meters, so companies would contract with a large supplier like Westinghouse Electric or Edison to have a power plant built for them on a fixed cost basis, and they used the lot. When the meter became available, it allowed the creation of things like the Tennessee Valley Authority, many small businesses and home markets.

How do you sort out the business value of the meter vs. the business value of electricity? That's the problem we have in our field. How do you measure the business value of the personal computer vs. the business value of Lotus' 1-2-3 vs. the business value of the network that gets information to 1-2-3 vs. the business value of the information itself?

How can IS solve this?

Investment in information technology looks more and more like research and development, where spending on R&D is a deliberate decision to lower this year's profits because people at the top feel something has to be protected to generate next year's profits or profits 10 years from now.

Coming back to the original question, I don't think it's the job of IS to justify the business value of the applications. That's up to the business units. If they are asking for very scarce capital, they should be accountable for the benefits.

What is the role of IS then?

IS must be much more accountable for its real costs. What I find is that we don't know our costs. As we spend money for development, we're really using development as a loss leader for maintenance and operations. For every MIP of PC power we add outside the data center, we're actually adding about 3.7G bytes of disk storage in the data center. So my rule of thumb is, when we quote the price, it's actually only 20% of the cost.

Besides determining the true cost of systems, how can IS managers change their companies' methods of evaluating expenditures?

They should encourage distribution of responsibility. If we're going to distribute the technology and distribute development, we must distribute business justification. In other words, I think we will see the end of IS budgets, because an application request is a request for capital that will go somewhere else. Now, if the business unit can justify that, then let them take the money away from advertising or hiring or whatever. They must determine whether their investment in IS applications is going to provide a higher rate of return than investment somewhere else.

In distributing the responsibility for costs, where would you choose to draw the line between users and IS?

The IS side looks more like the CFO than anything else. The CFO does not control what people spend their money on. He controls the methodology and standards for spending it. The CFO does not own the calculators people use, but he certainly has massive influence on the financial strategy of the company. IS is moving in that direction.

How can IS managers make these changes in the midst of the current cost-cutting atmosphere?

We can show that if you're not growing the IS budget 15% to 20% per year, you're falling behind the business needs. Any fool can cut costs — you just lay people off. We've really got to look at how we can protect the business needs and business efficiency. If we need to go back and ask for more money, we need to do it.

If we get into treating IS as just another cost, going along with the cost-cutting mentality, then in fact, we'll never get back in the game. A lot of the outsourcing is the notion that you can get rid of the cost. Could you imagine anyone outsourcing R&D?

If you're not increasing your IS budget by 15% to 20%, you're falling behind. What is your source for that figure?

That's been the historical rate of overall growth of IS in the economy for 30 years. Every time there is a breakout technology like PCs or office automation or end-user computing, the natural rate of demand growth is about 40%.

Besides, that is the way development compounds maintenance. For every dollar you spend on development, you're going to spend 20 cents on operations and 40 cents on maintenance and enhancement. So if you've committed a dollar of development, you've actually tied up $4 of capital for five years. If you grow the IS budget at 10%, at some point you're going to run out of maintenance or development. It's only in the 15% to 20% range that you can relatively keep them in balance.

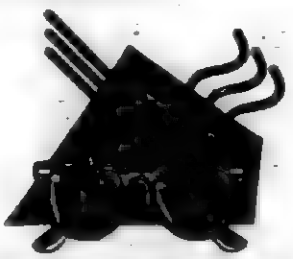
If we can't persuade people that the IS infrastructures are in the same category as R&D, then we're going to see the budgets cut again and again and again. The chairman of a pharmaceuticals company said that his job is simple: All he has to do is protect the company's cash flow so it can afford its R&D. That's the attitude you should take to [information technology]. Which part of it is worth protecting the way you protect R&D?

All the things on competitive advantage and business process re-engineering need to feed into that, but they are not the purpose in and of themselves. It should be business process re-engineering so we can streamline our companies to reduce the organizational cost of service.

All of us, when we talked about competitive advantage — we never actually looked at the price tag. So we haven't given a convincing economic model. We get very angry when CEOs keep trying to cut IS costs, and we see that as a failure on their part. But I think it's as much a failure on our part. We haven't given them a convincing reason for them to treat us like R&D. □

OUR 4th ANNUAL DUBIOUS DISTINCTION AWARDS

"Being serious is not a liability when you're talking about computers." — *Buzz Luttrell*
The best of the worst. Compiled by Neil Margolis and Joseph Maglitta. Editorial cartoons by Rich Tennant. Illustrations and design by Tom Monahan.



You bring the zither, I'll bring the crystals

Andersen Consulting created a new management slot for a "Director of New Age and Enterprise Systems."

What are they gonna call 'em? Medium systems?

Psychic prophet Will Loy included in a spate of predictions the news that we will soon be entering "a new age of miracles" that will include "supercomputers that talk to God and communicate with the dead."

Headline from press release dated June 12, 1990

Mips and Daewoo announce broad licensing agreement

Some companies will do anything to make a buck.

At the sign of the golden ballistic arches?

From a press release announcing the promotion of Marketing Director Ken Shrimplin to vice president of sales at Tustin, Calif.-based CMS Enhancements, Inc.: "Mr. Shrimplin . . . has been in the computer industry for 22 years, including positions with McDonald *(sic)* Douglas Corporation . . ."

The 1990 No Bell (And No Whistle, Either) Peace Prize

To Allen Michels and Matthew Saunders III, co-founders of Ardent Computer, Inc. and, later, executives of Stardent Computer, Inc. Within one year of Ardent's "merger of equals" with rival workstation vendor Stellar Computer, Inc., the pair hauled Stardent's Japanese partner and major investor into court. The charges: Conspiring to steal the firm's technology and siphon it off to a Japanese-controlled subsidiary.

Another gem from the folks who brought you the New Age and Enterprise Systems job slot

An Andersen Consulting public relations representative called a reporter to set up a "personal press conference." Asked what such a thing might be, the PR rep replied, "Oh, that's really just a telephone interview; you know how us marketing people are!"

Headline from a May press release announcing a planned merger between Siemens AG wholly owned subsidiary Dr.-Ing. Rudolf Hell GmbH and Eschborn, Germany-based Linotype AG

Linotype and Hell plan to join forces

Q: When? A: When Linotype freezes over . . .

Headline of another May press release

Errol Flynn accepts leading role at Xircom

But this is only to tide him over until something really tempting opens up at a swashbuckling firm . . .

Hopefully, the software is a little less finicky

As a promotion for one of its software programs, Quarterdeck Office Systems sent its customers and the press wristwatches bearing the message "Building OS/2 power to DOS." But would-be wearers reported that the watches were able to run only when hung on the wall.

Yes, we're positive they weren't party girls

Former Fidelity Investments IS executive Michael Simmons, in a Feb. 8, 1988 profile in *Computerworld*, had harsh words for colleagues who job-hop when the going gets tough. "They're prostitutes," he said. "They don't have to live with the results that they propagate on someone." Since then, Simmons has made two job changes in two years, moving from Fidelity to Bank of America and then to Bank of Boston.

The 1990 Sex Sells Awards

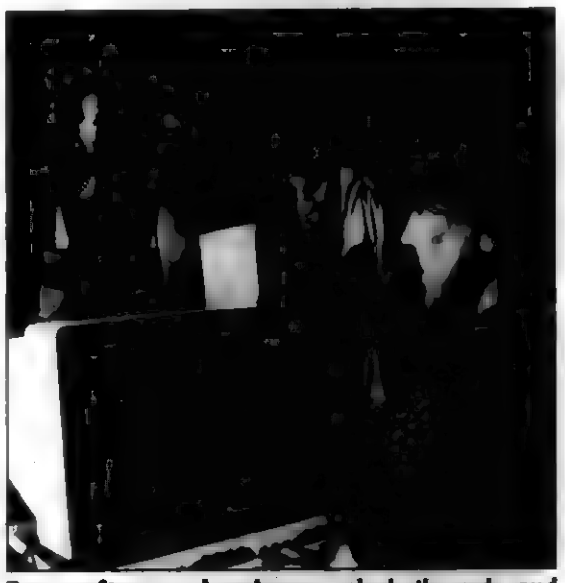
Those were no party girls — those were just job-hopping IS execs

Documents that came to light during a rate case investigation of Nynex Corp. this past summer bared a four-year period during which the firm held week-long annual funfests for employees and suppliers, complete with "women . . . hired to provide entertainment and sex," according to a report in *The Wall Street Journal*.

"People familiar with the Florida meetings say one Nynex employee won the 'Procurement Award' for three consecutive years, apparently for 'arranging for women' for the conventions," the *Journal* said. "Others won the 'Most Valuable Pervert Award' and the 'Moon Over Miami Award.' "

The runner-up

Sys Technology invited attendees to its Comdex/Fall '90 booth to ogle a scantily clad "Miss Sys" for her "eye-catching debut" in a live aerobics session. Attendees were also invited to be treated to an autographed poster of the sweaty Miss Sys.



Two software developers *check the code and Egyptian Queen Nefertiti looks on as a beta user trains on the new Cartouche interface from TUT Graphics, Inc., promised for commercial delivery as soon as the firm can unearth the user manual*

But can we sit on his lap and play with his little forked tail?

Following the May release on the Linotype and Dr.-Ing. Rudolf Hell proposed merger, Linotype sent out a release noting a press conference that was being held "not only as a show of solidarity on the part of the two companies on this project, but also to give journalists the opportunity to put questions to the Hell management."

Headline and kicker from an October press release

Fujitsu joins forces with Descartes-RAM; VAR [illegible]ement to better serve beverage industry

I drink, therefore I am.

Headline from a March press release

Intex announces 1990 TROLL user group meeting

The constitutional right to free assembly knows no bounds.

Letters we never finished reading

"Dear Editor, Please find enclosed the news release and a few statistics covering our new software package, Drawback-PLUS . . ."

Headline from a November press release datelined San Jose

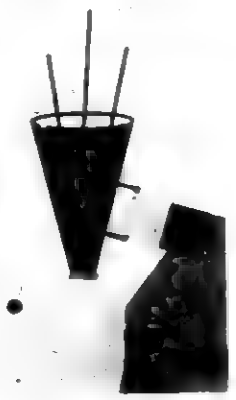
Thinking Machines and Ultra Network connect with Hippi

Are you sure this wasn't datelined Santa Cruz?

Headline from a May press release

Wall Data offers Rumba software development kit for graphical user interface creation

The original prototype was a Lambada software development kit, but the computer kept blushing and averting its interface.



For those who don't believe in wasting time with middle management

A mail-order software company released an artificially intelligent Biblical research software package called Ask God.

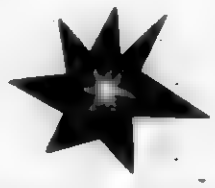
We can at least be grateful that it doesn't come from Groupe Bull

Wayzata Technology, Inc. announced the release of an Apple Macintosh-based compact disc/read-only memory full text called About Cows. Contents include "history, myths, literary references and trivia on America's favorite farm animal, plus color images of various bovine poses."

At least they had easy access to barf bags

Bantam Electronic Publishing planned to show a 90-second tape on the growth of the computer and computer book markets to captive audiences on some 9,000 American Airlines domestic and international flights during the month of November.

Psssttttt, guys: If anybody hands you something called a Mitsumi laptop, quickly run the other way



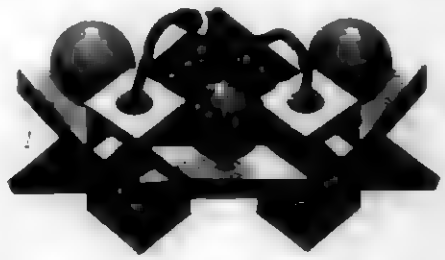
Japanese computer keyboard maker Mitsumi was referred to in an OEM's press release as "Mitsumi, the world's leading producer of keyboards for the exploding notebook computer market."

Aw, Ma — alphabet soup again?

"HFSI is disappointed in the recent decision by the General Accounting Office to uphold Martin Marietta's protest of the WWMCCS Information System (WIS) Workstation Segment Award to HFSI." (Opening sentence of a May 17 press release sent out by the Senior Counsel of Honeywell Federal Systems, Inc.)

And to add insult to injury, all those folks with emergencies probably never even found out which song won

Ring-in-your-vote phone calls to Finland's annual song contest, broadcast nationwide, blocked vital emergency and service numbers for several hours in October. When the voting lines became busy, callers resorted to nifty redial buttons, which in turn gave out wrong numbers. When automatic dialing took the number halfway, the lines suddenly freed up, so the phone dialed only the last digits of the whole number — which, ironically, coincided with Finland's emergency service code. Only 120,000 of 250,000 calls eventually made it through to the song contest.



Headline from a April press release

A new, two-component polyurethane, reenterable potting/encapsulating compound from Sterling Group

Don't leave home without it.

SHOWTIME

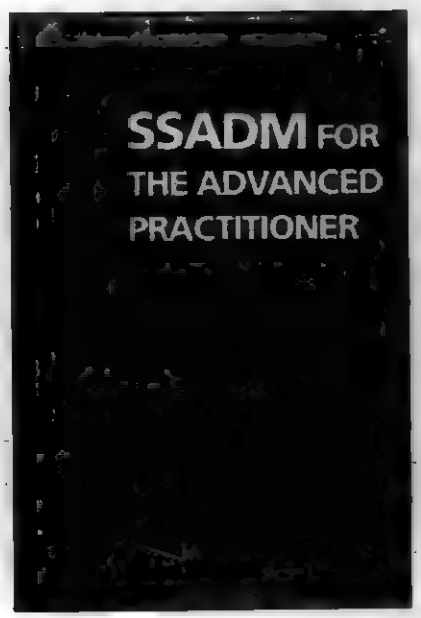
for the ADAPSO Foundation

Roasting John Imlay

"...ROASTED OR SOMEWHERE FRIED, IMLAY'S THE MAIN COURSE!"

Next time, just bring the piranha

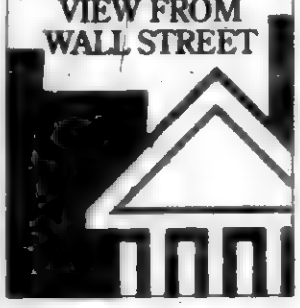
A prank by D&B Software CEO John Imlay to bring a tiger to an industry conference ended up backfiring. Imlay had planned to use the tiger — something of an Imlay signature since he featured a big cat in one of his well-known flamboyant company presentations — later that evening at a roast in his honor. Unfortunately, the cat had other ideas and mauled an attendee, though not seriously.



Ahhhhhhhhhhhh — Now we know what he's for . . .

Iraq President Saddam Hussein's August invasion of Kuwait instantly guaranteed the SSADM application design method 1990's Most Unfortunate Name Award.

outlook:
VIEW FROM WALL STREET



Easy Street? Not this year

BY KIM S. NASH

The past year was no day at the beach for computer firms, and industry vendors can probably shelve their Ray-Bans for most of 1991, too.

It's hardly a surprise that technology firms won't be 1991's hottest investment. Recession worries, budget squeezes and diminishing product demand continue to sour Wall Street's outlook.

So the industry is indeed headed for more distress — but how much and how bad?

• **Software shine fading.** Although software is one of the brighter spots in a gray industry, growth is expected to slow in 1991, thanks to a choking national economy.

For personal computer software firms, David Bayer, a senior software analyst at Montgomery Securities in San Francisco, predicts a growth rate of 15%, compared with 30% in 1990. David Wu at S. G. Warburg & Co. is more pessimistic, predicting "nothing above 10%."

Computer-aided software engineering makers, such as Knowledgeware, Inc. and Electronic Data Systems Corp., will probably fare well — thanks to the ever-increasing applications backlog, Bayer notes.

Firms that hop the graphical user interface train should do well, especially if their products work with Microsoft Corp.'s Windows 3.0, says Timothy McCollum, an analyst at Dean Witter Reynolds, Inc. Bayer agrees and especially likes Aldus Corp. and Adobe Systems, Inc.

Analysts concur that

Continued on page 19

A make-good year for vendors

Users will demand more as industry goes from 'tough to tougher'

BY NELL MARGOLIS

If you've been wondering what state the computer industry is likely to find itself in during 1991, the answer is Missouri.

"Show me!" will be the slogan of users from coast to coast — and "ex" the word for vendors who don't, won't or can't.

Until recently, users were willing to overlook a lot — if products and services were reasonably on-time and on-target. Now, however, many users — stung by negative experiences — are entering the new year with eyes painfully open to the importance of losses, layoffs and corporate reorganizations.

"Suddenly, users are afraid of [supplier] companies actually leaving the business," says Norman Weizer, computer industry analyst at Cambridge, Mass.-based management consulting firm Arthur D. Little, Inc.

With intensified user scrutiny and stiffer competition for shrinking customer dollars, life in the computer industry is "going to go from tough to tougher" in 1991, says David Wu, an

Continued on page 19

Debbie Palen

A recession by any other name . . .

President Bush called it "a slowdown." His chief economic adviser, Michael Boskin, termed it a "lull." Federal Reserve System Chairman Alan Greenspan called it "a meaningful downturn."

After months of semantic pussyfooting, it's time to call a fade a fade. Something bad is upon us, and it smells a lot like a recession.

That observation is not likely to shock information systems managers, who have been penny-pinching for many months and, in some cases, years.

Nor is it news to computer industry vendors and service providers, who have been bleeding heavily — even without the benefit of an official acknowledgment of the downturn.

OK. Everyone knows things are bad, especially in the Northeast and in the airline and banking industries, among others. But how bad will they get? For how long?

Wearied by a lengthy "pre-cession" and official obfuscation, *Computerworld* asked several top economists to illuminate what is really going on. Our "Recession Scorecard" is not infallible, but at least it's straight talk. □

JOSEPH MAGLITTA

Recession Scorecard

Roger E. Brinner *DRI/McGraw-Hill*	Yes. Started last October	Mild recession lasting three quarters, out by summer '91	Iraq's invasion of Kuwait	1Q: -2.1% 2Q: -0.4% 3Q: 2.6%	Will peak at 6.8% in third quarter of 1991
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Stephen Roach *Morgan Stanley & Co.*	Yes.	Mild and short, out by summer '91	Primarily oil shock and banking crisis	1Q: -1.5% 2Q: -1% 3Q: 3%	Will peak at 6.5% in third quarter of 1991
[illegible]	[illegible]	[illegible]	NA	[illegible]	[illegible]

CW Research: Kevin Burden

Make-good

FROM PAGE 18

analyst at S. G. Warburg & Co.

How can computer firms cope in this harsher climate?

In its 1990 "Report on the Computer Industry," management consulting firm McKinsey & Co. isolated six roles that it believes will be available to computer firms in the foreseeable future (see story this page).

Classic hits

Some of the same old vendors' songs will be rereleased in 1991, louder than before. Likely chart-toppers: "We Are an Open Systems Company;" "No Matter What You Think We Are, We Are a Software Company;" and the perpetual No. 1 hit, "We Are a Service Company."

In 1991, however, singers had better do more than just mouth the words. Any promising strategies that failed to deliver will fall from grace in 1991, according to analysts. Several approaches likely to fade are:

• **Mergermania.** "The history of the computer industry shows that acquisitions generally don't work," notes Labe, Simpson, Inc. analyst Peter Labe. Rarely, if ever, do such unions work as quickly or as completely as the parties privately hope or publicly promise. Although AT&T is seemingly bucking this trend by taking aim at NCR Corp., that action is basically an anomaly, observers say.

• **Imported strategies.** While it's always smart to pick up pointers from your competitors, Weizer says, what works in one culture doesn't always work in another. Vendor companies, he cautions, must be "very careful about what they try to adopt."

• **Reliance on overseas earnings to brighten dismal bottom lines.** Economic sluggishness isn't an ill that's confined to the U.S. "International business in the coming quarters will be much slower than people think," Wu says. "Companies betting on international to bail them out are going to be disappointed."

What *should* companies bet on? The smart ones, analysts say, might tag 1991 as the Year Accountants Gained Respect. Poor accounting practices, along with inept pricing policies, are largely responsible for the binds computer companies find themselves in now, Paine Webber, Inc. analyst Robert Therrien says.

"For the first time, perhaps, in computer industry history," says analyst Byron Walker at Moody's Investors Services, Inc., "companies are going to have to start paying attention to their balance sheets instead of to their quarterly bottom lines." □

Margolis is Computerworld's senior editor, industry.

What part will they play in 1991?

BY NELL MARGOLIS

In 1991, computer industry vendors will try to position themselves in one of six key roles, according to management consulting company McKinsey & Co.

• **Broad-based market leader.** This means a firm that offers basically everything to everyone. It's an attractive idea, but as McKinsey notes, the resources required to play and the whopping revenue required to grow limit this option to a very small group. Realistically, one analyst says, it could limit it to IBM.

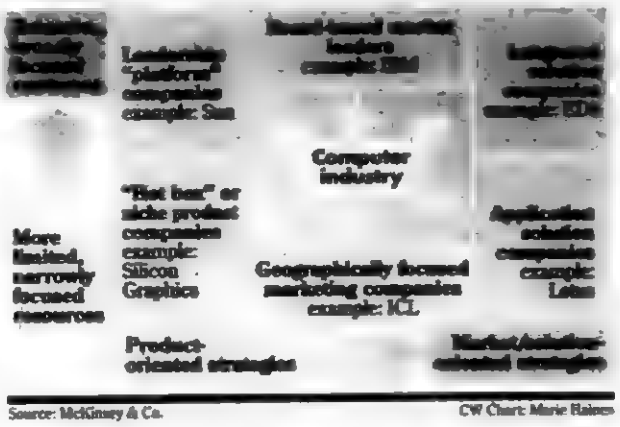
• **Leadership platform supplier.** This role, McKinsey says, falls to the firm that "continually breaks new ground by virtue of its technology." Membership requires hefty research and development investment, which probably means little leeway in other spending areas.

Leadership platform suppliers need partners early and often — third parties to build on the leadership platforms, as well as OEMs and resellers. Sun, anyone? Tandem Computers, Inc. and Stratus Computer, Inc. could both fit here — assuming they don't go for Hot Box/Niche Supplier. Apple used to be in this category. In 1991, the world will be watching to see if it stays in the running.

• **Hot box/niche supplier.** Firms that target a highly tailored product for the needs of a given market apply here. "In one or more ways," McKinsey explains, the hot box/niche supplier "does one better over existing competitors and generally tends toward faster, cheaper equipment."

Spread out

Computer vendors increasingly fall into one of six corners within the industry



Source: McKinsey & Co. CW Chart: Marie Haines

If Sun Microsystems, Inc. is any example, other analysts note, expect to see some companies segue from this role to that of leadership platform supplier. Current inhabitants of this niche include high-end scientific and technical graphics suppliers, disk-drive players and video-teleconferencing firms.

This is also a likely harbor for former broad-based market leaders. Watch for Prime Computer, Inc. and Wang Laboratories, Inc. to try to sail into this harbor in computer-aided design and manufacturing and imaging, respectively.

• **Geographic marketer.** This is defined by McKinsey as "a company that concentrates its sales efforts in a specific geographic region or regions." Also emphasized: customer relationships and support capabilities.

Take, for instance, a joint venture that was announced in November by New Jersey-based Software Plus, Inc. and Illinois-based System Software Associates, Inc., two software companies catering to the IBM Application System/400 user base. The venture shows that McKinsey is on the mark.

• **Application solution provider.** A good example here is Ross Systems, Inc. The privately held Redwood City, Calif.-based firm took a long, hard look at the weak market and economy and then decided to stick with the Digital Equipment Corp.-based financial application products that have kept it glowing while greedier neighbors have flashed and burned.

• **Integrated solution provider.** Included in this category are systems integrators and outsourcing vendors — Andersen Consulting and companies such as Legent, Inc. and Computer Associates International, Inc. — which offer soup-to-nuts software and services to data centers. One drawback to this role, McKinsey notes, is "competition from all directions, including partners." □

Easy street

CONTINUED FROM PAGE 18

Microsoft is the single standout in the software industry. With booming sales of Windows 3.0, Bayer pegs Microsoft's revenue for fiscal 1991 at $1.64 billion.

On the down side, analysts predict that Oracle Systems Corp., Computer Associates International, Inc. and other makers of software for large systems will continue their long, slow slides.

• **Skinny minis, mediocre mainframes.** More diets are on the plate for minicomputer firms. Mini makers must continue to slim down if they are going to make any money from open systems, says Laura Conigliaro, an analyst at Prudential-Bache Securities, Inc. The transition won't be speedy or smooth, she cautions, and will continue to erode growth rates.

Digital Equipment Corp. is still in transition from a proprietary-midrange line to a mix of open minicomputers and mainframe-class systems and is not expected to grow at all, according to Wu. Even among healthier large systems vendors, including Amdahl Corp., IBM and Cray Research, Inc., Wu predicts growth will be no better than 5%.

As for firms with big money problems — Unisys Corp., Data General Corp. and Wang Laboratories, Inc., among others — analysts see more lean times. "If 1991 is going to be worse for everybody, then these companies have an even greater challenge — and that's some understatement," Wu says.

• **Semiconductors: semisuccessful.** Chips are expected to be a fairly bright spot, especially those supplied to high-performance desktop systems. The big reason, says William Tai, an analyst at Alex. Brown & Sons, Inc., is the continued growth of the PC market.

Intel Corp. grew approximately 150% in 1990, reflecting its virtual lock on the IBM Personal Computer and compatible market — a situation unlikely to change in 1991.

Chip makers supplying mainframe and minicomputer manufacturers will do poorly, analysts say, because of continued slow demand for those machines. National Semiconductor, Inc., Advanced Micro Devices, Inc. (AMD) and Texas Instruments, Inc. are expected to grow between just 20% and 30%.

AMD has a slim shot at bottom-line improvement with a clone of Intel's 80386, but that would be the turnaround story of the year, Tai says.

Small companies that make Scalable Processor Architecture chips for workstation vendors, such as Sun Microsystems, Inc. and Tatung Science & Technology, Inc., could blossom in 1991. Watch Cypress Semiconductor and LSI Logic Corp.

Apple Computer, Inc.'s recent price cuts on its Macintosh line may foster sales for VLSI Technologies, Inc., which supplies processors used in the Macintosh. Both companies may benefit further from a recent joint venture to make reduced instruction set computing chips in England.

• **Mac to attack, but Compaq on track.** New products announced in late 1990 could help Apple. But analysts say Apple also needs to plug holes in its product line if it really wants to bite into the IBM Personal Computer and compatible pie. Apple must address its lack of a 386SX-class machine and a competitively priced portable, which the company says it plans to do next year, Wu says.

Analysts predict that high-end systems and clones will do best this year. □

Nash is a Computerworld researcher, features.

Seven changing companies looking for a lucky year

A new, open IBM keeps heavy cargo rolling out

BY MARYFRAN JOHNSON

IBM will be talking a Big Blue streak about open systems, software and services in 1991, as the industry giant buckles up for a rough economic ride with a trainload of new products and technologies in tow.

"Many of the cards IBM will be playing out in 1991 are, in the technological sense, on the table right now," says Robert Djurdjevic, president of Annex Research in Phoenix.

The aces in that deck are the Enterprise System/9000s, announced last September as the follow-on generation to the 3090 mainframes and older 4381 and 9370 midrange lines. Volume shipments of the new systems are scheduled to begin in 1991, and analysts are already crediting IBM with a smooth transition from the System/370 line to the System/390 "Summit" family.

Aside from delivering on Summit, IBM will continue to expand its Unix-based RISC System/6000 workstation and server line and the Personal System/2 family. New high-end Application System/400 minicomputers, with long-awaited multiprocessor capabilities, will be announced before mid-year 1991, analysts say.

At IBM's late summer AS/400 announcement, it announced the "opening up" of the OS/400 operating system to customers and third-party programmers who need to customize it for their own purposes.

"We are investing a lot of marketing energy into becoming a premier service and software provider," says William Grabe, IBM vice president and general manager of U.S. marketing and services.

"IBM's got a pretty admirable bag of goods to peddle next year," agrees Peter Burris, an analyst at International Data Corp. in Framingham, Mass. "But the No. 1 priority will be ensuring the sales force really understands how to position and sell those products. Issue No. 2 will be figuring out what IBM's open systems strategy is and communicating that to customers."

Like every other vendor on the planet, IBM is swearing fealty to standards-based, multivendor computing. "We are totally committed to open systems," Grabe says.

IBM
Armonk, N.Y.

CEO: John Akers

Biggest challenge: Lock in gains from Summit and other rollouts; continue toward standards-based computing

Strategy: Solidify interest in newest products, particularly among System/370 users

Customers can expect to see IBM pushing a wide array of new software products — many of them from third-party vendors — that give users the ability to access data and systems anywhere in the enterprise, Grabe adds.

He also promises "significant improvements" in 1991 that will permit easier interoperation with systems made by Apple Computer, Inc., Digital Equipment Corp., Sun Microsystems, Inc. and others.

On the software front, the biggest news this year will be shipments of Version 4 of IBM's MVS mainframe operating system and long anticipated releases of VM/ESA and VSE/ESA.

On Wall Street, IBM has been generating optimism lately as well. They note approvingly how IBM has consolidated operations and cut its work force by 8% since 1986. They credit IBM Chairman John Akers with streamlining operations through the elimination of thousands of overhead positions and the retraining of at least 65,000 employees for revenue-generating jobs in software, sales and services.

"I think IBM will continue to cut, and they are building a very cautious operating expense plan for 1991," says John Jones, a financial analyst at Montgomery Securities in San Francisco. "If there is a severe recession, however, IBM will get hurt like every other big firm." □

Johnson is a *Computerworld* senior editor, systems and software.

Firm makes its name, and that's no Bull

BY SALLY CUSACK

Motorists have grown accustomed to the brash slogans screaming down from billboards, and television viewers have become familiar with the message flashing brightly across the screen — *Globull. Knowledgebull. Expandabull. Reliabull.*

The blitz has caused some to wish openly that the splashy advertising campaign would become *Invisibull*. No chance.

Having established name recognition, Bull HN Information Systems, Inc., the U.S. arm of international corporation Groupe Bull, now plans to present the public with tangible proof that a new company *does* indeed exist in the old Honeywell buildings in Billerica, Mass.

Roland Pampel, president and chief executive officer of Bull HN, says the company plans to aggressively enter several new areas in 1991. Among them, he says, are commercial software applications, especially in the public services sector, and computer-aided software engineering, with a product to be introduced early in the new year.

Pampel also says he sees terrific opportunities for Bull HN in the global marketplace. He cites a recent agreement with Lucky Goldstar, the Korean manufacturing group, as one way of "aggressively attacking the Pacific Rim."

John Dunkle, vice president at Workgroup Technologies, Inc. in Hampton, N.H., says he believes Bull HN will survive the switch from being a proprietary hardware firm to a broad-based services provider and systems integrator if it can establish an identity firms in Fortune 500.

"They have the technology," Dunkle says. "It's more a matter of marketing."

Bull hopes to especially distinguish itself in niche markets. A good example is its Unix-based workstation system that was developed to assist social workers in child abuse prevention. The company also offers several other Unix-based local-area networking products aimed at legal firms and law enforcement agencies.

Marina Young, president and CEO at Information Strategies Group, a market research firm in Washington, D.C., says that Bull HN is definitely moving its focus away from big iron technology and turning toward applications.

Bull HN Information Systems, Inc.
Billerica, Mass.

CEO:
Roland Pampel

Biggest challenge:
Switch from proprietary hardware to broad-based services

Strategy:
Offer products in several areas, including public sector software and CASE

"Bull [HN] is positioning itself as a premier systems integrator," Young says. "It is saying, 'Tell us what you want, and we'll tell you how to get there.' "

Bull HN has stepped up its efforts to wed its proprietary GCOS operating system to the world of AT&T Unix System V-based systems and has backed those efforts up with a $2 billion commitment to research and development.

According to Steve Josselyn, a senior analyst at International Data Corp., a Framingham, Mass.-based market research firm, Bull HN's strategy is attainable and makes sense. But, he says, the question remains: Does Bull HN have the staying power it needs to realize these goals?

"[Bull] has to unify its existing architectures, while simultaneously downsizing the organization to accommodate the lower Unix market margins," Josselyn says.

Downsizing has been highly visible this past year, as Bull HN reduced its U.S. work force by 800. Layoffs will continue through December 1991, with large cuts targeted for its Billerica headquarters and facilities in Arizona. The firm lost $511 million in 1990.

But as the old company is swept out, the new company is sweeping in new business opportunities to better position itself for the changes of the 1990s.

"Bull [HN] has made some shrewd acquisitions in the past few years," Young says, referring to the purchase of Zenith Data Systems and Honeywell Federal Systems.

Steve Gardner, vice president of U.S. marketing at Bull HN, emphatically states that the message will change from "Knowbull" to "Knowbull for Something" in 1991. □

Cusack is a *Computerworld* staff writer.

Cash-strapped Unisys unifies products

BY ELLIS BOOKER

Gamely putting the best face on things, Unisys Corp.'s media department has spent the past months blitzing the industry with news: new products, new customers and new installations of Unisys systems at sites both large and small.

The campaign has not, however, hidden the obvious from either Wall Street analysts or customers. Unisys, the nation's third largest computer firm, is starting 1991 in serious financial trouble.

Unruh: *We are not in a crisis situation*

The investment community is awash with speculation about what assets the $10 billion computer and defense company intends to sell to meet its short-term debt obligations. All told, Unisys carries $4 billion in debt.

Company officials maintain they are not facing a liquidity crisis and point repeatedly to a $1.25 billion revolving credit line arranged for the company by a consortium of 20 banks. The credit is good through January 1993.

But this reserve does not comfort some analysts. "They're $250 million away from breaking a net-worth test," said David Schofield, a technology analyst at Duff & Phelps Investment Research Co. in Chicago. Should Unisys have a few more bad quarters with losses of $100 million or more, Schofield says, bankers could demand more control of the company or even "walk out on the revolver . . . and that would force [Unisys] into bankruptcy."

At the same time, other analysts paint a scenario in which a weakened Unisys is acquired, possibly by a Japanese or European company.

Among the more interesting of these hypothetical marriages involves Japan's Mitsui & Co., the Japanese trading entity (*keiretsu*) that includes Toshiba Corp., which might find some synergy with Unisys' workstation and Unix-based processor business.

Earlier this year, Mitsui acquired $150 million of Unisys' stock, and the firm already has a joint relationship with Unisys in the form of Nippon Unisys, in which both companies hold a 30% stake. However, a Japanese or European suitor is unrealistic unless Unisys divests itself of its defense businesses, these observers point out. In fact, the defense business is reportedly one of the assets Unisys has put up for sale.

Unfortunately, the clamor over finances has obscured Unisys' recent earnest efforts to rationalize its disparate product lines.

Formed in 1986 with the merger of Burroughs Corp. and Sperry Corp., Unisys became the country's third largest computer concern — but at a price. The company inherited incompatible computer architectures from its two parents.

Further complicating the picture, Unisys acquired Convergent Technologies, Inc. in 1988, picking up the San Jose, Calif.-based vendor's line of networked workstations. Factor in Unisys' own Unix line, represented by the U series, and its Timeplex, Inc. data communications subsidiary, and the complexity of the company's product picture is apparent.

In September, the firm unveiled a plan for wrapping its proprietary mainframes with client/server and open systems software approaches as the "glue" to attach these "information hubs" to each other and to hardware from other vendors.

Key will be the late first-quarter delivery of a "single environment that allows customers to use [our fourth-generation languages] in integrated fashion," says Jim Murtaugh, vice president and general manager of Unisys' Information Networking Group.

The coming year will also see Unisys delivering more components of its distributed, cooperative architecture. The plan for 1991 calls for mixing open, proprietary and de facto standards to unite Unisys' and other vendors' systems.

Customers, while generally calm, also admit to worrying about the company's long-term health. Some say they are investigating alternatives.

"In the short term, we're not concerned," says Michael Niestemski, business unit manager of aircraft build systems at Douglas Aircraft, a McDonnell Douglas Corp. unit. "But we are looking at things that might get us off the Unisys platform four or five years down the road."

But other users, citing Unisys' size and installed base, find little reason for alarm. "I don't see [the company] disappearing," declares Thomas F. Malanga, manager of information systems technical support for Sunshine Biscuits, Inc. in Woodbridge, N.J.

The company's current fiscal cloud shows no sign of lifting. A worse-than-expected $356.8 million loss in the third quarter and the likelihood of a loss in the fourth quarter battered Unisys stock, which absorbed a yearly low of 1¾, down from a 12-month high of 17¼. □

UNISYS

Unisys Corp.
Blue Bell, Pa.

CEO:
James Unruh

Biggest challenge:
Convince financial markets that massive debt burden does not threaten existence

Strategy:
Integrate acquired product lines; sell software to knit them together

Booker is *Computerworld*'s Chicago bureau chief.

Wang continues its long, uphill march back to profitability

BY SALLY CUSACK

When An Wang, an inventor, entrepreneur and philanthropist, died last March after a long bout with cancer, Wang Laboratories, Inc. Chief Executive Officer Richard W. Miller said the late chairman and founder "believed in and supported our plan to restore Wang Laboratories to profitability and industry leadership. Now it is up to us to finish the job."

Analysts agree that to "finish the job," Wang must make 1991 the year that it delivers on its promises to bring more open architecture products to the market. The hopes at the Lowell, Mass.-based company are high.

"Now that we've stabilized the financial condition of the company and strengthened our management team, the key will be a successful rollout of a full line of products capable of operating in a multivendor environment," Miller says.

Roger Sullivan, vice president of BIS CAP International, Inc. in Norwell, Mass., says Miller isn't just dreaming. "Wang is correctly de-emphasizing the importance of the proprietary VS mini and is repositioning it as a server to complement their strong imaging products," Sullivan says.

The company is also emphasizing customer applications, which requires a shift in company mind-set from minicomputer maker to a full-service, open systems vendor specializing in imaging and applications software, Sullivan says.

According to Barbara Babcock, vice president at Gartner Group, Inc., a Stamford, Conn.-based research firm, Wang has defined a strong, dual-focus strategy for 1991.

"They have a niche strategy of document imaging and a management strategy in targeted markets," Babcock says, referring to Wang's increasing presence in the legal, banking, insurance and medical fields.

Miller confirms the observation. "We're going to rely on our core technical strengths, combined with our newer imaging strengths, to move from the office automation to business processing automation environments," he says.

Miller was presented with no easy task in August 1989, when he accepted An Wang's invitation to take over the helm at Wang.

Arriving at the lowest point in Wang's history, Miller found a company deeply in debt and riddled with warring internal factions. Long-neglected customers angrily criticized Wang products and services.

But, Babcock says, "Miller is not afraid to shoot sacred cows and change the teams. It's remarkable what the company has achieved under him in 15 months."

Wang can look back at 1990 with some pride. It has paid off $575 million worth of bank debt, reduced operating expenses by $400 million annually and trimmed its work force by 3,900. Wang has also regained the confidence and support of its customer base — primarily through Miller's outreach program, Operation Customer — and has scored some large contracts with the federal government, Mellon Bank Corp. and ITT Hartford Insurance Group.

The good news in 1991, Sullivan says, is that Wang has gone through the necessary downsizings with which other companies are just beginning to deal. The bad news is that the U.S. is in a recession, and resistance to the new approach still lingers in some quarters at Wang.

Even though the entire organization is going through a "total commitment to quality training process," Sullivan says, Wang still must become more "field-focused" as opposed to "home-office-focused."

Wang is still dealing with poor public image. Despite a net profit of $2.6 million in the first fiscal quarter of 1991 — compared with a net loss of $62.1 million in 1990's first quarter — some customers and potential buyers are saying "wait and see."

The trick, Sullivan says, is to hold to the economic plan. A strong second quarter will show good progress, he says, and would "bode good news indeed" for Miller's dream of returning to profitability. □

WANG

Wang Laboratories, Inc.
Lowell, Mass.

CEO: Richard Miller

- **Biggest challenge:** Continue rebuilding customer and market confidence after recent setbacks
- **Strategy:** Concentrate move away from proprietary systems and toward imaging and applications software

Oracle slims down, branches out for a tough year ahead

BY JEAN S. BOZMAN

Oracle Systems Corp. is pulling itself together and preparing for highly competitive days ahead in 1991. Major changes in management, support and product development have taken place in recent months, following an autumn layoff of more than 500 people at the $971 million software firm.

The heady days of doubling revenue each year — as Oracle had done for 10 years — are gone.

"They're going to have to get into shape, financially and in terms of customer support, and that's a healthy thing," says Dale Lowery, president of the East Coast Oracle User Group.

The firm's financial troubles, which started last April and continued until the Sept. 25 announcement of a $36 million fourth-quarter loss, have been deep.

Wooing large customer bites will be key to Oracle's success in 1991, says Geoff Squire, executive vice president in charge of Oracle's worldwide sales organization. "Customers and business partners alike have been very understanding in recent months," he adds.

The shock waves from 1990 are still booming through Oracle. Since September, users say they have begun to notice improvements in customer support — something Oracle user groups had been demanding.

In recent months, Squire and Oracle USA President Michael Fields have toured customer sites around the world to make sure Oracle is listening to users' complaints and responding to them. Some Oracle employees are even being assigned to work at very large customer sites.

New products coming

To prosper against tough competitors like Sybase, Inc. and Ask Computer Systems, Inc., analysts say Oracle must add new layered software products on its core relational database management system (RDBMS). It has begun to do so with its computer-aided software engineering (CASE) tools and its applications for manufacturing and financial uses.

To build its new generation of product offerings, Oracle is working with outside vendors, including Hewlett-Packard Co. and Tandem Computers, Inc.

Oracle executives say many new offerings are being readied, including database, networking, and CASE tools and applications software for human resources and finance.

ORACLE

Oracle Systems Corp.
Redwood City, Calif.

• • • • •

CEO: Larry Ellison

Biggest challenge: Shrug off effects of major losses; broaden base past core RDBMS product

Strategy: Keep in touch with customers; move into CASE and other areas

But Oracle's main product debut for 1991 may be Version 7.0, an upgrade to Oracle's Version 6.0 RDBMS. The update is said to deliver new functionality, including two-phase commit for distributed transactions, database administration tools and new referential integrity features.

Selling such a wide array of products will be a big challenge. In September, Squire, who was previously president of Oracle's European sales division, was promoted to oversee all Oracle sales worldwide. The promotion came amid the departures of many top sales executives. Now, Squire and Chief Financial Officer Jeff Walker, both of whom report to Chief Executive Officer Larry Ellison, appear to be running the firm with Fields.

Oracle expects to see 25% revenue growth in 1991, Squire says, with the highest growth rates stemming from Europe and the Pacific.

Industry analysts are cautious, however. "The question is how much they've stolen from the future [business] to achieve their past results," says David Bayer, a senior software analyst at Montgomery Securities in San Francisco. "They're certainly not out of the woods." □

Bozman is *Computerworld*'s West Coast senior editor.

Can new Macs restore shine to Apple's future?

BY JAMES DALY

Nearly seven years after cofounders Steve Jobs and Steve Wozniak dazzled the world with the Macintosh personal computer, $5.56 billion Apple Computer, Inc. doesn't look so shiny.

Many observers link the woes to poor strategic planning, an overpriced, laggard product line and management turmoil. Also, Apple's once-snappy trademark icons and pull-down menus are now commonplace in the IBM world.

"Apple is about two years behind the curve in many of the things it does these days, and that's starting to hurt them," says Jim Poyner, an analyst at research firm William K. Woodruff & Co. in Dallas.

Fortunately for Apple, insiders say major changes are afoot. Chief Executive Officer John Sculley has promised "there will be no sacred cows" as the company realigns. And the October introduction of three low-cost machines — the Macintosh Classic, Macintosh LC and Macintosh IISI — sounded the death knell for expensive Apple products.

Critics say the cheaper products are a much-needed first step that will help the Cupertino, Calif., firm adjust to today's market.

During the 1980s, the success of the Macintosh helped Apple become financially solid. Unfortunately, while it was getting rich, the firm's corporate vision became blurry, watchers say.

"Apple's present mentality is a holdover from the era of Steven Jobs, who articulated the company's mission as 'building great computers' and 'changing the world,'" says Michael Ryall, a partner at Decision Strategies International, a consulting firm in Morristown, N.J. "But this vision is too vague to provide powerful guidance in the 1990s. It doesn't give the organization a clear road map." The result: Apple's share of the $42.3 billion domestic PC market has plummeted from about 15% only a few years ago to about 10% today, according to Dataquest, Inc., a San Jose, Calif., computer industry researcher.

Sculley *promises "there will be no sacred cows"*

During the same period, earnings hit the slow track; net revenue for the fiscal year ended Sept. 30 inched up only 5% from the year before. Compared with one year earlier, fourth-quarter profits plummeted 39% to $98.5 million.

Observers say the new low-cost Macintoshes, especially the Classic, offer Apple new hope. Paul Norris, an analyst at Gartner Group, Inc., a research firm in Stamford, Conn., estimates that 1 million Classic sales are possible within the next year.

The company also plans to continue an aggressive rollout schedule in 1991. Awaiting release is a cheaper and lighter (8 pounds) portable computer based on the Motorola, Inc. 68030 chip. Also planned is a high-end, 68040-based Macintosh and a new version of its operating system, System 7, that will include several communications and memory features not expected to appear on PCs for several years. There may even be a Macintosh based on reduced instruction set computing technology.

Analysts say the new lineup will help Apple better compete against powerful, low-cost IBM Personal Computer clones.

With the product momentum in full swing, Apple USA President Robert Puette says the company must now develop more effective distribution channels. Apple has long needed to patch up relations with dealers, who resent it selling directly to large customers. "We need to beef up the retail channel," Puette says. "We need to serve a wide variety of environments."

Plans include reviving slipping sales to schools and colleges, phasing out its "major accounts" sales force and turning corporate sales over to local dealers.

Apple is also planning to use leading systems integrators, such as Electronic Data Systems Corp. and Arthur Andersen & Co., and has invested cash in Exis, an independent Peat, Marwick, Main & Co. unit.

Industry analysts say all of these moves are needed to satisfy sophisticated corporate users and could help Apple ink the major business contracts that have forever seemed beyond its grasp.

Man on the spot

The task will fall to Morris Taradalsky, Apple's vice president of customer service and information technology. "For years, Apple was viewed as a company that simply did not understand the corporate world," Taradalsky says. "But with new products like our high-end Mac FX, that is changing."

Introduced in March, the FX is Apple's most workstation-like product yet, offering a 40-MHz Motorola 68030 computational engine.

Apple will also reportedly work with Japanese giants Sony Corp. and Toshiba Corp. to develop and manufacture its next-generation Macintosh laptop. The move would link Apple with experienced players in a hot market where it has so far only stubbed its toe.

"Apple is a strong firm with good products," says David Brown, an analyst at International Data Corp. in Framingham, Mass. "It dared to be different and won, and there is still plenty of opportunity left." □

Daly is a *Computerworld* West Coast senior correspondent.

Apple Computer, Inc.
Cupertino, Calif.

CEO: John Sculley

- **Biggest challenge:** Improve standing in the corporate desktop market; stave off Microsoft Windows 3.0
- **Strategy:** Concentrate on new low-cost offerings of flagship Macintosh line

Changing of guard, sharper customer focus in store at HP

BY J.A. SAVAGE

Observing Hewlett-Packard Co. management is often like watching poker dealers in Las Vegas. Shuffle. Lay down cards. Shuffle again. Though the company denies it, one thing HP's observers can count on in 1991 is more shuffling of the company's management and divisions.

"My crystal ball is clear enough that I can see additional changes at the top," says Michael Goulde, vice president of Open Systems Advisors, Inc., a consulting group in Boston. He predicts more focus on customers and marketing, led by top-level executives who can bring about needed changes.

Company watchers say other changes at HP are on the horizon in 1991, including a furthering of the open systems stance, faster systems based on symmetric multiprocessing and the promise of jazzier marketing. The company also says it plans to spend more on sales, training and advertising.

While 1990 revenue was up 11% to $13.2 billion, net earnings were down by the same amount. Net earnings per share were off by 13%. Over the year, however, quarterly revenue growth dipped from 17% (compared with the first quarter of 1989) to only 6% in the final quarter.

Late in 1990, HP reorganized its top management — including the chief executive position — for the fourth time in three years. The reason, according to analysts, was to improve decision-making and coordination between product groups.

Despite predictions of another big shake-up, HP says it won't make any more high-level changes. Dick Watts, manager of sales and distribution for HP computer products, says he does, however, expect ripple effects to be felt through the organization during the year.

Late in December, HP restructured its computer division, merging four groups into the new Networked Systems and Cooperative Computing Groups. According to Lewis E. Platt, head of Computer Systems, the simplified structure will help HP get products to market more quickly.

HP Chief Executive Officer John Young, who now shares the office with Chief Operating Officer Dean Morton, is expected to stay in his job at least through 1991, according to analysts.

In the coming year, the company will continue on its open systems crusade, which some analysts consider a risky strategy in the short term.

For instance, HP is considering full support of open systems — that is, being an integrator and hand-holder without regard to vendor hardware. This is a service users migrating in that direction are in dire need of, but one that is still an iffy proposition, according to Goulde.

"The people responsible for customer support on a worldwide basis are figuring out how far they can go," Goulde says. "Can HP support five platforms and 500 applications? Will it get cooperation from other vendors?"

Because of its faith in open systems, HP is better positioned than other companies to become an open systems vendor, says Carolyn Griffin, an analyst at International Data Corp. in Framingham, Mass.

HP has thrown its weight in with the Open Systems Foundation. In 1991, the company will offer the first version of OSF's Unix operating system, OSF/1, on its reduced instruction set computing (RISC) workstations and workstations based on the Motorola, Inc. 68040 processor.

Some users are wary. John Robinson, director of corporate information systems at Cox Enterprises, Inc. in Atlanta, fears HP's charge into the open systems business would force the company to lose focus on its own products. "I don't see how it could succeed in selling everyone's products," he says.

"They're not a strong marketing company," Robinson notes.

Other problems loom. HP's software strategy, New Wave Computing, invites confusion. New Wave is a host of products designed to facilitate networking, use idle CPU power and integrate multimedia. New Wave is also the name of a personal computer-based application that runs on top of MS-DOS Windows, with added features. "Clearing up that confusion is on their agenda," Goulde says.

On the hardware side, HP will roll out two new pieces of technology this year: symmetric multiprocessing for its Unix systems (Series 9000 Model 870/200 and 870/300), due in mid-year, and a faster single processor.

The company has announced work on multiprocessing and also aims to juice up the power of its RISC processor, with products with CPUs between 60 MHz and 90 MHz expected in 1991. □

HEWLETT PACKARD

Hewlett-Packard Co.
Palo Alto, Calif.

CEO:
John Young

Biggest challenge:
Settle management situation; concentrate on move to open systems

Strategy:
Hold current management lineup steady; put zip into marketing efforts

Savage is a *Computerworld* West Coast senior correspondent.

Do it your way, but quickly

BY LORY ZOTTOLA

outlook:
SYSTEMS INTEGRATION

The watchwords for integration in 1991 will be fast turnaround, targeted solutions and business-boosting results — especially when it comes to dealing with commercial systems integrators.

The following are some of the big integration issues that information systems managers will face in the coming year:

• **Do it yourself.** The majority of organizations will continue to handle large integration projects in-house. According to a study by The Ledgeway Group in Lexington, Mass., most IS managers are unwilling to use outside providers in such areas as change management, strategic planning and needs assessment.

Why? Among other reasons, analysts say, using a commercial integrator might be seen as a sign of internal IS weakness. More importantly, the commercial systems integration market is still unproven. "Because it's an immature market, it's taking users longer to get comfortable with what systems integration can do," says Bonnie Digrius, an analyst at Gartner Group, Inc. in Stamford, Conn.

As the 1990s unfold, however, that may change. The market for commercial systems integration is expected to grow 24% annually for the next few years, according to Douglas Wilder, manager of the systems integration program at Input, a research firm in Vienna, Va.

• **Fast is in.** Tougher economic times have focused IS managers on projects with short-term return on investments. For many, five- and 10-year projects are out. As a result, analysts expect great demand for professional services, such as outsourcing. This arrangement, Digrius explains, lets IS managers parcel out portions of their data centers or networks to cut costs while keeping strategic projects in-house.

• **Let's get vertical.** To make themselves more attractive to commercial customers, systems integrators will take a vertical bent in '91. Integration stalwarts such as Andersen Consulting, Electronic Data Systems Corp., IBM, Perot Systems Corp. and Logica PLC, among others, have reorganized or realigned themselves to zero in on vertical markets.

Wilder says hot IS areas for systems integrators in '91 include discrete manufacturing and state and local government.

• **Swing your partner, do-si-do.** Systems integrator alliances will continue at a head-spinning pace next year. Vendors will form ties or buy companies to get instant expertise in commercial areas in which they have limited presence.

For example, Andersen Consulting and Pyramid Technology Corp. are pushing Unix integration, and Perot Systems and IBM are courting facilities management. Such alliances will further the concentration at the high end of the systems integration market. Of the leading vendors in 1990, the top five have 50% of the market, according to Gartner Group.

Upshot: The biggest and best-focused vendors will become bigger and better focused in '91.

But be warned, says Irv Shapiro, president of Irv Shapiro & Associates in Skokie, Ill.: "IS needs to be careful when working with a system integrator who's in a particular area for the first time. Some vendors may be throwing baited hooks into the ocean to see where the bites are. Once they find the good areas, they may pull the other hooks out."

• **IS will play favorites.** Preferred vendor status will move into the systems integrator realms. "If you've been a happy camper with a system integrator you've worked with in the past, who better to call?" Digrius asks.

For novice integrator customers, this kind of relationship building can be especially helpful. Joe Greulich, MIS manager at Roberts Express, Inc., a transportation services company in Akron, Ohio, agrees. Now in the midst of an integrated database project with Ameritech Information Systems and SHL Systemhouse, Inc., Greulich says, "If we did this again, our [vendor] list would be very short." □

Zottola is a *Computerworld* senior editor, in depth.

Nicolas Asch

Is this any way to begin a decade?

A humorous look at the goofs, gaffes and glitches that made 1990 the year that wasn't

BY PAUL GILLIN

JANUARY

In Delaware, a Control Data Corp. computer-based state lottery system goes haywire, allowing lottery agents to buy $555,000 worth of winning tickets after the winning number is drawn.

Savings and loan tycoon Charles Keating contracts with CDC to process the financial statements at Lincoln Savings & Loan.

AT&T's nationwide network crashes, crippling long-distance services across the country for nearly nine hours. MCI reacts calmly to its foe's troubles, taking out a series of full page ads reading "Nyah nyah nyah nyaaah nyah."

FEBRUARY

The Software Publishers Association announces plans to combat software piracy by staging unannounced raids on selected large businesses. The first raid on a major Chicago-area retailer nets 17 illegal copies of Lotus' 1-2-3 and a half-dozen pirated copies of Ashton-Tate's Dbase at a cost of only four lives. The SPA calls the bloody attack "a warning."

Lotus unleashes a mainframe version of 1-2-3. Analysts charge that Lotus still can't free itself from the PC mentality, noting that 1-2-3/M is delivered in a shrink-wrapped box the size of a Buick.

MARCH

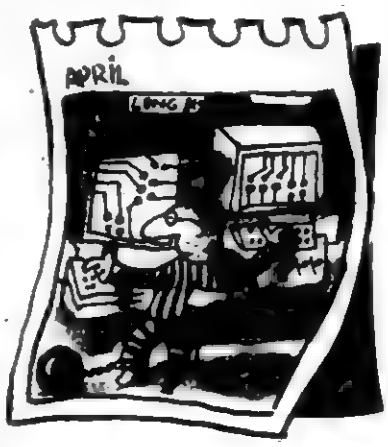
Former McCormack & Dodge president Frank Dodge sues Dun & Bradstreet Software, claiming he was forced out of the company. Dodge alleges that he was publicly humiliated by being locked out of his office. D&B Software vehemently denies that a snub was intended, pointing out that it was necessary to close Dodge's office while washing machines were being installed.

With Paperback Software International mired in a copyright suit with Lotus, Paperback Director Adam Osborne leaves to start a company that will build a "revolutionary" next-generation expert system product.

Aion Corp. reports that the source code to its next-generation expert system product is missing.

APRIL

Lotus and Novell stun the industry by announcing plans to merge. Signs of trouble emerge quickly, though, when the two companies clash over whether to serve crab canapes or mini egg rolls at the announcement press conference.



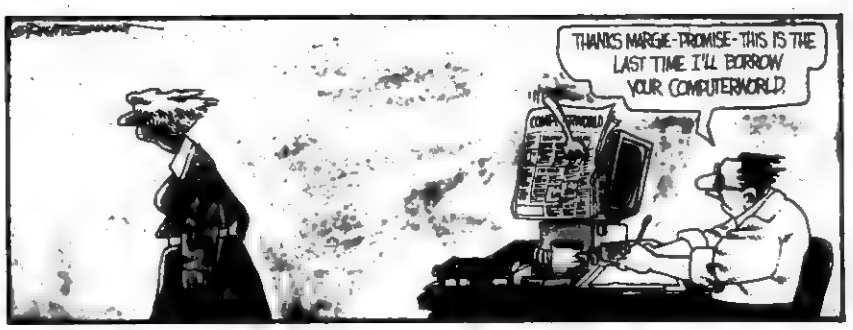
Leasing giant Atlantic Computer Systems all but goes out of business because of the collapse of a popular leasing program. The failure forces the company's IBM mainframe customers into a difficult choice between keeping their current equipment or upgrading to a 1990 Ford Taurus with the Power Option package.

Computer Associates announces that it will offer its own software architecture that supersedes those of IBM and DEC. The company says under the first stage of the CA '90s strategy, to be released in 1991, all product announcements will be printed on identical stationery.

Convicted Internet worm author Robert T. Morris is sentenced to three years' probation and 400 hours of community service. Morris chooses a volunteer job at AT&T headquarters in Morristown, N.J., working on the vendor's long-distance network.

MAY

The last major holdout to the surge of Microsoft's Windows support gives in as Lotus announces that it will port its 1-2-3 spreadsheet package to Windows, which is known inside Lotus headquarters as "The Great Satan." Lotus Chairman Jim Manzi dismisses the significance of the move, saying that the merger of Lotus/Novell will make Microsoft "dog doo-doo."



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   - 23. Dir./Mgr. Sys. Development, Sys. Architecture
   - 31. Mgrs., Supvr. of Programming, Software Dev.
   - 32. Programmers, Software Developers
   - 60. Sys. Integrators/VARs/Consulting Mgt.

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   - 12. Vice President, Asst. VP
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   - E. Local Area Networks
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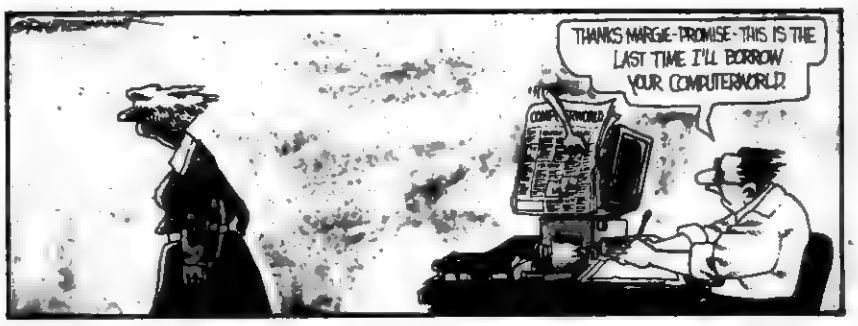

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   - 80. Manufacturer of Computers, Computer-Related Systems or Peripherals
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   - 22. Dir./Mgr. Tech. Planning, Adm. Svcs., Data Comm. Network Sys. Mgt., Dir./Mgr. PC Resources
   - 23. Dir./Mgr. Sys. Development, Sys. Architecture
   - 31. Mgrs., Supvr. of Programming, Software Dev.
   - 32. Programmers, Software Developers
   - 60. Sys. Integrators/VARs/Consulting Mgt.

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   - D. Communications Systems
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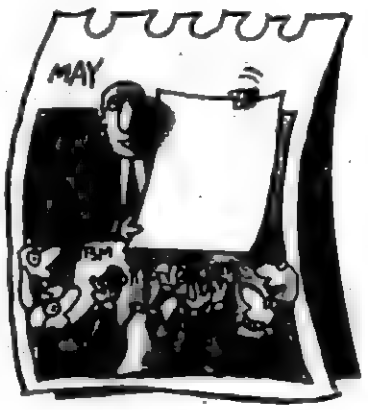


The Lotus/Novell merger falls apart at the eleventh hour as Novell suddenly demands an additional seat on Lotus' board, royalty rights to all Lotus products, a fleet of Cadillac limousines and season tickets to the Boston Celtics. Manzi learns of the disaster while on vacation at Disney World.

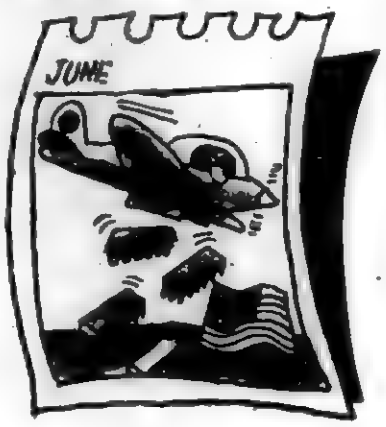
Microsoft introduces Windows 3.0 to widespread critical acclaim. Bill Gates sends Manzi a Federal Express package containing 1,000 plastic "dog doo-doos."

IBM releases the first version of its Repository Manager. Although the initial product consists of little more than a blank computer tape, every software vendor in the world announces plans to standardize on it, and a 400-member user group forms.

Japanese scientists say they have developed a computer with as much intelligence as Leona Helmsley, but they can't think of a use for it.

JUNE

Hitachi Data Systems announces a new family of processors that for the first time exceeds IBM's high-end offerings. The company denies charges that it is moving aggressively toward the mainframe market, noting that it positioned its announcement as far from Pearl Harbor Day as possible.



Lotus wins its "look-and-feel" lawsuit against Paperback Software. As punishment, the judge forces Paperback Software to assume all responsibilities for marketing Lotus' Manuscript word processor.

Lotus shocks the industry by announcing plans to merge with Oracle Systems.

JULY

Ashton-Tate finally ships a clean version of Dbase IV, 18 months after bug reports forced it to pull the original Dbase IV off the market. An Ashton-Tate spokesman says the fuss over the original product's problems were simply a result of confusion. "Did we say Dbase? We meant Dbeta-test," he says.

CA hits a financial brick wall as the nearly billion dollar company reports that quarterly revenue will fall well below last year's figures. The company says that it can't explain the slowdown except that for some reason, customers are having a problem understanding its strategy behind selling 32 different database management systems.

The Lotus/Oracle merger falls through at the last minute as Oracle demands full control of the board of directors, the right to produce 1-2-3 clones, a corporate jet and a seat on the Cambridge, Mass., city council. Manzi is informed while playing tennis in Guadeloupe.

AUGUST

After years of denying that it is overstaffed, DEC finally admits that it must cut its work force by 5,000 people, beginning with the 1,200 employees in the corporate Brushless Car Wash Department.

Charges are dropped against a 20-year-old hacker after prosecutors discover that information he allegedly stole from Bellsouth could be purchased from the company for a small fee. We are not making this up.

A blackout plunges New York's financial district into darkness, paralyzing the nation's securities trading markets. The failure is traced to a volunteer's cubicle at AT&T's Morristown, N.J., headquarters.

IBM says it is repositioning Systems Application Architecture (SAA) as "a grand architecture for all mankind," and will expand the SAA umbrella to encompass Unix, VMS, Apple Macintosh, Wheel of Fortune, bacon double cheeseburgers and all General Motors vehicles made since 1983.

Lotus announces plans to merge with Amdahl.

SEPTEMBER

IBM rolls out the most ambitious mainframe announcement in 25 years, replacing its System/370 with a radical new architecture consisting of millions of digital watches running in parallel. Analysts are quick to praise the IBM initiative but lambaste the System/390 for its annoying tendency to beep in movie theaters.

Wall Street darling Oracle Systems shocks investors by taking a $36 million quarterly loss. At a caviar and Dom Perignon luncheon at Tavern on the Green, Chairman Larry Ellison, dressed in a little black crushed velvet Italian number that matches the upholstery in his Ferrari, denies that expenses are out of control.

The Lotus/Amdahl merger falls through when the companies can't agree on whether to order the blueberry pancakes or the corned beef hash. Manzi is called back from the golf course.

OCTOBER

Compaq says it has solved problems that caused cases to crack in earlier versions of its notebook computer line. The new Compaq Rambopro comes in a molybdenum shell with a backlit screen covered by inch-thick plate glass. While analysts concede that the unit is sturdy, they question whether its 38-pound weight justifies the notebook label.

Apple finally gets into the low-cost computer business, introducing three Macintoshes. The company manages to trim costs substantially by removing the "Q" and "X" keys from the keyboard. "People rarely use them anyway," Apple CEO John Sculley says.

IBM researchers announce they have developed a microprocessor so small that no one cares.

Lotus announces that it plans a "merger of equals" with AT&T. An AT&T spokesman says this is the first he's heard of it.

NOVEMBER

Concerned about mounting losses, Unisys hands with similarly troubled Eastern Airlines in a joint promotional deal. Beginning in November, fliers on Eastern routes will each receive a free fourth generation language.

The U.S. government announces that injury claims associated with repetitive motion — such as typing — soared in 1989. Government spokesman Steve Ballmer says problems can be avoided if users switch to using mice and "insanely great" software such as Microsoft Windows.

Three members of the so-called Legion of Doom hacker group are sentenced to prison for breaking into Bellsouth computers. However, all three quickly escape by beheading the troll that guards the Cavern of Silver and whispering the magic password into the Lantern of Darkness.

DECEMBER

AT&T launches a hostile takeover bid for NCR, claiming that it wants the acquired company to run its foundering computer business. NCR Chairman Charles Exley spurns the offer, threatening to hold his breath until he turns blue. He is later coaxed off a fourth-story ledge at NCR headquarters in Dayton, Ohio.

Ashton-Tate's copyright infringement suit against Fox Software is thrown out of court when the judge rules Dbase itself was lifted from a public domain application. Paperback Software immediately files a countersuit against Lotus, claiming the idea for 1-2-3 was ripped off from an order of 15th-century Franciscan monks.

Data General announces a voluntary severance plan whose terms are so attractive that company founder Edson de Castro lays himself off.

COMPUTERWORLD'S

1991 All-Star Team

Yes, it's a bold idea: Create a committee of esteemed and interested computer industry observers to assemble the winningest, bitchin'est executive team ever. This dream team — composed of a board chair, chief executive, operating, financial and technical officers — would oversee the inner and outer workings a fictitious, medium-size computer company that produces a variety of hardware and software devices.

The result (drumroll, huzzah and fanfare) is *Computerworld*'s 1990 All-Star Team of computer company executives. — JIM NASH

Chief Operating Officer
John Sculley
Age: 51
Chairman and CEO of Apple Computer, Inc.
A noted outsider in the computing community, Sculley is the only all-star who comes close to having a traditional business background. One fan said Sculley "has shown that he can roll up his sleeves and get the job done — once he decides what the job is."

Decisiveness definitely works in Sculley's favor: Committee members liked his willingness to change key people and time-honored policies.

Big talents: Detailed determination, outsider viewpoint.

Runner-ups: Duck heroes 3Com Corp. CEO Eric Benhamou and Network General Corp. CEO Harry Saal.

Chief Financial Officer
H. Ross Perot
Age: 60
Chairman, Perot Systems Corp.; board of directors, Nextl, Inc.
The popular runner-up to Microsoft's Bill Gates is one of the last loose cannons in high tech. According to legend, Perot's first job was breaking horses for $1 apiece with his father in Texarkana, Texas.

Perot's advocates said he could act as a shield between Gates, Sculley and Jobs. His golden touch doesn't hurt, either. "Nothing he has ever touched has had money problems," one member observed.

Big talents: Dynamic management, financial foresight.

Runner-up: Richard Miller, CEO at Wang Laboratories, Inc.

Chief Executive Officer
Steve Jobs
Age: 35
Chairman, CEO of Next
The No. 2 pick is a mover — from Hewlett-Packard Co. to Atari, Inc. to Apple to Next. His strong suit is his ability to sell a product to investors and consumers. Said one associate said, "He has a knack for looking at current technologies and guessing the trajectory of the resulting products."

Another committee member praised Jobs' nurturing leadership skills: "He is a genius who is capable of inspiring the other geniuses of the world."

Big talents: Product salesmanship, tenacity in making sure a product gets to market.

Runner-ups: Bill Gates and Compaq Computer Corp. CEO Rod Canion.

Chief Technical Officer
Bill Joy
Age: 36
Vice President of Research and Development, Sun Microsystems, Inc.
The co-founder of Sun stole the chief technical officer show. "He's a helicopter way above us all," one committee member raved. "He's smart like nobody's business," another stated.

Joy's biggest talents, everyone agreed, lie in his Unix expertise. He designed the University of California at Berkeley version of the operating system while a graduate student at the university.

Big talents: Team player, technical brilliance.

Runner-up: Steve Wallach, vice president of technology and board member, Convex Computer Corp.

Chairman of the Board
Bill Gates
Age: 35
Chairman, CEO and co-founder of Microsoft
Everybody's choice for the top spot. "Bill's extremely intelligent," one committee member explained.

Gates has always called his own shots. Committee members praised his stubborn aggressiveness and alacrity in dealing with dangerous partners such as IBM. "When you see people go toe-to-toe with large competitors and they pull it off, it says something about the individuals involved," one member said.

Big talents: Ten-year vision, diplomacy and technology salesmanship.

Runner-ups: Compaq Chairman Ben Rosen, IBM Chairman John Akers.

Special thanks to the following members of the committee: Dick Schaffer, Technologic Partners; Hal Bell, Kaiser Permanente; Andy Seybold, Outsell, Inc.; Bobby Ryan, Ebenezer Holdings, Inc.; Nina Burns, Network Management Solutions; Sheldon Laube, Price Waterhouse; Joe Ervin, Bankamerica Systems Engineering; Dick Curry, Union Life Insurance; John Rebol, Alex. Brown & Sons, Inc.; Gary Chapman, Computer Professionals for Social Responsibility; Julian Horwich, Chicago Association for Microcomputer Professionals; Bill Taylor, Jonathan Positive Support Review, Inc.; Alice Brooks, Meadowcroft & Quist, Inc.; John Logue, Absolutes Group; Frank Dzubeck, Communications Network Architects, Inc.

outlook:
APPLICATION DEVELOPMENT AND DATA MANAGEMENT

Broad strokes, fine details

BY MARY BRANDEL

For some vendors of application development and database management tools, the next 12 months will fill in the big picture that's been touted for a year or more.

For others, there's never been a better time to pull out their best crayons and make their mark.

Here is what's visible so far:

• **AD/Cycle remains sketchy.** IBM delivered on its application development promise and its Repository blueprint in 1990. But "1991 is not the year for AD/Cycle. It's still in transition," says Jeff Tash at Database Decisions in Newton, Mass.

Instead, the next 12 months will be a time for customers to learn about the new environment, he says. IBM and its business partners will need to make good on the promise of an integrated Repository environment. That means we should see third-party tools with initial links to Repository Manager.

This doesn't mean there will be silence on the AD/Cycle front, though. "Look for incremental releases of additional interfaces for AD/Cycle, including one that lets PCs share Repository data," says Robert Binder, principal at Robert Binder Systems Consulting, Inc. in Chicago.

Meanwhile, customers will wait to hear from Index Technology Corp., Bachman Information Systems, Inc. and Knowledgeware, Inc. The big issue is how these tools will be adapted to link directly to Repository Manager.

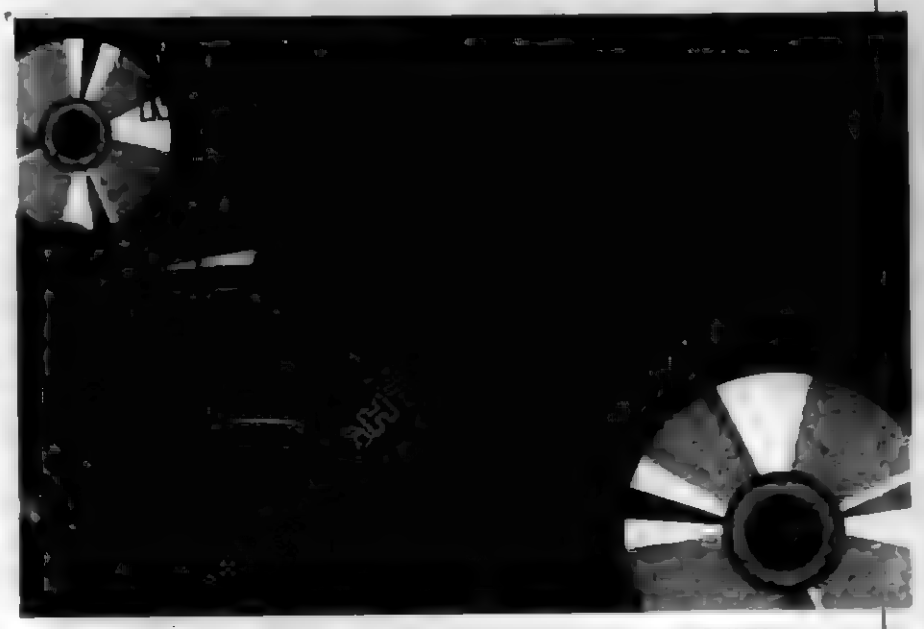
• **Cohesion takes shape.**

Continued on page 28

Desktop bonanza ahead

New technologies will make room for themselves this year

BY MICHAEL ALEXANDER



David Flaherty

Maybe it should be called the "Year of the Great Amalgamation," because that's what 1991 is shaping up to be. This will be the year in which a wide variety of new and emerging technologies converge on the desktop.

Object-oriented databases, electronic imaging, neural networks and, especially, multimedia are among the technologies expected to take on much greater importance in 1991, according to several experts.

In the coming year, corporate advanced technology groups will also be looking closely at imaging technology, technology watchers say.

But networking will be corporate America's No. 1 technology investment, says Mary Rhodes, a senior analyst at New Science Associates, a consulting firm based in Southport, Conn.

Here's a closer look at some key technologies for 1991:

• **Multimedia.** Applications are already moving rapidly into the marketplace, and that pace will quicken in 1991.

The recent agreement between Microsoft Corp. and IBM to cross-license Windows and OS/2 extensions in 1991, based on a common set of multimedia specifications, will help kick multimedia into high gear, according to several analysts.

"We see four major growth areas for multimedia applications," says Nick Arnett, president of Multimedia Computing Corp., a research firm in Santa Clara, Calif. "Learning and corporate education; sales and marketing and other persuasive business presentations; technical documentation for maintenance and repair; and scientific and engineering visualization."

Intel Corp. introduced a two-chip set for Digital Video Interactive in late 1990 that now makes it possible for a manufacturer to put multimedia capabilities into a desktop computer for about $1,000. This is a big leap in price/performance, which could begin to pay off handsomely for companies pursuing multimedia in 1991.

Because the multimedia market is so young, estimates of its value vary wildly. Depending on the definition used, sales in 1991 are estimated at between $500 million and $15 billion.

But analysts agree that it's still too

Continued on page 28

Small is big in PC land

BY RICHARD PASTORE

In 1991, a whirlwind of change on the portable personal computer horizon will fashion a smaller, cheaper and more powerful PC landscape.

Among the key developments:

- A glut of Intel Corp. 80386SX-based notebook PCs.
- Price decreases of as much as 35%.
- A 40% to 50% increase in U.S. laptop shipments.
- Rechargeable batteries that can outlast typical nickel-cadmium cells by 50%.
- Low-priced units based on new chip sets developed specifically for portables.
- Possible laptop PCs from IBM and a newer Macintosh portable from Apple Computer, Inc.
- Advances in affordable, easier-to-read color displays.

In 1991, the hot commodity is going to be the 386SX-based notebook-size computer, predicts Andrew Seybold, an analyst at Dataquest, Inc. in San Jose, Calif.

Despite the lack of volume shipments, it's clear that the industry's new darling will be SX IBM-compatible portables weighing less than seven pounds.

Comdex/Fall '90 was a precursor of the SX squalls to come. Intel's booth, for example, harbored some 14 prototype SX notebook machines. Richard Horan, editor-in-chief of *Portable Technology Update* in New York, says he counted a total of 50 386SX-based notebook announcements or prototypes on his Las Vegas rounds.

Price wars seen

What does the product glut mean for users? Price wars. Compaq Computer Corp.'s initial $7,000 benchmark price for its LTE 386SX has already been undercut several times: $1,000 by Texas Instruments, Inc.'s Travelmate and $3,600 by AST Research, Inc.'s Premium Exec 386SX/20, to name just two.

"We are forecasting a major price war to last for a year to a year and a half," says William Bluestein, an analyst at Forrester Research, Inc. in Cambridge, Mass. By the end of 1991, SX notebook prices will be approximately $2,500 to $3,000, he predicts.

As prices fall, more users will be pulled into the portable tempest. In fact, portables will be the only area of growth next year for the PC industry, according to Bluestein and other analysts.

According to Forrester, unit sales of portables weighing less than 15 pounds will make up 18% of all PCs purchased by nonhome/education buyers next year, up from 12% this year, according to Forrester.

Continued on page 29

Application

CONTINUED FROM PAGE 27

Expect a lot of action from Digital Equipment Corp.'s computer-aided software engineering (CASE) strategy. DEC plans to release CDD/Repository in the first half of 1991, and "virtually every vendor has signed up with DEC" to develop compatible CASE tools, says Vaughn Merlyn, chairman of CASE Research Corp. in Bellevue, Wash.

• **TI gives Unix extra gloss.** This could be the year that Texas Instruments, Inc. steps out of the shadows of AD/Cycle. A key will be continuing beyond the IBM mainframe market and into the open systems arena. "TI could do for CASE what Oracle did for the DBMS market," Merlyn says.

Not that there aren't already CASE tools for Unix. What TI has, however, is a set of integrated tools. "TI's integrated dictionary is here today," Tash says, "and they're maneuvering to find markets where they'll be most successful. They could come out with a full, integrated tool set for Unix."

In 1991, buyers should see the release of TI's Information Engineering Facility for Tandem Computers, Inc.'s Nonstop and DEC's VAX/VMS. "There's no doubt there's a vacuum to fill in CASE products for Unix," Merlyn says. "The question is, is TI big enough to do it?"

• **The rainbow effect.** Expect to see some jostling and positioning. "This will be the year to determine whether Computer Associates can regain some past successes of Cullinet and ADR," Tash says. The firm has a lot to offer people interested in downsizing, he adds.

Also, with Oracle's financial woes and Ask Computer Systems, Inc.'s recent purchase of Ingres Corp., Sybase, Inc. may change the position previously held by the two database management system leaders.

• **The object-oriented outline.** The term object-oriented will continue to buzz on both the DBMS and applications development fronts. IBM will announce support for object-oriented languages on AD/Cycle, with its first offering being Smalltalk in the first half of 1991. It will be 1992, however, before the Repository Manager Information Model will accommodate objects. This could be the year that DB2 gets some object-oriented extensions as well, according to Tash.

DEC will introduce its object oriented language Trellis for the commercial market, and it has a joint arrangement with Objectivity, Inc. to develop an object-oriented database.

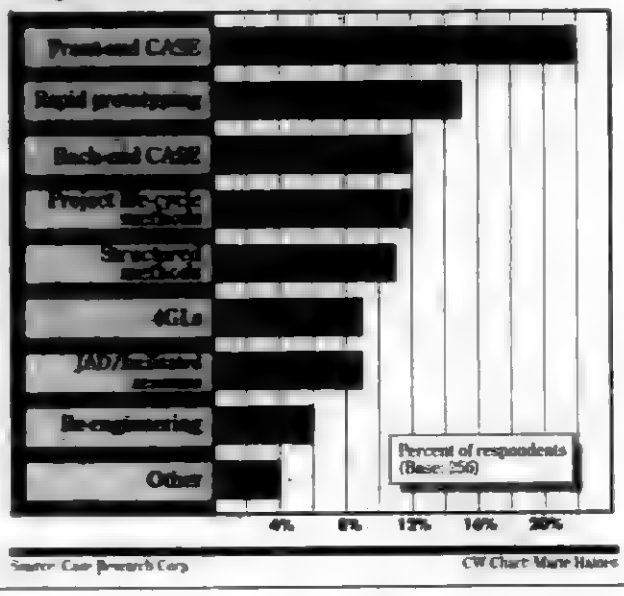
• **Distributed . . . finally?** Look for IBM to continue its quest for a distributed database. The firm will say in 1991 when it can provide links between its VM and MVS mainframe databases and has hinted about availability for other links, too. This hint means we may finally find out when the OS/2 database manager can talk to DB2 and other host DBMSs. But the goal to unite its four Systems Application Architecture databases is still years away.

At DEC, RDB will become interoperable with DEC's other databases via Network Application Support, and interoperability with Oracle databases should appear in late 1991. □

Brandel is a *Computerworld* senior editor, product spotlight.

Promising developments

When asked about the most promising approach to improving systems development in their organization, the majority of software developers at large and medium-size IBM shops said front-end CASE



Source: Case Research Corp. CW Chart: Marie Haines

Desktop

FROM PAGE 27

soon for the compelling business applications that could drive the multimedia market in the same way that spreadsheets fueled the advent of personal computers.

The missing link is multimedia standards for the way information is stored, manipulated and presented under multimedia applications. However, industry watchers say that standards in these areas will begin to fall into place next year.

Two groups within the International Standards Organization — Joint Photographics Experts Group and Motion Photographics Experts Group — are developing standards for still video and full-motion video, respectively.

Thus, what will be important about multimedia in 1991 is its expected impact on compression technology and standards, digital signal processing, video digitizing, optical storage and networks. And because multimedia often includes combinations of audio, video and other copyrighted material, experts say the issues of intellectual property ownership and royalty payments will also heat up in 1991.

• **CD-ROM.** More flavors of compact disc/read-only memory (CD-ROM) optical-disc technology will debut this year, bringing new multimedia capabilities to desktop computers.

Compact disc interactive (CDI), developed by Philips N.V., will pick up momentum with the introduction of consumer players, some experts believe. CDI in its current form is capable of storing 7,000 images or 72 minutes of full-screen, full-motion animation, along with digital stereo audio.

An extended architecture format of CD-ROM, called CD-ROM XA — which combines the audio and video capabilities of CDI and the industry standards of CD-ROM — will also debut. Some believe it could become a standard in its own right.

IBM will officially throw its weight behind an optical-disc technology and at the same time "legitimize" the technology, Rhodes predicts.

"Managing the storage demands, retrieval times of optical storage, the emergence of color and how it will be shipped across the network," will also become pressing issues in 1991, she adds.

• **Multimedia databases** that blend audio, video, text and other forms of data will inch closer to the mainstream in 1991, analysts say.

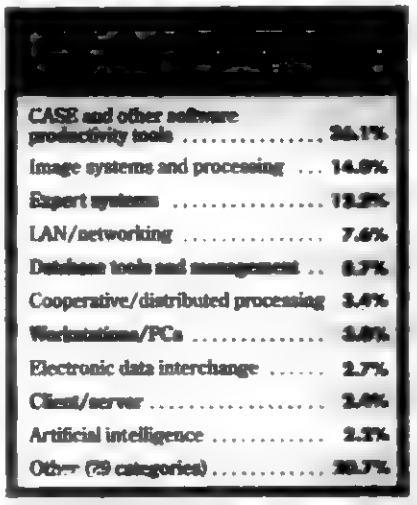
How to manage, manipulate and retrieve this diverse mix of information will be one of the key challenges facing vendors this year. The databases will be aimed at individual users rather than the distributed databases aimed at organizational computing. The solution will be found in object-oriented technology that will enable users to customize databases to suit their specific needs.

Several major vendors, including Oracle Systems Corp., are working on object-oriented DBMS products. Traditional database vendors such as Ingres Corp. and Sybase, Inc. will begin to feel competitive pressure as object-oriented databases start receiving more attention.

• **Image processing,** still in its infancy, is outpacing all other segments of data processing, according to some analysts. BIS CAP International, Inc., a Norwell, Mass.-based research firm estimates the market will reach $2 billion by 1993.

IS views its future

Software development tools and imaging lead the pack of emerging technologies that interest top IS managers most



Source: Index Group, Inc. CW Chart: Dorrea St. John

THE MISSING LINK is multimedia standards for the way information is stored, manipulated and presented under multimedia applications.

• **Networking.** Both local and wide-area networks continue to be a priority for Fortune 1,000 organizations.

A recent *Computerworld* survey of *Computerworld Premier 100* companies showed that nearly two-thirds considered networking and related technologies to be "the most critical" technology for competitive success over the next five years. LANs, in particular, were judged to be most important: They were cited by one-third of the respondents.

According to the Boston-based research firm The Yankee Group, communications budgets at Fortune 1,000 companies will rise an average of 6.1% in 1991.

With the growing popularity of LANs, many users may find a darker side to using them.

"I expect to see more companies will start finding problems with local-area networks and start questioning why they are using them," predicts Norman Weizer, senior consultant at Arthur D. Little, Inc. in Cambridge, Mass.

"With more work being done on the desktop, LAN security will become more important than ever," agrees Patrick Corrigan, managing director of Corrigan Group Information Services in San Francisco and co-author of *Building Local Area Networks*.

"The major network operating systems like Netware have pretty fair security," he continues. "The weak link in all of this is that it is easier to get access to a LAN system than a mainframe."

Yet despite these security concerns, Weizer predicts that expectations for LANs will continue to rise, causing companies to seek even greater use of the technology. He predicts that groupware and electronic conferencing in particular will become more prevalent.

• **Neural networks,** while still far from widespread commercial acceptance, will continue to mature this year. Several firms including IBM and Intel have been putting research dollars into software and chip technology.

The results of those efforts may begin to pay dividends in the latter part of 1991. The market for the technology will be about $100 million in 1991 but is expected to soar to $1 billion by the mid-1990s, according to some analysts.

• **Windows applications.** Among the other interesting areas will be more Windows-based applications that will expand the computing capabilities of both naive and experienced users, analysts say.

• **Laptop computers** running Windows-based applications will also be hot (see story page 27).

"That is going to be a screamer [in 1991]," Weizer says. "People who would not have considered it before will now in fact be willing to give up their under-[airplane]-seat space for it."

• **X-Window terminals** will also be judged useful or not by many corporations in 1991. For many, the choice will be between X-Window terminals and diskless PCs. □

Alexander is *Computerworld*'s senior editor, advanced technology.

PC land

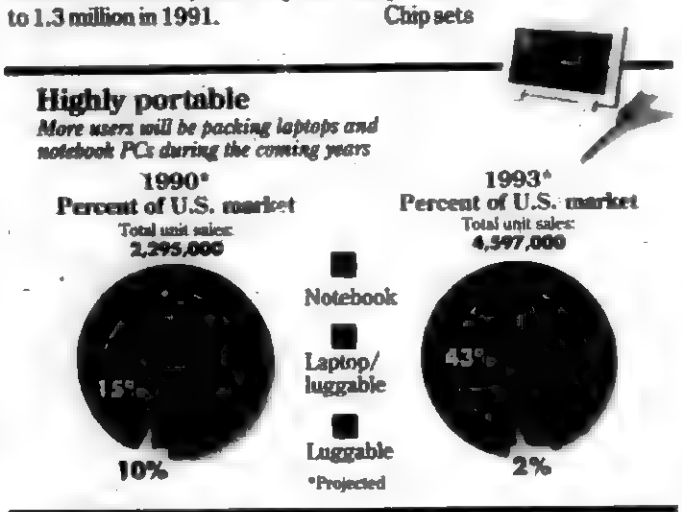
FROM PAGE 27

While the research company predicts a 10% decline in desktop PC shipments, it says laptop system unit sales are expected to increase from 832,000 this year to 1.3 million in 1991.

cadmium battery. Alternatively, the new batteries can offer the same life expectancy at half the size and weight.

A typical example is the nickel-hydride battery that is scheduled to ship with Toshiba Corp.'s $5,499 T2000SX system in January, 1991.

Chip sets



Industry developers, lured by potential profits, should soar to new heights of technological innovation.

"Since the notebook market is about to take off like crazy, people are finally going to put the research dollars into battery technology," Seybold says.

Better batteries

One advance already getting attention is the nickel-hydride battery. The new design can yield a 50% greater life span than the typical three hours of the nickel-

designed by Intel and Advanced Micro Devices, Inc. specifically for portables will also show up in machines from at least 20 vendors in 1991, according to analysts.

Because the chip sets consolidate previously separate components and controls, they make it cheaper for systems vendors to design and build smaller machines. This should in turn smooth the way for more low-priced notebook systems to enter the market.

The chip sets — the Intel 386SL and AMD AM286ZX and LX — are designed to require less power, further enhancing the potential for boosted battery life spans in portables using the chips.

New entries, pockets

The appearance of rumored new units from IBM and Apple will add zest to the portable zephyr. Even if the machines fail to appear or turn out to be flops, it probably won't be enough to slow market momentum.

Few Intel 1486-based portable systems are due yet. Despite IBM's entry into the portable 486-based arena this fall, next year will find machines from only a few firms chasing a small, highly specialized niche market, analysts agree. They note that few people feel they need a 486 on their desktop, let alone under their arms.

Pocket-size portables, which garnered a lot of attention this year for their novel packaging, will largely remain novelties in 1991. Observers say the machines trade off too much functionality for size and are unlikely to capture more than a specialty market.

While users acknowledge and appreciate the growing power and shrinking size of portables, "they're still a little off from what people want and need," says Steve Leopold, a portable computer user at Anritsu America, Inc. in Oakland, N.J. "I'll be happy when they come out with a nice color display that's cheap."

"Even if we don't move affordable color to the laptop, it will make it to the larger portables and may even put a little spark back into the transportable category," says George Thompson, an analyst at Datapro Research, Inc. in Delran, N.J.

Sharp Electronics Corp., a pioneer in portable color systems, will unveil its AC-powered, 15-pound Color Star unit next year for $10,000 to $15,000. Toshiba's color T5200C is already shipping and costs $9,499.

With or without color, the portable computer market will continue to evolve toward most users' ultimate goal — a powerful, uncompromising desktop personal computer that fits in a glove compartment and is as light as a summer breeze. ☐

Pastore is a Computerworld senior writer.

It's Shakeout Time

While a boom in the laptop market is good news for buyers, analysts say the competitive cyclone being whipped up by portable PC vendors may carry away several smaller competitors.

"The whole category is growing very rapidly, but the majority of manufacturers are finding it very unprofitable," says Dick Shaffer, president of Technologic Partners in New York.

According to Shaffer, only high-profile manufacturers with distinctive products — including Toshiba, Compaq and Zenith Data Systems — can hope to prosper.

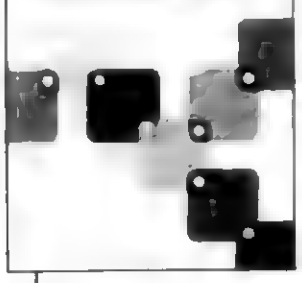
Other analysts say that even portable heavyweights such as Compaq could get battered. Already, a half-dozen competitors — including Texas Instruments, Inc. and AST Research, Inc. — have announced 386SX-based notebook PCs that underprice and/or outperform Compaq's fall 1990 LTE introduction.

Ironically, observers say it is likely that Compaq's newest LTE will divert sales from its other portables, especially its 386SX-based laptop, the SLT. "We think there will be some cannibalization of the SLT," says Lorie Strong, a Compaq product marketing manager. "But there's not enough LTE volume shipping yet to understand the effects."

RICHARD PASTORE

Get ready: More's coming

outlook: NETWORKING



BY JOANIE M. WEXLER

Buyers will see vendors responding with a new generation of networking choices in 1991. Several networking technologies will emerge, providing users with more connectivity, faster network speed and better bandwidth management. Among them:

• **Enhanced virtual private network services.** Public and private wide-area telecommunications suppliers will be butting heads with a variety of products and services. Major long-distance suppliers, in particular, will be beefing up their offerings.

Virtual private networks let users allocate a portion of the public network between their premises and a carrier's central office. The idea is to provide the advantages of a private network to companies lacking the traffic for dedicated communications lines.

MCI Communications Corp. will roll out a "shared network" service in 1991. U.S. Sprint Communications Co. will provide virtual network service internationally during the first quarter.

Private vendors will also continue to aggressively court users who need the high speeds and bandwidth management required for applications such as remote local-area network interconnection, imaging, video-conferencing and computer-aided design.

• **New public services.** Public carriers are striving to keep pace with the high-speed data networking technologies being rolled out by private companies.

AT&T says it will deliver a 384K bit/sec. version of its Software Defined Data Network in the first quarter. A 1.5M bit/sec. option is set to be released in the third quarter. The carrier has also committed to a first-quarter rollout of its Accunet T45 Reserved Service. The service will allow users to access 45M bit/sec. bandwidth on a demand or scheduled basis.

MCI says it will provide switched T1 and switched T3 services by the third quarter.

• **Frame relay, switched T1 and T3 and switched multimegabit data service.** Public carriers are working feverishly to compete with high-speed switched services that can accommodate video and other high-bandwidth applications.

"Buyers must continue to evaluate switching technologies, including multiplexed circuit switching, frame relay and cell relay," says Phil Evans, president of the International Communications Association.

Frame relay is a form of packet switching that moves data faster because it eliminates error detection and correction in each network link. Cisco Systems, Inc. and Stratacom, Inc. are already shipping products. Timeplex, Inc. has just started shipping a cell-relay product line.

The best choice is still unclear and is a major issue to be decided in 1991, says Lionel Gillerman, vice president of regulatory affairs at the Tele-Communications Association.

The big decision, adds Todd Dagres, director of communications research and consulting at The Yankee Group in Boston, will be whether companies should implement frame relay themselves or work with the local telephone companies in implementing switched multimegabit, an emerging 45M bit/sec. packet-switched data service.

• **FDDI as backbone technology.** Expect to see Fiber Distributed Data Interface (FDDI) as a key backbone in the latter half of 1991. "The standard is in place, products have rolled out and companies are going to exceed the capacity of 16M [bit/sec.] token-rings and 10M bit/sec. Ethernets," Dagres says. Some 20% of Fortune 1,000 firms will explore FDDI backbones, and some will even build production systems, he adds.

Prices for the fiber-based 100M bit/sec. LAN are expected to remain high for another year or two.

• **Interoperable LAN operating systems.** Personal computer/LAN interoperability will be hot in 1991. Analysts say users are demanding it.

Banyan Systems, Inc. will not commit to a link with Microsoft Corp.'s LAN Manager in 1991. Similarly, Novell, Inc. — with 55% of the LAN market share — is mum on linking its Netware LANs with other LANs.

"But there will be increasing pressure on LAN vendors to provide hooks to competitors' networks," says Kevin O'Neill, vice president of network research at Business Research Group in Newton, Mass. Dagres adds: "If they don't, someone else will."

Even IBM has announced that it will be providing hooks from Netware to its Netview network management system during the second quarter of 1991.

• **Wireless LANs.** In 1991, wireless technology will emerge as a cabling alternative, Dagres says, if the cost per connection can come close to shielded twisted pair. Motorola, Inc.'s 15M bit/sec. microwave technology announced last fall, for example, is set for availability in the first-quarter. ☐

Wexler is a Computerworld senior writer.

outlook:
PRINTERS AND OUTPUT DEVICES

Speedier, cheaper, colorful

BY STEFANIE MCCANN

Whether your users are doing simple memos or printing catalogs and big proposals, price, speed and color are expected to make their lives easier in 1991.

• **Print is cheap.** Look for lower prices on all types of printers. Competition and maturing products are the main reasons, says Larry Jamison, an analyst at BIS CAP International, Inc.

Prices for desktop impact printers will drop as low as $2,000.

• **Variations on a ream.** Analysts say not to expect many new printer technologies in 1991 — only enhancements. One hot new technology is dye diffusion, which uses a film with ink capsules. Heat breaks up capsules, and the ink gets transferred to the paper. Analysts say the process gives photographic quality.

• **Hot hybrids.** Multifunctional devices that combine facsimile, printer and photocopier into one device will be big. Typical of the new breed is Ricoh Corp.'s forthcoming DS320F, a $9,995 digital copier with fax capability. The DX-1 allows information to go directly from a personal computer screen to a fax machine, explains Tom Sandock, an analyst at BIS CAP.

• **Splashes of color.** Color may not be the biggest issue this year, but it will still be worth watching. Spectra, Inc. plans to release an OEM device for under $10,000 that it says plans to decrease the problem of ink chipping of paper. Eastman Kodak Co. will introduce a method of colorization in digital form that it says will improve speed and accuracy. □

McCann is a *Computerworld* editorial assistant.

"Hello, Europe? This is the U.S. calling"

BY ELISABETH HORWITT

Will this be the year that you can send a facsimile to Poland in less than a day?

As barriers to international trade come tumbling down across the European business community, multinational firms are clamoring for a comparable opening of European communications services.

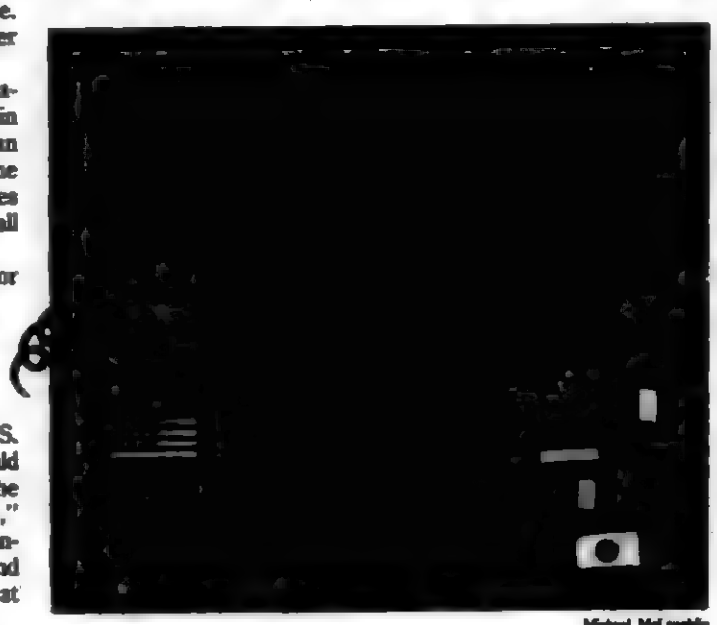
Especially desired are the competition, broader options and lower prices that often accompany deregulation.

Thus, 1991 could well be a watershed year for such improvements, coming as it does right before the official launch of the European open market in 1992 and after a year of key initiatives aimed at fostering pan-European communications systems.

However, firms are still encountering obstacles to setting up communications links to support marketing thrusts across Europe. Among the bigger problems are:

• **High rates.** Unreasonably high rates in some countries make an incoming call to the U.S. two to four times the cost of the same call in reverse.

Schindler Elevator Corp. recently held a meeting to break out the costs of a proposed U.S.-to-Switzerland link and discovered that "the U.S. half of the link would cost $3,000 and the Swiss half, $7,000," says Ed Hodgson, manager of computing and communications at Schindler.



Michael McLaughlin

• **Lack of digital connections.** Another problem is a scarcity of the high-speed digital connections that U.S. firms have come to take for granted. "I think people still communicate in Austria by building signal fliers on a hilltop," says Hodgson, whose company recently considered network options in that nation.

• **Differing standards.** A link from Italy to Sweden, for example, involves buying circuits separately from every Postal Telephone and Telegraph authority (PTT) in between — each with its own pricing, interfacing and equipment buying rules.

"In country A, you can only attach a modem specified by that country, sold by that PTT; in country B, you can use any modem," explains Donna Valtri, manager of network services marketing at GE Information Services. The European Community's Council of Ministers attempted to address the situation last summer by proposing the Open Network Provision (ONP), which calls for European carriers to "harmonize" their tariff structures and equipment provision regulations. An important component of ONP is a common standard for interfacing equipment with carrier-based services.

How quickly a truly open, competitive, pan-European network environment develops depends a great deal on how much pressure the European Commission and major users can bring to bear on recalcitrant countries.

The UK, France, Spain, Germany and Italy have all become highly attuned to business users' needs as they jockey for the position of most-favored hub of global networking.

"They're all in the throes of deregulation and hungry for business," says Douglas Fields, telecommunications manager for information services at United Parcel Service, Inc.

Some major advances can be expected from the Eastern European nations. Several countries are already talking with value-added network providers and seeking to "build an infrastructure where none exists," often with foreign help, Valtri says.

The real question is how fast the pan-European communications movement will invade the middle tier — countries that continue to support their PTTs' monopolies but stand to lose much if they do not join the open communications movement.

The European Commission targeted such protectionist policies last summer in its ONP by calling for PTTs to give value-added network providers and other network services guaranteed access to basic national telephone services.

However, the commission may not be able to make such adjurations stick. Here again, global firms may provide the needed commercial impetus where official bodies fail. Schindler has also been pressuring AT&T to deploy a switched 64K bit/sec. link to Switzerland via its Switched Digital International service. Companies like Schindler, with present and growing global communications needs, are likely to stay frustrated with what seems like a snail's pace toward viable pan-European networking. Still, significant improvements are coming:

• International circuit prices should fall on an average of 20% per year across Europe during the next five years, according to Stamford, Conn.-based research firm Gartner Group, Inc.

• Digital switched services are extending their reach, both within Europe and between the U.S. and Europe. AT&T's 64K bit/sec. Switched Digital International service provides savings over dedicated lines.

AT&T plans to expand the service to at least 10 more countries in 1991 and will also expand the bandwidth to 384K bit/sec. at an undisclosed future date.

• Virtually every major European country has promised that International Services Digital Network (ISDN) "will be available to everyone by 1992," says David Thunder, Gartner Group's program director of European Telecommunications Strategies.

• The Consultative Committee for International Telephony and Telegraphy recently announced approval of a global ISDN signaling standard, Q.767, which should finally make it possible for various carriers in Europe — and perhaps even the U.S. — to interconnect their ISDN services directly rather than through traditional switched 56K bit/sec. circuits.

• Several consortia are rumored to be jockeying for the chance to provide a pan-European broadband digital network.

The project will at long last mesh communications services throughout the various nations, says Jeremy Frank, Gartner Group's vice president of European telecommunications: "I hope that more than one will do it, because that would lower circuit prices, which are real expensive now." □

Horwitt is a *Computerworld* senior editor, networking.

Gloom looms over high-end market

BY ROSEMARY HAMILTON

In 1990, IBM and its mainframe rivals, Amdahl Corp. and Hitachi Data Systems Corp., put their cards on the table. In 1991, we'll see how willing customers are to play the game.

As 1990 ended, user reaction to the new generations was positive. But despite the upbeat response over the increased capacity and new technology that the Big Three plan to deliver this year, the mainframe market can't avoid taking a hit from gloomy economic forecasts.

Whether the grim predictions will actually hurt sales is unclear right now. Industry experts say economic uncertainty will spark even fiercer competition and backroom discounting of 35% to 50% will continue to be the norm.

Vendors differ on the seriousness of the economic outlook (see story this page). In any case, the mainframe providers have no choice but to simply plow ahead with their plans. Analysts have labeled 1991 "a transition year" as the three players get ready to deliver a new generation of systems.

Here are some of the highlights that buyers can expect from the mainframe market in 1991:

• **In with the old, in with the new.** The Big Three mainframe vendors will try to sustain the older generation of systems while drumming up business for the new models, most of which are scheduled for shipment beginning in the second quarter.

"Basically, [the vendors] will all be buying time," says Frank Gens, a vice president at Technology Investment Strategies Corp. in Framingham, Mass. Gens expects customers to keep pressing vendors for discounts in the "35% to 50% range on the large competitive bids" until the new generations are available.

• **Year of the Big MIPS.** Hitachi is determined to be first to market with big millions of instructions per second (MIPS) machines. The company plans a second-quarter delivery of a high-end model that runs at about 150 MIPS.

But don't be surprised if IBM, hoping to beat Hitachi, will "work overtime to deliver its 200 MIPer in the second quarter," Gens says. IBM's top-of-the-line Enterprise System/9000 is scheduled for shipment in the third quarter of 1991.

Hitachi and IBM will be joined by Amdahl in the fourth quarter when it starts shipping systems in the 150 MIPS to 200 MIPS range. Then all three vendors will be in a dead heat in terms of the system performance that they can provide.

Thus, 1990 will end with a twist: This will be the first time in recent years that all three have competed for the high-stakes, high-end business. In the past, Hitachi has been confined to lower end mainframe sales.

• **Baby brother systems.** After 1990's product blitzes, customers might consider a lull in rollouts good news. Some information systems managers are still reading through the 1,000-plus pages of customer letters from IBM's Sept. 5 announcement. But one of the more interesting introductions in 1991 could be some additions to those IBM volumes.

Some analysts predict that IBM will begin rolling down Summit technology to lower end ES/9000 models. Now, only the two high-end ES/9000s — the 820 and 900 — are based on next-generation technology. Gens says he expects IBM to begin replacing these hybrid models with Summit-based systems this year.

Hitachi has promised high-end announcements in the first quarter of 1991 but won't give any details.

Analysts say the obvious addition to the mainframe line would be five- and six-way models. While IBM announced a new-generation six-way system and Amdahl introduced an eight-way, Hitachi topped out with a four-way system last year.

• **Slow going on the Summit.** Count on only initial implementation of the new IBM mainframe architecture, System/390.

Highlights of System/390 were the new fiber-optic-based channel architecture, called Escon, and a system coupling capability, called Sysplex. But buyers will see no big ramp-up here; both will be delivered in phases. In fact, key pieces of Escon will not be available until late 1991.

In the first quarter, Amdahl and Hitachi are expected to announce when they will be System/390-compatible.

Analyst Bob Djurdjevic at Annex Research says IBM had initially indicated that System/390 would set the plug-compatible manufacturers (PCM) back 18 to 24 months. The PCMs are required to re-engineer their equipment to accommodate changes made by IBM when it introduces new software or hardware.

Meanwhile, Djurdjevic says, the PCMs were dropping hints that catching up with System/390 would be easier than attaining Enterprise Systems Architecture compatibility. □

Hamilton is *Computerworld*'s senior editor, systems.

A big year

The big three mainframe makers have high hopes for their newest high-end models

Hitachi
- High-end models in EX series
- Announced June 1990
- Maximum: 150 MIPS (4-way model)
- Available mid-1991

IBM
- Enterprise System/9000
- Announced September 1990
- Maximum: 200 MIPS (6-way model)
- Available late 1991

Amdahl
- New models of 5990 series
- Announced September 1990
- Maximum: 300-plus MIPS (8-way model)
- Available mid-1992

CW Chart: Doreen St. John

THE DEBATE: TO BUY OR NOT TO BUY

Everyone agrees the economy is in tough shape, but there's disagreement on how this will affect the mainframe market.

William Grabe, IBM's vice president and general manager of U.S. marketing and services, says it's difficult to determine what effect a recession would have on 1991 mainframe sales.

He points out that during economic downswings, customers tend to focus more on improving productivity, which he says IBM is well-positioned to do.

Others have different attitudes. Amdahl Chairman Jack Lewis says he is very concerned and suggests the economy will "overwhelm almost everything else" next year.

Hitachi Executive Vice President Jim Balassone says he is concerned but upbeat about next year, adding that IBM PCMs might actually benefit from an economic downswing. In a downturn, people are more concerned with cost, he says, and are more likely to convince management to look at PCMs if the savings are substantial.

One industry analyst suggests the IBM mainframe market could ride out 1991 with little impact.

Mainframes, says Marc Schulman, a vice president at UBS Securities, Inc., "are purchased by long procurement cycles. Barring a real economic squeeze, the blood probably isn't going to flow."

ROSEMARY HAMILTON

Microsoft claims the desktop mantle

outlook:
DESKTOP OPERATING SYSTEMS

BY PATRICIA KEEFE

With Microsoft Corp. firmly in control of the desktop, a welcome calm has settled on the opening days of the operating system market in 1991.

IBM has regained control of its baby, OS/2. But Windows 3.0 has won the corporate desktop for the next year or two.

Even so, several issues and products will pop up in 1991, most of which should further strengthen Microsoft's strong hand:

• **DOS keeps stinging.** Ever been stung by a dead bee? OS/2 has. DOS, once thought by many to be dead, actually has enough of a stinger left to drive decent OS/2 sales growth into 1992 and fend off Unix gains.

In 1989, desktop sales of Unix totaled a mere 400,000 units, according to Creative Strategies Research International. Sales will not hit the million-unit mark until at least 1991 — maybe. Meanwhile, DOS is expected to add 11 million units from 1990 to 1991.

In the meantime, OS/2 continues to operate in the shadows. It lives primarily in back-shop development projects at a small core of mostly IBM shops.

"Users have made a decision," according to David Marshak, an analyst at Patricia Seybold's Office Computing Group, "and it's Windows." Most developers will focus on Windows for the next two or three years, he says.

• **Fancier Windows.** Various enhancements — including multitasking, Truetype and handwriting recognition, as well as multimedia extensions to Windows 3.0 — are on the way. Windows will just keep getting more robust and all-encompassing, to the point where many developers expect that Bill Gates' pet operating environment will one day merge with OS/2. This could prove the kiss of death to the Presentation Manager interface, one developer close to Microsoft says.

• **Delivery of DOS Version 5.0.** Look for the newest version late in the first quarter. The announcement, combined with an outpouring of Windows applications and dropping prices in the Intel Corp. 80386 market will help push Windows over the top as the standard desktop environment in 1991.

• **Windows, OS/2 compatibility.** Microsoft has promised binary compatibility between Windows and OS/2, along with the tools necessary to enable Windows programs to run under OS/2. Once these are delivered, there will be no longer be any reason to develop separately for OS/2, says Brian Livingston, a network consultant.

• **OS/2 Lite.** Although IBM Executive Vice President Lee Reisweig predicts that the recently released 2M-byte OS/2 Version 1.3 will be the biggest OS/2 seller to date, users appear lukewarm to the idea. Applications availability will continue to be the main hitch to OS/2 growth.

• **Don't forget about OS/2 Version 2.0.** A big question mark is the impact of the 32-bit OS/2 2.0, which started shipping in limited quantities in fourth-quarter 1990. Corporate microcomputer managers have repeatedly said they would wait for 2.0.

However, the success of Windows 3.0 has resulted in backpedaling. Volume shipments of OS/2 Version 2.0 are expected by mid-1991, and the industry will be watching to see if multiuser 2.0 is hot enough to light a fire under the users turned on by Windows. Or is it too late?

• **Iron hand at Microsoft?** The success of Windows 3.0 could stir up another hornet's nest if developers grow nervous as Microsoft tightens its grip on operating system and environment software control.

• **What about Next?** Not this year, and maybe not next. □

Keefe is *Computerworld*'s senior editor, PCs and workstations.

Price wars, cheaper storage, safer tubes and more options

BY J. A. SAVAGE

Turboprops and jets both have their places in the sky. One is cheap, flies for short distances economically and offers passengers few amenities. The other works best for long-distance travel and costs more but has movies, headphones and other niceties.

In 1991, personal computers and workstations will be like airplanes: the basic vehicles will stay the same, but the options will grow.

This year watch for the following:

• **PC price wars.** To increasingly challenge IBM and Tandy Corp., firms such as AST Research, Inc. Dell Computer Corp. and Everex Systems, Inc. will drastically cut prices, says William Bluestein, an analyst at Forrester Research, Inc. in Cambridge, Mass. "There will be a bloody price war," he predicts. And others agree.

Despite that good news for buyers, fewer PCs may actually be sold. In Forrester's recent report, "PCs Meet the Recession," the firm predicted that PC sales will drop from about 6 million in 1990 to about 5.5 million in 1991.

Chipping away

Systems based on Intel's 1486 chip have a long way to go before they can be considered rivals to the 80386- and 386SX-based systems

Number of units sold

	1486	80386	386SX
1989			
Q4	—	159,804	133,604
1990			
Q1	486	136,675	121,798
Q2	2,365	153,418	161,335
Q3	3,702	146,907	197,201

Source: Stewboard, Inc. CW Chart: Doreen St. John

"The recession is causing companies to tighten capital spending," Bluestein says. "PC reins are being tightened in addition to having an already saturated desktop." Sales of Intel Corp. 1486-based models are also expected to be modest.

• **Fewer business computer outlets.** To combat the dreary sales forecast, vendors are aiming PCs at the home market. While the number of outlets for home computers will grow, analysts say the number of outlets for business PCs and workstations will decline. Distributors will be pressed by the shrinking profitability on PCs as their prices decline and by the increased amount of support needed for workstations as they become seen as a more powerful PC alternative.

"Personal computers are grossly overdistributed in the marketplace," says an analyst at Frank Lynn & Associates, Inc. in Chicago.

The resulting margin pressures, the analyst says, have squeezed nearly all profitability from the computer dealer channel and have left "little or no resources" to develop the market for a new technology, such as workstations. Some analysts say they believe these pressures will eliminate several top resellers.

As for hardware advances, Jeff Canin, an independent consultant in San Francisco, says there will be little in the way of new technology. His prediction? "More and cheaper."

• **High-speed, low-cost storage.** The newest peripherals on the scene are redundant arrays of inexpensive disks (RAID). These devices store data quickly and simultaneously on inexpensive 5¼-in. or 3½-in. disks using specialized software and processors.

Compaq Computer Corp. has committed to RAIDs, and Advanced Logic Research, Inc. in Irvine, Calif., is also looking into the technology.

• **Terminals with low electromagnetic radiation levels.** Low-emission VDTs will be available in volume in 1991. Most will come unbundled from small and large companies and will be aimed at a user population increasingly concerned about potential health effects from VDTs' electromagnetic fields.

outlook:
PCs AND WORKSTATIONS

• **Compact discs as a software medium for workstations.** Users will see a push for distribution on compact discs led by Sun Microsystems, Inc. By the end of 1991, Sun will distribute software only on compact disc.

• **No resolution on Unix for workstations.** Users looking for a conciliation between Unix variants for workstations will have to wait, analysts say. A bright spot: The availability of the Open Software Foundation's Release 1 and AT&T's System V Release 4 will mean fewer variants to port. □

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New hope for storage-hungry sites

BY MAURA J. HARRINGTON

At home, closet storage space seems to get more precious every year. At work, it seems to be the same with data storage.

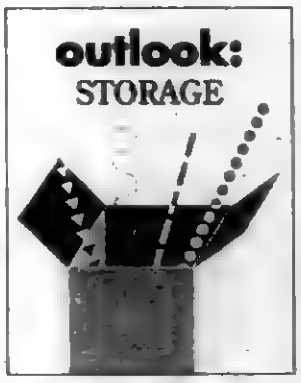
Fortunately, some promising trends await storage-hungry information systems managers in the new year. Here are some of them:

• **Automated tape libraries.** Automated library systems, using both magnetic tape cartridges and optical-disc storage technology, are expected to become more popular in 1991.

Greater interest in automated tape libraries is termed "a significant trend" by Bob Abraham, an analyst at Santa Barbara, Calif.-based Freeman Associates, a market research firm.

The technology is seen as offering a more efficient way to store tapes than the rolling shelving units used in many IS shops.

High-end automated storage systems are especially popular among users "with high volumes of backup," says Hinda Chalew, an analyst in the Computer Storage Service at San Jose, Calif.-based Dataquest, Inc. Automated systems mean cost savings in labor because a person no longer has to switch and store tape cartridges by hand, she explains.



Priced from $216,000 to more than $1 million, the 18-track units can hold as many as 6,000 tapes, or about 1.2 terabytes of data.

One maker of the systems, Storage Technology Corp. in Boulder, Colo., says it has sold more than 2,000 automated tape library systems since 1986. Other manufacturers of similar products include Memorex Telex Corp. in Tulsa, Okla. and Comperex Ltd. in Munich, Germany.

• **Rise of magnetic tape cartridges.** For midrange systems and workstations, the new year will see an increasing popularity of 8mm magnetic, or helical scan, drives. High capacity and a small form factor are likely to lure more users in 1991, analysts say. A single 8mm cassette can hold about 2.3G bytes of data, roughly four times the capacity of a ½-in. tape.

High-end Sparcstations from Sun Microsystems, Inc., high-end VAXs from Digital Equipment Corp. and some Application System/400s from IBM are among the products that now incorporate 8mm magnetic tape drives. Pricing for 8mm drives is about $2.60 per megabyte, averaging about $4,800 to $8,000.

• **Optical will shine.** Several different types of optical-disc drives are due out in volume by mid-year. Designed for DOS, OS/2, Unix and multiplatforms, the drives can access information from more than one operating system without having to change the disc.

Optimem, an Archive Corp. company in Mountain View, Calif., will continue shipping both 12-in. and 5-in. versions of write-once read-many optical-disc drives. Shipments began in December 1990. Prices start at $8,795 for a single drive and $22,800 for a network version.

Other planned introductions of rewritable magneto-optical disc drives are scheduled to come from Ricoh File Products Division in Los Altos, Calif. (prices start at $4,475; shipping is scheduled to begin in the second quarter) and Panasonic Communications & Systems Co.'s Office Automation Group, in Secaucus, N.J. (prices start at $4,500; shipping is set to start in January).

• **Optical jukeboxes.** Also increasing in popularity are optical-disc drive automated storage devices, frequently called jukeboxes. Several companies say they will offer devices in early 1991 with a capacities exceeding 650M bytes, providing the equivalent of daisy-chained magnetic drives for optical discs.

Among the notable offerings will be the $8,000 Desktop Robotic Library from Apunix Computer Systems in San Diego, a Ricoh product adapted for use with Sun systems. Sony Corp. and NEC Corp. in Japan, Toshiba America Information Systems, Inc.'s Disk Products Division and Pioneer Communications of America, Inc. are also among those planning to ship jukeboxes this year.

Unit shipments of all types of optical-disc systems will in some cases triple by 1993, according to Disk/Trend, Inc. optical analyst Bob Katzive. Sales of optical-disc drives will reach approximately 5 million units during the next two years.

Even so, it will take nearly a decade before optical- disc drives become an alternative to magnetic tape drives, notes Jim Porter, publisher of "Disk/Trend, Inc.," a trade publication based in Los Altos, Calif.

Still needed is an industrywide optical disc drive standard, along with better speed and reliability, Porter says. □

Harrington is a *Computerworld* West Coast correspondent.

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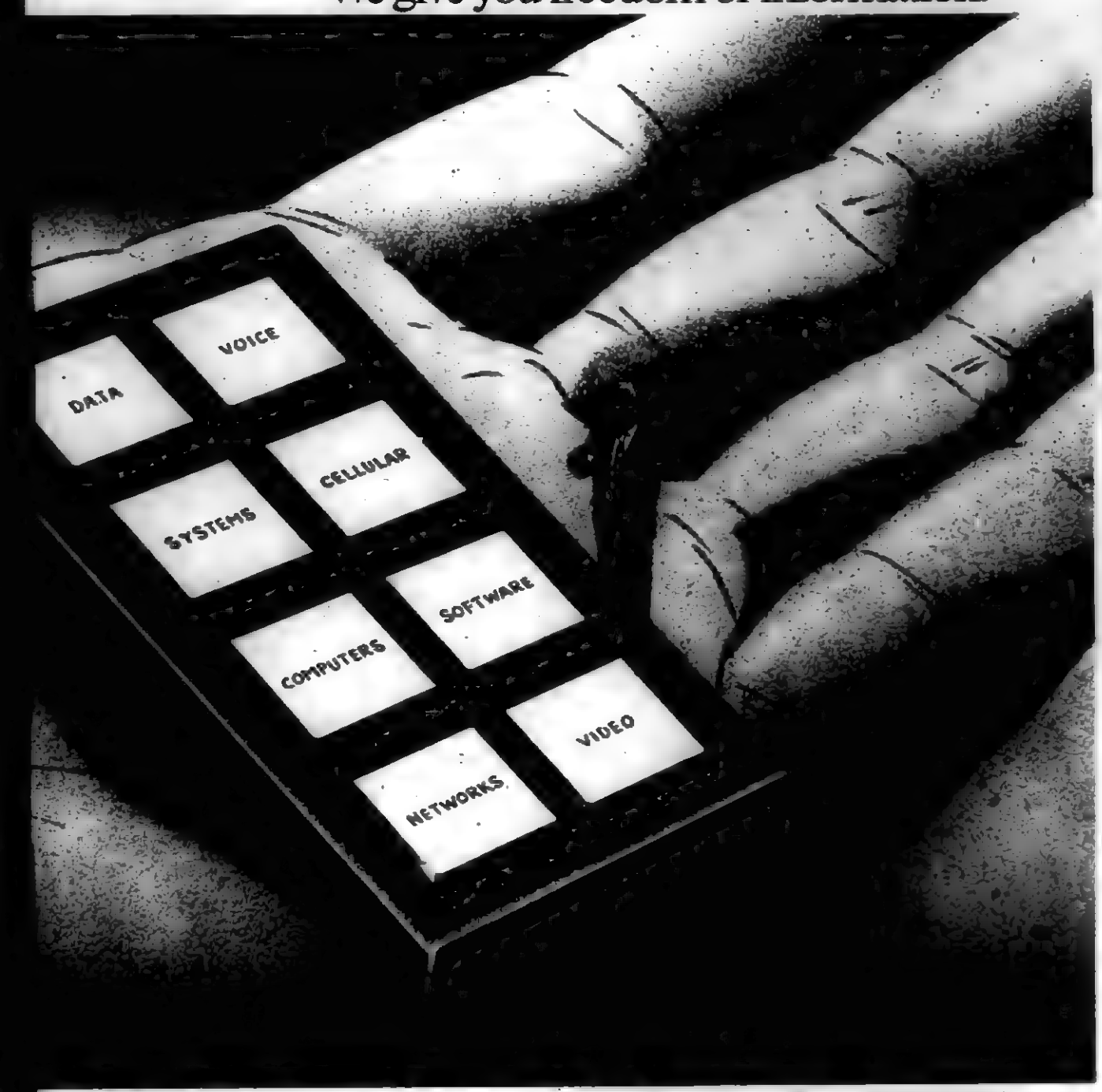

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Computerworld

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1991 Editorial Calendar
(January-June)

Executive Reports	Issue Date	Ad Closings	
		Color	B/W
Maximizing the I/S Investment: Laying the Groundwork for New Architectures	Jan. 7	Dec. 20	Dec. 28
Taming the Unmanageable Network	Jan. 21	Jan. 4	Jan. 11
How I/S and Individual Business Units are Negotiating Project Priorities	Feb. 18	Feb. 1	Feb. 8
How Large Companies are Creating Data Standardization	Mar. 4	Feb. 15	Feb. 22
Maximizing the I/S Investment: Evaluating Advanced Technologies	Mar. 18	Mar. 1	Mar. 8
The I/S Role in Workforce Education	Apr. 15	Mar. 29	Apr. 5
View from the Top: How CEOs and CFOs Evaluate I/S	Apr. 29	Apr. 12	Apr. 19
Maximizing the I/S Investment: Data Center Efficiency	May 13	Apr. 26	May 3
Striking the Right Balance Between Centralization and Decentralization	June 17	May 31	June 7
Product Spotlights/Buyers' Scorecards			
High-end Modems	Jan. 14	Dec. 28	Jan. 4
Network Connectors - Gateways, Bridges and Routers *(Featuring Buyers' Scorecard)*	Jan. 28	Jan. 11	Jan. 18
Systems for Flexible Manufacturing	Feb. 11	Jan. 25	Feb. 1
Relational Databases *(Featuring Buyers' Scorecard)*	Feb. 25	Feb. 8	Feb. 15
Project Management Software	Mar. 11	Feb. 22	Mar. 1
Software Maintenance Tools *(Featuring Buyers' Scorecard)*	Mar. 25	Mar. 8	Mar. 15
Sales Force Automation	Apr. 8	Mar. 22	Mar. 29
CASE Tools *(Featuring Buyers' Scorecard)*	Apr. 22	Apr. 5	Apr. 12
LAN Servers	May 6	Apr. 19	Apr. 26
Network Management *(Featuring Buyers' Scorecard)*	May 27	May 10	May 17
Minicomputers	June 10	May 24	May 31
Portables and Laptops *(Featuring Buyers' Scorecard)*	June 24	June 7	June 14
Integration Strategies			
Using Commercial Systems Integrators	Feb. 4	Jan. 18	Jan. 25
How Companies are Effectively Incorporating LANs into the Integration Strategy	Apr. 1	Mar. 15	Mar. 22
Strategic Integration of Databases	June 3	May 17	May 24
Industry Closeups			
Industry Closeup: Information Systems in Medical Care	Feb. 4	Jan. 18	Jan. 25
Industry Closeup: Information Systems in Transportation	Apr. 1	Mar. 15	Mar. 22
Industry Closeup: Information Systems in Energy Production	June 3	May 17	May 24
Special Reports			
Special Report: Advances on the PC Front	May 20	May 3	May 10

Get Serious with
COMPUTERWORLD

Faster than a speeding . . .

. . . well, not really. Unix will plod along in 1991 gaining favor with IS slowly but surely

BY JOHANNA AMBROSIO

If Unix had a superhero, he'd probably spend most of 1991 in a telephone booth trying to figure out how to put on his cape.

And so it will be in the commercial Unix market this year. As vendors continue to bring out new systems and software incorporating different bells and whistles, such as fancy graphical interfaces and integration with non-Unix systems, the majority of the users they are trying to woo will mostly continue to turn deaf ears to it all.

Yes, Unix will grow in the commercial sector but slowly. "There will be gradual, almost glacial movement," says Kevin O'Neill, vice president at the Business Research Group in Boston. "Unix still suffers from the 'ugly duckling' syndrome of being difficult to use and hard to learn."

Even in the area in which Unix may make the most progress this year — as a platform for client/server computing — it still lags behind other operating systems.

In an August 1990 survey done by the Business Research Group, only 12% of the 502 respondents said they would consider using Unix in a client/server environment. DOS garnered a 48% share, and even OS/2 got 25%. Unix may grab some of that OS/2 share, however, if users decide that Unix is a less risky decision, or a less expensive one, than OS/2.

Richard McGuire

Still, Unix growth will continue to be held back by two familiar problems: the lack of applications software and the existence of two major Unix versions.

While a large number of vendors, including Lotus Development Corp. and Ashton-Tate Corp., will ship more Unix versions of DOS software, it will take at least another year for the applications problem to be solved.

AT&T's Unix System V and the Open Software Foundation's OSF/1 will fight it out for market share, although products incorporating OSF/1 will not likely ship in volume until late in 1991 at the earliest. It will be another year before OSF/1 garners any significant following.

Now here's a bit of good news. Although the so-called Unix wars may result in users steering away from Unix until a winner is eventually decided on, the fact that both versions exist will probably benefit users in the long run.

"OSF/1 forced AT&T to modernize and modularize its operating system," says Judith Hurwitz, vice president at Patricia Seybold's Office Computing Group in Boston.

Then, too, Unix will help create a more receptive IS environment for the idea of open systems, although Unix may not be a recipient of this consciousness-raising. IBM and Digital Equipment Corp. are incorporating the ideas behind Unix — interoperability and applications portability — into their operating systems.

But whether Unix is even ready for prime time is in dispute. Both System V and OSF/1 will have high-level security and transaction processing features as well as other measures of a full-featured operating system by the time new versions ship in 1991.

"It is not prudent to put mission-critical applications on Unix," says Peter Schay, vice president at Gartner Group, Inc. in Stamford, Conn. However, he adds, "by 1993, there's a high probability it will be practical to do so."

Rikki Kirzner, senior industry analyst at Dataquest, Inc. in San Jose, Calif., strongly disagrees. "He's dead wrong. By the first half of [1991], there will be at least five fault-tolerant Unix vendors. Three will have security graded B2 or higher, and up to 18 will have disk-mirroring capabilities in Unix." Still, she says, the "IS component of the Unix market will grow the slowest."

Just like with superheroes, there are some things you can count on — and the continued torpid movement of Unix will be one of them. □

Ambrosio is *Computerworld's* Mid-Atlantic senior correspondent.

Taking Summit to a place no starship has gone before

BY JEAN S. BOZMAN

These are the voyages of the starship Summit. Its five-year mission: To defend space territory for the home planet, I-Beam, staving off the warships of the Plug-compatibles, the Digital Strivers, the dual-hulled Tandem vessels — and the growing legions from the planet Unix. The starship's captain plans to take the Summit where no vessel has gone before — to the outer edges of the User universe.

SCENE: *On the bridge of the Summit. Captain Pickard is anxious to leave.*

CAPTAIN: We paid several million dollars for the new Summit engines, didn't we, Georgy?

ENGINEER: Yes, captain, we did.

CAPTAIN: Then where are they?

ENGINEER: We have our old "J" engines, which have been upgraded. But we really shouldn't leave for the Far Sectors until the new ones are installed, which should be sometime in late 1991.

CAPTAIN: If we wait, we'll miss our scheduled rendezvous with the Klangons. They say they have a very important message for me. The entire future of the universe, as we know it, may depend on that meeting.

ENGINEER: Well then, we'll push off tomorrow with our souped-up Foothill models. They're quite good, really, except when the water-cooled panels spring a leak. But that only happens once every few light-years or so. I only have one other problem: I can't decide how to pay for the fuel in the warp-drive tanks.

CAPTAIN: No problem, Georgy. Connect the Summit communications ports to the I-Beam electronic funds exchange network on planet Earth. The money will be automatically deducted. Now, hand me that road map, First Officer Daton.

DATON, *a sophisticated computer (make that android), speaks up*: It's curious, Captain, but I can't find our destination on this map I bought at the I-Beam travel headquarters.

CAPTAIN: Don't worry, they'll patch us into the universal videoconference network when we're nearly there and beam us the destination coordinates. Carry on.

SCENE: *Nine months later, aboard the Summit, which is nearing the Far Sectors. Communications officer O-Hear-a is receiving a transgalactic message. The Klangon ships are dead ahead, but they're surrounded by dozens of other spaceships.*

CAPTAIN *(looking at shuttlecraft headed for a greenish planet)*: So that's the source of all the Unix code I've seen flashing around the universe.

The radio squeals.

KLANGON CAPTAIN: Commander Spacek here. Captain Pickard, I understand you're working with fiber-optic photons these days. Very effective at pushing your own Summit data to the farthest reaches of the universe. But you shouldn't even try to fight us. You've been keeping us out of your way all these years. But I'll bet you don't have the backbone to transport any Unix delegates on board.

Linda Huck

CAPTAIN: I already have one or two Unix delegates on board, but I won't let them anywhere near my Summit engines — unless, of course, my government demands that I do so.

KLANGON CAPTAIN: Ha! Too late! Looks like you're surrounded, Pickard!

The star-strewn view outside the Summit window is full of hundreds of spacecrafts, all very different in appearance. Data and voice communications are, indeed, being interchanged. "Do they know something I don't?" Pickard wonders.

He quickly orders engineering to reverse the thrust on the Summit warp drives and return to I-Beam.

CAPTAIN: We'll return to fight again! You'll see.

Next week: Headquarters speaks! □

Goodbye 1990

Buyer favorites of 1990

Networking management software ..... *Feb. 5*
Systems Center's Netmaster
Best feature: Internal integration

SQL relational DBMS ..... *March 5*
Sybase
Best feature: Effective user-defined integrity

Front-end CASE packages ..... *April 9*
Knowledgeware's IEW Analysis and Design
Best feature: Range of functions

General ledger software ..... *May 7*
Global Software's GL
Best feature: Meeting current business needs

Mainframe access control software ..... *June 11*
Computer Associates CA-ACF2
Best feature: Audit trail functions

Executive information systems ..... *July 16*
Pilot's Command Center
Best feature: Ease of screen design and maintenance

Triple-density direct-access storage devices
Amdahl's 6380-K ..... *Aug. 13*
Best feature: Hardware compatibility

Mainframes ..... *Sept. 17*
Amdahl's 5890 300E
Best feature: Reliability

Minicomputers ..... *Sept. 24*
Hewlett-Packard's HP 3000 Model 925
Best feature: Availability

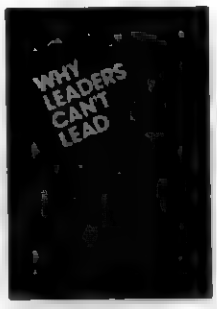
Real-time MVS performance monitors ... *Oct. 8*
Landmark Systems' The Monitor
Best feature: Effective on-line real-time reporting

Personal computers ..... *Nov. 12*
Hewlett-Packard's Vectra 386
Best feature: Reliability

T1 multiplexers ..... *Dec. 3*
Stratacom's IPX series
Best feature: Reliability

The best books

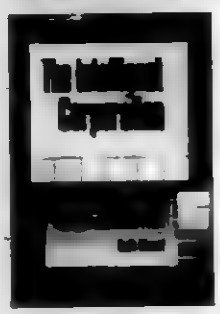
The following is a list of the best books reviewed by *Computerworld* in 1990. The books are listed in no particular order.



Why Leaders Can't Lead: The Unconscious Conspiracy Continues. By Warren Bennis (Jossey-Bass Publishers). From our review by Amiel Kornel: "For information systems professionals searching for a way to influence the direction of their organizations, Bennis can serve as a guide."

Computerizing the Corporation. By Vicki McConnell and Karl Koch (Van Nostrand Reinhold). From our review by Michael Fitzgerald: "The authors feel it is a trap to believe that just computerizing will make a company better. Instead, they say that companies must use technology to make employees work better."

The Intelligent Corporation: Creating a Shared Network for Information and Profit. By Ruth Stanat (Amacom Books). From our review by Joanie M. Wexler: "As a framework for thinking, the book delineates the financial, political and cultural issues companies must consider as they embark on a systematic approach to information gathering, sharing and maintenance."



Total Customer Service. By William H. Davidow and Bro Uttal (Harper & Row). From our review by Maryfran Johnson: "The authors succeed in taking a cliched yawner of a topic — who isn't out there declaring this the year, the decade or the millennium of the customer? — and making it zing with juicy anecdotes about famous companies."

Silicon Dreams. By Robert W. Lucky (St. Martin's Press). From our review by Donald St. John: "Lucky's gift is his ability to define a hierarchy of concepts and then examine the problem of processing information at each level."

The Improbable Machine. By Jeremy Campbell (Simon & Schuster, Inc.). From our review by Christopher Lindquist: "Campbell is very adept at reducing some very complex ideas into terms and examples that make the material much less of a chore than might first be assumed."

Father, Son & Co.: My Life at IBM and Beyond. By Thomas Watson Jr. (Bantam Books). From our review by Glenn Rifkin: "The book is a must read, offering an intriguing look inside one of the best known father/son relationships in history."

Influence Without Authority. By Allan R. Cohen and David L. Bradford (John Wiley & Sons). From our review by Carol Hildebrand: "The book is a realistic and engaging look at how to get things done when you don't necessarily have the authority to just say, 'Do it.' "

Breakthrough Thinking. By Gerald Nadler and Shozo Hibino (Prima Publishing). From our review by Joanne Kelleher: "Jump in at Chapter One and resist any urge to scoff or jeer as the authors talk about problems as opportunities, because by the end, you'll remember your initial cynicism with embarrassment."

Currents of Death: Power Lines, Computer Terminals, and the Attempt to Cover Up Their Threat to Your Health. By Paul Brodeur (Simon & Schuster). From our review by J. A. Savage: "Although the subject matter is technical, don't mistake it for dull."

G-Forces: The 35 Global Forces Restructuring Our Future. By Frank Feather (William Morrow and Co.). From our review by Joseph Maglitta: "What makes Feather different — and relevant for IS readers — is his ability to credibly tie technology into a wider, longer view of world development." □

Moving around

Never ones to shy away from opportunity, a large number of high-profile information systems executives switched jobs during the last year

IS Executive	Left	Joined
Stefan Gladysiewski	General Signal	EMI Music
Michael Heschel*	Bester International	Security Pacific
James Kinney	General Foods USA	Carlson Companies
Allan Loren	Apple	Covia
Charles Mayer	Tech Partners	First Boston
Michael Simmons	Bank of America	Bank of Boston
Martin Stein	Paine Webber	Bank of America

**Resigned from Security Pacific in November after a seven-month stay*

IN MEMORIAM

An Wang, 70
Founder, Wang Laboratories, Inc.
March 24

Robert Noyce, 62
CEO, Sematech Co.
June 3

Gary J. Biddle, 52
Vice president of information systems technology, American Standard, Inc.
Sept. 26

J. William Mullen, 42
President, National Computer Measurement Group, and consultant, BGS Systems, Inc.
Oct. 23

William M. Walsh, 54
Executive vice president, New York Clearing House Association
Nov. 10

Mary Jo Moccia, 55
Senior vice president, Midwest Stock Exchange
Nov. 16

Burton S. Golberg, 62
Former head of IBM's Large Systems Division and developer of IBM System 360 and System 370
Nov. 25

EDITORIAL

Backward glance

IN CASE YOU have forgotten, it was a pretty busy year, one that set the stage for an even more interesting 1991.

Jan. 8 — A state court in New York overturns what would have been the toughest VDT safety law in the country. Several other states will test similar laws throughout the year, but the VDT safety issue remains murky at best.

Jan. 22 — AT&T's vaunted long-distance service goes on the fritz for nine hours. The culprit is a software bug, but the incident raises legitimate concerns about the viability of the nation's communications links.

March 12 — Bitter long-term rivals MSA and McCormack & Dodge are "united" in a merger made by Dun & Bradstreet. By year's end, the company defies the naysayers and manages to hold the units together reasonably well, promising a sort of "year of the customer" in 1991.

April 2 — Wang Labs founder An Wang dies of cancer, his firm run aground by runaway expenses and misspent strategies. But new helmsman Rick Miller manages to make at least a little headway by the end of the year, while customer confidence remains implacably high.

May 7 — Ashton-Tate head Ed Esber steps down as the company ails. Seven months later, a judge removes copyright protection from Dbase, the company's flagship product. Uh-oh.

July 30 — DEC begins what will be a continuous effort to pare costs, starting with a rich early retirement offer in the summer and finishing the year amid rumors of unceremonious layoffs looming in 1991. The company experiences shipping delays for its VAX 9000 mainframe and, in December, reveals significant technical flaws that result in a sort of recall of the machine.

Aug. 20 — *Computerworld* leaks details of IBM's coming megamainframe announcement. Coupled with a midrange realignment and a vitalined personal computer and workstation strategy, IBM enters 1991 as one of the few bright hardware lights, even though its software efforts continue to falter.

Sept. 24 — High-flying Oracle is brought down to earth by the weight of sagging profits. Founder Larry Ellison radically recentralizes the formerly decentralized giant and vows reform to users.

Oct. 29 — A rapidly sinking Unisys announces a $350 million quarterly loss to cover the layoffs of 5,000 workers. Michael Blumenthal steps down as chairman while the firm's market value falls below $600 million, a far cry from the $10 billion of two years ago.

Dec. 3 — After lurking in the dark for months, recessionary fears come to the fore in the form of slashed information systems budgets for 1991. IS think tanks call for companies to re-engineer themselves with technology, but there's precious little money set aside to do so.

Dec. 10 — The bombshell of the year comes as AT&T launches a hostile takeover attempt of NCR, the last of the BUNCH companies. NCR resists, and the stage is set for a protracted and bloody battle spilling into 1991.

LETTERS TO THE EDITOR

Where's CTOS?

Computerworld gives only slight coverage to the CTOS/BTOS operating system and environment. It is the third most popular desktop system in the country, behind the personal computers and Macintoshes. Why have I not seen more coverage in *Computerworld* and other publications based on covering the broad market?

CTOS and the updated CTOS/VM already have many, if not most, of the current hot topics and features such as the following:

- Full protected-mode operation on the Intel 80286, 80386 and 1486 processor line.
- Local-area networking inside the operating system.
- Wide-area networks to connect several widely distributed CTOS networks as well as Transmission Control Protocol/Internet Protocol networks.
- Multitasking also built-in from the beginning.

David K. McClanahan
Oak Ridge Operations
Oak Ridge, Tenn.

Ageless OOP

As a proponent and user of object-oriented programming (OOP) languages, I am pleased to see the increasing acceptance of the object-oriented methodology in major companies as shown in "IBM on object-oriented path" [CW, Nov. 5]. However, it disturbs me to see OOP languages described as "radically different from today's software development procedures," when nothing could be further from the truth. The extension of both C and Pascal to support OOP has provided a familiar environment in which traditional programmers can explore and fully exploit the three planks of object-oriented programming. While it is true that Smalltalk (the original object-oriented language) seems quite different due to its lack of procedural constructs and its syntax, it will never be a mainstream language for precisely these reasons. I suspect that many writers mistakenly equate OOP with Smalltalk, and this is the source of the assertions such as the one above.

The penetration of OOP into traditional systems development will only become significant when users see it as evolution of existing methodologies and languages rather than a revolutionary change. You would be doing the industry a service by casting OOP in a more realistic light.

Nick Redding
Redding Computer & Communications Systems Consulting, Inc.
Nepean, Ont., Canada

User rights

Patricia Keefe's commentary "Users come first, right?" [CW, Dec. 10] hits the proverbial nail on the head with a 16-pound sledgehammer.

Having worked both sides of the fence as a user, software support representative and now as IS manager, I am painfully aware of the trend some companies are following.

My application vendor (who shall remain nameless) recently tried to get me and the rest of the installed users to cough up roughly $40,000 each for some "PC-like" bells and whistles, some to be delivered "soon" and the balance to be delivered in mid-1991. None of this new application "enhancement" was running on any customer machines that I know of, even in an "alpha" state.

I think there was some genuine interest in trying to provide the user with improved features, but the overriding message was that a cash infusion was needed but quick, so let's get the dough and worry about delivery later — let alone product quality.

Charles Simpson
IS Manager
3D Systems, Inc.
Valencia, Calif.

New image

I thought the most insightful statement in your special report on imaging technology [CW, Nov. 5] was on the order of: "In many situations, it's the information, not the document, that needs to be captured." Several years from now, we may expect a new wave of technology that offers to extract information from the millions of images that reside on compact discs. Some people may think images are all they will ever need. Such people should be especially careful that their long-range vision isn't obscured by the smoke of today's marketing.

John W. Krieger
Westinghouse
Savannah River Co.
Aiken, S.C.

C++ explained

Mr. Murray's letter, "C++ = Hype" [CW, Nov. 12], is an example of those who do not have an understanding of C++ and object-oriented programming coming to incorrect conclusions about a welcome advance to C

Dear Santa: Regarding the gifts you forgot . . .

MICHAEL COHN

Now that all of the Christmas presents have been opened, the computer users on your list may find that they didn't get the gifts they *really* wanted. Here are a few suggestions to help you get started on next year's holiday shopping.

The Deaktop Computer Halon Fire Prevention Kit. Show them you care with the perfect personalized safety system. Ideal for that security-conscious end user or for anyone who likes to smoke after a batch job. Extinguishes electrical fires in seconds — as well as any mammal within 30 feet.

Cohn is trying to be a computer salesman in Atlanta.

Commuter's "Office in a Briefcase." Give the gift that turns a car into a productivity center! The leather-bound "Office in a Briefcase" fits easily in the passenger seat and contains a personal computer, copier, cellular telephone, answering machine, facsimile machine and letter-quality printer. Just plug it into the cigarette lighter and stay busy during the worst rush hour. Your career can move ahead even if you're standing still, which will happen pretty often, because the unit sucks your car battery dry in about eight seconds.

1991 Project Calendar. At last! A calendar specifically designed for information systems project management. A separate, easy-to-read page for all 14 months in 1991.

The Disk Compactor. Stop throwing away old 5¼-in. floppies! Just load twelve at a time into this attractive, wood-grain-finish deakside Disk Compactor. In seconds, they're compressed into a single, nearly usable 3½-in. disk!

The Disk Compactor practically pays for itself, comes with a full-year warranty and may occasionally generate tremendous heat and pressure. Recommended for use with the Desktop Computer Halon Fire Prevention Kit.

The Keyboardless Display. This portable display is just two inches thick and needs no keyboard, mouse or lightpen! It comes with two knobs: one that draws up and down and another that draws left and right. All units are Christmas red and come standard with TIO-SI (Turn It Over and Shake It) for screen refresh.

Mainframe-of-the-Month Club. Own your own water-cooled processor! Put one in the den for the kids! It's affordable because it's shipped to you piece by piece. Examine the first component for 10 days. If you decide to keep it, a new piece will be sent to you about every month. Cancel at any time, or collect the whole set for hours of fun and multiprocessing. Some assembly required.

Hacker Zap. What better way to say you care than to protect the data of the ones you love. Hacker Zap inconspicuously attaches to any computer keyboard and comes with its own "secret password." Just wait until someone tries to sign on without it. Zap! Twenty thousand volts makes any perpetrator think twice.

Available at fine stores where computer products or weaponry are sold, except where prohibited by law.

Shetland Wool "On Call" Hiking Sweater. For the rugged IS outdoorsman or just for "keeping in touch" on that next camping trip. Waterproof side pouch keeps important disks safe and dry while the clear plastic pager pocket displays digital readout in any weather.

Available in either cable gray or raised-floor white. Little clips for your mittens are optional.

Necktie Template. Draw perfect flowcharts and look good at the same time. Why fumble for a hard-to-find template when all the essential processing symbols could be hanging just a few inches above your navel?

Made of soft, durable plastic with the look and feel of expensive polyester.

The Combination Decorative Holiday Wreath and Tape Protector Ring. A festive addition to your reel-to-reel tape library. Also available with the Tape Drive Cleaning Kit for removing those peaky stray pine needles.

The Complete IS Professional's Audio Library. Now your favorite manuals and macros are as close as the nearest tape player. This is the entire collection of most-loved computer classics, captured on 40 easy-listening cassettes.

Imagine the hours of enjoyment you'll experience as you catch up on *The Cobol Manual* or *The Microsoft C Compiler Runtime Library Reference*. Perfect for downtime, commute time or just for those quiet evenings at home.

programming.

Murray correctly points out that function prototyping is in ANSI C but doesn't understand that ANSI C got function prototyping from C++, not vice versa. C++ adds strong type checking to C — a welcome improvement. Prototyping is only one part of C++'s type-checking features.

Murray seems to believe that C++ compilers are unable to correctly identify which function is to be called based on the type of parameters passed to the function. If a compiler can correctly determine the type of parameters passed to a function (i.e., function prototyping), finding the correct function to call via the parameters is not difficult and is a very nice feature.

While these concepts may have been around for 30 years, C++ provides both designers and programmers with a tool to implement reliable, readable and maintainable systems.

Ken Avellino
Senior Programmer/Analyst
The Church of Jesus Christ of Latter-Day Saints
Salt Lake City, Utah

Staying inside

The article "How IBM, Perot lost out" [CW, Nov. 19] makes me wonder why Navistar International does not receive a special award for perception and wisdom. In today's world, where fools unknowingly step into the spider's web by outsourcing, it is refreshing to see a company do the opposite.

In my years of consulting and guiding people through the throes of carefully investigating outsourcing, the contracts and the *real* implications, I have rarely seen it function as a success.

In most cases, a naive and acquiescing top level of management is courted by the outsourcing company into a contract that, in effect, "gives away the farm." But since the onerous contract was signed by top management, one must essentially walk on eggs to survive the contractual terms and force the outsourcing company to follow even the most rudimentary terms of the contract.

A trillion kudos for Navistar — it is indeed the astute of the astute.

Richard A. Katzman
New Cumberland, Pa.

C++, yea!

In a recent letter to the editor, Jim Murray registered several complaints about the C++ language [CW, Nov. 12]. From his letter, it is clear that not only does Mr. Murray not know C++, but he's also not familiar with the basic concepts of object-oriented programming.

True, it was a mistake for *Computerworld* to claim that function prototyping is a "vital improvement" when such prototyping is also available from ANSI C. However, Mr. Murray goes on to say, "It is also stated that 'overloaded' function prototypes are allowed. I can have two functions with the same name, and the compiler will choose the 'right' one. That doesn't give me a warm feeling." Then neither must the notion of encapsulation: Why should the user of a function or method have to know how that function or method is implemented?

However, I agree with Mr. Murray's final statement. Good programs are designed (and implemented) by good programmers; the advantages of object-oriented programming in general — and C++ in particular — help to promote the reuse of those good programs, increasing the chance that the benefits of those good programmers' efforts will be enjoyed for years to come.

Rick Genter
Useful Software
Pepperell, Mass.

The lines are open

Computerworld's article "The Viability of Telecommuting in IS" [CW, Nov. 26] overstates the benefits of physical closeness to teamwork. During three years managing as a full-time telecommuter, I enjoyed better productivity and all the other benefits mentioned. I like to work with people face-to-face, but I'm convinced that teamwork depends on where people's heads are at, not where their bodies sit.

It *is* very helpful for people to have face-to-face contact with each other in the early stages of forming a telecommuting team. From time to time, that contact needs to be refreshed. But for weeks and months at a time, physical contact is unnecessary and may even be counterproductive. It's often a crutch.

Today, many telecommute a few days each week. They often put off things they feel would be better handled face-to-face. If they were not so close to the next opportunity for face-to-face contact, they would give some thought to handling things remotely. Many situations would then be resolved in a more timely and correct fashion.

Arnold B. Krueger
VM Technology Associates
Grosse Pointe Woods, Mich.

Fitting the mold

Regarding the commentary of Ms. Vivian Wilson [CW, Nov. 19], she is absolutely right — opportunities for blacks in data processing were never good and are only getting worse. Back 15 years ago, even 10 years ago, employers had no preconceived notion of what a programmer should look like, so they didn't have a template of a young white male (don't forget the wedding ring) against which to compare and reject candidates. Now, the industry has "matured" and regressed. Employers now have a better picture in their mind of what a data processing professional looks like. Lots of luck to anyone who doesn't "look" right.

Marianne G.C. Seggerman
Stamford, Conn.

Too fickle

As an Application System/400 user who purchased an AS/400 from an industry remarketer, I am appalled at the way IBM is handling the distribution of Release 3.0.

I have requested an early issue of Release 3.0. IBM has informed me that the software was not registered, although my remarketer has told me it was.

IBM is doing a lot of squabbling with its independent remarketers lately. I do not care who is at fault. All I want is Release 3.0.

IBM has no right to change support policies on a product it has already sold. When speaking with IBM, I was told there may be a 12% charge on the software for continued support. Twelve percent for what, Mr. Akers? What benefit will be reaped?

Philip Zacsek
Vice President of Information Systems
Allied American Insurance Co.
Park Ridge, Ill.

Unintended humor

I like reading humor in *Computerworld*, but I never thought I'd see it on the op-ed page in the form of an editorial by Massachusetts Gov. Michael Dukakis [CW, Dec. 10]. Why do you think we call the state Tax-achusetts? Your state has many high-tech firms that would like to attract high-tech workers like myself. But I'd never willingly move to such a soak-the-rich, high-tax state. Dukakis' policies didn't do much for your state, did they?

David Appel
Indianapolis, Ind.

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The Newsweekly of Information Systems Management

Officevision 2 delay; no release date given

BY ROSEMARY HAMILTON
CW STAFF

Saying it underestimated the task of developing a strategic office platform, IBM executives last month confirmed the second major delay of Officevision.

IBM said it intends to provide a status report on the delayed Officevision releases in the second quarter of 1991, according to Joseph Guglielmi, an IBM vice president and president of the Applications Solution Division.

"I don't like it, I don't want to be here, but we are here, and I have every confidence we will get this done," Guglielmi said.

As it stands today, Release 2 of Officevision/LAN series, which was scheduled to be out by the end of 1990, will be delivered at an unspecified future date.

Also, the OS/2 direct connect feature for all three host versions of Officevision is delayed. Previously, this feature was scheduled to ship with Release 2 for the host platforms, targeted for delivery in the fourth quarter of 1990 and early in 1991.

IBM's Guglielmi *says customers still want Officevision*

Guglielmi said the OS/2 direct connect may or may not be synchronized with the delivery of Release 2 for hosts. For instance, a Release 2 for MVS customers was delivered this fall without the direct connect feature.

"So they are putting us on hold until June," said Stuart Woodring, an analyst at Forrester Research, Inc. in Cambridge, Mass. "That's amazing. They've got to realize that Officevision is in some severe trouble today."

However, recent interviews with customers suggested that much of the Officevision user base is slowly implementing the product and, as a result, is not pushing IBM to deliver more quickly.

For instance, two MVS customers contacted said they did not care about IBM's delay in delivering the OS/2 direct connect feature, because they have yet to even install OS/2.

Both Guglielmi and Tony Mondello, IBM's vice president of office systems development who has direct responsibility for Officevision, acknowledged that they have their hands full but said that they expect to bounce back from these delays.

"I believe we will weather this with some difficulty, clearly, because there will be some disappointed people," Guglielmi explained, adding: "It is well known that we bit off a lot. But the customers want this. We are fully committed to this, and we are not going to blink."

Today's offering

In May 1989, IBM said it would deliver a second release of Officevision, which came to be known as the "real Officevision" in the industry because of its key features, throughout 1990.

However, the following is what is available today:

- Release 1 and 1.1 of Officevision/LAN series is shipping. Some new features, including additional MS-DOS support, will be added to Release 1.1 by March. A half-price deal is in effect for Release 1.1, and it can be licensed for $375 instead of $750.
- Release 2 of Officevision/MVS is shipping, but it is not Release 2 as originally described. It contains some new office functions and performance tuning. The OS/2 direct connect feature is not available.
- Release 1 of Officevision/VM is available, and a maintenance update was shipped quietly in the fall. Release 2, which may or may not ship with the OS/2 direct connect, is delayed.
- Officevision for the Application System/400 operates with different release numbers. The first Officevision went out as Release 2, and an update, called Release 3, is currently available. It does not have the OS/2 direct connect feature.

Systemview not catching user fancy

BY JOHANNA AMBROSIO
CW STAFF

ORLANDO, Fla. — At this point, IBM's Systemview architecture is not of immediate concern to most users. This became apparent at a conference in December, during which the subject was discussed and dismissed by users.

"All IBM shops will have to move to it someday, but right now, it's not even real," said James D. Galway, a staff member at the state of Utah's Division of Data Processing in Salt Lake City. "It's more a direction than anything else."

Most attendees at the Computer Measurement Group conference agreed that Systemview is a strategic ball to keep in the air for the future, but it is not on their immediate to-do lists. Instead, attendees said they are more concerned about the complex tasks of performance measurement, bottleneck diagnosis and software tuning.

Aubrey Chernick, chairman and chief executive officer at Candle Corp. in Los Angeles, said a new discipline will likely arise over the next few years to take care of these tasks. Called enterprise performance management, the idea will be to diagnose and fix problems that can occur anywhere in the network.

Complicating life for most performance specialists, Chernick said, are the increasing complexities of technology. Not only are individual technologies such as mainframes becoming more complex, but there are also many more performance interdependencies.

In addition, Chernick said, there are more different kinds of work loads sharing the same resources. "You can look at all of them, but even knowing where to start will be a major problem." He said a new kind of technician, called an enterprise performance engineer, will be able to supplement specialists' roles by knowing how a variety of technologies work together.

Simple approach

In keeping with the theme of trying to simplify performance management, several vendors announced products with easy-to-use interfaces that aim to provide "single-console" management of different systems. Users no longer have to log onto different monitors and learn various packages to know what is going on, they said.

Most vendors also said their products are consistent with the Systemview architecture announced by IBM in September.

Among the products introduced at the show were the following:

- Goal Systems International, Inc. in Columbus, Ohio, unveiled two new packages: Preview for DB2, which predicts DB2 performance, and In2itive for DB2, which analyzes DB2 performance. Both are based on expert systems technology.
- BGS Systems, Inc. in Waltham, Mass., announced BEST/1-DASD Consultant for MVS performance reporting, tuning and capacity planning. The company also introduced the Batch Support Facility for planning and managing batch jobs running under MVS.
- New releases of Mainview came from Boole & Babbage, Inc. in Sunnyvale, Calif. Among the improvements to its performance management packages is a friendlier user interface that offers improved access to more detailed information.
- Computer Associates International, Inc. in Garden City, N.Y., introduced Release 7.0 of CA-PMA/Look. The on-line monitoring tool sports a user interface that follows IBM's Common User Access (CUA) guidelines.
- Version 500 of Omegamon for CICS, which now adheres to IBM's CUA and supports color, and Version 3.3 of ISM/CP Base from The Information Systems Manager, Inc. in Bethlehem, Pa., which offers improved PR/SM support.

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FIRST CLASS SERVICE

IBM move irks AS/400 users

BY MARYFRAN JOHNSON
CW STAFF

IBM was looking a lot like Scrooge recently to some of its small business Application System/400 customers, who recently became "orphan accounts" when IBM severed its contracts with certain industry remarketers.

These customers, who bought their AS/400 hardware and software from IBM-authorized third-party vendors, are facing what they consider to be a special punishment now that their remarketers' contracts have expired. They must pay a 12% licensing fee on their current operating system software to obtain new releases of the OS/400 operating system and the software support formerly provided by resellers such as Atlanta-based Sun Data, Inc. and XL/Datacomp, Inc. in Hinsdale, Ill.

"I don't guess I've got much choice but to pay this 12%, but I'm sure going to scream and holler about it," said Frank Nestor, director of data processing at Summit Consulting, Inc. in Lakeland, Fla. "I bought and paid for this software, and while I did get a discount, now IBM wants 12% more."

IBM responded last month to the customer complaints with a prepared statement that the 12% charge is a "transition fee . . . to help defray costs for IBM to provide program services." It will be levied only on AS/400 customers whose remarketers have been dropped by IBM — a handful of firms among the 594 currently authorized remarketers for the midrange.

For Summit Consulting, that fee means roughly a $10,000 charge on the company's $100,000 worth of operating system software, which had been provided and maintained by XL/Datacomp. IBM's most visible dispute with its industry remarketers surfaced in a lawsuit filed by XL/Datacomp, but the two companies reached a settlement in October.

Settlement reached

The terms of the XL/Datacomp settlement included a provision of IBM software support to XL/Datacomp's former customers at no charge or limited charges.

Yet those charges do not look so limited to Chuck Hudson, MIS manager at Lynchburg, Va.-based C. B. Fleet Co., Inc., another former XL/Datacomp customer. "It's not the money so much as the principle," said Hudson, whose company will have to pay $7,310 to get back into the IBM fold. "This causes a very bad feeling for my upper management, who are looking for a new manufacturing system now. IBM may lose what could have been a $100,000 sale for them over this."

"I can't see paying 12% for something I've already paid for," said Philip Zacnek, vice president of information systems at Allied American Insurance Co. in Park Ridge, Ill.

Industry analysts said IBM is reining in its remarketer channel to regain control over the steep volume discounting it allowed in 1988 and 1989.

"IBM wanted those boxes moved, and now IBM wants to see more control with the AS/400, since it's a very strategic machine," said Tony Membrino, an analyst at Technology Investment Strategies, Inc. in Framingham, Mass. Instead of discounting AS/400 hardware at 40% or more, IBM is now limiting its remarketers to 15% discounts, regardless of how many machines they purchase.

"IBM inadvertently let this whole situation occur, and then they took too long to fix it," said Dave Andrews, president of ADM, Inc. in Cheshire, Conn., an AS/400 consulting firm. "A lot of these small customers are finding they now have to pay back whatever they saved last year, when they bought their machines at a discount."

Market shift could drive EIS away from mainframes

BY CAROL HILDEBRAND
CW STAFF

Corporate America's shift away from a mainframe mentality could cause a number of applications to fall victim to Darwinian principles. Among these is the traditional executive information system (EIS), according to a recent report from Forrester Research, Inc. in Cambridge, Mass.

The report predicted that an EIS market shake-up would result in mainframe-based systems giving way to personal computer- and workstation-based EISs that are cheaper and easier to use and that can more easily access host, local-area network and PC-based data. Forrester pinpointed a number of trends that will lead the move away from present-day EIS toward what it called "open EIS."

According to Stuart Woodring, co-author of the report, information is growing outside the mainframe database in many sources. "For example, I don't think there are EIS systems that are going to go pluck information off a server database that happens to reside on a LAN in the marketing department," he said.

Woodring said open EIS will be able to use existing technologies, such as Microsoft Corp.'s Windows, LANs and SQL. This will make for added adaptability and cut down on the high costs of mainframe-based EISs. With their high degree of customization and heavy maintenance demands, EIS costs can exceed $500,000, the report said.

There is a catch

One drawback to the open EIS is that it will require a higher degree of computer literacy than mainframe-based systems, which feature user-friendly interfaces and touch screens. But Woodring said that as traditional EIS vendors extend their products with drill-down and analysis capabilities, they also make them more complicated.

Open EISs are also not as powerful as their mainframe brethren. However, Woodring said, "I'm not sure that executives want to go that wild. How many real number-crunchers are there in the [executive] user population?"

Woodring cited products such as Forest & Trees from Channel Computing, Inc. as a good example of the open EIS trend, which he said was still in its early stages. "But within a couple of years, they'll have some really snappy products," he predicted.

EDI system accelerates customs processing tasks

ON SITE

BY SALLY CUSACK
CW STAFF

CHARLESTON, S.C. — If you are shipping grain to the Soviet Union, you better make sure you have cleared the transaction with the U.S. Customs Department.

That particular arm of the government oversees every item entering or leaving U.S. ports, and according to John D. Christensen, manager of information services at South Carolina's State Ports Authority, Customs is the Ports Authority's largest end user and operating partner.

"Our goal is to clear cargo as quickly as possible, and to do that, we must transfer information immediately to Washington D.C., and then act quickly on their response," he said.

The Ports Authority was one of the pioneers of the electronic data interchange (EDI) ideal. Eight years ago, the Ports Authority developed the Orion software system, a Cobol-based electronic filing system that runs in a CICS and VSAM environment on an IBM 4381 computer under DOS/VSE.

The Ports Authority claims that Orion gives the port an edge in rapid cargo movement by eliminating paperwork and subsequently moving cargo through the port five times faster than in most other ports around the world. "Cargo" in Charleston can be anything from grain to automobiles to heavy equipment.

Orion, which links 450 users throughout the waterfront community in Charleston, is in a constant state of evolution because of the variety of end users and their individual needs, Christensen said. The system is responsible for transmitting on-line information to and from brokers, shipping lines, freight forwarders, the U.S. Department of Agriculture and the customs agency in Washington, D.C.

"We are not standing back waiting for industry standards to be agreed upon," Christensen said. "We are implementing EDI functions now in conjunction with Orion, and with the exception of a single translator package, the effort was all in-house."

Orion consists of five primary components: Manifest, which provides data on bills of lading and related information through customs; cargo clearance; cargo movement; a customized built-in security function; and miscellaneous services such as electronic mail and query facilities for tracking status reports on cargo, ships and containers.

Referring to the waterfront community, Christensen said his department receives "100% participation from everyone in working together under the Orion system. There is an Orion committee which meets monthly to see what changes and enhancements need to be made to the system."

Update on the way

A mandate to upgrade the development strategy to include relational technology as an active participant in the Orion system is currently on the agenda, Christensen said. The Ports Authority is evaluating three database packages: IBM's DB2, Cincom Systems, Inc.'s Supra and Computer Associates International, Inc.'s Datacom.

The Ports Authority is also in the process of upgrading hardware and communications.

All of the Ports Authority's analog, bisynchronous communications lines have been converted to Synchronous Data Link Control, and there are now some personal computers in the field to replace several of the older IBM dumb terminals that link to Orion. Also, according to Christensen, the Ports Authority will make a decision on a significant hardware upgrade within the next 12 to 18 months. He added that he and his staff are now looking seriously at IBM's Enterprise System/9000 platform.

End users on the Orion system can track cargo through each stage of movement through the port. If cargo processing is delayed, for example, the system can determine where the cargo is and why it is being delayed.

While the Ports Authority is responsible for all enhancements, maintenance and repair of the software and hardware — a significant responsibility in itself — Christensen said the biggest challenge for IS is to "keep up with the rapid changes happening in the transportation industry."

SOFT NOTES

IPL teams up with Bull HN

IPL Systems, Inc. and **Bull HN Information Systems, Inc.** have struck a maintenance arrangement in which Bull will provide a range of support services for IPL's U.S. storage and tape subsystems.

Pulsar Systems, Inc. in Morris Plains, N.J., has received exclusive distribution and support rights to **Access Technology, Inc.**'s 20/20 spreadsheet for Prime Computer, Inc. systems. Under the agreement, Pulsar will perform all 20/20 program maintenance and provide enhancements and product releases for the Prime machines.

Control Data Corp. (CDC) in Minneapolis and **Volkswagen AG** in Wolfsburg, Germany, have created a joint venture to develop computer-aided design, manufacturing and engineering (CAD/CAM/CAE) software for the worldwide manufacturing market. The business, called Icem Systems GmbH, will focus on future development of Icem, a family of CAD/CAM/CAE products developed by CDC.

COMMENTARY

James Daly

One lawsuit too many

What a difference a day makes.

Ashton-Tate struggled back from two years of red ink, rid itself of a chief executive officer who admittedly didn't know how to use its flagship product and finally reversed its slipping market share. But it took only one federal judge and a simple ruling delivered on a sunny Southern California morning to make the company once again look like the kid who just can't do anything right.

The move came as the denouncement of a Dbase copyright protection suit Ashton-Tate filed against Fox Software two years ago. In effect, Ashton-Tate saw its own firecracker blow up in its hands: U.S. District Judge Terrence Hatter Jr.'s edict stripped the crucial Dbase product line of its copyright protection because the Torrance, Calif.-based company "knowingly" misled the U.S. Copyright Office by "repeatedly" failing to acknowledge that Dbase was derived from a program in the public domain.

While there is still plenty of legal jockeying to go before we see if the verdict actually sticks, many have already popped the cork on the cham-

Continued on page 44

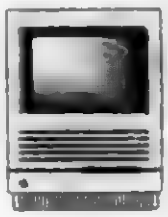
More Macintosh developers writing for Windows arena

BY JAMES DALY
CW STAFF

Software developers who once primarily focused on putting their best foot forward building crackerjack applications for the Apple Computer, Inc. Macintosh platform are increasingly doing the unthinkable: developing for the DOS world.

Now that Microsoft Corp.'s Windows 3.0 gives IBM Personal Computers and clones the simplified windows-and-icons appearance of the Macintosh, recession-wary developers are hungrily eyeing a DOS market that, at upwards of 40 million users, is nearly 10 times larger than Apple's steadily shrinking slice of the PC industry's pie, according to Framingham, Mass.-based market research firm International Data Corp.

"I can't think of any Mac developer who isn't writing for Windows," said Kathleen Lane, president of Softview, Inc. The Oxnard, Calif.-based company recently unveiled the fruits of a 12-member research and development team effort when it released a Windows 3.0 edition of its Macintax tax preparation package.



Lane added that the rapid success of Windows 3.0 — Microsoft officials claim to have sold more than one million units since it was introduced in May — should lure developers with similar vertical market applications, such as accounting packages, that are big in the DOS community.

Many developers said the graphical environment of Windows 3.0 cleared away many of the hurdles that came with character-based DOS applications. "Before, we needed to make a lot of compromises to address the DOS world, but that's no longer true," said Stephen MacDonald, senior vice president at Adobe Systems, Inc. "We see the PC world as the real opportunity area for us in the future. Our No. 1 job now is to migrate our Mac applications over to Windows."

MacDonald said Adobe is migrating many of its typefaces over to DOS in what will result in a dramatic sales realignment of the Mountain View, Calif., firm. Although less than 25% of Adobe's business now comes from the DOS world, that figure will rise to more than 50% during the next year, MacDonald said.

Apple users said they will keep a close eye on the amount of new software releases at January's Macworld Expo in San Francisco to see if the Windows development signals a refocusing of developer efforts.

"If there is a significant capital migration of programmers and dollars over to Windows, and developers are dropping everything to create packages for Windows, then it's really going to hurt," said Mike Bailey, a systems integrator at Lockheed Missiles and Space Corp. in Sunnyvale, Calif.

The secession has clearly worried Apple's top management. Analysts have long speculated that Apple abandoned longstanding plans to spin off its Claris Corp. software unit into a separate business in early 1990 because it feared Claris would focus on building applications for Windows 3.0.

Apple Chief Executive Officer John Sculley said he is hoping the success of a trio of low-cost Macintosh releases in October 1990 will dissuade any more defection. "We need the new products to restore developer momentum," Sculley said at a recent conference. "[Windows] could certainly affect our ability to attract independent software developers."

Softview Senior Vice President Ron Frankel acknowledged that the rapid sales of machines such as the low-end Macintosh Classic "has certainly renewed our enthusiasm for the Mac line." But, he added, "you still have to look at the whole picture. The growth in the Macintosh market just hasn't been there in the past few years, and that's got to change for us to prosper."

Dual-processor LAN Manager available

BY JIM NASH
CW STAFF

Four months late, Microsoft Corp. announced the availability of dual-processor add-on software for its LAN Manager network operating system in mid-December.

Microsoft said the first version will run on a Compaq Computer Corp. Systempro server.

Originally scheduled for shipment in August, LAN Manager Multiprocessor Server Pak is expected to free up CPU functions by automatically passing off networking tasks, such as file serving, to a secondary Intel Corp. 80386 or I486 chip in the Systempro.

Dennis McEvoy, president of Cooperative Solutions, Inc., a San Jose, Calif., software developer, said he received a beta-test copy of the package this month. The primary chip, he explained, will hold application code, including Sybase, Inc.'s SQL Server, while sharing the same memory between it and the secondary chip.

Internal testing of the Systempro in a client/server architecture running LAN Manager and SQL Server boosted performance about 40% using dual processing, said David Thatcher, LAN Manager product manager.

McEvoy, who already uses a dual-processing version of LAN Manager on a Parallan Computer, Inc. Server 290 midrange system, said he did not expect the same doubling of performance seen with some Unix systems using multiple processors.

The LAN Manager Multiprocessor Server Pak is priced at $2,495 and is available through Microsoft resellers.

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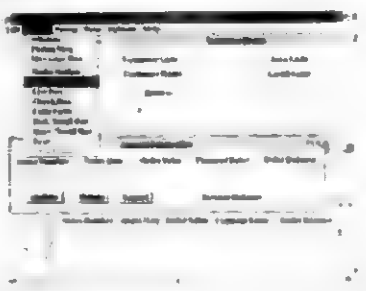

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Appletalk extended to PCs

BY JAMES DALY
CW STAFF

EMERYVILLE, Calif. — Farallon Computing, Inc. has become an early winner in Apple Computer, Inc.'s continuing push to disseminate key portions of its technological research. Farallon has announced that it will begin developing and marketing Appletalk networking products for Microsoft Corp.'s MS-DOS and Windows 3.0 platforms.

Insiders at Farallon, a 4-year-old networking firm, said the firm plans to take the licensed Apple networking technology and make it available for mixed environments of IBM Personal Computers and Apple Macintoshes.

Farallon's first offering is expected to be shown at the Macworld Expo in San Francisco in January.

The push is on

Apple researchers have long sought multiplatform options for Appletalk, the Cupertino, Calif.-based firm's method of allowing Macintosh computers transparent access to network-linked printers and other resources. Farallon's offerings will give Macintosh users a wider range of connectivity options and make it easier for Apple to push the Macintosh into large corporations that currently have many IBM PCs and clones.

Farallon is considered one of the major suppliers of Apple networking products. The privately held firm produces the Phonenet networking system, which allows the creation of networks containing tens of thousands of nodes. There are approximately 1.5 million computers connected on Farallon networks, according to company estimates.

While all of Farallon's technology has been built around the Macintosh, Farallon sources said that they hope to move quickly into the IBM-compatible world with inexpensive solutions to complex networking problems.

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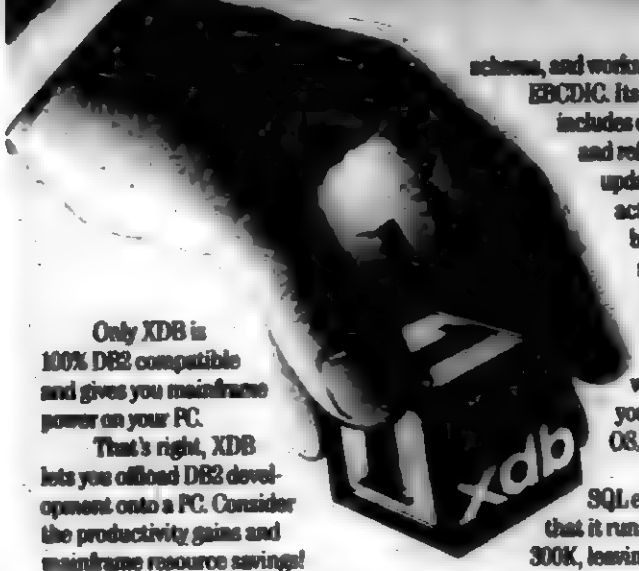

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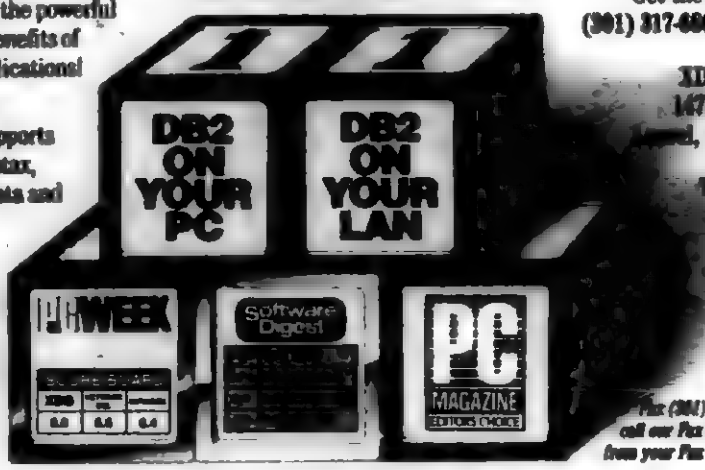

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"Develop on PCs then run the finished software without changes against DB2 data on mainframes thanks to XDB's DB2-compatible database server software." INFOWORLD

Daly

CONTINUED FROM PAGE 43

pagne. To software developers, the suit and its inherent implication that programming languages could be copyrighted lingered like a bad smell. To users, Ashton-Tate had grown fat and sloppy, offering an erratic product update schedule.

By eliminating Ashton-Tate's sole rights to Dbase, the door is now open for the development of Dbase clones. The likeliest candidates for entry are Borland International — which reportedly tried to buy Ashton-Tate several months ago — and Microsoft, which is expected to release its first database software product in the near future.

Dbase customers said they look forward to the effect the judgment will have on their checkbooks. "Prices will go down, and quality will go up; that's what competition is all about," said Scott Fueless, a principal analyst at M. W. Kellog Co., an engineering and construction firm in Houston.

In the end, Ashton-Tate got beaten at its own game, competing in the courtroom instead of the marketplace. For years, the company has failed to improve its products and has used the courts — rather than the research and development labs — to protect its products.

WHILE HATTER'S ruling was a victory for users, his decision to throw the case out on a technicality unfortunately left the central question of the case undecided: Can a programming language be copyrighted?

Users have grown weary of these internecine legal battles between software developers. "Personally, I'm sick of these look-and-feel lawsuits," said Jeff Smiley, a computer specialist at Resources Conservation Co. in Bellevue, Wash. "Just like with PC clones, software vendors keep building the same thing but improve on it as they see fit. And the similarity between the different packages is something we can count on to ease training and help us better integrate them into our system," he said.

The suit was filed to stymie Fox, which has severely threatened Ashton-Tate's former dominance of the PC database market. Dbase-workalike products now account for 20% of the PC database market, according to researchers at investment firm Alex. Brown & Sons.

While Hatter's ruling was a victory for users, his decision to throw the case out on a technicality unfortunately left the central question of the case undecided: Can a programming language be copyrighted? Expect to see that issue pop up again during the next few years.

But right now, it's time for Ashton-Tate to lick its wounds and map out a future based on innovation and not litigation. Without a deep technical base and no legal barrier against competitors, it's going to be a tough few years for the scrappy firm.

Daly is a *Computerworld* West Coast senior correspondent.

IBM lowers Netview prices

BY ELISABETH HORWITT
CW STAFF

IBM announced a massive reduction in high-end centralized system pricing for Netview Version 2 in December, claiming that the original price structure — which encouraged users to migrate from multiple centralized systems to a distributed network management strategy — was simply ahead of its time.

"Customers we talked to told us we had overestimated their readiness to move to a distributed, unattended system," said William Warner, IBM Communications Systems director of network management. "Under the old Version 2 pricing, users would pay a huge price for multiple central systems — in some cases over 100%" more than they paid for the older Version 1.1, Warner added.

IBM has lowered the cost of purchasing distributed Netview Version 2 for all host groups higher than Model Group 30, and of the centralized Version 2 for all model groups above Model Group 29, according to Ken Siedler, IBM's director of networking product marketing. The higher the group number, the greater the price decrease.

For example, the basic monthly license charge for central Netview Version 2 for MVS/XA, Model Group 50, was $3,453 under the old pricing structure and will be $1,822 according to the new one. Pricing for a comparable Netview Version 1.1 purchase is $1,300.

Model groups below the respective "pivot points" outlined above will be priced slightly higher under the new structure, an IBM spokesman said. However, IBM is giving a break to those users who have already made migration plans based on the old prices: those that install Version 2 by June 30, 1991, will pay the lower Sept. 5, 1990, prices for the software through the end of 1991, Siedler said.

Pricing maze

The Travelers Corp. is more interested in comparing the new Netview Version 2 pricing with Version 1.1 pricing than in comparing old and new Version 2 pricing, according to Jim Oleksiw, telecommunications director at Travelers.

The insurance firm had tentatively decided to wait for Netview Version 2.2, expected out in spring 1991, because Version 2.1 did not offer enough added functionality over Version 1.1 to justify migration under the old pricing structure, according to Oleksiw.

The price changes "sound like IBM is responding to its customers," Oleksiw said. "I don't think anyone was pleased" by the original Version 2 pricing, particularly high-end users such as Travelers, which primarily uses IBM mainframe Model Groups 40, 50 and 60, he added.

IBM is still expecting users to move from multiple central Netview hosts to one centralized host and several distributed systems, with automation applications gradually replacing the need for trained technicians at remote sites, Warner said. Current barriers in the way of such migration, he added, include the cost of developing automated applications, the cost of retraining and "political factors" such as network managers at remote sites resisting the loss of their autonomy.

IBM is lowering prices for distributed as well as centralized high-end systems, because it does not want to further discourage users from moving to distributed network management, "which everyone, including us, agrees is the wave of the future," said Mary Johnston-Turner, a principal at Northeast Consulting Resources, Inc.

IBM is also lowering the price of the Graphic Monitor Facility Workstation from $8,000 to $3,000, in recognition that users who are not yet ready to automate network management functions will continue to need multiple management workstations, Warner said.

IS: The hottest thing to hit Hollywood since the phone

ON SITE

BY JIM NASH
CW STAFF

"Cookie! You bring me Tom Hanks and Morgan Fairchild for *Romeo & Juliet, Part II*. I've got goose bumps. Do I love this man? Listen, let's do some E-mail."

The industry that raised schmoozing to an art form is going electronic. William Morris Agency, Inc., a large talent agency in Beverly Hills, Calif., installed 200 Next, Inc. workstations a year ago alongside 100 personal computers in a coast-to-coast wide-area network.

Agents in New York, Nashville and Beverly Hills can access the network and electronically thumb through a database containing a literal *Who's Who* in entertainment. The pairing of entertainment and computer industries is a natural, said Alex Henry, information systems manager at William Morris. Both are based on the power of information.

A talent agent's challenge is to remember who is available for which project at what price. Henry said William Morris' philosophy is that every agent represents every client.

Without near-immediate access to shared information, that premise could be lost in a worldwide corporation. Common access and the ability to send or receive requests through electronic mail have snagged new admirers, including former "technophobes," he said.

"We have agents who have never touched a computer, and they say, 'My assistant can have one,'" Henry explained. "We come back two or three weeks later, and they say, 'Give me one, too.'"

In demonstrating the network, Henry paged past some surprising personalities: Hanks, former U.S. Surgeon General C. Everett Koop, game show host Bob Barker, author Tom Clancy and comedian Andrew "Dice" Clay. Every night, information on them and others in publishing, movies, video, music and stage are updated on servers.

Talent agents *use Next workstations to match clients with opportunities*

"I have heard agents say they are 30% more productive. I can tell you how loud they scream when the machines are down," Henry said.

Henry could be an IS executive in almost any company. The former consultant at Deloitte & Touche exhibits none of the smarm and flash of most show business intimates, aside from a minor tendency to drop major names.

He oversees a system that grew out of a small AST Research, Inc. network running Novell, Inc. software over Arcnet in the Nashville office's music department. In classic Hollywood fashion, the idea came two years ago from an unknown, a temporary employee named Mia Bain, who had seen networks used in other offices. Today, Henry said, she is system manager of that network.

The Nashville office, which concentrates on the music industry, continues to rely on PCs, as do the music departments in both New York and Beverly Hills. Employees in Beverly Hills operate 164 Next workstations tied via Ethernet to 12 Next file servers. New York has 17 workstations and two file servers, and another 75 workstations have been ordered, Henry said.

He said one of the Novell servers in the Beverly Hills music department has been moved onto Ethernet — the first step in allowing users on both sides of the protocol wall to share files. He anticipates setting up either gateways or E-mail to bridge the gap before eventually standardizing on Next networks.

A 9.6K bit/sec. leased line connects New York and Beverly Hills, Henry explained. However, he added, that connection should be upgraded to a fractional T1 line this year.

In a satisfying twist, the speedy lines and Next's brawn are making possible memos that for all the world look like black-and-white commercials featuring the performers agents are promoting.

One such 15-frame-per-second memo, which was based on software developed by Adamation, located in Oakland, Calif., stumped for Clay's summer movie, *Ford Fairlane*.

"The William Morris system unquestionably is state of the art," said Lee Gruenfeld, a partner at Deloitte & Touche's information technology unit.

Gruenfeld and Henry worked on the project, recommending and installing the Next network.

Teleos links LANs over ISDN

BY JOANIE M. WEXLER
CW STAFF

EATONTOWN, N.J. — Integrated Services Digital Network (ISDN) vendor Teleos Communications, Inc. is facing off with T1 suppliers to provide equipment that companies can use to build hybrid public/private networks and reduce the number of communications lines they need.

A joint venture with IBM has resulted in an enhancement to Teleos' IAP6000 ISDN Access Server that allows it to link token-ring local-area networks over primary-rate ISDNs. This is reportedly the first product to support IBM's proprietary source-route bridging over ISDN, IBM spokesman Dennis Drogseth said.

The IAP6000 is a device that multiplexes a mixture of voice, data, image and video services onto one 1.54M bit/sec. primary-rate line. Traffic on the primary-rate line, which includes 23 64K bit/sec. channels, can then switch traffic to 23 remote locations simultaneously, explained product manager Tim Rubert. "Without the primary-rate access, users would need a lot more bridges and lines," Rubert said. While he acknowledged that the cost of multiple stand-alone source-routing bridges might trade off with that of an IAP6000, users gain the benefits of a 24th ISDN channel — the signaling channel — that can provide calling- and called-party number identification, as well as several other ISDN extras.

Dial-up bandwidth

"I want dynamic bandwidth allocation for everything," said George Paulous, telecommunications manager at Blockbuster Entertainment Corp. in Dallas. Bandwidth on demand is an advantage of ISDN in that users do not have to nail up and pay for circuits that may sit idle during nonpeak periods of the day.

Paulous said he is considering the IAP6000 to access ISDN for imminent videoconferencing applications between Blockbuster's two main offices in Dallas and Fort Lauderdale, Fla. He added that he would also like to use it to replace the dial-up modems and lines he uses daily to poll terminals in the 1,500 Blockbuster stores worldwide.

Ungermann-Bass makes a move into open systems

BY JIM NASH
CW STAFF

SANTA CLARA, Calif. — Ungermann-Bass, Inc. is cautiously stepping away from the proprietary enclave it has carved out for itself.

The company, which for a decade has focused on building virtually custom networking systems for large corporations, recently announced a network management tool that promises to be less proprietary.

The product is called Netdirector and is due in its first incarnation next month. A spokesman for the firm, a subsidiary of Tandem Computers, Inc., said Netdirector will monitor and control Ungermann-Bass networking components using the Xerox Network Systems Courier protocol. It will combine Sybase, Inc.'s SQL Server Version 1.1 and Microsoft Corp.'s LAN Manager Version 2.0 with the OS/2-based management software.

Ungermann-Bass said it will eventually support Simple Network Management Protocol and Common Management Information Services/Common Management Information Protocol.

It is working with British Telecom PLC to give limited two-way communications between Netdirector and British Telecom's Concert, a manager of devices such as Netdirector. Ungermann-Bass has demonstrated a similar collaboration with IBM's Netview software, but no product has been announced.

Several user shops that have seen beta-test versions said they were impressed by Netdirector. David Contreras, senior network engineer at Harris Methodist Health Services in New Orleans, has given it a two-month test.

Contreras said Harris has been looking for better ways to manage its 240-workstation network. "This is a direction we've been moving in for some time. Now we can use a single workstation and see a lot of events simultaneously," he said.

However, he said, he would like to see more consistency in keyboard and mouse requirements among Netdirector's various windows.

Doyle Friskney, director of communications and networking at the University of Kentucky in Lexington, said he liked the inclusion of an SQL database.

> "NOW WE CAN use a single workstation and see a lot of events simultaneously."
>
> DAVID CONTRERAS
> HARRIS METHODIST
> HEALTH SERVICES

He said the system is likely to pay for itself in data entry and data retrieval time savings. Using the database, Friskney said, he will combine four other databases that track the equipment and personnel associated with each part of the 45 local-area networks he manages. Administrators will have histories of machines and their users at their fingertips, he said.

Todd Dagres, an analyst at The Yankee Group in Boston, said information systems managers with large installed bases of connectivity equipment from market leaders Vitalink Communications Corp. and Cisco Systems, Inc. are likely to ignore Netdirector. This will limit the package's appeal to the 100 or so large corporations that have standardized on Ungermann-Bass bridges, routers, intelligent wiring hubs and other connectivity devices.

Netdirector costs between $7,500 and $16,000 and will reportedly contain Xerox Network Systems and Transmission Control Protocol/Internet Protocol drivers. Future versions are expected to include Microsoft's Presentation Manager for topological maps.

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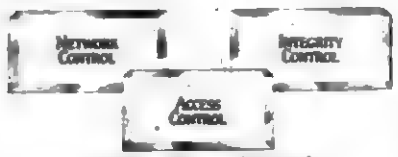

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MANAGER'S JOURNAL

EXECUTIVE TRACK

Henry Veldman, former director of technology at Allied-Signal Corp., has been named associate director at the **Automotive Industry Action Group (AIAG)** in Southfield, Mich. The AIAG, with 1,000 members from more than 700 companies, is a volunteer association working to increase the productivity of the motor vehicle and vehicle parts industries.

Veldman previously directed Allied-Signal's computer-aided design and manufacturing (CAD/CAM) technology group and was responsible for CAD/CAM systems throughout the $12 billion firm's worldwide operations.

At the AIAG, Veldman will coordinate the activities of both the CAD/CAM and continuous quality improvement project teams.

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George R. Balascak has been promoted to the new position of managing director of technical services at **Sea-Land Service, Inc.** in Edison, N.J.

Balascak was most recently director of technical services at Sea-Land. His new duties include managing the development and implementation of several major communications initiatives and managing technical support associated with new business ventures. He reports to John O. Parker, senior vice president of information resources.

Balascak joined Sea-Land, now a unit of CSX Corp., in 1965 and has held a series of positions in communications and information resources.

.....

Who's on the go?

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Turning the tide with technology

EDI could transform the TV ad business, but it won't be smooth sailing

BY JIM NASH
CW STAFF

Television's fiercest battle of this decade may not be Bud Bowl III or even a grudge wrestling match between Hulk Hogan and Rowdy Roddy Piper. It is more likely to be a slugfest between those who are trying to promote automated communications tools such as electronic data interchange (EDI) and those who oppose them.

EDI proponents claim that nothing less than the very survival of a business is at stake. Advertisers that spend an estimated $25 billion annually on the oldest video medium, network and local TV, now have rapidly multiplying options.

New avenues, such as in-store commercials, cable TV and home videos, are pulling advertisers away from traditional broadcasting, says Joe Harris, director of information technology at the TV Stations Division of NBC. However, Harris says he believes there is one way for television to hold onto its sponsors: by making the process of placing ads easier and more efficient.

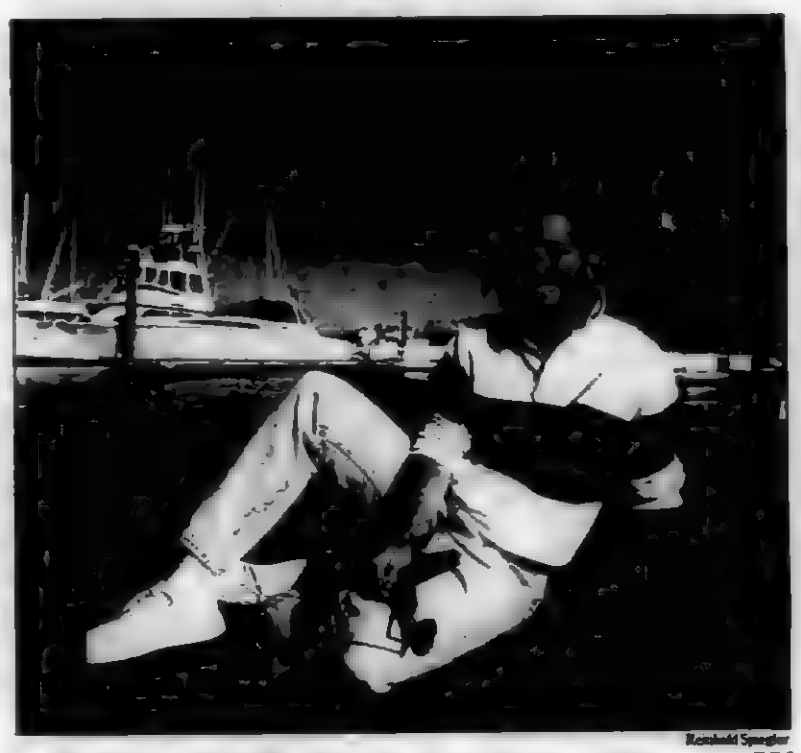
Few disagree with Harris' premise. But if efficiency means implementing EDI, stand back while everyone takes sides. The industry's dilemma typifies what could be the largest barrier to transforming business with information technology: resistance to change.

Opponents of EDI in the ad sales process, most of whom are intermediaries, fear it could result in electronic bulletin boards that simply list which stations have spots to sell, when the spots run and how much they cost. In short, opponents say, ad sales could become a commodity market with no use for the companies that today act as agents for TV stations.

Commonly referred to as "rep firms," these companies do much of the voluminous paperwork involved in ad contracts. But they go further by convincing advertisers that national or local spots are worth more than the ratings for a station's programs would indicate.

"There are those that would like to link up the entire business, and that is not what's in the best interest of our clients," says a rep firm information systems manager who requested anonymity. Stations spend millions positioning themselves, citing intangibles such as a station's civic involvement or its news show anchor. None of this would be translated through a bulletin board, the manager says.

Harris, who helped found Queens (N.Y.) College's first student radio station as an undergraduate there before moving on to professional television, says that bulletin-board services would not put rep firms out of business by themselves. He points out that there is already at least one on-line service for print and cable ads and a more limited computer system for TV.



Reinhold Spengler

The IS waters *are anything but calm in the television industry, where EDI proponents such as NBC's Harris are meeting resistance to change*

In the case of broadcasting, Harris says, EDI could stop at merely transmitting documents, change orders and confirmations. Placing an ad today is a cumbersome process that involves the advertiser, its ad agency, the rep firm and its TV station client.

Information is passed on paper and by voice back and forth repeatedly between the time a company decides to advertise and the time the station is paid for the commercial.

Expensive mistakes

Besides being lengthy, the current system costs the TV industry $2 billion per year in errors, Harris says. That is what he estimates is never collected by stations because of communications errors.

But rep firms worry that EDI presents a slippery-slope situation: One step down could mean a slide to the bottom.

Tribune Broadcasting Co. in Chicago is one player that remains cautious about EDI's ramifications. "We're both a buyer and a seller of commercials," says Bill Murray, director of IS at Tribune Broadcasting. "That gives us relationships on many sides of the fence," including one as a rep firm.

Tribune Broadcasting is part of Tribune Co., a media conglomerate whose portfolio includes the *Chicago Tribune*, superstation WGN-TV and the Chicago Cubs baseball team. It also includes TBC Plus, a TV rep firm. Although TBC Plus contributes no more than 5% of Tribune Co.'s revenue, it is "a test bed" that could pave the way for larger ambitions there, Murray says. He adds that the parent company is not prepared to endanger TBC Plus by pushing EDI.

But from WGN's perspective as well, the company opposes EDI. "Our motivation is pretty selfish, really," Murray says. EDI has the potential to turn broadcast advertising into a commodity in which the only good sold is the value of each station's market share. "If I reach 15% of the [TV viewing] market, I could demand only 15% of the ad revenue," he says.

Harris admits that Murray "speaks for the majority of the industry." That majority, he contends, is losing sight of one thing. "The laws of supply and demand here are changing; there is more supply," he says, referring to the increasing number of ad options open to advertisers.

Harris, a gregarious former ad salesman at NBC, insists that the situation requires an end to the status quo. To stanch the erosion of advertising, he proposes an alliance of broadcasters and rep firms to begin automating the ad process. A nonproprietary EDI system would simplify sales and allow rep firms to concentrate on representing rather than documenting, he says.

Harris worries that nontraditional broadcast media, which have already changed the business through various innovations, may also be the first to embrace EDI.

"If we don't do it, a competing media will — and will pave over broadcasting," he says. "Then we in the traditional television industry will be behind the eight ball."

Wendy's still has the beef but loses its veteran IS chief

BY CLINTON WILDER
CW STAFF

DUBLIN, Ohio — Hari Notowidigdo's tenure as Wendy's International, Inc.'s top information systems executive goes back even further than the "Where's the beef?" commercials, but now he is moving on.

Notowidigdo, vice president of IS for the past seven years, will leave the company in early January to pursue some new business interests. He said he has no dissatisfaction with the billion-dollar fast-food chain but is leaving for personal career reasons.

Looking for something new

"I always wanted to do something else beyond just retiring as CIO," he said. Notowidigdo declined to discuss his specific plans until they are more definite. Wendy's has not yet named a replacement.

Notowidigdo joined Wendy's as vice president of IS in 1983. He had previously worked at Borden, Inc., where he had been corporate director of information resource management.

Of his accomplishments at Wendy's, Notowidigdo said he is most proud of achieving effective IS management with a small IS staff, which currently numbers just 82. "I'm the lowest cost producer in the industry," he said.

Other notable IS implementations at Wendy's include joint development with IBM of a wireless terminal system and use of a personal computer-based expert system that helps Wendy's service representatives repair cooking and high-tech equipment at restaurant sites [CW, Sept. 25, 1989].

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CALENDAR

JAN. 13 - 19

ICA Winter Seminar. Houston, Jan. 13-16 — Contact: International Communications Association, Dallas, Texas (214) 233-3889.

Pacific Telecommunications Conference: Accessing the Global Network. Honolulu, Jan. 13-16 — Contact: PTC, Honolulu, Hawaii (808) 941-3789.

National Retail Federation Retail Industry Convention and Exposition. New York, Jan. 13-16 — Contact: NRF Convention Registrar, New York, N.Y. (212) 563-5113.

Technical Conference on the X Window System. Boston, Jan. 14-16 — Contact: MIT Laboratory for Computer Science, Cambridge, Mass. (617) 253-8861.

Computer Graphics Show. New York, Jan. 15-17 — Contact: Computer Graphics Show, Silver Spring, Md. (301) 587-4545.

Service and Quality: Tactical Deployment. St. Louis, Jan. 17-18 — Contact: Bonnie Sen, Washington University, St. Louis, Mo. (314) 889-5380.

Strategic Technology Implementation. Wellesley, Mass., Jan. 17-18 — Contact: CIMS Office, Babson College, Wellesley, Mass. (617) 239-4531.

Lundex '91. Irvine, Calif., Jan. 17-19 — Contact: Lundy, Elmhurst, Ill. (708) 863-3111.

JAN. 20 - 26

Data Visions '91. San Francisco, Jan. 20-23 — Contact: Earle Speraine, Wordtech Systems, Orinda, Calif. (415) 254-0900.

The Downsizing Conference. San Francisco, Jan. 21-22 — Contact: Digital Consulting, Andover, Mass. (508) 470-3880.

Unix Technical Conference. Dallas, Jan. 21-25 — Contact: Usenix Conference Office, El Toro, Calif. (714) 588-8649.

Infotext '91. Las Vegas, Jan. 22-23 — Contact: Bob Dale, Infotext Publishing, Capistrano Beach, Calif. (714) 493-2434.

Uniforum 1991. Dallas, Jan. 22-24 — Contact: Bob Liske, PEMCO, Des Plaines, Ill. (708) 299-3131.

JAN. 27 - FEB. 2

Conference on Image Management Systems. Phoenix, Jan. 27-30 — Contact: BIS CAP International, Norwell, Mass. (617) 883-9130.

Communication Networks '91 Conference and Exposition. Washington, D.C., Jan. 28-31 — Contact: Michael Sullivan, World Expo Corp., Framingham, Mass. (508) 820-8268.

Outsourcing: Options and Tactics. Orlando, Fla., Jan. 29-30 — Contact: The Yankee Group, Boston, Mass. (617) 367-1000.

Network Computing Forum and Exposition. Washington, D.C., Jan. 29-31 — Contact: Christine Krajewski, World Expo Corp., Framingham, Mass. (508) 820-8126.

FEB. 3 - 9

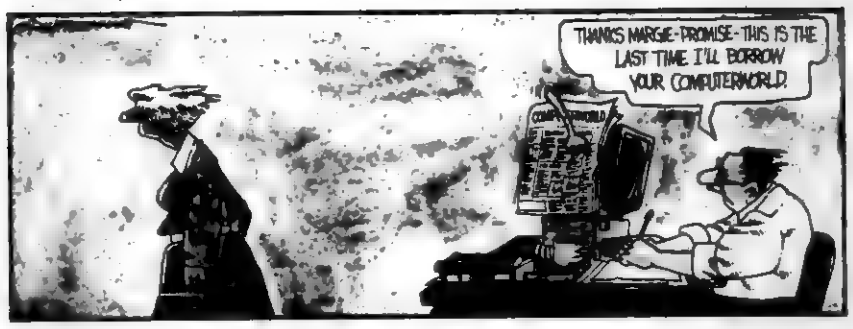
Macapp Conference. Phoenix, Feb. 4-8 — Contact: Macapp Developers Association, Everett, Wash. (206) 252-6946.

Macintosh/N.Y. '91. New York, Feb. 5-7 — Contact: Peter Kimpton, Exposition Management, Waltham, Mass. (617) 290-0412.

Florida Educational Technology Conference. Tampa, Fla., Feb. 5-8 — Contact: Barbara Ann Cox, Office of Educational Technology, Tallahassee, Fla. (904) 488-0980.

Seventh Annual Nolan Norton Institute Conference: The Enterprise of the Future —Today. Tarpon Springs, Fla., Feb. 7-8 — Contact: Nolan Norton Institute, Lexington, Mass. (617) 862-8820.

NOMDA West Regional Convention. San Diego, Feb. 7-9 — Contact: Katy Dunn, NOMDA, Kansas City, Mo. (816) 941-3100.



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   - 85. System Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
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NATIONAL
BRIEFS

State of grace

Two major institutional lenders were willing to extend a grace period to technically defaulting Tinton Falls, N.J.-based **Concurrent Computer, Inc.** this past autumn on the basis of an early look at a recapitalization plan being devised under the aegis of investment banker **Goldman, Sachs & Co.** The National Association of Securities Dealers Automated Quotations System (NASDAQ) followed suit. Although the firm has failed to meet NASDAQ's capital and surplus requirement, exchange officials continue to trade in Concurrent stock.

Good buy again

Vienna, Va.-based software house **Legent Corp.** furthered two of its often stated goals — growth by acquisition and extension of its software and service offerings beyond the IBM platform — with the recent purchase of Renton, Wash.-based **Flexlink International Corp.** Terms of the purchase were not disclosed; however, Legent Chief Executive Officer John Burton knows a good buy when he sees one: Burton came to Legent as part of the company's 1989 acquisition of **BST, Inc.**

Boomers

Gateway 2000's 151,681% growth over its first five years in existence was enough to land the North Sioux City, S.D.-based personal computer vendor in the No. 2 spot on *Inc. 500, Inc.* magazine's annual list of the 500 fastest-growing U.S. entrepreneurial companies. The computer industry contributed no less than 60% of *Inc.*'s Top 10 for 1990: **Corporate Express**, No. 4; **Computerware**, No. 5; **Brooktree**, No. 7; **Octocom Systems, Inc.**, No. 9; and **Northgate Computer Systems**, No. 10.

Happy holidays

Cary, N.C.-based **Compusource** came up with a Christmas present for **Hotsite**, its disaster recovery services division: the assets of **El Camino Recovery Services**, a joint venture company of third-party leasing firm **El Camino Resources Ltd.** Hotsite provides disaster recovery services to the IBM mainframe market. According to Compusource CEO Wayne Edge, the El Camino purchase is but the first of a series of imminent acquisitions.

It's not a bird, not a plane, but what exactly is 3Com?

ANALYSIS

BY JIM NASH
CW STAFF

3Com Corp. is a networking software company. No, it is a wide-area networking hardware firm. Hold everything: 3Com is a dessert topping.

The Santa Clara, Calif.-based firm that detractors condemn as trying to be all things to all people is doing it again. Although 3Com has refused to comment on the matter, internal documents state that the firm plans to abandon the local-area network operating system market.

Eric Benhamou, *3Com's chief executive officer*

It will instead concentrate on ambiguously described hardware and software for routers, bridges, servers and network management. According to documentation obtained by *Computerworld*, 3Com will sell the rights to its LAN Manager-based 3+Open software and license research and development for LAN tools to Microsoft Corp.

The documentation states that all current work on key development projects such as 3Com's X.500 electronic mail directory, Apple Computer, Inc. Macintosh connectivity and LAN Manager-Netware links will be basically handed over to Microsoft. Through the deal, 3Com essentially becomes a generic OEM.

While strategy shifts are to be expected from any firm, the number and nature of the changes at 3Com are beginning to disconcert some of the firm's users.

End-to-end connectivity was 3Com's "last value-added" product, said Matt Scholz, information systems manager at the San Diego County Water Authority. "They've changed their name to '3C-OEM.' "

Like Scholz, Bob Saur, IS manager at Index Technology Corp. in Cambridge, Mass., bought into 3Com's history of linking personal computers to PCs with a minimum of third-party products.

Now, Saur said, "somebody else makes their E-mail systems, and somebody else makes their network operating system."

"They should go back to being an adapter company if they can even do that," Scholz said. It was, in fact, a multibus Ethernet card for a Digital Equipment Corp. VAX that got 3Com off the ground in 1979, said Bob Buchanan, former 3Com program manager for distributed systems.

And it was the PC/Ethernet card business that helped fuel the company's numerous forays into related networking technologies. That dull but reliable profit workhorse continues to buoy 3Com.

In 1982, Buchanan said, 3Com began providing a network operating system that ran on Ethernet as well as servers and workstations. Three years ago, 3Com merged with Bridge Communications, Inc. to expand into communications hardware, explained Buchanan, now vice president and general manager of testing at Lanquest Group, Inc. in San Jose, Calif. In 1988, 3Com moved toward greater standardization with 3+Open, a value-added bonnet on LAN Manager.

Doug Whitman, president of Vencom, Inc., a venture capital firm in San Francisco, said the company may be racing back to its Bridge days, before management decided to go head-to-head with Novell, Inc. "That would be doing the right thing," Whitman said.

"It's time to close the book on the old management's goal to dominate the network operating system game," he added.

"Their hardware is fine," Bo Reahard, president of Sunrise Computer Systems, Inc. in Atlanta, said of 3Com. "Their bridges and routers are competitive, but they don't have much of a market presence."

Scholz said he doubts the firm can compete in networking hardware. Already, names such as Compaq Computer Corp. and Netframe Systems, Inc. are beginning to dominate the high-end server arena. And products by Cisco Systems, Inc., Wellfleet Communications, Inc. and Vitalink Communications Corp. are better known to users of bridges and routers.

Saur said he is already looking at other vendors' so-called superservers and diskless machines incorporating Intel Corp.'s 1486 chips.

Whitman said he is confident the company can rebuild its internetworking product line, as long as it goes back to selling its systems in bundles through value-added resellers.

In the meantime, resellers themselves are uneasy about 3Com's apparent willingness to license away key technology. John Taokatos Jr., president of

Continued on page 50

Faces of 3Com

1979: Founded by Robert Metcalfe, a principal inventor of Ethernet, 3Com Corp. sets up shop as a board maker.
1983: Firm branches out into file servers.
1984: 3Com goes public, raising $10 million.
1985: First token-ring products ship.
1986: 3Com ships its first network operating system, 3+.
1987: 3Com pushes into enterprise systems, purchasing Bridge Communications, Inc., a bridge and router company. Also teams up with Microsoft Corp. to develop and market OS/2 LAN Manager.
1988: Augmenting enterprise approach, 3Com buys Systems Network Architecture developer Communications Solutions, Inc. (CSI).
1990: 3Com unwraps remote and local internetworking products. This month, citing poor return on investment, 3Com tells managers it will hand over LAN Manager to Microsoft, try to sell CSI and recast itself as a "global data links" company.

ICL may transfer expertise to Japan

BY MOHAMMED ALKAMA
SPECIAL TO CW

PARIS — If excluded from European research programs, UK-based International Computers Ltd. (ICL), purchased last summer by Japanese giant Fujitsu Ltd., said it will invest its know-how in Japan.

"In the computer industry, one manages with the head and not with the heart," said Peter Bonfield, managing director of the Anglo-Japanese firm, in response to Europeans who have been critical of the Fujitsu takeover.

At a time when European manufacturers are questioning their futures, Bonfield said ICL found no purely European answer. Only a Japanese manufacturer, he said, was able to offer the firm a way to meet its ambition of doubling its size during the next six years.

Committed to remaining a European manufacturer, ICL will repatriate in March the production of high-end personal computer compatibles, which were, until now, manufactured by Taiwan-based Acer Technologies, Inc.

ICL also plans to develop a vast, indirect European sales network largely targeting the banking and distribution arenas. Bonfield refused to comment about whether this distribution network would include products from Japanese vendors.

ICL's new strategy will focus on the development of open systems, database integration and its presence in the networking market, he confirmed.

Top 3 priorities

These three priorities correspond to the commitments ICL made to the 40 work groups of the European Community's Esprit research project.

ICL participates in an artificial intelligence research center as well, created jointly with France's Groupe Bull and Germany's Siemens AG.

Regarding its possible expulsion from these programs, ICL is said to be prepared to assume its responsibilities and respect its commitments, which include not disclosing research results from the parent company.

Generating 30% of its turnover outside the UK, ICL needs Fujitsu as much as Fujitsu needs ICL, especially with the coming single European market. At the moment, no formal distribution agreement links ICL and Fujitsu, Bonfield said.

However, the two companies are currently working through the final stages of their new automated cash registers and bank distributors.

Alhama writes for Le Monde Informatique, *an IDG publication based in Paris.*

Typewriting on wall says PCs are it

BY RICHARD PASTORE
CW STAFF

After several abortive attempts in the early 1980s, typewriter manufacturers are again stretching beyond the narrow margins of word processing machines into the realm of personal computers. Smith Corona Corp. recently announced a new line of PCs, and late last month Somerville, N.J.-based AEG Olympia, Inc. launched its own line of IBM Personal Computer compatibles.

Olympia and its fellow office equipment makers have read the typewriting on the wall. "Typewriters are a shrinking market," said Dale Pritchett, vice president of Olympia office systems. Adding a line of PCs "is a necessary change for our dealers and for us," he added.

Olympia launched a not-quite-compatible PC in 1983 and watched it sink. Now the firm is back with a line ranging from an Intel Corp. 80386SX-based laptop to an Intel 1486-based tower.

Analysts are uncertain about this second wave's chances. "It has yet to be seen whether typewriter dealers have the skills and the customer base to sell PCs," said Mark Levitt, an analyst at International Data Group in Framingham, Mass.

Pritchett views *typewriters as 'a shrinking market'*

Olympia's parent company, Germany-based AEG Olympia Office GmbH, was also doubtful, so it hired outside computer people to build its PCs and design the marketing plan.

Olympia's greatest strength in this overcrowded market will come from loyal dealers and a large financing division. Pritchett pointed to 1,600 U.S. dealers, many of them exclusive Olympia dealers for decades. Forty percent already sell some type of PC, he said.

AEG Olympia's own credit service, Mercedes-Benz Credit Corp., is already set up to provide financing for dealers and customers, Pritchett said. This may be key, because budgetary pressures will help spur corporate PC leasing next year, according to Technology Investment Strategies Corp. in Framingham, Mass.

Two local IBM headquarters replaced with trade areas

BY NELL MARGOLIS
CW STAFF

The streamlining and cost-cutting campaign that has slimmed IBM to 92% of its 1986 work force and redeployed 65,000 employees in largely sales and service-oriented directions touched down recently in Boston and Minneapolis, where headquarters operations were closed down and replaced with "trading area operations."

In place of headquarters staff, the Boston and Minneapolis locations will now host trading operations personnel, an IBM spokesman said.

Trading areas are defined by IBM as "organizations developed around a defined geography — a major city, combination of cities or state — or an industry sector." Each trading area is staffed by "a cross-functional team of marketing, service and professional services people and headed by a general manager."

Familiar faces

In some instances, he noted, the faces will remain the same; only the jobs will change. "The whole idea is to get these folks closer to the customer and to save costs," he said. Customers, he added, should see anything from no difference to an improvement in service as a result of the redefinition.

The trading area concept, defined variously along individual city or geographical region lines, is still in its formative stages, the spokesman said.

Prototype trading areas have been up and running for the past 18 to 24 months in Columbus, Ohio; Indianapolis; Denver; Raleigh, N.C.; Austin, Texas; Phoenix; and Puerto Rico. By the end of 1991, the spokesman said, IBM hopes to have some 70 trading areas in full swing.

Boston headquarters operations have been folded into the firm's New York headquarters; Minneapolis headquarters jobs will now be served out of Dallas. IBM denied reports of a similar folding of its Los Angeles headquarters into the firm's San Francisco headquarters.

The spokesman was emphatic in stating that the moves are not a part of the firm's voluntary retirement program and are not aimed at generating attrition.

3Com

FROM PAGE 49

Professional Systems Group, Inc. in Racine, Wis., said his clients have "grave concerns" about the "mixed messages" 3Com is perceived as giving.

Tsoltatos said users want to know what the firm plans to keep. "I wouldn't be surprised if Microsoft licensed 3Com's demand-protocol architecture and other software . . . to meet the promises it made for 1991." Demand-protocol architecture was developed by 3Com to switch protocols on demand on a server the way a compact disc player switches discs on command.

3Com will only become a tougher sell to customers if bits are sold off. According to Reinhard, "3Com's dedicated file server's strength had a tight marriage with 3+Open."

Index turns to Sage

CAMBRIDGE, Mass. — Trailing takeover rumors and facing disappointing fourth-quarter results, computer-aided software engineering (CASE) tool vendor Index Technology Corp. announced its impending merger last week with Rockville, Md.-based Sage Software, Inc.

The deal will create a company that offers what officials claim is a range of complementary CASE products. Sage Chief Executive Officer Kevin J. Burns will serve as chairman and CEO; Index head Richard A. Carpenter will remain vice chairman and chief strategist.

Analysts questioned whether the combination can recapture momentum. Index's Excelerator line once dominated the IBM-based front-end CASE tool market; however, "Knowledgeware [Inc.] has been taking market share steadily away from them," said Scott Smith, an analyst at Donaldson, Lufkin & Jenrette, Inc.

Index is projecting a $1 million to $2 million loss on sales of $11 million to $12 million for its quarter ending Dec. 31.

Smith noted there are product line synergies in the combination that unites Index with Sage. "The challenge ahead is clearly to get momentum going in the face of some pretty stiff competition," he said.

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Musical chairs

Management shifts in the $4 billion, New York-based **Siemens Corp.** have been initiated by German parent **Siemens AG.** Horst Langer, Siemens Corp. chairman and chief executive officer, will become a Siemens board of directors member in Canada and Mexico and will remain chairman. President Hans Decker will assume the role of vice chairman. Albert Hoser, president and CEO of **Siemens Ltd.** in Bombay, India, will become president and CEO.

April fool

A previously announced public offering of a block of the Japanese government's shares in **Nippon Telegraph and Telephone Corp.** will indeed take place, starting on April 1, 1991 and continuing over the next five years. However, according to business press reports out of Tokyo, the government has reduced the size of its proposed offering by 50%. Under the revised plan, it will sell 500,000 shares per year; the other half of the originally proposed 5.2 million share offering will remain in government hands.

Motorin'

Japan-based precision components manufacturer **Minebea Co.** and German motor maker **Motoren GmbH & Co. KG** are targeting a Feb. 1, 1991 debut for two joint venture companies aimed at the hard disk drive spindle motor market. According to their game plan, a German joint venture to be called **Papst-Minebea-Disc-Motor GmbH** will carry out product and process development as well as the setup of manufacturing facilities for its Thailand-based sister company, **Papst-Minebea-Disc-Motor Thailand Ltd.**

Anything worth doing is worth doing twice

Japanese giant **Kobe Steel Ltd.** has made its second capital investment in Longmont, Colo.-based **Prairietek Corp.**, inventor of the 2½-in. hard disk drive. The strengthened trans-Pacific partnership gives Prairietek $14 million to bolster its growth, including a new Singapore operation. Kobe, whose investment in the disk drive vendor now totals $19 million, gets a 24% voting interest in the company and a seat on the board.

MRS finds niche amid Japanese TV market

BY SALLY CUSACK
CW STAFF

CHELMSFORD, Mass. — When MRS Technology, Inc. was formed in 1986, the Japanese had 80% of the world market for television sets.

No, MRS does not manufacture televisions; it manufacturers wafer-stepper systems: sophisticated components of the flat-panel display screen construction process.

"When we got started, we anticipated doing most of our business with Japan, where four of the world's largest TV display makers are located," said Jack Steele, chief financial officer of MRS.

He added that from the beginning, a key component in MRS' strategy was to find a Japanese business partner that would also be willing to take an equity investment stake in the fledgling company.

MRS executives really wanted a manufacturing company as opposed to a trading company, Steele said, and in September 1987, the founders struck an agreement with Japanese manufacturer Dainippon Screen Manufacturing Co.

Dainippon owns between 20% and 25% of MRS and is responsible for distributing the MRS Panelprinter system in Japan. Undaunted by stiff competition from industry giants Nikon, Inc. and Canon, Inc., Steele said MRS is just "emerging into profitability. We're just about at the cash break-even point."

The company hopes to distinguish itself from its competitors with a new robotic component that eliminates the need for human loading during the display assembly process. It is essential that the integrated circuitry on the flat-panel wafers remains dust-free, and human interaction increases the possibility of outside contamination.

"If a flake of dust gets into a chip, it would cause malfunctioning," said Chris Bohner-Miyachi, a software engineer at MRS. "The whole purpose of the robotics element is to keep things cleaner."

There are currently between 6,000 and 8,000 wafer-stepper systems installed around the world. In addition to the Dainippon agreement, MRS has also contracted with Semitec Semiconductor Equipment GmbH for European distribution and with Taesan Engineering Co. for the Korean market.

Survival tips for the coming year

Defensive planning helps you ride out lean times without being laid off

BY ALICE LAPLANTE
SPECIAL TO CW

You are the information systems manager of 20 programmers and analysts, and you have just been told you have to cut your staff down to 10. Or worse, you are one of the programmers on the chopping block.

With the economic forecast for 1991 looking grim, systems personnel need to take a long, hard look at themselves to ensure that if a layoff does occur, they will remain on the payroll.

The following are 10 survival tips culled from IS managers and technical recruiters who foresee a weakening economy in 1991 and technology that refuses to stand still.

1 Develop strong personal computer skills. What many IS managers say could be the most essential survival skill is also what can threaten longtime IS employees the most: PC experience.

"This is your No. 1 survival skill," says Jim Webber, president of Omicron, a consortium of 60 major U.S. corporations formed to help members use computer technology most effectively.

The most endangered species is Cobol programmers who never learned to use the PC because they thought it was a toy. Now, it's quite apparent that PCs are not toys, and they are replacing the world that Cobol programmers know. These programmers have to change if they want to survive, Webber says.

2 Learn about graphical user interfaces. With graphical user interfaces becoming increasingly popular, experience in programming for Presentation Manager, Microsoft Corp.'s Windows, Motif, Nextstep or any of the ever-increasing numbers of graphical user interface alternatives cannot hurt.

Graphical user interfaces have become popular, because companies are finding that they help increase employee productivity and decrease training costs. Not only are more PC applications with graphical user interfaces coming out, but many firms are also tacking graphical front ends onto their mainframes.

3 Become a connectivity expert. Connectivity is another key area: Programmers and analysts who have experience tying together machines from different vendors are going to be in high demand.

"The ability to build and operate a network, to make sure that IBM mainframes work with Sun workstations, DEC VAXs, Compaq PCs and Apple Macintoshes makes an individual valuable," says Roger Wilkerson, president of Search Specialists, a recruiting firm in San Jose, Calif.

4 Get downsizing experience. Downsizing — the porting of applications formerly on mainframes and minicomputers to workstations, PCs or distributed environments — will be a hot trend in 1991, according to industry watchers. The main reason is that downsized environments are easier to support in terms of time and money, IS managers say.

After conducting a survey, Webber found this to be true: Approximately 70% of IS budgets go into maintaining existing mainframe-based systems in most companies.

"If you can figure out a way to perform the current IS function more efficiently and productively on smaller systems so that overhead costs can be driven down, you will endear yourself to management," Webber says.

5 Master a broader range of skills. When the pressure is on the IS manager to lay off workers, the ones who can wear two or even three hats will be most useful and most likely to be retained on the payroll.

"It sounds obvious, but when it's time to make that hard decision, the more versatile employee is going to look the most attractive," says Gary Newman, MIS director at Arter & Hadden, a Cleveland-based law firm.

6 Be aggressive in applying technology to your company's business problems. Sean Meighan, head of systems operations at Sequel Corp., a disk-drive maker and former Unisys Corp. subsidiary, says he and his staff regularly attend business unit meetings on such topics as process manufacturing and quality control. Then, whenever a problem is discussed that has a possible systems solution, Meighan says, his employees can independently come up with answers that meet the business needs and present them to the appropriate line managers without being prompted.

7 Work on your communications skills. Newman was recently forced to lay off 20% of his systems staff to meet 1990 operating expense targets, even though the firm itself grew 25% this year.

The employees who survived the cut were the ones who communicated best with systems and nonsystems management and staff members, Newman says. "The ones I kept on were technically excellent programmers, but they also let people know what they were doing," he adds.

8 Get closer to end users. IS managers say it isn't enough simply to talk to managers. Getting to know individual workers in functional departments throughout the organization is equally essential; these are, after all, the people who have to use the applications you develop.

"A lot of mainstream MIS professionals are getting dropped by the wayside because they don't have the skills to deal with end users in a practical, positive way," Webber says.

9 Know your organization's business goals and objectives. "One of the reasons that my group is successful is that we do not consider ourselves programmers," Meighan says. "Our goal is the same as the company's: to raise manufacturing volume, but at the same time, to never ship a defective product. Everything else follows from that."

10 Think constantly of your career path. Finally, no matter how secure you think your job is, you should always be thinking several years ahead in terms of career planning.

"Don't expect to be spoon-fed career options," Webber says. "Always be on the lookout for options."

LaPlante is a free-lance writer based in Palo Alto, Calif.

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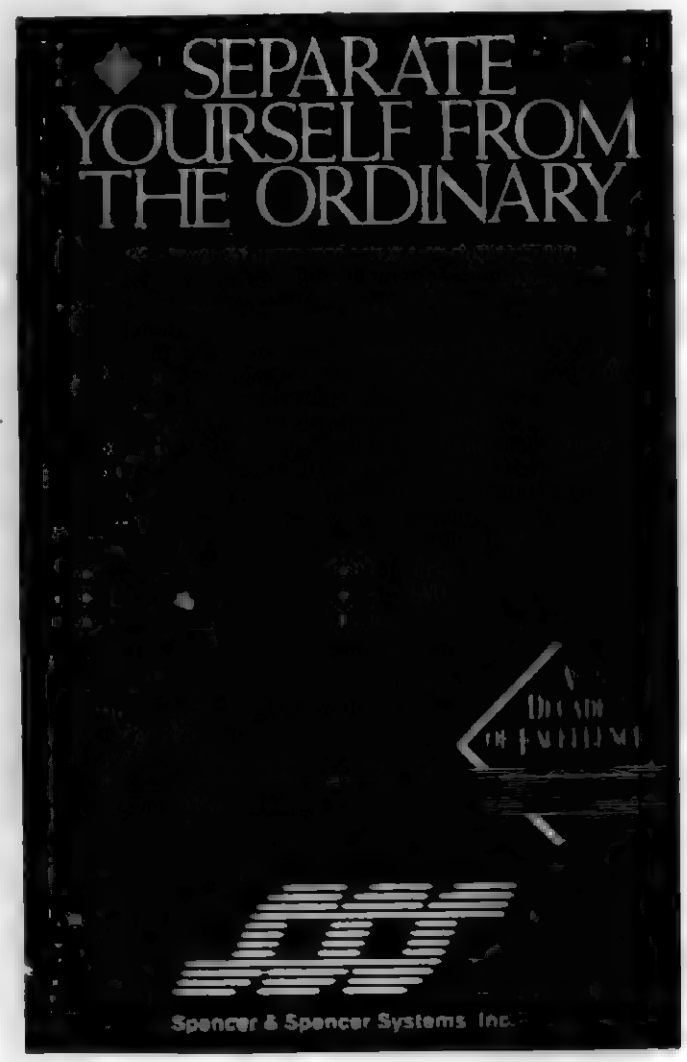

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Job Industry	of Computerworld's Audience ...
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Computer Manufacturer	79,521
large-scale computers	37,110
medium-scale computers	45,936
small-scale computers	33,851
personal computers	47,758
technical workstations	24,889
Software Vendor	130,589
for large-scale systems	57,561
for medium-scale	74,967
for small-scale systems	61,274
for personal computers	76,787
for technical workstations	26,379
Non-CPU Computer Products Manufacturer	36,994
VAR/dealer/retailer	27,557
DP Service Bureau/contract DP Services	53,077
Consulting/planning	86,677
Manufacturer (not computers)	168,664
Insurance	52,910
Healthcare	64,729
Banking/financial Services	97,953
Government - federal/state/local	110,399
Business Service (except DP)	40,108
Communications Systems	28,913
Public Utilities	54,364
Transportation	26,031
Wholesale/retail Trade	111,095
Education	125,184

SOURCE: Skill Survey of Computerworld's Audience, May 1990.

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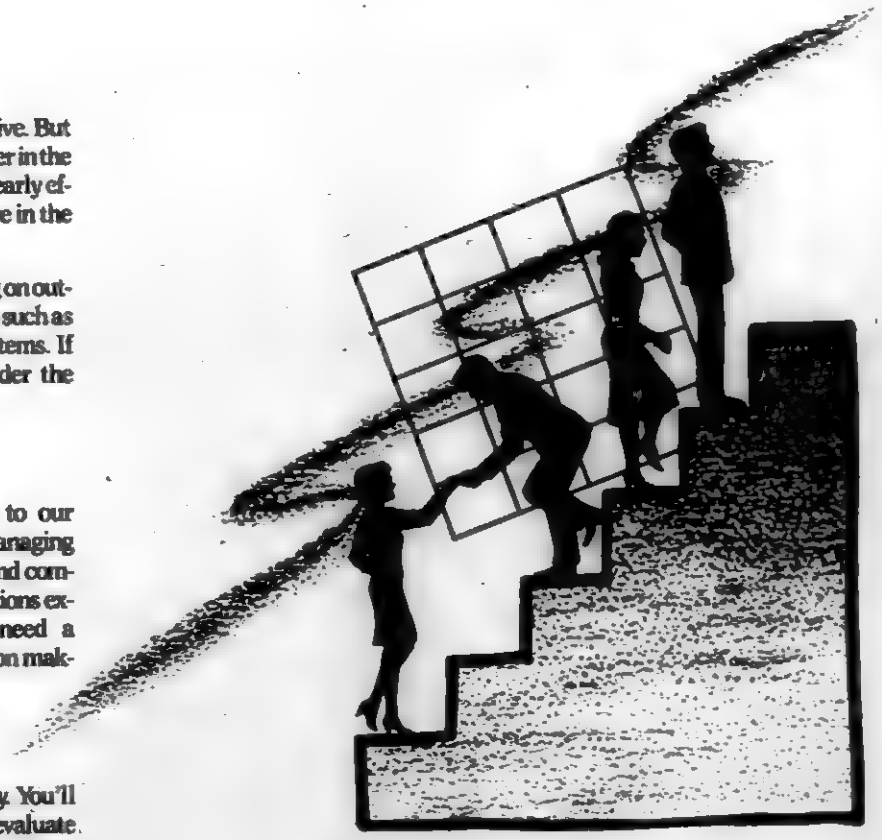

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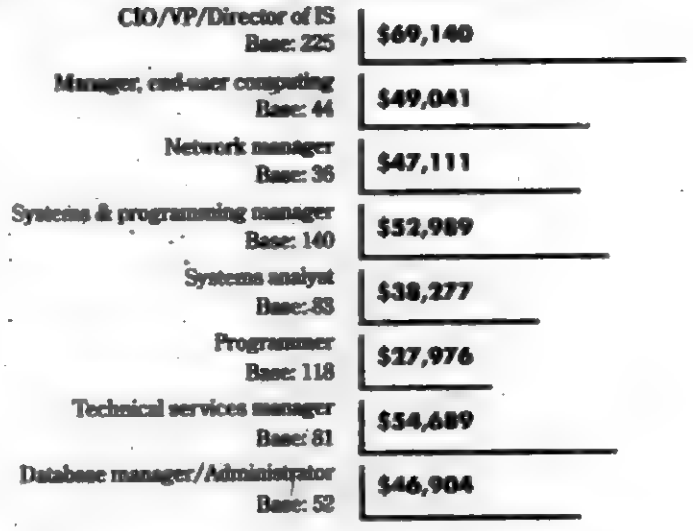

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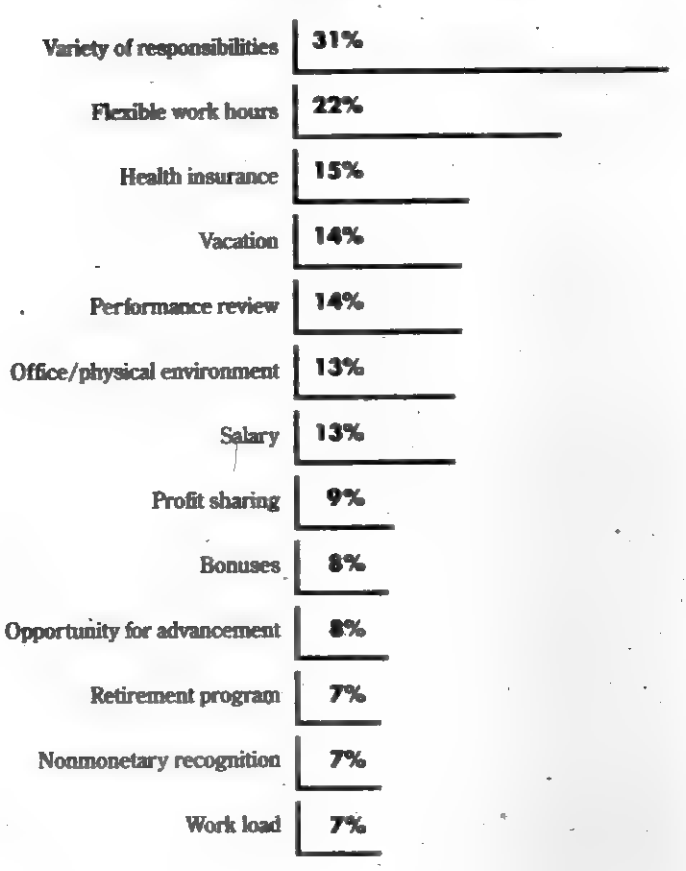

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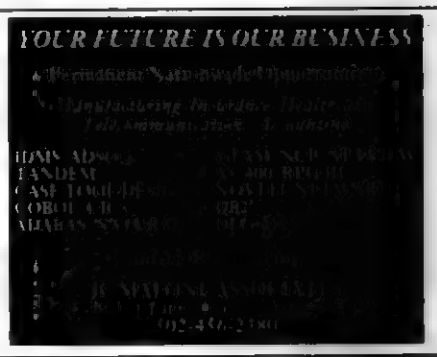

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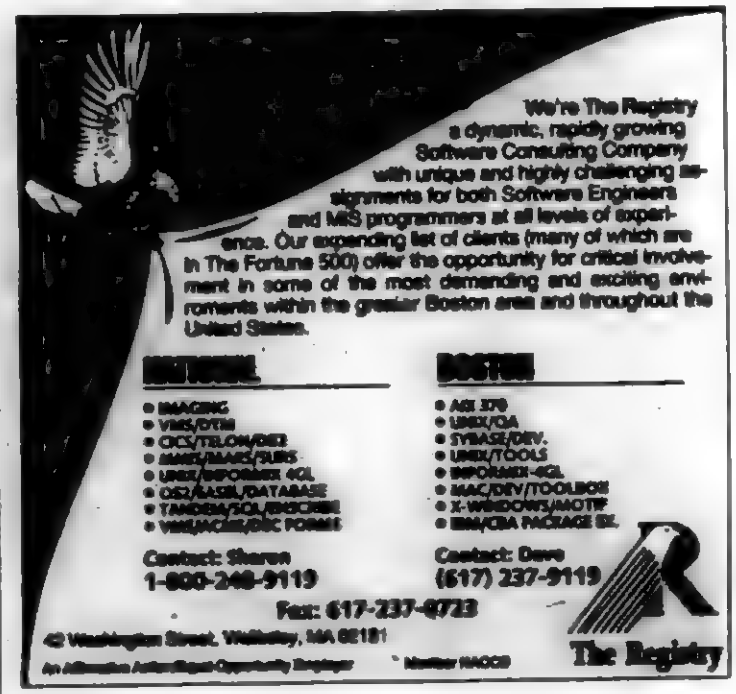

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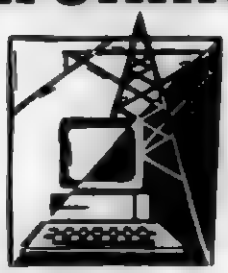

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Julie Kenzek, Chair
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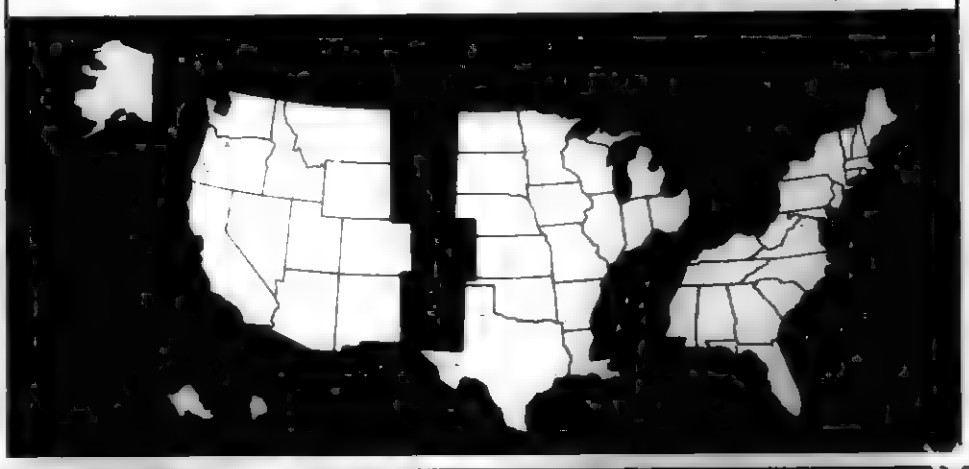

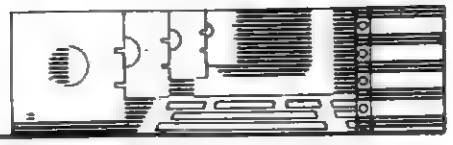

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Buyers' wish list

If you had an extra million dollars to spend, what would you buy?

Atlantic Steel's *Graham*

If this were a contest for the neediest company, I think we would win! Our IS department would be a prime example of making a system work with baling wire. We've got some good equipment; it's just outmoded. First of all, I'd want a larger CPU than our IBM 4341. Something above an IBM 4381. I would move from tape drives to cassettes. I'd put in either a token-ring or Ethernet network for my 42 personal computers. I would boost transmit rates up from 56K bit/sec. between my plants in Atlanta and Cartersville, [Ga.]. I have no disaster recovery. I want that. I would have maintenance on all my equipment.

Richard Graham
Director, MIS
Atlantic Steel Co.
Atlanta

Turner Broadcasting's *Johnson*

What I'd do is take that money and replace the rest of my outmoded private branch exchanges. I've got some locations that can use some new ones. In this way, I would be able to control all of our PBXs from a central location. I could program, do moves, adds, changes and so forth without having to dispatch someone to the remote site or call one of the regional Bell operating companies.

Michael Johnson
Corporate Director
MIS and Telecommunications
Turner Broadcasting System, Inc.
Atlanta

Revlon's *Hoffman*

I'd like to take the million dollars and somehow get a perfectly designed system. Or I would take the money and put it all into debugging every problem that exists so I can walk into next year without an open item on my request list. But on a more practical level, I'd go for laptop computers for my field reps. Then I'd upgrade my IBM Application System/400 for distributed processing to get the information out to the field. If I had anything left over, I would work for sales force automation to produce sales presentation information for the field.

Steve Hoffman
Director of Information Services
Beauty Care Division
Revlon, Inc.
New York

If I had $1 million, I would invest it in the best digital PBX I could possibly get my hands on — one that would be capable of robust yet seamless integration with my business and publishing systems. I would then invest whatever resources would be necessary to build applications to take advantage of that integration, such as telemarketing, database marketing and autodialing. We'd do a lot more with computer-integrated telephony than is currently being done. This all would cost a lot more than a million, but I'd be happy.

Robert Murphy
Director of Information Services
The Boston Globe
Boston

I would throw out all the old printers that we have now and buy everybody a new laser printer. We have an AS/400, so I would buy additional hard disks for more storage space. We hardly have any 80386-based PCs, so I would probably purchase 50 PCs, which would be about $150,000. One technology that I would love to get in here that I would never even consider because we'd never have the budget is PC networks. I would consider purchasing a Compaq Systempro, using that as a file server for all of the machines and see if we could tie everyone into our AS/400 that way.

Bob Curtis
Manager of MIS
New World Entertainment
Los Angeles

I don't know how wild and crazy this is, but I would invest the money in an image processing system — with scanning, file storage and optical disc. I'd buy such a system so we could store the images of leases and things of that nature. This ability would be extremely helpful — we're in the commercial real estate business. On the other hand, if I had all the money in the world to play with in my budget, I would invest it in wireless transmission so that I could eliminate our fiber-optics network, our coaxial cables and all that nuisance stuff.

Dave Luce
Corporate Director of IS
The Rockefeller Group
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The Boston Globe's Murphy

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	Closing price	Recent high	Recent low
IBM PC Model 176	$300	$450	$200
XT Model 086	$500	$550	$450
XT Model 089	$550	$625	$400
AT Model 099	$650	$975	$500
AT Model 239	$875	$1,025	$750
AT Model 339	$925	$1,100	$900
PS/2 Model 30-286	$1,100	$1,300	$1,025
PS/2 Model 60	$1,500	$1,800	$1,400
PS/2 Model 70P	$3,425	$3,450	$3,175
Compaq Portable II	$900	$1,050	$875
Portable 286	$1,100	$1,450	$1,000
SLT 286	$2,500	$2,625	$1,500
Portable 386	$2,400	$2,800	$2,200
LTE 286	$2,050	$2,200	$1,850
Deskpro 286	$1,050	$1,200	$975
Deskpro 386/20	$2,900	$3,150	$2,400
Apple Macintosh Plus	$750	$975	$700
SE	$1,150	$1,450	$1,100
II	$2,550	$2,900	$2,400
IIFX	$6,500	$6,900	$6,400

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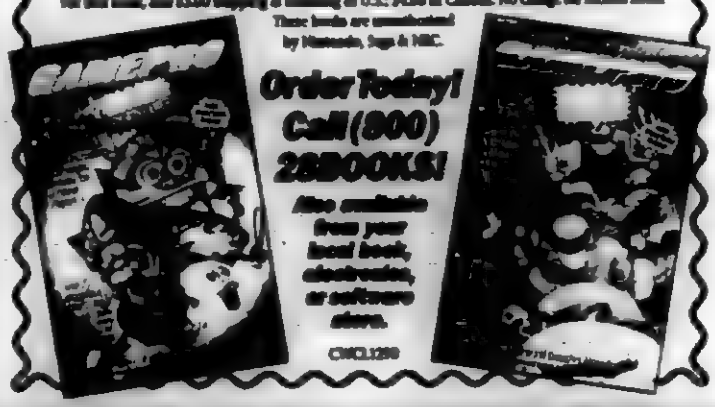

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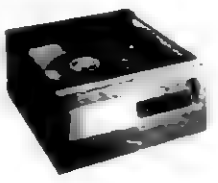

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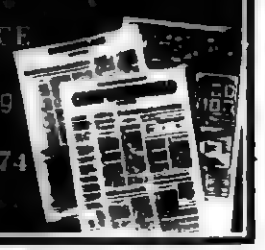

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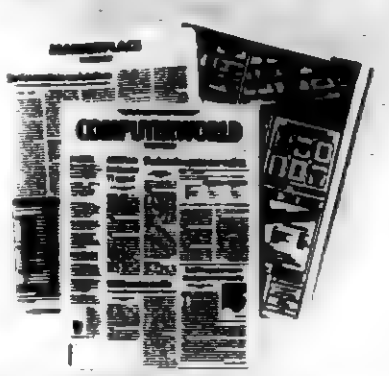

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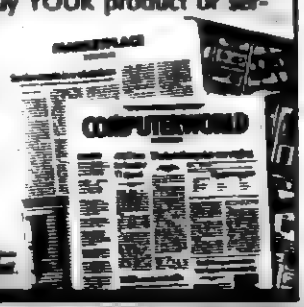

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Detailed specifications may be obtained from the CDPA office. The CDPA reserves the right to reject any and all bids and proposals and to waive informalities.

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General RFP No. 1992 due 3:30 p.m., Tuesday, January 22, 1991. This is a general RFP to be used through January 1992 for the acquisition of dedicated word processing/typing systems for MISSISSIPPI GOVERNING AUTHORITIES.

General RFP No. 1993 due 3:30 p.m., Tuesday, January 22, 1991. This is a general RFP to be used through January 1992 for the acquisition of data processing/telecommunications clerical contract personnel services for the STATE OF MISSISSIPPI.

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Worker education: a magic act?

Tight budgets are forcing companies to rethink their training techniques

BY JILL VITIELLO
SPECIAL TO CW

What's in store for training aficionados next year?

The general consensus, according to industry experts, is that technical training in 1991 must educate, inform and entertain more than ever to keep up with the demands of a work force that is becoming more technically sophisticated.

However, training managers and experts predict that budgets will continue to shrink, less expensive, self-paced, computer-based training (CBT) will skyrocket, and trainers themselves will need to change their ways.

While companies are beginning to pay attention to the competitive importance of proper technical training, they are putting little focus on actual training budgets. Furthermore, according to experts, training budgets will continue to be the first to get cut in crunch times. One way that cuts are now being made is by downsizing the training department.

As a result, fewer people are doing more work. Trainers are starting to think differently about how they do their jobs, says Fran Hall, a spokeswoman at DBMI Courseware Developers in Manchester, Conn. The most dramatic shift is a move away from instructor-led training to technology-based methods because they are less expensive. For example, Applied Technologies Group in Waltham, Mass., is relying heavily on CBT because it saves time and money, says Charles Barnicoat, group IS manager at the firm.

Technical advancements

A second reason for the increase in technology-based instruction, such as CBT, multimedia and self-training packages, is advances in areas such as optical storage on personal computers, compact disc/read-only memory and interactive digital video.

"CBT packages, which took a bad rap in the past, are now of a much better quality," says Ted Smith, manager of systems development at Union Carbide Corp. in Danbury, Conn. "The actors seem more realistic and knowledgeable, and the content has improved."

Time savings and a higher rate of learning retention among students are further strengthening the push for self-paced, technology-based training. In a study conducted by California State University at Fullerton, interactive videodisc training allowed students to learn in half the usual amount of time with a 40% greater retention rate and 300% greater mastery rate than is found with traditional instructor-led training.

However, people still find value in instructor-led training, according to Kelly Miller, national training coordinator at Logical Operations, Inc. in Rochester, N.Y.

For example, one major financial institution recently dropped its video-based training after finding that employees perform better with stand-up lectures, according to Gary Audin, president of Delphi, Inc., a training firm in Pompton Plains, N.J. Now the company uses CBT as an auxiliary training method for review or for those students with scheduling difficulties.

"In determining how to conduct training for 1991, we have to remember that different media work for different audiences and subjects," Audin says.

Smith agrees that a blend of training methods, such as mixing video with hands-on exercises, works best.

Trainer tracks

With the overall shift toward more technology-based self-training, a question lurks in the background: Where will that leave the trainer?

Elliot Masie, director and founder of the Association for Computer Training and Support in Raquette Lake, N.Y., predicts the evolution of a new kind of trainer, one who is an "applications coach." He envisions the training situation of the future this way: Eight students work independently on computer-based training modules. The applications coach roams the classroom, offering help and guidance as needed. Later, the coach is available for on-site support when the students return to their jobs.

Others say that trainers will have to be more versatile. "Trainers will want to use the full tool kit of instructional technologies to support the work force," says Bonnie Williams, vice president of sales and marketing at CES Training Corp. in Paramus, N.J.

Dan Roberts, vice president of Ouellette and Associates, Inc., a training firm in Bedford, N.H., says trainers must also be technicians. "If you haven't walked in the technical person's moccasins, you have no credibility with the people you're trying to train. Unless you've lived in the technical world, you can't customize training to meet the needs of those who live there every day."

A different direction

Clearly, training is heading in a new direction in 1991 and will require trainers and their departments to do some fancy footwork to keep up with tight budgets and increased demands.

With these pressures creeping into the picture, it will be tough for trainers to keep their objectives in sight in 1991.

"Technology is a resource, just like people, capital and time," says Vickie Walker, director of IS education at Aetna Life Insurance Co. in Hartford, Conn.

"If we are committed to advancing people through the corporation, we must help them by providing good training," she adds.

Despite the trends, trainers must keep their eyes on the mission of fitting training and methods to changing company needs.

Vitiello is a speech writer and free-lance journalist based in East Brunswick, N.J.

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NEWS SHORTS

Fire shuts down Wall St. system

Trading on Wall Street was delayed for over two hours last Thursday as a fire and explosion shut down the Manhattan building that houses the data center at Securities Industry Automation Corp. (SIAC). SIAC, which serves the New York and American Stock Exchanges, said it was ready to handle trades by 9:30 a.m, but health officials closed the building because of concerns about airborne contaminants released by a damaged transformer. Citicorp, Chemical Bank and other financial firms also have major data centers in that building.

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DG trims Asparagus

Data General Corp. recently said it ended its joint network development contract with Nippon Telegraph and Telephone in Japan. Launched in August 1987, the $100 million-plus project, code-named "Asparagus," was terminated on December 5 by both parties, said DG, which plans to use the technology in future Integrated Services Digital Network products.

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Cullinane joins Sentry board

Cullinet Software, Inc. founder John Cullinane is back in action, this time as a director of Sentry Publishing Co., which publishes technology-related magazines and newsletters. He will also head a joint venture with Sentry, to be called The Cullinane Group, which will provide publications, conferences and other services for information systems managers.

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Ameritech acquires services vendor

Ameritech and Knowledge Data Systems, Inc. signed a late-December aquisition contract worth approximately $26 million. San Francisco-based Knowledge Data, which specializes in IS services to the health-care industry, will operate as a division of Ameritech Information Systems, the IS arm of Ameritech. It reported revenue of $12.8 million in 1990.

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Amtrak cleared of VDT negligence

A federal court jury has cleared the National Railroad Passenger Corp., known as Amtrak, of charges that it failed to provide a safe workplace for employee Debra Harrinia, who blamed intensive work at a computer keyboard for her disabling wrist ailments.

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Suit claims Dbase overcharges

Just days after a federal judge declared the copyright to its flagship Dbase product invalid, Ashton-Tate Corp. was hit by a class-action suit from a group of users who feel they were overcharged during the company's reign as lord of the Dbase world. The lawsuit — filed by the Plymouth Meeting, Pa.-based group Rudolph, Palitz — asks for unspecified damages for anyone who licensed Dbase products before the Dec. 14 copyright decision.

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Zenith Data CEO steps out

Citing changes in his position resulting from the Groupe Bull buyout a year ago, Zenith Data Systems Chief Executive Officer John P. Frank recently announced his resignation.

AT&T vows to continue NCR purchase attempt

BY ELLIS BOOKER and MICHAEL FITZGERALD
CW STAFF

Whether heartfelt or not, NCR Corp.'s acrimony toward AT&T has grown steadily since the giant telephone company expressed its desire to buy NCR in December. Over the past weeks, NCR has made several defensive moves, from enlisting congressional support for its case to filing a lawsuit against AT&T.

However, AT&T officials said they will not participate in the war of words.

"This disparagement campaign is not going to make us go away," said Robert M. Kavner, head of AT&T's Computer Systems group. Kavner claimed AT&T will have higher growth in 1990 in the computer segment of its business than most computer companies, including NCR.

A merger will allow AT&T "to grow it at a greater rate than we could do in a short time organically," Kavner said.

In the interim, Kavner said his senior management team is preparing for "the best transition [that] has ever been done." In particular, he said, work is going on at AT&T Bell Laboratories to "identify what technologies we have that could be brought forward in the product line of a combined business."

Kavner was more careful regarding NCR Chairman Charles E. Exley Jr.'s threat, published in *Computerworld* Dec. 17, that he would "ax" a variety of AT&T's computer products — notably its 3B2 minicomputer family — should NCR's management team be given control of the merged operation.

"The mindset that he has is not the one we had envisioned when we said NCR management would have the authority to oversee the transition," Kavner said. He argued that Exley will not abandon the 3B2 once he sees the economics of the business and the future products planned for the 3B2 line.

AT&T's Kavner says *the firm will continue NCR acquisition battle*

Wait and see

AT&T now waits to see how many NCR shareholders will return proxy statements favoring the merger by a Jan. 15 deadline. AT&T needs 25% to force a special meeting of NCR's board.

NCR's defensive maneuvers have been varied. On Dec. 14, the same day that the board formally rejected AT&T's $90-a-share cash bid, Dayton, Ohio-based NCR filed a lawsuit in U.S. District Court for the Southern District of Ohio alleging that AT&T's filings in its tender offer were "false, manipulative and misleading."

NCR recently retained Goldman, Sachs & Co., a New York investment house. Analysts said NCR hired Goldman, Sachs in addition to its regular adviser, Dillon, Read & Co., Inc., because of its extensive international contacts, raising speculation that NCR would seek a "white knight" overseas. Congress is also getting into the act. Letters have been sent to U.S. Attorney General Richard Thornburgh urging a review of AT&T's plans for antitrust conflicts. Letters have also been sent to the head of the Federal Communications Commission, which regulates AT&T's long-distance business.

A third letter written by Representative Tony Hall (D-Ohio) is being circulated for signatures and will be sent to President Bush for referral to his Council on Competitiveness.

Finally, playing on AT&T's desire to keep NCR's management intact, Exley has threatened to leave the firm if the takeover goes through. Other industry observers continue to bet that AT&T will raise its $90-per-share cash offer to appease NCR's management and quickly complete the merger.

DEC still ironing out VAX 9000 wrinkles

BY MARYFRAN JOHNSON
CW STAFF

MAYNARD, Mass. — Mainframe growing pains had Digital Equipment Corp. officials reaching for the aspirin in late December, as reports surfaced about a hardware defect that repeatedly crashed some systems. Also stirring up concern were proposed changes in software licensing fees and a job switch for DEC's senior mainframe executive.

While the bug affected only four or five machines out of the first 75 shipped from July to September, DEC officials said they dispatched field engineers to all 75 sites to replace the multichip unit causing the trouble.

The multichip units are a core technology in the VAX 9000 and are comparable to IBM's Thermal Conduction Modules in its 3090 mainframes. The faulty multichip units were causing system crashes at sites with "very heavily loaded I/O and computation going on simultaneously," said Peter Ross, product manager for the VAX 9000.

"Our first inclination on this glitch is that it's not a problem," said George Kerns, vice president of information services at Contel Cellular, Inc. in Atlanta.

Even for customers untouched by the bug in the multichip units, "frustration" is often among the first words they use to describe their experience with the new mainframe. "We haven't experienced the glitch, but we've had other problems like our power supplies blowing up," said George Singer, VAX section manager at Aerospace Corp. in El Segundo, Calif.

DEC is also facing personnel adjustments. Robert Glorioso, the executive in charge of mainframe business, will remain vice president of the Information Systems Business unit but give up engineering responsibilities for the VAX 9000, a spokesman said.

Analysts and DEC insiders said in late December that mainframe hardware development responsibilities would likely end up with William Demmer, the vice president responsible for all midrange VAX systems and VMS development.

DEC will also change its software licensing procedures in 1991 to deal with reports of customer "sticker shock."

Developing a way to "meter" software use or expanding its present license management facility are two ways in which DEC is approaching the problem, said Mary Welch, DEC software business marketing manager.

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Computerworld (ISSN 0010-4841) is published weekly, with a single combined issue for the last week in December and the first week in January by CW Publishing/Inc., 375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171.
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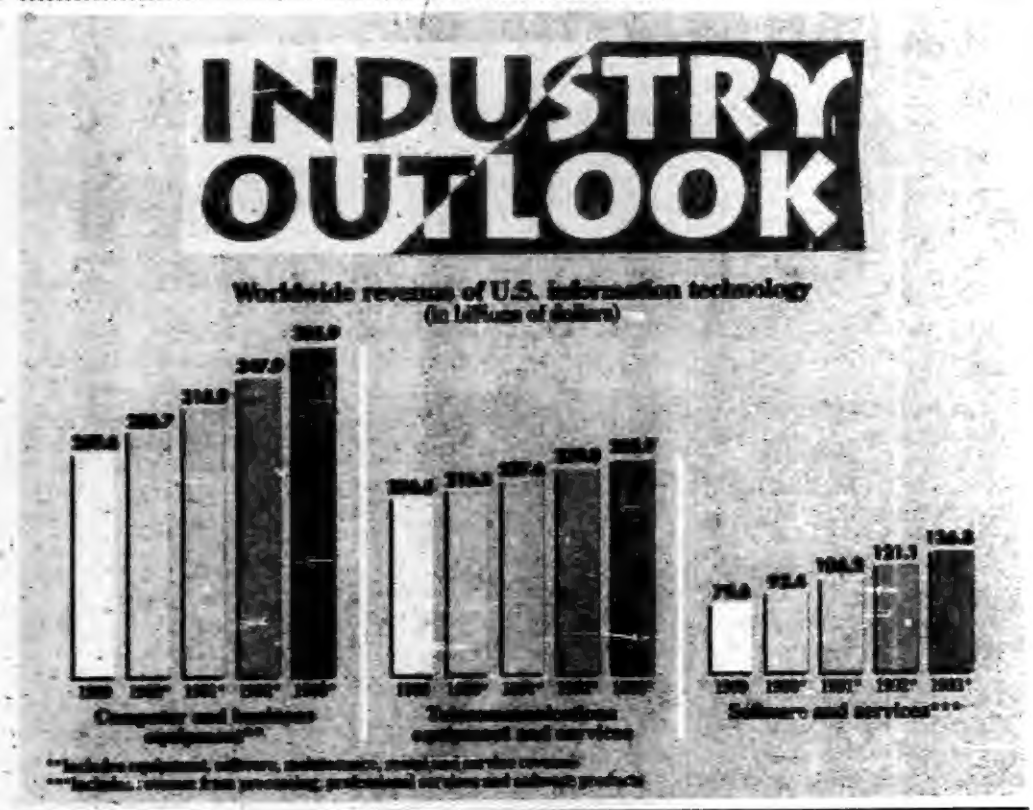

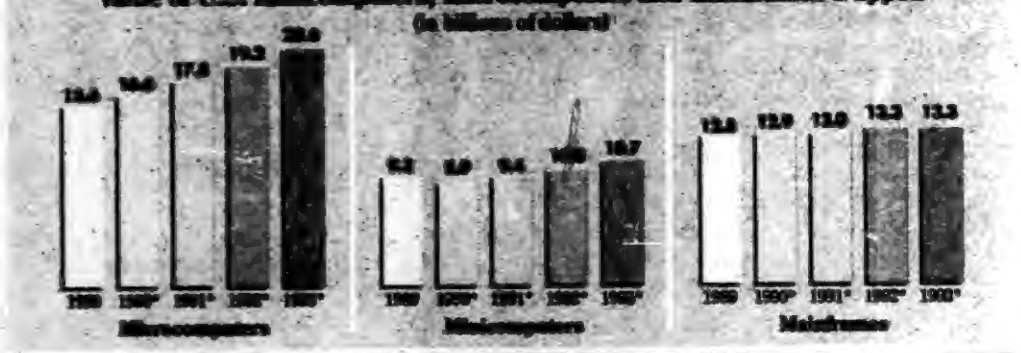

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NEXT WEEK

Keith Williams is one of the world's more unusual chief information officers, but he fits in perfectly with the alternative corporate lifestyle of Vermont-based Ben & Jerry's Homemade, Inc. However, Williams faces many of the same challenges as his pinstriped brethren, such as user resistance to change. He is profiled in Manager's Journal.

Stella Johnson

There's a lot more to changing architectures than shopping for new technologies. Developing a plan that makes sense and creating some momentum behind it are the hard parts. Figuring out how to move ahead without disrupting critical business functions is even harder. Read Executive Report to find out how to perform these tricky maneuvers.

INSIDE LINES

Out with the new . . .

1990 was definitely not the year of OS/2, which many in the industry would say was all but killed off as a viable competitor in the PC market. One member of the Microcomputer Managers Association says IBM has only itself to blame. Presentation Manager, he says, had to be compatible with IBM's mainframe graphics application programming interface. IBM demanded that Presentation Manager "be capable of running on a 286 and not detect or take advantage of 386 capabilities," he claimed. IBM had to do this because it had just sold millions of the 80286-based Personal System/2 Model 50s by telling customers that it was the perfect machine for OS/2.

. . . and in with the old?

After spending one year licking its wounds, Wang Labs seems poised once more to try and make the leap from its famed dedicated word processor tradition to the PC reality. Upword, an "advanced," Windows-based word processor for PCs, is making the beta-test rounds and is said to be close to shipping. The package requires a PC 200/300 with 640K bytes of random-access memory and a 20M-byte or greater hard drive. A plus for hard-core Wang WP users, the new interface reportedly does not require a mouse. More than 225 software changes have been made so far, based on beta-test input. To ensure upward continuity for Wang WP and WP Plus users, the package retains many Wang editing features.

Roasting on an open fire

U.S. Bell operating companies partnered with CATV companies are all set to overrun the UK network market if the government's Duopoly Review results, as expected, in further deregulation. According to one consultant, however, this will simply result in chaos as users struggle to keep track of who provides local service at what price in which district — and perhaps having to install several types of telecom equipment. Meanwhile, British Telecom is keeping ahead of its growing host of rivals by announcing support of IBM's computer-to-PBX link, Callpath, so that its users can hook their incoming calls to IBM host databases — just like in the U.S.

Joy to the world

Application Configured Computers, Inc., an antivirus software publisher and computer security consulting company, is trying to interest the Department of Defense, among other government agencies, in a computer virus that imperceptibly alters a monitor's refresh rate, thereby triggering a headache in the targeted operator. "It's a nonlethal weapon" that could be used against radar operators and others, says Tom Sobczak, a vice president at Application Configured Computers.

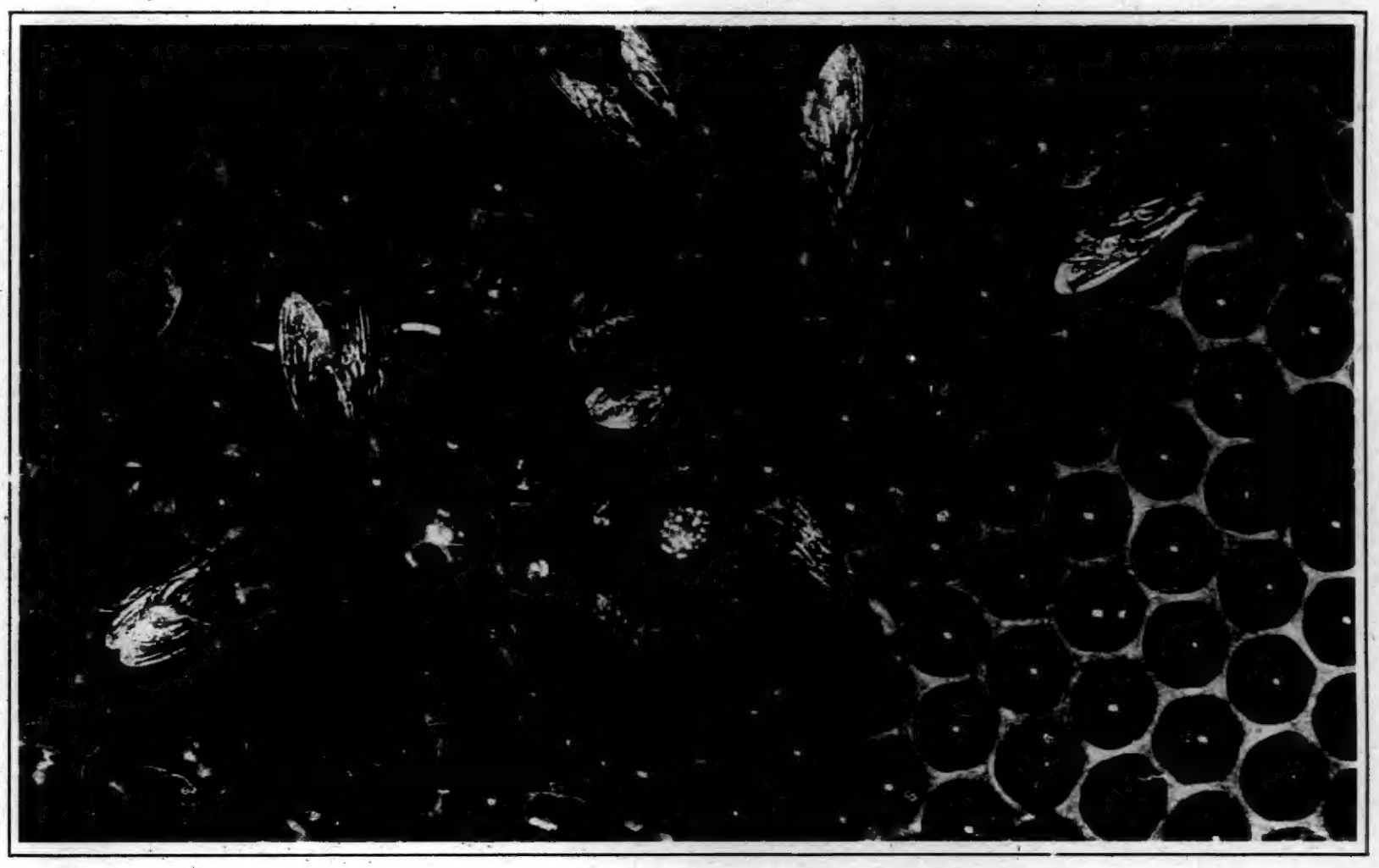
Ring in the new chief?

One very reliable source offered up this observation: "A headhunter I know tells me that Bachman Information Systems is quietly looking for a new chief executive officer, and the two leading contenders for the job are Jim McCormack and Frank Dodge." The public relations firm representing Bachman Information Systems, a Masa.-based CASE vendor, says current CEO Arnold Kraft isn't talking about stepping down, and the firm is "meeting and beating" projected numbers.

An oft-told fable

Connectivity will be the buzzword for Apple Computer at January's Macworld/San Francisco. The Cupertino, Calif.-based company plans to unveil a pair of Ethernet connectivity cards, one for the recently announced Macintosh LC and another for its Macintosh II family. Several transceivers, as well as an updated version of Apple's X-Window software for its A/UX Unix offering, will also debut.

News Editor Pete Bartolik is ringing in the New Year with a new toy to review and is looking for a few good helpers. A fax board is in place and is all set to try out, so jot down this alternate CW fax number: (508) 620-7721. If you'd prefer to stick with the tried and true, the standard CW fax number is (508) 875-8931. For those who scoff at fax pollution, send your New Year's tips via MCI Mail, addressed to COMPUTERWORLD, *or just call (800) 343-6474.*



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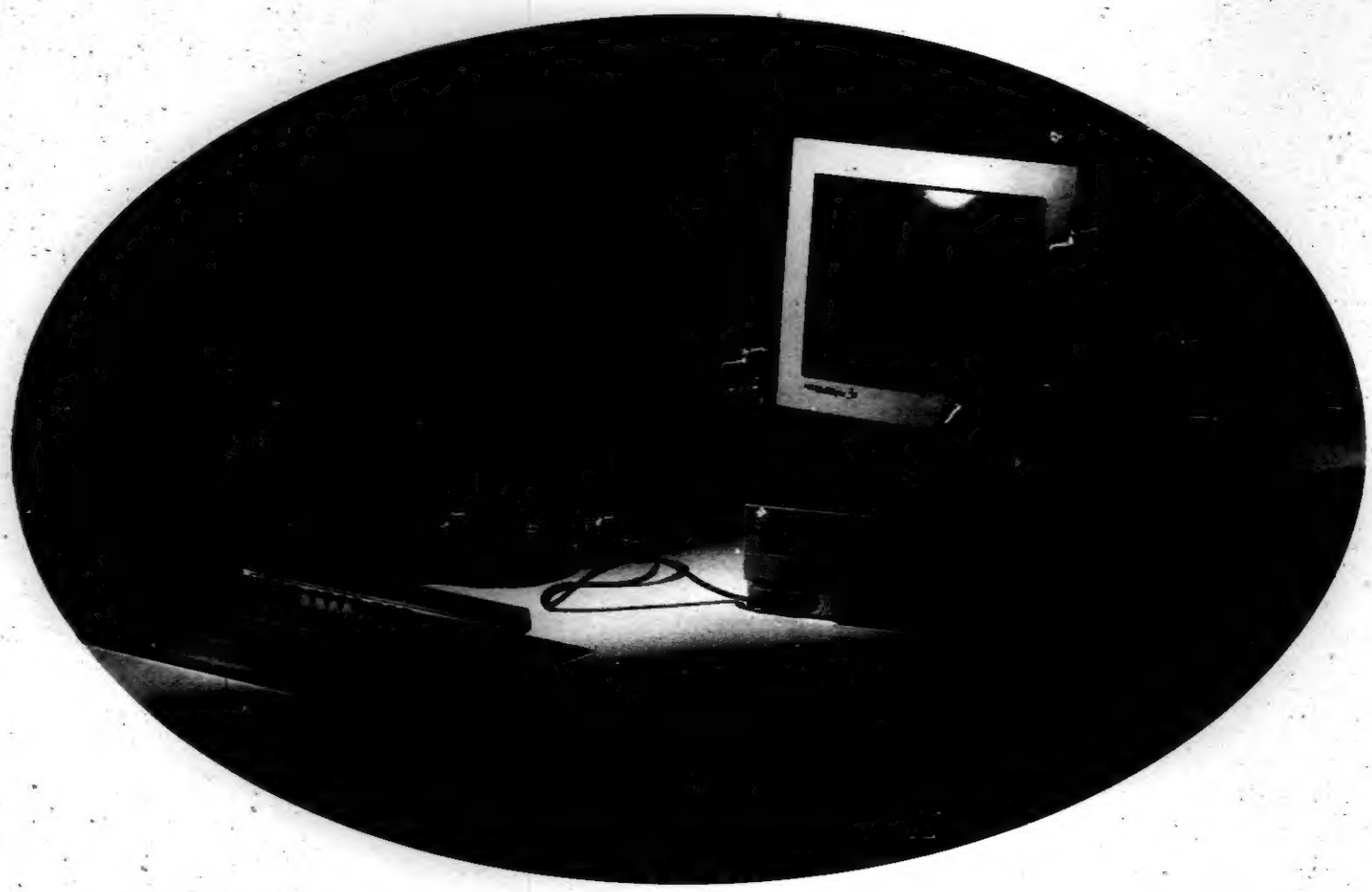

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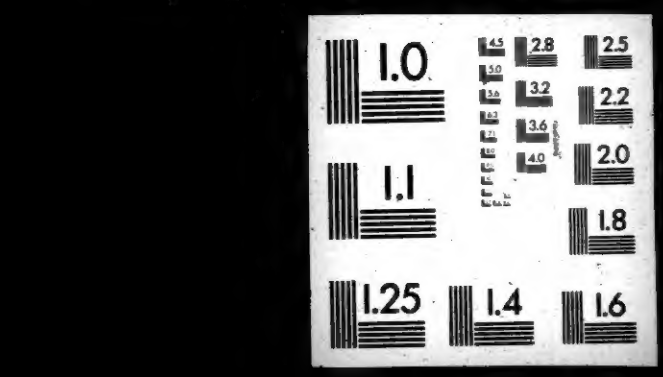
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